Integration Guide | PUBLIC
Document Version: 2502 – 2025-02-16

SAP Digital Manufacturing Integration Guide

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THE BEST RUN SAP

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1 Introduction

This Integration Guide provides you with information on the available integration options and gives you step-by-step instructions to integrate your business system with SAP Digital Manufacturing.

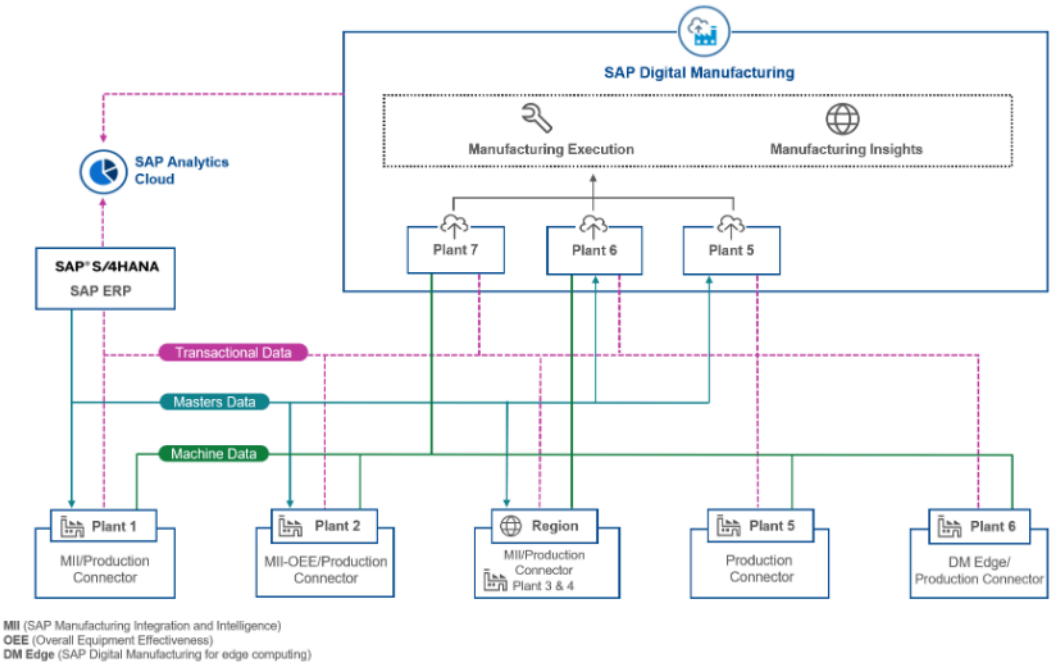
Overview

SAP Digital Manufacturing is a fully cloud-based manufacturing execution system that focuses on the execution, data analysis, control, and integration of manufacturing processes. SAP Digital Manufacturing connects the shop floor with your business system to optimize resources and execution.

This Integration Guide gives you an overview of the existing integration scenarios and provides you with detailed information on the steps required to integrate your business system with SAP Digital Manufacturing. The guide covers the technical as well as the business aspects of your integration project. You'll learn how to enable the data exchange between systems and how to make sure that the right business data are transferred.

Watch this video to get an overview of what the Integration Guide offers:

Example of a Hybrid Digital Manufacturing Landscape



SAP Digital Manufacturing can be integrated with the following business systems:

- SAP ERP
- SAP S/4HANA
- SAP S/4HANA Cloud Private Edition
- SAP S/4HANA Cloud Public Edition
- SAP Manufacturing Integration and Intelligence
- Production Connector for SAP Digital Manufacturing
- SAP Overall Equipment Effectiveness Management
- SAP Extended Warehouse Management

This integration enables the exchange of transaction data, master data, and machine data between the customer-level business systems and SAP Digital Manufacturing for execution or SAP Digital Manufacturing for insights.

> ⓘ Note
>
> The following documentation uses the term "SAP S/4HANA" to refer to both SAP S/4HANA Cloud Private Edition and SAP S/4HANA. If any of the information provided applies to only SAP S/4HANA Cloud Private Edition or SAP S/4HANA, this will be clearly specified.

Integration Options

The following integration scenarios are available:

- SAP Digital Manufacturing for execution Integration [page 8]
- Shop Floor Integration [page 497]
- Resource Orchestration Integration [page 510]
- SAP Digital Manufacturing for issue resolution Integration [page 552]

As an extensive capability of SAP Digital Manufacturing, SAP Digital Manufacturing for edge computing also provides multiple integration scenarios. For more information, see SAP Digital Manufacturing for edge computing Integration [page 577].

> → Recommendation
>
> The business scenarios presented in this Integration Guide are examples of how you might use SAP software in your company. The business scenarios are intended only as models and may not run in your specific system landscape exactly as they're described here. Be sure to check your requirements and systems to determine whether these scenarios can be used productively at your site. Also, we recommend that you test these scenarios thoroughly in your test systems to ensure they're complete and free of errors before going live.
>
> This Integration Guide primarily discusses the overall technical implementation of SAP Digital Manufacturing and not its subcomponents. This means that additional software dependencies might exist that aren't mentioned explicitly in this document.

Minimum Version Requirements and Supported Scenarios

Here you'll find detailed information on the minimum version requirements and supported scenarios:

- Minimum Version Requirements and Supported Scenarios for Integration with SAP ERP / SAP S/4HANA [page 11]
- Minimum Version Requirements and Supported Scenarios for Integration with SAP S/4HANA Cloud Public Edition [page 367]
- Minimum Version Requirements and Supported Scenarios for Integration with the Production Connector [page 503]
- Minimum Version Requirements and Supported Scenarios for Integration with SAP Extended Warehouse Management [page 458]
- Minimum Version Requirements and Supported Scenarios for Integration of SAP ERP with SAP Digital Manufacturing for issue resolution [page 552]
- Minimum Version Requirements and Supported Scenarios for Integration of SAP S/4HANA with SAP Digital Manufacturing for issue resolution [page 563]

> **Note**
>
> To find out more about any limitations or restrictions that could apply to your scenario, see 3379404.

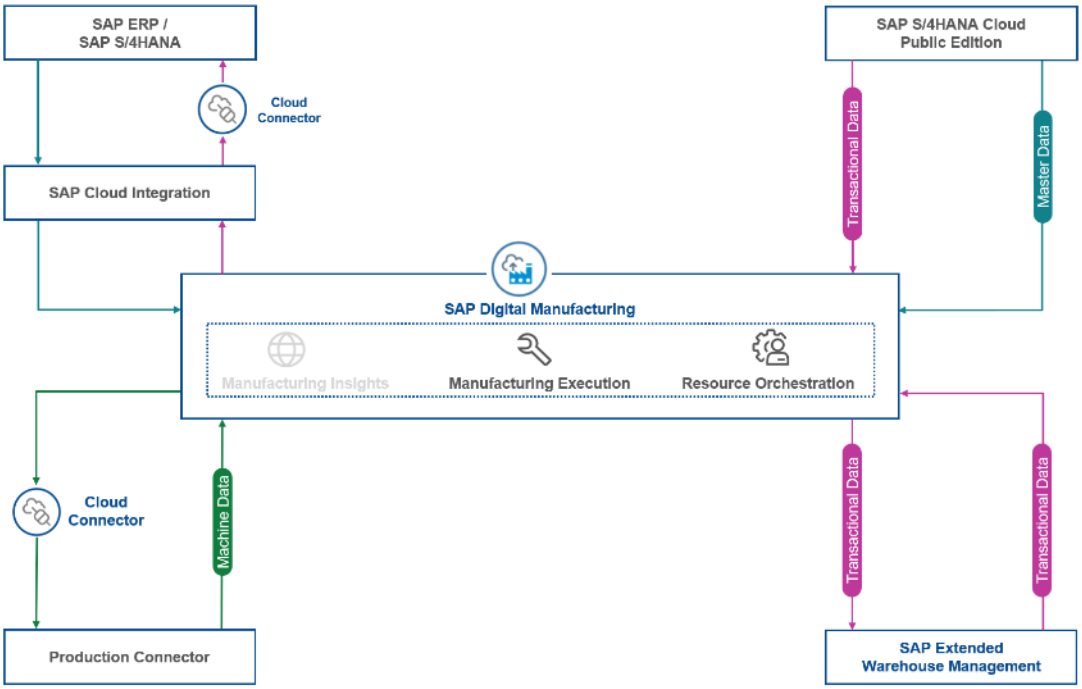
2 SAP Digital Manufacturing for execution Integration

SAP Digital Manufacturing for execution supports various integration scenarios for both discrete and process industries. The supported ERP systems include on-premise and cloud systems.

Overview

The following diagram gives you an overview of the possible integration scenarios between SAP Digital Manufacturing for execution and its partner systems. It doesn't provide information on the relationships the different partner systems might have with each other.

> **Note**
>
> The following documentation uses the term "SAP S/4HANA" to refer to both SAP S/4HANA Cloud Private Edition and SAP S/4HANA. If any of the information provided applies to only SAP S/4HANA Cloud Private Edition or SAP S/4HANA, this will be clearly specified.



- [page 10]
- Integration with SAP S/4HANA Cloud Public Edition [page 366]

- Integration with EWM [page 457]
- [page 500]
- Resource Orchestration Integration [page 510]

Business Scenarios

You can integrate SAP Digital Manufacturing for execution with SAP ERP, SAP S/4HANA, and SAP S/4HANA Cloud Public Edition to implement business scenarios for process and discrete industries. For more information, see:

- Overview Integration with SAP S/4HANA / SAP ERP for Discrete Industries [page 13]
- Overview Integration with SAP S/4HANA / SAP ERP for Process Industries [page 14]
- Overview Integration with SAP S/4HANA Cloud Public Edition for Discrete Industries [page 368]
- Overview Integration with SAP S/4HANA Cloud Public Edition for Process Industries [page 368]

Integration Scenarios

You can integrate SAP Digital Manufacturing for execution with various systems. The following table provides an overview of the integration scenarios and their constituent components:

	Integration Scenario				
Integrated Systems	**Integration with SAP ERP**	**Integration with SAP S/4HANA**	**Integration with SAP S/4HANA Cloud Public Edition**	**Integration with SAP Manufacturing Execution[1]**	**Integration with SAP Extended Warehouse Management[2]**
SAP ERP	*				*
SAP S/4HANA		*			*
SAP S/4HANA Cloud Public Edition			*		*
SAP Manufacturing Execution				*	
SAP Extended Warehouse Management	*	*	*		*
Cloud Connector	*	*		*	*
SAP Cloud Integration	*	*		*	*

- [1] Integration with SAP Manufacturing Execution is limited to Resource Orchestration.
- [2] For more information on the supported SAP Extended Warehouse Management versions, see Integration with EWM [page 457] and Minimum Version Requirements and Supported Scenarios [page 458].

Related Information

Integration with SAP S/4HANA or SAP ERP [page 10]
Integration with SAP S/4HANA Cloud Public Edition [page 366]
Integration with SAP Manufacturing Execution [page 514]
Integration with EWM [page 457]

2.1 Integration with SAP S/4HANA or SAP ERP

You can enable communication between your integrated ERP system and SAP Digital Manufacturing for execution.

> ⓘ Note
>
> The following documentation uses the term "SAP S/4HANA" to refer to both SAP S/4HANA Cloud Private Edition and SAP S/4HANA. If any of the information provided applies to only SAP S/4HANA Cloud Private Edition or SAP S/4HANA, this will be clearly specified.

SAP Digital Manufacturing for execution uses SAP Cloud Integration to communicate with integrated SAP S/4HANA or SAP ERP systems. You can connect multiple ERP systems, for example one system per plant or country. The global SAP Digital Manufacturing for execution system is used across all plants.

After you've completed the onboarding procedures as described in Onboarding and User Management, you can continue with the configurations required to establish connectivity between SAP Digital Manufacturing and your ERP system.

Integration with SAP S/4HANA or SAP ERP enables the data transfer from and to these systems. The data transfer can be broadly categorized into master data and transactional data. To transfer data, you need to make sure all prerequisites are met and the required configurations are set up. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16] and Business Integration with SAP S/4HANA or SAP ERP [page 128].

Related Information

Minimum Version Requirements and Supported Scenarios [page 11]

2.1.1 Minimum Version Requirements and Supported Scenarios

This topic describes the minimum release requirements, supported scenarios, and limitations for integrating SAP Digital Manufacturing with SAP ERP and SAP S/4HANA.

Minimum Release Requirements

To use all features provided by SAP Digital Manufacturing, you require:

- SAP ERP 6.0 EHP7 or higher
- SAP S/4HANA 1709 onwards

> ⓘ Note
>
> For some integration message types, there are higher versions requested. For more information on the supported message types and versions, see 3050090.

Supported Scenarios

Scenario	SAP ERP	SAP S/4HANA
Production order	Yes	Yes
Process order	Yes	Yes
Service order	Yes	Yes
Planned order	Yes	Yes
Material	Yes	Yes
Characteristic	Yes	Yes
Class	Yes	Yes
Classification Assignment	Yes	Yes
Bill of materials	Yes	Yes
Routing	Yes	Yes
Recipe	Yes	Yes
Work center	Yes	Yes
Equipment PRT	Yes	Yes

Scenario	SAP ERP	SAP S/4HANA
Work instruction at order header level	Yes	Yes
Yield/scrap	Yes	Yes
Inventory	Yes	Yes
Return inventory	Yes	Yes
Scrap inventory	Yes	Yes
Use Resource Orchestration for scheduling	Yes	Yes

Middleware Requirements

- SAP Cloud Integration and Cloud Connector are required as middleware
- SAP Cloud Integration in the Neo environment is supported

Supported IDocs

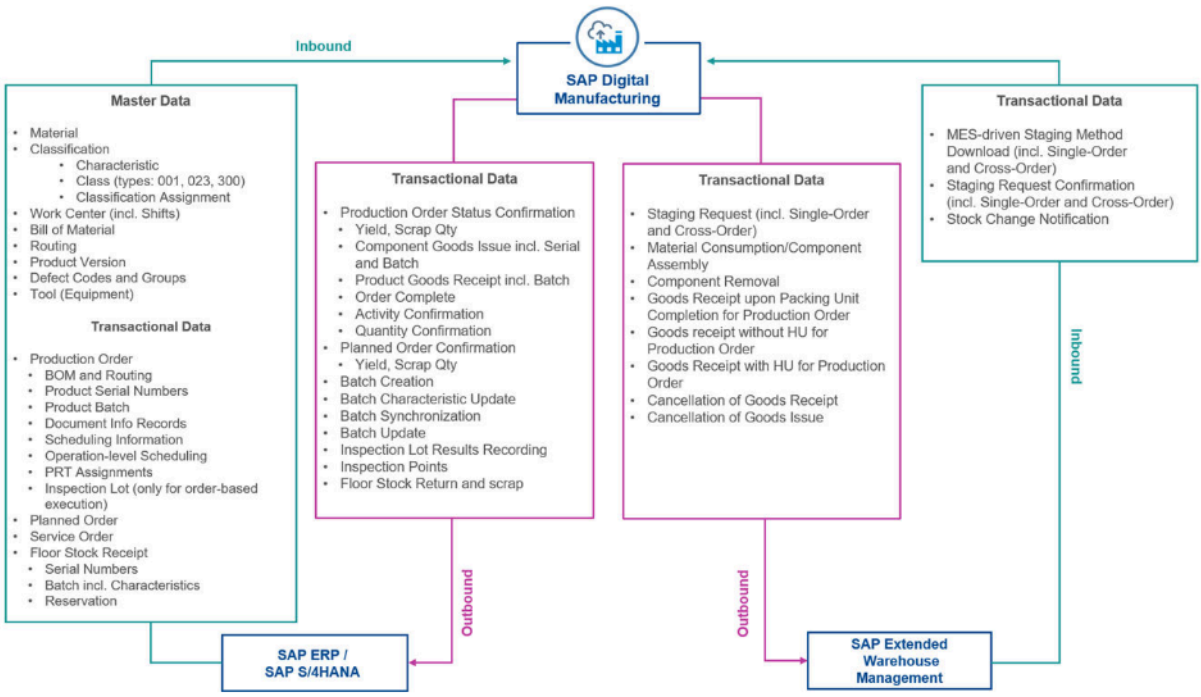
IDoc	SAP ERP	SAP S/4HANA
`MATMAS03`	Yes	Yes
`MATMAS04`	Yes	Yes
`MATMAS05`	Yes	Yes
`CHRMAS05`	Yes	Yes
`CLSMAS04`	Yes	Yes
`CLFMAS02`	Yes	Yes
`BOMMAT04`	Yes	No
`BOMMAT05`	No	Yes
`LOIROU04`	Yes	Yes
`LOIPRO05` (production and process orders)	Yes	Yes
`LOIPLO02` (planned order)	Yes	Yes
`IORDER01` (service order)	Yes	Yes
`INVCON02`	Yes	No

IDoc	SAP ERP	SAP S/4HANA
INVCON03	Yes	Yes
LOIWCS03	Yes	Yes
EQUIPMENT_CREATE02	Yes	Yes
PP_SHIFT01	Yes	Yes

> **Note**
>
> To find out more about any limitations or restrictions that could apply to your scenario, see 3379404.

2.1.2 Overview Integration with SAP S/4HANA / SAP ERP for Discrete Industries

The following diagram provides an overview of the integration of SAP Digital Manufacturing for execution and SAP ERP or SAP S/4HANA for discrete industries. Select highlighted areas for more detailed information.

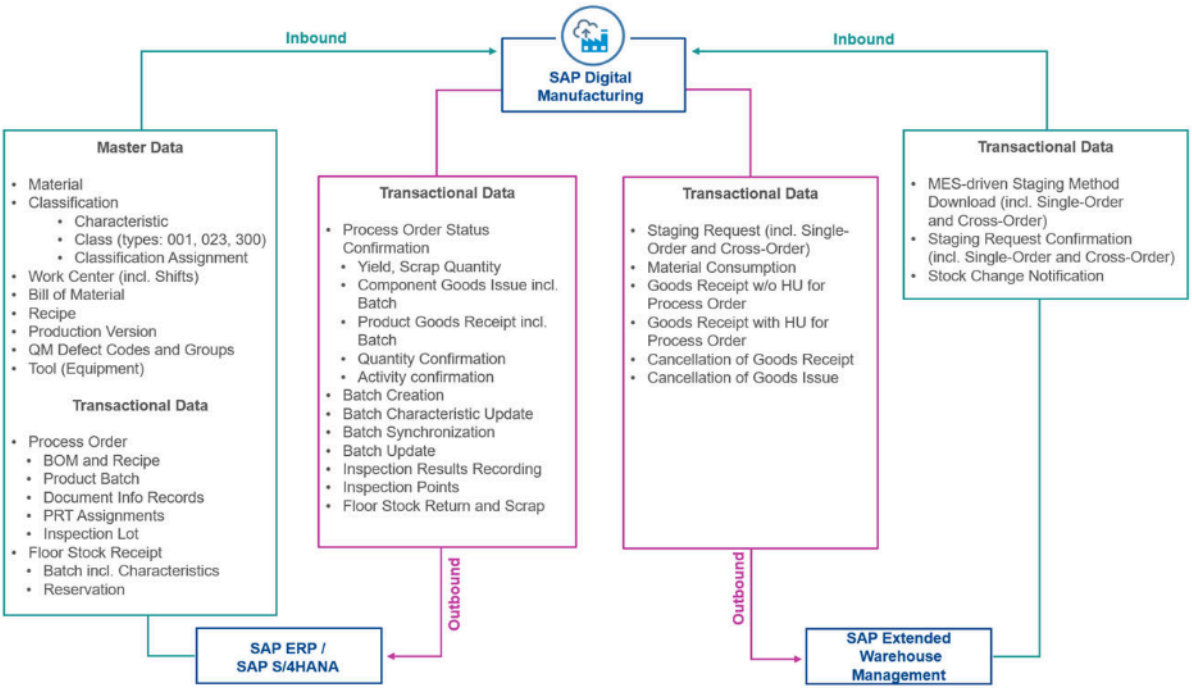


- Work Center Integration [page 162]
- Bill of Material Integration [page 149]
- Routing Integration [page 166]
- Production Version [page 152]

- Transferring QM Defect Code Groups and Codes from SAP S/4HANA [page 165]
- Tool Integration [page 169]
- Production Order Integration [page 172]
- Transfer of Floor Stock Data [page 230]
- Material Integration [page 130]
- Production Order Status Confirmation [page 187]
- Inspection Results Recording (Process Order and Production Order) [page 229]
- Configure Inspection Points
- Transfer of Floor Stock Return and Scrap Data [page 238]
- Integration with EWM [page 457]
- Staging Request Upon Order Release
- Material Consumption (Order POD)
- EWM Goods Receipt (Work Center POD)
- EWM Goods Receipt (Order POD)
- Component Removal
- Transferring a Planned Order [page 206]
- Planned Order Integration [page 205]
- Activity Confirmation [page 196]
- Quantity Confirmation [page 197]
- Classification Integration [page 138]
- Configuring a Production Order with a BOM and Routing (Make-to-Stock or Make-to-Order Manufacturing) [page 175]
- Configuring a Production Order with Serial Numbers [page 176]
- Configuring a Production Order with a Batch Number [page 178]
- Configuring a Production Order with Document Info Records [page 180]
- Configuring a Production Order with Scheduling Information [page 182]
- Transfer of Production Order with Operation-Level Scheduling [page 184]
- Transferring a Production Order with PRT Assignment [page 186]
- Production Order Complete [page 193]
- Service Order Integration [page 210]

2.1.3 Overview Integration with SAP S/4HANA / SAP ERP for Process Industries

The following diagram provides an overview of the integration of SAP Digital Manufacturing for execution and SAP ERP or SAP S/4HANA for process industries. Select highlighted areas for more detailed information.



- Material Integration [page 130]
- Work Center Integration [page 162]
- Bill of Material Integration [page 149]
- Recipe Integration [page 168]
- Production Version [page 152]
- Transferring QM Defect Code Groups and Codes from SAP S/4HANA [page 165]
- Tool Integration [page 169]
- Process Order Integration [page 198]
- Transferring a Process Order with Inspection Lot (type 03) [page 199]
- Transfer of Floor Stock Data [page 230]
- Process Order Status Confirmation [page 200]
- Activity Confirmation [page 204]
- Batch Characteristics Update [page 227]
- Configure Inspection Points
- Transfer of Floor Stock Return and Scrap Data [page 238]
- Staging Request Upon Order Release
- Material Consumption (Order POD)
- Integration with EWM [page 457]
- EWM Goods Receipt (Work Center POD)
- EWM Goods Receipt Cancellation
- Cancelling Goods Issues
- Classification Integration [page 138]

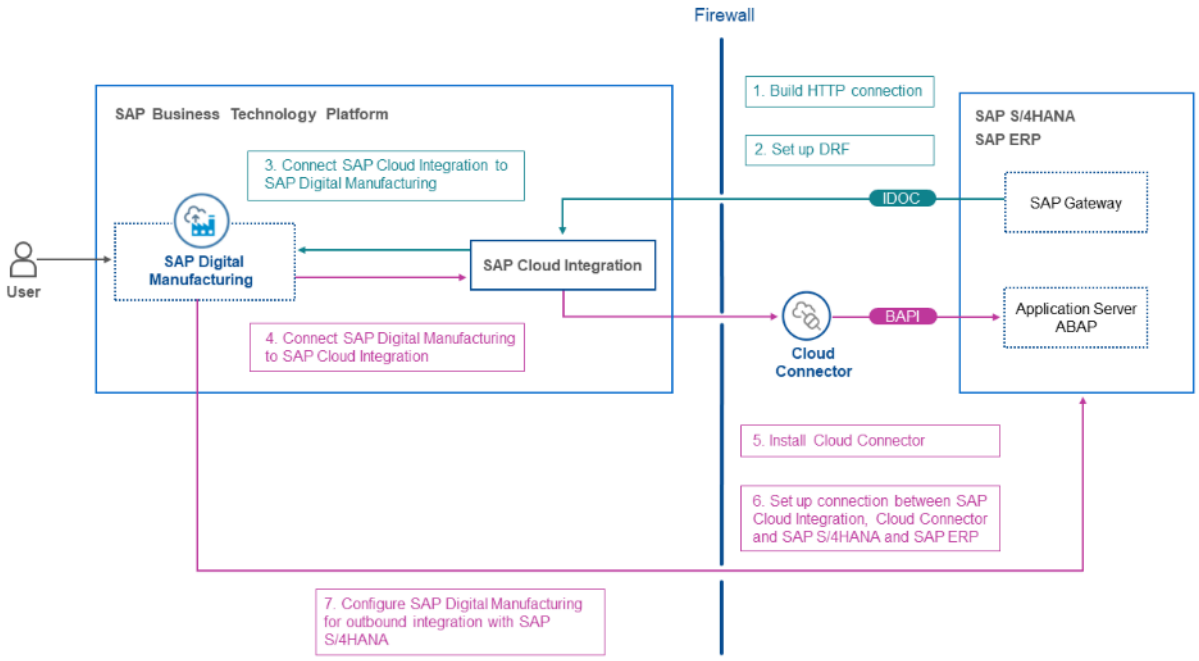
- Quantity Confirmation [page 203]
- Inspection Results Recording (Process Order and Production Order) [page 229]

2.1.4 Technical Integration with SAP S/4HANA or SAP ERP

Here are the administrative configurations that need to be set up to enable communication between SAP Digital Manufacturing for execution and SAP S/4HANA or SAP ERP.

Integration Overview

As the On-Premise Enterprise Network environment is protected by a firewall, an asymmetrical communication design connects SAP Digital Manufacturing for execution to SAP S/4HANA or SAP ERP.



- Build HTTP Connection [page 31]
- Data Replication Framework [page 37]
- Connect SAP Cloud Integration to SAP Digital Manufacturing [page 67]
- Connect SAP Digital Manufacturing to SAP Cloud Integration [page 86]
- Setting Up the Cloud Connector [page 23]
- Set Up Connection Between SAP Cloud Integration, Cloud Connector, and SAP S/4HANA or SAP ERP [page 105]
- Configure SAP Digital Manufacturing for Outbound Integration [page 107]

From SAP S/4HANA or SAP ERP to SAP Digital Manufacturing for execution, HTTPS is used to connect SAP Cloud Integration (previously called CPI). SAP Cloud Integration parses and sends the transaction to SAP Digital Manufacturing for execution for processing. Transaction examples: material import and production import.

From SAP Digital Manufacturing for execution to SAP S/4HANA or SAP ERP, an RFC is used to call SAP S/4HANA or SAP ERP BAPI from the SAP Cloud Connector. Transaction examples: production yield confirmation and production scrap confirmation.

In certain scenarios, you can also use OData for direct outbound calls to SAP S/4HANA to connect the systems. This doesn't apply for SAP ERP. For more information, see Enable Direct Communication To SAP S/4HANA [page 108].

> **ⓘ Note**
>
> For more information on the supported message types and needed integration artifacts, see 0003050090.

> **ⓘ Note**
>
> Plant names need to be unique across the different ERP systems at the client level.

> **ⓘ Note**
>
> You can check your integration scenario using the *Check Integration Configuration* functionality provided by the *Integration Message Dashboard* app.
>
> After choosing *Check Integration Configuration*, you select an integration message to start an automated test of the integration configuration that covers the full integration scenario from SAP Digital Manufacturing to the connected ERP system and back. The following tests are performed:
>
> - Destination check
> - SAP Cloud Integration parameter check
> - SAP Cloud Integration artifact check
> - Inbound connectivity check
>
> In case of an error, a message will point you to the solution.

> **→ Tip**
>
> If you're an integration developer and want to learn more about how to design integration flows, you can refer to the Integration Flow Design Guidelines. You'll find there lots of information on the underlying concepts as well as practical examples that will help you deepen your knowledge. For more information, see Integration Flow Design Guidelines.
>
> If you're particularly interested in optimizing workflow performance, you can jump right to this topic: Optimize Performance.

Overview Integration Steps

For the technical integration of SAP Digital Manufacturing for execution with SAP S/4HANA or SAP ERP, perform the tasks described in the following topics:

1. Before You Start [page 18]
2. Setting Up the Cloud Connector [page 23]
3. Build HTTP Connection [page 31]
4. Data Replication Framework [page 37]
5. Prepare Credentials for Initial Parameter Deployment [page 53]
6. Connect SAP Cloud Integration to SAP Digital Manufacturing [page 67]
7. Connect SAP Digital Manufacturing to SAP Cloud Integration [page 86]
8. Set Up Connection Between SAP Cloud Integration, Cloud Connector, and SAP S/4HANA or SAP ERP [page 105]
9. Configure SAP Digital Manufacturing for Outbound Integration [page 107]
10. Enable Direct Communication To SAP S/4HANA [page 108]

Related Information

Asynchronous Communication with SAP Cloud Integration [page 111]

Troubleshooting Overview [page 488]

2.1.4.1 Before You Start

This page shows you the prerequisite steps that must be completed before configuring integration with SAP S/4HANA or SAP ERP.

Before you start, you must have performed the following steps:

- If you integrate SAP Digital Manufacturing with multiple SAP S/4HANA or SAP ERP, these systems need to have unique system IDs. Systems are identified at the client level.
- Complete the onboarding process

  > ⓘ Note
  >
  > This includes the configuration of the `S4H_INTEGRATION_OAUTH` destination. The destination data is used by SAP Digital Manufacturing to provide authentication and authorization for internal system communication.

- Download SAP Cloud Integration package. For more information on SAP Cloud Integration, see SAP Cloud Integration.

  > → Tip
  >
  > The change log of the *SAP S/4HANA Integration with SAP Digital Manufacturing* package is available here: 3315636.

> You can find troubleshooting information and frequently asked questions here: 3549024.

> → Tip
>
> It's recommended to deploy all iFlows contained in the *SAP S/4HANA Integration with SAP Digital Manufacturing* package. For more information on the required artifacts for all integration message types, see 3050090.

- Create a separate subaccount for your SAP Cloud Integration tenant in SAP BTP cockpit in addition to your SAP Digital Manufacturing subaccount. Without two separate subaccounts, the direct communication scenarios that you might want to use now or in the future aren't supported. For more information, see Enable Direct Communication To SAP S/4HANA [page 108].
- Upload SSL certificates [page 19]
- Create a Technical User for SAP S/4HANA [page 21]
- Know how to get the SAP Cloud Integration Management URL [page 22]
- Know how to get the SAP Cloud Integration Runtime URL [page 23]
- The following business functions, which are the technical basis for the Data Replication Framework (DRF), have been implemented in SAP S/4HANA or SAP ERP:
  - LOG_PP_MES_INT_01
  - LOG_PP_MES_INT_02
  - LOG_PP_MES_INT_03
- You've implemented BADI `CO_MES_INT_REDISTRIBUTION` in SAP S/4HANA or SAP ERP. This BADI makes sure that the integrated ERP system doesn't communciate an order change to SAP Digital Manufacturing after receiving the release notification (RMES). For more information, see 2165261.

Next Steps

- Setting Up the Cloud Connector [page 23]
- Build HTTP Connection [page 31]
- Set Up Data Replication Framework (DRF) [page 37]
- Connect SAP Cloud Integration to SAP Digital Manufacturing [page 67]
- Connect SAP Digital Manufacturing to SAP Cloud Integration [page 86]
- Set Up Connection Between SAP Cloud Integration, Cloud Connector, and SAP S/4HANA or SAP ERP [page 105]
- Configure SAP Digital Manufacturing for Outbound Integration [page 107]
- Enable Direct Communication To SAP S/4HANA [page 108]

2.1.4.1.1 Upload SSL Certificates

This page shows you how to upload SSL certificates to build the trust between the systems.

The certificate uploading processes mentioned below apply to SAP Cloud Integration in both Neo and Cloud Foundry environments.

Upload SSL Certificate of SAP Cloud Integration to SAP ERP or SAP S/4HANA

Download SAP Cloud Integration Certificate

1. Go to the SAP Cloud Integration management URL, which you can find in the service key of your api plan service instance in your SAP Cloud Integration subaccount in SAP BTP cockpit. You can ignore any 404 error when accessing the URL. For details, see How to Get SAP Cloud Integration Management URL [page 22].
2. Choose 🔒 in the address bar to download the SSL certificate of SAP Cloud Integration. Save the certificate in file format `base-64 encoded X.509 (.cer)`.

Upload Certificate to SAP ERP or SAP S/4HANA

1. Log on to the SAP ERP or SAP S/4HANA system as an Administrator.
2. Use the transaction `STRUST` to access *Trust Manager*.
3. Upload the certificate you saved in previous steps to *SSL client SSL Client (Standard)* node.

Upload SSL Certificate of SAP Digital Manufacturing to SAP Cloud Integration

Download SAP Digital Manufacturing Certificate

If your SAP Cloud Integration tenant is already using `DigiCert Global Root G2`, you don't need to follow the steps belows because SAP Digital Manufacturing also utilizes `DigiCert Global Root G2` certification.

1. Log on to SAP BTP cockpit and go to your SAP Digital Manufacturing subaccount.
2. Under *Instances and Subsriptions* > *Subscriptions*, choose your SAP Digital Manufacturing application in the *Application* column.
3. Choose 🔒 in the address bar to download the certificate. Save the certificate in file format `base-64 encoded X.509 (.cer)`.

Upload Certificate to SAP Cloud Integration

For more information, see Importing a Certificate.

> → Tip
>
> For information on how to renew your SAP Cloud Integration certificate, see Security Artifact Renewal for Transport Level Security.
>
> If you renew your certificate in SAP Cloud Integration and use X.509 certificate-based authentication, you need to perform the steps decribed here again: Connection with Client Certificate Authorization (X.509) [page 76].

2.1.4.1.2 Create a Technical User for SAP S/4HANA

To connect SAP S/4HANA with SAP Cloud Integration and Cloud Connector, you need to create a technical user.

Prerequisites

- Access to transaction `SU01`
- Authorization to create technical users in the system

Context

You need a technical user for SAP S/4HANA to set up a connection between SAP S/4HANA, SAP Cloud Integration, and Cloud Connector.

Procedure

1. Log on to SAP S/4HANA.
2. Open transaction `SU01`.
3. Enter the name for the technical user and choose *Technical User* to create the user.
4. As *User Type*, choose *System* from the dropdown menu.
5. Assign a password for the user.
6. In the *Documentation* tab, enter a description for the user.
7. In the *Profiles* tab, assign `SAP_ALL` or `SAP_NEW` to your user.

   For more granular control over authorizations, you can define your own roles using one of the templates available here: 3538966.
8. Choose *Save*.

Results

You have created a technical user for SAP S/4HANA.

2.1.4.1.3 How to Get SAP Cloud Integration Management URL

This page shows how to get the management URL of SAP Cloud Integration.

Prerequisites

You need to be a member of the global account in order to access the instances and subscriptions of SAP Cloud Integration tenant and get the management URL.

Get SAP Cloud Integration Management URL (Cloud Foundry Environment)

1. In SAP BTP cockpit, select your SAP Cloud Integration subaccount and then choose *Instances and Subscriptions*.
2. In the *Instances* tab, choose an instance with *api* as *Plan*.
3. In the *Service Keys* tab, choose the service key.
4. In the *Credentials* window, you find the SAP Cloud Integration management URL in the *url* field.

   Example

   ```
   https://<Cloud Integration tenant>.it-
   <...>.cfapps.<datacenter>sap.hana.ondemand.com
   ```

Note

This instance is created during the integration process. For more information, see Create a Service Instance and Key with client credential authorization [page 63].

Get SAP Cloud Integration Management URL (Neo Environment)

1. In SAP BTP cockpit, select your subaccount and then choose *Applications* > *Subscriptions*.
2. In the *Subscribed Java Applications* section, choose the *<Cloud Integration tenant>tmn* application.
3. In the *Application URLs* section, you see the management URL named *https://<Cloud Integration tenant>-tmn.<...>.eu1.hana.ondemand.com*.

Related Information

How to Get SAP Cloud Integration Runtime URL [page 23]

2.1.4.1.4 How to Get SAP Cloud Integration Runtime URL

This page shows how to get the runtime URL of SAP Cloud Integration.

Prerequisites

You need to be a member of the global account in order to access the instances and subscriptions of Cloud Integration tenant and get the runtime URL.

Get SAP Cloud Integration Runtime URL (Cloud Foundry Environment)

1. In SAP BTP cockpit, select your SAP Cloud Integration subaccount and then choose *Instances and Subscriptions*.
2. In the *Instances* tab, find the instance for the *Process Integration Runtime* service, which has *integration-flow* as plan, and choose the link to the key in the *Credentials* column.
3. In the key credentials pop-up, under *JSON*, you can see the runtime URL under the `url` tag.

> **Note**
>
> This instance is created during the integration process. For more information, see Create Instances in SAP Cloud Integration Subaccount [page 96].

Get SAP Cloud Integration Runtime URL (Neo Environment)

1. In SAP BTP cockpit, select your SAP Cloud Integration subaccount and then choose *Applications* > *Subscriptions*.
2. In the *Subscribed Java Applications* section, choose the *<Cloud Integration tenant>iflmap* application.
3. In the *Application URLs* section, you will see the runtime URL named *https://<Cloud Integration tenant>-iflmap.avtsbhf.eu1.hana.ondemand.com*.

Related Information

How to Get SAP Cloud Integration Management URL [page 22]

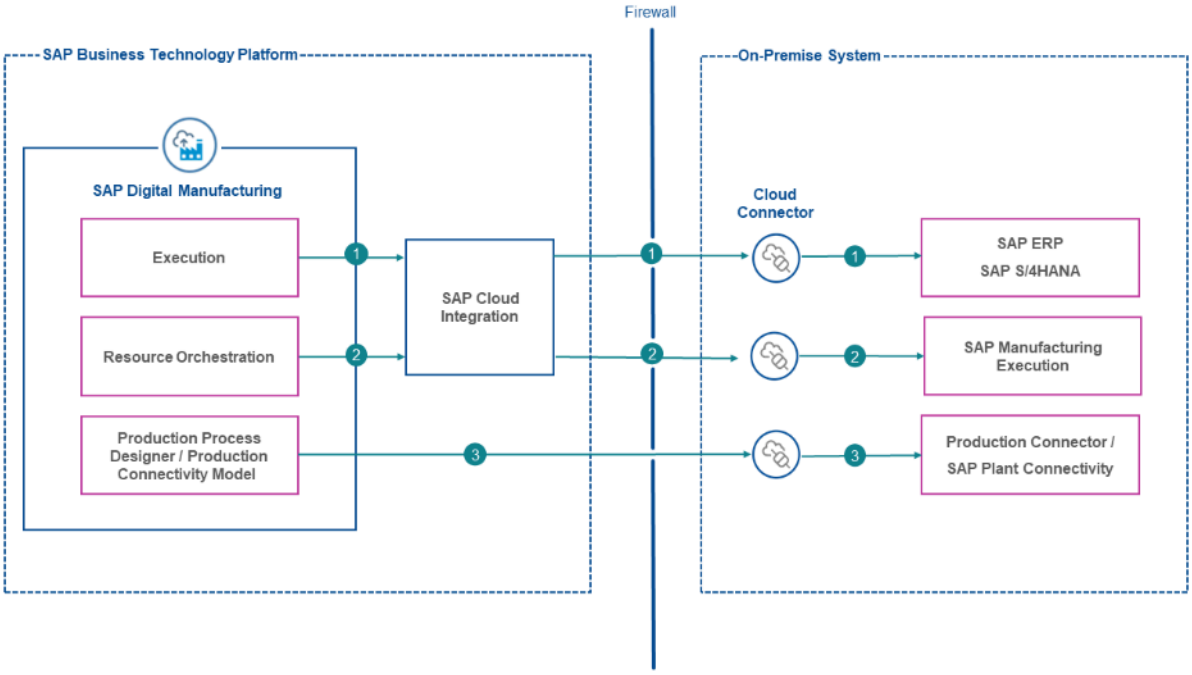
2.1.4.2 Setting Up the Cloud Connector

Configure a Cloud Connector that acts as a reverse invoke proxy between an on-premise network and the SAP Business Technology Platform. The Cloud Connector comes standard as part of the SAP Cloud Integration

service and serves as a link between the SAP Business Technology Platform and on-premise systems such as SAP S/4HANA.

In SAP Digital Manufacturing, the following integration scenarios use a Cloud Connector:

- Scenario 1 - Execution2S4 [page 10]: SAP Digital Manufacturing (execution) → SAP Cloud Integration → Cloud Connector → SAP S/4HANA
- Scenario 2 - REO2ME [page 514]: SAP Digital Manufacturing (resource orchestration) → SAP Cloud Integration → Cloud Connector → SAP Manufacturing Execution
- Scenario 3 - PPD/Insights/MM2PCo [page 500]: SAP Digital Manufacturing (Production Process Designer / insights / Production Connectivity Model) → Cloud Connector → Production Connector



2.1.4.2.1 Install Cloud Connector

Find out how to install the Cloud Connector.

Context

The installation files for the Cloud Connector are located at SAP Development Tools.

For prerequisites and instructions for installing the Cloud Connector, see the user assistance for SAP BTP Connectivity.

After the installation, an `Administrator` user account is automatically created. The initial password is `manage`. You're required to change the initial password when you log in for the first time.

2.1.4.2.2 Configure Subaccounts in Cloud Connector

For each SAP Business Technology Platform subaccount that you want to connect with an on-premises system, configure a tenant / customer subaccount in the Cloud Connector.

Prerequisites

- You need a user account for the subaccount to establish the connection between the SAP Business Technology Platform subaccount and the Cloud Connector. For Cloud Foundry and Neo environments, the requirements vary for this user.
  - For a subaccount in the Cloud Foundry environment, the subaccount user must be a security administrator of the subaccount.
  - For a subaccount in the Neo environment, the subaccount user must have the scope `manageSCCTunnels`. You can assign the user to the predefined role `Cloud Connector Admin` or `Administrator`, or assign the user to a custom role that includes the scope.
- You have configured an HTTP proxy for the Cloud Connector to access the Internet. The proxy must support SSL communication.

> **Note**
>
> With the Cloud Connector installed, you can configure the first subaccount and proxy. To do this, on the initial configuration page look for the proxy settings in *Connector* > *Configuration*.

Context

You always have two separate subaccounts: one for SAP Digital Manufacturing and one for SAP Cloud Integration.

For the following scenarios, configure the Neo or Cloud Foundry subaccount for SAP Cloud Integration in the Cloud Connector:

- Execution2S4
- REO2ME

For the following scenario, configure the Cloud Foundry subaccount for SAP Digital Manufacturing in the Cloud Connector:

- PPD/insights/MM2PCo

For more information about these scenarios, see Setting Up the Cloud Connector [page 23].

Procedure

1. 1. Using a web browser, log on to the Cloud Connector by using `https://<hostname>:<port>` as **`Administrator`**.

   > **Note**
   >
   > `<hostname>` is the hostname of the machine on which the Cloud Connector is installed. If you access the Cloud Connector locally from the same machine, enter **`localhost`**. For `<port>`, enter the port that you specified during the installation.
   >
   > The initial password for `Administrator` is `manage`.

2. Choose *Connector* > *Add Subaccount*.
3. In the *Add Subaccount* screen, enter the following information:

Field	Description
Region	Select the data center in which the SAP Business Technology Platform subaccount is hosted.
Subaccount	• [Cloud Foundry]: Enter the subaccount ID. • [Neo]: Enter the technical name of the subaccount. **Note** You can find the subaccount ID and technical name in the subaccount list in the global account or on the overview page of each subaccount.
Subaccount User	• [Cloud Foundry]: Enter the email address a subaccount user uses to log in to the SAP Business Technology Platform cockpit. • [Neo]: Enter the P- or S- ID of a subaccount user.
Password	Enter the password that the subaccount user uses to log in to the SAP Business Technology Platform cockpit.
Location ID	If you use more than one Cloud Connector to connect to the same subaccount, define a unique location ID per Cloud Connector for the subaccount.

4. Save the subaccount.
5. On the *Subaccount Dashboard*, in the *Actions* column, choose *(Connect this subaccount)* for this subaccount.

Results

The status of the subaccount is displayed as *Connected* in the Cloud Connector.

You can also verify the connection status of the subaccount in the SAP Business Technology Platform cockpit. In the subaccount, choose *Connectivity* > *Cloud Connectors*. The status should be *Connected*.

Related Information

Configure trust to SAP Digital Manufacturing by defining an allowlist of cloud applications that can use the Cloud Connector.

Initial Configuration

Cloud Foundry: Add Organization Members Using the Cockpit

Neo: Add Members to Your Subaccount

2.1.4.2.3 Configure Access Control

Expose an on-premise system to the cloud and specify the resources accessible from the cloud.

Context

To expose an on-premise system, create a virtual system in the Cloud Connector and then map it to an internal on-premise system. When making the configuration, you need to define a virtual host and a virtual port for the virtual system. The virtual host and port are used to identify the on-premise system when creating destinations in the corresponding SAP Business Technology Platform subaccount.

In addition, you must specify the resources that are accessible from the cloud. This step is required even if you don't limit access to resources. In other words, you need to explicitly specify that all resources are accessible.

For more information about the different integration scenarios, see Setting Up the Cloud Connector [page 23].

Procedure

1. In the Cloud Connector administration console, choose ▶ `<Subaccount>` ▶ *Cloud To On-Premise* ▶ *ACCESS CONTROL* ▶.
2. In the *Mapping Virtual To Internal System* section, choose + *(Add)*.

   A wizard appears that guides you through all the required settings.
3. In the wizard, enter the information according to the protocol used for communication and the specific on-premise system.
   - To communicate with SAP S/4HANA using RFC, follow the instructions at Configure Access Control (RFC).
     Applicable scenario: Execution2S4
   - To communicate with SAP S/4HANA, SAP Manufacturing Execution, or the Production Connector using HTTPS, follow the instructions at Configure Access Control (HTTP).
     Applicable scenarios: REO2ME, PPD/Insights/MM2PCo

   For the back-end type and principal type system, see the following table:

On-Premise System	Back-end Type	Principal Type
SAP S/4HANA	**ABAP System**	**None**
SAP Manufacturing Execution	**SAP Application Server Java**	**None**
Production Connector	**Other SAP System**	**None**

> **Note**
>
> The virtual host and virtual port can be freely defined. However, you can't edit the virtual host or virtual port after you've added the mapping.

4. To specify resources that are accessible from the cloud, add the resources for the system.

   You can find detailed instructions at Configure Accessible Resources. In addition, for the required configurations for each integration scenario, see the following table:

Scenario		Field	Description
Execution2S4	Resource 1	*Function Name*	Enter **CO_MES_PRODORDCONF_CREATE_TT**
		Enabled	Select the checkbox.
		Naming Policy	Select *Exact Name*.
	Resource 2	*Function Name*	Enter **CO_MES_SVK_WITH_LANGUAGE**
		Enabled	Select the checkbox.
		Naming Policy	Select *Exact Name*.
	Resource 3	*Function Name*	Enter **MB_MES_GOODSMVT_CREATE**
		Enabled	Select the checkbox.
		Naming Policy	Select *Exact Name*.
	Resource 4	*Function Name*	Enter **QIRF_SEND_CATALOG_DATA2**
		Enabled	Select the checkbox.
		Naming Policy	Select *Exact Name*.
	Resource 5	*Function Name*	Enter **BAPI**
		Enabled	Select the checkbox.
		Naming Policy	Select *Prefix*.
PPD/Insights/MM2PCo		*URL Path*	Enter **/cloudservices**

Scenario	Field	Description
	Enabled	Select the checkbox.
	Access Policy	Select *Path and all sub-paths*.
REO2ME	*URL Path*	Enter **/**
	Enabled	Select the checkbox.
	Access Policy	Select *Path and all sub-paths*.

> **Note**
>
> For more information on the supported message types and available BAPIs, see 0003050090.
>
> The following BAPIs aren't used directly by SAP Digital Manufacturing but are used by SAP Cloud Integration. Therefore, you must configure them in the cloud connector:
>
> `BAPI_TRANSACTION_COMMIT`
>
> `BAPI_TRANSACTION_ROLLBACK`

Results

In the SAP Business Technology Platform cockpit for the corresponding subaccount, you can find the accessible resource configuration. Choose *Connectivity* > *Cloud Connectors* > *Exposed Back-End Systems*.

2.1.4.2.4 Set Up Mutual Authentication with On-Premise Systems

To set up mutual authentication between the Cloud Connector and an on-premise system, import an X.509 client certificate into the Cloud Connector.

Context

The certificate must be issued for the **fully qualified domain name** (FQDN) of the machine on which you've installed the Cloud Connector. The Cloud Connector uses the so-called system certificate for all HTTPS requests to back-end systems that request or require a client certificate.

Related Information

Install a System Certificate for Mutual Authentication

2.1.4.2.5 Configure User Authentication Against On-Premise Systems

To secure the communication with an on-premise system, apply different user authentication methods depending on the integration scenario you use.

Context

For more information about the integration scenarios, see Setting Up the Cloud Connector [page 23].

Scenario	Authentication Method
Execution2S4	Basic authentication using destinations For more information about how to create the destinations, see Set Up Connection Between SAP Cloud Integration, Cloud Connector, and SAP S/4HANA or SAP ERP [page 105].
REO2ME	Basic authentication using destinations For more information about how to create the destinations, see Integrating Resource Orchestration to SAP Manufacturing Execution On-Premise (Outbound) [page 522].

Scenario	Authentication Method
PPD/Insights/MM2PCo	Principal propagation using an X.509 CA certificate. **Note** Principal propagation is possible but not required from 15.4 SP2 onwards. The certificate must be issued for the fully qualified domain name (FQDN) of the machine on which you've installed the Cloud Connector. If you use a self-signed certificate, place the public key in the *Trusted* store location in the file system of the Production Connector server: `C:\ProgramData\SAP\ProdCon\CertificateStores\CloudServicesHost\Trusted\certs` You can obtain the public key by choosing *Connector* > *Configuration* > *ON PREMISE* > *Download certificate in DER format*. For more information, see Configure a CA Certificate for Principal Propagation.

Related Information

Authenticating Users Against On-Premise Systems

2.1.4.3 Build HTTP Connection

If you want to allow SAP S/4HANA or SAP ERP to access data from SAP Cloud Integration, you need an HTTP connection for the communication.

Prerequisites

- You've got the SAP Cloud Integration runtime URL, which can be found in the provisioning email that is sent when the space is created. For more information, see How to Get SAP Cloud Integration Runtime URL [page 23].
- Depending on your environment and your preferred authentication method, you've got one of the following users:

Environment	User	Password	Comment
Cloud Foundry	P-User* authorized in SAP Cloud Integration	P-User password	Basic authentication
Cloud Foundry	SAP Cloud Integration Client ID	SAP Cloud Integration Client Secret	Recommended authentication because no need to change the password periodically. Same security level as with basic authentication
Neo	P-User* authorized in SAP Cloud Integration	P-User password	Basic authentication

> **Note**
>
> *For more information on how to obtain a P-user and on how grant it access to SAP Cloud Integration, see Granting Your P-User Access to SAP Cloud Integration in Neo Environment [page 34] or Granting Your P-User Access to SAP Cloud Integration in Cloud Foundry Environment [page 36].

To obtain a P-User ID, go to www.sap.com and register a new user using their email address.
If a user has already been registered with the SAP ID service (for example, at SAP Community or SAP Developer Center) using the same email address, the user doesn't need to register again.
To find an existing P-user, you've got two options:

- Log on to your account at www.account.sap.com using your email address. In your profile, under *Accounts*, you find your P-user ID.
- Log on to your account at www.sap.com using your email address. Go to your profile. Under *Personal Info* > *Personal Data*, you find your P-user ID under *User ID*.

> **Caution**
>
> Your P-user and the corresponding email address must not be bound to SAP Universal ID. To check whether or not your P-user and the corresponding email are already bound to SAP Universal ID, log on to your account at www.sap.com and go to the *Personal Info* tab. Choose *Access SAP Universal ID account manager* to access the *Manage my Account* app. Under *Accounts*, you find your users.
>
> If you get errors related to your credentials or the authorization, you can refer to 3085908.

- If you want to use a P-user, it has been authorized for SAP Cloud Integration. For more information see, Granting Your P-User Access to SAP Cloud Integration in Neo Environment [page 34] or Granting Your P-User Access to SAP Cloud Integration in Cloud Foundry Environment [page 36].

Procedure

1. In SAP S/4HANA or SAP ERP, run transaction code `SM59` to enter the *Configuration of RFC Connections* screen.
2. Choose *Edit* > *Create*
3. Enter the following general data:
   - *Destination*: Name of the HTTP connection, for example `DME_INT`

- *Connection Type*: G (HTTP Connection to External Server)

4. In the *Technical Settings* tab, enter data for the fields as follows:

Field	Example	Description
Target Host	<Cloud Integration tenant>-ifl-map.abcdef.eu1.hana.ondemand.com (Neo) or <Cloud Integration tenant>-abcd000-**rt**.cfapps.sap.hana.ondemand.com (Cloud Foundry)	SAP Cloud Integration runtime URL that is sent by the provisioning email when the space is created. Alternatively, you can get the runtime URL in the SAP BTP cockpit. For more information, refer to How to Get SAP Cloud Integration Runtime URL [page 23]. **Note** Do not paste *https://* as it is automatically added.
Port	443	
Path Prefix	/cxf/GenericMessageProcessor_00	The service implemented on SAP Cloud Integration to receive the message/IDOC from SAP S/4HANA or SAP ERP.
Proxy Host	**Example** proxy.wdf.sap.corp	The proxy host for the external system connection.
Proxy Service	**Example** 8080	The proxy service for the external system connection.

5. In the *Logon & Security* tab, activate *SSL* and complete the following settings for basic or OAuth 2.0 authentication:

Authentication Type	Credentials	Certificate
Basic Authentication	User and password	*DFAULT SSL Client (Standard)* **Note** *SSL* needs to be set to *Active*.

Authentication Type	Credentials	Certificate
OAuth 2.0 Authentication	Client ID and client secret **Note** Enter client ID and client secret under *Basic Authentication* as user and password.	*DFAULT SSL Client (Standard)* **Note** *SSL* needs to be set to *Active*.

6. Choose *Connection Test* to test the connection between SAP S/4HANA or SAP ERP and SAP Cloud Integration.

> **Note**
>
> If the `General Message Processor` iFlow has been deployed in SAP Cloud Integration, the *Status HTTP Response* shows the value `500`, which, contrary to what is normally expected, indicates a successful connection. Otherwise, an error message is displayed.

2.1.4.3.1 Granting Your P-User Access to SAP Cloud Integration in Neo Environment

Learn how to authorize your P-user for SAP Cloud Integration in Neo environment to enable basic authentication.

Prerequisites

- You've got the `Administrator` role for the subaccount.
- You've got the user IDs of the members that you want to add.
- You've got a P-user and password.
  To obtain a P-User ID, go to www.sap.com and register a new user using their email address.
  If a user has already been registered with the SAP ID service (for example, at SAP Community or SAP Developer Center) using the same email address, the user doesn't need to register again.
  To find an existing P-user, you've got two options:
  - Log on to your account at www.account.sap.com using your email address. In your profile, under *Accounts*, you find your P-user ID.
  - Log on to your account at www.sap.com using your email address. Go to *Manage my Account* > *Accounts* to find your users.

> **Caution**
>
> Your P-user and the corresponding email address must not be bound to SAP Universal ID. To check whether or not your P-user and the corresponding email are already bound to SAP Universal ID, log on to your account at www.sap.com and go to *Manage my Account* > *Accounts* to find your users.

> If you get errors related to your credentials or the authorization, you can refer to 3085908.

Context

To enable basic authentication, you need to grant your P-user access to SAP Cloud Integration first.

Procedure

1. In SAP BTP cockpit, select your SAP Cloud Integration subaccount.
2. Under *Overview*, choose *Members*.
3. Choose *Add Members*.
4. In the *User IDs* field, enter your P-User ID.
5. Assign the following roles to the member: *Administrator (predefined role)* and *Developer (predefined role)*.
6. Choose *Add Members*.
7. Choose *Security* > *Authorizations*.
8. On the *Users* tab, enter your P-user ID and choose *Show Assignments*.
9. Choose *Assign* in the area for individual assignment, not group assignment.

   The *Assign Roles to User* popup opens.
10. Go through the available subaccounts and applications to assign the following roles and save them:

`ESBMessaging.send`
`AuthGroup.BusinessExpert`
`AuthGroup.Administrator`
`AuthGroup.IntegrationDeveloper`

Results

Your P-user has now access to SAP Cloud Integration.

2.1.4.3.2 Granting Your P-User Access to SAP Cloud Integration in Cloud Foundry Environment

Learn how to authorize your P-user for SAP Cloud Integration in Cloud Foundry environment to enable basic authentication.

Prerequisites

- You've got the `Administrator` role for the subaccount in SAP BTP cockpit.
- You've got the user IDs of the members that you want to add.
- You've got a P-user and password.
  To obtain a P-User ID, go to www.sap.com and register a new user using their email address.
  If a user has already been registered with the SAP ID service (for example, at SAP Community or SAP Developer Center) using the same email address, the user doesn't need to register again.
  To find an existing P-user, you've got two options:
  - Log on to your account at www.account.sap.com using your email address. In your profile, under *Accounts*, you find your P-user ID.
  - Log on to your account at www.sap.com using your email address. Go to *Manage my Account* > *Accounts* to find your users.

> ⚠ Caution
>
> Your P-user and the corresponding email address must not be bound to SAP Universal ID. To check whether or not your P-user and the corresponding email are already bound to SAP Universal ID, log on to your account at www.sap.com and go to *Manage my Account* > *Accounts* to find your users.
>
> If you get errors related to your credentials or the authorization, you can refer to 3085908.

Context

To enable basic authentication, you need to grant your P-user access to SAP Cloud Integration first.

Procedure

1. In SAP BTP cockpit, select your SAP Cloud Integration subaccount.
2. Under *Security* > *Users*, choose *Create*.
3. Under *User Name*, enter the e-mail address belonging to your P-user.
4. Choose *Default Identity Provider*.
5. Choose *Create*.

6. Choose *Security* > *Role Collections*.
7. Choose +.
8. Give your collection a name, for example `My_RoleCollection`, and choose *Create*.
9. Select your collection and choose *Edit*.
10. On the *Roles* tab, under *Role Name*, choose and add the following roles to your collection:

`MessagingSend`
`MessagePayloadsRead`
`AuthGroup_BusinessExpert`

If you want to use the *CPI Async Mode*, there a some additional roles required. For more information, see Asynchronous Communication with SAP Cloud Integration [page 111].

11. Under *Security* > *Users*, choose your user.
12. In the detail view, choose *Assign Role Collection* to make the following assignments:

`My_RoleCollection`
`PI_Integration_Developer` (predefined)
`PI_Administrator` (predefined)

Results

Your P-user has now access to SAP Cloud Integration.

2.1.4.4 Data Replication Framework

You can use the Data Replication Framework (DRF) to send master and transactional data from SAP S/4HANA or SAP ERP to SAP Digital Manufacturing for execution using IDocs.

Use

You can use the Data Replication Framework (DRF) to send master and transactional data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using IDocs. An IDoc is a data container with a standardized structure that is used to exchange data. Several message types (for example, production order or work center) can be sent from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using IDocs.

To control the distribution of messages more precisely, you create replication models in which you can define filter criteria for the business objects (for example, production order or work center) to be sent to SAP Digital Manufacturing for execution.

> **Note**
>
> For more information on the Data Replication Framework (DRF) and automatic distribution of master data, see ERP-MES Integration (PP-MES) and 2515556.

General Overview of the Procedure

To use the Data Replication Framework (DRF), you must first set up ALE communication (Application Link Enabling), which is the technical basis for data exchange between your systems. You need to define the following elements in SAP ERP or SAP S/4HANA:

- Logical systems representing the communcation partners
- Document type (IDoc) and communication protocol
- IDoc message types to be exchanged
- Distribution model to control the distribution of IDoc messages

> **Note**
>
> If you set up the DRF, which is recommended, you don't need to create any distribution model. If you prefer working only with ALE, then you need the distribution model to control the distribution of IDoc messages.

After setting up the ALE communication, you can make the necessary configurations for the Data Replication Framework (DRF) that enables you to send messages in specific business contexts (for example, release of a production order in SAP ERP or SAP S/4HANA).

To set up the Data Replication Framework (DRF), you need to configure the following elements in SAP ERP or SAP S/4HANA:

- Assign business object types to your business system
- Replication model that defines which business objects (for example, production order or work center) are sent to which system
- Filter critera for the replication model that control the distribution of business objects (for example, *Plant*, *Order Type*, or *Material* as criteria to transfer all production orders belonging to a specific plant, specific order type, or specific material.)

Overview Setup Steps

To set up the Data Replication Framework (DRF), perform the tasks described in the following topics:

1. Before You Start [page 39]
2. Create Logical Systems [page 39]
3. Assign a Logical System to a Client [page 40]
4. Defining Outbound Communication in SAP S/4HANA or SAP ERP [page 42]
5. Define Outbound Messages for Partner Systems [page 43]
6. Define a Distribution Model [page 45]
7. Assign Business Objects to Your Business System [page 47]
8. Define Replication Models and Outbound Implementations [page 49]
9. Define Filter Criteria [page 51]

2.1.4.4.1 Before You Start

Here you find the requirements that must be met before you can start setting up the Data Replication Framework (DRF).

To set up the Data Replication Framework (DRF), the following requirements must be met:

- You have the `Administrator` role for SAP S/4HANA or SAP ERP.
- You have set up a HTTP connection. For more information, see Build HTTP Connection [page 31].
- The following business functions have been implemented in SAP S/4HANA or SAP ERP:
  - LOG_PP_MES_INT_01
  - LOG_PP_MES_INT_02
  - LOG_PP_MES_INT_03

2.1.4.4.2 Set Up Application Link Enabling (ALE)

2.1.4.4.2.1 Create Logical Systems

As administrator, you need to create logical systems in your SAP S/4HANA or SAP ERP client to set up the Data Replication Framework (DRF).

Prerequisites

You have the `Administrator` role for SAP S/4HANA or SAP ERP.

Context

To use the Data Replication Framework (DRF) for the transfer of master data from SAP S/4HANA or SAP ERP to SAP Digital Manufacturing for execution, you need to create two logical systems in your SAP S/4HANA or SAP ERP client. The first represents your SAP S/4HANA or SAP ERP system, the second your SAP Digital Manufacturing for execution system.

Procedure

Define the logical systems.

1. Use transaction `BD54` and define the logical system in the cross-client for SAP S/4HANA or SAP ERP.

> **Note**
>
> Creating a logical system is a cross-client activity, that is, all changes also affect all other clients in the system. You need the authorization `S_TABU_CLI` in order to do it.

2. Use transaction `BD54` and define the logical system for SAP Digital Manufacturing for execution.

Add the logical system representing SAP Digital Manufacturing for execution to your ERP system (client) to ensure the distribution of production orders.

3. Use transaction `SPRO` and choose *SAP Reference IMG*.
4. Choose *Production* > *Integration with a Manufacturing Execution System* > *Integrate Production Orders with a Manufacturing Execution System* > *Maintain Logical System for Distribution of Production Orders*.
5. Choose *New Entries* to add a logical system.

> **Example**

Plant	Order Type	Determ. Method Logical System	Logical System
`<Plant number>`, for example, **`1010`**	**`<Order type>`**, for example, **`*`**	**`Customizing Creates Logical System`**	**`Logical System`** representing SAP Digital Manufacturing for execution, for example `DMETest`

6. Choose *Save*.

Results

You have created two logical systems representing your source and target system.

2.1.4.4.2.2 Assign a Logical System to a Client

As administrator, you need to assign a logical system to a client in SAP S/4HANA or SAP ERP to set up the Data Replication Framework (DRF).

Prerequisites

- You have the `Administrator` role.
- You have defined a logical system for the SAP S/4HANA or SAP ERP system using transaction `BD54`. For more information, see Create Logical Systems [page 39].

Context

Setting up the Data Replication Framework (DRF) to enable data exchange between SAP S/4HANA or SAP ERP and SAP Digital Manufacturing for execution requires you to assign a logical system to your SAP S/4HANA or SAP ERP client.

Procedure

1. Log on to SAP S/4HANA or SAP ERP as an `Administrator`.
2. Access the activity using one of the following navigation options:

Option	Description
Transaction code	`SCC4`
Initial screen of the SAP system	*SAP Menu* > *Tools* > *Administration* > *Administration* > *Client Administration* > *Client Maintenance*

3. On the *Display View "Clients": Overview* screen, choose *Edit*.
4. Confirm the information message *Caution: The table is cross client*.
5. Select your SAP S/4HANA or SAP ERP client (for example, client 100) to be connected to the SAP Digital Manufacturing for execution system, and choose *Details*.
6. In the *Logical System* field, select the newly created logical system of your SAP S/4HANA or SAP ERP client using the value help.
7. Choose *Save* (`Ctrl` + `S`) and confirm the message *Be careful when changing the logical system*.
8. Choose *Back* (`F3`) twice.

Results

You have successfully assigned the logical system to your client.

2.1.4.4.2.3 Defining Outbound Communication in SAP S/4HANA or SAP ERP

As administrator, you define a port for outbound communication, the IDoc format as container for messages and the SOAP protocol in SAP S/4HANA or SAP ERP to enable data transfer between your system and SAP Digital Manufacturing for execution using the Data Replication Framework (DRF).

Prerequisites

You have the `Administrator` role in SAP S/4HANA or SAP ERP.

Context

To transfer master data from SAP S/4HANA or SAP ERP to SAP Digital Manufacturing for execution using the Data Replication Framework (DRF), you define a port for outbound communication in SAP S/4HANA or SAP ERP. Moreover, you choose the IDoc format as a container for your messages and SOAP as protocol for the data exchange.

Procedure

1. Use transaction `WE21`.
2. In *XML HTTP*, choose the RFC destination that you have created using `SM59` as described in Build HTTP Connection [page 31].
3. Choose *Application/x-sap.idoc* and *SOAP Protocol*.
4. Choose *Save*.

Results

You have defined a port for outbound communication.

2.1.4.4.2.4 Define Outbound Messages for Partner Systems

As administrator, you define outbound messages for partner systems in SAP S/4HANA or SAP ERP to enable data transfer to SAP Digital Manufacturing for execution using the Data Replication Framework (DRF).

Prerequisites

You have the `Administrator` role for SAP S/4HANA or SAP ERP.

Context

To set up the Data Replication Framework (DRF) to enable data transfer from SAP S/4HANA or SAP ERP to SAP Digital Manufacturing for execution, you navigate to the Partner Profiles and assign the logical system representing SAP Digital Manufacturing for execution to the SAP Digital Manufacturing for execution system. Moreover, you define outbound message types for the transfer of data from SAP S/4HANA or SAP ERP to SAP Digital Manufacturing for execution through a synchronized RFC.

Procedure

1. In transaction `WE20`, choose *Partner Type LS*.
2. Choose 🗎 to create a new logical partner system.
3. In *Partner No.*, enter the logical system representing SAP Digital Manufacturing for execution that you have created under Create Logical Systems [page 39] . Enter **`US`** in *Ty.*, <**`SAP ERP user`**> in *Agent*, and **`EN`** in *Lang*.
4. In the *Outbound* table, choose *Create outbound parameter.*
5. On the *Partner Profiles: Outbound Parameters* screen, select *Pass IDoc Immediately* and *Cancel Processing After Syntax Error*, and enter data in the following fields:

Field	Value
Message Type	BOMMAT
Receiver port	HCI_DME
Pack. Size	1
Basic type	BOMMAT05

> ⓘ Note
>
> HCI_DME ist just a placeholder for the receiver port, which refers to the port for outbound communication defined in a previous step: Defining Outbound Communication in SAP S/4HANA or

> SAP ERP [page 42]. You can define the receiver port's name as you please, but make sure that all message types defined here have the same receiver port name.

6. Repeat steps 3 and 4 to add the following parameters:

Message Type	Receiver Port	Basic Type
INVCON	HCI_DME	INVCON03
IORDER	HCI_DME	IORDER01
LOIPRO	HCI_DME	LOIPRO05 (production order and process order)
LOIPLO	HCI_DME	LOIPLO02 (planned order)
LOIROU	HCI_DME	LOIROU04
LOIWCS	HCI_DME	LOIWCS03
MATMAS	HCI_DME	MATMAS05
CHRMAS	HCI_DME	CHRMAS05
CLSMAS	HCI_DME	CLSMAS04
CLFMAS	HCI_DME	CLFMAS02
EQUIPMENT_CREATE	HCI_DME	EQUIPMENT_CREATE02 **Note** For more information, see Tool Integration [page 169].

> **Note**
>
> For more information on the supported IDoc versions, see 0003050090.
>
> For more information on how to enable LOIPRO05 version 2, see 3115603.

Results

You have enabled the data transfer from SAP S/4HANA or SAP ERP to SAP Digital Manufacturing for execution.

2.1.4.4.2.5 Define a Distribution Model

As administrator, you need to define a distribution model in SAP S/4HANA or SAP ERP to control the data transfer between your system and SAP Digital Manufacturing for execution. If you're implementing the data replication framework, you don't need to perform this step.

Prerequisites

You have the `Administrator` role for SAP S/4HANA or SAP ERP.

Context

If you're not implementing the data replication framework (DRF), you need to define a distribution model in SAP S/4HANA or SAP ERP to control the data transfer from SAP S/4HANA or SAP ERP to SAP Digital Manufacturing for execution. The distribution model defines which message types can be sent to SAP Digital Manufacturing for execution.

Procedure

1. Use transaction `BD64`.
2. On the *Display Distribution Model* screen, choose *Switch Between Display and Edit Mode*.
3. Choose *Create Model View* and enter data in the following fields:

Field	Example	Description
Short Text	DMEModel	The name of the model
Technical Name	DMEModel	The technical name of the model
Start Date		The current date
End Date	31.12.9999	

4. Choose the model view you created in the *Model Views* list and then choose *Add Message Type*. Make the following entries:

Field	Example	Description
Model View	**DEMMODEL**	Technical

Sender	**S4HCLNT100**	Your sending logical system.
Receiver	**DMETest**	Your receiving logical system. For more information, see Create Logical Systems [page 39].
Message Type	**BOMMAT**	

5. Choose *Continue*.
6. Repeat steps **4** and **5** to add the following message types:

Message Type	Description
INVCON	Inventory controlling
IORDER	SM / PM Order
LOIPRO	Production / process order
LOIPLO	Planned order
LOIROU	Routing
LOIWCS	Work center
MATMAS	Material master
CHRMAS	Characteristic
CLSMAS	Class
CLFMAS	Classification assignment

> ⓘ Note
>
> To add message type **EQUIPMENT_CREATE**, in step **4**, select the model view you created and choose *Add BAPI* instead of *Add Message Type*. Enter the values described in step **4** for *Model View*, *Sender / Client* and *Receiver / Server*. Select *Equipment* in *Object / Interface* and *Create* in *Method*.

7. Choose *Save*.

Results

You have defined a distribution model.

2.1.4.4.3 Set Up Data Replication Framework

2.1.4.4.3.1 Assign Business Objects to Your Business System

As administrator, you assign business objects in SAP S/4HANA or SAP ERP (business system) to SAP Digital Manufacturing for execution to exchange data using the Data Replication Framework (DRF).

Prerequisites

You have the `Administrator` role for SAP S/4HANA or SAP ERP.

Context

To transfer data from SAP S/4HANA or SAP ERP (business system) to SAP Digital Manufacturing for execution using a replication model within the Data Replication Framework (DRF), you need to assign your business system to a logical system and an RFC destination. Moreover, you need to add business objects to your business system, so that you can control the distribution of business objects using a replication model within the DRF.

Procedure

1. Use the `DRFIMG` transaction and choose *Define Custom Settings for Data Replication* > *Define Technical Settings* > *Define Technical Settings for Business Systems*.
2. On the *Change View "Define Business Systems": Overview* screen, choose *New Entries*.

   If you don't use the System Landscape Directory (SLD), an error message may be displayed because the business system can't be fetched from SLD. In this case, enter your logical system manually and ignore the error message for manual entry. Press Enter to save your entry.
3. On the *New Entries: Overview of Added Entries* screen, choose *Unicode*, and enter data in the following fields to create a business system:

Field	Value
Business System	**`DMESystem`**
Logical System	**`DMETest`** (For more information, see Create Logical Systems [page 39])

Field	Value
RFC Destination	**DME_INT** (For more information, see Build HTTP Connection [page 31])

4. Choose *Save*.
5. Choose the business system **DMESystem** you created and double-click *Define Bus.System, BO* in *Dialog Structure* on the side menu.
6. Choose *New Entries* and add the following business object types:

Field	Value	Description
BO Type	**97**	**Production Order**
BO Type	**92**	**Planned Order**
BO Type	**194**	**Material**
BO Type	**DRF_0043**	**Characteristic**
BO Type	**DRF_0044**	**Class**
BO Type	**DRF_0011**	**Class Assignment**
BO Type	**223**	**Production Bill of Operations**
BO Type	**493**	**Work Center**
BO Type	**467**	**Goods Movement**
BO Type	**183**	**Individual Material**
BO Type	468	PM Order

7. Choose *Save*.

Results

You have assigned your business system to SAP Digital Manufacturing for execution.

2.1.4.4.3.2 Define Replication Models and Outbound Implementations

As administrator, you define replication models and outbound implementations to control the data transfer from SAP S/4HANA or SAP ERP to SAP Digital Manufacturing for execution using the Data Replication Framework (DRF).

Prerequisites

You have the `Administrator` role for SAP S/4HANA or SAP ERP.

Context

You define replication models and outbound implementations in SAP S/4HANA or SAP ERP to control the transfer of business objects from your system to SAP Digital Manufacturing for execution using the Data Replication Framework (DRF).

Procedure

1. Use transaction `SPRO` and choose *SAP Reference IMG*.
2. Choose *Cross-Application Components* > *Processes and Tools for Enterprise Applications* > *Master Data Governance* > *Central Governance* > *General Settings* > *Data Replication* > *Define Custom Settings for Data Replication* > *Define Replication Models*.
3. Choose *New Entries* and complete the following fields:

Field	Example
Replication Model	**`DMEModel`**
Description	**`DMEModel`**
Log Days	**`10`**

4. Choose *Save*.
5. Choose the replication model you created and double-click *Assign Outbound Implementation* in *Dialog Structure* on the side menu.
6. Choose *New Entries* and add the following outbound implementations:

Field	Value	Description
Outbound Implementation	**97_1**	Production Order via IDoc
Outbound Implementation	**92_1**	Planned Order (Repetitive Manufacturing) via IDoc
Outbound Implementation	**194_1**	Material via IDoc (ME - enhanced Filter Object)
Outbound Implementation	CLF_CHRMAS	Characteristic via IDoc
Outbound Implementation	CLF_CLSMAS	Class via IDoc
Outbound Implementation	CLF_CLFMAS	Classification Assignment via IDoc
Outbound Implementation	**223_1**	Routing via IDoc (ME)
Outbound Implementation	**467_1**	Goods Movement via IDoc
Outbound Implementation	**493_1**	Workcenter via IDoc
Outbound Implementation	**183_1**	Equipment via IDoc (ME)
Outbound Implementation	468_1	PM Order via IDoc

> **Note**
>
> For more information on the supported IDoc versions, see 0003050090.

7. Choose *Save*.
8. Choose the outbound implementation **97_1** and double-click *Assign Target Systems for Repl. Model / Outb.Impl* in *Dialog Structure* on the side menu.
9. Choose *New Entries* to add the business system.
10. Repeat steps **8** and **9** to add the business system for other outbound implementations that you have created.
11. Choose *Save*.
12. Double-click *Define Replication Model* in *Dialog Structure* on the side menu, choose the replication model and then choose *Activate*.

Results

You've defined and activated a replication model with its outbound implementations.

2.1.4.4.3.3 Define Filter Criteria

As administrator, you define filter criteria for the Data Replication Framework (DRF) to control the distribution of business objects from SAP S/4HANA or SAP ERP to SAP Digital Manufacturing for execution.

Prerequisites

You have the `Administrator` role for SAP S/4HANA or SAP ERP.

Context

When you set up the Data Replication Framework (DRF) to enable the transfer of data from SAP S/4HANA or SAP ERP to SAP Digital Manufacturing for execution, you can define filter criteria for business objects (for example, production order or material) that belong to a replication model. With these filter criteria, you control the distribution of business objects to SAP Digital Manufacturing for execution. For example, you can use plant, order type, or material as criteria to transfer all production orders belonging to a specific plant, specific order type, or specific material.

> **Note**
>
> In this procedure, the values in the value help depend on the Customizing settings. For different parameters, define the DRF Customizing settings accordingly.

Procedure

1. Log on to the SAP S/4HANA or SAP ERP system as an `Administrator`.
2. Access the activity using one of the following navigation options:

Option	Description
Transaction code	`DRFF`
Initial screen of the SAP system	*SAP Menu* > *Cross Application Components* > *Processes and Tools for Enterprise Applications* > *Master Data Governance* > *Data Replication* > *Define Filter Criteria Replication*

3. On the *Define Filter Criteria* screen, select the *Goods Movement* line of the relevant SAP Digital Manufacturing replication model and choose *Create*.

   The *Create Filter Criteria* screen is displayed.
4. On the *Create Filter Criteria* screen, make the following entries in the *Filter Criteria to Include Business Objects* area:

1st Column	2nd Column	3rd Column	Note
Plant	**is**	**<Plant number>**, for example, **1010**	Choose + to create a second line.
Movement type	**is**	**311**	The 311 goods movement type is just one example. You can include movement types depending on your business requirements.
Special Stock	**is**	**E**	This special stock indicator is for make-to-order (MTO) production only. Include it if you only need to transfer stocks using goods movement types 311E, 411E and 413E. For more information, see Transfer of Floor Stock Data [page 230].

5. Choose *Save*.
6. Choose *Close*.
7. Repeat steps 3 to 6 for the following business objects of the replication model and make the corresponding entries:
   a. *Production Order*:

1st Column	2nd Column	3rd Column
Plant	**is**	**<Plant number>**, for example, **1010**

   b. *Planned Order*:

1st Column	2nd Column	3rd Column
Production Plant	**is**	**<Plant number>**, for example, **1010**

   c. *Product*:

1st Column	2nd Column	3rd Column
Plant	**is**	**<Plant number>**, for example, **1010**

   d. *Production Bill of Operations*:

1st Column	2nd Column	3rd Column
`Plant`	`is`	`<Plant number>`, for example, `1010`

e. *Workcenter*:

1st Column	2nd Column	3rd Column
`Plant`	`is`	`<Plant number>`, for example, `1010`

Results

You have successfully created the filter criteria for the various objects.

2.1.4.5 Prepare Credentials for Initial Parameter Deployment

For the deployment of the `Initial Parameters` integration flow, you can choose between basic authentication with P-User, OAUTH 2.0 authentication with authorization code, or OAUTH 2.0 client credential authorization depending on your environment (cloud foundry or neo).

Use

To make sure that all integration flows in SAP Cloud Integration can use all the integration parameters, you must enable SAP Cloud Integration to write initial parameters to SAP Cloud Integration. For this deployment of parameters, you create a security material in SAP Cloud Integration. With regards to authentication, you have the following options depending on your environment:

- Basic authentication with your P-user and password (Neo and Cloud Foundry)
- OAUTH 2.0 authorization code authentication based on a service key with grant type authorization code (Neo) (Recommended)
- OAUTH 2.0 client credential authorization (Cloud Foundry) (Recommended)

In a later step, this security material is needed to configure the `Initial Parameters` iFlow in SAP Cloud Integration.

To prepare the credentials for initial parameter deployment, follow one of the two approaches:

- Basic Authentication with P-User for Initial Parameter Deployment (Neo and Cloud Foundry) [page 54]
- OAuth 2.0 Client Credential Authentication for Initial Parameter Deployment (Cloud Foundry) [page 63]

- OAuth 2.0 Authentication with Authorization Code for Initial Parameter Deployment (Neo) [page 58]

2.1.4.5.1 Basic Authentication with P-User for Initial Parameter Deployment (Neo and Cloud Foundry)

Create a security material based on your P-user in SAP Cloud Integration. This material is needed to write initial parameters to SAP Cloud Integration in Neo or Cloud Foundry environment.

Prerequisites

- You've got the `Administrator` role for SAP Cloud Integration.
- You've got a P-user ID and have granted it access to SAP Cloud Integration. For more information, see Granting Your P-User Access to SAP Cloud Integration in Neo Environment [page 55] or Granting Your P-User Access to SAP Cloud Integration in Cloud Foundry Environment [page 57].

> **Note**
>
> Your P-user and the corresponding email address must not be bound to SAP Universal ID. To check whether or not your P-user and the corresponding email are already bound to SAP Universal ID, log on to your account at www.sap.com and go to *Manage my Account* > *Accounts* to find your users.

Context

You need to create a security material based on your P-user and password in SAP Cloud Integration. You'll use this security material, called here `PD_DEPLOYER_USER`, later when configuring the Initial Parameters integration flow in SAP Cloud Integration. The `PD_DEPLOYER_USER` security material is needed to ensure that SAP Cloud Integration can write the integration parameters to SAP Cloud Integration, so that all iFlows can access them.

Procedure

1. Log on to SAP Cloud Integration and choose *Monitor*.
2. Choose the *Security Material* app.
3. Choose *Create*, and select *User Credentials* for basic authentication.
4. Complete the following fields:

Field	`PD_DEPLOYER_USER` with P-user and password
Name	**`PD_DEPLOYER_USER`** **Note** You can choose a random name, but you need to use this name later for the *Tenant Credentials* in the *Initial Parameters* iFlow.
User	**`P-user ID`**
Password	**`P-user password`**

5. Choose *Deploy*.

Results

You've created a security material for basic authentication.

2.1.4.5.1.1 Granting Your P-User Access to SAP Cloud Integration in Neo Environment

Learn how to authorize your P-user for SAP Cloud Integration in Neo environment to enable basic authentication.

Prerequisites

- You've got the `Administrator` role for the subaccount.
- You've got the user IDs of the members that you want to add.
- You've got a P-user and password.
  To obtain a P-User ID, go to www.sap.com and register a new user using their email address.
  If a user has already been registered with the SAP ID service (for example, at SAP Community or SAP Developer Center) using the same email address, the user doesn't need to register again.
  To find an existing P-user, you've got two options:
  - Log on to your account at www.account.sap.com using your email address. In your profile, under *Accounts*, you find your P-user ID.
  - Log on to your account at www.sap.com using your email address. Go to *Manage my Account* > *Accounts* to find your users.

> ⚠ Caution
>
> Your P-user and the corresponding email address must not be bound to SAP Universal ID. To check whether or not your P-user and the corresponding email are already bound to SAP Universal ID, log on to your account at www.sap.com and go to *Manage my Account* > *Accounts* to find your users.
>
> If you get errors related to your credentials or the authorization, you can refer to 3085908.

Context

To enable basic authentication, you need to grant your P-user access to SAP Cloud Integration first.

Procedure

1. In SAP BTP cockpit, select your SAP Cloud Integration subaccount.
2. Under *Overview*, choose *Members*.
3. Choose *Add Members*.
4. In the *User IDs* field, enter your P-User ID.
5. Assign the following roles to the member: *Administrator (predefined role)* and *Developer (predefined role)*.
6. Choose *Add Members*.
7. Choose *Security* > *Authorizations*.
8. On the *Users* tab, enter your P-user ID and choose *Show Assignments*.
9. Choose *Assign* in the area for individual assignment, not group assignment.

   The *Assign Roles to User* popup opens.
10. Go through the available subaccounts and applications to assign the following roles and save them:

`ESBMessaging.send`
`AuthGroup.BusinessExpert`
`AuthGroup.Administrator`
`AuthGroup.IntegrationDeveloper`

Results

Your P-user has now access to SAP Cloud Integration.

2.1.4.5.1.2 Granting Your P-User Access to SAP Cloud Integration in Cloud Foundry Environment

Learn how to authorize your P-user for SAP Cloud Integration in Cloud Foundry environment to enable basic authentication.

Prerequisites

- You've got the `Administrator` role for the subaccount in SAP BTP cockpit.
- You've got the user IDs of the members that you want to add.
- You've got a P-user and password.
  To obtain a P-User ID, go to www.sap.com and register a new user using their email address.
  If a user has already been registered with the SAP ID service (for example, at SAP Community or SAP Developer Center) using the same email address, the user doesn't need to register again.
  To find an existing P-user, you've got two options:
  - Log on to your account at www.account.sap.com using your email address. In your profile, under *Accounts*, you find your P-user ID.
  - Log on to your account at www.sap.com using your email address. Go to *Manage my Account* > *Accounts* to find your users.

> ⚠ Caution
>
> Your P-user and the corresponding email address must not be bound to SAP Universal ID. To check whether or not your P-user and the corresponding email are already bound to SAP Universal ID, log on to your account at www.sap.com and go to *Manage my Account* > *Accounts* to find your users.
>
> If you get errors related to your credentials or the authorization, you can refer to 3085908.

Context

To enable basic authentication, you need to grant your P-user access to SAP Cloud Integration first.

Procedure

1. In SAP BTP cockpit, select your SAP Cloud Integration subaccount.
2. Under *Security* > *Users*, choose *Create*.
3. Under *User Name*, enter the e-mail address belonging to your P-user.
4. Choose *Default Identity Provider*.
5. Choose *Create*.

6. Choose *Security* > *Role Collections*.
7. Choose +.
8. Give your collection a name, for example `My_RoleCollection`, and choose *Create*.
9. Select your collection and choose *Edit*.
10. On the *Roles* tab, under *Role Name*, choose and add the following roles to your collection:

`MessagingSend`
`MessagePayloadsRead`
`AuthGroup_BusinessExpert`

If you want to use the *CPI Async Mode*, there a some additional roles required. For more information, see Asynchronous Communication with SAP Cloud Integration [page 111].

11. Under *Security* > *Users*, choose your user.
12. In the detail view, choose *Assign Role Collection* to make the following assignments:

`My_RoleCollection`
`PI_Integration_Developer` (predefined)
`PI_Administrator` (predefined)

Results

Your P-user has now access to SAP Cloud Integration.

2.1.4.5.2 OAuth 2.0 Authentication with Authorization Code for Initial Parameter Deployment (Neo)

Use OAuth 2.0 authentication with authorization code for the deployment of initial parameters in SAP Cloud Integration.

Overview

To make sure that all integration flows in SAP Cloud Integration can use all the integration parameters, you must enable SAP Cloud Integration to write initial parameters to SAP Cloud Integration. For this deployment of parameters, you create a client with authorization code in the SAP Cloud Integration subaccount in SAP BTP cockpit (Neo environment). You then create a security material in SAP Cloud Integration, called `PD_DEPLOYER_CLIENT`. In a later step, this material is needed to configure the *Initial Parameters* iFlow in SAP Cloud Integration, so that all integration flows can access all integration parameters.

Overview Setup Steps

To create the `PD_DEPLOYER_CLIENT` security material, perform the tasks described in the following topics:

1. Create a Client with Authorization Code [page 59]
2. Create a Security Material with OAuth 2.0 Authorization Code in SAP Cloud Integration [page 61]

2.1.4.5.2.1 Create a Client with Authorization Code

To enable authentication without user and password, you need to create a client with authorization code grant type in your SAP BTP cockpit (Neo Environment) .

Prerequisites

- You've got the `Administrator` role for SAP BTP cockpit.
- You've got access to the SAP Cloud Integration subaccount in SAP BTP cockpit (Neo Environment).

Context

To enable authentication without user and password for the SAP Cloud Integration to SAP Cloud Integration communication, you need to create a client with authorization code grant type in your SAP Cloud Integration subaccount (Neo Environment).

Procedure

1. In SAP BTP cockpit, go to your SAP Cloud Integration subaccount.
2. Go to *Security* > *OAuth* > *Clients* and choose *Register New Client*.

   The client creation menu opens.
3. Enter the following fields to create client:

Field	
Name	**`Client name`** **Note** You can choose a random name, for example `OAuth_Client`.
Subscription	Choose the subscription ending with **tmn**.
ID	The *Client ID* is generated automatically by the system, but you can choose *Regenerate ID*, if needed. **Note** You need the *Client ID* later when configuring the authorizations.
Authorization Grant	*Authorization Code*
Confidential	Do *not* check this field.
Skip Consent Screen	Do *not* check this field.
Redirect URI	**`Application URL of SAP Integration Cloud`** **Note** To find it, go to *Applications* > *Subscriptions* and choose the *Application* ending with *tmn*. Add `/itspaces/odata/api/v1/OAuthTokenFromCode` to this URI. You can also find the full *Redirect URI* when creating a security material with OAuth2 authorization code. **Example** `https://{…}tmn.hci.eu1.hana.ondemand.com`**/itspaces/odata/api/v1/OAuthTokenFromCode**.
Token Lifetime	**`1 hours`**
Refresh Token Lifetime	**`1 hours`**

4. Go to *Security* > *Authorizations* > *Users* and enter a user name according to this format: clientName_{client ID}, for example `OAuth_Client_123456-a123-a123-a123-a123445678`.
5. Choose *Show Assignments*.
6. In the *Roles* area, choose *Assign*.
7. Enter the following fields:

Field	
Subaccount	Choose the subaccount which the application ending with **tmn** is in.
Application	Choose the application ending with *tmn*.
Role	`AuthGroup.TenantPartnerDirectoryConfigurator`

8. Choose *Save*.

Results

You've created a client with OAUTH 2.0 authentication with authorization code grant type.

2.1.4.5.2.2 Create a Security Material with OAuth 2.0 Authorization Code in SAP Cloud Integration

Create a security material with OAuth 2.0 authorization code in SAP Cloud Integration.

Prerequisites

- You've got the `Administrator` role for SAP Cloud Integration.
- You've created a client with OAuth 2.0 authorization code in your SAP Cloud Integration subaccount in SAP BTP cockpit (Neo environment). For more information, see Create a Client with Authorization Code [page 59].

Context

You've created a client with OAuth 2.0 authorization code in your SAP Cloud Integration subaccount (Neo environment). Now you create and activate a security material based on authentication information found in the client. The security material, called here `PD_DEPLOYER_CLIENT`, is needed later to configure the Initial Parameters integration flow in SAP Cloud Integration. The `PD_DEPLOYER_CLIENT` security material is needed to ensure that SAP Cloud Integration can write the integration parameters to SAP Cloud Integration, so that all iFlows can access them.

Procedure

1. In SAP Cloud Integration, go to the *Monitor* section and choose the *Security Material* app.
2. Choose *Create* and then *OAuth2 Authorization Code*.

   The *Create OAuth2 Authorization Code* popup opens.
3. Enter the following fields:

Field	
Name	**`PD_DEPLOYER_Client`** **Note** You can choose a random name, but you need to use this name later for the *Tenant Credentials* in the *Initial Parameters* iFlow.
Provider	*Generic*
Authorization URL	You'll find the *Authorization URL* endpoint in your SAP Cloud Integration subaccount, under *Security* > *OAUTH* > *Branding*, for example `https://{…}hana.ondemand.com/oauth2/api/v1/authorize`
Token Service URL	You'll find the *Token Service URL* endpoint in your SAP Cloud Integration subaccount, under *Security* > *OAUTH* > *Branding*, for example `https://{…}hana.ondemand.com/oauth2/api/v1/token`
Client ID	**`Client ID`**, which was generated in your SAP Cloud Integration subaccount, for example `123456-a123-a123-a123-a123445678` For more information, see Create a Client with Authorization Code [page 59].
Client Secret	This field is mandatory but you can put in a random value.
Send as	*Body Parameter*

4. Choose *Deploy*.

   Your security material has been created and has status *Unauthorized*.
5. Authorise your security material by choosing ••• and *Authorize*.

Results

You've created and authorized a security material with OAuth 2.0 authorization code.

2.1.4.5.3 OAuth 2.0 Client Credential Authentication for Initial Parameter Deployment (Cloud Foundry)

Use OAuth 2.0 client credential authorization for the deployment of initial parameters in SAP Cloud Integration.

Use

To make sure that all integration flows in SAP Cloud Integration can use all the integration parameters, you must enable SAP Cloud Integration to write initial parameters to SAP Cloud Integration. For this deployment of parameters, you create a service instance in the SAP Cloud Integration subaccount in SAP BTP cockpit (Cloud Foundry environment). Then you create a service key for this instance, which is of grant type *OAuth2 Client Credentials*. With this key, you then create a security material in SAP Cloud Integration, called `PD_DEPLOYER_CLIENT`. In a later step, this material is needed to configure the Initial Parameters iFlow in SAP Cloud Integration, so that all integration flows can access all integration parameters.

Overview Setup Steps

To create the `PD_DEPLOYER_CLIENT` security material, perform the tasks described in the following topics:

1. Create a Service Instance and Key with client credential authorization [page 63]
2. Create a Security Material with OAuth 2.0 Client Credential Authentication in SAP Cloud Integration [page 65]

2.1.4.5.3.1 Create a Service Instance and Key with client credential authorization

To enable authentication without user and password in Cloud Foundry environment, you need to create a service instance and a service key with client credential authorization.

Prerequisites

- You've got the `Administrator` role for SAP BTP cockpit.
- You've got the `Administrator` role for SAP Cloud Integration.
- You've got access to the SAP Cloud Integration subaccount in SAP BTP cockpit (Cloud Foundry environment).

Context

To enable authentication without user and password for the SAP Cloud Integration to SAP Cloud Integration communication, you need to create a service instance and a service key with client credential authorization.

Procedure

1. In SAP BTP cockpit, go to your SAP Cloud Integration subaccount.
2. Go to *Services* > *Instances and Subscriptions* and choose *Create*.

   The *New Instance or Subscription* popup opens.
3. Enter the following fields to create a service instance:

Field	
Service	*Process Integration Runtime*
Plan	*api*
Runtime Environment	Cloud Foundry
Space	`Name of your space`
Instance Name	`Instance Name` **Note** You can choose a random name.

4. Choose Next and enter the following fields:

Field	
Configure instance paramters	*Form*
Roles	*AuthGroup_TenantPartnerDirectoryConfigurator*
Grant-types	*Client Credential*
Redirect-urls	

5. Choose *Next* and *Create*.
6. Under *Instances*, choose the instance that you've just created.
7. On the *Service Key* tab, choose Create.

   The *New Service Key* popup opens.
8. Enter the following fields:

Field	
Service Key Name	`Service Key` ⓘ Note You can choose a random name.
Key Type	*Clientid/Secret*

9. Choose *Create*.

> ⓘ Note
>
> You can access the service key content by choosing ••• and then *View*.

Results

You've created a service instance and a service key with client credential authorization.

2.1.4.5.3.2 Create a Security Material with OAuth 2.0 Client Credential Authentication in SAP Cloud Integration

Create a security material with OAuth 2.0 client credential authorization in SAP Cloud Integration.

Prerequisites

- You've got the `Administrator` role for SAP Cloud Integration.
- You've created a service instance and a service key with OAuth 2.0 client credential authorization in your SAP Cloud Integration subaccount in SAP BTP cockpit (Cloud Foundry environment). For more information, see Create a Service Instance and Key with client credential authorization [page 63].

Context

You've created a service key with OAuth 2.0 client credential authorization in your SAP Cloud Integration subaccount. Now, you create and activate a security material based on authentication information found in this service key in SAP Cloud Integration. The security material, called here `PD_DEPLOYER_CLIENT`, is needed later to configure the Initial Parameters integration flow in SAP Cloud Integration. The `PD_DEPLOYER_CLIENT`

security material is needed to ensure that SAP Cloud Integration can write the integration parameters to SAP Cloud Integration, so that all iFlows can access them.

Procedure

1. In SAP Cloud Integration, go to the *Monitor* section and choose the *Security Material* app.
2. Choose *Create* and then *OAuth2 Client Credentials*.

   The *Create OAuth2 Client Credentials* popup opens.
3. Enter the following fiels:

Field	
Name	**`PD_DEPLOYER_CLIENT`** **Note** You can choose a random name, but you need to use this name later for the *Tenant Credentials* in the *Initial Parameters* iFlow.
Token Service URL	**`Token service URL to be found in service key`** To be found in the service key created in SAP Cloud Integration subaccount.
Client ID	**`Client ID to be found in service key`** To be found in the service key created in SAP Cloud Integration subaccount.
Client Secret	**`Client secret to be found in service key`** To be found in the service key created in SAP Cloud Integration subaccount.
Client Authentication	*Send as Request Header*
Scope	Leave empty
Content Type	*application/json*
Resource	Leave empty
Audience	Leave empty

4. Choose *Deploy*.

Results

You've created and activated a security material with OAuth 2.0 client credential authorization.

2.1.4.6 Connect SAP Cloud Integration to SAP Digital Manufacturing

Connect SAP Cloud Integration to SAP Digital Manufacturing using iFlows.

Use

The communication from SAP Cloud Integration to SAP Digital Manufacturing is based on predefined integration flows (iFlow) that control the data transfer between both partner systems. These iFlows are contained in packages, such as the *SAP S/4HANA Integration with SAP Digital Manufacturing* package, and are configured in SAP Cloud Integration.

> **Note**
>
> It's recommended to deploy all iFlows contained in the *SAP S/4HANA Integration with SAP Digital Manufacturing* package. For more information on the required artifacts for all integration message types, see 3050090.
>
> You can find the change log of the *SAP S/4HANA Integration with SAP Digital Manufacturing* package here: 3315636

Overview of the Procedure

To enable this iFlow-based communication between your systems, you've to perform the following tasks:

1. Prepare the credentials for the initial parameter deployment. For more information, see Prepare Credentials for Initial Parameter Deployment [page 53].
2. Set up one of the two authorization methods:
   1. OAUTH 2.0 client credential authorization. For more information, see Connection with OAuth 2.0 Client Credential Authorization [page 68].
   2. OAUTH 2.0 client certificate authorization (x.509). For more information, see Connection with Client Certificate Authorization (X.509) [page 76].

2.1.4.6.1 Connection with OAuth 2.0 Client Credential Authorization

Set up an OAuth 2.0 client credential (client ID / client secret) connection from SAP Cloud Integration to SAP Digital Manufacturing.

Use

By enabling OAuth 2.0 client credential authentification for the communication from SAP Cloud Integration to SAP Digital Manufacturing, you benefit from the fact that you don't need a user and a password anymore.

Overview

To set up OAuth 2.0 client credential authentication from SAP Cloud Integration to SAP Digital Manufacturing, you need to create a service instance with a service key that supports OAuth 2.0 client credential authorization (client ID / client secret) in your SAP Digital Manufacturing subaccount. Then you create a security material that uses the authentication information found in the service key. As last step, you configure the relevant integration flow package in SAP Cloud Integration.

> ⓘ Note
>
> If you're already using client credential authorization, you can switch over from client credential authorization to OAuth 2.0 client certificate authorization (x.509). For more information about this procedure, see 3231128.

Step Overview

To set up security parameters with authorization code, perform the tasks described in the following topics:

1. Create a Service Instance and Service Key in SAP Digital Manufacturing Subaccount [page 69]
2. Create an OAuth 2.0 Client Credential Security Material [page 70]
3. Configure Inbound Processor iFlow [page 72]
4. Configure Initial Parameters iFlow [page 74]

2.1.4.6.1.1 Create a Service Instance and Service Key in SAP Digital Manufacturing Subaccount

Create a service instance and a service key supporting OAUTH 2.0 client credential authentication (client ID / client secret) in your SAP Digital Manufacturing subaccount in SAP BTP cockpit.

Prerequisites

- You've got the `Administrator` role for SAP BTP cockpit.
- You've got access to the SAP Digital Manufacturing subaccount in SAP BTP cockpit.

Context

To enable OAUTH 2.0 client credential authentication from SAP Cloud Integration to SAP Digital Manufacturing, you need to create a service instance and a service key supporting OAUTH 2.0 client credential authentication (client ID / client secret) in your SAP Digital Manufacturing subaccount in SAP BTP cockpit.

Procedure

1. In SAP BTP cockpit, go to your SAP Digital Manufacturing subaccount.
2. Go to *Services* > *Instances and Subscriptions* and choose *Create*.

   The *New Instance or Subscription* popup opens.
3. Enter the following fields to create a service instance:

Field	
Service	*SAP Digital Manufacturing Cloud Services*
Plan	*execution*
Runtime Environment	*Cloud Foundry*
Space	**`Name of your space`**

4. Choose Next and leave the *Parameters* popup empty.
5. Choose *Next* and *Create*.
6. Under *Instances*, choose the instance that you've just created.
7. On the *Service Keys* tab, choose Create.

   The *New Service Key* popup opens.
8. Enter the following fields to create a service key supporting client ID / client secret:

Field	
Service Key Name	**`Service Key`** ⓘ Note You can choose a random name.

9. Choose *Create*.

> ⓘ Note
>
> You can access the service key content by choosing ••• and then *View*.

Results

You've created a service instance and a service key supporting OAuth 2.0 client credential authentication.

2.1.4.6.1.2 Create an OAuth 2.0 Client Credential Security Material

Create a security material named **`CF_AUTH`** in SAP Cloud Integration that you need for the configuration of the integration flow.

Prerequisites

- You've got the `Administrator` role for SAP Cloud Integration.
- You've created a service instance and a service key supporting OAuth 2.0 client credential authorization in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Create a Service Instance and Service Key in SAP Digital Manufacturing Subaccount [page 69].

Context

You need to create a security material supporting OAuth 2.0 client credentials, called for example **`CF_AUTH`**, in SAP Cloud Integration that enables SAP Cloud Integration to send requests to SAP Digital Manufacturing. In a later step, you'll use this security material to configure the `INBOUND_PROCESSOR` integration flow in SAP Cloud Integration.

Procedure

1. Log on to SAP Cloud Integration and go to the *Monitor* section.
2. Choose the *Security Material* app.
3. Choose *Create*, and select *User Credentials*.

   The *Create User Credentials* popup opens.
4. Complete the following data:

Field	CF_AUTH
Name	**CF_AUTH** You can choose a random name, but you need to use this name later for the `DMC_Credentials` in the `INBOUND_PROCESSOR` iFlow.
Type	*User Credentials*
User	**<clientid of service key>** To be found in SAP Digital Manufacturing subaccount. For more information, see Create a Service Instance and Service Key in SAP Digital Manufacturing Subaccount [page 69].
Password	**<clientsecret of service key>** To be found in SAP Digital Manufacturing subaccount.

> **Note**
>
> Here's how to find the `<clientid of Service Key>` and the `<clientsecret of Service Key>`:
> In SAP BTP cockpit, go to your SAP Digital Manufacturing subaccount. Go to *Services* > *Instances and Subscriptions*. In the *Instances* tab, choose the key in the *Credentials* column. You find the `<clientid of Service Key>` and the `<clientsecret of Service Key>` in the *JSON* box of the *Credentials* popup.

5. Choose *Deploy*.

Results

You've created a security material.

2.1.4.6.1.3 Configure Inbound Processor iFlow

You configure the *INBOUND PROCESSOR* iFlow in SAP Cloud Integration to connect SAP Cloud Integration to SAP Digital Manufacturing using OAuth 2.0 client credential authorization.

Prerequisites

- You've got the `Administrator` role for SAP Cloud Integration.
- The *INBOUND PROCESSOR* integration workflow is available in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration. If not, an update of your package is required. For more information, see Upgrade Information [page 365].
- You've created a security material supporting OAuth 2.0 client credential authorization. For more information, see Create an OAuth 2.0 Client Credential Security Material [page 70].

Context

In this step, you configure the *INBOUND PROCESSSOR* integration flow SAP Cloud Integration. To connect SAP Cloud Integration to SAP Digital Manufacturing, you enter the name of the security material that gives access to SAP Digital Manufacturing, called here CF_AUTH, into the `DMC_CREDENTIAL` field. Moreover, you leave the `DMC_PRIVATE_KEY_ALIAS` field empty to use the OAUTH 2.0 client credential authorization.

> **Note**
>
> If you're already using client credential authorization, you can switch over from client credential authorization to OAUTH 2.0 client certificate authorization (x.509). For more information about this procedure, see 3231128.

Procedure

1. In SAP Cloud Integration, go to the *Discover* section.
2. Choose the *SAP S/4HANA Integration with SAP Digital Manufacturing* package.
3. Choose *Copy* to make a copy of the integration package.
4. Go to the *Design* section and choose your package.
5. In the *Artifacts* tab, search for the *INBOUND PROCESSOR* integration workflow and choose , then *Configure*.

   The *Configure "INBOUND PROCESSOR"* popup opens.
6. On the *Receiver* tab, keep the default parameters.
7. On the *More* tab, enter the following parameters:

Parameter	Value
DMC_API_URL	**`public-api-endpoint`** To be found in the service key in SAP Digital Manufacturing subaccount. For example: • **`https://api.<data center>.dmc.cloud.sap`** (production system) • **`https://api.test.<data center>.dmc.cloud.sap`** (quality system) For more information, see Create a Service Instance and Service Key in SAP Digital Manufacturing Subaccount [page 69].
DMC_CREDENTIAL	**`CF_AUTH`** The name of the security material that you've created. For more information, see Create an OAuth 2.0 Client Credential Security Material [page 70].
DMC_PRIVATE_KEY_ALIAS	Leave this field empty.
DMC_TOKEN_URL	Enter the `<URL of Service Key>`**/oauth/token**, taken from the service key in your SAP Digital Manufacturing`https://<...>.authentication.eu10.hana.ondemand.com`**/oauth/token**. For more information, see Create a Service Instance and Service Key in SAP Digital Manufacturing Subaccount [page 69].
ENDPOINT_ID	00

8. Choose *Save*.
9. To deploy the *INBOUND PROCESSOR* integration workflow, choose , then *Deploy*.

Results

You've configured and deployed the *INBOUND PROCESSOR* iflow.

2.1.4.6.1.4 Configure Initial Parameters iFlow

You configure the `Initial Parameters` iFlow in SAP Cloud Integration to connect SAP Cloud Integration to SAP Digital Manufacturing using OAuth 2.0 client credential authorization.

Prerequisites

- You've got the `Administrator` role for SAP Cloud Integration.
- You've created a security material for initial parameter deployment. For more information, see Prepare Credentials for Initial Parameter Deployment [page 53].
- You've configured the *INBOUND PROCESSOR* integration workflow. For more information, see Configure Inbound Processor iFlow [page 72].

Context

With this procedure, you configure the `Initial Parameters` integration flow in SAP Cloud Integration. To enable SAP Cloud Integration to write parameters to SAP Cloud Integration, so that all integration flows can access them, you enter the credential that you've prepared for your initial parameter deployment, for example PD_DEPLOYER_USER or PD_DEPLOYER_CLIENT, under `TENANT_CREDENTIALS`.

Procedure

1. In SAP Cloud Integration, go to the *Design* section.
2. Choose the *SAP S/4HANA Integration with SAP Digital Manufacturing* package.
3. In the *Artifacts* tab, search for the *Initial Parameters* integration workflow and choose , then *Configure*.

   The *Configure "Initial Parameters"* popup opens.
4. Enter the following parameters:

Parameter Name	Description	Value
`ENABLE_PLANT_CONVERSION`	Define if you want to enable plant conversion function to connect multiple ERP plants to SAP Digital Manufacturing.	Enter **`TRUE`** to enable this function. For more information, see Mapping Plants (Plant Conversion) [page 356].
`PID`	-	`DME_Generic_Processing_00`

Parameter Name	Description	Value
`TENANT_CREDENTIALS`	The SAP Cloud Integration user credential created in the *Security Material* app.	`PD_DEPLOYER_USER` or `PD_DEPLOYER_CLIENT` For more information, see Prepare Credentials for Initial Parameter Deployment [page 53].
`TENANT_URL`	SAP Cloud Integration management URL used for iFlow deployment.	Use the SAP Cloud Integration management URL in the email you received after successful SAP Cloud Integration tenant provisioning. If you haven't access to this mail, see How to Get SAP Cloud Integration Management URL [page 22].

5. Choose *Save*.
6. To deploy the *Initial Parameters* integration workflow, choose , then *Deploy*.
7. Under *Monitor Message Processing*, check whether the `Initial Parameters` message has status *Completed*.

> **Note**
>
> In SAP Cloud Integration, you've got the following monitoring options:
>
> - Under *Manage Integration Content*, you can check whether your integration flow has status *Started*.
> - Under *Monitor Message Processing*, you can check whether the integration message has status *Completed*.

> **Note**
>
> If you're using OAuth 2.0 Authentication with Authorization Code for initial parameter deployment (`PD_DEPLOYER_CLIENT`) and if the initial parameter message has status *Failed*, authorize your security material again under *Manage Security Material* and deploy the `Initial Parameters` integration flow again.

Results

You've configured and deployed the *Initial Parameters* iFlow.

2.1.4.6.2 Connection with Client Certificate Authorization (X.509)

Connect SAP Cloud Integration to SAP Digital Manufacturing using OAUTH 2.0 client certificate authentication (X.509).

Use

You can make the data exchange from SAP Cloud Integration to SAP Digital Manufacturing more secure by using an X.509 certificate.

General Overview of the Procedure

To enable OAUTH 2.0 client certificate authentication (X.509) from SAP Cloud Integration to SAP Digital Manufacturing, you need to create a service key with credential type x.509 in your SAP Digital Manufacturing subaccount and create an x.509 certificate that will enable secure communication between the systems. You upload the x.509 certificate in SAP Digital Manufacturing and SAP Cloud Integration. In SAP Cloud Integration, you then create a security material based on the authentication information found in the service key. In the last two steps, you configure the `INBOUND_PROCESSOR` integration flow and the `Initial Parameters` in SAP Cloud Integration.

Overview Setup Steps

To set up OAUTH 2.0 client certificate authentication (X.509) from SAP Digital Manufacturing to SAP Cloud Integration, perform the tasks described in the following topics:

1. Before You Start [page 77]
2. Create an X.509 Service Key in SAP Digital Manufacturing [page 77]
3. Create an X.509 Certificate [page 78]
4. Create a Key Pair and Upload the X.509 Certificate File to SAP Cloud Integration [page 79]
5. Create a Security Material with User Credentials in SAP Cloud Integration [page 80]
6. Configure Inbound Processor iFlow [page 82]
7. Configure Initial Parameters iFlow [page 84]

2.1.4.6.2.1 Before You Start

This page shows you the prerequisites that are required to connect SAP Cloud Integration to SAP Digital Manufacturing using an x.509 certificate.

Prerequisites

- You've got the `Administrator` role for SAP BTP cockpit.
- You've got the `Administrator` role for SAP Digital Manufacturing.
- You've got access to the SAP Digital Manufacturing subaccount in SAP BTP cockpit.
- You've got software to create certificate files of type `.pfx`, such as `openSSL`.

2.1.4.6.2.2 Create an X.509 Service Key in SAP Digital Manufacturing

Create a service key that supports X.509 credentials in your SAP Digital Manufacturing subaccount.

Prerequisites

- You've got the `Administrator` role for SAP BTP cockpit.
- You've got access to the SAP Digital Manufacturing subaccount in SAP BTP cockpit.

Context

To set up communication from SAP Digital Manufacturing to SAP Cloud Integration or from SAP Cloud Integration to SAP Digital Manufacturing using an X.509 certificate, you need to create a service key that supports X.509 credentials in your SAP Digital Manufacturing subaccount.

Procedure

1. In SAP BTP cockpit, go to your SAP Digital Manufacturing subaccount.
2. Under *Instances and Subscriptions*, choose your SAP Digital Manufacturing instance.
3. In the *Service Keys* tab, choose *Create* to create a service key.
4. In the *New Service Key* popup, enter a *Service Key Name* of your choice.

5. Paste `{"xsuaa":{"credential-type":"x509"}}` as parameter into the JSON format field.

> **Note**
>
> You can also specify the validity period:
>
> **Sample Code**
>
> ```
> {
>  "xsuaa": {
>  "credential-type": "x509",
>  "x509": {
>  "validity": 12,
>  "validity-type": "MONTHS"
>  }
>  }
> }
> ```
>
> The default setting is 7 days. The maximum duration is 1 year.
>
> Be aware that you need to create a new service key before the x.509 certificate of the current service key expires.
>
> > **Note**
> >
> > If you renew your certificate in SAP Cloud Integration, you need to perform the steps decribed in this chapter again starting with the service key creation. For more information on how to renew your SAP Cloud Integration, see Security Artifact Renewal for Transport Level Security.

6. Choose *Create*.

   You've created a service key supporting X.509 credentials.

2.1.4.6.2.3 Create an X.509 Certificate

Create an X.509 certificate that's needed for X.509 certificate-based data transfer between SAP Digital Manufacturing and SAP Cloud Integration.

Prerequisites

- You've the `Administrator` role for SAP BTP cockpit.
- You've got access to the SAP Digital Manufacturing subaccount in SAP BTP cockpit.
- You've created a service key supporting OAUTH 2.0 client certificate authorization for your SAP Cloud Integration instance. For more information, see Create an X.509 Service Key in SAP Digital Manufacturing [page 77].
- You've software to create certificate files of type `.pfx`, such as `openSSL`.

Context

To enable communication between SAP Digital Manufacturing and SAP Cloud Integration using X.509 credentials, you need to create an X.509 certificate based on information that can be found in the service key.

Procedure

1. In SAP BTP cockpit, go to your SAP Digital Manufacturing subaccount.
2. Under *Instances and Subscriptions*, choose your SAP Cloud Integration instance.
3. Open the service key.
4. In the *JSON* box, go to the *key* field, which is under the `"uaa"` tag, and copy the content of the *key* field into a new file of type `.pem`, for example `key.pem`, and save it.
5. In the *JSON* box, go to the *certificate* field, which is under the `"uaa"` tag, and copy the content of the *certificate* field into a new file of type `.pem`, for example `certificate.pem`, and save it.
6. Replace the `\n` characters of the files with line breaks.

   For example, you could use this code: `awk '{gsub(/\\n/,"\n")}1' key.txt | tee key_new.pem`.
7. Create a certificate file of type `.pfx`, for example `service.pfx`, combining `key.pem` and `certificate.pem`, and assign a password to it.

   If you're using OpenSSL to create the `.pfx` file, use this command: `openssl pkcs12 -export -out service.pfx -inkey key.pem -in certificate.pem`.

2.1.4.6.2.4 Create a Key Pair and Upload the X.509 Certificate File to SAP Cloud Integration

Create a key pair in SAP Cloud Integration and upload the X.509 certificate file to SAP Cloud Integration to enable data transfer from SAP Digital Manufacturing to SAP Cloud Integration.

Prerequisites

- You've got the `Administrator` role for SAP Cloud Integration.
- You've got an X.509 certificate with a password. For more information, see Create an X.509 Certificate [page 78].

Context

To set up communication from SAP Digital Manufacturing to SAP Cloud Integration or from SAP Cloud Integration to SAP Digital Manufacturing using an X.509 certificate, you need to create a key pair in SAP

Cloud Integration and upload the X.509 certificate into the system. Then you need to download the certificate to your computer to use it later in the integration process.

Procedure

1. In SAP Cloud Integration, go to the *Monitor* section and choose the *Keystore* tile.
2. Choose *Add*.
3. Choose *Key Pair*.
4. In the *Add Key Pair* popup, enter an *Alias* for the key pair, for example `DMC_KEY_PAIR`. You can choose a random name.
5. Upload the `.pfx` file, for example `service.pfx`, by using the *Browse* function.
6. Enter the password that you've defined for the `.pfx` file.
7. Choose *Add*.
8. In the *Actions* column of the newly created key pair, choose ••• (More) and then *Download Certificate*.

   A certificate of type `.cer` has been created, for example `dmc_service.cer`, and downloaded to your computer. You need it for the next step.

2.1.4.6.2.5 Create a Security Material with User Credentials in SAP Cloud Integration

Create a security material with OAuth authorization code in SAP Cloud Integration.

Prerequisites

- You've got the `Administrator` role for SAP Cloud Integration.
- You've created a service instance and a service key that supports client credentials with x.509 certificate in your SAP Digital Manufacturing. For more information, see Create an X.509 Service Key in SAP Digital Manufacturing [page 77].

Context

You've created a service key that supports client credentials with x.509 certificate in your SAP Digital Manufacturing in your SAP Digital Manufacturing subaccount. Now you create and activate a security material with client credentials based on authentication information found in the service key.

Procedure

1. In SAP Cloud Integration, go to the *Monitor* section and choose the *Security Material* app.
2. Choose *Create* and then *User Credentials*.

   The *Create User Credentials* popup opens.
3. Enter the following data:

Field	
Name	`CF_AUTH` **Note** You can choose a random nam, but you need to use this name later for the *DMC_Credentials* in `INBOUND_PROCESSOR` iFlow.
Type	*User Credentials*
User	**`Client ID`** To be found in the service key of the service instance in your SAP Digital Manufacturing subaccount. For more information, see Create an X.509 Service Key in SAP Digital Manufacturing [page 77].
Password	Leave this field empty
Repeat Password	Leave this field empty

4. Choose *Deploy*.

Results

You've created and activated a security material that supports OAuth 2.0 client certificate authorization (x.509).

2.1.4.6.2.6 Configure Inbound Processor iFlow

You configure the `INBOUND PROCESSOR` iFlow in SAP Cloud Integration to connect SAP Cloud Integration to SAP Digital Manufacturing using OAUTH 2.0 client certificate authorization (x.509).

Prerequisites

- You've got the `Administrator` role for SAP Cloud Integration.
- The *INBOUND PROCESSOR* integration workflow is available in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration. If not, an update of your package is required. For more information, see Upgrade Information [page 365].
- You've created a security material with user credentials supporting OAUTH 2.0 client certificate authorization. For more information, see Create a Security Material with User Credentials in SAP Cloud Integration [page 80].
- You've created a key pair with user credentials in SAP Cloud Integration. For more information, see Create a Key Pair and Upload the X.509 Certificate File to SAP Cloud Integration [page 79].

Context

In this step, you configure the `INBOUND_PROCESSSOR` integration flow in SAP Cloud Integration. To connect SAP Cloud Integration to SAP Digital Manufacturing, you enter the name of the security material that gives access to SAP Digital Manufacturing Cloud, called here `CF_AUTH`, into the `DMC_CREDENTIAL` field. To use the OAUTH 2.0 client certificate authentication (x.509), you copy the alias name of the certificate from the *Manage Keystore* app in SAP Cloud Integration into the *DMC_PRIVATE_KEY_ALIAS* field.

> **Note**
>
> If you're already using client credential authoriziation, you can switch over from client credential authorization to OAUTH 2.0 client certificate authorization (x.509). For more information about this procedure, see 3231128.

Procedure

1. In SAP Cloud Integration, go to the *Discover* section.
2. Choose the *SAP S/4HANA Integration with SAP Digital Manufacturing* package.
3. Choose *Copy* to make a copy of the integration package.
4. Go to the *Design* section and choose your package.
5. In the *Artifacts* tab, search for the *INBOUND PROCESSOR* integration workflow and choose , then *Configure*.

   The *Configure "INBOUND PROCESSOR"* popup opens.

6. On the *Receiver* tab, keep the default parameters.
7. On the *More* tab, enter the following parameters:

Parameter	Value
Type	*All Parameters*
DMC_API_URL	**`public-api-endpoint`** To be found in the service key in SAP Digital Manufacturing subaccount. For example: • **`https://api.<data center>.dmc.cloud.sap`** (production system) • **`https://api.test.<data center>.dmc.cloud.sap`** (quality system) For more information, see Create an X.509 Service Key in SAP Digital Manufacturing [page 77].
DMC_CREDENTIAL	`CF_AUTH` Enter the name of the security material that you've created in SAP Cloud Integration. For more information, see Create a Security Material with User Credentials in SAP Cloud Integration [page 80].
DMC_PRIVATE_KEY_ALIAS	`DMC_KEY_PAIR` Enter the alias of your certificate from the *Manage Keystore* app in SAP Cloud Integration. For more information, see Create a Key Pair and Upload the X.509 Certificate File to SAP Cloud Integration [page 79].
DMC_TOKEN_URL	**`certurl`/oauth/token** To be found in the service key in your SAP Digital Manufacturing subaccount. For more information, see Create an X.509 Service Key in SAP Digital Manufacturing [page 77].
ENDPOINT_ID	00

8. Choose *Save*.
9. To deploy the *INBOUND PROCESSOR* integration workflow, choose , then *Deploy*.

Results

You've configured and deployed the *INBOUND PROCESSOR* iflow.

Related Information

Create a Security Material with User Credentials in SAP Cloud Integration [page 80]

2.1.4.6.2.7 Configure Initial Parameters iFlow

You configure the `Initial Parameters` iFlow in SAP Cloud Integration to connect SAP Cloud Integration to SAP Digital Manufacturing using OAuth 2.0 client certificate authorization (x.509).

Prerequisites

- You've got the `Administrator` role for SAP Cloud Integration.
- You've configured the *INBOUND PROCESSOR* integration workflow. For more information, see Configure Inbound Processor iFlow [page 82].
- You've created a service key supporting OAUTH 2.0 client certificate authorization in SAP Digital Manufacturing. For more information, see Create an X.509 Service Key in SAP Digital Manufacturing [page 77].

Context

With this procedure, you configure the `Initial Parameters` integration flow in SAP Cloud Integration. To enable SAP Cloud Integration to write parameters to SAP Cloud Integration, so that all integration flows can access them, you enter the credential that you've prepared for your initial parameter deployment, for example `PD_DEPLOYER_USER` or `PD_DEPLOYER_CLIENT`, under `TENANT_CREDENTIALS`.

Procedure

1. In SAP Cloud Integration, go to the *Discover* section.
2. Choose the *SAP S/4HANA Integration with SAP Digital Manufacturing* package.
3. In the *Artifacts* tab, search for the *Initial Parameters* integration workflow and choose , then *Configure*.

   The *Configure "Initial Parameters"* popup opens.
4. Enter the following parameters:

Parameter Name	Description	Value
`ENABLE_PLANT_CONVERSION`	Define if you want to enable plant conversion function to connect multiple ERP plants to SAP Digital Manufacturing.	Enter **`TRUE`** to enable this function. For more information, see Mapping Plants (Plant Conversion) [page 356].
`PID`	-	`DME_Generic_Processing_00`
`TENANT_CREDENTIALS`	The user credential created in the *Security Material* app.	`PD_DEPLOYER_USER` or `PD_DEPLOYER_CLIENT` For more information, see Prepare Credentials for Initial Parameter Deployment [page 53].
`TENANT_URL`	SAP Cloud Integration management URL used for iFlow deployment.	Use the SAP Cloud Integration management URL in the email you received after successful SAP Cloud Integration tenant provisioning. If you'ven't access to this mail, see How to Get SAP Cloud Integration Management URL [page 22].

5. Choose *Save*.
6. To deploy the *Initial Parameters* , then *Deploy*.
7. Under *Monitor Message Processing*, check whether the `Initial Parameters` message has status *Completed*.

> → Tip
>
> In SAP Cloud Integration, you've got the following monitoring options:
>
> - Under *Manage Integration Content*, you can check whether your integration flow has status *Started*.
> - Under *Monitor Message Processing*, you can check whether the integration message has status *Completed*.

> → Tip
>
> If you're using OAuth 2.0 Authentication with Authorization Code for initial parameter deployment (`PD_DEPLOYER_CLIENT`) and if the initial parameter message has status *Failed*, authorize your security material again under *Manage Security Material* and deploy the `Initial Parameters` integration flow again.

Results

You've configured and deployed the *Initial Parameters* iFlow.

2.1.4.7 Connect SAP Digital Manufacturing to SAP Cloud Integration

To enable communication from SAP Digital Manufacturing to SAP Cloud Integration, you configure destinations and choose an authentication method.

Use

To enable communication from SAP Digital Manufacturing to SAP Cloud Integration, you need to configure SAP Cloud Integration destinations in your SAP BTP cockpit. Moreover, you need to choose an authentication method to build a connection between the systems. The procedure to set up authorization varies depending on the environment you're in. These are your options:

- Connection with Basic Authentication (Neo and Cloud Foundry) [page 86]
- Connection with Client Credential Authentication in Neo Environment [page 91]
- Connection with Client Credential Authentication in Cloud Foundry Environment [page 93]
- Connection with X.509 certificate-based Authorization in Cloud Foundry Environment [page 97]

2.1.4.7.1 Connection with Basic Authentication (Neo and Cloud Foundry)

Connect SAP Digital Manufacturing to SAP Cloud Integration using basic authentication in Neo or Cloud Foundry environment.

Prerequisites

- You've got a P-user with access to SAP Cloud Integration. For more information, see Granting Your P-User Access to SAP Cloud Integration in Neo Environment [page 88] or Granting Your P-User Access to SAP Cloud Integration in Cloud Foundry Environment [page 90].

  > **Note**
  >
  > Your P-user and the corresponding email address must not be bound to SAP Universal ID. To check whether or not your P-user and the corresponding email are already bound to SAP Universal ID, log on to your account at www.sap.com and go to *Manage my Account* > *Accounts* to find your users.

- You've got the SAP Cloud Integration runtime URL. For more information, see How to Get SAP Cloud Integration Runtime URL [page 23].

  > **Example**
  >
  > For SAP Cloud Integration in the Cloud Foundry environment, the URL is `https://<Cloud Integration tenant>.it-accd002-rt.cfapps.sap.hana.ondemand.com`.

> **Example**
>
> For SAP Cloud Integration in Neo environment, the URL is **`https://<Cloud Integration tenant>-iflmap.avtsbhf.eu1.hana.ondemand.com`**.

- You've got the SAP Cloud Integration management URL. For more information, see How to Get SAP Cloud Integration Management URL [page 22].

> **Example**
>
> For SAP Cloud Integration in Cloud Foundry environment, the URL is **`https://<Cloud Integration tenant>.it-accd002.cfapps.sap.hana.ondemand.com`**.

> **Example**
>
> For SAP Cloud Integration in Neo environment, the URL is **`https://<Cloud Integration tenant>-tmn.avt.eu1.hana.ondemand.com`**.

Context

To enable communication from SAP Digital Manufacturing to SAP Cloud Integration, you need to configure SAP Cloud Integration destinations in your SAP BTP cockpit. The `CPI_DESTINATION_IFLMAP` enables SAP Digital Manufacturing access the endpoints exposed by SAP Cloud Integration. The `CPI_DESTINATION_TMN` destination enables SAP Digital Manufacturing to access information such as SAP Cloud Integration logs.

> **Note**
>
> Instead of basic authentication, you can also enable client credential authentication (`OAuth2ClientCredentials`) for technical users. There are specific methods for the Neo and SAP Cloud Integration environment. For more information, see Connection with Client Credential Authentication in Neo Environment [page 91] or Connection with Client Credential Authentication in Cloud Foundry Environment [page 93].

> **Note**
>
> The `CPI_DESTINATION_TMN` destination is a prerequisite for the *Manage Integration Workflows* app as well as for the *Fetch CPI Logs* functionality available in the *Integration Message Dashboard* app. For more information, see Integration Message Dashboard.

Procedure

1. Log on to SAP BTP cockpit of SAP Digital Manufacturing and choose *Connectivity* > *Destinations* in the side menu bar.
2. Choose *Create Destination* and enter the following fields to create two SAP Cloud Integration destinations.

Field	CPI_DESTINATION_IFLMAP	CPI_DESTINATION_TMN
Name	**CPI_DESTINATION_IFLMAP**	**CPI_DESTINATION_TMN**
Type	*HTTP*	*HTTP*
URL	Enter the SAP Cloud Integration runtime URL. The part to enter here ends with **.com**. For example, **https://<Cloud Integration tenant><...>ondemand.com**. For more information, see above in the prerequisites section.	Enter the SAP Cloud Integration management URL. The part to enter here ends with **.com**. For example, **https://<Cloud Integration tenant><...>ondemand.com**. For more information, see above in the prerequisites section.
Proxy Type	*Internet*	*Internet*
Authentication	*BasicAuthentication*	*BasicAuthentication*
User	P-user	P-user
Password	**Password**	**Password**

2.1.4.7.1.1 Granting Your P-User Access to SAP Cloud Integration in Neo Environment

Learn how to authorize your P-user for SAP Cloud Integration in Neo environment to enable basic authentication.

Prerequisites

- You've got the `Administrator` role for the subaccount.
- You've got the user IDs of the members that you want to add.
- You've got a P-user and password.
  To obtain a P-User ID, go to www.sap.com and register a new user using their email address.
  If a user has already been registered with the SAP ID service (for example, at SAP Community or SAP Developer Center) using the same email address, the user doesn't need to register again.
  To find an existing P-user, you've got two options:
  - Log on to your account at www.account.sap.com using your email address. In your profile, under *Accounts*, you find your P-user ID.
  - Log on to your account at www.sap.com using your email address. Go to *Manage my Account* > *Accounts* to find your users.

> ⚠ Caution
>
> Your P-user and the corresponding email address must not be bound to SAP Universal ID. To check whether or not your P-user and the corresponding email are already bound to SAP Universal ID, log on to your account at www.sap.com and go to *Manage my Account* > *Accounts* to find your users.

> If you get errors related to your credentials or the authorization, you can refer to 3085908.

Context

To enable basic authentication, you need to grant your P-user access to SAP Cloud Integration first.

Procedure

1. In SAP BTP cockpit, select your SAP Cloud Integration subaccount.
2. Under *Overview*, choose *Members*.
3. Choose *Add Members*.
4. In the *User IDs* field, enter your P-User ID.
5. Assign the following roles to the member: *Administrator (predefined role)* and *Developer (predefined role)*.
6. Choose *Add Members*.
7. Choose *Security* > *Authorizations*.
8. On the *Users* tab, enter your P-user ID and choose *Show Assignments*.
9. Choose *Assign* in the area for individual assignment, not group assignment.

   The *Assign Roles to User* popup opens.
10. Go through the available subaccounts and applications to assign the following roles and save them:

`ESBMessaging.send`
`AuthGroup.BusinessExpert`
`AuthGroup.Administrator`
`AuthGroup.IntegrationDeveloper`

Results

Your P-user has now access to SAP Cloud Integration.

2.1.4.7.1.2 Granting Your P-User Access to SAP Cloud Integration in Cloud Foundry Environment

Learn how to authorize your P-user for SAP Cloud Integration in Cloud Foundry environment to enable basic authentication.

Prerequisites

- You've got the `Administrator` role for the subaccount in SAP BTP cockpit.
- You've got the user IDs of the members that you want to add.
- You've got a P-user and password.
  To obtain a P-User ID, go to www.sap.com and register a new user using their email address.
  If a user has already been registered with the SAP ID service (for example, at SAP Community or SAP Developer Center) using the same email address, the user doesn't need to register again.
  To find an existing P-user, you've got two options:
  - Log on to your account at www.account.sap.com using your email address. In your profile, under *Accounts*, you find your P-user ID.
  - Log on to your account at www.sap.com using your email address. Go to *Manage my Account* > *Accounts* to find your users.

> ⚠ Caution
>
> Your P-user and the corresponding email address must not be bound to SAP Universal ID. To check whether or not your P-user and the corresponding email are already bound to SAP Universal ID, log on to your account at www.sap.com and go to *Manage my Account* > *Accounts* to find your users.
>
> If you get errors related to your credentials or the authorization, you can refer to 3085908.

Context

To enable basic authentication, you need to grant your P-user access to SAP Cloud Integration first.

Procedure

1. In SAP BTP cockpit, select your SAP Cloud Integration subaccount.
2. Under *Security* > *Users*, choose *Create*.
3. Under *User Name*, enter the e-mail address belonging to your P-user.
4. Choose *Default Identity Provider*.
5. Choose *Create*.

6. Choose *Security* > *Role Collections*.
7. Choose +.
8. Give your collection a name, for example `My_RoleCollection`, and choose *Create*.
9. Select your collection and choose *Edit*.
10. On the *Roles* tab, under *Role Name*, choose and add the following roles to your collection:

`MessagingSend`
`MessagePayloadsRead`
`AuthGroup_BusinessExpert`

If you want to use the *CPI Async Mode*, there a some additional roles required. For more information, see Asynchronous Communication with SAP Cloud Integration [page 111].

11. Under *Security* > *Users*, choose your user.
12. In the detail view, choose *Assign Role Collection* to make the following assignments:

`My_RoleCollection`
`PI_Integration_Developer` (predefined)
`PI_Administrator` (predefined)

Results

Your P-user has now access to SAP Cloud Integration.

2.1.4.7.2 Connection with Client Credential Authentication in Neo Environment

Connect SAP Digital Manufacturing to SAP Cloud Integration using client credential authentication (`OAuth2ClientCredentials`) in Neo environment.

Prerequisites

- You have the SAP Cloud Integration runtime URL. For more information, see How to Get SAP Cloud Integration Runtime URL [page 23].

  > **Example**
  >
  > For SAP Cloud Integration in Neo environment, the URL is **`https://<Cloud Integration tenant>-iflmap.avtsbhf.eu1.hana.ondemand.com`**.

- You have the SAP Cloud Integration managment URL. For more information, see How to Get SAP Cloud Integration Management URL [page 22].

> **Example**
>
> For SAP Cloud Integration in Neo environment, the URL is **`https://<Cloud Integration tenant>-tmn.avt.eu1.hana.ondemand.com`**.

Context

To enable client credential communication (`OAuth2ClientCredentials`) from SAP Digital Manufacturing to SAP Cloud Integration, you need to create two `OAuth` clients in your SAP Cloud Integration subaccount. SAP Digital Manufacturing can access these clients using an authentication token provided by SAP Cloud Integration through its token endpoint. Moreover, you need to create destinations in SAP Digital Manufacturing that point towards SAP Cloud Integration. The `CPI_DESTINATION_IFLMAP` enables SAP Digital Manufacturing access the endpoints exposed by SAP Cloud Integration. The `CPI_DESTINATION_TMN` destination enables SAP Digital Manufacturing to access information such as SAP Cloud Integration logs.

> **Note**
>
> The `CPI_DESTINATION_TMN` destination is a prerequisite for the *Manage Integration Workflows* app as well as for the *Fetch CPI Logs* functionality available in the *Integration Message Dashboard* app. For more information, see Integration Message Dashboard.

Procedure

1. In SAP BTP cockpit, log on to your SAP Cloud Integration subaccount and then choose *Security* > *OAuth*. In *Branding* section, note down the *Token Endpoint*, for example `https://{...}.hana.ondemand.com/oauth2/api/v1/token`.
2. Choose the *Clients* tab, and register two clients: one for `ifmap` and another one for `tmn`. You can randomly define the *Name* and *Secret* of the client, for example **`oauth_client_ifmap`** and **`oauth_client_tmn`**. In *Subscription*, select the one ending with *ifmap* or *tmn*. In *Authorization Grant*, select *Client Credentials*. Note down the client IDs that are automatically generated.
3. Choose *Security* > *Authorization* > *Users* in the side menu bar.
4. Create two users: `oauth_client_<client ID of ifmap>` and `oauth_client_<client ID of tmn>` by choosing *Show Assignments*, for example `oauth_client_123456-a123-a123-a123-a12345678`.
5. In the *Roles* section, assign the following roles to the *Application* ending with tmn:
   - `AccessPoliciesArtifacts.AccessAll`
   - `AuthGroup.TenantPartnerDirectoryConfigurator`
   - `AuthGroup.BusinessExpert`
   - `AuthGroup.IntegrationDeveloper`

6. Assign the following role to the *Application* ending with ifmap: `ESBMessaging.send`.
7. Navigate to your SAP Digital Manufacturing subaccount in SAP BTP cockpit and choose *Connectivity* > *Destinations* in the side menu bar.
8. Choose *Create Destination* and enter the following fields to create two SAP Cloud Integration destinations.

Field	CPI_DESTINATION_IFLMAP	CPI_DESTINATION_TMN
Name	**CPI_DESTINATION_IFLMAP**	**CPI_DESTINATION_TMN**
Type	HTTP	HTTP
URL	Enter the SAP Cloud Integration runtime URL. For example: **https://<Cloud Integration tenant>-iflmap.avtsbhf.eu1.hana.ondemand.com**.	Enter the SAP Cloud Integration management URL. For example: **https://<Cloud Integration tenant>-tmn.avt.eu1.hana.ondemand.com**
Proxy Type	Internet	Internet
Authentication	`OAuth2ClientCredentials`	`OAuth2ClientCredentials`
Client ID	Enter the <client ID of iflmap> that's noted down in Step 2.	Enter the <client ID of tmn> that's noted down in Step 2.
Client Secret	Enter the secret you used to register clients in Step 2.	Enter the secret you used to register clients in Step 2.
Token Service URL Type	Select *Dedicated*.	Select *Dedicated*.
Token Service URL	Enter the token endpoint that's noted down in Step 1.	Enter the token endpoint that's noted down in Step 1.
Token Service User	Enter the same value as the one entered in the *Client ID* field.	Enter the same value as the one entered in the *Client ID* field.
Token Service Password	Enter the secret you used to register clients in Step 2.	Enter the secret you used to register clients in Step 2.

9. Choose *Save*.

2.1.4.7.3 Connection with Client Credential Authentication in Cloud Foundry Environment

Connect to SAP Cloud Integration using client credential authentication (OAuth2ClientCredentials) in Cloud Foundry environment.

Prerequisites

- You have the SAP Cloud Integration runtime URL. For more information, see How to Get SAP Cloud Integration Runtime URL [page 23].

> **Example**
>
> For SAP Cloud Integration in the Cloud Foundry environment, the URL is `https://<Cloud Integration tenant>.it-accd002-rt.cfapps.sap.hana.ondemand.com`.

- You have the SAP Cloud Integration management URL. For more information, see How to Get SAP Cloud Integration Management URL [page 22].

> **Example**
>
> For SAP Cloud Integration in Cloud Foundry environment, the URL is **`https://<Cloud Integration tenant>.it-accd002.cfapps.sap.hana.ondemand.com`**.

- In the SAP Cloud Integration subaccount in SAP BTP cockpit, you've created two service instances that each have a service key. The first instance is used for the `IFLMAP` destination and requires the *integration-flow* service plan. The second instance is used for the `TMN` destination and requires the *api* service plan. For more information, see Create Instances in SAP Cloud Integration Subaccount [page 96].

Context

To enable client credential communication (OAuth2ClientCredentials) from SAP Digital Manufacturing to SAP Cloud Integration, you need to create two destinations in SAP Digital Manufacturing that point towards SAP Cloud Integration. Each of these two destinations refers to its own SAP Cloud Integration service instance with its own client ID and client secret that can be found in the respective service key. The `CPI_DESTINATION_IFLMAP` enables SAP Digital Manufacturing access the endpoints exposed by SAP Cloud Integration. The `CPI_DESTINATION_TMN` destination enables SAP Digital Manufacturing to access information such as SAP Cloud Integration logs.

> **Note**
>
> The `CPI_DESTINATION_TMN` destination is a prerequisite for the *Manage Integration Workflows* app as well as for the *Fetch CPI Logs* functionality available in the *Integration Message Dashboard* app. For more information, see Integration Message Dashboard.

Procedure

1. In SAP BTP cockpit, log on to your SAP Cloud Integration subaccount and then choose *Services* > *Instances and Subscriptions* to find the two service instances you created. Note down the *clientid*, the *clientsecret*, and the *url* of the service key of each instance.
2. In SAP BTP cockpit, log on to your SAP Digital Manufacturing subaccount and choose *Connectivity* > *Destinations* in the side menu bar.
3. Choose *Create Destination* and enter the following fields to create two SAP Cloud Integration destinations.

Field	CPI_DESTINATION_IFLMAP	CPI_DESTINATION_TMN
Name	**CPI_DESTINATION_IFLMAP**	**CPI_DESTINATION_TMN**
Type	HTTP	HTTP
URL	Enter the SAP Cloud Integration runtime URL. For example: `https://<Cloud Integration tenant>.it-accd002-rt.cfapps.sap.hana.ondemand.com`	Enter the SAP Cloud Integration management URL. For example: `https://<Cloud Integration tenant>.it-accd002.cfapps.sap.hana.ondemand.com`
Proxy Type	Internet	Internet
Authentication	OAuth2ClientCredentials	OAuth2ClientCredentials
Client ID	Enter the **`<clientid of Service key>`** of instance 1, which has the *integration-flow* service plan.	Enter the **`<clientid of Service key>`** of instance 2, which has the *api* service plan.
Client Secret	Enter the **`<clientsecret of Service key>`** of instance 1, which has the *integration-flow* service plan.	Enter the **`<clientsecret of Service key>`** of instance 2, which has the *api* service plan.
Token Service URL Type	Select *Dedicated*.	Select *Dedicated*.
Token Service URL	Enter the **`<tokenURL of Service Key>/oauth/token`**, taken from the service key of instance 1, which has the *integration-flow* service plan.	Enter the **`<tokenURL of Service Key>/oauth/token`**, taken from the service key of instance 2, which has the *api* service plan.

Related Information

Creating Service Instance and Service Key for Inbound Authentication

2.1.4.7.3.1 Create Instances in SAP Cloud Integration Subaccount

Create two instances with a service key in your SAP Cloud Integration subaccount in Cloud Foundry environment.

Prerequisites

- You've got the `Administrator` role for SAP BTP cockpit.
- You've got access to your SAP Cloud Integration subaccount in SAP BTP cockpit.

Context

To set up client credential communication from SAP Digital Manufacturing to SAP Cloud Integration in Cloud Foundry environment, you need to create two instances with a service key in your SAP Cloud Integration subaccount. The first one, where *integration-flow* is chosen, is used later for `CPI_DESTINATION_IFLMAP`. The second one, where *API* is chosen, is used later for `CPI_DESTINATION_TMN`.

Procedure

1. In SAP BTP cockpit, go to your SAP Cloud Integration subaccount.
2. Go to *Services* > *Instances and Subscriptions*.
3. Choose *Create* to create an instance.
4. In the *New Instance or Subscription* popup, enter the following parameters:

Field	Value
Service	*Process Integration Runtime*
Plan	*integration-flow*
Runtime Environment	*Cloud Foundry*
Space	**`Name of your subaccount's space`**
Instance Name	**`Name`**

5. Choose *Next*.
6. Under *Configure instance parameters*, enter the following parameters:

Field	Value
Roles	`ESBMessaging.send`
Grant-types	`Client Credentials`
Redirect-urls	

7. Choose *Next*.
8. Choose *Create*.
9. Choose the instance that you've created.
10. In the *Service Key* tab, choose *Create* to create a service key.
11. In the *New Service Key* popup, enter a *Service Key Name* of your choice.
12. Under *Key Type*, choose *ClientId/Secret*.
13. Choose *Create*.

    Under *Service Keys*, you can see the new key.
14. Repeat the whole procedure to create another instance. This time, choose *API* as *Plan* and select the following roles:
    - `AccessAllAccessPoliciesArtifacts`
    - `AuthGroup_Administrator`
    - `AuthGroup_TenantPartnerDirectoryConfigurator`
    - `MonitoringArtifactsDeploy`
    - `MonitoringDataRead`
    - `SecurityMaterialDownload`
    - `MessagePayloadsRead`

    If you want to use the *CPI Async Mode*, there a some additional roles required. For more information, see Asynchronous Communication with SAP Cloud Integration [page 111].

2.1.4.7.4 Connection with X.509 certificate-based Authorization in Cloud Foundry Environment

Connect SAP Digital Manufacturing to SAP Cloud Integration using X.509 certificate-based authentication in Cloud Foundry environment.

Use

You can make the data exchange from SAP Digital Manufacturing to SAP Cloud Integration more secure by using a X.509 certificate.

General Overview of the Procedure

To enable X.509 certifficate-based communication from SAP Digital Manufacturing to SAP Cloud Integration, you need to create a service key in SAP Digital Manufacturing and create a certificate that will enable secure communication between the systems. You upload the x.509 certificate in SAP Digital Manufacturing and SAP Cloud Integration. Then you create two destinations in SAP Digital Manufacturing that points towards SAP Cloud Integration. The `CPI_DESTINATION_IFLMAP` destination enables SAP Digital Manufacturing to access the endpoints exposed by SAP Cloud Integration. The `CPI_DESTINATION_TMN` destination enables SAP Digital Manufacturing to access information such as SAP Cloud Integration logs.

Overview Setup Steps

To set up the X.509 certificate-based communication from SAP Digital Manufacturing to SAP Cloud Integration in Cloud Foundry environment, perform the tasks described in the following topics:

1. Before You Start [page 98]
2. Create an X.509 Service Key in SAP Digital Manufacturing [page 99]
3. Create an X.509 Certificate [page 100]
4. Create a Key Pair and Upload the X.509 Certificate File to SAP Cloud Integration [page 101]
5. Create Instances with an X.509 Service Key in your SAP Cloud Integration subaccount [page 102]
6. Create Destinations in SAP Digital Manufacturing [page 103]

2.1.4.7.4.1 Before You Start

This page shows you the prerequisites that are required to connect SAP Digital Manufacturing to SAP Cloud Integration using an x.509 certificate.

Prerequisites

- You've the `Administrator` role for SAP BTP cockpit.
- You've the `Administrator` role for SAP Cloud Integration.
- You've the `Space Developer` role in Cloud Foundry environment.
- You've access to the SAP Digital Manufacturing subaccount in SAP BTP cockpit.
- You've software to create certificate files of type `.pfx`, such as `openSSL`.

2.1.4.7.4.2 Create an X.509 Service Key in SAP Digital Manufacturing

Create a service key that supports X.509 credentials in your SAP Digital Manufacturing subaccount.

Prerequisites

- You've got the `Administrator` role for SAP BTP cockpit.
- You've got access to the SAP Digital Manufacturing subaccount in SAP BTP cockpit.

Context

To set up communication from SAP Digital Manufacturing to SAP Cloud Integration or from SAP Cloud Integration to SAP Digital Manufacturing using an X.509 certificate, you need to create a service key that supports X.509 credentials in your SAP Digital Manufacturing subaccount.

Procedure

1. In SAP BTP cockpit, go to your SAP Digital Manufacturing subaccount.
2. Under *Instances and Subscriptions*, choose your SAP Digital Manufacturing instance.
3. In the *Service Keys* tab, choose *Create* to create a service key.
4. In the *New Service Key* popup, enter a *Service Key Name* of your choice.
5. Paste `{"xsuaa":{"credential-type":"x509"}}` as parameter into the JSON format field.

> **Note**
>
> You can also specify the validity period, for example:
>
> **Sample Code**
>
> ```
> {
>  "credential-type": "x509",
>  "x509": {
>  "validity": 4,
>  "validity-type": "MONTHS"
>  }
> }
> ```
>
> The default setting is 7 days. The maximum duration is 1 year.
>
> Be aware that you need to create a new service key before the x.509 certificate of the current service key expires.

> **Note**
>
> If you renew your certificate in SAP Cloud Integration, you need to perform the steps decribed in this chapter again starting with the service key creation. For mor information on how to renew your SAP Cloud Integration, see Security Artifact Renewal for Transport Level Security.

6. Choose *Create*.

   You've created a service key supporting X.509 credentials.

2.1.4.7.4.3 Create an X.509 Certificate

Create an X.509 certificate that's needed for X.509 certificate-based data transfer between SAP Digital Manufacturing and SAP Cloud Integration.

Prerequisites

- You've got the `Administrator` role for SAP BTP cockpit.
- You've got access to the SAP Digital Manufacturing subaccount in SAP BTP cockpit.
- You've created a service key supporting OAuth 2.0 client certificate authorization for your SAP Cloud Integration instance. For more information, see Create an X.509 Service Key in SAP Digital Manufacturing [page 99].
- You've software to create certificate files of type `.pfx`, such as `openSSL`.

Context

To enable communication between SAP Digital Manufacturing and SAP Cloud Integration using X.509 credentials, you need to create an X.509 certificate based on information that can be found in the service key.

Procedure

1. In SAP BTP cockpit, go to your SAP Digital Manufacturing subaccount.
2. Under *Instances and Subscriptions*, choose your SAP Cloud Integration instance.
3. Open the service key.
4. In the *JSON* box, go to the *key* field, which is under the `"uaa"` tag, and copy the content of the *key* field into a new file of type `.pem`, for example `key.pem`, and save it.
5. In the *JSON* box, go to the *certificate* field, which is under the `"uaa"` tag, and copy the content of the *certificate* field into a new file of type `.pem`, for example `certificate.pem`, and save it.

6. Replace the `\n` characters of the files with line breaks.

   For example, you could use this code: `awk '{gsub(/\\n/,"\n")}1' key.txt | tee key_new.pem`.
7. Create a certificate file of type `.pfx`, for example `service.pfx`, combining `key.pem` and `certificate.pem`, and assign a password to it.

   If you're using OpenSSL to create the `.pfx` file, use this command: `openssl pkcs12 -export -out service.pfx -inkey key.pem -in certificate.pem`.

2.1.4.7.4.4 Create a Key Pair and Upload the X.509 Certificate File to SAP Cloud Integration

Create a key pair in SAP Cloud Integration and upload the X.509 certificate file to SAP Cloud Integration to enable data transfer from SAP Digital Manufacturing to SAP Cloud Integration.

Prerequisites

- You've got the `Administrator` role for SAP Cloud Integration.
- You've got an X.509 certificate with a password. For more information, see Create an X.509 Certificate [page 100].

Context

To set up communication from SAP Digital Manufacturing to SAP Cloud Integration or from SAP Cloud Integration to SAP Digital Manufacturing using an X.509 certificate, you need to create a key pair in SAP Cloud Integration and upload the X.509 certificate into the system. Then you need to download the certificate to your computer to use it later in the integration process.

Procedure

1. In SAP Cloud Integration, go to the *Monitor* section and choose the *Keystore* tile.
2. Choose *Add*.
3. Choose *Key Pair*.
4. In the *Add Key Pair* popup, enter an *Alias* for the key pair, for example `DMC_KEY_PAIR`. You can choose a random name.
5. Upload the `.pfx` file, for example `service.pfx`, by using the *Browse* function.
6. Enter the password that you've defined for the `.pfx` file.
7. Choose *Add*.

8. In the *Actions* column of the newly created key pair, choose ••• (More) and then *Download Certificate*.

   A certificate of type `.cer` has been created, for example `dmc_service.cer`, and downloaded to your computer. You need it for the next step.

2.1.4.7.4.5 Create Instances with an X.509 Service Key in your SAP Cloud Integration subaccount

Create two instances with a service key using X.509 credentials in your SAP Cloud Integration subaccount.

Prerequisites

- You've the Administrator role for SAP BTP cockpit.
- You've access to the SAP Digital Manufacturing subaccount in SAP BTP cockpit.
- You've a certificate file of type `.cer` that you've downloaded from SAP Cloud Integration. For more information, see Create a Key Pair and Upload the X.509 Certificate File to SAP Cloud Integration [page 101].

Context

To set up the X.509 certificate-based communication from SAP Digital Manufacturing to SAP Cloud Integration in Cloud Foundry environment, you need to create two instances with a service key using X.509 credentials in your SAP Cloud Integration subaccount. The first one, where *integration-flow* is chosen, is used later for `CPI_DESTINATION_IFLMAP`. The second one, where *API* is chosen, is used later for `CPI_DESTINATION_TMN`.

Procedure

1. In SAP BTP cockpit, go to your SAP Cloud Integration subaccount.
2. Go to *Services* > *Instances and Subscriptions*.
3. Choose *Create* to create an instance.
4. In the *New Instance or Subscription* popup, enter the following parameters:

Field	Value
Service	*Process Integration Runtime*
Plan	*integration-flow*
Runtime Environment	*Cloud Foundry*

Field	Value
Space	**`Name of your subaccount's space`**
Instance Name	**`Name`**

5. Choose *Next*.
6. Under *Configure instance parameters*, enter the following parameters:

Field	Value
Roles	`ESBMessaging.send`
Grant-types	`Client Credentials`
Redirect-urls	

7. Choose *Next*.
8. Choose *Create*.
9. Choose the instance that you've created.
10. On the *Service Keys* tab, choose *Create* to create a service key.
11. In the *New Service Key* popup, enter a *Service Key Name* of your choice.
12. Under *Key Type*, choose *External Certificate*.
13. Under *External Certificate*, paste the content of the certificate file that you've downloaded from SAP Cloud Integration, for example `dmc_service.cer`, into the empty box.
14. Choose *Create*.

    Under *Service Keys*, you can see the new key.
15. Repeat the whole procedure to create another instance and choose *API* as *Plan*.

2.1.4.7.4.6 Create Destinations in SAP Digital Manufacturing

Create two destinations in SAP Digital Manufacturing pointing towards SAP Cloud Integration.

Prerequisites

- You've the `Administrator` role for SAP BTP cockpit.
- You've access to the SAP Digital Manufacturing subaccount in SAP BTP cockpit.
- You've an X.509 certificate of type `.pfx`. For more information, see Create an X.509 Certificate [page 100].

Context

To set up the X.509 certificate-based communication from SAP Digital Manufacturing to SAP Cloud Integration in Cloud Foundry environment, you need to create two destinations in SAP Digital Manufacturing

pointing towards SAP Cloud Integration. The `CPI_DESTINATION_IFLMAP` destination enables SAP Digital Manufacturing to access the endpoints exposed by SAP Cloud Integration. The `CPI_DESTINATION_TMN` destination enables SAP Digital Manufacturing to access information such as SAP Cloud Integration logs.

> **Note**
>
> The `CPI_DESTINATION_TMN` destination is a prerequisite for the *Manage Integration Workflows* app as well as for the *Fetch CPI Logs* functionality available in the *Integration Message Dashboard* app. For more information, see Integration Message Dashboard.

Procedure

1. In SAP BTP cockpit, go to your SAP Digital Manufacturing subaccount.
2. Under *Destinations*, choose *Certificates* and upload the `.pfx` file, for example `service.pfx` to the system.
3. Choose *Create Destination* to create two destinations, one of type `CPI_DESTINATION_IFLMAP` and one of type `CPI_DESTINATION_TMN`. You can also modify existing destinations.
4. Under *Destination Configuration* enter the following values:

Field	`CPI_DESTINATION_IFLMAP`	`CPI_DESTINATION_TMN`
Name	`CPI_DESTINATION_IFLMAP`	`CPI_DESTINATION_TMN`
Type	*HTTP*	*HTTP*
Description	**`Description`**	**`Description`**
URL	SAP Cloud Integration runtime URL to be found in the SAP Cloud Integration subaccount under *Instances* in the *Credentials* column. Choose the *Key* that belongs to your instance with *integration-flow* plan. Under *url*, you find the runtime URL.	SAP Cloud Integration management URL to be found in the SAP Cloud Integration subaccount under *Instances* in the *Credentials* column. Choose the *Key* that belongs to your instance with *API* plan. Under *url*, you find the management URL.
Proxy Type	*Internet*	*Internet*
Authentication	*OAuth2ClientCredentials*	*OAuth2ClientCredentials*
Use mTLS for token retrieval	Tic box.	Tic box.
Client ID	To be found under *clientid* in your certificate file, for example `service.pfx`.	To be found under *clientid* in your certificate file, for example `service.pfx`.
Token Service Key Store Location	Choose your certificate file, for example `service.pfx`.	Choose your certificate file, for example `service.pfx`.

Field	CPI_DESTINATION_IFLMAP	CPI_DESTINATION_TMN
Token Service Key Store Password	Enter the password that you defined for your certificate file, for example `service.pfx`.	Enter the password that you defined for your certificate file, for example `service.pfx`.
Token Service URL Type	*Dedicated*	*Dedicated*
Token Service URL	To be found under *tokenurl* in the certificate.	To be found under *tokenurl* in the certificate.
Token Service User		
Token Service Password		

5. Choose *Save*.

2.1.4.8 Set Up Connection Between SAP Cloud Integration, Cloud Connector, and SAP S/4HANA or SAP ERP

Configure the Cloud Connector to make it operational for connections between your SAP BTP applications and on-premise systems.

Prerequisites

- You've got a technical user for SAP S/4HANA or SAP ERP. For more information, see Create a Technical User for SAP S/4HANA [page 21].
- You've got the `Administrator` role in SAP S/4HANA or SAP ERP.
- You've installed the Cloud Connector. For more information, see Setting Up the Cloud Connector [page 23].

Context

To enable communication from SAP Cloud Integration to SAP S/4HANA or SAP ERP, you need to configure the Cloud Connector, which acts as a reverse invoke proxy between your on-premise network and SAP Cloud Integration.

In your SAP Cloud Integration subaccount in SAP BTP cockpit, you create RFC destinations pointing towards SAP S/4HANA or SAP ERP.

Procedure

Configure the Cloud Connector

1. Initial configuration
   After installing and starting the Cloud Connector, log on to the administration UI and perform the required configuration to make your Cloud Connector operational. For more information, see Initial Configuration.
2. Add and connect your SAP Cloud Integration subaccount to the Cloud Connector. For detailed procedures, see Configure Subaccounts in Cloud Connector [page 25].
3. Add system mapping to SAP S/4HANA or SAP ERP and configure access control. For more information, see Configure Access Control [page 27].

Add RFC Destinations to SAP Cloud Integration Subaccount

Add RFC destinations of SAP S/4HANA or SAP ERP in the SAP Cloud Integration subaccount in SAP BTP cockpit.

1. In SAP BTP cockpit, go to your SAP Cloud Integration subaccount and choose *Connectivity* > *Destinations* in the side menu bar.
2. Choose *Create Destination*, and enter the following fields to create the destination:

Name	Type	Proxy Type	User	Password	Authorization Type	Location ID
Enter a destination name. **Note** You use this destination name later in the *Manage Business Settings* app in SAP Digital Manufacturing.	*RFC*	*OnPremise*	Enter the name of your technical user to access SAP S/4HANA / SAP ERP.	Enter the password to access SAP S/4HANA / SAP ERP.	*CONFIGURED_USER*	If you've maintained a location ID in the Cloud Connector, enter the location ID here.

3. Add the following *Additional Properties*:

Property	Description	Value
`jco.client.ashost`	The *Virtual Host* of SAP S/4HANA / SAP ERP defined in the Cloud Connector	**Example** `<virtual host>`

Property	Description	Value
`jco.client.client`	The client number of SAP S/4HANA / SAP ERP	Example 100
`jco.client.lang`	The language of SAP S/4HANA / SAP ERP	Example `EN`
`jco.client.sysnr`	The system number of SAP S/4HANA / SAP ERP	Example 22
`jco.destination.pool_capacity`	The connection number	Example 5

4. Check the availability of the destination connection.

2.1.4.9 Configure SAP Digital Manufacturing for Outbound Integration

You need to make configurations in SAP Digital Manufacturing to connect plants and enable integration with SAP ERP or SAP S/4HANA.

Prerequisites

You've got the `Manufacturing_Admin` role in SAP Digital Manufacturing.

Context

To integrate your on-premise system with SAP Digital Manufacturing, you need to create a plant in SAP Digital Manufacturing that represents your existing plant in SAP ERP or SAP S/4HANA. To make sure that integration messages can be sent from SAP Digital Manufacturing to SAP ERP or SAP S/4HANA, you map collaboration links to collaboration directives in the *Manage Collaborations Links* app.

Procedure

1. Define the SAP ERP or SAP S/4HANA plant you want to integrate with.
   1. Log on to SAP Digital Manufacturing using the Fiori Launchpad and choose the *Manage Plants* app.
   2. On the initial screen, choose *Create* to add the plant defined in SAP S/4HANA that you want to integrate with SAP Digital Manufacturing.
   3. Complete the fields on the *Create Plant* screen.
   4. Choose the *Manage Business Settings* app and complete the fields. Use the destination name that you've defined in your SAP Cloud Integration subaccount in SAP BTP cockpit. (For more information, see Set Up Connection Between SAP Cloud Integration, Cloud Connector, and SAP S/4HANA or SAP ERP [page 105].)
      For more information about the fields, see Manage Plants and Manage Business Settings.
2. Define the mapping of collaboration links with collaboration directives for outbound integration. For more information, see Manage Collaboration Links.
3. To verify whether the outbound communication was successful, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of the outbound integration messages. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of the outbound integration messages. For more information, see **Monitoring Message Processing**.

2.1.4.10 Enable Direct Communication To SAP S/4HANA

Enable the direct outbound communication from SAP Digital Manufacturing to Cloud Connector and then to SAP S/4HANA, without calling SAP Cloud Integration.

Prerequisites

- Cloud Connector is installed.
- The subaccount in your SAP BTP cockpit is connected to the Cloud Connector. More information, see Setting Up the Cloud Connector [page 23].
- SAP Digital Manufacturing and SAP Cloud Integration are in different subaccounts of your SAP BTP cockpit.

Context

For some integration scenarios, you need to enable the direct outbound communication using an OData connection from SAP Digital Manufacturing to Cloud Connector and then to SAP S/4HANA, without calling SAP Cloud Integration.

The following are the scenarios where direct communication to SAP S/4HANA is required:

> **Note**
>
> For more information on the supported message types and needed integration artifacts, see 0003050090.

- **Released by MES (RMES)**
  You can communicate the release of an order in SAP Digital Manufacturing to your integrated SAP S/4HANA system. For this scenario, you need to use the following collaboration directives / links in the *Manage Collaboration Links* app:
  - `COLLABORATION_ORDER_RELEASE_PI` and `ERP_SET_ORDER_STATUS_TO_RMES` for process orders
  - `COLLABORATION_ORDER_RELEASE_DI` and `ERP_SET_ORDER_STATUS_TO_RMES` for production orders

  You need to activate the `API_PRODUCTION_ORDER_2_SRV` or `API_PROCESS_ORDER_2_SRV` API in SAP S/4HANA.
  You need to activate the *Direct Access SAP S/4 HANA* switch of your collaboration directive in the *Manage Collaboration Directives* app.
- **Order Discard**
  When you discard an order in the *Manage Orders* app, the order status is updated to *DISC* in your SAP S/4HANA. For this scenario, you need to use the following collaboration directives / links in the *Manage Collaboration Links* app:
  - `COLLABORATION_ORDER_DISCARD_PI` and `ERP_SET_ORDER_STATUS_TO_DISC` for process orders
  - `COLLABORATION_ORDER_DISCARD_DI` and `ERP_SET_ORDER_STATUS_TO_DISC` for production orders

  You need to activate the *Direct Access SAP S/4 HANA* switch of your collaboration directive in the *Manage Collaboration Directives* app.
- **Defect Recording**
  When you log nonconformances with the *Direct Access SAP S/4Work Center POD*, the defect recording can be transferred to SAP S/4HANA. For this scenario, you need to use the following collaboration directives / links in the *Manage Collaboration Links* app:
  - `COLLABORATION_DEFECT_RECORD` and `ERP_DEFECT_RECORD` (ODATA V2) require SAP S/4HANA 2021 FPS0
  - `COLLABORATION_DEFECT_RECORD` and `ERP_DEFECT_RECORD_V2` (ODATA V4) require SAP S/4HANA 2022 FPS0

  You need to activate the *Direct Access SAP S/4 HANA* switch of your collaboration directive in the *Manage Collaboration Directives* app.
- **ERP Stock Read in Consolidated Inventory Management Mode**
  When you've enabled the consolidated inventory management mode in the *Manage Business Settings* app in integration with SAP S/4HANA, a submessage *ERP Stock Read* is triggered with *Inventory Download* message to sync back latest ERP data.
  The direct communication is only needed for consolidated inventory management mode in integration with SAP S/4HANA. For this scenario, you need to use the collaboration directive `ERP_CONSOLID_INV_READ_OP` for ERP together with collaboration link `COLLABORATION_CONSOLID_INV_READ_ERP_OP` in the *Manage Collaboration Links* app.
  You need to activate the *Direct Access SAP S/4 HANA* switch of your collaboration directive in the *Manage Collaboration Directives* app.
  If your integration scenario involves plant mapping (plant conversion), refer to 3419986.
- **QM Group Synchronization**

If you want to download the quality management groups from your integrated ERP system into the *Manage Nonconformance Groups* app using the *Sync QM Groups* functionality, you normally use collaboration directive `ERP_FETCH_DEFECT_CODE` and collaboration link `COLLABORATION_FETCH_DEFECT_CODE` with the *Direct Access SAP S/4HANA* flag set to *Off* (=default setting) in the *Manage Collaboration Directives* app.
But there are S/4HANA systems where the necessary `BAPI` (`BAPI_CODEGROUP_CODE_GETLIST`) is obsolete, so that the data exchange between SAP Digital Manufacturing, SAP Cloud Integration, and SAP S/4HANA isn't working. In this case, you need to activate the direct access to SAP S/4HANA by setting the *Direct Access SAP S/4HANA* flag to *ON*. Moreover, you need to create a destination as described below to enable direct communication (OData) between SAP Digital Manufacturing and SAP S/4HANA using the *Defect Code and Code Group API* (`/API_DEFECTCODE_SRV/A_DefectCodeGroup`). For more information, see Defect Code and Code Group - Read.

- **Backward Update with Resource Orchestration**
  To allow the Resource Orchestration tool to write back the changes in the schedule and dispatch operations to the same work centers hosted in SAP S/4HANA, you use the `ERP_UPDATE_REO_BACK_SCHEDULE` directive in the *Manage Collaboration Directives* app. The *Direct Access SAP S/4HANA* flag must be set to *ON*. Moreover, you need to create a destination as described below to enable direct communication (OData) between SAP Digital Manufacturing and SAP S/4HANA.
  In SAP S/4HANA, you need to enable the `API_PRODUCTION_ORDERS` service. For more information, see How to Enable ODATA SERVICES. The *REO Shop Order Schedule Update (S4)* integration message requires at least SAP S/4HANA 2020.

  > **Note**
  >
  > You switch on the backward update feature in the settings of the **Dispatching and Monitoring 2.0** app.

Procedure

1. Define the destination name.
   Go to the *Manage Business Settings* app to find the specific plant, and note down the ERP destination. It would be the destination name.
2. Map SAP S/4HANA to Cloud Connector.
   1. Log on to Cloud Connector and choose your SAP Digital Manufacturing subaccount. Note down the location ID.
   2. Choose Cloud To On-Premise settings, and add a virtual system mapping with below information.
      - *Back-end Type*: ABAP System
      - *Protocol*: HTTPS
      - *Internal Host*: SAP S/4HANA internal host
      - *Internal Port*: SAP S/4HANA internal port for HTTPS
      - *Virtual Host and Port*: You can specify it freely. It's recommended to use a virtual (cloud-side) name that is different from internal name. Make sure to note it down.
3. Add accessible resource for above virtual system mapping.
   - *URL Path*: `/sap/opu/odata4/sap` (ODATA V4) and `/sap/opu/odata/sap` (ODATA V2)
   - *Active*: Make sure it's checked.
   - *Access Policy*: Select *Path And All Sub-Paths*.

4. In SAP BTP cockpit, log on to your SAP Digital Manufacturing subaccount and choose *Connectivity* > *Destinations* in the side menu bar.
5. Create a new destination with the following information:
   - *Name*: **`<the ERP destination name from Step 1>`**
   - *Type*: *HTTP*
   - *URL*: **`http://<virtual host from Step 2>:<virtual port from Step 2>`**
   - *Proxy Type*: *OnPremise*
   - *Authentication*: *BasicAuthentication*
   - *Location ID*: **`<Location ID from Step 2>`**
   - *User*: User from SAP S/4 HANA
   - *Password*: Password for above user
   - *Additional Properties*: **`sap-client`** and **`<client for SAPS/4HANA>`**

Related Information

How to Enable OData Services in SAP S/4HANA

2.1.4.11 Asynchronous Communication with SAP Cloud Integration

Learn how to enable asynchronous communication with SAP Cloud Integration (Cloud Foundry environment) using the *CPI Async* mode. Using this mode, you benefit from increased stability for long-running transactions in SAP ERP or SAP S/4HANA.

Prerequisites

- You've implemented the steps required for the technical integration. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16].
- If you're using **Basic Authentication** between SAP Digital Manufacturing and SAP Cloud Integration, you need to assign the following roles to your P-user in your SAP Cloud Integration subaccount in SAP BTP cockpit:
  - `DataStoresAndQueuesRead`
  - `DataStoresAndQueuesDelete`
  - `DataStorePayloadsRead`

  For more information, see Granting Your P-User Access to SAP Cloud Integration in Cloud Foundry Environment [page 57] and Working with Role Collections.
- If you're using **Client Credential Authentication** (OAuth2ClientCredentials) between SAP Digital Manufacturing and SAP Cloud Integration, you need to go to your SAP Cloud Integration subaccount in SAP BTP cockpit and update the instance that the `CPI_DESTINATION_TMN` is pointing to with the following roles:

- `DataStoresAndQueuesRead`
- `DataStoresAndQueuesDelete`
- `DataStorePayloadsRead`

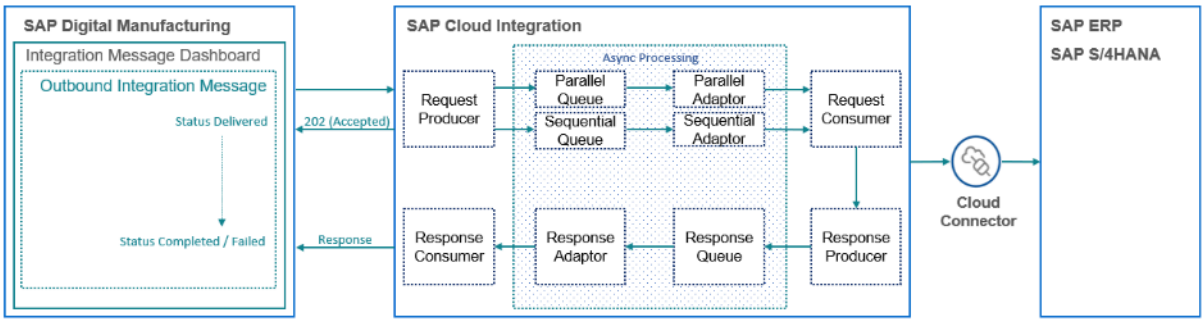
You need to update your service instance afterwards. For more information, see Updating a Service Instance and Create Instances in SAP Cloud Integration Subaccount [page 96].

- You've deployed the following integration artifacts from your *SAP S/4HANA Integration with SAP Digital Manufacturing* SAP Cloud Integration (Cloud Foundry):
  - `Async Request Producer`
    This iFlow receives the SAP Digital Manufacturing request message and puts the request message into the request JMS queue for parallel processing or into the request JMS queue for sequential processing depending on the message type.
  - `Async Request Consumer Parallel Adaptor`
    This iFlow consumes SAP Digital Manufacturing request messages that come from the JMS queue that handles the messages that can be processed in parallel. The adaptor transfers the messages to the `Async Request Consumer`.
  - `Async Request Consumer Sequential Adaptor`
    This iFlow consumes SAP Digital Manufacturing request messages that come from the JMS queue that handles the messages that need to be processed sequentially. The adaptor transfers the messages to the `Async Request Consumer`.
  - `Async Request Consumer`
    This iFlow gets the request message from the JMS request queue through the `Async Request Consumer Sequential Adaptor` or the `Async Request Consumer Parallel Adaptor` and consumes the request message. It sends the message to the integrated ERP system and gets a response.
  - `Async Response Producer`
    This iFlow puts the response from the integrated ERP system into the response JMS queue.
  - `Async Response Consumer Adaptor`
    This iFlow processes the response messages coming from the JMS queue and transfers them to the `Async Request Consumer`. It doesn't distinguish between messages that are processed in parallel and messages that are processed sequentially.
  - `Async Response Consumer`
    This iFlow consumes the response message from the response JMS queue through the `Async Response Consumer Adaptor` and sends the response to SAP Digital Manufacturing.

If your business case requires a modification of the default settings, see Overview Advanced CPI Async Settings [page 114].
For information on the supported message types, see 3050090.
For information on the supported collaboration links and directives, see Manage Collaboration Links.

> **Note**
>
> If you don't deploy one of the artifacts, the following error is displayed in the *Integration Message Dashboard*: `500 Internal Server Error - ...tvm.DirectVmConsumerNotAvailableException: No consumers available on endpoint: {Artifcat Name}. Exchange[].`

Context



In integration scenarios with SAP ERP or SAP S/4HANA, the asynchronous connection to SAP Cloud Integration (*CPI Async*) helps you achieve increased stability for long-running transactions on the ERP side. Once you've implemented the *CPI Async* mode, outbound integration messages are processed asynchronously in SAP Cloud Integration (Cloud Foundry environment).

After SAP Cloud Integration has received an outbound message coming from SAP Digital Manufacturing, it confirms the reception of the integration message back to SAP Digital Manufacturing. In the *Integration Message Dashboard* of SAP Digital Manufacturing, the status of the integration message changes from *In Process* to *Delivered*.

In SAP Cloud Integration, the Request Producer iFlow determines whether the message requires parallel or sequential processing and sends the messages to the JMS request queue for parallel processing (`SAP_DM_INT_`**REQ_P**`_00`) or to the JMS request queue for sequential processing (`SAP_DM_INT_`**REQ_S**`_00`). The message is stored in the queue until it's called by the Request Consumer iFlow (asynchronous processing) through the parallel adaptor or the sequential adaptor. The Request Consumer iFlow processes the request message and sends the message to the integrated SAP ERP or SAP S/4HANA system. Once the message has been sent successfully, the Response Producer iFlow sends the response to the JMS response queue (`SAP_DM_INT_`**RESP**`_00`). The Response Consumer iFlow retrieves the message from the Response JMS Queue through the response consumer adaptor and sends the response to SAP Digital Manufacturing. Then, the message status in the *Integration Message Dashboard* changes to *Completed* or *Failed*.

When transferring data from SAP Digital Manufacturing to the integrated ERP system, SAP Cloud Integration (CPI) distinguishes between messages that need to be processed sequentially and messages that can be processed in parallel. This distinction is necessary to meet the needs of the business process.

> **Example**
>
> Quantity confirmations require sequential processing. The order in which the messages are processed is important because all quantity confirmations must be processed by the ERP system before the order can be closed.

> **Example**
>
> The synchronisation of inspection results can be handled in parallel. Here, the order in which the messages are processed in SAP Cloud Integration (CPI) and sent to the integrated ERP system doesn't matter.

This distinction between messages that are processed sequentially or in parallel isn't made for the communication from the integrated ERP system to SAP Digital Manufacturing.

After modifying your integration setup as described in the prerequisites, you need to activate the *CPI Async* mode for each message individually, which is explained in this procedure:

Procedure

1. Navigate to the *Manage Collaboration Directives* app.
2. Choose the collaboration directive for which you want to enable the *CPI Async* mode.

   For information on the integration messages that support the *CPI Async* mode and the corresponding collaboration links and directives, see 3050090 and Manage Collaboration Links.
3. Switch on the *CPI Async* mode using the toggle switch.

Results

You've activated the *CPI Async* mode for your integration message.

As a check, perform the action that corresponds to the collaboration directive for which you've activated the *CPI Async* mode. In the *Integration Message Dashboard*, you can now see that the status of your integration message changes from *In Process* to *Delivered* and then to *Completed* or *Failed*. Depending on the processing speed, you might not see the status *Delivered*, though.

In the *Integration Message Dashboard*, automatic retry and manual retry aren't supported for messages in status *Delivered*.

For more information on your monitoring options, see Monitoring CPI Async [page 124].

Related Information

Overview Advanced CPI Async Settings [page 114]
Increasing the CPI Async Performance [page 120]
Increasing the Number of JMS Queues [page 121]

2.1.4.11.1 Advanced CPI Async Settings

2.1.4.11.1.1 Overview Advanced CPI Async Settings

Learn more about how to configure the integration artifacts needed for an asynchronous connection to SAP Cloud Integration (Cloud Foundry).

If the standard settings of the following integration artifacts don't suit your business needs, you'll find some information here on the key parameters that can be modified.

Async Request Producer

You can modify the settings below, to be found in SAP Cloud Integration in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package, by choosing the *Configure* option for the artifact:

- *Retention Threshold for Alerting (in d)*
  Enter the time period (in days) by which the messages have to be fetched. The default value is 1.
- *Expiration Period (in d)*
  Enter the time period (in days) by which the messages have to be fetched. Specify a time period for expiration period that is no less than the number of days entered for the *Retention Threshold for Alerting (in d)*. The recommendation is to use at least twice the retention threshold. The default is set to 30.
- *NonSequenceRequestQueueCount*
  Enter the number of queues for parallel processing. The default value is 1. For more information, see JMS Resource and Size Limits.
  If you increase the number of JMS queues for parallel processing, you also need to increase this counter.

  > **Note**
  >
  > If the *NonSequenceRequestQueueCount* value is smaller than the number of queues, the additional queues won't receive messages. If the *NonSequenceRequestQueueCount* value is larger than the number of queues, you will get an error: `400 Queue Not Found`.

- *SequenceRequestQueueCount*
  Enter the number of queues for sequential processing of messages. The default value is 1.
  For more information, see JMS Resource and Size Limits.
  If you increase the number of JMS request queues for sequential processing, you also need to increase this counter.

  > **Note**
  >
  > If the *SequenceRequestQueueCount* value is smaller than the number of queues, the additional queues won't receive messages. If the *SequenceRequestQueueCount* value is larger than the number of queues, you will get an error: `400 Queue Not Found`.

To know more about these settings, see Configure the JMS Receiver Adapter.

JMS Request Queue for Parallel Processing

In SAP Cloud Integration, you find the JMS Request Queue (`SAP_DM_INT_REQ_P_00`) in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package as part of the *Async Request Consumer Parallel Adaptor*. You can modify the following settings:

- *Queue Name*
  The default queue is `SAP_DM_INT_REQ_P_00`. If you create additional queues, use the same name but increase the counter at the end continuously: _01, _02, etc. The name for the second queue for parallel processing is `SAP_DM_INT_REQ_P_`**01**.
- *Number of Concurrent Processes*

The number of concurrent processes for each worker node. The recommended value depends on the number of worker nodes, the number of queues on the tenant, and the incoming load. Make sure to enter a value that is as small as possible (1-5) because JMS resources are limited. The default value is 1.

- *Retry Interval*
  Enter a value for the amount of time to wait before retrying message delivery. The default value is 1 minute.
- *Exponential Backoff*
  This setting makes sure that the retry interval is doubled after each unsuccessful retry. Therefore, the receiver back end isn't called every minute if it's unavailable for a longer time period.
- *Maximum Retry Interval*
  This value defines the maximum time between two retries if exponential backoff is used. It's recommended to keep the 16 minutes or even increase it if this is compatible with your scenario.
- *Dead-Letter Queue*
  Don't deselect this setting. For more information, see Configure the JMS Sender Adapter and Dead Letter Handling in JMS Adapter .

> **Example**
>
> To illustrate the retry mechanism, the following values have been defined:
>
> - *Retry Interval* is 3
> - *Exponential Backoff* is selected
> - *Maximum Retry Interval* is 16 min
> - *RetryCount* is 6 (You make this setting in the configuration section of the Async Request Consumer artifact.)
>
> Given these settings, retry will happen after 3 min, 6 min, 12 min, 16 min, 16 min, and 16 min.
>
> If *RetryCount* in the Async Request Consumer artifcact is set to 3 times, retry happens after 3 min, 6 min, and 12 min. In this case, the *Maximum Retry Interval* interval isn't reached.

To know more about these settings, see Configure the JMS Sender Adapter.

JMS Request Queue for Sequential Processing

In SAP Cloud Integration, you find the JMS Request Queue (`SAP_DM_INT_REQ_S_00`) in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package as part of the *Async Request Consumer Sequential Adaptor*. You can modify the following settings:

- *Queue Name*
  The default queue is `SAP_DM_INT_REQ_S_00`. If you create additional queues, use the same name but increase the counter at the end continuously: _01, _02, etc. The name for the second queue for parallel processing is `SAP_DM_INT_REQ_S_`**01**.
- *Number of Concurrent Processes*
  The number of concurrent processes for each worker node. The recommended value depends on the number of worker nodes, the number of queues on the tenant, and the incoming load. Make sure to enter a value that is as small as possible (1-5) because JMS resources are limited. The default value is 1.
- *Retry Interval*
  Enter a value for the amount of time to wait before retrying message delivery. The default value is 1 minute.

To know more about these settings, see Configure the JMS Sender Adapter.

Async Request Consumer Parallel Adaptor

You can modify the settings below, to be found in SAP Cloud Integration in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package, by choosing the *Configure* option for the artifact:

- *Number of Concurrent Processes*
  The number of concurrent processes for each worker node. The recommended value depends on the number of worker nodes, the number of queues on the tenant, and the incoming load. Make sure to enter a value that is as small as possible (1-5) because JMS resources are limited.

  > **Note**
  >
  > The default number of concurrent processes is 1. You should only increase this number if your scenario requires parallel processing. However, keep in mind that when processing large messages, having a high number of concurrent processes can cause out of memory problems.

- *Retry Interval (in min)*
  Enter a value for the amount of time to wait before retrying message delivery. The default value is 1 minute.
- *Maximum Retry Interval (in min)*
  Enter a value for the maximum amount of time to wait before retrying message delivery. The minimum value is 10 minutes. The default value is set to 16 minutes because retry count default value is 5 (Retry after 1 min, 2, min, 4 min, 8 min, 16 min).

Async Request Consumer Sequential Adaptor

You can modify the settings below, to be found in SAP Cloud Integration in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package, by choosing the *Configure* option for the artifact:

- *Retry Interval (in min)*
  Enter a value for the amount of time to wait before retrying message delivery. The default value is 1 minute.
- *Maximum Retry Interval (in min)*
  Enter a value for the maximum amount of time to wait before retrying message delivery. The minimum value is 10 minutes. The default value is set to 16 minutes, because retry count default value is 5 (Retry after 1 min, 2, min, 4 min, 8 min, 16 min).

Async Request Consumer

You can modify the settings below, to be found in SAP Cloud Integration in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package, by choosing the *Configure* option for the artifact:

- *RetryCount*
  Enter a value for the maximum times to retry message delivery. The default value is 5.

> **Note**
>
> Until the retry has been successful, the message remains in status *Delivered* in the *Integration Message Dashboard*.

To know more about these settings, see Configure the JMS Sender Adapter.

Async Response Producer

You can modify the settings below, to be found in SAP Cloud Integration in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package, by choosing the *Configure* option for the artifact:

- *Retention Threshold for Alerting (in d)*
  Enter the time period (in days) by which the messages have to be fetched. The default value is 1.
- *Expiration Period (in d)*
  Enter the time period (in days) by which the messages have to be fetched. Specify a time period for Expiration Periodwhich is no less than the number of days entered for the Retention Threshold for Alerting. The recommendation is to use at least twice the retention threshold. The default is set to 30.
- *ResponseQueueCount*
  Enter the count of response queue. The default is set to 1.
  If you increase the number of JMS response queues, you also need to increase this counter.

> **Note**
>
> If the *ResponseQueueCount* value is smaller than the number of queues, the additional queues won't receive messages. If the *ResponseQueueCount* value is larger than the number of queues, you will get an error: `400 Queue Not Found`.

To know more about these settings, see Configure the JMS Receiver Adapter.

JMS Response Queue

In SAP Cloud Integration, you find the JMS Response Queue (`SAP_DM_INT_RESP_00`) in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package as part of the *Async Response Consumer Adaptor*. You can modify the following settings:

- *Number of Concurrent Processes*
  The number of concurrent processes for each worker node. The recommended value depends on the number of worker nodes, the number of queues on the tenant, and the incoming load. Make sure to enter a value that is as small as possible (1-5) because JMS resources are limited.

> **Note**
>
> The default number of concurrent processes is 1. You should only increase this number if your scenario requires parallel processing. However, keep in mind that when processing large messages, having a high number of concurrent processes can cause out of memory problems.

- *Retry Interval*
  Enter a value for the amount of time to wait before retrying message delivery. The default value is 1 minute.
- *Exponential Backoff*
  This setting makes sure that the retry interval is doubled after each unsuccessful retry. Therefore, the receiver back end isn't called every minute if it's unavailable for a longer time period.
- *Maximum Retry Interval*
  This value defines the maximum time between two retries if exponential backoff is used. It's recommended to keep the 60 minutes or even increase it if this is compatible with your scenario.
- *Dead-Letter Queue*
  Don't deselect this setting. For more information, see Configure the JMS Sender Adapter and Dead Letter Handling in JMS Adapter .

> **Example**
>
> To illustrate the retry mechanism, the following values have been defined:
>
> - *Retry Interval* is 3
> - *Exponential Backoff* is selected
> - *Maximum Retry Interval* is 15
> - *RetryCount* is 6 (You make this setting in the configuration section of the *Async Response Consumer* artifact.)
>
> Given these settings, retry will happen after 3 min, 6 min, 12 min, 15 min, 15 min, and 15 min.
>
> If *RetryCount* in the *Async Response Consumer* artifcact is set to 3 times, retry happens after 3 min, 6 min, and 12 min. In this case, the *Maximum Retry Interval* interval isn't reached.

To know more about these settings, see Configure the JMS Sender Adapter.

Async Response Consumer Adaptor

You can find the settings below in SAP Cloud Integration in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package by choosing the *Configure* option for the artifact:

- *Number of Concurrent Processes*
  The number of concurrent processes for each worker node. The recommended value depends on the number of worker nodes, the number of queues on the tenant, and the incoming load. Make sure to enter a value that is as small as possible (1-5) because JMS resources are limited.

  > **Note**
  >
  > The default number of concurrent processes is 2. You should only increase this number if your scenario requires parallel processing. However, keep in mind that when processing large messages, having a high number of concurrent processes can cause out of memory problems.

- *Retry Interval*
  Enter a value for the amount of time to wait before retrying message delivery. The default value is 1 minute.

Async Response Consumer

You can find the settings below in SAP Cloud Integration in your *SAP S/4HANA Integration with SAP Digital Manufacturing* package by choosing the *Configure* option for the artifact:

- *RetryCount*
  Enter a value for the maximum times to retry message delivery. The default value is 10.

To know more about these settings, see Configure the JMS Receiver Adapter.

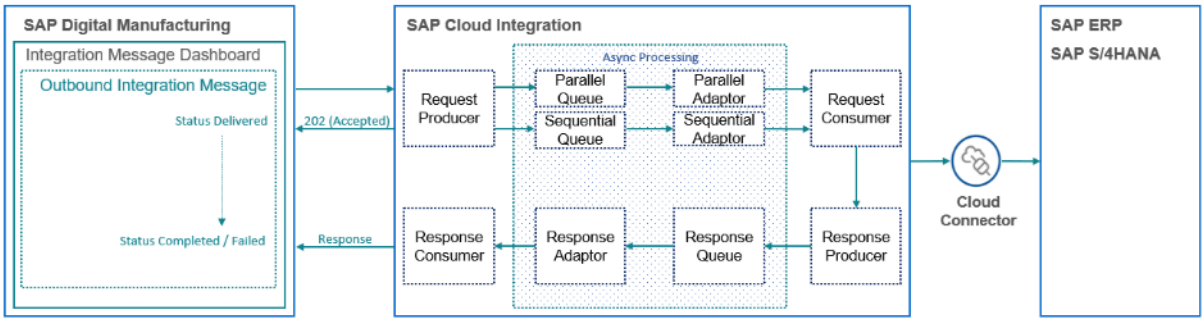
Related Information

Configure Asynchronous Messaging with Retry Using JMS Adaptor

2.1.4.11.1.2 Increasing the CPI Async Performance

Learn how to increase the number of messages that can be processed in the *CPI Async* scenario in SAP Cloud Integration (Cloud Foundry).

Overview



If the *CPI Async* default setup provided by the *SAP S/4HANA Integration with SAP Digital Manufacturing* package doesn't meet your business requirements in terms of message processing performance, you have several options to increase the message throughput in SAP Cloud Integration and you can take action on the following artifacts:

- *Async Request Consumer Parallel Adaptor*, which consumes messages coming from the JMS request queue that processes message that can be handled in parallel (Parallel Queue).
- *Async Request Consumer Sequential Adaptor*, which consumes messages coming from the JMS request queue that processes messages that need to be handled sequentially (Sequential Queue).
- *Async Response Consumer Adaptor*, which consumes messages coming from the JMS response queue.

More specifically, you can act on three levels:

- You can increase the number of concurrent processes in the *Async Request Consumer Parallel Adaptor* and the *Async Response Consumer Adaptor*. For more information, see Overview Advanced CPI Async Settings [page 114].
- You can increase the number of adaptors without increasing the number of JMS queues. For this, simply copy one of the adaptors and add a number to its name.

  > **Example**
  >
  > You copy the *Async Request Consumer Sequential Adaptor* and give it a unique name, for example *Async Request Consumer Sequential Adaptor 1*. No further changes are needed. The new adaptor is still connected to the same JMS queue as the intial adaptor.

- You can increase the number of JMS queues by copying an adaptor and creating a new JMS queue for it. For more information, see Increasing the Number of JMS Queues [page 121].

The appropriate level of action (adaptor settings, copying the adaptor, copying the adaptor and creating an additional JMS queue) depends on your specific situation that you need to analyze. For more information, see Monitoring CPI Async [page 124].

2.1.4.11.1.2.1 Increasing the Number of JMS Queues

Learn how to increase the number of JMS queues in your *CPI Async* scenario in SAP Cloud Integration (Cloud Foundry) to increase the throughput of integration messages.

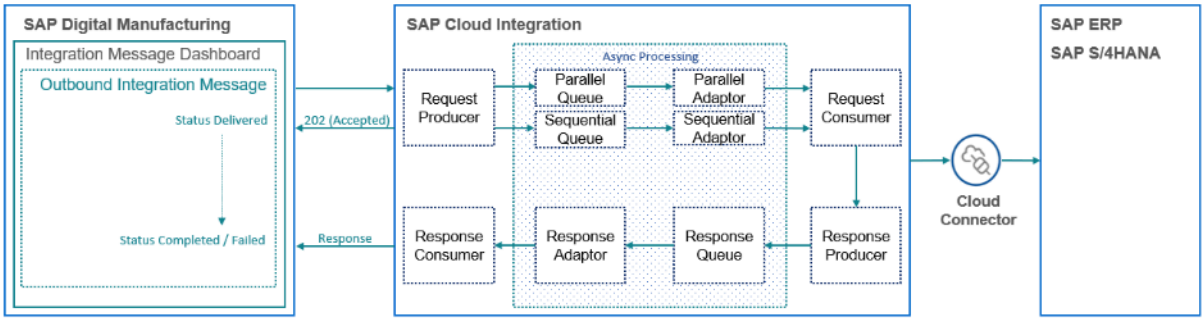
Prerequisites

- You've deployed the latest *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration (Cloud Foundry).
- You've created an empty package in the *Design* section of SAP Cloud Integration (Cloud Foundry).

  > **Note**
  >
  > If you only copy a package, the copied package is configurable only. You'll get the error message: *SAP S/4 HANA with SAP Digital Manufacturing package is configure only*. For the scenario described here, the package needs to be editable. This means you need to create the package.

- You've implemented the prerequisites described here: Asynchronous Communication with SAP Cloud Integration [page 111].

Context



You can increase the throughput of integration messages in your *CPI Async* scenario by increasing the number of the following queue types:

- *JMS Request Queue for Parallel Processing* (Parallel Queue)
- *JMS Request Queue for Sequential Processing* (Sequential Queue)
- *JMS Response Queue*

To create a queue, you must copy the corresponding adaptor first and change the name of the referenced queue. Then, the system automatically creates a new queue with the name you've defined.

> ⚠ Caution
>
> Follow this naming convention for the new queues: SAP_DM_INT_REQ_P_**01**, SAP_DM_INT_REQ_P_**02**,...

As a next step, you need to increase the queue count in the producer iFlow to make sure that the producer can send messages to the new JMS queue. Depending on the type of integration message, there's an adaptor/JMS queue for sequential processing and an adaptor/JMS queue for parallel processing.

> ⓘ Note
>
> If the queue counter value is smaller than the number of queues, the additional queues won't receive messages. If the queue counter value is larger than the number of queues, you will get an error: `400 Queue Not Found`.

For more information, see Asynchronous Communication with SAP Cloud Integration [page 111] and JMS Resource and Size Limits.

The procedure below describes how to add a *JMS Request Queue for Parallel Processing*, but applies to all three JMS queue types.

Procedure

1. In SAP Cloud Integration, go to the *Design* section and open your *SAP S/4HANA Integration with SAP Digital Manufacturing* package.
2. Choose the *Artifacts* tab and select the artifact *Async Request Consumer Parallel Adaptor* and choose *Actions*.

3. Choose *Copy*.
4. Give the artifact a unique name.
5. As *Package*, choose your newly created package.
6. Choose *Copy*.
7. In the *Design* section, choose the artifact that you've just created.

   The overview diagram opens.
8. Choose *Edit*.
9. Choose *JMS* in the diagram to access the settings.
10. Under *Connection*, change the *Queue Name* from `SAP_DM_INT_REQ_P_00` to `SAP_DM_INT_REQ_P_01`.

    Increase the counter at the end of the name by one for each additional JMS queue that you want to create. Stick to this pattern: `SAP_DM_INT_REQ_P_`**01**. The third JMS queue would be: `SAP_DM_INT_REQ_P_02`. If you don't follow this naming pattern, the request producer won't find the adaptor and the JMS queue.
11. Choose *Save*.

    The system automatically creates a new queue `SAP_DM_INT_REQ_P_01` that is connected to the *Async Request Consumer Parallel Adaptor 1*.
12. Choose *Save* and *Deploy*.
13. Choose the *Async Request Producer*.

    The overview diagram opens.
14. Choose *Edit*.
15. Choose *Externalized Parameters*.
16. Increase the *NonSequenceRequestQueueCount* by one.

    Given that you've got now two JMS queues: `SAP_DM_INT_REQ_P_00` and `SAP_DM_INT_REQ_P_01`, the counter needs to be 2.

    If you're creating an adaptor/JMS queue for sequential processing, you need to increase the *SequenceRequestQueueCount*.
17. Choose *Save* and *Deploy*.

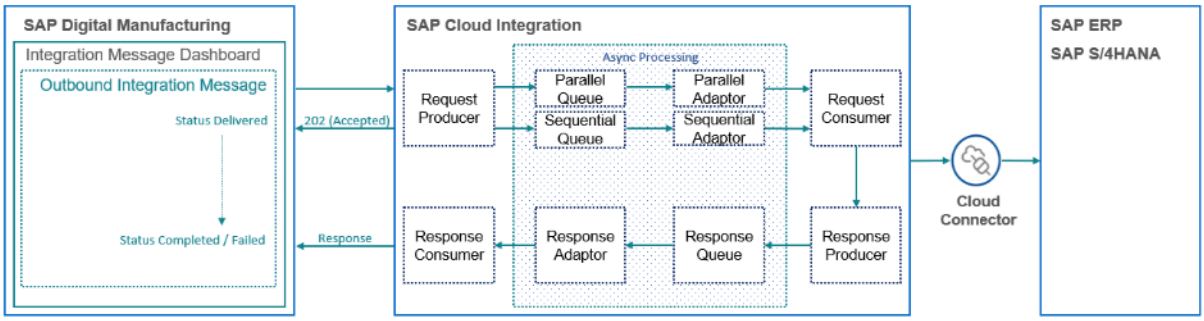
Results

You've created an additional JMS queue for parallel processing.

2.1.4.11.2 Monitoring CPI Async

Learn how you can monitor the asynchronous connection from SAP Digital Manufacturing to SAP Cloud Integration (Cloud Foundry environment).

Here an overview of the integration scenario:



You've got the following options for your monitoring:

Integration Message Dashboards

In the *Integration Message Dashboard* of SAP Digital Manufacturing, the status *Delivered* indicates that an integration message for which *CPI Async* is activated has been received by SAP Cloud Integration, but not yet processed or sent to the integrated SAP ERP or SAP S/4HANA system. Once SAP Cloud Integration has sent the message to the integrated ERP system, the message status in the *Integration Message Dashboard* changes to *Completed* or *Failed*.

Messages with status *Delivered* don't support automatic and manual retry.

The *CPI Correlation ID* of your message that you can find on the *Message Information* tab of *Integration Message Dashboard* for outbound messages supporting *CPI Async* mode can help you to monitor your integration scenario in SAP Cloud Integration.

SAP Cloud Integration

In the *Operate and Monitor Integration Scenarios* area ( ) of SAP Cloud Integration, you can monitor *CPI Async* integration scenarios with regards to these aspects:

- The messages of SAP Cloud Integration that are related to your integration message
- The JMS queues used by SAP Cloud Integration to implement the asynchronous processing

Internal Integration Messages in SAP Cloud Integration

Under *Monitor Message Processing* > *All Integration Flows*, enter the *CPI Correlation ID* of your integration message under *ID* to find the internal messages that are related to your integration message. You can find the *CPI Correlation ID* of your integration message in the *Integration Message Dashboard*.

> → Tip
>
> In SAP Cloud Integration, you can find the *CPI Correlation ID* within each message under *Monitor Message Processing* and use it in the *Integration Message Dashboard* of SAP Digital Manufacturing to search for the integration message.

If a message isn't transferred successfully from the JMS Queue to the Request Consumer iFlow through the Request Consumer Adaptor, the message is retried as configured in the sender channel of the JMS queue. You can find detailed information about errors and the retries in the message processing log. For more information, see Overview Advanced CPI Async Settings [page 114].

JMS Queues

Under *Manage Stores* > *Message Queues*, you'll find the following JMS queue messages that are used for the asynchronous processing of messages:

- `SAP_DM_INT_REQ_P_00`, which represents the request JMS queue for parallel processing
- `SAP_DM_INT_REQ_S_00`, which represents the request JMS queue for sequential processing
- `SAP_DM_INT_RESP_00`, which represents the response JMS queue, which doesn't distinguish between messages for parallel or sequential processing

By choosing *Details* next to *JMS Resources*, you can get information, such as *Number of Queues*, *Capacity*, *Queue Status*.

By choosing a JMS queue message, you can access processing-relevant information and retry or delete JMS queue messages.

> ⓘ Note
>
> There's a **dead letter queue** implemented for the JMS Request Consumer and the JMS Response Consumer. For more information, see Configure the JMS Sender Adapter and Dead Letter Handling in JMS Adapter.

2.1.4.12 Monitor Your Integration Scenario

Learn about how you can monitor your integration scenario.

Introduction

It's important to monitor certain integration points on a regular basis to ensure that the application is healthy and that your integration scenario is operational from end to end. For this monitoring, you've got several options, which are presented here.

Monitoring in SAP Digital Manufacturing

In SAP Digital Manufacturing, you can monitor your integration scenario using the *Integration Message Dashboard*. This dashboard shows you information on inbound and outbound messages and lets you retry failed messages. You can also use it to check your integration scenario for configuration errors and view the SAP Cloud Integration logs for failed outbound messages. For more information, see Integration Message Dashboard.

Monitoring in SAP Cloud Integration

In SAP Cloud Integration, you can check the status of your integration messages under *Monitor Message Processing*. For more information, see Monitor Message Processing.

Monitoring Using SAP Cloud ALM

Using the *Integration & Exception Monitoring* feature of SAP Cloud ALM, which isn't part of SAP Digital Manufacturing, you can monitor your end-to-end integration scenario centrally and access detailed information about the status of your integration messages in different systems of your integration scenario. When it comes to user authorization, be aware that the data made available to SAP Cloud ALM is a subset of the data available in the *Integration Message Dashboard*. For more information, see Integration & Exception Monitoring - Setup & Configuration.

The *Integration & Exception Monitoring* feature of SAP Cloud ALM uses the following integration statuses to monitor integration messages in SAP Digital Manufacturing:

Integration Status	Description
In Process	The message is currently under processing in SAP Digital Manufacturing. For inbound messages, it means that SAP Digital Manufacturing has received a message from an external system and is processing it. For outbound messages, it means a message is being prepared in SAP Digital Manufacturing to be sent to an external system.

Integration Status	Description
Failed	An error occurred when the message was processed in SAP Digital Manufacturing. For inbound scenarios, it indicates that the corresponding business object will not be available in SAP Digital Manufacturing. For outbound scenarios, it indicates that the message was not delivered and the corresponding action notification isn't sent to the external system. **Note** If the error is external, such as "Order locked in ERP", the integration status is *Completed*, `instead of` *Failed*, because the business object was delivered successfully to the external system.
Completed	The message has been processed successfully. For inbound scenarios, it indicates that the corresponding business object, for example, a material, is now available in SAP Digital Manufacturing. For outbound scenarios, it indicates that the message has been delivered and the corresponding action notification, such as yield confirmation, has been sent to an external system. **Note** If the error is external, such as "Order locked in ERP", the integration status is *Completed*, `instead of` *Failed*, because the business object was delivered successfully to the external system.

Note

The integration status *Not Started* isn't displayed in SAP Cloud ALM, but only available in the *Integration Message Dashboard* of SAP Digital Manufacturing. It indicates that a business process has been started but that the message hasn't been received by the integration layer of SAP Digital Manufacturing. Once the integration layer receives the message, the integration status is set to *In Process*.

If a message is stuck in status *Not Started*, the message isn't displayed in SAP Cloud ALM.

The times of the status changes are determined as follows in SAP Cloud ALM:

- The integration process starts when the integration status of a message in SAP Digital Manufacturing is set to *In Process* for the first time.
- The integration process ends when the integration status is changed from *In Process* to *Completed*, or when it's set to *Failed* for the last time (after retry).

This method of determining event times is slightly different from how the times are determined in the *Integration Message Dashboard*. As a result, the timestamp of a message in SAP Cloud ALM might not match the timestamp of the same message in the *Integration Message Dashboard* of SAP Digital Manufacturing.

2.1.5 Business Integration with SAP S/4HANA or SAP ERP

As an administrator, you set up the exchange of master data and transaction data between SAP S/4HANA or SAP ERP. Moreover, if you have multiple ERP plants with the same identifier that represent different plants in the real world, you can map these ERP plants to distinct plants in SAP Digital Manufacturing for execution using the plant conversion feature.

SAP S/4HANA or SAP ERP is the system of record for master data, and SAP Digital Manufacturing for execution is the system of record for all work-in-process (WIP) data.

- Integration of Master Data
  You can transfer master data such as materials, BOMs, routings and work centers from SAP S/4HANA or SAP ERP to SAP Digital Manufacturing.
- Integration of Transaction Data
  You can enable bidirectional transfer of transaction data such as orders, inventory, batch and quality inspection information.
- Plant Conversion
  If you use the same plant identifier in multiple SAP ERP or SAP S/4HANA systems, you can use plant conversion to map each plant identifier to one distinct plant in SAP Digital Manufacturing, so that integration messages are transferred correctly.

> **Example**
>
> You've got a plant A in ERP system 1 and a plant B in ERP system 2. They each represent a different plant in the real world, but they have the same identifier. With plant conversion, you can perform the following mapping to make sure that integration messages are transferred correctly:

Plant	Identifier in SAP ERP / SAP S/4HANA	Identifier in SAP Digital Manufacturing
Plant A in ERP 1	1000	1000-A
Plant B in ERP 2	1000	1000-B

Related Information

Integration of Master Data [page 129]
Integration of Transaction Data [page 170]
Mapping Plants (Plant Conversion) [page 356]

2.1.5.1 Integration of Master Data

You can transfer master data from an SAP ERP or an SAP S/4HANA system to SAP Digital Manufacturing for execution.

Use

The ERP system is the system of record for the master data and SAP Digital Manufacturing for execution is the system of record for all WIP data.

You can transfer the following master data:

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution
Material (incl. characteristics)	Material
BOM	BOM
Work center	Work center
Routing	Routing
Production version	Material, recipe, BOM
QM defect code and group	Nonconformance code and group
Usage Decision Code	Usage Decision Code
Tool	Equipment, tool
Recipe	Recipe
Classification	Classification

Prerequisites

The material of the BOM as well as the materials of the components and the work center are in SAP Digital Manufacturing for execution.

Sequence Considerations

You must transfer materials before BOMs.

Implementation Considerations

Some functions may behave differently depending on the SAP ERP version used for integration with SAP Digital Manufacturing for execution.

Related Information

Field Mapping for Integration to SAP ERP or SAP S/4HANA [page 258]
Allowed Characters for Key Fields [page 355]

2.1.5.1.1 Material Integration

You can transfer material master data from SAP ERP or SAP S/4HANA to create or update the corresponding material record in SAP Digital Manufacturing for execution.

Before orders can be created in SAP Digital Manufacturing, the material to manufacture must first exist in SAP ERP or SAP S/4HANA. The material integration process ensures that a material created in SAP ERP or SAP S/4HANA and transferred to SAP Digital Manufacturing can be created and released.

In some cases, specific material properties are required to manufacture the material. This information is stored as classification data in SAP ERP or SAP S/4HANA and associated to the material master record. This classification data must be maintained in SAP ERP or SAP S/4HANA and associated with the material. For reasons of performance and stability, the classification data contained in the material master isn't used for integration purposes. Instead, the classification data is transferred to SAP Digital Manufacturing separately from the material master.

Transferring the material and its classification data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing ensures consistent data so that inventory and WIP numbers are accurate between SAP ERP or SAP S/4HANA and SAP Digital Manufacturing for execution during production.

Integration information and constraints include the following:

- The material master is used by all components in the SAP ERP or SAP S/4HANA Logistics system.
- To ease integration, the data contained in the material master is required for the following functions in SAP ERP or SAP S/4HANA:
  - In *Inventory Management*, for goods movement postings and physical inventory
  - In *Production Planning and Control*, for material requirements planning and scheduling
- The SAP ERP or SAP S/4HANA base unit of measure for material is used by SAP Digital Manufacturing material, inventory ID, bill of materials (BOM), and order records and then reported back to SAP ERP or SAP S/4HANA in confirmations.
- The language of the material description value matches the SAP ERP or SAP S/4HANA plant language. If the description in the SAP ERP or SAP S/4HANA plant language isn't available, SAP Digital Manufacturing uses the value in the first available language.

Related Information

Manage Materials
Allowed Characters for Key Fields [page 355]

2.1.5.1.1.1 Transferring a Material Master

Learn how to create a material master in SAP ERP or SAP S/4HANA and transfer it to SAP Digital Manufacturing for execution.

Prerequisites

- You've set up the Data Replication Framework (DRF) to send `MATMAS05` IDocs from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution. Moreover, you've created and activated a replication model with the outbound implementation for the material (`194_1`). For more information, see Data Replication Framework [page 37].

  > **Note**
  >
  > For more information on the automatic distribution of changed master data, see 2515556 and 2700769.

  > **Note**
  >
  > You can find more information on the supported material master versions in this note: 0003050090.

Context

During production, material master data from SAP ERP or SAP S/4HANA is required for SAP Digital Manufacturing for execution. Therefore, you need to transfer material master data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution to create or update the corresponding material record in SAP Digital Manufacturing for execution. Here you learn how to create a material master record in SAP ERP or SAP S/4HANA and how to transfer it to SAP Digital Manufacturing for execution.

> **Note**
>
> Classification data (characteristic, class, classification assignment) is transferred separately from the material master. For more information, see Classification Integration [page 138].

Procedure

1. Create a material master record in SAP ERP or SAP S/4HANA (see Creating a Material Master Record).

   > **Note**
   >
   > It's recommended to use at least one letter or one special character in the material number in SAP ERP or SAP S/4HANA. By doing so, you make sure that SAP ERP or SAP S/4HANA doesn't fill up the material number up to the full length with leading zeros, which can lead to challenges in certain scenarios.

   > **Note**
   >
   > When you transfer master data to SAP Digital Manufacturing for execution, key fields can contain only allowed characters. For more information, see Allowed Characters for Key Fields [page 355].

2. Send the material master record to SAP Digital Manufacturing for execution.
   We recommend using the *Execute Data Replication* transaction (transaction code – `DRFOUT`).

   > **Note**
   >
   > You can send a material using the *Send Material* (`BD10`) transaction.

3. To verify whether the `MATMAS05` iDoc was transferred to SAP Digital Manufacturing for execution, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your `MATMAS05` iDoc. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your `MATMAS05` iDoc. For more information, see **Monitoring Message Processing**.

Related Information

Integration Message Dashboard
Manage Materials
Mapping a Material [page 258]

2.1.5.1.1.2 Transferring a Batch-Managed Material with Batch Characteristics

You can transfer a batch-managed material master record together with batch characteristics assigned to it from SAP ERP or SAP S/4HANA to create or update the corresponding material record in SAP Digital Manufacturing for execution.

Prerequisites

- You've set up the Data Replication Framework (DRF) to send `MATMAS03` IDocs from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution. Moreover, you've created and activated a replication model with the outbound implementation for the material (`194_1`). For more information, see Data Replication Framework [page 37].

  > **Note**
  >
  > For more information on the automatic distribution of changed master data, see 2515556.

  > **Note**
  >
  > `MATMAS05` is supported by SAP Digital Manufacturing for execution. For more information on the supported material master versions, see 0003050090.

- You've configured the *Batch Management*.
- You've assigned batch characteristics to the material.

Context

In production, you can't guarantee that material features are exactly alike. For example, you cannot guarantee that a certain color will always have the same shade. You can't avoid minor differences between production lots. To manage these differences, you must uniquely identify the individual production lots of the same material and manage them separately in inventory.

A batch is a quantity of the material produced during a given production run. A batch represents a homogeneous unit with unique specifications. A batch is a subset of the total quantity of a material held in stock. The subset is managed from all other subsets of the same material.

Materials that require precise identification, for example, pharmaceutical products are identified and managed in stock according to both, the material number and the batch number.

Procedure

1. Create a batch-managed material record in SAP ERP or SAP S/4HANA. For more information, see **Creating a Batch Master Record**.

> **Note**
>
> It's recommended to use at least one letter or one special character in the material number in SAP ERP or SAP S/4HANA. By doing so, you make sure that SAP ERP or SAP S/4HANA doesn't fill up the material number up to the full length with leading zeros, which can lead to challenges in certain scenarios.

> **Note**
>
> When you transfer master data to SAP Digital Manufacturing for execution, key fields can contain only allowed characters. For more information, see Allowed Characters for Key Fields [page 355].

2. Transfer the material master record to SAP Digital Manufacturing for execution.
   We recommend using the *Execute Data Replication* transaction (transaction code – `DRFOUT`).

   > **Note**
   >
   > You can send a material using the *Send Material* (`BD10`) transaction.

3. To verify whether the `MATMAS03` iDoc was transferred toSAP Digital Manufacturing for execution, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your `MATMAS03` iDoc. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your `MATMAS03` iDoc. For more information, see **Monitoring Message Processing**.

Related Information

Integration Message Dashboard
Manage Materials
Mapping a Material [page 258]

2.1.5.1.1.3 Transferring a Long Material Number

You can use a long material number record from SAP ERP or SAP S/4HANA to create or update the corresponding material record in SAP Digital Manufacturing for execution.

Prerequisites

SAP ERP and SAP S/4HANA

- You've set up the Data Replication Framework (DRF) to send `MATMAS03` IDocs from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution. Moreover, you've created and activated a replication

model with the outbound implementation for the material (`194_1`). For more information, see Data Replication Framework [page 37].

> **Note**
>
> For more information on the automatic distribution of changed master data, see 2515556.

> **Note**
>
> `MATMAS05` is supported by SAP Digital Manufacturing for execution. For more information on the supported material master versions, see 0003050090.

SAP ERP

- You've activated the following business functions:
  - `DIMP_SDUD`: Discrete Industries — Mill Products
  - `MGV_LAMA`: Long Material Number
- You've run the `ENLM` (Enable Long Material Number) report.
- You've implemented SAP Notes 1795373 and 1871674 or applied the corresponding support packages.

Context

The standard SAP ERP material number field uses the domain `MATNR`, which has an input, output, and database length of 18 characters.

The long material number (`MATNR_EXTERNAL`) is the normal 18-character material number plus 22 additional characters, allowing you to use 40-character material numbers.

For more information about sending long material number IDocs to SAP Digital Manufacturing for execution, see *Transfer of Long Material Number* on the SAP Help Portal at http://help.sap.com.

Procedure

1. Create a material master record in SAP ERP with a name that contains more than 18 characters. For more information, see Creating a Material Master Record.

   > **Note**
   >
   > When you transfer master data to SAP Digital Manufacturing for execution, key fields can contain only allowed characters. For more information, see Allowed Characters for Key Fields [page 355].

2. Send the material master record to SAP Digital Manufacturing for execution.
   We recommend that you use the *Execute Data Replication* transaction (transaction code – `DRFOUT`).

> **Note**
>
> You can send a material using the *Send Material* (`BD10`) transaction.

3. To verify whether the `MATMAS03` iDoc was transferred to SAP Digital Manufacturing for execution, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your `MATMAS03` iDoc. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your `MATMAS03` iDoc. For more information, see **Monitoring Message Processing**.

Related Information

Integration Message Dashboard
Manage Materials
Mapping a Material [page 258]

2.1.5.1.1.4 Transferring a Backflushed Material

You can transfer backflushed materials from SAP ERP or SAP S/4HANA to create or update corresponding material records in SAP Digital Manufacturing for execution.

Prerequisites

- You've set up the Data Replication Framework (DRF) to send `MATMAS03` IDocs from SAP ERP or SAP S/4HANA to . Moreover, you've created and activated a replication model with the outbound implementation for the material (`194_1`). For more information, see Data Replication Framework [page 37].

  > **Note**
  >
  > For more information on the automatic distribution of changed master data, see 2515556.

  > **Note**
  >
  > `MATMAS05` is supported by SAP Digital Manufacturing for execution. For more information on the supported material master versions, see 0003050090.

Context

Normally, a goods issue is posted for every material that is withdrawn during order processing. When you use backflushing, the goods issue posting is carried out later when the operation or phase is confirmed for the

material component. The backflush indicator that activates backflushing is set in SAP ERP or SAP S/4HANA and transferred to SAP Digital Manufacturing for execution.

Procedure

1. Create a backflushed material record in SAP ERP or SAP S/4HANA. For more information, see Creating a Material Master Record.

   > **Note**
   >
   > It's recommended to use at least one letter or one special character in the material number in SAP ERP or SAP S/4HANA. By doing so, you make sure that SAP ERP or SAP S/4HANA doesn't fill up the material number up to the full length with leading zeros, which can lead to challenges in certain scenarios.

   > **Note**
   >
   > When you transfer master data to SAP Digital Manufacturing for execution, key fields can contain only allowed characters. For more information, see Allowed Characters for Key Fields [page 355].

2. Transfer the material master record to SAP Digital Manufacturing for execution.
   We recommend that you use the *Execute Data Replication* transaction (transaction code – `DRFOUT`).

   > **Note**
   >
   > You can transfer materials using the *Send Material* (`BD10`) transaction.

3. To verify whether the `MATMAS03` iDoc was transferred to SAP Digital Manufacturing for execution, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your `MATMAS03` iDoc. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your `MATMAS03` iDoc. For more information, see **Monitoring Message Processing**.

Related Information

Integration Message Dashboard
Manage Materials
Mapping a Material [page 258]

2.1.5.1.2 Classification Integration

You can transfer classification data (characteristic, class, classification assignment) from your integrated SAP ERP or SAP S/4HANA system to SAP Digital Manufacturing.

Use

In some cases, specific material properties may be required to manufacture a material. This information is stored as classification data in SAP ERP or SAP S/4HANA and associated to the material master record. To be more precise, a characteristic is assigned to a class, and the class is assigned to a classification assignment, which binds the characteristic to the material master.

To transfer classification data to SAP Digital Manufacturing, you first need to transfer the corresponding material master and then the classification data in the following order:

1. Characteristic
2. Class
3. Classification assignment

For performance and stability reasons, the classification data download isn't triggered by the material master, but the classification data is transferred separately from your ERP system to SAP Digital Manufacturing using IDocs.

Overview

The integration procedure for classification data varies depending on the system you want to integrate with:

- Integration with SAP ERP [page 138]
- Integration with SAP S/4HANA [page 143]

2.1.5.1.2.1 Integration with SAP ERP

You can transfer classification data (characteristic, class, classification assignment) from your integrated SAP ERP to SAP Digital Manufacturing.

Use

You can transfer classification data, such as characteristics, classes, and classification assignments, from your integrated SAP ERP to SAP Digital Manufacturing to use this data in your production processes.

Overview

To transfer classification data to SAP Digital Manufacturing, perform the tasks described in the following topics:

1. Transferring a Characteristic [page 139]
2. Transferring a Class [page 140]
3. Transferring a Classification Assignment [page 142]

2.1.5.1.2.1.1 Transferring a Characteristic

Learn how to transfer a characteristic from SAP ERP to SAP Digital Manufacturing.

Prerequisites

- You've set up the technical integration. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16].
- You've set up ALE communication to send the `CHRMAS05` IDoc (characteristics) from SAP ERP to SAP Digital Manufacturing. For more information, see Set Up Application Link Enabling (ALE) [page 39].
- You've manually deployed the latest *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration.

> **Note**
>
> The mapping between the SAP Cloud Integration artifacts and the integration workflows available in the *Manage Integration Workflows* app is as follows:

SAP Cloud Integration Artifact	SAP Digital Manufacturing Integration Workflow
`Characteristic CHRMAS05 process request`	*Characteristic Download*
`Class CLSMAS04 process request`	*Class Download*
`ClassificationAssignment CLFMAS02 process request`	*Classification Assignment Download*

- You've implemented the *INBOUND PROCESSOR* iFlow in SAP Cloud Integration and activated it through the `Initial Parameters` iFlow. For more information, see Configure Inbound Processor iFlow [page 72] and Configure Initial Parameters iFlow [page 74].
- You've created a material master, and assigned a characteristic, class, and classification assignment to the material master in your SAP ERP system.
- You've transferred the material master to SAP Digital Manufacturing. For more information, see Transferring a Material Master [page 131].

Context

After transferring the material master from SAP ERP to SAP Digital Manufacturing, you need to transfer the characteristics separately from the material master to be able to use them for your shop floor processes.

Moreover, when you update a characteristic in your integrated SAP ERP system, you need to perform the following procedure to communicate this change to SAP Digital Manufacturing.

> ⓘ Note
>
> Alternatively, you can configure the change pointers in SAP ERP, so that the data is replicated automatically to SAP Digital Manufacturing.

Procedure

1. Use transaction `BD91` to distribute the characteristic.
2. In SAP Digital Manufacturing, go to the *Integration Message Dashboard* and check the status of the *Characteristics Download* integration message. For more information, see Integration Message Dashboard.

   If the *Characteristics Download* wasn't successful even after retry, you can go to SAP Cloud Integration and check the message status under *Monitor Message Processing*. For more information, see **Monitoring Message Processing**.

2.1.5.1.2.1.2 Transferring a Class

Learn how to transfer a class from SAP ERP to SAP Digital Manufacturing.

Prerequisites

- You've set up the technical integration. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16].
- You've set up ALE communication to send the `CLSMAS04` IDoc (class) from SAP ERP to SAP Digital Manufacturing. For more information, see Set Up Application Link Enabling (ALE) [page 39].
- You've manually deployed the latest *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration.

  > ⓘ Note
  >
  > The mapping between the SAP Cloud Integration artifacts and the integration workflows available in the *Manage Integration Workflows* app is as follows:

SAP Cloud Integration Artifact	SAP Digital Manufacturing Integration Workflow
`Characteristic CHRMAS05 process request`	*Characteristic Download*
`Class CLSMAS04 process request`	*Class Download*
`ClassificationAssignment CLFMAS02 process request`	*Classification Assignment Download*

- You've implemented the *INBOUND PROCESSOR* iFlow in SAP Cloud Integration and activated it through the `Initial Parameters` iFlow. For more information, see Configure Inbound Processor iFlow [page 72] and Configure Initial Parameters iFlow [page 74].
- You've created a material master, and assigned a characteristic, class, and classification assignment to the material master in your SAP ERP system.
- You've transferred the material master to SAP Digital Manufacturing. For more information, see Transferring a Material Master [page 131].
- You've transferred the characteristics to SAP Digital Manufacturing. For more information, see Transferring a Characteristic [page 139].

Context

After transferring the material master and the characteristic from SAP ERP to SAP Digital Manufacturing, you need to transfer the class separately from the material master to be able to use them for your shop floor processes.

Moreover, when you update a class in your integrated SAP ERP system, you need to perform the following procedure to communicate this change to SAP Digital Manufacturing.

> ⓘ Note
>
> Alternatively, you can configure the change pointers in SAP ERP, so that the data is replicated automatically to SAP Digital Manufacturing.

Procedure

1. Use transaction `BD92` to distribute the class.
2. In SAP Digital Manufacturing, go to the *Integration Message Dashboard* and check the status of the *Class Download* integration message. For more information, see Integration Message Dashboard.

   If the *Class Download* wasn't successful even after retry, you can go to SAP Cloud Integration and check the message status under *Monitor Message Processing*. For more information, see **Monitoring Message Processing**.

2.1.5.1.2.1.3 Transferring a Classification Assignment

Learn how to transfer a classification assignment from SAP ERP to SAP Digital Manufacturing for execution.

Prerequisites

- You've set up the technical integration. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16].
- You've set up ALE communication to send the `CLFMAS02` IDoc (classification assignment) from SAP ERP to SAP Digital Manufacturing. For more information, see Set Up Application Link Enabling (ALE) [page 39].
- You've manually deployed the latest *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration.

  > **Note**
  >
  > The mapping between the SAP Cloud Integration artifacts and the integration workflows available in the *Manage Integration Workflows* app is as follows:
  >
  > | SAP Cloud Integration Artifact | SAP Digital Manufacturing Integration Workflow |
  > | --- | --- |
  > | `Characteristic CHRMAS05 process request` | *Characteristic Download* |
  > | `Class CLSMAS04 process request` | *Class Download* |
  > | `ClassificationAssignment CLFMAS02 process request` | *Classification Assignment Download* |

- You've implemented the *INBOUND PROCESSOR* iFlow in SAP Cloud Integration and activated it through the `Initial Parameters` iFlow. For more information, see Configure Inbound Processor iFlow [page 72] and Configure Initial Parameters iFlow [page 74].
- You've created a material master, and assigned a characteristic, class, and classification assignment to the material master in your SAP ERP system.
- You've transferred the material master to SAP Digital Manufacturing. For more information, see Transferring a Material Master [page 131].
- You've transferred the characteristic to SAP Digital Manufacturing. For more information, see Transferring a Characteristic [page 139].
- You've transferred the class to SAP Digital Manufacturing. For more information, see Transferring a Class [page 140].

Context

After transferring the material master, its characteristic, and class, from SAP ERP to SAP Digital Manufacturing, you need to transfer the classification assignment separately from the material master to be able to use them for your shop floor processes.

Moreover, when you update a classification assignment in your integrated SAP ERP system, you need to perform the following procedure to communicate this change to SAP Digital Manufacturing.

> ⓘ Note
>
> By choosing *Refresh* in the *Manage Materials* app of SAP Digital Manufacturing, you can trigger a download of the classification assignments as well.

> ⓘ Note
>
> Alternatively, you can configure the change pointers in SAP ERP, so that the data is replicated automatically to SAP Digital Manufacturing.

Procedure

1. Use transaction `BD93` to distribute the classification assignment.
2. In SAP Digital Manufacturing, go to the *Integration Message Dashboard* and check the status of the *Classification Assignment Download* integration message. For more information, see Integration Message Dashboard.

   If the *Classification Assignment Download* wasn't successful even after retry, you can go to SAP Cloud Integration and check the message status under *Monitor Message Processing*. For more information, see **Monitoring Message Processing**.

2.1.5.1.2.2 Integration with SAP S/4HANA

You can transfer classification data (characteristic, class, classification assignment) from your integrated SAP S/4HANA system to SAP Digital Manufacturing using the data replication framework (DRF) and the business transaction events (BTE).

Context

You can transfer classification data, such as characteristics, classes, and classification assignments, from your integrated SAP S/4HANA system to SAP Digital Manufacturing using specific iDocs that are replicated through the data replication framework (DRF).

For ad-hoc replication, you can use transaction `DRFOUT`. After transferring the material master, you replicate the objects in the following order:

1. Characteristic
2. Class
3. Classification Assignment

It's recommended to set up the business transaction events (BTE) framework on top of the data replication framework (DRF) to enable the automatic replication of characteristic, class, and classification assignment. The topics referenced below provide you with more information.

> ⓘ Note
>
> You can find the minimum version requirements for the classification integration here: 3050090.

Overview

To transfer classification data to SAP Digital Manufacturing, perform the tasks described in the following topics:

1. Transferring a Characteristic [page 144]
2. Transferring a Class [page 146]
3. Transferring a Classification Assignment [page 147]

2.1.5.1.2.2.1 Transferring a Characteristic

Learn how to transfer a characteristic from SAP S/4HANA to SAP Digital Manufacturing.

Prerequisites

- Your system meets the minimum version requirements for the classification integration. For more information, see 3050090.
- You've set up the technical integration. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16].
- You've set up ALE and DRF communication to send the `CHRMAS05` IDoc (characteristics) from SAP S/4HANA to SAP Digital Manufacturing. For more information, see Set Up Application Link Enabling (ALE) [page 39].
- **Recommended**: You've set up business transaction events (BTE) to enable **automatic download** of characteristics, classes, and classification assignments. With transaction `FIBF`, you've implemented application `EDOC` (eDocuments) and application `CA-CL` (Classification). For more information, see Defining Business Transaction Event (BTE) for Electronic Documents.
- You've manually deployed the latest *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration.

  > ⓘ Note
  >
  > The mapping between the SAP Cloud Integration artifacts and the integration workflows available in the *Manage Integration Workflows* app is as follows:

SAP Cloud Integration Artifact	SAP Digital Manufacturing Integration Workflow
`Characteristic CHRMAS05 process request`	*Characteristic Download*
`Class CLSMAS04 process request`	*Class Download*
`ClassificationAssignment CLFMAS02 process request`	*Classification Assignment Download*

- You've implemented the *INBOUND PROCESSOR* iFlow in SAP Cloud Integration and activated it through the `Initial Parameters` iFlow. For more information, see Configure Inbound Processor iFlow [page 72] and Configure Initial Parameters iFlow [page 74].
- You've created a material master, and assigned a characteristic, class, and classification assignment to the material master in your SAP S/4HANA system.
- You've transferred the material master to SAP Digital Manufacturing. For more information, see Transferring a Material Master [page 131].

Context

After transferring the material master from SAP S/4HANA to SAP Digital Manufacturing, you need to transfer the characteristic separately from the material master to be able to use it for your shop floor processes.
By using the data replication framework (DRF) and the business transaction events (BTE) together, you can automate the replication, so that created or updated characteristics are transferred automatically to SAP Digital Manufacturing. For adhoc replication, you can follow the procedure below.

Procedure

1. Use transaction `DRFOUT` to distribute the characteristic.
2. In SAP Digital Manufacturing, go to the *Integration Message Dashboard* and check the status of the *Characteristics Download* integration message. For more information, see Integration Message Dashboard.

   If the *Characteristics Download* wasn't successful even after retry, you can go to SAP Cloud Integration and check the message status under *Monitor Message Processing*. For more information, see **Monitoring Message Processing**.

2.1.5.1.2.2.2 Transferring a Class

Learn how to transfer a class from SAP S/4HANA to SAP Digital Manufacturing.

Prerequisites

- Your system meets the minimum version requirements for the classification integration. For more information, see 3050090.
- You've set up the technical integration. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16].
- You've set up ALE and DRF communication to send the `CLSMAS04` IDoc (class) from SAP S/4HANA to SAP Digital Manufacturing. For more information, see Set Up Application Link Enabling (ALE) [page 39].
- **Recommended**: You've set up business transaction events (BTE) to enable **automatic download** of characteristics, classes, and classification assignments. With transaction `FIBF`, you've implemented application `EDOC` (eDocuments) and application `CA-CL` (Classification). For more information, see Defining Business Transaction Event (BTE) for Electronic Documents.
- You've manually deployed the latest *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration.

  > **Note**
  >
  > The mapping between the SAP Cloud Integration artifacts and the integration workflows available in the *Manage Integration Workflows* app is as follows:
  >
  > | SAP Cloud Integration Artifact | SAP Digital Manufacturing Integration Workflow |
  > | --- | --- |
  > | `Characteristic CHRMAS05 process request` | *Characteristic Download* |
  > | `Class CLSMAS04 process request` | *Class Download* |
  > | `ClassificationAssignment CLFMAS02 process request` | *Classification Assignment Download* |

- You've implemented the *INBOUND PROCESSOR* iFlow in SAP Cloud Integration and activated it through the `Initial Parameters` iFlow. For more information, see Configure Inbound Processor iFlow [page 72] and Configure Initial Parameters iFlow [page 74].
- You've created a material master, and assigned a characteristic, class, and classification assignment to the material master in your SAP S/4HANA system.
- You've transferred the material master to SAP Digital Manufacturing. For more information, see Transferring a Material Master [page 131].
- You've transferred the characteristic to SAP Digital Manufacturing. For more information, see Transferring a Characteristic [page 144].

Context

After transferring the material master and the characteristic from SAP S/4HANA to SAP Digital Manufacturing, you need to transfer the class separately from the material master to be able to use it for your shop floor processes. By using the data replication framework (DRF) and the business transaction events (BTE) together, you can automate the replication, so that created or updated classes is transferred automatically to SAP Digital Manufacturing. For adhoc replication, you can follow the procedure below.

Procedure

1. Use transaction `DRFOUT` to distribute the class.The integration of class and characteristic deletion isn't supported by
2. In SAP Digital Manufacturing, go to the *Integration Message Dashboard* and check the status of the *Class Download* integration message. For more information, see Integration Message Dashboard.

   If the *Class Download* wasn't successful even after retry, you can go to SAP Cloud Integration and check the message status under *Monitor Message Processing*. For more information, see **Monitoring Message Processing**.

2.1.5.1.2.2.3 Transferring a Classification Assignment

Learn how to transfer a classification assignment from SAP S/4HANA to SAP Digital Manufacturing.

Prerequisites

- Your system meets the minimum version requirements for the classification integration. For more information, see 3050090 .
- You've set up the technical integration. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16].
- You've set up ALE and DRF communication to send the `CLFMAS02` IDoc (classification assignments) from SAP S/4HANA to SAP Digital Manufacturing. For more information, see Set Up Application Link Enabling (ALE) [page 39].
- **Recommended**: You've set up business transaction events (BTE) to enable **automatic download** of characteristics, classes, and classification assignments. With transaction `FIBF`, you've implemented application `EDOC` (eDocuments) and application `CA-CL` (Classification). For more information, see Defining Business Transaction Event (BTE) for Electronic Documents.
- You've manually deployed the latest *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration.

> **Note**
>
> The mapping between the SAP Cloud Integration artifacts and the integration workflows available in the *Manage Integration Workflows* app is as follows:
>
> | SAP Cloud Integration Artifact | SAP Digital Manufacturing Integration Workflow |
> | --- | --- |
> | `Characteristic CHRMAS05 process request` | *Characteristic Download* |
> | `Class CLSMAS04 process request` | *Class Download* |
> | `ClassificationAssignment CLFMAS02 process request` | *Classification Assignment Download* |

- You've implemented the *INBOUND PROCESSOR* iFlow in SAP Cloud Integration and activated it through the `Initial Parameters` iFlow. For more information, see Configure Inbound Processor iFlow [page 72] and Configure Initial Parameters iFlow [page 74].
- You've created a material master, and assigned a characteristic, class, and classification assignment to the material master in your SAP S/4HANA system.
- You've transferred the material master to SAP Digital Manufacturing. For more information, see Transferring a Material Master [page 131].
- You've transferred the characteristic to SAP Digital Manufacturing. For more information, see Transferring a Characteristic [page 144].
- You've transferred the class to SAP Digital Manufacturing. For more information, see Transferring a Characteristic [page 144].

Context

After transferring the material master, the characteristic, and the class, from SAP S/4HANA to SAP Digital Manufacturing, you need to transfer the classification assignment separately from the material master to be able to use it for your shop floor processes. By using the data replication framework (DRF) and the business transaction events (BTE) together, you can automate the replication, so that created or updated classification assignments are transferred automatically to SAP Digital Manufacturing. For adhoc replication, you can follow the procedure below.

> **Note**
>
> By choosing *Refresh* in the *Manage Materials* app of SAP Digital Manufacturing, you trigger a download of the classification assigments.

Procedure

1. Use transaction `DRFOUT` to distribute the classification assignment.
2. In SAP Digital Manufacturing, go to the *Integration Message Dashboard* and check the status of the *Classification Assignment Download* integration message. For more information, see Integration Message Dashboard.

If the *Classification Assignment Download* wasn't successful even after retry, you can go to SAP Cloud Integration and check the message status under *Monitor Message Processing*. For more information, see **Monitoring Message Processing**.

2.1.5.1.3 Bill of Material Integration

You can transfer BOM master data from SAP ERP or SAP S/4HANA to create or update the corresponding BOM record in SAP Digital Manufacturing for execution.

Purpose

A bill of material (BOM) in SAP ERP or SAP S/4HANA contains a list of all components belonging to an assembly. This structured list of components can be transferred to SAP Digital Manufacturing for execution to ensure that all the components are tracked during the manufacturing process. To avoid mistakes such as duplicate entries of BOM data, use the BOM transfer functionality between SAP ERP or SAP S/4HANA and SAP Digital Manufacturing for execution.

Each BOM is transferred as a single level BOM, so subassembly BOMs need to be transferred separately. The structure of the BOM in SAP ERP or SAP S/4HANA may not match the structure of the BOM that manufacturing would prefer. Review the structure of the BOM in SAP ERP or SAP S/4HANA to see if you need to make any adjustments to the BOM structure.

2.1.5.1.3.1 Configuring a Bill of Material (BOM)

You can transfer BOM master data from SAP ERP to create or update the corresponding BOM Master type record in SAP Digital Manufacturing for execution.

Prerequisites

SAP ERP

- You've set up ALE / DRF communication to create and transmit `BOMMAT` IDocs. For more information, see Data Replication Framework [page 37].
- You've transferred materials to SAP Digital Manufacturing for execution. For more information, see Transferring a Material Master [page 131].

Procedural Steps

- 1. Create a bill of material master record in SAP ERP. For more information, see Steps in Creating a Simple Material BOM.

  > ⓘ Note
  >
  > You need to assign components to phases, not to operations, in the integrated ERP system.

  2. Send the BOM master record to SAP Digital Manufacturing for execution.
     We recommend that you use the *Material BOM Distribution* transaction (transaction code – `BD30`).

     > ⓘ Note
     >
     > The Bill of Material (BOM) can also be transferred to SAP Digital Manufacturing for execution with the `BOMMAT` IDoc.

  3. Verify the results in SAP Digital Manufacturing for execution. The corresponding BOM record is created or updated in SAP Digital Manufacturing for execution (see Manage Bills of Materials).

Related Information

Mapping a Bill of Material (BOM) [page 262]

2.1.5.1.3.2 Configuring a Bill of Material with Assembly Operations

You can transfer BOM master data with assigned assembly operations from SAP ERP to create or update the corresponding BOM Master type record in SAP Digital Manufacturing for execution.

The production processes for a product are described without reference to an order in routings. A routing is a description of which operations (process steps) have to be carried out, and in which order, to produce a material (product). The production processes describe the production resources or tools, material components, and test equipment required.

When describing the production resources/tools used to produce a material, the work scheduler is supported by the assignment of BOM items to operations.

This assignment means that the BOM items or materials are not reserved until the start point of the operation. If you do not assign items to specific operations, the system automatically assigns all material components in a BOM to the first operation when the order is opened. This means that they are all made available at the start point of the first operation.

Prerequisites

SAP ERP

- You have created materials and routings in SAP ERP.
- You have transferred materials to SAP Digital Manufacturing for execution (see *Material Transfer* on the SAP Help Portal at http://help.sap.com).
- You have also defined the *Data Replication Framework* (DRF) replication model to replicate `LOIPRO` IDocs (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* > *Basic Settings for MES Integration*). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.

Procedural Steps

- 1. Create a bill of material with allocated components in SAP ERP.
  2. Send a BOM master record to SAP Digital Manufacturing for execution within a production order.
  3. Verify the results in SAP Digital Manufacturing for execution. The corresponding BOM record is created or updated in SAP Digital Manufacturing for execution (see Manage Bills of Materials).

2.1.5.1.3.3 Configuring an Order-Specific Bill of Material

You can transfer BOM master data within a production order for make-to-order production.

In this case, SAP Digital Manufacturing for execution creates an order-specific BOM for use with this production order.

Procedural Steps

1. Create a finished material and transfer it to SAP Digital Manufacturing for execution.
2. Define a routing record in SAP ERP. You do not need to transfer it to SAP Digital Manufacturing for execution.
3. Define a BOM record in SAP ERP. You do not need to transfer it to SAP Digital Manufacturing for execution.
4. Transfer work center records that were used when creating the routing from SAP ERP to SAP Digital Manufacturing for execution.
5. Create and release a production order containing BOM and routing master data in SAP ERP.
6. In the *Manage BOMs* app, verify the results in SAP Digital Manufacturing for execution.

> **Note**
>
> The *Valid From* value for the BOM is not transferred within a production order. It is available in the `BOMMAT` IDoc only.

7. (optional) You can use the *Integration Message Dashboard* to verify that IDocs were received in SAP Digital Manufacturing for execution. For more information, see Integration Message Dashboard.

For more information about make-to-order processing, see *Make-to-Order Processing in ERP* on the SAP Help Portal at http://help.sap.com.

Related Information

Manage Bills of Materials

2.1.5.1.4 Production Version

As an optional step, you can replicate the production versions from SAP S/4HANA to SAP Digital Manufacturing using SOAP.

Prerequisites

- You've transferred the material master to SAP Digital Manufacturing.
- You've created a production version in your SAP S/4HANA system.
- You've downloaded the WSDL file of service consumer `ManufacturingProdnVersInfo_Out` via t-code `SE80`. Go to the repository browser, then *PP_SOA_SERVICES* > *Subpackages* > *Enterprise Services* > *Service Consumers* > *CLASCO_PRINT_MFG_PRODN_VERS*. You can also download the WDSL file here: Production Version. Choose *Download API Specification* and choose *WSDL*. You'll need to log in to get the file.
- In the downloaded WSDL file, you've filled the address of the `soap:address location` using the SAP Digital Manufacturing URL. To get the URL, go to the *SAAS tenant of SAP Business Technology Platform* > *Instances and Services*, find the needed instance and choose the *Keys* button under the *Credentials* column. Choose the URL for `manufacturing-execution-integration`. It should look like this:

Sample Code

```
</wsdl:binding>
<wsdl:service name="CO_PPINT_MFG_PRODN_VERS_service">
<wsdl:port name="CO_PPINT_MFG_PRODN_VERS_port_soap11"
binding="tns:CO_PPINT_MFG_PRODN_VERS">
<soap:address location="https:// [URL for manufacturing-execution-
integration]/ws?X-Identity-Zone-Subdomain= [subdomain from the SAAS
tenant] "/>
</wsdl:port>
</wsdl:service>
```

Overview

You can create a production version in your integrated ERP to establish a relationship between your material and one specific BOM and one specific routing/recipe out of all the BOMs and routings/recipes that exist for this material. You can download this production version to SAP Digital Manufacturing using the procedure described in this topic.

The production version download is **optional** and only needed if you want to be able to see the relationship between master BOM and recipe/routing. This information can be seen in respective tabs of the *Manage Materials* app and the *Manage Routings/Recipes* app accordingly. Otherwise, the production version isn't relevant for the integration with SAP Digital Manufacturing because the BOM and routing/recipe are transferred within the order.

Here the steps that you need to perform:

1. Upload the WSDL File in SOA Management [page 153]
2. Publish the WSDL File to the Service Registry [page 154]
3. Define a Profile [page 155]
4. Define a Provider System [page 156]
5. Define Logon Data to access SAP Digital Manufacturing [page 157]
6. Configure a Local Integration Scenario [page 158]
7. Accomplish Pending Tasks [page 159]
8. Configure the Web Service [page 159]
9. Create a Logical System [page 160]
10. Create an RFC Destination [page 160]
11. Set Up the Data Replication Framework [page 160]
12. Define a Replication Model [page 161]
13. Test your Scenario From the Integrated ERP system [page 161]
14. Check the Integration Scenario in SAP Digital Manufacturing [page 161]
15. Next Steps [page 161]

Procedure

Upload the WSDL File in SOA Management

1. Open *SOA Management* using transaction `SOAMANAGER`.
2. In *SOA Management*, navigate to *Tools* > *WSDL Upload*.
3. Choose *Create* and select *Via File* for the *WSDL Base* on the *Upload WSDL* screen.
4. Choose a name and description, for example `DM_PROD_VERS`.
5. Under *WSDL Location*, choose your WSDL file.
6. Choose *OK*.
   Your WSDL with name `DM_PROD_VERS` has been created.

7. Choose *(display)* to check the details of your your WSDL file:

Field	Content	Namespace
Service Binding	`CO_PPINT_MFG_PRODN_VERS`	`http://sap.com/xi/PP/Global2`
PortType Interface	`ManufacturingProdnVersInfo_Out`	`http://sap.com/xi/PP/Global2`
Message Request	`ManufacturingProdnVersInfo`	`http://sap.com/xi/PP/Global2`
Interface Operation	`ManufacturingProdnVersInfo_Out`	`http://sap.com/xi/PP/Global2`
WSDL Service	`CO_PPINT_MFG_PRODN_VERS_service`	`http://sap.com/xi/PP/Global2`
Endpoint URL	https://..../ws?X-Identity-Zone-Sub-domain={...}	`http://sap.com/xi/PP/Global2`

Publish the WSDL File to the Service Registry

1. Navigate to *SOA Management* > *Service Registry* > *Publication of external WSDL*.
2. On the *Import WSDL* tab, under *Load WSDL from*, select *Uploaded* and, under *Name*, search for the production version WSDL for SAP Digital Manufacturing Integration, for example `DM_PROD_VERS`.
3. Choose *Next*.
4. On the *Service Details* tab, enter the *Port Type Name* and the *Namespace*. Make sure that the port type name and namespace are identical to the service definition in t-code `SPROXY`. To find the t-code `SPROXY`, go to the repository browser and search for *PP_SOA_SERVICES* > *Subpackages* > *Enterprise Services* > *Service Consumers* > *CLASCO_PRINT_MFG_PRODN_VERS*. The information is in the *Service Consumer* section.

   Example

   - *Port Type Name*: `ManufacturingProdnVersInfo_Out`
   - *Namespace*: `http://sap.com/xi/PP/Global2`
   - *Internal Name*: `DM_PROD_VERS`

5. Choose *Next*.
6. On the *Classifications* tab, there are no entries needed.
7. Choose *Next*.
8. In the *Service State* tab, select *Configured*.
9. Choose *Next*.
10. On the *Bindings* tab, select the binding that will be published, for example `CO_PPINT_MFG_PRODN_VERS`.

    Example

    Here's what you should find in the details of your binding:

Field	Content
Access URL	`https://.../ws?X-Identity-Zone-Subdomain={…}`

Field	Content
Binding Name	`CO_PPINT_MFG_PRODN_VERS`
Binding Namespace	`http://sap.com/xi/PP/Global2`
Binding Description	
Binding URL	`https:...srt/wsdl/ext_DM_PROD_VERS?sap-client={…}`

11. Choose *Next*.
12. On the *Physical System* tab, if the physical system is already defined, choose the existing one. Otherwise, select *New* and enter the system name and enter any name for the host name. Select *Third Party* for the system type.
13. Choose *Next*.
14. On the *Summary* tab, check the *Service Details*.

Example

Field	Content
WSDL URL	`https:...srt/wsdl/ext_DM_PROD_VERS?sap-client={…}`
WSDL URL	`ManufacturingProdnVersInfo_Out`
Namespace	`http://sap.com/xi/PP/Global2`
Internal Name	`DM_PROD_VERS`
Description	
Documentation URL	
State	*Configured*

15. Choose *Finish*.

Define a Profile

If the profile is already defined, you can skip this step.

1. Navigate to *SOA Management* > *Technical Administration* > *Profiles*.
2. Under *Profiles*, choose *Create Profile*.
3. On the *General* tab, enter the profile name, description, and select *Old Profile Mode*.

Example

Field	Content
Name	**DM_NAME**
Profile Description	**DM_NAME**

Field	Content
Old Profile Mode	Select this field.

4. Choose *Next*.
5. On the *Security* tab, under *Authentication* select *User ID/Password* for the authentication method. For *Transport Security*, select *Secured Communication*.
6. Under *Identifiable Business Context*, choose *No IBC Determination* for the *IBC Determination Type*.
7. Choose *Next*.
8. On the *Transport Settings* tab, there are no settings required.
9. Choose *Finish* and confirm the activation of the profile.
   The new profile is created and active.

Define a Provider System

If the provider system is already defined, you can skip this step.

1. Navigate to *SOA Management* > *Technical Administration* > *Provider Systems*.
2. On the *General* tab, choose *Create* to create a provider system.
3. Enter the provider system name and the profile name. Use the profile name that you created before.

Example

Field	Content
Name	**DM_NAME**
Description	**DM_NAME**
Profile Name	Use the name of the profile that you've defined before, for example `DM_NAME`.
Profile Version	**1**

Note

The provider system name will be used in the Data Replication Framework as the business system in a later step.

4. Choose *Next*.
5. On the *Services Search Settings* tab, make the following settings:

Field	Content
Use Services Registry	Select the box
Services Registry	`SR_LOCAL`
SLD Identifier	Select the *SLD Identifier* from the table that corresponds to your *System ID*, for example DM_NAME.
Logical System	

Field	Content
Use WSIL	Don't select this option
User for WSDL Access	Enter the *User for WSDL Access* from the service registry (using the credentials for the SAP S/4HANA user)
Password for WSDL	Enter the password
Tolerant Search	Select this box for the search granularity.

6. Choose *Next*.
7. On the *Applications* tab, choose *Retrieve Business Applications*.
   Your business application is displayed in the table.
8. Choose *Finish* and confirm the activation of the provider system.
   Your provider system is displayed in the provider system list.
9. Choose the *Connection Test* icon ( ) from the *Actions* column.
   Check the results of the connection test.

Define Logon Data to access SAP Digital Manufacturing

If the logon data is already defined, you can skip this step.

1. Navigate to *SOA Management* > *Service Administration* > *Logon Data Management*.
2. On the *Maintenance* tab, choose *Create*.
3. Enter a name and description for the logon data, for example **DM_LOGON**.
4. Choose *Next*.
5. On the *Credentials* tab, enter the following elements:

Field	Content
Authentication Methode	*User/Password or X.509*
User Name	Client ID of SAP Digital Manufacturing. To be found in the service key.
Password	Client secret of SAP Digital Manufacturing. To be found in the service key.
X.509 SSL Client Certificate	
Signature PSE	
Encryption Certificate	

> **Note**
>
> To get the URL and basic authentication information for SAP Digital Manufacturing for execution go to the SAAS tenant of the SAP Business Technology Platform, select the needed service instance, and open the credentials by choosing the *Keys* button:
>
> - `manufacturing-execution-integration` is the URL for SAP Digital Manufacturing
> - `clientid` is the username
> - `clientsecret` is the password

> The `manufacturing-execution-integration` is the URL for SAP Digital Manufacturing. Use the following format: `https:// [URL for manufacturing-execution-integration]/ws?X-Identity-Zone-Subdomain= [subdomain from the SAAS tenant]`

6. Choose *Finish* and confirm the activation of the logon data.
   Your logon data is displayed in the logon data list and has status *Active*. You can choose your logon data, for example `DM_LOGON`, to check the details.

Configure the Local Integration Scenario

In this step, you can create a new scenario or add a new service group and binding assignment to an existing scenario.

1. Navigate to *SOA Management* > *Service Administration* > *Local Integration Scenario Configuration*.
2. Choose *Create*.
3. On the *General* tab, enter the name of the business scenario and the description, for example `DM_PROD_VERS`.
4. Choose *Next*.
5. On the *Service Definitions* tab, don't make any changes.
6. Choose *Next*.
7. On the *Service Groups* tab, choose *Add* to open the *Add consumer* value help.
8. Add the consumer uploaded from the external file. In the *Search criteria*, enter the following search criteria:

Field	Content
Object Name contains	**`*PRODN*`**
Maximum Number of Results	**`100`**

9. Choose *Search*.
10. In the *Search Results* section, select the correct consumer, for example `PPINT_SOA_MFG_PRODN_VERS` and choose *OK*.
11. Choose *Assign IBC Reference* to assign a provider IBC reference.
12. In the *Search criteria*, enter the following search criteria:

Field	Content
System contains	System name, for example **`*DM*`**.
Type is	*Client*

    Leave the other criteria empty.

13. Choose *Search*.
14. In the *Search Results*, select the provider IBC reference and choose *Assign to Service Group*.
15. Choose *Next*.
16. On the *Logon Data Assignment* tab, provide your logon data:

> **Example**
>
> | Service Group | Provider System | Logon Data |
> | --- | --- | --- |
> | PPINT_SOA_MFG_PRODN_VERS | CLIENT / DM_NAME / DM_NAME | DM_LOGON |

17. Choose *Finish* and confirm the activation of the integration scenario.
18. Your local integration scenario, for example DM_PROD_VERS, is displayed in the *Scenarios* list as being active.

Accomplish Pending Tasks

1. Navigate to *SOA Management* > *Service Administration* > *Pending Tasks*.
2. On the *Pending Tasks*, choose *Switch to Expert Mode*.
3. To find your tasks, filter by business scenario, for example *DM_PROD_VERS*, and set *Type* to *Local Configuration Requests*.
4. Choose *Rebuild List* to filter the tasks.
5. Choose *Process List* in the *Pending Tasks* window to create a central logical post for the service group.

Configure the Web Service

This series of steps is about checking the configuration.

1. Navigate to *SOA Management* > *Service Administration* > *Web Service Configuration*.
2. In the *Web Service Configuration* window, choose the *Design Time Object Search* tab and enter your search criteria:

> **Example**
>
> | *Object Type is* | *Consumer Proxy* |
> | --- | --- |
> | *Object Name contains* | ***PRODN*** |

3. You should get the consumer proxy after the search, for example CO_PPINT_MFG_PRODN_VERS.
4. Choose the consumer proxy to see the destination.
   The *Configurations* tab opens. Make sure that the state is *Active* for the provider system you defined.
5. In the *Define Logical Ports* section, select the business appl. ID (provider IBC reference) that you want to configure.
6. Choose the *(edit)* icon for details.
7. On the *Transport Settings* tab, choose *Complete URL* for the *URL Access Path*.
8. In the **URL* field, enter the SAP Digital Manufacturing for execution URL.

> **Note**
>
> To get the URL and basic authentication information for SAP Digital Manufacturing for execution go to the SAAS tenant of SAP Business Technology Platform, select the needed service instance, and open the credentials by choosing the *Keys* button.
>
> The `manufacturing-execution-integration` is the URL for SAP Digital Manufacturing. Use the following format: `https:// [URL for manufacturing-execution-integration]/ws?X-Identity-Zone-Subdomain= [subdomain from the SAAS tenant]`

9. For the *Logon Language* setting, choose *Language of User Context*.
10. For the *Transport Binding* section, choose the following values:

Field	Content
Make Local Call	**No Call in Local System**
**Transport Binding Type*	**SOAP 1.1**
Maximum Wait for WS Consumer	**0**
Optimized XML Transfer	**None**
Compress HTTP Message	**Inactive**
Compress Response	**True**

11. Check if all pending tasks have been completed.

Create a Logical System

Create a new logical system using transaction `BD54`.

1. Use transaction `BD54` to create a new logical system, for example `DM_NAME`.

Create an RFC Destination

1. In transaction `SM59`, create an RFC Destination of type G that points to SAP Cloud Integration that you use exclusively for the production version, for example `DM_NAME`. For more information, see Build HTTP Connection [page 31].
2. Choose *Connection Test*.
   You can ignore an `Error 500`.

Setting Up the Data Replication Framework

Set up the Data Replication Framework for production version replication via t-code `DRFIMG`.

1. Open transaction `DRFIMG`.
2. Choose *Define Technical Settings for Business Systems*.
3. Choose *Define Business Systems*.
4. Under *General*, enter the following parameters:

Name	Name of the provider system defined in `SOAMANAGER`, for example `DM_NAME`
Description	`DM_NAME`
Profile Name	Name of the profile defined in `SOAMANAGER`, for example `DM_NAME`
Profile Version	`1`

Define a Replication Model

Assign the business system to a combination of a replication model and the outbound implementation `FIN0002_PV`. You can reuse a previously created replication model for SAP Digital Manufacturing scenarios or you can create a new one.

1. In the *SAP Reference IMG*, navigate to *Cross Application Components* > *Processes and Tools for Enterprise Applications* > *Master Data Governance* > *Central Governance* > *General Settings* > *Data Replication* > *Define Custom Settings for Data Replication* > *Define Replication Models*.
2. Under *Define Replication Model*, create a replication model, for example `DM_NAME` by choosing *New Entries*.
3. Select your replication model, for example `DM_NAME`, and double-click *Assign Outbound Implementation*.
4. Select `FIN0002_PV` from the value help and save.
5. Choose *Assign Target Systems for Repl. Model /Outb.Impl*.
6. Assign your business system, for example `DM_NAME`, and save.
7. Choose *Assign Outbound Parameter*.
8. Assign the *Outbound Parameter Value* **`10`** to the *Outbound Parameter* `PACK_SIZE_BULK` and save.
9. Choose *Define Replication Model*.
10. In the *Replication Model* list, select your replication model, for example `DM_NAME`.
11. Choose *Activate*.
    Your replication model is activated.

Test your Scenario From the Integrated ERP system

You can test your integration scenario with transaction `DRFOUT`.

1. Open transaction `DRFOUT`.
2. Under *Replication Model*, enter the name of your replication model, for example `DM_NAME`.
3. Under *Outbound Implementation*, enter `FIN0002_PV`.
4. Under *Replication Mode*, choose *Manual Replication Filter Criteria*.
5. Set your filter criteria for *Material* and *Plant*, and save.
6. Choose *Execute* to perform the test.

Check the Integration Scenario in SAP Digital Manufacturing

In SAP Digital Manufacturing, you can check in the *Integration Message Dashboard* whether or not your *Production Version Download* has been successful.

If the transfer was successful, you can also see the production version in the *Manage Materials* app or the *Manage Routings/Recipes* app by searching with your material.

Next Steps

Download the routing master data, which already contains the master BOM, to SAP Digital Manufacturing.

For more information on configuring a service group in `SOAMANAGER`, see Configuring a Service Group.

2.1.5.1.5 Work Center Integration

You can transfer work center master data that is created or updated in SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution.

A work center is an area at a site at which inventory is manufactured or processed. Work centers are used to divide the portions of a routing along functional work lines.

A work center in SAP ERP or SAP S/4HANA can represent either a work center or a resource in SAP Digital Manufacturing for execution, depending on how the work center is configured. Configuring the work center in SAP ERP or SAP S/4HANA allows for capacity planning to take place. To keep the number of resources and work centers in SAP Digital Manufacturing for execution consistent with the capacity that is defined as available in SAP ERP or SAP S/4HANA, you can transfer the defined production work centers.

Integration information and conditions include:

- Operations are carried out at a work center in SAP ERP or SAP S/4HANA.
- The data stored in the work center is used in SAP ERP or SAP S/4HANA for the following:
  - Routings
    Work centers are assigned to operations in task lists. If default values are changed in a work center, the changes are effective in the task list in case a reference indicator has been set for the default value.
  - Work center hierarchies
    Work centers can be arranged in hierarchies. Hierarchies are used in capacity planning to cumulate available capacities and capacity requirements in a hierarchy work center.

Related Information

Manage Work Centers

2.1.5.1.5.1 Transferring a Work Center

You can transfer work center master data that is created or updated in SAP S/4HANA to SAP Digital Manufacturing for execution.

Shifts and shift assignments are transferred with work center capacities from SAP S/4HANA to SAP Digital Manufacturing for execution.

Prerequisites

SAP S/4HANA

- You've defined individual capacities using work center capacity assignments (see Manage Work Center Capacity) and Work Center Capacity Mapping [page 164].
- You've set up the Data Replication Framework to replicate `LOIWCS03` IDocs. For more information, see Data Replication Framework [page 37].

- Use the *Master Data Transfer* transaction (transaction code `POIM`) or *Execute Data Replication* transaction (transaction code `DRFOUT`) to transfer the master data.
- You can transfer work centers along with standard value keys (see SAP Note 2996757 and SAP Note 3379404).

> **Note**
>
> You can download the multi-language descriptions of the standard value keys (`CO_MES_SVK_WITH_LANGUAGE`). For more information, see 3134473.

SAP Digital Manufacturing for execution

(Optional) In the *Manage Business Settings* app, under *Plant*, you've set the *Create Default Resources during Work Center Transfer* flag to *Yes*.

> **Note**
>
> The *Create Default Resources during Work Center Transfer* flag only takes effect during the initial work center download. It doesn't impact any subsequent updates of a work center. For example, if you set this flag to *No* for the initial download, you can't activate the default resource creation for updates.

Procedural Steps

1. In SAP S/4HANA, open the *Master Data Transfer* (`POIM`) transaction.
2. Specify *Optimization System* (logical system / target system).
3. Select a work center for transfer.
4. Choose *Execute*.
5. Verify the results in the *Integration Message Dashboard* of SAP Digital Manufacturing for execution. There you should find two messages: *Work Center Download* and *Standard Value Key Download*. These messages show that the work center has been downloaded and that SAP Digital Manufacturing for execution has successfully retrieved the standard value key from the integrated ERP system.

   > **Caution**
   >
   > If the standard value keys aren't retrieved from the integrated ERP system because the automatic call made after the work center download fails, any subsequent order downloads fail too.

   You can check different aspects in the following apps:

   - You can view the transferred work centers in the *Manage Work Centers* app.
   - Work center capacity updates in SAP S/4HANA result in the corresponding changes in SAP Digital Manufacturing for execution.
   - You can view the capacity category in the *Manage Work Centers* app. *ERP Work Center* is set to *Yes* for work centers transferred from SAP S/4HANA.
   - You can view the transferred shifts in the *Manage Shifts* app. The shift name usually has the following format: the work center name, capacity category, SAP S/4HANA shift version, and internal SAP Digital Manufacturing version separated by an underscore (for example, `WCTEST1_008_01_V02`).

> **Note**
>
> Only one shift is supported for each day of the week.

Related Information

Manage Work Centers
Manage Resources
Manage Business Settings

2.1.5.1.5.1.1 Work Center Capacity Mapping

Learn about the mapping of work center capacities between SAP S/4HANA or SAP ERP and SAP Digital Manufacturing for execution.

Source Object in SAP S/4HANA	Naming in SAP S/4HANA	Target Object in SAP Digital Manufacturing for execution	Naming in SAP Digital Manufacturing for execution
Work Center	ProdWC	Work Center	ProdWC
		Resource (Default)	ProdWC **Note** You control the creation of the default resource by using the *Create Default Resources during Work Center Transfer* setting in the *Manage Business Settings* app.
Capacity Category	001	Category	001
Individual Capacity	`Station_A`	Resource	`Station_A`

2.1.5.1.6 Transferring QM Defect Code Groups and Codes from SAP S/4HANA

You can transfer Quality Management (QM) defect code groups and codes from SAP S/4HANA to SAP Digital Manufacturing for execution using the *Manage Nonconformance Groups* app.

Prerequisites

- You've set up the integration with SAP S/4HANA (see Technical Integration with SAP S/4HANA or SAP ERP [page 16]).
- You've checked that BAPI `BAPI_CODEGROUP_CODE_GETLIST` is available in your SAP S/4HANA system.

> **Note**
>
> There are SAP S/4HANA systems where this BADI is no longer used. If that's the case, you need to implement the direct communication scenario instead of the indirect scenario that involves SAP Cloud Integration as middleware. For more information, see Enable Direct Communication To SAP S/4HANA [page 108].

Procedural Steps

1. In the *Manage Nonconformance Groups* app, choose *Sync QM Groups*.
2. Search for production-relevant QM defect code groups that exist in the connected SAP S/4HANA system. You can check which QM code groups have been previously transferred by selecting *Yes* in the *Previously Synched* dropdown.

   > **Note**
   >
   > The selection is restricted to **catalog type 9 (defect types)** in SAP S/4HANA. Only released code groups are displayed and can be transferred.

3. Select one or more QM code groups and choose *Sync*. The selected QM code groups are transferred to SAP Digital Manufacturing for execution.

QM defect groups and codes that you transfer from SAP S/4HANA are marked with *ERP Group* and *ERP Code* indicators set to *Yes* in the *Manage Nonconformance Groups* and *Manage Nonconformance Codes* apps. A nonconformance code that originates from SAP S/4HANA is represented by a concatenated name (QM defect code and code group).

When you log a nonconformance code originated from SAP S/4HANA, it is automatically transferred to SAP S/4HANA and a generic defect record is created.

Related Information

Manage Nonconformance Groups
Manage Nonconformance Codes

2.1.5.1.7 Routing Integration

You can transfer routings from SAP ERP or SAP S/4HANA to create or update corresponding routing and operation activities in SAP Digital Manufacturing for execution.

In SAP ERP or SAP S/4HANA, the routing defines the key aspects of inventory-related information. The information includes the consumption points of components during the manufacturing process as well as the final confirmation step when the manufactured material is posted to the finished goods inventory.

If an SAP ERP routing uses sub-operations, then ERP routing operations are mapped to SAP Digital Manufacturing routing operation groups and SAP ERP sub-operations are mapped to SAP Digital Manufacturing operation activities.

• The routing defines the operations (process steps) and the sequence of operations required to produce a material (product). Routings are used as a template for production orders and planned orders (repetitive manufacturing) as well as a basis for product costing.

• The data stored in the routing serves as a basis for production planning activities in SAP ERP or SAP S/4HANA such as the following:

- In *Materials Management* to plan the usage of materials and external operations
- In *Production Planning and Control* to plan the usage of work centers
- In *Quality Management* to plan quality inspections for production activities

When you transfer routings to SAP Digital Manufacturing, the system creates two objects:

- Operation activity
  The description of the operation activity uses the short text defined for the operation in SAP ERP or SAP S/4HANA.
- Routing
  - SAP Digital Manufacturing for execution defaults the first routing to version `ERP001` and increments an additional integer value for subsequent updates. For example: `ERP001`, `ERP002`.
    A new routing version is created when you add operations or change one of the following in SAP ERP or SAP S/4HANA:
    - Operation number
    - Operation control key
    - Operation short text

> **Note**
>
> Operation activity master records can be created based on the SAP ME *Operation* and *Version* fields on the *Operation* record in the routing configuration.

Related Information

Manage Routings/Recipes

2.1.5.1.7.1 Transferring Linear and Nonlinear Routings

You can transfer routing master records from SAP ERP or SAP S/4HANA to create or update corresponding routing and operation records in SAP Digital Manufacturing for execution.

Nonlinear Routings

Besides transferring standard linear routings from integrated SAP ERP systems, you can also transfer nonlinear routings with parallel and alternate sequences from SAP S/4HANA.

Nonlinear master routing downloads follow the standard process for routing downloads from SAP ERP. The download results in either a master routing, or an order-specific routing on the SAP Digital Manufacturing for execution side that contains standard, parallel, and alternate sequence branches. If you transfer an order with a nonlinear routing that includes alternate sequences, SAP Digital Manufacturing for execution converts these alternate sequence steps to standard sequence steps when the alternate sequence is chosen for order execution on the SAP ERP side.

Prerequisites and procedural steps for transferring nonlinear routings from SAP S/4HANA are the same as for transferring standard routings.

> **⚠ Restriction**
>
> Make sure to follow nonlinear routing restrictions to ensure successful nonlinear routing downloads from SAP S/4HANA to SAP Digital Manufacturing for execution. For information on nonlinear routing restrictions, see SAP Note 3379404. In the SAP Note, go to the section on **Integration with SAP ERP or SAP S/4HANA** and scroll down to see the restrictions for **Nonlinear Routings**.

Prerequisites

SAP ERP or SAP S/4HANA

- You have created work centers with plant and production-relevant data in SAP ERP or SAP S/4HANA. You have transferred the work centers to SAP Digital Manufacturing for execution.

  > **ⓘ Note**
  >
  > Creating and setting up a work center is a required step for transferring routings.

- You have created a BOM and a routing for the produced material.

- You have transferred materials to SAP Digital Manufacturing for execution.
- You have set up ALE communication to create and transmit `LOIROU` IDocs.
- You have defined the *Data Replication Framework* (DRF) replication model to replicate `LOIROU` IDocs. For information about the SAP ERP versions supporting DRF, see SAP Note 1793291

Procedural Steps

1. Create a routing master record in SAP ERP or SAP S/4HANA.
2. Transfer the routing master record to SAP Digital Manufacturing for execution using the *Execute Data Replication* transaction (transaction code – `DRFOUT`).

   > **Note**
   >
   > Make sure that you have created and activated a replication model with the outbound implementation for the routing (`223_1`).

3. Verify the result in SAP Digital Manufacturing for execution in the *Manage Routings/Recipes* app.

Related Information

Manage Routings/Recipes

2.1.5.1.8 Recipe Integration

You can transfer recipe master records from SAP ERP or SAP S/4HANA systems to SAP Digital Manufacturing for execution.

Prerequisites

SAP ERP or SAP S/4HANA

- You have created work centers with plant and production-relevant data in the SAP ERP or SAP S/4HANA system. For more information, see *Creating, Changing and Displaying Work Centers* on the SAP Help Portal. You have transferred the work centers to SAP Digital Manufacturing for execution.
- You have created a BOM and a recipe for the produced material.
- You have transferred materials to SAP Digital Manufacturing for execution.
- You have set up ALE communication to create and transfer an `LOIROU04` IDoc.
- You have created and activated a replication model with an outbound implementation for recipes (`223_1`). For more information, see Data Replication Framework [page 37].

Procedure

- Create a recipe master record in SAP ERP or SAP S/4HANA.
- Transfer the recipe master record to SAP Digital Manufacturing for execution.
  We recommend using the *Execute Data Replication* transaction (transaction code – `DRFOUT`).
- Verify the results in the *Manage Routings/Recipes* and the *Integration Message Dashboard* apps in SAP Digital Manufacturing for execution.

Related Information

Integration Message Dashboard
Manage Routings/Recipes

2.1.5.1.9 Tool Integration

You can transfer PRTs from SAP ERP or SAP S/4HANA to create the corresponding tool record in SAP Digital Manufacturing for execution.

Unlike machines and fixed assets, production resources and tools (PRTs) are movable (not stationary) operating resources that are required to perform an activity and can be used repeatedly. There are several categories of PRTs in SAP ERP or SAP S/4HANA system. The category determines the characteristics and business functions that a PRT can have.

The PRTs can be assigned to operations / activities. You can use the assignment to track PRT usage during the production.

Before the tools can be scheduled and logged in SAP Digital Manufacturing for execution, the corresponding PRTs must first exist in SAP ERP or SAP S/4HANA and they need to be assigned to operations.

Integration Overview

The following table describes the supported PRT types and how tools are created for each type.

PRT Type	Tool	Integration
Equipment PRT	The system automatically creates corresponding equipment tools in the *Manage Tools* app when equipment PRTs are downloaded from SAP ERP.	Equipment PRTs are transferred from ERP to SAP Digital Manufacturing for execution through the `EQUIPMENT_CREATE02` IDoc. For more details, see Transferring a Tool [page 170].

PRT Type	Tool	Integration
Material PRT	Unlike the equipment PRT, the system does not create tools when material PRTs are downloaded from ERP. You need to manually create respective tools in the *Manage Tools* app.	Material PRTs are transferred from ERP to SAP Digital Manufacturing for execution together with the respective material master data.

2.1.5.1.9.1 Transferring a Tool

This section describes how to transfer equipment PRTs from SAP ERP to SAP Digital Manufacturing for execution to create corresponding tools in SAP Digital Manufacturing for execution.

Prerequisites

SAP ERP

- You have set up ALE communication to create and transmit an `EQUIPMENT_CREATE02` IDoc.
- You have created and activated a replication model with outbound implementation for the equipment (`183_1`). For more information, see Data Replication Framework [page 37].

SAP Digital Manufacturing

The referenced material (if there are any) of the equipment PRT has already been transferred from SAP ERP to SAP Digital Manufacturing.

Procedure

1. Create an equipment PRT in SAP ERP.
2. Send the equipment PRT to SAP Digital Manufacturing for execution.
   We recommend using the Execute Data Replication transaction (transaction code – `DRFOUT`).
3. Verify results in the *Manage Tools* app or the *Integration Message Dashboard* in SAP Digital Manufacturing for execution. For more information, see Manage Tools or Integration Message Dashboard.

2.1.5.2 Integration of Transaction Data

To integrate transaction data, transaction data is transferred from an SAP ERP or SAP S/4HANA system to the SAP Digital Manufacturing for execution system and then back to your integrated ERP system.

You can integrate the following transaction data with SAP ERP:

Transaction Data Integration

SAP ERP	SAP Digital Manufacturing for execution
Production order	Production order with routing
Production order with BOM	Production order with BOM and routing
Production order with a storage location assignment	Production order with storage location assignment **Note** There is no UI for storage location on the order or manage-storage location used goods receipt
Production order with routing	Production order with routing
Routing with document info record (only for order specific routing)	Order specific routing with work instruction
Production order with serial numbers	Production order with serial numbers and planned SFCs
Production order with document info record	Production order with work instruction **Note** The work instruction will be created with the order and attached at the order level. It will be displayed in the work center POD plugin work instruction for the specific order.
Production order with batch number	Production order with batch number A receipt for finished goods
Production order with schedule information	Production shop order with schedule information that is used in the *Dispatching & Monitoring* app
Production order with operation-level schedule information	Production shop order with schedule information
Production order with work center assignment on routing step and operation	Production shop order with work center assignment on routing step and operation
Confirmation	Completion of SFC
Consumption	Component assembling
Scrap	Scrap

You can integrate the following transaction data:

- Production order
- Production order confirmation
- Production order yield confirmation

- Component scrap confirmation for production order

2.1.5.2.1 Production Order Integration

You can transfer production order data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution.

This function supports long material numbers.

Order integration between SAP ERP or SAP S/4HANA and SAP Digital Manufacturing for execution provides the control point from production planning to the order. The transfer of the order and integration of the order confirmations are critical to maintaining order level data synchronization between the two systems.

The production order, typically converted from a planned order output of an MRP run in SAP ERP or SAP S/4HANA and used to launch discrete production, is transferred to the SAP Digital Manufacturing for execution system for release as a production order.

The order in SAP Digital Manufacturing for execution communicates to SAP ERP or SAP S/4HANA the confirmation of yield and scrap as production is done on the shop floor. If components have been assembled, they're included in the confirmation so that they can be issued to the order in SAP ERP or SAP S/4HANA.

> **Note**
>
> To distinguish between a discrete industry order and a process industry order, when this differentiation is required for the internal execution logic, SAP Digital Manufacturing relies on the *Auto complete and confirm* flag that is set on material level in the integrated ERP system. If this flag is active, the downloaded order is considered to be a discrete industry order and handled accordingly. If this flag isn't active, the downloaded order is treated as a process industry order and handled accordingly.

> **Note**
>
> In the integrated ERP system, implement BADI `CO_MES_INT_REDISTRIBUTION` to make sure that the release notification (RMES) isn't replicated back to SAP Digital Manufacturing after the release of the order in SAP Digital Manufacturing. For more information, see 2165261.
>
> When you release an order in the *Manage Orders* app in SAP Digital Manufacturing, a release notification (RMES) is sent to the integrated ERP system. If you don't use the BADI `CO_MES_INT_REDISTRIBUTION` on the ERP side, the ERP system will then communicate an order change to SAP Digital Manufacturing, which can cause issues.
>
> For more information about the implementation of the release notification (RMES) in your ERP system, see Production Order (Version 2) and Activate and Maintain Services.

Related Information

Manage Orders
Order Statuses
How Order Statuses Change in a Business Scenario

2.1.5.2.1.1 Transferring a Production Order

This section describes how to transfer production order data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution to create or update the corresponding production order record in SAP Digital Manufacturing for execution.

Prerequisites

SAP ERP or SAP S/4HANA

- You have transferred the material master records for the produced material and all the components.
- You have created a BOM and a routing for the produced material.
- You have created and sent work centers to SAP Digital Manufacturing.

> **Note**
>
> Make sure that the standard value key download, which starts automatically after the work center download, has been successful. Otherwise the order download won't work. In the *Integration Message Dashboard*, you can check the status of the *Standard Value Key Download* integration message to see if the standard value key download was successful.

- You have set up ALE communication to create and transmit `LOIPRO` IDocs.
- You have also defined the *Data Replication Framework* (DRF) replication model to replicate `LOIPRO` IDocs (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* > *Basic Settings for MES Integration*). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.

SAP Digital Manufacturing

- (Optional) You have imported BOM and routing master data from SAP ERP.
  BOM and routing masters that are sent from SAP ERP to SAP Digital Manufacturing prior to the production order download allow additional manual configurations to happen inside of SAP Digital Manufacturing. This prerequisite is optional because you can create the order-specific BOM and order-specific routing in SAP Digital Manufacturing directly from the production order download.
- You have enabled the artifact `ProductionOrder LOIPRO05 process request V2` in SAP Cloud Integration to use `LOIPRO05 V2`. For more information, see 3115603

> **Note**
>
> Creating and updating production orders using `ProductionOrder LOIPRO05 process request V2` is handled asynchronously in SAP Digital Manufacturing.

> → Tip
>
> You can transfer a production order to SAP Digital Manufacturing for execution without BOM components. To do this, you need to use the Production Order Download (LOIPRO05 V2) integration flow. In the *Manage Business Settings* app, you need to switch on the *Enable Order BOM Without Components* function.

Procedural Steps

1. Create or update a production order manually (transaction `CO01` and `CO02`) or automatically by converting a planned order (see *Creating a Production Order* on the SAP Help Portal at http://help.sap.com).
2. SAP ERP 6.05 and later with the activated business function (BF) `LOG_PP_MES_INT_02` distributes production orders automatically upon release based on the Data Replication Framework (DRF) filter settings (see Data Replication Framework [page 37]). Changes to the order are distributed immediately after the initial distribution.
3. Verify the results in SAP Digital Manufacturing.

The system creates or updates the production order based on the data received from Tools with Engineering status can't be used in Production/POD.

> ⓘ Note
>
> If the header text contains an invalid character that could cause the order detail API to fail formatting, the order download blocks it and you can't download the order successfully. In this case, remove the invalid character and download the order again.

> ⓘ Note
>
> You can update an order from your integrated ERP system before and after the release in SAP Digital Manufacturing. The updating options you have vary depending on the order category and the integrated ERP system. For more information, see Updating Orders Before the Release [page 216] and Updating Orders After the Release [page 220].

When the order is released in SAP Digital Manufacturing, shop floor operators can see the operation start and end time in the POD worklist.

Related Information

Manage Orders
Increasing the Build Quantity for Overproduction

2.1.5.2.1.2 Configuring a Production Order with a BOM and Routing (Make-to-Stock or Make-to-Order Manufacturing)

This section describes how to transfer a production order with BOM and routing from SAP ERP to create or update the corresponding BOM with defined assembly operations that are assigned to the production order in SAP Digital Manufacturing for execution.

Make-to-stock manufacturing is a manufacturing process in which you manufacture products for stock based on demand forecasts.

Make-to-order manufacturing is a manufacturing process in which manufacturing starts only after an order from a customer is received. Forms of make-to-order manufacturing vary. For example, an assembly process can start when there's actual demand or manufacturing starts with development planning.

If no sales order is attached to the production order, the order is used for make-to-stock manufacturing.

If the production order downloaded from your onpremise system contains BOM and routing data, SAP Digital Manufacturing for execution creates the order-specific BOM and routing based on the downloaded order data. If there's no BOM and routing in the production order, the order creation in SAP Digital Manufacturing for execution fails.

- You can transfer co-products and by-products defined for the BOM in SAP ERP to SAP Digital Manufacturing for execution with a production order.
- You can transfer alternate components defined for the BOM in SAP ERP to SAP Digital Manufacturing for execution with a production order. Among the components in an alternate group, the component with the highest priority becomes the primary component and the other components become alternate components.

Prerequisites

SAP ERP

- This function works only with SAP ERP 6.05 or later with the activated business function `LOG_PP_MES_INT_02` (configuration type C and D).
- You've transferred the material master records for the produced material and all the components.
- You've created a BOM and a routing for the produced material (see Manage Bills of Materials and Manage Routings/Recipes).
- You've created and transferred work centers to SAP Digital Manufacturing for execution.
- You've set up ALE communication to create and transfer `LOIPRO` IDocs. For more information, see Data Replication Framework [page 37].
- You've defined the *Data Replication Framework* (DRF) replication model to replicate LOIPRO IDocs (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* > *Basic Settings for MES Integration*. For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You've defined unique ISO codes for every unit of measure.

Procedural Steps

1. Create or update a production order containing the BOM and routing master data in SAP ERP.
2. SAP ERP 6.05 and later with the activated business function (BF) `LOG_PP_MES_INT_02` distributes production orders automatically upon release based on the *Data Replication Framework* (DRF) filter settings (see Data Replication Framework [page 37]). Changes to the order are distributed immediately after the initial distribution.

   > **Note**
   >
   > SAP ERP 6.05 with the activated BF `LOG_PP_MES_INT_01` (configuration type B) distributes production orders automatically upon release based on the customized settings.

   If you're using SAP ERP 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction `POIT` after creating or changing the order.

   > **Note**
   >
   > The `POIT` transaction supports only the IDoc base types `LOIPRO01`. Additional fields and segments of the IDoc types `LOIPRO02`, `LOIPRO03`, and `LOIPRO04` aren't supplied when distributing using the `POIT` transaction.

3. Verify the results in SAP Digital Manufacturing for execution.

The system creates or updates the production order, BOM, and routing records in SAP Digital Manufacturing for execution based on the data received from SAP ERP.

2.1.5.2.1.3 Configuring a Production Order with Serial Numbers

This section describes how to transfer serial numbers assigned to a production order from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing to create corresponding SFCs assigned to the production order in SAP Digital Manufacturing.

- In SAP ERP or SAP S/4HANA, serial numbers are unique at the material level.
- In SAP Digital Manufacturing, an SFC, which stands for shop floor control unit, is a unique identifier that represents an item to be produced on the shop floor.
- In an SAP ERP or SAP S/4HANA production order, you can define serial numbers for the product to be produced.
- These serial numbers within the production order are distributed automatically to SAP Digital Manufacturing.
- When a production order with serial numbers is imported from SAP ERP or SAP S/4HANA, the corresponding production order and SFCs are created using the numbering pattern of `<Material Number>-<Serial Number>`. These SFCs are used when you release the production order in SAP Digital Manufacturing.
  You can change this numbering pattern using custom XSLT in the *Manage Integration Workflows* app.
  You enable this pattern in the *Manage Business Settings* app. For more information, see Enabling Naming Patterns for Serialized SFCs and Manage Business Settings.

- The number of the transferred serial numbers equals the *Quantity value* of the production order (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* > *Integrate Production Order with a Manufacturing Execution System* > *Check Serial Numbers in MES Production Orders*).

Prerequisites

SAP ERP or SAP S/4HANA

- You have maintained a serial number profile for the header material so that a production order can contain serial numbers (in *Customizing for Logistics*, choose *Materials Management* > *Material Master* > *Material Change* > *Work Scheduling*).
- You have transferred the material master records for the produced material and all the components (see *Material Transfer* on the SAP Help Portal at http://help.sap.com).
- You have created a BOM and a routing for the produced material (see Manage Bills of Materials and Manage Routings/Recipes).
- You have set up ALE communication to create and transmit LOIPRO IDocs. For more information, see Data Replication Framework [page 37].
- You have also defined the *Data Replication Framework* (DRF) replication model to replicate `LOIPRO` IDocs (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* > *Basic Settings for MES Integration*). For information about the SAP ERP or SAP S/4HANA versions supporting DRF, see SAP Note 1793291.
- This function works with SAP ERP or SAP S/4HANA 6.05 and higher with the activated business function `LOG_PP_MES_INT_02`. For information about the SAP ERP or SAP S/4HANA versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.

SAP Digital Manufacturing

- (Optional) You have imported BOM and routing master data from SAP ERP or SAP S/4HANA.

> **Posting Instructions**
>
> BOM and routing masters that are sent from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing prior to the production order download allow additional manual configurations to happen inside of SAP Digital Manufacturing. This prerequisite is optional because you can create the BOM and routing master in SAP Digital Manufacturing directly from the production order download.

Procedural Steps

1. Create or update a production order containing serial numbers manually (transaction `CO01` and `CO02`) or automatically by converting a planned order.
2. SAP ERP or SAP S/4HANA 6.05 and later with the activated business function (BF) `LOG_PP_MES_INT_02` distributes production orders automatically upon release based on the *Data Replication Framework* (DRF) filter settings (see Data Replication Framework [page 37]). Changes to the order are distributed immediately after the initial distribution.

   > **Note**
   >
   > SAP ERP or SAP S/4HANA 6.05 with the activated BF `LOG_PP_MES_INT_01` (configuration type B) distributes production orders automatically upon release based on customized settings.

   If you use SAP ERP or SAP S/4HANA 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction `POIT` after creating or changing the order.

   > **Note**
   >
   > The `POIT` transaction supports only the IDoc base types `LOIPRO01`. Additional fields and segments of the IDoc types `LOIPRO02`, `LOIPRO03`, and `LOIPRO04` are not supplied when distributing using the `POIT` transaction.

3. Verify the results in SAP Digital Manufacturing.

SAP Digital Manufacturing creates or updates the production order with SFCs based on the data received from SAP ERP or SAP S/4HANA.

For more information, see *Transfer of Production Order with Serial Numbers* on the SAP Help Portal at http://help.sap.com.

2.1.5.2.1.4 Configuring a Production Order with a Batch Number

This section describes how to transfer production order data with a batch number from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution to create or update the corresponding production order record in SAP Digital Manufacturing for execution.

Certain material features cannot always be guaranteed to be exactly alike in production. For example, you cannot guarantee that a certain color will always have the same shade. Minor differences between production lots cannot be avoided. You need to be able to uniquely identify the individual production lots of the same material and manage them separately in inventory.

Materials that require such precise identification, for example pharmaceutical products, are identified and managed in stock according to both, the material number and batch number.

A batch is a quantity of the material produced during a given production run. A batch represents a homogeneous unit with unique specifications. A batch is a subset of the total quantity of a material held in stock. The subset is managed from all other subsets of the same material.

Prerequisites

SAP ERP or SAP S/4HANA

- You have transferred the batch managed material master records for the produced material and all the components (see *Material Transfer* on the SAP Help Portal at http://help.sap.com).
  For more information about creating batch managed material master record, see the *Configuring Batch Managed Material* section of this guide.
- You have created a BOM and a routing for the produced material (see Manage Bills of Materials and Manage Routings/Recipes).
- You have created and sent work centers to SAP Digital Manufacturing for execution.
- You have set up ALE communication to create and transmit LOIPRO IDocs. For more information, see Data Replication Framework [page 37].
- You have also defined the *Data Replication Framework* (DRF) replication model to replicate `LOIPRO` IDocs (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* > *Basic Settings for MES Integration*). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- This function works with SAP ERP 6.05 and higher with activated business function `LOG_PP_MES_INT_02`. For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.

SAP Digital Manufacturing for execution

- (Optional) You have imported BOM and routing master data from SAP ERP or SAP S/4HANA.

  > **Posting Instructions**
  >
  > BOM and routing masters that are sent from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution prior to the production order download allow additional manual configurations to happen inside of SAP Digital Manufacturing for execution. This prerequisite is optional because you can create the BOM and routing master in SAP Digital Manufacturing for execution directly from the production order download.

Procedural Steps

1. Create a batch-managed material record in SAP ERP or SAP S/4HANA (see Transferring a Batch-Managed Material with Batch Characteristics [page 133]).
2. Create or update a production order with a defined batch number manually (transaction `CO01` and `CO02`.
3. SAP ERP 6.05 and later with the activated business function (BF) `LOG_PP_MES_INT_02` distributes production orders automatically upon release based on the *Data Replication Framework* (DRF) filter settings (see Data Replication Framework [page 37]). Changes to the order are distributed immediately after the initial distribution.

> **Note**
>
> SAP ERP 6.05 with the activated BF `LOG_PP_MES_INT_01` (configuration type B) distributes production orders automatically upon release based on customized settings.

If you use SAP ERP 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction `POIT` after creating or changing the order.

> **Note**
>
> The `POIT` transaction supports only the IDoc base types `LOIPRO01`. Additional fields and segments of the IDoc types `LOIPRO02`, `LOIPRO03`, and `LOIPRO04` are not supplied when distributing using the `POIT` transaction.

4. Verify the results in SAP Digital Manufacturing for execution.

SAP Digital Manufacturing for execution creates or updates the production order with SFCs based on the data received from SAP ERP or SAP S/4HANA.

Related Information

Manage Materials

2.1.5.2.1.5 Configuring a Production Order with Document Info Records

This section describes how to transfer document info records attached to a production order in SAP ERP to create a production order and work instructions attached to the order operations in SAP Digital Manufacturing.

You can use this function with SAP ERP 6.0 EHP 6 or higher.

Documents from document management that you have assigned to the order header or to the operations directly or that you have defined as a production resource/tool at operation level are communicated to SAP Digital Manufacturing with the IDoc. Before distributing the order, the system checks whether the assigned documents were released. A URL that is part of the respective IDoc segments that provides an Internet Communication Framework (ICF) service of the ERP system can be used to access the originals linked to the documents. In this way, documents that are in the vault in document management can also be retrieved.

Data is transmitted over a secure connection (https port). To enable data transmission, you must activate the service for structuring and reading a URL for this purpose. To do that, choose transaction *SICF*, browse for `DEFAULT_HOST` in the *Virtual Host* field and choose *Execute*. Expand *default_host* > *sap* > *co_mes_int* > *co_mes_document*. Select the service and choose *Activate* in the *Service/Host* menu.

> **Note**
>
> If you want to allow several users to access an original document with the URL, ensure that the original is located in the SAP vault or in a network directory and not stored locally.

For more information, see *Production Order* on the SAP Help Portal at http://help.sap.com.

Prerequisites

SAP ERP

- You have transferred the material master records for the produced material and all the components (see *Material Transfer* on the SAP Help Portal at http://help.sap.com).
- You have created a BOM and a routing for the produced material (see Manage Bills of Materials and Manage Routings/Recipes).
- You have created and sent work centers to SAP Digital Manufacturing.
- You have set up ALE communication to create and transmit `LOIPRO` IDocs. For more information, see Data Replication Framework [page 37].
- You have also defined the *Data Replication Framework* (DRF) replication model to replicate LOIPRO IDocs (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* > *Basic Settings for MES Integration*). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.
- You have created and released a document info record of the type PRT or Non-PRT (transaction `CV01N`) in SAP ERP.

SAP Digital Manufacturing

- (Optional) You have imported BOM and routing master data from SAP ERP.

  > **Posting Instructions**
  >
  > BOM and routing masters that are sent from SAP ERP to SAP Digital Manufacturing prior to the production order download allow additional manual configurations to take place inside of SAP Digital Manufacturing. This prerequisite is optional because you can create the BOM and routing master in SAP Digital Manufacturing directly from the production order download.

Procedural Steps

1. Create or update a production order manually (transaction `CO01` and `CO02`) or automatically by converting a planned order.
2. To attach one or more document info records to a production order header, enter the document type.
3. Release and save the production order after attaching the document info records.
4. SAP ERP 6.05 and later with the activated business function (BF) `LOG_PP_MES_INT_02` distributes production orders automatically upon release based on the *Data Replication Framework* (DRF) filter

settings (see Data Replication Framework [page 37]). Changes to the order are distributed immediately after the initial distribution.

> **Note**
>
> SAP ERP 6.05 with the activated BF `LOG_PP_MES_INT_01` (configuration type B) distributes production orders automatically upon release based on customizing settings.
>
> If you use SAP ERP 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction `POIT` after creating or changing the order.

> **Note**
>
> The `POIT` transaction supports only the IDoc base types `LOIPRO01`. Additional fields and segments of the IDoc types `LOIPRO02`, `LOIPRO03`, and `LOIPRO04` are not supplied when distributing using the `POIT` transaction.

5. When the production order is sent to SAP Digital Manufacturing, the following records are created in SAP Digital Manufacturing:
   - Production order with operation activities and attachment points for the work instructions
   - Routing
   - Operation activities
   - Work instructions
6. Verify the results in SAP Digital Manufacturing.

For more information, see *Work Instruction* on the SAP Help Portal at http://help.sap.com.

2.1.5.2.1.6 Configuring a Production Order with Scheduling Information

This section describes how to transfer a production order with scheduling information from SAP ERP to create or update the corresponding production order with quantity splits associated with resources at a specific routing step in SAP Digital Manufacturing for execution.

The production order is used by production planning in SAP ERP to define the material to be processed, the location, the time, and the work required. You can also plan the resources to be used in the *Production Process Designer* in SAP Digital Manufacturing for execution.

You can control and monitor short-term planning on your shop floor. Typical users are production supervisors, foremen, or shift managers.

The release of the production order in SAP Digital Manufacturing for execution triggers production on the shop floor (see Order Schedule Information).

Prerequisites

SAP ERP

- You have transferred the material master records for the produced material and all the components (see *Material Transfer* on the SAP Help Portal at http://help.sap.com).
  For more information about creating a batch-managed material master record, see the *Configuring Batch Managed Material* section of this guide.
- You have created a BOM and a routing for the produced material (see Manage Bills of Materials and Manage Routings/Recipes).
- You have transferred the work centers with individual capacities.
- You have set up ALE communication to create and transmit `LOIPRO` IDocs. For more information, see Data Replication Framework [page 37].
- You have also defined the *Data Replication Framework* (DRF) replication model to replicate `LOIPRO` IDocs (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* > *Basic Settings for MES Integration*). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.

SAP Digital Manufacturing for execution

- You have imported a work center and resources from SAP ERP.
- (Optional) You have imported BOM and routing master data from SAP ERP.

> **Posting Instructions**
>
> BOM and routing masters that are sent from SAP ERP to SAP Digital Manufacturing for execution prior to the production order download allow additional manual configurations to take place inside of SAP Digital Manufacturing for execution. This prerequisite is optional because you can create the BOM and routing master in SAP Digital Manufacturing for execution directly from the production order download.

Procedural Steps

1. Create or update a production order manually (transaction `CO01` and `CO02`) or automatically by converting a planned order.
2. Allocate the production order quantity to specific resources for an operation to schedule production. This generates a unique split ID for each resource assigned to an operation.
3. Send the production order with scheduling information from SAP ERP to SAP Digital Manufacturing for execution.
4. SAP ERP 6.05 and later with the activated business function (BF) `LOG_PP_MES_INT_02` distributes production orders automatically upon release based on the *Data Replication Framework* (DRF) filter

settings (see Data Replication Framework [page 37]). Changes to the order are distributed immediately after the initial distribution.

> **Note**
>
> SAP ERP 6.05 with the activated BF `LOG_PP_MES_INT_01` (configuration type B) distributes production orders automatically upon release based on customized settings.
>
> If you use SAP ERP 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction `POIT` after creating or changing the order.

> **Note**
>
> The `POIT` transaction supports only the IDoc base types `LOIPRO01`. Additional fields and segments of the IDoc types `LOIPRO02`, `LOIPRO03`, and `LOIPRO04` are not supplied when distributing using the `POIT` transaction.

5. Verify the results in SAP Digital Manufacturing for execution.

SAP Digital Manufacturing for execution creates or updates the production order containing scheduling information based on the data received from SAP ERP.

2.1.5.2.1.7 Transfer of Production Order with Operation-Level Scheduling

This section describes how to transfer a production order with operation-level scheduling information from SAP ERP to create or update the corresponding production order that contains the operation start and end time in SAP Digital Manufacturing for execution.

The production order is used by production planning in SAP ERP to define the material to be processed, the location, the time, and the work required. Release of the production order in SAP Digital Manufacturing for execution triggers production on the shop floor.

Prerequisites

SAP ERP

- You have transferred the material master records for the produced material and all the components (see *Material Transfer* on the SAP Help Portal at http://help.sap.com).
- You have created a BOM and a routing for the produced material (see Manage Bills of Materials and Routings in the Manage Routings/Recipes App).
- You have transferred the work centers with individual capacities to SAP Digital Manufacturing for execution.
- You have created a production order either manually or by converting a planned order automatically.
- You have set up ALE communication to create and transmit LOIPRO IDocs. For more information, see Data Replication Framework [page 37].

- You have also defined the *Data Replication Framework* (DRF) replication model to replicate LOIPRO IDocs (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* > *Basic Settings for MES Integration*). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.
- You have defined unique ISO codes for every unit of measure.

SAP Digital Manufacturing for execution

- (Optional) You have imported the BOM and routing master data from SAP ERP.

> ⓘ Posting Instructions
>
> BOM and routing masters that are sent from SAP ERP to SAP Digital Manufacturing for execution prior to the production order download allow additional manual configurations to take place inside of SAP Digital Manufacturing for execution. This prerequisite is optional because you can create the BOM and routing master in SAP Digital Manufacturing for execution directly from the production order download.

Procedural Steps

1. Create a production order with scheduling information either manually or by converting a planned order automatically or update the production order in SAP ERP.

   > ⓘ Note
   >
   > Scheduling can be defined by using *Material Requirement Planning* (MRP) and detailed scheduling in *SAP Advanced Planning and Optimization* (APO).

2. SAP ERP 6.05 and later with the activated business function (BF) `LOG_PP_MES_INT_02` distributes production orders automatically upon release based on the *Data Replication Framework* (DRF) filter settings (see Data Replication Framework [page 37]). Changes to the order are distributed immediately after the initial distribution.

   > ⓘ Note
   >
   > SAP ERP 6.05 with the activated BF `LOG_PP_MES_INT_01` (configuration type B) distributes production orders automatically upon release based on customized settings.
   >
   > If you use SAP ERP 6.00 – 6.04 (configuration type A), you transfer the production order using the transaction `POIT` after creating or changing the order.

   > ⓘ Note
   >
   > The `POIT` transaction supports only the IDoc base types `LOIPRO01`. Additional fields and segments of the IDoc types `LOIPRO02`, `LOIPRO03`, and `LOIPRO04` are not supplied when distributing using the `POIT` transaction.

3. Verify the results in SAP Digital Manufacturing for execution.

The system creates or updates the corresponding production order containing scheduling information in SAP Digital Manufacturing for execution.

When the order is released in SAP Digital Manufacturing for execution, shop floor operators can see the operation start and end time in the POD worklist.

2.1.5.2.1.8 Transferring a Production Order with PRT Assignment

This section describes how to transfer production order data with PRT assignment from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution to create or update the corresponding production order record in SAP Digital Manufacturing for execution.

> ⓘ Note
>
> You can only transfer production order with equipment or material PRT assignment.

Prerequisites

SAP ERP or SAP S/4HANA

- You have completed all the prerequisites of Transferring a Production Order [page 173].
- The equipment PRT has already been transferred from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution. For detailed procedures, see Transferring a Tool [page 170].
- The material PRT has been transferred from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution together with the material master data.
- The PRTs have already been assigned to routing operations.

SAP Digital Manufacturing

- The collaboration link *COLLABORATION_PRT_ASSIGNMENT_GET* is mapped to the directive *ERP_PRT_ASSIGNMENT_GET* in the *Manage Collaboration Links* app.

Procedure

1. Create or update a production order manually (transaction `CO01` and `CO02`) or automatically by converting a planned order (see Creating a Production Order on the SAP Help Portal at http://help.sap.com).
2. SAP ERP 6.05 and later with the activated business function (BF) `LOG_PP_MES_INT_02` distributes production orders automatically upon release based on the Data Replication Framework (DRF) filter settings. Changes to the order are distributed immediately after the initial distribution.
3. Verify the results in the *Manage Orders* app or the *Integration Message Dashboard* in SAP Digital Manufacturing for execution. For more information, see Manage Orders or Integration Message Dashboard.

2.1.5.2.2 Production Order Status Confirmation

You can transfer the results of the production from SAP Digital Manufacturing for execution back to the production order in SAP ERP or SAP S/4HANA for reporting steps to keep the status of the systems aligned.

A status confirmation documents the processing status of orders, operations, sub-operations and individual capacities. It is an instrument for controlling orders.

With a confirmation you specify the following:

- The quantity in an operation that was produced as yield, scrap and the quantity to be reworked
- How much work was actually done
- Which work center was used for the operation
- Who performed the operation

Exact confirmation shortly after completion of an operation is essential for realistic production planning and control.

2.1.5.2.2.1 Production Yield Confirmation on Operation Complete

This section describes how to transfer a production yield confirmation message to SAP ERP.

The message is triggered when the SFC belonging to the production order completes an operation marked as the SAP ERP reporting step.

> ⓘ Note
>
> An SFC can be re-processed at an operation that the SFC has already completed.

This function supports long material numbers (see Transferring a Long Material Number [page 134]).

For more information about reporting consumed components, see the *Transfer of Goods Movement within Yield/Scrap Confirmation* section of this guide.

> ⓘ Note
>
> The *Final Confirmation Type* field was removed from the *Production Yield Confirmation* message to support the overproduction scenario in the *Manage Orders* app. For more information, see Increasing the Build Quantity for Overproduction. As this field was removed, the integrated ERP system sets the corresponding operation to `PCNF` (partially confirmed), even if the yield quantity reaches the target quantity. Status `CNF` (confirmed) is only set after the production order was manually or automatically completed in SAP Digital Manufacturing.
>
> If you have your own custom XSLT solution in place that communicates the final confirmation of each operation automatically to the integrated ERP system, be aware that this custom XSLT solution is not compatible with the overproduction scenario.

Prerequisites

SAP ERP

- You have verified that the control keys of the operations do not allow *Auto Goods Receipt* and that they allow confirmations (see *Control Key* on the SAP Help Portal at http://help.sap.com and SAP Note 1502536.
- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations.
- You have verified that the operation sequence is not checked (see *Logistics* > *Production* > *Shop Floor Control* > *Operations* > *Confirmation* > *Define Confirmation Parameters (transaction OPK4)*).

SAP Digital Manufacturing

- You have imported the production order data from SAP ERP.
- You have released the production order to the shop floor.
- You have verified that routings contain at least one ERP reporting step.
  We recommend that you mark the last routing operation as an ERP reporting step to ensure that all consumed components are reported to SAP ERP.
- You have verified that collaboration links and directives are configured. For more information, see Collaboration Link / Directive Mappings for Outbound Communication Scenarios.

Procedural Steps

1. Complete an SFC that belongs to the production shop order at the ERP reporting step.
2. The system triggers a collaboration event and sends the `Production Order Yield Confirmation` message to update the processing status of the production order and operations in SAP ERP.

> **Note**
>
> In SAP ERP, you can see the status of the production order on the *Display Production Order Confirmation: Details* screen (transaction `CO14`).
>
> If the production shop order contains scheduling information that has been transferred, then the confirmation message also contains quantity split IDs and the capacity category.

2.1.5.2.2.2 Scrap Confirmation for a Production Order

This section describes how to transfer scrap data for the production order to SAP ERP when an SFC is scrapped during production in SAP Digital Manufacturing for execution.

When an SFC is scrapped, the system reports consumption of the components for this SFC with a goods issue of the movement type `261`.

If components were reserved for this production order in SAP ERP, the consumption of these components is not reported to SAP ERP.

This function supports long material numbers (see Transferring a Long Material Number [page 134]).

For more information about reporting consumed components, see Transferring a Goods Movement within Yield/Scrap Confirmation [page 190].

Prerequisites

SAP ERP

- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that the operation sequence is not checked (see *Logistics* > *Production* > *Shop Floor Control* > *Operations* > *Confirmation* > *Define Confirmation Parameters (transaction OPK4)*).

SAP Digital Manufacturing for execution

- You've imported the production order data from SAP ERP.
- You've released the production order to the shop floor.
- You've verified that routings contain at least one ERP reporting step.
  We recommend that you mark the last routing operation as an ERP reporting step to ensure that all consumed components are reported to SAP ERP.
- You've verified that collaboration links and directives are configured. For more information, see Manage Collaboration Links and Manage Collaboration Directives.

Procedural Steps

1. Scrap an SFC belonging to the production order in SAP Digital Manufacturing for execution using *Log NC*.

2. The system triggers a collaboration event and sends the *Production Order Scrap Confirmation* message with the following information to SAP ERP to report the quantity of scrapped finished goods and component quantities consumed:

Data	Explanation
Plant	Name of your plant
Production Order	Production order number
Operation	Operation activity name
Quantity	Quantity that has been scrapped
Base Unit of Measure	Units of measure of the produced material
Capacity Category	Capacity category of the resource that was used to complete the SFC
Split	Yield of a split that was processed by a capacity when an operation is split
Components	Assembled components (For more information, see Transferring a Goods Movement within Yield/Scrap Confirmation [page 190]) **Note** The system does not send a serial number for a scrapped SFC to SAP ERP. **Note** If an SFC is scrapped on the non-reporting step, SAP Digital Manufacturing for execution tries to find a reporting step in the routing by checking future steps and uses the reporting step it finds.

In SAP ERP, you can see the status of the production order on the *Display Production Order Confirmation: Details* screen (transaction `CO14`).

If the production order contains transferred scheduling information, then the confirmation message also contains quantity split IDs and the capacity category.

2.1.5.2.2.3 Transferring a Goods Movement within Yield/ Scrap Confirmation

This section describes how to transfer goods movement (Goods Issue/Goods Receipt) to SAP ERP within production yield confirmations and scrap confirmations for production orders.

> **Note**
>
> An SFC can be re-processed at an operation that this SFC has already completed.

This function supports long material numbers.

Prerequisites

SAP ERP

- You have verified that the control keys of the operations do not allow *Auto Goods Receipt* but allow confirmations (see 1502536).
- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations.
- You have verified that the operation sequence is not checked (see *Logistics* > *Production* > *Shop Floor Control* > *Operations* > *Confirmation* > *Define Confirmation Parameters (transaction OPK4)*).

SAP Digital Manufacturing for execution

- You have imported the production order with BOM and routing data from SAP ERP.
- You have released the production order to the shop floor.
- You have received floor stock from SAP ERP.
- You have verified that routings contain at least one ERP reporting step.
  We recommend that you mark the last routing operation as an ERP reporting step to ensure that all consumed components are reported to SAP ERP.
- You have verified that collaboration links and directives are configured. For more information, see Collaboration Link / Directive Mappings for Outbound Communication Scenarios.

Procedure

1. Assemble a discrete component (by choosing *Add* in the *Assembly Point* or *As-Built Configuration* plugin, or when a component is assembled using the *Auto Assemble Component* hook point activity) or a time-based component.
2. Complete an SFC belonging to the production order at the ERP reporting step and scrap it.
3. The system triggers a collaboration event and sends a confirmation message that contains a goods movement section with the goods movement type `261` (goods issue for an order) for the assembled component to SAP ERP.

> **Note**
>
> Goods movement is triggered for non-BOM components. But it's not triggered for:
>
> - Co-products and by-products
> - Floor stock pegged to an order

> **Note**
>
> The goods movement section is included in the following messages:
>
> - `Production Order Yield Confirmation`
> - `Production Order Scrap Confirmation`

2.1.5.2.2.4 Transferring a Goods Movement (Goods Issue) Independent of Yield Confirmation

This section describes how to transfer a goods movement to SAP ERP on assembly of discrete components of a top assembly in SAP Digital Manufacturing for execution.

Prerequisites

SAP ERP

- You have verified that the component materials are not marked as backflushed (the *Backflush* checkbox on the *MRP 2* tab of the `MM01/MM02` transaction).

SAP Digital Manufacturing for execution

- In *Collaboration Link Maintenance*, you have verified that the `ERP_COMPONENT_ADD` directive is assigned to the `COLLABORATION_SFC_COMPONENT_ADD` link.
- You have imported the production order data from SAP ERP.
- You have received floor stock from SAP ERP.
- You have released the production order to the shop floor.

Procedural Steps

1. Choose *Add* in the *Assembly Point (Assemble Components)* or *As-Built Configuration* plugin to indicate that you have assembled a discrete component.
2. SAP Digital Manufacturing for execution triggers a collaboration action (`COLLABORATION_SFC_COMPONENT_ADD`).
3. The system sends the `Production Order Component Add` message with the goods movement type `261` (goods issue for an order) for the assembled component to SAP ERP.

2.1.5.2.2.5 Production Order Complete

You can transfer a production order complete message to SAP ERP or SAP S/4HANA.

The message is triggered when the following occurs in SAP Digital Manufacturing for execution:

- All SFCs belonging to a production order are completed at the operation marked as the last ERP reporting step (the *Is Last Reporting Step* checkbox in *Routing Step Properties*) and the status of the order changes to *Completed*.
- The production order is completed manually in the *Manage Orders* app. For more information, see Completing Orders.

Prerequisites

SAP ERP / SAP S/4HANA

- You've verified that the control keys of the operations do not allow *Auto Goods Receipt* but allow confirmations (see *Control Key* on the SAP Help Portal at http://help.sap.com and SAP Note 1502536).
- You've verified that all work centers have the same activity types arranged in the same sequence.
- You've verified that operations are not marked as milestone operations.
- You've verified that the operation sequence is not checked (see *Logistics* > *Production* > *Shop Floor Control* > *Operations* > *Confirmation* > *Define Confirmation Parameters (transaction OPK4)*).

SAP Digital Manufacturing for execution

- You have imported the production order data from SAP ERP or SAP S/4HANA.
- You have released the production order to the shop floor.
- You have verified that routings contain at least one ERP reporting step.
  We recommend that you mark the last routing operation as the ERP reporting step to ensure that all consumed components are reported to SAP ERP or SAP S/4HANA.
- You've set up the `COLLABORATION_ORDER_COMPLETE_DI` link and the `ERP_ORDER_COMPLETE_V2` directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps. For more information, see Collaboration Link / Directive Mappings for Outbound Communication Scenarios.

Procedural Steps

1. Change the status of the production shop order to *Completed*.

   > **Note**
   >
   > This can be done manually or by completing all SFCs belonging to the order at the operation marked as the last ERP reporting step. For more information, see Completing Orders.

2. SAP Digital Manufacturing for execution triggers a collaboration event.
3. The system sends the *Order Complete* message to update the processing status of the production order in SAP ERP or SAP S/4HANA.
   In SAP ERP or SAP S/4HANA, you can see the status of the production order on the *Display Production Order Confirmation: Details* screen (transaction `CO14`).

Related Information

Completing Orders
How Order Statuses Change in a Business Scenario
SAP Note 3489424

2.1.5.2.2.6 Report Serial and Batch Numbers for Semi-Finished Components

This section describes how to transfer a serial and batch number for semi-finished components to SAP ERP within production yield confirmation, planned order confirmation, scrap confirmation for production and planned orders, and container close messages.

Prerequisites

SAP ERP

- You have configured *Batch Management*.
- You have maintained a serial number profile for the header material so that a production order can contain serial numbers (in *Customizing for Logistics*, choose *Materials Management* > *Material Master* > *Material Change* > *Work Scheduling*).
- You have verified that the control keys of the operations do not allow *Auto Goods Receipt* but allow confirmations (see *Control Key* on the SAP Help Portal at http://help.sap.com and SAP Note 1502536).
- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations.
- You have verified that the operation sequence is not checked (see *Logistics* > *Production* > *Shop Floor Control* > *Operations* > *Confirmation* > *Define Confirmation Parameters (transaction OPK4)*).
- You have set up ALE communication to create and transmit `LOIPRO` IDocs.
- You have also defined the *Data Replication Framework* (DRF) replication model to replicate LOIPRO IDocs (in *Customizing for Production*, choose *Integration with a Manufacturing Execution System* > *Basic Settings for MES Integration*). For information about the SAP ERP versions supporting DRF, see SAP Note 1793291.

- You have defined unique ISO codes for every unit of measure.

SAP Digital Manufacturing for execution

- You've imported the material master records for the produced material and all the components.
- For materials to be assembled, you've specified which data will be collected on assembly:
  o SFC or `INV_SFC`
- You've imported the production order with BOM and routing data from SAP ERP.
- You've released the production shop order to the shop floor.
- You've received floor stock from SAP ERP.
- You've verified that routings contain at least one ERP reporting step.
- We recommend that you mark the last routing operation as the ERP reporting step to ensure that all consumed components are reported to SAP ERP.
- You've set up the collaboration links and directives in the *Manage Collaboration Links* and *Manage Colloabration Directives* apps. For more information, see Collaboration Link / Directive Mappings for Outbound Communication Scenarios.

Procedural Steps

1. Create a semi-finished material record in SAP ERP. It has to be either batch-managed or with an assigned serial number profile.
2. Create a finished material record with the BOM containing semi-finished material.
3. Create and release a production order in SAP ERP for semi-finished material. Release this order in SAP Digital Manufacturing for execution and complete SFCs until they get the status of *Done*.
4. Create and release a production order for your top assembly material (finished material).
5. Assemble a semi-finished component using either discrete (by choosing *Add in the Assembly Point* or *As-Built Configuration* plugin) or time-based assembling.

   > ⓘ Note
   >
   > Reporting of serial numbers is not supported for time-based components.

   > ⓘ Note
   >
   > The SFC has to be collected for the component during assembly.

6. Complete an SFC belonging to the production shop order at the ERP reporting step, scrap it or pack to the container and close it.
7. SAP Digital Manufacturing for execution triggers a collaboration event.
8. The system sends a confirmation message that contains a goods movement section with the goods movement type `261` (goods issue for an order) for the assembled component to SAP ERP.
   Note: The goods movement section is included in the following types of messages:
   - `Production Order Yield Confirmation`
   - `Production Order Scrap Confirmation`

2.1.5.2.2.7 Activity Confirmation

You can transfer activity confirmation messages for production orders from SAP Digital Manufacturing for execution to SAP ERP or SAP S/4HANA.

Prerequisites

SAP ERP or SAP S/4HANA

- You've created a work center and a standard value key.
- You've transferred the work center to SAP Digital Manufacturing for execution.

SAP Digital Manufacturing for execution

- The production order data is transferred from SAP ERP or SAP S/4HANA. For more information, see Transferring a Production Order [page 173].
- The production order is released to the shop floor using the *Manage Orders* app.
- The routing contains at least one ERP reporting step.
- You've implemented the following collaboration link and directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
`COLLABORATION_ACTIVITY_CONFIRMATION_DI`	`ACTIVITY_CONFIRMATION`

Procedure

1. In the *Order POD (Default)*, post an activity confirmation for the production order. For more information, see Order POD.
2. The system triggers a collaboration event and sends the *Production Order Activity Confirmation* message to trigger the posting of an activity confirmation in SAP ERP or SAP S/4HANA.
3. To verify whether the *Production Order Activity Confirmation* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *Production Order Activity Confirmation* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID that you can find in the *Integration Message Dashboard*. For more information, see **Monitoring Message Processing**.

2.1.5.2.2.8 Quantity Confirmation

You can transfer quantity confirmation messages from SAP Digital Manufacturing for execution to SAP ERP and SAP S/4HANA.

Prerequisites

SAP ERP and SAP S/4HANA

- You have verified that the control keys of the operations do not allow *Auto Goods Receipt* and that they allow confirmations (see *Control Key* on the SAP Help Portal).
- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations. For more information, see 1502536.
- You've made the following settings under *Logistics* > *Production* > *Shop Floor Control* > *Operations* > *Confirmation* > *Define Confirmation Parameters (transaction OPK4)*:
  - *The operation sequence is not checked*
  - *No message if no insp. results exist*
  - *Dates in Future* unchecked.

  Depending on your business scenario, you can choose other settings as well, which might impact your integration scenario.

SAP Digital Manufacturing for execution

- The production order data is transferred from SAP ERP or SAP S/4HANA.
- The production order is released to the shop floor.
- The routing contains at least one ERP reporting step.
- The collaboration link *COLLABORATION_QUANTITY_CONFIRMATION_DI* is mapped to the directive *PRODORD_QUANTITY_CONFIRMATION* in the *Manage Collaboration Links* app.

Procedure

1. In the *Order POD (Default)*, post quantities in the *Quantity Confirmation* tab.

   > **Note**
   >
   > There's a check performed in the background whether the current resource is relevant for OEE and scheduling (*Scheduling and OEE Relevant* flag is set in the *Manage Work Centers* app). If the resource isn't OEE and scheduling relevant, the confirmation is rejected.
   >
   > You can see the default resource against which yield/scrap is reported in the *Operation Details* tab.

2. The system triggers a collaboration event and sends the `Production Order Quantity Confirmation` message to trigger the posting of a quantity confirmation in SAP ERP or SAP S/4HANA.

2.1.5.2.3 Process Order Integration

You can transfer process orders from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution.

Prerequisites

SAP ERP or SAP S/4HANA

- You have created work centers with plant and production-relevant data in the *Logistics* module (see *Creating, Changing and Displaying Work Centers* on the SAP Help Portal. You have transferred work centers to SAP Digital Manufacturing for execution.
- You have created a BOM and a recipe for the produced material.

  > **Note**
  >
  > BOM components must be assigned to phases.

- You have transferred materials to SAP Digital Manufacturing for execution.
- You have set up ALE communication to create and transmit an `LOIPRO05` IDoc. For more information, see Data Replication Framework [page 37].
- You've implemented BADI `CO_MES_INT_REDISTRIBUTION` in the integrated ERP system. This BADI makes sure that the integrated ERP system doesn't communciate an order change to SAP Digital Manufacturing after receiving the release notification (RMES). For more information, see 2165261.

Procedure

1. Create or update a process order manually (transaction COR1 and COR2) or automatically by converting a planned order.

   > **Note**
   >
   > To distinguish between a discrete industry order and a process industry order, when this differentiation is required for the internal execution logic, SAP Digital Manufacturing relies on the *Auto complete and confirm* flag that is set on material level in the integrated ERP system. If this flag is active, the downloaded order is considered to be a discrete industry order and handled accordingly. If this flag isn't active, the downloaded order is treated as a process industry order and handled accordingly.

   > **Note**
   >
   > For overproduction scenarios in the process industry, it's recommended to configure the overdelivery limits only as soft limits (warning) in your integrated ERP system. If you configure the overdelivery limits as hard limits, you might encounter issues when trying to cancel orders in SAP Digital Manufacturing. For more information on how to deal with cancellations issues due to the overdelivery configuration in the integrated ERP system, see 3267541.

2. Release the process order to transfer it via the Data Replication Framework (DRF) to SAP Digital Manufacturing for execution using IDoc `LOIPRO05` according to the filter criteria you set in the DRF. For more information, see Data Replication Framework [page 37].

   > **Note**
   >
   > If you enable transfer of process orders using DRF, check the SAP notes: 2888888, 2931412, and 3017004.

3. Verify the results in *Manage Orders* and *Integration Message Dashboard* apps in SAP Digital Manufacturing for execution.

The system creates or updates the process order based on the data received from SAP ERP or SAP S/4HANA.

After releasing the order in SAP Digital Manufacturing for execution, the *Manage Orders* app allows shop floor operators to view the scheduled start and end time. It is important to note that the execution of process orders should be exclusively carried out through the *Order POD* app.

Related Information

Manage Orders
Order Statuses
How Order Statuses Change in a Business Scenario

2.1.5.2.3.1 Transferring a Process Order with Inspection Lot (type 03)

You can transfer the inspection lot (inspection type `03`) and inspection characteristics assigned to a process order from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution.

- In SAP ERP or SAP S/4HANA, an inspection lot documents a request for an inspection. Inspection characteristics are assigned to the inspection lot.
- In SAP ERP, the type 03 inspection lot refers to in-process inspection that takes place in production. With in-process inspections, an inspection lot is created for a process order. Characteristics are assigned to individual operations in the master recipe.
- When a process order with inspection lot / inspection characteristics are transferred from SAP ERP or SAP S/4HANA, the corresponding orders are created and inspection characteristics can be viewed at SFC operation level in the *Order POD (Default)*.

> **→ Tip**
>
> You can transfer a process order to SAP Digital Manufacturing for execution without BOM components. To do this, you need to use the Process Order Download (LOIPRO05 V2) integration flow. In the *Manage Business Settings* app, you need to switch on the *Enable Order BOM Without Components* function.

Prerequisites

SAP ERP and SAP S/4HANA

- You have completed all the prerequisites of Configuring a Process Order [page 198].
- Inspection characteristics have been assigned to individual operations in the master recipe.

SAP Digital Manufacturing

- You have set up ALE / DRF communication to create and transmit an `LOIPRO05` IDoc. For more information, see Data Replication Framework [page 37].

Procedure

1. Create a process order with inspection lot / inspection characteristics assigned to it (transaction COR1 and COR2).
2. Release the process order. The system transfers the order data to SAP Digital Manufacturing using IDoc `LOIPRO05` according to the filter criteria you set in the DRF. For more information, see Data Replication Framework [page 37].

   > **Note**
   >
   > If you enable transfer of process orders via DRF, make sure you checked these notes: SAP Note 2888888, SAP Note 2931412 and SAP Note 3017004.

3. Verify the results in the *Manage Orders* app and the *Integration Message Dashboard* in SAP Digital Manufacturing for execution. For more information, see Manage Orders or Integration Message Dashboard.

The system creates the process order based on the data received from SAP ERP or SAP S/4HANA.

When the order is released in SAP Digital Manufacturing for execution, shop floor operators can see the inspection characteristics at operation level in the *Order POD (Default)*.

Related Information

Process Order Integration [page 198]

2.1.5.2.4 Process Order Status Confirmation

You can transfer the results of the production from SAP Digital Manufacturing for execution back to the process order in SAP ERP or SAP S/4HANA for reporting steps to keep the status of the systems aligned.

A status confirmation documents the processing status of orders, operations and inventory movements. It is an instrument for controlling orders.

With a confirmation you specify the following:

- The quantity in an operation that was produced as yield or scrap.
- The progress of the order.
- Who performed the operation.
- Production activities that are completed at the phase level of an order.
- The SFC that was processed.

> **Note**
>
> The information about which SFC was processed is transferred to SAP Cloud Integration within the outbound confirmation message of process orders after you've performed one of the following actions:
>
> - Process Order Goods Issue
> - Process Order Goods Issue Cancellation
> - Process Order Goods Receipt
> - Process Order Goods Receipt Cancellation
> - Process Order Quantity Confirmation
> - Process Order Quantity Confirmation Cancellation
> - Process Order Activity Confirmation
> - Process Order Activity Confirmation Cancellation
>
> You need to perform the mapping of OData fields to BAPI fields between SAP Cloud Integration and your ERP system according to your needs.

Exact confirmation shortly after completion of an operation is essential for realistic production planning and control.

Related Information

Goods Receipt [page 201]
Goods Issue [page 202]
Quantity Confirmation [page 203]
Activity Confirmation [page 204]

2.1.5.2.4.1 Goods Receipt

You can transfer goods receipts for process orders to SAP ERP or SAP S/4HANA within goods receipt confirmations.

Prerequisites

SAP ERP or SAP S/4HANA

- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations.
- You have verified that the operation sequence is not checked (see *Production* > *Shop Floor Control* > *Operations* > *Confirmation* > *Define Confirmation Parameters (transaction OPK4)*).

SAP Digital Manufacturing

- The process order data is transferred from SAP ERP or SAP S/4HANA.
- The process order is released to the shop floor.
- The recipe contains at least one ERP reporting step.
- The collaboration link *COLLABORATION_GOODS_RECEIPT_CONFIRMATION* is mapped to the directive *GOODS_RECEIPT_CONFIRMATION* in the *Manage Collaboration Links* app.

Procedure

For the detailed procedure, navigate to the following topic in the Application Help for Execution: Creating Goods Receipts.

2.1.5.2.4.2 Goods Issue

You can transfer goods issue messages for process orders from SAP Digital Manufacturing for execution to SAP ERP or SAP S/4HANA.

Prerequisites

SAP ERP or SAP S/4HANA

- You've created a process order for which stock is available.

SAP Digital Manufacturing for execution

- The process order data is transferred from SAP ERP or SAP S/4HANA. For more information, see Process Order Integration [page 198].
- The process order is released to the shop floor.
- The recipe contains at least one ERP reporting step.
- Inventory is downloaded from the external SAP ERP system.
- Work centers are assigned to relevant users using the *Manage User Assignments app*. Users can post consumption only on assigned work centers.
- You've implemented the following collaboration links and directives in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
COLLABORATION_GOODS_ISSUE_CONFIRMATION	GOODS_ISSUE_CONFIRMATION

Procedure

1. In the *Order POD (Default)*, post a goods issue for the process order. For more information, see Consuming Materials.
2. The system triggers a collaboration event and sends the *Process Order Goods Issue* message to trigger the posting of a goods issue in SAP ERP or SAP S/4HANA.
3. To verify whether the *Process Order Goods Issue* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *Process Order Goods Issue* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID that you can find in the *Integration Message Dashboard*. For more information, see **Monitoring Message Processing**.

2.1.5.2.4.3 Quantity Confirmation

You can transfer quantity confirmation messages from SAP Digital Manufacturing for execution to SAP ERP and SAP S/4HANA.

Prerequisites

SAP ERP and SAP S/4HANA

- You have verified that the control keys of the operations do not allow *Auto Goods Receipt* and that they allow confirmations (see *Control Key* on the SAP Help Portal)
- You have verified that all work centers have the same activity types arranged in the same sequence.
- You have verified that operations are not marked as milestone operations. For more information, see 1502536.
- You've made the following settings under *Logistics* > *Production* > *Shop Floor Control* > *Operations* > *Confirmation* > *Define Confirmation Parameters (transaction OPK4)*:
  - *The operation sequence is not checked*
  - *No message if no insp. results exist*
  - *Dates in Future* unchecked.

  Depending on your business scenario, you can choose other settings as well, which might impact your integration scenario.

SAP Digital Manufacturing for execution

- The process order data is transferred from SAP ERP.
- The process order is released to the shop floor.
- The recipe contains at least one ERP reporting step.
- The collaboration link *COLLABORATION_QUANTITY_CONFIRMATION* is mapped to the directive *QUANTITY_CONFIRMATION* in the *Manage Collaboration Links* app.

Procedure

1. In the *Order POD (Default)*, post quantities in the *Quantity Confirmation* tab.

   > **Note**
   >
   > There's a check performed in the background whether the current resource is relevant for OEE and scheduling (*Scheduling and OEE Relevant* flag is set in the *Manage Work Centers* app). If the resource isn't OEE and scheduling relevant, the confirmation is rejected.
   >
   > You can see the default resource against which yield/scrap is reported in the *Phase Details* tab.

2. The system triggers a collaboration event and sends the `Process Order Quantity Confirmation` message to trigger the posting of a quantity confirmation in SAP ERP or SAP S/4HANA.

2.1.5.2.4.4 Activity Confirmation

You can transfer activity confirmation messages for process orders from SAP Digital Manufacturing for execution to SAP ERP or SAP S/4HANA.

Prerequisites

SAP ERP or SAP S/4HANA

- You've created a work center and a standard value key.
- You've transferred the work center to SAP Digital Manufacturing for execution.

SAP Digital Manufacturing for execution

- The process order data is transferred from SAP ERP or SAP S/4HANA. For more information, see Process Order Integration [page 198].
- The process order is released to the shop floor.
- The recipe contains at least one ERP reporting step.
- You've implemented the following collaboration links and directives in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
COLLABORATION_ACTIVITY_CONFIRMATION	ACTIVITY_CONFIRMATION

Procedure

1. In the *Order POD (Default)*, post an activity confirmation for the process order. For more information, see Order POD.
2. The system triggers a collaboration event and sends the *Process Order Activity Confirmation* message to trigger the posting of an activity confirmation in SAP ERP or SAP S/4HANA.
3. To verify whether the *Process Order Activity Confirmation* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *Process Order Activity Confirmation* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID that you can find in the *Integration Message Dashboard*. For more information, see **Monitoring Message Processing**.

2.1.5.2.5 Planned Order Integration

You can transfer planned orders from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing and send back yield and scrap confirmations.

Overview

You use planned orders for repetitive manufacturing where production is based on the quantity and not order-based as with production orders. Planned orders are the right choice if you want to manufacture a defined quantity within a specific time frame. With repetitive manufacturing, you generally use simple routings that don't change over time. The following features are supported:

- Yield confirmation is sent to the integrated ERP system after an SFC has been completed at the last operation.
- Scrap confirmation is sent to the integrated ERP system after an SFC has been scrapped.
- Goods issue posting to the integrated ERP system after operation / phase confirmation (backflush).

Integration

The inbound and outbound integration of planned orders is based on the implementation steps described in the technical integration section. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16].

If you've already implemented the infrastructure described in the technical integration section, you can find the planned order specific information in the following topics:

- Transferring a Planned Order [page 206]
- Scrap Confirmation for Planned Orders [page 208]
- Yield Confirmation for Planned Orders [page 209]

2.1.5.2.5.1 Transferring a Planned Order

You can transfer planned orders from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing.

Overview

You create planned orders in SAP ERP / SAP S/4HANA and transfer them to SAP Digital Manufacturing to control your production. For the transfer of planned orders, you rely on the technical infrastructure that you've set up between your integrated ERP system and SAP Digital Manufacturing. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16]. In the section below, you'll learned what needs to be done specifically to transfer planned orders to SAP Digital Manufacturing.

Prerequisites

SAP ERP / SAP S/4HANA

- You've transferred the material master records for the produced material and all the components.

  > **Note**
  >
  > You need to assign a REM profile (for example `0001`) to the material on view *MRP4*. If needed, you can create a REM profile using transaction `OSP2` (SPRO).

- You've created a BOM and a routing for the produced material (see Manage Bills of Materials and Manage Routings/Recipes).
- You've created and sent work centers to SAP Digital Manufacturing.
- You've set up Application Link Enabling (ALE) and the Data Replication Framework (DRF) for the `LOIPLO02` IDoc. For more information, see Data Replication Framework [page 37].

- You've implemented the *INBOUND PROCESSOR* iFlow in SAP Cloud Integration and activated it through the `Initial Parameters` iFlow. For more information, see Configure Inbound Processor iFlow [page 72] and Configure Initial Parameters iFlow [page 74].

> **Note**
>
> You can replicate planned orders with an opening date in the future periodically to the integrated ERP system. For more information, see 1555198.

SAP Digital Manufacturing

- (Optional) You've imported BOM and routing master data from SAP ERP or SAP S/4HANA.
- You've enabled the artifact *PlannedOrder LOIPLO02 process request* in SAP Cloud Integration to use `LOIPLO02` IDoc.

Procedure

1. In SAP ERP or SAP S/4HANA, create a planned order manually (transaction `MD11`).

   > **Note**
   >
   > Enter a storage location in the planned order in the integrated ERP system or in the *Putaway Storage Location* field in the *Manage Materials* app in SAP Digital Manufacturing.

   > **Note**
   >
   > A planned order creation can also be triggered via an MRP run. The planned order is then transferred automatically to SAP Digital Manufacturing.

2. Schedule the planned order to trigger the planned order download.
3. To verify whether the message of type `Order Download` IDoc was transferred to SAP Digital Manufacturing for execution, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your `LOIPLO02` IDoc (message type: Order Download). For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your planned order that you can find in the *Integration Message Dashboard*. For more information, see **Monitoring Message Processing**.

Related Information

Manage Orders

2.1.5.2.5.2 Scrap Confirmation for Planned Orders

Learn how to transfer scrap confirmations for planned orders from SAP Digital Manufacturing to SAP ERP or SAP S/4HANA.

Overview

After downloading a planned order from your integrated ERP system, you release it in the *Manage Orders* app and start the production using the *Work Center POD*. When you then scrap an SFC in the *Work Center POD*, this information is communicated to your integrated ERP system, if you've put in place the configuration described below.

Prerequisites

SAP ERP / SAP S/4HANA

- You've verified that all work centers have the same activity types arranged in the same sequence.

SAP Digital Manufacturing

- You've downloaded the planned order from SAP ERP or SAP S/4HANA. For more information, see Transferring a Planned Order [page 206].
- You've released the planned order to the shop floor using the *Manage Orders* app.
- You've verified that routings contain at least one ERP reporting step, which means that the *Last Reporting Activity* flag in the *Manage Routings/Recipes* app is set to *Yes*.
- You've configured the following collaboration link and directive in the *Manage Collaboration Directives* and the *Manage Collaboration Links* app:

Collaboration Link	Collaboration Directive
COLLABORATION_PLANNED_ORDER_SCRAP_CONFIRMATION	ERP_PLANNED_ORDER_SCRAP_CONFIRMATION

Procedure

1. In SAP Digital Manufacturing, in the *Work Center POD*, scrap an SFC belonging to the planned order using *Log NC*.
   The *Planned Order Scrap Confirmation* message is sent to the integrated ERP system.

> **Note**
>
> If an SFC is scrapped on the nonreporting step, SAP Digital Manufacturing tries to find a reporting step in the routing by checking future steps and uses the reporting step it finds.

2. To verify whether the *Planned Order Scrap Confirmation* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *Planned Order Scrap Confirmation* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your planned order that you can find in the *Integration Message Dashboard*. For more information, see **Monitoring Message Processing**.

2.1.5.2.5.3 Yield Confirmation for Planned Orders

Learn how to transfer a yield confirmations for planned orders from SAP Digital Manufacturing to SAP ERP or SAP S/4HANA.

Overview

After downloading a planned order from your integrated ERP system, you release it in the *Manage Orders* app and start the production using the *Work Center POD*. When you then complete an SFC in the *Work Center POD*, this information is communicated to your integrated ERP system, if you've put in place the configuration described below.

Prerequisites

SAP ERP / SAP S/4HANA

- You've verified that all work centers have the same activity types arranged in the same sequence.
- You've verified that routings contain at least one ERP reporting step, which means that the **Last Reporting Activity** flag in the **Manage Routings/Recipes** app is set to **Yes**.

SAP Digital Manufacturing for execution

- You've downloaded the planned order from SAP ERP or SAP S/4HANA. For more information, see Transferring a Planned Order [page 206].

- You've released the planned order to the shop floor using the *Manage Orders* app.
- You've verified that routings contain at least one ERP reporting step, which means that the *Last Reporting Activity* flag in the *Manage Routings* app is set to *Yes*.
- You've configured the following collaboration link and directive in the *Manage Collaboration Directives* and the *Manage Collaboration Links* app:

Collaboration Link	Collaboration Directive
COLLABORATION_PLANNED_ORDER_YIELD_CONFIR-MATION	ERP_PLANNED_ORDER_YIELD_CONFIRMATION

Procedural Steps

1. Complete the SFC at all operations.
2. After the completion of the last operation, the system triggers a collaboration event and sends the `Planned Order Yield Confirmation` message to SAP ERP or SAP S/4HANA.
3. To verify whether the *Planned Order Yield Confirmation* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *Planned Order Yield Confirmation* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your planned order that you can find in the *Integration Message Dashboard*. For more information, see **Monitoring Message Processing**.

2.1.5.2.6 Service Order Integration

You can transfer service orders from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing.

Overview

In the manufacturing industry, post-sales service and repair are important for customer satisfaction and retention. Often, when a product comes back to your plant, you need to control the service and repair process that takes places on the shop floor. For this, you can use service orders, which are orders of category `30`.
A service order is an electronic document that contains the information that is needed on the shop floor to perform the service and repair tasks, such as customer details, material or equipment to be serviced, dates and times for service activities, components (BOM) and any related documents or attachments.

You create service orders in your integrated SAP ERP / SAP S/4HANA and transfer them to SAP Digital Manufacturing where they are displayed in the *Manage Service Orders* app.

Integration

The inbound integration of service orders is based on the implementation steps described in the technical integration section. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16].

If you've already implemented the infrastructure described in the technical integration section, you can find the service order specific information in the following topics:

- Define Outbound Messages for Partner Systems [page 43]
- Define a Distribution Model [page 45]
- Assign Business Objects to Your Business System [page 47]
- Define Replication Models and Outbound Implementations [page 49]

2.1.5.2.6.1 Transferring a Service Order

You can transfer service orders from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing to control your service and repair processes on the shop floor.

Overview

You create service orders, which are orders of category `30` in your integrated SAP ERP / SAP S/4HANA system. After you release them, they are distributed as `IORDER01` IDoc to SAP Digital Manufacturing. The service order has the following elements:

- Material (Mandatory)
- Work center (Mandatory)
- Operation (Optional)
- Component (Optional)
- Equipment (Mandatory for serial number managed products)
- Notification (Optional)

> → Tip
>
> You can use the notification field for the customer complaint or maintenance information. You'll find the notification in the details page of the *Manage Service Orders* app.

For the transfer of service orders, you rely on the technical infrastructure that you've set up between your integrated ERP system and SAP Digital Manufacturing. You need to extend your integration scenario to cover the `IORDER01` IDoc. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16]. In the section below, you'll learned what needs to be done specifically to transfer service orders to SAP Digital Manufacturing and how to monitor this scenario. Once the download was successful, you can release the order in the *Manage Service Orders* app.

> → Tip
>
> You can use the Service Order Component Consumption (`POST /assembly/v1/serviceOrder/asBuilt/upload?plant=<plant>&sfc=<sfcId>`) API to upload the service order component

consumption data that isn't available in SAP Digital Manufacturing and add the as-built information to the service SFC. For more information, see SAP Business Accelerator Hub.

Prerequisites

SAP ERP / SAP S/4HANA

- You've transferred the material.
- You've created and sent work centers to SAP Digital Manufacturing.
- You've created an equipement.
- You've set up Application Link Enabling (ALE) and the Data Replication Framework (DRF) for the `IORDER01` IDoc. For more information, see Data Replication Framework [page 37].
- You've implemented the *INBOUND PROCESSOR* iFlow in SAP Cloud Integration and activated it through the `Initial Parameters` iFlow. For more information, see Configure Inbound Processor iFlow [page 72] and Configure Initial Parameters iFlow [page 74].
- You've deployed the the *Service Order Download (IORDER01)* integration workflow in SAP Cloud Integration.

> **Note**
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there, under *Plant Settings*. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

> **Note**
>
> The following fields aren't part of the standard `IORDER01` IDoc and aren't downloaded from your integrated ERP system:
>
> - Final due date
> - Storage location and batch number of components
> - Operation duration unit of measure
> - Task list type
> - Group
> - Group counter
> - Reservation Item Number
> - Maintenance Plan
>
> If you want to download these fields, you need to map your plant to your ERP system's destination in your *SAP S/4HANA Integration with SAP Digital Manufacturing* integration package, under *Plant Settings*, in SAP Cloud Integration. With this mapping in place, the `Service Order IORDER01 pre-process request` artifact, which is part of the `IORDER01_STD_PREXSLT` standard pre-xslt workflow available in the *Manage Integration Workflows* app, uses the destination to make a BAPI call to your ERP system after downloading the service order IDoc. If you don't provide the plant/destination mapping,

> the `IORDER01_STD_PREXSLT` standard pre-xslt workflow can't make the BAPI call to fetch the missing fields, but this doesn't impact the IDoc download itself.

SAP Digital Manufacturing

- You've got the following roles for the *Manage Service Orders* app:
  - `Service_Supervisor`
  - `Launchpad_Access`
  - `Plant_Read`
  - `Product_Read`
  - `Service_Order_Read` / `Service_Order_Manage`

Procedure

1. In SAP ERP or SAP S/4HANA, create a service order of category `30` that contains a material, a work center, and an equipment using transaction `IW31`.
2. Release the service order.
3. To verify whether the message of type *Order Download* (order category in the payload is `SERVICE_ORDER`) was transferred to SAP Digital Manufacturing for execution, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your order download message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your service order that you can find in the *Integration Message Dashboard*. For more information, see **Monitoring Message Processing**.

> → Tip
>
> You can anonymize the *Responsible Person* using the *Delete Data Subject Information* app.

Related Information

Manage Service Orders

2.1.5.2.6.2 Operation Activity Start and Completion Confirmation for Service Orders

Learn how to transfer operation activity start and completion confirmations for SFCs belonging to service orders from SAP Digital Manufacturing to SAP ERP or SAP S/4HANA.

Overview

After you download service orders from your integrated ERP system, you release them to the shop floor in the *Manage Service Orders* app and start the service / repair using the *Work Center POD* or the *Operation Activity POD*, where you've implemented the *SFC Start* and *SCF Complete* plugins. When you then start and end processing an SFC at an operation activity, the operation activity start and completion information is communicated to your integrated ERP system, if you've put in place the configuration described below.

Prerequisites

SAP ERP / SAP S/4HANA

- You've verified that operations are not marked as milestone operations.

SAP Digital Manufacturing

- You've downloaded the service order from SAP ERP or SAP S/4HANA. For more information, see Transferring a Service Order [page 211].
- You've released the service order to the shop floor using the *Manage Service Orders* app.
- You've implemented the *SFC Start* and *SFC Complete* plugins in the *Work Center POD* or the *Operation Activity POD*.
- You've implemented the *Service Order Confirmation Start* and *Service Order Confirmation Complete* integration workflows, which are part of the *SAP S/4HANA Integration with SAP Digital Manufacturing package*, in SAP Cloud Integration.

> **Note**
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

> **Note**
>
> The assembly and disassembly of compontents is supported. For this, inventory needs to be available in SAP Digital Manufacturing.

- You've configured the following collaboration links and directives in the *Manage Collaboration Directives* and the *Manage Collaboration Links* app:

Collaboration Link	Collaboration Directive
`COLLABORATION_SRV_ORDER_CONF_START`	`ERP_SRV_ORDER_CONF_START`
`COLLABORATION_SRV_ORDER_CONF_COMPLETE`	`ERP_SRV_ORDER_CONF_COMPLETE`

Procedure

1. In SAP Digital Manufacturing, in the *Work Center POD* or the *Operation Activity POD*, start an SFC belonging to the service oder.
   The *Service Order Operation Start* message is sent to the integrated ERP system to acknowledge the start of the operation activity. This post-confirmation indicates zero work and updates the status in the integrated ERP to `PCNF`.
2. Complete the SFC.
   The *Service Order Operation Complete* message is sent to the integrated ERP system. During completion, the system clears the reservation and sets the final confirmation for the operation. This changes the status to `CNF`.
3. To verify whether the *Service Order Operation Start* and the *Service Order Operation Complete* message were transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *Service Order Operation Start* and *Service Order Operation Complete* messages. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your planned order that you can find in the *Integration Message Dashboard*. For more information, see **Monitoring Message Processing**.

Related Information

Start
Complete
Transferring a Service Order [page 211]

2.1.5.2.7 Updating Orders Before the Release

Learn about the options you've got for updating a production or process order from your integrated ERP system before the order has been released to the shop floor and SFCs have been created in SAP Digital Manufacturing.

Use

Before releasing an order to the shop floor in the *Manage Orders* app, you can update it from your integrated ERP system. The updating options you have vary depending on the order type and the integrated ERP system.

Overview

Here you'll find an overview of the supported update scenarios. "X" means that the corresponding update is supported.

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Finished Goods Batch Number (Order Header)	X	X	X	X	X	X
Goods Receipt Storage Location (Order Header)	X	X	X	X	X	X
Customer Name (Order Header)	X	X	N/A	N/A	N/A	N/A
Sales Order (Order Header)	X	X	X	N/A	N/A	N/A
Sales Order Item (Order Header)	X	X	X			
Custom Field (Order Header)	X	X	N/A	X	X	N/A
Work Instruction (Order Header)	X	X	N/A	N/A	N/A	N/A

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Dates Changes (Order Header)	X	X	X	X	X	X
Inspection Lot Change (Order Header)	X	X	X	X	X	X
Operation Schedule (Order Schedule)	X	X	X	X	X	X
Production Version (Order Header)	X	X	N/A	X	X	N/A
Scheduling Type (Order Header)	N/A	N/A	N/A	N/A	N/A	N/A
Quantity Decrease (Order Header)	X	X	X	X	X	X
Quantity Increase (Order Header)	X	X	X	X	X	X
Serial Number (Order Header)	X	X	X	N/A	N/A	N/A
Technical Completion (TECO) (Order Header)	X **Note** If you revoke the technical completion in your ERP system, the order stays in status *Closed* in SAP Digital Manufacturing.	X	X **Note** If you revoke the technical completion in your ERP system, the order stays in status *Closed* in SAP Digital Manufacturing.	X **Note** If you revoke the technical completion in your ERP system, the order stays in status *Closed* in SAP Digital Manufacturing.	X **Note** If you revoke the technical completion in your ERP system, the order stays in status *Closed* in SAP Digital Manufacturing.	X **Note** If you revoke the technical completion in your ERP system, the order stays in status *Closed* in SAP Digital Manufacturing.
Order Header Long Text (Order Header)	X	X	X	X	X	X

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Order Header Schedule Dates/Plan Dates (Order Header)	X	X	X	X	X	X
BOM Component Storage Location (BOM Component)	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.
BOM Component Batch Number (BOM Component)	X	X	X	X	X	X
Underdelivery Tolerance (Order Header)	X	X	X	N/A	N/A	N/A
Overdelivery Tolerance (Order Header)	X	X	X	N/A	N/A	N/A
Warehouse Number (Order Header)	X	X	X	X	X	X
Addition / Removal of Component (BOM Component)	X	X	X (Addition) N/A (Removal)	X	X	X (Addition) N/A (Removal)
Component Assignment Change to Operation Activity / Phase (BOM Component)	X	X	X	X	X	X

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Addition / Removal of Operation / Phase (Operation)	X	X	X (Addition) N/A (Removal)	X	X	X (Addition) N/A (Removal)
Work Center Change in Operation / Phase (Operation)	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).
Control Key (Operation)	X	X	X	X	X	X
Change of Component Quantities (BOM Component)	X	X	X	X	X	X
Operation/ Phase Number (Operation)	X	X	X			
Operation/ Phase Text (Operation)	X	X	X	X	X	X
Order-Specific Bill of Material*	X	X	X	X	X	X
Order-Specific Routing*	X	X	X	X	X	X
Priority (Order Header)	X	X	N/A	X	X	N/A
Warehouse Number (BOM Component)	X	X	X	X	X	X

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
ERP Bom ID	X	X		X	X	
ERP Bom Usage	X	X		X	X	
ERP Alternative Bom ID	X	X		X	X	
ERP Routing Group	X	X				
ERP Group Counter	X	X				
ERP Recipe Group				X	X	
ERP Recipe				X	X	

*Objects are up-versioned if one of the following changes takes place:

- Changes to work centers on operations / phases
- Addition or removal of component
- Addition or removal of operations / phases
- Change of component quantities
- Changes to component assignment
- Changes to component units of measure, line numbers, or storage locations

2.1.5.2.8 Updating Orders After the Release

Learn about the options you've got for updating a production or process order from your integrated ERP system after the order has been released to the shop floor and SFCs have been created in SAP Digital Manufacturing.

Prerequisites

- For integration scenarios with SAP ERP or SAP S/4HANA, you need to set up some custom XSLT. For more information, see Updating Orders After the Release for Production Order (Custom XSLT).

> **Note**
>
> For integration scenarios with SAP S/4HANA Cloud Public Edition, there are no actions required.

- The order isn't in status *Completed*, *Discarded*, or *Closed* in SAP Digital Manufacturing.

Use

After releasing an order to the shop floor in the *Manage Orders* app, you can update it from your integrated ERP system. The updating options you've got depend on the order type and the integrated ERP system you're using.

Overview

Here you'll find an overview of the supported update scenarios. "X" means that the corresponding update is supported.

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Finished Goods Batch Number (Order Header)	X	X	X	X	X	X
Goods Receipt Storage Location (Order Header)	X	X	X	X	X	X
Customer Name (Order Header)	X	X	N/A	N/A	N/A	N/A
Sales Order (Order Header)	X	X	X	N/A	N/A	N/A
Sales Order Item (Order Header)	X	X	X			
Custom Field (Order Header)	X	X	N/A	X	X	N/A
Work Instruction (Order Header)	X	X	N/A	N/A	N/A	N/A
Dates Changes (Order Header)	X	X	X	X	X	X
Inspection Lot Change (Order Header)	N/A	N/A	N/A	N/A	N/A	N/A

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Operation Schedule (Order Schedule)	X	X	X	X	X	X
Production Version (Order Header)	X	X	N/A	X	X	N/A
Quantity Decrease (Order Header)	X **Note** Production orders from SAP ERP or SAP S/4HANA communicated through *Production Order Download (LOIPRO05 V2)* processed in the *Work Center POD* are supported.	X **Note** Production orders from SAP ERP or SAP S/4HANA communicated through *Production Order Download (LOIPRO05 V2)* processed in the *Work Center POD* are supported.	X	N/A	N/A	N/AX
Quantity Increase (Order Header)	X	X	X	X	X	X
Serial Number (Order Header)	X	X	X	N/A	N/A	N/A
Technical Completion (TECO) (Order Header)	N/A	N/A	N/A	N/A	N/A	N/A
Order Header Long Text (Order Header)	X	X	X	X	X	X

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Order Header Schedule Dates/Plan Dates (Order Header)	X	X	X	X	X	X
BOM Component Storage Location (BOM Component)	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.
BOM Component Batch Number (BOM Component)	X	X	X	X	X	X
Underdelivery Tolerance (Order Header)	X	X	X	N/A	N/A	N/A
Overdelivery Tolerance (Order Header)	X	X	X	N/A	N/A	N/A
Warehouse Number (Order Header)	X	X	X	X	X	X
Addition / Removal of Component (BOM Component)	X	X	X (Addition) N/A (Removal)	X	X	X (Addition) N/A (Removal)
Component Assignment Change to Operation Activity / Phase (BOM Component)	X	X	X	X	X	X

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Addition / Removal of Operation / Phase (Operation)	X	X	X (Addition) N/A (Removal)	X	X	X (Addition) N/A (Removal)
Work Center Change in Operation / Phase (Operation)	X **Note** For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X **Note** For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X **Note** For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X **Note** For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X **Note** For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X **Note** For integration with EWM, the new target work center must be mapped to a production supply area (PSA).
Control Key (Operation)	X	X	X	X	X	X
Work Instruction (Operation)	X	X	N/A	N/A	N/A	N/A
Change of Component Quantities (BOM Component)	X	X	X	X	X	X
Operation/ Phase Number (Operation)	X	X	X			
Operation/ Phase Text (Operation)	X	X	X	X	X	X
Order-Specific Bill of Material*	X	X	X	X	X	X
Order-Specific Routing*	X	X	X	X	X	X
Priority (Order Header)	X	X	N/A	X	X	N/A

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Warehouse Number (BOM Component)	X	X	X	X	X	X
ERP Bom ID	X	X		X	X	
ERP Bom Usage	X	X		X	X	
ERP Alternative Bom ID	X	X		X	X	
ERP Routing Group	X	X				
ERP Group Counter	X	X				
ERP Recipe Group				X	X	
ERP Recipe				X	X	

*Objects are up-versioned if one of the following changes takes place:

- Changes to work centers on operations / phases
- Addition or removal of component
- Addition or removal of operations / phases
- Change of component quantities
- Changes to component units of measure, line numbers, or storage locations

2.1.5.2.9 Enrichment of Order-Specific Objects

Enrichment is the process of copying some of the fields from master objects to order-specific objects during order integration.

The following fields are copied for BOM components:

- *Assembly Qty As Required*
- *Minimum Tolerance*
- *Maximum Tolerance*
- *Assembly Data Type*

For formula enrichment during order transfer, for every component of an order-specifc BOM, data type is copied from the corresponding master component. When data type is copied to the master component, the formula is enriched. The following objects are copied:

- *Assembly Data Type*

- *Assembly Qty As Required*

The following fields are copied for routings and recipes:

- Work instructions (on operation activity/phase and header level)
- Data collections (on operation activity/phase and header level)

The following fields are copied only for routings:

- Relaxed flow
- Quantity validation

The following fields are copied only for recipes

- Weighing relevant flag (on operation activity level)

2.1.5.2.10 Enrichment with Sub-Operations for Discrete Manufacturing

You can add sub-operations to an **order-specific** routing in SAP ERP, SAP S/4HANA, or SAP S/4HANA Cloud Public Edition, and then transfer this routing to SAP Digital Manufacturing. You can also add sub-operations to a **master** routing in SAP ERP or SAP S/4HANA and then transfer this routing to SAP Digital Manufacturing.

Overview

In a discrete industry scenario, you can add sub-operations to an order-specific routing in SAP ERP, SAP S/4HANA, or SAP S/4HANA Cloud Public Edition.

> ⚠ Caution
>
> Transferring a master routing with sub-operations to SAP Digital Manufacturing is supported only in SAP ERP and SAP S/4HANA.

These sub-operations are then transferred within the routing to SAP Digital Manufacturing. To make this transfer work, you need to use the latest *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration.

Reporting of SAP Digital Manufacturing activities back to the integrated ERP system is done at the last operation activity within the respective operation group.

Order confirmations are posted against the ERP parent Operation.

Mapping

In SAP Digital Manufacturing, ERP routings containing sub-operations are mapped as follows:

ERP System	SAP Digital Manufacturing
Operation	Operation Group
Sub-operation	Operation Activity
BOM components assigned to an Operation	First Operation Activity of the Operation Group

SAP Digital Manufacturing operation activity IDs for the case of suboperations consist of the ERP operation ID (the first four digits) and the ERP sub-operation ID (the last four digits).

2.1.5.2.11 Batch Characteristics Update

You can update batch characteristic values in SAP Digital Manufacturing for execution and synchronize the data to SAP ERP or SAP S/4HANA.

For an overview of prerequisites and the steps required to update batch characteristics, see Updating Batch Characteristics.

2.1.5.2.12 Batch Creation

You can transfer batch numbers created in SAP Digital Manufacturing for execution to SAP ERP or SAP S/4HANA.

The batch creation message is triggered when batch number is created in SAP Digital Manufacturing for execution. For an overview of prerequisites and the steps required to create batch numbers, see Creating Batch Numbers.

2.1.5.2.13 Inspection Characteristics Integration (Process Order and Production Order)

You can transfer inspection characteristics of an order from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution.

Prerequisites

SAP ERP or SAP S/4HANA

- An order exists for the material.
- QM is active for the material to be inspected. That means that in the inspection setup in the material master, the following applies:
  - An inspection type is active for inspection lot origin `03` (inspection during production)

    - The other indicators for the inspection type are set appropriately to meet your requirements for inspection lot processing.
- Inspection characteristics were created and assigned to one or more operations (production order) / one or more phases (process order) used in the order.

> **Note**
>
> In an integrated ERP system, you can create an additional value range, called first range, so that the inspection results recorded in SAP Digital Manufacturing are checked against two value ranges: the standard range and the first range.

> **Note**
>
> You can use after acceptance or rejection characteristics that are defined in an integrated ERP system. The acceptance or rejection characteristic is a conditional characteristic that depends on the valuation results of the previous mandatory characteristic in the same operation.
>
> Acceptance or rejection characteristics are supported for production orders from SAP ERP or SAP S/4HANA in the *Order POD* and the *Work Center POD*.

SAP Digital Manufacturing

- The *Order POD*, for process industry, or the *Work Center POD*, for discrete industry, are already configured with the Quality Inspection Characteristic List and the Quality Inspection Results plugins.
- You have deployed the following artifacts in *SAP S/4HANA Integration with SAP Digital Manufacturing Cloud* package in SAP Cloud Integration:
    - *API_INSPECTIONCATALOG_SRV*
    - *API_INSPECTIONLOT_SRV*
    - *API_CHARCATTRIBUTECATALOG_SRV*

Procedure

An inspection during production is triggered by the release of an order.

1. Release the order in SAP ERP or SAP S/4HANA.
2. Check and release the respective order in the *Manage Orders* app.
3. Check whether the inspection characteristics are available:
    - In the *Order POD*, select a specific order and you can verify the inspection characteristics of a specific operation / phase on the *Quality Inspection Characteristic List* tab.
    - In the *Work Center POD*, select a specific SFC and you can verify the inspection characteristics of a specific operation on the *Quality Inspection Characteristic List* tab.

Related Information

Inspection Results Recording (Process Order and Production Order) [page 229]

2.1.5.2.14 Inspection Results Recording (Process Order and Production Order)

You can record inspection results and sychronize the data from SAP Digital Manufacturing to SAP ERP or SAP S/4HANA.

Prerequisites

SAP ERP or SAP S/4HANA

Inspection characteristics have been transferred from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing. For more information, see Inspection Characteristics Integration (Process Order and Production Order) [page 227].

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> **Note**
>
> For more information on the supported message types and needed integration artifacts, see 3050090.

- The *Order POD*, the *Work Center POD*, or the *Operation Activity POD* is already configured with the Quality Inspection Results and the Quality Inspection Characteristic List plugins.
- You've deployed the following integration workflow and artifacts in *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration:
  - *Inspection Results Recording V2 integration* integration workflow

    > **Note**
    >
    > To deactivate the automatic valuation functionality that brings back to SAP Digital Manufacturing the acceptance or rejection from the integrated ERP system, you need to comment out the `<closed>` tag and the `<evaluation>` tag in this integration workflow.

  - *API_INSPECTIONCATALOG_SRV*
  - *API_INSPECTIONLOT_SRV*
  - *API_CHARCATTRIBUTECATALOG_SRV*
- You've mapped the *ERP_SYNC_INSP_RESULT_V2* directive to the *COLLABORATION_SYNC_INSP_RESULT* link in the *Manage Collaboration Links* app.

Procedure

For the procedure applying to process and production orders in the *Order POD*, see Recording Quality Inspection Results.

For the procedure applying to production orders in the *Work Center POD*, see Recording Quality Inspection Results.

> **Note**
>
> Serial numbers are supported for production orders processed in the *Work Center POD* and the *Operation Activity POD*.
>
> For any limitations that might exist in your scenario, see 3379404.

Related Information

Inspection Characteristics Integration (Process Order and Production Order) [page 227]

2.1.5.2.15 Work Instruction (DMS Document) Integration

This function lets you transfer the document info records from SAP ERP to create work instructions in SAP Digital Manufacturing for execution.

In particular, you can do the following:

- Transfer document info records attached to the production order
- Transfer document info records attached to routing operations

For more information about transferring document info records that are attached to the production order, see Configuring a Production Order with Document Info Records [page 180].

2.1.5.2.16 Transfer of Floor Stock Data

You can transfer floor stock data for certain goods movement types from an SAP ERP or SAP S/4HANA system to SAP Digital Manufacturing. You can use the transaction MIGO to trigger goods movements from the central storage location to the production storage location.

Use

> **Note**
>
> To use this functionality, you need to verify or update your integration configuration. For more information, see Updating Integration Configuration to Use Floor Stock Data [page 237].

> **Note**
>
> To ensure data consistency, you need to make some additonal configuration for your storage locations in ERP system. In SAP S/4HANA or SAP ERP, go to *SPRO* > *Production* > *Integration with Manufacturing*

Execution System > *Specify Production Storage Locations for an MES* >, and maintain your storage location with:

- Business system set as the business system for SAP Digital Manufacturing
- Type set as *Inventory management only by incoming transfer postings*

The storage location configured as such only supports incoming goods movement `311`. So, if you still want to post goods movement `261`, make sure that not all storage locations are configured this way.

The above settings apply to individual inventory management mode. If you're using the consolidated inventory management mode, you only need to set the business system as the business system for SAP Digital Manufacturing.

Consolidated Inventory Management Mode

If you've enabled *Consolidated* inventory management mode, all standard goods movement types in SAP S/4HANA are supported in SAP Digital Manufacturing . However, for integration with SAP ERP, only goods movement types that are relevant to *Unstricted-Use Stock* (`01`) are supported.

> **Note**
>
> For consolidated inventory management mode, you need to enable the `API_MATERIAL_STOCK_SRV` technical service in SAP S/4HANA.

In consolidated mode, an inbound goods movement triggers the *ERP Stock Read* request within the *Inventory Download* message to synchronize the ERP stock information to the system. This is realized by updating existing stocks or creating new inventory IDs in the system. However, the system handles the following goods movement types in a slightly different way:

- `261`: Floor stock receipt for order (production orders and process orders).
- `261E`: Floor stock receipt for order (production orders and process orders) and sales order

Although these goods movement types indicates inventory consumption in the integrated ERP system, when they are posted, inventory IDs are created in SAP Digital Manufacturing. These newly created stocks are reserved for corresponding orders.

> **Note**
>
> When you use consolidation mode and download an `INVCON03` or `INVCON02` IDoc with multiple material items, SAP Digital Manufacturing can split the incoming message into several *Inventory Download* integration messages.
>
> For this message split scenario to work, you need to update your *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration and deploy the integration flow *Inventory split request*. In the *Manage Integration Workflows* app, input `INVCON_SPLIT_REQUEST` in the field *Custom Service Workflow*, under *Service Stage Configuration*, of the *Inventory Download (INVCON03)* integration workflow. For more information, see Manage Integration Workflows.

Individual Inventory Management Mode

If you've enabled *Individual* inventory management mode, the following goods movement types are supported.

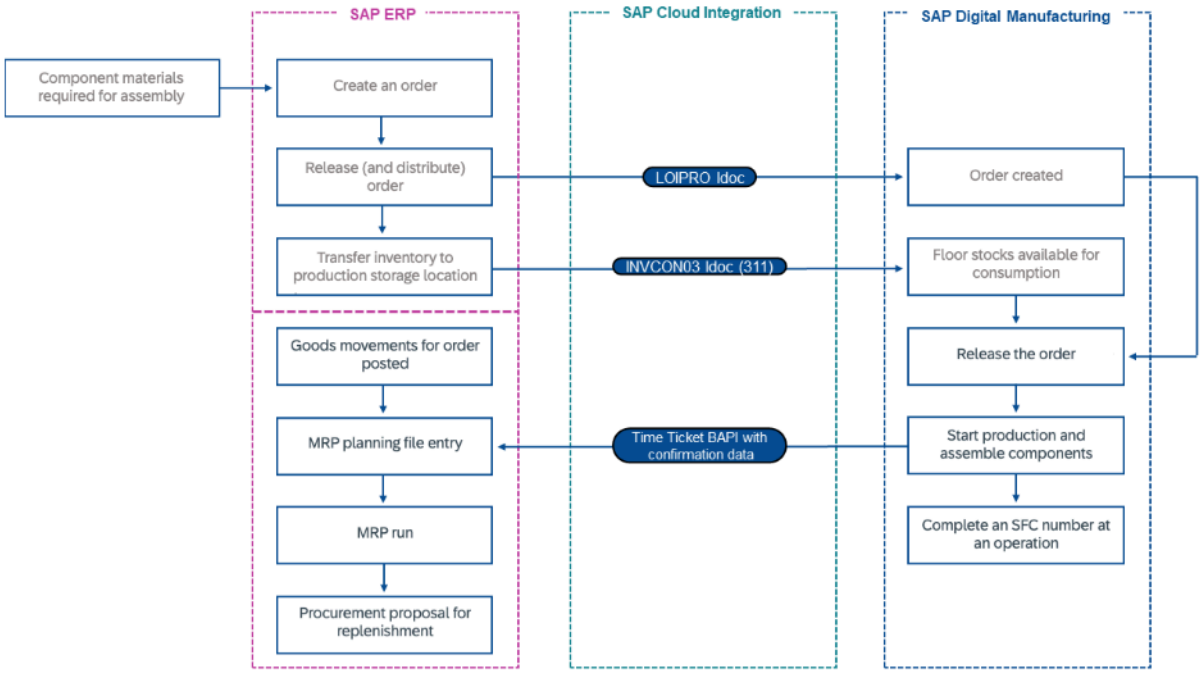
Inbound Integration

Goods Movement Types	Scenario
261	Floor stock receipt for order (production orders and process orders)
311	Floor stock receipt
311E	Floor stock receipt for sales order
411E	Floor stock transfer from sales order stock to own stock
413E	Floor stock transfer from one sales order stock to another sales order stock

Outbound Integration

Goods Movement Type	Scenario
261	Floor stock consumption for order (production orders and process orders)
261E	Floor stock consumption for sales order
262	Floor stock return for order (production orders and process orders)
312	Floor stock return
551	Goods issue for scrapping

Floor Stock Receipt (replenishment, goods movement type `311`)



The process for floor stock receipt without reservation (`311`) assumes that the goods are moved from a warehouse location to a production location, so that they can be used during the production process. These quantities are recorded and sent to SAP ERP or SAP S/4HANA as part of the production confirmation for consumption against the order.

- When you post a transfer of unrestricted-use stock from a central (issuing) storage location to a production storage location in SAP ERP or SAP S/4HANA using the goods movement type `311E` (transaction `MIGO`), the integrated ERP system triggers the IDoc `INVCON03`. This integrates the stock to the production storage location in SAP Digital Manufacturing. An *Inventory ID* is created to the new inventory.
  If the material is batch-managed, the *Batch Number* is also created and displayed in the new inventory. If you have serialized materials and want to download the serial number along with the stock transfer, as well as view the *Serial Number* in the new inventory, refer to the *Prerequisites* session below for more information.
- The inventory is ready for consumption without reservations.

When yield /scrap collaboration is triggered, the system sends a confirmation to the integrated ERP system to report consumed components.

Order-Specific Consumption (goods movement type `261`)

The process of floor stock receipt with reservation (`261`) assumes that the goods are issued from a warehouse location (central storage location) to an order consumption.

Goods consumption happens when a material leaves the storage location. This consumption creates an inventory ID in SAP Digital Manufacturing . This inventory ID is consumed during assembly but this information isn't reported to the integrated ERP systems, because the consumption has already happened.

- When you post a goods issue from a central storage location to a order in SAP ERP or SAP S/4HANA with the goods movement type `261` (transaction `MIGO`), the stock data is transferred through the `INVCON03` IDoc for order pegging in SAP Digital Manufacturing .
- SAP ERP or SAP S/4HANA performs the goods issue to the respective order.

- SAP ERP or SAP S/4HANA triggers the IDoc `INVCON03` to integrate the floor stock to the production storage location in SAP Digital Manufacturing with *Inventory ID* created and the reserved *Order* attached to the new inventory.
  If the material is batch-managed, the *Batch Number* is also created and displayed in the new inventory.
  If you have serialized materials and want to download the serial number along with the stock transfer, as well as view the *Serial Number* in the new inventory, refer to the **Prerequisites** session below for more information.
- The inventory is ready for consumption only for the reserved order .

Floor Stock Receipt (goods movement type `311E`)

The process of floor stock receipt for sales orders (`311E`) assumes that the goods are moved from a warehouse location (central storage location) to a production location with assigned sales orders, so that they can be used during the production process only for these sales orders.

- When you post a transfer of unrestricted-use stock from a central (issuing) storage location to a production storage location in SAP ERP or SAP S/4HANA using the goods movement type `311E` (transaction `MIGO`), the integrated ERP system triggers the IDoc `INVCON03`. This integrates the stock to the production storage location in SAP Digital Manufacturing. An *Inventory ID* is created, and the *Sales Order* and *Sales Order Item* are assigned to the new inventory.
  If the material is batch-managed, the *Batch Number* is also created and displayed in the new inventory.
  If you have serialized materials and want to download the serial number along with the stock transfer, as well as view the *Serial Number* in the new inventory, refer to the *Prerequisites* session below for more information.
- The inventory is ready for consumption only for the assigned sales order.

Floor Stock Transfer (goods movement type `411E`)

This process of floor stock transfer (`411E`) assumes that the goods are moved from sales order stock (stock reserved for sales orders) to own stock (stock without reservation), so that they can be used to manufacture products for any orders.

- When you post a transfer of unrestricted-use stock from sales order stock to own stock in SAP ERP or SAP S/4HANA using the goods movement type `411E` (transaction `MIGO`), the integrated ERP system triggers the IDoc `INVCON03`. This clears the stock reservation in SAP Digital Manufacturing. An *Inventory ID* is created, and the *Sales Order* and *Sales Order Item* are unassigned from the new inventory.
  If the material is batch-managed, the *Batch Number* is also created and displayed in the new inventory.
  If you have serialized materials and want to download the serial number along with the stock transfer, as well as view the *Serial Number* in the new inventory, refer to the *Prerequisites* session below for more information.
- The inventory is ready for consumption for any sales orders.

Floor Stock Receipt (goods movement type `413E`)

The process of floor stock transfer (`413E`) assumes that the goods are moved from one sales order stock to another sales order stock.

- When you post a transfer of unrestricted-use stock from one sales order stock to another sales order stock in SAP ERP or SAP S/4HANA using the goods movement type `413E` (transaction `MIGO`), the integrated ERP system triggers the IDoc `INVCON03`. This changes the stock reservation information in SAP Digital Manufacturing. The original inventory is updated, with the new *Sales Order* and *Sales Order Item* assigned to it.
  If the material is batch-managed, the *Batch Number* is also created and displayed in the new inventory.

If you have serialized materials and want to download the serial number along with the stock transfer, as well as view the *Serial Number* in the new inventory, refer to the *Prerequisites* session below for more information.

- The inventory is ready for consumption only for the newly assigned sales order.

Integration

- SAP ERP or SAP S/4HANA is the system of record for inventory management; SAP Digital Manufacturing is the system of record for floor stock management.
- A transfer posting in SAP ERP or SAP S/4HANA is used in the same way as a floor stock receipt in SAP Digital Manufacturing .
- For inventory ID records created in SAP Digital Manufacturing through the integration, the database field `ERP_INVENTORY` is equal to true.
- Floor storage location exists in both SAP ERP or SAP S/4HANA (`LGORT`) and SAP Digital Manufacturing (*Storage Location*); the *Receiving Storage Location* (`UMLGO`) exists only in SAP ERP.
- This function supports long material numbers (see Transfer of Long Material Number in the SAP Help Portal).

Prerequisites

SAP ERP or SAP S/4HANA

- You've created production storage locations for floor stock materials.
- You've set up ALE communication to create and transmit `INVCON03` IDocs. For more information, see Data Replication Framework [page 37].
- If you use SAP ERP 6.05 (with activated business functions `LOG_PP_MES_INT_01` and `LOG_PP_MES_INT_02`) or later, you've maintained integration of goods movements (see SAP Note 1555198).
- You've set up a filter for the goods movement type `261` and `311` (see Customizing for ALE Communication on the SAP Help Portal).
- You've created a BOM for the finished good material of the order.
- If you want to transfer stocks for serialized materials, ensure you've added a new segment specifically for serial numbers under the segment `E1ICIT` in the extended IDoc for `INVCON03`. The IDoc `INVCON03` doesn't support serial numbers by default, so you need to add this extension and also make other corresponding customizations to include serial numbers in the goods movements. For more information, see SAP Note 3452935.

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- You've created and configured data type for floor stock integration.
- For materials to be received into floor stock and assembled, you've specified the following in the *Manage Materials* app:
  - *Data to Collect on Assembly*: `INV` or `INV_SFC`
- You've created a storage location matching SAP ERP or SAP S/4HANA *Putaway Storage Location* (see Mapping a Production Order [page 270]).

- For the order-specific consumption scenario, you've created or imported shop order data so that components can be pegged (see Production Order Integration [page 172]).
- You've defined a numbering pattern for the number type floor stock receipt (see Configuring a Production Order with Serial Numbers [page 176]).
- For the outbound integration with Inventory Management (IM), you've mapped the following collaboration links to respective directives depending on your requirements in the *Manage Collaboration Links* app.
  - The link `COLLABORATION_ERP_INV_CLEAR_RESERVATION` is mapped to the directive `ERP_INVENTORY_CLEAR_RESERVATION`.
  - The link `COLLABORATION_ERP_SCRAP_CONFIRMATION` is mapped to the directive `ERP_SCRAP_CONFIRMATION`.
  - The link `COLLABORATION_ERP_YIELD_CONFIRMATION` is mapped to the directive `ERP_YIELD_CONFIRMATION_V2`. For more information, see 3420816.
  - The link `COLLABORATION_SFC_COMPONENT_ADD` is mapped to the directive `ERP_COMPONENT_ADD`.
- If you've enabled EWM integration, configure the following collaboration links.
  - The link `EWM_COLLABORATION_COMPONENT_ADD` is mapped to the directive `EWM_COMPONENT_ADD`.
  - The link `EWM_COLLABORATION_CONTAINER_CLOSE` is mapped to the directive `EWM_CONTAINER_CLOSE_CONFIRMATION`.
  - The link `EWM_COLLABORATION_SFC_DISPOSITION` is mapped to the directive `EWM_SFC_DISPOSITION`.
  - The link `EWM_COLLABORATION_YIELD_CONFIRMATION` is mapped to the directive `EWM_GOODS_ISSUE_POST`.

2.1.5.2.16.1 Configuring Floor Stocks

This section describes how to transfer floor stocks from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution to create corresponding floor stock records in the *Manage Floor Stocks* app.

Prerequisites

SAP ERP or SAP S/4HANA

- You have created floor stock materials you want to transfer.
- You have created central storage locations and production storage locations for the floor stock materials.
- You have set up ALE communication to create and transmit `INVCON03` IDocs.
- You have defined the DRF Replication Model to replicate `INVCON03` IDocs. For more information, see Data Replication Framework [page 37].

SAP Digital Manufacturing

- The floor stock materials are already downloaded from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing.
- You have created a production storage location matching ERP *Putaway Storage Location* (see Mapping a Production Order [page 270]).

- The collaboration link *COLLABORATION_BATCH_CHARACTERISTICS* is mapped to the directive *BATCH_CHARACTERISTICS* in the *Manage Collaboration Links* app.

Procedure

There are various methods to trigger the transfer of floor stocks. The following is one of the options.

1. Execute the transaction code `MIGO` to call up the *Transfer Posting* screen.
2. Transfer the floor stocks depending on your business requirements. The system supports the following scenarios.
   - Select *Transfer Posting* and *Other* with the goods movement type you want.
     - To transfer stocks for general usage, use the goods movement type `311`.
     - To transfer stocks allocated to a specific sales order, use the goods movement type `311E`.
     - To transfer stocks from sales order stock to own stock, use the goods movement type `411E`.
     - To transfer stocks from one sales order stock to another sales order stock, use the goods movement type `413E`.
   - To transfer stocks reserved for a specific production order, select *Goods Issue* and *Order* with goods movement type `261`.
3. Check and post the goods movement.
4. Verify the results in the *Manage Floor Stocks* app or the *Integration Message Dashboard* in SAP Digital Manufacturing.

Related Information

Integration Message Dashboard
Manage Floor Stocks

2.1.5.2.16.2 Updating Integration Configuration to Use Floor Stock Data

If you want to use floor stock integration functionality in SAP Digital Manufacturing, you need to update some settings in your configuration integration, as shown here.

The SaaS tenant of your system must generate a new service instance and key for `Digital Manufacturing Cloud Services`.

These are required for authentication in SAP Cloud Integration. You need to manually transfer this new service instance and key as described here.

Prerequisites

- You have set up the SAP Cloud Connector.
- You have carried out the necessary steps in Integration with SAP S/4HANA or SAP ERP [page 10].

Steps

1. Go to the SaaS tenant of your system and generate a new service instance and key for digital-manufacturing-services-**. Note down the `clientid` and `clientsecret` under the `uaa` tag.
2. Configure SAP Cloud Integration to connect with SAP Digital Manufacturing for execution.
   1. Go to your SAP Cloud Integration tenant. In the side menu bar, choose *Operations View* and then choose *Security Material* in *Manage Security* group.
   2. Add *User Credentials* with the *Name*: CF_AUTH, the *User*: `clientid`, and the *Password*: `clientsecret`.
3. Assign the collaboration directive *ERP_INVENTORY_CLEAR_RESERVATION* to the collaboration link *COLLABORATION_ERP_INV_CLEAR_RESERVATION* for the inventory Return and Scrap activity.

Result

You can now use the floor stock functionality as described in this chapter.

Related Information

Setting Up the Cloud Connector [page 23]

2.1.5.2.16.3 Transfer of Floor Stock Return and Scrap Data

You can transfer floor stock return and scrap data from SAP Digital Manufacturing to SAP ERP or SAP S/4HANA.

Use

> ⓘ Note
>
> To use this functionality, you need to verify or update your integration configuration. For more information, see Updating Integration Configuration to Use Floor Stock Data [page 237].

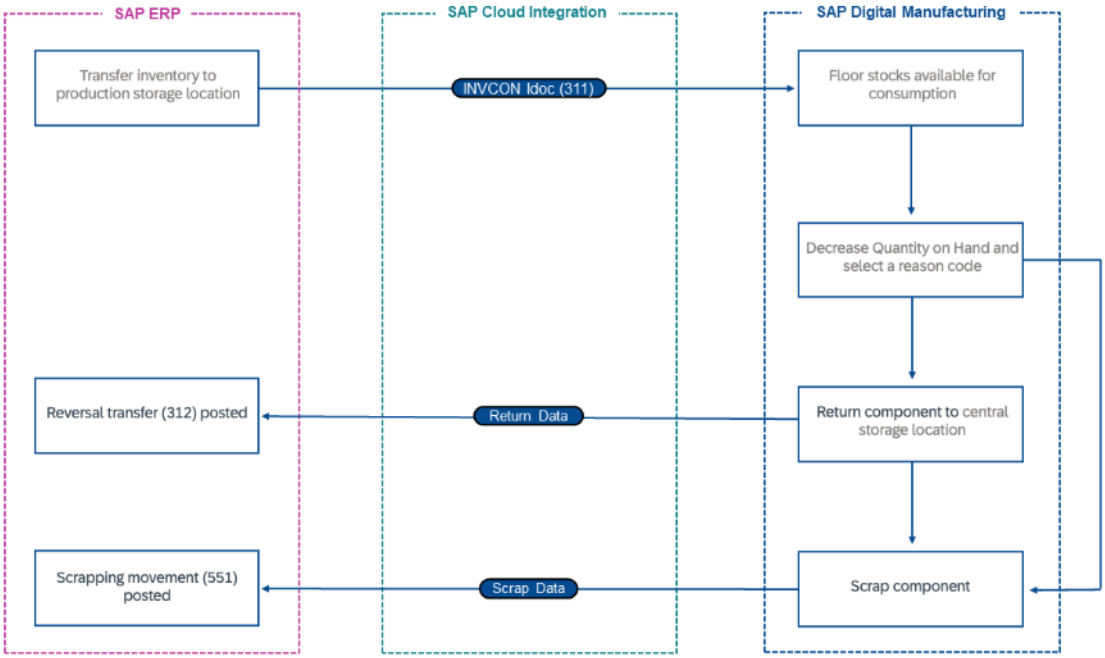
In SAP Digital Manufacturing, you can trigger the floor stock return to a central storage location or scrap stocks using repsective reason codes in the *Manage Floor Stocks* app.

In the ERP system, the floor stock is increased in the central storage location according to the return request. The inventory in the production storage location is decreased according to the return and scrap request.

The following scenarios are supported:

Order-Independent Floor Stock (311) Return (312) and Scrap (551)

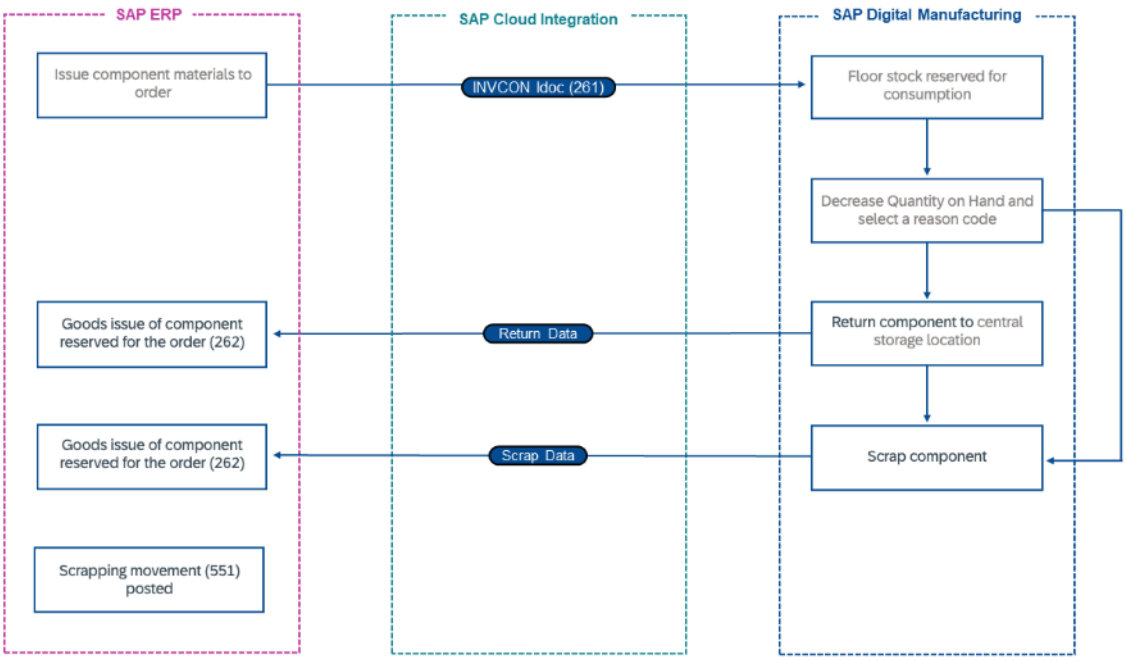
The graphic below shows the flow of floor stock return and scrap processes for stocks that are not reserved for any orders (production orders and process orders).



- The components are returned to the central storage location.
  SAP ERP or SAP S/4HANA posts a goods movement of the type `312`, the reversal of a one-step transfer posting.
- The components are scrapped.
  SAP ERP or SAP S/4HANA posts a scrapping movement of the type `551`.

Order-Specific Floor Stock (261) Return (262) and Scrap (551)

The graphic below shows the flow of floor stock return and scrap processes for stocks reserved for specific orders (production orders and process orders).



- The order componentes are returned to central storage location.
  SAP ERP or SAP S/4HANA reverses a goods issue of the order components with movement type `262`.
- The components are scrapped.
  SAP ERP or SAP S/4HANA scraps the order components.
- SAP ERP or SAP S/4HANA reverses a goods issue of the order components with movement type `262`, then posts a scrapping movement (type `551`).

Integration

- SAP ERP or SAP S/4HANA is the system of record for inventory management. SAP Digital Manufacturing is the system of record for floor stock management.
- SAP Cloud Integration is used as the connector between the SAP Digital Manufacturing and the SAP ERP or SAP S/4HANA floor stock control process for returning inventory and scrap.

Prerequisites

SAP Digital Manufacturing

- You have received floor stock data from SAP ERP or SAP S/4HANA.
- You have verified the pre-defined reason codes.
- The collaboration `COLLABORATION_ERP_INV_CLEAR_RESERVATION` is mapped to the directive ERP_INV_CLEAR_RESERVATION in the *Manage Collaboration Links* app. This initiates the data synchronization to the integrated ERP system.

SAP ERP or SAP S/4HANA

You have created a cost center for reporting material scrap quantities.

Activities

When you decrease the value of the *Quantity on Hand* field for an inventory ID, enter a reason code and choose *Save* in the *Manage Floor Stocks* app. The system sends a message to SAP ERP or SAP S/4HANA to post the corresponding goods movements.

If the reason code has the prefix `RTN-`, the component quantity is returned to SAP ERP or SAP S/4HANA central storage locations. If the reason code has the prefix `SCR-`, the component quantity is scrapped.

2.1.5.2.17 Time Tracking Integration

You can transfer time tracking data from SAP Digital Manufacturing to your integrated ERP system.

Overview

The integration of time tracking with your ERP system enhances data accuracy, and provides a holistic view of workforce and resource utilization as well production performance. It enables you to better manage production costs, improve efficiency, and make informed decisions.

Integration Scenarios

There are a number of integration scenarios that you can configure:

- Transfer direct labor for production, process, and service orders when you approve time records.
- Cancel the approval of time records for production, process, and service orders.
- Transfer production time for production and process orders when you approve time records.
- Cancel the approval of time records for production time for production and process orders.
- Transfer indirect labor to the SAP Cross-Application Time Sheet when you approve time records.
- Cancel the approval of time records for indirect labor.

2.1.5.2.17.1 Transferring Direct Labor Confirmations for Production Orders

Efficiently manage production orders in your integrated ERP system by tracking direct labor performed for production orders.

Overview

You record direct labor for production orders. After you approve a time record for direct labor, the system transfers the relevant data such as the duration and the operation to your integrated ERP system. For this to happen, you need to put the configuration in place as described below.

Prerequisites

SAP S/4HANA

You've integrated SAP Digital Manufacturing with your ERP system to transfer production orders. For more information, refer to Production Order Integration [page 172].

> ⓘ Note
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

SAP Digital Manufacturing

- You're tracking direct labor for production orders in the POD using the *Labor On* and *Labor Off* plugins.
- You've implemented the following collaboration link and directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
`COLLAB_TT_DIRECT_LABOR_RECORD_PROD_APPRV`	`ERP_TT_DIRECT_LABOR_RECORD_PROD_CRT`

Procedure

1. In SAP Digital Manufacturing, in the *Manage Time Tracking* app, approve a time record for the activity type *Direct Labor* for the *Order Category* `Production Order`.
   The *TT Approve Direct Labor Time for PROD* message is sent to the integrated ERP system.
2. To verify whether the *TT Approve Direct Labor Time for PROD* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *TT Approve Direct Labor Time for PROD* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your time tracking record that you can find in the *Integration Message Dashboard*. For more information, see Monitoring Message Processing.

Related Information

Mapping a Confirmation of Direct Labor or Production Time for a Production or Process Order [page 351]

2.1.5.2.17.2 Transferring Direct Labor Confirmations for Process Orders

Efficiently manage process orders in your integrated ERP system by tracking the direct labor you perform for these orders.

Overview

You record direct labor for process orders. After you approve a time record for direct labor, the system transfers the relevant data such as the duration and the operation to your integrated ERP system. For this to happen, you need to put the configuration in place as described below.

Prerequisites

SAP S/4HANA

You've integrated SAP Digital Manufacturing with your ERP system to transfer process orders. For more information, refer to Process Order Integration [page 198].

> **Note**
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

SAP Digital Manufacturing

- You're tracking direct labor for production orders in the POD using the *Labor On* and *Labor Off* plugins.
- You've implemented the following collaboration link and directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
`COLLAB_TT_DIRECT_LABOR_RECORD_PROC_APPRV`	`ERP_TT_DIRECT_LABOR_RECORD_PROC_CRT`

Procedure

1. In SAP Digital Manufacturing, in the *Manage Time Tracking* app, approve a time record for the activity type *Direct Labor* for the *Order Category* **`Process Order`**.
   The *TT Approve Direct Labor Time for PROD* message is sent to the integrated ERP system.
2. To verify whether the *TT Approve Direct Labor Time for PROC* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *TT Approve Direct Labor Time for PROC* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your time tracking record that you can find in the *Integration Message Dashboard*. For more information, see Monitoring Message Processing.

Related Information

Mapping a Confirmation of Direct Labor or Production Time for a Production or Process Order [page 351]

2.1.5.2.17.3 Transferring Direct Labor Confirmations for Service Orders

Efficiently manage service orders in your ERP system by tracking direct labor performed for service orders.

Overview

You record direct labor for service orders. After you approve a time record for direct labor, the system transfers the relevant data such as the duration and the operation to your integrated ERP system. For this to happen, you need to put the configuration in place as described below.

Prerequisites

SAP S/4HANA

You've integrated SAP Digital Manufacturing with your ERP system to transfer service orders. For more information, refer to Service Order Integration [page 210].

> ⓘ Note
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

SAP Digital Manufacturing

- You're tracking direct labor for service orders in the POD using the *Labor On* and *Labor Off* plugins.
- You've implemented the following collaboration link and directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
`COLLAB_TT_DIRECT_LABOR_RECORD_SRV_APPRV`	`ERP_TT_DIRECT_LABOR_RECORD_SRV_CRT`

Procedure

1. In SAP Digital Manufacturing, in the *Manage Time Tracking* app, approve a time record for the activity type *Direct Labor* for the *Order Category* `Service Order`.
   The *TT Approve Direct Labor Time for SRV* message is sent to the integrated ERP system.
2. To verify whether the *TT Approve Direct Labor Time for SRV* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *TT Approve Direct Labor Time for SRV* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your time tracking record that you can find in the *Integration Message Dashboard*. For more information, see Monitoring Message Processing.

Related Information

Mapping a Confirmation of Direct Labor for a Service Order [page 350]

2.1.5.2.17.4 Canceling the Approval of Direct Labor for Service Orders

Find out how to cancel the approval of direct labor for service orders in your integrated ERP system and SAP Digital Manufacturing.

Overview

You track direct labor for service orders. You've approved a time record for direct labor, and the system has transferred the relevant data to your integrated ERP system. You want to cancel the approval in both SAP Digital Manufacturing and your integrated ERP system. For this to happen, you need to put the configuration in place as described below.

Prerequisites

SAP S/4HANA

- You've configured your system to enable the transfer of direct labor time for service orders. For more information, refer to Transferring Direct Labor Confirmations for Service Orders [page 245].

> **Note**
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

SAP Digital Manufacturing

- You've set up your system to enable the transfer of direct labor time for service orders. For more information, refer to Transferring Direct Labor Confirmations for Service Orders [page 245].
- You've approved time records for direct labor for service orders.
- You've implemented the following collaboration link and directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
`COLLAB_TT_DIRECT_LABOR_RECORD_SRV_CANCEL`	`ERP_TT_DIRECT_LABOR_RECORD_SRV_CANCEL`

Procedure

1. In SAP Digital Manufacturing, in the *Manage Time Tracking* app, cancel a time record for the activity type *Direct Labor* for the *Order Category* **`Service Order`**.
   The *TT Cancel Direct Labor Time for SRV* message is sent to the integrated ERP system.
2. To verify whether the *TT Cancel Direct Labor Time for SRV* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *TT Cancel Direct Labor Time for SRV* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your time tracking record that you can find in the *Integration Message Dashboard*. For more information, see Monitoring Message Processing.

Related Information

Mapping a Cancellation of Direct Labor Time for a Service Order [page 352]

2.1.5.2.17.5 Transferring Production Time for Production Orders

Find out how to transfer production time for production orders to your integrated ERP system to improve real-time visibility, costing, and scheduling.

Overview

You track production time for production orders. After you approve a time record for production time, the system transfers the relevant data such as the duration and standard value to your integrated ERP system. For this to happen, you need to put the configuration in place as described below.

Prerequisites

SAP S/4HANA

- You've transferred work centers and their standard value parameters from your ERP system. For more information, refer to Transferring a Work Center [page 162].
- You've integrated SAP Digital Manufacturing with your ERP system to transfer production orders. For more information, refer to Production Order Integration [page 172].

> **Note**
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

SAP Digital Manufacturing

- You're tracking production time for production orders in the POD using the *Production Time On* and *Production Time Off* plugins.
- In the *POD Designer*, you've configured the *Production Time On* plugin to use standard value keys.
- You've implemented the following collaboration link and directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
`COLLAB_TT_PROD_TIME_RECORD_PROD_ APPRV`	`ERP_TT_PROD_TIME_RECORD_PROD_CRT`

Procedure

1. In SAP Digital Manufacturing, in the *Manage Time Tracking* app, approve a time record for the activity type *Production Time* for the *Order Category* `Production Order`.
   The *TT Approve Production Time for PROD* message is sent to the integrated ERP system.
2. To verify whether the *TT Approve Production Time for PROD* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *TT Approve Direct Labor Time for PROD* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your time tracking record that you can find in the *Integration Message Dashboard*. For more information, see Monitoring Message Processing.

Related Information

Mapping a Confirmation of Direct Labor or Production Time for a Production or Process Order [page 351]

2.1.5.2.17.6 Transferring Production Time for Process Orders

Learn how to transfer production time for process orders to your ERP system for improved visibility, costing, and scheduling.

Overview

You track production time for process orders. After you approve a time record for production time, the system transfers the relevant data such as the duration and standard value to your integrated ERP system. For this to happen, you need to put the configuration in place as described below.

Prerequisites

SAP S/4HANA

- You've integrated SAP Digital Manufacturing with your ERP system to transfer production orders. For more information, refer to Process Order Integration [page 198].
- You've transferred work centers and their standard value parameters from your ERP system. For more information, refer to Transferring a Work Center [page 162].

> **Note**
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

SAP Digital Manufacturing

- You're tracking production time for process orders in the POD using the *Production Time On* and *Production Time Off* plugins.
- In the *POD Designer*, you've configured the *Production Time On* plugin to use standard value keys.
- You've implemented the following collaboration link and directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
`COLLAB_TT_PROD_TIME_RECORD_PROC_APPRV`	`ERP_TT_PROD_TIME_RECORD_PROC_CRT`

Procedure

1. In SAP Digital Manufacturing, in the *Manage Time Tracking* app, approve a time record for the activity type *Production Time* for the *Order Category* **`Process Order`**.
   The *TT Approve Production Time for PROC* message is sent to the integrated ERP system.
2. To verify whether the *TT Approve Production Time for PROC* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *TT Approve Direct Labor Time for PROC* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your time tracking record that you can find in the *Integration Message Dashboard*. For more information, see Monitoring Message Processing.

Related Information

Mapping a Confirmation of Direct Labor or Production Time for a Production or Process Order [page 351]

2.1.5.2.17.7 Canceling the Approval of Direct Labor or Production Time for Production Orders

Find out how to cancel the approval of direct labor or production time for production orders in your integrated ERP system and SAP Digital Manufacturing.

Overview

You track direct labor or production time for production orders. You've approved a time record for direct labor or production time, and the system has transferred the relevant data to your integrated ERP system. You want to cancel the approval in both SAP Digital Manufacturing and your integrated ERP system. For this to happen, you need to put the configuration in place as described below.

Prerequisites

SAP S/4HANA

- You've configured your system to enable the transfer of direct labor or production time for production orders. For more information, refer to Transferring Direct Labor Confirmations for Production Orders [page 242], respectively Transferring Production Time for Production Orders [page 248].

> ⓘ Note
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

SAP Digital Manufacturing

- You've set up your system to enable the transfer of direct labor or production time for production orders. For more information, refer to Transferring Direct Labor Confirmations for Production Orders [page 242], respectively Transferring Production Time for Production Orders [page 248].
- You've approved time records for direct labor or production time for production orders.
- You've implemented the following collaboration link and directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
COLLAB_TT_DLR_PTR_PROD_CANCEL	ERP_TT_DLR_PTR_PROD_CANCEL

Procedure

1. In SAP Digital Manufacturing, in the *Manage Time Tracking* app, cancel a time record for the activity type *Direct Labor* or *Production Time* for the *Order Category* **`Production Order`**.
   The *TT Cancel Direct Labor and Production Time for PROD* message is sent to the integrated ERP system.
2. To verify whether the *TT Cancel Direct Labor and Production Time for PROD* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *TT Approve Direct Labor Time for PROD* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your time tracking record that you can find in the *Integration Message Dashboard*. For more information, see Monitoring Message Processing.

Related Information

Mapping a Cancellation of Direct Labor or Production Time for Production or Process Orders [page 353]

2.1.5.2.17.8 Canceling the Approval of Direct Labor or Production Time for Process Orders

Find out how to cancel the approval of direct labor or production time for process orders in your integrated ERP system and SAP Digital Manufacturing.

Overview

You track direct labor or production time for process orders. You've approved a time record for direct labor production time, and the system has transferred the relevant data to your integrated ERP system. You want to cancel the approval in both SAP Digital Manufacturing and your integrated ERP system. For this to happen, you need to put the configuration in place as described below.

Prerequisites

SAP S/4HANA

- You've configured your system to enable the transfer of direct labor or production time for process orders. For more information, refer to Transferring Direct Labor Confirmations for Process Orders [page 243], respectively Transferring Production Time for Process Orders [page 249].

> **Note**
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

SAP Digital Manufacturing

- You've set up your system to enable the transfer of direct labor or production time for process orders. For more information, refer to Transferring Direct Labor Confirmations for Process Orders [page 243], respectively Transferring Production Time for Process Orders [page 249].
- You've approved time records for direct labor or production time for process orders.
- You've implemented the following collaboration link and directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
`COLLAB_TT_DLR_PTR_PROC_CANCEL`	`ERP_TT_DLR_PTR_PROC_CANCEL`

Procedure

1. In SAP Digital Manufacturing, in the *Manage Time Tracking* app, cancel a time record for the activity type *Direct Labor* or *Production Time* for the *Order Category* **`Process Order`**.
   The *TT Cancel Direct Labor and Production Time for PROC* message is sent to the integrated ERP system.
2. To verify whether the *TT Cancel Direct Labor and Production Time for PROC* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *TT Cancel Direct Labor and Production Time for PROC* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your time tracking record that you can find in the *Integration Message Dashboard*. For more information, see Monitoring Message Processing.

Related Information

Mapping a Cancellation of Direct Labor or Production Time for Production or Process Orders [page 353]

2.1.5.2.17.9 Transferring Indirect Labor Activities to the SAP Cross-Application Time Sheet

Efficiently manage indirect labor in your integrated ERP system and SAP Digital Manufacturing by accurately tracking activities such as setup, cleaning, or maintenance.

Overview

You record indirect labor activities, such as setup, cleaning, or maintenance, during production. After you approve a time record for indirect labor, the system transfers the relevant data to the SAP Cross-Application Time Sheet in your integrated ERP system. For this to happen, you need to put the configuration in place as described below.

Prerequisites

SAP ERP / SAP S/4HANA

- You're using the SAP Cross-Application Time Sheet.
- You've created users that can record indirect labor activities.
- You've created a controlling area and a cost center. You've associated the cost center with the controlling area.
- You've created an activity type and assigned it to the cost center.
- You've created an internal order and defined appropriate settlement rules.

> ⓘ Note
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

SAP Digital Manufacturing

- You've assigned an *ERP Personnel Number* to the employee who records the indirect labor in the *Manage User Assignments* app. The *ERP Personnel Number* is the personnel number of the employee in your integrated ERP system.
- You've assigned an *ERP Internal Order* and an *ERP Activity Type* to the indirect labor activity in the *Configure Time Tracking* app.
- You've assigned an *ERP Controlling Area* and an *ERP Cost Center* to the work center in the *Manage Work Centers* app. In order to assign these values, you need to add custom fields to the app. For more information, refer to Create Custom Fields for Time Tracking Integration [page 256].
- You've implemented the following collaboration link and directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
COLLAB_TT_INDIRECT_LABOR_RECORD_APPRV	ERP_TT_INDIRECT_LABOR_RECORD_CRT

Procedure

1. In SAP Digital Manufacturing, in the *Manage Time Tracking* app, approve a time record for the activity type *Indirect Labor*.
   The *TT Approve Indirect Labor Time* message is sent to the integrated ERP system.
2. To verify whether the *TT Approve Indirect Labor Time* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *TT Approve Indirect Labor Time* message. For more information, see Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your time tracking record that you can find in the *Integration Message Dashboard*. For more information, see Monitoring Message Processing.

Related Information

Mapping an Indirect Labor Activity and the SAP Cross-Application Time Sheet [page 349]

2.1.5.2.17.9.1 Create Custom Fields for Time Tracking Integration

Learn how to create custom fields required for the integration of indirect labor activities with your ERP system.

Context

To transfer data for indirect labor activities to the SAP Cross-Application Time Sheet in your integrated ERP system, you need to create two custom fields. You use these fields to extend the *Manage Work Centers* app.

Procedure

1. On the SAP Digital Manufacturing launchpad, open the *Manage Custom Data* app.
2. In the sidebar, choose *Work Center* and then *Add*.
3. In the *Create Custom Field* dialog under *Data Field*, enter **`ERP_COST_CENTER`**.
4. Enter a *Field Label* of your choice and choose *Save*.
5. Choose *Add* to create a second field.
6. In the *Create Custom Field* dialog under *Data Field*, enter **`ERP_CONTROLLING_AREA`**.
7. Enter a *Field Label* of your choice and choose *Save*.

Results

The system adds the custom fields to the *Manage Work Centers* app under the *Custom Data* tab.

2.1.5.2.17.10 Canceling the Approval of Indirect Labor Activities

Find out how to cancel the approval of indirect labor activities in your integrated ERP system and SAP Digital Manufacturing.

Overview

You track indirect labor activities. You've approved a time record for indirect labor, and the system has transferred the relevant data to your integrated ERP system. You want to cancel the approval in both SAP

Digital Manufacturing and your integrated ERP system. For this to happen, you need to put the configuration in place as described below.

Prerequisites

SAP ERP / SAP S/4HANA

- You've configured your system to enable the transfer of indirect labor activities. For more information, refer to Transferring Indirect Labor Activities to the SAP Cross-Application Time Sheet [page 254].

> **Note**
>
> For this scenario, SAP Digital Manufacturing doesn't convert the plant time (UTC) to the ERP time zone internally. Instead, the *Plant Settings* artifact in the *S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration handles the conversion. It uses the plant / time zone mapping that you define there. The *ERP Time Zone* field in the *Manage Business Settings* app doesn't control this process for the scenario mentioned here.

SAP Digital Manufacturing

- You've set up your system to enable the transfer of indirect labor activities. For more information, refer to Transferring Indirect Labor Activities to the SAP Cross-Application Time Sheet [page 254].
- You've approved time records for indirect labor activities.
- You've implemented the following collaboration link and directive in the *Manage Collaboration Links* and *Manage Collaboration Directives* apps:

Collaboration Link	Collaboration Directive
`COLLAB_TT_INDIRECT_LABOR_RECORD_CANCEL`	`ERP_TT_INDIRECT_LABOR_RECORD_CANCEL`

Procedure

1. In SAP Digital Manufacturing, in the *Manage Time Tracking* app, cancel the approval of a time record for the activity type *Indirect Labor*.
   The *TT Cancel Indirect Labor Time* message is sent to the integrated ERP system.
2. To verify whether the *TT Cancel Indirect Labor Time* message was transferred to the integrated ERP system, you've got two options:
   1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of your *TT Cancel Indirect Labor Time* message. For more information, refer to Integration Message Dashboard.
   2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of your integration message. You can search for the relevant artifacts using the correlation ID of your time tracking record

that you can find in the *Integration Message Dashboard*. For more information, refer to Monitoring Message Processing.

Related Information

Mapping a Cancellation of an Indirect Labor Activity [page 353]

2.1.5.3 Field Mapping for Integration to SAP ERP or SAP S/4HANA

This section describes what fields in an SAP ERP or SAP S/4HANA system are mapped to what fields in SAP Digital Manufacturing.

2.1.5.3.1 Inbound Communication

2.1.5.3.1.1 Mapping a Material

You can transfer material data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using the IDoc `MATMAS03`.

This table contains field names in SAP ERP and SAP S/4HANA and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
ERP ID (`SNDPRN`)	*SenderBusinessSystemID*	
Plant (`WERKS`)	*plant*	
Material (`MATNR_LONG`)	*material*	If `MATNR_LONG` is present, it's selected. **Note** The lot size isn't downloaded from the integrated SAP ERP or SAP S/4HANA system. By default, it's set to -1.000 in SAP Digital Manufacturing for execution. If a serial number profile is present, the lot size is set to 1.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Material (`MATNR`)	*material*	If `MATNR_LONG` isn't present, `MATNR` is selected.
Procurement Type (`BESKZ`)	*procurementType*	If `BESKZ` is 'E', `procurementType` is 'M'. If `BESKZ` is 'F', procurementType is 'P'. Otherwise, `procurementType` is 'B'.
Material Type (`MTART`)	*materialType*	If `MTART` is in the ERP payload, it's selected.
Material Description (`MAKTX`)	*description*	If there's a segment `../E1MAKTM[SPRAS=//SupportedPlant/Language]/MAKTX` that indicates specific languages, this string is selected. Otherwise, the string contained in `../E1MAKTM/MAKTX` is selected. **Note** You can only map material descriptions in languages supported by SAP Digital Manufacturing. Refer to 2722461 for an overview of supported languages. If you require a language that isn't supported, you can use mediated integration to transform your message content.
	multiLanguageDescriptionDTOList	Complex element that isn't available in the ERP payload. The system loops over each `E1MAKTM` segment.
Material Description (`MAKTX`)	*multiLanguageDescriptionDTO*	The `languageCode` attribute of the `multiLanguageDescriptionDTO` field is set to the `SPRAS` value of the corresponding `E1MAKTM` element.
Base unit of measure (`MEINS`)	*unitOfMeasure*	
Gross weight (`BRGEW`)	*grossWeight*	
Net weight (`NTGEW`)	*netWeight*	
Unit of weight (`GEWEI`)	*unitOfWeight*	
International article number (EAN/UPC) (`EAN11`)	*ean*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Category of international article number (EAN) (`NUMTP`)	*eanCategory*	
Batch management requirement indicator (`XCHPF`)	*incrementBatchNumber*	If `XCHPF` is 'X', `incrementBatchNumber` is set to 'ORDER'. Otherwise, `incrementBatchNumber` is set to 'NONE'.
MRP controller (`DISPO`)	*mrpController*	
Issue storage location (`LGPRO`)	*putawayStorageLocation*	If `BESKZ` is equal to 'E', the field `putawayStorageLocation` is created. **Note** The maximum field length allowed in SAP Digital Manufacturing for execution less than or equal to 4.
Issue storage location (`LGPRO`)	*productionStorageLocation*	If `BESKZ` equals 'F', the field `productionStorageLocation` is created. **Note** The maximum field length allowed in SAP Digital Manufacturing for execution less than or equal to 4.
Issue storage location (`LGPRO`)	*putawayStorageLocation* *productionStorageLocation*	If `BESKZ` is neither 'E' nor 'F', the fields `putawayStorageLocation` and `productionStorageLocation` are created. Both fields get the value of `LGPRO`. **Note** The maximum field length allowed in SAP Digital Manufacturing for execution less than or equal to 4.
Indicator: backflush (`RGEKZ`)	*erpBackflushing*	If `RGEKZ` is '1', `erpBackflushing` is set to 'true'. Otherwise, it's set to 'false'.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	alternateUomDTOList	Complex element that isn't available in ERP payload. The system loops over each `E1MARMM` segment.
	alternateUomDTO	Complex element that isn't available in ERP payload.
Numerator for conversion to base units of measure (`UMREZ`)	*quantity*	The `quantity` field gets a `unitCode` attribute, to which the value of the base unit of measure (`MEINS`) is assigned.
Denominator for conversion to base units of measure (`UMREN`)	*correspondingQuantity*	The `correspondingQuantity` field gets a `unitCode` attribute, to which the value of the alternative unit of measure for stockkeeping unit (`MEINH`) is assigned.
Gross weight (BRGEW)	*grossWeight*	
Unit of weight (GEWEI)	*unitOfWeight*	
	eanList	Complex element that isn't available in the ERP payload. The system loops over each `E1MEANM` segment.
International article number (EAN/UPC) (`EAN11`)	*eanDTO*	The `eanDTO` field gets a `category` attribute, to which the value of the category of international article number (EAN) (`EANTP`) is assigned. It also gets a `mainEanIndicator` attribute, to which the value of the main EAN indicator (`HPEAN`) is assigned.
Serial number profile (`SERNP`)	*serialNumbProfile*	
Total shelf life (`MHDHB`)	*maxShelfLife*	
Period indicator for shelf life expiration date (`IPRKZ`)	*maxShelfLifeUnitCode*	
Dependent requirements ind. for individual and coll. reqmts (`SBDKZ`)	*bomExplosionDependent*	If `SBDKZ` is equal to '1' or '2', it's value is selected. Otherwise, the field is set to '0'.

Related Information

Specifying the Custom Value of Autocomplete and Confirm for a Material

2.1.5.3.1.2 Mapping a Bill of Material (BOM)

Data is transferred from SAP S/4HANA to SAP Digital Manufacturing for execution using the `BOMMAT05` IDoc.

This table contains field names in SAP S/4HANA and their corresponding field names in SAP Digital Manufacturing for execution:

SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
ERP ID (`SNDPRN`)	*SenderBusinessSystemID*	
Plant (`WERKS`)	*plant*	
Material Number (`MATNR_EXTERNAL`), *BOM usage* (`STLAN`), and *Alternative BOM* (`STLAL`)	*bom*	If `MATNR_EXTERNAL` is present, it's selected. Its value is concatenated with `STLAN` (`BOM usage`) and `STLAL` (`Alternative BOM`): `Material-BOMUsage-AltBOM`.
Material Number (`MATNR_LONG`), *BOM usage* (`STLAN`), and *Alternative BOM* (`STLAL`)	*bom*	If `MATNR_EXTERNAL` isn't present but `MATNR_LONG` is, `MATNR_LONG` is selected. Its value is concatenated with `STLAN` (`BOM usage`) and `STLAL` (`Alternative BOM`): `Material-BOMUsage-AltBOM`.
Material Number (`MATNR`), *BOM usage* (`STLAN`), and *Alternative BOM* (`STLAL`)	*bom*	If neither `MATNR_EXTERNAL` nor `MATNR_LONG` is present, `MATNR` is selected. Its value is concatenated with `STLAN` (`BOM usage`) and `STLAL` (`Alternative BOM`): `Material-BOMUsage-AltBOM`.
BOM description (`ZTEXT`)	*description*	If `ZTEXT` isn't empty, it's selected.
Material Number (`MATNR_EXTERNAL`)	*description*	If `ZTEXT` is empty and if there's a material number `MATNR_EXTERNAL`, the material number is selected.

SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Material Number (`MATNR_LONG`	*description*	If `ZTEXT` is empty and if there's no material number `MATNR_EXTERNAL`, but there's a material number (`MATNR_LONG`), the `MATNR_LONG` is selected.
Material Number (`MATNR`)	*description*	If `ZTEXT` is empty and if there are no no material numbers `MATNR_EXTERNAL` or `MATNR_LONG`, the `MATNR` is selected.
Function (`MSGFN`)	*action*	If `MSGFN` is `009`, `action` is set to `Create`. If `MSGFN` is `005`, `action` is set to `Change`.
Bill of Material (`STLNR`)	*erpBom*	
Bill of material status (`STLST`)	*status* *currentVersion*	If `STLST` equals '`02`', `status` is set to '`205`' and `currentVersion` is set to '`false`'. Otherwise, `status` is set to '`201`' and `currentVersion` is set to '`true`'.
	bomType	The field isn't present in the ERP payload. The value set to '`U`'.
	effectivityControl	The field isn't present in the ERP payload. The value set to '`R`'.
Base quantity (`BMENG_C`)	*baseQuantity*	
Unit of measure for base quantity (`BMEIN`)	*baseUom*	
	bomComponentDTOList	Complex element that isn't available in the ERP payload. The system loops over each `E1STPOM` segment and checks if either `IDNRK` or `IDNRK_LONG` contain a value. If this is the case, the `bomComponentDTO` section is created.
	bomComponentDTO	Complex element that isn't available in the ERP payload.
	component	Complex element that isn't available in the ERP payload.

SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Long material number for field IDNRK (`IDNRK_EXTERNAL`)	*material*	If `IDNRK_EXTERNAL` is present, it's selected.
BOM component (`IDNRK_LONG`)	*material*	If `IDNRK_EXTERNAL` isn't present but `IDNRK_LONG` is, `IDNRK_LONG` is selected.
BOM component (`IDNRK`)	*material*	If neither `IDNRK_EXTERNAL` nor `IDNRK_LONG` is present, `IDNRK` is selected.
BOM item number (`POSNR`)	*sequence*	
Component quantity (`MENGE_C`) and *Indicator: co-product* (`KZKUP`)	*bomComponentType*	If `MENGE_C` contains '-' and if `KZKUP` is empty, `bomComponentType` is set to 'B', which means by-product. If `MENGE_C` contains '-' and if `KZKUP` is equal to 'X', `bomComponentType` is set to 'C', which means co-product. Otherwise, `bomComponentType` is set to 'N', which means normal component.
	enabled	The field isn't present in the ERP payload. The value set to '`true`'.
Component quantity (`MENGE_C`) and *Base quantity* (`BMENG_C`)	*quantity*	The quantity is calculated as the division of `MENGE_C` by `BMENGE_C`.
Component quantity (`MENGE_C`)	*totalQtyBaseUom*	The system removes leading and trailing white-space from a string and replaces sequences of white-space characters by a single space. The system removes all hypens ('-') from `MENGE_C`).
	useItemDefaults	The field isn't present in the ERP payload. The value set to '`false`'.
	preAssembled	The field isn't present in the ERP payload. The value set to '`false`'.
	testPart	The field isn't present in the ERP payload. The value set to '`false`'.
Issue location for production order (`LGORT`)	*storageLocation*	
Base unit of measure (`MEINS`)	*unitOfMeasure*	
Alternative item: group (`ALPGR`)	*alternativeItemGroup*	
Alternative item: ranking order (`ALPRF`)	*alternativeItemPriority*	

SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Usage probability in % (alternative item) (`EWAHR`)	*usageProbability*	
	bomRefDesDTOList	Complex element that isn't available in the ERP payload. This field is created if `EBORT` is present in the E1STPUM segment.
	bomRefDesDTO	Complex element that isn't available in the ERP payload.
Installation point for subitem (`EBORT`)	*refDes*	The system transfroms all letters of `EBORT` from lowercase to uppercase.
	sequence	The field isn't present in the ERP payload. The value set to '`10`'.
Subitem quantity (`UPMNG_C`) and *Base quantity* (`BMENG_C`)	*quantity*	The quantity is calculated as the division of `UPMNG_C` (from `E1STPUM` segment) by `BMENG_C` (from `E1STKOM` segement).
BOM item node number (`STLKN`)	*erpRefDesSequence*	
BOM sub-item text (`UPTXT`)	*description*	
BOM item number (`POSNR`)	*erpSequence*	

Related Information

Specifying Data Values for BOM Downloading
Specifying Data Values for Order-Specific BOM Components
Specifying Custom Data Fields for BOM Components
Setting Backflushing for BOM Components
Setting Custom Data for Master BOMs
Setting Custom Data for Order BOMs

2.1.5.3.1.3 Mapping Alternate BOM Components

BOM components that belong to the same alternate group in SAP S/4HANA and ERP are mapped as alternate components for each other in SAP Digital Manufacturing.

Master BOM Component

ERP / SAP S/4HANA

DME Field	Default Value	SAP S/4HANA Field
`alternativeItemGroup` ERP Alternate Item Group		`ALPGR`
`alternates.enabled` Alternates Enabled	`TRUE`	
`alternates.priority` Alternates Priority		`ALPRF`
`alternates.material` Alternate Component		`IDNRK`

Order BOM

ERP / SAP S/4HANA

DME Field	Default Value	SAP S/4HANA Cloud Field
`alternativeItemGroup` ERP Alternate Item Group		`ALPGR`
`alternates.enabled` Alternates Enabled	`TRUE`	
`alternates.priority` Alternates Priority		`ALPRF`
`alternates.material` Alternate Component		`MATNR`

2.1.5.3.1.4 Mapping Installation Points of BOM Components

There may be a collection of sub-items on the SAP ERP side. For each sub-item, a separate BOM component with a corresponding quantity and installation point fields is created in SAP Digital Manufacturing. Installation point integration is supported only for production orders that are transferred from SAP S/4HANA.

Master BOM Component

DME Field	Default Value	SAP S/4HANA Field
`bomRefDesDTO.erpRefDesSequence`		`UPOSZ` Subitem Number

DME Field	Default Value	SAP S/4HANA Field
`bomRefDesDTO.refDes` Installation Point		`EBORT` Installation Point
`bomRefDesDTO.quantity` Assembly Quantity		`UPMNG` Sub-Item Quantity
`bomRefDesDTO.description` Installation Point Description		`UPTXT` Sub-Item Text

Order BOM

DME Field	Default Value	SAP S/4HANA Cloud Field
`ZBOMSubItem.ZBOMSubItemNumberValue`		`UPOSZ`
`ZBOMSubItem.ZBOMSubItemInstallationPoint` Installation Point		`EBORT`
`ZBOMSubItem.ZBillOfMaterialSubItemQuantity` Assembly Quantity		`UPMNG`
`ZBOMSubItem.ZBillOfMaterialSubItemText` Installation Point Description		`UPTXT`

2.1.5.3.1.5 Mapping a Routing with Operation Activities

Data is transferred from SAP ERP to SAP Digital Manufacturing for execution using the `LOIROU04` IDoc.

`LOIROU04` supports long material numbers (LMN) and mapping of work instructions. This table contains field names in SAP ERP and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP	SAP Digital Manufacturing for execution	Comment
Plant `(WERKS)`	*Plant*	
Key for Task List Group `(PLNNR)`; *Group Counter* `(PLNAL)` or `/E1AFREF/MES_ROUTINGID`	*Routing*	`PLNNR + "-" + PLNAL` `/E1AFREF/MES_ROUTINGID` if the routing was created in SAP ME and then sent to SAP ERP.

SAP ERP	SAP Digital Manufacturing for execution	Comment
	Version	`ERP001` for a new record and increments as necessary for updated records.
	Routing Type	*U* for a production routing type *V* for a master recipe routing type
Short Description `(KTEXT)`	*Description*	
	Status	*Releasable*
	Effectivity Control	`R` No logic in SAP Digital Manufacturing for execution yet.
	Current Version	Selected
Key for Task List Group `(PLNNR)`; *Group Counter* `(PLNAL)`	*Entry Routing*	
	Entry Routing Type	`U`
	Entry Routing Step ID	`10`
Key for Task List Group `(PLNNR)`; *Group Counter* `(PLNAL)`; *Sequence* `(PLNFL)`; *Operation* `(VORNR)` or `ME_OPERATION_ID` or `UVORN`	*Operation Activity*	`PLNNR + "-" + PLNAL + "-" + PLNFL + "-" + VORNR` or `ME_OPERATION_ID` or `UVORN`
Operation `(VORNR)`	*Reporting Step*	Operation step number in ERP. If sub-operations are used, then the reporting step is populated in a step mapped from the last sub-operation within an operation.
	Rework	Deselected
Sequence `(FLAGAT)`	Data field: `ERP_SEQUENCE`	`0`. Only a zero sequence routing is supported.
Key for Task List Group `(PLNNR)`, *Group Counter* `(PLNAL)`, *Sequence* `(PLNFL)`, *Operation* `(VORNR)` or `ME_OPERATION_ID` or `UVORN`	*Operation Activity*	Operation activity master name **Note** Operation activity master records can be created from the integration as specified here. They can also be created manually in the *Manage Operation Activities* app.

SAP ERP	SAP Digital Manufacturing for execution	Comment
	Operation Activity Version	`ERP001` or `ME_REVISION`
Operation Short Text `(LTXA1)`	*Operation Activity Description*	
	Maximum Loop Count	Set to `0` in `xslt` in the CPI
	Operation Activity Master Type	`N (Normal)`
Work Center ID `(ARBID)`	*Work Center*	Based on the *Work Center ID*, SAP Digital Manufacturing finds the work center. **Note** Replicate the work center before the routing.
	Relaxed Flow	*Relaxed Flow* is set to *Yes* for recipes and to *No* for routings.
Key for Task List Group `(PLNNR)`, *Group Counter* `(PLNAL)`, *Sequence* `(PLNFL)`, *Operation* `(VORNR)` or `ME_OPERATION_ID`	*Operation Group*	`PLNNR + "-" + PLNAL + "-" + PLNFL + "-" + VORNR` or `ME_OPERATION_ID`
Operation Short Text `(LTXA1)`	*Description*	Routing step description
Operation Short Text `(LTXA1)`	*Description*	Operation activity description
Document number `(DOKNR)` *Document Type* `(DOKAR)` *Document Part* `(DOKTL)` *Application number* `(ORIGINAL)`	*Work Instruction*	`DOKNR + '-' + DOKAR + '-' +DOKTL + '-' + ORIGINAL`
Document Version `(DOKVR)`	*Version*	

2.1.5.3.1.6 Mapping a Production Order

You transfer production production order data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using the IDoc `LOIPRO05 Production Order V2`.

This table contains field names in SAP ERP or SAP S/4HANA and the corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
ERP ID (`SNDPRN`)	*SenderBusinessSystemID*	
	ManufacturingOrder	Complex element that isn't available in the ERP payload.
Order number (`AUFNR`)	*ManufacturingOrder*	
Order category (`AUTYP`)	*ManufacturingOrderCategory*	
Order type (`AUART`)	*ManufacturingOrderType*	
Plant (`WERKS`)	*ProductionPlant*	
Material number (`MATNR_EXTERNAL`)	*material*	If `MATNR_EXTERNAL` is present, it's selected.
Material number (`MATNR_LONG`)	*material*	If `MATNR_EXTERNAL` isn't present but `MATNR_LONG` is, `MATNR_LONG` is selected.
Material number (`MATNR`)	*material*	If neither `MATNR_EXTERNAL` nor `MATNR_LONG` is present, `MATNR` is selected.
BOM category (`STLTY`)	*BillOfMaterialCategory*	
Bill of material (`STLNR`)	*BillOfMaterial*	
Alternative BOM (`STLAL`)	*BillOfMaterialVariant*	
BOM usage (`STLAN`)	*BillOfMaterialVariantUsage*	
Task list type (`PLNTY`)	*BillOfOperationsType*	
Key for task list group (`PLNNR`)	*BillOfOperationsGroup*	
Group counter (`PLNAL`)	*BillOfOperationsVariant*	
Total order quantity (`GAMNG`)	*MfgOrderPlannedTotalQty*	The `MfgOrderPlannedTotalQtypp:unitCode` attribute, to which the value of the common unit of measure for all order items (field gets a `GMEIN`) is assigned.
Base quantity (`BMENGE`)	*MfgOrdPlndTotQtyInBaseUnit*	The `MfgOrdPlndTotQtyInBaseUnit` field gets a `pp:unitCode` attribute, to which the value of the base unit of measure (`BMEINS`) is assigned.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Minimum lot size (`PLSVN`)	*BOOMinLotSizeQuantity*	The `BOOMinLotSizeQuantity` field gets a field gets a `pp:unitCode` attribute, to which the value of the task list unit of measure (`PLNME`) is assigned.
Maximum lot size (`PLSVB`)	*BOOMaxLotSizeQuantity*	The `BOOMaxLotSizeQuantity` field gets a `pp:unitCode` attribute, to which the value of the task list unit of measure (`PLNME`) is assigned.
Basic start date (`GSTRP`)	*MfgOrderPlannedStartDate*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Basic start (time) (`GSUZP`)	*MfgOrderPlannedStartTime*	If `GSUZP` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Basic finish date (`GLTRP`)	*MfgOrderPlannedEndDate*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Basic finish (time) (`GLUZP`)	*MfgOrderPlannedEndTime*	If `GLUZP` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Scheduled start (`GSTRS`)	*MfgOrderScheduledStartDate*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Scheduled start (time) (`GSUZS`)	*MfgOrderScheduledStartTime*	If `GSUZS` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Scheduled finish (`GLTRS`)	*MfgOrderScheduledEndDate*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Scheduled finish time (`GLUZS`)	*MfgOrderScheduledEndTime*	If `GLUZS` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Inspection lot number (`PRUEFLOS`)	*InspectionLot*	If `PRUEFLOS` isn't empty and isn't zero, it's selected. Leading zeros are added to `PRUEFLOS` until 12 places are reached.
Scheduling type (`TERKZ`)	*ZSchedulingType*	
Priority of vacancy assignment (`APRIO`)	*Priority*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Language (`TDSPRAS`)	*LongText*	If the `E1AFLTH` segment is present, the `LongText` element is created. The `LongText` field gets a `pp:MIMECode` attribute, which has the value '`application/json`', and a `pp:TextCategory` attribute, to which the value of the `SAPscript format of text` (`TDTEXTTYPE`) from the first `E1AFLTH` segment found is assigned. The LongText field gets the value of `TDSPRAS`, which is converted as follows: • 'E' becomes 'EN' • '1' becomes 'ZH' • 'D' becomes 'DE' • 'H' becomes 'HU' • '3' becomes 'KO' • 'F' becomes 'FR' • 'S' becomes 'ES' • 'M' becomes 'ZF' • 'J' becomes 'JA' Additionally, the system loops over each `E1AFLTP` segment that is a child of the first `E1AFLTH` segment. It creates a json object that contains the `tag column` (`TDFORMAT`) and `text line` (`TDLINE`) values and has this structure: [{"TDFORMAT": "tag column ","TDLINE":"text line", ...}].
	ManufacturingOrderSystemStatus	Complex element that isn't available in the ERP payload.
Object status (`STAT`)	*pp:OrderHasGeneratedOperations*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0328`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsClosed*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0046`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsConfirmed*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0009`', the field is created and the value is set to '`true`'.

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Object status (`STAT`)	*pp:OrderIsCreated*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0001`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsDeleted*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0013`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsDelivered*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0012`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsLocked*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0043`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsMarkedForDeletion*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0076`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsPartiallyConfirmed*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0010`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsPartiallyDelivered*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0074`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsPartiallyReleased*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0042`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsPreCosted*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0016`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsPrinted*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0007`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsReleased*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0002`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsScheduled*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0117`', the field is created and the value is set to '`true`'.

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Object status (`STAT`)	*pp:OrderIsTechnicallyCompleted*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0045`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsToBeHandledInBatches*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0369`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:SettlementRuleIsCreated*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0028`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:SettlementRuleIsCrtedManually*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0102`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:MaterialAvailyIsNotChecked*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0420`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderChangeIsRestricted*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0667`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderHasNoMaterialComponents*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0239`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderHasPostedGoodsMovements*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0321`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsDistributedToMES*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0048`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsHandedOverToProduction*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0666`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:OrderIsShopFloorOrder*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0665`', the field is created and the value is set to '`true`'.
Object status (`STAT`)	*pp:MaterialIsCommitted*	If the object status (`STAT`) in `E1JSTKL` is equal to '`I0340`', the field is created and the value is set to '`true`'.

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	ManufacturingOrderItem	Complex element that isn't available in the ERP payload. The system loops over each `E1AFPOL` segment.
Order item number (`POSNR`)	*ManufacturingOrderItem*	
Material number (`MATNR_EXTERNAL`)	*Material*	If `MATNR_EXTERNAL` is present, it's selected.
Material number (`MATNR_LONG`)	*Material*	If `MATNR_EXTERNAL` isn't present but `MATNR_LONG` is, `MATNR_LONG` is selected.
Material number (`MATNR`)	*Material*	If neither `MATNR_EXTERNAL` nor `MATNR_LONG` is present, `MATNR` is selected.
Order item planned total quantity (`PSMNG`)	*MfgOrderItemPlannedTotalQty*	The `MfgOrderItemPlannedTotalQty` field gets a `pp:unitCode` attribute, to which the value of the `unit of measure for in-house production` (`AMEIN`) is assigned.
Batch number (`CHARG`)	*Batch*	
Production version (`VERID`)	*ProductionVersion*	
Storage location (`LGORT`)	*StorageLocation*	
Warehouse number / warehouse complex (`LGNUM`)	*Warehouse*	
	MfgOrderSerialNumbers	Complex element that isn't available in the ERP payload. It's created if a segment '`E1AFSER`' is present.
	MfgOrderSerialNumber	Complex element that isn't available in the ERP payload. The system loops over each `E1AFSER` segment.
Serial number (`SERNR`)	*SerialNumber*	
Unique item identifier (`UII`)	*UniqueItemIdentifier*	
	GoodsReceiptTolerances	Complex element that isn't available in the ERP payload.
Underdelivery tolerance (`UNTTO`)	*pp:UnderdelivTolrtdLmtRatioInPct*	

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Unlimited overdelivery allowed (`UEBTK`)	*pp:UnlimitedOverdeliveryIsAllowed*	If `UEBTK` is 'X', the field is set to '`true`'. Otherwise, it's set to '`false`'.
Overdelivery tolerance (`UEBTO`)	*pp:OverdelivTolrtdLmtRatioInPct*	
	ManufacturingOrderVariantConfiguration	Complex element that isn't available in the ERP payload. It's created if a segment '`E1VCCHR`' is present.
	CharacteristicValuationOutb	Complex element that isn't available in the ERP payload.
Characteristic name (`ATNAM`)	*Characteristic*	
Characteristic value (`ATWRT`)	*CharcValue*	
	ManufacturingOrderActivityNetworkElement	Complex element that isn't available in the ERP payload. The system loops over each `E1AFFLL` element where the sequence category (`FLGAT`) isn't equal to '2'. Within each of theses segments, the system loops over each `E1AFVOL` element and choses it only if the last `E1JSTVL` child element contains an object status (`STAT`) child element that isn't equal to '`I0013`'.
	pp:MfgOrderNodeType	This element isn't available in the ERP payload. Its value is set to '`Operation`'.
Sequence (`PLNFL`), *Operation/activity number* (`VORNR`)	*pp:MfgOrderNodeID*	The string `SEQ_`, the value of `PLNFL`, the string `_OP_`, and the value of `VORNR` are concatenated. Example: '`SEQ_PLFNL_OP_VORNR`'.
	pp:OrderInternalBillOfOperations	Element that isn't available in the ERP payload and that is empty.
Operation/activity number (`VORNR`)	*pp:OrderIntBillOfOperationsItem*	
Operation/activity number (`VORNR`)	*pp:ManufacturingOrderOperation*	

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Minimum send-ahead quantity (`MINWE`)	*pp:ZMinimumSendAheadQuantity*	The `pp:ZMinimumSendAheadQuantity` field gets a `pp:unitCode` attribute, to which the value of the `unit of measure for activity` (`MEINH`) is assigned.
Unit for the minimum overlap time (`ZMINU`)	*pp:ZMinimumOverlapTime*	The `pp:ZMinimumOverlapTime` field gets a pp:`unitCode` attribute, to which the value of the `unit for the minimum overlap time` (`ZEIMU`) is assigned.
Optional overlapping (`UEKAN`)	*pp:ZOptionalOverlapping*	If `UEKAN` is 'X', the field is set to `'true'`. Otherwise, it's set to `'false'`.
Required Overlapping (`UEMUS`)	*pp:ZRequiredOverlapping*	If `UEMUS` is 'X', the field is set to `'true'`. Otherwise, it's set to `'false'`.
Flow manufacturing (`FLIES`)	*pp:ZFlowManufacturing*	If `FLIES` is 'X', the field is set to `'true'`. Otherwise, it's set to `'false'`.
Sequence (`PLNFL`)	*pp:ManufacturingOrderSequence*	
Sequence category (`FLGAT`)	*pp:ZOrderSequenceCategory*	
Work center (`ARBPL`)	*pp:WorkCenter*	
Work Center ID (`ARBID`)	*pp:WorkCenterInternalID*	
Operation total quantity (`MGVRG`)	*pp:OpPlannedTotalQuantity*	The `pp:OpPlannedTotalQuantity` field gets a `pp:unitCode` attribute, to which the value of the `unit of measure for activity` (`MEINH`) is assigned.
Base quantity (`BMSCH`)	*pp:OperationReferenceQuantity*	The `pp:OperationReferenceQuantity` field gets a pp:`unitCode` attribute, to which the value of the `unit of measure for activity` (`MEINH`) is assigned.
Operation short text (`LTXA1`)	*pp:MfgOrderOperationText*	
Operation short text (`LTXA1`)	*pp:MfgOrderSequenceText*	
Factory calendar (`KALID`)	*pp:FactoryCalendar*	
Earliest scheduled start: execution (date) (`FSAVD`)	*pp:OpErlstSchedldExecStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Earliest scheduled start: execution (time) (`FSAVZ`)	*pp:OpErlstSchedIdExecStrtTme*	If `FSAVZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Earliest scheduled finish: execution (date) (`FSEDD`)	*pp:OpErlstSchedIdExecEndDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Earliest scheduled finish: execution (time) (`FSEDZ`)	*pp:OpErlstSchedIdExecEndTme*	If `FSEDZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Latest scheduled start: execution (date) (`SSAVD`)	*pp:OpLtstSchedIdExecStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Latest scheduled start: execution (time) (`SSAVZ`)	*pp:OpLtstSchedIdExecStrtTme*	If `SSAVZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Latest scheduled finish: execution (date) (`SSEDD`)	*pp:OpLtstSchedIdExecEndDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Latest scheduled finish: execution (time) (`SSEDZ`)	*pp:OpLtstSchedIdExecEndTme*	If `SSEDZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Earliest finish of operation (date) (`FSEVD`)	*pp:EarliestFinishOfOperationDate*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Earliest finish of operation (time) (`FSEVZ`)	*pp:EarliestFinishOfOperationTime*	If `FSEVZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Earliest scheduled start: processing (date) (`FSSBD`)	*pp:OpErlstSchedIdProcgStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Earliest Scheduled Start: processing (time) (`FSSBZ`)	*pp:OpErlstSchedIdProcgStrtTme*	If `FSSBZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Latest scheduled start: processing (date) (`SSSBD`)	*pp:OpLtstSchedIdProcgStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.

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Latest scheduled start: processing (time) (`SSSBZ`)	*pp:OpLtstSchedldProcgStrtTme*	If `SSSBZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Processing time (`BEARZ`)	*pp:OpPlannedProcessingDurn*	The `OpPlannedProcessingDurn` field gets a `unitCode` attribute, to which the value of the `unit of measure for processing time` (`BEAZE`) is assigned.
Earliest scheduled start: teardown (date) (`FSSAD`)	*pp:OpErlstSchedldTrdwnStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Earliest scheduled start: teardown (time) (`FSSAZ`)	*pp:OpErlstSchedldTrdwnStrtTme*	If `FSSAZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Latest scheduled start: teardown (date) (`SSSAD`)	*pp:OpLtstSchedldTrdwnStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Latest scheduled start: teardown (time) (`SSSAZ`)	*pp:OpLtstSchedldTrdwnStrtTme*	If `SSSAZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Latest scheduled wait end date (`SSELD`)	*pp:LatestScheduledWaitEndDate*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Latest scheduled wait end time (`SSELZ`)	*pp:LatestScheduledWaitEndTime*	If `SSELZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Setup time (`RUEST`)	*pp:OpPlannedSetupDurn*	The `OpPlannedSetupDurn` field gets a `unitCode` attribute, to which the value of the `unit of measure for setup time` (`RSTZE`) is assigned.
Teardown (`ABRUE`)	*pp:OpPlannedTeardownDurn*	The `OpPlannedTeardownDurn` field gets a `unitCode` attribute, to which the value of the `unit of measure for teardown` (`ARUZE`) is assigned.

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Teardown (ABRUE)	*pp:ScheduledWaitDuration*	The ScheduledWaitDuration field gets a unitCode attribute, to which the value of the unit of measure for teardown (ARUZE) is assigned.
Teardown and wait occur in parallel (ABLIPKZ)	*pp:TeardownAndWaitIsParallel*	If ABLIPKZ is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
	pp:MfgOrderConfirmationGroup	Element that isn't available in the ERP payload and that is empty.
	pp:OperationControlProfile	Complex element that isn't available in the ERP payload. It gets a pp:OperationControlKey attribute, to which the value of the control key (STEUS) is assigned.
	pp:CompletionConfirmation	Complex element that isn't available in the ERP payload. It gets a pp:CompletionConfirmationCode attribute, to which the value of the confirmation (RUEK) is assigned.
Confirmation (RUEK)	*ConfirmationIsMilestoneConf*	If RUEK is '1', the field is set to 'true', otherwise it's set to 'false'.
Confirmation (RUEK)	*ConfirmationIsRequired*	If RUEK is '2', the field is set to 'true', otherwise it's set to 'false'.
Confirmation (RUEK)	*ConfirmationIsNotPossible*	If RUEK is '3', the field is set to 'true', otherwise it's set to 'false'.
Confirmation (RUEK)	*ConfirmationIsOptional*	If RUEK contains an empty string, a space, or a '0', or if it isn't present, the field is set to 'true', otherwise it's set to 'false'.
Indicator: scheduling (TERM)	*pp:OperationIsScheduled*	If TERM is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Indicator: determine capacity requirements (KAPA)	*pp:CapacityRequirementsAreDtmnd*	If KAPA is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Indicator: post goods receipt automatically (AUTWE)	*pp:GRIsPostedAutomatically*	If AUTWE is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.

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Not relevant for external manufacturing execution system (`NOT_MES_REL`)	*pp:OperationIsNotMESRelevant*	If `NOT_MES_REL` is 'X', the field is set to '`true`'. Otherwise, it's set to '`false`'.
	pp:StandardWorkFormulaParamGroup	Complex element that isn't available in the ERP payload. It gets a `StandardWorkFormulaParamGroupID` attribute, to which the value of the `standard value key` (`VGWTS`) is assigned. The subelements of this element are created depending on conditions.
	WorkCenterFormulaParam1	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value` `VGE01` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.
Keyword for parameter ID (`PAR01_LTXT`)	*StandardWorkFormulaParamName*	The field gets a `languageCode` attribute that is empty.
Standard value (`VGW01`)	*WorkCenterStandardWorkQty*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of measurement of standard value` (`VGE01`) is assigned.
Activity type (`LAR01`)	*CostCtrActivityType*	
Total activity to be confirmed (`TO_BE_CONF_ACTIVITY1`)	*ToBeConfirmedTotalWorkQty*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of total activity to be confirmed value` (`TO_BE_CONF_ACT_UOM1`) is assigned.

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	WorkCenterFormulaParam2	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value VGE02` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.
Keyword for parameter ID (`PAR02_LTXT`)	*StandardWorkFormulaParamName*	The field gets a `languageCode` attribute that is empty.
Standard value (`VGW02`)	*WorkCenterStandardWorkQty*	The field gets a pp:`unitCode` attribute, to which the value of the `unit of measurement of standard value` (`VGE02`) is assigned.
Activity type (`LAR02`)	*CostCtrActivityType*	
Total activity to be confirmed (`TO_BE_CONF_ACTIVITY2`)	*ToBeConfirmedTotalWorkQty*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of total activity to be confirmed value` (`TO_BE_CONF_ACT_UOM2`) is assigned.
	WorkCenterFormulaParam3	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value VGE03` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.
Keyword for parameter ID (`PAR03_LTXT`)	*StandardWorkFormulaParamName*	The field gets a `languageCode` attribute that is empty.
Standard value (`VGW03`)	*WorkCenterStandardWorkQty*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of measurement of standard value` (`VGE03`) is assigned.
Activity type (`LAR03`)	*CostCtrActivityType*	

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Total activity to be confirmed (`TO_BE_CONF_ACTIVITY3`)	*ToBeConfirmedTotalWorkQty*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of total activity to be confirmed value` (`TO_BE_CONF_ACT_UOM3`) is assigned.
	WorkCenterFormulaParam4	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value` `VGE04` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.
Keyword for parameter ID (`PAR04_LTXT`)	*StandardWorkFormulaParamName*	The field gets a `languageCode` attribute that is empty.
Standard value (`VGW04`)	*WorkCenterStandardWorkQty*	The field gets a `unitCode` attribute, to which the value of the `unit of measurement of standard value` (`VGE04`) is assigned.
Activity type (`LAR04`)	*CostCtrActivityType*	
Total activity to be confirmed (`TO_BE_CONF_ACTIVITY4`)	*ToBeConfirmedTotalWorkQty*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of total activity to be confirmed value` (`TO_BE_CONF_ACT_UOM4`) is assigned.
	WorkCenterFormulaParam5	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value` `VGE05` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.
Keyword for parameter ID (`PAR05_LTXT`)	*StandardWorkFormulaParamName*	The field gets a `languageCode` attribute that is empty.

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Standard value (`VGW05`)	*WorkCenterStandardWorkQty*	The field gets a `unitCode` pp:attribute, to which the value of the `unit of measurement of standard value` (`VGE05`) is assigned.
Activity type (`LAR05`)	*CostCtrActivityType*	
Total activity to be confirmed (`TO_BE_CONF_ACTIVITY5`)	*ToBeConfirmedTotalWorkQty*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of total activity to be confirmed value` (`TO_BE_CONF_ACT_UOM5`) is assigned.
	WorkCenterFormulaParam6	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value` `VGE06` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.
Keyword for parameter ID (`PAR06_LTXT`)	*StandardWorkFormulaParamName*	The field gets a `languageCode` attribute that is empty.
Standard value (`VGW06`)	*WorkCenterStandardWorkQty*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of measurement of standard value` (`VGE06`) is assigned.
Activity type (`LAR06`)	*CostCtrActivityType*	
Total activity to be confirmed (`TO_BE_CONF_ACTIVITY6`)	*ToBeConfirmedTotalWorkQty*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of total activity to be confirmed value` (`TO_BE_CONF_ACT_UOM6`) is assigned.
	pp:ManufacturingOrderComponent	Complex element that isn't available in the ERP payload. The system loops over each `E1RESBL` segment. The fields below are created only if the phantom item indicator (`DUMPS`) isn't equal to 'X'.
Phantom item indicator `DUMPS`	*ComponentType*	
Requirement type (`BDART`)	*RequirementType*	

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Requirement quantity (BDMNG)	*RequiredQuantityInBaseUnit*	The field gets a `pp:unitCode` attribute, to which the value of the `base unit of measurement` (`MEINS`) is assigned.
Requirements date for the component (BDTER)	*MatlCompRequirementDate*	If `BDTER` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Batch number (CHARG)	*Batch*	
Material number (MATNR_EXTERNAL)	*material*	If `MATNR_EXTERNAL` is present, it's selected.
Material number (MATNR_LONG)	*material*	If `MATNR_EXTERNAL` isn't present but `MATNR_LONG` is, `MATNR_LONG` is selected.
Material number (MATNR)	*material*	If neither `MATNR_EXTERNAL` nor `MATNR_LONG` is present, `MATNR` is selected.
Number of reservation/dependent requirements (RSNUM)	*Reservation*	
Item number of reservation / dependent requirements (RSPOS)	*ReservationItem*	
Movement type (inventory management) (BWART)	*GoodsMovementType*	
BOM item number (POSNR)	*BillOfMaterialItemNumber*	Only numbers are allowed.
Item category (bill of material) (POSTP)	*BillOfMaterialItemCategory*	
Order item number (AFPOS)	*ManufacturingOrderItem*	
Bill of material (STLNR)	*BillOfMaterial*	
BOM item node number (STLKN)	*BillOfMaterialItemNodeNumber*	
Production supply area (PRVBE)	*SupplyArea*	
Storage location (LGORT)	*StorageLocation*	
Warehouse number / warehouse complex (LGNUM)	*Warehouse*	
Indicator: backflush (BACKFLUSH)	*MatlCompIsMarkedForBackflush*	If `BACKFLUSH` is 'X', the field is set to '`true`'. Otherwise, it's set to '`false`'.
Indicator: co-product (KZKUP)	*MaterialIsCoProduct*	If `KZKUP` is 'X', the field is set to '`true`'. Otherwise, it's set to '`false`'.
Debit/credit indicator (SHKZG)	*DebitCreditCode*	
Special stock indicator (SOBKZ)	*InventorySpecialStockType*	

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Alternative item indicator (ALPOS)	*MaterialCompIsAlternativeItem*	If ALPOS is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Alternative item: group (ALPGR)	*AlternativeItemGroup*	
Alternative item: ranking order (ALPRF)	*AlternativeItemPriority*	
Alternative item: strategy (ALPST)	*AlternativeItemStrategy*	
Usage probability in % (alternative item) (EWAHR)	*UsageProbabilityPercent*	
	ZBOMSubItem	Complex element that isn't available in the ERP payload. The system loops over each E1STPUL segment.
Subitem number (UPOSZ)	*ZBOMSubItemNumberValue*	
Installation point for subitem (EBORT)	*ZBOMSubItemInstallationPoint*	
BOM sub-item text (UPTXT)	*ZBillOfMaterialSubItemText*	
Sub-item quantity (UPMNG)	*ZBillOfMaterialSubItemQuantity*	
	pp:ManufacturingOrderInspCharc	Complex element that isn't available in the ERP payload. The system loops over each E1QAMVL segment.
Insp. lot charac. no. (INSPCHAR)	*InspectionCharacteristic*	
Short text for the inspection characteristic (CHAR_DESCR)	*InspectionSpecificationText*	
Characteristic type (CHAR_TYPE)	*InspSpecCharacteristicType*	
Required confirmation for inspection characteristic (OBLIGATORY)	*InspSpecCharcCategory*	
Single results (SINGLE_RES)	*InspSpecRecordingType*	
Inspection scope (SCOPE)	*InspCharacteristicSampleSize*	The field gets a pp:unitCode attribute, to which the value of the base unit of measure for the inspection lot (SMPL_UNIT) is assigned.
Inspection scope (SCOPE_IND)	*InspectionScope*	
Documentation required for inspection results (DOCU_REQU)	*InspResultIsDocumentationRqd*	If DOCU_REQU is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Number of decimal places (DEC_PLACES)	*InspSpecDecimalPlaces*	

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Target value (`TARGET_VAL`)	*InspSpecTargetValue*	The field gets a `unitCode` attribute, to which the value of the `unit of measurement (internal code)` (`MEAS_UNIT`) is assigned.
Lower tolerance limit (`LW_TOL_LMT`)	*InspSpecLowerLimit*	The field gets a `unitCode` attribute, to which the value of the `unit of measurement (internal code)` (`MEAS_UNIT`) is assigned.
Upper tolerance limit (`UP_TOL_LMT`)	*InspSpecUpperLimit*	The field gets a `unitCode` attribute, to which the value of the `unit of measurement (internal code)` (`MEAS_UNIT`) is assigned.
Plausibility limit (lower) (`LW_PLS_LMT`)	*InspSpecLowerPlausibilityLimit*	The field gets a `unitCode` attribute, to which the value of the `unit of measurement (internal code)` (`MEAS_UNIT`) is assigned.
Plausibility limit (upper) (`UP_PLS_LMT`)	*InspSpecUpperPlausibilityLimit*	The field gets a `unitCode` attribute, to which the value of the `unit of measurement (internal code)` (`MEAS_UNIT`) is assigned.
Catalog type (`CAT_TYPE1`)	*CharacteristicAttributeCatalog*	
Selected set (`SEL_SET1`)	*SelectedCodeSet*	
Plant for selected set (`PSEL_SET1`)	*SelectedCodeSetPlant*	
Info field 1 from the characteristic (`INFOFIELD1`)	*InspSpecInformationField1*	
Info field 2 from the characteristic (`INFOFIELD2`)	*InspSpecInformationField2*	
Info field 3 from the characteristic (`INFOFIELD3`)	*InspSpecInformationField3*	
Defects recording automatically called up (`FEHLREC`)	*InspSpecIsDefectsRecgAutomatic*	If `FEHLREC` is 'X', the field is set to '`true`'. Otherwise, it's set to '`false`'.
Serial number to be recorded in QM subsystem (`SERIALREQU`)	*InspLotIsSerialNumberRequired*	If `SERIALREQU` is 'X', the field is set to '`true`'. Otherwise, it's set to '`false`'.
Valuation type for sample for QM subsystems (`VALN_TYPE`)	*InspCharcSampleValuationType*	

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	pp:LongText	The field isn't present in the ERP payload and gets the following attributes: • `pp:languageCode`, which is empty • `pp:MIMECode`, which is set to `'text/plain'` • `pp:TextCategory`, which is empty
	pp:ActivityNetworkElementSystemStatus	Complex element that isn't available in the ERP payload. The elements on the level below are created only if the respective conditions are met.
Object status (`STAT`)	*pp:CreatedStatusIsActive*	If the object status (`STAT`) in `E1JSTVL` is equal to `'I0001'`, the field is created and the value is set to `'true'`.
Object status (`STAT`)	*pp:ReleasedStatusIsActive*	If the object status (`STAT`) in `E1JSTVL` is equal to `'I0002'`, the field is created and the value is set to `'true'`.
Object status (`STAT`)	*pp:PrintedStatusIsActive*	If the object status (`STAT`) in `E1JSTVL` is equal to `'I0007'`, the field is created and the value is set to `'true'`.
Object status (`STAT`)	*pp:ConfirmedStatusIsActive*	If the object status (`STAT`) in `E1JSTVL` is equal to `'I0009'`, the field is created and the value is set to `'true'`.
Object status (`STAT`)	*pp:PrtlyConfirmedStatusIsActive*	If the object status (`STAT`) in `E1JSTVL` is equal to `'I0010'`, the field is created and the value is set to `'true'`.
Object status (`STAT`)	*pp:DeletedStatusIsActive*	If the object status (`STAT`) in `E1JSTVL` is equal to `'I0013'`, the field is created and the value is set to `'true'`.
Object status (`STAT`)	*pp:TechlyCompletedStatusIsActive*	If the object status (`STAT`) in `E1JSTVL` is equal to `'I0045'`, the field is created and the value is set to `'true'`.
Object status (`STAT`)	*pp:ClosedStatusIsActive*	If the object status (`STAT`) in `E1JSTVL` is equal to `'I0046'`, the field is created and the value is set to `'true'`.

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Object status (STAT)	*pp:ScheduledStatusIsActive*	If the object status (STAT) in E1JSTVL is equal to 'I0117', the field is created and the value is set to 'true'.
Object status (STAT)	*pp:PrtlyDeliveredStatusIsActive*	If the object status (STAT) in E1JSTVL is equal to 'I0074', the field is created and the value is set to 'true'.
Object status (STAT)	*pp:DeliveredStatusIsActive*	If the object status (STAT) in E1JSTVL is equal to 'I0012', the field is created and the value is set to 'true'.
	pp:ManufacturingOrderMESReference	Complex element that isn't available in the ERP payload.
Operation (SAP ME) (ME_OPERATION_ID)	*pp:MESOperation*	
Version (SAP ME) (ME_REVISION)	*pp:MESObjectVersion*	
	ManufacturingOrderActivityNetworkElement	Complex element that isn't available in the ERP payload. The system loops over each E1AFUVL element and choses it only if the last E1JSTUL child element contains an object status (STAT) child element that isn't equal to 'I0013'. The system creates this field and the fields below only if this condition is met.
	pp:MfgOrderNodeType	The element isn't available in the ERP payload. Its value is set to 'Suboperation'.
Sequence (PLNFL), *Operation/Activity Number* (VORNR) and *Suboperation* (UVORN)	*pp:MfgOrderNodeID*	The field receives the combination of the string 'SEQ_', the value of PLNFL, the string _SUBOP_, the value of VORNR, the string -, and the value of UVORN. For example: SEQ_PLNFL_SUBOP_VORN-UVORN.
	pp:OrderInternalBillOfOperations	The element isn't available in the ERP payload.
Suboperation (UVORN)	*pp:OrderIntBillOfOperationsItem*	
Suboperation (UVORN)	*pp:ManufacturingOrderOperation*	

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Minimum send-ahead quantity (`MINWE`)	*pp:ZMinimumSendAheadQuantity*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of measure for activity` (`MEINH`) is assigned.
Minimum overlap time (`ZMINU`)	*pp:ZMinimumOverlapTime*	The field gets a `pp:unitCode` attribute, to which the value of the `unit for the minimum overlap Time` (`ZEIMU`) is assigned.
Sequence (`PLNFL`)	*pp:ManufacturingOrderSequence*	
Sequence Category (`FLGAT`)	*ZOrderSequenceCategory*	
Object ID of the resource (`ARBID`)	*pp:WorkCenterInternalID*	
Operation total quantity (`MGVRG`)	*pp:OpPlannedTotalQuantity*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of measure for activity` (`MEINH`) is assigned.
Base quantity (`BMSCH`)	*pp:OperationReferenceQuantity*	The field gets a `pp:unitCode` attribute, to which the value of the `unit of measure for activity` (`MEINH`) is assigned.
Operation short text (`LTXA1`)	*pp:MfgOrderOperationText*	The system selects the `LTXA1` value of the current segment.
Operation short text (`LTXA1`)	*pp:MfgOrderSequenceText*	The system selects the `LTXA1` value of the parent node.
Factory calendar (`KALID`)	*pp:FactoryCalendar*	
Earliest scheduled start: execution (date) (`FSAVD`)	*pp:OpErlstSchedldExecStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Earliest scheduled start: execution (time) (`FSAVZ`)	*pp:OpErlstSchedldExecStrtTme*	If `FSAVZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Earliest scheduled finish: execution (date) (`FSEDD`)	*pp:OpErlstSchedldExecEndDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Earliest scheduled finish: execution (time) (`FSEDZ`)	*pp:OpErlstSchedldExecEndTme*	If `FSEDZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Latest scheduled start: execution (date) (`SSAVD`)	*pp:OpLtstSchedIdExecStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Latest scheduled start: execution (time) (`SSAVZ`)	*pp:OpLtstSchedIdExecStrtTme*	If `SSAVZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Latest scheduled finish: execution (date) (`SSEDD`)	*pp:OpLtstSchedIdExecEndDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Latest scheduled finish: execution (time) (`SSEDZ`)	*pp:OpLtstSchedIdExecEndTme*	If `SSEDZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Earliest finish of operation (date) (`FSEVD`)	*pp:EarliestFinishOfOperationDate*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Earliest finish of operation (time) (`FSEVZ`)	*pp:EarliestFinishOfOperationTime*	If `FSEVZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Earliest scheduled start: processing (date) (`FSSBD`)	*pp:OpErlstSchedIdProcgStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Earliest Scheduled Start: processing (time) (`FSSBZ`)	*pp:OpErlstSchedIdProcgStrtTme*	If `FSSBZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Latest scheduled start: processing (date) (`SSSBD`)	*pp:OpLtstSchedIdProcgStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Latest scheduled start: processing (time) (`SSSBZ`)	*pp:OpLtstSchedIdProcgStrtTme*	If `SSSBZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Processing time (`BEARZ`)	*pp:OpPlannedProcessingDurn*	The field gets a `unitCode` attribute, to which the value of the `unit of measure for processing time` (`BEAZE`) is assigned.
Earliest scheduled start: teardown (date) (`FSSAD`)	*pp:OpErlstSchedIdTrdwnStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Earliest scheduled start: teardown (time) (`FSSAZ`)	*pp:OpErlstSchedldTrdwnStrtTme*	If `FSSAZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Latest scheduled start: teardown (date) (`SSSAD`)	*pp:OpLtstSchedldTrdwnStrtDte*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Latest scheduled start: teardown (time) (`SSSAZ`)	*pp:OpLtstSchedldTrdwnStrtTme*	If `SSSAZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Latest scheduled wait end date (`SSELD`)	*pp:LatestScheduledWaitEndDate*	The date from the iDoc is transformed into this format: YYYY-MM-DD.
Latest scheduled wait end time (`SSELZ`)	*pp:LatestScheduledWaitEndTime*	If `SSELZ` isn't empty and isn't equal to '000000', the time from the iDoc is transformed into this format: hh:mm:ss.
Setup time (`RUEST`)	*pp:OpPlannedSetupDurn*	The field gets a `unitCode` attribute, to which the value of the `unit of measure for setup time` (`RSTZE`) is assigned.
Teardown (`ABRUE`)	*pp:OpPlannedTeardownDurn*	The field gets a `unitCode` attribute, to which the value of the `unit of measure for teardown` (`ARUZE`) is assigned.
Teardown (`ABRUE`)	*pp:ScheduledWaitDuration*	The field gets a `unitCode` attribute, to which the value of the `unit of measure for teardown` (`ARUZE`) is assigned.
	pp:TeardownAndWaitIsParallel	The element isn't available in the ERP payload and is empty.
	pp:MfgOrderConfirmationGroup	The element isn't available in the ERP payload and is empty.

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	pp:OperationControlProfile	The element isn't available in the ERP payload and is empty. The field gets a `pp:OperationControlKey` attribute, to which the value of the `control key` (`STEUS`) is assigned.
	StandardWorkFormulaParamGroup	Complex element that isn't available in the ERP payload. The field gets a `StandardWorkFormulaParamGroupID` attribute, to which the value of the `standard value key` (`VGWTS`) is assigned.
	WorkCenterFormulaParam1	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value` `VGE01` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.
Standard value (`VGW01`)	*WorkCenterStandardWorkQty*	This element gets a `pp:unitCode` attribute, to which the value of the `unit of measurement of standard value` (`VGE01`) is assigned.
Activity type (`LAR01`)	*CostCtrActivityType*	
	WorkCenterFormulaParam2	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value` `VGE02` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.

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Standard value (`VGW02`)	*WorkCenterStandardWorkQty*	This element gets a `pp:unitCode` attribute, to which the value of the `unit of measurement of standard value` (`VGE02`) is assigned.
Activity type (`LAR02`)	*CostCtrActivityType*	
	WorkCenterFormulaParam3	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value` `VGE03` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.
Standard value (`VGW03`)	*WorkCenterStandardWorkQty*	This element gets a `pp:unitCode` attribute, to which the value of the `unit of measurement of standard value` (`VGE03`) is assigned.
Activity type (`LAR03`)	*CostCtrActivityType*	
	WorkCenterFormulaParam4	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value` `VGE04` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.
Standard value (`VGW04`)	*WorkCenterStandardWorkQty*	This element gets a `pp:unitCode` attribute, to which the value of the `unit of measurement of standard value` (`VGE04`) is assigned.
Activity type (`LAR04`)	*CostCtrActivityType*	

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	WorkCenterFormulaParam5	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value` `VGE05` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.
Standard value (`VGW05`)	*WorkCenterStandardWorkQty*	This element gets a `pp:unitCode` attribute, to which the value of the `unit of measurement of standard value` (`VGE05`) is assigned.
Activity type (`LAR05`)	*CostCtrActivityType*	
	WorkCenterFormulaParam6	Complex element that isn't available in the ERP payload. This element and the elements on the level below are created if `unit of measurement of standard value` `VGE06` isn't empty. This element gets a `WorkCenterFormulaParamID` attribute that is empty.
Standard value (`VGW06`)	*WorkCenterStandardWorkQty*	This element gets a `pp:unitCode` attribute, to which the value of the `unit of measurement of standard value` (`VGE06`) is assigned.
Activity type (`LAR06`)	*CostCtrActivityType*	
	pp:LongText	The field isn't present in the ERP payload and gets the following attributes: • `pp:languageCode`, which is empty • `pp:MIMECode`, which is set to `'text/plain'` • `pp:TextCategory`, which is empty
	pp:ActivityNetworkElementSystemStatus	Complex element that isn't available in the ERP payload.

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Object status (`STAT`)	*pp:CreatedStatusIsActive*	The field is created and set to '`true`' if `STAT` in segment `E1JSTUL` is equal to '`I0001`'.
Object status (`STAT`)	*pp:ReleasedStatusIsActive*	The field is created and set to '`true`' if `STAT` in segment `E1JSTUL` is equal to '`I0002`'.
Object status (`STAT`)	*pp:PrintedStatusIsActive*	The field is created and set to '`true`' if `STAT` in segment `E1JSTUL` is equal to '`I0007`'.
Object status (`STAT`)	*pp:ConfirmedStatusIsActive*	The field is created and set to '`true`' if `STAT` in segment `E1JSTUL` is equal to '`I0009`'.
Object status (`STAT`)	*pp:PrtlyConfirmedStatusIsActive*	The field is created and set to '`true`' if `STAT` in segment `E1JSTUL` is equal to '`I0010`'.
Object status (`STAT`)	*pp:DeletedStatusIsActive*	The field is created and set to '`true`' if `STAT` in segment `E1JSTUL` is equal to '`I0013`'.
Object status (`STAT`)	*pp:TechlyCompletedStatusIsActive*	The field is created and set to '`true`' if `STAT` in segment `E1JSTUL` is equal to '`I0045`'.
Object status (`STAT`)	*pp:ClosedStatusIsActive*	The field is created and set to '`true`' if `STAT` in segment `E1JSTUL` is equal to '`I0046`'.
Object status (`STAT`)	*pp:ScheduledStatusIsActive*	The field is created and set to '`true`' if `STAT` in segment `E1JSTUL` is equal to '`I0117`'.
Object status (`STAT`)	*pp:PrtlyDeliveredStatusIsActive*	The field is created and set to '`true`' if `STAT` in segment `E1JSTUL` is equal to '`I0074`'.
Object status (`STAT`)	*pp:DeliveredStatusIsActive*	The field is created and set to '`true`' if `STAT` in segment `E1JSTUL` is equal to '`I0012`'.
	pp:ManufacturingOrderMESReference	Complex element that isn't available in the ERP payload.
Operation (SAP ME) (`ME_OPERATION_ID`)	*pp:MESOperation*	

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Version (SAP ME) (`ME_REVISION`)	*pp:MESObjectVersion*	
	ManufacturingOrderRelationship	Complex element that isn't available in the ERP payload. The system loops over each `E1AFVOL` element and choses it only if the last `E1JSTVL` child element contains an object status (`STAT`) child element that isn't equal to '`I0013`'. The `E1AFVOL` segments are arranged in ascending order based on the value of the `operation/activity number` (`VORNR`). The system checks if operation activities are positioned at the start, at the end, or in between the sequence.

	PredecessorMfgOrderNodeType	The field isn't present in the ERP payload.
		
		If the position of the current `E1AFVOL` segment in the list of `E1AFVOL` segments is '`1`', there are two cases:
		
		• If it's a standard sequence or if there's no branch operation, the field is set to `StartEvent`.
		• Otherwise, there are the following cases:
		  • If there's no operation before the branch operation and if it's a standard sequence, the field is set to `StartEvent`.
		  • If there's no operation before the branch operation and if it's not a standard sequence, the system recursively searches for node before the branch operation.
		  • Otherwise, the field is set to `Operation`.

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Sequence (`PLNFL`), *Order number* (`AUFNR`), or *operation/activity number* (`VORNR`)	*PredecessorMfgOrderNodeID*	The field isn't present in the ERP payload. If the position of the current `E1AFVOL` segment in the list of `E1AFVOL` segments is '`1`', there are the following cases: • If it's a standard sequence or if there's no branch operation, the value of `AUFNR` is concatenated with the string `SEVT`. • If there's no operation before the branch operation and if it's a standard sequence, the value of `AUFNR` is concatenated with the string `SEVT`. • If there's no operation before the branch operation and if it's not a standard sequence, the system recursively searches for node before the branch operation. • Otherwise, the system concatenates the string `SEQ_`, the value of `PLNFL`, the string `_OP_`, and the value of `VORNR` of the `E1AFVOL` segment where the last `E1JSTVL` segment doesn't have a status element with the value '`I0013`'. If the current `E1AFVOL` segment has an intermediary position in the list of `E1AFVOL` segments, the system concatenates the string SEQ_, the value of `PLNFL`, the string `_OP_`, and the value of `VORN` of the first `E1AFVOL` segment of the list of `E1AFVOL` segments where the last `E1JSTVL` segment doesn't have a status element with the value '`I0013`'. If the current `E1AFVOL` segment is at the last position in the list of `E1AFVOL` segments, the system concatenates the string `SEQ_`, the value of `PLNFL`, the string `_OP_`, and the value of `VORNR`.

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	SuccessorMfgOrderNodeType	The field isn't present in the ERP payload.
		
		If the current `E1AFVOL` segment isn't the last in the list of `E1AFVOL` segments, it's set to '`Operation`'. Otherwise, there are two cases:
		
		• If it's a standard sequence, the field is set to `EndEvent`.
		• Otherwise, there are three cases:
		  • If there's no operation after the return operation and if the sequence is a standard one, the field is set to `EndEvent`.
		  • If there's no operation after the return operation and if the sequence isn't a standard one, the system recursively searches for a node after the return operation.
		  • Otherwise, the field is set to `Operation`.

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Sequence (`PLNFL`), *Order number* (`AUFN`), *Operation/activity number* (`VORNR`)	*SuccessorMfgOrderNodeID*	The field isn't present in the ERP payload.
		
		If the current `E1AFVOL` segment isn't the last in the list of `E1AFVOL` segments, the system concatenates the string `SEQ_`, the value of `PLNFL`, the string `_OP_`, and the value of `VORNR`.
		
		Otherwise, there are two cases:
		
		• If it's a standard sequence, the system concatenates the value of `AUFNR` and the string `EEVT`.
		• Otherwise, there are three cases:
		  • If there's no operation after the return operation and if the sequence is a standard one, the system concatenates the value of `AUFNR` and the string `EEVT`.
		  • If there's no operation after the return operation and if the sequence isn't a standard one, the system recursively searches for the node after the return operation.
		  • Otherwise, the system concatenates the string `SEQ_`, the value of the `PLNFL` element from the parent node, the string `_OP_`, and the value of the `VORNR` element from the first `E1AFVOL` sibling segment that follows the current node, where the last `E1JSTVL` segment within that `E1AFVOL` sibling doesn't have a `STAT` element with the value '`I0013`'.

	NetworkActivityRelationType	The field isn't present in the ERP payload. The field is set to '`SucRel`'.

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	ManufacturingOrderRelationship	Complex element that isn't available in the ERP payload. The system loops over each `E1AFVOL` element and choses it only if the last `E1JSTVL` child element contains an object status (`STAT`) child element that isn't equal to '`I0013`'. The `E1AFVOL` segments are arranged in ascending order based on the value of the `operation/activity number` (`VORNR`).
	PredecessorMfgOrderNodeType	The field isn't present in the ERP payload. The field is set to '`Operation`'.
Sequence (`PLNFL`), *Operation/activity number* (`VORNR`)	*PredecessorMfgOrderNodeID*	The system concatenates the string `SEQ_`, the value of the `PLNFL` element from the parent node, the string `_OP_`, and the value of the `VORNR`.
	SuccessorMfgOrderNodeType	The field isn't present in the ERP payload. The field is set to '`Suboperation`'.
Sequence (`PLNFL`), *Order number* (`AUFN`), *Operation/activity number* (`VORNR`), *Suboperation* (`UVORN`)	*SuccessorMfgOrderNodeID*	The system concatenates the string `SEQ_`, the value of the `PLNFL` element from the parent node, the string `_SUBOP_`, the value of the `VORNR`, '-', and the value of `UVORN`.
	NetworkActivityRelationType	The field isn't present in the ERP payload. The field is set to '`PChild`'.

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	ERP Customer	Complex element that isn't available in the ERP payload. It's created if the following two conditions are met: • There's a non-empty `KUNAG` element in a `E1AFPOL` segment that has a number of order item (`POSNR`) attribute that is equal to '0001'. • There's a non-empty `NAME1` element in a `E1AFPOL` segment that has a number of order item (`POSNR`) attribute that is equal to '0001'.
Sold-to party (`KUNAG`)	*Customer*	
Name 1 (`NAME1`)	*CustomerName*	
	ErpCustomerOrder	Complex element that isn't available in the ERP payload. It's created if there's a `KDAUF` element in a `E1AFPOL` segment that has a number of order item (`POSNR`) attribute that is equal to '0001'.
Sales order number (`KDAUF`)	*CustomerOrder*	
Item number in sales order (`KDPOS`)	*CustomerOrderItem*	
Sales order number (`KDAUF`)	*SalesOrder*	This field and the `SalesOrderItem` field are created if there's a `KDAUF` element in a `E1AFPOL` segment that has a number of order item (`POSNR`) attribute that is equal to '0001'.
Item number in sales order (`KDPOS`)	*SalesOrderItem*	This field and the `SalesOrder` field are created if there's a `KDAUF` element in `E1AFPOL` segment that has a number of order item (`POSNR`) attribute that is equal to '0001'.

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	ChangeProduction	Complex element that isn't available in the ERP payload. For more information on this scenario, see Updating Orders After the Release for Production Order (Custom XSLT).
	SupportChangeAfterRelease	This element isn't available in the ERP payload. It's set to '`false`'.
	HoldProduction	This element isn't available in the ERP payload. It's set to '`BY_SFC`'.
	DataCollectionCopy	This element isn't available in the ERP payload. It's set to 'false'.
	QuantityCopy	This element isn't available in the ERP payload. It's set to 'false'.
	AutoScheduling	This element isn't available in the ERP payload. It's set to 'false'.
	workInstructionIn	Complex element that isn't available in the ERP payload. The system loops over each `E1AFDHO` element.
	workInstructionIn	Complex element that isn't available in the ERP payload.
	trackViewing	This element isn't available in the ERP payload. It's set to '`true`'.
Document number (DOKNR), *document type* (DOKAR), *document part* (DOKTL), *order number* (AUFNR), and *application number* (ORIGINAL)	*workInstruction*	The system concatenates the order number (`AUFNR`), document number (`DOKNR`), document type (`DOKAR`), document part (`DOKTL`), and order number (`AUFNR`) values from the parent node and the application number (`ORIGINAL`) value from the current node. Example: `AUFNRDOKNR-DOKAR-DOKTL-ORIGINAL`.
Document version (`DOKVR`)	*version*	
Original of document (`FILENAME`)	*erpFilename*	
ME integration: URL for accessing ERP objects (`URL`)	*url*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Short description of the original (DESCRIPTION) or *document description* (DKTXT)	*description*	If the DESCRIPTION string isn't empty, it's selected. Otherwise, DKTXT is selected.
	attachmentList	Complex element that isn't available in the ERP payload.
	workInstructionAttachmentPointDTO	Complex element that isn't available in the ERP payload. The system loops over each E1AFVOL segment. In each E1AFVOL segment, it loops over each E1AFDOO segment.
	shopOrderDTO	Complex element that isn't available in the ERP payload.
Order number (AUFNR)	*shopOrder*	
	workInstructionListIn	Complex element that isn't available in the ERP payload.
	workInstructionIn	
	trackViewing	This element isn't available in the ERP payload. It's set to 'true'.
Document number (DOKNR), *document type* (DOKAR), *document part* (DOKTL), *order number* (AUFNR), and *application number* (ORIGINAL)	*workInstruction*	The system concatenates the document number (DOKNR), document type (DOKAR), document part (DOKTL), and order number (AUFNR) values from the parent node and the application number (ORIGINAL) value from the current node. Example: AUFNRDOKNR-DOKAR-DOKTL-ORIGINAL.
Document version (DOKVR)	*version*	
Original of document (FILENAME)	*erpFilename*	
ME integration: URL for accessing ERP objects (URL)	*url*	
Short description of the original (DESCRIPTION) or *Description of the production resource/tool* (DKTXT)	*description*	
	attachmentList	Complex element that isn't available in the ERP payload.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	workInstructionAttachmentPointDTO	Complex element that isn't available in the ERP payload.
	shopOrderDTO	Complex element that isn't available in the ERP payload.
Order number (`AUFNR`)	*shopOrder*	
	workInstructionIn	Complex element that isn't available in the ERP payload. The system loops over each 'E1AFVOL' element and selects it if it doesn't contain any '`E1AFVOL2`' child element where '`NOT_MES_REL`' element is equal to 'X'.
	trackViewing	This element isn't available in the ERP payload. It's set to '`true`'.
Document number (DOKNR), *document type* (DOKAR), *document part* (DOKTL), *order number* (AUFNR), and *application number* (ORIGINAL)	*workInstruction*	The system concatenates the document number (`DOKNR`), document type (`DOKAR`), document part (`DOKTL`), and order number (`AUFNR`) values from the parent node and the application number (`ORIGINAL`) value from the current node. Example: `AUFNRDOKNR-DOKAR-DOKTL-ORIGINAL`.
Document version (`DOKVR`)	*version*	
Original of document (`FILENAME`)	*erpFilename*	
ME integration: URL for accessing ERP objects (`URL`)	*url*	
Short description of the original (`DESCRIPTION`) or *Description of the production resource/tool* (`DKTXT`)	*description*	If the `DESCRIPTION` field isn't empty, its content is selected. Otherwise the value of `DKTXT` is selected.
	attachmentList	Complex element that isn't available in the ERP payload.
	workInstructionAttachmentPointDTO	Complex element that isn't available in the ERP payload.
	shopOrderDTO	Complex element that isn't available in the ERP payload.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Order number (AUFNR)	*shopOrder*	
	bomComponentRef	Complex element that isn't available in the ERP payload. This element and the elements below are created if RSPOS is available. Otherwise, a routingDTO element and its subelements are created.
	bomDTO	Complex element that isn't available in the ERP payload.
Order number (AUFNR)	*bom*	
	bomType	This element isn't available in the ERP payload. It's set to 'U'.
	materialDTO	Complex element that isn't available in the ERP payload.
Material number (MATNR_EXTERNAL)	*material*	If MATNR_EXTERNAL is present, it's selected.
Material number (MATNR_LONG)	*material*	If MATNR_EXTERNAL isn't present but MATNR_LONG is, MATNR_LONG is selected.
Material number (MATNR)	*material*	If neither MATNR_EXTERNAL nor MATNR_LONG is present, MATNR is selected.
	version	This element isn't available in the ERP payload. It's set to '#'.
Item number of reservation / dependent requirements (RSPOS)	*sequence*	The RSPOS number is multiplied by 10.
	routingDTO	Complex element that isn't available in the ERP payload. This element and its child elements are created only if there's no RSPOS, which means that the bomComponentRef element above isn't created.
Order number (AUFNR)	*routing*	
	version	This element isn't available in the ERP payload. It's set to 'A'.
	routingType	This element isn't available in the ERP payload. It's set to 'U'.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	routingStepRef	Complex element that isn't available in the ERP payload.
Key of a step in a routing (SAP ME) (`MES_STEPID`), *order number* (`VORNR`), or generated step ID	*stepId*	If `MES_STEPID` is available, it's selected. If `MES_STEPID` isn't available, but `VORNR` is, `VORNR` is selected. Otherwise, the number of the current iteration is multiplied by 10 to generate a step ID.
Version (SAP ME) (`ME_REVISION`)	*version*	If `ME_REVISION` is available, this field is created.
	routingDTO	Complex element that isn't available in the ERP payload.
Order number (`AUFNR`)	*routing*	
	version	This element isn't available in the ERP payload. It's set to '`A`'.
	routingType	This element isn't available in the ERP payload. It's set to '`U`'.
	workInstructionIn	Complex element that isn't available in the ERP payload. The system loops over each 'E1AFDPO' element and selects it if it doesn't contain any '`E1AFVOL2`' child element where '`NOT_MES_REL`' element is equal to 'X'.
	trackViewing	This element isn't available in the ERP payload. It's set to '`true`'.
Document number (DOKNR), *document type* (DOKAR), *document part* (DOKTL), *order number* (AUFNR), and *application number* (ORIGINAL)	*workInstruction*	The system concatenates the document number (`DOKNR`), document type (`DOKAR`), document part (`DOKTL`), and order number (`AUFNR`) values from the parent node and the application number (`ORIGINAL`) value from the current node. Example: `AUFNRDOKNR-DOKAR-DOKTL-ORIGINAL`.
Document version (`DOKVR`)	*version*	
Original of document (`FILENAME`)	*erpFilename*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
ME integration: URL for accessing ERP objects (`URL`)	*url*	
Short description of the original (`DESCRIPTION`) or *Description of the production resource/tool* (`DKTXT`)	*description*	If the `DESCRIPTION` field isn't empty, its content is selected. Otherwise the value of `DKTXT` is selected.
	attachmentList	Complex element that isn't available in the ERP payload.
	workInstructionAttachmentPointDTO	Complex element that isn't available in the ERP payload.
	shopOrderDTO	Complex element that isn't available in the ERP payload.
Order number (`AUFNR`)	*shopOrder*	
	routingDTO	Complex element that isn't available in the ERP payload.
	routing	
	version	This element isn't available in the ERP payload. It's set to '`A`'.
	routingType	This element isn't available in the ERP payload. It's set to '`U`'.
	routingStepRef	Complex element that isn't available in the ERP payload.
Key of a step in a routing (SAP ME) (`MES_STEPID`), *order number* (`VORNR`), or generated step ID	*stepId*	If `MES_STEPID` is available, it's selected. If `MES_STEPID` isn't available, but `VORNR` is, `VORNR` is selected. Otherwise, the number of the current iteration is multiplied by 10 to generate a step ID.
Version (SAP ME) (`ME_REVISION`)	*version*	If `ME_REVISION` is available, this field is created.
	routingDTO	Complex element that isn't available in the ERP payload.
Order number (`AUFNR`)	*routing*	
	version	This element isn't available in the ERP payload. It's set to '`A`'.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	routingType	This element isn't available in the ERP payload. It's set to 'U'.

Related Information

Enabling Auto-Release of Production and Process Orders
Specifying Data Values for Production Orders
Specifying Custom Values of Resource Types for Production Orders
Disabling the Work Instruction Viewing Log
Activating Assembly Quantity as Required
Defining the Min/Max Tolerance of the Assembly Quantity
Specifying Custom Values on Routing Step for an Order-Specific Routing
Enabling Naming Patterns for Serialized SFCs
Activating Relaxed Flow for Production and Process Orders
Updating Orders After the Release for Production Order (Custom XSLT)
Controlling Schedule Updates
Customizing the Build Quantity

2.1.5.3.1.7 Mapping Inventory Download

You can transfer material data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using the IDoc `INVCON03`.

This table contains field names in SAP ERP and SAP S/4HANA and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
ERP ID (`SNDPRN`)	*SenderBusinessSystemID*	
Movement type (`BWART`)	*goodsMovementType*	
Debit/credit indicator (`SHKZG`)	*debitCreditCode*	
Plant (`WERKS`)	*plant*	
Sales Order Number (`KDAUF`)	*salesOrder*	This field is created if `KDAUF` is present. The system removes leading and trailing spaces. If the `KDAUF` value is a number, leading zeros are removed and the value is selected. If it's a string, it's selected as well.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Item Number in Sales Order (KDPOS)	*salesOrderItem*	This field is created if KDPOS is present.
Special Stock Indicator (SOBKZ)	*inventorySpecialStockType*	This field is created if SOBKZ is present.
Material number (MATNR_EXTERNAL)	*material*	If MATNR_EXTERNAL is present, it's selected.
Material number (MATNR_LONG)	*material*	If MATNR_EXTERNAL isn't present but MATNR_LONG is, MATNR_LONG is selected.
Material number (MATNR)	*material*	If neither MATNR_EXTERNAL nor MATNR_LONG is present, MATNR is selected.
Quantity (MENGE)	*quantityOnHand*	
Material document line item (ZEILE)	*erpMaterialDocumentLineItem*	
Material document year (MJAHR)	*erpMaterialDocumentYear*	This field is created if MJAHR is present.
Material document number (MBLNR)	*erpMaterialDocumentNumber*	This field is created if MBLNR is present.
Order number (AUFNR)	*reservedShopOrder*	This field is created if BWART equals 261. The system removes leading and trailing spaces. If the AUFNR value is a number, leading zeros are removed and the value is selected. If it's a string, it's selected as well.
Storage location (LGORT)	*receivingStorageLocation*	This field is created if LGORT is present as a string.
Issuing storage location (UMLGO)	*sourceStorageLocation*	This field is created if UMLGO is present as a string.
Batch (CHARG)	*batchNumber*	
Purchase order (EBELN)	*purchaseOrder*	The system removes leading and trailing spaces. If the EBELN value is a number, leading zeros are removed and the value is selected. If it's a string, it's selected as well.
Serial number (SERNR)	*serialNumbers*	Only if ZE1ICIT6 is present.

Related Information

Enhancement of INVCON03 with Serial Numbers

2.1.5.3.1.8 Mapping a Planned Order

You can transfer planned orders from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using the IDoc `LOIPLO02`.

This table contains field names in SAP ERP and SAP S/4HANA and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
ERP ID (`SNDPRN`)	*SenderBusinessSystemID*	
Planned Order (`PLNUM`)	*orderNumber*	
Planned Order Type (`PAART`)	*orderType*	
Planning Plant (PLWRK)	*productionPlant*	
Material Number (`MATNR_EXTERNAL`)	*material*	If `MATNR_EXTERNAL` is present, it's selected.
Material Number (`MATNR_LONG`)	*material*	If `MATNR_EXTERNAL` isn't present but `MATNR_LONG` is, `MATNR_LONG` is selected.
Material Number (`MATNR`)	*material*	If neither `MATNR_EXTERNAL` nor `MATNR_LONG` is present, `MATNR` is selected.
	billOfMaterialCategory	The field isn't present in the ERP payload.
Bill of Material Number (`STLNR`)	*billOfMaterial*	
Alternative BOM (`STALT`)	*alternativeBillOfMaterial*	
Alternative BOM (`STALT`)	*billOfMaterialVariant*	
BOM Usage (`STLAN`)	*billOfMaterialVariantUsage*	
Task List Type (`PLNTY`)	*billOfOperationsType*	
Key of the Task List Group (`PLNNR`)	*billOfOperationsGroup*	
Group Counter (`PLNAL`)	*billOfOperationsVariant*	
	totalPlannedQuantityInBaseUnit	Complex element that isn't available in the ERP payload.
Planned Total Order Quantity (`GSMNG`)	*value*	
Base Unit of Measure (`MEINS`)	*isoUnitCode*	
	totalConfirmedQuantityInBaseUnit	Complex element that isn't available in the ERP payload.
Total Confirmed Qty Planned Order (Repetitive Manufacturing) (`CNFQTY`)	*value*	
Base Unit of Measure (`MEINS`)	*isoUnitCode*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Scheduled Start (`GSTRS`) and *Earliest scheduled start: Execution (time)* (`GSUZS`)	*scheduledStartDate*	The date and time from the iDoc are transformed into this format: YYYY-MM-DDTHH:MM:SS.
Scheduled finish (`GLTRS`) and *Earliest scheduled finish: Execution (Time)* (`GLUZS`)	*scheduledCompletionDate*	The date and time from the iDoc are transformed into this format: YYYY-MM-DDTHH:MM:SS.
Planned Order Start Date (`PSTTR`)	*plannedStartDate*	The date from the iDoc is transformed into this format: YYYY-MM-DDTHH:MM:SS. Time value is created in the transformation and set to '00:00:00'.
Planned Order End Date (`PEDTR`)	*plannedCompletionDate*	The date from the iDoc is transformed into this format: YYYY-MM-DDTHH:MM:SS. Time value is created in the transformation and set to '23:59:59'.
	priority	There's no corresponding ERP field. The value is set to 500.
Storage Location (`LGORT`)	*erpPutawayStorageLocation*	
	batchNumber	The field isn't present in the ERP payload.
Production Version (`VERID`)	*productionVersion*	
Sales Order Number (`KDAUF`)	*salesOrder*	
Item Number in Sales Order (`KDPOS`)	*salesOrderItem*	
	orderSteps	Complex element that isn't available in the ERP payload. The system loops over each `E1PLOPL` segments with `FLGAT='0'` to find order steps. `E1PLOPL` segments are arranged in ascending order based on the value of the `VORNR` element.
	orderStep	Complex element that isn't available in the ERP payload.
Operation/Activity Number (`VORNR`)	*stepId*	
	erpStepType	The field isn't present in the ERP payload. The value is set to `Operation`.
Operation Short Text (`LTXA1`)	*operationText*	
Sequence (`PLNFL`)	*sequence*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Work Center ID (ARBID)	*erpWorkCenterId*	
Earliest Scheduled Start: Execution (Date) (FSAVD) and *Earliest scheduled start: Execution (Time)* (FSAVZ)	*earliestExecutionStartDate*	The date and time from the iDoc are transformed into this format: YYYY-MM-DDTHH:MM:SS.
Earliest Scheduled Start: Processing (Date) (FSSBD) and *Earliest Scheduled Start: Processing (Time)* FSSBZ	*earliestProcessingStartDate*	The date and time from the iDoc are transformed into this format: YYYY-MM-DDTHH:MM:SS.
Earliest Scheduled Start: Teardown (Date) (FSSAD) and *Earliest Scheduled Start: Teardown (Time)* (FSSAZ)	*earliestTeardownStartDate*	The date and time from the iDoc are transformed into this format: YYYY-MM-DDTHH:MM:SS.
Earliest Scheduled Finish: Execution (Date) (FSEDD) and *Earliest Scheduled Finish: Execution (Time)* (FSEDZ)	*earliestExecutionEndDate*	The date and time from the iDoc are transformed into this format: YYYY-MM-DDTHH:MM:SS.
Latest Scheduled Start: Execution (Date) (SSAVD) and *Latest Scheduled Start: Execution (Time)* (SSAVZ)	*latestExecutionStartDate*	The date and time from the iDoc are transformed into this format: YYYY-MM-DDTHH:MM:SS.
Latest Scheduled Start: Processing (Date) (SSSBD) and *Latest Scheduled Start: Processing (Time)* (SSSBZ)	*latestProcessingStartDate*	The date and time from the iDoc are transformed into this format: YYYY-MM-DDTHH:MM:SS.
Latest Scheduled Start: Teardown (Date) (SSSAD) and *Latest Scheduled Start: Teardown (Time)* (SSSAZ)	*latestTeardownStartDate*	The date and time from the iDoc are transformed into this format: YYYY-MM-DDTHH:MM:SS.
Latest Scheduled Finish: Execution (Date) (SSEDD) and *Latest Scheduled Finish: Execution (Time)* (SSEDZ)	*latestExecutionEndDate*	The date and time from the iDoc are transformed into this format: YYYY-MM-DDTHH:MM:SS.
	orderComponents	Complex element that isn't available in the ERP payload. The system first loops over each E1RESBAS segment to collect the RSNUM and RSPOS data. Then, it uses these values to loop over each E1RESBL segment that matches the RSNUM and RSPOS data.
	orderComponent	Complex element that isn't available in the ERP payload.
Requirement Type (BDART)	*requirementType*	
Order Item Number (AFPOS)	*orderItem*	
Bill of Material (STLNR)	*billOfMaterial*	
Item Category (Bill of Material) (POSTP)	*billOfMaterialItemCategory*	
BOM Item Number (POSNR)	*billOfMaterialItemNumber*	
BOM Item Node Number (STLKN)	*billOfMaterialItemNodeNumber*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Production Supply Area (`PRVBE`)	*supplyArea*	
	requiredQuantityInBaseUnit	Complex element that isn't available in the ERP payload.
Requirement Quantity (`BDMNG`)	*value*	
Base Unit of Measure (`MEINS`)	*isoUnitCode*	
	requiredQuantityInBaseUnit	There's no corresponding ERP field.
Number of Reservation/Dependent Requirements (`RSNUM`)	*reservation*	
Item Number of Reservation / Dependent Requirements (`RSPOS`)	*reservationItem*	
Warehouse Number / Warehouse Complex (`LGNUM`)	*warehouseNumber*	
Alternative Item: Group (`ALPGR`)	*alternativeItemGroup*	
Alternative Item: Ranking Order (`ALPRF`)	*alternativeItemPriority*	
Alternative Item: Strategy (`ALPST`)	*alternativeItemStrategy*	
Material Number (`MATNR_EXTERNAL`)	*material*	If `MATNR_EXTERNAL` is present, it's selected.
Material No. (`MATNR_LONG`)	*material*	If `MATNR_EXTERNAL` isn't present but `MATNR_LONG` is, `MATNR_LONG` is selected.
Material Number (`MATNR`)	*material*	If neither `MATNR_EXTERNAL` nor MATNR_LONG is present, `MATNR` is selected.
Batch Number (`CHARG`)	*batch*	
Movement Type (Inventory Management) (`BWART`)	*goodsMovementType*	
Alternative Item Indicator (`ALPOS`)	*materialCompIsAlternativeItem*	If `ALPOS` is equal to `X`, `materialCompIsAlternativeItem` is set to `true`. Otherwise, `materialCompIsAlternativeItem` is set to `false`.
Indicator: Backflush (`BACKFLUSH`)	*materialCompIsMarkedForBackflush*	If `BACKFLUSH` is equal to `X`, `materialCompIsMarkedForBackflush` is set to `true`. Otherwise, `materialCompIsMarkedForBackflush` is set to `false`.
Indicator: co-product (`KZKUP`)	*materialIsCoProduct*	If `KZKUP` is equal to `X`, `materialIsCoProduct` is set to `true`. Otherwise, `materialIsCoProduct` is set to `false`.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Storage Location (`LGORT`)	*storageLocation*	
Debit/Credit Indicator (`SHKZG`)	*debitCreditCode*	
	orderStepRelationships	Complex element that isn't available in the ERP payload. The system first loops over each `E1PLOPL` segment with `FLGAT='0'`. `E1PLOPL` segments are arranged in ascending order based on the value of the `VORNR` element. `orderStepRelationship` elements are created only for segments after the first iteration.
	orderStepRelationship	Complex element that isn't available in the ERP payload.
Operation/Activity Number (`VORNR`)	*predecessorStepId*	It's the `VORNR` element of the preceeding `E1PLOPL` segment that is selected.
	predecessorStepType	There's no corresponding ERP field. The value is set to `Operation`.
Operation/Activity Number (`VORNR`)	*successorStepId*	
	successorStepType	There's no corresponding ERP field. The value is set to `Operation`.
	relationType	There's no corresponding ERP field. The value is set to `SucRel`.

Related Information

Enabling Custom Resource Type For Planned Orders
Enabling Schedule Download For Planned Orders

2.1.5.3.1.9 Mapping a Work Center

You can transfer work center data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using the IDoc `LOIWCS03`.

This table contains field names in SAP ERP and SAP S/4HANA and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
ERP ID `SNDPRN`	*SenderBusinessSystemID*	
Plant (`WERKS`)	*plant*	
Work Center (`ARBPL`)	*workCenter*	
Short Description (`KTEXT`)	*description*	If there's a segment `E1CRHDL/E1CRTXL[SPRAS=//SupportedPlant/Language]/KTEXT)` in the iDoc that indicates specific languages, this string is used. If there's a segment `E1CRHDL/E1CRTXL[SPRAS='E']/KTEXT)`, the corresponding string is used. Otherwise, the string contained in `E1CRHDL/E1CRTXL/KTEXT` is used.
	capacityCategoryIn	Complex element that isn't available in ERP payload.
Capacity ID (`KAPID`)	*erpInternalId*	
Capacity category (`KAPAR`)	*category*	
Short Description (`KTEXT`)	*description*	
	capacityIn	Complex element that isn't available in ERP payload. The system loops over each `E1KAKOIL` segment.
Capacity ID (`KAPID`)	*erpInternalId*	
Capacity category (`KAPAR`)	*category*	
Capacity name (`NAME`)	*name*	
Short Description (`KTEXT`)	*description*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	capacityShiftIn	Complex element that isn't available in the ERP payload. The system loops over each `E1KAZYL` segment that has a `VERSN` value equal to the maximum `VERSN` value among all `E1KAZYL` elements in the parent context: `E1KAZYL[VERSN = max(../E1KAZYL/VERSN)]`.
Valid-From Date `DATUV`	*beginDate*	
Valid-to date (`DATUB`)	*endDate*	
Number of shifts in a day (`ANZSH`)	*shiftNumber*	
Available capacity version (`VERSN`)	*version*	
Length of the interval cycle (`ANZTG`)	*cycleLength*	
Ind.: Standard available capacity is valid for this interval (`KKOPF`)	*standardCapacity*	
	capacityOverrideIn	Complex element that isn't available in the ERP payload. The system loops over each `E1KAPAL` segment.
Shift number of an available capacity (`SCHNR`)	*shiftNumber*	
Current weekday number within the available capacity cycle (`TAGNR`)	*weekDayNumber*	
Start time in seconds (internal) (`BEGZT`)	*beginTime*	
End time in seconds (internal) (`ENDZT`)	*endTime*	
Object ID of the resource (`OBJID`)	*erpInternalId*	
Production supply area (`PRVBE`)	*supplyArea*	
Standard Value Key (`VGWTS`)	*standardValueKey*	
	standardValueIn	Complex element that isn't available in the ERP payload. The system loops over each `E1CRHDL/E1CRCOL` segment where the `FORML` value isn't empty. The segments are arranged in ascending order based on the value of the `LANUM` element.
Activity type number within a set (`LANUM`)	*sequence*	
Formula key for costing (`FORML`)	*standardValue*	

2.1.5.3.1.10 Field Mapping for a Standard Value Key (SVK)

The fields created in SAP S/4HANA On-Premise and ERP correspond to certain fields of SAP Digital Manufacturing for execution.

Work Center Download (LOIWCS) : Standard Value Key Mapping for an SV Group

SAP Digital Manufacturing for execution Field	SAP S/4HANA On-Premise
`.plant`	`WERKS`
`.standardValKey`	`VGWTS`
`StandardValue`	
`.standardVal`	`/CO_MES_STANDARD_VALUE_KEY_PULL/PARAME`
`.sequence`	`10 based sequence`

Work Center Download (LOIWCS) : Standard Value Key Mapping for a StandardValueText

SAP Digital Manufacturing for execution Field	SAP S/4HANA On-Premise
`.locale`	`EN`
`.description`	`/CO_MES_STANDARD_VALUE_KEY_PULL/ PAR_DESCRIPTION`

Routing Download (LOIROU) for a StandardValueTarget

SAP Digital Manufacturing for execution Field	SAP S/4HANA On-Premise
`.stepId`	`10 based sequence`
`.targetValue.value`	`VGW01..VGW06`
`.targetValue.unitOfMeasure.uom`	`VGE01..VGE06`

2.1.5.3.1.11 Mapping Characteristics Download

You can transfer characteristics from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using the IDoc `CHRMAS05`.

This table contains field names in SAP ERP and SAP S/4HANA and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
ERP ID (`SNDPRN`)	*SenderBusinessSystemID*	
Function (`MSGFN`)	*messageFunction*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Characteristic Name (ATNAM)	*characteristicName*	
Characteristic Name (ATNAM)	*charcInternalID*	
Data Type of Characteristic (ATFOR)	*dataType*	
Number of Characters (ANZST)	*charcLength*	
Number of Decimal Places (ANZDZ)	*charcDecimals*	
Value with Plus or Minus Sign (ATVOR)	*charcWithSign*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Value with template (ATSCH)	*charcValueWithTemplate*	
Case Sensitive (ATKLE)	*caseSensitive*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Entry Required (ATERF)	*entryRequired*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Single Value (ATEIN)	*singleValue*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Unit of Measurement (MSEHI)	*uom*	
Exponent display (ATDIM)	*exponentDisplay*	
Indicator: Restrictable Characteristic (ATGLA)	*restrictableCharc*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Interval Values Allowed (ATINT)	*intervalsAllowed*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Indicator: Additional Values (ATSON)	*additionalValuesAllowed*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Display Allowed Values Defined in Characteristic (ATWRD)	*displayAllowedValues*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Name of Person Responsible for Creating the Object (ANAME)	*createdBy*	
Record Creation Date (ADATU)	*creationDate*	If the date field in the ERP payload isn't empty and isn't equal to '00000000' or '0000-00-00', the date is converted into this format 'YYYY-MM-DDT00:00:00'.
Name of Person Who Changed Object (VNAME)	*modifiedBy*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Last Changed On (VDATU)	*lastChangeDate*	If the date field in the ERP payload isn't empty and isn't equal to '00000000' or '0000-00-00', the date is converted into this format 'YYYY-MM-DDT00:00:00'.
Status of a Characteristic (ATMST)	*charcStatus*	
Valid-From Date (DATUV)	*validFromDate*	If the date field in the ERP payload isn't empty and isn't equal to '00000000' or '0000-00-00', the date is converted into this format 'YYYY-MM-DDT00:00:00'.
Deletion Indicator (LKENZ)	*deletionIndicator*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
No Entry Can be Made for Characteristic (ATINP)	*noEntryForCharc*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Characteristic Not to be Displayed (ATVIE)	*noDisplayForCharc*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Class number (CLASS)	*internalClassNumber*	
Indicator for Allowed Tolerances (ATTOL)	*indicatorForAllowedTolerance*	If the ERP value is 'X', the field is set to 'true'. Otherwise, it's set to 'false'.
Counter for Sorting Object Allocations (DEP_LINENO)	*sortOrder*	
Status of a Characteristic (ATMST)	*charcStatus*	
	characteristicDescriptions	Complex element that isn't available in the ERP payload. The system loops over each E1CABTM segment.
	characteristicDescription	Complex element that isn't available in the ERP payload.
2-Character SAP Language Code (SPRAS_ISO)	*language*	
Characteristic Description (ATBEZ)	*description*	
	characteristicValues	Complex element that isn't available in the ERP payload. The system loops over each E1CAWNM segment.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	characteristicValue	Complex element that isn't available in the ERP payload.
Characteristic Name (`ATNAM`)	*characteristic*	
Int Counter (`ATZHL`)	*position*	
Characteristic Value (`ATWRT`)	*characteristicValue*	
Internal Floating Point From (`ATFLV`)	*fltpValueFrom*	
Internal Floating Point Value To (`ATFLB`)	*fltpValueTo*	
Code for value dependency (`ATCOD`)	*codeForValue*	
Default Value (`ATSTD`)	*defaultValue*	If the ERP value is '`X`', the field is set to '`true`'. Otherwise, it's set to '`false`'.
Unit of Measurement (`ATAWE`)	*fromValueUom*	
Unit of Measurement (`ATAW1`)	*toValueUom*	
Language Key (`SPRAS`)	*locale*	
Valid-From Date (`DATUV`)	*validFrom*	If the date field in the ERP payload isn't empty and isn't equal to '`00000000`' or '`0000-00-00`', the date is converted into this format '`YYYY-MM-DDT00:00:00`'.
Deletion Indicator (`LKENZ`)	*deletionIndicator*	
Tolerance From (`ATTLV`)	*toleranceFrom*	
Tolerance To (`ATTLB`)	*toleranceTo*	
Indicator: Tolerance Shown as a Percentage (`ATPRZ`)	*toleranceShownAsPercentage*	
Increment Within a Specified Interval (`ATINC`)	*incrementWithSpecificInterval*	

2.1.5.3.1.12 Mapping Class Download

You can transfer class data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using the IDoc `CLSMAS04`.

This table contains field names in SAP ERP and SAP S/4HANA and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
ERP ID (`SNDPRN`)	*SenderBusinessSystemID*	
Function (`MSGFN`)	*messageFunction*	
Class Type (`KLART`)	*classType*	
Class Number (`CLASS`)	*classInternalID*	
Class Number (`CLASS`)	*className*	
Class Status (`STATU`)	*status*	
Class Group (`KLAGR`)	*classGroup*	
Authorization Group for Finding Objects (`BGRSE`)	*classSearchAuthGrp*	
Classification Authorization Group (`BGRKL`)	*classClassfctnAuth*	
Class maintenance Authorization Group (`BGRKP`)	*classMaintAuthGrp*	
Document Number (`DOKNR`)	*docNumber*	
Document Type (`DOKAR`)	*documentType*	
Document Part (`DOKTL`)	*documentPart*	
Document Version (`DOKVR`)	*documentVersion*	
Name of Standards Organization (`NNORM`)	*classStandardOrgName*	
Standard Number (`NORMN`)	*classStandardNumber*	
Issue Date (`AUSGD`)	*ClassStandardStartDate*	If the date field in the ERP payload isn't empty and isn't equal to '`00000000`' or '`0000-00-00`', the date is converted into this format '`YYYY-MM-DDT00:00:00`'.
Version Number (`VERSI`)	*classStandardVersionStartDate*	If the date field in the ERP payload isn't empty and isn't equal to '`00000000`' or '`0000-00-00`', the date is converted into this format '`YYYY-MM-DDT00:00:00`'.
Version Number (`VERSI`)	*classStandardVersion*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Characteristics Table (`LEIST`)	*classStandardCharcTable*	
Local Class (`LOCLA`)	*classIsLocal*	If the ERP value is '`X`', the field is set to '`true`'. Otherwise, it's set to '`false`'.
Valid-From Date (`VONDT`)	*validityStartDate*	If the date field in the ERP payload isn't empty and isn't equal to '`00000000`' or '`0000-00-00`', the date is converted into this format '`YYYY-MM-DDT00:00:00`'.
Valid-to date (`BISDT`)	*validityEndDate*	If the date field in the ERP payload isn't empty and isn't equal to '`00000000`' or '`0000-00-00`', the date is converted into this format '`YYYY-MM-DDT00:00:00`'.
Same Classification (`PRAUS`)	*sameClassificationCheck*	If the ERP value is '`X`', the field is set to '`true`'. Otherwise, it's set to '`false`'.
Name of Person Responsible for Creating the Object (`ANAME`)	*createdBy*	
Record Creation Date (`ADATU`)	*creationDate*	If the date field in the ERP payload isn't empty and isn't equal to '`00000000`' or '`0000-00-00`', the date is converted into this format '`YYYY-MM-DDT00:00:00`'.
Name of Person Who Changed Object (`VNAME`)	*modifiedBy*	
Last Changed On (`VDATU`)	*lastChangeDate*	If the date field in the ERP payload isn't empty and isn't equal to '`00000000`' or '`0000-00-00`', the date is converted into this format '`YYYY-MM-DDT00:00:00`'.
	classDescriptions	Complex element that isn't available in the ERP payload. The system loops over each `E1SWORM` segment where `KLPOS` equals '`01`'.
	classDescription	Complex element that isn't available in the ERP payload.
2-Character SAP Language Code (`SPRAS_ISO`)	*language*	
Keywords (`KSCHL`)	*description*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	toClassCharacteristics	Complex element that isn't available in the ERP payload. The system loops over each `E1KSMLM` segment..
	classCharacteristic	Complex element that isn't available in the ERP payload.
Characteristic Name (`ATNAM`)	*characteristic*	
Item Number (`POSNR`)	*position*	
Characteristic origin (`HERKU`)	*characteristicOrigin*	
Relevancy Indicator (`RELEV`)	*relevancyIndicator*	
Valid-From Date (`DATUV`)	*validFrom*	If the date field in the ERP payload isn't empty and isn't equal to '`00000000`' or '`0000-00-00`', the date is converted into this format '`YYYY-MM-DDT00:00:00`'.
Deletion Indicator (`LKENZ`)	*deletionIndicator*	If the ERP value is '`X`', the field is set to '`true`'. Otherwise, it's set to '`false`'.

2.1.5.3.1.13 Mapping Classification Assignment Download

You can transfer classification assignment data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using the IDoc `CLFMAS02`.

This table contains field names in SAP ERP and SAP S/4HANA and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
ERP ID (`SNDPRN`)	*SenderBusinessSystemID*	
Name of database table for object (`OBJECT_TABLE`)	*AssignmentType*	
Classification: Object Field (90 length, technically needed) (`OBJEK_LONG`)	*objectKey*	If '`OBJEK_LONG`' isn't empty, its value is taken. Otherwise the value of '`OBJEK`' is selected.
Class Type (`KLART`)	*classType*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	classAssignment	Complex element that isn't available in the ERP payload. The system loops over each `E1KSSKM` segment.
	A_Class	Complex element that isn't available in the ERP payload.
Class number (`CLASS`)	*classInternalID*	
Valid-From Date (`DATUV`)	*validFromDate*	
Classification status (`STATU`)	*status*	
	validityStartDate	The field isn't present in the ERP payload.
	validityEndDate	The field isn't present in the ERP payload.
	keyDate	The field isn't present in the ERP payload.
	charcLastChangedDateTime	The field isn't present in the ERP payload.
	assignedCharValues	Complex element that isn't available in the ERP payload. The system loops over each `E1AUSPM` segment.
	assignedCharValue	Complex element that isn't available in the ERP payload.
Characteristic Name (`ATNAM`)	*characteristicName*	
Characteristic Name (`ATNAM`)	*charcInternalID*	
Valid-From Date (`DATUV`)	*validFromDate*	
Characteristic Value (`ATWRT`)	*characteristicValue*	
Internal Floating Point From (`ATFLV`)	*internalFloatValueFrom*	
Unit of Measurement (`ATAWE`)	*uom*	
Characteristic Value (`ATWRT`)	*internalFloatValueTo*	
Characteristic Value (`ATWRT_LONG`)	*charcValue*	

2.1.5.3.1.14 Mapping Equipment Download

You can send equipment data from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using the IDoc `EQUIPMENT_CREATE02`.

This table contains field names in SAP ERP and SAP S/4HANA and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
ERP ID (`SNDPRN`)	*SenderBusinessSystemID*	
	equipment	Complex element that isn't available in the ERP payload.
Maintenance Plant (`MAINTPLANT`)	*plant*	
Material Number (`MATERIAL_LONG`)	*materialNumber*	
Equipment Number (`EXTERNAL_NUMBER`)	*equipmentNumber*	If the `EXTERNAL_NUMBER` value represents a number, the system removes the leading zeros and trailing decimal zeros. If `EXTERNAL_NUMBER` is a string, all leading and trailing white space is removed.
Equipment Number (`EXTERNAL_NUMBER`)	*toolNumber*	If the `EXTERNAL_NUMBER` value represents a number, the system removes the leading zeros and trailing decimal zeros. If `EXTERNAL_NUMBER` is a string, all leading and trailing white space is removed.
Serial Number (`SERIALNO`)	*serialNumber*	If the `SERIALNO` value represents a number, the system removes the leading zeros. If `SERIALNO` is a string, all leading and trailing white space is removed.
	quantity	There's no corresponding ERP field. The value is set to 1.
Description of technical object (`DESCRIPT`)	*description*	
Asset location (`MAINTLOC`)	*location*	
Equipment category (`EQUICATGRY`)	*equipmentCategory*	

2.1.5.3.1.15 Mapping a Service Order

You can transfer service orders from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing for execution using the IDoc `IORD01`.

This table contains field names in SAP ERP and SAP S/4HANA and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	upsertOrderApiRequest	Complex element that isn't available in the ERP payload.
SenderBusinessSystemID (`SNDPRN`)	*SenderBusinessSystemID*	
idocNumber (`DOCNUM`)	*idocNumber*	
Order Number (`AUFNR`)	*orderNumber*	
Plant (`WERKS`)	*plant*	
	orderCategory	The field isn't available in the ERP payload and is set to `SERVICE_ORDER`.
Material Number (`MATNR`, `MATNR_EXTERNAL`, or `MATNR_LONG`) or *Assembly* (`BAUTL`, `BAUTL_EXTERNAL`, `BAUTL_LONG`)	*material*	If `MATNR_EXTERNAL` is present, it's selected. Otherwise, `MATNR_LONG` is selected. If neither is present, `MATNR` is selected. Leading and trailing white-space is removed. If there's no material available, one of the assembly values is used. If `BAUTL_EXTERNAL` is present, it's selected. Otherwise, `BAUTL_LONG` is selected. If neither is present, `BAUTL` is selected. Leading and trailing white-space is removed.
	productionVersion	
	plannedQuantityInBaseUnit	The field is set to '1'.
	plannedQuantityInProductionUnit	
	productionUnit	
	productionIsoUnit	
	batchNumber	
	erpOrder	The field is set to 'true'.
	erpBomId	
	erpBomUsage	
	erpAlternativeBomId	
	erpRoutingGroup	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	erpGroupCounter	
Priority (`PRIOK`)	*priority*	Only included if `PRIOK` is present.
	underdeliveryTolerance	
	minimumDeliveryQuantity	
	overdeliveryTolerance	
	maximumDeliveryQuantity	
Earliest start date (`GSTRP`) and *Earliest start time* (`GSUZP`)	*plannedStart*	Transforms the date and time from the parameters `GSTRP` and `GSUZP` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.
Latest finish date (`GLTRP`) and *Latest finish time* (`GLUZP`)	*plannedEnd*	Transforms the date and time from the parameters `GLTRP` and `GLUZP` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.
Scheduled start date (`GSTRS`) and *Scheduled start time* (`GSUZS`)	*scheduledStart*	Transforms the date and time from the parameters `GSTRS` and `GSUZS` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.
Scheduled end date (`GLTRS`) and *Scheduled end time* (`GLUZS`)	*scheduledEnd*	Transforms the date and time from the parameters `GLTRS` and `GLUZS` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.
	putawayStorageLocation	
	warehouseNumber	
	salesOrder	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Partner (PARNR)	*customerId*	If there's a E1ORPAR segment where the partner function (PARVW) element is equal to 'SP', the system selects the partner (PARNR) value of this segment. If there's a E1ORTOB_PARTNR segment where the partner function (PARVW) element is equal to 'SP', the system selects the partner (PARNR) value of this segment.
Name 1 (Name1)	*customerName*	If there's a E1ORPAR segment where the partner function (PARVW) element is equal to 'SP', the system selects the name 1 (Name1) value of this segment. If there's a E1ORTOB_PARTNR segment where the partner function (PARVW) element is equal to 'SP', the system selects the name 1 (Name1) value of this segment.
Equipment Number (EQUNR)	*equipmentNumber*	
Planner Group for Customer Service and Plant Maintenance (INGRP)	*plannerGroup*	The system chooses the first INGRP element in the E1NTHDR segment.
Description (E1ORHDR_LTXT or KTEXT)	*headerText*	If E1ORHDR_LTXT is present, the segment is selected. Otherwise, KTEXT is used. The headerText field includes the value, language, and mimeType.
Text Line (TDLINE) or (KTEXT)	*value*	If there are one or more E1ORHDR_LTXT segments, the system loops over them and selects each TDLINE element. The values are separated with new line characters. If there's no E1ORHDR_LTXT segment, the system checks if there's a KTEXT field and selects its value.
2-Character SAP Language Code (LANGU_ISO)	*language*	
	mimeType	The field is set to 'text/plain'.
	serialNumbers	Complex element that isn't available in the ERP payload.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Serial Number (SERNR)	*serialNumber*	If there's a SERNR field in the E1ORTOB segment, this field is created and the value of SERNR is selected.
	customValues	
	notifications	Complex element that isn't available in the ERP payload.
Notification Number (QMNUM)	*notifications*	The system loops over each E1NTHDR segment and selects the QMNUM value.
	bom	Complex element that isn't available in the ERP payload.
Order Number (AUFNR) and *Material Number / Assembly*	*bom*	The system concatenates the AUFNR value and the value that was selected for the material / assembly (see above).
	description	The system uses the value that was selected for the material / assembly (see above).
	components	Complex element that isn't available in the ERP payload.
	component	The system loops over each E1OROPR segment that does not contain 'DLT' in its STTXT segment and selects the E1OROPR_MAT child elements that contain a MATNR, MATNR_EXTERNAL, or MATNR_LONG field.
Material Number (MATNR or MATNR_EXTERNAL or MATNR_LONG)	*material*	If MATNR_EXTERNAL is present, it's selected. Otherwise, MATNR_LONG is selected. If neither is present, MATNR is selected. Leading and trailing white-space is removed.
	sequence	The field reflects the position of the current segment.
	erpSequence	The field reflects the position of the current segment.
	componentType	The field is set to 'NORMAL'.
Required quantity of the component (BDMNG)	*totalQuantityInBaseUnit*	
	baseUnit	
Base Unit of Measure (MEINS)	*baseIsoUnit*	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	assemblyQuantityAsRequired	
	alternatesEnabled	
	alternativeItemGroup	
	assemblyDataType	
	assemblyOperationActivity	
Order Number (`AUFNR`) / *Operation/ Activity Number* (`VORNR`)	*operationActivity*	The system concatenates the `AUFNR` value with the `VORNR` value: `AUFNR-0-VORNR`.
	backflushEnabled	
	componentScrap	
	toleranceOver	
	toleranceUnder	
	storageLocation	
	batchNumber	
Number of reservation/dependent requirements (`RSNUM`)	*reservationNumber*	
	reservationItemNumber	
	warehouseNumber	
	productionSupplyArea	
	customValues	
	routing	Complex element that isn't available in the ERP payload.
Order Number (`AUFNR`)	*routing*	
	routingType	The field is set to '`SERVICE_ORDER_ROUTING`'.
	description	The system uses the value used for material (see above).
Order Number (`AUFNR`)	*entryRoutingStepId*	The system loops over each `E1OROPR` segment that does not contain 'DLT' in its `STTXT` child segment and selects the `Operation/Activity Number` (`VORNR`) if the segments position is '1'.
	quantityValidation	The field is set to '`true`'.
	automaticGoodsReceipt	
	relaxedFlow	
	routingOperationGroups	Complex element that isn't available in the ERP payload.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	routingOperationGroup	The system loops over each `E1OROPR` segment that does not contain 'DLT' in its `STTXT` child segment.
Order Number (`AUNFR`) and *Operation/ Activity Number* (`VORNR`)	*routingOperationGroup*	The value of `AUNFR` and the value of `VORNR` are concatenated: `AUFNR-0-VORNR`.
Operation/Activity Number (`VORNR`)	*operationNumber*	
Operation/Activity Number (`VORNR`)	*description*	
	routingStepIds	Complex element that isn't available in the ERP payload.
Operation/Activity Number (`VORNR`)	*routingStepId*	Complex element that isn't available in the ERP payload.
	routingSteps	Complex element that isn't available in the ERP payload. The system loops over each `E1OROPR` segment that does not contain 'DLT' in its `STTXT` child segment.
Operation/Activity Number (`VORNR`)	*stepId*	
Operation Short Text (`LTXA1`)	*description*	
Work Center (`ARBPL`)	*workCenter*	
Operation/Activity Number (`VORNR`)	*reportingStep*	
Operation/Activity Number (`VORNR`)	*erpSequence*	If the value of `VORNR` is a number, it's selected. Otherwise, the value of the current position is used.
	entry	If the current position is '1', the field is created and set to '`true`'.
	lastReportingStep	If the current position is the last one, the field is created and set to '`true`'.
Control Key (`STEUS`)	*controlKey*	
	nextStepIds	Complex element that isn't available in the ERP payload. The system loops over the `E1OROPR` segment that don't contain 'DLT' in its `STTXT` child segment.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Operation/Activity Number (VORNR)	*nextStepId*	If there's an E1OROPR segment positioned right after the current segment, it's selected as next step.
	routingOperation	Complex element that isn't available in the ERP payload.
	operationActivity	Complex element that isn't available in the ERP payload.
Order Number (AUFNR) and *Operation/Activity Number* (VORNR)	*operationActivity*	The system concatenates AUFNR and VORN: AUFNR-0-VORN.
Order Number	*schedules*	Complex element that isn't available in the ERP payload. The system loops over the E1OROPR segment that don't contain 'DLT' in its STTXT child segment.
Order Number	*schedule*	Complex element that isn't available in the ERP payload.
	baseQuantity	
	baseQuantityUnit	
	baseQuantityIsoUnit	
	weighRelevant	
Activity Type (LARNT)	*erpServiceActivityType*	
Work involved in the activity (ARBEI)	*serviceWork*	
	serviceWorkUnit	
Unit for work (ARBEH)	*serviceWorkIsoUnit*	
Normal duration of the activity (DAUNO)	*serviceDuration*	
	serviceDurationUnit	
Unit for work (ARBEH)	*serviceDurationIsoUnit*	ARBEH is mapped to serviceDurationIsoUnit because the standard IDoc doesn't have a field for unit for duration.
Number of capacities required (ANZZL)	*numberOfServiceCapacities*	
	customValues	
	operationActivities	Complex element that isn't available in the ERP payload.
Order Number (AUFNR) and *Operation/Activity Number* (VORNR)	*operationActivity*	The system concatenates AUFNR and VORN: AUFNR-0-VORN.
	customValues	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	schedules	Complex element that isn't available in the ERP payload. The system loops over the `E1OROPR` segment that don't contain 'DLT' in its `STTXT` child segment.
	schedule	Complex element that isn't available in the ERP payload.
Operation/Activity Number (`VORNR`)	*routingStepId*	
Earliest scheduled start: Execution (date) (`FSAVD`) and *Earliest scheduled start: Execution (time)* (`FSAVZ`)	*earliestSetupStartDate*	The system transforms the date and time from the parameters `FSAVD` and `FSAVZ` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.
Earliest scheduled start: Execution (date) (`FSAVD`) and *Earliest scheduled start: Execution (time)* (`FSAVZ`)	*earliestProcessingStartDate*	The system transforms the date and time from the parameters `FSAVD` and `FSAVZ` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.
Earliest scheduled finish: Execution (date) (`FSEDD`) and *Earliest scheduled finish: Execution (time)* (`FSEDZ`)	*earliestTeardownStartDate*	The system transforms the date and time from the parameters `FSEDD` and `FSEDZ` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.
Earliest scheduled finish: Execution (date) (`FSEDD`) and *Earliest scheduled finish: Execution (time)* (`FSEDZ`)	*latestTeardownEndDate*	The system transforms the date and time from the parameters `FSEDD` and `FSEDZ` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
Earliest scheduled start: Execution (date) (`FSAVD`) and *Earliest scheduled start: Execution (time)* (`FSAVZ`)	*latestSetupStartDate*	The system transforms the date and time from the parameters `FSAVD` and `FSAVZ` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.
Earliest scheduled start: Execution (date) (`FSAVD`) and *Earliest scheduled start: Execution (time)* (`FSAVZ`)	*latestProcessingStartDate*	The system transforms the date and time from the parameters `FSAVD` and `FSAVZ` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.
Earliest scheduled finish: Execution (date) (`FSEDD`) and *Earliest scheduled finish: Execution (time)* (`FSEDZ`)	*latestTeardownStartDate*	The system transforms the date and time from the parameters `FSEDD` and `FSEDZ` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.
Earliest scheduled finish: Execution (date) (`FSEDD`) and *Earliest scheduled finish: Execution (time)* (`FSEDZ`)	*latestTeardownEndDate*	The system transforms the date and time from the parameters `FSEDD` and `FSEDZ` into the format 'YYYY-MM-DDTHH:MM:SS.000Z'. If there's no time value available, it converts the date into the format 'YYYY-MM-DDT00:00:01.000Z'.
	latestWaitingEndDate	
Work involved in the activity (`ARBEI`)	*planProcessingTime*	The mapping doesn't involve the normal duration of activity (`DAUNO`) because the service order iDoc doesn't contain the corresponding time unit. If you need the normal duration of activity (`DAUNO`) to be mapped to `planProcessingTime`, you can modify the XSLT and enhance the IDoc so that it provides the corresponding information.
	processingTimeUnit	
Unit for work (`ARBEH`)	*processingTimeIsoUnit*	
	plannedQuantityInBaseUnit	

SAP ERP / SAP S/4HANA	SAP Digital Manufacturing for execution	Comment
	minSendAheadQuantity	
	minSendAheadQuantityUnit	
	minSendAheadQuantityIsoUnit	
	minOverlapTime	
	minOverlapTimeUnit	
	minOverlapTimeIsoUnit	
	overlapping	

> **Note**
>
> The following fields aren't part of the standard `IORDER01` IDoc and aren't downloaded from your integrated ERP system:
>
> - Final due date
> - Storage location and batch number of components
> - Task list type
> - Group
> - Group counter
>
> If you want to download these fields, you need to map your plant to your ERP system's destination in your *SAP S/4HANA Integration with SAP Digital Manufacturing* integration package, under *Plant Settings*, in SAP Cloud Integration. With this mapping in place, the `Service Order IORDER01 pre-process request` artifact, which is part of the `IORDER01_STD_PREXSLT` standard pre-xslt workflow available in the *Manage Integration Workflows* app, uses the destination to make a BAPI call to your ERP system after downloading the service order IDoc. If you don't provide the plant/destination mapping, the `IORDER01_STD_PREXSLT` standard pre-xslt workflow can't make the BAPI call to fetch the missing fields, but this doesn't impact the IDoc download itself.

Related Information

Enabling Custom Resource Type For Planned Orders
Enabling Schedule Download For Planned Orders

2.1.5.3.2 Outbound Communication

2.1.5.3.2.1 Mapping a Production Yield Confirmation

Production yield confirmation is transferred from SAP Digital Manufacturing to SAP ERP or SAP S/4HANA using *CO_MES_PRODORDCONF_CREATE_TT*.

This table contains field names in SAP ERP and SAP S/4HANA and their corresponding field names in SAP Digital Manufacturing:

SAP Digital Manufacturing	SAP ERP / SAP S/4HANA	Comment
	IS_TIMETICKETS	Complex element
messageId	*CONF_ID*	The system concatenates the current date and time 'YYYDDHHMMSS' with the value of the `SAP_MessageProcessingLogID` and returns only the last 40 characters from the concatenated string.
orderId	*ORDERID*	
Sequence	*SEQUENCE*	If the value of `Sequence` is a number, it's formated into a six digit number, for example '12' becomes '000012'. If the value of `Sequence` is a string, white space is removed from the string.
OrderOperation	*OPERATION*	
OrderSuboperation	*SUB_OPER*	
CapacityCategoryCode	*CAPA_CATEGORY*	If the `CapacityRequirementSplit` element isn't empty, the system checks whether or not `CapacityCategoryCode` is empty. If `CapacityCategoryCode` isn't empty, its value is selected. If `CapacityCategoryCode` is empty, the field is set to '001'. If `CapacityRequirementSplit` is empty, the field remains empty.
CapacityRequirementSplit	*SPLIT*	If `CapacityRequirementSplit` isn't empty, this field is created. If `CapacityCategoryCode` isn't empty, it's value is selected. Otherwise, the field is set to '001'.

SAP Digital Manufacturing	SAP ERP / SAP S/4HANA	Comment
FinalConfirmationType	*FIN_CONF*	
OpenReservationsIsCleared	*CLEAR_RES*	If `OpenReservationsIsCleared` is `'true'`, the field is set to 'X'. Otherwise, the field is set to ' '.
PostingDate	*POSTG_DATE*	The `PostingDate` is converted from YYYY-MM-DDTHH:MM:SS to YYYY-MM-DD.
VarianceReasonCode	*DEV_REASON*	
ConfirmationText	*CONF_TEXT*	
Plant	*PLANT*	
WorkCenter	*WORK_CNTR*	
ConfirmationUnitSAPCode	*CONF_QUAN_UNIT*	
ConfirmationUnitISOCode	*CONF_QUAN_UNIT_ISO*	
ConfirmationYieldQuantity / *ConfirmationReworkQuantity*	*YIELD*	If the `ConfirmationYieldQuantity` element isn't empty, the system selects its value. Otherwise, the `ConfirmationReworkQuantity` value is selected.
ConfirmationScrapQuantity	*SCRAP*	
OpWorkQuantityUnit1	*CONF_ACTI_UNIT1*	
WorkQuantityUnit1ISOCode	*CONF_ACTI_UNIT1_ISO*	
OpConfirmedWorkQuantity1	*CONF_ACTIVITY1*	
NoFurtherOpWorkQuantity1IsExpd	*NO_REMN_ACTI1*	If `NoFurtherOpWorkQuantity1IsExpd` is `'true'`, the field is set to 'X'. Otherwise, the field is set to ' '.
OpWorkQuantityUnit2	*CONF_ACTI_UNIT2*	
WorkQuantityUnit2ISOCode	*CONF_ACTI_UNIT2_ISO*	
OpConfirmedWorkQuantity2	*CONF_ACTIVITY2*	

SAP Digital Manufacturing	SAP ERP / SAP S/4HANA	Comment
NoFurtherOpWorkQuantity2IsExpd	*NO_REMN_ACTI2*	If `NoFurtherOpWorkQuantity2IsExpd` is '`true`', the field is set to 'X'. Otherwise, the field is set to ' '.
OpWorkQuantityUnit3	*CONF_ACTI_UNIT3*	
WorkQuantityUnit3ISOCode	*CONF_ACTI_UNIT3_ISO*	
OpConfirmedWorkQuantity3	*CONF_ACTIVITY3*	
NoFurtherOpWorkQuantity3IsExpd	*NO_REMN_ACTI3*	If `NoFurtherOpWorkQuantity3IsExpd` is '`true`', the field is set to 'X'. Otherwise, the field is set to ' '.
OpWorkQuantityUnit4	*CONF_ACTI_UNIT4*	
WorkQuantityUnit4ISOCode	*CONF_ACTI_UNIT4_ISO*	
OpConfirmedWorkQuantity4	*CONF_ACTIVITY4*	
NoFurtherOpWorkQuantity4IsExpd	*NO_REMN_ACTI4*	If `NoFurtherOpWorkQuantity4IsExpd` is '`true`', the field is set to 'X'. Otherwise, the field is set to ' '.
OpWorkQuantityUnit5	*CONF_ACTI_UNIT5*	
WorkQuantityUnit5ISOCode	*CONF_ACTI_UNIT5_ISO*	
OpConfirmedWorkQuantity5	*CONF_ACTIVITY5*	
NoFurtherOpWorkQuantity5IsExpd	*NO_REMN_ACTI5*	If `NoFurtherOpWorkQuantity5IsExpd` is '`true`', the field is set to 'X'. Otherwise, the field is set to ' '.
OpWorkQuantityUnit6	*CONF_ACTI_UNIT6*	
WorkQuantityUnit6ISOCode	*CONF_ACTI_UNIT6_ISO*	
OpConfirmedWorkQuantity6	*CONF_ACTIVITY6*	
NoFurtherOpWorkQuantity6IsExpd	*NO_REMN_ACTI6*	If `NoFurtherOpWorkQuantity6IsExpd` is '`true`', the field is set to 'X'. Otherwise, the field is set to ' '.
BusinessProcessEntryUnit	*CONF_BUS_PROC_UNIT1*	

SAP Digital Manufacturing	SAP ERP / SAP S/4HANA	Comment
BusProcessEntrUnitISOCode	*CONF_BUS_PROC_UNIT1_ISO*	
BusinessProcessConfirmedQty	*CONF_BUS_PROC1*	
NoFurtherBusinessProcQtyIsExpd	*NO_REMN_BUS_PROC1*	If `NoFurtherBusinessProcQtyIsExpd` is '`true`', the field is set to 'X'. Otherwise, the field is set to ' '.
ConfirmedExecutionStartDate	*EXEC_START_DATE*	The `ConfirmedExecutionStartDate` value is converted from YYYY-MM-DDTHH:MM:SS to YYYY-MM-DD.
ConfirmedExecutionStartTime	*EXEC_START_TIME*	If the `ConfirmedExecutionStartTime` value contains a 'T', the system extracts the time in this format: HH:MM:SS. If 'T' is not present, the input time is returned as is.
ConfirmedSetupEndDate	*SETUP_FIN_DATE*	The `ConfirmedSetupEndDate` value is converted from YYYY-MM-DDTHH:MM:SS to YYYY-MM-DD.
ConfirmedSetupEndTime	*SETUP_FIN_TIME*	If the `ConfirmedSetupEndTime` value contains a 'T', the system extracts the time in this format: HH:MM:SS. If 'T' is not present, the input time is returned as is.
ConfirmedProcessingStartDate	*PROC_START_DATE*	The `ConfirmedProcessingStartDate` value is converted from YYYY-MM-DDTHH:MM:SS to YYYY-MM-DD.
ConfirmedProcessingStartTime	*PROC_START_TIME*	If the `ConfirmedProcessingStartTime` value contains a 'T', the system extracts the time in this format: HH:MM:SS. If 'T' is not present, the input time is returned as is.
ConfirmedProcessingEndDate	*PROC_FIN_DATE*	The `ConfirmedProcessingEndDate` value is converted from YYYY-MM-DDTHH:MM:SS to YYYY-MM-DD.

SAP Digital Manufacturing	SAP ERP / SAP S/4HANA	Comment
ConfirmedProcessingEndTime	*PROC_FIN_TIME*	If the `ConfirmedProcessingEndTime` value contains a 'T', the system extracts the time in this format: HH:MM:SS. If 'T' is not present, the input time is returned as is.
ConfirmedTeardownStartDate	*TEARDOWN_START_DATE*	The `ConfirmedTeardownStartDate` value is converted from YYYY-MM-DDTHH:MM:SS to YYYY-MM-DD.
ConfirmedTeardownStartTime	*TEARDOWN_START_TIME*	If the `ConfirmedTeardownStartTime` value contains a 'T', the system extracts the time in this format: HH:MM:SS. If 'T' is not present, the input time is returned as is.
ConfirmedExecutionEndDate	*EXEC_FIN_DATE*	The `ConfirmedExecutionEndDate` value is converted from YYYY-MM-DDTHH:MM:SS to YYYY-MM-DD.
ConfirmedExecutionEndTime	*EXEC_FIN_TIME*	If the `ConfirmedExecutionEndTime` value contains a 'T', the system extracts the time in this format: HH:MM:SS. If 'T' is not present, the input time is returned as is.
Personnel	*PERS_NO*	
TimeRecording	*TIMEID_NO*	
EmployeeWageType	*WAGETYPE*	
EmployeeSuitability	*SUITABILITY*	
NumberOfEmployees	*NO_OF_EMPLOYEE*	
EmployeeWageGroup	*WAGEGROUP*	
BreakDurationUnit	*BREAK_UNIT*	
BreakDurationUnitISOCode	*BREAK_UNIT_ISO*	
ConfirmedBreakDuration	*BREAK_TIME*	
EnteredByExternalUser	*EX_CREATED_BY*	

SAP Digital Manufacturing	SAP ERP / SAP S/4HANA	Comment
ConfirmationExternalEntryDate	*EX_CREATED_DATE*	The `ConfirmationExternalEntryDate` value is converted from YYYY-MM-DDTHH:MM:SS to YYYY-MM-DD.
ConfirmationExternalEntryTime	*EX_CREATED_TIME*	If the `ConfirmationExternalEntryTime` value contains a 'T', the system extracts the time in this format: HH:MM:SS. If 'T' is not present, the input time is returned as is.
ExternalSystemConfirmation	*EX_IDENT*	
ConfirmationReworkQuantity	*IV_2ND_TIME_CONFIRMATION*	If `ConfirmationReworkQuantity` isn't empty, the field is set to 'X'.
	IV_PROPOSE_ACTIVITIES	
ProposeBackflush	*IV_PROPOSE_BACKFLUSH*	If `ProposeBackflush` is `'true'`, the field is set to 'X'. Otherwise, the field is set to ' '.
	IT_GOODSMOVEMENTS	Complex element. The system loops over each `ProdnOrdConfMatlDocItmType` element.
	item	Complex element
Material	*MATERIAL / MATERIAL_LONG*	If the material name's length is less than or equal to 18 characters, the field `MATERIAL` is created. Otherwise, the field `MATERIAL_LONG` is created. In both cases the value of `Material` is selected.
Plant	*PLANT*	
StorageLocation	*STGE_LOC*	
Batch	*BATCH*	
GoodsMovementType	*MOVE_TYPE*	
InventorySpecialStockType	*SPEC_STOCK*	
SalesOrder	*SALES_ORD*	
SalesOrderItem	*S_ORD_ITEM*	

SAP Digital Manufacturing	SAP ERP / SAP S/4HANA	Comment
QuantityInEntryUnit	*ENTRY_QNT*	
EntryUnitSAPCode	*ENTRY_UOM*	
orderId	*ORDERID*	
OrderItem	*ORDER_ITNO*	
Reservation	*RESERV_NO*	
ReservationItem	*RES_ITEM*	
GoodsMovementRefDocType	*MVT_IND*	
ProdnOrdConf2/ProdnOrdConf2Type/OrderOperation	*ACTIVITY*	
MaterialDocumentYear	*REF_DOC_YR*	
MaterialDocument	*REF_DOC*	
MaterialDocumentItem	*REF_DOC_IT*	
StorageType	*STGE_TYPE*	
StorageBin	*STGE_BIN*	
	IT_GOODSMVT_SERIALNUMBER	Complex element. The system loops over each `MatlDocItmSerialNumberType` element.
	item	Complex element
MatDocItm	*MATDOC_ITM*	
SerialNo	*SERIALNO*	
Uii	*UII*	

2.1.5.3.2.2 Mapping Inspection Points

Inspection points are transferred from SAP Digital Manufacturing to SAP ERP or SAP S/4HANA using *ERP_SYNC_INSP_RESULT_V2_Request*.

This table contains field names in SAP Digital Manufacturing and their corresponding field names in SAP ERP and SAP S/4HANA:

SAP Digital Manufacturing	SAP ERP / SAP S/4HANA	Comment
	BAPI_INSPOPER_RECORDRESULTS	Complex element
	HANDHELD_APPLICATION	
sch:inspectionLot	*INSPLOT*	
sch:inspectionOperationNumber	*INSPOPER*	
	INSPPOINTDATA	Complex element
sch:inspectionLot	*INSPLOT*	
sch:inspectionOperationNumber	*INSPOPER*	
sch:inspectionPointId	*INSPPOINT*	
	CHAR_RESULTS	Complex element
inspectionLot	*INSPLOT*	
inspectionOperationNumber	*INSPOPER*	
sch:inspectionCharacteristic	*INSPCHAR*	
	EVALUATED	
	CHAR_ATTR	
	CHAR_INVAL	
	INSPECTOR	
	CODE1	
	CODE_GRP1	
	SINGLE_RESULTS	Complex element The system loops over each `inspectionCharacteristic` element and processes each of its `singleResult` elements.
	item	Complex element
inspectionLot	*INSPLOT*	
inspectionOperationNumber	*INSPOPER*	

SAP Digital Manufacturing	SAP ERP / SAP S/4HANA	Comment
inspectionCharacteristic	*INSPCHAR*	
inspectionPointId	*INSPSAMPLE*	
sch:resultValueId	*RES_NO*	
	LAST_RES	
sch:measuredValue	*RES_VALUE*	
	RES_ATTR	
	RES_INVAL	
sch:inspector	*INSPECTOR*	
sch:resultText	*REMARK*	
sch:attributeCode	*CODE1*	
sch:attributeCodeGroup	*CODE_GRP1*	
	SAMPLE_RESULTS	Complex element If `sch:inspectionPointId` isn't empty, the system loops over each `sch:inspectionCharacteristic` element.
	item	Complex element The system loops over each `sch:inspectionCharacteristic` element.
sch:inspectionLot	*INSPLOT*	
sch:inspectionOperationNumber	*INSPOPER*	
sch:inspectionCharacteristic	*INSPCHAR*	
	INSPSAMPLE	
	INSPSAMPLE	
	LAST_SMPL	
	CLOSED	This element is set to 'X'.
	EVALUATED	
	SMPL_ATTR	
	SMPL_INVAL	

SAP Digital Manufacturing	SAP ERP / SAP S/4HANA	Comment
sch:characteristicValuationResult	*EVALUATION*	If `sch:inspectedNumber` isn't equal to `sch:characteristicSampleSize`, this field is created.
	INSPECTOR	
	REMARK	
	CODE1	
	CODE_GRP1	

Related Information

Disabling Auto Valuation and Completion of Inspection Points
Enabling Auto Valuation and Completion of Inspection Characteristics

2.1.5.3.2.3 Mapping a Production Scrap Confirmation

Data is transferred from SAP Digital Manufacturing for execution to SAP ERP using the `BAPI_PRODORDCONF_CREATE_TT` or `CO_MES_PRODORDCONF_CREATE_TT BAPI`.

This table contains field names in SAP ERP and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP	SAP Digital Manufacturing for execution	Comment
	SFC Number `(SFC_BO)`	
Plant `(PLANT)`	*Plant*	
Movement Type `(MOVE_TYPE)`		`261.`
Order Number `(ORDERID)`	*Order*	The order is determined from `SFC_BO`
Yield to Be Confirmed `(SCRAP)`	*Quantity*	SFC quantity / quantity completed (normally `1`, except for non-serialized SFC)
Activity Number `(OPERATION)`	Custom data field: `REPORTING_STEP`	SAP ERP operation number related to the process sequence number (routing reporting step)
	Operation	

SAP ERP	SAP Digital Manufacturing for execution	Comment
Batch Number (BATCH)	*Batch Number*	
FIN_CONF		1
CLEAR_RES		X
CONF_QUAN_UNIT_ISO	unitOfMeasure	
Capacity Category (CAPA_CATEGORY)	erpCapacityCategory	
Split Number (SPLIT)	*Split ID* (splitId)	
Component section		
MOVE_TYPE		The type of goods movement; 261 for *Goods Issue*
MATERIAL or MATERIAL_EXTERNAL or MATERIAL_LONG	item	
PLANT	*Plant*	
STGE_LOC	*Storage Location*	
BATCH	batchNumber	
ENTRY_QNT	*Quantity*	
CO_MES_PRODORDCONF_CREATE_TT		BAPI name is changed from BAPI_PRODORDCONF_CREATE_TT to CO_MES_PRODORDCONF_CREATE_TT
CONF_ID	messageID	
ACTIVITY	reportingStep	

2.1.5.3.2.4 Mapping an Independent Components Consumption

Data is transferred from SAP Digital Manufacturing for execution to SAP ERP using the `MB_MES_GOODSMVT_CREATE` BAPI.

This table contains field names in SAP ERP and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP	SAP Digital Manufacturing for execution	Comment
`DETERMINE_RESERVATIONS`		Always set to `X`
`GM_CODE`		Always set to `03`
`PSTNG_DATE`	*Date Time* `(dateTime)`	
`DOC_DATE`	*Date Time* `(dateTime)`	
Storage Location `(STGE_LOC)`	`Storage location`	*Floor Stock Storage Location* available for the selected Inventory ID. If not available, the value is defined in *ERP Production Storage Location* field in *Material Maintenance*.
Batch Number `(BATCH)`	*Batch Number* `(batchNumber)`	
Consumption Quantity `(ENTRY_QNT)`	*Consumption Quantity*	
Order Number `(ORDERID)`	*Shop Order* for pegged inventory `(shopOrder)`	
`MOVE_TYPE`		`261`
`ACTIVITY`	*Reporting Step*	Reporting step of a routing step where component was assembled
`GOODSMVT_SERIALNUMBER` segment		
`SERIALNO`		`ERP_SERIAL_NUMBER` field collected during assembly

2.1.5.3.2.5 Mapping a Production Order Complete

Data is transferred from SAP Digital Manufacturing for execution to SAP ERP by calling the `BAPI_PRODORDCONF_CREATE_TT`.

This table contains field names in SAP ERP and their corresponding field names in SAP Digital Manufacturing for execution:

SAP ERP	SAP Digital Manufacturing for execution	Comment
Plant (`PLANT`)	*Plant*	
Order Id (`ORDERID`)	*Order Number*	
Operation (`OPERATION`)	*Operation*	
Yield (`YIELD`)		`0`
`FIN_CONF`		`X`
`CLEAR_RES`		`X`

2.1.5.3.2.6 Mapping an Indirect Labor Activity and the SAP Cross-Application Time Sheet

You transfer indirect labor activities from SAP Digital Manufacturing to the time sheet in SAP S/4HANA using `BAPI_CATIMESHEETMGR_INSERT`.

The table contains field names in SAP Digital Manufacturing and the corresponding field names in `BAPI_CATIMESHEETMGR_INSERT`.

SAP Digital Manufacturing	`BAPI_CATIMESHEETMGR_INSERT`	Comment
`plant`	`PLANT`	Mandatory
`erpPersonnelNumber`	`EMPLOYEENUMBER`	Mandatory
`workCenter`	`WORK_CNTR`	
`workDate`	`WORKDATE`	Mandatory
`internalOrder`	`REC_ORDER`	Mandatory
`controllingArea`	`CO_AREA`	Mandatory
`senderCostCenter`	`SEND_CCTR`	Mandatory
`erpActivityType`	`ACTTYPE`	Mandatory
`duration`	`CATSHOURS`	Mandatory
`timeRecordId`		This data is part of the payload. You can use it for custom integration.

SAP Digital Manufacturing	BAPI_CATIMESHEETMGR_INSERT	Comment
timeRecordUser		This data is part of the payload. You can use it for custom integration.
timeRecordActivity		This data is part of the payload. You can use it for custom integration.
approvingUser		This data is part of the payload. You can use it for custom integration.
approvedAt		This data is part of the payload. You can use it for custom integration.

2.1.5.3.2.7 Mapping a Confirmation of Direct Labor for a Service Order

You can transfer confirmations for direct labor performed for service orders from SAP Digital Manufacturing to SAP S/4HANA using BAPI_ALM_CONF_CREATE.

The table contains field names in SAP Digital Manufacturing and the corresponding field names in BAPI_ALM_CONF_CREATE.

SAP Digital Manufacturing	BAPI_ALM_CONF_CREATE	Comment
plant	PLANT	Mandatory
order	ORDERID	Mandatory
operation (stepID)	OPERATION	Mandatory
approvedAt	POSTG_DATE	Mandatory
duration	ACT_WORK	Mandatory
uom	UN_WORK	The value is derived from the operation.
	UN_WORK_ISO	Not part of the payload unless provided by the service order. The value is derived from the operation.
startDate	EXEC_START_DATE	
startTime	EXEC_START_TIME	
endDate	EXEC_FIN_DATE	
endTime	EXEC_FIN_TIME	
timeRecordActivity	ACT_TYPE	The value is derived from the operation.
erpPersonnelNumber	PERS_NO	
approvingUser		This data is part of the payload. You can use it for custom integration.

SAP Digital Manufacturing	BAPI_ALM_CONF_CREATE	Comment
timeRecordId		This data is part of the payload. You can use it for custom integration.
timeRecordUser		This data is part of the payload. You can use it for custom integration.

2.1.5.3.2.8 Mapping a Confirmation of Direct Labor or Production Time for a Production or Process Order

You can transfers confirmations for direct labor and production time for production orders and process orders from SAP Digital Manufacturing to SAP S/4HANA using BAPI_PRODORDCONF_CREATE_TT and BAPI_PROCORDCONF_CREATE_TT respectively.

The table contains field names in SAP Digital Manufacturing and the corresponding field names in BAPI_PRODORDCONF_CREATE_TT and BAPI_PROCORDCONF_CREATE_TT.

SAP Digital Manufacturing	BAPI_PRODORDCONF_CREATE_TT/ BAPI_PROCORDCONF_CREATE_TT	Comment
plant	PLANT	Mandatory
order	ORDERID	Mandatory
sfc		
operation	OPERATION	Mandatory
subOperation	SUB_OPER	Mandatory
sequence	SEQUENCE	Mandatory
timeRecordId		
timeRecordUser	EX_CREATED_BY	Mandatory
erpPersonnelNumber		
startDate		
startTime		
endDate		
endTime		
approvingUser		
approvedAt	POSTG_DATE	Mandatory
timeRecordActivity		
standardValueQuantity1	CONF_ACTIVITY1	
standardValueUom1	CONF_ACTI_UNIT1	Mandatory
standardValueQuantity2	CONF_ACTIVITY2	Mandatory

SAP Digital Manufacturing	BAPI_PRODORDCONF_CREATE_TT/ BAPI_PROCORDCONF_CREATE_TT	Comment
standardValueUom2	CONF_ACTI_UNIT2	Mandatory
standardValueQuantity3	CONF_ACTIVITY3	Mandatory
standardValueUom3	CONF_ACTI_UNIT3	Mandatory
standardValueQuantity4	CONF_ACTIVITY4	Mandatory
standardValueUom4	CONF_ACTI_UNIT4	Mandatory
standardValueQuantity5	CONF_ACTIVITY5	Mandatory
standardValueUom5	CONF_ACTI_UNIT5	Mandatory
standardValueQuantity6	CONF_ACTIVITY6	Mandatory
standardValueUom6	CONF_ACTI_UNIT6	Mandatory

2.1.5.3.2.9 Mapping a Cancellation of Direct Labor Time for a Service Order

You can cancel confirmations for direct labor time for service orders transferred from SAP Digital Manufacturing to SAP S/4HANA using BAPI_ALM_CONF_CANCEL.

The table contains field names in SAP Digital Manufacturing and the corresponding field names in BAPI_ALM_CONF_CANCEL.

SAP Digital Manufacturing	BAPI_ALM_CONF_CANCEL/	Comment
plant		
order		
operation		
timeRecordId		
timeRecordUser		
cancellingUser		
cancelledAt	POSTG_DATE	Mandatory
timeRecordActivity		
confirmationNumber	CONFIRMATION	Mandatory
confirmationCounter	CONFIRMATIONCOUNTER	Mandatory

2.1.5.3.2.10 Mapping a Cancellation of Direct Labor or Production Time for Production or Process Orders

You can cancel confirmations for direct labor or production time for production orders and process orders transferred from SAP Digital Manufacturing to SAP S/4HANA using `BAPI_PRODORDCONF_CANCEL` (production orders) and `BAPI_PROCORDCONF_CANCEL` (process orders), respectively.

The table contains field names in SAP Digital Manufacturing and the corresponding field names in `BAPI_PRODORDCONF_CANCEL` and `BAPI_PROCORDCONF_CANCEL`.

SAP Digital Manufacturing	BAPI_PRODORDCONF_CANCEL/ BAPI_PROCORDCONF_CANCEL	Comment
plant		
order		
sfc		
operation		
timeRecordId		
timeRecordUser		
cancellingUser		
cancelledAt	POSTG_DATE	Mandatory
timeRecordActivity		
confirmationNumber	CONFIRMATION	Mandatory
confirmationCounter	CONFIRMATIONCOUNTER	Mandatory

2.1.5.3.2.11 Mapping a Cancellation of an Indirect Labor Activity

You can cancel the approval of indirect labor activities transferred from SAP Digital Manufacturing to SAP S/4HANA using `BAPI_CATIMESHEETMGR_DELETE`.

The table contains field names in SAP Digital Manufacturing and the corresponding field names in `BAPI_CATIMESHEETMGR_DELETE` .

SAP Digital Manufacturing	BAPI_CATIMESHEETMGR_DELETE	Comment
plant		
workCenter		
internalOrder		
timeRecordUser		
cancellingUser		

SAP Digital Manufacturing	BAPI_CATIMESHEETMGR_DELETE	Comment
cancelledAt		
timeRecordActivity		
confirmationCounter	COUNTER	Mandatory

2.1.5.4 Units of Measure in SAP Digital Manufacturing for execution

Materials are downloaded to SAP Digital Manufacturing for execution with their base units of measure (UOM) as well their alternate units. Other business objects, such as orders, have their own units of measure. Alternate units of measure correlate to base units of measure using a recalculation coefficient defined in SAP S/4HANA and SAP ERP.

> **Note**
>
> In SAP Digital Manufacturing for execution, each alternate unit of measure must be unique for the given material.

From the technical perspective, SAP Digital Manufacturing for execution supports the following unit of measure features:

- Standard units of measure
  SAP Digital Manufacturing for execution has a fixed list of standard units of measure that cannot be modified. This list can be seen in the UOM browse in different applications, such as the *Manage Materials* app or the *Manage Routings/Recipes* app. If UOMs used for your business setup are not available in the list of standard UOMs, please use the possibility to add these UOMs with the custom UOM capability described below.
- Custom units of measure
  You can create, view, and delete custom units of measure (UOMs) using the *Unit of Measure* API. If you're using custom UOMs, make sure to set up custom UOMs before attempting to download business objects, such as materials that use the custom UOM from external systems. You can add custom UOMs to already existing dimension groups. To do this, you need to enter the code for the necessary dimension group. For more information, see Unit of Measure API.
- Units of measure in SAP Digital Manufacturing for execution are defined as internal codes that correlate with standard ISO codes and commercial names.
  Internal units defined as primary ISO codes are converted into commercial units. The names of commercial units are displayed on the screen in the local language. For example, the abbreviation for "bottle" in English is `BT` while in German it is `FL`. The commercial unit abbreviation is language-dependent.

2.1.5.5 Allowed Characters for Key Fields

When you transfer master data such as materials or work centers to SAP Digital Manufacturing for execution, key fields can contain only allowed characters.

Key fields, such as object names, support the characters mentioned below. If key fields contain characters that aren't allowed, the download fails. The following table provides an overview of the allowed characters for different object types with regards to the object download.

Objects	Allowed Characters
All objects	• Any combination of Latin-based letters and numbers • Spaces before, between, and after characters
Material, bill of materials (BOM), and work instruction	You can use the following special characters: • Asterisk `*` • At sign `@` • Caret `^` • Closed parenthesis `)` • Equals sign `=` • Exclamation mark `!` • Hyphen `-` • Open parenthesis `(` • Period `.` • Plus sign `+` • Tilde `~` • Underscore `_` • Forward slash `/` • Hashtag `#` • Dollar sign `$`
Work center, resource, and resource type	• Forward slash `/` • Period `.` • Hashtag `#` • Quotation mark `"` • At sign `@` • Backtick `` ` `` • Space `␣` • Colon `:` • German Umlaut `Ä`, `Ö`, `Ü`, `ä`, `ö`, `ü` • German Eszett `ß`
Nonconformance code and nonconformance group	• Forward slash `/` • German Umlaut `Ä`, `Ö`, `Ü`, `ä`, `ö`, `ü` • German Eszett `ß`

> **⚠ Caution**
>
> Do not use a forward slash / at the beginning or the end of a material or BOM name, or multiple forward slashes consecutively, as such scenarios are not supported. Do not use double forward slashes in the names of work centers, shifts, and resources.

> **ⓘ Note**
>
> Before you implement a business scenario, check if you can use special characters for your scenario in SAP Digital Manufacturing for execution. Just because you can download objects with special characters doesn't mean you can use them in your SAP Digital Manufacturing for execution scenario without modifications. You can find information about the limitations that exist for special characters in 3379404.

2.1.5.6 Mapping Plants (Plant Conversion)

You can integrate several ERP plants with the same identifier into one SAP Digital Manufacturing tenant using the plant-mapping feature.

Prerequisites

- You've set up the technical integration. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16].
- You've created a unique destination for each ERP plant in your SAP Cloud Integration subaccount. For more information, see Set Up Connection Between SAP Cloud Integration, Cloud Connector, and SAP S/4HANA or SAP ERP [page 105].
- You've created a plant with a unique name in SAP Digital Manufacturing for each ERP plant using the *Manage Plants* app. For more information, see Manage Plants.
- You've enabled the S/4HANA integration mode in the *Manage Business Settings* app for each plant. For more information, see Manage Business Settings.

  > **ⓘ Note**
  >
  > In the *Manage Business Settings* app, the *ERP Destination* corresponds to the destination that you've created in your SAP Cloud Integration subaccount and that points to the integrated ERP system.

Context

If you need to integrate more than one SAP ERP or SAP S/4HANA system with SAP Digital Manufacturing, you may encounter a situation where the same plant identifier is used for multiple plants in different ERP systems. For example, there's Plant 1000 in ERP 1 and Plant 1000 in ERP 2. To address this, you need to create a mapping that ensures the inbound and outbound data goes to the correct system. This means you create two

plants in SAP Digital Manufacturing, such as plant 100A and plant 100B, which represent the two Plants 1000 in the integrated ERP systems. Then, you use the plant conversion feature in SAP Cloud Integration to create two mappings for each plant in SAP Cloud Integration: One is for outbound communication and the other is for inbound communication between SAP Digital Manufacturing and the integrated SAP ERP or SAP S/4HANA system.

> **Note**
>
> If you want to use plant conversion in the context of an integration with EWM, see Mapping Plants (Plant Conversion) [page 486]

Procedure

1. In SAP Cloud Integration, go to *Build and Develop Integration Content* ( ) and select the *SAP S/4HANA Integration with SAP Digital Manufacturing* package.
2. Under *Artifacts*, search for *Initial Parameters*.
3. Choose *Actions* ( ) and then *Configure*.
4. Set *ENABLE_PLANT_CONVERSION* to **TRUE**.
5. Save your changes.
6. Choose *Actions* ( ) and then *Deploy*.
7. Under *Artifacts*, search for *Plant Value Mapping*.
8. Choose *Actions* ( ) and then *Configure*.

   The *Configure Plant Value Mapping* window opens.
9. Under *Value Mappings*, choose *Add*.
10. Create the following two entries for each of the integrated ERP systems:

ERP, WERKS	DMC, PLANT	Description
`<Logical System>:<ERP Plant Identifier>` **Note** Use the logical system that represents the integrated ERP system. For more information, see Create Logical Systems [page 39]. **Example** QE5ABCD300:1000	`<Plant Name in SAP Digital Manufacturing>` **Note** Use the plant name that you've defined in the *Manage Plants* app. For more information, see Configure SAP Digital Manufacturing for Outbound Integration [page 107]. **Example** 100A	This mapping is used for the data transfer from your ERP system to SAP Digital Manufacturing. **Note** There's no need to enter your space in this line.

ERP, WERKS	DMC, PLANT	Description
`<ERP Destination Field for Plant>:<ERP Identifier>` **Note** Use the destination you've created for the integrated ERP system in your SAP Cloud Integration. For more information, see Set Up Connection Between SAP Cloud Integration, Cloud Connector, and SAP S/4HANA or SAP ERP [page 105]. **Example** QE5abcd300rfc:1000	`<Plant Name in SAP Digital Manufacturing>` **Note** Use the plant name that you've defined in the *Manage Plants* app. For more information, see Configure SAP Digital Manufacturing for Outbound Integration [page 107]. **Example** 100A	This mapping is used for the data transfer from SAP Digital Manufacturing to your ERP system. **Note** There's no need to enter your space in this line.

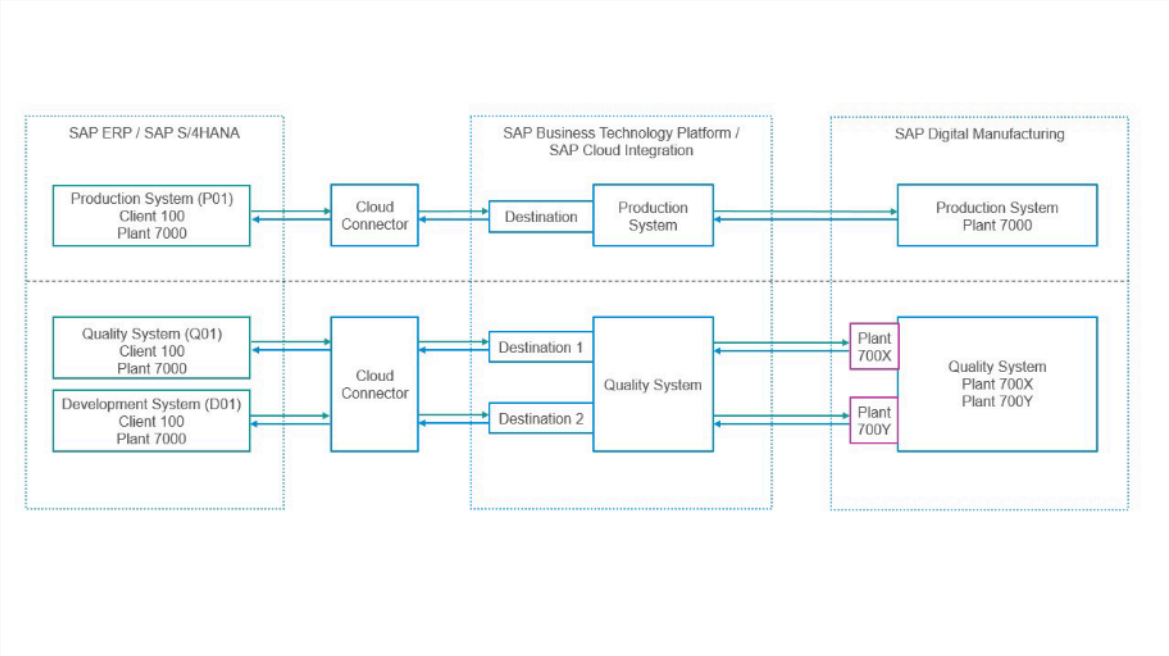
11. Choose *Save* and *Deploy*.

Results

Your ERP plants are mapped to their respective plants in SAP Digital Manufacturing for inbound and outbound communication.

> **→ Tip**
>
> As a test, you can download a work center with standard value keys from your integrated ERP system to SAP Digital Manufacturing because the data transfer is bidirectional. If your configuration is correct, you find two integration messages in the *Integration Message Dashboard*:
>
> - *LOIWCS03*
> - *Standard Value Key Download*

> **Note**
>
> You can map your 3-tier landscape for your SAP ERP or SAP S/4HANA system to a 2-tier SAP Digital Manufacturing landscape without changing your plant identifiers using the plant conversion functionality. The setup looks like this:



> For more information, see Bridging a 3-Tier SAP ERP Landscape to a 2-Tier SAP Digital Manufacturing Cloud Landscape.

Related Information

How to Get SAP Cloud Integration Management URL [page 22]

2.1.6 Customizing the Integration Scenario

You can customize your integration scenario by using predefined XSLT code and standard integration flows, or by implementing your own XSLT transformation rules and integration flows.

Overview

You can adapt your integration with SAP ERP or SAP S/4HANA to your needs by using the predefined customizing options available through predefined XSLT code in the *Manage Integration Workflows* app together

with the standard integration flows from the *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration. This is the recommended approach.

If you want to implement your own integration flows in SAP Cloud Integration, you need to create custom integration workflows in the *Manage Integration Workflows* app that make sure that the field mapping between ODATA and BAPI messages takes place between SAP Digital Manufacturing and SAP Cloud Integration.

For more information see:

- Predefined Customizing Options Using XSLT [page 360]
- User-Defined Customizing Options [page 361]

2.1.6.1 Predefined Customizing Options Using XSLT

You can customize integration workflows using XSLT in the *Manage Integration Workflows* app in SAP Digital Manufacturing to benefit from certain fields or attributes that aren't covered by the standard workflows.

Use

In SAP Digital Manufacturing, you can add additional fields to various apps to include certain pre-defined or customer-specific attributes and data. These attributes and data are transferred within iDoc messages from SAP ERP or SAP S/4HANA to SAP Digital Manufacturing transiting through SAP Cloud Integration. Although the main part of the workflow (iFlow) configuration takes part in SAP Cloud Integration, some configurations can be done using XSLT code in the *Manage Integration Workflows* app in SAP Digital Manufacturing. In this app, you can change the XSLT code that transforms the incoming iDoc messages into messages that SAP Digital Manufacturing uses internally. By changing the XSLT code, you can make sure that, for example, the value of a certain attribute that normally doesn't make it into SAP Digital Manufacturing is available there.

Predefined Customizing Options

You can choose among many predefined customizing options that are already contained in the standard XSLT code but are commented out. In the *Manage Integration Workflows* app, you can choose a workflow, for example `LOIPRO05_PRODORDER`, copy the whole XSLT script from the *Standard XSLT* field into the *Custom XSLT* field. Then you uncomment the section that you want to activate.

For detailed information on the existing custom XSLT options and on how to activate them using the *Manage Integration Workflows* app, see Manage Integration Workflows.

> ⓘ Note
>
> If you need data from different systems, the best approach is usually to consolidate this data in a single system before sending it to SAP Digital Manufacturing. This is even more important if the data needs to be consolidated, including ID mappings, for example.

> **Note**
>
> If you're already working with your own custom XSLT and need to find the exact positon where an XSLT snippet needs to be inserted to activate a new functionality, you can refer to the position of that XSLT snippet in the *Standard XSLT*.

> **Note**
>
> You can check your integration scenario using the *Check Integration Configuration* functionality provided by the *Integration Message Dashboard* app.
>
> After choosing *Check Integration Configuration*, you select an integration message to start an automated test of the integration configuration that covers the full integration scenario from SAP Digital Manufacturing to the connected ERP system and back. The following tests are performed:
>
> - Destination check
> - SAP Cloud Integration parameter check
> - SAP Cloud Integration artifact check
> - Inbound connectivity check
>
> In case of an error, a message will point you to the solution.

Related Information

Manage Integration Workflows

2.1.6.2 User-Defined Customizing Options

You can adapt your integration scenario to your needs by using custom integration flows in SAP Cloud Integration and custom integration workflows in the *Manage Integration Workflows* app.

Overview

Instead of using the standard integration flows provided by SAP Digital Manufacturing through the *SAP S/4HANA Integration with SAP Digital Manufacturing* package, you can create custom integration flows in SAP Cloud Integration. To know more about how to create custom integration flows, see SAP Cloud Integration.

When working with custom integration flows in SAP Cloud Integration, you need to create custom integration workflows in the *Manage Integration Workflows* app that take over data from an SAP Cloud Integration integration flow or pass data to the integration flow.

> **Note**
>
> It's recommended to use the standard integration flows provided by the *SAP S/4HANA Integration with SAP Digital Manufacturing* package in connection with the standard / custom XSLT options available in the

Manage Integration Workflows app. For more information, see Predefined Customizing Options Using XSLT [page 360].

Inbound and Outbound Integration

Once you've created and deployed your custom integration flow in SAP Cloud Integration, you need to perform some configurations in SAP Digital Manufacturing to enable the communication between SAP ERP or SAP S/4HANA and SAP Digital Manufacturing. These configurations are described in the following topics:

- SAP Cloud Integration to SAP Digital Manufacturing [page 362]
- SAP Digital Manufacturing to SAP Cloud Integration [page 364]

Related Information

Predefined Customizing Options Using XSLT [page 360]

2.1.6.2.1 SAP Cloud Integration to SAP Digital Manufacturing

You can connect your custom SAP Cloud Integration integration flow to SAP Digital Manufacturing using the *Manage Integration Workflows* app.

Prerequisites

- The technical integration has been implemented. For more information, see Technical Integration with SAP S/4HANA or SAP ERP [page 16].
- You've got the root name of the iDoc that is sent from your integrated ERP system to SAP Cloud Integration.

  > ⓘ Note
  >
  > You can find information about how to handle iDoc extension here: 3548940 .

- You've created and deployed your custom integration flow in SAP Cloud Integration. This integration flow fetches the incoming data and sends it to SAP Digital Manufacturing.
- You've got the *Service Workflow* name of your SAP Cloud Integration integration flow.
- You've created some XSLT code that you can use in the *Manage Integration Workflows* app in SAP Digital Manufacturing to transform the incoming data.

Context

You can connect your custom SAP Cloud Integration integration flow to SAP Digital Manufacturing using the *Manage Integration Workflows* app to adapt your communication scenario to your needs.

> → Tip
>
> If you're an integration developer and want to learn more about how to design integration flows, you can refer to the Integration Flow Design Guidelines. You'll find there lots of information on the underlying concepts as well as practical examples that will help you deepen your knowledge. For more information, see Integration Flow Design Guidelines.
>
> If you're particularly interested in optimizing workflow performance, you can jump right to this topic: Optimize Performance.

> ⓘ Note
>
> For more information about the xslt fields available in the *Manage Integration Workflows* app, see Manage Integration Workflows.

Procedure

1. In SAP Digital Manufacturing, go to the *Manage Integration Workflows* app.
2. On the *Custom Workflow* tab, choose *Create*.
3. Under *Root Name*, enter the root name of your iDoc.
4. **Optional:** Enter an *Identifier* to mark the outgoing message.

   The identifier of your message will be found under *Application Message ID* in SAP Cloud Integration.
5. Under *Service Configuration* > *Pre-Service Stage Configuration* > *XSLT* enter your XSLT code.
6. Under *Service Stage Configuration* > *Service Workflow*, enter the name of your service workflow.
7. Choose *Save*.

Results

You've added your custom integration workflow to the *Manage Integration Workflows* app.

To verify whether the integration workflow works as planned, you've got two options:

1. In SAP Digital Manufacturing for execution, go to the *Integration Message Dashboard* and check the status of the corresponding outgoing message. For more information, see Integration Message Dashboard.
2. In SAP Cloud Integration, go to *Monitor Message Processing* and check the status of the message corresponding to your custom integration workflow. For more information, see **Monitoring Message Processing**.

2.1.6.2.2 SAP Digital Manufacturing to SAP Cloud Integration

You can adapt your outbound integration scenario by modifying the standard integration workflows available in the *Manage Integration Workflows* app.

For integration scenarios involving outbound custom integration flows in SAP Cloud Integration, you can adapt the standard integration workflows available in the *Manage Integration Workflows* app, so that they call the custom integration flows that you've implemented in SAP Cloud Integration during execution.

You can add references to your SAP Cloud Integration custom integration workflows in the following fields of the standard integration flows available in the *Manage Integration Workflows* app:

Field	Description
Workflow URL	The referenced artifact takes over control. You need to enter the address of the `ProcessDirect` adaptor that triggers your custom artifact in SAP Cloud Integration.
Pre-Service Stage Configuration / *Custom Pre-XSLT Workflow*	With this field, you can enhance the outgoing message before the message transformation using a custom artifact in SAP Cloud Integration. This artifact then takes precedence over the standard pre-XSLT transaction. You need to enter the address of the `ProcessDirect` adaptor that triggers your custom artifact in SAP Cloud Integration.
Pre-Service Stage Configuration / *Custom Post-XSLT Workflow*	With this field, you can enhance the outgoing message after the message transformation using a custom artifact in SAP Cloud Integration. This artifact then takes precedence over the standard post-XSLT transaction. You need to enter the address of the `ProcessDirect` adaptor that triggers your custom artifact in SAP Cloud Integration.
Service Stage Configuration / *Custom Service Workflow*	With this field, you can define a SAP Cloud Integration artifact that sends the transformed message to the destination system to perform the intended action. This artifact then takes precedence over the standard service transaction. You need to enter the address of the `ProcessDirect` adaptor that triggers your custom artifact in SAP Cloud Integration.

Field	Description
Post-Service Stage Configuration / *Custom Post-Service Workflow*	With this field, you can enhance the message received as a result of the service transaction using a custom artifact in SAP Cloud Integration. This artifact then takes precedence over the standard post-service transaction. You need to enter the address of the `ProcessDirect` adaptor that triggers your custom artifact in SAP Cloud Integration.
Custom Error Handler Workflow	With this field, you can define which custom artifact in SAP Cloud Integration should perform actions after the service transaction has failed. This artifact takes precedence over the standard fail handler transaction. You need to enter the address of the `ProcessDirect` adaptor that triggers your custom artifact in SAP Cloud Integration.

2.1.7 Upgrade Information

When an upgrade of SAP Digital Manufacturing for execution is released, you need to manually update the *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration and deploy the integration artifacts it contains.

Prerequisites

You've got the `Administrator` role in SAP Cloud Integration.

Context

To use the features of the new release, you need to update the *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration. You can only update the package to the latest version. For the change log, see 3315636.

> → Tip
>
> It's recommended to deploy all iFlows contained in the *SAP S/4HANA Integration with SAP Digital Manufacturing* package.
>
> If the update includes the *Initial Parameters* iFlow, you need to make sure that the corresponding message is completed in SAP Cloud Integration. For more information see: 3445056.
>
> For more information on the required artifacts for all integration message types, see 3050090.

Procedure

1. In SAP Cloud Integration, go to the *Design* section.
2. Choose the *SAP S/4HANA Integration with SAP Digital Manufacturing* package.
3. Choose *Update package* and then *Update*.
   You've updated the package.
4. On the *Artifacts* tab, select an artifact.
5. Choose *Actions* ( ) and then *Deploy*.
6. Deploy the remaining artifacts manually.

Results

You've updated your *SAP S/4HANA Integration with SAP Digital Manufacturing* package and deployed its artifacts.

2.2 Integration with SAP S/4HANA Cloud Public Edition

You can enable the communication between SAP S/4HANA Cloud Public Edition and SAP Digital Manufacturing.

> **Note**
>
> Since SAP Digital Manufacturing is a software service on SAP Business Technology Platform, Cloud Foundry environment, integration with SAP S/4HANA Cloud Public Edition doesn't require SAP Cloud Integration or cloud connector which are both used for integration between cloud application and on-premise systems.

Use the Communication Management apps to enable data exchange between SAP Digital Manufacturing and SAP S/4HANA Cloud Public Edition.

After you have completed the onboarding procedures as mentioned in Onboarding and User Management, you can continue with the configurations that are required to build up connectivity between SAP Digital Manufacturing and integrated SAP S/4HANA Cloud Public Edition. For detailed steps, see Technical Integration with SAP S/4HANA Cloud [page 369].

For more details about supported data exchange between the systems, see Business Integration with SAP S/4HANA Cloud [page 397].

Related Information

Minimum Version Requirements and Supported Scenarios [page 367]

2.2.1 Minimum Version Requirements and Supported Scenarios

Here are the minimum release requirements, supported scenarios, and limitations for integrating SAP Digital Manufacturing with SAP S/4HANA Cloud Public Edition.

Minimum Release Requirements

SAP Digital Manufacturing is compatible with SAP S/4HANA Cloud Public Edition releases 2002 or higher.

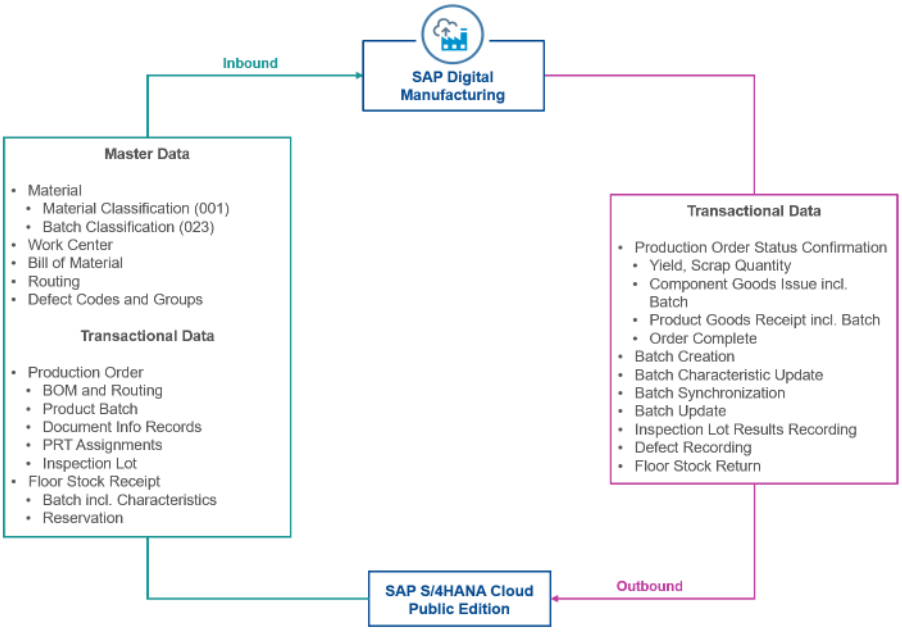
SAP S/4HANA Cloud Public Edition Objects Integrated with SAP Digital Manufacturing

Object	Communication Scenario
Material	SAP_COM_0009
Material classification	SAP_COM_0163, SAP_COM_0309
BOM	SAP_COM_0105
Goods movement	SAP_COM_0263
Batch number	SAP_COM_0337
Recipe, routing, and production version	SAP_COM_0519
Process and production order	SAP_COM_0522
Quality inspection	SAP_COM_0318
Inspection lot	SAP_COM_0110
Material stock	SAP_COM_0164
QM defect code groups and codes	SAP_COM_0153

> **Note**
>
> To find out more about any limitations or restrictions that could apply to your scenario, see 3379404.

2.2.2 Overview Integration with SAP S/4HANA Cloud Public Edition for Discrete Industries

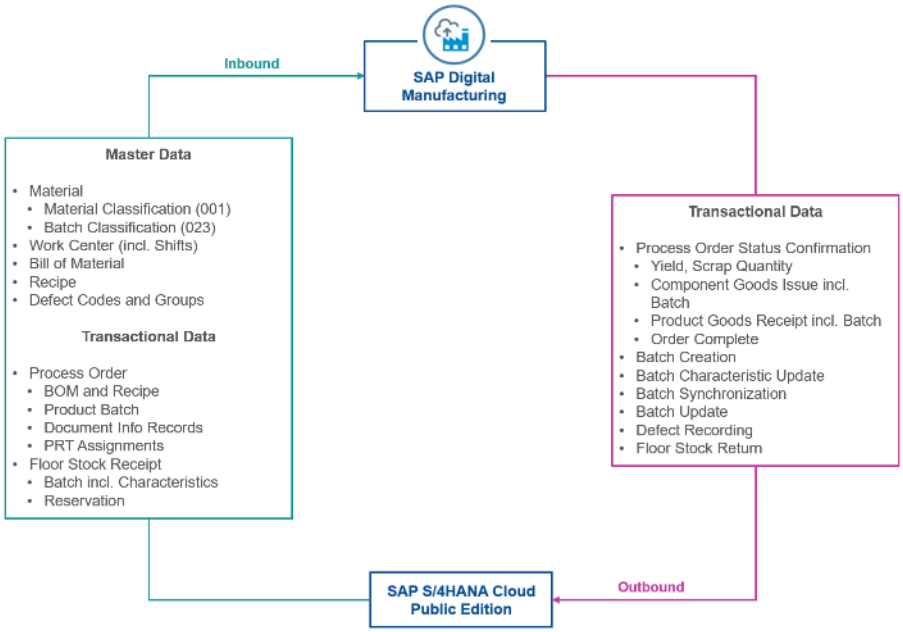
The following diagram provides an overview of the integration of SAP Digital Manufacturing for execution and SAP S/4HANA Cloud Public Edition for discrete industries. Select highlighted areas for more detailed information.



- Transferring a Material Master [page 399]
- Transferring a Work Center [page 401]
- Transferring QM Defect Code Groups and Codes from SAP S/4HANA Cloud Public Edition [page 405]
- Transferring Production Order with PRT Assignment [page 409]
- Inspection Characteristics Integration (Production Order) [page 416]
- Transfer of Floor Stock Data [page 410]
- Inspection Results Recording (Production Order) [page 417]
- Transfer of Floor Stock Return Data [page 414]

2.2.3 Overview Integration with SAP S/4HANA Cloud Public Edition for Process Industries

The following diagram provides an overview of the integration of SAP Digital Manufacturing for execution and SAP S/4HANA Cloud Public Edition for process industries. Select highlighted areas for more detailed information.



- Transferring a Material Master [page 399]
- Transferring a Work Center [page 401]
- Transferring QM Defect Code Groups and Codes from SAP S/4HANA Cloud Public Edition [page 405]
- Transfer of Floor Stock Data [page 410]
- Transfer of Floor Stock Return Data [page 414]
- Transferring a Master Recipe [page 402]
- Integration of Transaction Data [page 408]
- Batch Characteristics Update [page 416]
- Batch Creation [page 416]

2.2.4 Technical Integration with SAP S/4HANA Cloud

You can transfer data between SAP S/4HANA Cloud and SAP Digital Manufacturing for execution using various communication arrangements.

This page demonstrates the steps that are required to enable data transfer between these two systems.

Creating Destinations

Creating Communication Users

Creating Communication Systems

Creating Communication Arrangements

Confirming Integration

- #unique_289/unique_289_Connect_42_subsection-im1 [page 370]
- #unique_289/unique_289_Connect_42_subsection-im2 [page 370]
- #unique_289/unique_289_Connect_42_subsection-im3 [page 370]
- #unique_289/unique_289_Connect_42_subsection-im4 [page 371]
- #unique_289/unique_289_Connect_42_subsection-im5 [page 371]

Create a Destination

Create an `S4H_ODATA_INTEGRATION` destination for inbound and outbound integration in your SAP Digital Manufacturing for execution subaccount in SAP BTP cockpit.

For more information, see Create Destination S4H_ODATA_INTEGRATION [page 394].

Create a Communication User

Create a communication user in SAP S/4HANA Cloud for inbound calls. For more information, see Creating a Communication User [page 373].

Create a Communication System

Create a communication system in SAP S/4HANA Cloud.

To create a communication system, you need to provide the following:

- The API endpoint, which you can find in the `"public-api-endpoint"` property in the service key of the service instance). For more information, see Creating a Service Instance and a Service Key [page 375].

- A user ID and password for the outbound communication user (taken from the Saas-tenant, in the service key of the service instance). For more information, see Creating a Service Instance and a Service Key [page 375].

For more information, see Creating a Communication System [page 374].

Create a Communication Arrangement

Select one of the following communication scenarios in SAP S/4HANA Cloud to create a communication arrangement:

Communication Scenario ID	*Communication Scenario Name*
SAP_COM_0009	*Product Integration*
SAP_COM_0105	*Product Lifecycle Management - Master Data Integration*
SAP_COM_0163	*Classification Systems OData Integration*
SAP_COM_0309	*Product Classification Integration*
SAP_COM_0519	*Production Planning Master Data Integration*
SAP_COM_0522	*Manufacturing Execution - Order and Confirmation Integration*

For more information, see Creating Communication Arrangements [page 377].

Confirm Integration

Confirm the transfer of a specific business object (for example, a product or master recipe) from an application in SAP S/4HANA Cloud (for example, the *Replicate by Object Selection* app or the *Replicate by Model Selection* app) to SAP Digital Manufacturing for execution.

After setting up this integration, you need to configure the collaboration links and directives. For more information, see Manage Collaboration Links.

> **Note**
>
> Do not enter any personal data in any text fields or in any files uploaded to SAP Digital Manufacturing for execution.

> **Note**
>
> You can check your integration scenario using the *Check Integration Configuration* functionality provided by the *Integration Message Dashboard* app.
>
> After choosing *Check Integration Configuration*, you select an integration message to start an automated test of the integration configuration that covers the full integration scenario from SAP Digital Manufacturing to the connected ERP system and back. The following tests are performed:
>
> - Destination check
> - SAP Cloud Integration parameter check
> - SAP Cloud Integration artifact check

- Inbound connectivity check

In case of an error, a message will point you to the solution.

Related Information

Integration of Master Data [page 398]
Integration of Transaction Data [page 408]
Manage Collaboration Links

2.2.4.1 Before You Start

This page shows you the prerequisite steps that must be completed before configuring the integration with SAP S/4HANA Cloud Public Edition.

Before you start, you must have performed the following steps:

- Complete the onboarding process

  > ⓘ Note
  >
  > This includes the configuration of the `S4H_INTEGRATION_OAUTH` destination. The destination data is used by SAP Digital Manufacturing to provide authentication and authorization for internal system communication.

  > → Tip
  >
  > As an option, you can include SAP Cloud Integration as a middleware to enhance your integration between SAP S/4HANA Cloud Public Edition and SAP Digital Manufacturing with an indirect component.

Next Steps

- Creating a Service Instance and a Service Key [page 375]
- Creating a Communication User [page 373]
- Creating a Communication System [page 374]
- Creating Communication Arrangements [page 377]

2.2.4.2 Creating a Communication User

To integrate SAP Digital Manufacturing with SAP S/4HANA Cloud Public Edition, you need to create a communication user.

Prerequisites

You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.

Context

To integrate SAP Digital Manufacturing with SAP S/4HANA Cloud Public Edition, you need to create a communication user with a password in SAP S/4HANA Cloud Public Edition. Once it has been assigned to a communication system representing SAP S/4HANA Cloud Public Edition, the communcation user enables SAP Digital Manufacturing to access SAP S/4HANA Cloud Public Edition.

Procedure

1. In SAP S/4HANA Cloud Public Edition, go to *Communication Management*.
2. Choose *Maintain Communication Users*.
3. Choose *New*.
4. Enter the user name, for example **`DM_COM_USER`** and a description.
5. Enter a password.
6. Choose *Create*.

Results

You've created a communication user that will be assigned to a communcation system later.

2.2.4.3 Creating a Communication System

To integrate SAP S/4HANA Cloud Public Edition and SAP Digital Manufacturing, you need to create a communication system.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role for SAP S/4HANA Cloud Public Edition.
- You've created a communication user and a password. For more information, see Creating a Communication User [page 373].
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've got the ID of your system.
- You've got the ID of your logical system.
- You've got the ID of your business partner.

Context

To establish a connection between SAP S/4HANA Cloud Public Edition and SAP Digital Manufacturing, you need to create a communication system in SAP S/4HANA Cloud Public Edition, which represents SAP S/4HANA Cloud Public Edition. In this communication system, you register the partner systems with their respective credentials. For inbound calls to SAP S/4HANA Cloud Public Edition, you add the communication user and its password. For outbound calls to SAP Digital Manufacturing, you use the client ID and client secret of the service key that you've created in your SAP Digital Manufacturing subaccount in SAP BTP cockpit.

Procedure

1. In SAP S/4HANA Cloud Public Edition, go to the *Communication Management*.
2. Choose *Communication Systems*.
3. To create a new communication system, choose *New*
4. On the *New Communication System* screen, make the following entries:

Field	Value
System ID	Enter an ID of your choice, for example **`SAP_DM_TENANT`**
System Name	Enter a name of your choice, for example **`SAP Digital Manufacturing`**

5. Choose *Create*.
6. In the *General* tab, make the following entries in the *Technical Data* section:

Field	Description
Host Name	Enter the address taken from the service key that you've created in your SAP Digital Manufacturing subaccount. You can find it in the service key credentials under the property `public-api-endpoint`. **Example** `https://api.<datacenter>.dmc.cloud.sap` (production system) `https://api.test.<datacenter>.dmc.cloud.sap` (quality system)
Logical System ID	Enter an ID of your choice, for example **`SAP_DM_TENANT`**.
Port	Use the default value, for example, `443`.
Business System	Enter an ID of your choice, for example **`SAP_DM_TENANT`**.

7. On the *User for Inbound Communication* tab, choose *Add* to specify the user name.
8. Select *User Name and Password* as the *Authentication Method*.
9. Choose *OK*.
10. Use the credentials that were used to create the communication user.
11. On the *User for Outbound Communication* tab, for the *Authentication Method*, select *User Name and Password*.
12. For the user name and password, use the *clientid* and *client secret* from the service key.
13. On the *Business Partners* tab, select the business partner.
14. Choose *Create*.
15. Choose *Save*.

2.2.4.3.1 Creating a Service Instance and a Service Key

Create a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit to integrate with SAP S/4HANA Cloud Public Edition.

Prerequisites

- You've completed the Onboarding Process.
- You've got the `Administrator` role for SAP BTP cockpit.
- You've got access to the SAP Digital Manufacturing subaccount in SAP BTP cockpit.

Context

To enable communication from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing, you need to create a service instance and a service key supporting OAUTH 2.0 client credential authentication (client ID / client secret) in your SAP Digital Manufacturing subaccount in SAP BTP cockpit.

Procedure

1. In SAP BTP cockpit, go to your SAP Digital Manufacturing subaccount.
2. Go to *Services* > *Instances and Subscriptions* and choose *Create*.

   The *New Instance or Subscription* popup opens.
3. Enter the following fields to create a service instance:

Field	Value
Service	*SAP Digital Manufacturing Cloud Services*
Plan	*execution*
Runtime Environment	*Cloud Foundry*
Space	`Name of your space`

4. Choose *Next* and leave the *Parameters* popup empty.
5. Choose *Next* and *Create*.
6. Under *Instances*, choose the instance that you've created.
7. On the *Service Key* tab, choose Create.

   The *New Service Keys* popup opens.
8. Enter the following fields to create a service key supporting client ID / client secret:

Field	Value
Service Key Name	`Service Key` **Note** You can choose a random name.

9. Choose *Create*.

   Note

   You can access the service key content by choosing ••• and then *View*.

Results

You've created a service instance and a service key supporting OAuth 2.0 client credential authentication.

2.2.4.4 Creating Communication Arrangements

A communication arrangement specifies the metadata for a specific communication scenario, such as material replication. The metadata for the communication arrangement is contained in a service key. You can define one or more destinations for a communication arrangement.

You need to create a communication arrangement to allow inbound communication to the SAP S/4HANA Cloud Public Edition tenant and outbound communication to the SAP Digital Manufacturing for execution tenant. The communication arrangement defines the user and the system for specific communication scenarios.

For general information on communication arrangements and how to create them, see How to Create a Communication Arrangement and Communication Arrangement.

2.2.4.4.1 Product Integration (SAP_COM_0009)

This communication arrangement is for downloading materials from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create the communication arrangement for product integration, follow these steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud Public Edition system.
2. Open the *Communication Arrangements* app.
3. To create a communication arrangement, choose *New*.

4. Select the communication scenario `SAP_COM_0009` (*Product Integration*).

> **Note**
>
> For an overview of the APIs provided by the communication scenario `SAP_COM_0009`, go to the SAP Business Accelerator Hub.

5. The *Arrangement Name* is filled automatically.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help.

> **Note**
>
> The communication user that was created earlier is automatically added to the *Inbound Communication* section.

8. In *Outbound Communication*, select the user that is associated with your *Communication System*.

> **Note**
>
> When you choose this user, the system defaults the *Authentication Method* assigned to this user.

9. In the *Outbound Services* section, activate the *Product Master - Replicate from SAP S/4HANA Cloud to Client* service.
10. In the *Path* for the *Product Master - Replicate from SAP S/4HANA Cloud to Client* service, enter **`/internal/ws?X-Identity-Zone-Subdomain=<subdomain>`**.

> **Note**
>
> To find the <subdomain> value, go to the subaccount that you've used to deploy SAP Digital Manufacturing on the SAP BTP cockpit. The <subdomain> value is displayed in the *Overview* under the *General* tab.

11. In the *Job Execution Details* section, specify the frequency for job execution by entering the relevant value in the *Run Every* field. If the job is scheduled, the *Job Status* becomes *Active*. You can also specify the number of objects that can be replicated in one job execution.
12. Under *Additional Properties*, in the *Replication Model* field, enter any name for the replication model that you want to create for the selected outbound interfaces. If you've enabled *Job Execution*, choose the replication mode *C*.
13. Choose an *Output Mode*. If *Job Execution* is enabled, you have to choose output mode *P*.
14. Choose *Save*.

> **Note**
>
> For complete material replication, you need to configure three communication arrangements:
>
> - `SAP_COM_0009` for product integration
> - `SAP_COM_0163` for classification systems OData/SOAP integration
> - `SAP_COM_0309` for product classification integration

Related Information

Classification Systems OData/SOAP Integration (SAP_COM_0163) [page 381]
Product Classification Integration (SAP_COM_0309) [page 384]

2.2.4.4.2 Product Lifecycle Management - Master Data Integration (SAP_COM_0105)

This communication arrangement is for downloading BOM data from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create this communication arrangement, follow these steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud Public Edition system.
2. Open the *Communication Arrangements* app.
3. To create a communication arrangement, choose *New*.
4. Select the communication scenario `SAP_COM_0105` (*Product Lifecycle Management - Master Data Integration*).

   > **Note**
   >
   > For an overview of the APIs provided by the communication scenario `SAP_COM_0105`, go to the SAP Business Accelerator Hub.

5. The *Arrangement Name* field is filled automatically.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help. The communication user that was created earlier is automatically added to the *Inbound Communication* section.

The inbound services added to the communication scenario in the back-end system are reflected in the communication arrangement under *Inbound Services*.

8. To activate the communication arrangement, choose *Save*.

2.2.4.4.3 Material Document Integration (SAP_COM_0108)

This communication arrangement is for transferring goods movements from SAP Digital Manufacturing for execution to SAP S/4HANA Cloud Public Edition.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create the communication arrangement for material document integration, follow these steps:

1. Log on to the SAP Fiori launchpad in the SAP S/4HANA Cloud Public Edition system.
2. Open the *Communication Arrangements* app.
3. To create a communication arrangement, choose *New*.
4. Select the communication scenario *SAP_COM_0108* (*Material Document Integration*).

   > **Note**
   >
   > For an overview of the APIs provided by the communication scenario `SAP_COM_0108`, go to the SAP Business Accelerator Hub.

5. The *Arrangement Name* field is filled automatically.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that you created earlier from the input help.

   > **Note**
   >
   > The communication user that you created earlier is automatically added to the *Inbound Communication* section.

8. In *Outbound Communication* section, select the user that is associated with your *Communication System*.

> **Note**
>
> When you choose this user, the system defaults the *Authentication Method* assigned to this user.

9. In the *Outbound Services* section, make sure that the *Service Status* is *Active*.
10. In the *Path* for the *Material Document – Receive Confirmation*, enter **`/internal/ws?X-Identity-Zone-Subdomain=<subdomain>`**.

> **Note**
>
> To find the <subdomain> value, go to the subaccount that you've used to deploy SAP Digital Manufacturing on the SAP BTP cockpit. The <subdomain> value is displayed in the *Overview* under the *General* tab.

11. To activate the communication arrangement, choose *Save*.

> **Note**
>
> To enable the integration, you also need to go to SAP Digital Manufacturing and map the collaboration link `COLLABORATION_ERP_INV_CLEAR_RESERVATION` to the directive `ERP_INVENTORY_CLEAR_RESERVATION` in the app.

2.2.4.4.4 Classification Systems OData/SOAP Integration (SAP_COM_0163)

This communication arrangement is for downloading material classifications from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud Public Edition system.
2. Open the *Communication Arrangements* app.
3. To create a communication arrangement, choose *New*.
4. Select the communication scenario `SAP_COM_0163` (*Classification Systems OData/SOAP Integration*)

   > **Note**
   >
   > For an overview of the APIs provided by the communication scenario `SAP_COM_0163`, go to the SAP Business Accelerator Hub.

5. The *Arrangement Name* field is filled automatically.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help.

   > **Note**
   >
   > The communication user that was created earlier is automatically added to the *Inbound Communication* section.

8. The inbound services added to the communication scenario in the back-end system are reflected in the communication arrangement under *Inbound Services*.
9. Under *Outbound Services* > *Characteristic Data for Classification - Replicate (Asynchronous, Outbound)*, unselect the *Service Status* to deactivate the outbound services.
10. To activate the communication arrangement, choose *Save*.

2.2.4.4.5 Material Document Outbound Notification Integration (SAP_COM_0263)

You can use this communication arrangement to transfer goods movements from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].
- You've assigned a business partner to your communication system.

Procedure

To create the communication arrangement, complete the following steps:

1. Log on to the SAP Fiori launchpad in the SAP S/4HANA Cloud Public Edition system.
2. Open the *Communication Arrangements* app.
3. To create a communication arrangement, choose *New*.
4. Select the communication scenario *SAP_COM_0263* (*Material Document Outbound Notification Integration*).

   > **Note**
   >
   > For an overview of the APIs provided by the communication scenario `SAP_COM_0263`, go to the SAP Business Accelerator Hub.

5. The *Arrangement Name* field is filled automatically.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that you created earlier from the input help.

   > **Note**
   >
   > The communication user that you created earlier is automatically added to the *Outbound Communication* section.

8. In the *Outbound Services* section, make sure that the *Service Status* is *Active*.
9. In the *Path* for the *Material Document – Receive Notification* service, enter **`/internal/ws?X-Identity-Zone-Subdomain=<subdomain>`**.

   > **Note**
   >
   > To find the <subdomain> value, go to the subaccount that you've used to deploy SAP Digital Manufacturing on the SAP BTP cockpit. The <subdomain> value is displayed in the *Overview* under the *General* tab.

10. Choose *Save*.
11. Open the *Output Parameter Determination* app.

    > **Note**
    >
    > For more information on defining output settings for specific business objects, see Output Parameter Determination.

12. In the *Select Business Rules* section, select *Goods Movement* for *Show Rules For* and select *Output Type* for *Determination Step*.
13. In the *Maintain Business Rules* section, choose *Edit*.
14. In *Table Contents*, choose ⊕ (Insert New Row).
15. Under *Output Type*, choose *Direct Value Input* from the dropdown menu.
16. Under *Output Type*, enter *MMIM_MATDOC_GDSMVMT_ESOA* (Goods Movement ESOA) and select the corresponding row.
17. Choose *OK*.

18. Make the following settings for the *MMIM_MATDOC_GDSMVMT_ESOA* (Goods Movement ESOA) row by using *Direct Value Input* from the respective columns dropdown menu:
    - *Print Active = X(Yes)*
    - *Plant* = The plant for integration
    - *Movement Type = 311*
19. Select your row and choose *Activate* to apply your settings.

Related Information

Material Document Integration (SAP_COM_0108) [page 380]

2.2.4.4.6 Product Classification Integration (SAP_COM_0309)

This communication arrangement is for downloading material classifications from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the *Communication Arrangements* app.
3. To create a communication arrangement, choose *New*.
4. Select the communication scenario `SAP_COM_0309` (*Product Classification Integration*) from the pick list.

> **Note**
>
> For an overview of the APIs provided by the communication scenario `SAP_COM_0309`, go to the SAP Business Accelerator Hub.

5. The *Arrangement Name* field is filled automatically.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help.

   > ⓘ Note
   >
   > The communication user that was created earlier is automatically added to the *Inbound Communication* section.

8. The inbound services added to the communication scenario in the back-end system are reflected in the communication arrangement under *Inbound Services*.
9. To activate the communication arrangement, choose *Save*.

2.2.4.4.7 Batch Management OData Integration (SAP_COM_0337)

This communication arrangement is for integrating batch management in SAP S/4HANA Cloud Public Edition with SAP Digital Manufacturing for execution.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create the communication arrangement for batch management integration, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud Public Edition system.
2. Open the *Communication Arrangements* app.
3. To create a communication arrangement, choose *New*.
4. Select the communication scenario *SAP_COM_0337* (*Batch Management OData Integration*).

   > ⓘ Note
   >
   > For an overview of the APIs provided by the communication scenario `SAP_COM_0337`, go to the SAP Business Accelerator Hub.

5. The *Arrangement Name* field is filled automatically.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help.

> **Note**
>
> The communication user that was created earlier is automatically added to the *Inbound Communication* section.

8. In *Inbound Communication* select a user. The system defaults the *Authentication Method* assigned to this user.
9. To activate the communication arrangement, choose *Save*.

> **Note**
>
> To enable the integration, you also need to go to SAP Digital Manufacturing and ensure that the collaboration link *COLLABORATION_BATCH_CREATION* is mapped to the directive *BATCH_CREATION* in the *Manage Collaboration Links* app.

Related Information

Creating Batch Numbers

2.2.4.4.8 Production Planning Master Data Integration (SAP_COM_0519)

This communication arrangement is for downloading a master recipe with a production version from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud Public Edition system.
2. Open the *Communication Arrangements* app.
3. To create a communication arrangement, choose *New*.
4. Select the communication scenario `SAP_COM_0519` (*Production Planning Master Data Integration*).

   > **Note**
   >
   > For an overview of the APIs provided by the communication scenario `SAP_COM_0519`, go to the SAP Business Accelerator Hub.

5. The *Arrangement Name* field is filled automatically.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help.

   > **Note**
   >
   > The communication user that was created earlier is automatically added to the *Inbound Communication* section.

8. In the *Outbound Communication* section, the user associated with the *Communication System* is displayed by default in the value help for the *User Name* field. By choosing the user, the *Authentication Method* is defaulted with same authentication method associated with this user.
9. In the *Outbound Services* section, ensure that the *Service Status* checkbox is selected for all `SOAP` services. The following services must be *Active*:
   - *Master Recipe – Replicate*
   - *Production Routing – Replicate*
   - *Production Version - Replicate*
   - *Work Center – Replicate*
10. In the *Path* for every `SOAP` service, enter the API endpoint:

Service	`SOAP` Version 2 API Endpoint
Master Recipe	`/internal/dmc/ws/masterRecipeV2?X-Identity-Zone-Subdomain=<subdomain>`
Production Routing	`/internal/dmc/ws/productionRoutingV2?X-Identity-Zone-Subdomain=<subdomain>`
Production Version	`/internal/dmc/ws/productionVersionV2?X-Identity-Zone-Subdomain=<subdomain>`
Work Center	`/internal/dmc/ws/workCenterV2?X-Identity-Zone-Subdomain=<subdomain>`

> **Note**
>
> To find the <subdomain> value, go to the subaccount that you've used to deploy SAP Digital Manufacturing on the SAP BTP cockpit. The <subdomain> value is displayed in the *Overview* under the *General* tab.

11. In the *Job Execution Details* section, you can specify how frequently the job is executed by entering the relevant value in the *Run Every* field. Once the job is scheduled, the *Job Status* becomes *Active*. You can also specify the size of the objects that can be replicated in one job.
12. In the *Additional Properties* section, in the *Replication Model* field, enter any name for the replication model that you want to create. If you've enabled job execution, choose a *Replication Mode*.
13. Choose an *Output Mode*. If the job execution is enabled, you must choose output mode `P`.
14. In the input help of the *System Filter* field, select *active* or *inactive* mode, depending on your requirements.
15. To activate the communication arrangement, choose *Save*.

2.2.4.4.9 Manufacturing Execution - Order and Confirmation Integration (SAP_COM_0522)

This communication arrangement is for downloading production or process orders from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud Public Edition system.
2. Open the *Communication Arrangements* app.
3. To create a communication arrangement, choose *New*.
4. Select the communication scenario `SAP_COM_0522` (*Manufacturing Execution - Order and Confirmation Integration*).

> **Note**
>
> For an overview of the APIs provided by the communication scenario `SAP_COM_0522`, go to the SAP Business Accelerator Hub.

5. The *Arrangement Name* field is filled automatically.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help.

> **Note**
>
> The communication user that was created earlier is automatically added to the *Inbound Communication* section.

The included inbound services are listed in the *Inbound Services* section.

Interaction	*SAP S/4HANA Cloud*	**Format**	**SAP S/4HANA Cloud Interface**
Process Order Confirmation	Inbound	`OData V2`	`API_PROC_ORDER_CONFIRMATION_2_SRV`
Production Order Confirmation	Inbound	`OData V2`	`API_PROD_ORDER_CONFIRMATION_2_SRV`
Production Order (Version 2)	Inbound	`OData V2`	`API_PRODUCTION_ORDER_2_SRV`
Process Order (Version 2)	Inbound	`OData V2`	`API_PROCESS_ORDER_2_SRV`

8. In the *Outbound Communication* section, the user associated with the *Communication System* is displayed by default in the value help for the *User Name* field. By choosing the user, the *Authentication Method* is defaulted with same authentication method associated with this user.

Interaction	**SAP S/4HANA Cloud Public Edition**	*Format*	**SAP S/4HANA Cloud Public Edition** *Interface*
Manufacturing Order - Send	Outbound	`SOAP`	`CO_PPINT_MFGORD_EXE_REQ_OUT_V2`

9. In the *Outbound Services* section, ensure that the *Service Status* checkbox is selected for *Manufacturing Order -Send, Version 2*.

> **Note**
>
> In SAP S/4HANA Cloud Public Edition, the delivered order types are set by default to shop floor distribution when you create a communication scenario. By activating the integration, all orders are automatically distributed to your shop floor system unless you define filter criteria. Without a filter, you can no longer confirm orders in the SAP S/4HANA Cloud Public Edition system. You confirm orders

> in your shop floor system and the confirmations are transferred to the SAP S/4HANA Cloud Public Edition system.

10. In the *Path* for *Manufacturing Order - Send, Version 2*, enter **`/internal/dmc/ws/manufacturingOrderV2?X-Identity-Zone-Subdomain=<subdomain>`**.

> **Note**
>
> To find the <subdomain> value, go to the subaccount that you've used to deploy SAP Digital Manufacturing on the SAP BTP cockpit. The <subdomain> value is displayed in the *Overview* under the *General* tab.

11. In the *Additional Properties* section, enter the following data:

First Column (Property Name)	*Second Column (Property Value)*	*Note*
Material	`<your materials>`	Select the materials for which orders are distributed to your shop floor system.
Order Type	`<your order types>`	Select the order type of the orders that are distributed to your shop floor system.
Plant	`<your plant>`	Select your plant.

> **Note**
>
> The system evaluates the filter criteria using the following logic:
>
> - If you apply several filter criteria to the same attribute (for example, material), the system applies the filter if any filter criterion is true.
> - If you apply several filter criteria to different attributes (for example, material and order type), the system applies the filter if all filter criteria are true.
> - The system ignores empty fields.

12. To activate the communication arrangement, choose *Save*.

> **Note**
>
> To enable the integration, you also need to go to SAP Digital Manufacturing and ensure that the collaboration link *COLLABORATION_QUANTITY_CONFIRMATION* is mapped to the directive *QUANTITY_CONFIRMATION* and the collaboration link *COLLABORATION_GOODS_RECEIPT_CONFIRMATION* is mapped to the directive *GOODS_RECEIPT_CONFIRMATION* in the *Manage Collaboration Links* app.

2.2.4.4.10 Inspection Master Data Integration (SAP_COM_0110)

This communication arrangement is for retrieving inspection information from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud Public Edition system.
2. Open the *Communication Arrangements* app.
3. To create a new communication arrangement, choose *New*.
4. Select the communication scenario `SAP_COM_0110` (*Inspection Master Data Integration*) from the pick list.
5. The *Arrangement Name* field is filled automatically with the name of the selected integration scenario. Adapt the *Arrangement Name* if required.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help.
8. In *Inbound Communication*, select a user. The system defaults the *Authentication Method* assigned to this user.
9. The inbound services added to the communication scenario in the backend system will be reflected here in the communication arrangement under *Inbound Services*.
10. To activate the communication arrangement, choose *Save*.

2.2.4.4.11 Quality Inspection Process Integration (SAP_COM_0318)

This communication arrangement is for uploading inspection recording results from SAP Digital Manufacturing for execution to SAP S/4HANA Cloud Public Edition.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud Public Edition system.
2. Open the *Communication Arrangements* app.
3. To create a new communication arrangement, choose *New*.
4. Select the communication scenario `SAP_COM_0318` (*Quality Inspection Process Integration*) from the pick list.
5. The *Arrangement Name* field is filled automatically with the name of the selected integration scenario. Adapt the *Arrangement Name* if required.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help.

   > **Note**
   >
   > The communication user that was created earlier is automatically added to the *Inbound Communication* section.

8. In *Inbound Communication*, select a user. The system defaults the *Authentication Method* assigned to this user.
9. The inbound services added to the communication scenario in the backend system will be reflected here in the communication arrangement under *Inbound Services*.
10. To activate the communication arrangement, choose *Save*.

2.2.4.4.12 Defect Processing Integration (SAP_COM_0153)

This communication arrangement is for transferring Quality Management (QM) defect code groups and codes from SAP S/4HANA Cloud to SAP Digital Manufacturing.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create the communication arrangement for defect processing integration, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud system.
2. Open the *Communication Arrangements* app.
3. To create a new communication arrangement, choose *New*.
4. Select the communication scenario *SAP_COM_0153* (*Defect Processing Integration*).
5. The *Arrangement Name* field will be filled automatically with the name of the selected integration scenario. Adapt the *Arrangement Name* if required.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help.

   > **Note**
   >
   > The communication user that was created earlier is automatically added to the *Inbound Communication* section.

8. In *Inbound Communication*, select a user. The system defaults the *Authentication Method* assigned to this user.
9. To activate the communication arrangement, choose *Save*.

2.2.4.4.13 Material Stock Integration (SAP_COM_0164)

This communication arrangement is for retrieving inventory stock information from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing.

Prerequisites

- You've got the `SAP_BR_ADMINISTRATOR` role in SAP S/4HANA Cloud Public Edition.
- You've created a service instance and a service key in your SAP Digital Manufacturing subaccount in SAP BTP cockpit. For more information, see Creating a Service Instance and a Service Key [page 375].
- You've created a communication user in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].
- You've created a communication system in SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication System [page 374].

Procedure

To create this communication arrangement, complete the following steps:

1. Log on to SAP Fiori launchpad in the SAP S/4HANA Cloud Public Edition system.
2. Open the *Communication Arrangements* app.
3. To create a new communication arrangement, choose *New*.
4. Select the communication scenario `SAP_COM_0164` (*Material Stock Integration*) from the pick list.
5. The *Arrangement Name* field is filled automatically with the name of the selected integration scenario. Adapt the *Arrangement Name* if required.
6. Choose *Create*.
7. In the *Common Data* section, select the *Communication System* that was created earlier from the input help.
8. In *Inbound Communication*, select a user. The system defaults the *Authentication Method* assigned to this user.
9. The inbound services added to the communication scenario in the backend system will be reflected here in the communication arrangement under *Inbound Services*.
10. To activate the communication arrangement, choose *Save*.

2.2.4.5 Create Destination S4H_ODATA_INTEGRATION

Configure the `S4H_ODATA_INTEGRATION` destination for inbound and outbound integration from SAP Digital Manufacturing for execution to SAP S/4HANA Cloud Public Edition.

- You've got the `Administrator` role for SAP BTP cockpit.
- You've got access to your SAP Digital Manufacturing subaccount in SAP BTP cockpit.

- You've got the `Administrator` role for SAP S/4HANA Cloud Public Edition.
- You've got the user name and password of the communication user representing SAP S/4HANA Cloud Public Edition. For more information, see Creating a Communication User [page 373].

Context

The destination data is used by SAP Digital Manufacturing to integrate with SAP S/4HANA Cloud Public Edition.

Procedure

1. In your SAP Digital Manufacturing subaccount in SAP BTP cockpit, go to *Destinations*.
2. Choose *Create Destination* to create the `S4H_ODATA_INTEGRATION` destination.
3. Enter the name, **`S4H_ODATA_INTEGRATION`**, and description of the destination.
4. Select *HTTP* as *Type of Destination*.
5. Under *URL*, enter the *API-URL* of your SAP S/4HANA Cloud Public Edition system and add **/sap/opu/odata/sap** to it.

   > **Note**
   >
   > You can find the *API-URL* in one of the following inbound communcation scenarios that you've created in a previous step:
   > - `SAP_COM_0163`
   > - `SAP_COM_0309`
   > - `SAP_COM_0009`

   > **Example**
   >
   > Depending on your system, the url should look like this: `https://{system_name}-api.s4hana.ondemand.com`**/sap/opu/odata/sap**

6. Select *Internet* as *Proxy Type*.
7. Select `BasicAuthentication` as *Authentication*. The destination data will be used by SAP Digital Manufacturing for execution to provide authentication and authorization for SAP S/4HANA Cloud OData integration.
8. Enter the user name and password using the credentials of the communication user in SAP S/4HANA Cloud Public Edition.
9. Under *Additional Properties* check that *Use default JDK Truststore* is selected.
   SAP Digital Manufacturing for executionacturing Cloud for execution uses the destination data to provide authentication and authorization for SAP S/4HANA Cloud Public Edition integration.
10. Choose *Save*.
11. Choose *Check Connection* to check whether the connection has been established. You can ignore the 403 response.

2.2.4.6 Managing Supported Plants

You can connect the SAP S/4HANA Cloud Public Edition system to plants for integration with SAP Digital Manufacturing for execution. The global SAP Digital Manufacturing for execution system is used across all plants.

Prerequisites

- If you integrate SAP Digital Manufacturing for execution with multiple SAP S/4HANA Cloud Public Edition systems, these systems need to have different system IDs. Systems are identified at the client level.
- Each plant needs to have a unique plant name across the tenant.
- You have to create and set up plants for integration in the *Manage Plants* and *Manage Business Settings* apps.

Related Information

Manage Plants
Manage Business Settings

2.2.4.7 Defining Operations in SAP S/4HANA Cloud for SAP Digital Manufacturing for execution

In SAP S/4HANA Cloud, you can define operations to use data in SAP Digital Manufacturing for execution.

In SAP S/4HANA Cloud, you define on operation level if an operation in a master recipe or routing is relevant for the transfer to SAP Digital Manufacturing for execution. The tables below show the mapping rules for recipe steps and dependent objects to use in SAP Digital Manufacturing for execution, such as operation activities, BOM components, and the standard value key in SAP S/4HANA Cloud. These rules are valid for both the process order and master recipe.

> ⓘ Note
>
> Operation transfer is controlled by exclusion flags. If you set the relevant exclusion flag, the operation will not be downloaded to SAP Digital Manufacturing for execution. If the flag is not set, the operation will be downloaded together with all dependent objects.

Mapping Rules for an Operation in SAP S/4HANA Cloud
If an operation is flagged `operationIsNotMESRelevant` = `true`, the system doesn't transfer this operation or any phase belonging to this operation to SAP Digital Manufacturing.

Mapping Rules for an Operation in SAP S/4HANA Cloud
If an operation is flagged `operationIsNotMESRelevant` = `false`, the system transfers this operation and all phases belonging to this operation that are flagged `operationIsNotMESRelevant` = `false` to SAP Digital Manufacturing.
If an operation is flagged `operationIsNotMESRelevant` = `false`, but none of its phases are flagged `operationIsNotMESRelevant` = `false`, the system does not transfer this operation or any phase belonging to it, to SAP Digital Manufacturing.
Note that BOM components that are attached to a `notMESRelevant` step are not mapped.

Mapping for an Operation Flag in SAP S/4HANA Cloud
Path of `operationIsNotMESRelevant` flag in `ProcessOrder`: `/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:OperationControlProfile/n1:OperationIsNotMESRelevant`
Path of `operationIsNotMESRelevant` flag in `MasterRecipe`: `/n0:ManufacturingMasterRecipeInfomation/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/OperationControlProfile/n1:OperationIsNotMESRelevant`

2.2.5 Business Integration with SAP S/4HANA Cloud

The following scenarios are supported in the integration with SAP S/4HANA Cloud Public Edition.

- Integration of Master Data
  You can transfer master data such as materials, BOMs, routings and work centers from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing.
- Integration of Transaction Data
  You can enable bidirectional transfer of transaction data such as orders, inventory, batch and quality inspection information.

Related Information

Integration of Master Data [page 398]
Integration of Transaction Data [page 408]

2.2.5.1 Integration of Master Data

You can transfer master data from an SAP S/4HANA Cloud Public Edition system to an SAP Digital Manufacturing for execution system.

Master Data Integration

Master data represents the business data your company requires about business partners, individuals, organizations, or products. Master data tends to remain unchanged over longer periods of time and supports transactional processes. You can use Master Data Maintenance to maintain master data. For more information, see Master Data Maintenance.

You can integrate the following master data with SAP S/4HANA Cloud Public Edition:

Master Data Integration from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing

SAP S/4HANA Cloud	SAP Digital Manufacturing Cloud for execution
Material If Classification (Class and Characteristics) data is maintained for a material in SAP S/4HANA Cloud, that data is also downloaded. *Class Type* `022` (batch management activated at plant level), `023` (batch management activated at client level) and `300` (material) are downloaded.	Material
Work Center (PP-PI Resource)	Work Center
Master Recipe	Master Recipe
Master Routing	Master Routing

Prerequisites

- You have defined and set up plants for integration using the *Manage Plants* and *Manage Business Settings* apps.

Sequence Considerations

- 1. Transfer the materials.
  2. Transfer the component materials.
  3. Transfer the work centers.
  4. Transfer the master recipe / master routing.

> **Note**
>
> The master BOM is downloaded using an OData call while downloading your master recipe or master routing. The master BOM is downloaded only when at least one component is assigned to the routing or recipe step.

5. Transfer the process order / production order.

- Materials must be transferred before master recipe / master routing and process order / production order.
- Finished items must be transferred before routings.

Implementation Considerations

Some functions may behave differently depending on the SAP S/4HANA Cloud Public Edition version used for integration with SAP Digital Manufacturing for execution.

Related Information

Integration of Transaction Data [page 408]

2.2.5.1.1 Transferring a Material Master

You can transfer a material master created or updated in SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing.

Prerequisites

- You've set up the technical integration. For more information, see Technical Integration with SAP S/4HANA Cloud [page 369].
- You've set up the following communication arrangements in your SAP S/4HANA Cloud Public Edition system:
  - `SAP_COM_0009 for product integration`. For more information, see Product Integration (SAP_COM_0009) [page 377].
  - `SAP_COM_0163 for classification systems OData/SOAP integration`. For more information, see Classification Systems OData/SOAP Integration (SAP_COM_0163) [page 381].
  - `SAP_COM_0309 for product classification integration`. For more information, see Product Classification Integration (SAP_COM_0309) [page 384].

Context

During production, material master data from SAP S/4HANA Cloud Public Edition is required for SAP Digital Manufacturing. Therefore, you need to transfer material master data from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing to create or update the corresponding material record in SAP Digital Manufacturing. Here you learn how to transfer a material master record created in SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing.

> **Note**
>
> The following class types are supported for download from SAP S/4HANA Cloud Public Edition:
>
> - 001 (material class)
> - 022 (classification)
> - 023 (batch)
> - 300 (variant)

Procedural Steps

1. In your SAP S/4HANA Cloud Public Edition system, open the *Replicate by Object Selection* app.
2. Select *Product* from the *Business Object Type* dropdown.
3. Enter your material in the *Business Objects to be Replicated* table.
4. Select a target system under *Target System Selection*.

   > **Note**
   >
   > The target system is the business system you defined for the communication system. For more information, see Creating a Communication System [page 374].

5. Choose *Replicate*.
6. To verify whether the material master has been transferred to SAP Digital Manufacturing, you've got the following options:
   - In SAP S/4HANA Cloud Public Edition, check the replication status by choosing *Display Log*.
   - In SAP S/4HANA Cloud Public Edition, check the message status in the *Message Dashboard*.
   - In SAP Digital Manufacturing, go to the *Integration Message Dashboard* and check the status of your *Material Download* integration message. For more information, see Integration Message Dashboard.

2.2.5.1.2 Transferring a Work Center

You can transfer work centers created or updated in SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution.

Prerequisites

- You have maintained the `SAP_COM_0519` communication arrangement in the SAP S/4HANA Cloud Public Edition SOAP interface for the work center: `CO_PPINT_WORK_CENTER_SPRX`.
- Ensure that the user that transfers work centers has read authorization to the work center and resource objects in SAP S/4HANA Cloud Public Edition.

Procedural Steps

1. Log on to the SAP S/4HANA Cloud Public Edition system.
2. Open the *Replicate by Object Selection* app.
3. Select *Workcenter* from the *Business Object Type* dropdown.
4. Enter your work center in the *Work Ctr* field.
5. Enter your plant in the *Plant* field.
6. Select a target system in the *Target System Selection* table.

   > **Note**
   >
   > The target system is the business system you defined for the communication system. For more information, see Creating a Communication System [page 374].

7. Choose *Replicate*.
8. Check logs for the replication status.

You can view the transferred work centers in the *Manage Work Centers* app. Work center capacity updates in SAP S/4HANA Cloud Public Edition will result in the corresponding changes in SAP Digital Manufacturing for execution and in addition, you can see the capacity category in the *Manage Work Centers* app. Note that *ERP Work Center* is set to *Yes* for the work centers transferred from SAP S/4HANA Cloud Public Edition.

You can control if a default resource is created in SAP Digital Manufacturing for execution when a work center is transferred from SAP S/4HANA Cloud Public Edition using the *Create Default Resources during Work Center Transfer* setting in the *Plant and Product* category of the *Manage Business Settings* app.

> **Note**
>
> If an individual capacity description is updated within a work center in SAP S/4HANA Cloud Public Edition, the existing resource will not be updated but a new resource will be created in SAP Digital Manufacturing.

Related Information

Manage Work Centers
Manage Business Settings

2.2.5.1.3 Transferring a Master Recipe

You can transfer a master recipe created or updated in SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing.

Prerequisites

- You've set up the technical integration. For more information, see Technical Integration with SAP S/4HANA Cloud [page 369].
- You've set up the following communication arrangement in your SAP S/4HANA Cloud Public Edition system: `Production Planning Master Data Integration (SAP_COM_0519)`.
- You've transferred the material master. For more information, see Transferring a Material Master [page 399].

Context

During production, master recipe data from SAP S/4HANA Cloud Public Edition is required for the shop floor processes that are going on in SAP Digital Manufacturing. Therefore, you need to transfer master recipe data from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing to create or update the corresponding recipe record in SAP Digital Manufacturing. Here you learn how to transfer a master recipe from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing.

> **Note**
>
> Once you've transferred the recipe, SAP Digital Manufacturing calls the BOM from your SAP S/4HANA Cloud Public Edition system if at least one component is assigned to the recipe step. For more information, see Updating and Upversioning a BOM [page 407].

Procedural Steps

1. In your SAP S/4HANA Cloud Public Edition system, open *Replicate by Object Selection* app.
2. Select *Master Recipe* from the *Business Object Type* dropdown.
3. Enter the following elements in the *Business Objects to be Replicated* table:

- Material
- Plant
- Type
- Group
- Group Counter

4. Select a target system under *Target System Selection*.

> **Note**
>
> The target system is the business system you defined for the communication system. For more information, see Creating a Communication System [page 374].

5. Choose *Replicate*.
6. To verify whether the master recipe has been transferred to SAP Digital Manufacturing, you've got the following options:
   - In SAP S/4HANA Cloud Public Edition, check the replication status by choosing *Display Log*.
   - In SAP S/4HANA Cloud Public Edition, check the message status in the *Message Dashboard*.
   - In SAP Digital Manufacturing, go to the *Integration Message Dashboard* and check the status of your *Master Recipe Download* integration message. For more information, see Integration Message Dashboard.
7.

2.2.5.1.4 Transferring a Master Routing

You can transfer a master routing created or updated in SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing.

Prerequisites

- You've set up the technical integration. For more information, see Technical Integration with SAP S/4HANA Cloud [page 369].
- You've set up the following communication arrangement in your SAP S/4HANA Cloud Public Edition system: `Production Planning Master Data Integration (SAP_COM_0519)`.
- You've transferred the material master. For more information, see Transferring a Material Master [page 399].

Context

During production, master routing data from SAP S/4HANA Cloud Public Edition is required for the shop floor processes that are going on in SAP Digital Manufacturing. Therefore, you need to transfer master routing data from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing to create or update the corresponding

routing record in SAP Digital Manufacturing. Here you learn how to transfer a master routing from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing.

> **Note**
>
> Once you've transferred the master routing, SAP Digital Manufacturing calls the BOM from your SAP S/4HANA Cloud Public Edition system if at least one component is assigned to the routing step. For more information, see Updating and Upversioning a BOM [page 407].

Procedural Steps

1. In your SAP S/4HANA Cloud Public Edition system, open the *Replicate by Object Selection* app.
2. Select *Production Bill of Operations* from the *Business Object Type* dropdown.
3. Enter the following elements in the *Business Objects to be Replicated* table:
   - Material
   - Plant
   - Type
   - Group
   - Group Counter
4. Select a target system under *Target System Selection*.

   > **Note**
   >
   > The target system is the business system you defined for the communication system. For more information, see Creating a Communication System [page 374].
5. Choose *Replicate*.
6. To verify whether the master routing has been transferred to SAP Digital Manufacturing, you've got the following options:
   - In SAP S/4HANA Cloud Public Edition, check the replication status by choosing *Display Log*.
   - In SAP S/4HANA Cloud Public Edition, check the message status in the *Message Dashboard*.
   - In SAP Digital Manufacturing, go to the *Integration Message Dashboard* and check the status of your *Master Routing Download* integration message. For more information, see Integration Message Dashboard.

2.2.5.1.5 Transferring QM Defect Code Groups and Codes from SAP S/4HANA Cloud Public Edition

You can transfer Quality Management (QM) defect code groups and codes from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution using the *Manage Nonconformance Groups* app.

Prerequisites

- You have set up integration with SAP S/4HANA Cloud Public Edition (see Technical Integration with SAP S/4HANA Cloud [page 369]).
- You have set up the communication arrangement for the *Defect Processing Integration* (`SAP_COM_0153`) communication scenario in SAP S/4HANA Cloud Public Edition.

Procedural Steps

1. In the *Manage Nonconformance Groups* app, choose *Sync QM Groups*.
2. Search for the production-relevant QM defect code groups that exist in the connected SAP S/4HANA Cloud Public Edition system. The selection is restricted to catalog type 9 (Defect types) in SAP S/4HANA Cloud Public Edition. Only released code groups are displayed and can be transferred.
   You can check which QM code groups have been previously transferred by selecting *Yes* in the *Previously Synched* dropdown. If you need to transfer new QM code groups, select *Yes* in the *Previously Synched* dropdown.
3. Select one or more QM code groups and choose *Sync*.

The selected QM code groups are transferred to SAP Digital Manufacturing for execution. QM defect groups and codes transferred from SAP S/4HANA Cloud Public Edition are marked with *ERP Group* and *ERP Code* indicators set to *Yes* in the *Manage Nonconformance Groups* and *Manage Nonconformance Codes* apps. Note that a nonconformance code originated from SAP S/4HANA Cloud Public Edition is represented by the concatenated name (QM defect code and code group).

When you log a nonconformance code originated from SAP S/4HANA Cloud Public Edition, it is automatically transferred to SAP S/4HANA Cloud Public Edition and a generic defect record is created.

Related Information

Defect Processing Integration (SAP_COM_0153) [page 393]
Manage Nonconformance Groups
Manage Nonconformance Codes
Create Destination S4H_ODATA_INTEGRATION [page 394]

2.2.5.1.6 Current Version Dependencies

You can change the current version of different master data objects, such as BOMs, routings, and materials.

Note that when you change the current version of a BOM, routing, or a material, the dependencies between these objects will also change.

2.2.5.1.7 Updating and Upversioning a Material

You can update and upversion master materials in SAP S/4HANA Cloud, as well as SAP ERP and SAP S/4HANA.

Changes to the following fields trigger material upversioning:

- Base UOM
- Alternate UOM
- Material Type
- Production Version

Changes in all other fields will result in a material update only.

2.2.5.1.8 Updating a Master Recipe

You can update master recipes in SAP S/4HANA Cloud Public Edition.

When master recipe data is updated in SAP S/4HANA Cloud Public Edition, the data is updated according to the following rules:

1. All the master recipe fields that have been mapped are updated.
2. All the enrichments done in SAP Digital Manufacturing for execution (for example, work instructions and data collection attachments) are kept.
3. When a resource is changed on a phase in SAP S/4HANA Cloud Public Edition, then this resource is updated to a phase in
   SAP Digital Manufacturing for execution, but work instructions and data collection attachments are deleted from the phase.
4. When a phase is deleted in SAP S/4HANA Cloud Public Edition, then the phase, along with its work instructions and data collections, is deleted in
   SAP Digital Manufacturing for execution

2.2.5.1.9 Updating and Upversioning a Routing

You can update and upversion master routings in SAP S/4HANA Cloud and SAP S/4HANA.

Changes to the following routing header fields trigger routing upversioning:

- Description
- Adding Operation Activities
- Removing Operation Activities
- Status

Changes to the following routing operation activity fields trigger routing upversioning:

- Description
- Work Center
- Control Key
- Long Text
- Standard Value Keys and Values
- Normal Operation Activity

Changes in all other fields will result in a routing update only.

2.2.5.1.10 Updating and Upversioning a BOM

You can update and upversion master BOMs in SAP S/4HANA Cloud, as well as SAP ERP and SAP S/4HANA.

A master BOM is downloaded from SAP S/4HANA Cloud to SAP Digital Manufacturing for execution using an OData call while downloading a master recipe or master routing. A master BOM is downloaded only when at least one component is assigned to the routing or recipe step. The master BOM is downloaded from SAP S/4HANA Cloud using OData protocol using the connection details maintained in the `S4H_ODATA_INTEGRATION` destination.

Changes to the following fields trigger BOM upversioning:

- Description
- Add Component
- Remove Component
- Change Quantities
- Header Base Quantity
- Component Type
- Component Scrap %
- Component UOM
- Storage Location
- Line Number

Changes in all other fields will result in a BOM update only.

2.2.5.2 Integration of Transaction Data

You can transfer transaction data between an SAP S/4HANA Cloud Public Edition system and an SAP Digital Manufacturing for execution system.

Transaction Data Integration

Transaction data is data that's created during an event or operation. It is assigned to certain master data, for example the produced quantity of a particular product included in an individual order, and it changes with each transaction.

You can integrate the following transaction data withSAP S/4HANA Cloud Public Edition :

Transaction Data for outbound integration from SAP Digital Manufacturing for execution to SAP S/4HANA Cloud Public Edition

SAP Digital Manufacturing for execution	SAP S/4HANA Cloud Public Edition
Quantity Confirmation	Quantity Confirmation
Material Consumption (Goods Issue)	Material Consumption (Goods Issue)
Goods Receipt	Goods Receipt
Activity Confirmation	Activity Confirmation

Transaction Data for inbound integration from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing

SAP S/4HANA Cloud Public Edition	SAP Digital Manufacturing for Execution
Process Order / Production Order	Order

Prerequisites

- Master data integration has been set up (see Integration of Master Data [page 398]).

Sequence Considerations

1. Transfer the master data.
2. Transfer the process order data.

Implementation Considerations

Some functions may behave differently depending on the SAP S/4HANA Cloud Public Edition version used for integration with SAP Digital Manufacturing for execution.

Related Information

Integration of Master Data [page 398]

2.2.5.2.1 Transferring Production Order with PRT Assignment

You can transfer production order data with PRT assignment from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution to create or update the corresponding production order.

> ⓘ Note
>
> You can only transfer production orders with material PRT assignment.

Prerequisites

SAP S/4HANA Cloud Public Edition

- You've created communication arrangement to transfer production order from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution. For details, see Manufacturing Execution - Order and Confirmation Integration (SAP_COM_0522) [page 388].
- The material PRT has been transferred from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution together with the material master data.
- The material PRT has already been assigned to routing operations.

SAP Digital Manufacturing

- The collaboration link *COLLABORATION_PRT_ASSIGNMENT_GET* is mapped to the directive *ERP_PRT_ASSIGNMENT_GET* in the *Manage Collaboration Links* app.

Procedure

1. Create or update a production order manually in SAP S/4HANA Cloud Public Edition.
2. Release the order to SAP Digital Manufacturing.

3. Choose *Save*.
4. Verify the results in the *Manage Orders* app or the *Integration Message Dashboard* in SAP Digital Manufacturing for execution. For more information, see Manage Orders or Integration Message Dashboard.

> **Note**
>
> You can update an order from your integrated ERP system before and after the release in SAP Digital Manufacturing. The updating options you have vary depending on the order category and the integrated ERP system. For more information, see Updating Orders Before the Release [page 216] and Updating Orders After the Release [page 220].

> **Note**
>
> The order-specific BOM and routing/recipe are created in SAP Digital Manufacturing using the data available in the order that has been transferred from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing.

2.2.5.2.2 Transfer of Floor Stock Data

You can transfer floor stock data for certain goods movement types from an SAP S/4HANA Cloud Public Edition system to SAP Digital Manufacturing for execution.

Use

You can select the inventory management mode you want to enable for your plant in the *Manage Business Settings* app. Depending on the mode you enabled, the supported goods movement types varies.

> **Note**
>
> Unlike with the integration to SAP ERP or SAP S/4HANA, no IDocs or SAP Cloud Integration are used for the integration to SAP S/4HANA Cloud Public Edition. The SAP Digital Manufacturing for execution system is directly integrated with SAP S/4HANA Cloud Public Edition.

> **Note**
>
> In SAP S/4HANA Cloud Public Edition, the filter *Print Active* need be set as *=X(Yes)* for output type *MMIM_MATDOC_GDSMVMT_ESOA* in *Output Parameter Determination*. The *Print via Output Control* need be checked for posting the goods movement to SAP Digital Manufacturing for execution system.

Consolidated Inventory Management Mode

If you have enabled *Consolidated* inventory management mode, all standard goods movement types in SAP S/4HANA Cloud Public Edition are supported in SAP Digital Manufacturing for execution.

> **Note**
>
> For consolidated inventory management mode, you need to enable the `API_MATERIAL_STOCK_SRV` technical service in SAP S/4HANA Cloud Public Edition.

Individual Inventory Management Mode

If you have enabled *Individual* inventory management mode, the following goods movement types are supported.

Inbound Integration

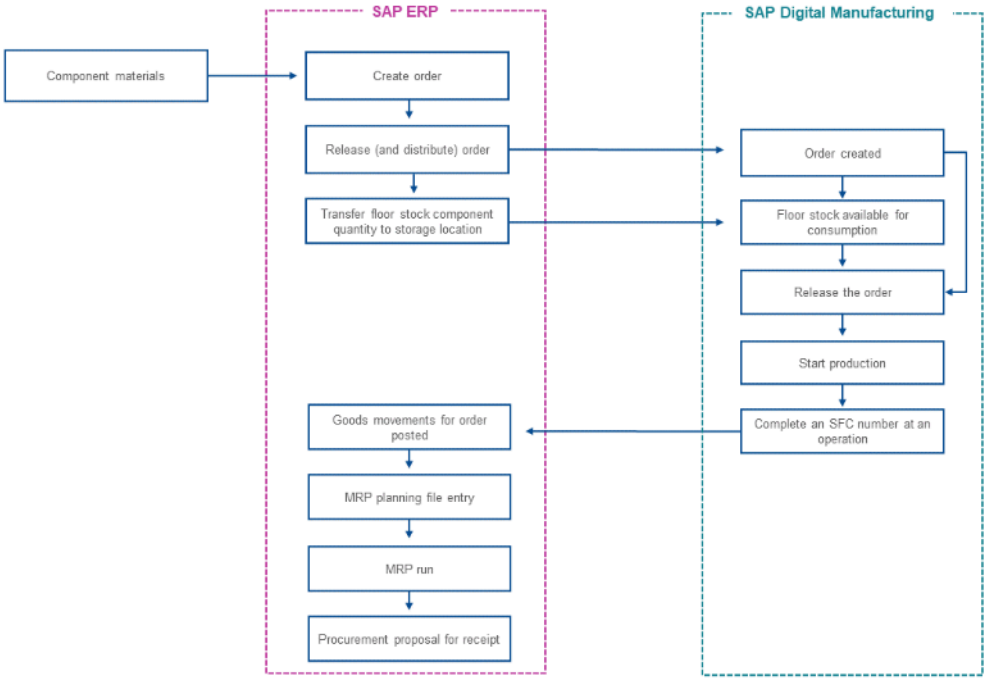
Goods Movement Types	Scenario
311	Floor stock receipt

Outbound Integration

Goods Movement Type	Scenario
261	Floor stock consumption
312	Floor stock return

The following scenarios are supported:

Floor Stock Receipt (replenishment, goods movement type `311`)



In your SAP S/4HANA Cloud Public Edition system, you can use the *Post Goods Movement* app to trigger goods movement from the central storage location to the production storage location.

The process for floor stock receipt without reservation (goods movement type `311`) in SAP Digital Manufacturing for execution assumes that the received goods are moved from a central warehouse location to a production location, so that they can be used during the production process.

- When you post a transfer of unrestricted-use stock from a central (issuing) storage location to a floor stock (production) storage location in SAP S/4HANA Cloud Public Edition using the goods movement type `311`, the stock data is transferred from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution via the soap call of communication scenario *SAP_COM_0263*.
- SAP S/4HANA Cloud Public Edition triggers the outbound message *MMIM_MATDOC_GDSMVMT_ESOA* to integrate the floor stock to the production storage location in SAP Digital Manufacturing for execution with *Inventory ID* created to the new inventory.
  If the material is batch-managed or serialized material, the *Batch Number* or *Serial Number* is also created and displayed in the new inventory.
  The inventory is ready for consumption without reservation in SAP Digital Manufacturing for execution.
- A floor stock receipt is created for the specified components.

When *COLLABORATION_GOODS_ISSUE_CONFIRMATION* is triggered, SAP Digital Manufacturing for execution sends a confirmation to SAP S/4HANA Cloud Public Edition to report consumed components.

Integration

- SAP S/4HANA Cloud Public Edition is the system of record for inventory management; SAP Digital Manufacturing for execution is the system of record for floor stock management.
- A transfer posting in SAP ERP or SAP S/4HANA is used in the same way as a floor stock receipt in SAP Digital Manufacturing for execution.
- For inventory ID records created in SAP Digital Manufacturing for execution through the integration, the field *ERP Inventory* is checked.

Prerequisites

SAP S/4HANA Cloud Public Edition

- You have created production storage locations for floor stock materials.
- You have set up communication arrangement for *SAP_COM_0108* and *SAP_COM_0263*.
- You have set up a filter for *Print Active* and the goods movement type `311` in *Output Parameter Determination*.
- You have created a BOM for the finished good material of the order.

SAP Digital Manufacturing

- You have created a storage location matching SAP S/4HANA Cloud Public Edition *Storage Location*.
- For the production order-specific consumption scenario, you have created or imported shop order data so that components can be pegged.
- You have defined a numbering pattern for the number type floor stock receipt.
- For outbound integration, make sure the following collaboration links are mapped to respective directives in the *Manage Collaboration Links* app.

- The link `COLLABORATION_GOODS_ISSUE_CONFIRMATION` is mapped to the directive `GOODS_ISSUE_CONFIRMATION`.
- The link `COLLABORATION_GOODS_RECEIPT_CONFIRMATION` is mapped to the directive `GOODS_RECEIPT_CONFIRMATION`.
- The link `COLLABORATION_QUANTITY_CONFIRMATION` is mapped to the directive `QUANTITY_CONFIRMATION`.
- The link `COLLABORATION_BATCH_CHARACTERISTICS` is mapped to the directive `BATCH_CHARACTERISTICS`.

2.2.5.2.2.1 Updating Integration Configuration to Use Floor Stock Data

If you want to use the floor stock integration functionality in SAP Digital Manufacturing, you need to update some settings in your integration configuration, as described in this topic.

Prerequisites

You have made the following configurations to connect SAP Digital Manufacturing for execution to SAP S/4HANA Cloud Public Edition:

- Creating a Service Instance and a Service Key [page 375]
- Creating a Communication User [page 373]
- Creating a Communication System [page 374]
- Creating Communication Arrangements [page 377]
- Create Destination S4H_ODATA_INTEGRATION [page 394]
- Managing Supported Plants [page 396]
- Defining Operations in SAP S/4HANA Cloud for SAP Digital Manufacturing for execution [page 396]

Procedure

1. Go to the SaaS tenant of your system and generate a new service instance and key for `Digital Manufacturing Cloud Services`. Note down the `clientid` and `clientsecret` under the `uaa` tag.
2. Update the destination configuration for *S4H_INTEGRATION_OAUTH*.
   - Go to SAP BTP cockpit, and in the side menu bar, choose *Connectivity* > *Destinations*.
   - Update the credentials for *S4H_INTEGRATION_OAUTH* with the `clientid` and `clientsecret` noted in above step.
3. Assign the collaboration directive `ERP_INVENTORY_CLEAR_RESERVATION` to the collaboration link `COLLABORATION_ERP_INV_CLEAR_RESERVATION` for the inventory return activity.

Results

You can now use the floor stock functionality as described in this chapter.

> ⓘ Note
>
> If you have already enabled the transfer of floor stock data and you want to integrate inbound inventory with batch characteristic values, you need to create a new service broker (while keeping the old service broker you've created before) and complete the above procedures again.

2.2.5.2.2.2 Transfer of Floor Stock Return Data

You can transfer floor stock return data from SAP Digital Manufacturing for execution to SAP S/4HANA Cloud Public Edition.

Use

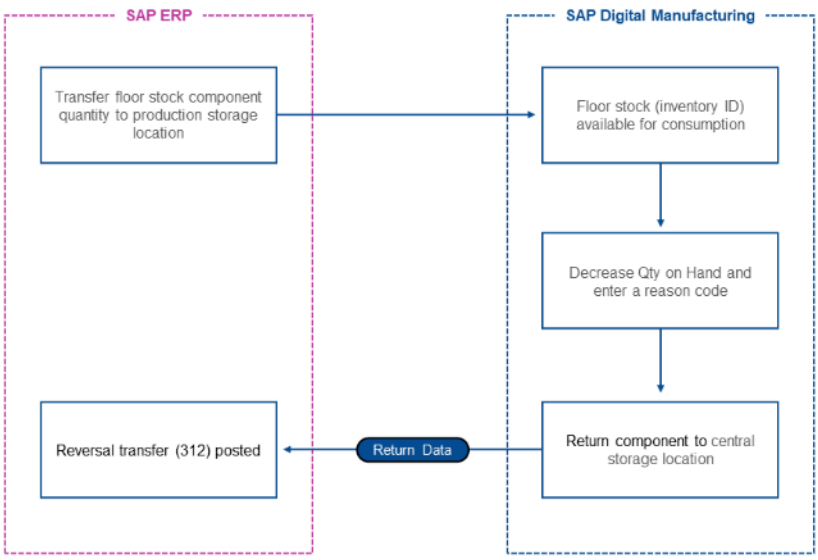
This function lets you transfer floor stock return data from SAP Digital Manufacturing for execution to SAP S/4HANA Cloud Public Edition.

1. In SAP Digital Manufacturing for execution, you can trigger the floor stock return to a central storage location.
2. The SAP Digital Manufacturing collaboration `COLLABORATION_ERP_INV_CLEAR_RESERVATION` (`ERP_INVENTORY_CLEAR_RESERVATION`) is triggered in SAP Digital Manufacturing for execution. This initiates the data synchronization to the SAP S/4HANA Cloud Public Edition system.
3. In the SAP S/4HANA Cloud Public Edition system, the floor stock is increased in the central storage location according to the return request. The inventory in the production storage location is decreased according to the return request.

The following scenario is supported:

Process Order-Independent Floor Stock (`311`) Return (`312`)

The diagram shows the flow of a floor stock return that's synchronized from SAP Digital Manufacturing for execution to SAP S/4HANA Cloud Public Edition for process order-independent floor stock.



The components are returned to the central storage location.SAP S/4HANA Cloud Public Edition posts a goods movement of the type `312`, the reversal of a one-step transfer posting.

Integration

SAP S/4HANA Cloud Public Edition is the system of record for inventory management; SAP Digital Manufacturing for execution is the system of record for floor stock management.

Prerequisites

SAP Digital Manufacturing

You have received floor stock data from SAP S/4HANA Cloud Public Edition.

Activities

When you decrease the value of the *Qty on Hand* field for an inventory ID, enter a reason code and choose *Save* in the *Manage Floor Stock* app in SAP Digital Manufacturing for execution. A message is sent to SAP S/4HANA Cloud Public Edition to post the corresponding goods movements.

Related Information

Manage Floor Stocks

2.2.5.2.3 Batch Characteristics Update

You can update batch characteristic values and sychronize the data from SAP Digital Manufacturing to SAP S/4HANA Cloud Public Edition.

For an overview of prerequisites and the steps required to update batch characteristics, see Updating Batch Characteristics.

2.2.5.2.4 Batch Creation

You can transfer batch number created in SAP Digital Manufacturing to SAP S/4HANA Cloud Public Edition.

The batch creation message is triggered when batch number is created in SAP Digital Manufacturing for execution. For an overview of prerequisites and the steps required to create batch numbers, see Creating Batch Numbers.

2.2.5.2.5 Inspection Characteristics Integration (Production Order)

You can transfer an inspection lot (type `03`) from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution.

Prerequisites

SAP S/4HANA Cloud Public Edition

- You have maintained the `SAP_COM_0522` communication arrangement in the SAP S/4HANA Cloud Public Edition SOAP interface for the production order: `CO_PPINT_MFGORD_EXE_REQ_OUT_V2`. For more information, see Manufacturing Execution - Order and Confirmation Integration (SAP_COM_0522) [page 388].
- The inspection lot (type `03`) has been created and assigned inspection characteristics.

> **Note**
>
> You can use after acceptance or rejection characteristics that are defined in an integrated ERP system. The acceptance or rejection characteristic is a conditional characteristic that depends on the valuation results of the previous mandatory characteristic in the same operation.

> Acceptance or rejection characteristics are supported for production orders from SAP S/4HANA Cloud Public Edition in the *Order POD* and the *Work Center POD*.

- The inspection lot has been assigned to the production order.

Procedure

Release the production order in SAP S/4HANA Cloud Public Edition, and the inspection characteristics are downloaded to SAP Digital Manufacturing for execution.

Related Information

Inspection Results Recording (Production Order) [page 417]

2.2.5.2.6 Inspection Results Recording (Production Order)

You can record inspection results and sychronize the data from SAP Digital Manufacturing for execution to SAP S/4HANA Cloud Public Edition.

Prerequisites

SAP S/4HANA Cloud Public Edition

- The inspection lot (type `03`) has been created and assigned inspection characteristics.
- The inspection lot has been assigned to the production order.
- The base sample quantity must be set to 1.
- You have maintained the `SAP_COM_0318` communication arrangement in the SAP S/4HANA Cloud Public Edition. For more information, see Quality Inspection Process Integration (SAP_COM_0318) [page 392].

> ⓘ Note
>
> Serial numbers are supported for production orders processed in the *Work Center POD* and the *Operation Activity POD*.
>
> For any limitations that might exist in your scenario, see 3379404.

Procedure

1. In the *Work Center POD*, record inspection results for the order you want to work on.
2. Complete an operation activity of the order. The system updates the inspection characteristics data for your order in SAP S/4HANA Cloud Public Edition.

Related Information

Inspection Characteristics Integration (Production Order) [page 416]

2.2.5.2.7 Enrichment with Sub-Operations for Discrete Manufacturing

You can add sub-operations to an **order-specific** routing in SAP ERP, SAP S/4HANA, or SAP S/4HANA Cloud Public Edition, and then transfer this routing to SAP Digital Manufacturing. You can also add sub-operations to a **master** routing in SAP ERP or SAP S/4HANA and then transfer this routing to SAP Digital Manufacturing.

Overview

In a discrete industry scenario, you can add sub-operations to an order-specific routing in SAP ERP, SAP S/4HANA, or SAP S/4HANA Cloud Public Edition.

> ⚠ Caution
>
> Transferring a master routing with sub-operations to SAP Digital Manufacturing is supported only in SAP ERP and SAP S/4HANA.

These sub-operations are then transferred within the routing to SAP Digital Manufacturing. To make this transfer work, you need to use the latest *SAP S/4HANA Integration with SAP Digital Manufacturing* package in SAP Cloud Integration.

Reporting of SAP Digital Manufacturing activities back to the integrated ERP system is done at the last operation activity within the respective operation group.

Order confirmations are posted against the ERP parent Operation.

Mapping

In SAP Digital Manufacturing, ERP routings containing sub-operations are mapped as follows:

ERP System	SAP Digital Manufacturing
Operation	Operation Group
Sub-operation	Operation Activity
BOM components assigned to an Operation	First Operation Activity of the Operation Group

SAP Digital Manufacturing operation activity IDs for the case of suboperations consist of the ERP operation ID (the first four digits) and the ERP sub-operation ID (the last four digits).

2.2.5.2.8 Updating Orders Before the Release

Learn about the options you've got for updating a production or process order from your integrated ERP system before the order has been released to the shop floor and SFCs have been created in SAP Digital Manufacturing.

Use

Before releasing an order to the shop floor in the *Manage Orders* app, you can update it from your integrated ERP system. The updating options you have vary depending on the order type and the integrated ERP system.

Overview

Here you'll find an overview of the supported update scenarios. "X" means that the corresponding update is supported.

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Finished Goods Batch Number (Order Header)	X	X	X	X	X	X
Goods Receipt Storage Location (Order Header)	X	X	X	X	X	X
Customer Name (Order Header)	X	X	N/A	N/A	N/A	N/A

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Sales Order (Order Header)	X	X	X	N/A	N/A	N/A
Sales Order Item (Order Header)	X	X	X			
Custom Field (Order Header)	X	X	N/A	X	X	N/A
Work Instruction (Order Header)	X	X	N/A	N/A	N/A	N/A
Dates Changes (Order Header)	X	X	X	X	X	X
Inspection Lot Change (Order Header)	X	X	X	X	X	X
Operation Schedule (Order Schedule)	X	X	X	X	X	X
Production Version (Order Header)	X	X	N/A	X	X	N/A
Scheduling Type (Order Header)	N/A	N/A	N/A	N/A	N/A	N/A
Quantity Decrease (Order Header)	X	X	X	X	X	X
Quantity Increase (Order Header)	X	X	X	X	X	X
Serial Number (Order Header)	X	X	X	N/A	N/A	N/A

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Technical Completion (TECO) (Order Header)	X **Note** If you revoke the technical completion in your ERP system, the order stays in status *Closed* in SAP Digital Manufacturing.	X	X **Note** If you revoke the technical completion in your ERP system, the order stays in status *Closed* in SAP Digital Manufacturing.	X **Note** If you revoke the technical completion in your ERP system, the order stays in status *Closed* in SAP Digital Manufacturing.	X **Note** If you revoke the technical completion in your ERP system, the order stays in status *Closed* in SAP Digital Manufacturing.	X **Note** If you revoke the technical completion in your ERP system, the order stays in status *Closed* in SAP Digital Manufacturing.
Order Header Long Text (Order Header)	X	X	X	X	X	X
Order Header Schedule Dates/Plan Dates (Order Header)	X	X	X	X	X	X
BOM Component Storage Location (BOM Component)	X **Note** The BOM component storage location change is supported by EWM 2021 or higher.	X **Note** The BOM component storage location change is supported by EWM 2021 or higher.	X **Note** The BOM component storage location change is supported by EWM 2021 or higher.	X **Note** The BOM component storage location change is supported by EWM 2021 or higher.	X **Note** The BOM component storage location change is supported by EWM 2021 or higher.	X **Note** The BOM component storage location change is supported by EWM 2021 or higher.
BOM Component Batch Number (BOM Component)	X	X	X	X	X	X

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Underdelivery Tolerance (Order Header)	X	X	X	N/A	N/A	N/A
Overdelivery Tolerance (Order Header)	X	X	X	N/A	N/A	N/A
Warehouse Number (Order Header)	X	X	X	X	X	X
Addition / Removal of Component (BOM Component)	X	X	X (Addition) N/A (Removal)	X	X	X (Addition) N/A (Removal)
Component Assignment Change to Operation Activity / Phase (BOM Component)	X	X	X	X	X	X
Addition / Removal of Operation / Phase (Operation)	X	X	X (Addition) N/A (Removal)	X	X	X (Addition) N/A (Removal)
Work Center Change in Operation / Phase (Operation)	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).
Control Key (Operation)	X	X	X	X	X	X

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Change of Component Quantities (BOM Component)	X	X	X	X	X	X
Operation/ Phase Number (Operation)	X	X	X			
Operation/ Phase Text (Operation)	X	X	X	X	X	X
Order-Specific Bill of Material*	X	X	X	X	X	X
Order-Specific Routing*	X	X	X	X	X	X
Priority (Order Header)	X	X	N/A	X	X	N/A
Warehouse Number (BOM Component)	X	X	X	X	X	X
ERP Bom ID	X	X		X	X	
ERP Bom Usage	X	X		X	X	
ERP Alternative Bom ID	X	X		X	X	
ERP Routing Group	X	X				
ERP Group Counter	X	X				
ERP Recipe Group				X	X	
ERP Recipe				X	X	

*Objects are up-versioned if one of the following changes takes place:

- Changes to work centers on operations / phases
- Addition or removal of component
- Addition or removal of operations / phases
- Change of component quantities
- Changes to component assignment

- Changes to component units of measure, line numbers, or storage locations

2.2.5.2.9 Updating Orders After the Release

Learn about the options you've got for updating a production or process order from your integrated ERP system after the order has been released to the shop floor and SFCs have been created in SAP Digital Manufacturing.

Prerequisites

- For integration scenarios with SAP ERP or SAP S/4HANA, you need to set up some custom XSLT. For more information, see Updating Orders After the Release for Production Order (Custom XSLT).

  > ⓘ Note
  >
  > For integration scenarios with SAP S/4HANA Cloud Public Edition, there are no actions required.

- The order isn't in status *Completed*, *Discarded*, or *Closed* in SAP Digital Manufacturing.

Use

After releasing an order to the shop floor in the *Manage Orders* app, you can update it from your integrated ERP system. The updating options you've got depend on the order type and the integrated ERP system you're using.

Overview

Here you'll find an overview of the supported update scenarios. "X" means that the corresponding update is supported.

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Finished Goods Batch Number (Order Header)	X	X	X	X	X	X

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Goods Receipt Storage Location (Order Header)	X	X	X	X	X	X
Customer Name (Order Header)	X	X	N/A	N/A	N/A	N/A
Sales Order (Order Header)	X	X	X	N/A	N/A	N/A
Sales Order Item (Order Header)	X	X	X			
Custom Field (Order Header)	X	X	N/A	X	X	N/A
Work Instruction (Order Header)	X	X	N/A	N/A	N/A	N/A
Dates Changes (Order Header)	X	X	X	X	X	X
Inspection Lot Change (Order Header)	N/A	N/A	N/A	N/A	N/A	N/A
Operation Schedule (Order Schedule)	X	X	X	X	X	X
Production Version (Order Header)	X	X	N/A	X	X	N/A

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Quantity Decrease (Order Header)	X **Note** Production orders from SAP ERP or SAP S/4HANA communicated through *Production Order Download (LOIPRO05 V2)* processed in the *Work Center POD* are supported.	X **Note** Production orders from SAP ERP or SAP S/4HANA communicated through *Production Order Download (LOIPRO05 V2)* processed in the *Work Center POD* are supported.	X	N/A	N/A	N/AX
Quantity Increase (Order Header)	X	X	X	X	X	X
Serial Number (Order Header)	X	X	X	N/A	N/A	N/A
Technical Completion (TECO) (Order Header)	N/A	N/A	N/A	N/A	N/A	N/A
Order Header Long Text (Order Header)	X	X	X	X	X	X
Order Header Schedule Dates/Plan Dates (Order Header)	X	X	X	X	X	X

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
BOM Component Storage Location (BOM Component)	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.	X Note The BOM component storage location change is supported by EWM 2021 or higher.
BOM Component Batch Number (BOM Component)	X	X	X	X	X	X
Underdelivery Tolerance (Order Header)	X	X	X	N/A	N/A	N/A
Overdelivery Tolerance (Order Header)	X	X	X	N/A	N/A	N/A
Warehouse Number (Order Header)	X	X	X	X	X	X
Addition / Removal of Component (BOM Component)	X	X	X (Addition) N/A (Removal)	X	X	X (Addition) N/A (Removal)
Component Assignment Change to Operation Activity / Phase (BOM Component)	X	X	X	X	X	X
Addition / Removal of Operation / Phase (Operation)	X	X	X (Addition) N/A (Removal)	X	X	X (Addition) N/A (Removal)

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
Work Center Change in Operation / Phase (Operation)	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).	X Note For integration with EWM, the new target work center must be mapped to a production supply area (PSA).
Control Key (Operation)	X	X	X	X	X	X
Work Instruction (Operation)	X	X	N/A	N/A	N/A	N/A
Change of Component Quantities (BOM Component)	X	X	X	X	X	X
Operation/ Phase Number (Operation)	X	X	X			
Operation/ Phase Text (Operation)	X	X	X	X	X	X
Order-Specific Bill of Material*	X	X	X	X	X	X
Order-Specific Routing*	X	X	X	X	X	X
Priority (Order Header)	X	X	N/A	X	X	N/A
Warehouse Number (BOM Component)	X	X	X	X	X	X
ERP Bom ID	X	X		X	X	

Order Update	SAP ERP Production Order	SAP S/4HANA Production Order	SAP S/4HANA Cloud Public Edition Production Order	SAP ERP Process Order	SAP S/4HANA Process Order	SAP S/4HANA Cloud Public Edition Process Order
ERP Bom Usage	X	X		X	X	
ERP Alternative Bom ID	X	X		X	X	
ERP Routing Group	X	X				
ERP Group Counter	X	X				
ERP Recipe Group				X	X	
ERP Recipe				X	X	

*Objects are up-versioned if one of the following changes takes place:

- Changes to work centers on operations / phases
- Addition or removal of component
- Addition or removal of operations / phases
- Change of component quantities
- Changes to component units of measure, line numbers, or storage locations

2.2.5.3 Field Mapping for the Integration to SAP S/4HANA Cloud

The fields created in SAP S/4HANA Cloud correspond to certain fields of SAP Digital Manufacturing for execution.

> **Note**
>
> For the connection to an SAP S/4HANA Cloud system, certain communication arrangements need to be active. For more information, see Integration with SAP S/4HANA or SAP ERP [page 10].

Material and Data Collection Group Mapping (based on SAP_COM_0309 and SAP_COM_0163 Scenarios for DC Groups, and SAP_COM_0009 Scenario for Materials)

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`productInternalID`	`material`	N/A
`baseMeasureUnitCode`	`unitOfMeasure`	N/A

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
Every `description` with a supported `languageCode`	`descriptions`	Only supported language codes will be displayed.
N/A	`version`	`A`
N/A	`currentVersion`	`TRUE`
N/A	`lotSize`	`one`
N/A	`status`	`releasable`
N/A	`quantityRestriction`	`ANY_NUMBER`
`productTypecode/value`	`materialType`	N/A
`supplyPlanning/ procurementTypeCode`	`procurementType`	If `E`→ `Manufactured`. If `F`→ `Purchased`. In other cases → `Manufactured_purchased`.
`supplyPlanning/ productRequirementsPlanningResponsibleCode`	`mrpController`	N/A
`plant/plantId`	`plant`	N/A
N/A	`incrementBatchNumber`	If `product/ batchManagementRequiredIndicator` = `true` or `product/plant/ batchManagementRequiredIndicator` = `true` → `ORDER`. In other cases → `NONE`.
`plant/workScheduling/ productionInventoryManagedLocationInternalID`	`productionStorageLocation` or `putawayStorageLocation`	If `procurementType` = `Manufactured` → putawayStorageLocation In other cases → `productionStorageLocation`
N/A	`DataCollectionGroup`	If `Material procurementType` = `Manufactured` or `Manufactured_purchased`
N/A	`DataCollectionGroup/status`	`releasable`
N/A	`DataCollectionGroup/plant`	N/A
N/A	`DataCollectionGroup/version`	`A`

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	DataCollectionGroup/currentVersion	true
API_CLFN_PRODUCT_SRV/A_ClfnClassForKeyDate/Class	DataCollectionGroup/dcGroup	N/A
API_CLFN_PRODUCT_SRV/A_ClfnClassForKeyDate/ClassTypeName	DataCollectionGroup/description	dcGroup
Not developed yet.	DataCollectionGroup.attachedPoints[0].material	material
API_CLFN_CHARACTERISTIC_SRV/A_ClfnCharacteristicForKeyDate/Characteristic	DataCollectionGroup.dcParameters[].parameterName	N/A
API_CLFN_CHARACTERISTIC_SRV/A_ClfnCharacteristicForKeyDate/CharcDescription	DataCollectionGroup.dcParameters[].description	parameterName If En localization not null.
API_CLFN_CHARACTERISTIC_SRV/A_ClfnCharacteristicForKeyDate/CharcDataType	DataCollectionGroup.dcParameters[].dcParameterType	TEXT
N/A	DataCollectionGroup.dcParameters[].sequence	N/A
product/class	material/inventoryDataType	If product/classType = 023 and material/procurement_type = Purchased or Manufactured_purchased.
material/plant	DataType/plant	N/A
N/A	DataType/category	N/A
product/class/Class (product class name)	DataType/dataType (datatype name)	N/A
product/class/characteristics	DataType/dataFields	N/A
characteristic	DataField	N/A
characteristic/EntryIsRequired	DataField/Required	N/A
material/plant	DataField/Plant	N/A

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
characteristic/characteristic (name)	DataField/fieldName	N/A
characteristic/CharcDataType	DataField/type	N/A
characteristic/CharcStatus	DataField/status	N/A
characteristic/ CharcDescription	DataField/description	If language code is set to EN.
characteristic/ CharcDescription	DataField/fieldLabel	If language code is set to EN.
characteristic/CharcDataType	DataField/type	If NUM→ FieldType/NUMBER. If CHAR → FieldType/TEXT. If DATE → FieldType/DATE. If Default → FieldType.TEXT_AREA.

Process Order SOAP Message (based on SAP_COM_0522 Scenario ID)

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field
ManufacturingOrder	• Shop Order • BOM (with the type *Order*) • Recipe (with the type *Order*) • Phase (with the type *Operation Activity*) • Data Collection Groups

Master Recipe SOAP Message (based on SAP_COM_0519 Scenario ID)

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field
BillOfOperations	• Recipe (with the type *Production*) • Phase (Operation Activity) • Data Collection Groups

Order Recipe Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	/version	A
/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ProductionPlant	/plant	N/A
N/A	/status	RELEASABLE

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`/currentVersion`	`True`
`/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/Material`	`/description`	N/A
`/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ManufacturingOrder`	`/recipe`	N/A
N/A	`/recipeType`	If `ManufacturingOrderCategory` = 40, then `SHOPORDER_SPECIFIC_RECIPE`. Otherwise, `SHOPORDER_SPECIFIC`.
N/A	`/relaxedFlow`	If `ManufacturingOrderCategory` = 40, then `True`.
N/A	`/routingSteps/stepId`	10 based counter
`/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ ManufacturingOrderActivityNetworkElement/ n1:MfgOrderOperationText`	`/routingSteps/ description`	N/A
N/A	`/routingSteps/isEntry`	`True` for the first step.
`/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ ManufacturingOrderActivityNetworkElement/ n1:ManufacturingOrderOperation`	`/routingSteps/ reportingStep`	N/A
`/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ProductionPlant`	`/routingSteps/ workCenter/plant`	
`/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ ManufacturingOrderActivityNetworkElement/ n1:WorkCenter`	`/routingSteps/ workCenter/workCenter`	
`/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ProductionPlant`	`/routingSteps/ routingOperation/ operation/plant`	N/A

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ManufacturingOrder-/ n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ ManufacturingOrderActivityNetworkElement/ n1:ManufacturingOrderSequence-/ n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ ManufacturingOrderActivityNetworkElement/ n1:ManufacturingOrderOperation	/routingSteps/ routingOperation/ operation/operation	N/A
N/A	/routingSteps/ routingOperation/ operation/version	Default A
N/A	/routingSteps/ routingOperation/ stepType	NORMAL N
/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ManufacturingOrder-/ n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/Material-/ n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/BillOfMaterialVariantUsage-/ n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/BillOfMaterialVariant	/routingSteps/ routingStepComponentList/ bomComponent/bom/bom	N/A
N/A	/routingSteps/ routingStepComponentList/bomComponent/bom/ version	Default A
N/A	/routingSteps/ routingStepComponentList/bomComponent/bom/ bomType	Default SHOPORDERBOM
/n0:ManufacturingOrderExecuteRequest/ ManufacturingOrder/ ManufacturingOrderActivityNetworkElement/ n1:ManufacturingOrderComponent/Material	/routingSteps/ routingStepComponentList/bomComponent/ material/material	N/A
N/A	/routingSteps/ routingStepComponentList/bomComponent/ material/version	Default A

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`/routingSteps/routingStepComponentList/bomComponent/sequence`	10 based counter. Sequence in the order BOM.
N/A	`/routingSteps/routingStepComponentList/sequence`	10 based counter
N/A	`/routingSteps/nextStepList/nextStep/stepId`	The ID of the next step.
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrder-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:ManufacturingOrderSequence-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:ManufacturingOrderOperation`	`/routingOperationGroups/routingOperationGroup`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:MfgOrderOperationText`	`/routingOperationGroups/description`	N/A

Shop Order Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ProductionPlant`	`/plant`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrder`	`/shopOrder`	N/A

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`/status`	If `OrderIsDelivered` or `OrderIsTechnicallyCompleted` or `OrderIsDeleted`, then `CLOSED (504)`. Otherwise `RELEASABLE (501)`.
N/A	`/shopOrderType/orderType`	`PRODUCTION`
N/A	`/erpOrder`	Default `True`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/MfgOrdPlndTotQtyInBaseUnit`	`/erpUnitOfMeasure`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ProductionPlant`	`/routing/plant`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrder`	`/routing/routing`	N/A
N/A	`/routing/routingType`	If `ManufacturingOrderCategory` = 40, then `SHOPORDER_SPECIFIC_RECIPE`. Otherwise, `SHOPORDER_SPECIFIC`.
N/A	`/routing/version`	Default `A`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/Material`	`/material/material`	N/A
N/A	`/material/version`	Default `A`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ProductionPlant`	`/material/plant`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ProductionPlant`	`/bom/plant`	N/A

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrder-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/Material-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/BillOfMaterialVariantUsage-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/BillOfMaterialVariant`	`/bom/bom`	N/A
N/A	`/bom/bomType`	Default `SHOPORDERBOM`
N/A	`/bom/version`	Default `A`
N/A	`/priority`	`500`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/MfgOrderPlannedStartDate + /n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/MfgOrderScheduledStartTime`	`/plannedStartDate`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/MfgOrderPlannedEndDate + /n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/MfgOrderScheduledEndTime`	`/plannedCompletionDate`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/MfgOrderPlannedTotalQty`	`/buildQuantity`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/MfgOrderPlannedTotalQty`	`/orderedQuantity`	N/A

Order BOM Mapping for the BOM Header

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`/version`	Default `A`
N/A	`/currentVersion`	Default `True`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrder-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/Material-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/BillOfMaterialVariantUsage-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/BillOfMaterialVariant`	`/bom`	`AUFNR-MATNR-STLAN-STLAL`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/Material`	`/description`	N/A
N/A	`/bomType`	Default `SHOPORDERBOM`
N/A	`/status`	Default `RELEASABLE`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/BillOfMaterial`	`/erpBom`	N/A

Order BOM Mapping for the BOM Component

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`/sequence`	10 based counter
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:ManufacturingOrderComponent/RequiredQuantityInBaseUnit`	`/quantity`	N/A

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ProductionPlant`	`material/plant`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:ManufacturingOrderComponent/Material`	`material/material`	N/A
N/A	`material/version`	Default `A`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ProductionPlant`	`bom/plant`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrder-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/Material-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/BillOfMaterialVariantUsage-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/BillOfMaterialVariant`	`bom/bom`	N/A
N/A	`bom/bomType`	Default `SHOPORDERBOM`
N/A	`bom/version`	Default `A`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:ManufacturingOrderComponent/Batch`	`.customValues.BATCH_NUMBER`	N/A

Order Mapping for the Data Collection Group

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ProductionPlant`	`/plant`	N/A
N/A	`/version`	Default `A`
N/A	`/currentVersion`	Default `True`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrder-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:ManufacturingOrderOperation@SVK`	`/dcGroup`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:StandardWorkFormulaParamGroup/@StandardWorkFormulaParamGroupID`	`/description`	N/A

Order Data Collection Group Mapping for the Data Collection Parameter

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrder-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:ManufacturingOrderOperation-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/@WorkCenterFormulaParamID`	`/parameterName`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/StandardWorkFormulaParamName`	`/description`	N/A
N/A	`/sequence`	10 based sequence
N/A	`/dcParameterType`	`NUMBER`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/WorkCenterStandardWorkQty/@unitCode`	`/unitOfMeasure`	N/A

Order Data Collection Group Mapping for the Data Collection Group Attachment Point

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`/sequence`	`10`

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`/routingStep`	Routing step reference

Order Mapping for the Operation Activity Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ProductionPlant`	`/plant`	N/A
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrder-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:ManufacturingOrderSequence-/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:ManufacturingOrderOperation`	`/operation`	N/A
N/A	`/version`	Default `A`
N/A	`/currentVersion`	Default `True`
N/A	`/type`	Default `NORMAL_OPERATION`
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:MfgOrderOperationText`	`/description`	N/A
N/A	`/status`	Default `RELEASABLE`
N/A	`/resourceType`	Default `DEFAULT`

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:WorkCenter`	`/workCenter`	N/A

Master Recipe Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`/version`	Deault `A`
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsHeader/n1:BillOfOperationsPlant`	`/plant`	N/A
N/A	`/status`	Default `RELEASABLE`
N/A	`/currentVersion`	Default `True`
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsGroup`	`/description`	N/A
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsGroup-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsVariant`	`/recipe`	N/A
N/A	`/recipeType`	`PRODUCTION_RECIPE`
N/A	`/relaxedFlow`	If `ManufacturingOrderCategory` = 40, then `True`.
N/A	`/routingSteps/stepId`	10 based counter

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/OperationDescription	/routingSteps/description	N/A
N/A	/routingSteps/isEntry	True for the first step.
/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/Operation	/routingSteps/reportingStep	N/A
/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsHeader/n1:BillOfOperationsPlant	/routingSteps/workCenter/plant	N/A
/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/WorkCenter	/routingSteps/workCenter/workCenter	N/A
/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsHeader/n1:BillOfOperationsPlant	/routingSteps/routingOperation/operation/plant	N/A

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsGroup-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsVariant-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/Operation`	`/routingSteps/routingOperation/operation/operation`	N/A
N/A	`/routingSteps/routingOperation/operation/version`	Default `A`
N/A	`/routingSteps/routingOperation/stepType`	`NORMAL` `N`
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsGroup-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsVariant-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/Operation`	`/routingOperationGroups/routingOperationGroup`	N/A

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/OperationDescription`	`/routingOperationGroups/description`	N/A

Master Recipe Operation Activity Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsHeader/n1:BillOfOperationsPlant`	`/plant`	N/A
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsGroup-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsVariant-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/Operation`	`/operation`	N/A
N/A	`/version`	Default `A`
N/A	`/currentVersion`	Default `True`
N/A	`/type`	Default `NORMAL_OPERATION`

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/OperationDescription`	`/description`	N/A
N/A	`/status`	Default `RELEASABLE`
N/A	`/resourceType`	Default `DEFAULT`
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/WorkCenter`	`/workCenter`	N/A

Master Recipe Data Collection Group Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution	Conditions
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsHeader/n1:BillOfOperationsPlant`	`/plant`	N/A
N/A	`/version`	Default `A`
N/A	`/currentVersion`	Default `True`

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution	Conditions
/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsGroup-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsVariant-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/Operation	/dcGroup	N/A
/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/StandardWorkFormulaParamGroup/@StandardWorkFormulaParamGroupID	/description	N/A

Master Recipe Data Collection Parameter Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsGroup-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsVariant-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/Operation-/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/@WorkCenterFormulaParamID	/parameterName	N/A
/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/StandardWorkFormulaParamName	/description	N/A
N/A	/sequence	10 based sequence
N/A	/dcParameterType	NUMBER

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/WorkCenterStandardWorkQty/@unitCode`	`/unitOfMeasure`	N/A

Master Recipe Data Collection Group Attachment Point Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`/sequence`	`10`
N/A	`/routingStep`	Routing step reference

Master Recipe Standard Value Key Mapping for a Standard Value Group

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsHeader/n1:BillOfOperationsPlant`	`/plant`	N/A
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/StandardWorkFormulaParamGroup/@StandardWorkFormulaParamGroupID`	`/standardValKey`	N/A

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/@WorkCenterFormulaParamID`	`/standardVal`	N/A
10 based sequence	`/sequence`	N/A

Master Recipe Standard Value Key Mapping for a Standard Value Text

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/StandardWorkFormulaParamName/@languageCode`	`/locale`	N/A
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/StandardWorkFormulaParamName`	`/description`	N/A

Master Recipe Standard Value Key Mapping for a Standard Value Target

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`/id`	N/A
10 based sequence	`/stepId`	N/A
`/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/WorkCenterStandardWorkQty`	`/targetValue`	N/A

Master Recipe BOM Header oData Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`version`	`A`
N/A	`currentVersion`	`TRUE`
`BillOfMaterial`	`erpBom`	N/A
`Material`	`description`	N/A
N/A	`bomType`	`USERBOM`
`Plant`	`plant`	N/A
`BillOfMaterial-BillOfMaterialVariant`	`bom`	N/A

Master Recipe BOM Component oData Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`BillOfMaterialItemQuantity`	`quantity`	N/A
`BillOfMaterialItemUnit`	`unitOfMeasure`	N/A
`BOMItemInternalChangeCount`	`changeNumber`	N/A
`BillOfMaterialItemNodeNumber`	`sequence`	N/A
`BillOfMaterialItemNodeNumber`	`erpSequence`	N/A

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
N/A	`assemblyQtyAsRequired`	`TRUE`
N/A	`bomComponentType`	• `CO_PRODUCT` if `MaterialCoProduct` • `BY_PRODUCT` if `BillOfMaterialItemQuantity` is less than 0 • Or else `NORMAL`
`BillOfMaterialComponent, Plant`	`material`	Material entity found by search fields

Control Key Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Conditions
`/n0:ManufacturingOrderExecuteRequest/ManufacturingOrder/ManufacturingOrderActivityNetworkElement/n1:OperationControlProfile/@n1:OperationControlKey`	`/controlKey`	N/A
N/A	`/gi`	N/A

Statuses Mapping

SAP S/4HANA Cloud Field	SAP Digital Manufacturing for execution Field	Meaning
`DLV`	`I0012`	Delivered
`TECO`	`I0045`	Technically completed
`DLFL`	`I0076`	Deletion Flag

2.2.5.3.1 Mapping a Material

You can transfer material data from SAP S/4HANA Cloud Public Edition to SAP Digital Manufacturing for execution.

Mapping the European Article Number (EAN) and Units of Measure (UOMs)

SAP S/4HANA Cloud Public Edition	SAP Digital Manufacturing for execution	Comment
`GlobalTradeItemNumber`	`unitsOfMeasureEans`	
`tradeNumber.productStandardID`	`Ean.ean`	
`tradeNumber.getProductStandardVariantID())`	`Ean.category`	
`tradeNumber.isProductStandardMainIndicator()`	`Ean.isMain`	
`tradeNumber.getMeasureUnitCode`	`Ean.internalUom`	
`Uom.grossWeight`	`Ean.grossWeight`	
`Ean.netWeight`	`Ean.netWeight`	

2.2.5.3.2 Mapping of Tolerance-Related Fields of the Order Header Material

The following table contains the mapping of tolerance-related fields of the order header material.

Database field	XML order field of node `ManufacturingOrder.ManufacturingOrderItem.GoodsReceiptTolerances`	DMC field	Type
`SHOP_ORDER.TOLERANCE_UNDER`	`UnderdelivTolrtdLmtRatioInPct`	`ShopOrder.toleranceUnder`	`BigDecimal`
`SHOP_ORDER.TOLERANCE_OVER`	`OverdelivTolrtdLmtRatioInPct`	`ShopOrder.toleranceOver`	`BigDecimal`
`SHOP_ORDER.OVER_DELIVERY_IS_ALLOWED`	`UnlimitedOverdeliveryIsAllowed`	`ShopOrder.overDeliveryIsAllowed`	`Boolean`

2.2.5.3.3 Mapping Alternate BOM Components

BOM components that belong to the same alternate group in SAP S/4HANA Cloud are mapped as alternate components for each other in SAP Digital Manufacturing for execution.

Master BOM Component

SAP S/4HANA Cloud

DME Field	Default Value	SAP S/4HANA Cloud Field
`alternativeItemGroup` ERP Alternate Item Group		`AlternativeItemGroup`
`alternates.enabled` Alternates Enabled	`TRUE`	
`alternates.priority` Alternates Priority		`AlternativeItemPriority`
`alternates.material` Alternate Component		`BillOfMaterialComponent`

Order BOM

SAP S/4HANA Cloud

DME Field	Default Value	SAP S/4HANA Cloud Field
`alternativeItemGroup` ERP Alternate Item Group		`AlternativeItemGroup`
`alternates.enabled` Alternates Enabled	`TRUE`	
`alternates.priority` Alternates Priority		`AlternativeItemPriority`
`alternates.material` Alternate Component		`Material`

2.2.5.3.4 Mapping for a Standard Value Key (SVK)

The fields created in SAP S/4HANA Cloud correspond to certain fields of SAP Digital Manufacturing for execution.

Standard Value Key Mapping for an SV Group

SAP Digital Manufacturing for execution Field	SAP S/4HANA Cloud
`.plant`	`/ n0:ManufacturingMasterRecipeInfomationMessage /BillOfOperations/BillOfOperationsHeader/ n1:BillOfOperationsPlant`
`.standardValKey`	`/ n0:ManufacturingMasterRecipeInfomationMessage /BillOfOperations/ BillOfOperationsActivityNetworkElement/ BillOfOperationsActivityNetworkElementTimeSli ce/StandardWorkFormulaParamGroup/ @StandardWorkFormulaParamGroupID`
`StandardValue`	
`.standardVal`	`/ n0:ManufacturingMasterRecipeInfomationMessage /BillOfOperations/ BillOfOperationsActivityNetworkElement/ BillOfOperationsActivityNetworkElementTimeSli ce/StandardWorkFormulaParamGroup/ WorkCenterFormulaParam1/ @WorkCenterFormulaParamID`
`.sequence`	`10 based sequence`

Standard Value Key Mapping for a StandardValueText

SAP Digital Manufacturing for execution Field	SAP S/4HANA Cloud
`.locale`	`/ n0:ManufacturingMasterRecipeInfomationMessage /BillOfOperations/ BillOfOperationsActivityNetworkElement/ BillOfOperationsActivityNetworkElementTimeSli ce/StandardWorkFormulaParamGroup/ WorkCenterFormulaParam1/ StandardWorkFormulaParamName/@languageCode`

SAP Digital Manufacturing for execution Field	SAP S/4HANA Cloud
.description	/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/StandardWorkFormulaParamName

Standard Value Key Mapping for a StandardValueTarget

SAP Digital Manufacturing for execution Field	SAP S/4HANA Cloud
.id	
.stepId	10 based sequence
.targetValue	/n0:ManufacturingMasterRecipeInfomationMessage/BillOfOperations/BillOfOperationsActivityNetworkElement/BillOfOperationsActivityNetworkElementTimeSlice/StandardWorkFormulaParamGroup/WorkCenterFormulaParam1/WorkCenterStandardWorkQty

2.3 Integration with EWM

You can integrate SAP Digital Manufacturing with EWM to achieve planned and efficient processing of all logistics processes in your warehouse.

Why EWM

Different from the Inventory Management (MM-IM) application, EWM provides the option of mapping your entire warehouse complex in detail in the system, down to storage bin level. Not only does this give you an overview of the total quantity of a product in the warehouse, but you can also always see exactly where a specific product is, at any time, in your warehouse complex.

Use

You can use advanced production integration to stage products that are needed by production and to post the consumption of products so the goods issue process can be completed. When production is done, you can pack finished goods in a container and trigger the transfer of goods receipt back to SAP ERP.

To learn more about how to set up the configurations to connect SAP Digital Manufacturing and EWM, see Connecting to EWM in SAP S/4HANA 1909 to 2020 (Deprecated) [page 459] or Connecting to EWM in SAP S/4HANA 2021 [page 464]. For the detailed integration processes and transfer of data and goods movements, see EWM Integration Scenarios.

Supported EWM

The integration capabilities mentioned in this documentation applies to the EWM embedded in SAP S/4HANA 2021 and higher versions, as well as decentralized EWM based on SAP S/4HANA 2021 and higher.

The integration with EWM supports only SAP S/4HANA and SAP ERP. If you're using SAP S/4HANA, you have the option to use either the embedded or the decentralized EWM. But, if you're using SAP ERP, you can only use the decentralized EWM.

Related Information

Minimum Version Requirements and Supported Scenarios [page 458]

2.3.1 Minimum Version Requirements and Supported Scenarios

Here are the minimum release requirements, supported scenarios, and limitations for integrating SAP Digital Manufacturing with EWM.

Minimum Release Requirement

SAP Digital Manufacturing is compatible with EWM embedded in SAP S/4HANA 2021 and higher version, as well as decentralized EWM based on SAP S/4HANA 2021 and higher.

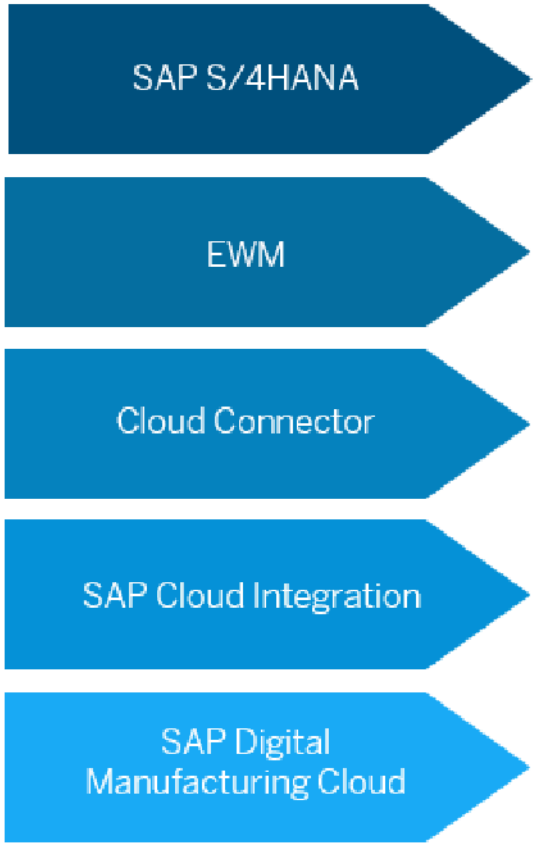
Scenarios Supported

For more information about the supported scenarios, see EWM Integration Scenarios.

2.3.2 Connecting to EWM in SAP S/4HANA 1909 to 2020 (Deprecated)

This topic shows you the configurations you need to enable integration with EWM versions ranging from EWM in SAP S/4HANA 1909 to EWM in SAP S/4HANA 2020.

> ⓘ Note
>
> The integration with EWM versions lower than EWM in SAP S/4HANA 2021 is deprecated. You're still able to use the older version, but it's set to be decommissioned and won't be available for use after one year. If you're using the older versions, we suggest you switch to integration with EWM in SAP S/4HANA 2021 or higher versions as soon as you can.



- #unique_338/unique_338_Connect_42_subsection-im1 [page 460]
- #unique_338/unique_338_Connect_42_subsection-im2 [page 460]
- #unique_338/unique_338_Connect_42_subsection-im3 [page 460]
- #unique_338/unique_338_Connect_42_subsection-im4 [page 461]
- #unique_338/unique_338_Connect_42_subsection-im5 [page 461]

Configuration in SAP S/4HANA

Follow the configuration steps in Technical Integration with SAP S/4HANA or SAP ERP [page 16] to enable communication from EWM to SAP Digital Manufacturing.

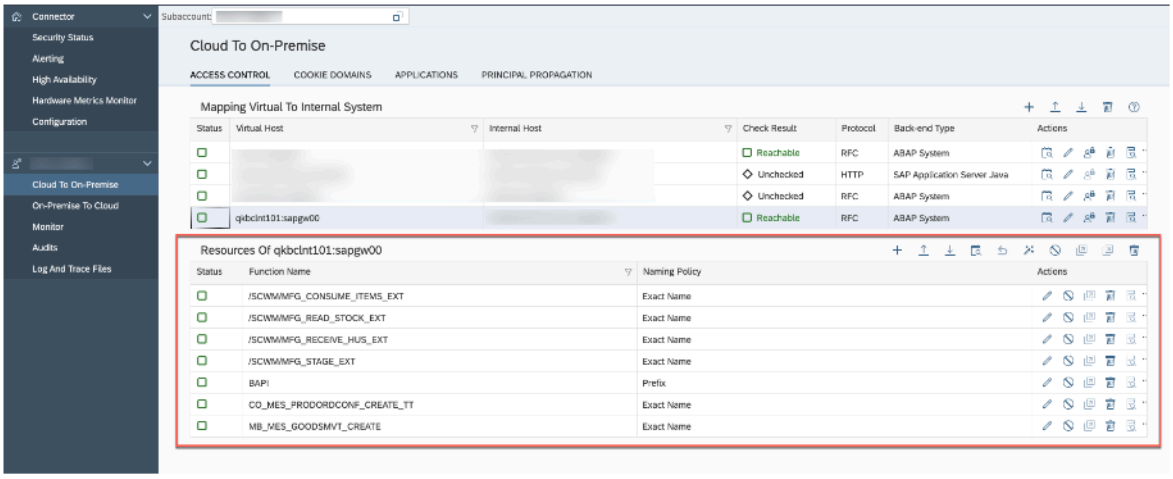
Configuration in EWM

Please refer to SAP Note 2944311 for detailed configurations that needs to be completed in order to enable the integration.

Configuration in SAP Cloud Connector

Configure access control to specify the backend systems and resources that can be accessed by your cloud applications.

1. Log on to SAP Cloud Connector.
2. From your subaccount menu, choose *Cloud To On-Premise* and select the tab *Access Control*.
3. Select the virtual host of the EWM system, and add below resources to it.



- `/SCWM/MFG_CONSUME_ITEMS_EXT`
  External interface for EWM goods issue posting.
- `/SCWM/MFG_REVERSE_ITEMS_EXT`
  External interface for EWM goods issue cancellation.
- `/SCWM/MFG_READ_STOCK_EXT`
  External interface for EWM stock synchronization.
- `/SCWM/MFG_RECEIVE_HUS_EXT`
  External interface for EWM goods receipt posting.
- `/SCWM/MFG_REVERSE_HUS_EXT`
  External interface for EWM goods receipt cancellation.
- `/SCWM/MFG_STAGE_EXT`
  External interface for EWM staging.
- `BAPI`
  BAPI related external interfaces.
- `CO_MES_PRODORDCONF_CREATE_TT`
  External interface for production order goods issue posting.
- `MB_MES_GOODSMVT_CREATE`
  External interface for production order component add.

> **Note**
>
> The virtual host representing the EWM system also needs to be added as property in the RFC destination in SAP Cloud Integration.

Configuration in SAP Cloud Integration

Create destinations to specify EWM system for outbound message fromSAP Digital Manufacturing to EWM.

1. Log on to *SAP BTP Cockpit* and choose *Connectivity* > *Destinations*.
2. Choose *New Destination* to create destinations for SAP Cloud Integration with the SAP Cloud Connector.
3. Enter the destination name, and select *RFC* as *Type*.
4. Enter the username and password to access EWM.
5. In *Additional Properties*, add the following properties:

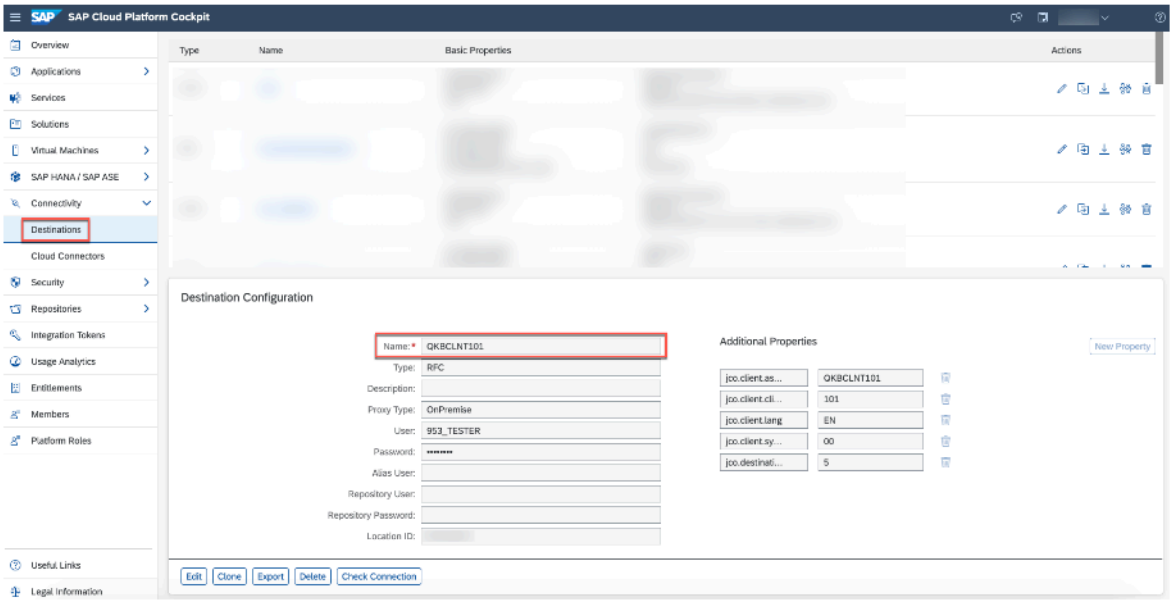
Property	Description	Value
`jco.client.ashost`	The *Virtual Host* of the EWM system defined in the SAP Cloud Connector.	Example `<virtual host>`
`jco.client.client`	The client number of EWM.	Example 1000
`jco.client.lang`	The language of EWM.	Example `EN`
`jco.client.sysnr`	The system number of EWM.	Example 22
`jco.destination.pool_capacity`	The connection number.	Example 5

Configuration in SAP Digital Manufacturing

1. Set up logical systems and system destinations. Go to the *Manage Business Settings* app and configure the following settings.

Field	Description	Example
Integration Mode	Indicates which ERP system SAP Digital Manufacturing is integrated with.	S/4 HANA

Field	Description	Example
ERP Destination	Enter here the destination of your ERP system. Make sure the destination is the same as the one that is configured for your SAP Cloud Integration tenant. To see the ERP destination configured for SAP Cloud Integration tenant, go to SAP BTP cockpit, and choose *Connectivity* > *Destinations* in the side menu bar.	Refer to below screenshot.
EWM Destination	Enter here the destination name for your EWM system. Make sure the destination is the same as the one that is configured for your SAP Cloud Integration tenant. To see the EWM destination configured for SAP Cloud Integration tenant, go to SAP BTP cockpit, and choose *Connectivity* > *Destinations* in the side menu bar.	Refer to below screenshot.
ERP Logical System	The logical system of ERP defined in EWM system. To see your logical system, in EWM, go to *Customizing for Extended Warehouse Management under SCM Basis* > *Integration* > *Basic Settings for Setting Up the System Landscape* > *Name Logical Systems*	



2. Maintain EWM-managed storage locations. Go to the *Manage Storage Locations* app, create storage locations with the same names as the storage locations in the EWM system, and enable *EWM-Managed Storage Location*.
3. Go to the *Manage Collaboration Links* app and assign the following directives to respective collaboration links to enable outbound integration from SAP Digital Manufacturing toEWM.

Collaboration Link	Collaboration Directive	Description
EWM_COLLABORATION_SHOPORDER_RELEASE	EWM_SINGLE_ORDER_STAGING_REQUEST	This collaboration link is triggered by order release to send single-order staging request to EWM.
EWM_COLLABORATION_COMPONENT_ADD	EWM_COMPONENT_ADD	This collaboration link is triggered by Assemble Components plugin to send component consumption to EWM.
EWM_COLLABORATION_YIELD_CONFIRMATION	EWM_GOODS_ISSUE_POST	When EWM_COLLABORATION_COMPONENT_ADD is not configured, this collaboration link is triggered by SFC complete to send component consumption to EWM.
EWM_COLLABORATION_SFC_DISPOSITION	EWM_SFC_DISPOSITION	When EWM_COLLABORATION_COMPONENT_ADD is not configured, this collaboration link is triggered by SFC scrap to send component consumption to EWM.
COLLABORATION_SFC_COMP_REMOVE_EWM_OP	EWM_COMPONENT_REMOVE_OP	This collaboration link is triggered by component removal for production order in Work Center POD.
EWM_COLLABORATION_CONTAINER_CLOSE	EWM_CONTAINER_CLOSE_CONFIRMATION	This collaboration link is triggered by closing container to send goods receipt message to EWM.
COLLABORATION_ERP_SCRAP_CONFIRMATION	ERP_SCRAP_CONFIRMATION	This collaboration link is triggered by SFC scrap to report scrapped component quantity to SAP ERP.
COLLABORATION_ERP_YIELD_CONFIRMATION	ERP_YIELD_CONFIRMATION_V2	This collaboration link is triggered by SFC Complete to report quantity of finished goods to SAP ERP. For more information, see 3420816.
EWM_COLLABORATION_FG_GOODS_RECEIPT	EWM_GOODS_RECEIPT	This collaboration link is triggered by *Goods Receipt* plugin to report goods receipt of finished goods to EWM.
EWM_COLLABORATION_CO_GOODS_RECEIPT	EWM_GOODS_RECEIPT	This collaboration link is triggered by *Goods Receipt* plugin to report goods receipt of co-products to EWM.
EWM_COLLABORATION_BY_GOODS_RECEIPT	EWM_GOODS_RECEIPT	This collaboration link is triggered by *Goods Receipt* plugin to report goods receipt of by-products to EWM.

Collaboration Link	Collaboration Directive	Description
`COLLABORATION_INV_READ_EWM`	`EWM_INV_READ`	This collaboration link is only required when you use the EWM stock sync public API (`/inventories/ewmSynchronization`.

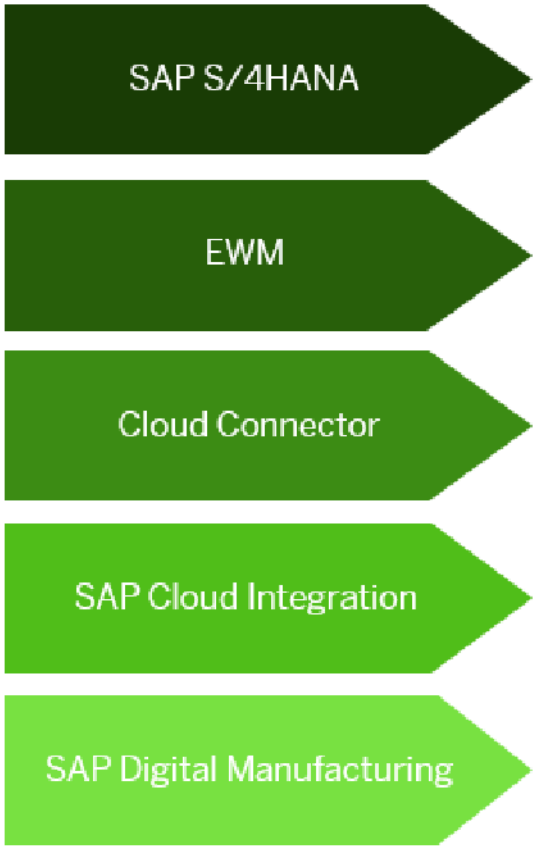
Related Information

Connecting to EWM in SAP S/4HANA 2021 [page 464]
Integration Scenario with EWM in SAP S/4HANA 1909 to 2020 (Deprecated)

2.3.3 Connecting to EWM in SAP S/4HANA 2021

This topic shows you the configurations you need to enable integration with EWM in SAP S/4HANA 2021 or higher versions.

> ⓘ Note
>
> Compared to older EWM versions, you can use MES-driven staging which allows you to request materials more flexibly with EWM in SAP S/4HANA 2021 or higher versions. For more information, see Staging Request.



- #unique_339/unique_339_Connect_42_subsection-im1 [page 465]
- #unique_339/unique_339_Connect_42_subsection-im2 [page 465]
- #unique_339/unique_339_Connect_42_subsection-im3 [page 475]
- #unique_339/unique_339_Connect_42_subsection-im4 [page 479]
- #unique_339/unique_339_Connect_42_subsection-im5 [page 483]

Configuration in SAP S/4HANA

Follow the configuration steps in Technical Integration with SAP S/4HANA or SAP ERP [page 16] to enable communication from EWM to SAP Digital Manufacturing.

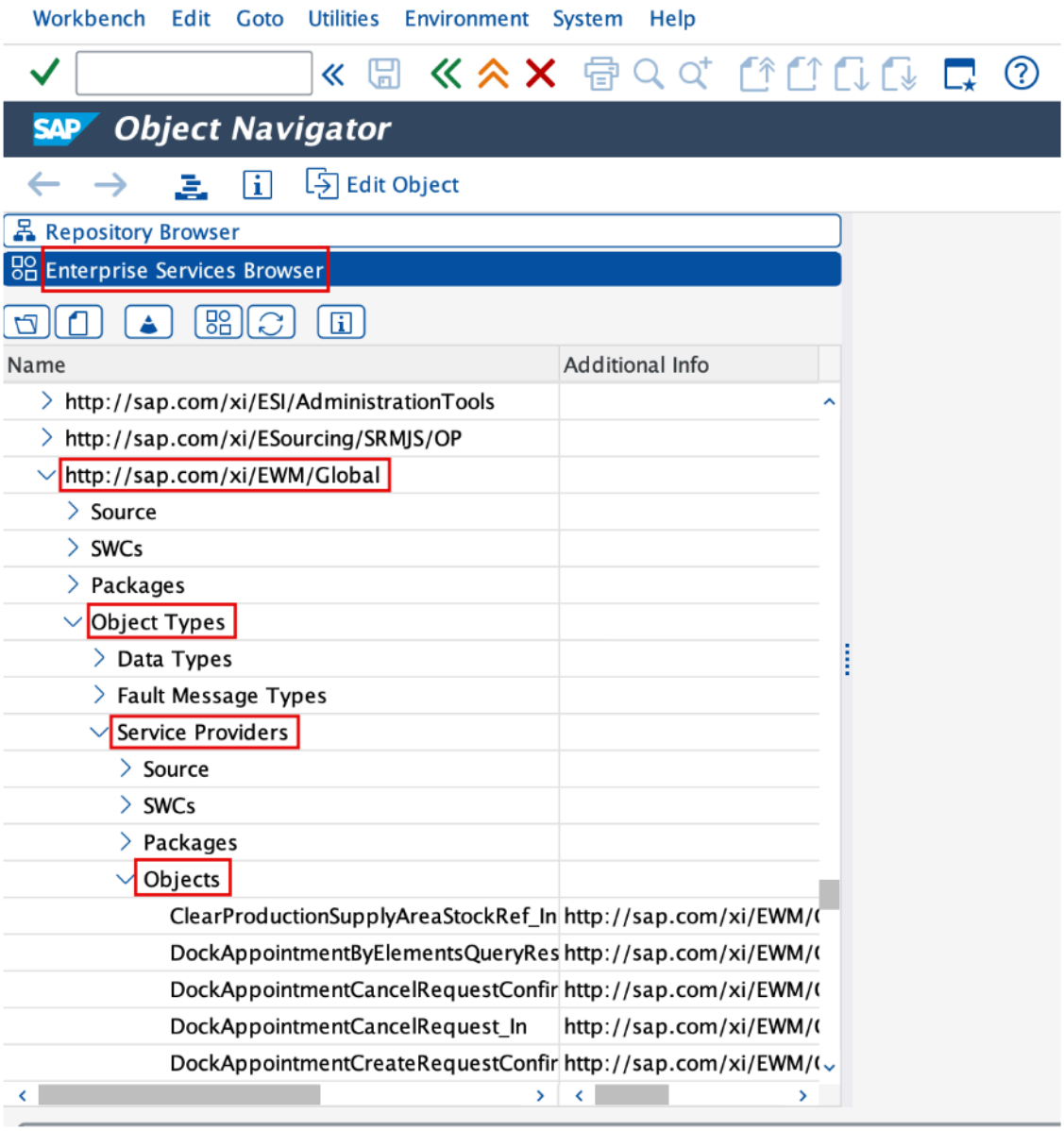
Configuration in EWM

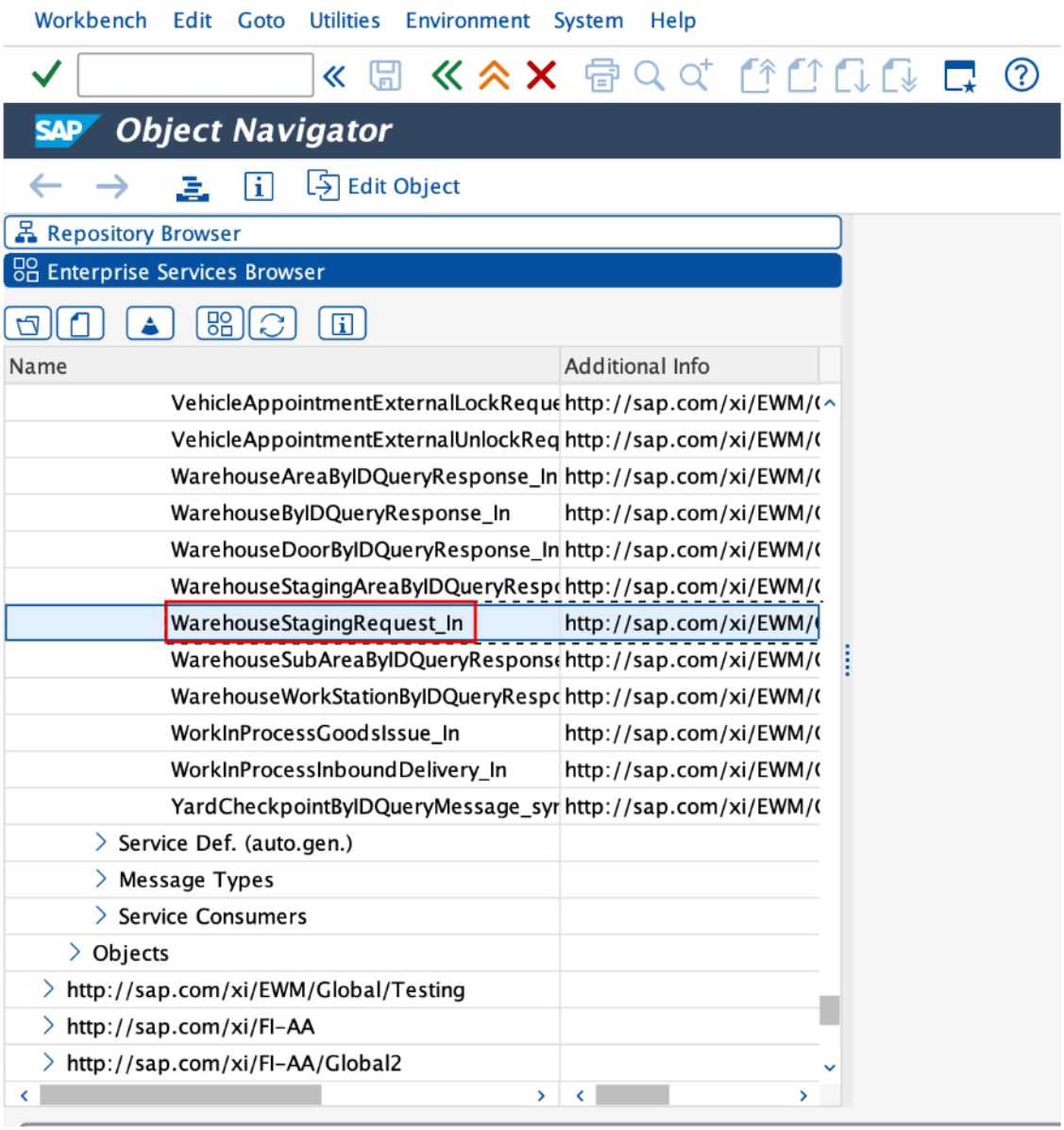
Make the following configurations in EWM system. These mainly include using SOA Manager to complete the configuration for consumer proxies for EWM, as well as some stock notification configurations.

> ⓘ Note
>
> For additional information on the configuration process, see also 3137363.

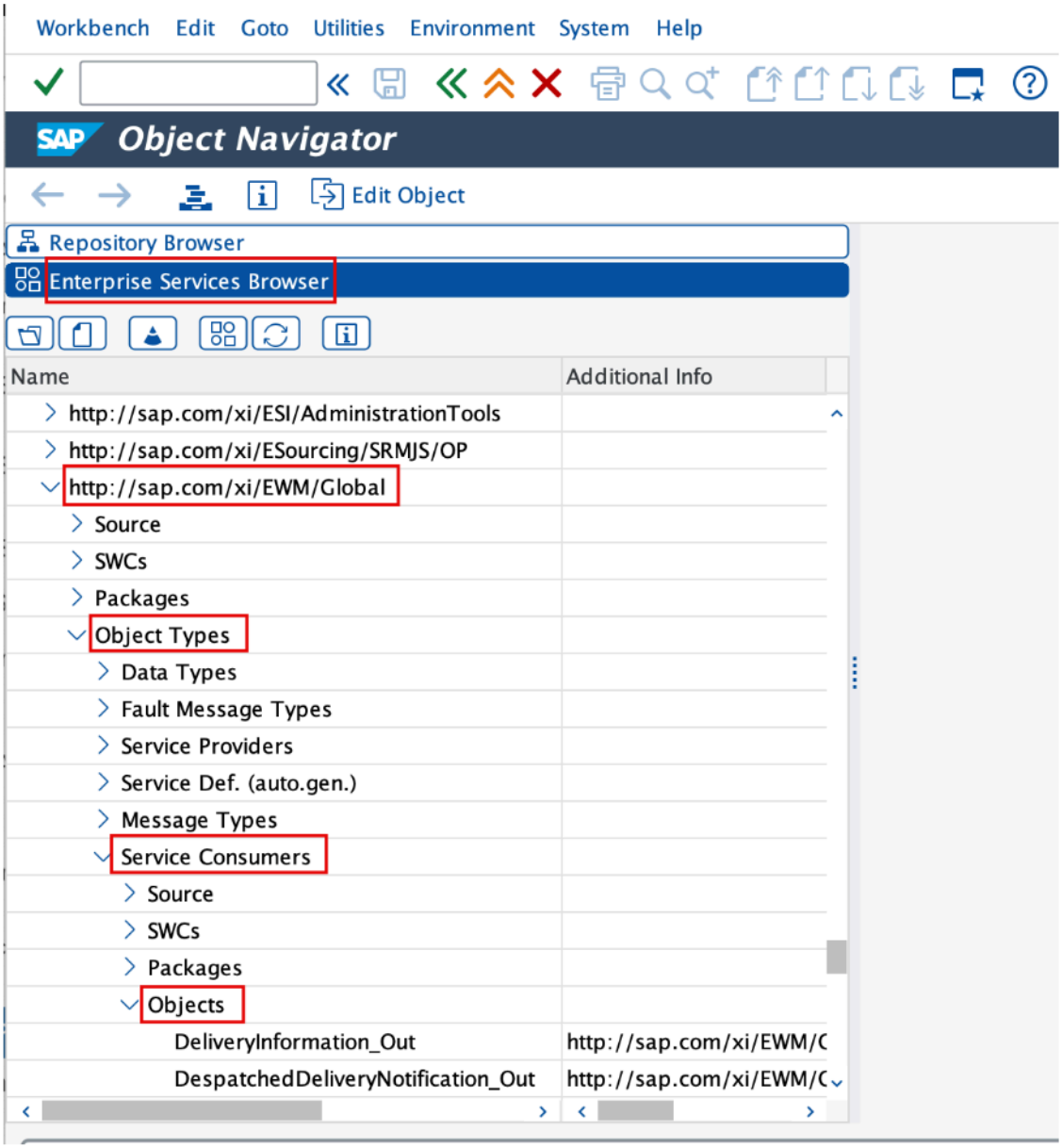
> ⓘ Note
>
> To use the EWM WIP processing feature, in addition to the configurations listed below, ensure you've finished all the settings in How to Set Up WIP Management.

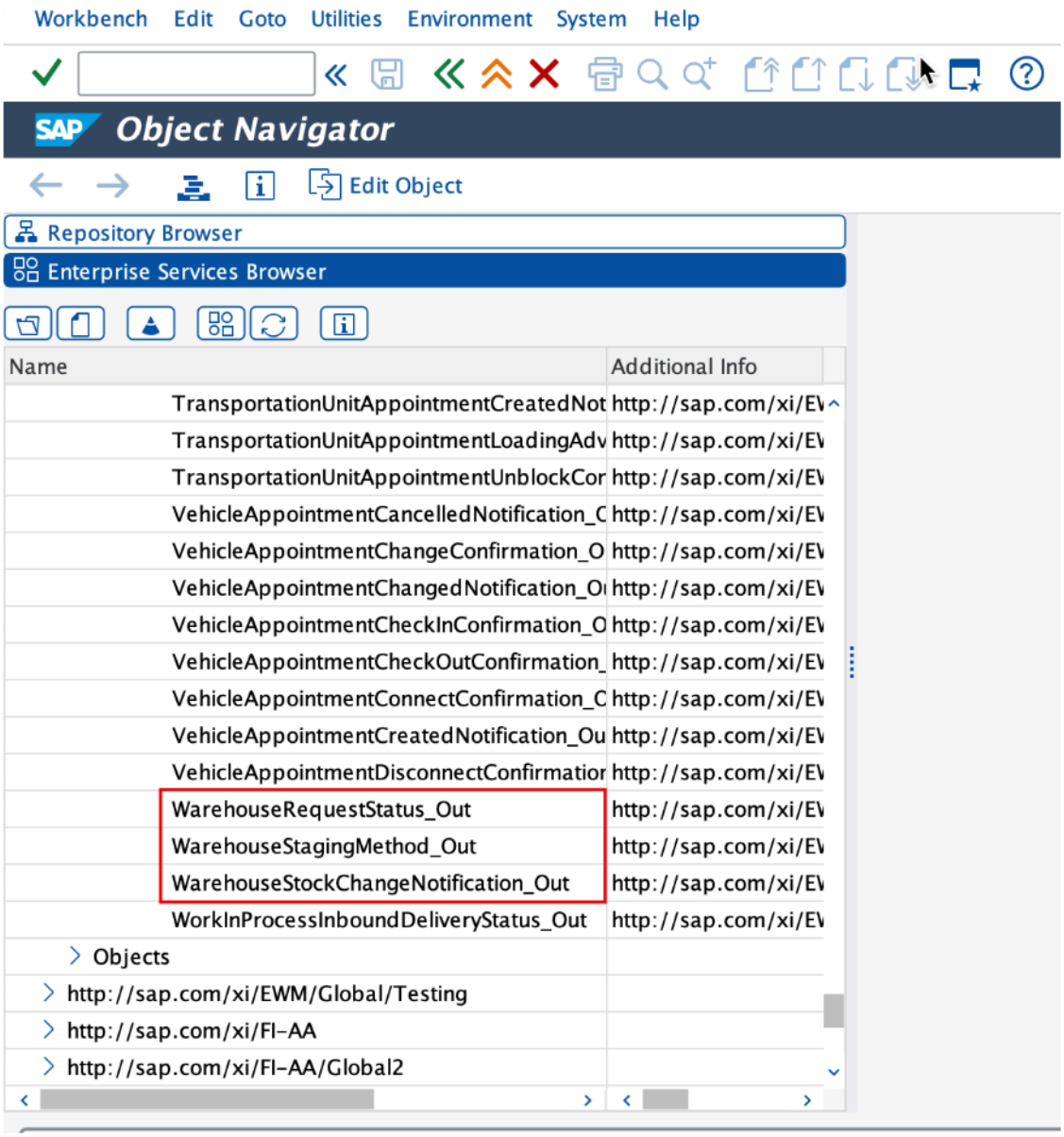
1. Check the 4 EWM web services: 1 service provider and 3 service consumers.
   1. Log on to EWM and execute the transaction code `SPROXY`.
   2. On the *Enterprise Services Browser* screen, choose *Namespaces* > *http://sap.com/xi/EWM/Global* > *Object Types* > *Service Providers* > *Objects*, and you can find an object named *WarehouseStagingRequest_In*.



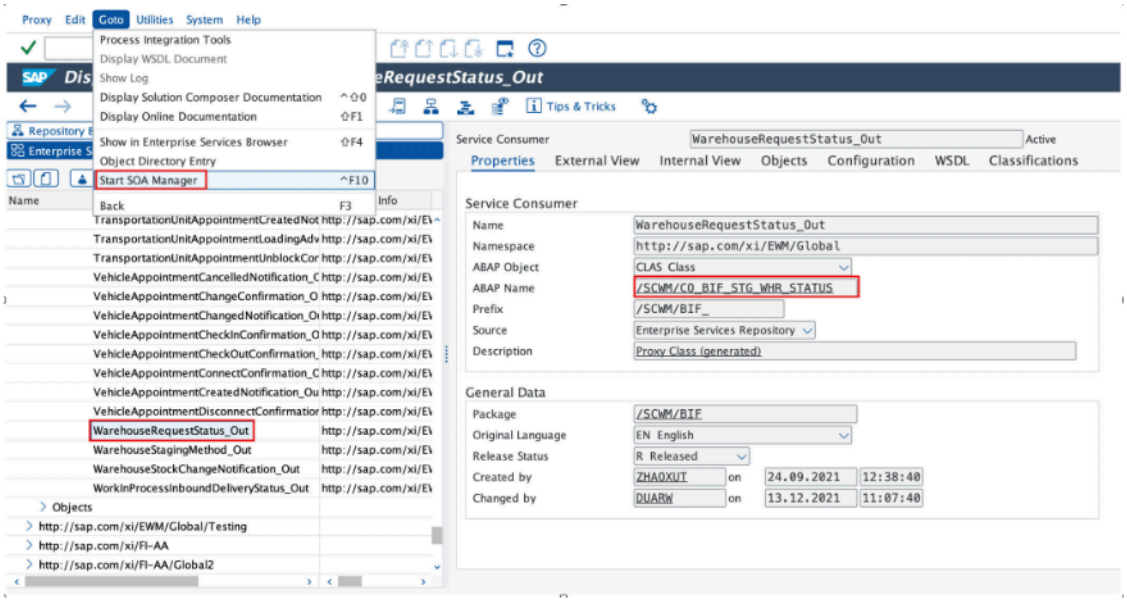


3. On the *Enterprise Services Browser* screen, choose *Namespaces* > *http://sap.com/xi/EWM/Global* > *Object Types* > *Service Consumers* > *Objects*, and you can find 3 object named *WarehouseRequestStatus_Out*, *WarehouseStagingMethod_Out* and *WarehouseStockChangeNotification_Out* respectively.


Workbench
Edit
Goto
Utilities
Environment
System
Help
Object Navigator
Edit Object
Repository Browser
Enterprise Services Browser
Name
Additional Info
http://sap.com/xi/ESI/AdministrationTools
http://sap.com/xi/ESourcing/SRMJS/OP
http://sap.com/xi/EWM/Global
Source
SWCs
Packages
Object Types
Data Types
Fault Message Types
Service Providers
Service Def. (auto.gen.)
Message Types
Service Consumers
Source
SWCs
Packages
Objects
DeliveryInformation_Out
http://sap.com/xi/EWM/C
DespatchedDeliveryNotification_Out
http://sap.com/xi/EWM/C

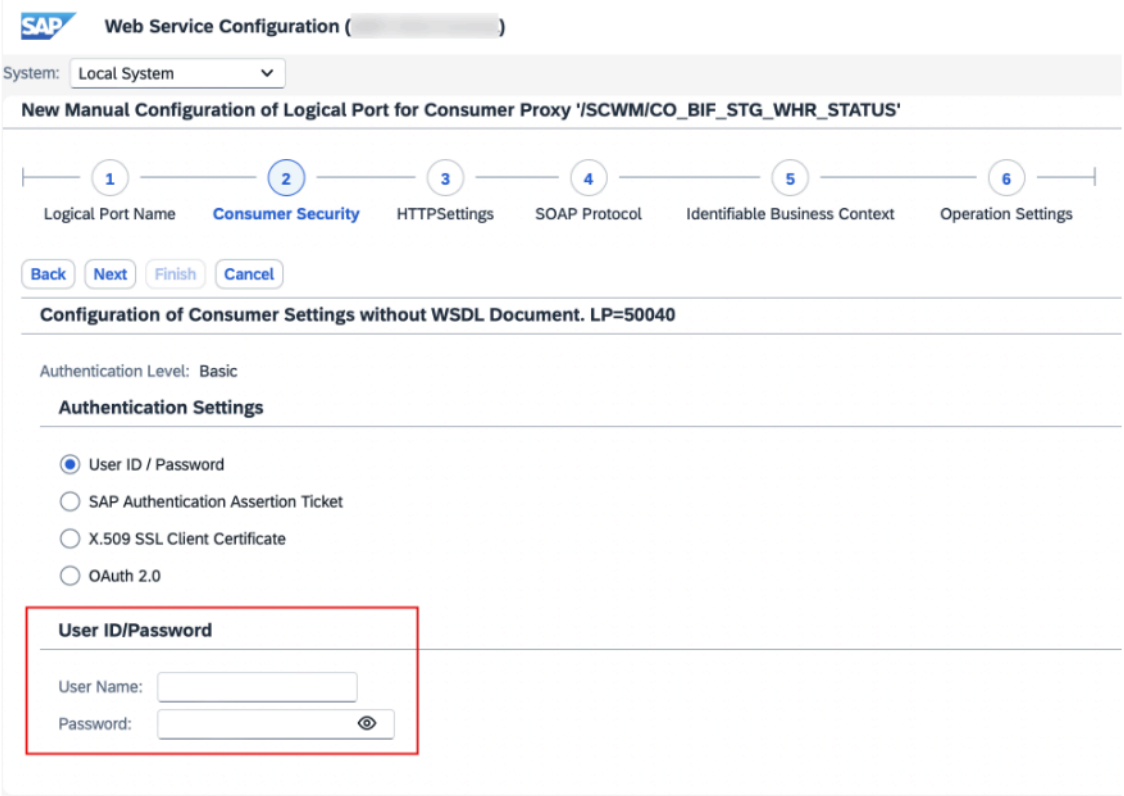


2. Create and configure logical ports for consumer proxies of the 3 consumer services.
   1. Doubleclick one of the consumer service object checked in above Step 1 to see its detailed information. For example, you can doubleclick *WarehouseRequestStatus_Out*.
   2. In the top navigation menu, choose *Goto* > *Start SOA Manager*.

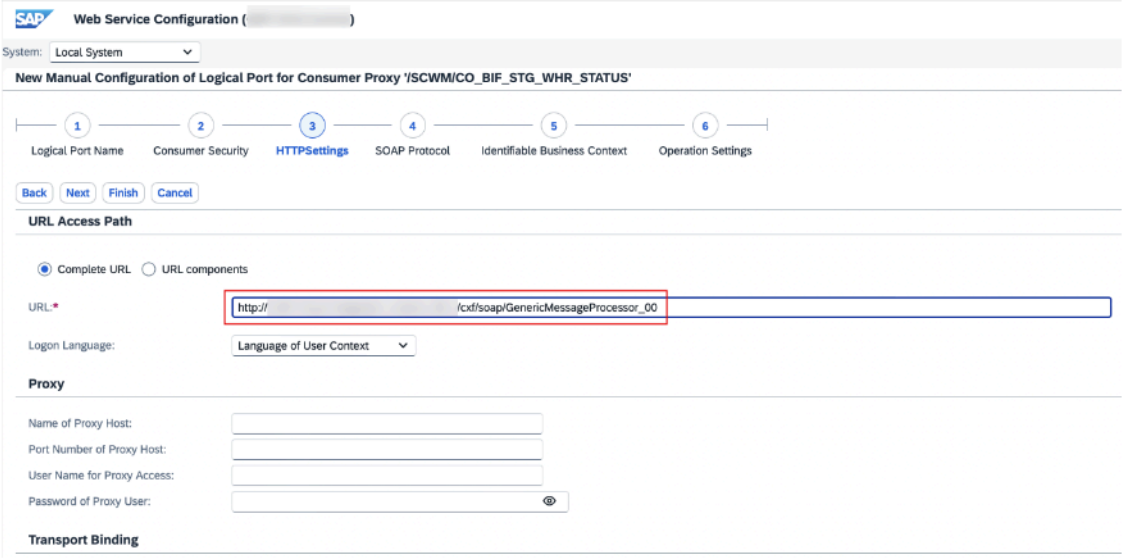


3. On the *Web Service Configuration* screen of SOA Manager, choose *Create* > *Manual Configuration* to define logical ports for the consumer proxy */SCWM/CO_BIF_STG_WHR_STATUS*.

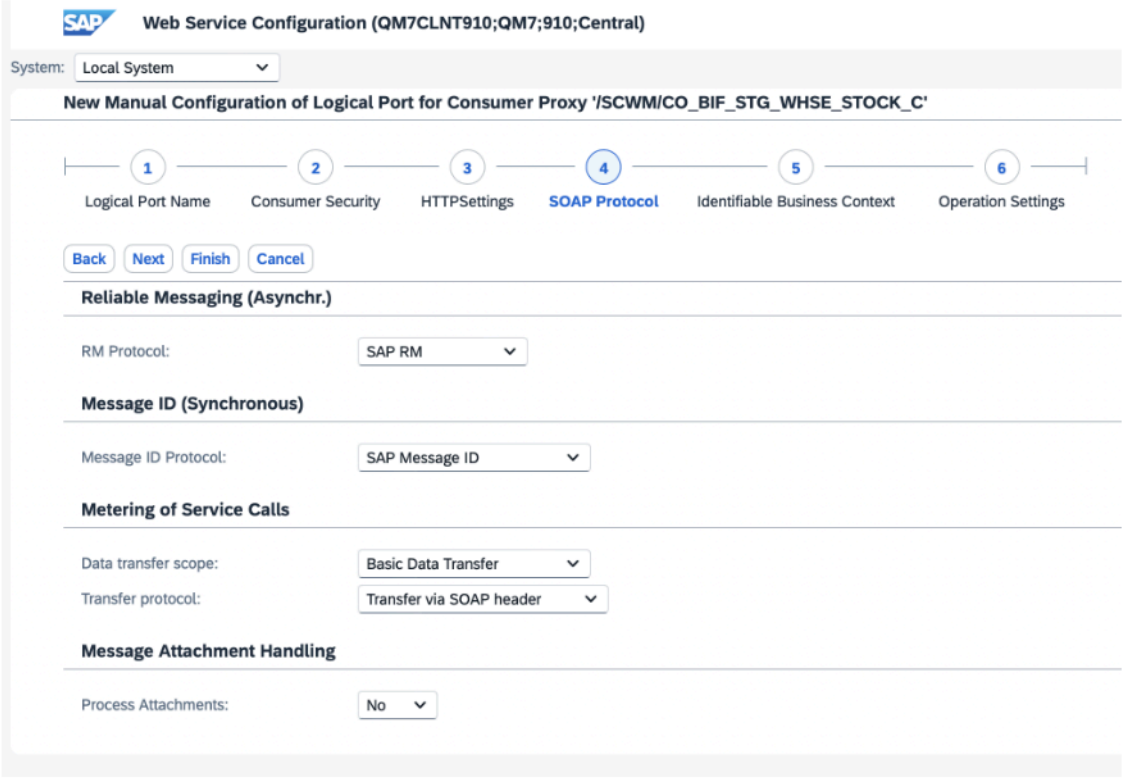
4. On the manual configuration screen, enter a name in *Logical Port Name*.
5. In *Consumer Security*, enter the P-user name and password that you've granted access to in your SAP Cloud Integration subaccount in your SAP BTP cockpit. For more information, see Granting Your P-User Access to SAP Cloud Integration in Cloud Foundry Environment [page 57].
   If you're using SAP Cloud Integration in Cloud Foundry environment, you can also enter the client ID and client secret of the integration flow service key. For more details about creating integration flow service keys, check out Create Instances in SAP Cloud Integration Subaccount [page 96].



6. In *HTTPSettings*, enter the URL in *URL Access Path*. The URL should be: **`<SAP Cloud Integration runtime URL>/cxf/soap/GenericMessageProcessor_00`**.
   For more information about getting SAP Cloud Integration runtime URL, see How to Get SAP Cloud Integration Runtime URL [page 23].



7. In *SOAP Protocol*, select the options as displayed in below screenshot.

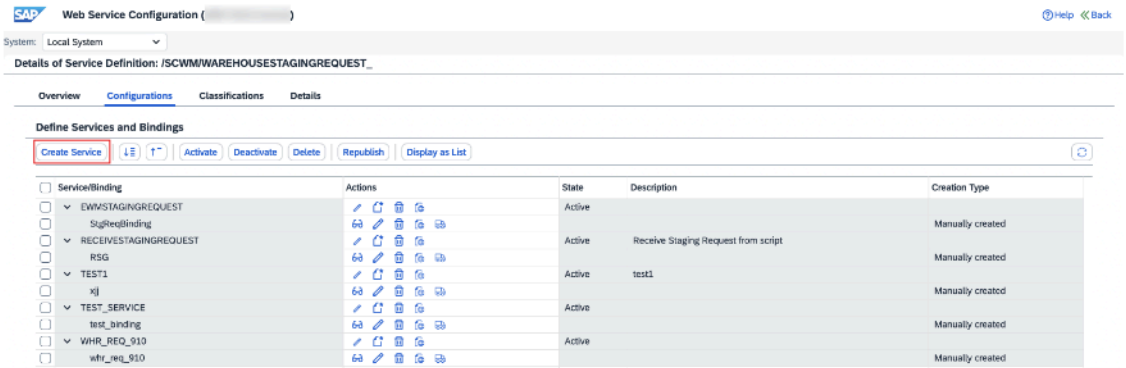


8. Continue to complete the remaining steps. You can keep the default settings. Choose *Finish*.
9. Set the logical port to default by choosing *Set Log.Port Default*.

> **Note**
>
> If you don't set the logical port to default, no messages are created.

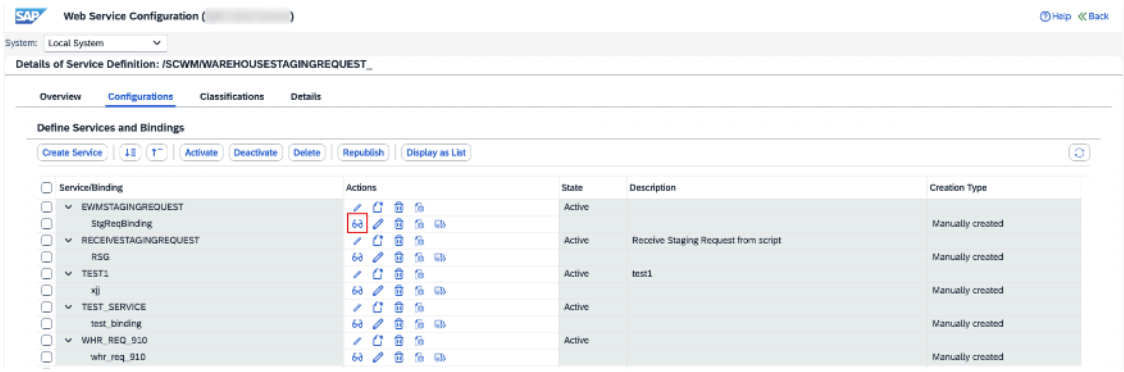
10. Repeat step a-g to define logical ports for the other two consumer services *WarehouseStagingMethod_Out* and *WarehouseStockChangeNotification_Out*.

3. Create service binding for the provider service *WarehouseStagingRequest_In*.
   1. Doubleclick the provider service object *WarehouseStagingRequest_In*.
   2. In the top navigation menu, choose *Goto* > *Start SOA Manager*.
   3. On the *Web Service Configuration* screen of SOA Manager, choose *Create Service*.

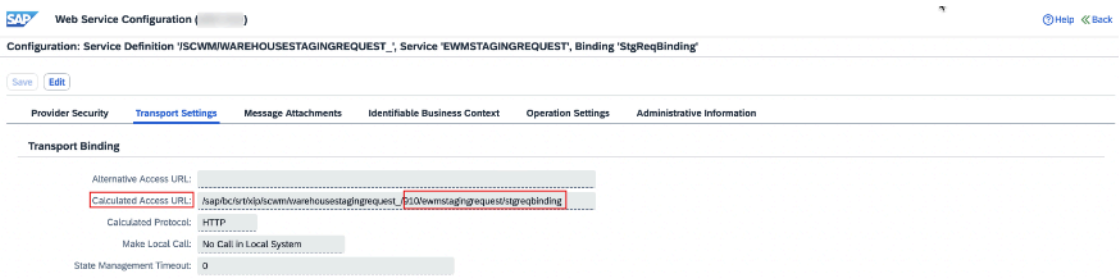


   4. In *Service and Binding Name*, enter *Service Name* and *New Binding Name*.
   5. In *Provider Security* step, select *User ID/Password* in the *Authentication Settings* section.
   6. Continue to complete the remaining steps. You can keep the default settings. Choose *Finish*.

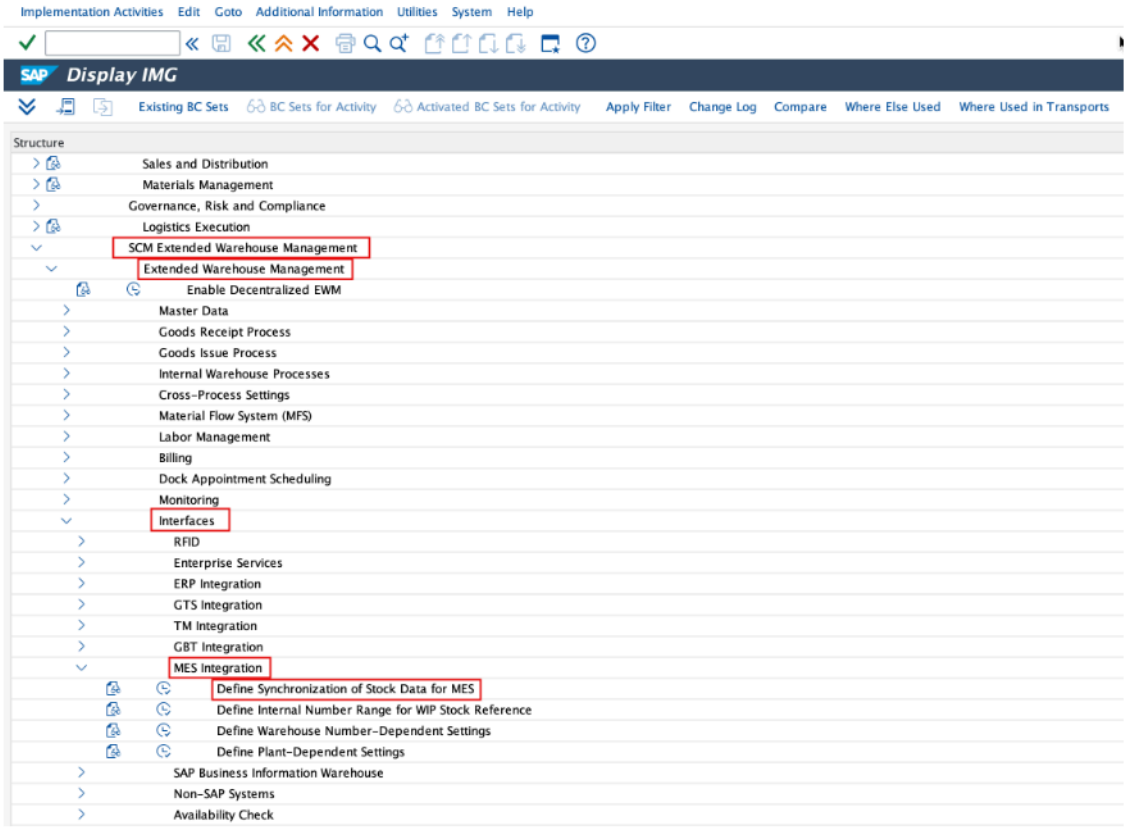
7. In the Service/Binding list, choose *Display Binding* for the binding you just created.



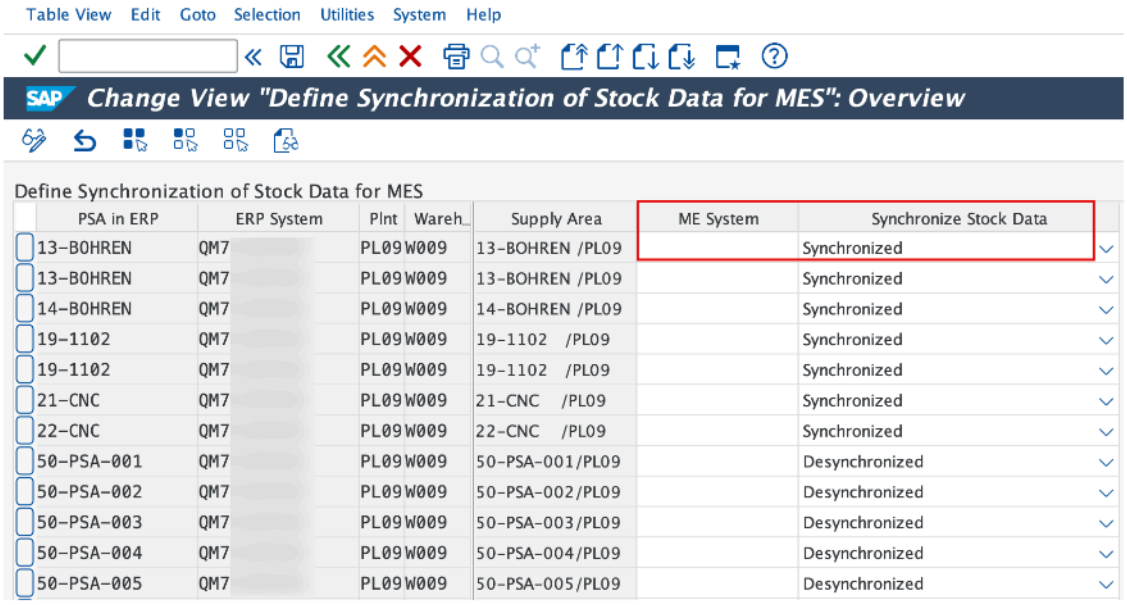
8. In the Transport Settings tab, note down the value in *Calculated Access URL*.



4. Make EWM stock synchronization configurations.
   1. Execute the transaction code `SPRO` and choose *SAP IMG Reference*.
   2. Choose *SCM Extended Warehouse Management* > *Extended Warehouse Management* > *Interfaces* > *MES Integration* > *Define Synchronization of Stock Data for MES*.



3. Leave *ME System* empty. Select *Synchronized* in the *Synchronize Stock Data* column.



PSA in ERP	ERP System	Plnt	Wareh.	Supply Area	ME System	Synchronize Stock Data
13-BOHREN	QM7	PL09	W009	13-BOHREN /PL09		Synchronized
13-BOHREN	QM7	PL09	W009	13-BOHREN /PL09		Synchronized
14-BOHREN	QM7	PL09	W009	14-BOHREN /PL09		Synchronized
19-1102	QM7	PL09	W009	19-1102 /PL09		Synchronized
19-1102	QM7	PL09	W009	19-1102 /PL09		Synchronized
21-CNC	QM7	PL09	W009	21-CNC /PL09		Synchronized
22-CNC	QM7	PL09	W009	22-CNC /PL09		Synchronized
50-PSA-001	QM7	PL09	W009	50-PSA-001/PL09		Desynchronized
50-PSA-002	QM7	PL09	W009	50-PSA-002/PL09		Desynchronized
50-PSA-003	QM7	PL09	W009	50-PSA-003/PL09		Desynchronized
50-PSA-004	QM7	PL09	W009	50-PSA-004/PL09		Desynchronized
50-PSA-005	QM7	PL09	W009	50-PSA-005/PL09		Desynchronized

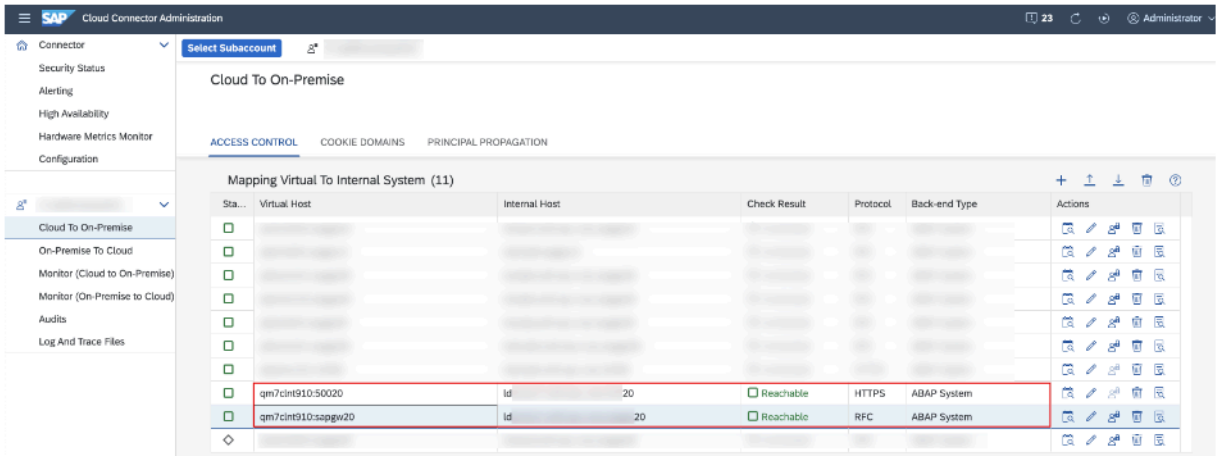
5. Check that the `SCWM` service is activated.
   1. In the SAP Easy Access Menu, choose *Tools* > *Administration* > *Administration* > *Network* > *HTTP Service Hierarchy Maintenance* (transaction code *SICF*) . The systems open the *Define Services* screen.
   2. In the *Hierarchy Type* field, select *Service* and choose *Execute*.
   3. In the *Virtual Hosts/Services* column under *default host*, follow the path *sap/bc/srt/xip/SCWM*.

4. If the *SCWM* service is grayed out, it isn't activated. In this case, right-click *SCWM* and choose *Activate*.

> **Note**
>
> To make the staging method download work, you need to define the staging method in EWM first. For more information, see Sending Staging Method to MES.

Configuration in SAP Cloud Connector

Add 2 virtual host mappings to support RFC and SOAP outbound requests from cloud connector to EWM.



To add the mappings for RFC and SOAP requests, follow below steps:

If you have already integrated with SAP S/4HANA, you should already have the RFC connection in place. In this case, you can skip the first three steps and go directly to Step 4.

1. In the cloud connector administration console, choose *<Subaccount>* > *Cloud To On-Premise* > *ACCESS CONTROL* >.
2. In the *Mapping Virtual To Internal System* section, choose *Add*.
3. In the *Add System Mapping* pop-up, fill in the required fields step by step. You can refer to below table for field values.

Field Name	Value	
Back-end Type	ABAP System	
Protocol	RFC	
Connection Type	Without load balancing	
Application Server	Example: idcixxx.wdf.sap.corp	To find the application server and instance number of your ERP system: 1. Log on to your target ERP system, and execute transaction code `SMICM`. 2. From the top menu, choose > *Goto* > *Services* >.

Field Name	Value	
Instance Number	Example: 43000	3. You can see the application server in the *Host Name* column, and the instance number in the *Service Name/Port* column.
Virtual Application Server	Example: xxxclnt910	It is recommended to use a virtual server (cloud-side) name that is different from internal application server name. To enable EWM integration, make sure you use the same value for these fields: • The *Virtual Application Server* for RFC protocol in the Cloud Connector • The *Virtual Host* for HTTPS protocol in the Cloud Connector • The *Destination* of the SAP Cloud Integration subaccount in SAP BTP Cockpit • The *EWM Destination* in the *Manage Business Settings* app in SAP Digital Manufacturing To avoid errors in SAP Digital Manufacturing's outgoing messages, ensure the value you specify for the above fields don't contain special characters such as underscores, periods and hyphens, etc.
Virtual Instance Number	Example: 43000	The default value is the instance number you entered previously. Leave it unchanged.

4. For RFC protocol, add the following accessible resources to it.
   - `/SCWM/MFG_CONSUME_ITEMS_EXT`
     External interface for EWM goods issue posting.
   - `/SCWM/MFG_REVERSE_ITEMS_EXT`
     External interface for EWM goods issue cancellation.
   - `/SCWM/MFG_READ_STOCK_EXT`
     External interface for EWM stock synchronization.
   - `/SCWM/MFG_RECEIVE_HUS_EXT`
     External interface for EWM goods receipt posting.
   - `/SCWM/MFG_REVERSE_HUS_EXT`
     External interface for EWM goods receipt cancellation.
   - `/SCWM/MFG_STAGE_EXT`
     External interface for EWM staging.

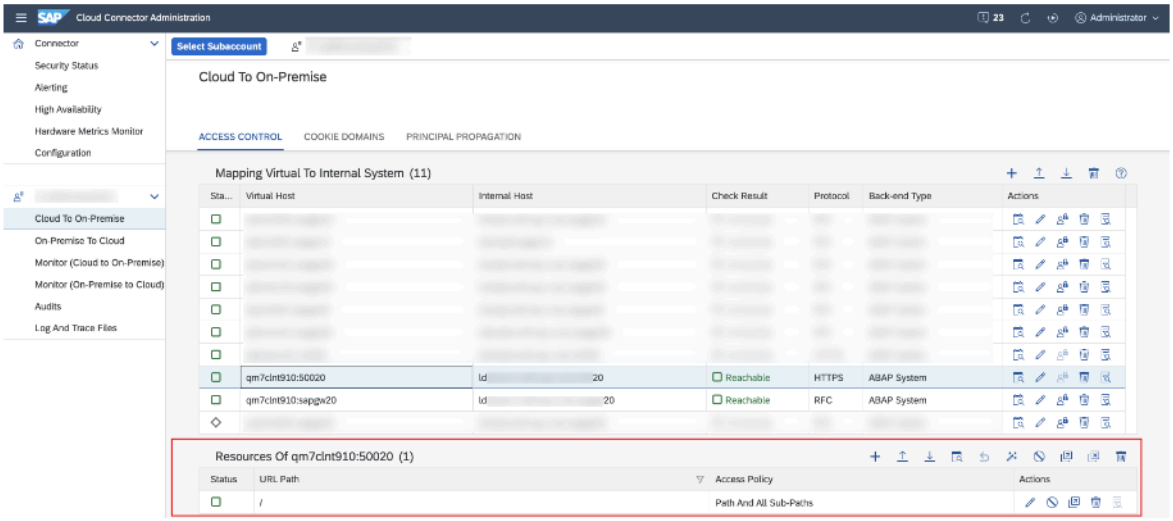
- `BAPI`
  BAPI related external interfaces.
- `CO_MES_PRODORDCONF_CREATE_TT`
  External interface for production order goods issue posting.
- `MB_MES_GOODSMVT_CREATE`
  External interface for production order component add.

5. Samewise, add another mapping and this time, specify *HTTPS* as the *Protocol*. Refer to below table to fill the required fields.

Field Name	Value	
Back-end Type	ABAP System	
Protocol	HTTPS	
Internal Host	Example: idcixxx.wdf.sap.corp	To find the internal host and internal port of your ERP system: 1. Login to your target ERP system, and execute transaction code `SMICM`. 2. From the top menu, choose *Goto* > *Services*. 3. You can see the internal host in the *Host Name* column, and the internal port in the *Service Name/Port* column.
Internal Port	Example: 43000	

Field Name	Value	
Virtual Host	Example: xxxclnt910	It is recommended to use a virtual (cloud-side) name that is different from internal host name. To enable EWM integration, make sure you use the same value for these fields: • The *Virtual Application Server* for RFC protocol in the Cloud Connector • The *Virtual Host* for HTTPS protocol in the Cloud Connector • The *Destination* of the SAP Cloud Integration subaccount in SAP BTP Cockpit • The *EWM Destination* in the *Manage Business Settings* app in SAP Digital Manufacturing To avoid errors in SAP Digital Manufacturing's outgoing messages, ensure the value you specify for the above fields don't contain special characters such as underscores, periods and hyphens, etc.
Virtual Port	Example: 43000	The default value is the internal port you entered previously. Leave it unchanged.
Principal Type	X.509 Certificate (Strict Usage)	
Host In Request Header	Use Internal Host	

6. For HTTPS protocol, add *URL Path* **/** and allow access to *Path And All Sub-Paths*.



Configuration in SAP Cloud Integration

> **Note**
>
> To enable EWM integration, make sure you use the same value for these fields:
>
> - The *Virtual Application Server* for RFC protocol in the Cloud Connector
> - The *Virtual Host* for HTTPS protocol in the Cloud Connector
> - The *Destination* of the SAP Cloud Integration subaccount in SAP BTP Cockpit
> - The *EWM Destination* in the *Manage Business Settings* app in SAP Digital Manufacturing
>
> To avoid errors in SAP Digital Manufacturing's outgoing messages, ensure the value you specify for the above fields don't contain special characters such as underscores, periods and hyphens, etc.

Add RFC destination of EWM in SAP Cloud Integration.

1. Log on to your SAP Cloud Integration subaccount in the SAP BTP Cockpit, and choose *Connectivity* > *Destinations* in the side menu bar.
2. Choose *Create Destination* and enter the following fields to create the destination.

Name	Type	Proxy Type	User	Password	Authorization Type	Location ID
To enable EWM integration, make sure you use the same value for these fields: • The *Virtual Application Server* for RFC protocol in the Cloud Connector • The *Virtual Host* for HTTPS protocol in the Cloud Connector • The *Destination* of the SAP Cloud Integration subaccount in SAP BTP Cockpit • The *EWM Destination* in the *Manage Business Settings* app in SAP Digital Manufacturing To avoid errors in SAP Digital Manufacturing's outgoing messages, ensure the value you specify for	*RFC*	*OnPremise*	Enter the username to access EWM	Enter the password to access EWM	*CONFIGURED_USER*	If you have maintained a location ID in the Cloud Connector, enter the location ID here.

Name	Type	Proxy Type	User	Password	Authorization Type	Location ID
the above fields don't contain special characters such as under-scores, periods and hyphens, etc.						

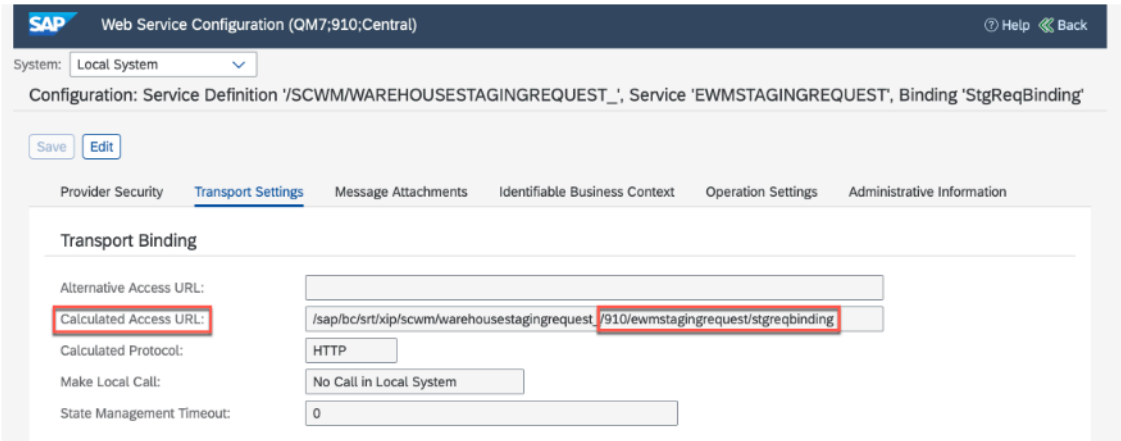
3. Add the following *Additional Properties*:

Property	Description	Value
`jco.client.ashost`	The *Virtual Host* of the EWM system as defined in the Cloud Connector. **Note** The virtual host defined here must be the same as the EWM destination configured in the *Manage Business Settings* app.	**Example** `<virtual host>`
`jco.client.client`	The client number of EWM.	**Example** 100
`jco.client.lang`	The language of EWM.	**Example** `EN`
`jco.client.sysnr`	The system number of EWM.	**Example** 22
`jco.destination.pool_capacity`	The connection number.	**Example** 5

Configuration for SAP Cloud Integration iFlow

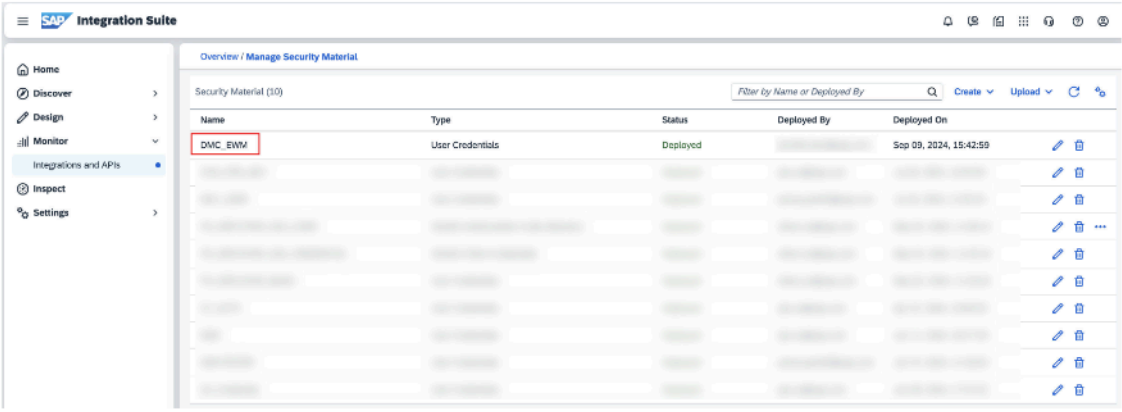
1. Log on to SAP Cloud Integration and choose the *SAP S/4HANA Integration with SAP Digital Manufacturing* integration package.
2. In the *Artifacts* tab, search for the *EWM OrderStaging process request* artifact.
3. Choose *Actions* > > *Configure* to set the following parameters.

- *EWM_PORT*
  Enter the port that is configured in cloud connector virtual host as mentioned in the **Configuration in Cloud Connector** section.
- *EWM_URL*
  Enter the value appended to the string "**`warehoustagingrequest_`**" of the *Calculated Access URL* field. You can find this field in the service/binding created for the EWM provider service. You can refer to the screenshot below to see where this field is located in the EWM system.



> ⚠ Caution
>
> The service name must be the same for all systems (development, quality, and production).

- *Location ID*
  Enter the location ID that you have maintained in the Cloud Connector.
- *Credential Name*
  Enter the security material name defined in SAP Cloud Integration. The credentials refer to a technical user defined in EWM / SAP S/4HANA. For more information about the technical user, see Create a Technical User for SAP S/4HANA [page 21] .



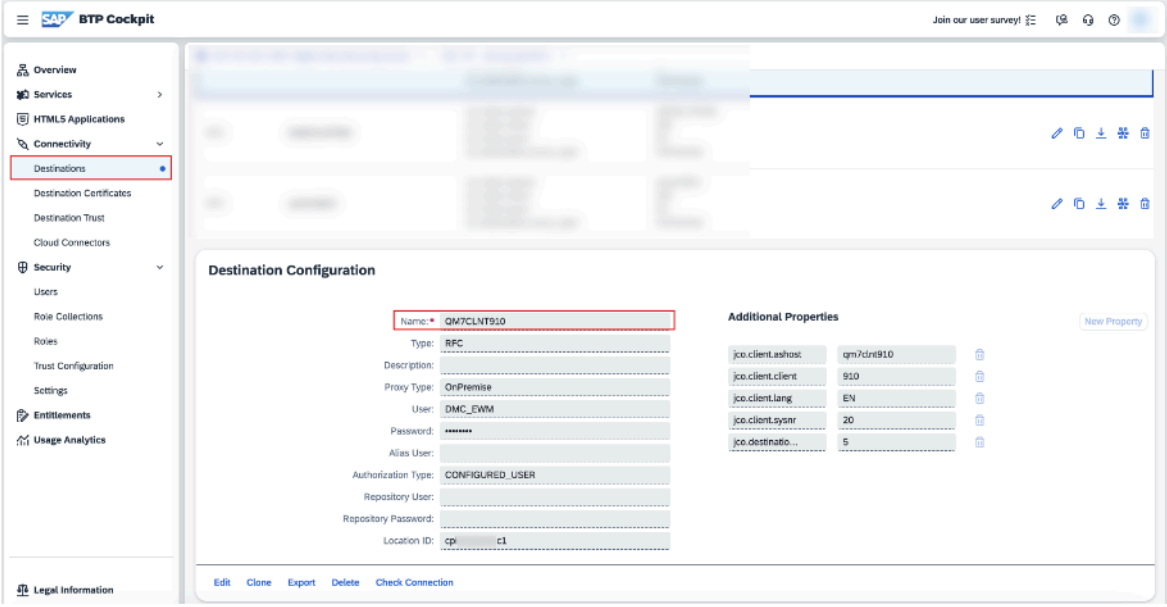
> ⚠ Caution
>
> The user credentials must be the same for all systems (development, quality, production).

Configuration in SAP Digital Manufacturing

1. Set up logical systems and system destinations. Go to the *Manage Business Settings* app and configure the following settings.

Field	Description	Example
Integration Mode	Indicates which ERP system SAP Digital Manufacturing is integrated with.	S/4 HANA
ERP Destination	Enter here the destination of your ERP system. Make sure the destination is the same as the one that is configured for your SAP Cloud Integration tenant. To see the ERP destination configured for SAP Cloud Integration tenant, go to SAP BTP cockpit, and choose *Connectivity* > *Destinations* in the side menu bar.	Refer to below screenshot.

Field	Description	Example
EWM Destination	Enter the destination of your ERP system. Make sure the destination is the same as the one that is configured for your SAP Cloud Integration tenant. To see the ERP destination configured for the SAP Cloud Integration tenant, go to SAP BTP cockpit, and choose *Connectivity* > *Destinations* in the side menu bar. To enable EWM integration, make sure you use the same value for these fields: • The *Virtual Application Server* for RFC protocol in the Cloud Connector • The *Virtual Host* for HTTPS protocol in the Cloud Connector • The *Destination* of the SAP Cloud Integration subaccount in SAP BTP Cockpit • The *EWM Destination* in the *Manage Business Settings* app in SAP Digital Manufacturing To avoid errors in SAP Digital Manufacturing's outgoing messages, ensure the value you specify for the above fields don't contain special characters such as underscores, periods and hyphens, etc.	
ERP Logical System	The logical system of ERP defined in EWM system. To see your logical system, in EWM, go to *Customizing for Extended Warehouse Management under SCM Basis* > *Integration* > *Basic Settings for Setting Up the System Landscape* > *Name Logical Systems*	



2. Maintain EWM-managed storage locations. Go to the *Manage Storage Locations* app, create storage locations with the same names as the storage locations in the EWM system, and enable *EWM-Managed Storage Location*.
3. Go to the *Manage Collaboration Links* app and assign the following directives to respective collaboration links to enable outbound integration from SAP Digital Manufacturing to EWM.

Collaboration Link	Collaboration Directive	Description
`EWM_COLLABORATION_SHOPORDER_RELEASE`	`EWM_SINGLE_ORDER_STAGING_REQUEST`	This collaboration link is triggered by order release to send single-order staging request to EWM.
`EWM_COLLABORATION_COMPONENT_ADD`	`EWM_COMPONENT_ADD`	This collaboration link is triggered by Assemble Components plugin to send component consumption to EWM.
`EWM_COLLABORATION_YIELD_CONFIRMATION`	`EWM_GOODS_ISSUE_POST`	When `EWM_COLLABORATION_COMPONENT_ADD` is not configured, this collaboration link is triggered by SFC complete to send component consumption to EWM.
`EWM_COLLABORATION_SFC_DISPOSITION`	`EWM_SFC_DISPOSITION`	When `EWM_COLLABORATION_COMPONENT_ADD` is not configured, this collaboration link is triggered by SFC scrap to send component consumption to EWM.
`COLLABORATION_SFC_COMP_REMOVE_EWM_OP`	`EWM_COMPONENT_REMOVE_OP`	This collaboration link is triggered by component removal for production order in Work Center POD.

Collaboration Link	Collaboration Directive	Description
EWM_COLLABORATION_CONTAINER_CLOSE	EWM_CONTAINER_CLOSE_CONFIRMATION	This collaboration link is triggered by closing container to send goods receipt message to EWM.
COLLABORATION_ERP_SCRAP_CONFIRMATION	ERP_SCRAP_CONFIRMATION	This collaboration link is triggered by SFC scrap to report scrapped component quantity to SAP ERP.
COLLABORATION_ERP_YIELD_CONFIRMATION	ERP_YIELD_CONFIRMATION_V2	This collaboration link is triggered by SFC Complete to report quantity of finished goods to SAP ERP. For more information, see 3420816.
EWM_COLLABORATION_FG_GOODS_RECEIPT	EWM_GOODS_RECEIPT	This collaboration link is triggered by *Goods Receipt* plugin to report goods receipt of finished goods to EWM.
EWM_COLLABORATION_CO_GOODS_RECEIPT	EWM_GOODS_RECEIPT	This collaboration link is triggered by *Goods Receipt* plugin to report goods receipt of co-products to EWM.
EWM_COLLABORATION_BY_GOODS_RECEIPT	EWM_GOODS_RECEIPT	This collaboration link is triggered by *Goods Receipt* plugin to report goods receipt of by-products to EWM.
COLLABORATION_INV_READ_EWM	EWM_INV_READ	This collaboration link is triggered by EWM stock read requests. It reads EWM stock and synchronizes the stock information to SAP Digital Manufacturing.

Related Information

Connecting to EWM in SAP S/4HANA 1909 to 2020 (Deprecated) [page 459]
Integration Scenario with EWM in SAP S/4HANA 2021

2.3.4 Mapping Plants (Plant Conversion)

If you're managing the same plant in multiple EWM systems, you can use plant conversion to map the EWM plant to different plants in SAP Digital Manufacturing.

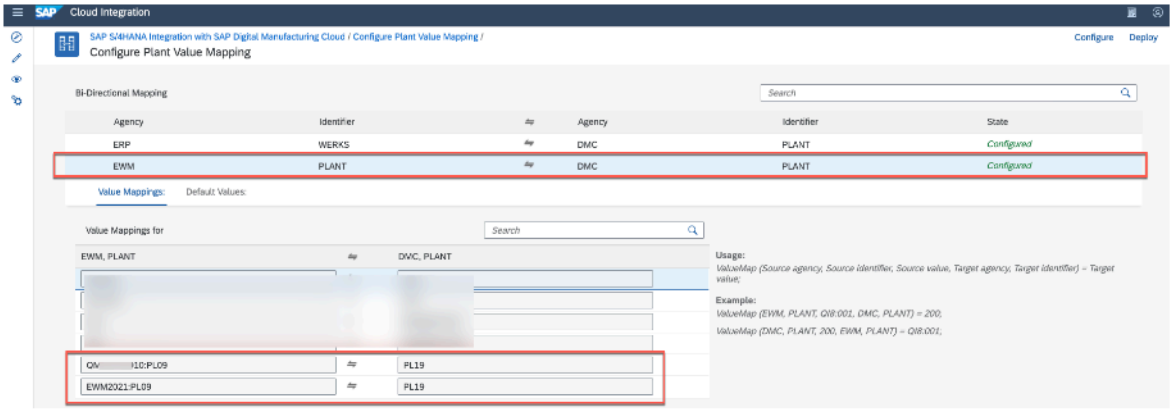
> **Note**
>
> Plant conversion is supported in integration with EWM in SAP S/4HANA 2021 version or higher.

Procedure

Follow below steps to enable plant converion in EWM integration:

1. Log on to SAP Cloud Integration and search for the *SAP S/4HANA Integration with SAP Digital Manufacturing* package.
2. Enter the package and choose the *Artifacts* tab.
3. In *Plant Value Mapping* artifact, choose *Actions* > *Configure*.
4. Select the EWM row item and add value-mapping configuration.
5. For each EWM plant in one EWM system, add two mapping items. For example, if you've maintained the same plant A in two EWM systems, you need to configure the mappings as follows:

EWM, PLANT	DMC, PLANT
<EWM programID A>:<EWM Plant A> **Note** For EWM embedded in SAP ERP, the EWM Program ID equals ERP logical system maintained in the *Manage Business Settings* app. To see your logical system, in EWM customizing, go to *SCM Extended Warehouse Management* > *SCM Basis* > *Integration* > *Basic Settings for Creating the System Landscape* > *Name Logical Systems*.	<DMC Plant A1>
<EWM Destination A>:<EWM PlantA> **Note** Use the EWM destination maintained in the *Manage Business Settings* app. In this app, you can freely define the EWM destination.	<DMC Plant A1>
<EWM programID B>:<EWM Plant A>	<DMC Plant B1>
<EWM Destination B>:<EWM PlantA>	<DMC Plant B1>



Related Information

Manage Business Settings

2.4 Troubleshooting Overview

If you run into problems during or after setting up a specific integration scenario, you can find general troubleshooting information in this guide. The information will be updated as applicable.

Troubleshooting for the Integration with SAP S/4HANA [page 489]

Trouble with User Role Management or Role Templates

Due to changes in the usage of business services of SAP Business Technology Platform, certain role collections need to be adjusted, otherwise you won't be able to access some of the apps on the launchpad. For some Production Connectivity Model and Network apps, you need to adjust your role collections by adding some new roles from different applications. For more information, see Role Templates (Persona-Based) as well as the SAP Note 2924331.

Trouble Using Integrated Floor Stock

If you want to use floor stock integration in SAP Digital Manufacturing, and be able to transfer floor stock data from and to an SAP ERP, SAP S/4HANA or SAP S/4HANA Cloud Public Edition system, you need to update certain settings in your configuration integration. In case of issues, check that all necessary configuration settings are done.

- If you use SAP ERP or SAP S/4HANA, see Updating Integration Configuration to Use Floor Stock Data [page 237]
- If you use SAP S/4HANA Cloud Public Edition, see Updating Integration Configuration to Use Floor Stock Data [page 413]

For more detailled troubleshooting information and guidance for a specific integration scenario, please refer to the Implementation Starter Kit for your scenario: Implementation Starter Kits for Discrete Manufacturing for SAP Digital Manufacturing.

> **Note**
>
> The content of Implementation Starter Kits is available only to registered or licensed customers and partners.

You can also refer to SAP Note 3544506 for frequently asked questions in inventory management and relevant integration scenarios.

Related Information

How to Contact Us
Integration Message Dashboard

2.4.1 Troubleshooting for the Integration with SAP S/4HANA

This section helps you to track, analyse, and resolve issues which can occur regarding the integration between SAP ERP or SAP S/4HANA and SAP Digital Manufacturing via SAP Cloud Integration using IDOCs.

It provides the following troubleshooting steps per business scenario:

Related Information

Master Data Upload from SAP ERP to SAP Digital Manufacturing Fails [page 489]
Production Order Transfer to ERP Fails [page 490]
Production Order Status is not Updated in SAP S/4HANA or SAP ERP [page 490]

2.4.1.1 Master Data Upload from SAP ERP to SAP Digital Manufacturing Fails

Find out what to do when master data can't be replicated to SAP Digital Manufacturing.

Symptom

Master data has been created in SAP ERP and you are trying to replicate this master data to SAP Digital Manufacturing, but the data is not available in SAP Digital Manufacturing.

> **Note**
>
> You can transfer work centers along with standard value keys (see 2996757). To know how to download the multi-language descriptions of the standard value keys, see 3134473.

Troubleshooting Steps

1. Check if the correct IDoc has been created and sent successfully.
2. Check if the IDoc has been created, but not sent.
3. Check, if no IDoc has been created.
   You can find a detailed description of the necessay steps in IDoc Troubleshooting Steps [page 491].
4. If the IDoc has been been created and sent, but is not yet visible in SAP Digital Manufacturing, check the message processing in SAP Cloud Integration. To do so, follow the steps outlined in SAP Cloud Integration Troubleshooting Steps [page 491] message status in SAP Digital Manufacturing.
5. You may also check for incoming messages in the *Integration Message Dashboard* in SAP Digital Manufacturing. For more information, see Integration Message Dashboard.

2.4.1.2 Production Order Transfer to ERP Fails

Find out what to do when the production order doesn't reach SAP Digital Manufacturing.

Symptom

You have released a production order through the transaction codes `CO01` or `CO02` in SAP S/4HANA or SAP ERP, yet the production order is not reaching SAP Digital Manufacturing.

Troubleshooting Steps

1. Check if the correct IDoc has been created and sent successfully.
2. Check if the IDoc has been created, but not sent.
3. Check, if no IDoc has been created.
   You can find a detailed description of the necessay steps in IDoc Troubleshooting Steps [page 491].
4. If the IDoc has been been created and sent, but is not yet visible in SAP Digital Manufacturing, check the message processing in SAP Cloud Integration. To do so, follow the steps outlined in SAP Cloud Integration Troubleshooting Steps [page 491].
5. You may also check for incoming messages in SAP Digital Manufacturing. To do so, follow the general guidance on how to use the *Integration Message Dashboard* app.

Related Information

Integration Message Dashboard

2.4.1.3 Production Order Status is not Updated in SAP S/4HANA or SAP ERP

Find out what to do when status updates for production orders don't reach connected systems.

Symptom

You are executing a production order on the shop floor. Status updates for goods issues, goods receipts, and the order status aren't reaching SAP S/4HANA or SAP ERP.

Troubleshooting Steps

1. Check the message status in the *Integration Message Dashboard* in SAP Digital Manufacturing. For more information, see Integration Message Dashboard.
2. If the message has been delivered successfully to SAP Cloud Integration, check the message processing on the platform. To do so, follow the steps described in SAP Cloud Integration Troubleshooting Steps [page 491].

2.4.1.4 SAP Cloud Integration Troubleshooting Steps

Learn how to troubleshoot for specific IDoc-related issues.

How to open tickets for issues regarding SAP Cloud Integration usage?

If you encounter issues regarding how to use SAP Cloud Integration such as obtaining P-User accounts and restarting SAP Cloud Integration, etc., you can open a customer support ticket and assign it to LOD-HCI-PI component.

How to troubleshoot issues with message processing in SAP Cloud Integration?

For detailed troubleshooting steps, please see SAP Note 3006794.

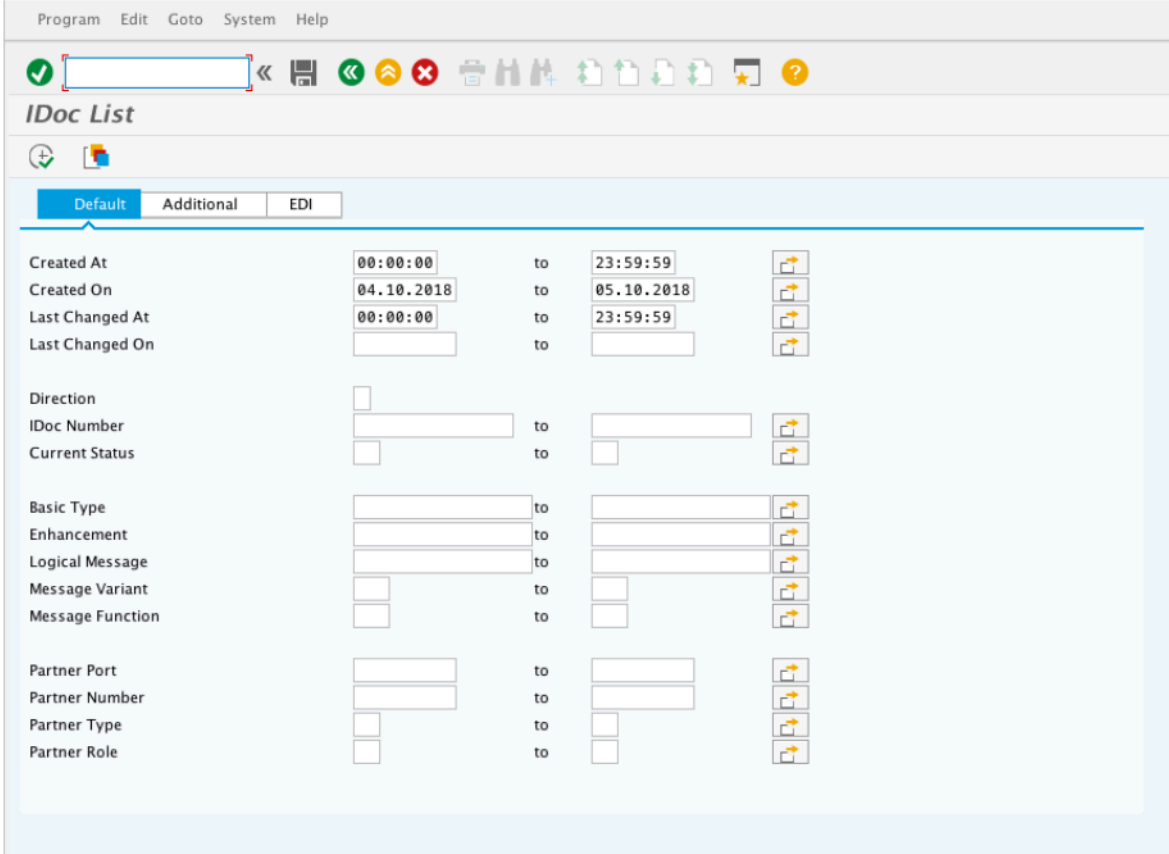
2.4.1.5 IDoc Troubleshooting Steps

Learn how to troubleshoot for specific IDoc-related issues:

Check if the correct IDoc has been created and sent:

Has the IDoc been created successfully?

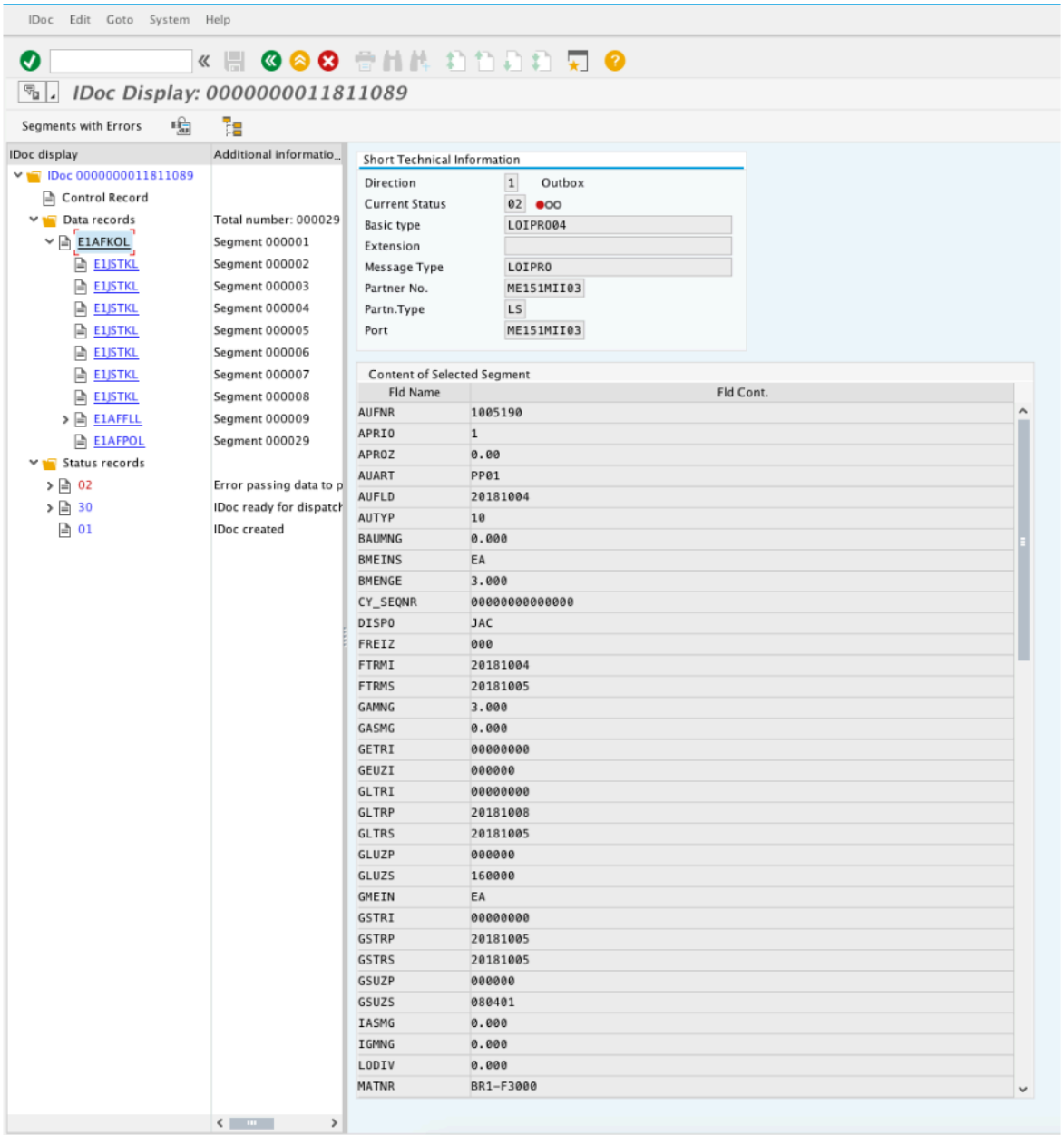
1. Access your SAP ERP or SAP S/4HANA system.
2. Use transaction WE02 to find errors in IDoc processing and check for IDocs with status *Failed*.



3. Choose F8. The system lists all IDocs that were sent in the respective period. IDocs that have successfully been posted outbound have the *Status 03* and a green light.
4. If you can't find the required IDoc in this list, it has not been created successfully in SAP ERP or SAP S/4HANA. If you can see the IDoc in this list, but it doesn't have *Status 03* and a green light, proceed to analyze as outlined below.

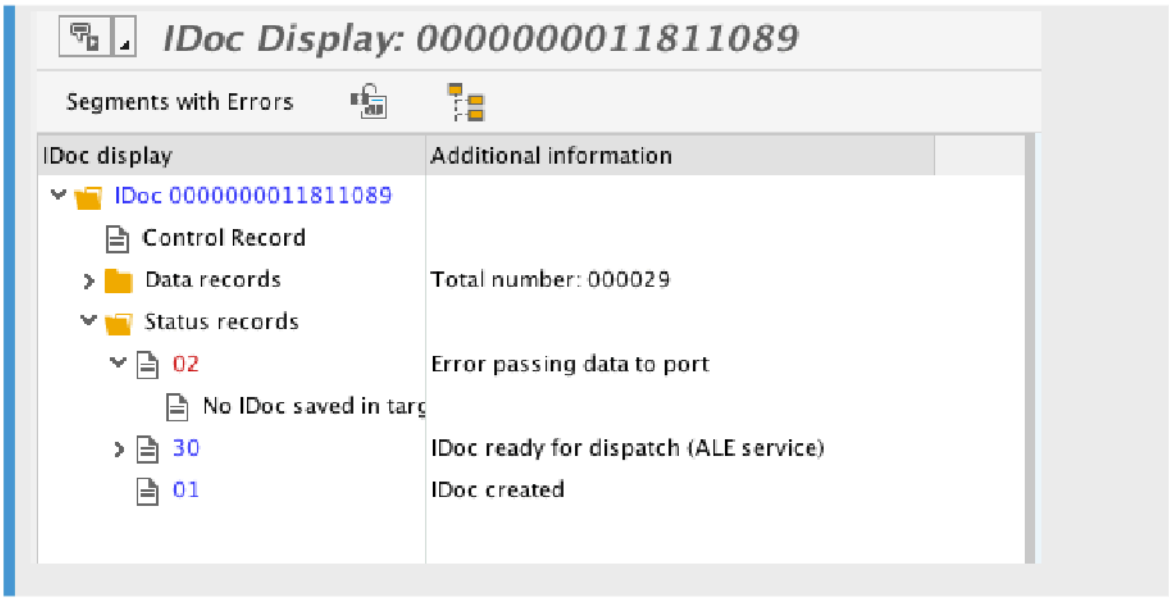
Has the created IDoc been sent successfully?

1. Double-click the IDoc you need to analyze. You can find the production order details under *Data records*.

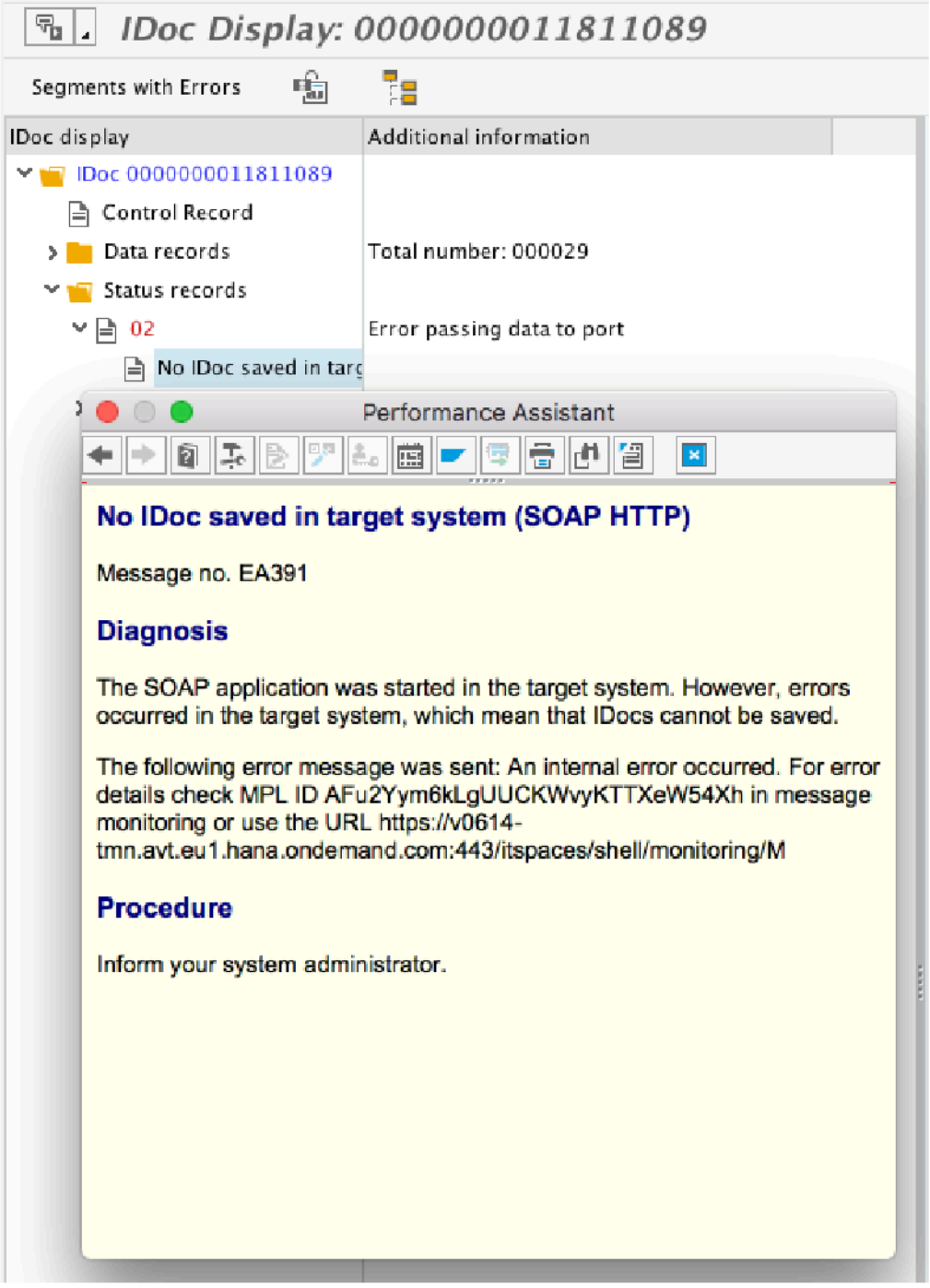


2. Check the status of the IDoc and the respective error code under *Status Records*.

> **Example**
>
> Error Code 02 – Error passing data to port.



3. Click on the record for detailed information.



According to the diagnosis information, the IDoc has been sent to SAP Cloud Integration with the specified MPL ID. Example:
SAP Cloud Integration: https://v0614-tmn.avt.eu1.hana.ondemand.com:443/itspaces/shell/monitoring/M
ID: AFu2Yym6kLgUUCKWvyKTTXeW54Xh

4. To solve the issue, go to the SAP Cloud Integration to check the message processing.
   For more information, see SAP Cloud Integration Troubleshooting Steps [page 491].

2.5 Extensibility Information

This chapter gives an overview of the extensibility options you've got for SAP Digital Manufacturing.

Introduction

With extensibility, you can customize and enhance existing products and functionalities based on industry-specific or customer-specific requirements. This section provides you with an overview of the available extensibility options for SAP Digital Manufacturing and how to make use of these options.

> ⓘ Note
>
> In addition to the documentation available here, you can also refer to the documentation for SAP Cloud Integration for data services on the SAP Help Portal (especially the chapters *Data Flows*, *Transform Operations*, *Scripts and Functions*).

Extending SAP Digital Manufacturing Using the SAP BTP Kyma Environment

One of the environments in which you can deploy your own developments is the Kyma environment for SAP Business Technology Platform. The Kyma environment includes a serverless engine that lets you build, run, and manage serverless applications and services to extend SAP Digital Manufacturing. You can enable the Kyma environment in the *Overview* section of your subaccount in the SAP BTP cockpit. To know more about the additional capabilities offered by the Kyma environment for SAP Business Technology Platform, see Kyma Environment.

SAP Samples

You can find samples for plugins, business processes, as well as other useful content to show how you can extend your solution to meet your needs in the *Develop* section on the SAP Help Portal.

API

You can find an overview of the APIs that SAP Digital Manufacturing offers here: APIs for SAP Digital Manufacturing. The full API documentation is available in the SAP Business Accelerator Hub.

For the procedure to create a service key that is needed to access SAP Digital Manufacturing using an API, see Create a Service Instance and Service Key in SAP Digital Manufacturing Subaccount [page 69].

Custom Integration Flows

You can add the custom integration workflows that you've deployed in SAP Cloud Integration to the *Manage Integration Workflows* app. For more information, see User-Defined Customizing Options [page 361].

iDoc Extension

You can use iDoc extensions to adapt your integration scenario to your needs. For more information, see 3548940.

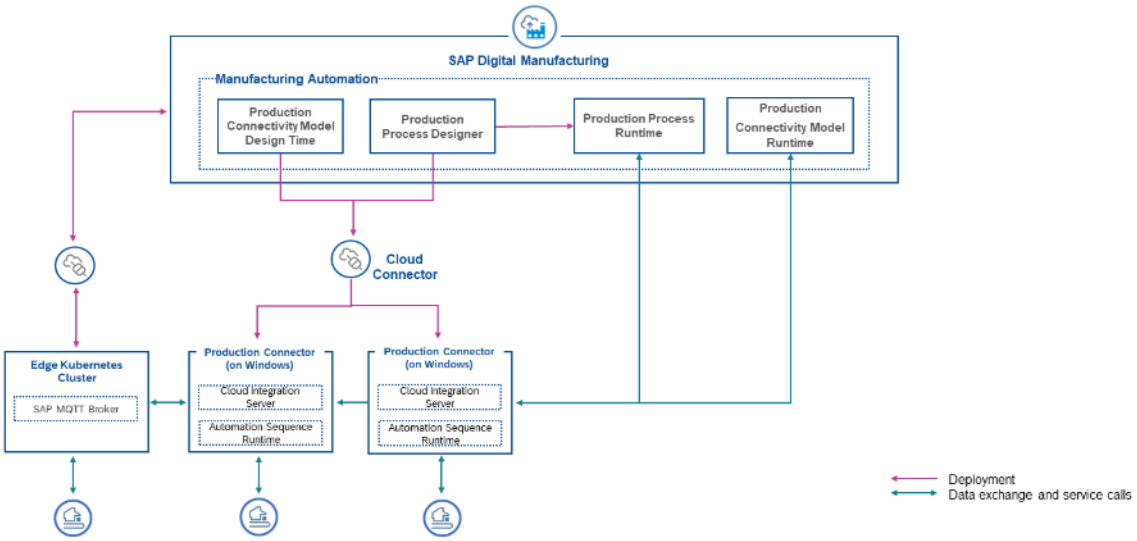
Related Information

Predefined Customizing Options Using XSLT [page 360]

3 Shop Floor Integration

SAP Digital Manufacturing connects to the shop floor through the Production Connector to retrieve machine data for analytics and run production processes.

Integration Overview



> **Note**
>
> You can use one Cloud Connector to connect multiple Production Connectors across tenants, such as production and quality.

3.1 Integration Scenarios

Learn about the integration scenarios that are supported in the context of the Asset Model.

- **Digital Twin Configuration**
  You use the Production Connectivity Model to configure and manage the assets and service providers to establish connectivity to the shop floor. The model helps you configure the digital twins of the machines on the shop floor. For more information, see Digital Twin Configuration [page 498].
- **Machine Data Integration**

You can create service providers that help you connect Production Connectivity Model to tags from external data sources and also services from various external and internal sources. For more information, see Machine Data Integration [page 498].

- **Production Process Configuration**
  You can use the Production Process Designer to model production processes and translate the production process designs into configurations by deploying them to the Production Connector. For more information, see Production Process Configuration [page 500].
- **Production Process Execution**
  The Production Connector executes the production processes as configured and transmits data between the machines and SAP Digital Manufacturing. For more information, see Production Process Execution [page 500].

Related Information

Asset Model

3.1.1 Digital Twin Configuration

Using the Production Connectivity Model, you can configure and manage an asset and service providers to establish connectivity to the shop floor. The model helps you configure the digital twins of your asset on the shop floor.

You can configure an asset and its constant properties such as dimensions or other manufacturer specifications, as well as the sensor data points.

To create a digital twin of your asset, see Managing Assets.

To onboard an asset to the Production Connectivity Model, see Manage Asset Connectivity.

3.1.2 Machine Data Integration

A machine can contain one or more shop floor systems. A shop floor system in the Production Connectivity Model is a server that provides an endpoint that you can use to access data and functions of the machine.

Using shop floor systems, you can connect the Production Connectivity Model to tags provided by external data sources as well as to services provided by external and internal sources. With the help of shop floor systems, you can model objects, services, and tag information in the Production Connectivity Model. When you configure a shop floor system, you define the shop floor system type (internal or external) and the usage of the shop floor system in Production Connector, for example, usage as a data source. The corresponding elements are then deployed to Production Connector using the activation flow provided by the *Deploy Shop Floor Elements* app.

The following table shows which objects configured in the Production Connectivity Model, correspond to which configuration elements in Production Connector.

Mapping of Entities

Object in Production Connectivity Model	Shop Floor System Type	Usage Type	Production Connector Configuration Elements
Shop Floor System	External	OPC UA data source	OPC UA source system and corresponding agent instance
Shop Floor System	External	OPC DA data source	OPC DA source system and corresponding agent instance
Shop Floor System	External	IP21 data source	IP21 source system and corresponding agent instance
Shop Floor System	External	AF data source	Asset Framework source system and corresponding agent instance
Shop Floor System	External	OPC UA server (in this case, you select methods and not tags)	OPC UA source system (without agent instance)
Shop Floor System	Internal	OPC UA server	OPC UA server created and running in Production Connector and corresponding agent instance
Tag	Internal	-	Tag
Service	External	-	Service, only metadata
Service	Internal	Direct destination call	Service, method definition, method notification with reference to a destination system
Client proxy	-	Universal Web Server	Destination system of the type Universal Web Service (RESTful)
Client proxy	-	OPC UA server	Destination system of the type OPC UA destination system

Managing Shop Floor System

You can use shop floor system to model the following:

- Data sources
  You can connect an external data source, such as an OPC UA server, and define all the properties of the data source. The data source provides tags.
- External servers (type: OPC UA server)
  You can connect an external OPC UA server that provides methods.
- Internal servers (type: OPC UA server)
  You can define an OPC UA server that is created automatically in Production Connector. You can define the methods in the configuration of the shop floor system.

- Internal servers (type: Web server)
  You can define a Production Connector web server that is created automatically in Production Connector. You can define the Web services in the configuration of the service.
- Execution in SAP Digital Manufacturing
  You can connect a manufacturing execution service provided by SAP Digital Manufacturing to the Production Connectivity Model. The manufacturing services allow you, for example, to start or complete an SFC.

Related Information

Deploy Shop Floor Elements

3.1.3 Production Process Configuration

Using the Production Process Designer, you can model production processes (automation sequences) that automate the production on the shop floor using services provided by service providers connected to the Production Connector systems. After a design is completed, you deploy and activate the production process design to transfer the configurations to the runtime environment, including these Production Connector systems.

3.1.4 Production Process Execution

As a manufacturing automation software, the Production Connector enables machine-to-machine communication and connects equipment with SAP Digital Manufacturing

After a shop floor design is deployed to the Production Connector, it is responsible to do the following:

- Execute automation that's configured by shop floor designs
- Call services in SAP Digital Manufacturing when tag values change
- Write values that are passed from SAP Digital Manufacturing into tags on equipment
- Read tag values from equipment and pass them on to SAP Digital Manufacturing

3.2 Integrate with the Production Connector for SAP Digital Manufacturing

The Production Connector for SAP Digital Manufacturing is the connectivity layer between SAP Digital Manufacturing and the shop floor.

The supported versions of the Production Connector for SAP Digital Manufacturing are available in 3253702.

> **Note**
>
> To connect the Production Connector for SAP Digital Manufacturing to SAP Digital Manufacturing via the Cloud Connector, refer to the procedure described here: Cloud Integration Guide.

> **Note**
>
> It's strongly recommended that you use the Production Connector for SAP Digital Manufacturing instead of SAP Plant Connectivity as your connectivity layer. SAP has already ended the support for SAP Plant Connectivity in the integration with SAP Digital Manufacturing. For more information, see 3255564.
>
> To know more about your migration options, see 3223128 and Preparing the Migration from SAP Plant Connectivity.
>
> If you've already created a connection from SAP Plant Connectivity to the cloud using **SAML**, have a look at the bottom of this page.

The table below shows you how you can assign the Production Connector roles based on the SAP Digital Manufacturing roles of each user. Note, however, that this mapping is not mandatory.

SAP Digital Manufacturing Role \ Production Connector Role	Administrator This procedure is about enabling communication from the Production Connector to the	CertificateAdministrator	PCoConfigurator	ServiceExecutor	DataReader	DataStorer	FileProcessor	Operator	BackupCreator
Production_Engineer			Yes	Yes	Yes	Yes			
Automation_Engineer		Yes	Yes	Yes	Yes	Yes			Yes
Production_Supervisor				Yes	Yes	Yes			
Production_Operator				Yes	Yes	Yes			
Manufacturing_Admin		Yes							
Global_Regional_Manager					Yes				

SAP Digital Manufacturing Role \ Production Connector Role	Administrator This procedure is about enabling communication from the Production Connector to the	CertificateAdministrator	PCoConfigurator	ServiceExecutor	DataReader	DataStorer	FileProcessor	Operator	BackupCreator
Plant_Manager					Yes				

Enable Communication from the Production Connector to the Cloud

Context

This procedure is about enabling communication from the Production Connector to SAP Digital Manufacturing. For an overview of the available connectivity use cases, navigate to the *Use Cases* section under: Set Up Connectivity to Shop Floor with Production Connectivity Model and Production Connector On-Premise.

SAP Digital Manufacturing supports two authentication methods for incoming Web service calls: SAML OAuth certification and x.509 certificate authentication. The Production Connector uses x.509 authentication by default; the SAML OAuth method is legacy and no longer recommended.

The following procedure is recommended: To use x.509 authentication for the Production Connector, you need to create a destination in your subaccount that you use for your production process in SAP BTP cockpit. For more information, see Create a Destination for SAP Digital Manufacturing.

> **Note**
>
> If you migrate from SAP Plant Connectivity (version 15.5.4) to the Production Connector with a destination still using a valid SAML OAuth certificate, you can continue to use SAML authentication. However, once your SAML certificate expires, you need to replace it manually. For more information, see Certificates.
>
> If you want to migrate destination configurations that still use SAML OAuth to use x.509 authentication, you need to redeploy the production process or subscription.
>
> Older Windows operating systems may issue an error message if you generate or refresh the Production Connector to Cloud Certificate (X.509 OAuth). Refer to the procedure described in SAP Note 3194709 in this case.

3.2.1 Minimum Version Requirements and Supported Scenarios

Here are the minimum release requirements, supported scenarios, and limitations for integrating machinery and equipment on the shop floor using the Production Connector.

Minimum Release Requirements

Information on the Production Connector versions that are supported by the current release of SAP Digital Manufacturing is available here: 3253702.

> → Recommendation
>
> To use the latest features and developments, install the highest available patch level of the pertaining Production Connector release.

3.2.2 Assignment of Production Connector Role to IAS User Groups

Production Connector roles can be manually assigned to users in the Production Connector or assigned to user groups in SAP Digital Manufacturing. Assigning the Production Connector roles to user groups helps minimize the downtime in the Production Connector as the assignment is managed from the cloud.

Access to Production Connector functions for SAP Digital Manufacturing users is managed by assigning the relevant Production Connector roles to user groups.

Prerequisites

Before the assignment, ensure the following:

1. User groups with users are created in your Identity Authentication tenant.
2. Role collections in SAP Digital Manufacturing are assigned to the relevant user groups in SAP Business Technology Platform.
3. You have to set the *Principal Type* to *None* in the mapping of the Virtual to Internal System of the Cloud Connector to allow authorization checks that consider user groups.

   > ⓘ Note
   >
   > This is setting is automatically made if you used the assisted configuration of the Cloud Connector integration in the Production Connector.

For more information, see Manage Users and Authorization.

Production Connector roles correspond to certain user rights that are required in SAP Digital Manufacturing. User groups with users are created in your Identity Authentication to perform Production Connector functions. You assign the user rights to user groups in the *Production Connector* section of the *Configure Production Connectivity* app. For information on how to assign user rights to user groups, see User Groups.

When a new Production Connector is configured in SAP Digital Manufacturing, by default a technical user group `SAP_Technical_UG` is available that can be used to manage service calls from production processes running in cloud. The access to read indicator values is provided by default. Access for other services such as applying set points, writing indicator values, printing through file transfer to network location managed in the Production Connector, triggering of Production Connector processes configured through the cloud and so on can be provided by editing the permissions of the technical group.

See the table below to know the user right that corresponds to a specific role in the Production Connector:

Authorization in SAP Digital Manufacturing	Production Connector Role	Role Description in the Production Connector
Manage Production Connectivity Model configuration	PCoConfigurator	Configuration of Production Connector
Read access to indicator measurements	DataReader	Reading and Browsing of Data Tags
Operate shop floor systems (start/stop agents)	Operator	Starting and Stopping of Service Providers
Write access to set indicator value	FileProcessor	Reading and Writing of Files
Invoke production process or Production Connector services	ServiceExecutor	Execution of Services
Administration of certificates	CertificateAdministrator	Administration of Certificates
Printing/file storage	DataStorer	Writing of Data Tags

3.3 Integration with SAP MII

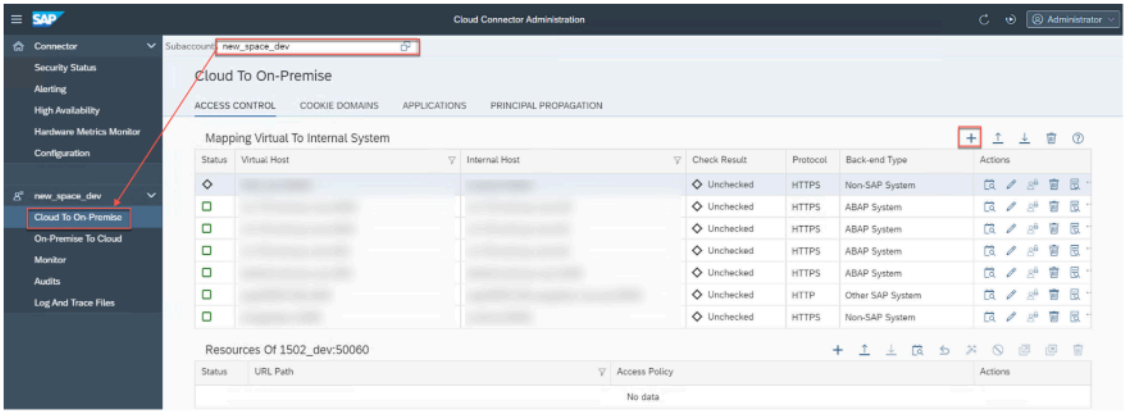
This document guides the user to set up the integration between SAP Manufacturing Integration and Intelligence (MII). The integration enables the user to import transactions from MII and design production processes with these transactions as services.

Prerequisites

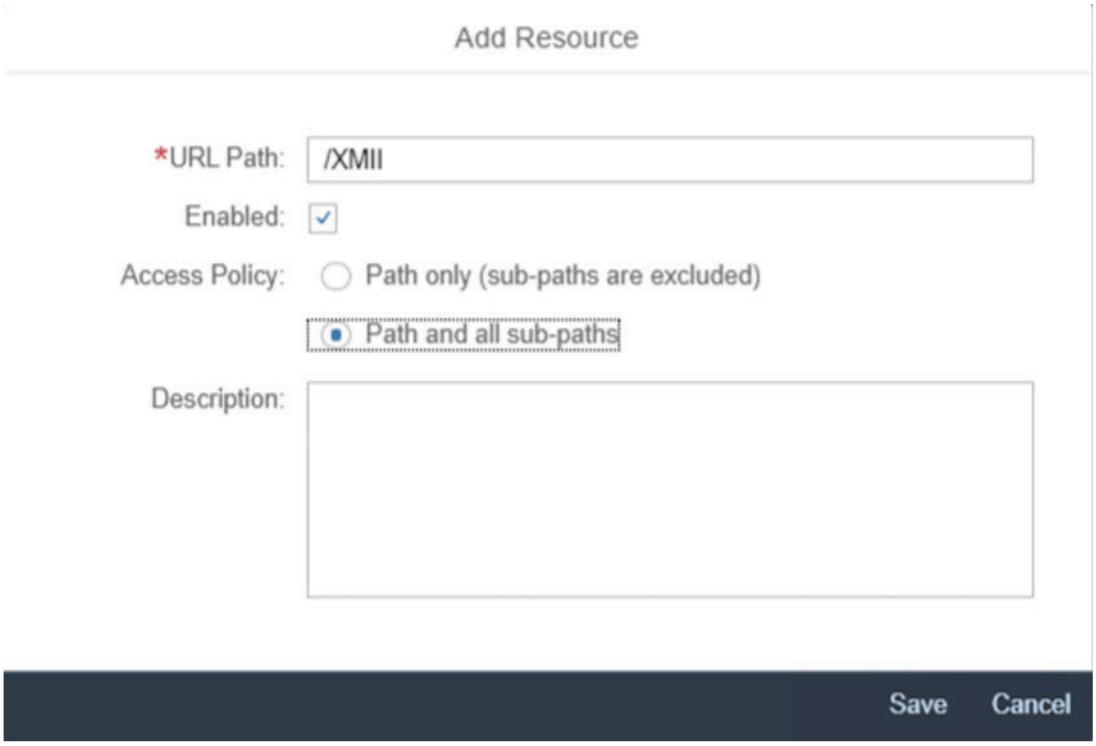
You have added the SAP Digital Manufacturing subaccount in your cloud connector.

Set up cloud connector

1. Log on to the cloud connector administration console.
2. Choose *<YourSubaccount>* > *Cloud To On-Premise*.
3. Map your MII system to a virtual system configured in the cloud connector:
   1. On the *ACCESS CONTROL* tab, in the *Mapping Virtual To Internal System* section, choose + *(Add)*.



   2. Specify the backend type as *SAP Application Server Java*.
   3. Specify the protocol as either *HTTP* or *HTTPS*, as appropriate.
   4. Specify the internal host and internal port.
   5. Specify the virtual host and virtual port.
   6. Select the principal type as *None*.
   7. Select *Use Internal Host* for *Host in Request Header*.
   8. Optionally, enter a description for this system.
4. Configure access control to the resources on your MII system:
   1. Select the newly created system.
   2. In the *Resources Of <System>* section, choose + *(Add)*.
   3. Add the resource.



Create destination for MII system

1. Log on to your subaccount for SAP Digital Manufacturing.
2. Choose *Connectivity* > *Destinations*.
3. Choose *Create Destination*.
4. Enter the following information:

Field	Description
Name	Enter an identifiable and unique name.
Description	[Optional] Enter a description for the destination.
Type	Select *HTTP*.
URL	Enter http://<virtualhost>:<virtualport> or https://<virtualhost>:<virtualport>, according to your configuration in the cloud connector.
Proxy Type	Select *OnPremise*.
Authentication	Select *BasicAuthentication*.

Field	Description
User	Enter the user name and password for an MII user that has the `SAP_XMII_Administrator` or `SAP_XMII_Developer` role. To create custom role with specific actions, see Actions for Permissions. **Note** `XMII_Read_Only` is a must action for the customized role. You should be assigned to the transactions that you want to import into the service registry.

Caution

There is security risk to use HTTP/Basic authentication in destination configuration.

5. Save the destination.
6. Check if the connection is OK.

Note

Ignore 404 (Not Found) error, if any. However, you will still need to check other errors such as 401 (Unauthorized).

Create a web server for MII and manage destinations

For details, see Manage Web Servers.

Import transactions into service registry

For details, see Import MII Transactions.

3.4 Troubleshooting - Configure Production Connectivity App

This section provides description of typical problems that you may encounter while configuring the Cloud Connector and the Production Connector, and establishing connectivity between SAP Digital Manufacturing and the Production Connector.

3.4.1 Connectivity Issues

You might face the following issues while establishing connectivity between SAP Digital Manufacturing and the Production Connector through the Cloud Connector.

Connection cannot be established; please contact your system administrator

Follow these steps to verify the configurations on Cloud Connector and on the Production Connector to debug the connectivity issue between SAP Digital Manufacturing and the Production Connector.

1. Go to Cloud Connector and open your subaccount. Verify if the status shows **Connected** and **Location ID** value is the same as configured in the SAP Digital Manufacturing Cloud Connector object in the *Configure Production Connectivity* app. (Note: .)

   > **Note**
   >
   > If multiple Cloud Connectors are connected, you must configure different Location IDs.

2. Choose *Cloud to On-Premise* to verify the mapping in Mapping Virtual to Internal System. Verify the Virtual Host and Virtual Port values shown here are same as configured in the SAP Digital Manufacturing Cloud Connector object.
3. Go to *Principal Propagation* tab and check if the IDP configurations have been synchronized. In case there is an update of the SAML IDP configuration for a subaccount on cloud side, then you must trigger synchronize action again by refreshing the trust configuration (using the *Refresh* option).
4. In the Cloud Connector, choose *Configuration* and go to the *On Premise* tab. Verify that the *System* and *CA Certificates* are added and are valid. Now go to the Production Connector server.
   1. For a signed certificate, verify if the CA certificate chain (all certificates in the certificate path, including the root certificate and, if any, all intermediate certificates) have been placed in the Issuer Store location in the file system of the server, where the Production Connector is installed. Ensure that the certificate is valid:
      `C:\ProgramData\SAP\ProdCon\CertificateStores\CloudServicesHost\Issuer\certs`
   2. For a self-signed certificate, verify if the public key of the certificate has been placed in the Trusted Store location in the file system of the Production Connector:
      `C:\ProgramData\SAP\ProdCon\CertificateStores\CloudServicesHost\Trusted\certs`
   3. In the Cloud Connector, check if Principal Propagation is set to name (this is the default setting).
5. Restart the main service of the Production Connector to apply any configuration change.

6. For the Production Connector, go to *Control Center* > *Cloud Integration* > *Port Settings* and verify that the server status is *Running*.
7. In the *Certificate* field of the Production Connector, check if the server certificate that you have created for the cloud server is selected and is valid (has not expired):

   To check this, go to the *Control Center of the Production Connector* > *Cloud Integration* > *Server Security Settings* > .

3.4.2 Internal Server Error

An internal server error occurred in the Production Connector. Please contact the system administrator.

Please check the Production Connector `MainService` log. The log files (`ProdConMainServerLog_yyyy.MM.dd.csv`) can be found under:

```
C:\Program Files(x86)\SAP\ProductionConnector\Logs
```

See the error logs for the time duration.

3.4.3 User Authorization Issues

If you receive an error message about an authorization error when connecting to the Production Connector, check the following settings:

- Make sure that the user is assigned to a user group and that this user group has the required authorization roles for the pertaining Production Connector installation. You can check the user group assignment in the *Configure Production Connectivity* app in SAP Digital Manufacturing.
  As an alternative to assigning users to groups, you can add all users who require access to the Production Connector cloud services through SAP Digital Manufacturing. You can do this in the Control Center of the Production Connector under *Cloud Integration* > *User Configuration*.
  The user ID in the Production Connector must match the *Subject Name Identifier* attribute selected in the **Identity Authentication Service** of the user. For example, if the attribute value is *E-Mail*, you need to provide the email ID of the SAP Digital Manufacturing user in the *User ID* field of the Production Connector.
- Check whether the parameters for validation of **JSON Web Tokens (JWT)** are correctly configured. You can find the corresponding settings in the Control Center of the Production Connector under *Cloud Integration* > *JWT Validation*.

4 Resource Orchestration Integration

Learn to connect ERP systems and applications to SAP Digital Manufacturing for resource orchestration to enable seamless data transfer and synchronization.

SAP Digital Manufacturing for resource orchestration is a cloud-based scheduling service that enables you to control operations and monitor events on the shop floor. Integrating other systems and applications with SAP Digital Manufacturing for resource orchestration can help manufacturers to:

- Streamline their production processes and improve overall efficiency
- Achieve end-to-end visibility into their production processes
- Make data-driven decisions and optimize resource usage

To learn about the features and its functionalities, see About Resource Orchestration.

To find the limitations or restrictions that apply to your scenario, see 3379404.

Related Information

Overview Characteristics-Based Sequencing [page 510]
Integration with SAP Manufacturing Execution [page 514]
Integration with SAP SuccessFactors Employee Central [page 531]
Data Engineering Configuration [page 547]

4.1 Overview Characteristics-Based Sequencing

Schedule operations based on characteristics in SAP Digital Manufacturing for resource orchestration for production orders from SAP S/4HANA system.

Scheduling operations based on characteristics sequencing is an effective way to optimize manufacturing processes. In this approach, the sequencing of operations in resource orchestration is determined by the characteristics of the product being manufactured. Characteristics represent distinct features or attributes of a material, such as color, size, shape, and so on. By assigning characteristics to a material, you can:

- Optimize the production process and reduce the time and effort required.
- Reduce the risk of errors, defects, or other quality control issues.
- Adjust the production process quickly and easily to accommodate changes.
- Improve resource allocation in the most efficient and effective way.

4.1.1 Integration with SAP S/4HANA

Characteristic-based sequencing is a feature that allows users to sequence production orders based on characteristic values.

You can extend your integration scenario involving SAP Digital Manufacturing for resource orchestration and SAP S/4HANA using the options provided in this chapter. However, characteristic-based sequencing feature is not supported for orders coming from SAP ERP.

To benefit from the options described here, you need to set up the integration between SAP Digital Manufacturing, which includes SAP Digital Manufacturing for resource orchestration, and SAP S/4HANA. More information, see Integration with SAP S/4HANA or SAP ERP [page 10].

To implement characteristics-based sequencing, you've to do the following:

1. Maintain Custom Data [page 511]
2. Modify Data Values for Production Orders [page 512]

4.1.1.1 Maintain Custom Data

Use the *Manage Custom Data* app to define custom data to be used as characteristic values in production orders.

Prerequisites

To schedule characteristics-based operations in SAP Digital Manufacturing for resource orchestration using the *Dispatching and Monitoring* app you must perform the prerequisites mentioned here:

- You've established integration with SAP S/4HANA system.
- You've created a configurable material for a semi-finished or a finished material that contains the characteristics and their values in SAP S/4HANA system and before sending it to SAP Digital Manufacturing:
  - You've created characteristics. Use the **REO_** prefix for each characteristic's name.

    > Example
    >
    > **REO_RED**

  - You've assigned **class type 300** as the material class.
  - You've assigned your characteristics to your classification. Use the **REO_** prefix for its name.
  - You've created a configurable material. Use the **REO_** prefix for its name. Otherwise, you can't schedule the order in the *Dispatching and Monitoring* app.

    > Example
    >
    > **REO_CONFIG_MAT_COLOR**

  - You've assigned your classification to the material.

- You've defined the configuration profile for the configurable material and linked it.

Context

Perform the steps to map and manage **REO_** specific data in the shop order category. This allows you to sort the materials associated with production orders (prefixed with **REO_**) easily in resource orchestration.

Procedure

1. Launch the SAP Digital Manufacturing application.
2. Go to the *Manage Custom Data* app.
3. Select the *Shop Order* custom field definition.
4. Choose *Add* to create a custom field that represents a characteristic of a configurable material.

> Example
>
> Identify the characteristics of the configurable material and define them as custom data:
>
> - *Data Field*: Represents characteristics of the material.
>
> > Example
>
> > **REO_COLOR**
>
> - *Field Label*: UI label displayed for the data field

4.1.1.2 Modify Data Values for Production Orders

Perform the transformation of the incoming `XSLT` message by adding custom data values.

Prerequisites

To schedule characteristics-based operations in SAP Digital Manufacturing for resource orchestration using the *Dispatching and Monitoring* app you must perform the prerequisites mentioned here:

- You've established integration with SAP S/4HANA system.
- You've created a configurable material for a semi-finished or a finished material that contains the characteristics and their values in SAP S/4HANA system and before sending it to SAP Digital Manufacturing:
  - You've created characteristics. Use the **REO_** prefix for each characteristic's name.

> **Example**
>
> **REO_RED**

- You've assigned **class type 300** as the material class.
- You've assigned your characteristics to your classification. Use the **REO_** prefix for its name.
- You've created a configurable material. Use the **REO_** prefix for its name. Otherwise, you can't schedule the order in the *Dispatching and Monitoring* app.

> **Example**
>
> **REO_CONFIG_MAT_COLOR**

- You've assigned your classification to the material.
- You've defined the configuration profile for the configurable material and linked it.

Context

Perform the steps to customize existing integration workflows in the *Manage Integration Workflows* app. To enable this function, you need to modify the `XSLT` of the workflow type `Production Order Download (LOIPRO05 V2)`.

> **Note**
>
> For more information on how to enable `LOIPRO05` version 2, see 3115603.

Procedure

1. In the *Manage Integration Workflows* app, enter **LOIPRO05** in the search field.
2. In the workflow `Production Order Download (LOIPRO05 V2)`, go to the *Standard XSLT field* and copy the whole section into the *Custom XSLT field*.
3. In the *Custom XSLT* field, make the required modifications:

   Search for the code snippet in the *Custom XSLT*.

   ```
   <CustomFieldList>
           <CustomField>
               <Attribute>ABC</Attribute>
                  <Value>value_1</Value>
            </CustomField>
            <CustomField>
               <Attribute>XYZ</Attribute>
                  <Value>value_2</Value>
            </CustomField>
   </CustomFieldList>
   ```

   Replace the code snippet with the code here.

   ```
   <CustomFieldList>
   ```

```
    <xsl:for-each select="E1VCCHR">
        <CustomField>
            <Attribute>
                <xsl:value-of select="ATNAM"/>
            </Attribute>
            <Value>
                <xsl:value-of select="ATWRT"/>
            </Value>
        </CustomField>
    </xsl:for-each>
</CustomFieldList>
```

> **Note**
>
> If you're already working with your own custom XSLT and need to find the exact positon where an XSLT snippet needs to be inserted to activate a new functionality, you can refer to the position of that XSLT snippet in the *Standard XSLT*.

The E1VCCHR message segment in the LOIPRO05 V2 IDoc document contains information such as the characteristic values, dependencies, and restrictions for a configurable material. Check for data that starts with `REO_` and its attribute. This helps you validate if all characteristics specific to SAP Digital Manufacturing for resource orchestration that were defined earlier, while creating the production order, are displayed.

4. To verify the data do as follows:
   1. Launch the SAP Digital Manufacturing application.
   2. Navigate to the *Integration Message Dashboard* > *Payload* > *Request Payload* to check if the characteristics are downloaded into custom data of the order.

      > **→ Tip**
      >
      > Check the attributes of `<CustomFieldList>`.

   3. Go to the *Manage Orders* app.
   4. Search for the relevant production order that's transferred from SAP S/4HANA system.
   5. Choose the production order and select the *Custom Data* tab.
      Check for data that starts with **`REO_`** and its attribute. This helps you validate if all **`REO`** specific characteristics defined earlier, while creating the production order, are displayed.
      For more information, see Maintain Custom Data [page 511].
5. Go to the *Dispatching and Monitoring* app to sort and schedule operations based on sequencing of characteristics.

   Use the multi-sorting and filtering options in the worklist table to schedule characteristics-based dispatching operations. For more information, see Worklist Area.

4.2 Integration with SAP Manufacturing Execution

In addition to using Resource Orchestration with SAP Digital Manufacturing for execution, you can also integrate it with SAP Manufacturing Execution.

This integration lets production supervisors create schedules using Resource Orchestration in SAP Digital Manufacturing for execution and then transfer the scheduling data to SAP Manufacturing Execution

The integration of SAP Manufacturing Execution with Resource Orchestration supports the following business scenarios:

- Scheduling of orders that you create in the SAP Manufacturing Execution system using Resource Orchestration where the supervisor dispatches operations to resources. The scheduled dates and resources from Resource Orchestration are then transferred to the SAP Manufacturing Execution system.
- Orders that you release in Resource Orchestration trigger the creation of an SFC in the SAP Manufacturing Execution system. All further execution is carried out in the SAP Manufacturing Execution system.

Related Information

Minimum Version Requirements and Supported Scenarios [page 515]

4.2.1 Minimum Version Requirements and Supported Scenarios

Here are the minimum release requirements, supported scenarios, and limitations for integrating SAP Digital Manufacturing with SAP Manufacturing Execution.

Minimum Release Requirements

You can integrate Resource Orchestration in SAP Digital Manufacturing with SAP Manufacturing Execution 15.1SP05 or higher.

> → Recommendation
>
> To use the latest features and developments, integrate with the highest available patch level of SAP Manufacturing Execution.

Supported Scenarios

- Scheduling shop orders in Resource Orchestration and SAP Digital Manufacturing through the Operator POD in SAP Manufacturing Execution
  - Shop orders created in SAP ERP and replicated to SAP Manufacturing Execution
  - Shop orders created in a standalone SAP Manufacturing Execution system
  - Re-scheduling shop orders in Resource Orchestration
- Automatically replicating shop orders and schedules generated in SAP Manufacturing Execution to Resource Orchestration

- Enhancing the *SO Step Report* in SAP Manufacturing Execution to display schedules that include scheduled dates and resource information
- Releasing orders from Resource Orchestration to SAP Manufacturing Execution

Manual and automatic scheduling modes are supported for all scenarios.

4.2.2 Integrating SAP Manufacturing Execution On-Premise to Resource Orchestration (Inbound)

You can connect SAP Manufacturing Execution On-Premise to Resource Orchestration.

Context

After you get the email from SAP confirming that provisioning is complete, create a ticket to request data needed for data replication. After receiving the data, define plants in your system and install and configure SDI (see Setting Up the Connection to SAP Digital Manufacturing [page 516]). After you have configured SDI, create a second ticket with SAP to request data replication.

Note that steps for configuring SDI often change and vary depending on the database source, such as Oracle or SAP S/4HANA. For more information, see Set Up Data Provisioning Monitoring and HANA Smart Data Integration.

For the initial setup, create a remote source using `SDI_USER`.

4.2.2.1 Setting Up the Connection to SAP Digital Manufacturing

You can set up the connection to SAP Digital Manufacturing using SAP HANA Smart Data Integration (SDI).

> **Note**
>
> SDI works for SAP Digital Manufacturing hosted on AWS and MS Azure. However, for SAP Digital Manufacturing hosted on MS Azure, we recommend you use Data Engineering for SAP Digital Manufacturing. **To set up the connection using Data Engineering** see the Setup Guide.

SAP HANA Smart Data Integration (SDI) replicates business data from on-premise systems to the HANA database in SAP Digital Manufacturing. SDI uses the HANA DP Agent 2.0 for this purpose. It's a client component that is available with your cloud license and has to be installed on the on-premise network to set up the connection.

1. Install and configure SDI (HANA DP Agent 2.0). For more information, see Install the Data Provisioning Agent.
2. Depending on the source database, configure the appropriate adapter. Based on the adapter you choose, provide permissions to data source tables.

> **Note**
>
> One data provisioning agent can connect to multiple source systems that use different databases.
>
> The agent offers various adapters. You must choose the correct adapter that corresponds to the database of your data source system. For example, if you use an SAP HANA database with SAP Manufacturing Execution, you must use an SAP HANA adapter. For more information, see the user assistance for SAP HANA Smart Data Integration and SAP HANA Smart Data Quality on the SAP Help Portal.

3. When you've configured the data provisioning agent, Create a Customer Incident [page 517]. The SAP DevOps team reaches out to you to initiate data replication.
4. Any data table changes at the source system are tracked automatically by the data provisioning agent. Once the data provisioning agent gets the table changes, it sends these changes to the SAP HANA database.

> **Note**
>
> - The data provisioning agent uses different mechanisms depending on the source database. For example: SAP HANA database uses triggers. Microsoft SQL uses logs.

5. Enter the system details, such as the logical system ID, of the on-premise system that you intend to use as the data source in the *Manage Business Settings* app. For more information, see Manage Business Settings.

Result: After these steps in the workflow are completed, the data tables are available in SAP Digital Manufacturing and are continuously updated.

Related Information:

- Downloading and Configuring the HANA DP Agent 2.0
- Configure the Data Provisioning Agent
- SAP HANA Smart Data Integration Data Provisioning Agent Sizing Guide

4.2.2.1.1 Create a Customer Incident

Once you configure the DP Agent, the process of data replication can be initiated. To start this process, create an incident.

You must create an incident on the Support Portal.

> **Note**
>
> S-User account is required.

The required support component details are as follows:

- **Onboarding and Operations Issue**: MFG-DM-OPS
- **Short Text**: DMC Data Replication: Request for technical information `<CUSTOMER_NAME>`
- **Priority**: Medium

- **Detailed Text**:
  - DB type (HANA, Oracle, MSSQL and so on)
  - Host
  - Port Number
  - Database Name
  - Schema
  - Period for Data Replication (For example - 3 months, 6 months and so on)
  - System ID for each system (or Netweaver ID if SID does not exist)
  - Client (Client needed if it is ERP)

Please share a username and password in secure storage. This user must have *SELECT*, *TRIGGER* and *CREATE ANY* permissions, with the *GRANT* option, on the source system *SCHEMA*.

> **Note**
>
> After installation and configuration of the agent, update `dpagentconfig.ini` in the root folder as follows, and then restart the agent:
>
> - `parameter framework.async.fetchSize`: set to 50
> - `parameter framework.maxDataSize`: set to 5MB
> - `parameter framework.fetchSize`: set to 1000

4.2.2.1.2 Data Replication

SAP replicates a fixed set of data tables from the source systems based on certain start data.

After replication, the data tables are available in the SAP HANA database, that is used by SAP Digital Manufacturing.

Any data table changes at the source system is being tracked automatically by the DP agent. Once the DP agent gets the changes, it sends the delta to the SAP HANA database.

> **Note**
>
> The DP agent has different mechanisms based on the source database. For example: HANA database uses triggers. Microsoft SQL uses logs.

For DM Data Engineering, any data table changes at the source system is being tracked automatically by the Data Engineering agent. Once the Data Engineering agent gets the changes, it sends the delta to the SAP DMC database, based on the schedule maintained. For more information, refer the Manage Data Models topic in DMC Data Engineering.

Related Information

SAP ME Tables [page 519]

4.2.2.1.2.1 SAP ME Tables

SAP ME

Table Name	Short Description
WORK_INSTRUCTION_LOG	Work instruction log
WORK_CENTER	Work center
USR	User
SHOP_ORDER	Shop order
AR_SHOP_ORDER	Shop order archive
SFC_DATA	SFC data
SFC_BOM	SFC bill of material
SFC_ASSY	SFC assembly
SFC	SFC
AR_SFC	SFC archive
RMA_NUMBER	RMA number
RMA_DATA	RMA data
RESRCE	Resource
OPERATION	Operation
NC_DATA	Non conformance data
AR_NC_DATA	Non conformance data archive
NC_CODE	Nonconformance code
LABOR_CHARGE_CODE	Labor charge code
ITEM_GROUP_MEMBER	Item group member
ITEM_GROUP	Item group
ITEM	Item
INCIDENT_NUMBER	Incident number
ACTIVITY_LOG	Activity log
AR_ACTIVITY_LOG	Activity log archive

Table Name	Short Description
PARAMETRIC	Parametric
PARAMETRIC_MEASURE	Parametric measure
NC_GROUP	Nonconformance group
NC_GROUP_MEMBER	Nonconformance group member
ITEM_T	Item text
RESOURCE_SPEED_LOSS	Resource speed loss
PRODUCTION_LOG	Production log
RESOURCE_REASON_CODE	Resource reason code
RESOURCE_REASON_CODE_T	Resource reason code text
RESOURCE_SHIFT	Resource shift
RESOURCE_STATUS_LOG	Resource status log
SHOP_ORDER_STANDARD_RATE	Shop order standard rate
SITE	Site
TIME_ELEMENT	Time element
TIME_ELEMENT_T	Time element text
TIME_ELEMENT_TYPE	Time element type
TIME_ELEMENT_TYPE_T	Time element type text
USER_SHIFT	User Shift
USER_SHIFT_DEFINITION	User shift definition
USER_SHIFT_DEFINITION_BREAKS	User shift definition breaks
USER_SHIFT_T	User shift text
DATA_FIELDS	Data field
RESOURCE_TYPE	Resource type
AR_ NC_CUSTOM_DATA	Archived nonconformance custom data
NC_CUSTOM_DATA	Nonconformance custom data
NC_DATA_REF_DES	Nonconformance data reference description

Table Name	Short Description
SHOP_ORDER_SFC	Shop order SFC
STATUS_MEANING	Status meaning
WORK_CENTER_MEMBER	Work center member
ROUTER_OPERATION	Router operation
SFC_ROUTER	SFC router
SFC_STEP	SFC step
BOM_COMPONENT	BOM component
COMP_TIME_LOG	Component time log
COMP_TIME_REF_DES	Component time reference description
INVENTORY	Inventory
PROCESS_LOT	Process lot
PROCESS_LOT_MEMBER	Process lot member
RESOURCE_TIME_LOG	Resource time log
RESOURCE_TIME_MEMBER	Resource time member
ROUTER	Router
ROUTER_STEP	Router step
SFC_ROUTING	SFC routing
SHOP_ORDER_TYPE	Shop order type
DC_GROUP	Data collection group
DC_PARAMETER	Data collection parameter
SFC_IN_WORK	SFC InWork
SHOP_ORDER_SCHEDULE	Shop order schedule
RESOURCE_TYPE_RESOURCE	Resource type resource
BOM	BOM
INVENTORY_ASSY_DATA	Inventory assembly data
STATUS	Status

Table Name	Short Description
NC_CODE_T	Nonconformance code text
WORK_CENTER_T	Work center text

4.2.3 Integrating Resource Orchestration to SAP Manufacturing Execution On-Premise (Outbound)

You can connect Resource Orchestration to SAP Manufacturing Execution On-Premise.

Context

Here you learn how you can connect Resource Orchestration to SAP Manufacturing Execution On-Premise.

Procedure

1. Install and configure Cloud Connector.

   For information on installing and configuring the Cloud Connector, see Setting Up the Cloud Connector [page 23].
2. Configure SAP Cloud Integration to connect with SAP Digital Manufacturing for execution.
   1. Go to *Operations View* > *Manage Security* > .
   2. Add *User Credentials* with the *Name*: `CF_AUTH`, the *User*: `<the clientid of uaa>`, and the *Password*: `<the clientsecret of uaa>`.

      > **Note**
      >
      > To get the `clientid` and `clientsecret`, go to *SAP BTP Cockpit (of SAP Digital Manufacturing for execution)* > *Services* > *Service Instance* > *Service Key* , the `clientid` and `clientsecret` are under the `uaa` tag.
   3. Add *User Credentials* with the *Name*: `PD_DEPLOYER_USER` and the *User*: `<the SAP Cloud Integration user>`, *Password*: `<the password of SAP Cloud Integration user>`.
   4. To search for the **Digital Manufacturing Execution Integration** package in the content hub, go to > *Discover* .
   5. Choose the **Digital Manufacturing Execution Integration** package (Integration iflow package of SAP Digital Manufacturing for execution).
   6. Choose *Copy* to copy the **Digital Manufacturing Execution Integration** package to the customer tenant.

7. To set the following parameters in *Initial Parameters* go to ▶ > *Design* > *Digital Manufacturing Execution Integration package* > *Artifacts* > *Initial Parameters* > *Action* > *Configure* ⌛.

Parameter Name	Description	Value
`PID`		`DME_GENERIC_PROCESSING_00`
`TENANT_CREDENTIALS`	The user credential created in SAP Cloud Integration Security Material.	`PD_DEPLOYER_USER`
`TENANT_URL`	SAP Cloud Integration Tenant Management URL used for access from the Eclipse plugin. Used during content deployment (iflow).	Refer to the email the customer received after confirming successful SAP Cloud Integration tenant provisioning. Add the Management URL (accessed from the Eclipse plugin) included in the CPI successful provisioning email. **Example** https://xxxx-tmn.avt.eu1.hana.ondemand.com
`COMMON_DMC_REO_M_E_OP_SECURITY_MATERIAL_LIST`	The list to map the plant and technical user credential for integration. Format: `<plant1>=<user credential1>;<plant2>=<user credential2>`	**Example** `SAP=ME_CREDENTIAL1;1000=ME_CREDENTIAL2`

Parameter Name	Description	Value
COMMON_DMC_REO_M_E_OP_URL_LIST	The list to map the plant and the URL of wsdl. Format: <plant1>=<url1 of wsdl with virtual host and port>;<plant2>=<url2 of wsdl with virtual host and port>	**Example** SAP=http://vhreo:50000/manufacturing-papiservices/ShopOrderServiceWSService;1000=http://vhreo2:51038/manufacturing-papiservices/ShopOrderServiceWSService **Note** Use http for the virtual address. To retrieve the WSDL URL from SAP ME system, go to *SAP NetWeaver Administrator* > *Configuration* > *Connectivity* > *Single Service Administration*. Search for ShopOrderServiceWS. Choose WSDLs tag to get the URL of WSDL. Use the virtual host and port number from Cloud Connector.

8. Save and deploy *Initial Parameters*.
9. If multiple Cloud Connectors are configured for the same SAP Cloud Integration tenant, then you should configure the location ID from the Cloud Connector for the following artifacts:
   - REO Update ShopOrder Schedule process request
   - REO Release ShopOrder Schedule process request
10. Choose *Actions* > *Update* for the selected artifact and enter the following fields:
    - Type
    - ENDPOINT_ID
    - LOCATION_ID
11. After you have entered the fields, save and deploy these artifacts.
12. Deploy the rest of the artifacts.
    - General Message Processor
    - REO - Release ShopOrder Schedule - Service
    - REO - Update ShopOrder Schedule - Service
    - REO - Update ShopOrder Schedule Splitter
13. Go to > *Overview* > *Manage Integration Content* to verify that all the artifacts are started.

3. Configure SAP Business Technology Platform of SAP Digital Manufacturing for execution.

1. To create destinations for integration, under the corresponding tenant go to *SAP BTP Cockpit SAP Digital Manufacturing for execution* > *Connectivity* > *Destinations*.
2. Create the destination `CPI_DESTINATION_IFLMAP`.
3. Under *Type of Destination*, for `CPI_DESTINATION_IFLMAP` select *HTTP*.
4. Enter the `CPI Runtime URL` in URL.
5. Select *Internet* as *Proxy Type*.
6. Select `BasicAuthentication` as *Authentication*.
7. Enter the *User* and *Password*.
8. Create the destination `CPI_DESTINATION_TMN` for the front-end process.
9. Under *Type of Destination* for `CPI_DESTINATION_TMN`, select *HTTP*.
10. Under URL, enter the URL for `CPI Management URL`.
11. Under *Proxy Type*, select *Internet*.
12. Under *Authentication*, select `BasicAuthentication`.
13. Enter the *User* and *Password*.
14. The destination data is used by SAP Digital Manufacturing for execution to find the specific SAP Cloud Integration for integration.

4. Configure SAP Digital Manufacturing for execution
   1. In the SAP Digital Manufacturing Fiori Launchpad, choose *Execution* .
   2. Choose *Manage Plants*.
   3. Add or maintain the SAP S/4HANA plant that needs to be supported with SAP Digital Manufacturing for execution in the *Main* section of the *Manage Plants* app.

Properties	Description	Value
Plant Name	The plant name of SAP Digital Manufacturing for execution.	Example `1000`
Description	The description of the plant of SAP Digital Manufacturing for execution.	Example `1000 Plant`
Time Zone	The time zone of SAP Digital Manufacturing for execution.	Example *Europe/Berlin*

Properties	Description	Value
Local	If set to *Yes*, this plant will be used for integration between SAP Digital Manufacturing for execution and SAP S/4HANA. If set to *No*, this plant will be used for integration between Resource Orchestration in SAP Digital Manufacturing for execution and SAP Manufacturing Execution. Order creation and release are not allowed in SAP Digital Manufacturing for execution.	Example *No*

4. Maintain the SAP S/4HANA plant that needs to be integrated with SAP Digital Manufacturing for execution in the *Integration* category of the *Manage Business Settings* app.

Properties	Description	Value
Integration Mode	The integration mode type that is supported. *S/4HANA*: Indicates that this plant is integrated with SAP S/4HANA. *S/4HANA Cloud*: Indicates that this plant is integrated with SAP S/4HANA Cloud.	Example S/4HANA
Execution Time Zone	The time zone in SAP Digital Manufacturing for execution	Example America/New York
ERP Time Zone	The time zone of SAP S/4HANA	Example Europe/Berlin
Language	The language used in SAP Digital Manufacturing for execution	Example English-E

Properties	Description	Value
ERP Destination	If *S/4HANA* is set for *Integration Mode*, this field is visible. Enter the destination name that is configured in SAP Cloud Integration. *Connectivity* > *Destination*	Example ECCCLNT500

4.2.4 Configuring Master Data for Resource Orchestration in SAP ME System

This section explains the steps to configure master data relevant to Resource Orchestration in SAP Manufacturing Execution (SAP ME) system.

1. Logon to the SAP ME system.
2. In the upper-right corner of the *Activity Manager* screen, choose the site (plant) link to change to a different site. The *Site Selection* screen opens. Sites that you are assigned to are displayed.
3. Choose the relevant site/plant.
4. **Maintain Resource Types**
   1. Choose *Resource Type Maintenance* under *Maintenance* > *Product Configuration*.
   2. Enter a resource type or choose an existing resource type from the list. Enter a brief description (optional).
   3. Choose *Save*. The resource type is created.

   > **Note**
   >
   > You can also assign a resource type to a resource. Choose a resource from the list of *Available Resources* and move the resource to the *Assigned Resources* list.

   For more information on maintaining resource types in SAP ME, see Resource Type Maintenance.
5. **Maintain Resources**
   1. Choose *Resource Maintenance* under *Maintenance* > *Product Configuration*.
   2. Enter a name for the resource or choose a resource from the list.
   3. Choose the status as *Enabled*. This indicates that the resource is available.
   4. Go to the *Resource Type* tab to associate a resource with a resource type. Choose the resource type created in step 4 from the *Available Resources Types* list and move it to the *Assigned Resource Types* list.

      > **Note**
      >
      > You can associate resources with resource types in either *Resource Maintenance* or in *Resource Type Maintenance*.

   5. Choose *Save*. The resource is created and associated with the resource type.

   For more information on maintaining resource in SAP ME, see Resource Maintenance .

6. **Maintain Material Groups**
   In this step, you assign materials of the same characteristics to a material group.
   1. Choose *Material Group Maintenance* under *Maintenance* > *Product Configuration*.
   2. Enter a material group or choose a material group from the list. Enter a brief description (optional).
   3. Choose *Save*. The material group is created.

   For more information on maintaining material groups in SAP ME, see Material Group Maintenance.
7. **Maintain Materials**
   In this step, you assign the material to a material group.
   1. Choose *Material Maintenance* under *Maintenance* > *Product Configuration*.
   2. Enter a material or choose a material from the list.
   3. Enter the version.
      Select *Current Version* checkbox so that the version you have added is the considered as the current version.
   4. To assign the material group to the material, go to the *Material Group* tab. Choose the material group created in step 6 from the *Available Material Groups* list and move it to the *Assigned Material Groups* list.
   5. Choose *Save*. The material is created and is assigned to a material group.

   For more information on maintaining material in SAP ME, see Material Maintenance.
8. **Maintain Custom Data**
   In this step, you create fields that appear *Custom Data* tab (in *Work Center Maintenance*) to provide additional information when defining master data.
   1. Choose *Custom Data Maintenance* under *Maintenance* > *Product Configuration*.
   2. Choose the category as *Work Center*.
   3. Choose *Insert New* to create a new record. This record displays the sequence, data field and field label. The sequence displays the order of the custom data.
   4. Enter **`REO_MATERIAL_GROUP`** for both *Data Field* and *Field Labels* fields.
   5. Choose *Save*. The custom data has been created.

   For more information on maintaining custom data in SAP ME, see Custom Data Maintenance.
9. **Maintain Work Center Records**
   In this step, you create and change work center records by assigning either resources or work centers to them. A specific resource can belong to only one work center.
   1. Choose *Work Center Maintenance* under *Maintenance* > *Product Configuration*.
   2. Enter a name for the work center or choose a work center from list.
   3. Enter or choose the Standard Value Key. This field is the standard value key associated with a work center.
   4. Select the *SFC Can Be Released to This Work Center* checkbox to release SFCs to this work center.
   5. Choose *Insert New* to insert a new work center or resource record. The sequence displays the order of the work center or resources in the work center.
   6. Choose the type as resource in the *Work Center or Resource* field.
   7. Choose the resource created in step 5.
   8. Go to the Custom Data tab.
   9. In the *REO_MATERIAL_GROUP* data field, add the material group that you have created in step 6.
   10. Save the record.

   For more information on maintaining work center records in SAP ME, see Work Center Maintenance.
10. *Define operations*
    In this step, you define operation and its attributes.

1. Choose *Operation Maintenance* under *Maintenance* > *Product Configuration*.
2. Enter a name for an operation name or choose an operation from the list.
3. Choose the resource type that you have created in step 4.
4. Enter the *ERP Control Key* as **PP01**.
5. Choose the work center that you have created in step 9. Choose the same work center for the ERP work center as well.
6. Choose *Save*. The operation is created for resource type and work centers.

You can create multiple operations for different resource types and work centers.
For more information on maintaining operations in SAP ME, see Operation Maintenance.

11. **Maintaining Orders**
In this step, you define shop orders of different types.
    1. Choose *Shop Order Maintenance* under *Maintenance* > *Production* > *Product*.
    2. Enter a shop order number or choose an existing shop order number.
    3. In the *Planned Material* field, enter the material created in step 7.
    4. Enter or choose a planned routing and enter the version of the routing.
    5. Enter the *Planned Start* and *Planned Completion* dates for the order.
    6. In the Build Qty field, enter the build quantity of the material for this shop order.
    7. Enter the priority for this shop order, and each SFC released by this shop order. The larger the number, the higher the priority.
    8. Choose *Save*. The shop order is created.
    9. Choose the *Shop Order Schedule Report* to view the schedule report with the operation details.

    For more information on maintaining shop orders in SAP ME, see Shop Order Maintenance.

4.2.5 Maintain Custom Data

Use the *Manage Custom Data* app to define custom data to be used as characteristic values in production orders.

Prerequisites

To schedule characteristics-based operations in SAP Digital Manufacturing for resource orchestration using the *Dispatching and Monitoring* app you must perform the prerequisites mentioned here:

- You've established integration with SAP S/4HANA system.
- You've created a configurable material for a semi-finished or a finished material that contains the characteristics and their values in SAP S/4HANA system and before sending it to SAP Digital Manufacturing:
    - You've created characteristics. Use the **REO_** prefix for each characteristic's name.

      > Example
      >
      > **REO_RED**

    - You've assigned **class type 300** as the material class.

- You've assigned your characteristics to your classification. Use the **REO_** prefix for its name.
- You've created a configurable material. Use the **REO_** prefix for its name. Otherwise, you can't schedule the order in the *Dispatching and Monitoring* app.

  > Example
  >
  > **REO_CONFIG_MAT_COLOR**

- You've assigned your classification to the material.
- You've defined the configuration profile for the configurable material and linked it.

Context

Perform the steps to map and manage **REO_** specific data in the shop order category. This allows you to sort the materials associated with production orders (prefixed with **REO_**) easily in resource orchestration.

Procedure

1. Launch the SAP Digital Manufacturing application.
2. Go to the *Manage Custom Data* app.
3. Select the *Shop Order* custom field definition.
4. Choose *Add* to create a custom field that represents a characteristic of a configurable material.

   > Example
   >
   > Identify the characteristics of the configurable material and define them as custom data:
   >
   > - *Data Field*: Represents characteristics of the material.
   >
   > > Example
   > >
   > > **REO_COLOR**
   >
   > - *Field Label*: UI label displayed for the data field

4.3 Integration with SAP SuccessFactors Employee Central

Optimize workforce management and resource allocation by integrating SAP SuccessFactors Employee Central with SAP Digital Manufacturing for resource orchestration.

Introduction

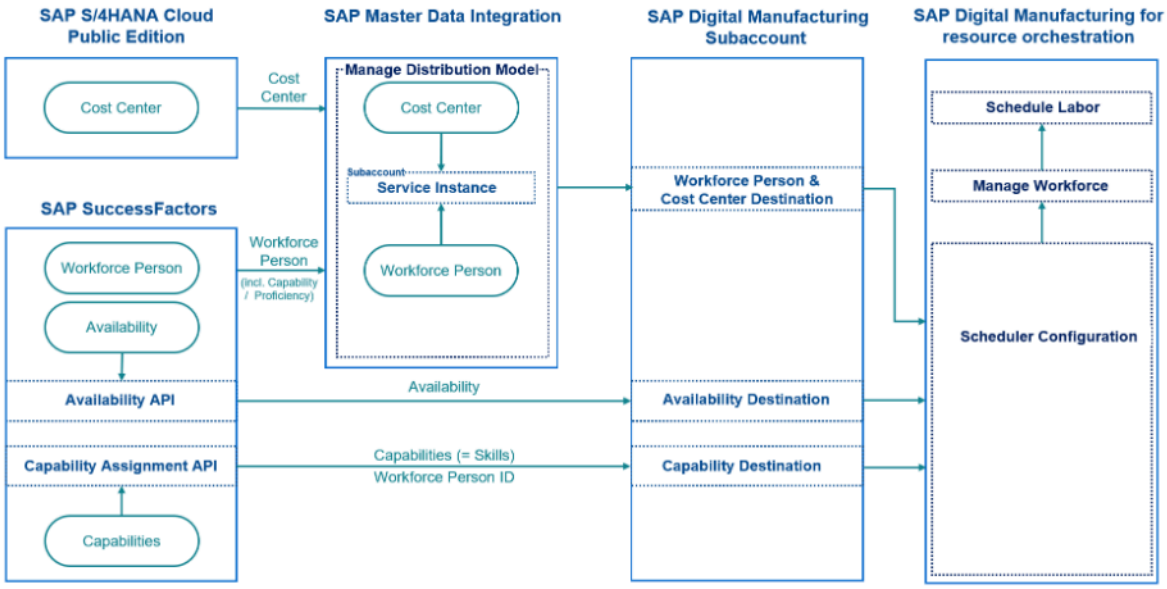
SAP SuccessFactors Employee Central and SAP Digital Manufacturing for resource orchestration can optimize workforce management and resource allocation by providing users with information about employees, their availability, capabilities (= skill templates and employees' skills), and cost center. You use this information to make better decisions about production scheduling, resource allocation, and other aspects of manufacturing operations.

For example, users can use workforce availability data to ensure they have the right number of employees working during the actual working time. This information can be used to optimize capacity utilization and improve overall productivity.

Master data processed by SAP Digital Manufacturing for resource orchestration include:

- **Workforce Person**: This data comprises of information about individual employees, including their personal details, employment details, and other relevant attributes.
- **Workforce Availability**: This data includes information about when employees are available to work, such as their shift schedule and vacation days.
- **Workforce Capability**: This data includes information about your employees' skills.
- **Cost Center**: This data links employees to their respective cost centers, enabling accurate cost allocation and budgeting. The cost center data is fetched from SAP S/4HANA Cloud Public Edition.

Integration Overview



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The integration process involves connecting SAP S/4HANA Cloud Public Edition and SAP SuccessFactors Employee Central to SAP Master Data Integration, which acts as a hub for the replication of cost center and workforce person master data. In SAP Master Data Integration, distribution models control the distribution of cost center and workforce person master data, which can be consumed by SAP Digital Manufacturing through a service instance and a destination. Availability master data is retrieved directly from SAP SuccessFactors Employee Central through the Availability API. Capability master data is also retrieved directly from SAP SuccessFactors Employee Central through the Workforce Capability Assignment API.

In SAP Digital Manufacturing for resource orchestration, the *Scheduler Configuration* app connects to the workforce person / cost center destination as well as to the availability destination and the capability destination to retrieve the master data. This data is then used in the *Manage Workforce*, *Manage Skills Template*, *Manage Skill Matrix*, and *Schedule Labor* apps to perform shift planning utilizing skills data on the shop floor.

Related Information

Before You Start [page 533]
Create a Master Data Integration Instance [page 534]
Create Distribution Models for Cost Center and Workforce Person [page 536]
Create a Destination for Cost Center and Workforce Person [page 538]
Create a Destination for Availability [page 539]
Create a Destination for Workforce Capability (Skills) [page 541]
Configure SAP Digital Manufacturing for resource orchestration to Retrieve Data [page 545]
Configure SAP Digital Manufacturing for resource orchestration to Use Master Data [page 547]

4.3.1 Before You Start

This page shows you the prerequisite steps that you must complete before implementing the integration of SAP Digital Manufacturing for resource orchestration and SAP SuccessFactors Employee Central.

Before you start, you must have performed the following steps:

- You've connected SAP S/4HANA Cloud Public Edition to SAP Master Data Integration and enabled the cost center integration. For more information, see Cost Center Replication: Setup Instructions and Integrating SAP S/4HANA Cloud with SAP Master Data Integration.
- You've connected SAP Master Data Integration to SAP SuccessFactors Employee Central and enabled the cost center integration. For more information, see Integrating Cost Center from SAP Master Data Integration to Employee Central.
- You've connected SAP SuccessFactors Employee Central to SAP Master Data Integration and enabled the integration of workforce person. For more information, see Integrating SAP SuccessFactors Employee Central with SAP Master Data Integration.
- You've enabled the workforce availability solution in SAP SuccessFactors Employee Central and have got access to the *Workforce Availability* API provided by SAP SuccessFactors Employee Central. For more information, see Enabling Workforce Availability and Workforce Availability API.

  > **Note**
  >
  > In this integration scenario, the *Workforce Availability* API is consumed directly. There's no integration workflow between SAP Digital Manufacturing for resource orchestration and SAP SuccessFactors Employee Central.

- You've got access to the *Workforce Capability Assignment* (`/v1/WorkforceCapabilityAssignment`) API provided by SAP SuccessFactors and have set up the OAuth 2.0 authentication for API use in SAP SuccessFactors. For more information, see Authentication Using OAuth 2.0.

4.3.2 Create a Master Data Integration Instance

Create a SAP Master Data Integration service instance in your SAP Master Data Integration subaccount to transfer cost center and workforce person master data to SAP Digital Manufacturing.

Prerequisites

You've got the `Administrator` role for your SAP Master Data Integration subaccount.

Context

Once you've integrated SAP SuccessFactors Employee Central and SAP S/4HANA Cloud Public Edition with SAP Master Data Integration, your cost center and workforce person master data is available in SAP Master Data Integration. To transfer the master data from SAP Master Data Integration to SAP Digital Manufacturing, you need to create an SAP Master Data Integration service instance and a service key in your SAP Master Data Integration subaccount. Then you assign a business system ID to this service instance. The business system ID links the service instance to the business objects that you create in a later step to control the distribution of workforce person and cost center data.

Procedure

1. In the SAP BTP cockpit, go to your SAP Master Data Integration subaccount.
2. Under *Service Marketplace*, search for *Master Data Integration*.
3. Choose the *Master Data Integration* tile.

   The *Master Data Integration* view opens.
4. Choose *Create* to create an instance of *Master Data Integration*.
5. Enter the following fields to create a service instance:

Field	
Service	*Master Data Integration*
Plan	*sap-integration*
Runtime Environment	*Cloud Foundry*
Space	**`Name of your space`**
Instance Name	Choose an instance name, for example `DM-SF-Integration`.

6. Choose *Next* and add the following parameters:

JSON	Description
`"businessSystemId": "",`	Choose a unique identifier for your business system, for example "businessSystemId": "DM". **Note** The business system ID is the link between the business object you create later and this instance. The business system ID ensures that cost center and workforce person data are available through the service instance.
`"enableTenantDeletion": false,`	
`"application": "sfsf"`	`sfsf` represents SAP SuccessFactors Employee Central

7. Choose *Create*.
8. Under *Instances*, choose the instance that you've created.
9. On the *Service Key* tab, choose Create.

   The *New Service Keys* popup opens.
10. Enter the following fields to create a service key supporting client ID / client secret:

Field	Value
Service Key Name	**`Service Key`** **Note** You can choose a random name.

11. Choose *Create*.

    Note

    You can access the service key content by choosing ••• and then *View*.

Results

You've created a service instance and a service key.

4.3.3 Create Distribution Models for Cost Center and Workforce Person

Create two business objects to integrate cost center and workforce person master data with SAP Digital Manufacturing.

Prerequisites

- You've got the `Administrator` role for your SAP Master Data Integration subaccount.
- You've got the `DLAB_MDO_Admin` role collection for SAP Master Data Integration.
- You've created a service instance and a service key for the integration of master data in your SAP Master Data Integration subaccount. For more information, see Create a Master Data Integration Instance [page 534].

Context

To make the cost center and workforce person master data stored in SAP Master Data Integration available for SAP Digital Manufacturing, you need to create two business objects. The first one controls the distribution of cost center data, and the second one controls the distribution of workforce person data. The business system name you defined during the instance creation is used in the business objects, ensuring that the cost center and workforce person data is available through the service instance.

Procedure

1. In the SAP BTP cockpit, go to your SAP Master Data Integration subaccount.
2. Under *Service Marketplace*, search for *Master Data Integration (Orchestration)*.
3. Choose the *Master Data Integration* tile.

   The *Master Data Integration (Orchestration)* view opens.
4. Choose *Go to Application*.

   The Fiori Launchpad of SAP Master Data Integration opens.
5. Choose the *Manage Distribution Model* tile.

   The *Manage Distribution Model* app opens.
6. Choose *Create*.
7. Under *Header*, enter a name for your distribution model, for example **`SF-HR-CC`** for the cost center data, or **`SF-HR-WP`** for the workforce person data.
8. Under *Description*, choose *Create* to create a description for the distribution object.
9. Under *Provider*, choose *Create*.

10. Make the following settings:

Parameter	Value
Business System	The business system ID defined in the service instance. For example, **DM**.
Destination	*MDI*
Local Configuration Required	No

11. Under *Consumer*, choose *Create*.
12. Make the following settings:

Parameter	Value
Business System	Enter the business system ID defined in the instance, for example **DM**. For more information, see Create a Master Data Integration Instance [page 534].
Destination	Leave empty.
Local Configuration Required	Yes
Application Category	*SAP S/4HANA Cloud (S/4)*

13. Under *Parameters*, choose *Business Object Type*.
14. Make the following settings:

Parameter	Value
Business Object Type	`sap.odm.finance.costobject.CostCenter` OR `sap.odm.workforce.WorkforcePerson`
Business Object Type Version	3.0.0
API	`MDI_LOG_COST_CENTER`
Package Size	1
Mode	*Pull*
Recurrence Pattern	*Continuous Distribution*

15. **Optional:** Under *Object Selection*, filter for different attributes, such as your company code or your cost center ID.
16. Choose *Save*.
17. Choose *Activate*.
18. Create the second distribution model. All the parameters are the same except for the *Business Object Type*.

Results

You've created and activated two business objects for the distribution of cost center and workforce person master data.

4.3.4 Create a Destination for Cost Center and Workforce Person

To make the cost center and workforce person master data available in SAP Digital Manufacturing, you need to create a destination for cost center and workforce person data in your SAP Digital Manufacturing subaccount.

Prerequisites

- You've got the `Administrator` role for your SAP Digital Manufacturing subaccount.
- You've got the client ID and client secret of your SAP Master Data Integration instance as well as the token service URL. For more information, see Create a Master Data Integration Instance [page 534].

Context

To retrieve the cost center data and workforce person data available in SAP Master Data Integration, you need to create a destination in your SAP Digital Manufacturing subaccount. This destination needs to point to your SAP Master Data Integration instance through which cost center data and workforce person master data are replicated. To set up this destination, use the credentials found in the service key of your SAP Master Data Integration instance.

Procedure

1. In the SAP BTP cockpit, log on to your SAP Digital Manufacturing subaccount and choose *Connectivity* > *Destinations* in the side menu bar.
2. Choose *Create Destination* and enter the following fields to create a destination pointing to your SAP Master Data Integration instance. You can choose a random name for the destination.

Field	Value
Name	Destination name, for example **`SF_MDI_COSTCENTER_WORKFORCE_DESTINATION`**
Type	HTTP
URL	Enter the URL to be found under the `uaa` tag in the service key of the corresponding service instance. For example: `https://<Master Data Tenant>.cfapps.sap.hana.ondemand.com`
Proxy Type	Internet

Field	Value
Authentication	OAuth2ClientCredentials
Client ID	Enter the client ID to be found in the service key of the corresponding service instance.
Client Secret	Enter the client secret to be found in the service key of the corresponding service instance.
Token Service URL Type	Select *Dedicated*.
Token Service URL	Enter the `<URL of Service Key>`**/oauth/token**. For example: https://<Authentication Tenant>.sap.hana.ondemand.com**/oauth/token**

3. Under *Additional Properties*, create the following properties:

Property	Value
MDOConsumer	*true*
MDOONEmds	*true*
Use default JDK truststore	Checked

4. Choose *Save*.
5. Choose *Check Connection*.

   You can ignore the error "`404: Not Found`" that might be displayed.

Results

You've created a destination for the replication of cost center and workforce person master data.

4.3.5 Create a Destination for Availability

To transfer availability master data from SAP SuccessFactors Employee Central to SAP Digital Manufacturing for resource orchestration, you need to create a destination for availability master data in your SAP Digital Manufacturing subaccount.

Prerequisites

- You've got the `Administrator` role for your SAP Digital Manufacturing subaccount.
- You've got acces to the *Workforce Availability* API provided by SAP SuccessFactors Employee Central and have enabled the workforce availability solution in SAP SuccessFactors Employee Central. For more information, see Before You Start [page 533].

- You've registered your client in SAP SuccessFactors Employee Central. For more information, see Registering Your OAuth2 Client Application.

Context

To retrieve the SAP SuccessFactors Employee Central availability data, you need to create a destination in your SAP Digital Manufacturing subaccount. You use this destination to call the *Workforce Availability* API provided by SAP SuccessFactors Employee Central directly.

Procedure

1. In the SAP BTP cockpit, log on to your SAP Digital Manufacturing subaccount and choose *Connectivity* > *Destinations* in the side menu bar.
2. Choose *Create Destination* and enter the following fields to create a destination pointing to the *Workforce Availability* API provided by SAP SuccessFactors Employee Central. You can choose a random name for the destination.

Field	Value
Name	Destination name, for example **`SFSF_WORKFORCE_AVAILABILITY`**
Type	HTTP
URL	Enter the host of your SAP SuccessFactors Employee Central *Workforce Availability* API. For example: `https://<SAP SuccessFactors API URL>/odata/v2/restricted/_WorkforceAvailabilityService/WorkforceAvailability`
Proxy Type	Internet
Authentication	OAuth2SAMLBearerAssertion
Key Store Location	Leave empty
Key Store Password	Leave empty
Audience	www.successfactors.com
AuthnContextClassRef	urn:oasis:names:tc:SAML:2.0:ac:classes:PreviousSession
Use mTLS for token retrieval	Keep unselected
Client Key	Use the client key that is created when registering your client in your SAP SuccessFactors Employee Central. For more information, see Registering Your OAuth2 Client Application.

Field	Value
Token Service URL Type	Dedicated
Token Service URL	<BASEURL>/oauth/token
Token Service User	Leave empty
Token Service Password	Leave empty

3. Under *Additional Properties*, create the following properties:

Field	Value
apiKey	Use the client key that is created when registering your client in your SAP SuccessFactors Employee Central. For more information, see Registering Your OAuth2 Client Application.
companyId	Your company code
nameIdFormat	urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified
SystemUser	Your technical user name
Use default JDK truststore	Selected

4. Choose *Save*.
5. Choose *Check Connection*.

Results

You've created a destination connected to the *Workforce Availability* API provided by SAP SuccessFactors Employee Central.

4.3.6 Create a Destination for Workforce Capability (Skills)

To transfer workforce capability (skills) master data from SAP SuccessFactors Employee Central to SAP Digital Manufacturing for resource orchestration, you need to create a destination for workforce capability master data in your SAP Digital Manufacturing subaccount.

Prerequisites

- You've got the `Administrator` role for your SAP Digital Manufacturing subaccount.
- You've created capabilities / skills and proficiency rating scales in SAP SuccessFactors under the capability attribute type *Skill* and you've assigned these to a workforce person. For more information, see Creating Attributes in the Talent Intelligence Hub and Adding Attributes to the Growth Portfolio.

> → Remember
>
> Integration is only supported for the capability attribute type *Skill*. Other capability attribute types aren't replicated to SAP Digital Manufacturing.

- You've set up cost center and workforce person integration to make sure that your capability attributes and proficiency rating scales are replicated to SAP Digital Manufacturing. For more information, see:
  - Create Distribution Models for Cost Center and Workforce Person [page 536]
  - Create a Destination for Cost Center and Workforce Person [page 538]
- You've got access to the *Workforce Capability Assignment* (`/v1/WorkforceCapabilityAssignment`) API provided by SAP SuccessFactors and have enabled the workforce capability solution in SAP SuccessFactors. For more information, see Before You Start [page 533].
- You've registered your client and received the API key for your *Workforce Capability Assignment* API. For more information, see Creating API Keys [page 544].

Context

To retrieve the capabilities (= skills) that you've assigned to a workforce person in SAP SuccessFactors Employee Central, as well as the workforce person ID, you need to create a destination in your SAP Digital Manufacturing subaccount. Use this destination to call the *Workforce Capability Assignment* (`/v1/WorkforceCapabilityAssignment`) API provided by SAP SuccessFactors directly.

Procedure

1. In the SAP BTP cockpit, log on to your SAP Digital Manufacturing subaccount and choose *Connectivity* > *Destinations* in the side menu bar.
2. Choose *Create Destination* and enter the following fields to create a destination pointing to the *Workforce Capability Assignment* API. You can choose a random name for the destination.

Field	Value
Name	Destination name, for example **`SFSF_WORKFORCE_CAPABILITY`**
Type	HTTP
URL	Enter the endpoint of your *Workforce Capability Assignment* API. For example: `https://<hostname>/rest/ecosystem/wholeself/v1/WorkforceCapabilityAssignment`
Proxy Type	Internet
Authentication	OAuth2SAMLBearerAssertion

Field	Value
Key Store Location	Leave empty
Key Store Password	Leave empty
Audience	www.successfactors.com
AuthnContextClassRef	urn:oasis:names:tc:SAML:2.0:ac:classes:PreviousSession
Use mTLS for token retrieval	Keep unselected
Client Key	Use the client key that is created when registering your client in your SAP SuccessFactors Employee Central. For more information, see Creating API Keys [page 544].
Token Service URL Type	Dedicated
Token Service URL	<BASEURL>/oauth/token
Token Service User	Leave empty
Token Service Password	Leave empty

3. Under *Additional Properties*, create the following properties:

Field	Value
apiKey	Use the client key, also known as API key, that is created when registering your client in your SAP SuccessFactors Employee Central. For more information, see Creating API Keys [page 544].
companyId	Your company code
nameIdFormat	urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified
SystemUser	Your technical user name
Use default JDK truststore	Selected

4. Choose *Save*.
5. Choose *Check Connection*.

Results

You've created a destination connected to the *Workforce Capability Assignment* API provided by SAP SuccessFactors Employee Central.

4.3.6.1 Creating API Keys

Register your client application to enable OAuth2 authentication for API users.

Prerequisites

- You've the permission as an administrator to access the *Manage OAuth2 Client Applications* in SAP SuccessFactors Employee Central.
- You've downloaded the trust certificate from your SAP Digital Manufacturing subaccount: *Connectivity* > *Destinations* > *Download Trust*.
- You've set up OAuth 2.0 for authenticating API users in SAP SuccessFactors. For more information, see Authentication Using OAuth 2.0.

Context

Learn how to create an API key using the *Manage OAuth2 Client Applications* app in SAP SuccessFactors. Once you've registered your application, you'll receive a unique API key that allows SAP Digital Manufacturing to access the SAP SuccessFactors REST API.

For more information, see Registering Your OAuth2 Client Application.

Procedure

1. In SAP SuccessFactors Employee Central, go to *Manage OAuth2 Client Applications* and choose *Register Client Application* to get an exclusive API key.

Field	Description
Company	The name of your company. This value is prefilled based on the instance of the company currently logged in.
Application Name	(Required) Provide a unique name.
Application URL	(Required) A unique URL of the Workforce Capability Assignment API provided by SAP SuccessFactors Employee Central. Example `https://<hostname>.ondemand.com/rest/ecosystem/wholeself/v1/WorkforceCapabilityAssignment`.

Field	Description
X.509 Certificate	(Required) The certificate corresponding to the private and public key used in the OAuth 2.0 authentication process. Paste the content from the downloaded trust certificate in the *X.509 Certificate* field.

2. Choose *Register*.

Results

You've successfully registered your client application for OAuth2 authentication. An API key is generated and assigned to your application. You can view the API key by choosing *View* on the registered application list.

4.3.7 Configure SAP Digital Manufacturing for resource orchestration to Retrieve Data

To replicate workforce person, cost center, and availability master data to SAP Digital Manufacturing for resource orchestration, you need to configure the *Scheduler Configuration* app.

Prerequisites

You've created three destinations in your SAP Digital Manufacturing subaccount. One points to your SAP Master Data Integration instance and retrieves workforce person and cost center master data. The other two destinations point to the availability endpoint and the capability assignment endpoint. For more information, see:

- Create a Destination for Cost Center and Workforce Person [page 538]
- Create a Destination for Availability [page 539]
- Create a Destination for Workforce Capability (Skills) [page 541]

Context

To make workforce person, cost center, availability, and skill master data available in SAP Digital Manufacturing for resource orchestration, you need to make some configurations in the *Scheduler Configuration* app. First, connect the app to the destination that points to the SAP Master Data Integration service instance to access workforce person and cost center master data. Then, connect the app to the destinations that point to the *Workforce Availability* API and the *Workforce Capability Assignment API*. Lastly, define the version of data you want to use and how often you want the data to be retrieved.

Procedure

1. In the *Scheduler Configuration* app, choose *Edit*.
2. Make the following configurations:

Field	Description
Workforce Destination	The name of the corresponding destination, for example **`SF_MDI_COSTCENTER_WORKFORCE_DESTINATION`**
Workforce Availability Destination	The name of the corresponding destination, for example **`SFSF_WORKFORCE_AVAILABILITY`**
Workforce Skills Destination	The name of the corresponding destination, for example **`SFSF_WORKFORCE_CAPABILITY`**
Run Every	The frequency at which the data is pulled
Work Center Entity Version	**`3.0.0`**
Cost Center Entity Version	**`3.0.0`**

3. Choose *Save*.

Results

The workforce person, cost center, availability, and skill master data is available in SAP Digital Manufacturing for resource orchestration.

Related Information

Schedule Replication of Workforce Data

4.3.8 Configure SAP Digital Manufacturing for resource orchestration to Use Master Data

Involves onboarding employees to relevant cost centers, and using the workforce information for shop floor operations.

Context

After establishing the connection between SAP SuccessFactors Employee Central, SAP S/4HANA Cloud Public Edition, and SAP Digital Manufacturing for resource orchestration, you must configure SAP Digital Manufacturing for resource orchestration to utilize the imported master data.

You need to perform the following steps in SAP Digital Manufacturing for resource orchestration:

Procedure

1. Got to the *Manage Business Settings* app and enable *Integration with SAP SuccessFactors* in the *Labor* section. See: Manage Business Settings.
2. Go to the *Schedule Labor* app, to effectively plan and assign labor to work orders, ensuring that the right resources are available on the shop floor. See: Optimize Workforce Availability.
3. Go to the *Manage Skills Template* app, to retrieve the employee skill data. See: Data Integration.
4. Go to the *Manage Workforce* app, to onboard employees, assigning them to relevant cost centers, and ensuring their availability for labor planning. See: Onboarding the Workforce.

4.4 Data Engineering Configuration

The concept of Data Engineering (DE) revolves around replicating data from on-premise systems to the cloud. This data is then available in SAP Digital Manufacturing for resource orchestration.

Replication of on-premise data to the cloud is achieved using three apps:

- *Manage Data Agents*: The data agent queries the source table to get data. You can source data from your on-premise systems, such as SAP ME, SAP MII, SAP ECC, and SAP S/4HANA. Using this app, you can create new data agents and delete or check the status of existing data agents, download scripts, and copy connection strings. For more information on downloading scripts and copying connection strings, see Manage Data Agents in the *Setup Guide for Data Engineering*.
- *Manage Connections*: After setting up a data agent, you need a connection or a bridge, to connect your source database to a target or destination database. This app helps you create a connection. Additionally, you can delete and check the status of existing connections. Choose any connection to edit or change the connection details, and save them as different views. Before saving, you can test your connection to verify the status (whether *Connected* or *Disconnected*). You can also suspend and resume connections.

- *Manage Data Replicas*: With the data agent and connection up and running, you replicate the data to a destination table. You can choose how to replica or replicate the source data in the destination table using this app. You can create a new data replica. You can copy or delete an existing data replica. You can suspend and resume data replicas. The *Pipeline Status* displays as *Completed* or *In progress*. Hover on each status. A link is displayed. Choose the link to get a snapshot of the pipeline status. Choosing *Details* provides information on the total and failed runs. *Delta Load Triggered*, *Upload to Cloud*, and *Insert to Database* show the different stages of the pipeline run.
  Using *Replication Schedule*, you can set a schedule for data replication. The schedule can be set in minutes, hours, or days. These replications happen in deltas, based on the schedule provided. You can save and activate existing data replicas, by clicking on them. You can also save and activate newly created data replicas. On activation, the system displays a confirmation message, stating that the data replica is activated. Once the data is copied, the *Initial Load Status* displays as: `N of N rows are copied`. Here, N represents the number of rows. You can edit the activated data replica to include additional filters or accommodate any changes that you make.

You must have the role of `Manufacturing_Admin_Limited`, or `Manufacturing_Admin` to view and modify the data or connections in the apps. For more information on role templates, see Role Templates (Persona-Based).

For additional setup information, see Setup Information.

Related Information

Manage Data Agents [page 548]
Manage Connections [page 549]
Manage Data Replicas [page 550]
Setup Information

4.4.1 Manage Data Agents

You can create, delete, check the status, download the script, and copy the connection string of data agents.

Using SAP Digital Manufacturing, you can connect an on-premise system to a Cloud system.

To achieve this goal, data from on-premise systems needs to be first replicated or copied to Cloud.

You can source data from your on-premise systems like SAP ME, SAP MII, SAP ECC, and SAP S/4HANA.

The data agent queries the source table to get data. This data is then replicated on to a destination table. You can choose how to model or replicate the source data in the destination table, using the *Manage Data Models* app.

When you create a new data agent, the system associates the newly created data agent with a connection string.

This connection string serves as an input in the shell script to run and complete the installation of the agent.

You can save different variants and check the status of data agents.

You can delete a data agent only if no open connections exist.

Once you have created a data agent, you can directly create a new connection, instead of exiting the *Manage Data Agents* app and navigating to the *Manage Connections* app. Choose *Create Connection* to directly create a connection from the *Manage Data Agents* app.

For more information on configuring and managing data agents, see **Setup Information** under the Setup Guide for Data Engineering.

4.4.2 Manage Connections

You can create, edit, delete, and check the status of connections.

After the setup of the data agent, you need to create a connection to the source system. You can create these connections to your databases or files using Fiori apps, such as *Manage Connections*.

After you create a connection and choose *Save* to store the connection in Cloud, a copy of this is sent to the data agent as well.

You can edit and change connection details and save these changes as *Views*.

Using the *Suspend* and *Resume* buttons, you can suspend or resume one or more connections, that are in the *Connected* and *Disconnected* state. Once a connection is suspended, all activated data models associated with this connection, are also suspended. A warning is issued for this. Likewise, on resumption of a connection, the connection as well as associated (suspended) data models resume.

> ⓘ Note
>
> If you want to suspend more than one connection, and if any one of these connections is already in *Suspended* state, then it will remain as it is. The same is true with resumption of connections as well.

Once you have created a connection, you can directly create a new data model, instead of exiting the *Manage Connections* app and navigating to the *Manage Data Models* app. Choose *Create Data Model* to directly create a data model from the *Manage Connections* app.

Click any connection with any status (Connected or Disconnected) to edit fields such as *Description*, *Data Agents*, *System Type*, and so on.

You can verify that the target database is reachable and can be connected, using the *Test Connection* button.

The following system types are supported:

- SAP ME WIP
- SAP ME ODS
- SAP MII OEE
- SAP ECC
- SAP S/4HANA

The following database types are supported:

- HANA
- Oracle
- SQL Server

> **Note**
>
> A connection can be deleted only if there are no active data models for it or associated with it.

For more information on configuring and managing connections, see **Setup Information** under the Setup Guide for Data Engineering.

4.4.3 Manage Data Replicas

You can create, copy, and delete data replicas.

To replicate data, you need to create a data replica. This data replica is a mapping of the source table to the target table, and contains the data to be replicated or copied.

> **Note**
>
> The data agent and connection must be up and running to configure the *Manage Data Replicas* app.

You can select a data source, while acquiring data.

The *Create* button is a dropdown, with two options: *New Data Replica* and *Bulk Data Replicas*. Using the *New Data Replica* option, you can create a new data replica. Using the *Bulk Data Replicas* option, you can create multiple data replicas, at once. The need to individually create multiple data replicas is therefore eliminated.

You can suspend or resume data replicas, using the *Suspend* and *Resume* buttons.

> **Note**
>
> You cannot suspend certain data replicas, such as those with status *New*, *Deletion Started*, *Deletion Failed*, and, replicas where the initial load is running. The *Suspend* feature works only for activated replicas. Once suspended, you cannot activate or delete a data replica. You can edit and save a suspended data replica. If you choose *Resume*, then all the data replicas that are in suspended state are resumed. All operations of the replica are allowed, once you perform the *Resume* operation.

You can filter data from the source and set a frequency for the ongoing load.

Using *Replication Schedule*, you can set a schedule for data replication. The schedule can be set in minutes, hours, or days. These replications happen in deltas, based on the schedule provided.

On the preview page, you can see the status of initial load and delta load, and the run logs. The *Pipeline Status* reflects the latest information on the status and start and end times, related to a data replica. Click any status to get a snapshot of the pipeline. Choose *Details* to navigate to the Run Logs Details page. It gives information on the total and failed runs. *Delta Load Triggered*, *Upload to Cloud*, and *Insert to Database* show the different stages of the pipeline run.

In case of failed delta loads, an *Error Log* is generated. Click *Error Log* to view details.

If you do not want to wait for the normal delta load to bring data, you can always trigger an 'on-demand' delta load, using the *Trigger Now* button.

You can terminate an ongoing run (for example:- if the run is taking abnormally long to complete) using the *Terminate Current Run* button. This button not only terminates the existing run, but also immediately starts a new run (That is: A new run is scheduled immediately, but reflects soon after, for example - after a minute).

For more information on configuring and managing data replicas, see Setup Information, under the Setup Guide for Data Engineering.

5 SAP Digital Manufacturing for issue resolution Integration

This guide provides information about how to configure the integration of SAP Digital Manufacturing for issue resolution with other systems.

5.1 Integrating SAP Digital Manufacturing for issue resolution with SAP ERP

5.1.1 Minimum Version Requirements and Supported Scenarios

To be able to integrate your SAP ECC system with SAP Digital Manufacturing for issue resolution, one of the following combinations of support package and SAP Notes must be installed on your SAP ECC system:

- SAP_APPL 618 SP17 and SAP Notes:
  - 3088115
  - 3229330
  - 3229706
- SAP_APPL 618 SP18 to SP19 and SAP Notes:
  - 3229330
  - 3229706
- SAP_APPL 618 SP20
  No additional SAP Notes are required.

5.1.2 SAP ECC Business System

The SAP ECC system identifies itself using its business system at the SAP Digital Manufacturing for issue resolution system when a new problem-solving process is triggered. This is achieved via the function module `LCR_GET_OWN_BUSINESS_SYSTEM`. Therefore, ensure that the symptom described the SAP Knowledge Base Article 1918427 does not occur.

If the System Landscape Directory (SLD) is used, the business system should be maintained via SLD.

If SLD is not used, follow the SAP Note 2924308 to locally provide a business system name via the program `SXMS_BS_CACHE`.

5.1.3 Maintain Connection Data

To setup the integration it is necessary to create two RFC destinations. One to connect to the SAP Digital Manufacturing for issue resolution authentication endpoint and another one to connect to the SAP QIR API. Both are HTTP connections. The corresponding host addresses are different and must not be mixed up.

5.1.3.1 Create RFC Destination for Authentication Endpoint HTTP Connection

Learn how to create an RFC destination for the authentication endpoint HTTP connection, enabling secure integration with SAP Digital Manufacturing for issue resolution.

1. Open the app for defining RFC connections (transaction SM59).
2. Create a new destination with connection type `G` (HTTP Connections to External Server).
3. Enter a description, for example **`Connection to SAP QIR API Authentication`**.
4. Enter the authorization server URL which is used for SAP Digital Manufacturing for issue resolution (without the protocol prefix **`https://`**).
   For more information about how to find the client ID in the SAP BTP cockpit, see How to Find Authorization Server Data [page 553]
5. Enter the port number 443.
6. Enter the following path prefix: **`/oauth/token?grant_type=client_credentials`**.
7. Under *Logon Procedure* select *Basic Authentication*.
8. Enter the client ID and the client secret.
9. In the logon and security settings, activate SSL.
10. Save your settings.

5.1.3.1.1 How to Find Authorization Server Data

Learn to provide the necessary authorization server data in the OAuth 2.0 client settings for your SAP Digital Manufacturing for issue resolution subaccount.

The following steps help you to find this data in the SAP BTP cockpit.

1. Log on to the SAP BTP cockpit.
2. Under *Subaccounts*, select your SAP Digital Manufacturing for issue resolution subaccount.
3. Under *Cloud Foundry* > *Spaces*, open the space for your SAP Digital Manufacturing for issue resolution subaccount.
4. Under *Service* > *Instances*, select the instance for your SAP Digital Manufacturing for issue resolution service.

5. In the *Service Keys* section, open the keys view (under ... > *View*).
   In the keys view, the following attributes provide the necesssary information:
   - The ID for your authorization server is provided by the attribute `"clientid"`.
   - The client secret is provided by the attribute `"clientsecret"`.
   - The authorization server URL is provided by the attribute `url`.

   > **Note**
   >
   > Use authorization server URL to construct the token and authorization endpoint URLs:
   > - Token Endpoint: `<authorization server URL>/oauth/token`
   > - Authorization Endpoint: `<authorization server URL>/oauth/authorize`

5.1.3.2 Create RFC Destination for API HTTP Connection

Find out how to create an RFC destination for an API HTTP connection for SAP Digital Manufacturing for issue resolution integration.

Follow these steps:

1. Open the app for defining RFC connections (transaction `SM59`).
2. Create a new destination with connection type `G` (*HTTP Connection to External Server*).
3. Enter a description, for example, **`Connection to`** SAP Digital Manufacturing for issue resolution.
4. Enter the API URL for the host on which the SAP Digital Manufacturing for issue resolution system is running (**without** the protocol prefix **`https://`**). For more information how to find the API URL in the SAP BTP cockpit, see How to Find the API Host URL [page 554].
5. Enter the port number **`443`**.
6. Enter the following path prefix: **`/odata/v4/ProblemSolvingProcessService/ProblemSolvingProcess`**.
7. Under *Logon & Security*, activate SSL (Secure Socket Layer).
8. Save the RFC connection.
   If you want to check whether the connection works, select *Connection Test* and as a result the value `http 401 (Unauthorized)` should be returned.

5.1.3.2.1 How to Find the API Host URL

Learn how to find the API host URL for the SAP Digital Manufacturing for issue resolution system to configure the RFC destination.

In the RFC destination settings, you need to provide the API URL for the host on which the SAP Digital Manufacturing for issue resolution system is running. The following steps help you to find this URL.

1. Log on to the SAP BTP cockpit.
2. Under *Subaccounts*, select your SAP Digital Manufacturing for issue resolution subaccount.
3. Under *Cloud Foundry* > *Spaces* , open the space for your SAP Digital Manufacturing for issue resolution subaccount.

4. Under *Service* > *Instances*, select the instance for your SAP Digital Manufacturing for issue resolution service.
5. In the *Service Keys* section, open the keys view (under ... > *View*).
6. The attribute "`psp_api`" contains the API host URL you need for the RFC destination. Copy the URL without `https://`.

5.1.3.3 Configure QM Integration Scenario

Learn how to configure QM integration scenarios to enable integration with SAP Digital Manufacturing for issue resolution.

1. In Customizing for Quality Management (transaction `QCC0`), choose *Environment* > *Tools* > *Configure QM Integration Scenarios*.

   > **Note**
   >
   > If this Customizing node is not available in your system you can open the corresponding view **`V_QINTEG_CONF`** in transaction `SM30`.

2. Choose the integration scenario **`Problem-Solving with`** SAP Digital Manufacturing for issue resolution.
3. Add a new entry.
4. Enter the following data:
   - *Destination*:
     Enter the RFC destination you have defined under Create RFC Destination for API HTTP Connection [page 554].
   - *UI Host URL*:
     Enter the UI host URL for the SAP Digital Manufacturing for issue resolution subaccount. For more information, see How to Find the API Host URL [page 554].
     The field *UI Path* must be kept empty.
   - Set the integration scenario state to active, so that it can be used for triggering a supplier and customer problem-solving process.
   - *OAuth Destination*:
     Enter the RFC destination you have defined under Create RFC Destination for Authentication Endpoint HTTP Connection [page 553].
5. Save your settings.

5.1.3.3.1 How to find the UI Host URL

In the QM integration scenario, you need to provide the UI host URL for your SAP Digital Manufacturing for issue resolution subaccount. The following steps help you to find this URL.

1. Log on to the SAP BTP cockpit.
2. Under *Subaccounts*, select your SAP Digital Manufacturing for issue resolution subaccount.
3. Under *Instances and Subscriptions*, search for your subscribed SAP Digital Manufacturing for issue resolution subaccount.

4. Choose *Go to Application*.
5. Log on to the system and copy the first part of the browser URL including "…`ondemand.com`".

5.1.4 Settings for Quality Notifications

5.1.4.1 Create Logical System and Assign Destination

Learn how to create a logical system and link it with the RFC destination that is used for the SAP Digital Manufacturing for issue resolution integration.

You must set up this logical system by following these steps:

1. Open the app for defining logical systems (transaction `BD54`).
2. Create a new entry and enter the following data:
   - Enter a logical system, for example, **`QIRONBTP`**.

     > **Note**
     >
     > If you are migrating from SAP Supplier Problem-Solving (SPS) to SAP Digital Manufacturing for issue resolution (QIR) it is recommended to create a new logical system for QIR and not to use the existing logical system created for SPS. That way you can set up your development or quality system to integrate SPS and QIR at the same time. This might support testing during the migration phase. The production system should have only one active integration to either to Supplier Problem-Solving or to SAP Digital Manufacturing for issue resolution, but this is not checked by the system.

   - Enter a name for the logical system, for example, **`QIR`** or **`SPS`**.
3. Save the logical system.
4. Open the app for assigning RFC destinations to logical systems (transaction `BD97`).
5. Position the cursor on the logical system you have just created and choose *More* > *Standard Dialog Destination*.
6. Select the RFC destination you have created under Create RFC Destination for API HTTP Connection [page 554].
7. Save the assignment.

5.1.4.2 Create Code Groups and Codes for Tasks

In this step, you create code groups and code for the task catalog of quality notifications (for example, catalog `2`). The codes will be used in the tasks that are created from action box activities.

1. Open the *Edit Code Groups* app (transaction `QS41`).
2. Enter catalog **2** (Tasks) or your customer-specific task catalog.
3. Choose *Continue*.
4. Either select an existing code group or create a new code group.
   Double-click on *Codes* in the dialog structure.

5. You can create codes for two possible scenarios:
   - *Supplier Problem-Solving*
     Create a code that describes requesting a solution from a supplier: **`Request Solution by Supplier`**.
   - *Customer Problem-Solving*
     Create a code that describes starting a problem-solving process for a customer complaint: **`Start Problem-Solving`**.
6. The codes are used in tasks that are created in a quality notification to document an action box activity that triggers a new problem-solving process.
7. Save the data.

5.1.4.3 Define Functions for Action Box

Learn how to define action box functions for supplier and customer problem-solving processes.

You can create action box activities for the scenarios of *Supplier Problem-Solving* and *Customer Problem-Solving*.

The following suggestions can be used as the descriptions for the action box activities:

- *Request Solution by Supplier*
  Triggers a new supplier problem-solving process.
- *Review Solution by Supplier*
  Navigates to an existing supplier problem-solving process for the selected notification item.
- *Start Problem-Solving*
  Triggers a new customer problem-solving process.
- *Review Problem-Solving*
  Navigates to an existing customer problem-solving process for the selected notification item.

1. In Customizing for Quality Management (transaction `QCC0`), choose *Quality Notifications* > *Notification Processing* > *Additional Notification Functions* > *Define Action Box*.
2. Select the notification type for your scenario, for example **`Q2`** (Complaint Against Supplier) for supplier problem-solving or a corresponding customer-specific notification type. Double-click on *Activities* in the dialog structure.

   > **Note**
   >
   > The integration is only available for notification types with notification origin `Q1` (Customer Complaint) or `Q2` (Complaint against Supplier).

3. To navigate to a problem-solving process of a notification item, add a new entry and enter the following data:
   1. Enter a technical name for the function (for example, **`X900`**) and a description.
   2. Enter a sort number.
   3. Select the details of the entry:
      1. Set the usage to *Any view (change, display)* and *Notification*.
      2. For the documentation, select *None*.
      3. Enter the function module **`QICR_NAV_TO_PSP_FOR_ITEM`**.

    4. Select any icon you wish to be displayed for the activity in the action box and add a quick info text.
    5. Optional: If you are migrating from SAP Supplier Problem-Solving to SAP Digital Manufacturing for issue resolution you cannot select *Dependent Follow-Up Function*.
  4. Save the new function and go back to the list of entries.
4. To trigger a problem-solving process for a notification item, add an additional new entry with the following data:
  1. Enter a technical name for the function (for example, **`X900`**) and a description.
  2. Enter a sort number.
  3. Select the details of the entry:
    1. Set the usage to *Any view (create, change)* and *Notification*.
    2. For the documentation, select *As task*.
    3. Enter the function module **`QICR_REQUEST_PSP_FOR_ITEM`**.
    4. Select any icon you wish to be displayed for the activity in the action box and add a quick info text.
    5. Depending on your scenario, enter the corresponding code group and code you have created under Create Code Groups and Codes for Tasks [page 556].
    6. In section *Specific Details for Task* select indicator *Completed*.
    7. Optional: You cannot choose *Dependent Follow-Up Functions* if you are migrating from SAP Supplier Problem-Solving to SAP Digital Manufacturing for issue resolution. If you are not migrating, add a new entry and enter the function you have created in the step above that enables the navigation to the problem-solving process.
  4. Go back and save the second function.

5.1.4.4 Mapping of Codes and Priorities

You can map code groups, codes and priorities you defined in SAP ERP Central Component to SAP Digital Manufacturing for issue resolution. You do this in your SAP ECC System.

5.1.4.4.1 Mapping of Priorities

SAP Digital Manufacturing for issue resolution has its own definition of priorities. You can map each priority that is defined for quality notification types that are relevant in this context to a priority that is defined in SAP Digital Manufacturing for issue resolution.

The priority of a quality notification from which a problem-solving process is triggered in SAP Digital Manufacturing for issue resolution shall be reflected in the problem-solving process automatically, for example, a complaint against supplier of priority **`Very High`** shall result in a supplier problem-solving process in SAP Digital Manufacturing for issue resolution of priority **`Very High`**.

Prerequisites

You have defined the priority types with the corresponding priorities and assigned them to the notification types in Customizing under *Quality Notifications* > *Notification Processing* > *Response Control* > *Define Priorities*.

Key Features

Automatic Mapping of Priorities

The mapping of priorities of SAP ECC and SAP Digital Manufacturing for issue resolution is done automatically if the ID of the priorities is identical in both systems. For example, if you have defined the priority **very high** with the ID **1** in SAP ECC, the priority will be automatically mapped to the priority with the ID **1** in SAP Digital Manufacturing for issue resolution.

> **Note**
>
> You have to make sure that both priorities have the same meaning in SAP ECC and SAP Digital Manufacturing for issue resolution.

> **Example**
>
> - In SAP ECC a priority **1** of priority type **QM** with the meaning **very high** is defined.
> - In SAP Digital Manufacturing for issue resolution the same priority **1** with the meaning **very high** is defined.
> - In SAP ECC no mapping between the notification-specific and the SAP Digital Manufacturing for issue resolution specific priorities is defined.
> - When a problem-solving process is triggered from an item in a quality notification and the priority **1** is assigned, then priority **1** is passed as priority for the problem-solving process. Since there is a priority with ID **1** defined in SAP Digital Manufacturing for issue resolution, the assigned priority is accepted and the problem-solving process is created.

Mapping of priorities

If you use different priorities in SAP ECC and SAP Digital Manufacturing for issue resolution, you can define a mapping for the priorities.

> **Note**
>
> The mapping of priorities functionality uses Master Data Governance (MDG) value mapping and transaction `VMIMG` offered by MDG is used to define the mapping.

1. Launch transaction `VMIMG` to define the MDG value mapping.
2. Choose *Maintain Value Mapping*.
3. In column *Global Data Type* select `QM_QN_PRIORITY`.
4. In column *Navigation* choose *Display Mapping Relationships*.
5. Edit the *Assign Code Lists* screen and enter the following data:

> **Note**
>
> In SAP ECC the priorities that can be assigned to quality notifications are organized in priority types. Each priority type has several priorities assigned. The data model for priorities in SAP QIR does not have this two-level hierarchy, hence there is only a mapping from combinations of ECC priority type and priority to a QIR priority.

   1. *Mapping ID*: `0000000001`
   2. *List Agency ID*: `QUALITY_ISSUE_RESOLUTION_ON_BTP`
   3. *List ID*: The ID of the ECC priority that you want to map priorities from
   4. *Internal List ID*: same value as *List ID*
6. Select the row and choose folder *Define Value Mapping*.
7. Create entries for each priority that should be mapped from SAP ECC to SAP Quality Resolution:
   1. Enter an ID for the *Mapping Combination*.
   2. *Internal Code Value*: ID of the ECC priority (value help is available).
   3. *External Code Value*: ID of the priority defined in SAP Digital Manufacturing for issue resolution
   4. Save your changes.

5.1.4.4.2 Mapping of Codes

SAP Digital Manufacturing for issue resolution has its own definition of defect codes. You can map each defect code that is defined in SAP ERP Central Component (SAP ECC) to a code defined in SAP Digital Manufacturing for issue resolution.

When codes are mapped, the defect code of a quality notification item from which a problem-solving process is triggered in SAP Digital Manufacturing for issue resolution is automatically shown as the defect code in the problem description of the problem-solving process. For example, a complaint against supplier for an item with defect code **`Scratched`** will result in a supplier problem-solving process in SAP Digital Manufacturing for issue resolution also referring to defect code **`Scratched`**.

Prerequisites

You have defined the code groups and codes for defects in SAP ECC with the *Edit Code Groups* app.

You have defined the code groups and codes for defects in SAP Digital Manufacturing for issue resolution with the *Define Problem-Solving Codes* app.

Key Features

Automatic Mapping of Codes

The mapping of the code groups and codes of SAP ECC and SAP Digital Manufacturing for issue resolution is done automatically if the IDs of the code groups and codes are identical in both systems. For example, if you

have defined the code **Scratched** with the ID **0001** in SAP ECC, the code will be automatically mapped to the code with the ID **0001** in SAP Digital Manufacturing for issue resolution.

> **Note**
>
> You have to make sure that both code groups and codes have the same meaning in SAP ECC and SAP Digital Manufacturing for issue resolution.

> **Example**
>
> - In SAP ECC you have defined code group **QM-M** and code **0001** in catalog **9** (Defect Types) with the meaning **Scratched**.
> - In SAP Digital Manufacturing for issue resolution the same code **0001** with the meaning **Scratched** is defined in code group **QM-M**.
> - In SAP ECC no mapping between the catalog, code group, and code is defined.
> - When a problem-solving process is triggered from an item in a quality notification with type **Q2** and the code group **QM-M** and code **0001** are assigned to the item, **QM-M** and **0001** are passed as defect code group and defect code to the problem-solving process. Since there is a code group **QM-M** containing code **0001** defined in SAP Digital Manufacturing for issue resolution, the assigned defect code group and code are accepted and the problem-solving process is created. The problem description has the defect code group **QM-M** and code **0001** assigned.
>
> > **Note**
> >
> > The code group and code must have identical IDs in SAP Digital Manufacturing for issue resolution and SAP ECC and you must ensure that they share the same meaning.

Mapping of Codes

If you use different codes in SAP ECC and SAP Digital Manufacturing for issue resolution, you can define a mapping for the codes.

> **Note**
>
> The mapping codes functionality uses Master Data Governance (MDG) value mapping and transaction `VMIMG` offered by MDG is used to define the mapping.

1. Launch transaction `VMIMG` to define the MDG value mapping.
2. Choose *Maintain Value Mapping*.
3. Map the catalogs:
   1. In column *Global Data Type* select `QMKAT`.
   2. In column *Navigation* choose *Display Mapping Relationships*.
   3. Edit the *Assign Code Lists* screen and enter the following data:
      - *Mapping ID*: `0000000001`
      - *List Agency ID*: `QUALITY_ISSUE_RESOLUTION_ON_BTP`
      - *List ID*: `QCATALOG`
   4. Select the row and choose folder *Define Value Mapping*.
   5. Create entries for each catalog that should be mapped from SAP ECC to SAP Quality Resolution:
      1. Enter an ID for the *Mapping Combination*.

2. *Internal Code Value*: ID of the ECC catalog (value help is available)
3. *External Code Value*: ID of the catalog defined in SAP Digital Manufacturing for issue resolution

> **Note**
>
> In the standard system, code groups and codes for defects are assigned to catalog `9` (Defect Types). If you use catalog `9` for defect codes you can skip creating a mapping for it. Codes from this catalog will automatically by mapped to catalog `01` in SAP Digital Manufacturing for issue resolution.

4. Save your changes.

4. Map the code groups:
   1. In column *Global Data Type* select `QMGRP`.
   2. In column *Navigation* choose *Display Mapping Relationships*.
   3. Edit the *Assign Code Lists* screen and enter the following data:
      1. *Mapping ID*: Any arbitrary unique alpha-numeric value
      2. *List Agency ID*: `QUALITY_ISSUE_RESOLUTION_ON_BTP`
      3. *List ID*: The ID of the ECC catalog that you want to map code groups from
      4. *Internal List ID*: same value as *List ID*
   4. Select the row and choose folder *Define Value Mapping*.
   5. Create entries for each code group that should be mapped from SAP ECC to SAP Quality Resolution:
      1. Enter an ID for the *Mapping Combination*.
      2. *Internal Code Value*: ID of the ECC code group (value help is available).
      3. *External Code Value*: ID of the code group defined in SAP Digital Manufacturing for issue resolution
      4. Save your changes.
5. Map the codes:
   1. In column *Global Data Type* select `QMCOD`.
   2. In column *Navigation* choose *Display Mapping Relationships*.
   3. Edit the *Assign Code Lists* screen and enter the following data:
      1. *Mapping ID*: any arbitrary unique alpha-numeric value
      2. *List Agency ID*: `QUALITY_ISSUE_RESOLUTION_ON_BTP`
      3. *List ID*: The ID of the ECC catalog concatenated with the code group ID that you want to map codes from (for example **`9QM-E`**, if you want to map code from catalog **`9`** and code group **`QM-E`**)
      4. *Internal List ID*: same value as *List ID*
   4. Select the row and choose folder *Define Value Mapping*.
   5. Create entries for each code that should be mapped from SAP ECC to SAP Quality Resolution:
      1. Enter an ID for the *Mapping Combination*.
      2. *Internal Code Value*: ID of the ECC code (value help is available).
      3. *External Code Value*: ID of the code defined in SAP Digital Manufacturing for issue resolution
      4. Save your changes.

5.2 Integrating SAP Digital Manufacturing for issue resolution with SAP S/4HANA

Purpose

This integration guide provides information about the settings you need to make in the SAP S/4HANA system to be able to trigger a problem-solving process in SAP Digital Manufacturing for issue resolution from a quality notification in SAP S/4HANA.

5.2.1 Minimum Version Requirements and Supported Scenarios

To be able to integrate your SAP S/4HANA system with SAP Digital Manufacturing for issue resolution, the following prerequisites must be fulfilled:

- One of the following support packages (or higher) is installed on your SAP S/4HANA system, depending on the problem-solving scenarios you plan to use:

Customer and Supplier Problem-Solving	Internal Problem-Solving
SAP S/4HANA 1809 SPS09	SAP S/4HANA 1809 SPS10
SAP S/4HANA 1909 SPS07	SAP S/4HANA 1909 SPS08
SAP S/4HANA 2020 SPS05	SAP S/4HANA 2020 SPS06
SAP S/4HANA 2021 SPS03	SAP S/4HANA 2021 SPS04
SAP S/4HANA 2022 FPS00	SAP S/4HANA 2022 FPS01
	SAP S/4HANA 2023 FPS00

- If you have not yet installed one of the support packages, you can implement the following SAP Notes to install the required features:
  - 3208349
  - 3208760
  - 3211584
  - 3215767
  - Additionally, for internal problem-solving: 3271300
- You have configured the SAP Digital Manufacturing for issue resolution solution as described in the administration guide.
- Optionally, the following support packages or SAP Notes can be installed to make use of optional improvements in the integration:
  Improved error handling is available as of:
  - SAP S/4HANA 1809 SPS09
  - SAP S/4HANA 1909 SPS07

- SAP S/4HANA 2020 SPS05
- SAP S/4HANA 2021 SPS03
- SAP S/4HANA 2022 FPS01

Another option is to install the SAP Note 3241952.

- The following SAP Notes can be installed optionally:
  - 3246137 can be installed to fix non-severe program errors.
  - 3265674 can be installed to better support customer-provided function modules for the integration.
  - 3331584 can be installed to fix a problem regarding the material number transferred from SAP S/4HANA to SAP Digital Manufacturing for issue resolution.

5.2.2 SAP S/4HANA Business System

The SAP S/4HANA system identifies itself using its business system at the SAP Digital Manufacturing for issue resolution system when a new problem-solving process is triggered. This is achieved via the function module `LCR_GET_OWN_BUSINESS_SYSTEM`. Therefore, ensure that the symptom described the SAP Knowledge Base Article 1918427 does not occur.

If the System Landscape Directory (SLD) is used, the business system should be maintained via SLD.

If SLD is not used, follow the SAP Note 2924308 to locally provide a business system name via the program `SXMS_BS_CACHE`.

5.2.3 Maintain Connection Data

5.2.3.1 Create OAuth 2.0 Client

Learn how to create an OAuth 2.0 client to authenticate API calls between your SAP system and SAP Digital Manufacturing for issue resolution.

1. Open the app for configuring OAuth 2.0 clients (transaction `OA2C_CONFIG`).
2. Create a new OAuth 2.0 client and enter the following data:
   - Select the OAuth 2.0 client profile **`QICR_PROBLEM_SOLVING`**.
   - Keep the proposed configuration name **`QICR_PROBLEM_SOLVING`**.
   - Enter the OAuth 2.0 client ID and Client Secret for your authorization server.
3. In the authorization server settings, enter the following data:
   - Authorization endpoint: **`<authorization server URL>/oauth/authorize`** **without** the protocol prefix **`https://`**
   - Token endpoint: **`<authorization server URL>/oauth/token`** **without** the protocol prefix **`https://`**

> **Note**
>
> Ensure that you have entered the authorization endpoint or token endpoint URL in the corresponding fields. If the entered URL is not correct, the SAP S/4HANA system won't be able to authenticate the

> API call to SAP Digital Manufacturing for issue resolution which will lead to unexpected error messages when triggering a new problem-solving process.

For more information about how to find the authorization server URL in the SAP BTP cockpit, see How to Find Authorization Server Data [page 565].

4. Make the following access settings:
   - For the client authentication, select *Form Fields*.
   - For the resource access authentication, select *Header Fields*.
   - For the grant type, select *Client Credentials*.
5. Save the new OAuth 2.0 client.

Related Information

OAuth 2.0 Client for AS ABAP

5.2.3.1.1 How to Find Authorization Server Data

Learn to provide the necessary authorization server data in the OAuth 2.0 client settings for your SAP Digital Manufacturing for issue resolution subaccount.

The following steps help you to find this data in the SAP BTP cockpit.

1. Log on to the SAP BTP cockpit.
2. Under *Subaccounts*, select your SAP Digital Manufacturing for issue resolution subaccount.
3. Under *Cloud Foundry* > *Spaces*, open the space for your SAP Digital Manufacturing for issue resolution subaccount.
4. Under *Service* > *Instances*, select the instance for your SAP Digital Manufacturing for issue resolution service.
5. In the *Service Keys* section, open the keys view (under ... > *View*).
   In the keys view, the following attributes provide the necesssary information:
   - The client ID is provided by the attribute "`uaa.clientid`".
   - The client secret is provided by the attribute "`uaa.clientsecret`".
   - The server URL of the authorization server is provided by the attribute "`uaa.url`".

   > **Note**
   >
   > Use authorization server URL to construct the token and authorization endpoint URLs:
   > - Token Endpoint: **`<authorization server URL>/oauth/token`**
   > - Authorization Endpoint: **`<authorization server URL>/oauth/authorize`**

5.2.3.2 Create RFC Destination for HTTP Connection

1. Open the app for defining RFC connections (transaction `SM59`).
2. Create a new destination with connection type `G` (*HTTP Connection to External Server*).
3. Enter a description, for example, **`Connection to`** SAP Digital Manufacturing for issue resolution.
4. Enter the API URL for the host on which the SAP Digital Manufacturing for issue resolution system is running (**without** the protocol prefix **`https://`**). For more information how to find the API URL in the SAP BTP cockpit, see How to Find the API Host URL [page 566].
5. Enter the port number **`443`**.
6. Enter the following path prefix: **`/odata/v4/ProblemSolvingProcessService/ProblemSolvingProcess`**.
7. Under *Logon & Security*, activate SSL (Secure Socket Layer).
8. Under *Logon & Security* choose *OAuth Settings* and enter the OAuth client profile and the configuration name you have defined under *Create OAuth 2.0 Client*.
9. Save the RFC connection.
   If you want to check whether the connection works, select *Connection Test* and as a result the value `http 200 (OK)` should be returned.

> **Note**
>
> If you downported the functionality to SAP S/4HANA 2020 and below:
>
> The OAuth 2.0 client and configuration are not entered in the RFC destination (see Configure QM Integration Scenario [page 567]).

5.2.3.2.1 How to Find the API Host URL

Learn how to provide the API URL for the host on which the SAP Digital Manufacturing for issue resolution system is running. You need to configure this in the RFC destination settings to ensure proper connectivity between your systems.

The following steps help you to find this URL.

1. Log on to the SAP BTP cockpit.
2. Under *Subaccounts*, select your SAP Digital Manufacturing for issue resolution subaccount.
3. Under *Cloud Foundry* > *Spaces*, open the space for your SAP Digital Manufacturing for issue resolution subaccount.
4. Under *Service* > *Instances*, select the instance for your SAP Digital Manufacturing for issue resolution service.
5. In the *Service Keys* section, open the keys view (under ... > *View*).
6. The attribute `"psp_api"` contains the API host URL you need for the RFC destination. Copy the URL without `https://`.

5.2.3.3 Configure QM Integration Scenario

Learn to configure the QM integration scenarios to enable the integration with SAP Digital Manufacturing for issue resolution. This is necessary to trigger supplier and customer problem-solving processes.

Follow these steps:

1. In Customizing for Quality Management (transaction `QCC0`), choose *Environment* > *Tools* > *Configure QM Integration Scenarios*.

   > **Note**
   >
   > If this Customizing node is not available in your system you can open the corresponding view **`V_QINTEG_CONF`** in transaction `SM30`.
   >
   > /

2. Add a new entry.
3. Enter the following data:
   - Enter the RFC destination you have defined under Create RFC Destination for HTTP Connection [page 566].
   - Enter the UI host URL for the SAP Digital Manufacturing for issue resolution subaccount starting with `https://`. For more information, see How to Find the UI Host URL [page 567].
     The field *UI Path* must be kept empty.
   - Set the integration scenario state to active, so that it can be used for triggering a supplier and customer problem-solving process.
   - Only relevant for SAP S/4HANA 2020 and below: Enter the OAuth client profile and the configuration name you have defined under Create OAuth 2.0 Client [page 564].
4. Save your settings.

5.2.3.3.1 How to Find the UI Host URL

Learn how to find the UI host URL, needed for the QM integration.

In the QM integration scenario, you need to provide the UI host URL for your SAP Digital Manufacturing for issue resolution subaccount. The following steps help you to find this URL.

1. Log on to the SAP BTP cockpit.
2. Under *Subaccounts*, select your SAP Digital Manufacturing for issue resolution subaccount.
3. Under *Instances and Subscriptions*, search for your subscribed SAP Digital Manufacturing for issue resolution subaccount.
4. Choose *Go to Application*.
5. Log on to the system and copy the first part of the browser URL including "…`ondemand.com`".

5.2.3.4 Create Logical System and Assign Destination

Learn how to create a logical system and link it with the RFC destination that is used for the SAP Digital Manufacturing for issue resolution integration.

You must set up a logical system by following these steps.

1. Open the app for defining logical systems (transaction `BD54`).
2. Create a new entry and enter the following data:
   - Enter a logical system, for example, **`QIRONBTP`**.

     > **Note**
     >
     > If you are migrating from SAP Supplier Problem-Solving (SPS) to SAP Digital Manufacturing for issue resolution (QIR) it is recommended to create a new logical system for QIR and not to use the existing logical system created for SPS. That way you can set up your development or quality system to integrate SPS and QIR at the same time. This might support testing during the migration phase. The production system should have only one active integration to either to Supplier Problem-Solving or to SAP Digital Manufacturing for issue resolution, but this is not checked by the system.

   - Enter a name for the logical system, for example, **`QIR`** or **`SPS`**.
3. Save the logical system.
4. Open the app for assigning RFC destinations to logical systems (transaction `BD97`).
5. Position the cursor on the logical system you have just created and choose *More* > *Standard Dialog Destination*.
6. Select the RFC destination you have created under Create RFC Destination for HTTP Connection [page 566].
7. Save the assignment.

5.2.4 Settings for Quality Notification

5.2.4.1 Create Code Groups and Codes for Tasks

In this step, you create code groups and code for the task catalog of quality notifications (for example, catalog `2`). The codes will be used in the tasks that are created from action box activities.

1. Open the *Edit Code Groups* app (transaction `QS41`).
2. Enter catalog **`2`** (Tasks) or your customer-specific task catalog.
3. Choose *Continue*.
4. Either select an existing code group or create a new code group.
   Double-click on *Codes* in the dialog structure.
5. You can create codes for the following scenarios:
   - *Supplier Problem-Solving*
     Create a code that describes requesting a solution from a supplier: **`Request Solution by Supplier`**.

- *Customer Problem-Solving*
  Create a code that describes starting a problem-solving process for a customer complaint: **`Start Problem-Solving`**.
- *Internal Problem-Solving*
  Create a code that describes starting a problem-solving process for an internal complaint: **`Start Problem-Solving`**.

6. The codes are used in tasks that are created in a quality notification to document an action box activity that triggers a new problem-solving process.
7. Save the data.

5.2.4.2 Define Function for Action Box

Learn how to configure Action Box activities for problem-solving processes, allowing you to access and manage problem-solving tasks directly from the notification.

You can create action box activities for the scenarios of *Supplier Problem-Solving*, *Customer Problem-Solving*, and *Internal Problem-Solving*.

The following suggestions can be used as the descriptions for the action box activities:

- *Request Solution by Supplier*
  Triggers a new supplier problem-solving process.
- *Review Solution by Supplier*
  Navigates to an existing supplier problem-solving process for the selected notification item.
- *Start Problem-Solving*
  Triggers a new customer problem-solving process or internal problem-solving process.
- *Review Problem-Solving*
  Navigates to an existing customer problem-solving or internal problem-solving process for the selected notification item.

1. In Customizing for Quality Management (transaction `QCC0`), choose *Quality Notifications* > *Notification Processing* > *Additional Notification Functions* > *Define Action Box*.
2. Select the notification type for your scenario, for example **`Q2`** (Complaint Against Supplier) for supplier problem-solving or a corresponding customer-specific notification type. Double-click on *Activities* in the dialog structure.

   > **Note**
   >
   > The integration is only available for notification types with notification origin `Q1` (Customer Complaint), `Q2` (Complaint against Supplier), or `Q3` (Internal Problem Notification).

3. To navigate to a problem-solving process of a notification item, add a new entry and enter the following data:
   1. Enter a technical name for the function (for example, **`X900`**) and a description.
   2. Enter a sort number.
   3. Select the details of the entry:
      1. Set the usage to *Any view (change, display)* and *Notification*.
      2. For the documentation, select *None*.

3. Enter the function module **QICR_NAV_TO_PSP_FOR_ITEM**.
4. Select any icon you wish to be displayed for the activity in the action box and add a quick info text.
5. Optional: If you are migrating from SAP Supplier Problem-Solving to SAP Digital Manufacturing for issue resolution you cannot select *Dependent Follow-Up Function*.

4. Save the new function and go back to the list of entries.

4. To trigger a problem-solving process for a notification item, add an additional new entry with the following data:
   1. Enter a technical name for the function (for example, **X900**) and a description.
   2. Enter a sort number.
   3. Select the details of the entry:
      1. Set the usage to *Any view (create, change)* and *Notification*.
      2. For the documentation, select *As task*.
      3. Enter the function module **QICR_REQUEST_PSP_FOR_ITEM**.
      4. Select any icon you wish to be displayed for the activity in the action box and add a quick info text.
      5. Depending on your scenario, enter the corresponding code group and code you have created under Create Code Groups and Codes for Tasks [page 568].
      6. In section *Specific Details for Task*, select indicator *Completed*.
      7. Optional: You cannot choose *Dependent Follow-Up Functions* if you are migrating from SAP Supplier Problem-Solving to SAP Digital Manufacturing for issue resolution. If you are not migrating, add a new entry and enter the function you have created in the step above that enables the navigation to the problem-solving process.
   4. Go back and save the second function.

5.2.4.3 Mapping of Codes and Priorities

You can map code groups, codes, and priorities you defined in SAP S/4HANA to SAP Digital Manufacturing for issue resolution. You do this in your SAP S/4HANA system:

- Mapping of Codes
- Mapping of Priorities

5.2.4.4 Define Partner as Person Responsible

Learn how to a assign a Person Responsible as the first team member in the problem-solving process for a quality notification.

The creation of a problem-solving process from a quality notification requires a responsible partner to be added as the first team member. If no responsible person can be determined, the system cannot create the problem-solving process.

The following settings are required:

1. You assign a partner function to a notification type. In Customizing of Quality Management you need to assign a partner function to *Person Responsible* under *Quality Notifications* > *Notification Creation* > *Partners* > *Assign Partner Function to Notification Type*.

2. In the quality notification you need to add a partner to the partner function defined as *Person Responsible*. The e-mail address of the partner that is entered in the partner function assigned to *Person Responsible*, also belongs to a user in SAP Digital Manufacturing for issue resolution.
3. The partner is added as first team member in the problem-solving process in SAP Digital Manufacturing for issue resolution. You can change their role or delete the team member in the problem-solving process.

5.3 Integrating SAP Digital Manufacturing for issue resolution with SAP S/4HANA Cloud Public Edition

5.3.1 Maintain Connection Data

5.3.1.1 Establish Your Communication Arrangement in SAP S/4HANA Cloud Public Edition

A communication arrangement needs to be set up in SAP S/4HANA Cloud Public Edition to communicate with the SAP Digital Manufacturing for issue resolution web service and to provide the navigation to the SAP Digital Manufacturing for issue resolution Fiori apps.

Prerequisites

Before doing the configuration in SAP S/4HANA Cloud Public Edition, you need to have the administrator business user that contains the business catalog `SAP_CORE_BC_COM` (*Communication Management*), for example, the business role `SAP_BR_ADMINISTRATOR` (*Administrator*).

Context

The communication scenario name is `SAP_COM_0837` (*S/4HANA QM/NCM* - SAP Digital Manufacturing for issue resolution *Integration*).

Procedure

1. Log on to the SAP Fiori launchpad in your SAP S/4HANA Cloud Public Edition system.
2. Create a technical communication user.

a. Under *Communication Management*, choose *Maintain Communication Users*.
b. Choose *New* to create a new user (for example, **QM_0837_COM_USER**).
c. Enter a description and password for the user and choose *Create*. Remember the password to later configure the destination in SAP Business Technology Platform.
d. Make note of the user data. You need the user data to create the communication arrangement.

3. Create a communication system.
   a. Under *Communication Management*, choose *Communication Systems*.
   b. Choose *New* to create a system.
   c. Enter a system ID (for example `ZSAP_COM_0837`) and a system name, and choose *Create*.
   d. Under the *Technical Data* section, enter information regarding the system you wish to integrate.

      The following data is necessary: *Host Name*, *UI Host Name*, *Port*, *Auth. Endpoint*, *Token Endpoint*.

      > **Note**
      >
      > Ensure that you have entered the authorization endpoint or token endpoint URL in the corresponding fields. If the entered URL is not correct, the SAP S/4HANA Cloud Public Edition system won't be able to authenticate the API call to SAP Digital Manufacturing for issue resolution which will lead to unexpected error messages when triggering a new problem-solving process.

      For more information on how to find the Host Name, Auth. Endpoint and Token Endpoint, see How to Find the API Connection Data and OAuth 2.0 Authorization Data [page 573].

      For more information about how to find the UI Host Name, see How to Find the UI Host URL [page 574].
   e. In the *User for Inbound Communication* section, choose the + button, enter the technical communication user you created previously, and save.
   f. In the *User for Outbound Communication* section, choose the + button. Select *OAuth 2.0* as Authentication Method and Client Authentication *Basic*. Enter the *OAuth 2.0 Client ID* and *Client Secret*.

      For more information about how to find the client ID and client secret in the SAP Cloud Platform Cockpit, see How to Find the API Connection Data and OAuth 2.0 Authorization Data [page 573].
   g. Make note of the user data. You need the user data to create the communication arrangement.
4. Create a communication arrangement.
   a. Under *Communication Management*, choose *Communication Arrangements*.
   b. Choose *New*, select the scenario `SAP_COM_0837` *S/4HANA QM/NCM* - SAP Digital Manufacturing for issue resolution *Integration*, and choose *Create*.

      You can adapt the arrangement name if necessary.
   c. Under *Common Data*, select the *Communications System* from the input help you created previously and also:
      - Verify that the technical user is entered for *Inbound Communication*.
      - Verify that the service `Product Master (A2X)` is displayed under *Inbound Services*. Note down the Service URL as it is required in a later step.
   d. Under *Outbound Communication* select the *OAuth 2.0 Client ID* that was used to created the outbound user in the communication system.
   e. Under *Outbound Service* enter the paths as follows:

Description	Path
Navigation to SAP Digital Manufacturing for issue resolution App	Empty path
Issue Resolution Problem-Solving Process API	/odata/v4/ProblemSolvingProcessService/ProblemSolvingProcess

f. Save the communication arrangement.

Note:

The value of *Own SAP Cloud System* of the Communication Arrangement is sent as name of the source system to SAP Digital Manufacturing for issue resolution when problem-solving processes are created. This information is required when configuring the connection between SAP S/4HANA Cloud Public Edition and SAP BTP as described in the *Administration Guide* > *Connecting SAP BTP with SAP S/4HANA Cloud.*

5.3.1.1.1 How to Find the API Connection Data and OAuth 2.0 Authorization Data

In the communication system, you need to provide the host URL of the API where the SAP Digital Manufacturing for issue resolution system is running and the UI host URL. The following steps help you to find this data.

1. Log on to the SAP BTP cockpit.
2. Under *Subaccounts*, select your SAP Digital Manufacturing for issue resolution subaccount.
3. Under *Cloud Foundry* > *Spaces*, open the space for your SAP Digital Manufacturing for issue resolution subaccount.
4. Under *Service* > *Instances*, select the instance for your SAP Digital Manufacturing for issue resolution service.
5. In the *Service Keys* section, open the keys view.
   - The attribute "`psp_api` " contains the host URL you need for the communication system. Copy the URL without `https://`.
   - The client ID is provided by the attribute "`uaa.clientid`".
   - The client secret is provided by the attribute "`uaa.clientsecret`".
   - The server URL of the authorization server is provided by the attribute "`uaa.url`".

> **Note**
>
> Use authorization server URL to construct the token and authorization endpoint URLs:
>
> - Token Endpoint: **`<authorization server URL>/oauth/token`**
> - Authorization Endpoint: **`<authorization server URL>/oauth/authorize`**

5.3.1.1.2 How to Find the UI Host URL

In the communication system, you need to provide the UI host URL. The following steps help you to find this URL.

1. Log on to the SAP BTP cockpit.
2. Under *Subaccounts*, select your SAP Digital Manufacturing for issue resolution subaccount.
3. Under *Cloud Foundry* > *Spaces*, open the space for your SAP Digital Manufacturing for issue resolution subaccount.
4. Under *Instances and Subscriptions*, search for your SAP Digital Manufacturing for issue resolution subaccount.
   To create service instances and service keys, see 'Service Instance and Service Key.'
5. Choose *Go to Application* .
6. Log on to the system and copy the first part of the browser URL including "...**ondemand.com**".

5.3.2 Settings for Quality Notifications

5.3.2.1 Default Follow-Up Actions

The supplier, customer and internal problem-solving processes are triggered by follow-up actions, which are executed by the action box activities *Request Solution by Supplier*, *Start Problem-Solving* and *Start Internal Problem-Solving*. For this purpose the default follow-up actions `SAP_QNCP` (Start Problem-Solving Process) and `SAP_QNSP` (Request Solution by Supplier) and `SAP_QNIP` (Start Internal Problem-Solving) are provided.

Prerequisites

In the *Edit Code Groups* app, assign the follow-up actions `SAP_QNCP`, `SAP_QNSP` or `SAP_QNIP` to exactly one task code of catalog 2 (Tasks) and select the indicator *Follow-Up Action Relevance*.

Activities

You can check the follow-up actions in your configuration environment under *Notification Processing* > *Define Follow-Up Actions for Tasks*.

5.3.2.2 Default Settings for Action Box Activities

Find out how to configure default action box activities for supplier problem-solving processes in SAP S/4HANA Cloud Public Edition to ensure proper integration for various notification types.

For the integration of the supplier problem-solving process in SAP S/4HANA Cloud Public Edition the following action box activities are provided for the notification types `Q1` (Customer Complaint) and `Q2` (Complaint Against Supplier) as configuration content:

- `Q1` (Customer Complaint)
  - 0500: Start Solution by Supplier
    The follow-up action `SAP_QNCP` (Start Problem-Solving Process) is assigned to the activity.
  - 0510: Review Problem-Solving
- `Q2` (Complaint Against Supplier)
  - 0520: Request Solution by Supplier
    The follow-up action `SAP_QNSP` (Start Problem-Solving Process) is assigned to the activity.
  - 0530: Review Solution by Supplier
- `Q3` (Internal Problem Notification)
  - 0500: Start Problem-Solving
    The follow-up action `SAP_QNIP` (Start Internal Problem-Solving Process) is assigned to the activity.
  - 0510: Review Problem-Solving

Prerequisites

The action box activities are automatically visible in the action box for the corresponding notification type if the communication arrangement was created for SAP Digital Manufacturing for issue resolution integration scenario `SAP_COM_0837`.

You can hide the action box activities for a notification type with an implementation of the BAdI *Adjust Execution of Action Box Follow-Up Action* (`BADI_QQM_NOTIF_ACTIONBOX_FOA`) in the *Custom Logic* app.

Activities

You can check the action box activities in your configuration environment under *Notification Processing* > *Define Action Box*.

5.3.2.3 Define Partner as Person Responsible

Learn how to define a partner as the person responsible in SAP Quality Notifications, ensuring a responsible team member is assigned to the problem-solving process.

The creation of a problem-solving process from a quality notification requires a responsible partner to be added as the first team member. If no responsible person can be determined, the system cannot create the problem-solving process.

The following settings are required:

1. You assign a partner function to a notification type. In your configuration environment use the search function to open the activity *Assign Partner Functions to Notification Type* and assign a partner function to *Person Responsible*.
2. In the quality notification you need to add a partner to the partner function assigned to *Person Responsible*. The e-mail address of the partner that is entered in the partner function assigned to *Person Responsible* also belongs to a user in SAP Digital Manufacturing for issue resolution as well.
3. The partner is added as first team member in the problem-solving process in SAP Digital Manufacturing for issue resolution. You can change their role or delete the team member in the problem-solving process.

5.3.2.4 Settings for Navigation

For the integration of SAP Digital Manufacturing for issue resolution with quality notifications you need the authorization for remote app *Manage Problem-Solving Processes* (F3909).

The app is assigned to business catalog `SAP_QM_BC_NOTIFICATIONS_PC`. If the business catalog is assigned to the business role for a business user in the *Maintain Business Role* app, no further action is required.

Related Information

Configuration of Integrated SAP BTP Apps

6 SAP Digital Manufacturing for edge computing Integration

This section provides an overview of supported integration scenarios for SAP Digital Manufacturing for edge computing.

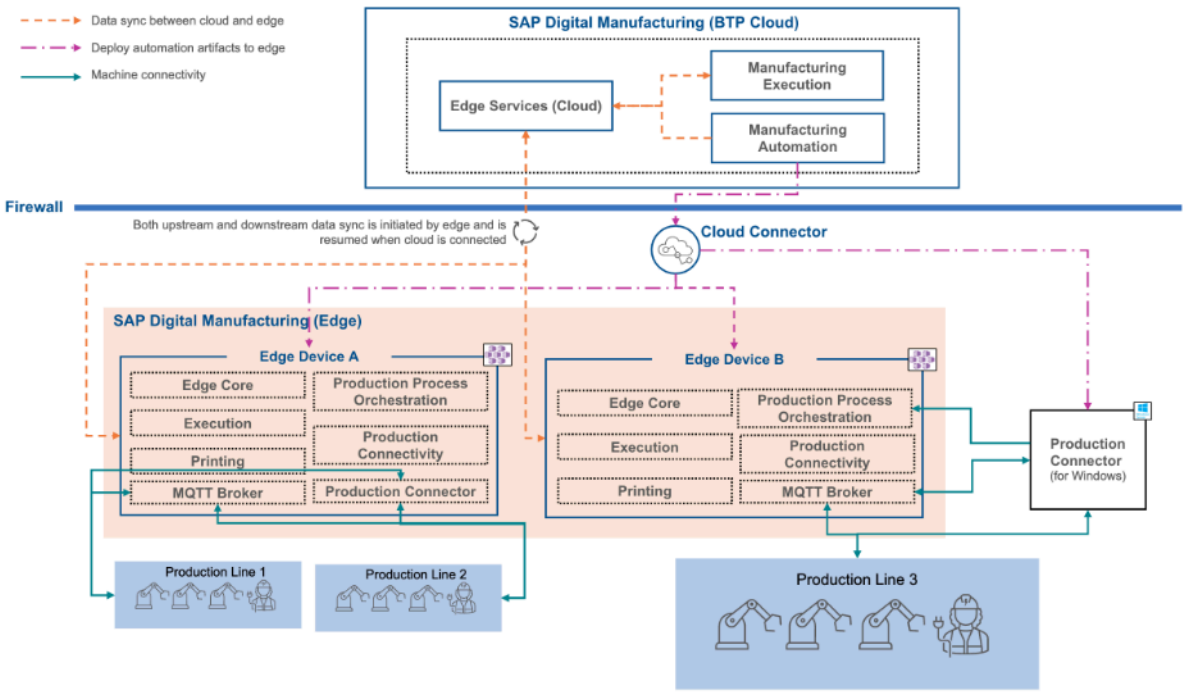
Additionally, an SAP MQTT Broker on edge is provided by SAP. The broker is located on a Kubernetes cluster fully operated by an SAP customer, as a capability of the SAP Digital Manufacturing for edge computing solution. (See: SAP MQTT Broker [page 579])

For integrating your own APIs and apps with SAP Digital Manufacturing for edge computing, see API Integration and UI Integration.

Overview

The following diagram provides an overview of the integration scenarios for SAP Digital Manufacturing for edge computing.

Additionally, the diagram demonstrates the connection of Production Connector on Windows as a standalone system and Production Connector on edge with related modules in edge devices and machines across one or more production lines. This integration scenario allows for the possibility of either one plant per edge device or multiple plants per edge device.



6.1 Enable Production Connector to Invoke Edge Services

This topic describes steps on enabling Production Connector (Windows) to invoke APIs of SAP Digital Manufacturing for edge computing.

Prerequisites

- You have obtained a client certificate issued for a technical user "dm-edge-services".
- You have obtained the CA certificate signing the SAP Digital Manufacturing for edge computing server certificate. The CA certificate file must include the entire CA chain, starting with the signing CA and ending with the root CA.

Procedure

1. Concatenate the client certificate and key and export to `client.pfx`. Below command assumes that the client certificate file is `client.crt` and its key file is `client.key`.

   ```
   openssl pkcs12 -export -out client.pfx -inkey client.key -in client.crt
   ```

2. In the *Manage Computer Certificates* window of the Windows machine where the Production Connector is installed:
   a. Import the CA certificate to the *Trusted Root Certification*
   b. Import the client pfx file to the *Web Machine Default*
3. Copy the root CA certificate to the `C:\ProgramData\sap\ProdCon\CertificateStores\TrustedCertificates\certs` folder. Copy the signing CA certificate to the `C:\ProgramData\sap\ProdCon\CertificateStores\TrustedIssuers\certs` folder.
4. Connect the Production Connector web server to the SAP Digital Manufacturing for edge computing services type web server and choose the client certificate you have imported in step 2.b. This also ensures that these services are available for use in the left panel of the production process designer. For details, see Setting up Connections Between Web Servers, Edge Web Server, and Configure Client Proxy for Third-Party Service.
5. Add the service to the connected web server. For details, see Adding and Deploying Services from a Connected Web Server.

Related Information

Available Services and Subprocesses
Manage Subscriptions

6.2 SAP MQTT Broker

The SAP MQTT Broker is the central component in the MQTT-based communication system of SAP.

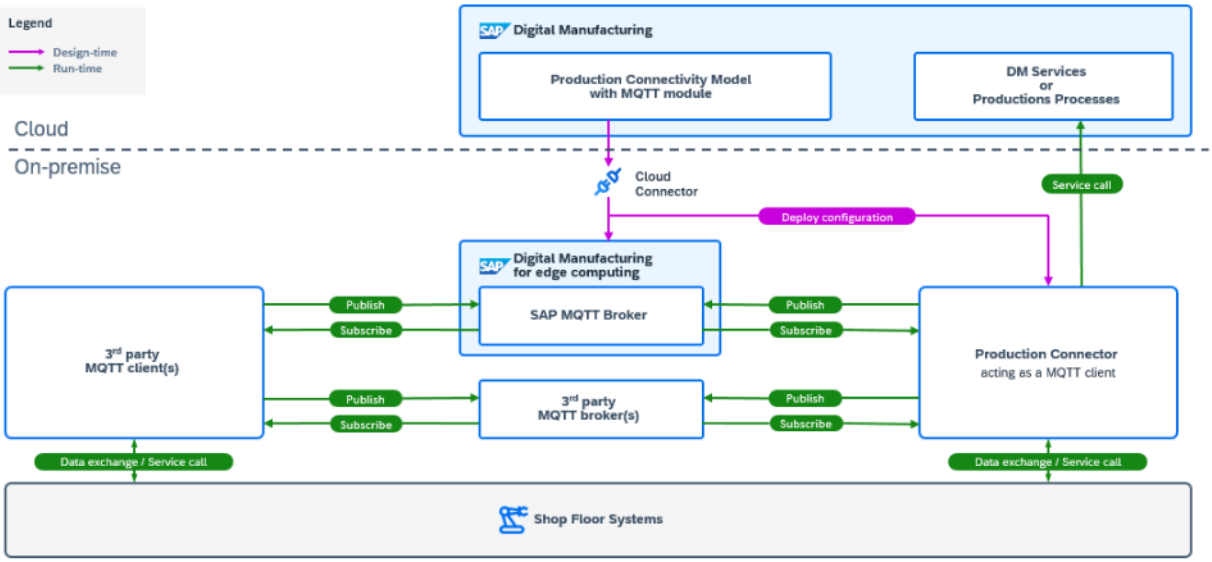
> ⚠ Caution
>
> In a future release, SAP MQTT broker will be deprecated. You are recommended to use a third-party MQTT broker. For more information, refer to: Third-Party MQTT Broker.

The SAP MQTT Broker is the central component in the MQTT-based communication system of SAP. The SAP MQTT Broker acts as a message broker or message server that enables communication between the MQTT clients. The broker receives messages published by clients on a certain topic and sends these messages to the clients subscribed to the same topic. At SAP, the Production Connector is the MQTT client that connects to the SAP MQTT Broker.

> ⓘ Note
>
> You can configure and use only one SAP MQTT Broker per edge Kubernetes cluster.

The MQTT messages exchanged via the broker usually represent tags, events, or time series data generated by MQTT clients, for example, to report the status of a machine on the shop floor.

Possible MQTT clients are machines, shop floor systems, or servers that can run an MQTT library and can connect to the SAP MQTT Broker over the network. The Production Connector (on Windows) can also run an MQTT client to connect to the SAP MQTT Broker, and thus exchange messages with other MQTT clients on the shop floor. An MQTT client can take the role of a publisher or a subscriber. When the Production Connector runs as a publisher, it publishes messages on a target topic that other MQTT clients will receive if subscribed to that topic. Messages from the Production Connector can originate from custom processes in SAP Digital Manufacturing, or from tags or events that the Production Connector reads from other shop floor devices. When the Production Connector runs as a subscriber, it receives messages published by other MQTT clients on certain topics that the Production Connector must be subscribed to. Such messages may represent measured values from sensors or events from the shop floor. After receiving them, the Production Connector may forward them to a destination within SAP Digital Manufacturing, or to other shop floor devices that the Production Connector is connected to.



The Manage Message Brokers app is part of the Production Connectivity Model in the cloud. The configured data, such as certificates that are required for secure communication or authorization data to control the access to MQTT topics, are sent to the edge Kubernetes cluster via the Cloud Connector after you have deployed the configuration.

The configuration that controls access to the SAP MQTT Broker is performed in the *Manage Message Brokers* app, in the *Clients* and *Production Connectors* sections:

- The *Clients* section configures the authorization policies that regulate access to the SAP MQTT Broker via third-party clients. This configuration results in data that's deployed to the SAP MQTT Broker.

  > ⓘ Note
  >
  > Third-party clients must also be configured so that they can successfully connect to the broker, as they need to be provided with a valid client certificate, the MQTT URL, and so on. SAP takes no responsibility for the provisioning of this configuration to third-party clients. You must ensure that clients have the appropriate configuration to successfully connect to the SAP MQTT Broker.

- The *Production Connectors* section controls the configuration that enables a Production Connector to connect to an SAP MQTT Broker. SAP takes the responsibility of propagating the required configuration on both the SAP MQTT Broker and the Production Connector.

> ⓘ Note
>
> The Production Connector only supports the payload of type JSON. Payload is a data structure that contains the contents of an MQTT message that is to be transferred. It is possible to send images, text in any encoding, encrypted data, and virtually all data in binary form.

Related Information

SAP MQTT Broker Deployment: An Introduction

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