Infor Education
Master Infor products.
Maximize your potential.

Infor OS: Configuring ION Connect Training Workbook

Infor OS

July 15, 2022

Course code: 01_9952106_IEN0030_ION

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About this workbook

Welcome to this Infor Education course! We hope you will find this learning experience enjoyable and instructive. This Training Workbook is designed to support the following forms of learning:

- Classroom instructor-led training with an Infor certified instructor
- Virtual classroom instructor-led training with an Infor certified instructor
- Self-directed learning through Infor Campus

This Training Workbook is not intended for use as a product user guide.

Workbook design

This Training Workbook contains both conceptual information to introduce topics and step-by-step procedural instructions for practical application of those concepts.

Symbols and notes are provided throughout this Training Workbook for ease of reference. Refer to the *Symbols used in this workbook* section below to familiarize yourself with these symbols.

The PDF bookmarks pane provides quick and easy navigation between lessons, topics, and appendices, when needed.

Instructor-led training (ILT)

If you are taking this course as ILT, your instructor will provide details on accessing the Infor Education Training Environment needed to complete the student exercises. Your instructor will also assign you and other students an account login and password from Appendix A of this Training Workbook.

Some exercises in this workbook cannot be performed in the live Training Environment that is shared by multiple students during class. In these instances, a hyperlink to a recorded simulation is provided in the Training Workbook for your reference. Your instructor may also perform the exercises one time in the system on behalf of the class, if needed. Do not attempt to complete the steps for any of these demos in the system. Doing so could adversely affect the Training Environment, the intended flow of the course, and the success and quality of the course for all students in the class.

Self-directed learning (SDL)

Some SDL courses offer Lab on Demand in addition to simulations. If you are taking this course through Infor Campus as SDL, and the course offers Lab on Demand, refer to the Lab on Demand screen in the self-directed learning course for course environment information. The Lab on Demand screen includes instructions and logins to launch and access the corresponding Infor Education Training Environment as well as logins and passwords required for completion of course exercises and demos.

The exercises and demos in this course build upon each other as they prepare the system for subsequent exercises and demos. If you are taking this course as SDL with Lab on Demand, you must complete all of the exercises and demos in the order they are presented in the Training Workbook. This ensures you will achieve the expected results and a successful course outcome.

Instructor-recorded presentations and simulations (SDL only)

If you are taking this course as SDL, there may be instructor-recorded presentations and/or simulations available to assist you.

If instructor-recorded presentations are available, a hyperlink to the recording will be included on the first page of each corresponding lesson of the interactive workbook on the Training Workbook tab of the self-directed learning course.

If simulations are available, the demos and exercises throughout the interactive Training Workbook will include hyperlinks to simulations that allow you to view and/or practice the execution of the demo or exercise. These same simulations are also accessible via the Demonstrations tab of the self-directed learning course. Please note that the data used in some simulations may not exactly match the data provided in the Training Workbook.

Learning Libraries

Learning Libraries in Infor Campus include learning materials that are available to you online, anytime, anywhere. These materials can supplement instructor-led training, providing you with additional learning resources to support your day-to-day business tasks and activities.

Please note that if you accessed this Training Workbook directly via a Learning Library, you will not have access to the Infor Education Training Environment that is provided with all instructor-led and most self-directed learning course versions, as referenced above. Therefore, you will not be able to practice the exercises in the specific Training Environment for which the exercises in this Training Workbook were written.

Symbols used in this workbook


Exercise


Your notes


Question


Demo


Important note


Answer


Scenario or Discussion


Critical note


Task simulation


For your reference


Simulated activity

Course overview

Estimated time

0.5 hours

Learning objectives

Upon completion of this course, you should be able to:

- Provide an overview of the parts of ION Connect.
- Illustrate how the Enterprise Connector is used.
- Identify the different types of Data Flows used in ION Connect.
- Demonstrate how API Flows are used in ION Connect.
- Describe advanced filters including routing, merging, splitting, and file transformation.
- Define working with the ION Messaging Service (IMS).
- Demonstrate the use of scripting in Data Flows.
- Demonstrate how to work with custom and error BODs.

Topics

- What’s new or removed in this course
- Course description and agenda

What’s new or removed in this course

The following are new or removed in this version of the course:

- A simulation for installing Enterprise Connector was added to this course.
- Network connectors were added to this course.
- API Flows were added to this course.
- Scripting was added to this course.

Course description and agenda

This course covers the skills necessary to configure and manage Infor ION Connect. Topics include external system connection points, the Enterprise Connector, Data Flows, API Flows, advanced filters, ION Messaging Service (IMS), ION scripting, and custom and error BODs. This training is for Infor OS Cloud Edition. Previous course name/code: Infor OS: Configuring ION Connect (CE) - 01_9952006_IEN0004_ION.

Course duration

16 hours

Prerequisite courses

- Infor OS: Foundation for On Premises and Single Tenant (01_0951200_IEN0070_ION) and Infor OS: Foundation Differences for Multi-Tenant (01_9952107_IEN0028_ION)
  or
- Infor OS: Foundation for Multi-Tenant - Part 1 (01_9952012_IEN0014_ION) and Infor OS: Foundation for Multi-Tenant - Part 2 (01_9952012_IEN0012_ION)

Prerequisite knowledge

To optimize your learning experience, Infor recommends that you have the following knowledge prior to taking this course:

- Understanding of Extensible Markup Language (XML) and XML schemas
- Understanding of Structured Query Language (SQL), basic procedural language extensions to the SQL/transact-SQL (PLSQL/T-SQL)

Audience

- Customer user
- Pre-sales consultant
- Business consultant
- Technical consultant
- Support
- System administrator

System requirements

- Infor OS Training Environment

Reference materials

Infor OS reference materials are available from the following locations:

- Infor OS Help menu
- Infor Concierge®

Course agenda

The agenda below details the contents of this course, including lesson-level learning objectives and supporting objectives.

Lesson	Lesson title	Learning objectives	Estimated time (hours)
Course overview		Review course expectations.	0.5
1	ION Connect overview	Provide an overview of the parts of ION Connect. • Explain the basics of ION. • Describe what network connectors are used for. • Define how the programs work together. • Define uses for ION OneView.	1.0
2	The Enterprise Connector	Illustrate how the Enterprise Connector is used. • Describe the usage of the Enterprise Connector. • Demonstrate the process of installing an Enterprise Connector.	2.0
3	Data Flows	Identify the different types of Data Flows used in ION Connect. • Explain the different types of Data Flows. • Describe the difference between Document Flows and Data Lake Flows. • Describe file connection points. • Describe FTP and SFTP transfers. • Explain how to set up and use database connections.	2.0
4	API Flows	Demonstrate how API Flows are used in ION Connect. • Explain API Flow usage.	1.5
5	Advanced filters	Describe advanced filters including routing, merging, splitting, and file transformation. • Compare filters and routing.	3.0

Lesson	Lesson title	Learning objectives	Estimated time (hours)
		• Describe advanced filters. • Describe merging. • Describe using a Splitter. • Describe the ION Mapper. • Create a Data Flow using a splitter. • Create a Data Flow using the ION Mapper.	
6	ION Messaging Service (IMS)	Define working with the ION Messaging Service (IMS). • Explain how to use IMS and IMS via API. • Define message queues.	2.0
7	ION scripting	Demonstrate the use of ION scripting in Data Flows. • Provide an overview of ION scripting.	1.0
8	Working with custom and error BODs	Demonstrate how to work with custom and error BODs. • Define custom BOD development. • Explain how to work with error BODs.	2.0
Course summary		Debrief course.	0.5

Appendices

This section contains information that is not part of the instructional content of this course, but it provides additional related reference information.

Appendix	Appendix title	Content description
Appendix A	User accounts	This appendix provides a reference for student and instructor login credentials and if applicable, assigned exercise data.
Appendix B	Check your understanding answers	This appendix provides answers to the check your understanding questions found at the end of each lesson.

Appendix	Appendix title	Content description
Appendix C	Simulated activity steps	This appendix provides the steps to the simulated activities.

Lesson 1: ION Connect overview

Estimated time

1.0 hour

Learning objectives

After completing this lesson, you will be able to provide an overview of the parts of ION Connect. In this lesson, you will:

- Explain the basics of ION.
- Describe what network connectors are used for.
- Define how the programs work together.
- Define uses for ION OneView.

Topics

- ION basics
- How the products are related
- ION OneView

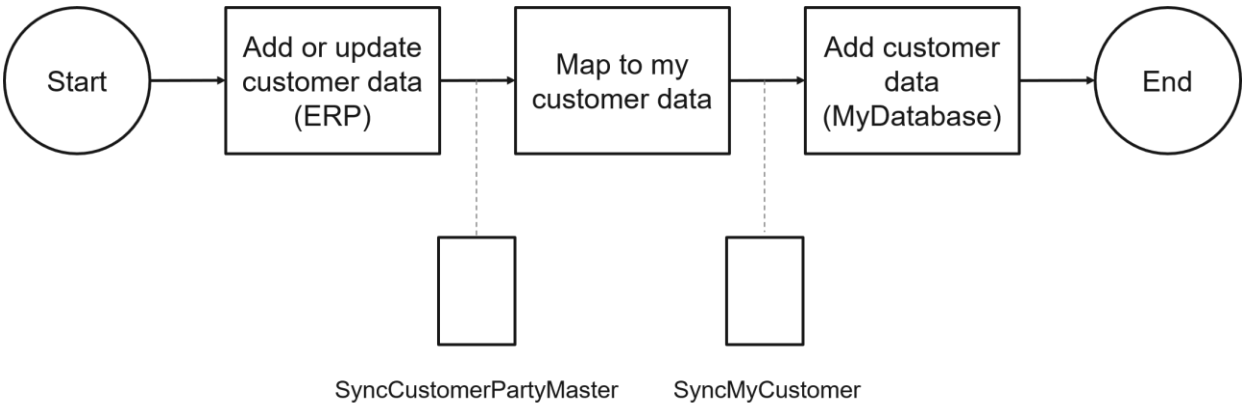
ION basics

With ION Connect you can establish connections between applications which can either be Infor applications or locally deployed third-party applications.

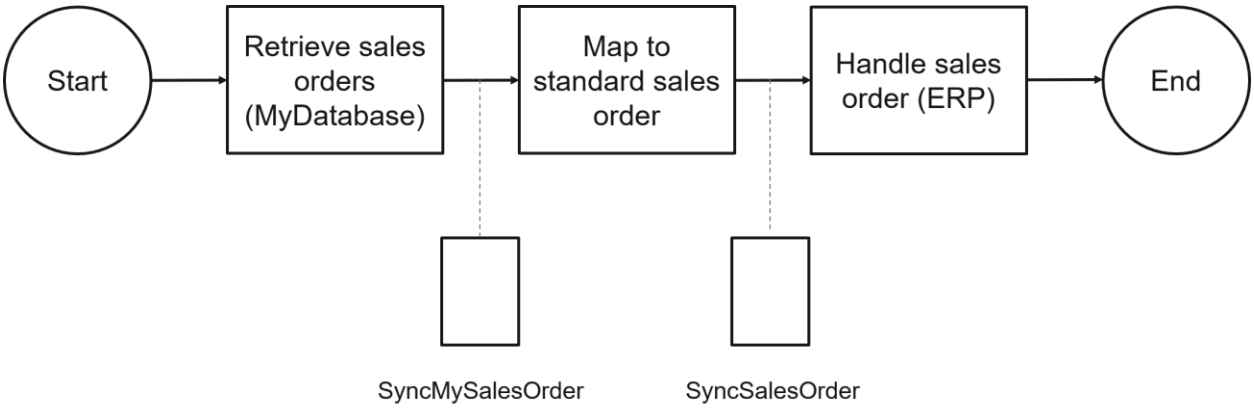
The Infor applications can either be in Infor Cloud or on-premises. Typically, Infor applications use standard business object documents (BODs) and third-party applications do not.

Each third-party application has its own data structure; you require mapping to transform the data from the third-party application to the data as expected by other connection points.

These are examples using a third-party connector. The database illustrates a third-party destination.



Document flow to send order data from Infor application to database



Document flow to send order data from database to Infor application

Connection points

Connection points for integration with cloud applications are created by the system administrator depending on your entitlement. You can use these connection points in data flows and you can edit their document configuration.

For the on-premises applications that require an integration through Infor ION Cloud Edition (CE), you must create the connection points yourself. The on-premises applications communicate with Infor ION Cloud Edition (CE) through the Enterprise Connector (EC).

Note: Connection points are not activated separately. A connection point is activated automatically when a data flow that uses that connection point is activated.

The Enterprise Connector currently supports the connection points described here.

Connection point	Description
File connection point	• Connection from ION to a local application that cannot send or receive BODs but can create/process files • Connection from the file connection point through the Enterprise Connector to the local file application • Supports connecting to a local file server using FTP or SFTP and to a local Windows shared folder

Database connection point	• Defines a connection from ION to a third-party application that cannot send or receive BODs, but has a database available
	  ○ You can retrieve data from a database and send it to one or more Infor applications.
	  ○ You can also use data from Infor BODs to update your database.
	• Connection from the database connection point through the Enterprise Connector to the local database application

Message queue connection point	• Offered as connectivity through message queues
	  ○ ION Desk offers the ability to create a connection point to read or write a message queue.
	  ○ ION Java Messaging Standard (JMS) queues are used.
	  ○ You can send or receive messages to or from ION.
	• Connection from the message queue connection point through the Enterprise Connector to the local JMS application

ION API connection point	• Defines a connection from ION to a REST API interface of application
	  ○ You can send data to the application, retrieve data from an application, and send it to one or more applications.
	  ○ You can also use data from ION to retrieve appropriate response data.

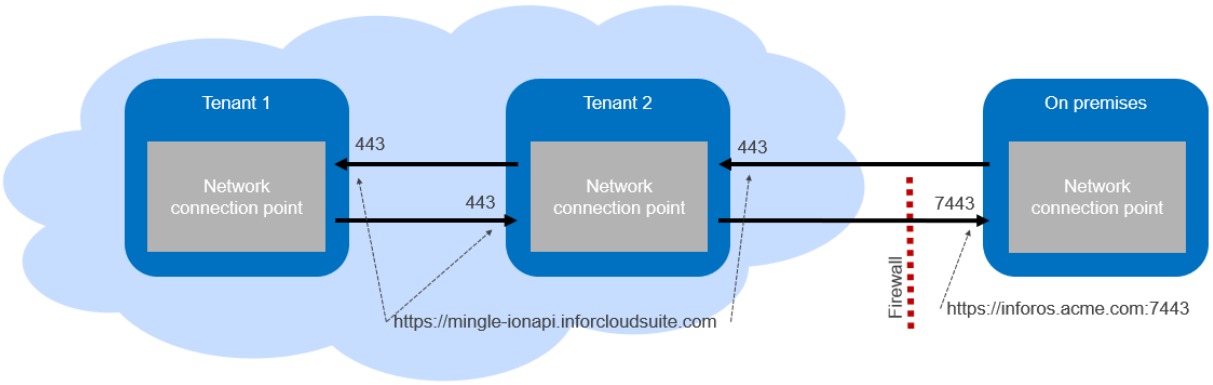
ION network connection point

The ION network connection point enables integration with another Infor OS deployment, with an Infor OS customer environment in the Infor Cloud, or an on-premises deployed Infor OS. The integration uses Infor ION API as proxy. This can be a bidirectional or unidirectional (receive from/send to partner) integration.

For multi-tenant to on-premises environments, the on-premises server must have port 7443 on the firewall open to IMS ION API. It is not possible to define the internal and external name manually in ION API.

The sending environment is set up as an **ION API authorized app** (*.ionapi file) and it grants access to the remote side.

In an on-premises environment, port 7443 is used for ION API. The same alias is used for Infor OS and the ION API connection.



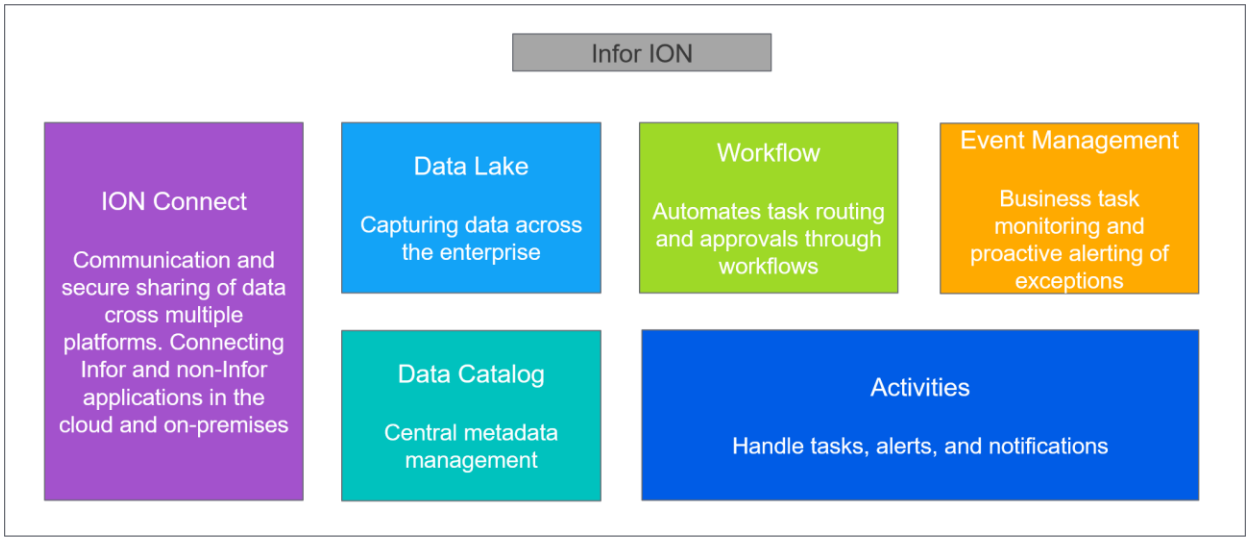
The ION network connection point

How the products are related

Infor ION is an interoperability and business process management platform designed to integrate applications, people, processes, and data to run your business.

Infor ION enables Infor and customer activities to configure a routed infrastructure, set up workflows, design and activate business event monitors, and manage the tasks and alerts through Infor Ming.le™.

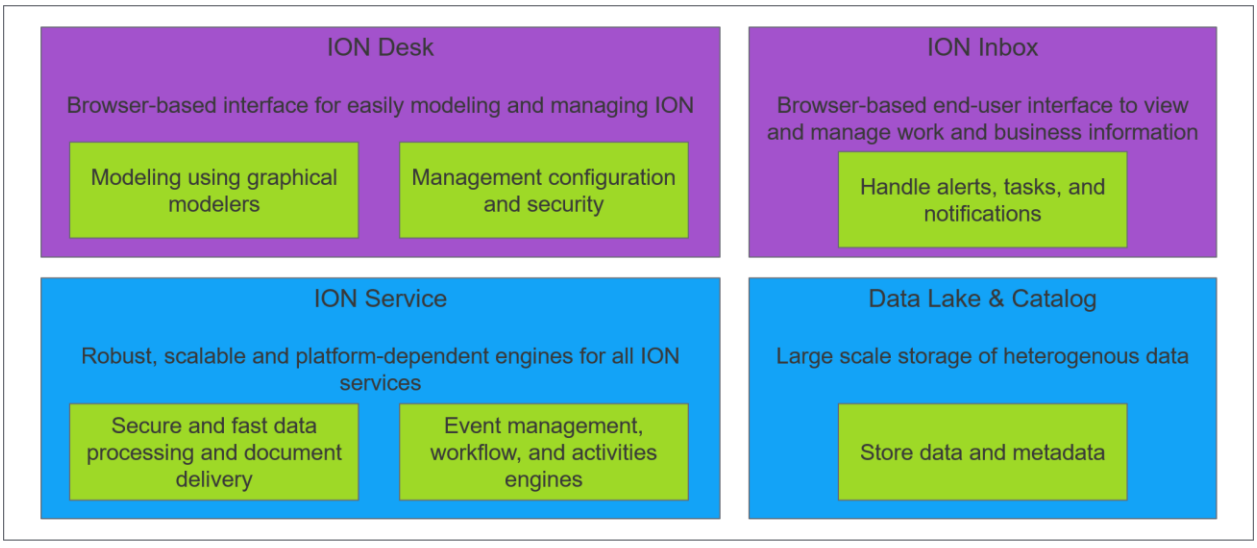
This diagram shows the Infor ION components.



Infor ION components

The Infor ION suite is a set of services built by Infor that simplifies connectivity and data sharing across all applications.

This diagram shows the Infor ION suite broken out into its different components that can be seen in ION Desk.



Infor ION suite

Exercise 1.1: Infor OS overview

In this exercise, you will log in to Infor OS and download the course files to be used throughout the exercises in this course.

Before you begin:

- Ensure you are logged in to the Training Desktop for the Infortrn user account.

  Note: Your instructor will assign user account logins and passwords from Appendix A of this Training Workbook.

Exercise steps

Verify you are logged in to the Training Desktop. If not, log in following instructions provided by your course instructor.

Note: Some SDL courses offer Lab on Demand in addition to simulations. If you are taking this course through Infor Campus as SDL and the course offers Lab on Demand, follow the instructions on the course Lab On Demand screen.

Part 1: Log in to Infor OS

1. Double-click the **Infor OS** icon on the desktop.
2. Type *[your assigned Infor Ming.le username]* in the **Username** field.
3. Type *[password from the instructor]* in the **Password** field.
4. Click the **Sign in** button. The **Infor OS** application opens in Google Chrome.

Part 2: Download items from IDM

1. Click the **App Menu** icon.
2. Click the **Document Management** shortcut.
3. Click the **Search Document Management** drop-down arrow.
4. Click the **Document Type** drop-down arrow.
5. Click the **Infor EDU Class Resources** list item.
6. Click the **Search** button.
7. Click to select the **InforOS_ConfiguringIONConnect.zip** check box.
8. Click the **Download** icon.
9. Click the **Original Format** list item.
10. Click the **up arrow** for the **InforOS_ConfiguringIONConnect.zip** item in the taskbar.
11. Click the **Show in Folder** list item.
12. Right-click the **InforOS_ConfiguringIONConnect.zip** file.
13. Click the **Extract All** list item.
14. Click the **Browse** button.

15. Click the **Desktop** icon.
16. Click the **New Folder** link.
17. Type *Class Files* in the **Folder** field.
18. Click the **Select Folder** button.
19. Click to clear the **Show extracted files when complete** check box.
20. Click the **Extract** button.
21. Click the **X** button to close the **Explorer** window.

ION OneView

You access ION OneView by selecting **OneView** in the ION Desk navigation pane.

ION OneView is used to:

- Track business documents from a single consolidated view and searching for documents using different search criteria.
- View all ION components that were triggered by the incoming document.
  This includes connection points, document flow filters and content-based routing, mappings, ION engines (e.g., monitor, workflow, activities), monitors, activation policies, and workflows.
- View more details of these ION components:
  - Detailed properties for each ION component displayed.
  - List of events that were logged by each ION component when processing the message.
  - Drill-down views to display the appropriate manage pages that are related to the selected ION component.
- Give visibility and correlation of the different messages sent or generated:
  - Original messages that triggered the whole list of components displayed
  - Confirm BODs messages generated due to any error when processing the original message
  - Mapped/updated messages created during the processing of the original message
- View content of messages.
  - This is only available for authorized users - based on the roles and permissions configured. When viewing the contents of a message you can format the message to make it more readable. By default the message contents are displayed as is. When the used format in the message content is not readable, download the whole message and determine its content with your tools.

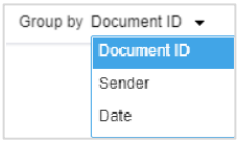
ION OneView displays:

- Timeline view: This is a graphical representation of the message trip within ION and all ION components that were triggered during that trip.
- Advanced view: This is a list of all the events that were logged for the message during its processing within ION.

Search documents in ION OneView

The controls used on the **OneView** page toolbar are described in the following table:

Name	Type	Description
Refresh		Refreshes the live data • Some of the search fields drop-down values are dynamically generated based on the available data to search on.
Reset		Clears up custom filters and resets all the filters to default

Name	Type	Description
Filters		Saves the search criteria • If you save the search criteria, the **Filters** icon becomes “filled.”
Filters		Indicates that the search criteria are saved and are used if you bookmark the page • To bookmark the page, click the **Bookmarks** icon in the Infor Ming.le top navigation panel. • If you open the saved bookmark from the Infor Ming.le Bookmarks menu, the OneView page opens and the saved search criteria are applied automatically. • If you edit the saved search criteria, the icon becomes "unfilled." To save the updated search criteria and use them when bookmarking the page, click the **Filters** icon again.
Group-by		Selects a custom filter to use for grouping of the search results together with the document type and document name • Available options are Document ID (default), Sender, and Date.
Timeline		Selects **Timeline** view for the search results • The icon is faded when Timeline view is selected.
Advanced		Selects **Advanced** view for the search results • The icon is faded when Advanced view is selected.
Search		Opens or closes the **Search** panel • This control is used to gain more space for the results.
Settings		Opens or closes the **Settings** panel • This control is used to customize the view of the components by show or hide components. • These settings are saved for each ION user logged. • The settings are saved within a specific machine.

When available, you can use the **Text** field filter to get more precise results and search faster. Click the **Search** button to start searching with the specified filters.

This text filter options are described in the following table:

Name	Type	Description
Starts with		Shows the documents where the value **Starts with** the search string
Equals		Shows the documents where the value is exactly identical to the search string
Contains		Shows all the documents where the value **Contains** the search string

Basic search

You can use a basic search with most commonly used filters.

The basic search fields are described in the following table:

Search criteria	Description
Date and Time Range	This field represents the date-time in which messages started their processing within ION (Message entered ION event). Click the calendar button to select the search period: • **Last hours (1-23)** selects documents from date range starting from exactly (selected value from 1 to 23) multiplied by 60 minutes in the past till current date-time in UTC. • **Last 24 hours** selects documents from date range starting from exactly 24 hours in the past till current date-time in UTC. • **Last 7 days** selects documents from date range starting from exactly seven days in the past till current date-time in UTC. • **Date Time Range** selects documents with date range between the specified "Start Date" and "End Date" including time (hh.mm). "End Date-Time" must be later than "Start Date-Time." • **All** selects anything until the current date-time.
Document Name	This field lets you search by a document name, for example, Sync.SalesOrder. Documents are selected from the drop-down list which shows the documents that are processed by ION and for which the current user has view permission.

Search criteria	Description
	To update the list, click Refresh. To filter the list of available documents use a search field on top of the list and specify a search string in the field to see only those documents that contain the specified string. **Note:** This filter is only working when the selected display view is "Time-line."
Document ID from Message Content	This field lets you specify one or more document IDs, comma-separated. To limit the search results and improve the response time, use the text filter. If the document ID is not found in the message content. The document ID from the message header is used, unless it is blank or wrapped in double quotes. **Note:** The ION OneView engine does not support field values enclosed in double quotes. The double quotes indicate that the search value is a "phrase" meaning the search engine searches for an exact match. The use of values that are enclosed in double quotes is forbidden.

Custom search

You can search by important fields from document contents, using values of required and optional header fields. You can also search for documents that are handled in certain objects such as connection point, activation policy, and mapping.

Button	Description
	Located next to the Filters header • With this button you can add an advanced search filter.
	Located above each search field • Use this button to remove any filter.

The **Field Type** drop-down has a list of search fields grouped by categories. The options available depend on the actual search data. Click **Refresh** to update the lists.

When searching you can use any combination of elements from these groups, combined with the three basic criteria.

After selecting the field type, specify a value in the matching field. When selected, the value is removed from the list of options.

Exercise 1.2: Using OneView

In this exercise, you will explore ION OneView and the filters.

Before you begin:

- Ensure you are logged in to Infor Ming.le and are at the homepages screen for your assigned user account. If not, refer to Exercise 1.1.
- Ensure you have completed Exercise 1.1 because it provides data or configurations for this exercise.

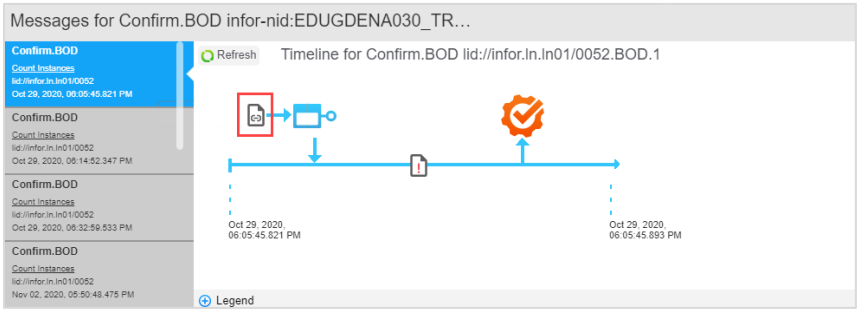
Exercise steps

Part 1: Use the filter

1. Click **App Menu > ION Desk > OneView**. **Note:** You may need to click the **hamburger** icon to see the menu.
2. Click the **+** button. The **+** button is next to the **Filters** heading.
3. Click to select the **Sender Logical ID** check box.
4. Click the **OK** button. The **Sender Logical ID** filter option will be added.
5. Click the **Date and Time Range** calendar icon.
6. Click the **All** list item.
7. Type *lid://infor.ln.ln01/0000* the **Sender Logical ID** field.
8. Click to select the **lid://infor.ln.ln01/0000** check box.
9. Click the **Search** button. **Note:** Best practice is to use search criteria to limit your search results in some way.

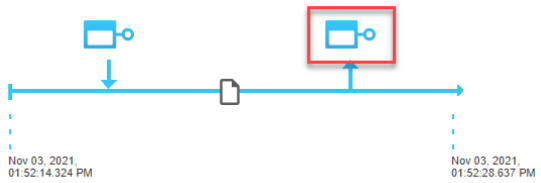
Part 2: Explore the search results

1. Click the **Sort by** drop-down arrow.
2. Click the **Document ID** list item. This will change the results to be sorted in **Document ID** order.
3. Click the **Confirm BOD** document. The left side shows all of the **Confirm BOD** instances.
4. Click a **Confirm BOD** document.
5. Click the first **document** icon if not already selected. This is the starting point of the BOD.

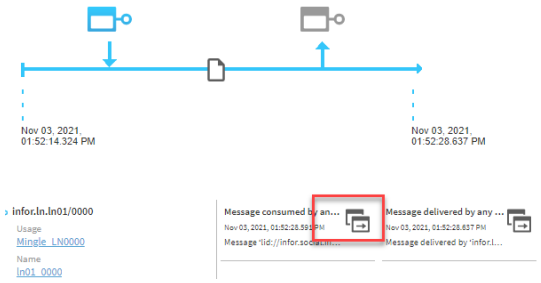


6. Make note of the **Document Details**.

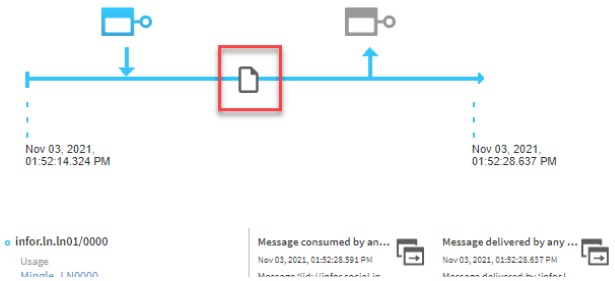
7. Click the **Show timeline for this message** link. **Note:** You may need to click a few confirm BODs to find one with a timeline.
8. Click the **Infor application connection point** icon.



9. Click the **grey** icon next to the **Message entered ION** or **Message consumed by** section.



10. Review the **Event Details**.
11. Click the **Close** button.
12. Double-click the **document** icon on the line. This opens the **Message Content** window.

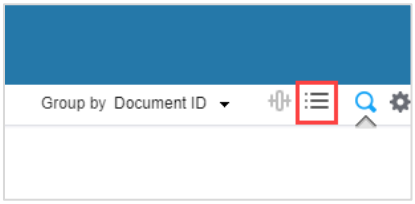


13. Click the **Format </>** icon.
14. Click the **download** icon. **Note:** The download icon is located at the top of the pop-up window.

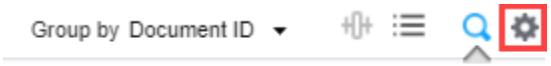
15. Click the **X** button to close the **Message Content** window.

Part 3: Navigation

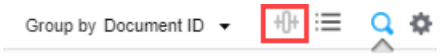
1. Click the **Advanced** icon. The data is now displayed in a less graphical, but more linear method.



2. Click the **Settings** icon. This allows you to further filter what results are displayed. **Note:** Most users will leave all of these filters activated.



3. Click the **Timeline** icon to return to the timeline view.



Check your understanding

ION Connect can only establish connections with Infor applications.

a) True
b) False

Infor ION is an interoperability and business process management platform designed to integrate applications, people, processes, and data to run your business. Select the included components from the list below.

a) Data Catalog
b) Data Lake
c) Event Management
d) ION Connect
e) Workflow

ION OneView provides two different views. Describe them.

_____

_____

_____

_____

Refer to Appendix B for answers to the check your understanding questions.

Lesson 2: The Enterprise Connector

Estimated time

2.0 hours

Learning objectives

After completing this lesson, you will be able to illustrate how the Enterprise Connector is used. In this lesson, you will:

- Describe the usage of the Enterprise Connector.
- Demonstrate the process of installing an Enterprise Connector.

Topics

- The Enterprise Connector
- Installing Enterprise Connector

The Enterprise Connector

You can use the Enterprise Connector to provide hybrid service integration for Infor cloud services and your local deployed services.

Enterprise Connector provides an out-of-the-box connectivity with Infor Cloud through AWS SQS and S3 web services, used for intermediate storage. The Enterprise Connector service is deployed in your on-premises infrastructure and is responsible for the communication with the Infor Cloud services. The Enterprise Connector uses outbound connections to Amazon Web Services® (AWS®) that are exposed through https and port 443. Only an outbound connection is required.

Infor Cloud services do not require any inbound connection to the Enterprise Connector. For performance reasons, the Enterprise Connector service must be installed close to the applications for which it has a connection point running. To achieve low latency, we recommend that the Enterprise Connector service is installed in the same network segment. You may have local services that are distributed over multiple physical locations. Therefore, it is supported to have multiple Enterprise Connector services for the same Infor Cloud tenant. In Infor OS, an Enterprise Connector is related to a location.

Installing Enterprise Connector

The Enterprise Connector arranges connectivity between ION in the cloud and your local application. The Enterprise Connector is running as a Grid service. Install it on a local Windows server, as close as possible to your application integration point. Since the exchange of messages is asynchronous through Amazon SQS and S3, ensure the Enterprise Connector service can access the Amazon services.

You can install multiple Enterprise Connectors at the same host. To separate these installations, each installation requires its own database, its own port numbers, and a unique name for the installation folder. The server must also be sufficiently sized to support the load of additional Enterprise Connectors.

When installing Enterprise Connector, NT SERVICE\ALL SERVICES must be granted the "Log on as a service" role on the Enterprise Connector server before the installer is run. This is a default setting in Windows, but it might have been revoked on your system.

Enterprise Connector currently supports these connection points:

Type	Description
Infor Application connection point	Defines a connection from ION to a local application that can send and receive messages. The messages are sent using Outbox tables and received using Inbox tables. ION connects to the Inbox and Outbox through JDBC.
IMS connection point	Defines an ION Messaging Service based connection point that can send and receive messages. The communication is https and REST based.
Infor LN/Baan connection point	A special type of application connection point that connects to a local LN/Baan system. The connection is made from the Infor LN/Baan connection point created through the Enterprise Connector to the LN application. The typical connection information of Infor LN, such as the hostname, BSE environment, username, password, and Bshell, is used. The Maximum processing time per message property in the Infor LN/Baan connection point defines the timeout for the processing of a single message. If there is no response from Infor LN/Baan after this time, processing of this message is stopped and a Confirm BOD is generated. ION continues with the processing of the next message. A timeout can happen if the message processing in LN is taking more time than the defined limit, or if the bshell does not respond anymore. When using the channels to enable parallel processing, the maximum number of bshells allowed per channel is limited to 10.
File connection point	Defines a connection from ION to a local application that cannot send or receive messages but can create/process files. The connection is made from the File connection point through the Enterprise Connector to the local File application. It supports connecting to a local file server using FTP or SFTP and to a local Windows shared folder.

Type	Description
Database connection point	With the Database Connector you can connect applications that cannot send or receive documents but have a database available. In this way, you can retrieve data from a database and send it to one or more Infor applications. Or you can use data from Infor BODs to update your database. There are two types of database connection point: • Stored Procedure • AnySQL Modeler With the Stored Procedure type you can call stored procedures that are defined in your database, pass inputs, and receive output in the form of Infor BODs. With the AnySQL Modeler you can create SQL select statements to read data from a database in visual modeler with minimum knowledge of SQL language. Learning specifics of each database protocol is not required. The same modeling experience is used for each of the supported database server types. Output is provided in the form of JSON documents.
Message Queue connection point	You can use connectivity through message queues. You can create a connection point to read or write a message queue. The Message Queue Connector of ION Enterprise Connector acts as a JMS client. A connection point that is configured as a JMS Client, enables ION to directly connect to external JMS queues that are provided by other vendors. Messages are transported back and forth. The use of this connection type requires a JMS BundleWrapper.

Accessing simulated activities

Infor recommends that you use the Chrome™ browser to launch the portable document format (PDF) Training Workbook and simulations using the following steps:

1. Navigate to the **PDF** file.
2. Right-click the **PDF file name > Open with > Google Chrome**.

Note: If you launch a simulation in Internet Explorer (IE), you may be asked for your credentials. You can bypass this by clicking OK to launch the simulation.

Simulated activity 2.1: Installing Enterprise Connector

This activity simulates how to install Enterprise Connector.

Do **not** attempt to perform the steps of this simulated activity in the Infor Education training environment. Doing so will interfere with the configurations made for this course and could cause damage to the training environment.

If you are taking this course as instructor-led training, the instructor will use the Show Me feature of the simulated activity to review the steps and demonstrate this activity. After the instructor's demonstration, you will have the opportunity to practice the steps using the Guide Me feature of the same simulated activity.

While you are practicing the activity in the simulated training environment, you can follow the steps provided in Appendix C: Simulated activity steps.

Click **here** to practice this task in a simulated training environment.

Configuring Enterprise Connector

If Enterprise Connector is installed on a Windows platform, then by default, only the user that installed Enterprise Connector has access to the installation folder. In order to add access for additional users, they must be added to the IONEnterpriseConnector_full group.

Scenario

In Exercise 2.2, there is a third-party vendor that sends you a full BOD file that needs to be brought to LN and processed. This vendor can output to full BOD files, but does not have the ability to connect directly to ION. In this exercise, we will examine setting up the file connection point to read the file in from a shared folder and send it on to LN for processing, this is making use of the Enterprise Connector to securely connect to the local shared drive to pick up the file.

Exercise 2.2: Set up and test an EC connection point in ION

In this exercise, you will set up a new Enterprise Connection (EC) point.

Before you begin:

- Ensure you are logged in to Infor Ming.le and are at the homepages screen for your assigned user account. If not, refer to Exercise 1.1.
- Ensure you have completed Exercise 1.1 because it provides data or configurations for this exercise.

Exercise steps

Part 1: Setting up the Enterprise Connector

1. Double-click the **FileShare** icon on the desktop.

   Note: If this shortcut does not appear:

   - Click the **search (magnifying glass)** icon in the **Microsoft Windows** taskbar.
   - Type *\\EC-2020\FileShare* in the **Search** field.
   - Press **Enter**.
   - Type *Inforuser* in the **User Name** field.
   - Type *!nfor08* in the **Password** field.
   - Click the **OK** button. The **FileShare** folder opens.
2. Double-click the **ION_Connect** folder.
3. Right-click the blank space.
4. Click the **New** menu.
5. Click the **Folder** menu item.
6. Type *STB[XX]* in the **New Folder** name field.

Note: In this course, when the exercise step indicates XX, replace XX with your assigned student ID number. For example, if your student ID number is 03, type *STB03*. Refer to **Appendix A** for your assigned credentials.

7. Press **Enter**. Leave this folder open for future exercises.
8. Click the **Google Chrome** icon in the taskbar to return to **Infor ION Desk.**
9. Click the **Connect** menu.
10. Click the **Data Flows** menu item.
11. Click the **+ Add** button.
12. Click the **Document Flow** list item.
13. Type *STB[XX]_ECtoLNFile* in the **Name** field.
14. Type *This flow will move files to LN* in the **Description** field.

Part 2: Create the document flow

1. Drag a **File** connector between the **Start** and **End** items on the document flow.
2. Drag an **Application** connector after the **File1** item on the document flow.
3. Click to select the **File1** activity.
4. Type *EC* in the **Name** field.
5. Click the **Save** button.
6. Click the **New** button. The **New** button is located next to the **File Connector** drop-down arrow.
7. Click the **File** list item.
8. Type, select, or confirm the following on the **File Connection Point (through Enterprise Connector)** screen:

Item	Details
Name	STB[XX]_FileECOUT
Description	File Enterprise Connector Outbound
Location	[Available Location] **Note:** There should only be one option here.
Transfer Protocol	Shared Folder
SMB v2	Unchecked
Host Name	EC-2020
User Name	Inforuser
Password	!nfor08

9. Click the **Test** button. A message that the test succeeded displays.
10. Click the **OK** button.
11. Click the **Save** button.
12. Click the **Documents** tab at the top of the screen.
13. Click the **+ Add** button.
14. Confirm the **Read a file from a folder** radio button is selected.

15. Click the **Document** radio button.
16. Click the **search** icon in the **Document** field.
17. Type *Sync.PurchaseOrder* in the **Filter** field.
18. Click the **Sync.PurchaseOrder** BOD item.
19. Click the **OK** button.
20. Click to select the **Create non-existing folder(s)** check box. **Note:** You may have to scroll down to see this field in the **Read File Settings** portion of the screen.
21. Type *\FileShare\ION_Connect\STB[XX]\PO_Out* in the **Read Location** field.
22. Type *\FileShare\ION_Connect\STB[XX]\PO_Out\Error* in the **Error Location** field.
23. Type **.xml* in the **File Name Pattern** field.
24. Confirm **Move File** is selected in the **After Read** field.
25. Type *\FileShare\ION_Connect\STB[XX]\PO_Out\Archive* in the **Archive Location** field.
26. Click the **Test** button. A message that the test succeeded displays.
27. Click the **OK** button.
28. Click the **Windows Explorer** icon in the taskbar.
29. Double click the **STB[XX]** folder. The **PO_Out** folder that **ION Desk** created should display.
30. Click the **Google Chrome** icon to return to **ION Desk**.
31. Click the **Save** button.
32. Click the **back** button to return to the document flow. **Note:** This is the **back** button next to the **Save** button, not the **Google Chrome back** arrow.
33. Click the **Application1** icon.
34. Type *LN* in the **Name** field.
35. Click the **+ Add** button.
36. Click to select the **In01_0052** check box.
37. Click the **OK** button.
38. Click the **Save** button.
39. Click to select the **In01_0052** check box.

40. Click the **pencil** icon.
41. Click the **Documents** tab.
42. Verify the **Sync.PurchaseOrder** appears with the **Receive in Application** check box selected.
43. Click the **Save** button.
44. Click the **Back** arrow.

Part 3: Add a document in the document flow

1. Click the **document** icon between the **EC** and **LN** items.
2. Click the **+ Add** button.
3. Click to select the **Sync.PurchaseOrder** check box.
4. Click the **OK** button.
5. Click the **Save** button.
6. Click the **Activate** icon.

Part 4: Test

1. Click the **Windows Explorer** icon in the taskbar.
2. Right-click the **Desktop > Class Files > InforOS_ConfiguringIONConnect > Exercise 2.2 > PO01.xml** item.
3. Click the **Copy** list item.
4. Right-click the blank space of the **EC-2020\fileshare\ION_Connect\STBXX\PO_Out** folder.
5. Click the **Paste** list item. The **PO01** file will process and move to the **Archive** folder.
6. Click the **Google Chrome** icon to return to **ION Desk**.
7. Click the **OneView** menu.
8. Verify **Last Hour** is selected in the **Date and Time Range** field.
9. Click the **Sender Logical ID** dropdown arrow.
10. Click to select the **infor.file.stb[XX]_fileecout** check box.
11. Click the **Search** button. The **ION_PO01** PO appears in the list.

Check your understanding

Select all statements below that are TRUE about the Enterprise Connector.

a) The Enterprise Connector provides hybrid service integration for Infor Cloud services and your local deployed services.
b) The service is deployed in your on-premises infrastructure and is responsible for the communication with the Infor Cloud services.
c) Infor Cloud services require an outbound connection to the Enterprise Connector.
d) For performance reasons, the Enterprise Connector service does not need to be installed close to the applications for which it has a connection point running.

The Enterprise Connector credentials file is stored in a csv formatted file.

a) True
b) False

Refer to Appendix B for answers to the check your understanding questions.

Lesson 3: Data Flows

Estimated time

2.0 hours

Learning objectives

After completing this lesson, you will be able to identify the different types of Data Flows used in ION Connect. In this lesson, you will:

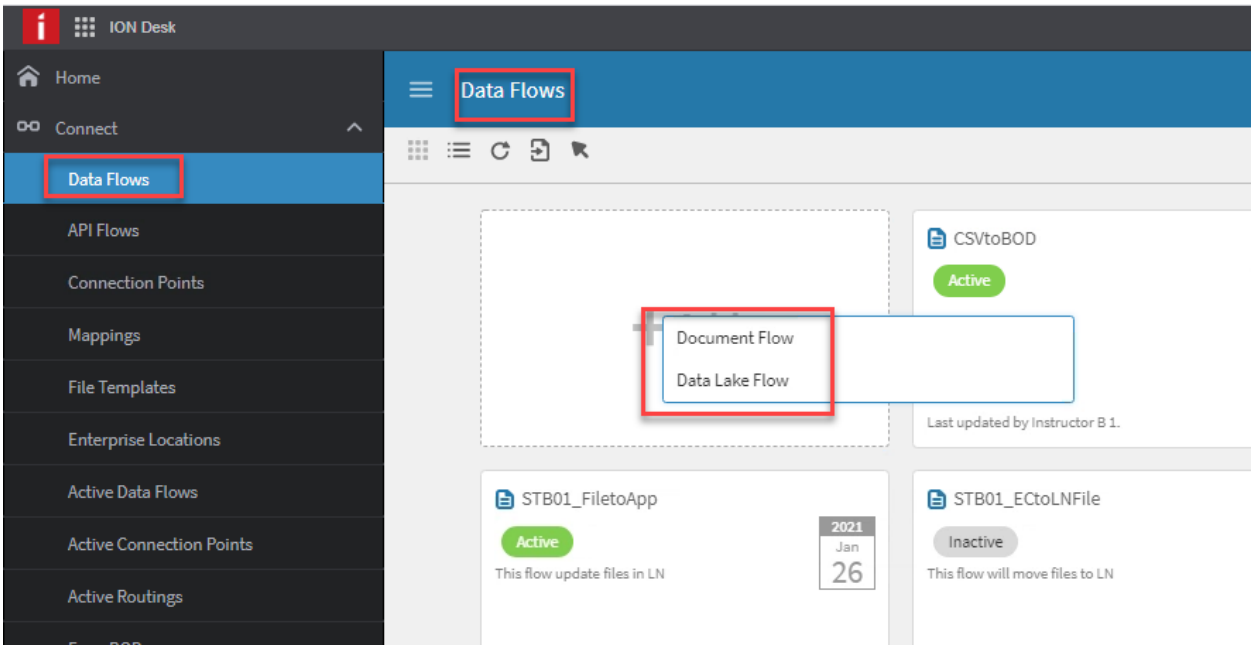
- Explain the different types of Data Flows.
- Describe the difference between Document Flows and Data Lake Flows.
- Describe file connection points.
- Describe FTP and SFTP transfers.
- Explain how to set up and use database connections.

Topics

- Data Flows
- Document Flows
- Data Lake Flows
- File connection points
- What is SFTP
- Database connection

Data Flows

The most important items in ION Connect are the Data Flows. A Data Flow is a sequence of activities that send or receive data. Data Flows are event-driven. When a document is published by an application, the next step in the flow is triggered. Each flow starts and ends with one or more connection points. Connection points can be reused in multiple data flows, and the same connection point can be used multiple times in a Data Flow. Data Flows refers to either a Document Flow or a Data Lake Flow.



Example: Creating Data Flows

Document Flows

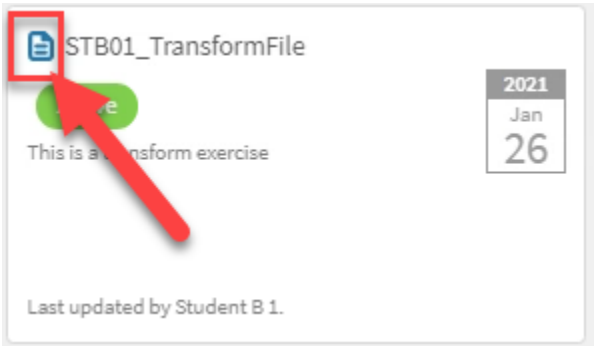
A Document Flow is a sequence of activities that send or receive documents. Document Flows are event-driven. When a document is published by an application, the next step in the flow is triggered. Usually, a Document Flow represents a business process; for example, an invoicing process where an invoice is created for a delivery that was shipped or a maintenance process where a service order is planned based on a customer repair request.

A user must have the **IONDeskAdmin** security role or be associated with a group that contains that role to work with Document Flows.

In a simple Document Flow, two connection points are involved. One connection point sends a specific type of documents, and the other connection point receives those documents. Document Flows can be more complex. In addition to connection points, Document Flows can contain other items:

Document Flow	Description
Mappings	Mappings are used to translate a document to another format. For example, if you retrieve custom sales order documents from your database, you must translate them to standard Infor BODs to load them into an Infor application.
Scripts	Scripts are used for executing custom Python code on incoming documents. For example, scripts can be used to facilitate and solve common use cases such as data object format conversion, data mapping, complex calculations, and transformations.
Parallel flows	Parallel flows are used if a document must be sent to multiple connection points, or if documents from multiple connection points must be sent to a single connection point.
Filters	Filters are used to limit the number of messages that are delivered to a connection point. For example, if only documents having a specific status are relevant for an application, you can filter out the documents having another status.
Content-based routings	Content-based routings are used to send a document to a subset of available destinations based on the document contents. For example, if three warehouses exist, each having their own warehouse management system, a SalesOrder message can be routed to one of these warehouses. The warehouse code that is specified in the SalesOrder message is used. The execution of document flows is fully automatic. After a flow is defined and activated, the relevant documents are routed accordingly.

Document Flows can be identified by the icon in the image below:



Example: Document Flow icon

Data Lake Flows

A Data Lake Flow is a sequence of activities that results in sending data into Data Lake or sequence of activities starting with retrieval of data from Data Lake.

In a simple Data Lake Flow, two connection points are involved. One Data Lake connection point sends a specific type of documents, and the other connection point receives those documents. Or a connection point sends a specific type of documents, and the Data Lake connection point receives those documents. Data Lake Flows can be more complex.

Asynchronous activities are not allowed to be modeled in Data Lake Flow; specifically, these connection points:

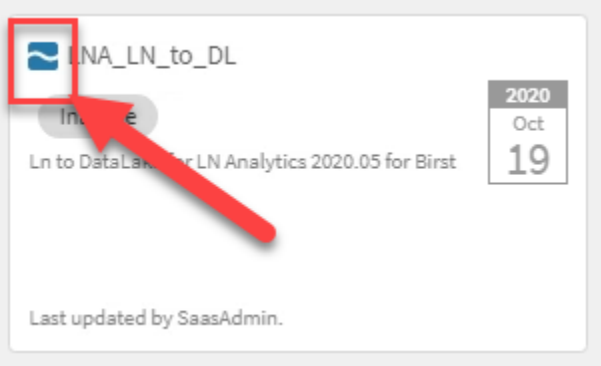
- Application (IMS)
- Application (in-box/outbox)
- LN
- CRM Business Extension
- File
- ION API (Send, Read)
- Database (Read, Send, Request/Reply)
- Message Queue (JMS)

Documents that are modeled in Data Lake Flows are subject to storage policies.

In addition to connection points, Data Lake flow can contain other items such as:

- Mappings that are used to translate a document to another format.
- Scripts that are used for executing custom Python code with a document input.
- Parallel flows that are used when sending documents from multiple connection points to Data Lake.

Note: Data Lake Flows can be identified by the icon in the image below:



Example: Data Lake Flow Icon

File connection points

The file connection point defines a connection from ION to an application that cannot send or receive BODs, but can create and process files.

In this way, data can be retrieved using files that are processed in ION and then sent to one or more Infor applications. In addition, ION can create files using data from Infor BODs, JSON, DSV, or ANY documents that can be processed by other applications.

The message size limit for an individual message is 5 MB in all versions of ION.

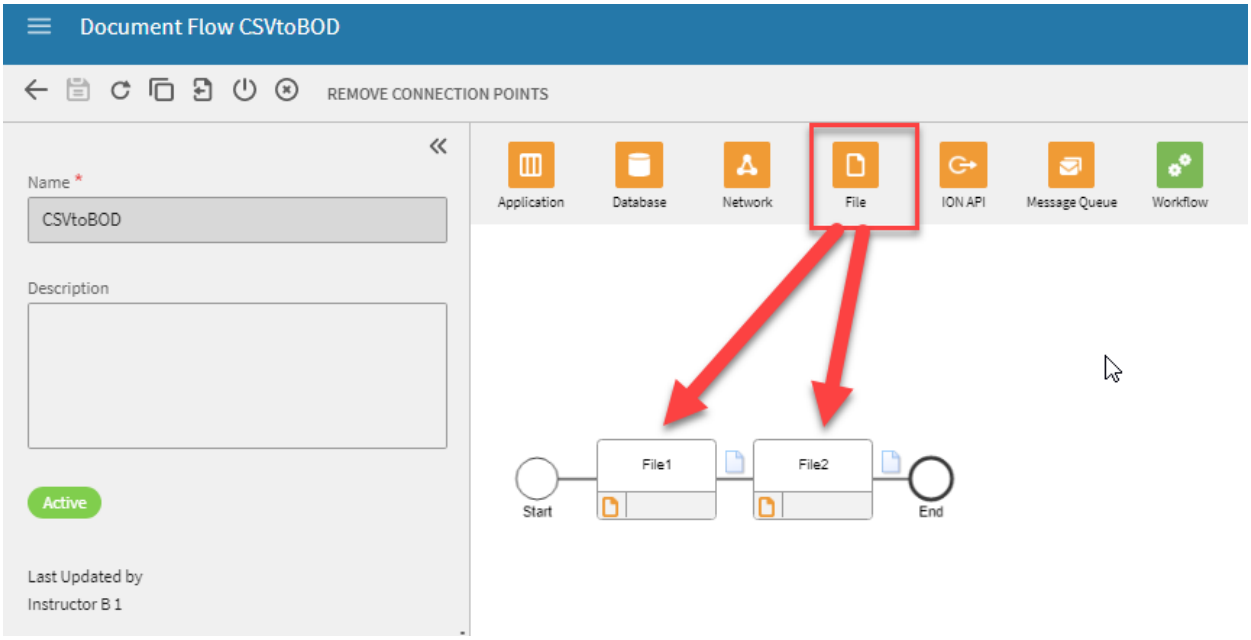
For your reference

As of May 2020, there are new license tiers available that have increased usage limits for the individual message size.

There is also a 1 MB buffer available to all customers to provide flexibility and to prevent over-size message warnings for just a few bytes over the 5 MB limit.

In a document flow, a file connection point can be used in a similar way as any other type of connection points. Data from a file is packed as an ION document in the ION service. All documents with BOD type can be delivered to any other connection point or used in:

- An event monitor
- Workflow activation policy
- Document flow mapping
- Content-based routing



Example: Using a File Connection Point in a Document Flow

Support for other document types such as JSON, DSV, or ANY is added throughout ION. Data from any connection point can be converted to a file.

Each file has its own structure and format. To use a file connection point, an ION document or a file template must be defined. The document defines schema and properties of the file. The template describes what type of files are processed and how the content is mapped to a BOD. A file connection point can handle files in two ways. It can:

- Use the file content as is. In that case no transformation is done on the file content. The content can be of type BOD, JSON, DSV, or ANY.
- Transform the file content to and from BODs. In that case a file template is used. Each file has its own structure and format. The file template describes the schema of a file.

The standard properties for any connection point, such as name and tenant. Note that for file connection points the logical ID type is fixed ('file'). The logical ID is lid://infor.file. followed by the connection point name. In the logical ID, the characters from the name are converted to lowercase.

- The protocol and connection settings to access the file system
- Which documents are sent and received and how the file is read or written

After setting the connection properties, click Test. You are informed whether the test is successful and if the connection details are correct.

If you selected the shared folder transfer protocol, the path to the shared folder is not yet known. Clicking the **Test** button is testing the connectivity to the host, not validating the connection details.

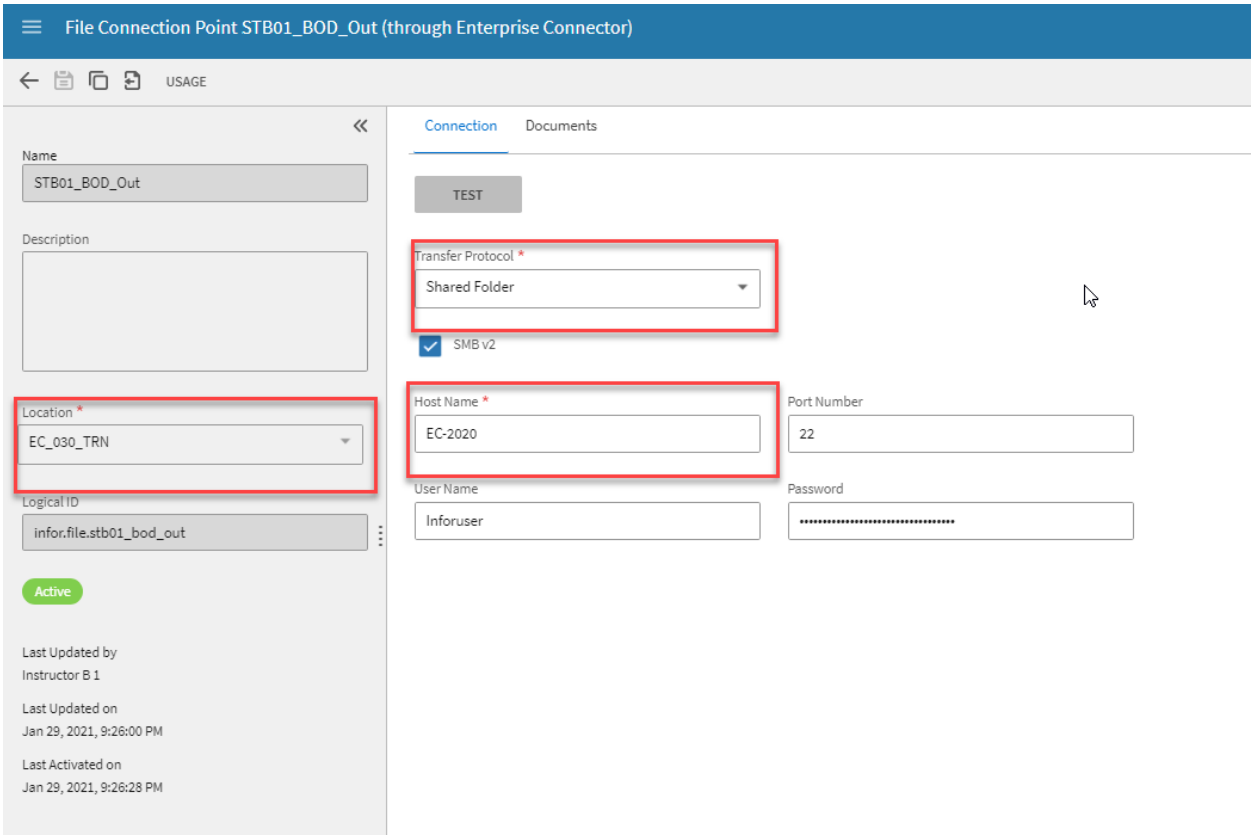
The name of the shared folder is defined in the **Documents** tab. The shared folder's user name and password and the smbv1 and smbv2 settings can only be tested for the specified read or write scenarios.

Note: In an Infor ION Desk, the file connection points that are provisioned for you by Infor Cloud Operations do not show connection parameters.

Connection properties

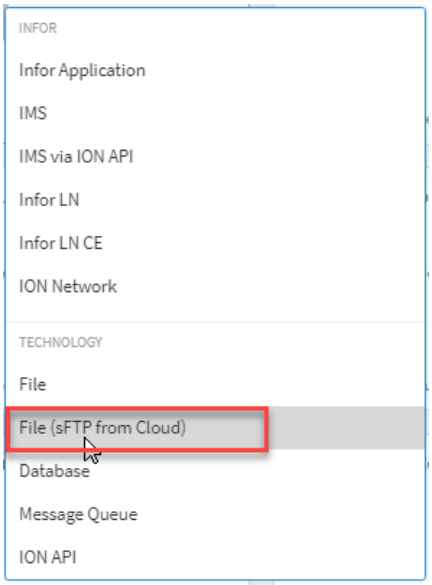
You can specify connection properties on the **Connection** tab of a file connection point. This transfer protocol independent properties are described in the following table:

Property	Description
Transfer protocol	This property is used to select one of the supported protocols: Shared folder, FTP, FTP Secure (FTPS) or SFTP.
Host name	This property is used to specify the host name of the server that hosts the files.
Port name	This property is used to specify the port for FTP, FTPS or SFTP transfer protocols. • For FTP and FTPS - default port is 21 • For SFTP - default port is 22
User	This property is used to specify the user name to connect to the file system.
Password	This property is used to specify the password to connect to the file system.



Example: Configuring a File Connection Point

If you select the type **SFTP from Cloud**, then the transfer protocol is already selected as SFTP and disabled.



Example: Configuring a File (sFTP from Cloud) Connection Point

FTP protocol

FTP is the standard network protocol that is used for the transfer of computer files between a client and server on a computer network.

When transfer protocol FTP is selected, the additional property **Enable Passive mode** is shown. Select the property to enable the passive mode.

FTPS protocol

The **Explicit FTP over Transport Layer Security (TLS)** mode is supported by ION. In this variant, the connection is made using SSL/TLS extension over the plain FTP. Normally the default port 21 is used.

The **Implicit FTP over TLS** mode or the negotiate mode is not supported. This mode switches to plain FTP in case FTPS connection fails.

When **Transfer Protocol FTPS** is selected, additional properties are displayed. The FTPS specific properties are described in the following table:

Property	Description
Import and trust certificate	This property is used to import the server public certificate
Enable Passive mode	This property is used to disable the passive mode and enable active mode. • Passive mode: Port number is received from server. • Active mode: Random port number is selected by ION from data port range.
Override default data port range for Active mode	When Active mode is selected, a random port in the range of 1024 – 65535 is automatically chosen. • Select this check box to override the default data port range. You can choose your own port range for ION to use.
Minimum port	This property is used to specify the minimum port number for active mode data port range. • The default value is 1024.
Maximum port	This property is used to specify the maximum port number for active mode data port range. • The default value is 65535.
Use client certificate to authenticate	This property is used to enable two-way SSL authentication. The FTPS server is requested to use a client certificate in addition to user name and password. The server certificate is verified for authenticity by ION.
Client SSL keystore password	This property is used to specify the client SSL keystore password.

Property	Description
Import client certificate	This property is used to import the client private certificate.

Location

The **Location** field is shown for the file connection points defined by an Enterprise Connector. Specify the location where the application is deployed. A location must be chosen or created to be able to use this type of connection. To create an Enterprise Location, you can navigate to **ION Desk > Connect > Enterprise Locations**.

Document properties

On the **Document** tab of the file connection point, you can specify:

- Multiple actions to read or write files
- Which document or file template is used for each action defined
- How incoming documents must be written to files
- How documents must be produced based on data read from file

File share locations

When configuring file connection point for file share locations, specific folder locations must be defined for **Read Location**, **Error Location**, **Archive Location,** and **Write Location**. For any of these locations, follow these guidelines:

- Use \ when specifying the location folder path
- Specify the path relative to the root note
- Do not use characters: ? < > : * | " \0
    - Valid example: share\ReadFolder
    - Invalid example: c:\share\ReadFolder

Note: When configuring the file connection point, the locations can be verified when testing the actions in order to check their correctness and accessibility. In activating file connection point, these locations are not validated.

Keywords

There are keywords that can be used where the file connector creates new files:

- **Read file**: If the **Rename** option is selected, the new name of the file (new file name pattern) can be specified using keywords.
- **Write file**: The name that is created by the action (file name pattern) and the file path (write location) can be specified by using keywords.

Press **Ctrl + Spacebar** to view the list of possible keywords. When a keyword is selected, it is displayed between square brackets. For example, to rename a file using the keyword, the New File Name Pattern can be set to:

```
[original_filename][document_id][current_datetime].copy
```

The available keywords and in which action configuration they can be used are described in the following table:

Keyword	Description	Action: Configuration
accounting_entity	This is the Accounting Entity that is populated in the message header.	Read: Not applicable Write: Write location and file name pattern
current_date	The current UTC date is represented as yyyy-MM-dd, indicating: • y: year • M: Month in year • d: Day in month	Read: New file name pattern Write: File name pattern
current_datetime	The current UTC date time is represented as yyyy-MM-dd_HH-mm-ss-SSS, indicating: • y: year • M: Month in year • d: Day in month • H: Hour in day (0-23) • m: Minute in hour • s: Second in minute • S: Millisecond	Read: New file name pattern Write: File name pattern
custom_<<Name>>	This is the custom header that is populated in the message headers. Replace the placeholder <<Name>> with the correct custom header name.	Read: Not applicable Write: Write location and file name pattern
document_id	This is the document ID of the BOD that is associated with the file template that is used in the read or write file action type. Ensure that the document_id is a required field in the corresponding file template.	Read: New file name pattern Write: File name pattern
document_name	This is the full document name as defined in ION registry, for BODs in format: verb_name.noun_name	Read: Not applicable Write: Write location and file name pattern

Keyword	Description	Action: Configuration
<filename>	This is any field name that is defined in the file template and used in the read or write file action type. Ensure that the field is required in the corresponding file template.	Read: New file name pattern Write: File name pattern
location_id	This is the location that is populated in the message header	Read: Not applicable Write: Write location and file name pattern
noun_name	This is the BOD type that is populated in the extension.	Read: Not applicable Write: Write location and file name pattern
original_extension	This is the extension of the file that is read by the **Read File** action type. It is the BOD type that is populated in the message header. For **Write File** action type, this keyword is replaced by the value that is specified in the file extension attribute, if available. This is the file extension attribute that is specified in the referenced file template.	Read: New file name pattern Write: File name pattern
original_filename	This is the file name of the file that is read by the **Read File** action type without the file extension. For **Write File** action type, this keyword is replaced by the value that is specified in the file name attribute, if available. This is the file name attribute that is specified in the referenced file template.	Read: New file name pattern Write: File name pattern
source	This is the source that is populated in the message header.	Read: Not applicable Write: Write location and file name pattern
tenant_id	This is the tenant Id that is populated in the message header which can be used to decide the write location.	Read: Not applicable Write: Write location and file name pattern
variation_id	This is the variation Id that is populated in the message header.	Read: Not applicable Write: File name pattern

Justification of file connector

The Infor application connector is preferred, because it is decoupled and event-driven and the application can validate incoming data. From a modeling and management perspective, the Infor application connector also is the best choice, because the modeling is simple and the management in ION Desk is the richest for this connector.

Alternative connector

In addition to the Infor application connector, file connector is provided as an alternative where files are used to send or receive messages. If you cannot use the Infor application connector, you can consider using the file connector.

File connector is preferred for legacy applications that only support a file-based integration, and it can be event-driven. The application at the other side must be able to create files in a format that ION can process or read files as provided by ION. The data must be transformed to a BOD (XML) message. Multilevel data (header and lines) can be formatted in multiple ways in one or more files, while the file connector does not support all options. There is a risk of delivering the same message twice if there are interruptions or timeouts.

What is SFTP?

The SFTP protocol is a secure FTP protocol or FTP over SSH. This protocol differs from the FTPS protocol, but both are supported.

When SFTP is selected, you can authenticate through a password or a private/public key pair. When the private/public key pair is used for authentication, both the FTP client and the FTP server have their own pairs. Their public keys must be exchanged. In ION there is no key generation feature. To use this mode of authentication, you must:

- Ask your security provider for a private/public key pair for ION. You can also create a key pair for ION with a third party key generation tool that supports the OpenSSH format such as PuTTYgen. **Note:** When using the PuTTYgen tool to generate a private key, use the export OpenSSH key function from conversions menu. Do not click the **Save Private Key** button. Otherwise, the private key is not exported in the required OpenSSH format.
- Import the private key of the ION pair together with its passphrase using the client private key passphrase and the import the client private key fields.
- Share the public key of the ION pair with the FTP administrator of the file server.
- Obtain the public key of the FTP server from the FTP administrator and import it into ION from the file connection point details page.

The SFTP specific properties are described in this table:

Property	Description
Authentication using public and private keys	Select the **Authentication using public and private keys** check box to enable authentication using public and private keys.
Import server public key	Use the Import server public key in OpenSSH format, for authentication, with this structure: <modeled host name> <public key type> <public key> An example: nlbanhoudetan01 ssh-rsa AAAB3NzaC1yc2EAAAA
Client private key passphrase	Use this property to specify the client private key passphrase.
Import client private key	Use this property to import and store your client private key in OpenSSH format. Private keys that are generated in OpenSSH format earlier than version 7.8 are supported.

Database connection

With the database connector you can connect applications that cannot send or receive documents but have a database available.

In this way, you can retrieve data from a database and send it to one or more Infor applications. Or you can use data from Infor BODs to update your database.

There are two types of database connection points:

- Stored Procedure
- AnySQL Modeler

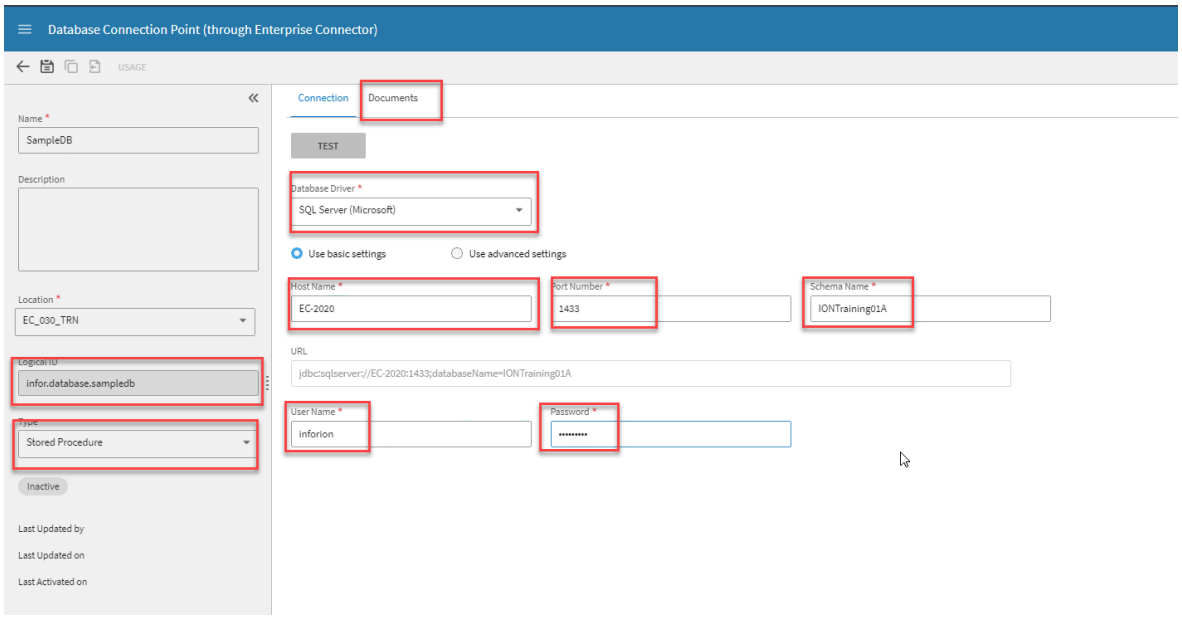
With the stored procedure type, you can call stored procedures that are defined in your database, pass inputs, and receive output in the form of Infor BODs.

With the AnySQL modeler you can create SQL select statements to read data from the database in the visual modeler with a minimum knowledge of SQL language. Learning the specifics of each database protocol is not required. The same modeling experience is used for each of supported database server types. The output is provided in the form of JSON document.

In a document flow, the use of database connection points is comparable to the use of any type of connection points. BOD or JSON documents from a database can be delivered to other supported connection points. Data in BODs from any connection point can be delivered to a database.

The definitions of a database connection point include:

- The standard properties for any connection point, such as name, description, and tenant.
  - For database connection points the logical ID type is fixed ('database'). The logical ID is lid://infor.database followed by the converted name.
- The selection of a connection point type.
- The method for connection to the database.
- Which documents are sent and received and how the data must be read from the database for these documents.



Example: Configuring a Database Connection Point

Check your understanding

Which of the following are true about Data Flows? Select all that apply.

a) Flows start and end with one or more connection points.
b) Flows only start with connection points.
c) They are event-driven.
d) Connection points cannot be reused in multiple Data Flows.
e) Connection points can be reused in multiple Data Flows.

When SFTP is selected, you can authenticate through a password or a private/public key pair.

a) True
b) False

The definitons of a database connection point include: (select all that apply).

a) The standard properties for any connection point, such as name, description, and tenant.
b) The selection of a connection point type.
c) The method for connection to the database.
d) Which documents are sent and received and how the data must be read from the database for these documents.

Refer to Appendix B for answers to the check your understanding questions.

Lesson 4: API Flows

Estimated time

1.5 hours

Learning objectives

After completing this lesson, you will be able to demonstrate how API Flows are used in ION Connect. In this lesson, you will:

- Explain API Flow usage.

Topics

- API Flows

API Flows

The API Flow modeler is comparable to other ION modelers, such as Data Flows and Work Flows.

API Flow parameters

API Flow parameters are used to move information in the API Flows. All API Flow request parameters, ION API step output parameters, and Decision output parameters are available in API Flow as API Flow parameters.

The flow parameters can be data types such as string or integer, and JSON object.

The API flow parameters can be referenced in input fields as `${<activityName>.<parameterName>}`, for example `${getInventory.list}`. API Flow parameters coming directly from API Flow request are referenced using "input" instead of activity name, for example as `${input.store}`.

You can also use the help function to select an API Flow parameter. On the selected input field, press **CTRL+SPACEBAR**. A list of available API Flow parameters is displayed. Select an API Flow parameter to add to the input field.

Step	Description
ION API	A step to perform a call to an ION API operation. In this step, you can define an API request and output parameters.
Parallel	An unconditional execution of two or more execution branches in parallel. In this step, you can define parallel calls to multiple APIs. The API flow waits until all the API calls in each of the branches are completed.
Decision	An evaluation of an expression that has several possible follow-up branches. The default branch is executed when values in the other branches do not match the expression result. In this step, you can define conditional flows based on API response code, response message etc. The decision step is exclusive. Only one branch is executed to avoid conflicts and merging of the results.
Yes or No decision	A step that allows users to create a Yes or No decision to filter out or terminate certain results in the API call. Only available for Professional or Enterprise customers.
JQ transform	A step to transform the response under certain conditions set by the user. The user specifies values or conditions and JQ Transform applies those to the call. If those conditions are met, then the output reflects that information. Only available for Professional and Enterprise customers.

The API Flows are used for ION API Orchestration. You can define synchronous business flows in which you can chain more APIs, execute conditional logic, and expose the whole flow as a new API.

For example, you can model an Inventory check flow or a Price check flow. You can evaluate conditions in the request and invoke different ION APIs to get the data. You can enrich the response by adding more data from additional ION APIs. The final response can be presented back in the client preferred format. Only JSON request body and JSON response are supported by ION API Flows.

Parallel API Flows

With the parallel flow, the modeler can execute multiple steps in parallel. Each step can use the ION API Flow parameters from the previous steps as input. The parallel flow is expected to be executed faster than a sequential flow. The flow continues to the next steps only when all the branches of a parallel flow are completed.

The parallel block does not have properties. You can add or remove branches by right-clicking the diamond shape.

Decision API Flows

With the decision steps, the modeler can decide which branch (steps) must be taken, depending on values of input API Flow parameters.

You can add or remove branches by right-clicking the diamond shape. There is always one default branch and it is the one at the bottom which is marked in the model with the small line across the input line. The default branch cannot be removed.

The flow only executes the first, from top, matching branch to avoid conflicts and results being merged.

API Flow parameters that are created in the steps inside a decision flow cannot be referenced directly. You must use a decision step name as an identifier instead of an individual step name.

For your reference

In the Professional and Enterprise levels:

- You can add conditions or values to the API call to alter the information in the output
- You can create a Yes or No decision filter in the API call
  - It is based on parameters and conditions set by the user
  - With this Yes or No format you can add a step to the API call that terminates a task to filter out certain results

Prerequisites

To create API Flows, you must have modeling authorization in the ION Desk. You must be assigned the security role settings **IONDeskAdmin** and **MingleIONenabled**.

Time-out limits

API Flows are synchronous end to end. The duration of the flow must be less than the global gateway time-out, which is 5 minutes. For asynchronous requests the time-out limit can be up to 2 hours.

The duration of each individual task must be less than 5 minutes. If a step results in a failure, then the API Flow is stopped and a time-out error message is displayed.

Payload Limits

Request and Response payload size for whole API Flow should be less than 5 MB.

Request and Response payload size for individual ION API task should be less than 3 MB.

Exercise 4.1: Create an API Flow

In this exercise, you will create an API Flow that shows the weather for the currently logged in user.

Before you begin:

- Ensure you are logged in to Infor OS for your assigned user account. If not, refer to Exercise 1.1.

Exercise steps

Part 1: Add department to Infor Federation Services (IFS) record

1. Click the **User Menu**.
2. Click the **User Management** list item.
3. Click the **User Details** link next to your user name. The **User Details** screen displays with the **Details** tab selected.
4. Type *Edinburgh* in the **Department** field. **Note:** There is not a location field in the **User** profile, so to test this API we will use the **Department** field instead.
5. Click the **Save** icon.

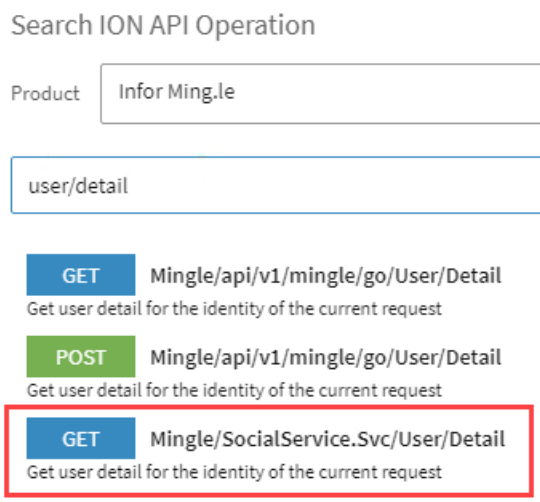
Part 2: Set up the flow

1. Click **App Menu > ION Desk > Connect > API Flows** in the navigation pane. **Note:** You may need to click the **hamburger** icon to see the **Connect** menu.
2. Click the **+ Add** button.
3. Type *STB[XX]_WeatherFromMingleID* in the **Name** field.
4. Type *Get weather from Ming.le ID* in the **Description** field.
5. Drag an **ION API** icon onto the document flow diagram between the **Start** and **End** nodes. **IONAPI1** displays between the **Start** and **End** nodes.
6. Drag a second **ION API** icon onto the document flow diagram between the **IONAPI1** and the **End** node. **IONAPI2** displays between the **Start** and **End** nodes.
7. Drag a third **ION API** icon onto the document flow diagram between the **IONAPI2** and the **End** node. **IONAPI3** displays between the **Start** and **End** nodes.
8. Click the **Start** node on the workflow diagram. The **API Flow Properties** pane displays with the **Request** tab selected.
9. Click the **Method** drop-down arrow.
10. Click the **GET** list item.
11. Type *STB[XX]_Weather* in the **Endpoint Name** field.

12. Type *STB[XX]_Weather* in the **Endpoint Path** field.
13. Type *Forecast* in the **Resource Name** field.
14. Type *Forecast* in the **Resource Path** field.

Part 3: Set up the first API activity (capture User GUID)

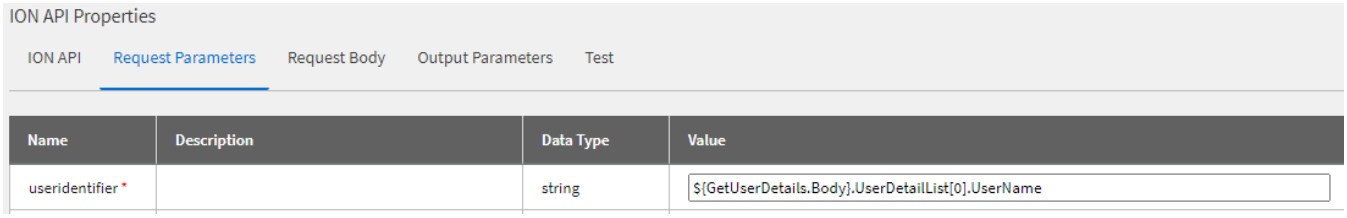
1. Click the **IONAPI1** activity in the flow.
2. Type *GetUserDetails* in the **Name** field.
3. Click the **SELECT** button.
4. Click the **Product** drop-down arrow.
5. Click the **Infor Ming.le** list item.
6. Type *user/detail* in the **Search** field.
7. Press **Enter**.
8. Click the **Ming.le/SocialService.Svc/User/Detail GET** item.



9. Click the **OK** button.
10. Click the **Output Parameters** tab.
11. Click the **+ Add** button.
12. Click to select the check box for the first row.
13. Type *Body* in the first **Name** field.
14. Click the **Save** icon.
15. Click the **Test** tab.
16. Click the **TEST** button.
17. Click to scroll to the bottom of the **Output Parameters** section. The **user GUID** displays.

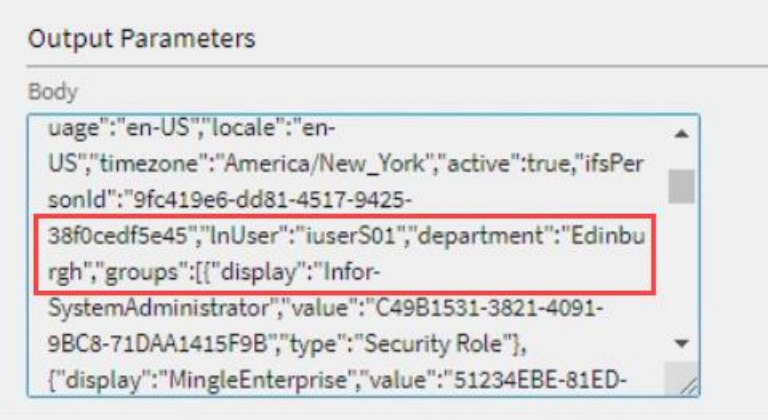
Part 4: Set up the second API activity (department information)

1. Click the **IONAPI2** activity.
2. Type *GetUserDepartment* in the **Name** field.
3. Click the **SELECT** button.
4. Click the **Product** drop-down arrow.
5. Click the **IFS Service** list item.
6. Type *useridentifier* in the **Search** field.
7. Press **Enter**.
8. Click the **ifsservice/usermgmt/v2/users/{useridentifier} GET** item.
9. Click the **OK** button.
10. Click the **Request Parameters** tab.
11. Click in the **Value** field.
12. Press **CTRL + spacebar**.
13. Click the **GetUserDetails.Body** list item.
14. Type *.UserDetailList[0].UserName* after **{GetUserDetails.Body}** in the **Value** field.



15. Click the **Output Parameters** tab.
16. Click the **+ Add** button.
17. Click to select the check box for the first row.
18. Type *Body* in the first **Name** field.
19. Click the **Save** icon.
20. Click the **GetUserDetails** activity.
21. Click the **Test** tab.
22. Click the **TEST** button.
23. Click in the **Output Parameters Body** field.
24. Press **CTRL + A** to highlight **[the information]** in the **Output Parameters Body** field.
25. Right-click the highlighted information.
26. Click the **Copy** menu item.
27. Click the **GetUserDepartment** activity.
28. Click the **Test** tab.
29. Right-click in the **GetUserDetails.Body** field.

30. Click the **Paste** menu item.
31. Click the **TEST** button.
32. Verify that the department displays in the **Output Parameters Body** field.

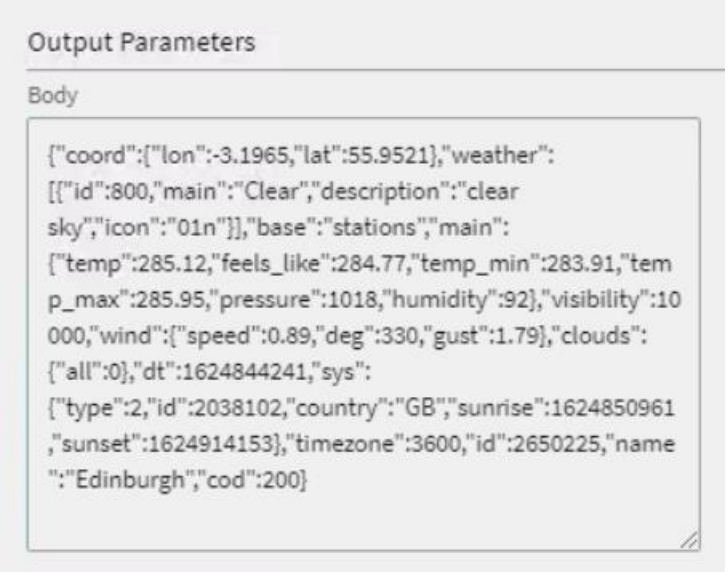


Note: We don't currently have location as a property in the IFS record, so we have populated the department field with a city name.

Part 5: Set up the third API activity (weather)

1. Click the **IONAPI3** activity.
2. Type *GetWeather* in the **Name** field.
3. Click the **SELECT** button.
4. Click the **Product** drop-down arrow.
5. Click the **WeatherMap** list item. This is an external API suite that has been registered.
6. Click the **Search** icon in the **Search** field.
7. Click the **openweather GET** list item.
8. Click the **OK** button.
9. Click the **Request Parameters** tab.
10. Click in the first **Value** field.
11. Press **CTRL + spacebar**.
12. Click the **GetUserDepartment.Body** list item.
13. Type *.response.userlist[0].department* after **{GetUserDepartment.Detail}** in the **value** field.
14. Click the **Output Parameters** tab.
15. Click the **+ Add** button.
16. Click to select the check box for the first row.
17. Type *Body* in the first **Name** field.
18. Click the **Save** icon.
19. Click the **GetUserDetails** activity.
20. Click the **Test** tab.

21. Click the **TEST** button.
22. Click in the **Output Parameters Body** field.
23. Press **CTRL + A** to highlight **[the information]** in the **Output Parameters Body** field.
24. Right-click the highlighted information.
25. Click the **Copy** menu item.
26. Click the **GetUserDepartment** activity.
27. Click the **Test** tab.
28. Right-click in the **GetUserDetails.Body** field.
29. Click the **Paste** menu item.
30. Click the **TEST** button. The response displays in the **Output Parameters Body** field.
31. Press **CTRL + A** to highlight **[the information]** in the **Output Parameters Body** field.
32. Right-click the highlighted information. A menu displays.
33. Click the **Copy** menu item.
34. Click the **GetWeather** activity.
35. Click the **Test** tab.
36. Right-click in the **GetUserDepartment.Body** field.
37. Click the **Paste** menu item.
38. Click the **TEST** button. The weather information displays in the **Output Parameters Body** field.



39. Click the **Activate** icon to activate the API Flow.

Exercise 4.2: Testing the API Flow using the ION API Gateway

In this exercise, you will test the API Flow created in Exercise 4.1 using the ION API Gateway and leverage the Infor API Flows suite.

Before you begin:

- Ensure you have completed Exercise 4.1 because it provides data or configurations for this exercise.
- Ensure you are logged in to Infor OS for your assigned user account. If not, refer to Exercise 1.1.

Exercise steps

1. Click the **App Menu** icon.
2. Click the **Infor ION API** icon.
3. Click the **Infor API Flows** tile.
4. Click the **Documentation** icon for your newly created API Flow, **STB[XX]_Weather**.
5. Click the **Get** button for the **forecast** endpoint.
6. Click the **Try it out** button.
7. Click the **Execute** button. The weather information is returned in the **Response body** field.

Check your understanding

The ION API Flows feature allows you to put API calls together with logical elements.

a) True
b) False

By default, an API Flow is synchronous.

a) True
b) False

Refer to Appendix B for answers to the check your understanding questions.

Lesson 5: Advanced filters

Estimated time

3.0 hours

Learning objectives

After completing this lesson, you will be able to describe advanced filters including routing, merging, splitting, and file transformation. In this lesson, you will:

- Compare filters and routing.
- Describe advanced filters.
- Describe merging.
- Describe using a Splitter.
- Describe the ION Mapper.
- Create a Data Flow using a splitter.
- Create a Data Flow using the ION Mapper.

Topics

- Filters vs. routing
- Advanced filters
- Document merging
- Data Flow splitters
- ION Mapper

Filters versus routing

A connection point can send documents. The document flow defines which types of documents must be delivered to which other connection points. Even for a single document type, not all document instances are relevant for the next activity in a flow. Based on the content of the document, documents may or may not be needed. Use filtering or content-based routing to avoid delivering too many documents to a connection point. In the toolbox of the document flow modeler, two types of flows are available for this purpose.

Filter

Depending on the document content and the filter conditions specified, messages are sent to a destination if the filter condition is fulfilled or ignored.

For example, the code definition BOD represents multiple types of code master data. An application can only be interested in a subset of all code definitions, for example only reason codes are relevant.

The filtering is not limited to connections having only one document. Multi-document flows, such as master data flows or reporting flows, can also be filtered. You do not have to create multiple flows in that case.

Routing

Depending on the document content, messages of the same type are distributed to one or more destinations, depending on the routing conditions. If none of the routing conditions is met, documents are ignored.

For example, a warehouse management application represents only one warehouse per application instance. An ERP application sends SyncPurchaseOrder messages. Depending on the warehouse on the purchase order line, the message must be sent to one or more specific warehouse management instances. A message is only sent to application instance WMS_1 if it contains at least one line for warehouse.

Note: To define filters or routing, the metadata for the documents to be routed must be available in the Registry.

If the filter or routing receives BODs with the same document name but different verbs, the filtering or routing is the same for these verbs.

Note: The content-based routing depends on the data that is available in the BOD. If the sending application does not set attributes that are used in the condition, the result is not as expected. The contents of the BOD can also depend on the used verb and action code. For example, if a **Sync** message is sent with actionCode **Delete**, the document can only contain the identifiers, such as the documentID. To deal with such situation, use the actionCode in a condition or include a condition that explicitly checks for the existence of an attribute.

Content-based filtering and routing do not change the contents of a BOD. Either the complete BOD is passed on or not. Note that:

- A document in the BOD can include repeating elements, such as multiple sales order lines. If the condition includes a check on such lines, the BOD is passed on if at least one of the lines matches the condition.
- For some verbs, a BOD can contain multiple document instances, such as multiple sales orders. In that case, the BOD, including all document instances, is passed on if at least one of the sales orders matches the condition.

Scenario

Consider the same scenario from **Exercise 2.3**, but in this case, we need to implement filters in the Document Flow so that only files with a specific value get sent to LN. In **Exercise 5.1**, we will be sending only BODs that filter on one value of an attribute on the BOD, if the value matches the condition the BOD will send to LN. In **Exercise 5.2**, we will examine adding variable filters where we will filter on multiple conditions and combine them using an AND or OR in the condition.

Exercise 5.1: Add a filter to a purchase order flow

In this exercise, you will add a filter to a data flow. This filter will send only POs that meet the criteria to LN.

Before you begin:

- Ensure you are logged in to Infor Ming.le and are at the Homepages screen for your assigned user account. If not, refer to Exercise 1.1.
- Ensure you have completed Exercise 2.2 because it provides data or configurations for this exercise.

Exercise steps

Part 1: Duplicate the data flow

1. Click the **Connect** menu.
2. Click **Data Flows** menu item.
3. Click the **STBXX_ECtoLNFile Deactivate** icon.
4. Click the **Duplicate** icon for the **STBXX_ECtoLNFile** data flow.
5. Type *STB[XX]_FiletoApp* in the **Name** field.
6. Type *This flow will update files in LN* in the **Description** field.
7. Click the **Save** button.

Part 2 Add the filter

1. Drag a **filter** icon between the **EC** and **LN** items.
2. Type *STB[XX]_PAINTFilter* in the **Name** field.
3. Type *This will select POs from suppliers based on different criteria* in the **Description** field.
4. Click the **Attributes** tab.
5. Click the **+ Add From Content** button.
6. Click **PurchaseOrder BOD > PurchaseOrder > PurchaseOrderHeader > SupplierParty > Name**.
7. Click the **OK** button.
8. Click the **Conditions** tab.

9. Click the **+ Add** button.
10. Type, select, or confirm the following on the **Condition Builder** screen:

Item	Details
Name	SupplierName
Attribute	Name
Operator	=
Value	PAINT **Note:** This field is case sensitive and it must match the BOD exactly.

11. Click the **OK** button.
12. Click the **Used Condition** drop-down arrow.
13. Click the **SupplierName** list item.
14. Click the **Save** button.
15. Click the **Activate** icon.

Part 3: Confirm in OneView

1. Click the **Windows Explorer** icon in the taskbar.
2. Right-click the **Desktop > Class Files > InforOS_ConfiguringIONConnect > Exercise 5.1 > PO02.xml** item.
3. Click the **Copy** list item.
4. Right-click in the blank space of the **FileShare > ION_Connect > STBXX > PO_Out** folder.
5. Click the **Paste** list item. The file will process and move to the **Archive** folder.
6. Click the **Google Chrome** icon to return to **ION Desk**.
7. Click the **OneView** menu.
8. Verify **Last hour** is selected in the **Date and Time Range** field.
9. Click the **Filter +** and click the check box for the **Sender Logical ID** filter.
10. Click the drop-down arrow in the **Sender Logical ID** filter.
11. Click to select the **infor.file.stb[XX]_fileecout** check box.
12. Click the **Search** button.
13. Click the **ION_PO02** item. **Note:** If there are multiple messages, you may have to click the latest message.
14. Make note of the **Filtered Out** icon next to the filter symbol. This indicates that **ION_PO02** did not meet the criteria.

15. Click the **Windows Explorer** icon in the taskbar.
16. Right click the **Desktop > Class Files > InforOS_ConfiguringIONConnect > Exercise 5.1 > PO02.xml** file.
17. Click the **Edit with Notepad ++** list item.
18. Press **CTRL + F** to open the **Find** window.
19. Type *supplierparty* in the **Find what** field.
20. Click the **Find Next** button.
21. Click the **X** button to close the **Find** window.
22. Type *PAINT* in the **Name** field between the **<Name>** and **</Name>** items.
23. Type *ION_PO03* in place of **ION_PO02** the **Document ID** field before the **</ID>** item. **Note:** The **DocumentID** section is above the **SupplierParty** section of the file.

```
<PurchaseOrder>
    <PurchaseOrderHeader>
        <DocumentID>
            <ID accountingEntity="0052" location="D_P00001" lid="lid://infor.ln.ln01/0052" variationID="47">ION_PO02</ID>
        </DocumentID>
        <AlternateDocumentID>
```

24. Click the **File** menu.
25. Click the **Save As** menu item.
26. Navigate to the **FileShare > ION_Connect > STBXX > PO_Out** folder.
27. Type *PO03.xml* in the **File name** field.
28. Click the **Save** button. The file processes and moves to the **Archive** folder.
29. Click the **Google Chrome** icon in the taskbar.
30. Click the **OneView** menu.
31. Verify **Last hour** is selected in the **Date and Time Range** field.
32. Verify the **Sender Logical ID** filter shows the **infor.file.stb[XX]_fileecout** logical id selected.
33. Click the **Search** button.
34. Click the **ION_PO03 Sync.PurchaseOrder** document. The criteria has now been met and the **Filtered Out** icon will no longer display.

Exercise 5.2: Variable filter

In this exercise, you will update the data flow to add a variable filter.

Before you begin:

- Ensure you are logged in to Infor Ming.le and are at the homepages screen for your assigned user account. If not, refer to Exercise 1.1.
- Ensure you have completed Exercise 1.3 because it provides data or configurations for this exercise.

Exercise steps

Part 1: Update the filter

1. Click the **Connect** menu.
2. Click the **Data Flows** menu item.
3. Click the **STBXX_FiletoApp** data flow.
4. Click the **deactivate** icon.
5. Click the **filter** section of the data flow.
6. Click the **Attributes** tab.
7. Click the **+ Add From Content** button.
8. Click the **PurchaseOrder BOD > PurchaseOrder > PurchaseOrderHeader > ShipFromParty > PartyIDs > ID** item.
9. Click the **OK** button.
10. Click the **ID** field. This will allow you to update the **Name**.
11. Type *ShipFromID* in the **Name** field.
12. Click the **Conditions** tab.
13. Click the **+ Add** button.
14. Type, select, or confirm the following on the **Condition Builder** screen:

Item	Details
Name	ShipFrom
Attribute	ShipFromID
Operator	=
Value	WH1

15. Click the **OK** button.

16. Click the **+ Add** button.
17. Type, select, or confirm the following on the **Condition Builder** screen:

Item	Details
Name	VariableFilter
Type	Combined
AND	Selected
SupplierName	Selected
ShipFrom	Selected

18. Click the **OK** button.
19. Click the **Used Condition** drop-down arrow.
20. Click the **VariableFilter** list item.
21. Click the **Save** button.
22. Click the **Activate** icon.

Part 2: Test in OneView

1. Right-click the **Desktop > Class Files > InforOS_ConfiguringIONConnect > Exercise 3.2 > PO04.xml** item.
2. Click the **Copy** list item.
3. Right-click the blank space in the **PO_Out** folder.
4. Click the **Paste** list item. The file will process and move to the **Archive** folder.
5. Click the **Google Chrome** icon to return to **ION Desk**.
6. Click the **OneView** menu.
7. Verify **Last hour** is selected in the **Date and Time Range** field.
8. Verify the **Sender Logical ID** filter shows the **infor.file.stb[XX]_fileecout** logical id selected.
9. Click the **Search** button.
10. Click the **ION_PO04 Sync.PurchaseOrder** document.
11. Click the **Filter** icon.
12. Click the **Document matches filter** item. The **Event Details** window opens showing which of the filter criteria were matched.
13. Click the **Windows Explorer** shortcut in the taskbar.
14. Right click the **Desktop > Class Files > InforOS_ConfiguringIONConnect > Exercise 3.2 > PO05.xml** item.

15. Click the **Edit with Notepad ++** list item.
16. Verify **TEST** displays in the **SupplierParty Name** field. **Note:** This is Row 47 in the file.

17. Click the **File** menu.
18. Click the **Save As** menu item.
19. Navigate to the **FileShare > ION_Connect > STBXX > PO_Out** folder.
20. Verify **PO05** displays in the **File Name** field.
21. Click the **Save** button. The file processes and moves to the **Archive** folder.
22. Click the **Google Chrome** icon in the taskbar.
23. Click the **OneView** menu.
24. Verify **Last hour** is selected in the **Date and Time Range** field.
25. Verify the **Sender Logical ID** filter shows the **infor.file.stb[XX]_fileecout** logical id selected.
26. Click the **Search** button.
27. Click the **ION_PO05 Sync.PurchaseOrder** document.
28. Make note of the **Filtered Out** icon next to the filter symbol. This indicates that the PO did not meet the criteria since we changed the name from PAINT to TEST.

Advanced filters

In addition to filtering content on a single condition, users can look at any logical number of conditions (including headers).

Multiple flows can be defined using the same connection points and document types. In ION Service those flows using a logical disjunction ('or') are combined. For example, an active flow orders that SyncSalesOrder documents having status X must be sent from A to B. Another active flow orders that SyncSalesOrder documents having status Y must be sent from A to B. Then all SyncSalesOrder documents having status X or Y are sent from A to B.

Filtering is done at message level. Either the whole message is delivered or nothing. The message is not partially delivered (for example by only including the relevant purchase order lines). When using attributes that occur multiple times in a document the document is passed on if at least one of the lines matches the filter. For example, attributes from an order line can occur multiple times.

The actionCode in BODs is not changed by the filtering. If the first BOD with actionCode Add is filtered out, and the second BOD for the same object instance with actionCode Update is passed.

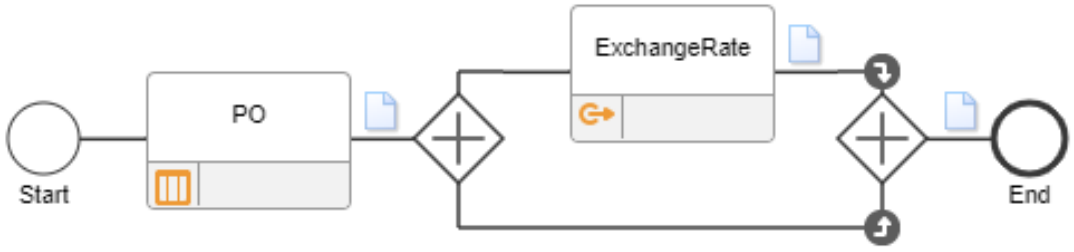
Filtering is not applied to BODs used in Event Management. If an application publishes SyncSalesOrder and an event monitor exists for SalesOrder. Then all SyncSalesOrder BODs are delivered to the event monitor, even if in the document flow a filter is specified.

Document merging

With merge you can combine two documents together into one output document. The Merge activity in Data flow is available only for environments that are licensed with a Professional or Enterprise license. There are two merge types:

- Basic enrichment of the original document
- Advanced merge using script

Note: this is not used to combine two different documents but instead to combine new values to the original document as see in the image below. Here we are pulling exchange rates from an API and enriching the original document with the exchange rates.



Example of a Data Flow using the merge function

Three important documents are considered in a merge:

Document	Description
Input document	This is the document that is received from the activity preceding the merge. It is used to request additional information in the top branch. It can also be called the original document.
Patch document	This is the last document that is created in the top branch of merge. The document is defined in the document selection before the merging part of merge.
Output document	This is the document that is created by adding some information from the patch document to the input document.

Basic enrichment of the original document

In basic enrichment, the values of primitive types and leaf elements from the patch document are identified using path expressions. The place in the input document, where each value should be inserted,

is also identified using a path expression. The enriched document is then constructed and sent as output to the next step. The output document is an enriched input document, that means that input and output documents must have the same schema.

BOD or JSON conventional document types are supported in basic enrichment. You can use different document types for patch and input (output). For example, patch document BOD and input (output) document JSON conventional.

All message headers from source documents are persisted during the enrich process. The only new message ID is created for the output document.

Advanced merge using script

When using this type, a single input document is received. In the top branch additional information can be requested. The input parameters for the script are then defined either as an input document, patch document and its headers. The script is executed and the output parameters of the script are mapped to the output document.

All document types are supported in the advanced merge and the output document can be different from the input document.

Data Flow splitters

You can use a splitter in the data flow to split one document that contains multiple instances of the same object into separate documents. Each document with one object together with a document header and footer.

For example, when a purchase order with multiple purchase order lines is received and as the next step an API must be called per line. A splitter can be used to split a purchase order into multiple purchase orders. Each one containing all headers and footers and only one purchase order line. An API is then called once per each created purchase order.

Supported document types for splitting are BOD and JSON conventional. To define a required splitting element, you must use Xpath or JSON path, respectively.

Rules for using a splitter in a data flow

When using a splitter in a data flow, these rules apply:

- One output document is created for each instance of element defined by the path.
- The message ID of the output documents is the same as the message ID of the input document but extended with a sequence number.
- If a defined path is not found in an input document, no splitting is done. The input document is passed to the output as is.
- If an input document is split into at least two output documents, the instances message header is deleted.
- All other message headers are copied from the input document to all output documents.
- A sibling to a parent element without any instance of element that is defined by a path, is not included in any output document.

Scenario

You have a BOD that has multiple lines on it coming from a third party and you need to read the BOD in as separate files to send on to another external system. Each line item in the BOD should create a separate file. You should be able to trace the steps of the document flow in OneView and see all the different files being generated.

Exercise 5.3: Using a splitter in a Data Flow

In this exercise, you will split the lines of the PO into multiple files to be sent to different files or warehouses.

Before you begin:

- Ensure you are logged in to Infor Ming.le and are at the homepages screen for your assigned user account. If not, refer to Exercise 1.1.
- Ensure you have completed Exercise 1.3 because it provides data or configurations for this exercise.

Exercise steps

Part 1: Create the data flow

1. Click **App Menu > ION Desk > Connect > Data Flows**. **Note:** You may need to click the **hamburger** icon to see the menu.
2. Click the **+ Add** button.
3. Click the **Document flow** list item.
4. Type *STB[XX]_Splitter* in the **Name** field.
5. Type *This is a splitter exercise* in the **Description** field.
6. Drag a **File** item to the data flow.
7. Drag a second **File** item to the data flow.
8. Drag a **Splitter** item between the two file items.
9. Click the **File1** item.
10. Type *PO_Publish* in the **Name** field.
11. Click the **File Connector** drop down-arrow.
12. Click the **STBXX_FileECOut** list item.
13. Click the **Save** button.
14. Click the **File2** item.
15. Type *PO_Write* in the **Name** field.
16. Click the **Save** button.
17. Click the **New** button.
18. Click the **File** list item.
19. Type, select, or confirm the following on the **File Connection Point (through Enterprise Connector)** screen:

Item	Details
Name	STBXX_POProcessing

Item	Details
Description	File Enterprise Connector PO Processing
Location	[Available Location] **Note:** There should only be one option here.
Transfer Protocol	Shared Folder
SMB v2	Unchecked
Host Name	EC-2020
User Name	Inforuser
Password	!nfor08

20. Click the **Test** button. A message that the test succeeded displays.
21. Click the **OK** button.
22. Click the **Documents** tab.
23. Click the **+ Add** button.
24. Click the **Write a file to a folder** radio button.
25. Click the **Document** radio button.
26. Click the **search** icon in the **Document** field.
27. Type *Sync.PurchaseOrder* in the **Filter** field.
28. Click the **Sync.PurchaseOrder** item.
29. Click the **OK** button.
30. Click to select the **Create non-existing folder(s)** check box.
31. Type *\FileShare\ION_Connect\STBXX\PO_Write* in the **Write Location** field.
32. Type *PO_[document_id]_[current_datetime].xml* in the **File Name Pattern** field.

    Note: Select **[document_id]** and **[current_datetime]** by pressing **CTRL + spacebar** and selecting the items from the list.
33. Click the **If File exists** drop-down arrow.
34. Click the **Error** list item.
35. Click the **Save** button.
36. Click the **back** button to return to the document flow.
37. Click the **Document** icon before the **Splitter** item.
38. Click the **+ Add** button.

39. Click to select the **Sync.PurchaseOrder** check box.
40. Click the **OK** button.
41. Click the **Splitter** item.
42. Click the **Configuration** tab.
43. Click the **search** icon to the right of the **Path** field.
44. Click to select the **PurchaseOrder > PurchaseOrderLine** field.
45. Click the **OK** button.
46. Click the **Save** button.
47. Click the **Activate** icon.

Part 2: Test the splitter

1. Click the **Windows Explorer** icon in the taskbar.
2. Right-click the **Desktop > Class Files > InforOS_ConfiguringIONConnect > Exercise 5.3 > PO06.xml** file.
3. Click the **Copy** list item.
4. Right-click the **FileShare > ION_Connect > STBXX > PO_Out** folder
5. Click the **Paste** list item. The file should process and move over to the **Archive** folder.
6. Click the **Google Chrome** icon in the taskbar.
7. Click the **OneView** menu.
8. Verify **Last hour** is selected in the **Date and Time Range** field.
9. Click the **Search** button.
10. Click the **ION_PO06 Sync.PurchaseOrder** item. The splitter and the results of each line in the PO display.
11. Click the **Windows Explorer** icon in the taskbar.
12. Click the **FileShare > ION_Connect > STBXX > PO_Write** folder. There is an xml file for each line in the PO.

ION Mapper

A mapping is a description of how to transform (translate) messages, or documents, sent between internal and external resources.

In a homogeneous situation where every component speaks the same language, no mapping is required. But the data from the sending connection point may not match the expectations of the receiving connection points. For example, when using technology connectors such as the Database Connector. In that case you can use a mapping to transform the message contents.

The translated data can be used by other applications connected through ION and enables straight through processing of documents.

ION Mappings provides the capabilities to define mappings between standard or custom documents. A graphical modeler, called the Graphical mapping editor, is used to define the transformation.

You can use a graphical mapping to:

- Change a document.
  - For example map Sync.MyCustomSalesOrder to Sync.SalesOrder.
- Change the verb of a document.
  - For example, map Sync.MyProduct to Load.MyProduct.
- Extend the document by adding content or translating data values without changing the document type.
  - For example, map `Sync.SalesOrder` to `Sync.SalesOrder` to add some fixed property values.

Sensitive data mapping

You can use a sensitive data mapping to hide certain values or to remove them from the output document. When you use sensitive data mappings, you can perform these actions on document nodes:

- Mask data from nodes.
- Remove data from nodes.
- Remove nodes from a document.

A mapping cannot combine two BODs or split one BOD into multiple BODs. You can achieve the latter with a parallel flow having a specific mapping in each branch.

Note: To create mappings, you must understand the structure and contents of the source and target documents. Additionally, for part of the mapping functionality you must also have sufficient background knowledge and experience regarding:

- XML concepts such as elements, attributes and namespaces.
- Programming concepts such as functions, input/output parameters and loops.
- XSLT (Extensible Stylesheet Language Translation).

Scenario

In this next exercise we have a Sync.PurchaseOrder BOD being generated by LN, we need to transform this BOD into a Process.SalesOrder BOD for the fulfillment by the Warehouse Management system. We will use the ION Mapper to transform from one standard BOD to another standard BOD. You can change the verb and noun with the ION Connect Mapper on any BOD whether it is custom or standard.

Exercise 5.4: Transform file from another format

In this exercise, you will transform a sales order (SO) to a purchase order (PO) using the ION Mapper.

Before you begin:

- Ensure you are logged in to Infor Ming.le and are at the homepages screen for your assigned user account. If not, refer to Exercise 1.1.
- Ensure you have completed Exercise 1.1 because it provides data or configurations for this exercise.

Exercise steps

Part 1: ERP is unable to send a SO to a shipment

1. Click **App Menu > ION Desk > Connect > Data Flows**. **Note:** You may need to click the **hamburger** icon to see the menu.
2. Click the **+ Add** button.
3. Click the **Document Flow** menu item.
4. Type *STB[XX]_TransformFile* in the **Name** field.
5. Type *This is a transform exercise* in the **Description** field.
6. Drag the **Application** icon to the work area.
7. Drag a second **Application** icon to the work area.
8. Click the **Application1** icon.
9. Type *OtherERP* in the **Name** field.
10. Click the **Application2** icon.
11. Type *WarehouseManagement* in the **Name** field.
12. Drag a **Mapping** icon between the **OtherERP** and the **WarehouseManagement** icons.
13. Click the **Save** button to save the **Document Flow**.

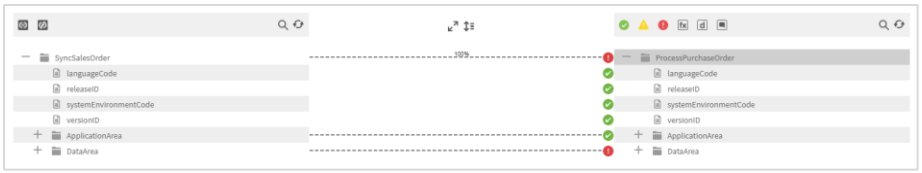
Part 2: Update the items

1. Click the **OtherERP** icon.
2. Click the **+ Add** button.
3. Type *In* in the **Filter** field.

4. Click to select the **In01_0052** check box.
5. Click the **OK** button.
6. Click the **Document** icon between the **OtherERP** and the **Mapping1** items.
7. Click the **+ Add** button.
8. Type *PurchaseOrder* in the **Filter** field.
9. Click to select the **Sync.PurchaseOrder** check box.
10. Click the **OK** button.
11. Click the **WarehouseManagement** item.
12. Click the **+ Add** button.
13. Click the **In01_0051** check box.
14. Click the **OK** button.
15. Click the **Save** button.
16. Click the **In01_0051** check box.
17. Click the **pencil** icon.
18. Click the **Documents** tab.
19. Verify the **Process.SalesOrder Receive in Application** check box is selected.
20. Click the **back** button to return to the data flow.

Part 3: Update the mapping

1. Click the **Mapping1** item.
2. Click the **New** button.
3. Click the **Graphical Mapping** list item.
4. Type *STB[XX]_Mapping* in the **Name** field.
5. Click the **search** icon in the **Source** field.
6. Type *Sync.PurchaseOrder* in the **Filter** field.
7. Click the **Sync.PurchaseOrder** item.
8. Click the **OK** button.
9. Click the **search** icon in the **Target** field.
10. Type *Process.SalesOrder* in the **Filter** field.
11. Click the **Process.SalesOrder** item.
12. Click the **OK** button.
13. Click the **SyncPurchaseOrder** item and drag the cursor to the **ProcessSalesOrder** item. This will map everything that it is able to reconcile. (Drag from the folder on the left until the bar turns a darker gray on the right.)



14. Click the **+** icon for the **DataArea** item in the **SyncPurchaseOrder** column.
15. Click the **+** icon for the **DataArea** item in the **ProcessSalesOrder** column.
16. Click the **DataArea Sync** item and drag the cursor to the **DataArea Process** item.
17. Click the **DataArea PurchaseOrder** item and drag the cursor to the **DataArea SalesOrder** item. This should resolve the remaining **red exclamation point** icons.
18. Click the **+** icon for the **PurchaseOrder** item in the **SyncPurchaseOrder** column.
19. Click the **+** icon for the **SalesOrder** item in the **ProcessSalesOrder** column.
20. Click the **PurchaseOrderHeader** item and drag the cursor to the **SalesOrderHeader** item.
21. Click the **PurchaseOrderLine** item and drag the cursor to the **SalesOrderLine** item. This should resolve the remaining **red exclamation point** icons.
22. Click the **Save** button.

Part 4: Verify the process

1. Click the **Testing** tab.
2. Click the **file folder** icon in the **Load a document** field.
3. Click the **Desktop > Class Files > InforOS_ConfiguringIONConnect > Exercise5.4 > SyncPurchaseOrder.xml** file.
4. Click the **Open** button.
5. Click the **Preview** button.
6. Click the **Format** button. The **Purchase Order** on the **Input** side has become a **Sales Order** on the **Output** side.
7. Click the **Save** button.
8. Click the **Approve (check mark)** icon next to the **Draft** status. This will **Approve** the mapping.
9. Click the **back** button to return to the document flow.
10. Click the **Activate** button.

Part 5: Test in OneView

1. Click the **App Menu** icon.
2. Click the **LN** shortcut.
3. Click the **Procurement > Orders > PO Intake Workbench** shortcut.
4. Click the **Purchase Orders** Tab.
5. Click a **PO** line in the bottom section that has a status of **Created**. Make note of the **PO number** for the item.
6. Click the **Actions** menu in the bottom toolbar.

7. Click the **Approve** list item.
8. Click the **App Menu > ION Desk > OneView** menu.
9. Confirm **Last hour** is displayed in the **Date and Time Range** field.
10. Click the **Search** button.
11. The **Process.SalesOrder** that you approved in **Step 7** displays.

Check your understanding

Which of the following are true about filtering or routing? Select all that apply.

a) Filtering allows messages to be sent to a destination only if conditions are met.
b) Filtering and routing can be used to avoid delivering too many documents to a connection point.
c) Routing allows documents to be ignored if the conditions are not met.
d) Messages of the same type are routed to one or more destination.

Refer to Appendix B for answers to the check your understanding questions.

Lesson 6: ION Messaging Service (IMS)

Estimated time

2.0 hours

Learning objectives

After completing this lesson, you will be able to define working with the ION Messaging Service (IMS). In this lesson, you will:

- Explain how to use IMS and IMS via API.
- Define message queues.

Topics

- IMS and IMS via ION API
- Using messaging queues

IMS and IMS via ION API

IMS is a loosely coupled connector that makes integrations easier. It allows applications to integrate with ION through REST/JSON APIs. IMS does not require direct access to an application's database, instead, it communicates through the secured https protocol, using OAuth 1.0, or ION API for authentication.

Specifications for IMS include well-defined API methods which are implemented by ION and must also be implemented by the concerned application. After implementation, they can push messages to each other through the APIs. IMS can send and receive multiple message requests in parallel. Therefore, sequence of message transport is not guaranteed when using the IMS connector. This is important to note if sequencing is important.

Application connection points are of type IOBOX or IMS. IMS integration can be a direct integration or through ION API. The characteristics of these connection point types are described in this table:

Type	Description
IOBOX	This connection point type sends messages using outbox tables and receives messages using in-box tables. The in-box and outbox are connected through JDBC. Only messages of type BOD are supported with this connection point.
IMS	This connection point type exchanges messages with an application through predefined REST methods. This type of connection point authenticates through OAuth 1.0. IMS supports all document types that are defined in the ION Data Catalog.
IMS via ION API	This connection point type exchanges messages with an application through predefined IMS REST methods. Connectivity and authentication is handled by ION API.

The Infor applications typically offer this way of connecting to ION. Other applications can also adopt this.

Configuring an IMS integration through ION API

Before you can configure an IMS integration between an application and ION, through ION API, you must prepare the application for this communication.

You cannot make IMS API calls through the swagger **Try it out!** option because the IMS side verifies the authentication of the calling side.

For an IMS through ION API, the **ClientId** of the ION API authorized application must be included in the request; the swagger cannot take care of this. You can use a client such as Postman, to make the call to ION API and use the authorized application credentials.

Exercise 6.1: Using the Infor Messaging Service

In this exercise, you will use Postman to send messages through IMS.

Before you begin:

- Ensure you are logged in to Infor Ming.le and are at the homepages screen for your assigned user account. If not, refer to Exercise 1.1.
- Ensure you have completed Exercise 1.1 because it provides data or configurations for this exercise.

Exercise steps

Part 1: Create and download the authorization file

1. Click **App Menu > Infor ION API > Authorized Apps**.
2. Click the **+ Add** button.
3. Type *STB[XX]_IMS_CP* in the **Name** field.
4. Click the **Backend Service** radio button.
5. Type *STB[XX] IMS authorized application* in the **Description** field.
6. Click the **Save** button.
7. Click to highlight the **Client ID** field.
8. Right-click the highlighted information.
9. Click the **Copy** list item.
10. Click the **Download Credentials** button.
11. Click to activate the **Create Service Account** slider.
12. Type *Student B [X]* in the **Search User** field. **Note:** You do not need the leading zero. If your assigned user account is **Student 01-09.**
13. Click **[your assigned user account]** list item.
14. Click the **Download** button.

    Note: Google Chrome may display a message asking if you want to download multiple files, if this happens, click the **Allow** button.
15. Click the **up arrow** for the **STBXX_IMS_CP.ionapi** file in the taskbar.
16. Click the **Show in folder** list item.
17. Right-click the **STBXX_IMS_CP.ionapi** file.
18. Click the **Edit with Notepad++** list item.
19. Click the **Plugins > JSON Viewer > Format JSON** menu item. It will look like the image below.

If **JSON Viewer** doesn't show as an option in the **Plugins** menu (*this part may not be needed*)

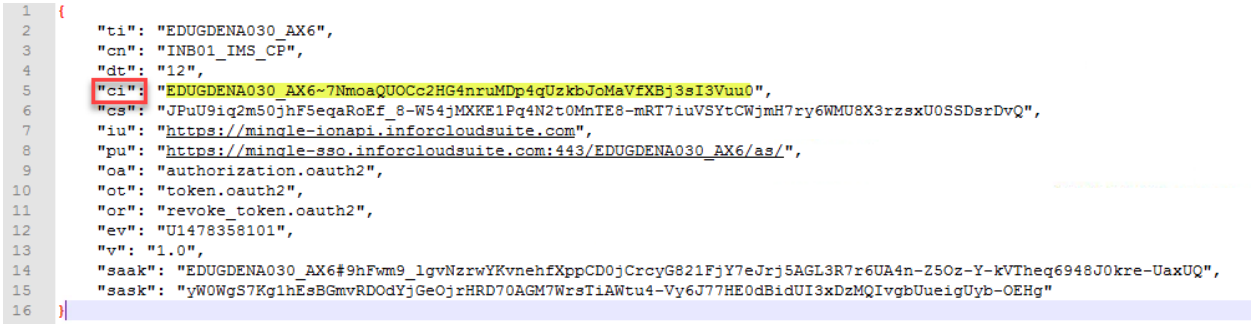
- Click the **Plugins** menu.
- Click the **Plugins Admin** menu item.
- Type *JSON* in the **Search** field.
- Click the **JSON Viewer** checkbox.
- Click the **Install** button.
- Click the **Yes** button. The Notepad++ window displays.
- Go back to **Step 19**.

20. Click the **Google Chrome** shortcut in the taskbar.
21. Click the **Save** button.

Part 2: Create the data flow

1. Click the **App Menu** icon.
2. Click the **ION Desk** icon.
3. Click the **hamburger** icon.
4. Click the **Connect** menu.
5. Click the **Data Flows** menu item.
6. Click the **+ Add** button.
7. Click the **Document Flow** list item.
8. Type *STB[XX]_IMS2File* in the **Name** field.
9. Drag an **Application** item to the timeline.
10. Drag a **File** item to the timeline.
11. Click the **Application1** icon on the timeline.
12. Type *STB[XX]_IMS_Postman* in the **Name** field.
13. Click the **New** icon.
14. Click the **IMS via ION API** list item.
15. Click the **Yes** button to save the changes.
16. Type *STB[XX]_IMS_CP* in the **Name** field.
17. Click to clear the **Application has IMS End Point** check box.
18. Return to Notepad ++ where you have the **STB*XX*_IMSCP.ionapi** file open.

19. Navigate to the **“ci”** variable and select the values between the quotes.
20. Right click **Copy.**



21. Right-click the **ION API Client Id** field.
22. Click the **Paste** list item.
23. Press the **spacebar** after the pasted information in the **Client Id** field.

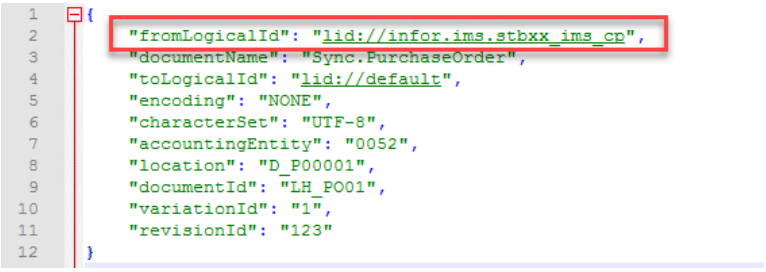
    Note: There is a known issue with the number of characters needed in this field to save. We will remove this space in step 30.
24. Click the **Documents** tab.
25. Click the **+ Add** button to add a document.
26. Type *Sync.PurchaseOrder* in the **Filter** field.
27. Click to select the **Sync.PurchaseOrder** document check box.
28. Click the **OK** button.
29. Verify the **Send from Application** check box is selected.
30. Click the **Save** button.
31. Click the **Connection** tab.
32. Click at the end of the **ION API Client ID** field.
33. Delete the space at the end of the field.

    Note: This is the extra space we added in step 20.
34. Click the **Save** button.

Part 3: Update json file

1. Highlight the information in the **Logical ID** field.
2. Right-click the highlighted information.
3. Click the **Copy** list item.
4. Click the **Windows Explorer** icon in the task bar.
5. Right-click the **Desktop > InforOS_ConfiguringIONConnect > Exercise 6.1 > ims-conf.json** file.
6. Click the **Edit with Notepad++** list item.
7. Delete the information in the **fromLogicalID** field after **lid://**.
8. Right-click after **lid://**.

9. Click the **Paste** list item.



10. Click the **Save** icon.
11. Click the **Google Chrome** icon to return to **ION Desk**.
12. Click the **Back** button to return to the **Document Flow**.
13. Click the **File1** icon.
14. Type *File_Out* in the **Name** field.
15. Click the **New** button next to the **File Connector** drop-down field.
16. Click the **File** list item.
17. Type, select, or confirm the following on the **File Connection Point (through Enterprise Connector)** screen:

Item	Details
Name	STBXX_FileOut
Location	[Available Location] **Note:** There should only be one option here.
Transfer Protocol	Shared Folder
SMB v2	Unchecked
Host Name	EC-2020
User Name	Inforuser
Password	!nfor08

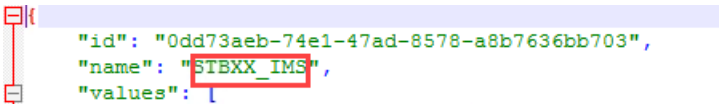
18. Click the **Test** icon. A message that the test succeeded displays.
19. Click the **OK** button.
20. Click the **Documents** tab.
21. Click the **Add +** icon.
22. Click the **Write a file to a folder Scenario** radio button.

23. Click the **Document** radio button.
24. Click the **Search** icon in the **Document** field.
25. Type *Sync.PurchaseOrder* in the **Filter** field.
26. Click to select the **Sync.PurchaseOrder BOD**.
27. Click the **OK** button.
28. Click to select the **Create non-existing folder(s)** check box.
29. Type *\FileShare\ION_Connect\STB[XX]\FullBODOutput* in the **Write Location** field.
30. Type *Shipment[document_id]_[current_datetime].xml* in the **File Name Pattern** field.

    Note: Select **[document_id]** and **[current_datetime]** by pressing **CTRL + spacebar** and selecting the item from the list.
31. Click the **Test** button. A message that the test succeeded displays.
32. Click the **OK** button.
33. Click the **Save** button.
34. Click the **back** arrow to return to the **Document Flow**.
35. Click the **document** icon between the **STBXX_IMS_Postman** and **File_Out** items.
36. Click the **+ Add** button.
37. Click to select the **Sync.PurchaseOrder** check box.
38. Click the **OK** button.
39. Click the **Save** button.

Part 4: Update Postman

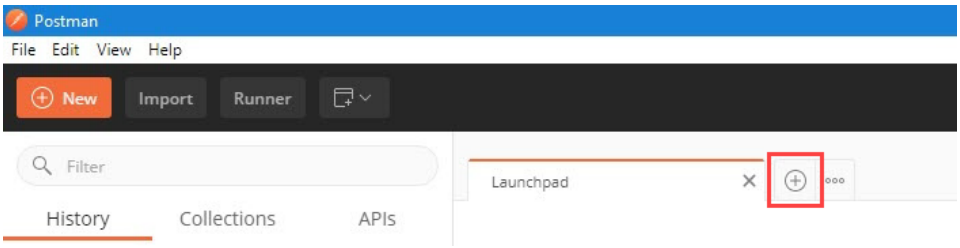
1. Click the **minimize** icon to minimize **Google Chrome**.
2. Right click the **Desktop > InforOS_ConfiguringIONConnect > Exercise 6.1 > TEMPLATE.postman_environment.json** file.
3. Click the **Edit with Notepad ++** list item.
4. Right-click the **TEMPLATE.postman_environment.json** tab.
5. Click the **Move to Other View** menu item. This will open the two windows next to each other.
6. Type *STB[XX]_IMS* in the **name** field between the quotes. You will replace the **STBXX_IMS** that is currently there.



7. Click to highlight the information between the quotes after **ci** on the **STBXX_IMS_CP.ionapi** tab.
8. Right-click the highlighted information.
9. Click the **Copy** menu item.
10. Right-click in the space between the quotes after the **ci value** field on the **TEMPLATE.postman_environment.json** tab.

```
"id": "0dd73aeb-74e1-47ad-8578-a8b7636bb703",
"name": "STBXX_IMS",
"values": [
    {
        "key": "ci",
        "value": ""
        "enabled": true
    },
```

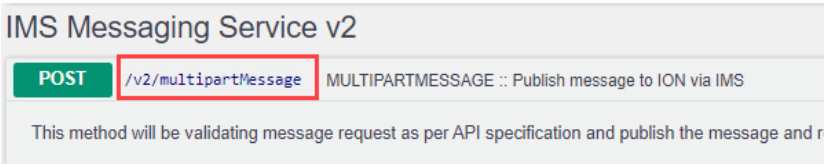
11. Click the **Paste** menu item.
12. Repeat steps 7-11 to add the information from the **STBXX_IMS_CP.ionapi** tab to the **TEMPLATE.postman_environment.json** tab for each of the values listed.
    - cs
    - pu
    - ot
    - saak
    - sask
13. Verify the **TEMPLATE.postman_environment.json** tab is selected.
14. Click the **File** menu.
15. Click the **Save As** list item.
16. Type *STB[XX].postman_environment.json* in the **File name** field.
17. Click the **Save** button.
18. Navigate to the **Desktop**.
19. Double-click the **Postman** shortcut on the desktop. It may take **Postman** a few seconds to open.
20. Click the **Manage Environments** icon (next to the **eye** icon).
21. Click the **Import** button.
22. Click the **Choose Files** button.
23. Click the **Desktop > InforOS_ConfiguringIONConnect > Exercise 6.1 > STBXX.postman_environment.json** file created above.
24. Click the **Open** button.
25. Click the **X** to close the **Manage Environments** window.
26. Click the drop-down arrow for the **No Environment** window.
27. Click to select your new environment **STB*XX*_IMS** from the list.
28. Click the **+** tab to add a blank workspace if there is not already one available.



29. Click the **GET** drop-down arrow.

30. Click the **POST** list item.
31. Click the **Google Chrome** icon in the taskbar.
32. Click **App Menu > Infor ION API > Available APIs**.
33. Click the **Infor ION** tile.
34. Click the **Documentation** icon for the **ION Messaging Service** Endpoint.
35. Click the **/v2/multipartMessage Post** button. Make note of the Parameters.
36. Click to highlight the **Endpoint URL** at the top of the page.

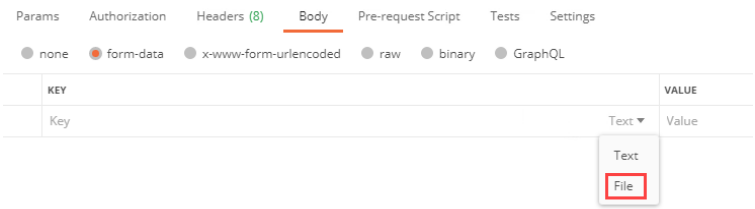
37. Right-click the highlighted **Endpoint URL**.
38. Click the **Copy** list item.
39. Click the **Postman** shortcut in the taskbar.
40. Right-click the **Enter Request URL** field.
41. Click the **Paste** list item.
42. Click the **Google Chrome** shortcut in the task bar.
43. Highlight the information after the **Post** button for the **MultipartMessage**.



44. Right-click the highlighted information.
45. Click the **Copy** list item.
46. Click the **Postman** shortcut in the taskbar.
47. Right-click at the end of the **URL** in the **Enter Request URL** field.
48. Click the **paste** list item. It should look similar to the image below.

Part 5: Update Postman – Body tab

1. Click the **Body** tab.
2. Click to select the **form-data** radio button.
3. Click the **Text** drop-down arrow. **Note:** You may not see this option until you hover over the **Key** field.



4. Click the **File** list item.
5. Type *ParameterRequest* in the **Key** field.
6. Click the **Select Files** button for the **ParameterRequest** key.
7. Click the **Desktop > Class Files > InforOS_ConfiguringIONConnect > Exercise 6.1 > ims-conf.json** file.
8. Click the **Open** button.
9. Click the second **Text** drop-down arrow.
10. Click the **File** list item.
11. Type *MessagePayload* in the second **Key** field.
12. Click the **Select Files** button for the **MessagePayload** key.
13. Click the **Desktop > Class Files > InforOS_ConfiguringIONConnect > Exercise 5.1 > Sync.PurchaseOrder.xml** file.
14. Click the **Open** button.

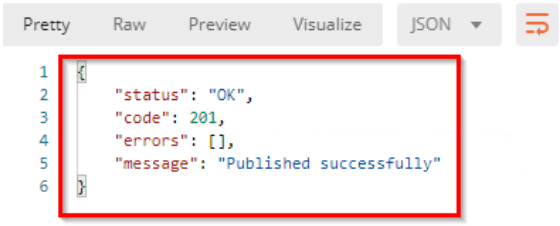
Part 6: Update Postman – Authorization tab

1. Verify **STBXX_IMS** displays in the environment field (the top right corner).
2. Click the **Authorization** tab.
3. Click the **TYPE** drop-down arrow.
4. Click the **OAuth 2.0** list item.
5. Scroll down to the **Grant Type** field on the right side.
6. Click the drop-down arrow for **Authorization Code**.
7. Click to select **Password Credentials** in the **Grant Type** field.

Click the **i** icon to see more information about each field and to verify you are using the correct variables.

8. Type *{{pu}}{{ot}}* in the **Access Token URL** field.
9. Type *{{saak}}* in the **Username** field.
10. Type *{{sask}}* in the **Password** field.
11. Type *{{ci}}* in the **Client ID** field.
12. Type *{{cs}}* in the **Client Secret** field.
13. Type *email* in the **Scope** field.

14. Verify **Send as Basic Auth header** is selected in the **Client Authentication** field.
15. Click the **Get New Access Token** button.
16. Click the **Proceed** button.
17. Click the **Use Token** button.
18. Click the **Send** button. A confirmation message that the BOD was published displays.



19. Click the **Google Chrome** icon in the taskbar.
20. Click the **App Menu > ION Desk > OneView** menu.
21. Verify **Last hour** is selected in the **Date and Time Range** field.
22. Click the **Filter +** and click the check box for the **Sender Logical ID** filter.
23. Click the drop-down arrow in the **Sender Logical ID** filter.
24. Select the **lid://infor.ims.stbxx_ims_cp** logical id from the list.
25. Click the **Search** button.
26. Click the **LH_PO01** item. When the screen refreshes, you will see that the message was processed.
27. Click the **Windows Explorer** shortcut in the taskbar.
28. Double-click the **FileShare > ION_Connect > STB[XX] > FullBODOutput** folder. The **Shipment[document_id]_[current_datetime].xml** file displays.

Using message queues

Message queue connection point

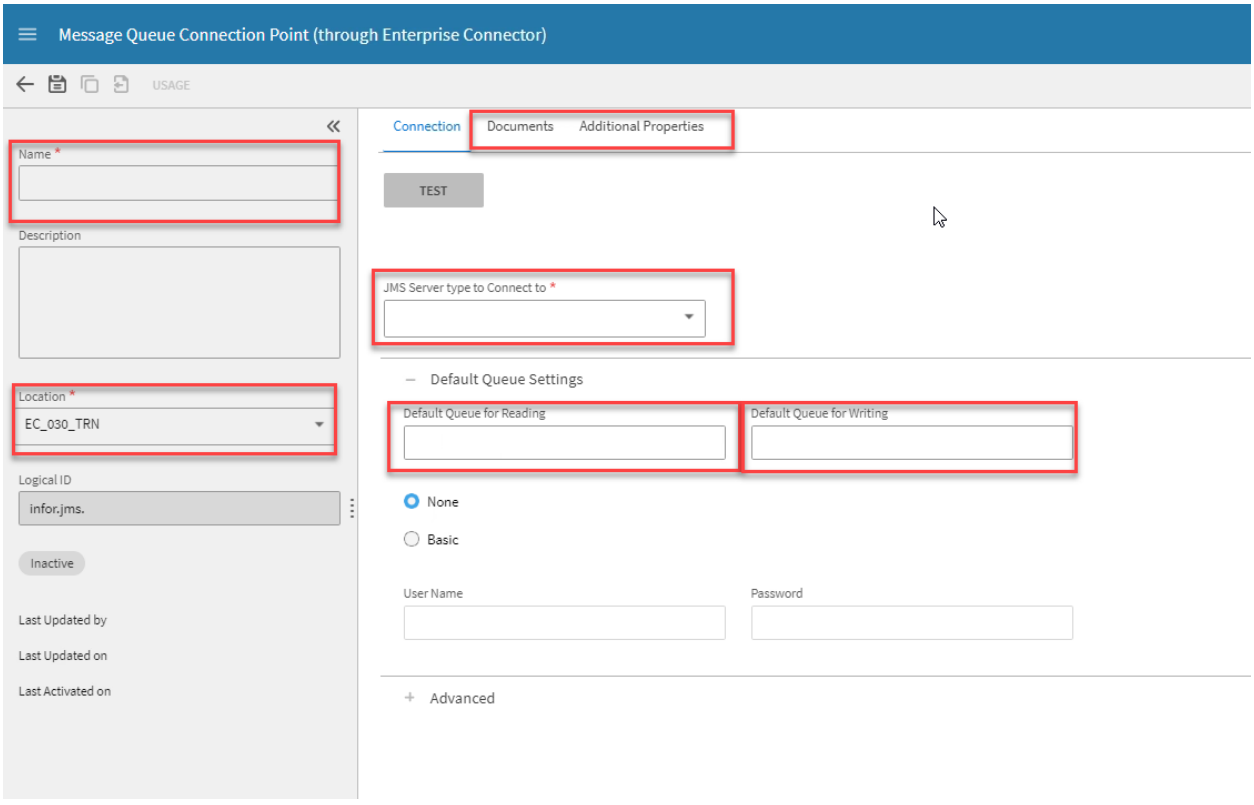
You can use connectivity through message queues. In ION Desk you can create a connection point to read or write a message queue. Java Messaging Standard (JMS) queues are used. You can send or receive messages to or from ION.

ION acts as a JMS client. It can directly connect to external JMS queues that are provided by other vendors and transport messages back and forth.

You can use complete BODs as messages or use any XML message. In the latter case, it is ensured that your XML message is packed as a BOD in the ION Service. In this way, your data can be handled and monitored in ION like any other BOD. For example, you can use mapping or content-based routing on your messages, trigger alerts and workflows. Consequently, you can use message queue connection points in a document flow like any other type of connection point.

A message queue connection point specifies:

- The standard properties for any connection point, such as name and tenant. Note that for message queue connection points the logical ID type is fixed (JMS), the logical ID is lid://infor.jms followed by the converted name.
- What queue or queues to use and how to connect to these queues.
- Which documents can be sent and received and how the BODs must be translated to JMS messages or the other way around.



Message queue connection point

Check your understanding

What are the three types of Application connection points?

_____

_____

_____

_____

What does a message queue connection point specify?

_____

_____

_____

_____

Refer to Appendix B for answers to the check your understanding questions.

Lesson 7: ION scripting

Estimated time

1.0 hour

Learning objectives

After completing this lesson, you will be able to demonstrate the use of ION scripting in Data Flows. In this lesson, you will:

- Provide an overview of ION scripting.
- Discuss troubleshooting techniques

Topics

- ION Scripting overview
- Scripts
- Libraries
- Troubleshooting

ION scripting overview

ION scripting is a feature for multi-tenant (MT) environments which allows integration developers, administrators, and analysts to write custom Python code as part of their business process integrations. These scripts are then used as a data transformation activity within a Document Flow or Data Lake Flow. It is not meant as a replacement for the graphical mapper, but is an expansion used to expand the capabilities of the graphical mapper. ION scripting can be used to and solve common actions such as:

- Data object format conversion
- Data mapping
- Complex calculations & transformations
- Simplified data manipulation orchestration

The two primary components of data transformation management are:

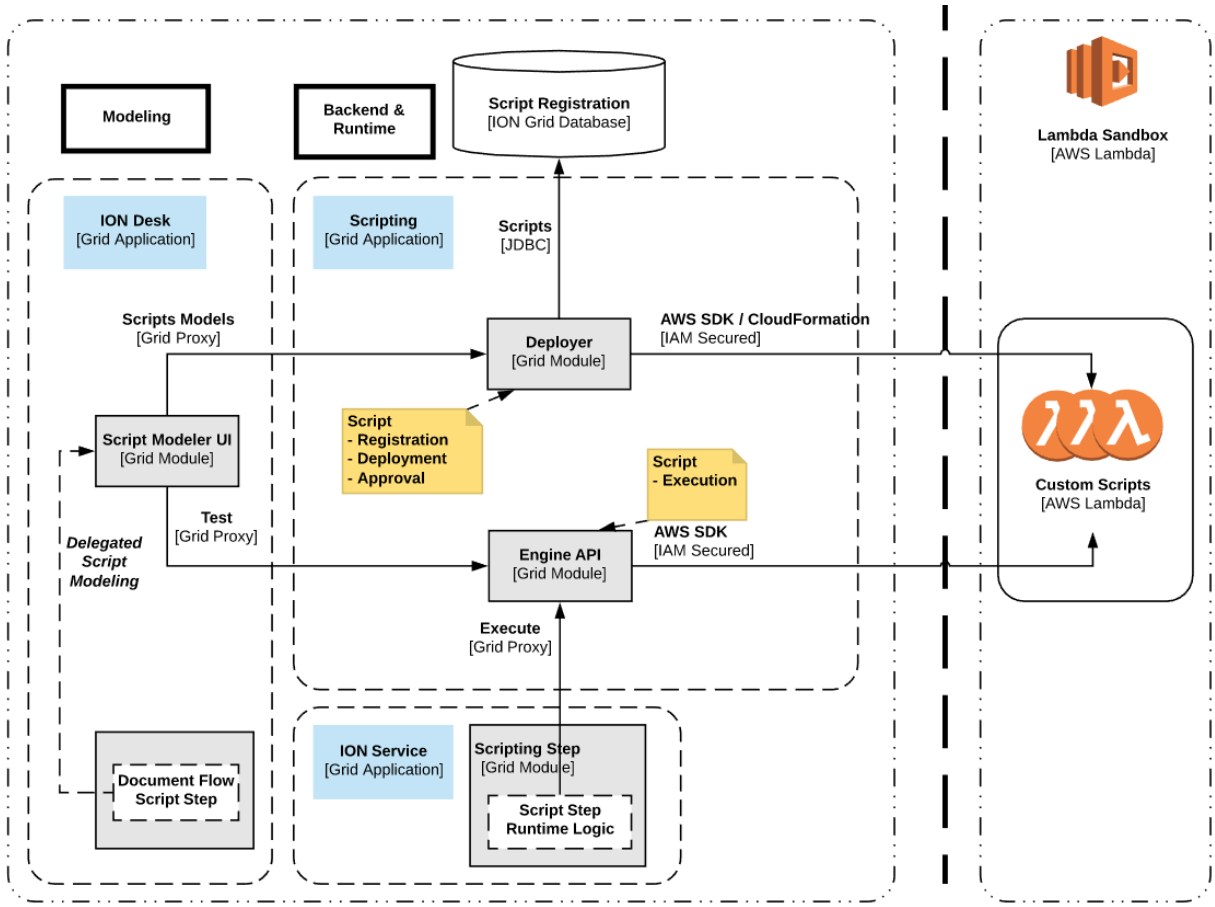
- **Scripts** provide a functional management page and browser-based development integrated development environment (IDE) for writing or importing Python scripts. These scripts can then be referenced and managed as an activity within ION's Data Flow modelers.
- **Libraries** provide a management component for importing and storing custom and open-source Python packages that can be referenced within an ION script. Libraries can be useful in accelerating development to leverage functional packages that may complete or automate an otherwise complex business requirement.

ION scripting provides a suite of tools to simplify the process of writing scripts. It may not provide the developer features typically associated with local IDE clients and applications. For complex coding use cases or advanced developers, developing scripts within an IDE and importing them into ION scripting can be a preferred development workflow.

Script execution, performance, and behavior can differ between a local IDE client and ION scripting. Sufficient testing must be done to ensure consistent development expectations when deploying a script within a Data Flow. When you are developing code outside ION scripting, you should ensure the code and libraries you work with are supported.

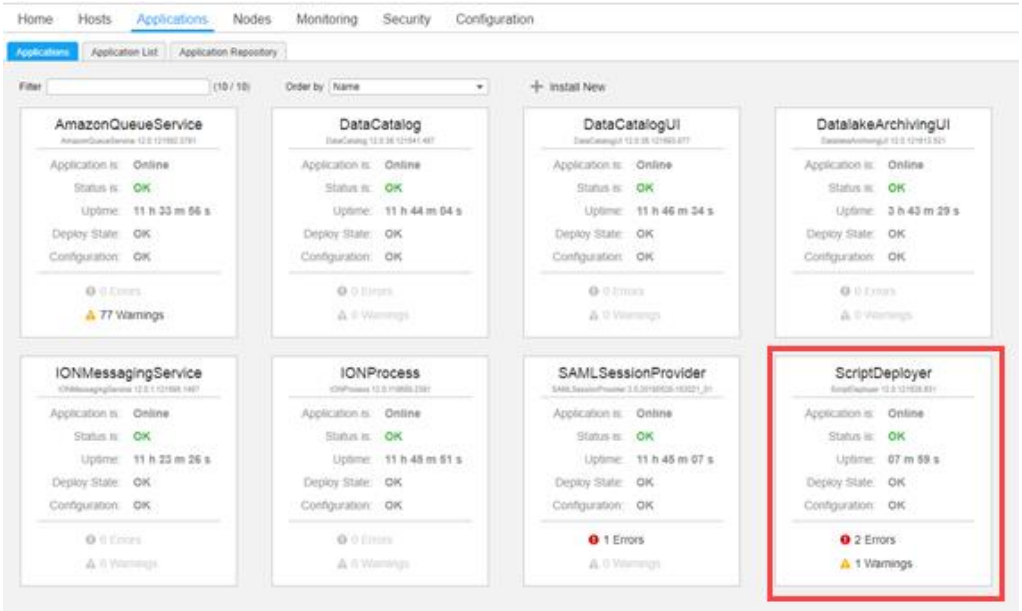
This means that not only can you manage BOD or XML files, but now you can also manage other file types such as JSON or Newline Delimiter JSON NDJSON. Python (versions 3 and above) is currently the only language that is supported in the scripting tool.

The scripting tool uses the AWS Lambda service in the background to function. Lambda is a computing service that runs code in response to events and automatically manages the computing resources required by that code. AWS Lambda is a MT Cloud Technology tool. It links the ION Grid to the ION Desk front end (as seen in the image below).



AWS Lambda architecture

The Scripting tool is a part of the Script Deployer service. In the image below, you can see the ScriptDeployer service has been added to the Infor ION Grid.



The ION Grid

Limitations

Since we are using AWS Lambda, we need an AWS account. Lambda will only allow you to have 1000 concurrent executions. It uses what is called an Elastic Network Interface (ENI). This means that resources will be given on a demand basis and the resources for these queries are all in a shared pool. If you exceed your given amounts, AWS will automatically start to throttle you.

Scripting has a few limitations as well:

- Scripts must be less than 6 MB
- Memory for execution is 1 GB
- While testing, the script must complete in 30 seconds
- While running, the script must complete in 15 seconds
    - A script that completes in 20 seconds will test successfully, but it will fail when running the script

Scripting is a closed box solution that only allows data to be sent to it. It can only be used to manipulate data within Infor OS. We cannot use the scripting tool to call an API or something else outside the network.

Scripts page

From the **Scripts** page, you can:

- Add a new script
- Delete scripts
- Duplicate a script
- Export or import scripts
- Approve scripts
- Check the usage of a script
- Search by keywords
- Filter by approval status
- Change the view between the Tiles view (default) and the Grid view

Deleting scripts

Scripts can be deleted regardless of whether that script is actively used in a Data Flow. Multiple scripts can be deleted at the same time by selecting them all.

Duplicating scripts

When duplicating a script, the latest version of the script is copied into a new script. Note that any sample files or content pasted into the **Testing** tab is not migrated to the new script.

Exporting scripts

You can export one or more scripts and save them as a JSON file export. Multiple scripts can exported at the same time by selecting them all. During export, any sample files or input content used during testing is not included in the file export process.

Importing scripts

When scripts are imported, they are imported and displayed in the Overview page as the newest ones. If an existing script is detected in ION Scripting while it is being imported, you are asked to select a preferred import behavior. You can select one of these options:

- Append as Draft. Select the imported duplicate scripts in the grid that must be appended as draft to the corresponding existing ones.
  Note: Draft versions on the existing scripts are overwritten. If there is no draft version, a new one is created.
- Skip importing the non-selected scripts in the grid.
- Rename the non-selected duplicate scripts after importing.

Script details

Script details are displayed on the tiles in the Tiles view, or in the data grid in the Grid view. For each script, the following details are displayed:

- Script name
- Script description
- Script version status

- Script latest approved version number
- Last updated date
- Last updater's username

Approving scripts

Scripts can be approved individually or in multiples. You can select multiple scripts by selecting one or more rows and click **Approve**. After the approval action is completed, a status dialog box is displayed with the status for each script. The status' can indicate the following information:

- Successfully approved the draft version
- No draft versions were found to be approved
- An error occurred while approving the draft version, because the script is invalid. In this scenario, open the script to investigate and solve the issue.

Script usage

You can identify and understand how ION scripts are deployed by clicking the **Usage** link on the tile. This will indicate which document flows or Data Lake flows are currently using the script. You can further drill down to the modeling page of the flow by clicking on the flow name.

Searching and filtering scripts

After clicking the **Search** icon, specify a search string. The string is matched against the script name, script description, and last updater's username. The search results can be further narrowed by clicking the **Filter** icon to filter by version status, which includes:

- **Draft:** Scripts that have only a draft version and no approved versions.
- **Approved with a Draft:** Scripts containing a draft version and approved versions.
- **Approved:** Scripts that have all versions approved.

Libraries page

The library details page consists of the following:

- Library's left panel with the name, description, and contents of the library.
- Versioning widget for managing multiple imported library versions.
- Information tab with general information about the library.
- Read-only code editor to browse the contents of the library.

The library details are parsed from the library package itself. Attributes and details describing the library may be unavailable or otherwise not listed if the package developer did not provide these details.

In the library details page, you can perform the following actions:

- Change the description of the library.
- Export the library to a .whl file.
- Check the library usage.

Libraries are considered read-only with the exception of the description field. ION administrators may append a custom description to help describe library functionality and usage.

Note that the version of the library exported from ION is the version currently selected and viewed within the ION Scripting UI. To export a different version of the library, select a previous version to view before exporting.

On the **Libraries** page you can:

- Import and export one or more libraries
- Delete one or more libraries
- Check the usage of a library
- Search by keywords
- Change the view between the Tiles view (default) and the Grid view

Importing libraries

The supported file format extension is Python Wheels (.whl). You can manage and use different versions of the same library in scripts; however, you cannot import a library with an existing name and version in the system. On import, the following details are retrieved from the file:

- Library Name
- Description
- License
- Author
- External Dependencies to other libraries
- Contents of the library

When importing a library, you can either import a single library or multiple libraries at once.

To import multiple libraries, create a .zip file that contains all of the .whl formatted libraries.

If you import an existing library with a different release version, a confirmation dialog box is displayed that a new version of an existing library is appended to the existing library. If you attempt to import an unsupported library, a confirmation dialog box is displayed. You are informed that one or multiple of these exceptions occurred:

- Library file is in a not supported format
- Platform tag is not supported
- Python version tag is not supported
- ABI tag is not supported

Deleting libraries

When deleting libraries, you can select multiple libraries and delete them. In the Grid view, select one or multiple rows and click **Delete**.

Note: You cannot delete a library that is used in an approved script version. To delete such a library, first remove the library dependency from the script.

Exporting libraries

You can export one library or more libraries at once. A single library is exported as a Python Wheel package. Multiple libraries are exported in a .zip file containing multiple Python Wheel packages.

When exporting a library, you can select multiple libraries and export them. In the Grid view, select one or multiple rows and click **Export**.

Library details

For each library, the following details are displayed on the tiles in the Tiles view, or in the data grid in the Grid view:

- Library name
- Library description
- Last updated date
- Last updated by
- Library Version

Library usage

You can identify and understand how ION libraries are deployed by clicking the **Usage** link on the tile. The usage dialog box displays these details for each library version:

- Name of script using the library version
- Script description
- Script version number
- Script version status

Note: Missing library versions are also shown in case a script is using a version that was deleted or never uploaded. These missing Library versions are indicated with an error status in the **Library Usage** dialog box. Multiple versions of a library cannot be used in a single script version.

Searching libraries

The search string is matched against the library name, script description, and last updater's username.

Troubleshooting

There is a **Testing** tab for you to input your python code and do a test run to be sure you do not have any errors. This is the best way to test your code.

Once the code has been tested and appears to be running correctly, we can look for any problems in the Confirm BOD.

Lesson 7 exercise overview

An organization needs to manage documents with different formats. They currently output a BOD, but their vendor requires a JSON message. In order to meet their vendors requirements, they must transform the BOD to a JSON using Python Scripting.

Exercise 7.1: Create script (BOD to JSON)

In this exercise, you will create a python script to convert an XML BOD to a JSON file.

Before you begin:

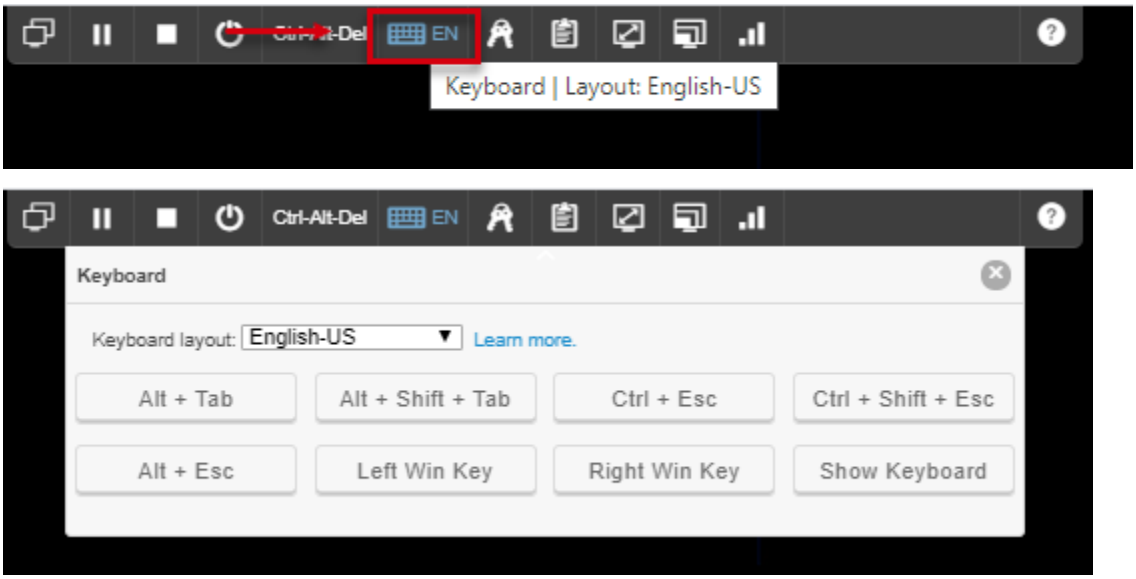
- Ensure you are logged in to Infor OS for your assigned user account. If not, refer to Exercise 1.1.
- Ensure you have completed Exercise 6.1 because it provides data or configurations for this exercise.

Exercise steps

Part 1: Design

1. Click the **Google Chrome** icon in the task bar to return to **ION Desk**.
2. Click the **Connect** menu.
3. Click the **Data Flows** menu item.
4. Click on the **STB[XX]_IMS2File** data flow. The **Document flow** opens to the modeling screen.
5. Click the **Deactivate** icon.
6. Drag a **Script** item in between the **STB[XX]_IMS_Postman** and **File_Out** items in the flow.
7. Type *STB[XX]_BOD2JSON* in the **Name** field.
8. Type *Convert BOD to JSON format* in the **Description** field.
9. Click the **Save** icon to save the **Document Flow**.
10. Click the **New** button next to the **Script** drop-down field.
11. Type *BODtoJSON* in the **Name** field.
12. Click the **Minimize** (-) button to minimize the Google Chrome window.
13. Right-click the **Desktop > Class Files > InforOS_Foundation2 > Exercise 7.1 > Scripting7.1** file.
14. Click the **Edit with Notepad ++** menu item.
15. Press **CTRL + A** to select all.
16. Right-click the highlighted content.
17. Click the **Copy** menu item.
18. Click the **Google Chrome** shortcut in the taskbar.

19. Click the **Keyboard** icon on the **Skytap** toolbar, as shown below. A menu of keyboard options displays, also shown below.



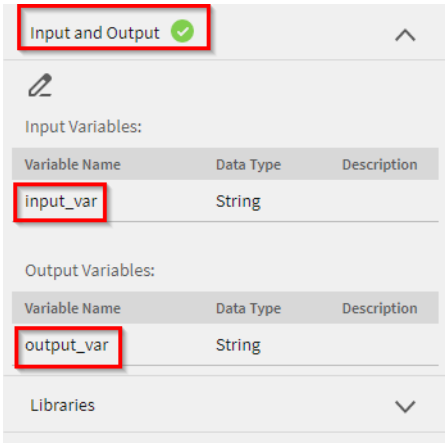
20. Click the **Show Keyboard** button. A keyboard displays in a panel on the bottom part of the screen, as shown below.

21. Click anywhere in the white space of the **BOD Message** panel. The cursor will flash continually.
22. Click the **Ctrl** button on the keyboard on the screen. The button is highlighted in yellow, as shown below.

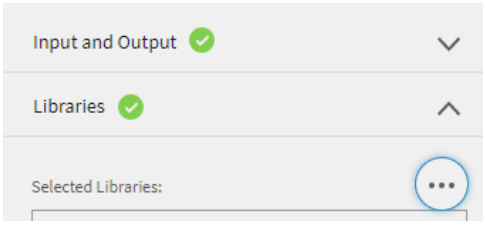
23. Click the **V** button on the onscreen keyboard. The **Sync.Shipment** BOD file is pasted into the **BOD Message** pane.
24. Click the **Ctrl** button on the onscreen keyboard. The yellow highlight is removed from the key indicating it has been deselected.

You *mus*t deselect the **Ctrl** key from the onscreen keyboard anytime you use it or it will remain activated.

25. Click the **Close (X)** button on the **Keyboard**. This closes the keyboard.
26. Click the **pencil** icon on the right side of the screen. This will allow you to edit the **Input** and **Output** variables.
27. Verify you are on the **Input Variables** tab.
28. Click the **+ Add** button.
29. Type *input_var* in the **Variable Name** field. **Note:** You may have to type over existing text.
30. Verify the **Data Type** is listed as **String**.
31. Click the **Output Variables** tab.
32. Click the **+ Add** button.
33. Type *output_var* in the **Variable Name** field. **Note:** You may have to type over existing text.



34. Verify the **Data Type** is listed as **String**.
35. Click the **UPDATE** button.
36. Click the **downward-facing arrow** to expand the **Libraries** section.
37. Click the **ellipses (…)** to the right side of the **Selected Libraries** section.



38. Click the **Add Library** list item.
39. Click to select the **xmltodict** check box. This library is available because it has already been updated to the tenant.
40. Click the **OK** button.

41. Click the **Save** icon.

Part 2: Testing

1. Click the **Testing** tab.
2. Click the **Minimize** (-) button to minimize the Google Chrome window.
3. Navigate to the **FileShare > ION_Connect > STB[XX] > FullBODOutput** folder. The **Shipment[document_id]_[current_datetime].xml** file.
4. Right-click the file.
5. Click the **Edit with Notepad++** menu item.
6. Press **CTRL + A** to highlight the script.
7. Right-click the highlighted text.
8. Click the **Copy** list item.
9. Click the **Google Chrome** shortcut in the taskbar.
10. Right-click in the blank space of the **Input_var (String)** window.
11. Click the **Paste** list item.
12. Click the **Test** button. A window opens asking if you want to save the script.
13. Click the **YES, SAVE & TEST** button.
14. Click the **Output Variable Expand** button to expand the window area. The XML structure has been converted into a JSON file.

    Note: You can also download the file by clicking the **Download** icon.
15. Click the **checkmark** icon in the **Versions** section of the screen to approve the script. You cannot use a script in a flow unless it has been approved.
16. Click the **back** button to return to the **Document Flow**.

Part 3: Update the Document Flow

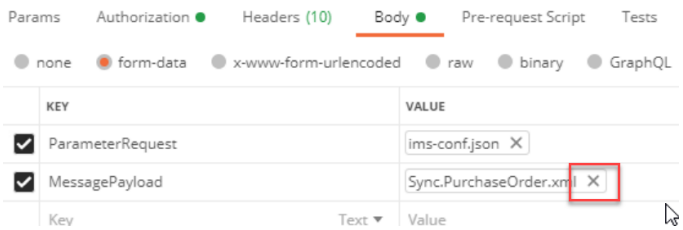
1. Click the **STB[XX]_BOD2JSON** item.
2. Click the **Document Mapping** tab.
3. Click to highlight the **Sync.PurchaseOrder** document.
4. Click the **Search** icon on the **Output Document** field.
5. Type *Any* in the **Filter** field.
6. Click the **AnyDocument** item.
7. Click the **OK** button.
8. Click the **Save** icon.
9. Click the **File_Out** item in the **Document Flow**.
10. Click the **Details** button next to the **File Connector** drop-down field.
11. Click the **+ Add** icon.
12. Click the **Write a file to a folder** radio button.

13. Click the **Document** radio button.
14. Click the **search** icon in the **Document** field.
15. Type *Any* in the **Filter** field.
16. Click the **AnyDocument** item.
17. Click the **OK** button.
18. Click to select the **Create non-existing folder(s)** check box.
19. Type *\FileShare\ION_Connect\STB[XX]\JSON* in the **Write Location** field.
20. Type *PO[current_datetime].json* in the **File Name Pattern** field.

    Note: Select **[current_datetime]** by pressing **CTRL + spacebar** and selecting the item from the list.
21. Click the **Test** button. A message that the test succeeded displays.
22. Click the **Save** icon.
23. Click the **back** button to return to the **Document Flow**.

Part 4: Test

1. Click the **Activate** icon.
2. Click the **Postman** shortcut in the taskbar.
3. Click the **X** to remove the **Sync.PurchaseOrder.xml** in the **MessagePayload** field.
4. Click the **Windows Explorer** shortcut in the taskbar.
5. Right-click the **Desktop > Class Files > InforOS_Foundation2 > Exercise 7.1 > Sync.PurchaseOrder.xml** file.
6. Click the **Edit with Notepad++** list item.
7. Update the **Document ID** from **LH_PO01** to **LH_PO02**.
8. Click the **File** menu.
9. Click the **Save** menu item.
10. Click the **Postman** shortcut in the taskbar.
11. Click the **X** to remove the old payload file.



12. Click the **Select Files** button next to the **MessagePayload** field to add the new payload file that was just updated.
13. Click the **Desktop > Class Files > InforOS_Foundation2 > Exercise 7.1 > Sync.PurchaseOrder.xml** file.
14. Click the **Open** button.

15. Click the **Send** button. A message that it was “Published successfully” displays.
16. Click the **Google Chrome** shortcut in the taskbar to return to **ION Desk**.
17. Click the **OneView** menu.
18. Click the **Filter +** icon.
19. Click the **Sender Logical ID** filter check box.
20. Click the drop-down arrow in the **Sender Logical ID** filter.
21. Select the **lid://infor.ims.stbxx_ims_cp** logical id from the list.
22. Click the **Search** button. The **LH_PO02** document displays.
23. Click the **Windows Explorer** shortcut in the taskbar.
24. Double-click the **FileShare > ION_Connect > STB[XX] > JSON** folder. The **PO_[current_datetime].json** file displays.
25. Right click the file and edit with **Notepad++.**
26. Click the **Plugins** menu and select the **Format JSON** from the list. You can now see the results of the script that have transformed the BOD file to JSON format.

Check your understanding

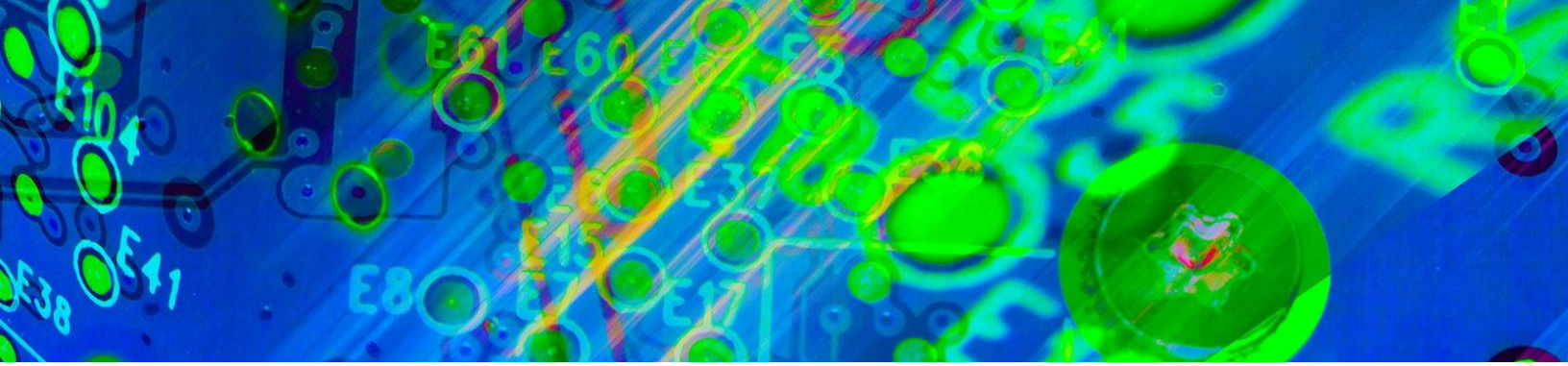
Which programming language you can use in the script?

a) Python
b) Javascript
c) Java
d) C#

Can you use a script in a document flow that is not approved?

a) Yes
b) No

Refer to Appendix B for answers to the check your understanding questions.



Lesson 8: Working with custom and error BODs

Estimated time

2.0 hours

Learning objectives

After completing this lesson, you will be able to demonstrate how to work with custom and error BODs. In this lesson, you will:

- Define custom BOD development.
- Explain how to work with error BODs.

Topics

- Custom BOD development
- Error BODs

Custom BOD development

BOD generation applies to Delimited, Fixed-Length, Fixed-Length & Delimited, XML, and Raw Data Format types. For full BOD, no BOD is generated as it already exists in the registry.

In case all configurations are valid, a window opens for you to browse and select a sample file which content matches the file template configuration defined. This is used to validate the configuration that is defined against the provided sample content. This applies to Delimited, Fixed-Length, and Fixed-Length & Delimited format types.

After it is validated, another window opens; listing the BOD schema elements and the option to change the data type of the elements. A Document ID element must be specified to complete the BOD generation steps. For raw data files, the document ID is already selected. If the **Use Data Fields for File Name** is selected, the attributes for file name and file extension are listed as well. When you click the **OK** button, information is displayed about the structure of the generated BODs.

After these steps are completed, a BOD is generated using the noun and verb schema. This BOD is stored in the **ION Data Catalog** as a custom BOD and linked to the file template. This BOD represents the schema to use for rendering and parsing text content.

The defined data types in the generated schema are stricter than shown in the generate UI. Define your example file with values in the appropriate range. These are the value ranges:

- -128 and 127. This range is generated as **byte**.
- -32768 and 32767. This range is generated as **short**.
- -2147483648 and 2147483647. This range is generated as **int**.
- -9223372036854775808 and 9223372036854775807. This range is generated as **long**.

Custom BODs that are generated from File Format Templates can be managed through Custom Documents on the Data Catalog menu in ION Desk.

The contents of the noun in the DataArea section must match the file format template that is defined when the type of files is:

- Delimited
- Fixed-Length
- Fixed-Length & Delimited

Otherwise a confirm BOD is generated.

Optional fields

In case of delimited, fixed-length, fixed-length & delimited type of files, you can make a field optional by selecting the optional flag. All fields without this optional flag are treated as mandatory.

An application that produces a delimited file and wants to omit an optional field must still mark the field separator for the omitted field. It can be substituted with the optional value indicator if applicable. In case of fixed length/ fixed length & delimited files, the omitted field's position must be filled with correct number of fill characters.

An application that consumes the file data must treat an optional field as omitted from the source if it encounters the optional value indicator, in case of delimited files. In case of fixed length/fixed length & delimited files fill characters must be filled in the field's position. When reading from a file, these conditions on each field are checked:

- Is the field marked as optional in the file template?
- Does this field's position in the file data contain the optional value indicator?

When both conditions are true, the field is treated as blank. No further validation is performed to check if the optional value matches with its data type. While generating a custom BOD from the file data, this field is ignored and the XML element corresponding to the field is not included. The BOD is processed fully and no confirm BOD is raised. The file will not be moved to the error folder.

Scenario

In this exercise, we need to send airline data that is received from an external source to an Infor ERP. You will create a document flow to read in the CSV file and transform it into a custom BOD using ION. Once the data enters ION it is transformed into a custom BOD in the ION Service, from there it can be distributed to the ERP for processing. In addition you could also use a mapping to transform it from a custom BOD to a standard BOD.

Exercise 8.1: Creating and using custom BODs

In this exercise, you will create a file template that creates a custom BOD in the data catalog and use it in a data flow.

Before you begin:

- Ensure you are logged in to Infor Ming.le and are at the homepages screen for your assigned user account. If not, refer to Exercise 1.1.
- Ensure you have completed Exercise 1.1 because it provides data or configurations for this exercise.

Exercise steps

Part 1: Create the BOD

1. Click **App Menu > ION Desk > Connect > File Templates**. **Note:** You may need to click the **hamburger** icon to see the menu.
2. Click the **+ Add** button.
3. Type *STB[XX]_DemoCSV* in the **Name** field.
4. Type *This is a csv template* in the **Description** field.
5. Type, select, or confirm the following on the **File Template** screen:

Item	Details
Document	STB[XX]_AirlineSampleData
Generated document	Single
Field Separator	,
Line Separator	\r\n

6. Click the **Save** button.
7. Click the **Fields** tab.
8. Click the **+ Add** button six times. This will add six fields.
9. Type *ArrDelay* in the first **Field Name** field.
10. Update the remaining **Fields** information as follows:

Sequence number	Field Name
2	CRSDepTime
3	UniqueCarrier
4	Origin
5	Dest
6	Date

11. Click the **Save** button.

Part 2: Test the BOD

1. Click the **Generate Metadata** button.
2. Click the **Upload** button.
3. Click the **file folder** icon.
4. Click the **Desktop > Class Files > InforOS_ConfiguringIONConnect > Exercise 4.1 > ArlineSampleDate.csv** file.
5. Click the **Open** button.
6. Click the **OK** button.
7. Click the **plus (+) symbol** to expand the **AirlineSampleDate** attribute.
8. Click the **UniqueCarrier** item. This will select the **Unique Carrier** field as the Document ID.
9. Click the **OK** button. A message confirming the document metadata generation is successful displays.
10. Click the **OK** button.
11. Click the **Data Catalog** menu.
12. Click the **Object Schemas** menu item.
13. Click the **Refresh** icon. The **AirlineSampleData BOD** displays.

Part 3: Set up the first file in the data flow

1. Click the **Connect** menu.

2. Click the **Data Flows** menu item.
3. Click the **+ Add** button.
4. Click the **Document Flow** menu item.
5. Type *STB[XX]_CSVtoBOD* in the **Name** field.
6. Type *This will update a CSV file to a BOD* in the **Description** field.
7. Drag a **File** item to the data flow.
8. Drag a second **File** item to the data flow.
9. Click the **File1** item.
10. Type *CSV_IN* in the **Name** field.
11. Click the **Save** button.
12. Click the **New** button.
13. Click the **File** list item.
14. Type, select, or confirm the following on the **File Connection Point (through Enterprise Connector)** screen:

Item	Details
Name	STBXX_CSV_In
Location	[Available Location] **Note:** There should only be one option here.
Transfer Protocol	Shared Folder
SMB v2	Unchecked
Host Name	EC-2020
User Name	Inforuser
Password	!nfor08

15. Click the **Test** button. A message that the test succeeded displays.
16. Click the **OK** button.
17. Click the **Documents** tab.
18. Click the **+ Add** button.
19. Click the **Read a file from a folder** radio button.
20. Click the **File Format Template** drop-down arrow.
21. Click the **STBXX_DemoCSV** list item.

22. Click the **Document Verb** drop-down arrow.
23. Click the **Sync** list item.
24. Click to select the **Create non-existing folder(s)** check box.
25. Type *\FileShare\ION_Connect\STB[XX]\Custom_File_Read* in the **Read Location** field.
26. Type *\FileShare\ION_Connect\STB[XX]\Custom_File_Read\Error* in the **Error Location** field.
27. Type **.csv* in the **File Name Pattern** field.
28. Verify **Move File** is selected in the **After Read** field.
29. Type *\FileShare\ION_Connect\STB[XX]\Custom_File_Read\Archive* in the **Archive Location** field.
30. Click the **Test** button. A message that the test succeeded displays.
31. Click the **OK** button.
32. Click the **Save** button.
33. Click the **back** button to return to the data flow.

Part 4: Set up the second file in the data flow

1. Click the **File2** item.
2. Type *BOD_Out* in the **Name** field.
3. Click the **Save** button.
4. Click the **New** button.
5. Click the **File** list item.
6. Type, select, or confirm the following on the **File Connection Point (through Enterprise Connector)** screen:

Item	Details
Name	STBXX_BOD_Out
Location	[Available Location] **Note:** There should only be one option here.
Transfer Protocol	Shared Folder
SMB v2	Unchecked
Host Name	EC-2020
User Name	Inforuser
Password	!nfor08

7. Click the **Test** button. A message that the test succeeded displays.
8. Click the **OK** button.
9. Click the **Documents** tab.
10. Click the **+ Add** button.
11. Click the **Write a file to a folder** radio button.
12. Click the **Document** radio button.
13. Click the **search** icon in the **Document** field.
14. Type *Sync.STB[XX]AirlineSampleData* in the **Filter** field.
15. Click the **Sync.STB[XX]AirlineSampleData BOD**.
16. Click the **OK** button.
17. Click to select the **Create non-existing folder(s)** check box.
18. Type *\FileShare\ION_Connect\STB[XX]\Custom_File_Write* in the **Write Location** field.
19. Type *AirlineSampleDataFullBOD[current_datetime].xml* in the **File Name Pattern** field.

    Note: Select **[current_datetime]** by pressing **CTRL + spacebar** and selecting the item from the list.
20. Verify **Overwrite** displays in the **If File Exists** in the drop-down field.
21. Click the **Test** button. A message that the test succeeded displays.
22. Click the **OK** button.
23. Click the **Windows Explorer** icon in the taskbar.
24. Click the **FileShare > ION_Connect > STBXX** folder. The **Custom_File_Read** and **Custom_File_Write** folders were created.
25. Click the **Google Chrome** shortcut in the taskbar.
26. Click the **Save** button.
27. Click the **back** button to return to the data flow.
28. Click the **Document** icon between the **CSV_In** and **BOD_Out** items.
29. Click the **+ Add** button.
30. Click to select the **Sync.AirlineSampleData** check box.
31. Click the **OK** button.
32. Click the **Save** button.
33. Click the **Activate** icon.

Part 5: Test in OneView

1. Click the **Windows Explorer** shortcut in the taskbar.
2. Right-click the **Desktop > Class Files > InforOS_ConfiguringIONConnect > Exercise 4.1 > AirlineSampleDate.csv** file.
3. Click the **Copy** list item.

4. Right-click the blank space in the **FileShare > ION_Connect > STBXX > Custom_File_Read** folder.
5. Click the **Paste** list item. The file will process and move to the **Custom_File_Write** folder.
6. Double-click the **Custom_File_Write** folder. The csv file has processed and the title has been updated with the date and time.
7. Click the **Google Chrome** shortcut in the taskbar.
8. Click the **OneView** menu.
9. Confirm **Last hour** displays in the **Date and Time Range** field.
10. Click the **Search** button. The **Sync.AirlineSampleData** custom BOD displays.

Error BODs

Error messages

The Error BODs page in ION Desk enables you to view and handle errors. ION receives error messages sent from other applications and from ION itself. Users can therefore track error and warning conditions at the enterprise level so that all error issues can be managed together. Error messages can be received for example if:

- An application cannot process a message received from ION.
- A business rule within an application is not met during the processing of a message.
- ION received a message from an application that is not in a proper format.

The term error message is also a regular BOD identified by the verb - **Confirm** and by the noun - **BOD**. **Confirm BOD** is a technical name synonymous with the term **Error Message**.

Searching error messages

You can search the error messages that are based on these properties:

- Its own properties
- The properties of the original message that caused the error message
- A combination of both

Handling error messages

After a list of the selected error messages is displayed, you can mark them as **Handled** or **Unhandled**.

Resubmitting error messages

Resubmitting a message sends a copy of the original message to the application that has sent the error message. This is useful when troubleshooting errors as you can solve the situation which caused an error message and then resubmit the original message to verify if the problems were resolved. Only one message can be resubmitted at a time.

You can only resubmit a message if the error message was raised by an application. If ION raises the error message because of an improper format, you cannot resubmit the message.

Resubmit is enabled if the logical ID of the error message sender is present in the **To** list of the original message.

This activity is logged in the **Resubmit History** tab of the error message.

Exercise 8.2: Resolving error BODs

In this exercise, you will resolve existing error BODs.

Before you begin:

- Ensure you are logged in to Infor Ming.le and are at the homepages screen for your assigned user account. If not, refer to Exercise 1.1.
- Ensure you have completed Exercise 1.1 because it provides data or configurations for this exercise.

Exercise steps

1. Click the **App Menu** > **ION Desk > Connect >Error BODs** menu item. **Note:** You may need to click the **hamburger** icon to see the menu.

   Note: The **Date Range** field will be filled in automatically, however, the dates will vary depending on if you select the link in the left menu or the link on the **System Overview** page.
2. Click the **Search** button. Make note of how many errors are shown in the list.
3. Click the **Time Stamp** field. The arrow that allows you to re-sort the field displays.
4. Click the **down** arrow in the **Time Stamp** field to sort in **Descending** order.
5. Click to select the **check box** for the **newest error** in the list.
6. Click the **Details** (right-facing arrow) icon.

7. Click the **item** in the list.
8. Click the **View Reason** link. The **Reason** screen opens and you can download the message if you want.
9. Click the **Close** button.
10. Click the **Original Message** tab. You are able to see additional information about the error.
11. Click the **Format </>** icon. This gives you a better view of the message content. **Note:** You can also download the XML message.
12. Click the **Mark Handled** icon.
13. Click the **back** button to return to the list of error messages.

Check your understanding

Custom BODs that are generated from file format templates cannot be managed through custom documents on the Data Catalog menu in ION Desk.

a) True
b) False

Confirm BOD is a technical name synonymous with the term _____.

_____

_____

_____

_____

Refer to Appendix B for answers to the check your understanding questions.

Course summary

Estimated time

0.5 hours

Learning objectives

Now that you have completed this course, you should be able to:

- Provide an overview of the parts of ION Connect.
- Illustrate how the Enterprise Connector is used.
- Identify the different types of Data Flows used in ION Connect.
- Demonstrate how API Flows are used in ION Connect.
- Describe advanced filters including routing, merging, splitting, and file transformation.
- Define working with the ION Messaging Service (IMS).
- Demonstrate the use of scripting in Data Flows.
- Demonstrate how to work with custom and error BODs.

Topics

- Course review

Course review

What is the difference between a charge and a split?

_____

_____

_____

_____

Match each of the following items with the screen through which it is defined. The possible screens are: Allocation Calendar, Allocation Ratio, Allocation Setup, Allocation Setup Report, Allocation Source, and Allocation Target.

Item to define	Screen
Report of all setups	
Split or charge	
Live days in each period	
To which account allocations are posted	
Cost-center split on allocated transactions	
Year-to-date movements are selected	

Type a multiple choice question?

a) Distractor 1
b) Distractor 2
c) Distractor 3
d) Answer

The steps for XXXX appear below in the wrong order. Reorder the steps from **1-6** to reflect the correct sequence.

Step X	
Step X	
Step X	
Step X	
Step X	
Step X	
Step X	

Refer to Appendix B for answers to the course review questions.

Appendices

The following are included in this section:

- Appendix A: User accounts
- Appendix B: Check your understanding (CYU) answers
- Appendix C: Simulated activity steps

Appendix A: User accounts

Your instructor will assign you a student user ID from the table listed below to use for class exercises.

Infor OS: Configuring ION Connect (2106) 01_9952106_IEN0030_ION						
Training Environment entry point (VM)	**ID**	**User**	**Password**			
[Training Desktop Server for 1/class] or [Landing Server for 1/student]	All	[user]	[password]			
Application	**ID**	**User name**	**Password**	**[Add title or remove column]**	**[Add title or remove column]**	**[Add title or remove column]**
Instructor login (for course demos): [application]	[ID]	[user]	[password]	[content or N/A]	[content or N/A]	[multiple content or N/A] [multiple content or N/A]
Student logins (for course exercises): [application]	[ID]	[user]	[password]	[content or N/A]	[content or N/A]	[multiple content or N/A] [multiple content or N/A]

Appendix B: Check your understanding answers

This section provides the answers to the questions found at the end of each lesson.

Lesson 1: ION Connect overview

ION Connect can only establish connections with Infor applications.

a) True
b) False

Infor ION is an interoperability and business process management platform designed to integrate applications, people, processes, and data to run your business. Select the included components from the list below.

a) Data Catalog
b) Data Lake
c) Event Management
d) ION Connect
e) Workflow

ION OneView provides two different views. Describe them.

The timeline view is a graphical representation of the message trip within ION and all ION components that were triggered during that trip. The advanced view is a list of all the events that were logged for the message during its processing within ION.

Lesson 2: The Enterprise Connector

Select all statements below that are true about the Enterprise Connector.

a) The Enterprise Connector provides hybrid service integration for Infor Cloud services and your local deployed services.
b) The service is deployed in your on-premises infrastructure and is responsible for the communication with the Infor Cloud services.
c) Infor Cloud services require an outbound connection to the Enterprise Connector.
d) For performance reasons, the Enterprise Connector service does not need to be installed close to the applications for which it has a connection point running.

The Enterprise Connector credentials file is stored in a csv formatted file.

a) True
b) False

Lesson 3: Data Flows

Which of the following are true about data flows? Select all that apply.

a) Flows start and end with one or more connection points.
b) Flows only start with connection points.
c) They are event-driven.
d) Connection points cannot be reused in multiple data flows.
e) Connection points can be reused in multiple data flows.

When SFTP is selected, you can authenticate through a password or a private/public key pair.

a) True
b) False

The definitions of a database connection point include: (select all that apply).

a) The standard properties for any connection point, such as name, description, and tenant.
b) The selection of a connection point type.
c) The method for connection to the database.
d) Which documents are sent and received and how the data must be read from the database for these documents.

Lesson 4: API Flows

The ION API Flows feature allows you to put API calls together with logical elements.

a) True
b) False

By default, an API Flow is synchronous.

a) True
b) False

Lesson 5: Advanced filters

Which of the following are true about filtering or routing? Select all that apply.

a) Filtering allows messages to be sent to a destination only if conditions are met.
b) Filtering and routing can be used to avoid delivering too many documents to a connection point.
c) Routing allows documents to be ignored if the conditions are not met.
d) Messages of the same type are routed to one or more destination.

Lesson 6: ION Messaging Service (IMS)

What are the three types of Application connection points?

IOBOX, IMS, and IMS via ION API

What does a message queue connection point specify?

The standard properties for any connection point, such as name and tenant.,

What queues to use and how to connect to these queues.

Which documents can be sent and received.

Lesson 7: Scripting

Which programming language you can use in the script?

e) Python
f) Javascript
g) Java
h) C#

Can you use a script in a document flow that is not approved?

i) Yes
j) No

Lesson 8: Working with custom and error BODs

Custom BODs that are generated from file format templates cannot be managed through custom documents on the Data Catalog menu in ION Desk.

a) True
b) False

Confirm BOD is a technical name synonymous with the term _____.

Error BOD

Appendix C: Simulated activity steps

This section provides the steps for the simulated activities. You can use the steps as a reference when reviewing the simulations during class or when performing these activities in your organization's environment.

Do **not** attempt to perform the steps of these simulated activities in the Infor Education training environment. Doing so will interfere with the configurations made for this course and could cause damage to the training environment.

Simulated activity 2.1: Installing Enterprise Connector

This activity simulates the installation of the Enterprise Connector.

Simulation steps

Part 1: Create an Enterprise Location

1. Click **App Menu > ION Desk > Connect > Enterprise Locations** menu item. **Note:** You may need to click the **hamburger** icon to see the menu.
2. Click the **Add +** icon.
3. Type *MyEnterpriseLocation* in the **Name** field.
4. Type *My Enterprise Location* in the **Description** field.
5. Click the **OK** button. The system processes the request and the **Location** window displays.
6. Click the **Show credentials** link. The **Location ID** and **Location Secret Key** display.
7. Click the **Download Credentials** link to download the credentials. We will use this downloaded file in a future step.
8. Click the **Close** button. The **Location** window closes.
9. Click the **Download Enterprise Connector** icon. A message that **This type of file can harm your computer** displays.
10. Click the **Keep** button.
11. Click the **up arrow** button in the taskbar.
12. Click the **Show in folder** list item.

Part 2: Run the installation process

1. Double-click the **.jar** file. The **Installation** window displays.
2. Click the **Next** button. The **Installation Path** window displays.

   Note: This directory would need to be different if you are installing on a second environment, such as a DEV and TRAIN environment on the same physical server.
3. Click the **Next** button to accept the default location. A message confirming the **target directory will be created** displays.

4. Click the **OK** button. A message that the **ION Enterprise Connector will be installed** displays.
5. Click the **OK** button. The **Grid Connection Configuration** window displays.

   Note: These numbers would need to be different if you are installing on a second environment, such as a DEV and TRAIN environment on the same physical server.
6. Click the **Next** button. The **JDK Path** displays.
7. Click the **Next** button. The **Database Selection** window displays.

   Note: The Grid Database Name would need to be different if you are installing on a second environment, such as a DEV and TRAIN environment on the same physical server.
8. Click the **Next** button. The **Database Configuration** window displays.
9. Verify *sa* displays in the **Database Administrator User** field.
10. Type *Password* in the **Database Administrator Password** field.
11. Type *sa* in the **ION Runtime Database User** field.
12. Type *Password* in the **ION Runtime Database User Password** field.
13. Click the **Next** button. The **Location Credentials and Tenant Mapping** window displays.
14. Click the **File Explorer** folder in the taskbar.
15. Double-click the **Location_MyEnterpriseLocation.xls** file.
16. Click the **Select All** area of the worksheet. **Note**: The **Select All** area of the worksheet is the area above the column numbers and to the left of the row letters.
17. Click the **line** between the A & B columns. This will resize all of the columns at the same time.
18. Right-click the information in the **Location ID** field.
19. Click the **Copy** list item.
20. Click in the **Access Key ID** field in the **Location Credentials and Tenant Mapping** window.
21. Press **CTRL + V**.
22. Right-click in the **Location Secret Key** field on the **Microsoft Excel** spreadsheet.
23. Click the **Copy** list item.
24. Click in the **Secret Access Key** field in the **Location Credentials and Tenant Mapping** window.
25. Press **CTRL + V**.
26. Click the **Google Chrome** shortcut in the taskbar.
27. Click to highlight the **tenant information** in the **URL** field. The tenant information is between the first set of / / in the URL field.
28. Right-click the highlighted information.
29. Click the **Copy** list item.
30. Click the minimize button to minimize the **ION Desk** window.
31. Click the **Next** button. The **Proxy Service** window displays.

    Note: We are not using a proxy service in this exercise, but you are able to complete the proxy information after install if you decide to use it a proxy server.
32. Click the **Next** button. The **Ready to Install** window displays.

33. Click the **Install** button. The **Enterprise Location installer** begins processing. **Note:** The installer takes several minutes to install.
34. Click the **Next** button. A message that the installation has completed successfully displays.
35. Click the **Done** button. The **Installation** window closes.
36. Click the **Refresh** button on the **Enterprise Locations** window.