# TADM12

## Technical Implementation and Operation II for SAP S/4HANA and SAP Business Suite part 1/2

**PARTICIPANT HANDBOOK**
**INSTRUCTOR-LED TRAINING**

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# Typographic Conventions

American English is the standard used in this handbook.

The following typographic conventions are also used.

| | |
|---|---|
| This information is displayed in the instructor's presentation | |
| Demonstration | |
| Procedure | |
| Warning or Caution | |
| Hint | |
| Related or Additional Information | |
| Facilitated Discussion | |
| User interface control | *Example text* |
| Window title | *Example text* |

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# Course Overview

**TARGET AUDIENCE**

This course is intended for the following audiences:

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# UNIT 1 Application Lifecycle Management

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## UNIT OBJECTIVES

- Outline the Concept of Application Lifecycle Management
- Explain the Importance of the SAP Solution Manager System and the System Landscape Directory in Application Lifecycle Management
- Describe Aspects of the technical Implementation of SAP Systems and Business Processes
- List the Tools in the SAP Solution Manager System for Business Process Operations
- List Tools for maintaining SAP Systems

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Unit 1
Lesson 1

# Describing Application Lifecycle Management

**LESSON OVERVIEW**
This lesson provides an introduction to application lifecycle management in SAP systems. We begin by discussing the individual steps in the lifecycle of an application. We then examine two of the tools that support you in managing this lifecycle: the System Landscape Directory (SLD) and the SAP Solution Manager system.

**Business Example**

Your company plans to implement new business processes. As the project manager, you want to know how you can use SAP tools to simplify lifecycle management for your SAP applications.

**LESSON OBJECTIVES**
After completing this lesson, you will be able to:

- Outline the Concept of Application Lifecycle Management
- Explain the Importance of the SAP Solution Manager System and the System Landscape Directory in Application Lifecycle Management

## Application Lifecycle Management

Software, like any other product, has a certain lifecycle. A software product's lifecycle is the time span between its conception and market launch (in the company) and its removal from the market. Software lives as long as it is still in use and continues to be a profitable product on the market. Planning a software lifecycle is a task for a company's strategy management.

In the SAP environment, the focus is more on the applications (that is, the business processes) than the individual SAP systems involved. Therefore, Application Lifecycle Management (ALM) is a top priority for SAP. ALM is an ongoing process for managing the entire life span of an application through active control, development, and maintenance. In contrast, Software Lifecycle Management contains tools and processes to install, maintain, or upgrade a specific SAP system, which is needed for certain applications and business processes.

Due to the increasing complexity of solution landscapes, every business has integration needs specific to its mission-critical applications. The more integrated and more complex the software applications and solutions are in the customer landscape, the greater the need for an end-to-end approach to lifecycle management. Application Lifecycle Management guarantees extensive support to cover the entire life cycle of IT applications, from design to decommissioning.

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Figure 1: Phases in Application Lifecycle Management

The IT Infrastructure Library (ITIL) forms a set of predefined, standardized processes, functions, and roles for the lifecycle of typical IT services (IT service management (ITSM)) that typically occur in every IT infrastructure at larger companies. They involve suggested best practices that can be adapted to the specific needs of a company.

In line with the six phases of application management defined under ITIL, the lifecycle also has six phases:

- The most important task in the requirements phase is to evaluate scenarios and the corresponding business processes and to check whether they can be realized in the project.
- In the design phase, an implementation project manager oversees and directs the deployment of new products, services, or projects for an organization. The project manager creates a blueprint for the project, defines the milestone, and creates the work breakdown structure.
- In the build & test phase, the changes are implemented first. These changes might be a solution extension with custom development activities, Customizing changes, or integration of a partner or third party application. Developers perform tests of the functions, while quality assurance prepares functional tests and tests of user acceptance for the next phase. The list of relevant business processes determines which tests are covered. Therefore, the build & test phase involves all relevant kinds of tests, including the following:
  - Regression tests
  - Integration tests
  - Scenario tests
  - User acceptance tests
  - Performance tests
- The objective of the deployment phase is to transition from the pre-production environment to live operations. In this phase, support structures are created for end users

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that are available not only during the critical period after going live, but also in the long term.

- The longest phase in the lifecycle is the operate phase, in which the end users work with the product. In this phase, any errors that occur are fixed by SAP developers in the form of error corrections.
- During the operate phase, it may become apparent (through an analysis of compliance with service level agreements, for example) that optimizations are needed. In the optimize phase, you carry out the activities that are required to improve the results. This can also result in new requirements.

### Importance of the SAP Solution Manager System in Software Lifecycle Management

The SAP Solution Manager system supports customers at the start of the project (to implement an SAP application), during functional and technical implementation, during running operation, and during the optimization of their system landscapes. The SAP Solution Manager system also makes it possible to communicate with SAP and its partners at any time and therefore enhances the extensive on-site service.

The SAP Solution Manager Launchpad is the central starting point for all functions for administrative tasks in the SAP Solution Manager system. SAP Fiori apps are also available for various applications.

The different areas in the SAP Solution Manager Launchpad cover the different aspects of Application Lifecycle Management and enable access to role-specific functions. The structure of the launchpad depends on the user's respective role: You have access to relevant messages, alerts, reports, and documents for which your role is authorized.

Figure 2: User Experience Monitoring

The figure "User Experience Monitoring" shows the SAPUI5-based app for User Experience Monitoring as an example. This app is the central starting point for the administrator for monitoring the availability of the systems and performance of the connections from the end user perspective in real time.

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Figure 3: SAP Solution Manger

SAP Solution Manager System gives you the benefits of a number of additional functions, such as implementation support, as well as monitoring functions and IT Service Management and its functions for reporting incidents. SAP Solution Manager 7.2 also supports SAP S/4HANA and hybrid solutions.

SAP Solution Manager links the customer's support organization (Customer Center of Expertise – CCoE) with the SAP Support Portal. This enables workflows that use both platforms. In IT Service Management, for example, you can forward the incidents from end users directly to SAP Support.

The interaction between the SAP Solution Manager system, which has direct access to the customer landscape, and the SAP Support backbone to the SAP Global Support organization offers a platform for professional service and support processes. In turn, these processes enable the delivery of proactive services that are custom-tailored to the CCoE's specific needs and requirements. This structure helps to improve the reliability and performance of the customer's business processes, reducing the total cost of ownership and providing a better return on investment.

### SAP System Landscape Directory and Landscape Management Database

The complexity of modern software landscapes and the dependencies between individual software components and applications make support for landscape planning, monitoring and maintenance, as well as for implementation and upgrades, absolutely indispensable.

A description of the system landscape is needed for various SAP Solution Manager applications, such as monitoring and alerting, as well as for calculating updates and upgrades with the *Maintenance Planner*. The SAP Solution Manager system collects and saves detailed information on the system landscape, for example:

- Information about the technical system
- Details of technical systems that are often used for communication with other systems, such as *host names*, *ports*, and *clients*.

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Landscape descriptions are based largely on data that is provided automatically: on the SAP software catalog and the information that the technical systems send automatically via the System Landscape Directory (SLD). The landscape data is often completed manually, based on human decisions.

- The System Landscape Directory (SLD) is the central directory for SAP system landscape information that is relevant for software lifecycle management. It contains a description of the current SAP system landscape (that is, which software components are installed on which SAP systems) and a repository of the software components that could theoretically be installed (for example, the software components developed by SAP). As this data is automatically updated, the SLD provides current SAP system landscape information with minimal administrative effort. This makes the SLD the central information provider for SAP (and non-SAP) tools that require this data.
- The Landscape Management Database (LMDB) in the SAP Solution Manager system lets you centrally display, edit, and create information about technical systems, hosts, and logical component groups. The LMDB collects information about the technical system, including its installed product instances and software component versions. Technical system information is needed for monitoring, for example.

Figure 4: System Landscape Directory (SLD)

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Figure 5: Landscape Management Database (LMDB)

## More Information

Additional information on SAP Solution Manager is available in the *SAP Community Network* under the quick link https://www.sap.com/community/topics/application-lifecycle-management.html and under the quick link /solutionmanager in the SAP Support Portal.

Specific information on the System Landscape Directory is available in corresponding WIKI *System Landscape Directory (SLD) – Overview* on the *SAP Community Network* in (https://wiki.scn.sap.com/wiki/display/SL/System+Landscape+Directory+%28SLD%29+-+Overview).

SAP training course *SM100 - SAP Solution Manager Configuration for Operations* describes the different activities, functions, and features that belong to the *Operations* area in SAP Solution Manager and provides information about the basic configuration of SAP Solution Manager.

**LESSON SUMMARY**

You should now be able to:

- Outline the Concept of Application Lifecycle Management
- Explain the Importance of the SAP Solution Manager System and the System Landscape Directory in Application Lifecycle Management

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Unit 1
Lesson 2

# Implementing Business Processes and Installing SAP Systems

## LESSON OVERVIEW

SAP Software Lifecycle Management can be broken down into different parts: Implementation and installation, operation and monitoring, and maintenance and upgrades. This lesson covers the *implementation and installation* phase of an SAP application.

The lesson begins with some important considerations that need to be addressed before the actual installation of an SAP system. You then learn about the available installation tools and documentation.

### Business Example

As part of its upgrade to SAP enhancement package 8 for SAP ERP 6.0, your company wants to install additional SAP systems. As a member of the project team, you want to find out about the concepts and tools available for implementing SAP applications.

## LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe Aspects of the technical Implementation of SAP Systems and Business Processes

## The Role of the SAP Solution Manager System in the Implementation of SAP Business Processes

The SAP Solution Manager system gives you central access to tools, methods, documents, and other data that you need to implement SAP business processes. You can make good use of the implementation content, which is delivered with the SAP Solution Manager system and updated regularly, by adapting it for use in your company-specific context.

## Processes of the SAP Solution Manager System

The SAP Solution Manager system provides comprehensive tools for the implementation of business processes (characterized by the lifecycle phases *Requirements*, *Design*, and *Build & Test* in application lifecycle management). These tools include the following:

- Solution Documentation
- Test Management
- Custom Code Management

The solution documentation process supports you with the automatic evaluation of business processes in the SAP Solution Manager system. It thus helps you to optimize your business processes. You can analyze the actively used business processes and the use of new applications, for example. The wizard for the solution documentation performs a structure-

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specific analysis of the business processes, which helps you to prepare for upgrade projects and to evaluate new functions and customer developments.

Figure 6: Business Process Monitoring

Test management helps you determine the testing scope needed for cross-system business processes, manage the tests centrally, and carry out the tests. Test management involves the phases *test scope identification*, *test planning*, *test execution*, and *change deployment*.

SAP standard software is developed, comprehensively tested, and documented according to proven standards. The individual applications are integrated with one another. Customers can develop their own applications to enhance the SAP standard software. These custom developments meet special requirements or offer functions that the SAP standard software does not provide yet. However, custom developments do not always meet the quality standards of SAP standard software, they are often not documented sufficiently, and there is no overview for making the number or use of custom developments transparent. The SAP Solution Manager system provides a process that enables you to structure, coordinate, and optimize your custom developments, starting with the current situation. The custom code management process is the central starting point for accessing all the functions you need to generate a comprehensive overview of custom developments. In turn, this enables you to continuously optimize their quantity and quality, as well as the implementation methods, and even the impact of changes on the SAP objects used.

Integration between the SAP Solution Manager system and the project management functions of SAP Portfolio and Project Management (SAP PPM) make it possible for you to manage project times, project resources, and status values, for example.

## SAP Activate

With SAP Activate, SAP provides an innovation implementation framework that accelerates the implementation of SAP S/4HANA during the entire customer lifecycle. It features directly executable digitized business and technology processes, guided configuration, and a next-generation methodology.

This SAP Activate methodology provides an end-to-end approach for any SAP S/4HANA implementation type: cloud, on-premise, hybrid, or mobile. It is scalable and flexible enough for small implementations, but also robust enough for major projects.

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- SAP Best Practices packages offer deployable digitized business and technology processes that have been optimized for SAP S/4HANA. They enable you to benefit from SAP's knowledge and experience with standard processes and concentrate on your innovations.
- Guided configuration is the content lifecycle management tool for configuring and testing the selected *SAP Best Practices* .

The SAP Activate methodology consists of the following four phases:

1. *Prepare* — Initial planning and project preparation
2. *Explore* — Determine the extent to which your business requirements can be met by *SAP Best Practices* , conduct solution design workshops, and document and prioritize requirements and open items
3. *Realize* — Iterative development and testing of the entire solution landscape, based on the requirements and documents from the *Explore* phase
4. *Deploy* — Transition to the production environment

The project team generates documents and results in each of these phases, which serve as templates for the subsequent phases.

Figure 7: SAP Activate - Implementation Methodology for SAP S/4HANA

The implementation contents consist of structures for scenarios, processes, and configurations that are predefined for SAP S/4HANA applications. In addition, implementation-relevant utilities are provided in the form of general documentation, preconfigurations, and test cases.

After the implementation project is complete, the implemented business scenarios and processes, along with the corresponding SAP system information, is transferred to a customer-specific store (production branch). It is available here for operations and can be used in the *Operate* phase (and for business process monitoring).

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> Note:
> A branch represents a version of the solution documentation that contains both the processes and the involved systems.

## Installation Considerations

Before you begin with the actual installation of one or more SAP systems, you should first consider several fundamental questions regarding the SAP system architecture. Some of these questions are listed in the figure "SAP Systems Installation Questions".

Figure 8: Installation Aspects

These questions are discussed in more detail in the remaining part of this lesson.

Figure 9: Installation Considerations

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### Sizing

To get an initial idea of what hardware is necessary to operate the SAP system, estimate the hardware requirements of your SAP system (sizing). This includes the required network bandwidth, physical memory, CPU size, and I/O capacity. The size of the hardware and database is influenced by business considerations as well as technical aspects (i.e. the number of users, the applications used, and the data volume caused by these applications on the network).

SAP provides its own tool for the initial assessment of the required hardware: the *Quick Sizer*. Based on questions on the expected number of users, applications, and so on, Quick Sizer determines an SAPS value (SAP Application Performance Standard) which the hardware partner can use to determine a hardware configuration for the SAP system.

> Hint:
> For more information about sizing, go to https://www.sap.com/about/benchmark/sizing.quick-sizer.html. There is also a link directly to the *Quick Sizer* (tab *Quick Sizer*).
>
> Note that sizing is an ongoing process. You may have to adjust the sizing whenever additional users access the SAP system or new applications are deployed.

### Supported Platforms

The Product Availability Matrix (PAM) provides technical information and release planning information for the individual SAP products and their versions.

Using PAM, you can find information about the availability of SAP component releases (product versions), the end of their respective maintenance periods, upgrade paths, and technical release information (such as database platforms, operating systems, and supported languages).

> Hint:
> To access the Product Availability Matrix, go to the SAP Support Portal and choose quick link /pam.

### Load Balancing

In SAP systems that have multiple application servers and large numbers of users, the question of how best to distribute the users among the application servers of the SAP system frequently arises. The SAP system provides various mechanisms for load balancing:

- When logging on with the SAP GUI, the (ABAP) Message Server can distribute individual users to the various application servers when they log on to the SAP system. Since this distribution takes place at the time of the SAP system logon and cannot be changed before logging out, it is known as *logon load balancing*.
- Once a user is logged on to a specific application server under the SAP GUI protocol, the ABAP dispatcher takes care of balancing the individual work processes.
- HTTP requests received via the Internet Communication Manager (ICM) of an application server are – if the ICM cannot answer the request itself from the cache – forwarded by the

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ICM to the responsible ABAP dispatcher (or a Java server node). In other words, the ICM distributes HTTP requests within an application server to the ABAP (or Java) runtime environment.

- Finally, the SAP Web Dispatcher (or a non-SAP, commercial web switch) – in the demilitarized zone (DMZ) before the SAP system – distributes incoming HTTP requests to the individual application servers of the SAP system according to specified rules.

Figure 10: Load Balancing

### High Availability

In many cases – especially in the area of intercompany processes – the availability of production systems is crucially important.

SAP provides a proven, scalable, multi-tier architecture. The individual elements of this architecture can be protected either by horizontal scalability – that is, the use of multiple components that tolerate the failure of individual components – or by cluster and switchover solutions. All SAP hardware partners provide proven solutions that, together with other hardware and software products, ensure high availability for SAP applications.

The following figure emphasizes the single points of failure (SPOF) for an SAP system based on AS ABAP. These are:

- ABAP message server (or Java message server in systems based on AS Java)
- ABAP or Java enqueue (work) process
- Database
- SAP Web Dispatcher (if used)

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Figure 11: High Availability

## Installation Tools and Utilities

Once all architectural considerations have been completed, preparations for the actual installation of the SAP systems (or SAP systems) can begin. We recommend acquainting yourself with the documentation before doing so. Special SAP tools are available for the actual installation and basic configuration.

### Documentation

The figure "Documentation Types" lists different types of documentation that are required for the installation, configuration, and operation of SAP systems.

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4.7.2.2 System Landscape

4.7.3 Implementation Sequence

4.8 Corporate Services

4.8.1 Processes in Detail

- **Master guides** contain information about planning and general best practices.
- **Installation guides** describe the steps needed to install a specific SAP system.
- The **(online) documentation** provides information that you need to perform your tasks for software lifecycle management.

Figure 12: Guides

Once you have determined the scenarios that you want to implement and you know your performance requirements (such as the expected number of users or data throughput), you can use the Master Guide to get an idea of which building blocks (SAP systems with usage types, for example, or independent engines) you need. You can then use this information to plan the mapping of these building blocks to your SAP system landscape.

The Master Guide (for example, Master Guide – SAP ERP 6.0) contains information about the SAP system landscape you need for the scenario you want to implement (such as Procurement and Logistics Execution), along with the required system landscape.

> Note:
> In addition to the master guide for the product, there may be another master guide for an SAP Enhancement Package, which provides additional information.

Once you have worked your way through the Master Guide, you will know which usage types you should install on which hosts and which SAP system in the SAP system landscape. We recommend working through the Master Guide before you begin the installation.

In SAP Enhancement Package 5 for SAP ERP 6.0 and later, there is another guide for technical planning of the implementation of the SAP Business Suite landscape. This guide contains essential information about:

- Building blocks for SAP system landscapes
- Planning the SAP system landscape
- Distribution scenarios and example implementations

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Hint:
The guide is available for example on SAP Help Portal for SAP SCM ( https://help.sap.com/viewer/p/SAP_SUPPLY_CHAIN_MANAGEMENT ) in area *Administration→ Planning Guide – SAP Business Suite Landscape Implementation (<Language>)*.

You also need the installation guide for the SAP system itself (such as Installation Guide – SAP Enhancement Package 8 for SAP ERP 6.0 – Java and ABAP). The installation guides contain planning information about the software units to be installed (such as settings that need to be made before the actual installation).

Hint:
For SAP NetWeaver, this documentation is available also at https://help.sap.com/viewer/nwguidefinder .

For the actual work with the installed SAP system, SAP provides documentation for the respective releases.

**Installation Tools**

The technical installation of an SAP system is performed with the tool Software Provisioning Manager (SWPM). Depending on which scenario is used, a configuration wizard may also be available to simplify and speed up the configuration.

Note:
Software Provisioning Manager 1.0 is the successor to product-specific and release-specific installation tools, such as SAPinst. This tool is part of the Software Logistics Toolset and contains the latest SAPinst version with software provisioning services various products and versions and for all platforms.

For more information about the Software Logistics Toolset, go to SAP Support Portal on page https://support.sap.com/en/tools/software-logistics-tools.html (or its successor).

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Figure 13: SAP Software Provisioning Manager (SWPM)

The SWPM installation tool checks the required system prerequisites (Prerequisites Check) and performs the installation. Depending on which usage types are to be installed, a wizard may guide you through the installation process. After you have answered all the questions about the installation, SWPM installs the desired SAP system. The tool also executes the first configuration steps.

### Addendum: SAP Rapid Deployment Solutions

Every department at a modern company wants software that is easy to implement.

To cut the costs of the conventional development and implementation process, SAP provides a variety of best practices that can be used instantly. These *SAP Rapid Deployment Solutions* contain standard software that you integrate in your existing IT landscape and can still be adapted flexibly according to your company's future requirements. These solutions were designed for customers who attach great importance to the rapid implementation of new software solutions – whether to streamline key business processes or to benefit quickly from the latest SAP innovations.

> Note:
> More information on SAP Rapid Deployment Solutions and about SAP Best Practices is available in SAP Best Practices Explorer ( https://rapid.sap.com/bp ).

## Additional Information

Additional information on the topics covered in this lesson is available on *SAP Help Portal* (http://help.sap.com ) and *SAP Support Portal* (http://support.sap.com ) under the following links:

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- https://www.sap.com/about/benchmark/sizing.html on the subject of sizing
- https://support.sap.com/pam for supported hardware and software versions
- https://help.sap.com/viewer/nwguidefinder for SAP NetWeaver
- https://support.sap.com/sltoolset for information about the Software Logistics Toolset

The training course *ACT100 - SAP Activate Methodology* introduces the *SAP Activate* framework and the methods that are needed for the efficient, successful implementation of software solutions in the SAP S/4HANA framework. In addition, in training course *E2E600 - SAP Solution Manager 7.2 for SAP S/4HANA Implementations*, you can learn how SAP Solution Manager 7.2 helps your business to transition to SAP S/4HANA.

**LESSON SUMMARY**

You should now be able to:

- Describe Aspects of the technical Implementation of SAP Systems and Business Processes

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Unit 1
Lesson 3

# Describing Business Process Operations

**LESSON OVERVIEW**
This lesson introduces the tools that the SAP Solution Manager system provides for your business process operations.

**LESSON OBJECTIVES**
After completing this lesson, you will be able to:

- List the Tools in the SAP Solution Manager System for Business Process Operations

## Tools in the SAP Solution Manager System for Business Process Operations

The SAP Solution Manager system provides comprehensive functions and tools for the regular operation of business processes (characterized by the *Deploy*, *Operate*, and *Optimize* phases in Application Lifecycle Management). These tools include

**Tools in the SAP Solution Manager System for Operations (Selection)**

- Monitoring Business Processes and Interfaces
- Root Cause Analysis
- Delivery of SAP Services
- Gateway to the SAP Support infrastructure

*Business process and interface monitoring* in the SAP Solution Manager system enables you to identify and solve potential problems before critical situations occur. This helps you to avoid expensive downtimes of systems and business processes while minimizing the risk of data inconsistencies. Graphical illustrations give you an overview of entire business processes. You collect application-specific KPIs automatically.

Today's distributed, multi-technology customer solutions give users multichannel access through various devices and client applications. To analyze the root cause of an incident in such cases, a systematic, top-down approach is required. This approach can be managed using tools that enable the most efficient analysis possible and implement SAP's proven methods. The objective of root cause analysis is either to solve a given problem completely or, in cases where that is not possible, to localize the problem and find a short-term countermeasure (workaround) to restore service operations as quickly as possible and with minimal interruption for end users. The tools for root cause analysis are designed to minimize the resources required in every step of the solution process. In addition, the infrastructure of the root cause analysis is open for the integration of new SAP technologies, SAP applications, and third-party software.

The service delivery enables you to use the different services from SAP for supporting your live operations. You can send a service request to SAP, create your own services locally and edit the requirements accordingly, or accept or reject a service suggested by SAP. The

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session details let you save your own context information for the sessions, assign service sessions directly to projects, and display documents, among other features.

The SAP Solution Manager system also serves as the gateway to SAP Active Global Support (SAP AGS) and the SAP Support infrastructure. In turn, SAP AGS can collaborate with many other SAP organizations (such as Development and SAP Consulting) to give customers the right assistance at the right time.

### Application Example: Application Operations

Application Operations in the SAP Solution Manager system includes all the functions for the central monitoring, alerting, analysis, and administration of SAP solutions.

The components for application operations offer the following functions:

- System and application monitoring: You can monitor the status of complex landscapes and manage alerts with the end-to-end monitoring and alerting infrastructure. An example for system monitoring is shown in the figure below.
- Technical analyses and dashboards : Interactive, technical analysis functions enable you to run analyses for a wide range of aspects in multiple solutions. The dashboards for application operations give you a quick overview of the availability and performance of the systems you manage.
- Data volume management: You can monitor the data volume in your system landscape and reduce overall operating costs by reducing the size of your databases and the monthly data growth.
- Technical administration and guided procedures : Technical administration enables the efficient planning, implementation, execution, and analysis of your daily operating activities.
- Root cause analysis and exception management : You can analyze the root cause of a message and apply a top-down approach to develop solutions for distributed, multi-technology systems.

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Figure 14: Application Example: Graphical System Monitoring

## Application Example: IT Service Management

With IT Service Management, the SAP Solution Manager system provides a central message management and processing instance. It makes it possible for you to contact all the parties involved in a message. This could be all users of your company's system landscape or solutions, such as employees, customers, consultants, or support staff.

The integration between Application Lifecycle Management (ALM) and the SAP Solution Manager system lets you integrate the features of IT Service Management with ALM, as shown in the figure "SAP IT Service Management on the SAP Solution Manager System – Integrated IT Support Processes".

Figure 15: SAP IT Service Management

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When a defined threshold value is exceeded in monitoring, for example, an incident can be generated. The tools of the SAP Solution Manager system (such as root cause analysis) can then be used to fix the incident.

Note:
Many processes of the SAP Solution Manager system, such as *Incident Management*, *Service Request Management*, *Problem Management*, *Change Request Management*, and *Service Level Management*, have been externally certified and are compliant with the IT Infrastructure Library (ITIL) processes.

**LESSON SUMMARY**
You should now be able to:

- List the Tools in the SAP Solution Manager System for Business Process Operations

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Unit 1
Lesson 4

# Maintaining SAP Systems

**LESSON OVERVIEW**

Once SAP systems have been installed and are in productive use, they have to be maintained at regular intervals as part of software lifecycle management.

This lesson provides first an overview of the different types of maintenance for SAP systems, followed by an examination of the tools provided by SAP for this purpose.

**Business Example**

Your company plans to implement SAP software. As a member of the project team, you want to find out which part of the SAP software can be maintained with the help of which tools.

**LESSON OBJECTIVES**

After completing this lesson, you will be able to:

- List Tools for maintaining SAP Systems

## Maintaining SAP Systems

One important element of SAP Software Lifecycle Management is the maintenance and updates of SAP systems. A number of different terms are used in the SAP context, depending on the type of maintenance involved. They are delimited from one another – together with the names of the tools used – in the figure “Overview of SAP System Maintenance” .

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Figure 16: Maintenance

The individual types of changes to the repository and the tools provided for making them are described in detail in the following. This lesson does not cover changes to the runtime environment.

> Note:
> Note that maintenance often requires downtime of the SAP system or parts of the system. This downtime must be coordinated between system administrators and the user departments – for example, neither end user jobs should be active in the system during this downtime, nor should data transfers from other systems take place.

## Software Logistics

SAP provides the Change and Transport System (CTS) for software logistics (the transport of changes from the development system to a test system and then to a production system). You can use it to transport both ABAP and non-ABAP applications.

ABAP CTS checks and controls changes to Customizing and to repository data made using Implementation Guides (IMG) or the ABAP Workbench. It records changes in transport requests and transports them to downstream systems after they are released. These transports are logged so that it is easy to trace which changes were imported to which SAP systems. The main areas of the CTS are the *Transport Organizer* (transaction `SE09`) and the *Transport Management System* (transaction `STMS`).

SAP NetWeaver Development Infrastructure (NWDI) and other non-ABAP development environments (for developing SAP NetWeaver Portal content, for example) can be integrated with the CTS.

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Hint:
For an overview of possible scenarios, along with additional information, go to the SAP Community Network and refer to the document Resources on CTS+ (https://wiki.scn.sap.com/wiki/pages/viewpage.action?pageId=448469096 ) which can be reached from the SAP Community Software Logistics Wiki (https://wiki.scn.sap.com/wiki/display/SL by choosing *Change and Transport System* → *Enhanced Change & Transport System (CTS-PLS)* ).

Note:
SAP NetWeaver Development Infrastructure (NWDI), which can be used to develop Java applications, enables the central management and control of source texts in the Design Time Repository, as well as the central administration of the archives for a development project in the Component Build Service. The entire software lifecycle can be managed and controlled using the Change Management Service (CMS), which enables integration with the ABAP-based Change and Transport System. The integrated SAP NetWeaver Developer Studio development environment supports the creation and local building of components.

- **With the Change and Transport System (CTS), SAP provides a tool for transporting software changes through the entire SAP system landscape automatically**
- **The CTS can transport ABAP and non-ABAP changes**

**https://www.sap.com/community/topic/software-logistics.html**

Figure 17: Change and Transport System

In addition to the Change and Transport System, the SAP Solution Manager system offers *Change Request Management* ), which enables central change tracking, supporting customers in making their system landscapes consistent and transparent.

This process makes it possible for you to manage your projects end-to-end in the SAP Solution Manager system: from change management and project planning to resource

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management and cost control and from the physical transport of changes from the development environment into the production environment.

### SAP Note Corrections

There are many different reasons for SAP Notes. SAP Notes can provide information of any kind for customers and partners of SAP. However, they often also contain solutions for known problems with an SAP system. SAP Security Notes contain SAP recommendations for strengthening the security of SAP systems.

> Note:
> For more information about *SAP Security Notes*, go to the SAP Support Portal at https://support.sap.com/securitynotes

When talking about SAP Notes in this lesson, we refer only to those SAP Notes that contain a solution for an error in the source code of an ABAP program supplied by SAP. These SAP Notes describe how to remove these errors in the SAP system by changing the source code.

Always read an SAP Note carefully before you implement it. The SAP Note can contain prerequisites, interactions, and references to pre-processing and post-processing activities, such as making changes to a table, that you must consider when you implement it. By implementing an SAP Note, you can remove the error it refers to.

Implementing an SAP Note manually leads to high costs and is susceptible to errors, because necessary preparations may be overlooked or the person implementing the SAP Note may not realize that the SAP Note is not valid for his or her release.

The SAP Note Assistant (transaction `SNOTE`) is a tool from SAP that enables the automatic implementation of SAP Notes. Automatic implementation of corrections contributes to enhanced quality, because it reduces errors due to manual implementation.

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Figure 18: SAP Note Assistant

From January 1, 2020, the download and upload process will stop working unless Note Assistant, transaction `SNOTE` is enabled in ABAP systems to work with digitally signed SAP Notes. Learn more about actions required from your side on the SAP Support Portal page for Digitally Signed SAP Notes. To understand the overall impact of the SAP Support Backbone update, refer to SAP Support Portal. Check https://support.sap.com/en/my-support/knowledge-base/note-assistant.html and https://support.sap.com/en/release-upgrade-maintenance/maintenance-information/connectivity-to-sap.html

Note:
For digitally signed SAP Notes check SAP Notes 2408073 - Handling of Digitally Signed notes in SAP Note Assistant and 2537133 - FAQ - Digitally Signed SAP Notes

Hint:
The SAP Note Assistant cannot implement all error corrections.

Note:
The SAP Solution Manager system includes the system recommendations, which helps you manage the SAP Notes that have not yet been implemented or installed in the systems you manage. You can start this from the SAP Solution Manager Launchpad (transaction `SM_WORKCENTER`, *Change Management* area).

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### SAP Support Package Stacks

Whereas error corrections using SAP Notes are only available for ABAP-based software components and only affect individual programs or development objects, *Support Packages* always contain a large quantity of error corrections for a specific software component (at a specific release level). SAP Support Packages are available for ABAP- and Java-based software components.

The increasing variety of components in a product version makes it necessary to improve the transparency of Support Packages and patches that are implemented and to set clear guidelines regarding recommended or allowed combinations. For this purpose, a new SAP Support Package stack is usually put together for most product versions every three to six months. These stacks contain the current best combination of SAP Support Package versions for the individual software components. This reduces the theoretical range of SAP Support Package combinations to those combinations that are useful in practice. SAP Support Package stacks represent combinations of SAP Support Packages stipulated by SAP for the respective product version, and we recommend that you regularly import these.

Hint:
Special Support Package stacks for the latest product versions are sometimes distributed as Feature Packages, which can also contain new features in addition to error corrections and legal changes. This makes it possible to deploy innovations quickly.

The tools used to import the SAP Support Packages depend on the type of SAP Support Package involved. SAP Support Packages for AS ABAP-based software components, for example, can be imported using the Support Package Manager (transaction `SPAM`). SAP Support Packages for AS Java-based software components are imported using the Software Update Manager (SUM).

Note:
SAP offers a large number of add-ons to supplement a standard SAP system. They can involve industry solutions, plug-ins, or even customer-specific development projects. To enable the installation and maintenance of these add-ons directly from the SAP system, the SAP Add-on Installation Tool (transaction code `SAINT`) was developed.

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## SAP Support Packages

- Collection of improvements in the SAP system.
- Imported as SAP Support Package stacks
  - **AS ABAP: Support Package Manager (*SPAM*)***
    or **Software Update Manager (SUM)**
  - **AS Java: Software Update Manager (SUM)**
- Can be downloaded from the SAP Support Portal**

Tools can be downloaded from **https://support.sap.com/sltoolset**

* Software Update Manager (SUM) is mandatory in rare cases:
see SAP Note 1803986 - Rules to use SUM or SPAM/SAINT to apply SPs for ABAP stacks

** Using the Maintenance Planner for calculation and approval

Figure 19: SAP Support Packages

Hint:
Concerning Java-based SAP systems, the Software Update Manager is the successor to the Java Support Package Manager (JSPM). For details, see SAP Note 1589311 – *Replacements of outdated tools via SL Toolset* .

SAP Support Packages are available on the SAP Support Portal.

Note:
To download SAP Support Package stacks for SAP systems based on SAP NetWeaver 7.0 (and higher), the Maintenance Optimizer in SAP Solution Manager or its successor, the Maintenance Planner, is required.

For more information, visit the SAP Community Network under http://wiki.scn.sap.com/wiki/display/SM/Maintenance+Tools%3A+Maintenance+Planner+and+Maintenance+Optimizer. The Maintenance Planner is available in the SAP Support Portal under https://apps.support.sap.com/sap/support/mp/index.html

### SAP System Upgrade

A release change of an SAP system is - depending on the start and the target release - sometimes called *SAP Enhancement Package installation* and sometimes *SAP system upgrade*. The newer release changes are SAP system upgrades, always.

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Figure 20: SAP System Upgrade

Note:
SAP SAP ERP 6.0 EHP 8 is based on SAP NetWeaver AS 7.50 and is therefore only available as a Unicode version. Accordingly, a Unicode-based system is required as the starting point for an SAP system upgrade to SAP ERP 6.0 EHP 8. As a result, you may have to perform a Unicode conversion before you can perform the SAP system upgrade.

## Software Update Manager (SUM)

An upgrade is the change from an older software version to a newer version. This involves replacing all the repository objects supplied by SAP (programs, table definitions, and so on) and the runtime environment.

Hint:
In contrast, an update generally involves activities for maintenance or expansion of a system, such as installing an enhancement package, installing add-ons, or importing Support Package stacks.

There are many different reasons to upgrade SAP systems, but they can be divided roughly into three areas. This is why we also differentiate between three different upgrade procedures:

- Technical upgrades focus solely on the required future compatibility of the existing SAP application and no reducing risks.
- Functional upgrades involve limited functional enhancements and reduce the total cost of ownership (TCO), in which SAP modifications are returned to the standard version, for example.

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- **Strategic upgrades** also include intra-enterprise structural change and implementing new strategic business processes as part of an SAP upgrade's project scope.

Depending on the type of upgrade, the associated upgrade project also has varying degrees of scope. SAP offers you tailored upgrade services, tools, and content that offer effective support for the major challenges involved in deciding on an upgrade and during the planning and execution of an upgrade project.

From a technical perspective, the upgrade is performed by the Software Update Manager (SUM).

> Note:
> The Software Update Manager integrates the tools SAPUp (for ABAP-based systems) and SAPJup (for Java-based systems). For details, see SAP Note 1589311 – *Replacements of outdated tools via SL Toolset* .

Figure 21: Software Update Manager

The SAP Solution Manager system supports the preparation, structuring, and execution of upgrade projects. It provides a portfolio of procedures, tools, and services that simplify the upgrading of SAP systems. In addition to this, the SAP Solution Manager system also provides documentation options for all project-related information, configuration support, and test management, among other things.

## Migrating to SAP S/4HANA

Once you have decided to implement SAP S/4HANA, your exact path to SAP S/4HANA depends on various factors. One of these factors is your current system landscape: For example, you might already be using SAP Business Suite on SAP HANA, you might be a new SAP customer, or you could already have a complex, organically grown SAP landscape that

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you want to simplify and transform. These three scenarios are shown in the figure "Migrating to SAP S/4HANA" .

Figure 22: SAP S/4HANA Conversion

- In the new implementation scenario, you are installing a new SAP S/4HANA system and migrating the data that you previously managed in a non-SAP solution.
- In the system conversion scenario, you already use SAP Business Suite on SAP HANA or on a different database and you are converting your existing SAP System to an SAP S/4HANA system.
- Finally, in the landscape transformation scenario, the requirements are more complex. You may want to use SAP S/4HANA as your central financials system, for example, or move other selected applications to SAP S/4HANA. Or you might want to simplify your system landscape by consolidating different business systems in a new SAP S/4HANA system.

### Software Logistics Toolset

You use the software logistics tools and processes to manage the system landscape in all phases of the lifecycle. In addition to the initial implementation of an application, the tools support ongoing system optimization and adaptation to changed requirements, as well as the implementation of new features.

Until the end of 2010, SAP application projects were shipped together with release-specific software logistics (SL) tools.

To provide the latest software logistics tools for releases of SAP application products, an independent delivery channel for the software logistics tools was established in 2011 under the name Software Logistics Toolset (SL Toolset). They enable customers to benefit from regular improvements to the SL tools. Current, downward compatible software logistics tools help to achieve a standard user experience across all supported product releases and reduce total operating costs.

For more information about these tools, see https://support.sap.com/sltoolset .

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### More Information

More information on the topics covered in this lesson is available on SAP Support Portal (http://support.sap.com ), under the following links:

- Quick link /notes for the *SAP Notes* database
- Link https://support.sap.com/en/my-support/knowledge-base/security-notes-news.html for *SAP Notes* that strengthen the security of the SAP systems
- Link https://support.sap.com/sltoolset for the *Software Logistics Toolset*

In addition to this, selected topics from this lesson are also covered in the following additional courses:

- *ADM100 - System Administration I for SAP S/4HANA and SAP Business Suite*
- *ADM800 - AS Java – Administration*
- *ADM328 - SAP S/4HANA Conversion and SAP System Upgrade*

**LESSON SUMMARY**

You should now be able to:

- List Tools for maintaining SAP Systems

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# Learning Assessment

1. Which SAP tools support you in your application lifecycle management tasks?

   *Choose the correct answers.*

   - [ ] A SAP Solution Manager
   - [ ] B Transaction S_LIFECYCLE in any AS ABAP-based SAP system
   - [ ] C System Landscape Directory (SLD)
   - [ ] D SAP Advanced Landscape Optimizer (SAP ALO)
   - [ ] E SAP Landscape Planning Tool - Version 1 (LPT1)

2. Which of the following statements about load balancing in SAP systems are correct?

   *Choose the correct answers.*

   - [ ] A The Internet Communication Manager (ICM) distributes HTTP requests to all available application servers on your SAP system.
   - [ ] B The ABAP Message Server can distribute requests to all available application servers during logon with the SAP GUI.
   - [ ] C The ABAP dispatcher distributes user requests to the work processes of the present application server.
   - [ ] D The SAP Web Dispatcher can distribute HTTP requests to different application servers of an SAP system in succession.

3. Which tools does the SAP Solution Manager system provide for the operation of business processes?

   *Choose the correct answers.*

   - [ ] A Root Cause Analysis
   - [ ] B IT Service Management
   - [ ] C Quick Sizer

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4. Which statements about SAP Support Packages and SAP enhancement packages are correct?

   *Choose the correct answers.*

   - [ ] A SAP Support Packages contain error corrections and legal changes.
   - [ ] B Importing SAP Support Packages is a purely voluntary measure.
   - [ ] C SAP enhancement packages are cumulative.
   - [ ] D SAP enhancement packages can add new functions to the SAP system.

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# Learning Assessment - Answers

1. Which SAP tools support you in your application lifecycle management tasks?

   *Choose the correct answers.*

   [X] A SAP Solution Manager

   [ ] B Transaction S_LIFECYCLE in any AS ABAP-based SAP system

   [X] C System Landscape Directory (SLD)

   [ ] D SAP Advanced Landscape Optimizer (SAP ALO)

   [ ] E SAP Landscape Planning Tool - Version 1 (LPT1)

   *SAP Solution Manager* and the *System Landscape Directory* are important tools in the application lifecycle management context. The other terms are made-up names; transaction *S_LIFECYCLE* is also fictitious.

2. Which of the following statements about load balancing in SAP systems are correct?

   *Choose the correct answers.*

   [ ] A The Internet Communication Manager (ICM) distributes HTTP requests to all available application servers on your SAP system.

   [X] B The ABAP Message Server can distribute requests to all available application servers during logon with the SAP GUI.

   [X] C The ABAP dispatcher distributes user requests to the work processes of the present application server.

   [X] D The SAP Web Dispatcher can distribute HTTP requests to different application servers of an SAP system in succession.

   The *Internet Communication Manager* (ICM) of an application server instance can only forward HTTP requests to the processes in its own application servers. If load balancing is desired for HTTP requests, the *SAP Web Dispatcher* can be installed on a computer in the demilitarized zone (DMZ) and be connected to one ore more SAP system(s).

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3. Which tools does the SAP Solution Manager system provide for the operation of business processes?

   *Choose the correct answers.*

   [X] A Root Cause Analysis

   [X] B IT Service Management

   [ ] C Quick Sizer

   Root Cause Analysis and IT Service Management are tools provided by the SAP Solution Manager system. The Quick Sizer tool is available outside the SAP system.

4. Which statements about SAP Support Packages and SAP enhancement packages are correct?

   *Choose the correct answers.*

   [X] A SAP Support Packages contain error corrections and legal changes.

   [ ] B Importing SAP Support Packages is a purely voluntary measure.

   [X] C SAP enhancement packages are cumulative.

   [X] D SAP enhancement packages can add new functions to the SAP system.

   SAP Support Packages contain error corrections and legal changes. SAP recommends importing SAP Support Packages in the form of Support Package stacks. Imports of SAP Support Packages are not entirely voluntary, due to the need to implement legal changes in the SAP system. SAP enhancement packages can change business processes and may add new functions to the SAP system.

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# UNIT 2 Introduction to SAP Software Logistics

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SAP System Landscape 39

**Lesson 2**

Client Concept 46

**Lesson 3**

System Change Options and Client Change Options 51

**UNIT OBJECTIVES**

- Describe SAP systems
- Identify data types in an SAP system
- Describe the system change options and client change options in an SAP system

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# SAP System Landscape

**LESSON OVERVIEW**
In this lesson, you will learn about the SAP's product portfolio, SAP Business Suite, SAP NetWeaver, SAP systems and instances. You will also identify the components of the SAP system landscape that SAP recommends.

**Business Example**

An SAP system administrator needs to understand the roles of different SAP systems in the SAP system landscape before deciding how to configure the Transport Management System.

**LESSON OBJECTIVES**
After completing this lesson, you will be able to:

- Describe SAP systems

## SAP System Components

Figure 23: SAP S/4HANA and SAP Business Suite

The SAP Product Portfolio offers SAP applications for the following areas:

- Enterprise Resource Planning (SAP ERP)

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- Customer Relationship Management (SAP CRM)
- Supplier Relationship Management (SAP SRM)
- Supply Chain Management (SAP SCM)
- Product Life Cycle Management (SAP PLM)

These applications are part of the SAP Business Suite. As a result, a customer with an SAP Business Suite license also has a license for each application in the SAP Business Suite.

> Note:
> Sometimes the terms “SAP solution” and “SAP application” are used interchangeably.

An SAP application is a virtual bundle of business functions. You cannot install, patch, upgrade, or administrate an SAP application. You cannot log onto an SAP application because an SAP application consists of several SAP components, such as SAP ECC, SAP SCM server, and so on. From a technology point of view, it is the SAP components that a customer installs or upgrades. You can log on and work with a component. A common term for an SAP component is an “SAP system”.

SAP ECC is the central component of SAP ERP (SAP ERP Central Component), which in turn is the central application of the SAP Business Suite. However, SAP now offers SAP S/4HANA (SAP S/4HANA Server). SAP S/4HANA Server is a new SAP system in the new SAP S/4HANA Suite. You could say that SAP S/4HANA Server is “the new SAP ECC system”.

It is possible to convert your existing SAP ECC system to an SAP S/4HANA Server system, by performing an SAP S/4HANA conversion.

Another important product to mention is SAP NetWeaver, which represents the technology stack provided by SAP to support the SAP Business Suite. Again, you cannot install SAP NetWeaver, or patch or update SAP NetWeaver as a whole. SAP NetWeaver is a bundle of several SAP systems. For example:

- SAP Business Warehouse (SAP BW)
- SAP Enterprise Portal (SAP EP)
- SAP Process Integration (SAP PI)
- SAP Master Data Management (SAP MDM)

These SAP systems can be installed as needed to serve different requirements.

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Figure 24: SAP System Examples

The figure above shows some examples of SAP systems:

- A basic AS ABAP 7.52, used as SAP Fiori Front-End Server for an SAP S/4HANA Server system
- An SAP ECC 6.08 system
- An SAP S/4HANA 1511 Server system
- An SAP S/4HANA 1809 Server system

In this course, we use an SAP S/4HANA 1809 Server system, and an SAP Fiori Front-End Server 5.0 system, running on AS ABAP 7.52.

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## AS ABAP Based SAP Systems

Figure 25: Release Development of Software Component SAP BASIS

This course describes, how to set up and transport within an SAP system landscape of AS ABAP based SAP systems.

The figure shows a history of some of the releases of the central software component SAP_BASIS.

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## SAP System Landscape Recommendations

Figure 26: SAP System Landscape: Aims

To maintain data security, you should protect application data by using the client concept, which separates data according to clients, and the authorization concept, which separates data within one client according to the users.

In addition, you should strictly separate the environments for development, quality assurance, and production.

The stability and performance of the production client should not be affected by development and test activities in other clients.

Changes to repository objects are client-independent, and immediately affect the business functions and processes. Therefore, changes have to be tested before being transported to the production system.

If you had only one SAP system, no further development would be possible after production had started. Changes to repository objects could only be made when production operations were stopped for development and testing.

A two-system landscape is not optimal, because both development and quality assurance testing take place in the development system.

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Figure 27: The SAP Recommended SAP System Landscape

To ensure smooth production operation, an SAP system landscape should contain the three SAP systems, the standard clients, and any required additional clients.

A three-system landscape is recommended and meets the needs of most customers.

- Development takes place in the development system. Changed objects are then released to the quality assurance system.
- In the quality assurance system, you can test new developments without affecting the production environment.

  A quality assurance system enables you to integrate development efforts and to check the validity and consistency of transported objects before moving the objects into production.
- All objects imported into the quality assurance system should also be delivered to one or more production systems.

The three-system landscape is also a basis to apply SAP Support Packages or to perform a release upgrade.

SAP systems in the same SAP system landscape require unique SAP system names, known as the System ID (SID).

SAP provides the tools required for the creation, documentation, and distribution of changes within an SAP system landscape. It also provides the tools to set up the SAP system landscape so that it supports the management, verification, and testing of all changes:

- A single client is recommended for all customizing work. Set the client change options appropriately before using your clients.

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- A single SAP system (the development system) is recommended for all development work. Set the system change options appropriately.
- To create and assign appropriate user authorizations to developers and customizers, use the sample profiles included in the SAP system. These authorizations control whether a user can create, modify, or release tasks and transport requests.
- Record and document all changes to a client or SAP system.

Figure 28: Change and Transport System

The Change and Transport System (CTS) comprises the following tools:

- The Change and Transport Organizer (CTO) provides functions for organizing software development projects. It is designed to support projects of all sizes, whether they are carried out centrally or in a distributed environment.
- The Transport Management System (TMS) organizes, monitors, and performs transports for all SAP systems within an SAP system landscape. In addition, TMS is used to configure and manage the setting up of SAP systems and transport routes within an SAP system landscape.
- The transport tools are executables and programs that communicate with the SAP system, the database, and files generated during the transport process.

**LESSON SUMMARY**

You should now be able to:

- Describe SAP systems

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Unit 2
Lesson 2

# Client Concept

**LESSON OVERVIEW**
In this lesson, you will learn how to identify client roles in the SAP system. In addition, you will learn about the concepts of change management within an SAP system environment.

**Business Example**

As an SAP system administrator or project team leader, you must monitor software configuration changes and program code changes to protect your production system from incorrect configuration settings or program bugs.

**LESSON OBJECTIVES**
After completing this lesson, you will be able to:

- Identify data types in an SAP system

## Data in an SAP System

Data in an SAP system can be divided into two categories:

1. Client-dependent data

   Application, customizing, and user master data, which only affect one client.

2. Client-independent data

   Customizing data and all repository objects, which affect the whole SAP system environment.

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Figure 29: Data Types in an SAP System

The ABAP dictionary is a data dictionary that is part of the ABAP repository.

### Clients in an SAP System

A client is a self-contained unit in commercial, organizational, and technical terms. It has its own user master data and set of table key ranges.

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Figure 30: Clients in SAP Systems

The data of different clients is separated at the kernel level. Open SQL statements executed by an SAP application use the client number in the `WHERE` clause. A table may contain data from several different clients, however the `WHERE` clause limits access to particular clients.

Client-dependent data types are as follows:

- User master data, such as parameters and user groups.
- Customizing data, such as organizational units, assignments, and document types.
- Application data, such as business transaction data and material master data.

The SAP client concept can integrate several companies or subsidiaries in a single client. It does so using the following methods:

- Company Codes

  Company codes define the smallest corporate organizational units, for which a complete self-contained set of accounts can be drawn up for external reporting.

- SAP Authorization Concept

  The SAP authorization concept enables the parent company to access all subsidiaries for report purposes, while subsidiary-specific data is protected against access from other subsidiaries through company code definition.

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Figure 31: Standard Client Roles

Standard client roles fulfill the optimal minimum requirements of your SAP system.

The standard clients are as follows:

- Client CUST: *Development and Customizing*

  The central customizing client, where complete adaptation of the SAP system to customer-specific needs takes place. All changes performed in this client are recorded so that they can be supplied to other clients using the Transport Management System (TMS).

- Client QTST: *Quality Assurance*

  Used to test and verify the new customizing settings in the application.

- Client PROD: *Production*

  The client for production activities — that is, where your company's business is carried out. Customizing changes that are imported into this client have to first be tested carefully in the QTST client. This ensures that production operation is free of disruption.

To realize the full benefits of a three-system landscape, every critical client should have a separate SAP system.

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Figure 32: Additional Client Roles

Additional clients within an SAP system landscape may include:

- A sandbox client to experiment with transaction data and settings.
- A test client to verify customizing changes against sample data in a more stable environment. This can be done by copying customizing settings from the customizing client to the sandbox client. This is called a unit test.
- An end-user training environment.
- A client that satisfies customer-specific requirements.

**LESSON SUMMARY**

You should now be able to:

- Identify data types in an SAP system

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Unit 2
Lesson 3

# System Change Options and Client Change Options

## LESSON OVERVIEW

In this lesson, you will learn about the system change options and client change options of an SAP system.

### Business Example

As a transport administrator, you need to set the correct system change options for each SAP system and the correct client change options for all clients.

## LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Describe the system change options and client change options in an SAP system

## System Change Options

Figure 33: System Change Options

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The system change options define whether repository objects and client-independent customizing objects can be globally modified. If they are globally modifiable, you can specify whether each software component and namespace can be modified.

To reach the system change option, go to transaction `SE06` and choose *System Change Option*. A software component is a set of dedicated packages.

For the software components, there are four different possible settings:

- Modifiable
- Restricted Modifiability

  This means that you can only create objects as non-originals.
- Not Modifiable; Enhanceable Only

  This means that changes are not allowed. Objects can be enhanced using the *Enhancement Framework* only.
- Not Modifiable; Not Enhanceable

  This means that changes and enhancements are not allowed.

You can reserve name spaces for software developed by SAP customers and partners. These name spaces are designed for large-scale customer enhancements, as well as add-ons developed by partners.

The syntax for objects from reserved name spaces is as follows: */<name space>/<object name>*.

For each SAP system, the customer can define whether objects contained in the name spaces and name ranges can be changed. To enable you to change objects, the SAP system must not be globally locked to changes.

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## Client Change Options

Figure 34: Client Change Options

Client change options, found in the client's *T000* master table, can be maintained using transaction `SCC4`.

Two settings must be maintained to implement controls on where changes are made, and to enforce the changes being recorded to transport requests.

These settings are as follows:

- Changes and transports for client-specific objects.
- Client-independent object changes.

The following list provides a brief description of what each option allows. Changes and transports for client-specific objects are as follows:

Changes without automatic recording

This flag means that changes in the customizing settings of the client are permitted. The changes are not automatically recorded in a transport request.

Customizing settings can be exported from the client by manually creating a transport request. A manual transport can be carried out in the particular transaction (if possible) or manually.

This variant makes sense for pure test, training or demonstration clients.

Automatic recording of changes

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This flag means that changes are permitted in the customizing settings of the client. Changes are automatically recorded in a transport request.

It is also possible to export customizing settings independently of the automatic recording from the client, by manually creating or recording a transport request.

In a productive client, settings that can be maintained as "current settings" are excluded from automatic recording. Current settings (such as exchange rates, posting periods, and so on) are maintained without recording the changes.

This variant can be used for customizing clients.

No changes allowed

This flag means that changes in the customizing settings of the client are not permitted.

However, customizing settings can be exported from the client by manually creating or recording a transport request.

In a productive client, customizing settings that can be maintained as "current settings" are excluded from the client lock. This means that current settings (such as exchange rates, posting periods, and so on) can always be maintained in the productive client.

This variant can be used for productive clients, demonstration clients, and training clients.

Changes without automatic recording, no transports allowed

This flag means that changes are permitted in the customizing settings of the client. However, the changes are not automatically recorded in a transport request.

No manual transport of customizing settings is possible from the client.

This variant can be used for pure test clients.

**Cross-Client Object Changes**

This feature controls in which clients you are allowed to maintain client-independent objects.

It makes sense not to allow client-independent maintenance, if the objects to be maintained are exclusively application objects (all client dependent) or client-related customizing objects. In this case (for example, in a test client), you must ensure that client-independent functionality cannot be changed.

Client-independent functions include all client-independent customizing objects (e.g. factory calendar, definition of price list conditions, printer controls). But in particular they also include all objects of the SAP repository (programs, function modules, screens, dictionary objects etc.).

Changes to repository and cross-client customizing allowed

There are no restrictions on the maintenance of client-independent objects for the client when this setting is used. Both client-independent customizing objects and objects of the SAP repository can be maintained.

Use this setting in the customizing and development client only.

No changes to cross-client customizing objects

Client-independent customizing objects cannot be maintained in the client with this setting.

Only use this if the development client is separate from the customizing client.

No changes to repository objects

With this setting, objects of the SAP repository cannot be maintained in the client.

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Only use this if the customizing client is separate from the development client.

No changes to repository and cross-client customizing objects

This is a combination of both restrictions:

- Neither client-independent customizing objects, nor objects of the SAP repository, can be maintained in the client.

Use this in every client in the landscape, except for the customizing and development clients.

> Note:
> Please note that *Automatic recording of changes* does not refer to recording for audit purposes. Recording for audit purposes is also possible.
>
> To record data changes from within the SAP system, you can set the profile parameter: *rec/client* , via transaction `RZ10`.
>
> To record data changes caused by importing transport requests, you can set the *tp* parameter: *RECCLIENT*, via transaction `STMS`.

Figure 35: Customizing Using Current Settings

In a customizing project, and also during the maintenance of a SAP system, all customizing changes should be transported and tested in the quality assurance system. But certain kinds of customizing changes, so called data-only customizing changes, need to be carried out in a production client — without being saved as transport requests. Examples of such data, which may require frequent adjustment in SAP systems, include:

- Interest Rates
- Health Insurance Premiums

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- Pension Schemes
- Tax Schemes
- Currency Exchange Rates

.

As these types of changes have a frequent change rate, and they are not subject to extensive testing like other customizing changes, these changes are done directly in the productive client in the production system. To avoid having to use transport requests for these changes, SAP has introduced the Current Settings function.

The Current Settings function may be used within a production client, without impacting business flow-related customizing objects.

SAP-approved Current Settings for customizing objects are kept in the field *CURSETTING*, in the table *OBJH*.

When using Current Settings in a production environment, the following settings are made:

- The client role is set to: *Production*.
- Client independent object changes are set to: *No changes to Repository and cross-client Customizing objects*.
- Changes and transports for client-dependent objects are set to: *No changes allowed*.

**LESSON SUMMARY**
You should now be able to:

- Describe the system change options and client change options in an SAP system

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# Learning Assessment

1. Which of the following are SAP systems?

   *Choose the correct answers.*

   - [ ] A SAP ECC
   - [ ] B SAP ERP
   - [ ] C SAP S/4HANA Server
   - [ ] D SAP Business Suite
   - [ ] E SAP BW

2. SAP recommends a three-system landscape as the minimal landscape when performing own development

   *Determine whether this statement is true or false.*

   - [ ] True
   - [ ] False

3. Which of the following is always client independent?

   *Choose the correct answer.*

   - [ ] A Repository objects
   - [ ] B Application data
   - [ ] C Customizing
   - [ ] D User master records

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4. Which of the following are standard client roles?

   *Choose the correct answers.*

   - [ ] A Development and customizing
   - [ ] B Monitoring
   - [ ] C Quality Assurance
   - [ ] D Importing
   - [ ] E Production

5. If you set the client change options (transaction `SCC4`) for client 100 to 'Changes to Repository and cross-client Customizing allowed' and the system change options (transaction SE06) global settings to 'Not Modifiable', you can then change repository objects from within client 100.

   *Determine whether this statement is true or false.*

   - [ ] True
   - [ ] False

6. Which of the following client change options allow you to change client specific customizing within the specific client?

   *Choose the correct answers.*

   - [ ] A Changes without automatic recording
   - [ ] B Automatic recording of changes
   - [ ] C No changes allowed
   - [ ] D Changes w/o automatic recording, no transports allowed

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# Learning Assessment - Answers

1. Which of the following are SAP systems?

   *Choose the correct answers.*

   [X] A SAP ECC

   [ ] B SAP ERP

   [X] C SAP S/4HANA Server

   [ ] D SAP Business Suite

   [X] E SAP BW

   You are correct! The SAP ECC, SAP S/4HANA Server and SAP BW are SAP systems. SAP ERP is not an SAP system, it is an application. SAP Business Suite is not an SAP system, it is the bundle of the applications SAP ERP, SAP CRM, SAP SCM, SAP SRM and SAP PLM. Read more on this in the lesson 'SAP System Landscape' of the course ADM325.

2. SAP recommends a three-system landscape as the minimal landscape when performing own development

   *Determine whether this statement is true or false.*

   [X] True

   [ ] False

   You are correct! A three-system landscape is the minimal landscape when performing own development, recommended by SAP. Read more on this in the lesson 'SAP System Landscape' of the course ADM325.

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3. Which of the following is always client independent?

   *Choose the correct answer.*

   [X] A Repository objects

   [ ] B Application data

   [ ] C Customizing

   [ ] D User master records

   You are correct! Repository objects are always client independent. Application data is client dependent. Customizing is partly client dependent and partly client independent. User master records are client dependent. Read more on this in the lesson 'SAP System Landscape' of the course ADM325.

4. Which of the following are standard client roles?

   *Choose the correct answers.*

   [X] A Development and customizing

   [ ] B Monitoring

   [X] C Quality Assurance

   [ ] D Importing

   [X] E Production

   You are correct! Development and customizing, Quality Assurance and Production are standard client roles. Monitoring and Importing are not client roles. Read more on this in the lesson 'Client Concept' of the course ADM325.

5. If you set the client change options (transaction `SCC4`) for client 100 to 'Changes to Repository and cross-client Customizing allowed' and the system change options (transaction SE06) global settings to 'Not Modifiable', you can then change repository objects from within client 100.

   *Determine whether this statement is true or false.*

   [ ] True

   [X] False

   You are correct! It is not possible to change repository objects if the system change options, global settings are set to 'Not Modifiable'. it does not matter how the client change options are set in this case. Read more on this in the lesson 'System Change Options and Client Change Options' of the course ADM325.

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6. Which of the following client change options allow you to change client specific customizing within the specific client?

   *Choose the correct answers.*

   [X] A Changes without automatic recording

   [X] B Automatic recording of changes

   [ ] C No changes allowed

   [X] D Changes w/o automatic recording, no transports allowed

   You are correct! Changes without automatic recording, Automatic recording of changes and Changes w/o automatic recording, no transports allowed allow you to change client specific customizing within the specific client. No changes allowed does not allow you to change client specific customizing within the specific client. Read more on this in the lesson 'System Change Options and Client Change Options' of the course ADM325.

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# UNIT 3 Setting Up an SAP System Landscape

**Lesson 1**

Setting Up the Transport Management System (TMS) 63

**Lesson 2**

Extended Transport Control 83

**UNIT OBJECTIVES**

- Set up the Transport Management System (TMS)
- Explain the use of transport target groups and client dependent transport routes

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Unit 3
Lesson 1

# Setting Up the Transport Management System (TMS)

**LESSON OVERVIEW**
In this lesson, you will learn how to set up the transport management system (TMS). At first some basic terms such as SAP system landscape, transport domain and transport group are introduced. Then you will learn how to set up a transport domain and how to configure a transport domain controller. After that, transport routes are defined. Finally the QA approval procedure will be introduced and the TMS setup will be checked.

**Business Example**

An SAP system administrator needs to understand the roles of different SAP systems and clients in the SAP system landscape before making decisions on how to configure the Transport Management System (TMS). After you have installed the first SAP system but before you perform customizing or development, you need to configure the TMS so that it will record, track and control customizing and development changes for the subsequent transports to other SAP systems in the SAP system landscape.

**LESSON OBJECTIVES**
After completing this lesson, you will be able to:

- Set up the Transport Management System (TMS)

## Overview and Prerequisites

The following list provides an overview of what has to be considered before, during, and after installation of an SAP system.

**Setting Up the SAP System Landscape: Overview**

- Before SAP system and database installation:
  - Define the network structure for the SAP system landscape.
  - Install the hardware and the operating systems for the SAP systems.
- During SAP system and database installation:
  - Create one common transport directory (in certain cases you want to have more then one).
- After SAP system and database installation:
  - If you have set up the SAP system using a database copy, initialize the Change and Transport Organizer (CTO) (transaction `SE06`).
  - In any case, set up the Transport Management System (TMS).

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Hint:
To initialize the Change and Transport Organizer (CTO), go to transaction `SE06` and choose *Standard Installation* → *Perform Post-Installation Actions* .

To configure the SAP system landscape using the TMS, go to transaction `STMS`. This process will be described in detail in this lesson.

To set up your SAP system landscape, it is sufficient to start with an existing SAP system as a development system. The quality assurance and production systems are not required at this stage. All future SAP systems can be represented at this stage as "virtual systems". You will also have to create a transport directory at file system level for all SAP systems. This directory is required for the TMS.

Figure 36: Creating a Transport Directory

Depending on your existing SAP system landscape, the global transport directory and all necessary subdirectories are created automatically during the installation of the SAP system. See the installation guide of your SAP system for more details.

The SAP profile parameter *DIR_TRANS* has to point to the path of the transport directory. For Linux and UNIX, the default path is */usr/sap/trans* . For Microsoft Windows, the default path is *\\<hostname\sapmnt\trans* .

The subdirectories required in the common transport directory include (among others):

- *bin*: configuration files for *tp* (TP_<domain name>.PFL) and TMS (DOMAIN.CFG).
- *buffer*: transport buffer file for each SAP system, indicating which transport requests are to be imported in which sequence.
- *data*: data part of the exported transport requests.

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- *cofiles*: command or transport request information files, which include information on the transport type, object classes, required import steps, and post-processing exit codes.
- *log*: transport logs, trace files, and statistics.
- *tmp*: temporary data and log files.
- *sapnames*: information about transport requests per SAP user.
- *actlog*: information about SAP user per transport request and transport task.
- *EPS*: download directory for SAP Support Packages (Electronic Parcel Service).

> Note:
> To enable transports in a heterogeneous operating system environment, you must set up different transport directories. However, to enable transports in a heterogeneous operating system environment using a single transport directory, refer to SAP Note 83327 – *Setting Up Transport System in Heterogeneous System Group*.

Transporting enables you to synchronize customizing and development in multiple SAP systems, through the transfer of changes from the development system to downstream SAP systems. Transports along the transport routes must occur in only one direction.

Figure 37: Logical and Physical Transport Sequence

As mentioned above, transporting requires a transport directory to enable SAP systems in the SAP system landscape to store and access various data files, command files, and log files.

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Physically, objects in a three-system landscape are transported in three steps:

1. All objects in a (transportable) transport request, that are to be released, are exported by being copied from the database of the source system to the transport directory.
2. These objects are imported into the database of the quality assurance system. Here, they are tested and validated.
3. After testing and verification, the objects can be imported into the database of the production system.

> Note:
> The terms “export” and “import” are meant as *copy*, not as *move*.
>
> At the end of the process, the objects exist four times: in the database of DEV, QAS and PRD, and in the transport directory.

### TMS: Concepts and Terminology

Depending on the size of an organization and the scope of its SAP implementation, there may be many different individuals carrying out customizing and development projects. Some will be involved in customizing specific application areas, others may be involved in the development of new ABAP programs, others in the QA testing and acceptance of changes. There can be hundreds or even thousands of changes that have to be transported through the SAP systems in the landscape. The transport of these changes will be done using the functions of the TMS.

The concepts behind TMS are as follows:

- Centralized configuration of Change and Transport System (CTS) for all SAP systems.
- Centralized management of transport requests, especially the import process.
- Transport strategy based on predefined transport routes.

The purpose of the TMS, accessed via transaction `STMS`, is to centrally control the propagation of changes through the SAP system landscape based on predefined paths. This is designed to ensure the consistency of the SAP repository and the contents of the customizing tables in all SAP systems in the landscape. All necessary activities can be done from within the SAP system (using the SAP authorization concept) and there is no need to manually execute scripts at operating system level.

With TMS you are able to perform the following activities:

- Define an SAP system's role within an SAP system landscape or transport domain.
- Configure the transport routes, using either an editor or delivered standard configuration settings.
- Configure the transport tool program's (*tp*) parameter profile.
- Display the import queues of all SAP systems in the transport domain.
- Define quality assurance and acceptance procedures in the QA system.
- Schedule the import of transport requests in an import queue.
- Perform transports between SAP systems without a common transport directory.

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- Handle transport proposals of developers.

Thus, TMS enables SAP system administrators to centrally manage the transport configuration of multiple SAP systems, by defining transport domains, assigning transport domain controllers, and defining transport routes.

Figure 38: What is an SAP System Landscape?

A transport domain consists of all SAP systems that you plan to manage centrally. Within the transport domain, all SAP systems must have unique SAP system IDs (SIDs). Only one of these SAP systems is identified as the (transport) domain controller.

The transport domain controller is the SAP system where all TMS configuration settings are maintained. Any changes to the configuration settings are distributed to all SAP systems in the landscape. This ensures that the TMS configuration settings are consistent throughout the domain. The transport domain controller stores the reference configuration, and all other SAP systems receive a copy of the reference configuration.

An SAP system landscape is a set of SAP systems that share customizing and repository objects, via transported transport requests. A typical landscape is made up of, but not limited to, a development, a quality assurance, and a production system. In most cases, the SAP system landscape and the transport domain are made up of the same SAP systems, but it is not uncommon to have multiple landscapes within one transport domain.

Examples of a single transport domain with multiple system landscapes are as follows:

- A multi-national company may have separate landscapes for each subsidiary. DE1, QA1, and PR1 may be the landscape for the Asian implementation, and DE2, QA2, and PR2 may be the landscape for the European implementation. Even though they are separate system landscapes, both can still be controlled centrally in one transport domain.

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- An SAP customer may have multiple system landscapes for different kinds of SAP systems. DEV, QAS, and PRD may be the landscape for the SAP ECC systems, while DBW, QBW, and PBW may be the landscape for the SAP BW systems. Again, separate system landscapes are controlled centrally using one transport domain.

A transport domain contains at least one transport group. Very simply, a transport group consists of one or more SAP systems that share a common transport directory. The following figure shows the relation between a transport domain and a transport group.

Figure 39: Transport Domain and Transport Group

TMS supports several transport directories within a single transport domain. This might be the case, for example, for the multi-national company mentioned above where each subsidiary may have its own (local) transport directory. Or think about a transport domain containing a landscape that has a DEV system with its own transport directory, and QAS and PRD systems sharing a common transport directory, for security reasons. In this case, the domain would consist of two transport groups.

Note:
The terms “transport domain”, “transport domain controller”, and “transport group” concern only the SAP systems in the environment. They do not include the transport relationship between SAP systems, which is defined by the transport routes.

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### Establishing a Transport Domain

To set up a transport domain, first determine which SAP systems should be included in the transport domain. The transport domain should contain all SAP systems, which will be centrally administered using TMS.

> Note:
> Not all SAP systems need to be installed and present when the transport domain is first configured, but planning what the landscape will look like is necessary. These future SAP systems can be represented by so called "virtual systems".

### Overview

The configuration of TMS can be broken down into three individual steps:

1. Configuring the transport domain defines which SAP systems will be included in the domain.
2. Configuring the transport routes defines the SAP system and client roles within the landscape(s).
3. Optional: Configuring the QA procedure defines who is responsible for approving the acceptance of changes and the promotion of those changes to the delivery system(s).

The following figure shows the three steps. Note that the first two steps are mandatory for setting up an SAP system landscape, whereas the last step (QA procedure configuration) is optional.

Figure 40: Setting Up the Transport Management System

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### Initializing the Transport Domain Controller

The first SAP system you configure is automatically selected as the transport domain controller. However, you can later switch the role of the transport domain controller to a different SAP system.

Figure 41: Establishing a Transport Domain

As certain configuration tasks that are relevant to the entire transport domain (e.g. creating transport routes) can only be carried out on the transport domain controller, SAP recommends that the SAP system chosen to be the transport domain controller has the following attributes:

- High availability
- High security precautions
- Highest level of maintenance

Therefore, a production system might be the ideal choice to be transport domain controller. As the development system is usually installed before the quality assurance and production systems, the common practice is to configure the development system as the transport domain controller and later move the assignment of the transport domain controller to the production system. Another scenario might be to use an SAP system that you already use for central monitoring and central user administration as the transport domain controller.

> Note:
> The system load on the SAP system caused by work on the transport domain controller is very low.

When using TMS (transaction `STMS`) for the first time after a new SAP system installation, you are automatically prompted to initialize the TMS. You must initialize the TMS while logged on to client 000. To configure TMS, you need the authorization S_CTS_ADMIN.

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### Initializing the Transport Domain Controller

Transaction `STMS`, in client 000, will perform the following activities:

- Assign the SAP system as the transport domain controller.
- Create the transport domain name: DOMAIN_<SID>.
- Create the transport group: GROUP_<SID>.
- Create the system user TMSADM in client 000.
- Create RFC destinations.
- Set up the file DOMAIN.CFG and the TP_<domain name>.PFL, in directory *bin* of the transport directory.

In more detail: when you initialize the TMS, the following actions will automatically be carried out by the SAP system:

- A transport group is created with the name: *GROUP_<SID>*.
- In client 000, the system user *TMSADM* is created.
- The RFC destinations required for the TMS are generated.
- The TMS configuration file *DOMAIN.CFG* is stored in the transport subdirectory *bin*. This file contains the transport domain name and description, as well as the transport domain controller's host name, instance number, SID, and transport group.
- The transport profile for the transport control program *tp* is generated and stored in the transport subdirectory *bin*, under the name *TP_<domain name>.PFL*. The parameters in this profile are maintained using transaction `STMS`.

> Note:
> The name of the transport domain cannot contain blanks, and cannot be changed afterwards without reconfiguring the transport domain controller. By default, a transport domain will have the name *DOMAIN_<SID>*, where *<SID>* is the SAP system ID of the transport domain controller.

## Adding Additional SAP Systems to a Transport Domain

To add new SAP system to an existing transport domain, you must perform configuration activities on both the new SAP system and the transport domain controller.

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Figure 42: Adding Additional SAP Systems to a Transport Domain

Each additional SAP system must apply for inclusion to the transport domain controller. As configuration of the TMS can only be done on the transport domain controller, the transport domain controller must confirm inclusion for each SAP system. The initial screen of transaction `STMS` indicates if an SAP system is waiting for inclusion in the transport domain.

The description of the transport domain is stored in the file *DOMAIN.CFG* in the *bin* subdirectory of the common transport directory. All other SAP systems connected to this transport directory read the file *DOMAIN.CFG* during `STMS` initialization, so to identify the transport domain controller and transport group address. If your SAP systems do not have a common transport directory, you can manually configure TMS with the address of the transport domain controller. In this case choose *Other configuration*→ *Include System in Domain* when entering transaction `STMS` for the first time. In the next popup, enter the target host and the instance number of the transport domain controller. In any case, when an SAP system has been configured for the TMS and has been approved in the domain, you will find a newly created user TMSADM and generated RFC destinations required for the TMS.

Hint:
When configuring the TMS on an SAP system, you can specify the application server (i.e. the instance) to be used for all TMS functions. Choose the instance with the highest availability.

Caution:
To exchange data and objects between the SAP systems of an SAP system landscape, all SAP systems should have the same release, SAP Support Package level, and correction level. For more information on transporting between different releases, see the composite SAP Note 1090842 – *Cross-Release Transports* .

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Figure 43: Centralized Configuration Data

The SAP systems within a transport domain communicate with each other using Remote Function Calls (RFCs). RFC communication requires user IDs to access target SAP systems. When SAP systems are added to a transport domain, the necessary RFC destinations and user IDs are automatically configured by the TMS tool. The transport domain configuration settings are distributed throughout the transport domain using RFC communication.

Changes to the transport domain configuration are made on the transport domain controller, and then distributed to all SAP systems in the transport domain. Each time you make a change on the transport domain controller, a dialog box is displayed asking whether to distribute the change. You can distribute several changes in one distribution process.

When SAP systems are initially added to the TMS configuration, the communication user TMSADM is configured with limited authorizations. This user is used when distributing and activating the TMS configurations.

There are two types of RFC destinations created by the TMS:

TMSADM@<SID>.<domain name>
TMSSUP@<SID>.<domain name>.

The user TMSADM is inserted as a system user in the TMSADM@<SID>.<domain name> destination, but there is no RFC user inserted into the TMSSUP@<SID>.<domain name> destination. Therefore, if you try to execute a function that goes beyond the limited authorizations of the TMSADM user, for example, scheduling an import, TMS uses the TMSSUP destination. As a result, the SAP system prompts you for a user name and password on the target SAP system that does have the necessary authorizations.

## Virtual SAP Systems

Extending a transport domain is not restricted to physically installed SAP systems. Virtual SAP systems are often included as place holders for planned SAP systems and are replaced by the planned SAP system after it is physically installed. In addition, you can extend the transport domain to include external SAP systems, for example, an SAP system from a different transport domain.

By creating virtual SAP systems, you can model the transport routes of the planned SAP system landscape and ensure that the import queues of subsequent SAP systems will already be created and maintained for later use. In the beginning stages of a new SAP

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implementation, customers frequently have only the development system physically installed and store the development and customizing work in the transport directory and import queues of the respective planned SAP systems.

### Backup Domain Controller

If the SAP system that is acting as the transport domain controller fails, no changes can be made to the TMS configuration. SAP therefore recommends that you configure a backup domain controller that can take over the function of the transport domain controller when required.

It may also be necessary to move the transport domain controller to another SAP system. In such a case, you must activate the backup domain controller. Then, the backup domain controller becomes the transport domain controller and vice versa.

Figure 44: Transport Domain Management using a Backup Domain Controller

> Hint:
> The SAP system that you select as a backup domain controller must be an existing SAP system; it cannot be a virtual or an external SAP system.

To check the current status of the transport domain configuration for each SAP system in the transport domain, access the TMS *system overview*. From the TMS initial screen, choose *Overview*→ *Systems*. In this overview, you can also see whether the configuration is up to date, and whether any errors occurred when distributing the configuration.

### Configuring tp

The transport control program tp requires a transport profile. This profile provides information on establishing a database connection for all sap systems in the transport domain, as well as other technical information on performing the transport process. TMS

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generates and manages this transport profile as a part of the transport domain configuration. Do not adjust the transport profile using a text editor at operating system level.

Figure 45: Configuring the Transport Control Program tp

To display the *tp* parameters of an SAP system, call transaction `STMS`. Choose *Overview→ Systems*. Mark one SAP system and choose *SAP System→ Display*. Choose the tab *Transport Tool* . From the menu, choose *Goto→ tp Parameters*. This displays the parameters in *TP_<domain name>.PFL*, as well as the default value of other parameters used by the programs *tp* and *R3trans*. If a parameter is not specified in the *TP_<domain name>.PFL* file, a default value will be used. Global parameters override defaults. Local parameters override global parameters. For example, you can specify a global parameter value for all but one SAP system, if a local parameter applies to that SAP system.

You can switch between the *Display All Parameters* and *Display Substituted Parameters Only* views (content of TP_<domain name>.PFL), by using the *Display Less* and *Display More* buttons.

Note:
The example in the above figure shows the setting of the *tp* parameter *RECCLIENT* to *ALL* (all clients). This can be used to record changes to data caused by the import of transport requests. This may be necessary for audit purposes. To record data changes done from within the SAP system, you can use profile parameter *rec/client* , as mentioned in a previous lesson.

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Note:
Up to release SAP R/3 4.6C, there was a configuration file tpparam. It was possible to maintain tpparam with a text editor, however this file is no longer used. It is not possible to maintain TP_<domain name>.PFL with a text editor.

After performing an upgrade (for example, from SAP R/3 4.6C to SAP ECC 6.08), you might need to transfer your settings from the old configuration file to the new one. You can do this in the parameter overview, by choosing *Extras→ Apply Configuration* from TPPARAM.

## Configuring Transport Routes

Transport routes indicate the role of each SAP system and the flow of transport requests. The transport routes are what actually define your SAP system landscape.

### Overview

The initialization of TMS and the setup of the transport domain defines the systems in the environment in terms of the transport domain, transport controller, and transport group.

You must define the transport relationship between these SAP systems. Even though TMS has been initialized, you cannot perform transports until the transport routes have been configured and distributed.

After establishing a transport domain, you need to perform the following activities:

**Configuring Transport Routes**

1. Model transport routes from the transport domain controller, using:
   - Default standard configurations (one-, two-, and three system landscapes)
   - Graphical editor for non-standard configurations
2. Distribute and activate the new configuration data for all SAP systems within the transport domain

To reduce the effort of specifying individual transport routes, you can use standard configurations. Transport routes for the standard configurations are generated automatically.

You can choose from the following standard configurations:

- Single System
- Development and Production System
- Three Systems in Group

If you use the standard configuration function, the current configurations for all SAP systems involved are replaced by the standard settings. Existing packages, transport layers, or objects created in the SAP system are not deleted. For complex SAP system landscapes, define additional consolidation and delivery routes after setting up the transport route configuration on the basis of one of the standard configurations.

After you have defined a transport route, you must activate and distribute it to all SAP systems in the transport domain.

There is a version management of the stored configurations. If you modify and save an active configuration, the version counter is increased. To activate a stored version, from the start

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screen of transaction `STMS` choose *Overview* → *Transport Routes* → *Configuration* → *Get Other Version*. This displays a list of all versions of the transport route configuration. Select the version you want from the list. To activate an older version, use the *distribute and activate* procedure.

To ensure consistency, transport routes can be configured only on the transport domain controller. To help define a transport route, the TMS provides a graphical editor and a hierarchical list editor, which can be used interchangeably, as well as standard configurations for a one, two, and three-system landscape.

### Transport Layers and Transport Routes

As previously stated, transport routes define the flow of the transport requests from one SAP system to the next. These routes are called either *consolidation* or *delivery* routes.

Figure 46: Transport Routes

A consolidation route is an "export/ import" route. Typically, the consolidation route proceeds from the development system (where the transport request is exported from) to the quality assurance system (where the transport requested is imported into) in a standard three-system landscape. Consolidation routes have *transport layers* in order to be addressed.

A delivery route is an "another import" route. In a standard three-system landscape, the delivery route is specified between the quality assurance system and the production system. This is because there is no additional export from the quality assurance system, but another import in the production system. Delivery routes have no names.

All repository objects are grouped into logical units called *packages* (formerly: development classes). The definition of each package contains an assignment to a transport layer. The transport layer is the name of a consolidation route. Objects, via the assignment to the package, inherit this transport layer assignment.

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All SAP delivered objects are assigned according to their packages to the transport route *SAP*.

Customizing objects (and others) are not grouped into packages. They follow the standard transport route. This standard transport route is named *Z<SID of the development system>* by default.

In the context of transport routes, an SAP system may play the following roles:

**SAP System Roles within Transport Routes:**

Integration system

The SAP system where changes originate and are assigned to transport requests. The SAP system where customer changes are integrated with the SAP standard, customer developments and modifications take place.

Consolidation system

The target SAP system of a consolidation route.

Delivery system

The target SAP system of a delivery route.

Figure 47: Three System Landscape Using a Standard Configuration

You will need to configure more transport layers and transport routes if you have a more complex landscape. You will also need to reroute certain objects away from the standard transport routes. For example, if a separate training system exists and there are certain programs that are to run there, but you do not want those programs getting into the quality assurance or production system.

If the standard configurations delivered by SAP do not meet your landscape needs, TMS has editors available to allow you to maintain the landscape.

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The graphical editor delivers a visual drag and drop interface, where the SAP systems in the transport domain can be positioned and linked using the mouse. This is the default editor in the transaction `STMS`.

To create transport routes, use the mouse to drag the appropriate SAP systems from the node area, and drop them in the display area. To create a transport route between these SAP systems, from the screen *Change Transport Routes* , choose the *Add Transport Route* button. The mouse pointer becomes a stylus. Using the stylus, draw a line connecting the two SAP systems between which a transport route is desired. In the *Create Transport Route* popup, enter the required information for either the consolidation or delivery route. In case of a consolidation route you need to assign a transport layer. You can create the transport layer right here. Save your changes.

The following figure shows a more complex SAP system landscape.

Figure 48: More Complex SAP System Landscape

## Distribution and Activation of Transport Routes

Changes in the transport route configuration are not valid until they are distributed and activated. To distribute and activate the changes from the TMS editor of the transport domain controller, choose the *Distribute and Activate* icon and activate, or go to *Configuration→ Distribute and Activate* . For activation, the RFC connections, that were created during the set up of the transport domain, are used.

To avoid any possible inconsistencies, especially if there are any released transport requests waiting in any import queues, TMS performs a number of consistency checks on the version of the transport routes being activated, for example, whether the settings of the transport control program *tp* are consistent with the transport route configuration. The activation also triggers checks to verify that new transport routes do not affect existing transport requests. If

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any problems exist, the configuration will not be activated and you will receive an error message indicating the nature of the error.

> Note:
> Once you have configured the transport routes correctly, the only reason that changes would need to be made would relate to a change in your SAP system landscape, for example, adding a new SAP system to the landscape.

In this setup, the SAP system *S4E* is treated as a second productive system with a different transport directory. The SAP system *TRN* is used as a training system that needs its own consolidation route.

### Configuring QA Approval Procedure

When a transport request is released and exported from the development system ( *S4D*), the consolidation system's (*S4Q*) import buffer is populated. The import buffer is a list of transport requests waiting for import. Once the transport request is imported into the consolidation system, the import buffer for all delivery systems ( *S4P*) is populated.

Figure 49: QA Approval Procedure

With the QA approval procedure, the buffer of the delivery systems is populated but the entries are flagged as inactive. In other words, the transport requests cannot be imported until the responsible person(s) flags the transport request as approved, which results in activating the entries in the delivery systems' buffers.

TMS Quality Assurance increases the quality and the availability of the production systems by letting you check transport requests in the QA system before they are delivered to subsequent SAP systems. The SAP system for which the QA approval procedure is activated is called the *QA system*. When the QA approval procedure is activated, a transport request will

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only be imported into the delivery system(s) if all the QA approval steps are processed in the QA system and the request has been approved. When you configure the QA system, you determine how many QA approval steps have to be processed for each transport request.

Figure 50: Configuring the QA Approval Procedure

The figure above shows you how to activate the QA approval process from the graphical editor and how to define the approval steps.

> Hint:
> The authorization object *S_CTS_ADMI* (field *CTS_ADMFCT*) defines whether or not you belong to the department (value *QTEA*) or to the SAP system administration (value *TADM*). The corresponding authorizations are *S_CTS_QATEST* for the department and *S_CTS_ADMIN* for the SAP system administration.

## Verifying the TMS Setup

Once you have configured the TMS, there are some tests that you can perform to verify that there are no technical problems with the TMS configuration:

### Verifying TMS Setup

- RFC connection test
- Transport directory check
- Transport control program ( *tp*) check

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As the transport domain controller communicates with other SAP systems in the domain using RFCs, you should check the RFC connections between the SAP systems in the domain. To do this, from the *System overview* screen of the `STMS`, select an SAP system from the list and choose *SAP System* → *Check* → *Connection Test*. This verifies communications in both directions – to and from the transport domain controller.

Exports physically write files into the file system level, and import, read, and update these files. Therefore you should verify that the transport directory is available and has the appropriate file system level permissions. To do this, from the *System overview* screen of the `STMS`, choose *SAP System* → *Check* → *Transport Directory*. This action creates, reads, and deletes a file to each of the transport directory subdirectories, and returns a report on the success or failure of all subdirectories. If you receive any errors, the appropriate corrections would need to be made at the file system level.

As exports and imports are physically executed by the operating system level program *tp*, you should verify that the *tp* program and its parameter configuration are consistent. To do this, from the *System overview* screen of the `STMS`, choose *SAP System* → *Check* → *Transport Tool*. This executes tests verifying the *tp* interface, the transport profile, the RFC destinations, and connection to the databases, and returns a report of the results.

### Related Information

The following SAP Notes might be helpful:

- SAP Note 556734: *FAQ Transport: Setup and further information*
- SAP Note 28781: *Central transport directory NT/UNIX*
- SAP Note 83327: *Setting up transport system in heterogeneous SAP system group*

**LESSON SUMMARY**
You should now be able to:

- Set up the Transport Management System (TMS)

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# Extended Transport Control

## LESSON OVERVIEW

In this lesson, you will learn about extended transport control. This covers the use of both transport target groups and client dependent transport routes. Transports between transport groups and between different transport domains are also discussed.

### Business Example

As an SAP system administrator you are asked to ensure that certain development objects or customizing objects can be imported into more than one subsequent SAP system or into more than one specific client of a Quality Assurance (QA) system.

## LESSON OBJECTIVES

After completing this lesson, you will be able to:

- Explain the use of transport target groups and client dependent transport routes

## Extended Transport Control

Using SAP standard transport control, it is not possible to transport a transport request from one development system to multiple quality assurance systems in an easy way. The reason for that is that it is not possible to create two transport routes with the same transport layer from one and the same SAP system. As every repository object is assigned (via a package) to a certain transport layer, it follows that a transport request can only have one target system.

## Transport Target Groups

The solution for the problem stated above is to create a *transport target group* , which may lead to one or to more SAP system(s).

Figure 51: Transport Target Groups

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To create a transport target group, use transaction `STMS` and choose *Overview → Transport Routes* and from there choose (using the change mode) *Edit → Transport Target Group → Create*.

> Note:
> The name of the transport target group must start and end with "/".

When a transport request, which has a transport target group as target, is released, it will fill the import queue(s) of all SAP systems in this transport target group. In the figure above, all released transport requests that contain objects pointing to the transport layer ZDEV are ready for import into both the QA1 system and the QA2 system.

### Client-Dependent Transport Control

Because some SAP system landscapes contain multiple clients in the development and quality assurance systems, it is a challenge for the TMS administrator to maintain consistent (client dependent) customizing across the landscape. Different SAP systems and different clients within an SAP system may need to receive changes at different times, depending on quality assurance approval and acceptance procedures. Communication errors between customizing project leaders and TMS administrators can inadvertently cause inconsistencies in the configuration settings of certain clients.

Because the majority of customizing is client dependent, during the scheduling of an import process, the import scheduler prompts the TMS administrator for a target client. The administrator would need to manually schedule the imports for the different clients, possibly based on instructions from customizing project leaders, and would also have to keep track of which transport requests had and had not been imported into which clients.

TMS offers the Extended Transport Control (also known as client dependent transport control, CTC) whereby the administrator can automate the process by:

- Client dependent transport target groups.
- Client dependent consolidation routes.
- Client dependent delivery routes.

*Client dependent transport targets*: the transport targets of consolidation and delivery routes do not just specify an SAP system, they also specify a client. Client dependent transport targets are entered in the form: *<SID>.<client>* (for example, **`S4Q.100`**). Transport target groups combine several client dependent transport targets under a symbolic name. You can specify transport target groups when you define consolidation and delivery routes. To differentiate them from traditional transport targets, you must start and end the names with "/" (for example, **`/TTG01/`**).

> Note:
> In the context of client independent transport routes, transport target groups have already been discussed in the previous subsection. The concept of transport target groups and client dependent transport routes can easily be combined.

*Client dependent consolidation routes*: For each transport layer, the consolidation routes determine where changes made in the SAP system are transported to after the transport request has been released. If you have activated extended transport control, then the transport target can be a specific client in a target system or a transport target group. If you

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do not activate extended transport control, the transport administrator has to specify the correct target client at the time of import.

*Client dependent delivery routes*: Delivery routes determine whether transport requests are to be flagged for import into subsequent SAP systems/clients, after they have been imported into an SAP system. If you have activated extended transport control, then you can set the delivery routes as client dependent. This makes it possible to supply several clients in one SAP system in sequence. You can also specify a target group as the target of a delivery route.

Figure 52: Extended Transport Control using Client-Dependent Transport Routes

In the figure above, objects pointing to the transport layer *ZS4D* will be imported (via transport target group */S4Q/*) into *S4Q* client 100 and *S4D* client 200. Imagine that client 200 in *S4D* is a client for functional tests. After QA approval in the *S4Q* system (client 100), the objects are forwarded to *S4P* client 100, *S4E* client 100, *TRN* client 100 and *S4Q* client 200.

Extended transport control makes daily transport tasks easier and increases security. Extended transport control also reduces the need for communication between project leaders and SAP system administrators, because the transport routes can now be configured completely. No additional details about the target client need to be given at the time of import.

To take advantage of this function, in the transport program profile, you must explicitly set the (*tp*) parameter *CTC* (client dependent transport control) to *TRUE* (value of `1`) – the default value is *FALSE* (value of `0`), which deactivates the extended transport control. This is also done automatically, when choosing a client-specific transport target group.

> Caution:
> After activating the CTC, you can use the normal system-to-system transport or client dependent transport routes, but not a mixture of both types of connections in the same SAP system landscape. When using client dependent transport routes, you must specify the clients when defining the source and target systems.

The standard transport layer (Z<SID of the development system>) determines the default transport target of the transport requests. When you use Extended Transport Control, you can set a different standard transport layer for individual clients from that set in the SAP

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system. This means that you can forward customizing requests from different clients into different transport targets. The client dependent standard transport layer is also the default transport layer for new packages that have been created in a client. If you accept this default, then the client independent objects that have been created in client independent customizing are transported along the same route as the corresponding client dependent customizing.

> Note:
> This scenario would contradict SAP's recommendation that all customizing/ development changes originate in one single client. Client dependent transport layers should only be used in circumstances, for example, as shown in the figure above.

### Project Development and Maintenance

When developing in large projects, it can be necessary to have two development and two quality assurance systems:

One of the development and quality assurance systems is used for daily error fixing, small developments, minor customizing changes – or with other words: for maintaining the production system.

The second development and quality assurance (or test) system is used for performing a large customer development. This can be necessary, because this large customer development would take a long time and would change the development system in a way, that it can not be used as a maintenance system for the production system any longer. Some customers call very large customer development projects a "release" – which is not an SAP term in this context.

Changes in the maintenance development system have to be replicated (not transported) in the project development system. And on the other hand, if the large customer development project is ready, it has to be forwarded into the maintenance development system. Here the objects from the large customer development project have to be re-packed into new transport requests, in order to be transported to the quality assurance system.

Figure 53: Transport Landscape with Maintenance and Project Development

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In this scenario from the slide and in this course, S4N (new project) and S4T (test) are used for developing large customer projects. S4D and S4Q are used for maintaining S4P on a daily basis.

> Note:
> S4N, S4T, S4D, S4Q, and S4P are in one line, sequentially, behind each other. For better reading, this line is split in two lines in the slide.

There is no delivery route from S4D to S4Q. This means, the objects from the large customer development project have to be re-packed into new transport requests in the S4D system. The alternative would be, to create a delivery route from S4D to S4Q and just forward the transport requests from the large customer development project – without changing them.

From both development systems, the transport layer SAP origins. This is to be able, to change objects of the SAP standard in both development systems. Check out that there is only one transport layer for own development, ZS4D. It is used by the consolidation route that origins both, in S4N and S4D. Otherwise there would be problems, when re-packing the own developed objects from S4N in S4D. Another possibility would be, to have two transport layers, e.g. ZS4N and ZS4D – both used in S4N and S4D. Or: to use only transport layer ZS4N in S4N and one transport layer ZS4D in S4D – but in this case the customer packages in S4N and S4D would have to point to the corresponding, different transport layers.

### Transport between Transport Groups and Transport Domains

If you configure different transport groups in your SAP system landscape, there will be the need to perform transports between these different transport groups. If there is more than one transport domain in your company, there might be the need to perform a transport from one transport domain to another domain.

### Transports between different Transport Groups

Usually all the SAP systems in a transport domain share the same common transport directory. There are situations, however, in which separate transport directories are set up for different parts of the same domain.

Multiple common transport directories are used, for example, when:

- an SAP system is connected to the domain through a slow or expensive network connection,
- strict security measures prevent allowing direct file system access from other SAP systems.
- dissimilar hardware platforms prevent the use of a common transport directory.

Within a transport domain, SAP systems that share a common transport directory form a *transport group*. The TMS supports transports between transport groups. The following figure outlines the procedure on how to transport transport requests between different transport groups.

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Figure 54: Transport Between Transport Groups

After a transport request has been released from DEV, the request is marked for import into the target system. Be aware that this happens in the transport directory of the DEV system (step 1). If the source and target systems are in different transport groups, however, the import queue of the target system must be adjusted from the *Import Queue* screen in the target system group choosing *Extras → Other Requests → Find in Other Groups* (this corresponds to step 2 in the figure above). TMS searches for requests for the selected SAP system in the import buffers (on file system level) of all transport groups in the transport domain, and transfers the data files and cofiles belonging to the transport requests. Before the transfer of the data file, the transport request is marked in the import queue with a "lightning" icon that disappears after adjusting the import queue of the target system.

Note:
There are limitations in regards to transporting between different transport groups:

- The transport logs displayed are specific to the transport group of the SAP system you are using, i.e. they are not copied to the other transport directory.
- Transports displayed in the Change and Transport Organizers are also specific to the transport group of the SAP system you are using.

### Transports Between Different Transport Domains

If you have configured multiple transport domains and want to make transports between SAP systems in different domains, you can use domain links to link the two domains or external SAP systems to transport between different transport domains.

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**Transport between different Transport Domains**

- Domain link (needs a permanent network connection)
- External systems

For a domain link there must be a permanent network connection between the SAP systems in the two domains, similar to the connection between SAP systems within the same transport domain.

Linking two transport domains with a domain link involves two steps:

1. One transport domain controller has to request a link between the two transport domains.
2. The transport domain controller of the other transport domain has to confirm the link between the two transport domains.

To request a transport domain link, enter transaction `STMS` and choose *Overview*→ *Systems*. In the *SAP system overview* choose *SAP System*→ *Create*→ *Domain Link*. Enter the SAP *system name*, *host name*, and *instance number* of the transport domain controller you want to link to, and then confirm your entries. The SAP system generates the required RFC destinations automatically and sends the address data of the local transport domain controller to the transport domain controller of the other transport domain.

To confirm a link between two transport domains, enter transaction `STMS` and choose *Overview*→ *Systems*. In the *System Overview* position the cursor on the transport domain controller where you have requested the domain link and choose *SAP System*→ *Approve*. Confirm the prompt and distribute the configuration.

After you have established a domain link,

- you can make transports between SAP systems in different transport domains in the same way as you make transports between SAP systems in different transport groups; RFC is used to transfer transport files between the transport directories involved.
- you can display transport logs of SAP systems in the other transport domain.

> Note:
> Transport domains are independent administrative units. You can only make changes (such as transport route changes) in the transport domain controller of the transport domain. Transport routes also are not distributed between transport domains. You can, however, configure a route between SAP systems in different domains, but must configure it twice, once in each transport domain. The transport domains that are linked by a domain link must have different names.

If you cannot operate a permanent RFC connection between SAP systems in the two transport domains, you can use **external systems** to make transports between the two domains.

External systems are like virtual systems. However, for this type of SAP system, an separate transport directory is also defined. This directory can either be located on a disk partition that can be accessed by an SAP system in the other domain, or it is on a replaceable data medium, for example a DVD, memory stick or portable hard disk.

The idea behind external systems is to reduce the problem of transporting between **different** transport domains to the problem of transporting between different transport groups in the **same** transport domain.

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Figure 55: Transport Between Transport Domains using External SAP Systems

In the figure above, you want to transport between the SAP systems *DE1* in *DOMAIN_A* and *DE2* in *DOMAIN_B*. In transport domain *DOMAIN_A*, you create an external system called **DE2** (pointing to the transport directory *Transport Directory ext* ). In transport domain *DOMAIN_B*, you create an external system called **DE1** (pointing to the transport directory *Transport Directory ext* as well). In addition, in both transport domains you need to define a transport route between these two SAP systems. You must also configure the host of the SAP system *DE1* so that they can access the directory *Transport Directory ext* . In the same way, the SAP system *DE2* in the domain *DOMAIN_B* must be able to access the directory *Transport Directory ext* .

After you export a transport request from *DE1* to *Transport Directory 1* , you perform a transport between transport groups in *DOMAIN_A*. As a result, data files, cofiles and the buffer entries for *DE2* exist in *Transport Directory ext* . Next, you perform a transport between transport groups in *DOMAIN_B* so that all necessary data is sent to the transport directory *Transport Directory 2* . Then you can perform the import into *DE2*.

To configure an external system, log on to the SAP system that is the transport domain controller and call transaction `STMS`. In the *SAP system overview* that appears choose *SAP System* → *Create* → *External System* . Enter the path and a short description of the transport directory. You also need to enter the transport directory path for the specific platform and relative to the communication system. The transport domain controller is proposed as the communication system. *Save* your entries and confirm the distribution prompt.

**LESSON SUMMARY**

You should now be able to:

- Explain the use of transport target groups and client dependent transport routes

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# Learning Assessment

1. When setting up the Transport Management System (TMS) some steps must be performed in a certain sequence. Bring the following activities into the right sequence, regarding the setup of TMS.

   *Arrange these steps into the correct sequence.*

   - [ ] Configure the Quality Assurance (QA) procedure
   - [ ] Create a transport directory
   - [ ] Define the SAP systems of the transport domain
   - [ ] Create a transport domain
   - [ ] Configure the transport routes

2. Which actions are performed automatically when creating a new transport domain in Transport Management System (transaction `STMS`)?

   *Choose the correct answers.*

   - [ ] A The SAP system is assigned to the transport domain
   - [ ] B The standard transport layer is created
   - [ ] C A transport group is created
   - [ ] D The Quality Assurance (QA) procedure is set up
   - [ ] E User TMSADM is created

3. A transport domain always consists of one transport directory only.

   *Determine whether this statement is true or false.*

   - [ ] True
   - [ ] False

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4. You want transport requests that are exported from the development system to be added to the import queues of multiple quality assurance systems simultaneously. Which technique should be used for this?

   *Choose the correct answer.*

   - [ ] A Transport target groups
   - [ ] B Client-dependent transport routes
   - [ ] C Quality Assurance (QA) procedure
   - [ ] D External systems

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