Target Audience

- System administrators
- Technology consultants

Document version: 1.01 – May 26, 2008
# Typographic Conventions

<table>
<thead>
<tr>
<th>Type Style</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Example Text</td>
<td>Words or characters quoted from the screen. These include field names, screen titles, pushbutton labels, menu names, menu paths, and menu options. Cross-references to other documentation.</td>
</tr>
<tr>
<td>Example text</td>
<td>Emphasized words or phrases in body text, graphic titles, and table titles.</td>
</tr>
<tr>
<td>EXAMPLE TEXT</td>
<td>Technical names of system objects. These include report names, program names, transaction codes, table names, and key concepts of a programming language when they are surrounded by body text, for example, SELECT and INCLUDE.</td>
</tr>
<tr>
<td>Example text</td>
<td>Output on the screen. This includes file and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.</td>
</tr>
<tr>
<td>Example text</td>
<td>Exact user entry. These are words or characters that you enter in the system exactly as they appear in the documentation.</td>
</tr>
<tr>
<td>&lt;Example text&gt;</td>
<td>Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.</td>
</tr>
</tbody>
</table>

# Icons

<table>
<thead>
<tr>
<th>Icon</th>
<th>Meaning</th>
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<tr>
<td>🚨</td>
<td>Caution</td>
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<td>🧪</td>
<td>Example</td>
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<td>📝</td>
<td>Note</td>
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<tr>
<td>🚚</td>
<td>Recommendation</td>
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<tr>
<td>🔧</td>
<td>Syntax</td>
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</tbody>
</table>

Additional icons are used in SAP Library documentation to help you identify different types of information at a glance. For more information, see Help on Help → General Information Classes and Information Classes for Business Information Warehouse on the first page of any version of SAP Library.
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1 Introduction
This section provides introductory information you need know before you begin upgrading SAP Transactionware Enterprise (SAP TE).

1.1 Document History
The following table provides an overview of the most important document changes.

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<th>Version</th>
<th>Date</th>
<th>Description</th>
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<tr>
<td>1.00</td>
<td>05/26/2008</td>
<td>First version – no changes</td>
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1.2 About this Document
Purpose
This Guide provides step-by-step instructions for upgrading SAP TE. It is intended for SAP or SAP-approved system administrators and technology consultants.

2 Overview

2.1 Guiding Principles
The following are the core principles of the SAP TE upgrade process.

2.1.1 Phased Upgrading for Multiple Stores
Provide the capability to apply a selective upgrade for example, not to all of the Stores but to a group of Stores at the same time, in a so called staged approach.

2.1.2 External Systems Decoupled from Upgrades
There is minimal impact when the interface specification between an external system and SAP TE is changed.

2.1.3 Complete and Unattended Upgrade at Stores
For a normal upgrade, the minimal manual intervention should be required from either Store or Corporate administrative personnel.

2.1.4 Best Practice
For the SAP TE 3.1 upgrade not more than two SAP TE versions can be active at a given time. This is the case when fail-over to Head Office mechanism is utilized and a staged approach is used for multiple store upgrades. In that scenario two different SAP TE versions can be deployed at different Stores at the same time and they require different SAP TE versions at Head Office for fail-over.
2.2 Levels of Upgrades

Upgrades come with three levels of significance, and a one-size-fits-all approach is not suitable to work for all three.

The following three levels of upgrades are possible:

- **Patches** - involve minimal changes that should be upgraded simply and without losing any data. It is also applied to an existing installation. The code can be updated without breaking any interfaces, and the data can be updated in places, without having to move it.

- **Standard upgrades** - involve significant changes that might require adjustments and data conversion, but which should have no data loss.

- **Exceptional upgrades** - involve very significant changes that cannot be handled like a standard upgrade. It generally requires more significant efforts to convert from one version to another, when an exceptional upgrade is required.

An exceptional upgrade is needed when one of the following conditions exists:

- There is no established upgrade between the two versions. Either the prior version is an older version than what is supported by upgrades to the current version, or the prior version is a customer-specific version, from which a standard upgrade has not been implemented.

- The interfaces (JMS, RMI, database, configuration and so on) between the prior and new versions cannot be made compatible. This incompatibility must prevent interaction between systems running the two versions.

- There would be data loss encountered when using a standard upgrade approach. Data loss can occur when there is data in the prior version for which there is no place to Store it in the new version or for which there is no consistent way that the data could be converted. In general, this should be avoided if at all possible, but there could be situations where it is unavoidable.

The terms *patch, standard upgrade* and *exceptional upgrade* are not intended to be necessarily correlated with the patch, minor and major software version levels, or releases. They reflect the level of effort required to create and apply the upgrade, and the impact that it will have on the system. A patch release might be applied by either a patch upgrade or standard upgrade, and a major or minor version release might be applied by a patch, standard or exceptional upgrade.

### 2.2.1 Patches

The general approach to applying a patch upgrade is to do an in-place data upgrade and to replace the existing JAR files with ones containing the new version. This is regardless of the type of system (Head Office or Store). It requires that the patched system be fully compatible with any other system with which it interacts, including internal (Head Office or Store) systems and external systems.

### 2.2.2 Standard Upgrade

For a standard upgrade, there might be interface changes that need to be handled, but they can be handled by a standard approach. While the data upgrade might take some time and effort, it can be accomplished in a standard manner.

The general approach to performing a standard upgrade is to perform a data and configuration upgrade. This can include schema as well as content conversion, rather than to drop in the complete new set of code for both the enterprise application and the standalone utilities, apply any middleware changes that are required, and finally deploy the new enterprise application.
2.2.3 Exceptional Upgrade

An exceptional upgrade may be handled in part by a standard upgrade, but it could have some aspect requiring customization (at a minimum to create it). It might even require a completely different approach if the differences are too significant.

There are many ways that an exceptional upgrade can be accomplished. The simplest is a customized form of a standard upgrade. A solution on the other end of the spectrum in terms of complexity would be a migration approach, where the old and new versions are run in parallel and in isolation, while Stores are converted to run the newer version. To the extent that the approach for a standard upgrade can be used to support an exceptional upgrade, the extensible standard upgrade will be the approach that is described here that can handle an exceptional upgrade.

The upgrade from SAP TE version 3.0 to version 3.1 is the type of exceptional upgrade including significant changes in the Java platform used, system infrastructure, SAP TE application security model, and many application code and application data model enhancements. It cannot be performed as a standard upgrade because it requires a customized process for upgrading data.

The upgrade from version 3.0 to 3.1 is handled as the combination of standard upgrade and additional Data Migration steps required before running standard upgrade. Depending on the SAP TE topology used, post-upgrade environment cleanup steps are also required. The Data Migration steps create the new modified version 3.1 database and copy over all data from the old version 3.0 database. Multiple data model changes introduced in SAP TE 3.1 cannot be safely performed in place of the old version 3.0 database by the standard upgrade process.

2.3 Upgrade Context

The context in which upgrades need to operate can be different for every retailer. For some retailers, SAP TE owns the Store and POS client systems, and needs to manage the whole process of distribution, scheduling and application of the updates. For other retailers, SAP TE is one of a set of applications used by the Stores, and thus the SAP TE upgrade needs to be coordinated with upgrades to other systems, which can include distribution, scheduling and being applied by these other upgrades.

The SAP TE versions 3.0 and 3.1 run on IBM's WRS, and the technical context for upgrades is a WRS environment. The upgrades are managed by using Tivoli Configuration Manager (TCM). If SAP TE is just a part of the retailer’s Store applications, it is expected that the coordination with these other systems will be managed using TCM.

2.4 Procedures

There are many views and levels of process flow to be considered for an upgrade. The following provides an understanding of the context in which it is expected that upgrades will operate, and the expected flow of the processing from different perspectives.

2.4.1 Logistics View

From a logistics perspective, updates are typically applied to a retailer’s enterprise following a sequence resembling the one below:

1. Upgrade all enterprise systems that need to handle new versions of interfaces for data received from SPA TE (for example, TLogs and services). This step is not required by the 3.1 upgrade.
2. Upgrade the POS Head Office system. This can be done by itself to allow for detection of any issues that this might cause, or it might be done with the next step.

3. Upgrade the POS Store system and terminals at a single Store or a small set of Stores. This is often called a pilot, and is typically followed by an assessment period to determine whether the new version is working successfully or not. Sometimes this is repeated with different Stores or groups of Stores that might have different characteristics.

4. Upgrade a large group of Stores. This is the beginning of what is often called the roll-out, and is repeated until all Stores are updated.

5. Any time after or during step 2 above, any enterprise system that feeds new data to the POS that was not handled by the prior version can be updated. This strategy allows the retailer to detect any critical issues as soon as possible and, if needed, roll back the update for the affected systems.

### 2.4.2 Head Office Level Procedures

At the retailer’s Head Office (the location, not just the Server), the following tasks need to be performed:

1. Prepare for the system upgrade: This includes lab testing, enterprise system upgrades, making back-ups.

2. Prepare TCM Server for upgrade: Place the software distribution for upgrade and the third-party libraries required by SAP TE 3.1 on the TCM Server. Customize SAP TE 3.1 distribution, migrate secure keys and passwords from SAP TE 3.0 to the SAP TE 3.1 to use new security model. Repackage SAP TE 3.1 for distributing to the Head office and Stores.

3. Apply the Head Office system upgrade: All of the following activities are performed by triggering activity plan execution on the TCM Server - distributing repackaged SAP TE 3.1 and WRS 6.1 software to the Head Office Server, start Data Migration process on the Head Office Server in background mode, periodically verify process status; after migration is completed trigger the system upgrade process. Running Data Migration process does not require normal business operations to be interrupted.

4. Prepare the Store system upgrade(s): On the TCM Server, create a list of Stores that need to be upgraded next and register them with the TCM Server.

5. Distribute the Store system upgrade(s): Distribute repackaged SAP TE 3.1, WRS 6.1 software, and POS client Images to registered Store Servers using TCM.

6. Schedule the Store system upgrade(s): This is required in order to synchronize business activities with upgrade steps that need to be performed.

7. Perform post-upgrade activities: If Master Data Import (MDI) process is enabled, stop the Data Migration process and delete the old version 3.0 database once all stores are upgraded to the new SAP TE version.

### 2.4.3 Store Level Procedures

The following activities need to be done at the Stores (the location, not just the Server):

1. The upgrade needs to be received (SAP TE 3.1, WRS 6.1 software, and POS client Images).

2. When the scheduled time is reached, trigger the following upgrade steps using TCM Server:
   
   a. Start Data Migration process on the Head Office Server in background mode, and periodically verify process status.
   
   b. After migration is completed, trigger the system upgrade process. Running Data Migration process does not require normal business operations to be interrupted.
3. After store upgrade has finished, the POS images need to be distributed from the Store Server to the POS client machines and Transnet service has to be configured as well. Transnet service configuration is out of scope of this document.

4. Perform post-upgrade activities: Delete the old version 3.0 database.

### 3 Preparation for Upgrade

This section provides information about how to prepare for a successful upgrade of SAP TE from version 3.0 to 3.1.

The software can be acquired via a DVD or the SAP Service Marketplace.

#### 3.1 System Requirements

##### 3.1.1 Environment

- IBM Tivoli Configuration Manager (TCM) V4.2.3 Server for Linux for Intel must be available to deploy SAP TE. This Server cannot be used to run SAP TE, only to deploy it.
- TCM 4.2.3/TMF 4.1.1 infrastructure
- Previous SAP TE version 3.0 are up and running.

##### 3.1.2 Required Software

<table>
<thead>
<tr>
<th>Required Software: SAP TE 3.1</th>
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<tbody>
<tr>
<td>Middleware</td>
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<td>Middleware</td>
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</tbody>
</table>
### 3.1.3 Port Settings

If POSM-HO-FO topology is used at Head Office and it is planned to utilize SAP TE version co-existence, then port 2810 has to be open for communication.

### 3.2 Preparing Installation Image Repository

**Use**

Perform the following steps to prepare installation image repository.

**Prerequisites**

A Tivoli ITCM product is installed and functioning correctly.

**Procedure**

The following steps are performed on ITCM Server as the root user:

1. Log on to the Linux machine where the Tivoli ITCM Server is running as the root user using an assigned password.

2. Extract the contents of the SAP TE archive from the provided installation media. Assuming the installation media is DVD and mounted at `/media/dvd`. The archive file name is `TransactionwareEnterprise-3.1.0.x.tar.gz` where x is the build number of SAP TE and may vary. Execute the following commands:

   ```
   cd /media/dvd
   tar -Pzxvf TransactionwareEnterprise-3.1.0.x.tar.gz
   ```

   Once the tar command is completed, the `/opt/sap/te` directory will be created. That directory should contain two folders: bin and build.

3. Copy the IBM WebSphere Systems Management Accelerators images from the installation media to the `/opt/sap/te` directory:

   ```
   cd /opt/sap/te
   mkdir wrs61
   cd /media/dvd
   cp wrs61_linuxIntel_d1.tar /opt/sap/te
   cp wrs61_linuxIntel_d2.tar /opt/sap/te
   cp wrs61_linuxIntel_d3.tar /opt/sap/te
   cp wrs61_linuxIntel_d4.tar /opt/sap/te
   ```
> cp wrs61_linuxIntel_d5.tar /opt/sap/te
> cp wrs61_linuxIntel_d6.tar /opt/sap/te

If the installation media is CD, the files will be on separate CDs and you will need to switch CDs between the file copying steps listed above.

4. Extract the contents of the files copied in step 3 using the following commands:

> cd /opt/sap/te
> tar -C wrs61 -xvf wrs61_linuxIntel_d1.tar
> tar -C wrs61 -xvf wrs61_linuxIntel_d2.tar
> tar -C wrs61 -xvf wrs61_linuxIntel_d3.tar
> tar -C wrs61 -xvf wrs61_linuxIntel_d4.tar
> tar -C wrs61 -xvf wrs61_linuxIntel_d5.tar
> tar -C wrs61 -xvf wrs61_linuxIntel_d6.tar

As a result of this, six subdirectories called disk1, disk2, disk3, disk4, disk5, disk6 will be created under /opt/sap/te/wrs61.

5. Download and copy the JAXB 2.1 reference implementation JAXB2_20070917.jar file to the directory /opt/sap/te

### 3.3 Installing IBM WebSphere Systems Management Accelerators v6.1

#### Use
Install WRS Solution Installer v6.1 on the Tivoli ITCM Server

#### Prerequisites
Previous steps have been completed

#### Procedure
The following steps are performed on the ITCM Server as the root user:

1. Navigate to the bin directory of the WRS 6.0 SIF installation and backup WRS 6.0 command line configuration files using the following commands:

> cd /opt/IBM/SIF/isp/linux/bin
> mv SifSetupCmdLine.sh SifSetupCmdLine.sh.backup
> mv SifSetupCmdLine.sh.orig SifSetupCmdLine.sh.orig.backup

2. Navigate to the wrs61 directory and start WRS 6.1 installation in the silent mode:

> cd /opt/sap/te/wrs61
> ./disk1/install_linux_es.sh -silent -V licenseAccepted=true
Upgrade Guide: SAP Transactionware Enterprise

3. Execute the following command periodically and wait until it returns 0 indicating that WRS 6.1 installation has been completed. Approximate installation time is 30 minutes.

> ps -ef | grep “embedded” | grep -v “grep embedded” | wc -l

3.4 Update ITCM Software Package Descriptors and Activity Plans

Use
Update ITCM Server with resources required for upgrading SAP TE from version 3.0 to version 3.1

Prerequisites
- Previous steps have been completed
- ITCM Server is up and running

Procedure
The following steps are performed on the ITCM Server as the root user:
- Navigate to the /opt/sap/te/bin/upgrade3.0-3.1 and run Tivoli update shell script.

> cd /opt/sap/te/bin/upgrade3.0-3.1
> ./updateTivoliDesktop.sh /opt/sap/te

3.5 Preparing External Libraries

Use
Prepare JAVA API for XML Binding version 2.1 (JAXB 2.1) Reference Implementation libraries utilized by SAP TE 3.1

Prerequisites
Previous steps have been completed

Procedure
The following step is performed on the ITCM Server as the root user:
- Extract the contents of the JAXB 2.1 reference implementation using the following commands:

> cd /opt/sap/te
> export JAVA_HOME=/opt/IBM/SIF/java50/jre
> export PATH=$JAVA_HOME/bin:$PATH
> export LANG=en_US.ISO-8859-1
> java –jar JAXB2_20070917.jar
> export JAXB20_HOME=/opt/sap/te/jaxb-ri-20070917

This will open up a license acceptance screen. Read the agreement to the bottom and click on the Accept button to complete the extraction.

### 3.6 Creating BASE POS Client and OLC Images

**Use**

To create the POS client image, OLC (Off-line Capable) and non-OLC

**Prerequisites**

Previous steps have been completed

**Procedure**

Follow procedure in the SAP TE 3.1 Installation Guide on Creating the BASE POS Client and OLC Images.

### 3.7 Customizing SAP Transactionware Enterprise

#### 3.7.1 Create Customization Files

**Use**

Update SAP TE 3.1 configuration files with settings from the previous SAP TE 3.0 installation. Before customizing the configuration files, copies are made so that the originals are available for reference.

**Prerequisites**

Previous steps have been completed

**Procedure**

The following steps are performed on the ITCM Server as the root user:

1. Navigate to the SAP TE upgrade-30-31 directory and execute the bash script `clone_custom_31.sh`.
2. Usage:

   ```bash
   sh clone_custom.sh <previous-te-home> <clone_dir> <new_db_name>
   ```
   
   Where `<previous-te-home>` is the SAP TE 3.0 home directory on the ITCM Server.
   
   For example `/data/repack/te-build`.
   
   `<clone_dir>` represents the location where you would like to place your customized files. The recommended location is `/opt/sap/te/config`.
   
   `<new_db_name>` is the new database name which will be used for the data migration prior to running SAP TE upgrade. The recommended value is `TE_DFLT2`.
Using the recommended parameters and assuming the SAP TE 3.0 home directory is /data/repack/te-build the command would be:

```bash
> cd /opt/sap/te/build/deployment/upgrade-30-31
> ./clone_custom_31.sh /data/repack/te-build
> /opt/sap/te/config TE_DFLT2
```

You are prompted for the Head Office upgrade mode. If you are planning to use version co-existence then answer is yes [Y, y] otherwise it is no [N, n] to continue with the process.

3. Verify that the `<clone_dir>` was created, which in this case is /opt/sap/te/config.

### 3.7.2 Configuring Security

#### Use

SAP TE 3.1 offers new TWSecurity 2.0 model as a library for securing critical data, such as credit card numbers and other personal information.

Before the upgrade process can begin, you must migrate security settings from the previous SAP TE 3.0 to the new SAP TE 3.1 application. It includes all login names and passwords, and secure keys used for data encryption.

#### Prerequisites

Previous steps have been completed

#### Procedure

The following steps are performed on the ITCM Server as the root user:

1. Navigate to the SAP TE upgrade-30-31 directory and execute the bash script `migrate_key_storage.sh`.

2. Usage:

   ```bash
   sh migrate_key_storage.sh <previous-te-home> <java_15_home>
   ```

   Where  `<previous-te-home>` is the SAP TE 3.0 home directory on the ITCM Server. For example /data/repack/te-build.

   `<java_15_home>` is Java 1.5 home directory. WRS 6.1 distribution includes Java 1.5 and after WRS 6.1 installation it is located in /opt/IBM/SIF/java50/jre directory.

   Using the recommended parameters and assuming the SAP TE 3.0 home directory is /data/repack/te-build, the command would be:

   ```bash
   > cd /opt/sap/te/build/deployment/upgrade-30-31
   > ./migrate_key_storage.sh /data/repack/te-build
   > /opt/IBM/SIF/java50/jre
   ```

   When the script starts, you are prompted for the keystore password and the private key password that are used by the SAP TE 3.0. These passwords are required for exporting secure keys from SAP TE 3.0 to SAP TE 3.1.
If SAP TE 3.0 has dedicated password files for different sites you will be prompted with questions if the new key storages created for those sites share the same password. If answer is yes [Y, y], you will be prompted for the new key storage password only once and that password will be applied to all key storages. If answer is no [N, n,] you will be prompted for the new key storage password for each site separately.

### 3.7.3 Customize Precondition Check Utility for Stores

**Use**

Before launching the SAP TE 3.0 system upgrade, an additional step must be performed - which is the verification of upgrade preconditions. The Precondition Check utility is used by an Upgrade process in order to validate if basic business rules are satisfied.

The key properties in the file are:

- Validation of POS terminal status: If terminal validation is required, the `pos.check` value should equal true. The other attributes correspond to different states which could be accepted for upgrade.
  - `pos.check`
  - `pos.allowOpenTerminals`
  - `pos.allowUnpostedTransactions`
  - `pos.allowUnreconciledTills`
  - `pos.allowMissingBankDeposit`

- Validation of Store status: If Store validation is required the `store.check` value has to equal true. The other attributes correspond to different states which could be accepted for upgrade.
  - `store.check`
  - `store.allowOpen`

**Prerequisites**

Previous steps have been completed

**Procedure**

Using VI or a text editor of your choice, open the `PreconditionCheck.properties` file:

```bash
> vi /opt/sap/te/build/deployment/upgradebase/upgradecheck/preconditionCheck.properties
```

Search for and edit values of the properties with names starting with `pos. and store. Allowed values are false and true.`
3.7.4 Generate Distribution Files

Use

Generate distribution files for node types. HO, ST, POS, and OLC POS. Distribution files are used to deploy SAP TE to the required nodes.

Prerequisites

Previous steps have been completed.

Procedure

The following steps are performed on the ITCM Server as the root user:

1. Navigate to the SAP TE utils directory:

   ```
   cd /opt/sap/te/build/utils
   ```

2. Set the required JAXB20_HOME, JAVA_HOME, and LANG environment variables:

   ```
   export JAXB20_HOME=/opt/sap/te/jaxb-ri-20070917
   export JAVA_HOME=/opt/IBM/SIF/java50/jre
   ```

3. Execute the bash script `repackage.sh`.

   ```
   sh repackage.sh <clone_dir> <output_dir>
   [ALL|ST|HO|OLC|CLIENT] <HO_hostname>
   ```

   Where `<clone_dir>` is the directory you created previously (see Section 3.6.1 for details).

   `<output_dir>` is the directory where the utility will create the repackaged application. The recommended location is `/opt/sap/te/dist`.

   `<HO_hostname>` is the hostname of the Head Office node in your enterprise. Using the recommended values and assuming the Head Office hostname is `headoffice` the command would be:

   ```
   ./repackage.sh /opt/sap/te/config /opt/sap/te/dist ALL headoffice
   ```

   If you change the location of `<output_dir>` from `/opt/sap/te/dist`, you will need to modify Tivoli Software Package definitions described later in this document.

4. Verify the `<output_dir>` contains a ZIP and a TAR file for each node type of HO, ST, POS, and OLC POS.
3.8 Update POS Register Images

Use
To create the POS client image, OLC (Off-line Capable) and non-OLC, perform the following steps.

Prerequisites
Previous steps have been completed

Procedure
Follow procedure in the *SAP Transactionware Enterprise 3.1 Installation Guide*, section on Update POS Register Images.

4. Upgrade

The Head Office and Stores upgrade consists of the following phases:
- Tivoli ITCM configuration modifications
- Distributing upgrade software to the Head Office and Stores
- Running data migration at the Head Office and Stores
- Verifying data migration status at the Head Office and Stores
- Upgrading the Head Office and Stores
- Perform Post-Upgrade steps if required.

It is required that Head Office is upgraded first; Stores can be upgraded after that. The SAP TE 3.1 product comes with the set of Activity Plans pre-configured for upgrade.

4.1 Upgrade Head Office

4.1.1 Modify Server Configuration for Head Office

Use
Configure Tivoli ITCM to add Head Office to the list of subscribers for the upgrade.

Prerequisites
- Previous steps have been completed
- ITCM Server is up and running
- Tivoli Desktop application is installed

Procedure
1. Login to the Tivoli Desktop.
2. Open the UpgradeHeadOfficeList Profile Manager by selecting the **Subscribers** icon and follow the path **Subscribers → HeadOffice → UpgradeHeadOfficeList**. You are taken to the **Profile Manager** screen.
3. In the **Profile Manager** screen, choose **Profile Manager** dropdown menu and select **Profile Manager → Subscribers**. You should now see the **Subscribers** screen.
4. In the **Subscribers** screen, from the **Available to become Subscribers** list add the **headoff** endpoint to the **Current Subscribers** list of the UpgradeHeadOfficeList Profile Manager and choose the **Set Subscriptions & Close** button.

5. Close the **Subscribers, Profile Manager, and Policy Region: Head Office** windows.

### 4.1.2 Distribute Upgrade Software to Head Office Endpoint

**Use**

To distribute WRS 6.1 and SAP TE 3.1 software to the Head Office

**Prerequisites**

- Previous steps have been completed
- ITCM Server is up and running
- Tivoli Desktop application is installed

**Procedure**

1. Login to the Tivoli Desktop
2. Start the Activity Plan Monitor by selecting the Activity Plan Monitor icon. After login you should see the Activity Plan Monitor screen.
3. In the menu of the **Activity Plan Monitor** screen, select **Plans → Submit**.
4. In the **Select plan for submission** screen, select **WRS_TE_30-31_Dist** plan and choose **OK**.
5. You should now see the **Plan Submission Parameters** screen for the selected plan. You do not need to modify anything at this step.
6. Choose **Submit** to start the distribution process.

Monitor the result of the plan execution in the **Activity Plan Monitor** window. The distribution is successful if for the **WRS_TE_30-31_Dist** plan the status switches from **Started** to **Successful**.

### 4.1.3 Start Data Migration Process at Head Office

**Use**

To create the new SAP TE 3.1 database and migrate all data from the SAP TE 3.0 database to the new one.

**Prerequisites**

- Previous steps have been completed
- ITCM Server is up and running
- Tivoli Desktop application is installed

**Procedure**

1. Login to the Tivoli Desktop.
2. Start the Activity Plan Monitor by selecting the Activity Plan Monitor icon.
3. In the Activity Plan Monitor screen, select **Plans → Submit**.
4. In the Select plan for submission screen, select **TE_30–31_DATA_MIGRATION** plan and choose **OK**.
5. You should now see the **Plan Submission Parameters** screen for the selected plan.
6. Choose the **Variables** tab.
7. In this screen, edit the **TE_USER_AC** variables:
   - **TE_USER_AC** variable - this is the TE user name on the target Server.
8. Choose **Submit** to start the data migration process.

Monitor the result of the plan execution in the Activity Plan Monitor screen. Data migration is started successfully in background mode if, for the **TE_30-31_DATA_MIGRATION** plan, the status switches from Started to Successful.

### 4.1.4 Verify Data Migration Status at Head Office

Depending on the size of the database, the time to complete Data Migration may vary from a few hours to a few days. The Data Migration status can be periodically checked using the **TE_30-31_CHECK_DATA_MIGRATION** plan provided with SAP TE 3.1

**Use**

To verify the Data Migration process status

**Prerequisites**
- Previous steps have been completed
- ITCM Server is up and running
- Tivoli Desktop application is installed

**Procedure**
1. Login to Tivoli Desktop.
2. Start the Activity Plan Monitor.
3. In the **Activity Plan Monitor** screen, select **Plans → Submit**.
4. In the **Select plan for submission** screen, select **TE_30-31_CHECK_DATA_MIGRATION** plan and choose **OK**.
5. Choose the **Variables** tab page in the **Plan Submission Parameters** screen.
6. Edit the **RECORD_THRESHOLD_AC** and **TE_USER_AC** variables in this tab page.

   - **RECORD_THRESHOLD_AC** variable - when the **TE_30-31_CHECK_DATA_MIGRATION** plan gets executed on the target Server, it counts the number of records left to copy from the SAP TE 3.0 database to the SAP TE 3.1 database and compares it with the **RECORD_THRESHOLD_AC** value.
   - **TE_USER_AC** variable: This is the SAP TE user name on the target Server.

   If the number of records is less then **RECORD_THRESHOLD_AC**, the execution result status is **Successful**, otherwise it is **Failed**. When the Data Migration process starts for the first time, the number of records is very high because the SAP TE 3.1 database is empty. In some time when almost all data are copied from the older to the newer database and only changes that happen in older database get captured and copied to the new database, the number of records reaches a value which is close to the number of records recently changed in the SAP TE 3.0 database. If there are no activities in the old database, the number of records goes to zero but when normal business processes are running that value can be around few thousands depending on the type of activities. It is recommended to set **RECORD_THRESHOLD_AC** value to a few thousands.
If the plan execution status is **Failed**, the \texttt{TE\_Linux\_Inst\_Check\_Data\_Migration.v3.1.b0.p0.log} plan log file has to be evaluated as failure does not necessarily mean that Data Migration did not work as it was mentioned before.

Following is an example of the log file content when it fails if number of records left to copy is more then \texttt{RECORD\_THRESHOLD\_AC} value:

\begin{verbatim}
ACTION=-v
TE_USER=trivers
JAVA_15_HOME=/opt/IBM/SIF/java50/jre
RECORDS\_THRESHOLD=0
TIME\_TO\_SLEEP=

=========== DATA MIGRATION STATUS ===========
SET\_NAME,STATUS,AMOUNT
UPGRSET_0,0,0
UPGRSET_1,0,0
UPGRSET_10,0,0
UPGRSET_11,0,0
UPGRSET_12,0,0
UPGRSET_13,0,0
UPGRSET_2,0,0
UPGRSET_20,0,0
UPGRSET_21,0,4

=========== DATA MIGRATION STATUS ===========
RECORDS\_TO\_PROCESS=4
There are 4 records left to process.

As seen in the above example, the number of records that need to be processed is 4 (\texttt{RECORDS\_TO\_PROCESS=4}) but the threshold was set to 0 (\texttt{RECORDS\_THRESHOLD=0}). This indicates that the Data Migration process is still running and does not meet to the set criteria. In this situation the \texttt{TE\_30-31\_CHECK\_DATA\_MIGRATION} plan needs to be executed again later to verify the status.
\end{verbatim}

7. Choose **Submit** to start the data migration process verification.

8. Monitor the result of the plan execution in the \textit{Activity Plan Monitor} screen. Data migration is finished if for the \texttt{TE\_30-31\_CHECK\_DATA\_MIGRATION} plan the execution status switches from **Started** to **Successful**.

### 4.1.5 Running Upgrade at Head Office

**Use**

To upgrade the SAP TE 3.0 to 3.1 at the Head Office

**Prerequisites**

- Previous steps have been completed
- ITCM Server is up and running
- Tivoli Desktop application is installed

**Procedure**

1. Login to the Tivoli Desktop.
2. Start the Activity Plan Monitor.
3. In the \textit{Activity Plan Monitor} screen, select **Plans \rightarrow Submit**.
4. In the *Select plan for submission* screen, select `TE_30-31_UPGRADE_HO` plan and choose *OK*.

5. Select the *Variables* tab in the *Plan Submission Parameters* screen.

6. In this screen, edit the `MODE_AC`, `NEW_TE_WAS_PROFILE_AC`, and `TE_INSTALL_HOME_AC` variables.
   - **MODE_AC** variable: If you are planning to use SAP TE version co-existence at the Head Office, the value has to be `HO_CO_EXIST`, otherwise it should be `HO_UPGRADE`.
   - **NEW_TE_WAS_PROFILE_AC** variable: If you are planning to use SAP TE version co-existence at the Head Office, you have to provide the name for the second WebSphere profile where the old SAP TE 3.0 version will be deployed or accept default value. If version co-existence is not required, leave that variable without changes.
   - **TE_INSTALL_HOME_AC** variable: This is the home directory of the SAP TE 3.0 on the target Server.

7. Choose *Submit* to start the upgrade process at Head Office.

8. Monitor the result of the plan execution in the *Activity Plan Monitor* screen.

9. Upgrade is finished if for the `TE_30-31_UPGRADE_HO` plan the execution status switches from *Started* to *Successful*.

10. Once the Head Office upgrade status is successful, remove the `headoff` endpoint added in Section 4.1.1 Modify Server Configuration for Head Office from the *Current Subscribers* list of the UpgradeHeadOfficeList.

### 4.2 Upgrade Stores

#### 4.2.1 Modify Server Configuration for Stores

**Use**

Configure Tivoli ITCM to add Stores to the list of subscribers for the upgrade.

**Prerequisites**

- Previous steps have been completed
- ITCM Server is up and running
- Tivoli Desktop application is installed

**Procedure**

1. Login to the Tivoli Desktop Manager
2. Open the UpgradeStoreList Profile Manager by following the path: *Subscribers ➔ Stores ➔ UpgradeStoreList*
3. In the *Profile Manager* screen, select *Profile Manager ➔ Subscribers*.
4. In the *Subscribers* screen, from the *Available to become Subscribers* list, select the Store endpoints where you are planning to start upgrade simultaneously.
5. Add them to the *Current Subscribers* list of the UpgradeStoreList Profile Manager, and choose *Set Subscriptions & Close*. 
4.2.2 Distribute Upgrade Software to the Store Endpoints

**Use**
To distribute WRS 6.1 and SAP TE 3.1 software to all Stores included in the UpgradeStoreList

**Prerequisites**
- Previous steps have been completed
- ITCM Server is up and running
- Tivoli Desktop application is installed

**Procedure**
Follow steps described in Section 4.1.2 Distribute Upgrade Software to Head Office Endpoint.

4.2.3 Start Data Migration Process at Stores

**Use**
To create the new SAP TE 3.1 database and migrate all data from the SAP TE 3.0 database to the new database.

**Prerequisites**
- Previous steps have been completed
- ITCM Server is up and running
- Tivoli Desktop application is installed

**Procedure**
Follow steps described in the Section 4.1.3 Start Data Migration Process at Head Office.

4.2.4 Verify Data Migration Status at Stores

**Use**
To verify the Data Migration process status

**Prerequisites**
- Previous steps have been completed
- ITCM Server is up and running
- Tivoli Desktop application is installed

**Procedure**
Follow steps described in Section 4.1.4 Verify Data Migration Status at Head Office.

4.2.5 Running Upgrade at Stores

**Use**
To upgrade the SAP TE 3.0 to 3.1 at Stores
Prerequisites

- Previous steps have been completed
- ITCM Server is up and running
- Tivoli Desktop application is installed

Procedure

1. Login to the Tivoli Desktop.
2. Start Activity Plan Monitor.
3. In the Activity Plan Monitor screen, select Plans → Submit.
4. In the Select plan for submission screen, select TE_30-31_UPGRADE_ST plan and choose OK.
5. Select the Variables tab page in the Plan Submission Parameters screen.
   - There is only one mode available for the Store: ST_UPGRADE. Edit the TE_INSTALL_HOME_AC variable in this screen.
   - TE_INSTALL_HOME_AC variable: This is the home directory of SAP TE 3.0 on the target Server
6. Choose Submit to start the upgrade process at Stores.
7. Monitor the result of the plan execution in the Activity Plan Monitor screen. Upgrade is finished if for the TE_30-31_UPGRADE_ST plan the execution status switches from Started to Successful.
8. Once the Stores’ upgrade status is successful, remove the Store endpoints added in section 4.2.1 from the Current Subscribers list of the UpgradeStoreList.

4.2.6 Setting Up POS Device(s)

Use

To verify the Data Migration process status

Prerequisites

Previous steps have been completed

Procedure

Follow steps described in the SAP Transactionware Enterprise 3.1 Installation Guide section 4.2 Setting up POS Device(s).

5. Post-Upgrade Operations

5.1 Post-Upgrade Operations at Stores

Use

To clean up and free resources utilized during upgrade
Prerequisites

- Previous steps have been completed
- Store was upgraded successfully

Procedure

After Store was upgraded successfully the old SAP TE 3.0 database version can be dropped. Perform the following steps as the DB2 Admin user:

1. Navigate to the replication directory of the SAP TE 3.0 installation, stop and clean MDI process. Assuming that the SAP TE 3.0 home directory is `/data/te-build` execute the following commands:

   ```
   > cd /data/te-build/deployment/replication
   > sh replication.sh cleanApplyMDI
   ```

2. Drop old version 3.0 database. Assuming that database name is `TE_DFLT`, execute the following command:

   ```
   > db2 drop database TE_DFLT
   ```

5.2 Post-Upgrade Operations at Head Office

Use

To clean up and free resources utilized during upgrade

Prerequisites

- Previous steps have been completed
- All Stores have been upgraded successfully

Procedure

Required Head Office operations depend on configuration settings:

1) SAP TE version co-existence is utilized

Undeploy the SAP TE 3.0 application and stop the second Server.

Perform the following step as the TE user:

1. Navigate to the upgradebase directory of the SAP TE 3.0 installation and undeploy 3.0 POS application. Assuming that the SAP Enterprise 3.0 home directory is `/data/te-build` and the name of the WebSphere profile where it was deployed is `WRSProfile01` execute the following commands:

   ```
   > cd /data/te-build/deployment/upgradebase
   > sh undeploy_pos.sh was WRSProfile01
   > $WAS_HOME/bin/stopServer.sh Server1 -profileName WRSProfile01
   ```

2. Perform the following steps as the root user:
a. Navigate to the root directory:

```bash
> cd /root
```

b. Using VI or any other text editor of your choice open rc.startTE file:

```bash
> vi rc.startTE
```

c. Assuming that name of the WebSphere profile where SAP TE 3.0 was deployed is WRSProfile01, search for line containing text

```
"/opt/IBM/WebSphere/AppServer/bin/startServer.sh Server1 -profileName WRSProfile01 &" and delete it.
```

2) DB2 data replication mechanism is utilized for the Master Data Import (MDI) process

Clean replication process transferring data from old version 3.0 database to the Stores running SAP TE 3.0. Also, data transferring between new version 3.1 and old version 3.0 databases can be stopped and cleaned up at the Head Office.

1. Perform the following steps as the DB2 Admin user:

a. Navigate to the upgrade directory of the SAP TE 3.1 installation, stop and clean Data Migration process.

```bash
> cd /opt/sap/te/product/deployment/upgrade
> sh upgrade.sh stopApplyCoexistence 3_1_to_3_0
> sh upgrade.sh stopCaptureCoexistence 3_1_to_3_0
> sh upgrade.sh cleanApplyCoexistence 3_1_to_3_0
> sh upgrade.sh cleanCaptureCoexistence 3_1_to_3_0
```

b. Drop the old version 3.0 database. Assuming that the database name is TE_DFLT, execute the following command:

```bash
> db2 drop database TE_DFLT
```

2. Perform the following steps as the root user:

a. Navigate to the root directory:

```bash
> cd /root
```

b. Using VI or any other text editor of your choice open rc.startTE file:

```bash
> vi rc.startTE
```

c. Assuming that the name of the DB2 Admin user is db2inst1 and the SAP TE 3.0 home directory is /data/te-build, search for the lines containing the following text and delete them:

```
su - db2inst1 -c "cd /data/te-build/deployment/replication; /data/te-build/deployment/replication/launchReplication.sh"
su - db2inst1 -c "cd /opt/sap/te/product/deployment/upgrade ; sh upgrade.sh startCaptureCoexistence 3_1_to_3_0 > /dev/null &"
sleep 20
```

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su - db2inst1 -c "cd /opt/sap/te/product/deployment/upgrade ; sh upgrade.sh startApplyCoexistence 3_1_to_3_0 > /dev/null &"

3) DB2 data replication mechanism is not utilized for the MDI process.

Perform the following steps as the DB2 Admin user:

a. Drop old version 3.0 database. Assuming that database name is TE_DFLT execute the following command:

```bash
> db2 drop database TE_DFLT
```

6. Troubleshooting

In case of failure, evaluate the following log files:

1) **Data Distribution:**
   - /data/logs/TE_Linux_Distribute.v3.1.b0.p0.log activity plan log file on ITCM Server

2) **Data Migration:**
   - /data/logs/TE_Linux_Inst_Data_Migration.v3.1.b0.p0.log activity plan log file on the ITCM Server
   - /opt/sap/te/product/logs/data_migration.log process log file on the target Server

3) **Data Migration Verification:**
   - /data/logs/TE_Linux_Inst_Check_Data_Migration.v3.1.b0.p0.log activity plan log file on the ITCM Server
   - /opt/sap/te/product/logs/check_data_migration.log process log file on the target Server

4) **Upgrade process:**
   - /opt/IBM/SIF/logs directory containing all log files related to WRS 6.1 upgrade on the target Server
   - /opt/sap/te/product/logs/upgrade.log process log file on the target Server
   - /opt/IBM/WebSphere/AppServer/profiles/<profile-name>/logs/Server1/SystemOut.log WebSphere Application Server log file on the target Server
   - /opt/IBM/WebSphere/AppServer/profiles/<profile-name>/logs/Server1/te_Server.log SAP TE log file on the target Server
   - /data/logs/HO_TE_Linux_Inst_Upgrade.v3.1.b0.p0.log activity plan log file on the ITCM Server

7. Reference

For more information, see the **SAP TE 3.1 Installation Guide** available on the SAP Service Marketplace.