SAP™ Test Data Migration Server (TDMS)

Using SAP® SAP R/3 4.6C and R/3 Enterprise

Document Version 1.00 – October 10, 2005
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**Typographic Conventions**

<table>
<thead>
<tr>
<th>Type Style</th>
<th>Represents</th>
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<tr>
<td>Example Text</td>
<td>Words or characters that appear on the screen. These include field names, screen titles, pushbuttons as well as menu names, paths and options. Cross-references to other documentation</td>
</tr>
<tr>
<td>Example text</td>
<td>Emphasized words or phrases in body text, titles of graphics and tables</td>
</tr>
<tr>
<td>EXAMPLE TEXT</td>
<td>Names of elements in the system. These include report names, program names, transaction codes, table names, and individual key words of a programming language, when surrounded by body text, for example, SELECT and INCLUDE.</td>
</tr>
<tr>
<td>Example text</td>
<td>Screen output. This includes file and directory names and their paths, messages, names of variables and parameters, source code as well as 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. Pointed brackets indicate that you replace these words and characters with appropriate entries.</td>
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<tr>
<td>EXAMPLE TEXT</td>
<td>Keys on the keyboard, for example, function keys (such as F2) or the ENTER key.</td>
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**Icons**

<table>
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<th>Icon</th>
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1 Getting Started

This Test Data Migration Server (TDMS) Master Guide provides a central starting point for the technical implementation, configuration and use of TDMS.

The TDMS scenario includes the following variants:

- Setup of a non-production system – such as a test system or training system – that contains only master data and customizing (variant MD&C)
- Setup of a non-production system that contains master data and customizing plus application data starting from a defined “from-date” (variant TIME)

As an option, it is also possible to include stock-taking data in variant MD&C.

For both of these variants, an initial setup is required when a non-production system is created for the first time in a given system constellation. Once this has been done, the non-production system can be refreshed at regular intervals following a simplified procedure.

The following types of users have been defined for TDMS:

- Consultant: Has the required knowledge and experience to implement TDMS at a customer site
- Operator: Is responsible for the refresh of non-production systems in an existing TDMS environment

This Master Guide provides the information about which actions and which guides are required during the above mentioned processes. It is relevant for everyone who works with TDMS.

- **Getting Started** contains valuable information about using this document and related information (documentation and SAP Notes).
- **TDMS Overview** contains the following information:
  - Short introduction to TDMS
  - System landscape
  - An overview of the TDMS scenario variants and the different options and procedures
1.1 Available Documentation for TDMS

The following is an overview of the documentation types that you need in the various life cycle phases of TDMS. It covers only the materials that are provided specifically for TDMS. In addition, you may want to have a look at the related topics in general SAP documentation such as SAPterm (SAP’s terminology database), SAP Library or the Security Guide for SAP NetWeaver.

1.1.1 Cross-Phase Documentation

Terminology
For technical reasons, the specific terminology for TDMS 2005 (English and German) is currently provided separately (not in SAPTerm).

Target group: Everyone who implements or works with TDMS software

Security Guide
A collective security guide is available for the SAP NetWeaver technologies like SAP Web Application Server (SAP Web AS). This document contains general guidelines and suggestions about system security. In addition, there is a separate Security Guide that covers TDMS-specific security issues.

Target group:
- Consultants who implement and work with TDMS
- Security specialists
- (System administration)

Migration Process Tree Documentation
For TDMS 2005, all configuration activities as well as the subsequent tasks during a system setup or refresh are listed in a migration process tree. The migration process tree is available at package level (for details on the TDMS package concept, see below).

Documentation is available for each step in the tree. To read the documentation, choose the documentation icon next to the required step in the tree.

Target group:
- Consultants who implement TDMS (or make substantial changes to an existing TDMS installation)
- Operators (for refresh)

1.1.2 Implementation

Master Guide
The Master Guide is the starting point for implementing an SAP solution. It provides scenario-specific descriptions of preparation, execution, and follow-up of an implementation. It also includes references to other documents.

Target group: Everyone who implements or uses TDMS software (at consultant or operator level)
1.1.3 Production Operation

Solution Operation Guide

The Solution Operation Guide provides additional information for operating an SAP solution. It contains tips and tricks as well as solutions for questions that are relevant in some, but not all TDMS projects.

Target group:
- TDMS operators
- System administrators
- (TDMS consultants)

1.1.4 Upgrade

All required upgrade information for TDMS will be made available in due time for the new release (TDMS 2006).
1.2 Specific Features of TDMS

TDMS includes the following specific features that help you to carry out your TDMS activities conveniently and efficiently.

1.2.1 Overview Screen

When you have installed the TDMS software in the system that will be used as the TDMS server, call transaction CNV_MBT_TDMS to access the overview screen.

Using the overview screen, you carry out all subsequent TDMS tasks that are not related to an individual transfer (or “package”). For example, you can create a TDMS project, subproject or package, or establish the required RFC destinations.

The overview screen shows all existing projects, subprojects and packages for the given TDMS server. You can access all items listed there if you have the required authorizations and registrations. (For details on the TDMS authorization and registration concepts, see section 1.2.4).

1.2.2 Migration Process Tree

A migration process tree will be created for every instance of a migration (or “package”) you create.

For each of the nodes (or steps) of a migration process tree, there is documentation that tells you why this particular step is necessary, and how to proceed. To read the documentation, choose the documentation icon next to the required step.

For most of the steps, there is also an executable function. Depending on the nature of the related step, this function will either start a program in the background or call a selection screen in which you make the required entries. To execute the function, choose the execution icon next to the required step.

The tree structure will look differently depending on whether you are creating or refreshing a non-production system. (The migration process tree for a refresh is considerably shorter.)

In addition, each Migration Process Tree has a standard view and an extended view. The extended view has more steps than the standard view and is used for making project-specific settings and for trouble-shooting purposes. As a rule, you will work exclusively with the standard view. If you do need to switch to the extended view, you will be explicitly asked to do so, for example in the long text of a message.

Like an Implementation Guide (IMG), a migration process tree consists of different phases. You cannot execute a function in a phase until all steps in the previous phases have been completed.

There are a few places in the tree where you can choose if you want to execute a multitude of related steps collectively or individually. The default approach is to execute the steps collectively. Individual execution is an additional option for advanced users, which makes it possible to re-execute individual steps if required, or modify the settings for individual steps.
1.2.3 Procedure Monitor

TDMS comes with a procedure monitor, which provides the following features:

- You get an overview of the phases and steps as well as the related status information.
- You can monitor the progress of programs running in the background.
- You can access all available logs for TDMS activities.

The procedure monitor for a given package is available as soon as you have created the package. It can be accessed from the overview screen as well as from the migration process tree screen. We recommend that you work with two modes in the TDMS server – one for the migration process tree and one for the procedure monitor.

1.2.4 User Roles and Registration Functions

TDMS has its own user roles: Lead, user and guest. Depending on the role a user is assigned, he has certain authorizations and can execute different tasks in a TDMS project. The definitions of the roles are shipped together with the TDMS software.

In addition, TDMS has its own registration mechanisms for the different levels of project organization. This is particularly useful if more than one migration is being carried out in a system landscape at a given time and not all of the users are equally involved in all of the migrations.

For more details about user roles and registration functions, see the Security Guide for TDMS.

1.3 Important SAP Notes

You must read the SAP Installation Notes before you start the installation. These SAP notes contain the most recent information on the installation.

Make sure that you have the up-to-date version of each SAP Note, which you can find in the SAP Service Marketplace at the Internet address:

service.sap.com/notes

<table>
<thead>
<tr>
<th>SAP Note Number</th>
<th>Title</th>
<th>Description</th>
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<tbody>
<tr>
<td>877860</td>
<td>Installation DMIS 2005_1</td>
<td>Note on TDMS installation</td>
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2 TDMS Overview

The SAP Test Data Migration Server (TDMS) is used for creating and refreshing non-production systems (particularly test systems) with a reduced, but still consistent dataset.

The rationale behind TDMS is as follows: Approximately 80 % of the data volume of a typical database is contained in less than 10 % of the tables. The biggest tables are normally transactional data tables. This means that there are two options for creating non-production systems with a reduced dataset:

- The transfer is limited to the tables containing customizing and master data. This option is implemented in the TDMS MD&C approach.
- Only a certain part of the transactional data is included in the transfer. To ensure that the dataset of the resulting non-production system is consistent, rules for delimiting the data for transfer must be defined. In the TDMS TIME approach, this is achieved by defining a “from date”. That is, all data that belongs to the time after the defined “from date” will be included in the transfer together with the customizing and master data, while the rest is left behind. More details about how to choose the “from date” are given below.

From a technical perspective, both options can be used for creating test systems, training systems and development systems. There is no general rule about which option to choose in which situation, because this choice depends on a number of project-specific factors. If you plan to set up a quality assurance (QA) system, however, you should always use the TIME approach, because a QA system must contain a certain amount of application data so that the required tests can be carried out in it.

For the MD&C as well as for the TIME variant, an initial setup is required when a non-production system is created for the first time in a given system constellation of sender and receiver system.

Once this has been done, an operator can refresh the non-production system at regular intervals following a simplified procedure.
2.1 System Landscape

The system landscape for a TDMS installation consists of the following elements:

- The system from which the data supply for the non-production system is taken (sender system). Normally, this will be a production system; however it might also be a quality assurance system that was set up as a full copy of the production system.
- The TDMS server, which acts as
  - Central system on which the settings and customizing for the setup of the non-production system are stored
  - Process control system.
- The non-production system (receiver system)

From a technical perspective, it would be possible for the TDMS server to be combined with the sender system or with the receiver system. With regard to data security, however, we strongly recommend that you implement the TDMS server separately. Typically, this would mean that the TDMS server is installed on a machine of its own. However it is also possible to operate it on a machine where a development system (or similar) resides.

The following minimum requirements apply for the central system (and consequently for the TDMS server):

- R/3 system with WebAS 6.20 and SAP ABA
- 4 CPUs
- 4 GB RAM
- required disk space: min. 20 GB

Regarding the patch level, there are no specific requirements for TDMS.

The sender system and the receiver system must be on the same release level – either 4.6C or 4.7. The TDMS software must be installed on all systems that are part of the given TDMS landscape.

The systems must be linked via RFC connections. For more information about how to configure these connections, see the related activity in the migration process tree.

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You can manage more than one sender – receiver combination via a single central system and control system. To facilitate this, TDMS has different levels at which settings can be made:

- **Project:** A compilation of one or more subprojects (which are related from a technical or content point of view); a project may, for example, correspond to a given system landscape.
- **Suproject:** A combination of a sender client, a receiver client, and the RFC connection between them. If it makes sense from an organizational perspective, more than one subproject can be created for a given combination.
- **Package:** An instance of a transfer. That is, you create a new package every time you do an initial setup or refresh for a given combination of sender system (production or QA system) and receiver system (non-production system). Each package has its own migration process tree and procedure monitor.

With regard to the fact that TDMS works at client level, a separate subproject needs to be set up for every client whose data is going to be transferred to a non-production environment by means of TDMS.

### 2.2 Preparations for Using TDMS

Before you can create non-production systems using TDMS, the system landscape must be set up and some basic decisions regarding the configuration of TDMS for your requirements need to be made.

#### 2.2.1 Choosing a Scenario Variant

First of all, you need to consider the pros and cons of the two different approaches (MD&C versus TIME) in relation to your specific requirements, and to decide for one of them.

If you opt for the TIME variant, you may want to give some thought to the definition of the optimal “from date”. There is a trade-off between completeness of the data and system size:

If you choose a “from date” that lies very far in the past, even the data for very long-running business transactions will be transferred completely; however this also means that the receiver system will not be much smaller than the sender system (as it contains almost the same dataset).

On the other hand, if you choose a very recent “from date”, the resulting non-production system will be comparatively small, but you run a risk of having a lot of incomplete business transactions (and consequently inconsistencies) in the receiver system.

The following considerations may help you to choose the best “from date”:

- Which are the most important business transactions in your company? How long do they typically take?
- Does the non-production system have to include data from business transactions that take place only at certain times of the year or not very often?
- Do you have a fixed upper limit for the possible size of the non-production system?

The migration process tree also offers some functions that help you to finalize your selection of the optimal “from date”. For example, you can check if a given date coincides with the beginning of a posting period for the relevant organizational units.

#### 2.2.2 Technical Considerations

Regarding the data transfer as such, you have the following options:
The data can be extracted directly from the sender system. However this means that no changes in the sender system (which will normally be a production or QA system) are allowed during the transfer, because otherwise the resulting non-production system may be inconsistent.

Alternatively, you can avoid this downtime by using the snapshot technology or a mirror of the sender system. For details, see the project documentation for storage snapshot technology, which is available in the SAP Service Marketplace at service.sap.com/slo.

Another issue you need to consider is how to ensure that the data dictionary (DDIC) and cross-client customizing of the receiver system (non-production system) reflect the current situation in the related production system.

The safest way of achieving this is to build up the non-production system by taking a copy of the receiver system. However, you can also use an existing copy of the production system (such as a test system) if you are sure that the relevant parts of its dataset are identical with the corresponding parts in the related production system.

Next, you create a system shell by deleting all data except the DDIC and the cross-client information from this system copy. The required functions for doing this deletion come with TDMS and are accessible via the migration process tree. During the actual migration, you then transfer only the required parts of the client-dependent data from the sender system to the receiver system.

As long as the DDIC and cross-client information in the sender system do not change, all you have to do to reset the non-production system is to create a new TDMS refresh package. If, however, any changes have taken place, you need to ensure consistency between the non-production system and the production system by importing the relevant transports to the non-production system.

In addition, you may want to keep a system shell so that you have it available when creating a non-production system for a given production system from scratch. There are different ways of achieving this:

- **Save shell**: A save shell is a simple backup of the system shell created in preparation to a TDMS implementation. When a new system is built up using a save shell, all transports that have gone into the related production system after creation of the backup must be imported to the shell.

- **Master shell**: A master shell is also created as a copy of the original system shell. However it is included in the transport chain and receives all transports that go into the production system. As a consequence, it always reflects the current status of the DDIC and cross-client information in the production system, and no additional transports are required when a new system is to be created based on the master shell.

### 2.2.3 Checking out Required Standard Technologies

We assume that you are familiar with the following standard methods that are used in connection with TDMS:

- **System Copy**
- **Remote Function Call (RFC)**

The specific requirements in these areas with regard to TDMS are explained in the TDMS documentation. If, however, you want to learn more about any of these methods in general, have a look at the related topics in SAP Library.
2.2.4 Set up the TDMS Server
The standard way of setting up the TDMS server is to install the TDMS software in an empty SAP system. Alternatively, an existing system (typically a development system) may be used. SAP Note 877860 describes the installation procedure and provides additional information with regard to the installation of TDMS.

2.2.5 Set up the Receiver System
For a TDMS project to be successful, the Repositories of the sender system and the receiver system must be absolutely identical. This may be achieved by using a test system that has been created from a recent copy of the relevant production system. However the safest (and recommended) way is to create a full copy of the sender system, install the TDMS software on it and use the deletion function provided by TDMS to delete all client-specific data from the system.

2.2.5.1 Create a Full Copy of the Sender System
Create a full copy of the sender system in accordance with the standard procedure for system copy. Then install the TDMS software in the system.

2.2.5.2 Prepare the Receiver Client
With TDMS, you can either use an existing client as the receiver client, or create a new client to be used as the receiver client.

If you want to use a new client, set it up by means of the client copy tool, profile SAP_UCSV (client-dependent customizing, users, authorization profiles and variants).

This is necessary because data related to users and variants is not transferred from the sender system to the receiver system, but this data is needed for working with the new client.

2.2.5.3 Create the System Shell for the Receiver System
Create a system shell by deleting the client-specific data (application data) from the system copy so that it contains only the DDIC and the cross-client data from the sender system. The required functions for deleting the relevant tables are included in the TDMS software and are started via the Migration Process Tree.

2.2.6 Install the TDMS Software in the Sender System
Follow the procedures described in the Installation Guide and in SAP Note 877860.
2.3 Setting Up a Non-Production System Using TDMS

Having installed the software in all participating systems as described in SAP Note 877860, you can set up your first TDMS project in the TDMS server: Start transaction CNV_MBT_TDMS to call up the overview screen and make the required entries for getting started with TDMS (such as defining a project, subproject and package and specifying the RFC connections). When you have completed all preparations, you can create the migration process tree for your project, which will guide you through all subsequent steps.

2.3.1 Variant ‘Master Data & Customizing’

The drawing provides an overview of the data transfer process for TDMS scenario variant Master Data & Customizing. For a short explanation of the phases in this process, see the following sections.

2.3.1.1 Package Settings

In this phase, you make some technical settings. Thus, you ensure that tables containing user-related data will not be transferred to the receiver system.

2.3.1.2 Analysis of the Sender System

In this phase, you classify the tables in the sender system to ensure that only tables containing master data and customizing information will be transferred. SAP standard tables are classified automatically by the TDMS software. Customer-specific tables are also classified automatically if they contain the required information. Any remaining tables must be classified manually to ensure that they are handled correctly during the transfer.

2.3.1.3 Preparations in the Receiver System
To prepare the system copy for becoming the receiver system in the TDMS process, you need to remove all client-dependent data. In this phase, you make the necessary preparations and then delete the client-specific data from the receiver system.

### 2.3.1.4 Data Transfer

In this phase, the actual data transfer (migration) takes place.

### 2.3.1.5 Postprocessing Tasks

Finally, some postprocessing is required. For example, number ranges and table buffers in the receiver system must be reset.
2.3.2 Time-Based Variant

The drawing provides an overview of the data transfer process for the time-based scenario variant of TDMS. For a short explanation of the phases in this process, see the following sections.

2.3.2.1 Package Settings

In this phase, you make some technical settings. Thus, you ensure that tables containing user-related data will not be transferred to the receiver system.

2.3.2.2 System Analysis

In this phase, you decide which tables need to be transferred in reduced form to get a consistent non-production system that is as small as possible. Also, you define the rules for the data reduction (selection groups). Finally, you confirm your settings so that they become effective for the data transfer.

2.3.2.3 Preparations in the Receiver System

To prepare the system copy for becoming the receiver system in the TDMS process, you need to remove all client-dependent data. In this phase, you make the necessary preparations and start the TDMS functions that delete the client-specific data from the receiver system.

2.3.2.4 Data Transfer

In this phase, you repeat the size check for the tables to ensure that no significant changes have taken place after the preparation phase, and finally start the actual data transfer.

2.3.2.5 Postprocessing Tasks
Finally, some postprocessing is required. Thus, number ranges and table buffers in the receiver system must be reset.

### 2.4 Refreshing a Non-Production System Using TDMS

The procedure for refreshing a non-production system using TDMS is quite similar to the one for the setup. However with regard to the fact that most of the settings have already been made, the refresh consists of fewer steps than the setup and does not require specific consultant knowledge.

During the system analysis phase, you check if you need to transfer additional tables to the non-production system (receiver system), or if you simply want to update the content of the tables that already exist in the receiver system. If you opted for the TIME approach, you can specify a new “from date” in this phase. The rules for reducing the amount of data (selection groups) are then defined based on your settings.

Also, the receiver system must be reduced to shell status again. To this purpose, you start the TDMS functions for deleting the existing client-dependent data from the receiver system. If changes in the DDIC or in cross-client tables have been made in the sender system and should be reflected in the receiver system, the necessary update transports are made in this phase.

Once you have accepted the TDMS settings for the refresh, you can generate the programs and jobs for the transfer (and the data reduction, if applicable). Then the actual data transfer takes place. Finally there are some postprocessing tasks, such as adapting the logical system and the user addresses, before the receiver system is ready to be used as a non-production system again.