HP Asset Manager

Software version: 9.30

Multi-Tenancy

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Introduction

Overview of this guide

This guide describes the following about the Asset Manager multi-tenancy (MT) system:

- Overview of the Asset Manager MT system
- How the Asset Manager MT system works
- How to implement the MT system
- How to migrate data from a non-MT environment to an MT environment

Who is this guide intended for?

This guide is intended for:

- Asset Manager administrators and support staff responsible for implementing, customizing and troubleshooting the MT system
- End users who would like to understand how the MT system in Asset Manager functions

Contents of this guide

Chapter Overview

This chapter provides an overview of the Asset Manager multi-tenancy architecture.

Chapter Setting up the MT environment

This chapter explains how to set up the multi-tenancy system for the first time.

Chapter Administration

This chapter explains how to perform various administrative operations, such as enabling multi-tenancy, managing access, etc.

1 Overview

Asset Manager version 9.30 introduces a new architecture optimized for simpler implementation and better support of multi-tenancy functionalities. The Asset Manager multi-tenancy architecture is best suited for Managed Services Providers (MSPs) who wish to support multiple client organizations with minimum hardware, software, installation and maintenance requirements and costs. The architecture also lays the foundation for SaaS and cloud computing infrastructure that MSPs are planning to implement.

With the Asset Manager multi-tenancy architecture, MSPs are able to host, maintain and manage assets of multiple customers using a single instance of Asset Manager and the same set of tables hosted on a single copy of a physical database.

Some of the differentiating characteristics of Asset Manager multi-tenancy architecture are:

- The Asset Manager multi-tenancy feature can be enabled or disabled at the database level.
- The MT-enabled Asset Manager database can be divided into metadata non-MT tables and MT tables made up of business data, which enables the implementers/users of the Asset Manager MT system to focus on the business related MT tables.
- Normally tenant users can only view and manipulate data in their own tenant. However, a special type of user (leveraged user) can be configured to view and manipulate data in multiple tenants.
- Even in a multi-tenancy table, you can share some records among tenants by utilizing the shared data concept.

- The architecture is highly customizable and extensible -- user created tables are MT tables by default and MSPs can decide to make the same customization available for several customers or restrict the specific customization to one single customer.
- The restriction imposed by the multi-tenancy architecture can be supplemented by the existing access restrictions of Asset Manager to better control and secure access to sensitive customer data.

Important:

Data integrity is key in a multi-tenant environment: a record belonging to a tenant can only be linked to records shared or belonging to the same tenant. Asset Manager enforces this integrity through the user interface: a user working on tenant A will not be able to link any record to records specific to tenant B.

Asset Manager has tools to check the integrity of the Asset Manager repository or to move records from one tenant to another. However, there is no active integrity checking when records are created from an external source (through import, HP Connect-It or web services) . The checks would be highly complex and have a huge impact on performance. It is the responsibility of the implementer to ensure the integrity of imported records.

Summary of MT related tables

The following tables are introduced in Asset Manager version 9.30 to support the functionalities of multi-tenancy:

- Tenant (amTenant)
- Viewable Tenants (amViewTenant)

For how to use these tables to set up your MT environment, ▸ Working with MT related tables [page 19].

Glossary

Note:

Except the multi-tenancy concept, the following terms are specific to the Asset Manager MT architecture.

Multi-tenancy

Multi-tenancy refers to a principle in software architecture where a single instance of the software runs on a server, serving multiple client organizations (tenants).

Viewable tenant

Viewable tenant is a property or privilege of a user which enables the user to view data in a specified tenant.

It defines the tenant in which the user has read access. A user can have many viewable tenants.

Primary tenant

Primary tenant is a property or privilege of a user which enables the user to manipulate data in a specified tenant.

It defines the tenant in which the user has write access. A user can have one primary tenant at one time.

It can also be viewed as the default tenant of the user -- by default, any operation the user performs occurs in the primary tenant of the user. For example, when a user creates a record, the record is created in the primary tenant by default.

Leveraged user

Leveraged user is a special type of user who can view data of more than two tenants.

Leveraged user can also manipulate data in multiple tenants, but can only manipulate data in one tenant at one time. The user has to switch the primary tenant to modify data in another tenant.

Shared data

Shared data has two meanings in the Asset Manager MT architecture:

- It can be viewed as the data in the MT tables which is visible to users of all tenants
- It can also be viewed as a special tenant made up of such data

Leveraged data

Leveraged data is the data in the non-MT tables. It is always visible to users of all tenants and not subject to the access restriction imposed by the Asset Manager MT architecture.

2 Setting up the MT environment

Prerequisite

- Asset Manager 9.30 or above

Asset Manager offers support of MT functionalities from version 9.30 onward.

If you are using older versions of Asset Manager, you need to migrate to 9.30 following the normal migration process as detailed in the Asset Manager **Migration** guide.

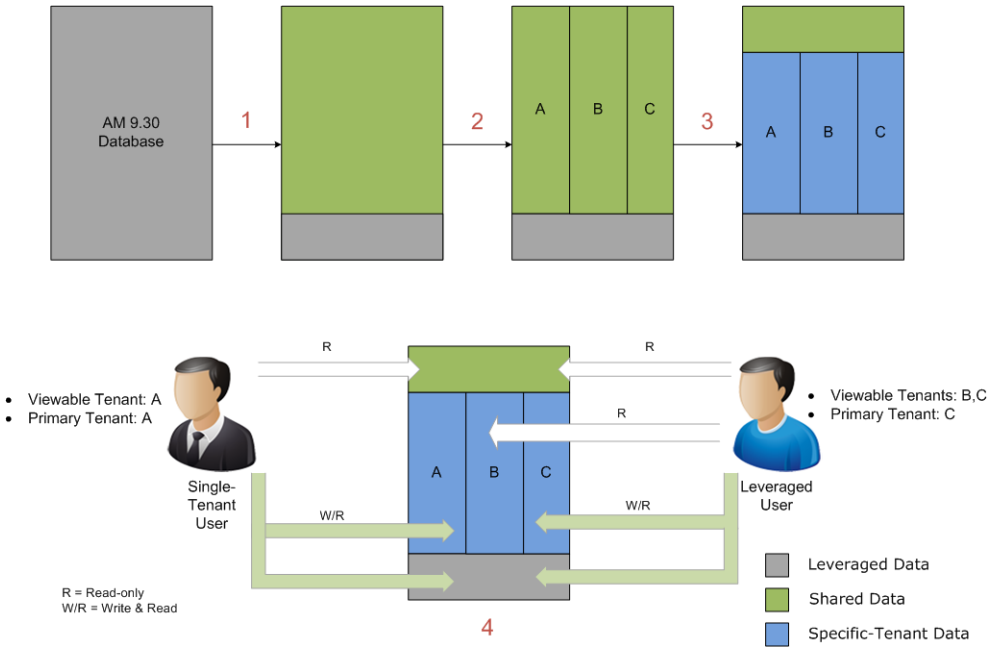
Note:

Before migrating, make sure that the tables in your production database do not have a field named **lTenantId** or a link named **Tenant**. These fields are reserved for the multi-tenancy architecture.

Setting up the MT environment

This section lists the typical steps to follow when setting up the MT environment for the first time.

Figure 2.1. Setting up the MT environment



1 Enabling MT [page 17]

2 Creating tenants [page 19]

3 Populating data into tenants

- By default, when the database is converted to an MT database (by enabling MT), all existing data in the MT tables is shared data.

  You need to move data into their respective tenants.

  ▸ Moving data across tenants [page 30]

- You can also import outside data into various tenants

  ▸ Importing data into your tenants [page 33]

4 Managing access to tenants

▸ How access to tenant data is controlled [page 28]

In particular,

- Assigning viewable tenants to a user [page 20]
- Setting the primary tenant for a user [page 24]

3 Administration

Enabling and disabling MT

Enabling MT

To enable the MT feature:

1. Start Asset Manager Application Designer.
2. Connect to the database (**File/ Open.../ Open existing database** menu).
3. Select the **Database/ Enable multi-tenancy** menu.
4. Click **Save** and execute the **Save database structure** wizard.
5. Your Asset Manager system is transformed into a multi-tenancy environment.
6. For the Web client, you need to restart the application server hosting the Asset Manager Web Service for the transformation to take effect.

   You can confirm your Asset Manager database is MT enabled by checking some indicators.

   See Checking whether your Asset Manager system is MT-enabled [page 18].

Creating a pre-enabled MT database

You can also create a new pre-enabled multi-tenancy database using the command line version of Asset Manager Application Designer: amdbal.

Syntax:

amdbal -create:<path to `gbbase.xml`>;<path to `gbbase_xx.xml`>;<name of the database to create>;<path to the `bin` sub-folder of the Asset Manager installation folder> -usemultitenancy

For example:

```
amdbal -create:'C:\Program Files\HP\Asset Manager 9.30 xx\config\gbbase.xml;C:\Program Files\HP\Asset Manager 9.30 xx\config\gbbase_en.xml;AMDemo93en;C:\Program Files\HP\Asset Manager 9.30 xx\bin' -usemultitenancy
```

where **xx** is replaced by the two letter language code of your Asset Manager installation.

Checking whether your Asset Manager system is MT-enabled

You can check whether your Asset Manager has multi-tenancy enabled by any of the following indicators from various applications of Asset Manager:

Table 3.1. Indicators of a multi-tenancy enabled Asset Manager system (for leveraged users and administrators)

	Indicators for the MT environment	Behavior in the non-MT environment
Asset Manager Application Designer	The **Multi-tenant** column has the value **Yes** for some tables	The **Multi-tenant** column has the value **No** for all tables
	The **Database/ Enable multi-tenancy** menu option is selected	The **Database/ Enable multi-tenancy** menu option is not selected
Asset Manager Windows client	A **Tenant** column is added to the list screen of MT tables, for example, amPortfolio	No **Tenant** column is added to the list screen of MT tables
	The tenant of the login user is displayed in the status bar alongside the database and user login information	No tenant information is available in the status bar
Asset Manager Web client	A **Tenant** column is added to the list screen of MT tables, for example, amPortfolio	No **Tenant** column is added to the list screen of MT tables
	The user's primary tenant is displayed on the upper right corner of the Web client	The user's primary tenant is not displayed on the main page of the Web client

Note:

These indicators only apply to leveraged users and administrators.

Single-tenant users are confined within their own tenant and are not necessarily aware whether they are using a MT system or not.

For the definition of leveraged user, ▸ Leveraged user [page 13].

Disabling MT

Perform the same steps in Enabling MT [page 17] to disable the multi-tenancy system.

Note:

By disabling MT, you will turn all data into leveraged data, thus visible to people across tenants. Make sure you fully understand the impact and consequences before proceeding.

All your MT configurations and other tenant information are not lost when disabling MT. They will be accessible once you enable MT again.

Working with MT related tables

Tenants (amTenant)

Creating tenants

To create a new tenant:

1. Display the tenants (**Administration/ Multi tenancy/ Tenants** link on the navigation bar).
2. Click **New**.
3. Populate the detail of the record.

Modifying tenant details

To modify the detail of a tenant:

1. Display the tenants (**Administration/ Multi tenancy/ Tenants** link on the navigation bar).
2. Display the detail of the tenant you want to modify.
3. Web client: Click **Modify**.

4 Modify the detail of the tenant.

5 Confirm the modification by clicking **Modify** (Windows client) or **Save** (Web client).

Deleting tenants

To delete a tenant:

1 Display the tenants (**Administration/ Multi tenancy/ Tenants** link on the navigation bar).

2 Select the tenant you want to delete.

3 Click **Delete**.

4 If a message appears, confirm the deletion by clicking **OK** (Windows client) or **Yes** (Web client).

Note:

You are not allowed to delete the tenant if the tenant has **Viewable Tenants** associated. You need to delete the associated viewable tenants first to delete the tenant.

If any MT table contains records assigned to the tenant you are going to delete, you need to first move the records out of the tenant. Otherwise, the deletion will not be successful.

You can use the **Move data across tenants** menu to move the records from that tenant. ▸ Moving data across tenants [page 30].

You may need to go through all the tables listed in List of MT tables [page 35] to make sure all data is moved out of the tenant.

Viewable tenants (amViewTenant)

▸ Viewable tenant [page 13].

The **Viewable Tenants** (amViewTenant) table defines the many-to-many relationship between employees and tenants:

- One tenant can have multiple users associated
- One user can view data in multiple tenants

Assigning viewable tenants to a user

To assign viewable tenants to a user:

Method 1: Use the **amEmplDept** table

1. Display the employees and departments (**Organization management/ Organization/ Employees and departments** link on the navigation bar).
2. Display the detail of the employee to whom you want to assign tenant read privileges.
3. Select the **Multi tenancy** tab.
4. Add viewable tenants to an employee as follows:

   To add viewable tenants one at a time:

   Windows client:

   1. Click + next to the **Viewable Tenants** list.
   2. Designate a tenant for the employee.
   3. Click **Add**.
   4. Click **Modify**.

   Web client:

   1. Click **Add** below the **Primary tenant** field.
   2. Designate a tenant for the employee.
   3. Click **Add**.

   To add multiple viewable tenants at a time:

   Windows client:

   1. Click **Add tenant** to the right of the detail window.
   2. Select the tenants to add. You can use Shift- or Ctrl-click to select several tenants.
   3. Click **OK**.

   Windows client:

   1. Select **Add tenant(s) to the selected employee** from the **Actions** drop-down list.
   2. Select the boxes before the tenants you want to add to the user.
   3. Click **OK**.

Method 2: Use the **amTenant** table

1. Display the tenants (**Administration/ Multi tenancy/ Tenants** link on the navigation bar).
2. Select the tenant to which you want to assign users.
3. In the detail of the tenant, click + (Windows client) or **Add** (Web client).

   The amViewTenant table appears with the **Tenant** field populated with the **Code** of the selected tenant.
4. Populate the **User** field.

5 Click **Add**.

Changing viewable tenants assigned to a user

To change the viewable tenant for a user:

Method 1: Use the **amEmplDept** table

1 Display the employees and departments (**Organization management/ Organization/ Employees and departments** link on the navigation bar).
2 Display the detail of the employee for whom you want to modify tenants in which the employee has read privileges.
3 Select the **Multi tenancy** tab.
4 Display the detail of the viewable tenant as follows:
   - Windows client: Click next to the **Viewable Tenants** list.
   - Web client: Click the link representing the record.
5 Web client: Click **Modify**.
6 Web client: Click next to the **Tenant** field.
7 In the screen that follows, select a new tenant.
8 Click **Modify** (Windows client) or **Save** (Web client).

Method 2: Use the **amTenant** table

1 Display the tenants (**Administration/ Multi tenancy/ Tenants** link on the navigation bar).
2 Display the detail of the tenant for which you want to change the users who have read privileges.
3 Display the detail of the viewable tenant for which you want to change the user by clicking (Windows client) or the link representing the user (Web client).

   The amViewTenant table appears with the **Tenant** field populated with the **Code** of the selected tenant.
4 Web client: Click **Modify**.
5 Change the value of the **User** field.
6 Confirm the modification by clicking **Modify** (Windows client) or **Save** (Web client).

Removing viewable tenants from a user

> **Note:**
>
> If a viewable tenant happens to be the primary tenant of the user, the viewable tenant cannot be deleted unless you delete the user's primary tenant first.
>
> ▸ Deleting the primary tenant for a user [page 25].

To remove a viewable tenant from a user:

Method 1: Use the **amEmplDept** table

1. Display the employees and departments (**Organization management/ Organization/ Employees and departments** link on the navigation bar).
2. Display the detail of the employee for whom you want to delete tenants in which the employee has read privileges.
3. Select the **Multi tenancy** tab.
4. Select the viewable tenant to delete from the **Viewable Tenants** list.
5. Delete the viewable tenant as follows:
   - Windows client: Click - next to the **Viewable Tenants** list.
   - Web client: Click **Delete** below the **Primary tenant** field.
6. Windows client: Click **Modify**.
7. If a message appears, confirm the deletion by clicking **OK** (Windows client) or **Yes** (Web client).

Method 2: Use the **amTenant** table

1. Display the tenants (**Administration/ Multi tenancy/ Tenants** link on the navigation bar).
2. Display the detail of the tenant from which you want to remove users.
3. Select the viewable tenant to delete, and click - (Windows client) or **Delete** below the **Primary tenant** field (Web client).
4. If a message appears, confirm the deletion by clicking **OK** (Windows client) or **Yes** (Web client).
5. Windows client: Click **Modify**.

Primary tenant (PrimaryTenant)

▸ Primary tenant [page 13].

Note:

- The primary tenant for a user must be one of his viewable tenants.
- If the **Primary tenant** field (on the **Multi tenancy** tab of the employee detail) for a user is left blank, and the **Can create or modify shared data** field on the **Profile** tab of the employee detail is selected, the user's primary tenant is **Shared data**.
- When a leveraged user or an administrator creates a record, the record is created in the primary tenant of the user by default.

Setting the primary tenant for a user

Note:

When you add a viewable tenant to a user, the tenant is automatically set as the user's primary tenant under the following conditions:

- The user cannot edit shared data.

  The **Can create or modify shared data** field on the **Profile** tab of the employee detail is not selected
- No primary tenant is specified for the user before adding the viewable tenant.

  The **Primary tenant** field (on the **Multi tenancy** tab of the employee detail) is empty.

If the primary tenant is automatically set when adding viewable tenants, this section can be skipped.

To add the primary tenant for a user:

1. Display the employees and departments (**Organization management/ Organization/ Employees and departments** link on the navigation bar).
2. Display the detail of the employee for whom you want to add tenants in which the employee has write privileges.
3. Select the **Multi tenancy** tab.
4. Web client: Click **Modify**.
5. If not added, add viewable tenants.

   ▸ Assigning viewable tenants to a user [page 20].

Note:

The administrator has read and write privileges to data in all tenants without assigning any viewable tenants. However, to create data in a specific tenant as an administrator, the tenant should be set as the primary tenant for the administrator.

To do this, the tenant should be assigned as the viewable tenant for the administrator first.

6 Click (Windows client) or (Web client) next to the **Primary tenant** field.

7 Select a tenant from the list as your primary tenant.

8 Confirm the modification by clicking **Modify** (Windows client) or **Save** (Web client).

Changing the primary tenant for a user

Note:

This wizard is only accessible to leveraged users and administrators with more than one viewable tenant.

The primary tenant of the current user can be modified in real-time using the **Change your Primary Tenant...** wizard, which can be accessed as follows:

- Windows client: Use the **Tools/ Change primary tenant** menu or press **F10**.
- Web client: Click the **Tenant:<name of your primary tenant>** link on the top right corner of the Web client.

Deleting the primary tenant for a user

To delete the primary tenant of a user:

1 Display the employees and departments (**Organization management/ Organization/ Employees and departments** link on the navigation bar).

2 Display the detail of the employee for whom you want to delete tenants in which the employee has write privileges.

3 Select the **Multi tenancy** tab.

4 Web client: Click **Modify**.

5 Delete the value of the **Primary tenant** field.

6 Confirm the deletion by clicking **Modify** (Windows client) or **Save** (Web client).

Managing user access to tenants

This section describes how to use the MT access restriction to restrict what users have which level of access to what tenant. To ensure appropriate user authorizations, the existing access restriction mechanism should be used on top of the MT access restriction to define the user role, for example.

Types of tenant users

According to the tenants they have access to, users of the Asset Manager MT system can be categorized as follows:

- Administrator

  By default, the administrator has read and write privileges to data in all tenants regardless of whether viewable tenants and the primary tenant are specified for the user or not.

  A user is assigned database administrator privileges by enabling the **Administration rights** (bAdminRight) option on the **Profile** tab of the employee detail.

- Leveraged user

  ▸ Leveraged user [page 13].

  A user is a leveraged user under one of the following conditions:

  - The user is assigned more than two viewable tenants
  - The user is assigned one viewable tenant, and the user can update shared data (the **Can create or modify shared data** field on the **Profile** tab of the employee detail is selected)

    Tip:

    The user has access to two tenants in this case, if you view shared data as a special tenant.

- Single-tenant user

  This type of user is assigned one viewable tenant and can only access the data in that particular tenant plus shared data.

  They are not necessarily aware whether they are in an MT environment.

Table 3.2. Composition of an MT-enabled Asset Manager 9.30 database

From the table perspective	From the data (records) perspective
MT tables	Specific-tenant data
	Shared data
Non-MT tables	Leveraged data

From the perspective of tables, an MT-enabled Asset Manager database (version 9.30 or later) is comprised of the following types of tables:

- MT tables

  MT tables are tables whose records are capable of being segregated into various tenants.

  ▸ List of MT tables [page 35] for the comprehensive list of MT tables in the out-of-the-box Asset Manager database.

  Note:

  All user-created tables (except system created many-to-many relation tables) are also MT tables.

  The MT tables are made up of the following types of data:
  - Shared data
  - Specific-tenant data

  Note:

  Shared data and specific-tenant data can be converted into each other.

  ▸ Moving data across tenants [page 30].

- Non-MT tables

  Non-MT tables are metadata tables identified by HP as not appropriate or necessary to be partitioned into tenants, thus data in such tables are always shared by all tenants.

  Examples of non-MT tables include:
  - System-wide gadgets, such as wizards, workflow, etc. An example of this is **Actions** (amAction)
  - Tables containing generic and standard definitions, for example **Time zones** (amTimeZone), **Units** (amUnit).
  - All the feature tables

  Data in non-MT tables is referred to as **leveraged data**.

Access to leveraged data is controlled by the normal access restriction mechanism available in Asset Manager.

Tip:

The non-MT tables can be identified by using Asset Manager Application Designer: those tables whose **Multi-tenant** column has the value **No** in an MT-enabled database are non-MT tables.

From the records (data) level, an MT-enabled Asset Manager database (version 9.30 or later) is comprised of the following types of data:

- Specific-tenant data

  Specific-tenant data are records in MT tables accessible only to users who are granted access to the tenant.

  If you are a leveraged user or an administrator, you can identify the tenant of a record (in the MT tables) by the value of the **Tenant** column.
- Shared data

  Shared data are records in MT tables visible to users of all tenants.

  If you are a leveraged user or an administrator, you can identify shared data by the value of the **Tenant** column in the MT tables: those records whose **Tenant** column is empty are shared data.
- Leveraged data

  Leveraged data are records in non-MT tables.

  The data is always visible to users of all tenants. It is not possible to restrict access to such data by tenants.

How access to tenant data is controlled

This section describes how read and write (including the capability to create, modify and delete) access to each type of tenant data is controlled.

Note:

The person responsible for managing and administering the access to an MT environment should have full access to the following tables:

- amTenant (non-MT table)
- amViewTenant (non-MT table)
- amEmplDept (MT table)

> **Note:**
>
> This section only covers the data in the MT tables. The read and write access to non-MT tables is controlled by the existing access restriction mechanism of Asset Manager.
>
> For data in the MT tables, MT access restriction is applied on top of the existing access restriction mechanism of Asset Manager.
>
> For further information about the existing access restriction mechanism of Asset Manager, see the **Administration** guide, chapter **Controlling access to the database**.

Read access

- Specific-tenant data

  Read access to specific tenants is granted by assigning viewable tenants to the user.

  ▸ Assigning viewable tenants to a user [page 20].
- Shared data

  Shared data is always visible to users of all tenants.

Write access

Write access to a tenant includes the ability to create, modify and delete data in that tenant.

- Specific-tenant data

  A user has write access to data in a specific tenant if the tenant is set as the primary tenant of the user.

  ▸ Setting the primary tenant for a user [page 24].
  - If you are a leveraged user, you have read access to more than one tenant. However, you have write access to only one tenant at one time. You need to switch the primary tenant to manipulate data in another tenant.

    ▸ Changing the primary tenant for a user [page 25].
  - If you are an administrator, you can manipulate data in different tenants without setting or switching primary tenant.
- Shared data

  > **Warning:**
  >
  > Since shared data is accessible to users of all tenants, make sure you fully understand the impact and consequences before you make any modification to the shared data.

  A user can manipulate shared data when the following conditions are met:

- The **Can create or modify shared data** field on the **Profile** tab of the employee detail is selected.
- The login user's **Primary tenant** field is empty.

Exceptions

SAP Crystal Reports can bypass the MT access restriction.

Populating data into tenants

How data is populated into various tenants

Data is populated into their respective tenant in any of the following ways:

- User created tenant data: When the user creates new records, the records go to the primary tenant of a user by default.
- Tenant data within the Asset Manager database: Such data can be moved from tenant to tenant.
- Tenant data from an outside system or from another Asset Manager database: Such data can be imported by using HP Connect-It or the Asset Manager Import Tool.

Moving data across tenants

Warning:

Only an administrator with in-depth knowledge of the structure of your Asset Manager production database and the relationship between tables is qualified to move data across tenants. Otherwise, the integrity of your database may be damaged.

To move data in MT tables from one tenant into another:

1. Start Asset Manager Application Designer.
2. Connect to the database (**File/ Open.../ Open existing database** menu).
3. Select the **Action/ Move data across tenants...** menu.

   You can move data across different tenants:

   - From shared data to a specific tenant
   - From a specific tenant to shared data

Note:

As shared data will be accessible to users of all tenants, make sure that this is what you intend to do before moving data into or out of the shared data tenant.

- From one specific tenant to another

4 Select **Source tenant** and **Target tenant**.

5 Select either of the following options:

- Manually input filters on all multi-tenant tables

  This option enables you to move data in any MT table across tenants in one single operation. It lists all the MT tables and allows you to manually specify records in each table to be moved by defining filters.

  When using this method, you need to work out the relationship among records in all the related tables and make sure that the integrity of the database is preserved.

  Tip:

  Use this option when you fully understand which records in which tables will be moved and the relationship between tables of your database.

  You can use this option to move data into its correct tenant as suggested by the results of the Diagnostics tool.

- Resolve dependencies for the following set of records

  When using this option, first specify the records to be moved in one MT table. The tool then suggests all the associated data in other tables that would be moved along with the records you selected.

  Tip:

  Use this option when the relationship between the tables for which you are going to move data is very complex.

6 If you selected the **Manually input filters on all multi-tenant tables** option, go to step 7.

If you selected the **Resolve dependencies for the following set of records** option, do the following:

1 From the **Table** drop-down list, select a table for which you want to change the tenant of some records.

2 Specify a filter to select a subset of records in the above table to move to another tenant.

7 Click **Start**. The **Dependencies processing** window appears and depending on the option selected, different content is shown.
   - If you selected the **Manually input filters on all multi-tenant tables** option, the **Dependencies processing** window presents all the MT tables.

     You need to manually specify which records to move from the source tenant to the target tenant for each of these tables.

     For each table, you also have the opportunity to change the target tenant to the **shared data** tenant or choose to not move data in the specified table.
   - If you selected the **Resolve dependencies for the following set of records** option, the **Dependencies processing** window lists all the tables which contain records associated with the records specified in step 6 and also suggests the number of records in each table to be moved to the target tenant.

     For each table in the list, you also have the opportunity to change the target tenant to the **shared data** tenant or choose to not move data in the specified table.

8 Click **Move**.

9 If you selected the **Resolve dependencies for the following set of records** option, you may need to execute the **Move data across tenants** command several times to move all data in various tables into your target tenant.

Note:

After moving data across tenants, it is strongly recommended to validate the integrity of the MT database. See the section below.

Validating the integrity of the MT database

1 Start Asset Manager Application Designer.

2 Connect to the database (**File/ Open.../ Open existing database** menu).

3 Select the **Action/ Diagnostics / Repair database...** menu.

4 In the **Database diagnostics** window, select the **Multi-tenancy diagnostics** task.

Note:

The multi-tenancy diagnostics tool only performs multi-tenancy diagnostics. It will not repair the database to solve the problems found regardless of whether you select the **Repair** option or not.

5 Click **Run**.

A detailed message is displayed indicating the records violating the multi-tenancy integrity rules. You can use the **Move data across tenants** command to move all problematic records to their correct tenant, using the **Manually input filters on all multi-tenant tables** option.

▸ Moving data across tenants [page 30].

Importing data into your tenants

Via the AM import module

To import data into various tenants, you can manually add a column representing the tenant of each record in the import file.

If no tenant is specified, the data will be imported into the shared data tenant.

After importing data into various tenants, you should validate the integrity of your MT database, following the instructions in Validating the integrity of the MT database [page 32]

A List of MT tables

The following lists all the Asset Manager tables which have MT capability:

- amAbsence (Absences)
- amAdjustment (Adjusting items)
- amAggregation (Aggregation)
- amAsset (Assets)
- amAssetRent (Asset rents)
- amAstCntrDesc (Assets covered by contracts)
- amAstProjDesc (Assets included in projects)
- amAstRntExpLin (Asset rent payments)
- amBudgCenter (Budget centers)
- amBudgClass (Budget classifications)
- amBudget (Budgets)
- amBudgetCategory (Budget categories)
- amBudgLine (Budget lines)
- amCalcField (Calculated fields)
- amCatalog (Catalogs)
- amCatProduct (Products)
- amCatRef (Catalog references)
- amCatRefScript (Catalog reference scripts)
- amCatScriptData (Formatted data from catalogs)
- amCbkRule (Chargeback rules)
- amCbkScript (Chargeback scripts)

- amCbkSplitLine (Split-billing lines)
- amCbkSplitRule (Split-billing rules)
- amCbkStoredEvent (Chargeback events)
- amCbkSystem (Chargeback systems)
- amCCSplit (Cost center split operations)
- amCFAql (AQL-type calculated field scripts)
- amCFScript (Script-type calculated field scripts)
- amClientResource (Client-resource relationships)
- amCMTargetTask (Deployment tasks)
- amCntrEmpl (Employees covered by a contract)
- amCntrProjDesc (Contracts assigned to projects)
- amCntrRent (Schedule level rents)
- amCntrRntExpLin (Contract rent payments)
- amCompany (Companies)
- amComputer (IT equipment)
- amConditions (Contract terms and conditions)
- amContact (Contacts)
- amContract (Contracts)
- amCostCategory (Cost types)
- amCostCenter (Cost centers)
- amCRType (Client-resource relationship types)
- amDashboardItem (Dashboard item)
- amDateAlarm (Alarms)
- amDecisionTree (Decision tree)
- amDelegation (Delegations)
- amDeprScheme (Depreciation calculation formulas)
- amDocBlob (Contents of the documents)
- amDocument (Documents)
- amDownTimePeriod (Downtime)
- amEmplDept (Employees and departments)
- amEmplGroup (Employee groups)
- amEmplProjDesc (Employees assigned to projects)
- amEntitlement (Named entitlements)
- amEscalScheme (Escalation schemes)
- amEscSchLevel (Escalation levels)
- amESDComputerTask (Scheduled task targets)
- amESDDelivMethod (Delivery methods)
- amESDPackage (Distribution packages and scripts)

- amESDTask (Scheduled tasks)
- amExpenseLine (Expense lines)
- amExtensionCard (Extension cards)
- amFDView (Business home pages)
- amFieldAdjust (Adjusted fields)
- amFieldAdjustTempl (Adjustment types)
- amFinancialYear (Financial years)
- amFixedAsset (Fixed assets)
- amFloorPlan (Floor plans)
- amFloorPlanPos (Floor plan positions)
- amForm (Internal forms)
- amFYDivision (Time division)
- amHistory (History)
- amInventModel (Inventoried models)
- amInvoice (Supplier invoices)
- amInvoiceLine (Invoice lines)
- amItemReceived (Items received)
- amKnowlBase (Knowledge base)
- amLoan (Loans)
- amLoanPayment (Loan amortization schedule lines)
- amLocation (Locations)
- amLogicalDrive (Logical drives)
- amLossValLine (Loss values applicable to a given contract)
- amLossValRate (Loss rate defined for a given calculation rule)
- amLossValRule (Loss value calculation rules)
- amMail (Messages)
- amModel (Models)
- amModelPair (Cable model pairs/conductors)
- amModelPort (Model ports)
- amModelSlot (Model slots)
- amModelSoftInfo (Installations to create)
- amMonitor (Monitors)
- amNetworkCard (Network cards)
- amNews (Current news)
- amOutputEvent (Output events)
- amPasswordHist (Password history)
- amPCard (Payment cards)
- amPeriod (Periods)

- amPhone (Telephones)
- amPhoneFeat (Telephone functions)
- amPhoneFeatTpl (Telephone function templates)
- amPhysicalDrive (Physical drives)
- amPKFT (Assignments of functions to keys)
- amPOrder (Orders)
- amPOrdLine (Purchase order lines)
- amPort (Ports)
- amPortfolio (Portfolio items)
- amProblemClass (Problem types)
- amProdClassCode (Classification codes)
- amProdOption (Product options)
- amProject (Projects)
- amQuery (Queries)
- amReceipt (Receiving slips)
- amReceiptLine (Receipt lines)
- amReconcProposal (Reconciliation proposals)
- amReport (Reports)
- amReqLine (Request lines)
- amRequest (Requests)
- amReservation (Reservations)
- amReturnEnv (Return slip)
- amRightsUsesCount (Rights/Utilizations count)
- amSeverity (Severity)
- amSloLine (Service level objective lines)
- amSlot (Slots)
- amSoftInstall (Software installations or utilizations)
- amSoftLicCounter (Software counters)
- amStdConditions (Standard terms and conditions)
- amStdCondSets (Collection of standard terms and conditions)
- amStock (Stock)
- amStockRule (Stock rules)
- amThirdParty (Third parties)
- amTicket (Helpdesk tickets)
- amTicketHistLine (Helpdesk ticket history)
- amTraining (Training)
- amViewDef (Views)
- amWorkCalendar (Calendar of business days)

- amWorkOrder (Work orders)

B List of MT related APIs

The following are the APIs related with MT, which can be used in scripts, etc.
For detailed information about these APIs, ▸ **Programmer's Reference** guide

- AmIsMultiTenant
- AmIsMultiTenantSystem
- AmGetPrimaryTenant
- AmSetPrimaryTenant
- AmIsLeveragedUser
- AmValidateTIR
- AmSetVisibleTenants