OMEGAMON XE Shared Documentation
6.3.0 Fix Pack 2 and above

Multi-tenancy Guide

IBM

Note

Before using this information and the product it supports, read the information in "Notices" on page 23.

Contents

Chapter 1. Overview of OMEGAMON multi-tenancy

The OMEGAMON multi-tenancy solution allows the monitoring of distinctly separate sets of resources. With OMEGAMON multi-tenancy, general users can access information for resources assigned to their tenant only and cannot access information about the resources of another tenant. For example, an IT service provider or data center might provide services to multiple, unrelated customers and the services might need to be tracked separately by customer. In the OMEGAMON multi-tenancy solution, each customer would be considered a tenant. The OMEGAMON administrator or system programmer would configure the multi-tenancy feature, and the general end user would have access to only those OMEGAMON products and resources that are assigned to the customer with which the user is associated.

OMEGAMON multi-tenancy concepts and architecture

Use this topic to familiarize yourself with the concepts and architecture upon which the OMEGAMON multi-tenancy feature is based.

Monitoring environment

The monitoring environment for an OMEGAMON multi-tenancy scenario has the following components:

- Tivoli Enterprise Monitoring Server (TEMS). The OMEGAMON multi-tenancy solution allows data collection from multiple LPARs using a single TEMS.
- Tivoli Enterprise Monitoring Agents (TEMA)
- Enhanced 3270 user interface (enhanced 3270UI)
- Tivoli Enterprise Portal (TEP). The TEP is used for configuration.
- User-defined Managed Systems Lists (MSLs)
- User-defined tenant (customer) definitions

Managed systems lists (MSLs)

The OMEGAMON multi-tenancy feature uses *Managed Systems Lists (MSLs)*, which are defined sets of resources, to restrict access to resources by tenant. The following explanation describes how the MSLs are used.

In general, for data collection, an OMEGAMON client issues an SQL query to a TEMS, which in turn is passed to one or more agents. The SQL query requests one or more columns from one or more tables. The key element in the query is the information that tells the TEMS which agent to invoke. This element is called an *origin node* and is a unique token that the agent registers with the TEMS when the agent starts up.

The following example requests information for a CICS region on an LPAR:

```
SELECT COLUMN1, COLUMN2, COLUMN3, FROM PRODUCT.CICSTABLE,
WHERE (ORIGINNODE = 'LPAR.CICSNAME' )
```

The origin node is referred to as a *Managed System Name (MSN)* and identifies one agent monitoring one system or subsystem. However, many requests need to target multiple agents monitoring multiple systems, and so instead of an origin node, a *Managed Systems List (MSL)* is used. An MSL is a list of MSNs, or origin nodes.

The following example requests information using an MSL:

```
SELECT COLUMN1, COLUMN2, COLUMN3, FROM PRODUCT.PLEXTABLE,
WHERE SYSTEM.PARMA=('NODELIST',"OMEGAMON-CICS-LIST",18)
```

In this example, the `OMEGAMON-CICS-LIST` is an MSL that contains one MSN for every CICS region that belongs in the same CICSplex.

Each OMEGAMON product provides an out-of-the-box MSL that is used to contain all discovered systems or subsystems that belong to it. In an OMEGAMON single-tenant configuration, the product-provided MSLs are used for data collection, allowing inclusion of all discovered resources. In an OMEGAMON multi-tenancy configuration, for each tenant, you must define one or more MSLs (one MSL for each *managed system type*) and include only those systems that belong to that tenant. The user-defined MSLs are then used in the system-generated SQL queries for data collection and limit the scope of collection to only those resources that have been included.

OMEGAMON products that generate queries using the following format are supported in multi-tenancy mode:

```
SYSTEM.PARMA=('NODELIST',"msl",nn)
```

Where *msl* is the product-provided MSL name and *nn* is the length of the name in characters.

Note: A *managed systems list* is also referred to as a *managed system list* and a *managed system group*.

Silent first workspace

The OMEGAMON multi-tenancy solution uses a silent workspace (KOBLOGON) as the first workspace. The silent first workspace retrieves the multi-tenancy information for the user ID that is logging on, and then calls the designated first workspace to display.

OMEGAMON multi-tenancy terminology

This topic describes terms as they apply to the OMEGAMON multi-tenancy feature.

customer
A tenant in an OMEGAMON multi-tenancy configuration. For each customer, a distinct set of resources (defined with MSLs), users, and groups are defined. A user for a particular customer can only access the resources defined to that customer. Multiple customers can exist in multi-tenancy mode.

group
A tenant definition that logically associates one or more users with the same logon experience and working environment. A group defines the first workspace and the product tabs to display when a user logs on.

managed system group
See *Managed Systems List*.

Managed Systems List (MSL)
A defined set of resources. Specifically, an MSL is a list of *Managed Systems Nodes (MSNs)*. The MSL is used to control the scope of data collection. Each OMEGAMON product provides an out-of-the-box MSL that contains all discovered systems or subsystems that belong to it. In a multi-tenancy configuration, one or more MSLs are defined for each tenant to limit the scope of collection. Also referred to as a *managed system list* and a *managed system group*.

Managed System Node (MSN)
A unique token used for agent identification. An MSN is used in data collection to identify one agent monitoring one system or subsytem. Also referred to as an *origin node*.

multi-tenancy mode
A feature in the OMEGAMON enhanced 3270 user interface that allows the monitoring of distinctly separate sets of resources.

managed system type
In OMEGAMON multi-tenancy, the managed system type is a pre-defined value used to identify the OMEGAMON agent or type of managed system when specifying user-defined MSLs in customer definitions. For more information, see "Creating tenant definitions" on page 9.

Origin node

See *Managed System Name (MSN)*.

super user

A designation for a user ID that allows the user to log on to the enhanced 3270 user interface address space, running in multi-tenancy mode, and not be restricted by any multi-tenancy rules. This setting allows an OMEGAMON System Programmer to log on to a multi-tenancy address space and access data from all sources while tenants are restricted to their own customer views.

tenant

A monitoring environment consisting of a distinct set of resources for data collection. See also *customer*.

user

A tenant definition that establishes the group and customer to which a user ID belongs and indicates if the user ID is designated as a *super user*. Unless the user is designated as a super user, a user can access only those resources that are assigned to the customer to which the user ID belongs.

Chapter 2. Installation

Review information about installing OMEGAMON multi-tenancy support.

OMEGAMON multi-tenancy support is installed as part of OMNIMON Base V7.5.0. For information about installing the framework, see the *Program Directory*.

APARs for multi-tenancy support

The following table lists the APARs that provide multi-tenancy support in OMEGAMON:

Product	APAR (PTF if available)	Description
OMNIMON Base V7.5.0	OA57511 (PTF UJ00549)	Introduces multi-tenancy support in the OMEGAMON framework. This maintenance is required to operate any OMEGAMON product in multi-tenancy mode.
OMNIMON Base V7.5.0	OA58270 (PTF UJ00873)	Provides updated multi-tenancy support in the OMEGAMON framework for OMEGAMON for Messaging on z/OS.
OMNIMON Base V7.5.0	OA58324 (PTF UJ01503)	Provides updated multi-tenancy support in the OMEGAMON framework.
OMEGAMON for CICS	OA58058 (PTF UJ00691)	Provides a usability improvement in OMEGAMON for CICS that simplifies the multi-tenancy configuration process.
OMEGAMON for Db2 Performance Expert on z/OS	PH16515 (PTF UI67209)	Provides multi-tenancy support in OMEGAMON for Db2 Performance Expert on z/OS. This maintenance is required to operate OMEGAMON for Db2 Performance Expert on z/OS in multi-tenancy mode.
OMEGAMON for IMS on z/OS	OA58195 (PTF UJ00721)	Provides multi-tenancy support in OMEGAMON for IMS on z/OS. This maintenance is required to operate OMEGAMON for IMS on z/OS in multi-tenancy mode.
OMEGAMON for Messaging on z/OS	OA58339 (PTF UJ01518)	Provides multi-tenancy support in OMEGAMON for Messaging on z/OS. This maintenance is required to operate OMEGAMON for Messaging on z/OS in multi-tenancy mode for the IBM MQ Monitoring agent.
OMEGAMON for Messaging on z/OS	OA58340 (PTF UJ01519)	Provides multi-tenancy support in OMEGAMON for Messaging on z/OS. This maintenance is required to operate OMEGAMON for Messaging on z/OS in multi-tenancy mode for the IBM Integration Bus Monitoring agent.
OMEGAMON for z/OS	OA56925 (PTF UA99795)	Provides multi-tenancy support in OMEGAMON for z/OS. This maintenance is required to operate OMEGAMON for z/OS in multi-tenancy mode.

Chapter 3. Configuration

Perform the necessary steps to configure the OMEGAMON enhanced 3270 user interface to operate in multi-tenancy mode.

About this task

To configure the OMEGAMON enhanced 3270 user interface for operation in multi-tenancy mode, you must define information about the tenant and the systems to be managed, and you must enable the feature.

Perform the following procedure for each tenant.

Procedure

1. Define the Managed Systems Lists. See "Defining a Managed Systems List (MSL)" on page 7.
2. Define the customer (tenant) and the relationships between the customer and the MSLs. The required definitions can be made in PDS members or in RACF. See "Creating tenant definitions" on page 9.
3. Enable multi-tenancy mode. See "Enabling multi-tenancy mode" on page 15.

Defining a Managed Systems List (MSL)

Define the MSLs for a tenant.

The Managed Systems List (MSL) is a list of Managed System Name (MSN) entries (or, origin nodes).

Each OMEGAMON provides an out-of-the-box MSL that contains all discovered systems or subsystems that belong to it. This MSL is all that is needed for an environment consisting of only a single tenant.

For an environment that has multiple tenants, one or more MSLs must be defined for each tenant to limit the scope of collection to that of the tenant.

It is recommended that you use the TEP to create your MSLs.

Notes:

- A *managed systems list* is also referred to as a *managed system list* and a *managed system group*.
- The TEP **Object Group Editor** stores MSL and MSN data in the Hub TEMS to which it is connected. If the enhanced 3270 user interface is connected to the same Hub TEMS, it has access to that same stored data. Equally true, if the enhanced 3270 user interface **Object Editor** stores data into the TEMS, the TEP will have access to that same stored data.

Before you create your MSLs for your multi-tenant implementation, review the following considerations:

- Naming convention. See "Naming convention" on page 7.
- Scope of resources to include in the MSL. See "Scope of resources" on page 8.

Naming convention

When creating managed systems lists, it is important to choose a naming convention that is meaningful. Although there are not any requirements or validation for the name, the following suggested format is recommended:

```
env_OMcode_customer
```

Where:

- *env* is the environment, such as T for Test, P for Production, or D for Development
- *OMcode* is the OMEGAMON product code, such as C5 for CICS or I5 for IMS

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- *customer* is the customer ID (up to 10 characters)

Additionally, the use of uppercase letters is recommended.

For example, T_C5_ACMECORP would be the MSL for CICS test regions for the ACME Corporation.

Note: A benefit of using this naming convention is that in the required Customer definition (described in "Creating tenant definitions" on page 9), if the MSL name ends with ?, then the customer ID will be substituted.

Scope of resources
Before you create your MSL, plan what managed system nodes to include. For example, you can create an MSL containing a single CICS region. One MSL must be created for each managed system type.

Note: In OMEGAMON for CICS, if you want to have a CICSplex per LPAR, you must define each one.

Procedure

To create your MSL in TEP, see "Creating an MSL using TEP" on page 8.

Creating an MSL using TEP

Use the Tivoli Enterprise Portal (TEP) to create a managed systems list (MSL) for the tenant.

Before you begin

Review the content in "Defining a Managed Systems List (MSL)" on page 7.

About this task

Use the **Object Group Editor** in the Tivoli Enterprise Portal (TEP) to create one or more MSLs for each tenant. One MSL must be created for each managed system type.

Perform the following steps for each MSL to create.

Notes:

- A *managed systems list* is referred to as a *managed system group* in the TEP.
- For more information about using the **Object Group Editor**, see the *Tivoli Enterprise Portal User's Guide*.

Procedure

1. Click the **Object Group Editor** icon in the Tivoli Enterprise Portal.
2. Under **Groups**, if the **Managed system** node is collapsed, expand it.
3. Click one of the available managed system types, then click **Create new group**.
4. Type a descriptive name for the managed system group and click **OK**.
   The new managed system group is displayed in the managed system folder.
5. Select a managed system from the **Available Managed Systems** list and move it to the **Assigned** list. You can select multiple managed systems by holding down Ctrl while clicking each managed system. You can also, after selecting a managed system, use Shift+click to select all managed systems between this selection and the first selection.
6. Save your changes and either keep the editor open with **Apply** or exit with **OK**. The managed system group is now available.

What to do next
Create customer, group, and user definitions for the tenant. See "Creating tenant definitions" on page 9.

Creating tenant definitions

Create the customer, group, and user definitions for an OMEGAMON multi-tenancy environment.

About this task

For each tenant, you must define the customer and the relationships between the customer and the MSLs. This process requires the definition of the following components:

- **Customer.** A customer definition contains a customer ID (up to 10 characters), a descriptive customer name (up to 50 characters), and the list of MSLs for the customer. Each managed system type requires a unique MSL. One customer definition is created for each tenant.
- **Group.** A group definition defines the group to which a user will belong. For each group, you also specify the first workspace to display at logon and the OMEGAMON tabs to display in the workspace. Multiple groups can be defined and can be used by multiple tenants.
- **User.** A user definition specifies information for an individual z/OS TSO user ID. This information includes the group and the customer to which the user belongs; a user can belong to one group and one customer only. A user can also be defined as a *super user*. A *super user* designation allows the user ID to log on to the enhanced 3270 user interface address space, running in multi-tenancy mode, and not be restricted by any multi-tenancy rules. This capability allows an OMEGAMON system programmer to log on to a multi-tenancy address space and access data from all sources while regular users are restricted to their own customer views.

You can create the tenant definitions in PDS members or in RACF, which can provide greater security. Because the RACF implementation typically requires the involvement of your RACF administrator, it is recommended that you test your tenant definitions using PDS members and then, when satisfied, transfer the definitions to RACF.

Procedure

1. Use one of the following procedures to create your tenant definitions:
   - "Creating tenant definitions in PDS members" on page 9
   - "Creating tenant definitions in RACF" on page 12
2. Indicate if the tenant definitions are to be used in the PDS members or in RACF. See "Setting the location of the tenant definitions" on page 15.

Creating tenant definitions in PDS members

Define the customer and the relationships between the customer and the MSLs using PDS members.

About this task

For each tenant, you must define the customer and the relationships between the customer and the MSLs. This process requires the definition of the following components: customer, group, users. Each of these components is defined in a PDS member in the UKOBDATF data set that is allocated to the enhanced 3270 user interface address space (allocated to the RKOBPROF DD name). Template members are provided in data set RKOBDATF and must be copied to data set UKOBDATF for customization.

The following list describes the definitions to be made.

Note: The definitions described in this topic can also be made in RACF for greater security. See "Creating tenant definitions in RACF" on page 12.

- **Customer**. Customers are defined in member KOBCUST. Each customer entry defines the customer ID, title, and associated MSLs for the customer. The following example shows the format for the customer definition:

```
CUSTOMER:customerID,
CUSTNAME:"customerTitle",
msType="msl",
```

```
msType="msl",
msType="msl"
```

Where:

– *customerID* is the customer ID, which can be up to 10 characters.

– *customerTitle* is the unique customer descriptive title, which can be up to 50 characters.

– *msType* is the managed system type. A separate definition is made for each type. Valid values: ZOS, CICS, IMS, DB2, CTG, MQ, QSG, IIB, STOR, MFN, JAVA.

– *msl* is the name of the managed system list (group) for the respective managed system type. A unique MSL must be specified for each managed system type. If the MSL name ends with ?, then the customer ID will be substituted. See "Naming convention" on page 7 for the recommended MSL name format.

The following example shows a customer definition. For each MSL name ending with ?, the ? is replaced by ACMECORP. For example, CICS="T_C5_?" is converted to CICS="T_C5_ACMECORP".

```
CUSTOMER:ACMECORP,
CUSTNAME:"UNIQUE CUSTOMER TITLE",
ZOS="T_M5_ACMECORP",
CICS="T_C5_?",
IMS="T_I5_ACMECORP"
DB2="T_D5_?",
CTG="T_GW_?",
MQ="T_MQ_ACMECORP",
QSG="T_QSG_ACMECORP",
IIB="T_IIB_ACMECORP",
STOR="T_S3_?",
MFN="T_N3_ACMECORP",
JAVA="T_JJ_?"
```

• **Group.** Groups are defined in member KOBGROUP. This member defines the groups to which a user will belong. In each group entry, you also specify the first workspace to be displayed at logon and the OMEGAMON tabs to be displayed in the workspace for the group. The following example shows the format for a group definition:

```
GROUP:group,FIRSTWS=workspace,
SHOWEVT=n,SHOWZOS=n,SHOWCICS=n,SHOWCTG=n,SHOWIMS=n,
SHOWDB2=n,SHOWMQ=n,SHOWIIB=n,SHOWMFN=n,SHOWSTOR=n,SHOWJAVA=n
```

Where:

– *group* is the group name, which can be up to 10 characters.

– *workspace* is the workspace to display at logon, which is an 8-character panel ID.

– *n* specifies whether the respective tab is displayed in the first workspace. Valid values are Y and N. The variables and corresponding tabs are as follows:

Option	Tab
SHOWEVT	**Events** **Note:** Multi-tenancy mode is not currently supported for the Events tab. The user will see all available resources and will not be restricted to only those resources in the user-defined MSLs for the tenant.
SHOWZOS	**z/OS**
SHOWCICS	**CICS**
SHOWCTG	**C/TG**
SHOWIMS	**IMS**
SHOWDB2	**DB2**

Option	Tab
SHOWMQ	**MQ** **Note:** The MQ tab displays the queue-sharing group (QSG) information. To include QSG information, you must define an MSL for the QSG managed system type for the customer.
SHOWIIB	n/a **Note:** There is not a corresponding tab for the Integration Bus (IIB) agent. To view IIB information, use the **Integration Bus** option on the **Navigate** menu.
SHOWMFN	**MFN**
SHOWSTOR	**STOR**
SHOWJAVA	**JVM**

The following example shows a group definition.

```
GROUP:OMEGCICS,FIRSTWS=KOBSCICS,
SHOWEVT=N,SHOWZOS=Y,SHOWCICS=Y,SHOWCTG=Y,SHOWIMS=N,
SHOWDB2=N,SHOWMQ=Y,SHOWIIB=Y,SHOWMFN=N,SHOWSTOR=N,SHOWJAVA=Y
```

- **User.** Users are defined in member KOBUSER. This member defines information about individual user IDs. A user can be defined as a *super user*. A *super user* definition allows the designated user ID to log on to the enhanced 3270 user interface address space, running in multi-tenancy mode, but not be restricted by any multi-tenancy rules. This allows an OMEGAMON System Programmer to log on to a multi-tenancy address space and access data from all sources while regular users are restricted to their own customer views.

  The following example shows the format for the definition of a user:

  ```
  USERID:user  GROUP:group  SUPER:nnn CUSTOMER=customerID
  ```

  Where:

  - *user* is the z/OS TSO user ID, which can be up to 8 characters.
  - *group* is the associated group name, which can be up to 10 characters.
  - *nnn* indicates if the user is a super user. Valid values are YES and NO.
  - *customerID* is the associated customer ID, which can be up to 10 characters. This parameter is omitted for super users.

  The following example shows definitions for two users:

  ```
  USERID:TSUSER  GROUP:OMEGALL  SUPER:YES
  USERID:TSUSERA GROUP:OMEGCICS SUPER:NO  CUSTOMER=ACMECORP
  ```

Use the following procedure to create the customer, group and user definitions in PDS members.

Procedure

1. Locate and copy the KOBCUST, KOBUSER and KOBGROUP members from the RKOBDATF dataset to the UKOBDATF data set.
2. Edit the new KOBCUST, KOBGROUP, and KOBUSER members in the UKOBDATF data set to define information about the customer, groups and users. Use a file editor such as the ISPF editor to do this. For details about the definitions, see About this task.

What to do next
In the KOBLOGON workspace, make sure the MODE value is set to PDS, as described in "Setting the location of the tenant definitions" on page 15.

Creating tenant definitions in RACF

Define the customer and the relationships between the customer and the MSLs using RACF.

Before you begin

Because of the authority that is required, some of the steps in this task must be performed by the RACF administrator. It is recommended that you test your tenant definitions using PDS members and then, when satisfied, transfer the definitions to RACF.

Additionally, if RACF is used, the OMEGAMON started task needs to be authorized to issue RACROUTE EXTRACT requests for CSDATA fields for any user ID logging to the enhanced 3270 user interface.

About this task

You can optionally create the customer, group and user definitions for the tenant in RACF.

Note: The definitions described in this topic can also be made in PDS members in the UKOBDATF data set. See "Creating tenant definitions in PDS members" on page 9.

RACF User Profiles are used to create user definitions, and General Resource Profiles are used to create groups and customer definitions.

The following list describes the definitions to be made.

- **Customer.** A resource is created for each customer. The customer ID is defined as the resource name within RACF security class $KOBSEC, and the customer details are defined as installation data for the resource. The following example shows a customer definition:

```
CLASS       NAME
-----       ----
$KOBSEC     customerID

LEVEL  OWNER      UNIVERSAL ACCESS  YOUR ACCESS  WARNING
-----  --------   ----------------  -----------  -------
 00    TSUSER           NONE             NONE    NO

INSTALLATION DATA
-----------------
msType="msl" CUSTNAME="customerTitle"

APPLICATION DATA
----------------
NONE

AUDITING
--------
FAILURES(READ)

NOTIFY
------
NO USER TO BE NOTIFIED
```

Where:

  – *customerID* is the customer ID, which can be up to 10 characters.
  – *customerTitle* is the unique customer descriptive title, which can be up to 50 characters.
  – *msType* is the managed system type. A separate definition is made for each type. Valid values: ZOS, CICS, IMS, DB2, CTG, MQ, QSG, IIB, STOR, MFN, JAVA.
  – *msl* is the name of the managed system list (group) for the respective managed system type. A unique MSL must be specified for each managed system type. If the MSL name ends with ?, then the customer ID will be substituted. See "Naming convention" on page 7 for the recommended MSL name format.

- **Group.** A resource is created for each group. The group name is defined as the resource name within RACF security class $KOBSEC, and the group details are defined as installation data for the resource. The following example shows a group definition:

```
CLASS       NAME
-----       ----
$KOBSEC     group

LEVEL  OWNER       UNIVERSAL ACCESS  YOUR ACCESS  WARNING
-----  --------    ----------------  -----------  -------
 00    TSUSER            READ             READ     YES

INSTALLATION DATA
-----------------
FIRSTWS=workspace,SHOWEVT=n,SHOWZOS=n,SHOWCICS=n,SHOWCTG=n,SHOWIMS=n,SHOWDB2=n,
SHOWMQ=n,SHOWIIB=n,SHOWMFN=n,SHOWSTOR=n,SHOWJAVA=n

APPLICATION DATA
----------------
NONE

AUDITING
--------
FAILURES(READ)

NOTIFY
------
NO USER TO BE NOTIFIED
```

Where:

- *group* is the group name, which can be up to 10 characters.
- *workspace* is the workspace to display at logon, which is an 8-character panel ID.
- *n* specifies whether the respective tab is displayed in the first workspace. Valid values are Y and N. The variables and corresponding tabs are as follows:

Option	Tab
SHOWEVT	**Events** **Note:** Multi-tenancy mode is not currently supported for the Events tab. The user will see all available resources and will not be restricted to only those resources in the user-defined MSLs for the tenant.
SHOWZOS	**z/OS**
SHOWCICS	**CICS**
SHOWCTG	**C/TG**
SHOWIMS	**IMS**
SHOWDB2	**DB2**
SHOWMQ	**MQ** **Note:** The MQ tab displays the queue-sharing group (QSG) information. To include QSG information, you must define an MSL for the QSG managed system type for the customer.
SHOWIIB	n/a **Note:** There is not a corresponding tab for the Integration Bus (IIB) agent. To view IIB information, use the **Integration Bus** option on the **Navigate** menu.
SHOWMFN	**MFN**
SHOWSTOR	**STOR**
SHOWJAVA	**JVM**

- **Users.** Definitions for user IDs are contained within RACF custom data fields, which are contained in a CSDATA segment. For each user ID, the following RACF CSDATA fields are used:
  - OMGROUP. This field has a maximum length of 10 and typically contains an 8-character value like OMEGCICS.
  - OMSUPER. This field has a maximum length of 8. Valid values are YES and NO.
  - OMCUST. This field has a maximum length of 10 and typically contains a 6 to 8-character value like CUSTID.

  The following example shows the CSDATA fields for a user:

  ```
  SECURITY-LEVEL=NONE SPECIFIED
  CATEGORY-AUTHORIZATION
   NONE SPECIFIED
  SECURITY-LABEL=NONE SPECIFIED

  CSDATA INFORMATION
  -----------------
  OMEG GROUP group
  OMEG SUPER nnn
  OMEG CUSTOMER customerID
  ```

  Where:
  - *group* is the associated group name, which can be up to 10 characters.
  - *value* indicates if the user is a super user. Valid values are YES and NO.
  - *customerID* is the associated customer ID, which can be up to 10 characters. This parameter is omitted for super users.

  For more information about CSDATA fields, see the *z/OS Security Server RACF Security Administrator's Guide*.

  Note: To display, add, or modify information in the CSDATA segment, you must have the appropriate authorization. These tasks are typically performed by the RACF administrator. Additionally, the OMEGAMON started task needs to be authorized to issue RACROUTE EXTRACT requests for CSDATA fields for any user ID logging to the enhanced 3270 user interface.

In addition to creating the tenant definitions, you need to indicate that RACF will be used. See .

Use the following procedure to create the customer, group and user definitions in RACF. Refer to the *z/OS Security Server RACF* documentation for details.

Procedure
1. Create your customer definitions using RACF General Resource Profiles (Option 2 on the RACF - Services Option Menu).
2. Create your group definitions using RACF General Resource Profiles (Option 2 on the RACF - Services Option Menu).
3. Create your user definitions using RACF User Profiles (Option 4 on the RACF - Services Option Menu).
4. Authorize the OMEGAMON started task to issue RACROUTE EXTRACT requests for CSDATA fields for any user ID logging to the enhanced 3270 user interface.

What to do next
In the KOBLOGON workspace member, set the MODE value to SAF, as described in .

Setting the location of the tenant definitions

Set the location of the tenant definitions.

About this task

The customer, group, and user definitions for the tenant can exist in either PDS members or RACF. You must indicate which of these locations to use.

This setting is controlled by the MODE parameter in the silent logon workspace (KOBLOGON), which is used when operating in multi-tenancy mode. The following figure shows the MODE parameter:

```
/********************************************************************/
/*        PDS or SAF - Where are your Multi-Tenancy Definitions   */
/********************************************************************/

SET MODE=PDS             /* Value is either PDS or SAF      */
```

MODE

Specifies the location of the tenant definitions. The following are valid values:

- **PDS** - (Default) Definitions are made in PDS members in the UKOBDATF data set that is allocated to the enhanced 3270 user interface address space.
- **SAF** - Definitions are made in RACF.

It is recommended that you test your tenant definitions using PDS members and then, when satisfied, transfer the definitions to RACF.

Use the following steps to update the MODE parameter.

Note: The default value for the MODE parameter is PDS. If you use only PDS members for your tenant definitions, you can skip this step.

Procedure

1. Locate the KOBLOGON workspace panel definition member.
2. Edit the member to set the MODE parameter to PDS for PDS members or SAF for RACF. Use a file editor such as the ISPF editor to do this.

What to do next

Enable multi-tenancy mode. See .

Enabling multi-tenancy mode

Enable multi-tenancy mode by updating the enhanced 3270 user interface started task JCL.

About this task

To operate the enhanced 3270 user interface in multi-tenancy mode, you must add the MULTI parameter to the job step JCL for the enhanced 3270 user interface address space.

The following message in the JES system log indicates that multi-tenancy mode is enabled:

```
OMV020I e3270UI is running in Multi-Tenancy Mode
```

Procedure

1. Locate the member that contains the JCL for the enhanced 3270 user interface address space.
2. Edit the member to add the MULTI=Y parameter and setting, as shown in the following example:

```
//*
//E3270UI EXEC PGM=KOBGATW0,
```

```
//             REGION=&RGN,TIME=&TIM,MEMLIMIT=&MEMLIM,
//             PARM=('MODE=&MODE,APPL=&APPL,FOLD=&FOLD,UMAX=&UMAX',
//             'TIMEOUT=&TIMEOUT',
//             'MULTI=Y',
//             'PROD=&PROD,FSCR=&FSCR,0M=&0M')
```

3. Start or restart the address space. When the enhanced 3270 user interface address space is up, the
   following message is displayed in the JES system log:

```
OMV020I  e3270UI is running in Multi-Tenancy Mode
```

What to do next
Log on to the OMEGAMON enhanced 3270 user interface, running in multi-tenancy mode. See Chapter 4,
"Working in multi-tenancy mode," on page 17.

Chapter 4. Working in multi-tenancy mode

Operate your enhanced 3270 user interface in multi-tenancy mode.

After you have completed the necessary configuration steps to operate in multi-tenancy mode, log on to your enhanced 3270 user interface.

Note: If you have issues when logging on, see Chapter 5, "Troubleshooting," on page 19.

Tenant workspaces

Review characteristics of the enhanced 3270 user interface that are unique to operating in multi-tenancy mode.

The following list describes characteristics of the workspace that are unique to operating in multi-tenancy mode:

- **Menus.** The workspace action bar provides a set of menus: File, Edit, View, Tools Navigate, and Help. For a regular user operating in multi-tenancy mode, only a subset of the menu options is enabled.

  Note: All options are enabled for users defined as super users.

- **Plex ID, Sys ID.** The following characteristics apply for regular users operating in multi-tenancy mode:

  – The Plex ID (NAV1) field is read-only. You cannot switch to a different system outside the scope of your multi-tenancy definition. Instead, you must go back to the home workspace (PF3 or the HOME command) to select a different plex.

  – The Sys ID (NAV2) field is unlocked, or is as set by the individual OMEGAMON product. Many OMEGAMON products use validation of the Plex ID and Sys ID values together to ensure that an overwritten Sys ID value is within the scope of the Plex ID value. This validation is a registry lookup, and if not found an error message is displayed explaining that the combination of the Plex ID value (locked or not) and the Sys ID value is invalid.

  Note: These restrictions do not apply for users defined as super users.

- **Tabs.** Only those tabs that have been designated for inclusion are displayed in the workspace. This setting is made in the group definition, which is described in "Creating tenant definitions" on page 9.

- **Footer.** The name of the customer associated with the logged-on user is displayed in the minimize bar. This value is set in the customer definition, which is described in "Creating tenant definitions" on page 9.

Note: The **=panelid** command, which is used for out-of-context navigation, is not functional in multi-tenancy mode.

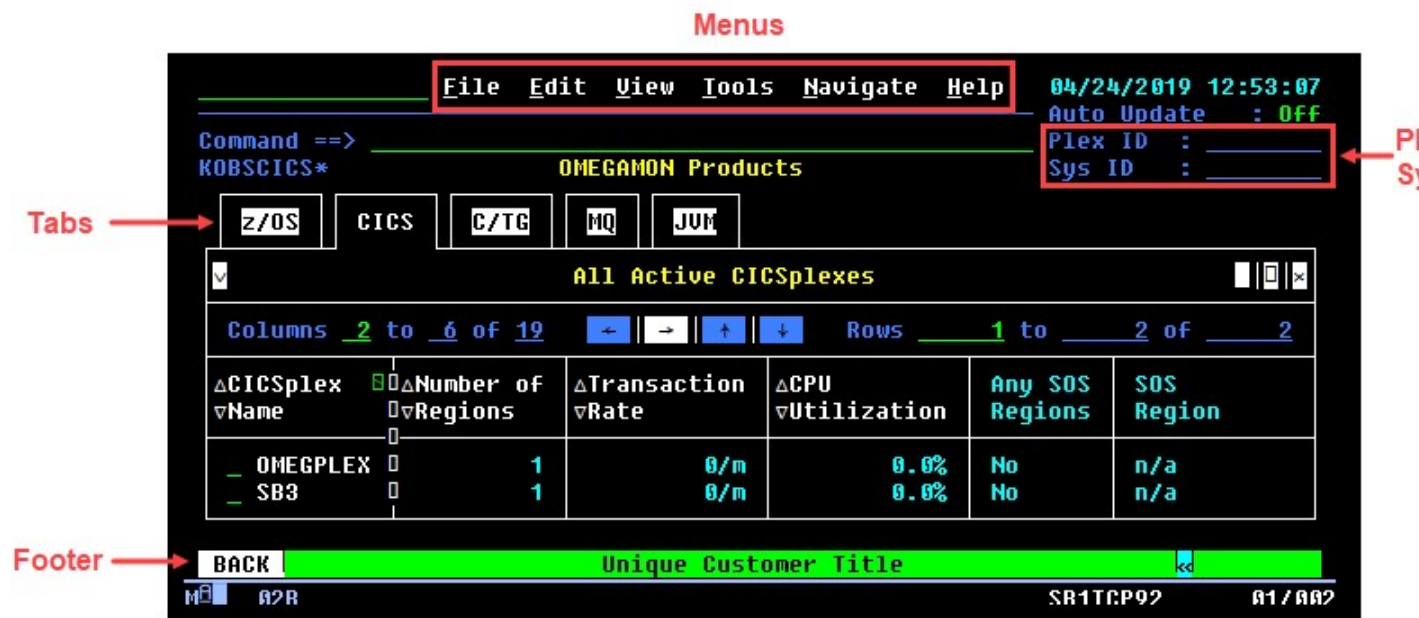The following figure highlights the items described in the list:

Figure 1. Workspace in multi-tenancy mode

Chapter 5. Troubleshooting

The troubleshooting section provides problem determination and resolution for the issues that are most commonly encountered with the OMEGAMON multi-tenancy feature.

First workspace does not load

When you log on in multi-tenancy mode, the first workspace does not load.

Symptom

The following error message is displayed:

```
                    First Workspace Error
The Initial workspace KOBLOGON is invalid. It is marked as a silent
workspace, but it did not set the ZDESTID variable. All silent
workspaces must set ZDESTID to enable forward navigation.

You should alter KOBLOGON to include the following statement:

SET ZDESTID=panelid

where panelid is your desired displayable first workspace.
```

Explanation

The OMEGAMON multi-tenancy solution uses a silent workspace, KOBLOGON, as the first workspace.

When you log on in multi-tenancy mode, the KOBLOGON workspace is invoked. This workspace retrieves multi-tenancy-related information for the user ID that is logging on, and then calls the first workspace to display, as defined for the group to which the user belongs.

In the silent KOBLOGON workspace, the first workspace to display is specified in the ZDESTID parameter, as shown in the following figure:

```
/******************************************************************/
/*          NAVIGATE FORWARD TO FIRST WORKSPACE                 */
/******************************************************************/

<SUBPANEL>

<EPILOG>
SET ZDESTID=&FIRSTWS
<EPILOGEND>

<SUBPANELEND>
```

The ZDESTID parameter by default should be set to the value in the FIRSTWS variable.

The FIRSTWS variable is defined in the group definition, which is shown in the following example:

```
GROUP:group,FIRSTWS=workspace,
SHOWEVT=value,SHOWZOS=value,SHOWCICS=value,SHOWCTG=value,SHOWIMS=value,
SHOWDB2=value,SHOWMQ=value,SHOWIIB=value,SHOWMFN=value,SHOWSTOR=value,SHOWJAVA=value
```

Procedure

1. In the KOBLOGON workspace definition, check that the ZDESTID variable is defined correctly.
2. In the group definition in the KOBGROUP member or in RACF, as appropriate for your setup, check that the FIRSTWS variable is set correctly.

No data condition

When you log on in multi-tenancy mode, the workspace loads but does not display any data.

Symptom

Multi-tenancy mode has been configured for the OMEGAMON enhanced 3270 user interface. The enhanced 3270 user interface address space has been started and you are able to log on, but your enhanced 3270 user interface is displaying an empty workspace.

Explanation

As described in "OMEGAMON multi-tenancy concepts and architecture" on page 1, in a single-tenant configuration, product-provided MSLs are used in the system-generated SQL queries for data collection while in a multi-tenancy configuration, user-defined MSLs are used, limiting the scope of collection to only those resources assigned to the tenant. If the user-defined MSLs are not set up correctly, it is possible that unexpected or no results will display.

To resolve the problem, you can analyze the system-generated SQL using trace. The following examples show how the queries appear in trace for single and multi-tenant configurations.

Single-tenant configuration

In a single-tenant configuration, a product-provided MSL name is used in the system-generated SQL query. The following example is of a standard trace of the enhanced 3270 user interface in a single-tenant configuration. The user is logging on to the CICS first workspace KOBSCICS. This example shows a typical workspace query that displays the CICS plexes defined to OMEGAMON:

```
KOBUIFD1I SQL1 Query Length : 00284
..SELECT CICSPLEX, NREGIONS, TRANRATE, CPUUTIL, AN+
YSOS, CBUFFW, CSTRINGW, ENQWAIT, IORATE, PAGERATE,+
 STGVIOL, AIDS, ICES, HIMAXTP, HIMAXTR, ALLACB, WP+
ERFINDX, WSERVCLAS, SOSREGION, ORIGINNODE  FROM OM+
CICS.KCPPLX  WHERE SYSTEM.PARMA('NODELIST','*IBM_C+
ICSplex',13)  ORDER BY CICSPLEX ASC
```

In this example, the query specifies a SYSTEM.PARMA value of NODELIST and "*IBM_CICSplex". "*IBM_CICSplex" is the product-provided MSL for the OMEGAMON for CICS product and will retrieve data from all Managed System Nodes (MSNs) defined within that MSL.

Multi-tenancy configuration

In multi-tenancy mode, the user-defined MSL name is substituted into the system-generated query. The substitution is reflected in the trace, as shown in the following standard trace excerpt:

```
============= MULTI-TENANCY MODIFY SQL ============
SYSTEM.PARMA('NODELIST','*IBM_CICSplex',13)  ORDER+
SYSTEM.PARMA('NODELIST','&CICSMSL',nn)       ORDER+
SYSTEM.PARMA('NODELIST','T_C5_TENANT_MSL',nn)     +
SYSTEM.PARMA('NODELIST','T_C5_TENANT_MSL',15)     +
==================================================
--------------------------------------------------
KOBUIGD1I SQL1 Query Length : 00291
SELECT CICSPLEX, NREGIONS, TRANRATE, CPUUTIL, ANYS+
OS, CBUFFW, CSTRINGW, ENQWAIT, IORATE, PAGERATE, S+
TGVIOL, AIDS, ICES, HIMAXTP, HIMAXTR, ALLACB, WPER+
FINDX, WSERVCLAS, SOSREGION, ORIGINNODE  FROM OMCI+
CS.KCPPLX  WHERE SYSTEM.PARMA('NODELIST','T_C5_TEN+
ANT_MSL',15        ORDER BY CICSPLEX ASC <ENDSQL><+
```

In this example, the multi-tenant customer was defined as having a CICS MSL of "T_C5_TENANT_MSL". The trace shows the step-by-step substitution process and the final SQL that will be sent to the TEMS.

Note: Only the OMEGAMON products that generate queries that use the following format are supported in multi-tenancy mode:

```
SYSTEM.PARMA=('NODELIST',"msl",nn)
```

Where *msl* is the product-provided MSL name and *nn* is the length of the name in characters.

Procedure

1. Initiate a trace.
2. Locate the following text: MULTI-TENANCY MODIFY SQL
3. Examine the details of the MSL substitution process and correct any errors.

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