This document provides information about Oracle Communications Unified Inventory Management (UIM) Release 7.3.3. The document includes information about the following topics:

- Software Compatibility
- New Features
- Oracle Communications Network Service Orchestration Solution 1.1.1 New Features
- Known Problems in UIM 7.3.3
- Fixed Issues in UIM 7.3.3
- UIM 7.3.2 Release Notes
- UIM 7.3.1 Release Notes
- UIM 7.3 Release Notes

**Software Compatibility**

- UIM 7.3.3 requires the use of Oracle Communications Design Studio Release 7.3.2.
- UIM 7.3.3 is compatible with Network Service Orchestration (NSO) Release 1.1.1.
- UIM requires Java SE 7. Be sure to keep Java up to date with the latest critical patch.
- See “Unified Inventory Management System Requirements” in UIM Installation Guide for a full list of software requirements.

**New Features**

The following sections provide information about new and enhanced features in UIM 7.3.3.

**Assigning Resources in Pending Statuses**

UIM 7.3.3 enables you to consume resources in pending statuses under certain conditions. Pending statuses include both Inventory statuses, such as Pending Install and Assignment statuses, such as Pending Unassign. For definitions of life cycle statuses and information about when they occur, see “Life Cycles and Statuses” in UIM Concepts.
You can assign a resource in a pending status as long as its effective date (the date on which the pending status will be resolved) is before the effective date of the configuration or other entity to which it is assigned.

You can consume resources in the following statuses:

<table>
<thead>
<tr>
<th>Status</th>
<th>Status Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pending Install</td>
<td>Inventory</td>
</tr>
<tr>
<td>Pending Available</td>
<td>Inventory</td>
</tr>
<tr>
<td>Pending Unassign</td>
<td>Assignment</td>
</tr>
</tbody>
</table>

Consumption of pending resources creates dependencies based on effective dates. UIM manages these dependencies by preventing consumption when it is not allowed. If you create a resource in the context of a business interaction, UIM prevents you from assigning that resource to a consumer in another context or in current inventory until the business interaction is complete.

UIM also manages dependencies within business interactions. A business interaction can include both the creation of a resource and its assignment to a consumer. For example, suppose you use an engineering work order to create a logical device that represents a provider-edge router. You want to assign the logical device to a connectivity design version that you are completing in the same engineering work order.

Because all of these tasks occur in the same engineering work order, the effective dates of the logical device and connectivity design version are the same. UIM manages dependencies to ensure that the assignment can be completed. When completing the engineering work order, UIM changes the logical device status to Installed status before the assignment occurs.

The same dependency management occurs for other statuses. For example, if a resource is unassigned from one consumer and assigned to another in the same business interaction, UIM ensures that the status changes occur in the proper order to allow the assignment.

You search for and assign pending resources the same way you do other resources. Search results for pending resources include information about their statuses and effective dates so you can determine whether you can assign them. See “Searching for Pending Resources” in UIM Concepts for more information.

Figure 1 illustrates a service configuration in which pending resources are assigned as configuration items. Note that the Assignment status of each of the resources is Pending Assign. The Resource column shows the Inventory status (Pending Install) of each resource. It also shows the due dates of the resources and information about engineering work orders to which they belong.
Changes to Resource Statuses and Hierarchies

UIM 7.3.3 displays status information differently than it did in previous releases. In previous releases, the Inventory status of a resource could be different in current inventory than it was in a business interaction context. In UIM 7.3.3, the Inventory status of resources is the same in all contexts.

Having a consistent view of resource statuses is important in UIM 7.3.3 because of the ability to assign pending resources. A resource created in a business interaction can now be assigned to a configuration version or design version in current inventory or another business interaction context. The resource and its status must therefore be visible outside of the context of the business interaction in which it was created.

For example, in older versions of UIM, a logical device created in a business interaction context was visible only in that context until the business interaction was completed. In UIM 7.3.3, that logical device is immediately visible in current inventory and in all business interaction contexts. Its status is Pending Install.

This new feature changes the way UIM validates entities. In UIM 7.3.3, validation occurs immediately after you make a change to a resource, whether the change occurs in current inventory or in a business interaction context. In previous releases, validation of changes in a business interaction context occurred only after the completion of the business interaction.

The new validation pattern affects resource hierarchies, such as device interface hierarchies in logical devices, port hierarchies in Equipment entities, and so on. For example, suppose that a logical device specification sets the maximum number of device interfaces at four. You create a logical device based on this specification and create two device interfaces in current inventory and two in a business interaction context. In UIM 7.3.3, you cannot create any additional device interfaces in any context because UIM considers the interfaces in both Installed and Pending Install status when it validates the logical device.

In previous versions of UIM, validations considered only the device interfaces created in the current context. The device interfaces created in the business interaction context were not considered until the business interaction was completed. As a result, you could create device interfaces in current inventory up to the maximum value. The logical device would therefore fail validation when you completed the business interaction because the maximum value was violated.

The following list includes additional examples of the differences between resource statuses in UIM 7.3.3 and earlier versions:
In UIM 7.3.3., a resource that you delete in a business interaction is in Pending Remove status in all contexts until the business interaction is completed. In previous releases, it was in Installed status in current inventory and contexts other than the one in which it was deleted. In the business interaction in which it was completed, the resource was not visible at all.

In UIM 7.3.3, a deactivated resource (Inventory status Unavailable) that you activate in an engineering work order transitions to Pending Available status in all contexts. In earlier versions of UIM, the resource would have remained in Unavailable status outside the context of the engineering work order.

Expanding the Configuration Hierarchy Display
You can now expand and collapse all or portions of configuration hierarchy tree views simultaneously. Previously you could expand only individual lines.

You use the Expand All, Collapse All, Expand All Below, and Collapse All Below commands in the View menu in the Configuration Items section of a Configuration Summary page for this purpose. Figure 2 shows these commands in a Service Configuration Summary page.

![View Menu in Service Configuration Summary Page](image)

Oracle Communications Network Service Orchestration Solution
1.1.1 New Features
Network Service Orchestration (NSO) Solution 1.1.1 includes the following enhancements:

- Improved Navigation in the User Interface
- Asynchronous Communication with Client Applications
- Updated REST API URLs and Parameters
Improved Navigation in the User Interface
You can now use standard NFV terminology for entities in the UIM user interface. The user interface provides specialized menu items and screens that allow navigation and display of NFV entities. This functionality is enabled by a new cartridge that you can deploy into UIM.

For more information, see the section about the sample branding cartridge in Network Service Orchestration Solution 1.1.1 Implementation Guide.

Asynchronous Communication with Client Applications
In previous releases, client applications had to query NSO to determine when an operation was completed. Querying was necessary because NSO service requests perform long-running processes.

In NSO 1.1.1, the solution provides the final status of network service life cycle actions asynchronously so that northbound systems no longer need to poll. The solution provides the final status of the following life cycle actions:

- Instantiate a network service
- Terminate a network service
- Add VNFs to a network service
- Delete VNFs from a network service
- Scale a VNF
- Configure a VNF
- Upgrade the software version of a VNF

For more information about these asynchronous responses, see Network Service Orchestration Solution 1.1.1 Implementation Guide.

Updated REST API URLs and Parameters
The REST API URLs and request parameters for the following life cycle operations have been updated:

- Discover VIM resources
- Instantiate network service
- Terminate network service
- Scale VNF
- Heal VNF
- Upgrade Network Service

See Network Service Orchestration Solution 1.1.1 Implementation Guide for detailed information about the latest versions of the REST API URLs and parameters.

Known Problems in UIM 7.3.3
Table 2 lists and describes the known problems in UIM 7.3.3.
<table>
<thead>
<tr>
<th>Bug Number</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>22453534</td>
<td>Spaces between the fields of characteristics are being trimmed, when product is configured to trim the spaces.</td>
<td>No workaround available.</td>
</tr>
<tr>
<td>23112771</td>
<td>IPv4 network search disappears on reset of saved search.</td>
<td>Restart the search from left navigator bar.</td>
</tr>
<tr>
<td>21830824</td>
<td>While upgrading to Release 7.3.1, you see an error stating that you are unable to revoke permissions for uimuser.</td>
<td>You can ignore this error. If you continue with the installation, UIM is deployed successfully.</td>
</tr>
<tr>
<td>21360819, 21360796</td>
<td>When you modify and redeploy rule sets containing Java or Groovy code, the modifications are not applied to the custom.ear file.</td>
<td>Redeploy dependent applications after you make such modifications.</td>
</tr>
<tr>
<td>22232510</td>
<td>During rehoming, connectivities at the VC3 level are not listed in the Impact Items tab in Rehome section of the Project Details page.</td>
<td>Verify the state of VC4 riders manually to inspect the impacted items down the hierarchy.</td>
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<td>The ruleset cache is not updated when a modified cartridge is deployed to UIM. Ruleset changes do not take effect.</td>
<td>Restart the UIM application.</td>
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<tr>
<td>19048380</td>
<td>When a network includes a rider pipe consuming multiple TDM connectivities, network node deletion fails.</td>
<td>Node deletion works correctly if the rider is a channelized connectivity rather than a pipe.</td>
</tr>
<tr>
<td>13813260</td>
<td>The Map View page displays a blue screen displayed when opened from the Recent Items menu.</td>
<td>In some cases, when you return to the Map View page by using the Recent Items menu, a blue screen is displayed rather than the correct content. You can open the Map View page normally from the Network Summary page.</td>
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<tr>
<td>12694608</td>
<td>Out-of-memory errors caused by deployment architecture.</td>
<td>You may experience out-of-memory errors if you deploy multiple cartridges with rulesets or super-cartridges that require server redeployment. The error can occur after three to eight redeployments. After the error occurs, you must restart the WebLogic server. You can avoid the error by manually restarting the server periodically while you are installing cartridges.</td>
</tr>
</tbody>
</table>
Fixed Issues in UIM 7.3.3

Table 3 lists the fixed issues in UIM 7.3.3.

<table>
<thead>
<tr>
<th>Bug Number</th>
<th>Issue</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>23051807</td>
<td>Path Analysis results are limited to two trails.</td>
<td>Path Analysis results now provide unlimited trails when there is no capacity provided or required for a pipe segment and when the Pipe specification is sharable.</td>
</tr>
</tbody>
</table>

UIM 7.3.2 Release Notes

This section includes the Release Notes content for UIM 7.3.2.

Model Documentation for UIM 7.3.2

No schema changes were made for UIM 7.3.2. As a result, the UIM Information Model Reference and Oracle Communications Information Model Reference are unchanged for this release. You can continue to use the UIM 7.3.1 versions of these documents.

UIM Service Fulfillment Web Service Packaging

The Service Fulfillment Web service enables an external system to create new business interactions and change existing business interactions in UIM. The web service packaging has changed in the following ways:

- In UIM Release 7.2.4, the Service Fulfillment Web Services were deprecated from the location of the UIMServiceFulfillment.war file, but remained there for backward compatibility. They were added to the existing InventoryWS.war file.
- In UIM Release 7.3.0, the Service Fulfillment Web Services were removed from the UIMServiceFulfillment.war file.

For UIM 7.3.0 release and beyond, you must ensure the correct URI value is updated to reflect the InventoryWS.war file location.

See UIM Web Services Developer’s Guide for more specific information about packing and about how to use the Service Fulfillment Web Service.
New Features
This section includes information about new features introduced in UIM 7.3.2.

Support for NSO 1.1
UIM 7.3.2 supports Oracle Communications Network Service Orchestration (NSO) Solution 1.1.

NSO 1.1 provides enhanced Network Function Virtualization (NFV) capabilities that enable you to onboard and deliver services on your network quickly. The solution is integrated with OpenStack, but also supports other third-party Virtualized Infrastructure Managers (VIMs). The solution supports customization and integration with third-party VNF managers, SDN Controllers, and VNF monitoring engines.

The NSO solution includes the following functionality:
- Onboarding of network services and VNFs
- Instantiation, scaling, and termination of network services
- Monitoring and healing of VNFs
- Resource orchestration

The NSO solution includes sample cartridges that you can use to implement network protection as a service. For more information about the NSO solution, see Oracle Communications Network Service Orchestration Solution 1.1 Implementation Guide.

Known Problems in This Release
No new known problems have been identified in UIM 7.3.2. See "Known Problems in UIM 7.3.1" for information about known problems found in the previous release.

UIM 7.3.1 Release Notes
This section includes the Release Notes content for UIM 7.3.1.

New Features
The following sections describe the new features introduced in UIM 7.3.1.

Workflow Management
UIM 7.3.1 includes enhanced workflow management features. These features enable you to use projects, business interactions, and engineering work orders to plan and manage activities such as site build-outs and network expansion.

You can now add workflow templates to business interactions and engineering work orders. Workflow templates define an ordered series of activities that must be completed before you can complete the engineering work order or business interaction.

Workflow Overview
UIM 7.3.1 features address all phases of workflow management, from design to implementation:
- You design workflows as Process specifications in Design Studio. You use a graphical tool to design workflows that include ordered sets of activities and
transitions. The content of activities are determined by Task specifications and Checklist specifications. When you deploy Process specifications to UIM, they become available as workflow templates that can be associated with engineering work orders and business interactions.

The following illustration shows the graphical tool that you use to design workflows in Design Studio.

See Design Studio Help and “Designing Workflows” in UIM Concepts for more information.

- In UIM, project managers and others can create business interactions and engineering work orders that include workflow templates. You can optionally group related business interactions and engineering work orders into projects.

- Project managers assign workflow activities to users. They also monitor workflow progress, add activities to workflows, and change activity statuses. See “Updating Workflows” and “Monitoring Progress” in UIM Concepts for more information.

The following illustration shows the Gantt Chart tab, one of the tools that you can use to monitor and manage workflows.

- Users assigned to activities receive email notifications when their activities are ready to be worked on. By default, UIM sends notifications when activities are assigned to users or user groups and when activities transition to Ready
status. You can extend notification to include additional events (including events unrelated to workflows) and additional types of notification.

See “About Email Notification” in UIM Concepts and “Extending Email Notification” in UIM Developer’s Guide for more information.

- Assigned users track their work in UIM. The My Activities page in UIM displays a list of assigned activities that are ready to be completed. The My Group Activities page displays the same information for a work group. See “About Assigned Activities” in UIM Concepts for more information.

The following illustration shows the My Activities page.

![My Activities](image)

### Workflow-Related Specifications in Design Studio and Entities in UIM

The relationship between workflow-related specifications that you define in Design Studio and entities that you create in UIM is different from that of other specifications and entities.

- An Engineering Work Order in Design Studio does not correspond to an Engineering Work Order in UIM. Engineering Work Orders in UIM are all based on the same specification (Engineering Work Order), which is a specially-configured Business Interaction specification.

- In Design Studio, you define Process specifications, which include process flows. When you deploy Process specifications to UIM, they become available as workflow templates to business interactions and engineering work orders.

- In Design Studio, you define Task specifications that you associate with activities in process flows. In UIM, only activities are visible. Their content is determined by the Task specification with which they are associated in Design Studio.

### Packet-Over-Packet Connectivity

UIM 7.3.1 enables you to enable packet connectivity with packet connectivity. This capability is sometimes called “packet-over-packet.” For example, a 40GigE Carrier Ethernet connectivity can enable a 10GigE Carrier Ethernet connectivity.

For each segment of the path, the rate code of the enabling connectivity must be greater than or equal to the rate code of the enabled connectivity. For example, an
Ethernet connectivity with a 10GigE rate code can be enabled by a connectivity with a 40GigE rate code but not by one with a 1GigE rate code.

Packet connectivities enabled by other packet connectivities must be terminated on flow interfaces. This rule is true throughout all levels of enablement. For example, your inventory could include a 40GigE connectivity enabling a 10GigE which enables a 1GigE connectivity. In this situation, 10GigE and 1GigE connectivities must be terminated on flow interfaces. Assuming it is not enabled by another packet connectivity, the 40GigE connectivity can be terminated on either a flow interface or directly on a media interface.

For packet connectivities not enabled by other packet connectivity, you can terminate directly on a media interface only if its rate code exactly matches the rate code of the connectivity. If the rate codes, do not match, you see an error message.

If the rate code of the media interface exceeds that of the connectivity, UIM creates a child flow interface that matches the capacity of the connectivity. It then terminates the connectivity on that flow interface. The remaining capacity of the parent media interface remains available for consumption.

Figure 3 shows the menu in the Connectivity Design tab in which you select how you want to terminate a connectivity. If you select Terminate at Media Interface, you can select a media interface. If you select Terminate at Flow Interface, you select a media interface and UIM automatically creates a flow interface for you.

Figure 3 Choosing a Termination Interface

Service Connectivity Enhancements
UIM 7.3.1 supports two types of service connectivity:

- Service configuration-controlled service connectivities existed in previous UIM releases. They exist and can be created only as part of service configurations. See “Service Configuration-Controlled Connectivity” in UIM Concepts for more information.

- Service connectivities that can exist outside of service configurations are new in UIM 7.3.1. For example, you can create service connectivities that represent the connectivity requirements of a VoIP service. You can also use service connectivities to represent circuits that are designed internally by a provider, such as an X2 link in an LTE backhaul scenario. See “Service Connectivity Examples” in UIM Concepts for examples of these types of service connectivities.

OTN Support
UIM 7.3.1 supports Optical Transport Network (OTN) connectivity. OTN is a series of standards created to combine the benefits of SONET/SDH with the bandwidth-expanding capabilities of Wave Division Multiplexing (WDM). OTN is able to carry many types of data, including both channelized and packet signals.

Support for Single Sign-On Authentication
UIM now includes support for single sign-on (SSO) authentication. UIM implements the SSO authentication solution using Oracle Access Manager, which enables you to seamlessly access multiple applications without being prompted to authenticate for each application separately. The main advantage of SSO is that you are authenticated only once, which is when you log in to the first application; you are not required to authenticate again when you subsequently access different applications within the same web browser session.

UIM also supports single logout (SLO). If you access multiple applications using SSO within the same web browser session, and then if you log out of any one of the applications, you are logged out of all the applications.


UIM Reference Web Service
The UIM 7.3.1 Reference Web Service now includes a single web service example. The previously deprecated operations have been removed. The web service example is based on the creation of logical device.

You can now find the Reference Web Service in the UIM Software Developer’s Kit (SDK). See “Developing Custom Web Services” in UIM Web Services Developer’s Guide for more information.

Known Problems in UIM 7.3.1
Table 4 lists and describes the known problems in UIM 7.3.1.

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<thead>
<tr>
<th>Bug Number</th>
<th>Description</th>
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</tr>
</thead>
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<td>21830824</td>
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</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-------</td>
</tr>
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<td>19048380</td>
<td>When a network includes a rider pipe consuming multiple TDM connectivities, network node deletion fails.</td>
<td>Node deletion works correctly if the rider is a channelized connectivity rather than a pipe.</td>
</tr>
<tr>
<td>20144423</td>
<td>The Network Service Orchestration (NSO) solution requires that a VNF manager must fully complete a set of actions in a service request or, in the case of failure, that it fully roll back that set of actions. If the VNF manager does not roll back all the actions in the service request, NSO will be out of sync with the VNF manager and the VNF.</td>
<td>In the case of a service request failure in which the VNF manager does not roll back all the actions in the service request, you must roll back the actions manually.</td>
</tr>
<tr>
<td>13813260</td>
<td>The Map View page displays a blue screen displayed when opened from the Recent Items menu.</td>
<td>In some cases, when you return to the Map View page by using the Recent Items menu, a blue screen is displayed rather than the correct content. You can open the Map View page normally from the Network Summary page.</td>
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</tr>
<tr>
<td>10242392</td>
<td>System allows the creation of duplicate IDs.</td>
<td>When you create ranges of equipment or logical device entities, IDs that duplicate existing entities can be created. To avoid this issue, ensure to specify ID ranges that do not duplicate existing entities. <strong>Note:</strong> This issue does not apply to telephone number range creation.</td>
</tr>
</tbody>
</table>
**Fixes in UIM 7.3.1**

Table 5 lists customer-reported bugs and previous known issues that have been fixed in UIM 7.3.1.

**Table 5  Fixed Issues in UIM Release 7.3.1**

<table>
<thead>
<tr>
<th>Bug Number</th>
<th>Issue</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>20477648</td>
<td>When upgrading from UIM 7.2.4.1 or UIM 7.2.4.2, the installer displays the following error: &quot;Unable to revoke permissions for the role uimuser. Permissions not found. MBeanserver has thrown an unknown exception. Please check installer log files for more details&quot;</td>
<td>The installer code has been corrected so this error no longer occurs.</td>
</tr>
</tbody>
</table>

**UIM 7.3 Release Notes**

This section includes the Release Notes content for UIM 7.3.

**New Features Introduced in UIM 7.3**

This section provides information about features introduced in UIM 7.3.

**Connectivity Enhancements**

UIM 7.3 introduces a large number of new and improved features related to connectivity. See UIM Concepts and UIM Help for additional information about all of these features.

**Connectivity Specifications**

In releases prior to UIM 7.3, you could not create multiple Connectivity specifications. Instead, there was a single specification (TDM Facility). All Connectivity entities created in UIM were based on that specification. You could modify it only by adding entity-level characteristics.

You can now define Connectivity specifications in Design Studio and create entities based on those specifications in UIM. Just as with other specifications, you can include characteristics, rulesets, and so on. In addition, when you define a Connectivity specification, you designate its connectivity type. See “Connectivity Types” for more information.

For backward compatibility, the TDM Facility specification still exists, but has been renamed from TDM Facility to Channelized Facility. UIM entities based on that specification are unchanged.

**Connectivity Types**

UIM now supports three types of Connectivity entities, each of which is designed for use with particular technologies. When you define a Connectivity specification, you specify one of the following connectivity types:
Multiplexed. Multiplexed (or Channelized) connectivities support technologies such as E-Carrier, T-Carrier, J-Carrier, SDH, and SONET, and WDM.

Packet. Packet connectivities support technologies such as Ethernet, Frame Relay, ATM, and MPLS. See "Support for Packet Connectivity" for additional information.

Service. Service connectivities deliver services to end customers. Service connectivity consumes other types of connectivity and resources, but cannot be consumed itself. Service connectivities are used as part of service arrangements involving packet technology, such as Carrier Ethernet.

The specifications for the three connectivity types include different default characteristics. In UIM, you see a different set of tabs in Connectivity Summary pages depending on the connectivity type.

Support for Packet Connectivity
UIM now includes dedicated Packet Connectivity entities to support networking technologies such as Ethernet, Frame Relay, Asynchronous Transfer Mode (ATM), and Multiprotocol Label Switching (MPLS).

In release previous to UIM 7.3, you modeled packet connectivity by using Pipe entities, while multiplexed technologies were supported by Channelized Connectivity entities. With the addition of Packet Connectivity entities, you can now address most common telecommunications connectivity scenarios by using Connectivity entities. Connectivity entities take advantage of pre-defined rate codes, technologies, functions, and other attributes. (Pipe entities are still fully supported for backward compatibility and to model physical connectivity such as cable pairs and local loops.)

Packet connectivity can coexist with channelized connectivity and pipes. For example, a packet facility can be enabled by one or more channels of a T-Carrier channelized connectivity. Similarly, a packet connectivity can enable or be enabled by a pipe.

In addition to Packet Connectivity entities themselves, UIM 7.3 includes flow interfaces and flow identifiers that are used in packet scenarios. See "Flow Interfaces" and "Flow Identifiers" for more information.

New sample cartridges available with UIM 7.3 provide specifications that enable you to implement packet services. You can also create your own packet connectivities in Design Studio. See "Support for Carrier Ethernet Services" and "Sample Cartridges and Cartridge Packs" for more information about the sample cartridges.

Flow Interfaces
To support packet connectivity, UIM now includes Flow Interface entities.

Flow interfaces partition media interfaces (device interfaces at the top of their hierarchies) into virtual channels based on bit rate. Flow interfaces are similar to the sub-device interfaces used to terminate channelized connectivity, but are used to terminate packet connectivity only. They have configurations that capture their attributes.

When you define a Flow Interface specification, you specify one of four termination types:

- Access. Indicates that the purpose of an interface is to terminate connectivity that provides access to a service provider network, such as Ethernet UNI connectivity.
- **Internetwork.** Indicates that the purpose of an interface is to terminate connectivity that interconnects two service provider networks, such as Ethernet E-NNI connectivity.

- **Trunk.** Indicates that the purpose of an interface is to terminate connectivity that connects equipment and devices in the same network, such as Ethernet I-NNI connectivity.

- **Unknown.** Indicates that the purpose of the interface is unknown. Used to support scenarios not covered by the Access, Internetwork, and Trunk termination types.

**Flow Identifiers**

To support packet connectivity, UIM now includes Flow Identifier entities. Flow identifiers are used to represent the ways that various packet network technologies identify and distinguish network traffic. By isolating network traffic in this way, the same physical or infrastructure network can support multiple virtual networks. For example, the Ethernet technology uses VLAN IDs (or *tags*) for this purpose.

Flow identifiers are defined by specifications. Predefined flow identifier specifications are provided in the Carrier Ethernet and Packet sample cartridges, but you can also define your own in Design Studio.

**Support for Carrier Ethernet Services**

The Carrier Ethernet sample cartridge pack (OracleComms_UIM_CarrierEthernet) supports the implementation of Carrier Ethernet services with UIM.

The Carrier Ethernet cartridge pack models Carrier Ethernet services and networks based on the MEF 10.3, 23.1, and 26.1 definitions. It models the components laid out in the MEF definitions as UIM entity specifications. You can deploy these specifications as-is to UIM, or you can clone and modify them in Design Studio.

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**Note:** The Carrier Ethernet cartridge replaces the Metro Ethernet Technology Pack, an older UIM cartridge that models some of the same components. Because the Carrier Ethernet cartridge uses current UIM features and is based on the latest Carrier Ethernet 2.0 MEF specifications, Oracle recommends that you use it for Carrier Ethernet solutions rather than the Metro Ethernet cartridge.

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The cartridge pack includes specifications for:

- Services, including E-Line and E-Lan services.
- Networks, including EVCs and OVCs.
- Connectivities, including INNI, ENNI, and UNI.
- Flow identifiers, including SP VLAN IDs and CE VLAN IDs.
- Performance parameters, including Class of Service and Bandwidth Profiles.
- Flow interfaces, including Access, Trunk, and Internetworking interfaces.

The cartridge pack is fully documented. See *UIM Carrier Ethernet Cartridge Pack Guide* for introductory and reference information as well as implementation examples. See *"Sample Cartridges and Cartridge Packs"* for information about additional sample cartridge packs.
Sample Cartridges and Cartridge Packs
UIM 7.3 includes new sample cartridges and cartridge packs, which are delivered differently than in previous releases. These sample cartridges and cartridge packs address four networking and connectivity technologies:

- UIM Carrier Ethernet cartridge pack (OracleComms_UIM_CarrierEthernet)
- UIM Packet cartridge (OracleComms_UIM_Packet)
- UIM DSL cartridge (OracleComms_UIM_DSL)
- UIM Channelized cartridge (OracleComms_UIM_Channelized)

In addition to these new connectivity samples, the domain-specific cartridge packs previously classified as technology packs are now available as samples:

- Cable TV cartridge pack
- Consumer VoIP cartridge pack
- GSM 3GPP cartridge pack
- L2 VPN cartridge pack
- Metro Ethernet cartridge pack
- MPLS L3 VPN cartridge pack

You can open the cartridge packs in Design Studio to view their content or extend them.

Many of the cartridge packs have full documentation. They are available for download as part of the UIM software from the Oracle Software Delivery Cloud at:

https://edelivery.oracle.com/

The sample cartridge packs and their documentation are included in the OracleComms_UIM_CartridgePacks.zip file.

Network Enhancements
To support packet connectivity, UIM 7.3 includes Network entity enhancements.

Network Technologies and Network Types
When you define a Network specification in Design Studio, you must now select a network type and a technology. The network type is not displayed for Network entities in UIM, but drives the functionality associated with them. The network type and network technology are interdependent.

In UIM 7.3, when you create a Network entity, you specify a technology. The technology determines which specifications you can use to create the entity. For example, if you set the Technology data element to Ethernet, you can select only a specification that is valid for the Ethernet technology. (You can also set the technology to Undefined.) Valid technologies are defined in the Base Technologies cartridge. See UIM Cartridge Guide for more information.

There are three types of networks in UIM. You specify the type when you define a Network specification in Design Studio. The network type and the network technology are interdependent.

- An infrastructure network is a resource-based network such as SDH, ATM, Ethernet, or MPLS.
A packet virtual network (PVN) is a collection of the interfaces and connectivities that support a packet-based connectivity service. Multipoint Ethernet virtual circuits (EVCs) are examples of PVNs. See "Packet Virtual Networks" for more information.

A service network consolidates service locations, network access connectivity, and supporting virtual networks to provide a unified view of a connection-oriented service. See "Service Networks" for more information.

The network type and the network technology are interdependent:

- The Undefined technology is available for Network and Service Network types.
- Packet technologies, such as ATM, Frame Relay, MPLS and Ethernet, are available for Packet Virtual Network and Service Network types.
- All other technologies are available for the Network type.

Packet Virtual Networks

UIM 7.3 includes a new type of network, the packet virtual network (PVN). PVNs represent the elements in a service provider’s network that fulfill a connection-oriented service based on packet technologies such as Ethernet, ATM, Frame Relay, and MPLS.

A PVN typically includes nodes that represent flow interfaces and edges that represent packet network connectivity and cross-connects. See "Flow Interfaces" for more information about flow interfaces.

---

**Note:** PVNs are not required to have any edges. They can exist as a set of nodes that represent flow interfaces with no edge connectivity modeled.

---

PVNs can be referenced by multiple services and are always created with configurations.

Service Networks

Service networks are virtual networks that provide an end-to-end view of a connection-oriented service, such as a multipoint Ethernet service. Unlike other networks, you create service networks from the service configuration of the parent service.

For example, if you have a Carrier Ethernet service, its service network is based on the resources that enable the service.

A service network can include nodes that represent:

- Packet virtual networks that support the service
- Service locations
- Parties that represent service providers who own external networks that support the service

A service network can include edges that represent:

- Service connectivity
- Network access connectivity that links packet virtual networks

**Figure 4** illustrates a service network that includes three service locations, three packet virtual networks, and network access connectivities that connect them.
**SONET and SDH Attributes**

Some data elements that used to be included in all Network specifications are now relevant only to networks based on the SONET and SDH technologies. These data elements are: **Enforce Same Channel Assignment**, **Ring Type**, and **Protection Type**.

If you used a previous version of UIM, the upgrade process will convert existing entities to SONET or SDH-based specifications depending on their **Protection Type** values.

**Property Location Enhancements**

UIM 7.3 includes enhancements to the Property Location entity, in part to support packet connectivity.

**Service Locations**

UIM 7.3 introduces a new kind of property location, the service location. A service location represents the place where a service originates or where the service is delivered. (Service locations are sometimes called customer sites or end-user locations.) For example, a Carrier Ethernet service is delivered to one or more service locations by a service provider.

Service locations can be outside the boundaries of a service provider’s network. For example, **Figure 5** illustrates a Carrier Ethernet network in which two service locations are inside the service provider network and one service location is outside it.
Figure 5 Service Locations

Because service locations can be outside of the service provider network, they do not require network location codes or network entity codes. In cases where service locations are within your provider network, however, you may want to identify a service location as a network location by assigning it a network location code. In this scenario, the Property Location entity is both a service location and a network location.

Property Locations in Place Hierarchies
You can now include property locations in place hierarchies. For example, you could create property locations for sites that host equipment and include them in the hierarchies of Place entities that represent geographic areas.

See UIM Concepts and UIM Help for more information about property locations and place hierarchies.

IP Address Management
UIM 7.3 introduces native IPv4 and IPv6 Address management. In previous releases, you modeled IP addresses by using Custom Network Address entities. UIM now provides a consolidated view of your IP address inventory for service and network management.

Using the new IP address management features, you can:

- Create IPv4 and IPv6 network addresses.
- Partition subnets to support variable length subnet masking (VLSM).
- Join subnets to form larger subnets.
- Create host IP addresses.
- Track IP addresses from initial creation through statuses and uses.
- Reserve IP addresses for a specific purpose.
Assign IP addresses to services, logical devices, logical device accounts, device interfaces, and networks.

You can also use UIM resource pools to group IP addresses by service, geography, and other categories. Figure 6 illustrates a resource pool that contains IPv4 and IPv6 subnets.

**Figure 6  IP Address Resource Pool**

You can use Oracle BI Publisher (or a third-party reporting tool) to generate utilization reports for your IP inventory. Sample BI Publisher reports are provided with UIM and can be customized to meet your requirements.

Web Services can be used for all aspects of IP address management, including:

- Bulk creation and deletion of IP addresses and subnets
- Reservation of IP addresses and subnets
- Assignment of IP addresses and subnets based on geography or service type
- Auto-creation and assignment of IP addresses and subnets

If you modeled IP addresses as custom network addresses in an earlier release, you can continue to use those entities or upgrade to take advantage of the improved new functionality.

See *UIM Concepts* and UIM Help for more information about IP address management.

**Network Targets**

UIM 7.3 includes support for network targets. A network target is a resource on which services or other resources must be activated. For example, in a GSM network, a voice mail service must be activated on a voice mail server. In this scenario, the voice mail server is the target for the voice mail account.

In UIM, you use the **Target** role type to identify Logical Device or Party entities as network targets. This capability enables UIM to pass information about network targets to activation systems.
When you assign a Target role to a Logical Device or Party entity, it becomes a target for other entities associated with it in various ways.

You can see information about network targets in two places in Logical Device and Party Summary pages and in the Configuration Items section of Configuration pages. See UIM Concepts and UIM Help for more information about network targets.

**Network Address Domains**

You can now use network address domains to define a context for the uniqueness of network addresses. You define Network Address Domain specifications in Design Studio. In UIM, you can use network address domains with the following entities:

- Flow identifiers
- IPv4 addresses
- IPv6 addresses
- IP subnets
- Telephone numbers

Predefined Network Address Domain specifications are included in some sample cartridges, such as the Carrier Ethernet cartridge.

See UIM Concepts and UIM Help for more information about network address domains.

**Inventory Group Types and Resource Pools**

In Design Studio, you can now optionally associate Inventory Group specifications with Inventory Group Type specifications. Inventory group types define specific entities or groups of entities that can or must be included in the inventory group. Inventory groups with inventory group type associations are called resource pools.

Resource pools are used to manage the assignment of resources in UIM. For example, you can create a Telephone Number Resource Pool Inventory Group Type specification in Design Studio and then associate it with appropriate inventory group specifications to define telephone number resource pools. In UIM, you can add telephone numbers to these resource pools and use them to manage assignments.

See UIM Concepts and UIM Help for more information about inventory group types and resource pools.

**Groovy Language Support in Rulesets**

UIM 7.3 includes support for developing Groovy scripts to provide the rule logic within a ruleset to extend UIM, in addition to the existing Drools rule functionality. Groovy is a dynamic language that compiles into Java byte code, and has a high degree of flexibility in semantics compared to Java code. In Design Studio, you can now choose whether you want a rule to execute at runtime with a given Groovy script or a Drools rule. Both Groovy and Drools logic can exist for a single rule, which aids in converting existing Drools rule logic into Groovy scripts.

For more information on keywords, operators, and semantics, see more on the Groovy Language at the following Web site:

http://www.groovy-lang.org/index.html
NSO Cartridge Version
A new version of the NSO cartridge has been released to work with UIM 7.3. You must use cartridge version 1.0.1 with UIM 7.3. Version 1.0 is incompatible.

Fixes in This Release
Table 6 lists customer-reported bugs and previous known issues that have been fixed in UIM 7.3.

Table 6  Fixed Bugs

<table>
<thead>
<tr>
<th>Service Request (SR) Number</th>
<th>BugDB Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR:3-10714431281</td>
<td>21096673</td>
<td>Issue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UIM ignores the value set for the RowLockExpirationDuration property in the system-config.properties file.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resolution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The code has been corrected to honor the value set for this property.</td>
</tr>
<tr>
<td>SR:3-8997463771</td>
<td>18760488</td>
<td>Issue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cannot delete referenced device interfaces in canceled configurations.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resolution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The UIM API has been corrected allow these deletions.</td>
</tr>
<tr>
<td>SR:3-8376560641</td>
<td>18144611</td>
<td>Issue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unable to search for Calendar-type characteristics based on the dateTime primitive data type with Greater Than and Lesser Than operators.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resolution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The UIM API has been corrected to allow these searches.</td>
</tr>
</tbody>
</table>

Known Problems in This Release
Table 7 lists the known problems in UIM 7.3.
<table>
<thead>
<tr>
<th>Service Request (SR) Number</th>
<th>DB Number</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
</table>
| NA                         | 20477648   | When upgrading from UIM 7.2.4.1 or UIM 7.2.4.2 to UIM 7.3.0, the installer displays the following error:  
“Unable to revoke permissions for the role uimuser. Permissions not found. MBeanserver has thrown an unknown exception. Please check installer log files for more details” | You can ignore this error.                                                                                                                                                                                                                                         |
| NA                         | 19795972   | When upgrading cluster installations from UIM 7.2.4.1 to UIM 7.3, the upgrader reports a sever error if you choose to upgrade Map Viewer.  
If you select Retry in the error dialog box, Map Viewer and UIM are upgraded successfully.  
If you select Continue in the error dialog box, UIM is upgraded successfully. You must redeploy Map Viewer from Weblogic Console. |                                                                                                                                                                                                                                                                  |
| NA                         | 19048380   | When a network includes a pipe consuming multiple TDM connectivities, network node deletion fails.  
This issue does occur when channelized connectivity consumes multiple connectivities.                                                                                                                      |                                                                                                                                                                                                                                                                  |
| NA                         | 20144423   | The Network Service Orchestration (NSO) solution requires that a VNF manager fully completes a set of actions in a service request. If the VNF cannot fully complete the actions, it must roll back all actions in the request.  
If the VNF manager does not roll back all the actions in the service request, then NSO will be out of sync with the VNF manager and the VNF.  
If a service request fails and the VNF manager does not roll back all actions, you must roll back the actions manually in the VNF manager.                                                                 |                                                                                                                                                                                                                                                                  |
**Table 7 (Cont.) Known Issues**

<table>
<thead>
<tr>
<th>Service Request (SR) Number</th>
<th>DB Number</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
</table>
| NA                          | 18481828  | During upgrade to UIM 7.2.4, an error message appears stating that the application cannot be deployed. The upgrade log displays a message similar to the following:  
  <Mar 28, 2014 12:34:53 PM IST> <Error>  
  <Deployer> <BEA-149265>  
  <Failure occurred in the execution of deployment request with ID '1395990272881' for task '13'.  
  Error is:  
  'weblogic.application.ModuleException: Exception activating module: EJBModule(inventoryEJB.jar)'. | Ignore this error. Click **Continue** in the installer interface to proceed with the upgrade. The upgrade will complete without additional errors. UIM will be accessible after restart. |
| NA                          | 13813260  | The Map View page displays a blue screen displayed when opened from the **Recent Items** menu.                                                                                                                                                               | In some cases, when you return to the Map View page by using the **Recent Items** menu, a blue screen is displayed rather than the correct content.  
  You can open the Map View page normally from the Network Summary page. |
## Table 7 (Cont.) Known Issues

<table>
<thead>
<tr>
<th>Service Request (SR) Number</th>
<th>DB Number</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>12694608</td>
<td>Out-of-memory errors caused by deployment architecture.</td>
<td>You may experience out-of-memory errors if you deploy multiple cartridges with rulesets or super-cartridges that require server redeployment. The error can occur after three to eight redeployments. After the error occurs, you must restart the WebLogic server. You can avoid the error by manually restarting the server periodically while you are installing cartridges.</td>
</tr>
<tr>
<td>NA</td>
<td>10242392</td>
<td>System allows the creation of duplicate IDs.</td>
<td>When you create ranges of equipment or logical device entities, IDs that duplicate existing entities can be created. To avoid this issue, ensure to specify ID ranges that do not duplicate existing entities. <strong>Note:</strong> This issue does not apply to telephone number range creation.</td>
</tr>
<tr>
<td>NA</td>
<td>NA</td>
<td>The ora_uim_base_tags base cartridge is not packaged with the other base cartridges.</td>
<td>For this release, this base cartridge has been packaged with the sample cartridges in the OracleComms_UIM_CartridgePacks.zip file. You can download this file as part of the UIM software from the Oracle Software Delivery Cloud at: <a href="https://edelivery.oracle.com/">https://edelivery.oracle.com/</a></td>
</tr>
</tbody>
</table>

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