Oracle® Communications Network Integrity

Optical UIM Integration Cartridge Guide

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Oracle Communications Network Integrity Optical UIM Integration Cartridge Guide, Release 7.3.2

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Contents

7 About Design Studio Construction

8 About Design Studio Extension

Preface

This guide describes the functionality and design of the Oracle Communications Network Integrity Optical UIM Integration cartridge.

Audience

This guide is intended for network administrators who want to understand the design and functionality of this cartridge, and for Network Integrity integrators and developers who want either to build or to extend similar cartridges.

You should be familiar with the following documents:

- *Network Integrity Concepts*: for an overview of Network Integrity
- *Network Integrity Developer's Guide*: for detailed information about Network Integrity cartridge components and extensibility
- *Network Integrity Installation Guide*: for information about the cartridge deployer to deploy and undeploy cartridges to the run-time application
- *Network Integrity UIM Integration Cartridge Guide*: because the Optical UIM Integration cartridge extends the UIM Integration cartridge
- *Network Integrity Optical TMF814 CORBA Cartridge Guide*: because the Optical UIM Integration cartridge extends the Optical TMF814 CORBA cartridge

This guide assumes that you are familiar with the following Oracle products and components:

- Oracle Communications Design Studio for Network Integrity
- Oracle Communications Unified Inventory Management (UIM)
- Network Integrity Optical TMF814 CORBA Cartridge

This guide assumes that you are familiar with the following concepts and technologies:

- Development and extensibility of Network Integrity cartridges
- TMF814 and Multi Technology Network Management (MTNM) standards and terminology
- Common object request broker architecture (CORBA) standards and terminology
- Synchronous digital hierarchy (SDH)
- Oracle Communications Information Model

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Document Revision History

The following table lists the revision history for this guide:

Version	Date	Description
E66047-01	May 2016	Initial release.

1

Overview

This chapter provides an overview of the Oracle Communications Network Integrity Optical UIM Integration cartridge.

About the Optical UIM Integration Cartridge

The Optical UIM Integration cartridge demonstrates end-to-end integration of TMF814 discovery and assimilation of your synchronous digital hierarchy (SDH) networks with Oracle Communications Unified Inventory Management (UIM).

The reference implementation contained in this cartridge discovers and models physical and logical entities for Huawei OptiX OSN 3500 devices. The physical and logical entities can be assimilated into end-to-end optical SDH circuits.

The reference implementation demonstrates full integration with UIM for import, discrepancy detection, and discrepancy resolution with all discoverable and assimilated entities.

The reference implementation demonstrates automatic discrepancy resolution. Automatic discrepancy resolution enables Network Integrity to automatically correct specific discrepancies without the user having to interact with the UI. Complete the reference implementation to specify the types of discrepancies that you want automatically resolved. The automatic discrepancy resolution reference implementation is built using Java. See *Network Integrity Developer's Guide* for more information.

For the Huawei OptiX OSN 3500 device model, this cartridge implements modeling of only a single shelf. This cartridge can be modified to support systems in your configuration that have a multi-shelf setup that use Huawei OptiX OSN 3500 extended subracks.

About the Physical and Logical Device Hierarchies

The Optical UIM Integration cartridge discovers your network using a TMF814 common object request broker architecture (CORBA) interface. This cartridge provides discovery actions capable of discovering both physical (equipment) and logical (interface) hierarchy details of managed elements (MEs). This cartridge uses the TMF814 CORBA interface as a discovery protocol to connect and retrieve details from network-management systems (NMSs) or element-management systems (EMSs).

Using this cartridge, you can build Network Integrity to capture and retrieve data about a network system from equipment and system vendors that have adopted the TMF814 standard.

The Optical UIM Integration cartridge can be used to discover the following network systems:

- Synchronous optical networking (SONET)
- Synchronous digital hierarchy (SDH)
- Dense wavelength-division multiplexing (DWDM)
- Asynchronous transfer mode (ATM)
- Ethernet

This cartridge supports versions 2.0, 2.1, 3.0, and 3.2 of the TMF814 implementation for the ManagedElementMgr and EquipmentInventoryMgr managers.

This cartridge translates Multi Technology Network Management (MTNM) objects obtained during discovery into the Oracle Communications Information Model and then writes the objects to the Network Integrity database. The cartridge supports model correction to show only a single shelf.

To ensure scalability, this cartridge processes MEs individually. The duration of a discovery scan is proportional to the number and size of MEs to be discovered. You cannot pause and resume a scan, but you can stop a scan.

Import allows logical device and physical device hierarchies in UIM to be imported to Network Integrity to compare objects with discovered data.

Discrepancy detection compares the logical trees of what is discovered and what is imported from UIM. Filtering is required to set the boundaries of the comparator. For more information about discrepancy detection actions and processors, see *Network Integrity Developer's Guide*.

Discrepancy resolution allows the discovered logical device and physical device hierarchies to be created and updated in UIM.

About Cartridge Dependencies

This section provides information about dependencies that the Optical UIM Integration cartridge has on other entities.

Run-Time Dependencies

For the Optical UIM Integration cartridge to work at run time:

- You must deploy the Address_Handlers cartridge to Network Integrity.
- UIM must be installed and be accessible to Network Integrity.

The following components must be deployed to UIM:

- UIM Integration web service
- ora_uim_network_device
- ora_uim_huawei_tdm_network_device

Design-Time Dependencies

The Optical UIM Integration cartridge has the following dependencies:

- Abstract_CORBA_Cartridge
- Address_Handlers

- NetworkIntegritySDK
- Optical_Model
- OpticalAssimilation_Model
- ora_ni_uim_ocim
- ora_uim_huawei_tdm_network_device
- ora_uim_model
- ora_uim_network_device
- TMF814_Model
- TMF814Discovery_Cartridge
- UIM_Integration_Cartridge

Opening the Cartridge Files in Design Studio

To review and extend the Optical UIM Integration cartridge, download the Oracle Communications Network Integrity Optical UIM Integration cartridge software from the Oracle software delivery website:

https://edelivery.oracle.com/

The software contains the Optical UIM Integration cartridge ZIP file, which has the following structure:

- **\UIM_Cartridge_Projects**
- **\Network_Integrity_Cartridge_Projects**

The **Network_Integrity_Cartridge_Projects\Optical_UIM_Cartridge** project contains the extendable Design Studio files.

See *Network Integrity Concepts* for guidelines and best practices for extending cartridges.

See the Design Studio online Help for more information about opening projects in Design Studio.

Building and Deploying the Cartridge

See the Design Studio online Help for information about building and deploying cartridges.

2

About the Cartridge Components

This chapter provides information about the components of the Oracle Communications Network Integrity Optical UIM Integration cartridge.

The Optical UIM Integration cartridge contains the following actions:

- Discover Enhanced Huawei U2000 Action
- Discover Enhanced TMF814 Action
- Assimilate Huawei Optical Circuits Action
- Import Logical Optical from UIM Action
- Import Optical from UIM Action
- UIM Detect Huawei Device Discrepancies Action
- UIM Detect Optical Circuit Discrepancies Action
- UIM Detect TMF814 Device Discrepancies Action
- Resolve Optical in UIM Action

Discover Enhanced Huawei U2000 Action

The Discover Enhanced Huawei U2000 action discovers logical device hierarchies and models them as Network Device model hierarchies. This discovery action also remodels the physical device hierarchy into a Huawei OptiX OSN 3500 physical device hierarchy by changing the specification on the equipment objects from TMF814 specifications to Huawei OptiX OSN specifications. When a Huawei specification is not found during remodeling, the original specification is retained.

This discovery action extends the Discover Huawei U2000 action (from the Optical TMF814 CORBA cartridge) and inherits all its processors. For information about the inherited processors in this action, see *Network Integrity Optical TMF814 CORBA Cartridge Guide*.

The Discover Enhanced Huawei U2000 action contains the following processors run in the following order:

1. CORBA Property Initializer (inherited)
2. TMF814 CORBA Property Initializer (inherited)
3. CORBA Connection Manager (inherited)
4. TMF814 Property Initializer (inherited)
5. TMF814 Property Customizer (inherited)

6. Huawei Customizer (inherited)
7. TMF814 Session Manager (inherited)
8. TMF814 Device Recorder Initializer (inherited)
9. TMF814 ME Collector (inherited)
10. TMF814 Device Modeler (inherited)
11. TMF814 Equipment Collector (inherited)
12. TMF814 Equipment Modeler (inherited)
13. TMF814 PTP Collector (inherited)
14. TMF814 PTP Modeler (inherited)
15. TMF814 CPT Discoverer for PTP (inherited)
16. Huawei MSTP EndPoint Collector (inherited)
17. Huawei MSTP EndPoint Modeler (inherited)
18. TMF814 FTP Collector (inherited)
19. TMF814 FTP Modeler (inherited)
20. TMF814 CTP Discoverer for FTP (inherited)
21. Huawei Logical Device Remodeler
22. Huawei Physical Device Remodeler
23. TMF814 Device Persister (inherited)
24. TMF814 Device Recorder Persister (inherited)
25. TMF814 Cross-Connect Discoverer (inherited)
26. TMF814 Topological Link Collector (inherited)
27. TMF814 Topological Link Modeler (inherited)
28. TMF814 Pipe Persister (inherited)

Figure 2–1 illustrates the processor workflow of the Discover Enhanced Huawei U2000 action.

Figure 2–1 Discover Enhanced Huawei U2000 Action Processor Workflow

Huawei Logical Device Remodeler

This processor remodels the TMF814 discovery results into logical device hierarchies.

Huawei Physical Device Remodeler

This processor remodels the physical device hierarchy into a Huawei OptiX OSN 3500 physical device model.

If the device model is an OptiX OSN 3500 device, this processor calls the HuaweiOptiXOSN3500Remodeler class.

If the device model is not an OptiX OSN 3500 device, this processor does not remodel the physical device hierarchy.

You can add other Huawei device remodeler classes into the remodeler when the remodel class is specific to the device.

The following example shows the changes that are made when the HuaweiOptiXOSN3500Remodeler class is called. This flow is used to remodel the physical devices returned by the TMF814 discovery processors.

```
For each shelf {
  replace specification
  For each slot {
    replace specification
    For each card {
      replace specification
      For each port {
        replace specification
      }
    }
  }
}
```

Discover Enhanced TMF814 Action

The Discover Enhanced TMF814 action discovers logical device hierarchies and remodels them as Network Device model hierarchies.

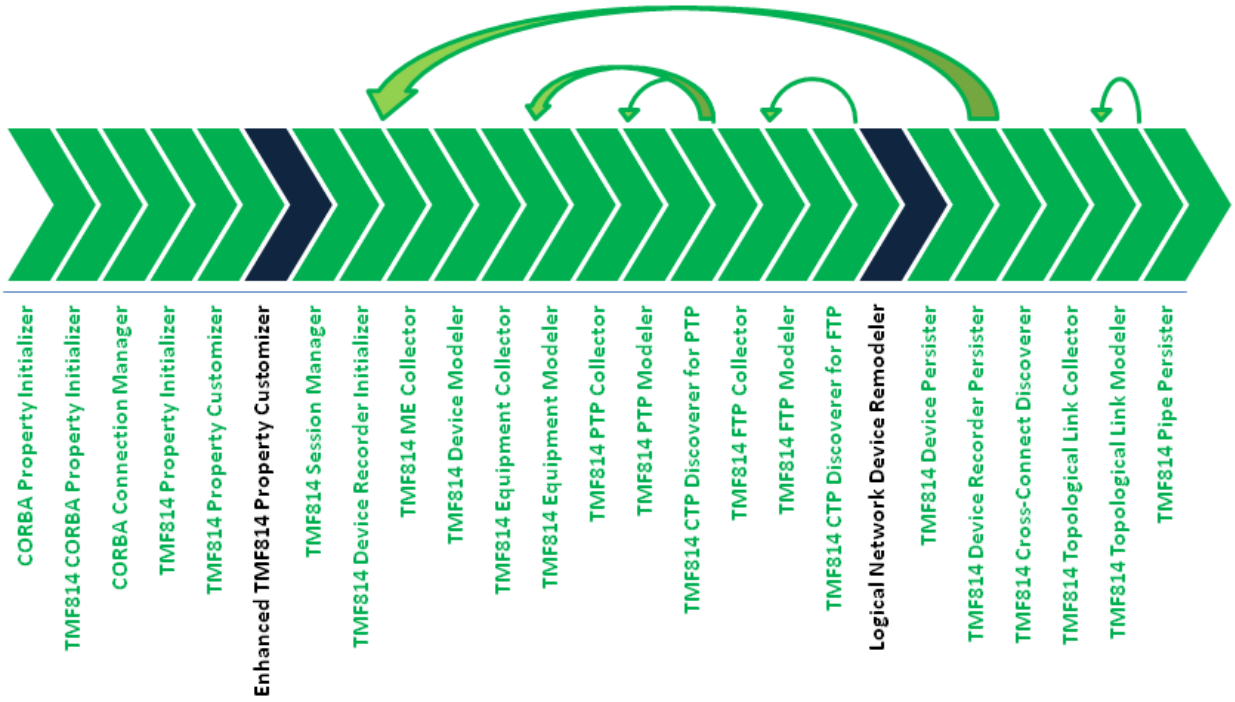
This discovery action extends the Discover TMF814 action (from the Optical TMF814 CORBA cartridge) and inherits all its processors. For information about the inherited processors in this action, see *Network Integrity Optical TMF814 CORBA Cartridge Guide*.

The Discover Enhanced TMF814 action contains the following processors run in the following order:

1. CORBA Property Initializer (inherited)
2. TMF814 CORBA Property Initializer (inherited)
3. CORBA Connection Manager (inherited)
4. TMF814 Property Initializer (inherited)
5. TMF814 Property Customizer (inherited)
6. Enhanced TMF814 Property Customizer
7. TMF814 Session Manager (inherited)
8. TMF814 Device Recorder Initializer (inherited)
9. TMF814 ME Collector (inherited)
10. TMF814 Device Modeler (inherited)
11. TMF814 Equipment Collector (inherited)
12. TMF814 Equipment Modeler (inherited)
13. TMF814 PTP Collector (inherited)
14. TMF814 PTP Modeler (inherited)
15. TMF814 CPT Discoverer for PTP (inherited)
16. TMF814 FTP Collector (inherited)
17. TMF814 FTP Modeler (inherited)
18. TMF814 CTP Discoverer for FTP (inherited)
19. Logical Network Device Remodeler
20. TMF814 Device Persister (inherited)
21. TMF814 Device Recorder Persister (inherited)
22. TMF814 Cross-Connect Discoverer (inherited)
23. TMF814 Topological Link Collector (inherited)
24. TMF814 Topological Link Modeler (inherited)
25. TMF814 Pipe Persister (inherited)

Figure 2–2 illustrates the processor workflow of the Discover Enhanced TMF814 action.

Figure 2–2 Discover Enhanced TMF814 Action Processor Workflow



Enhanced TMF814 Property Customizer

This processor sets the modeler processors to model only the logical device tree and not to model the physical device tree.

Logical Network Device Remodeler

This processor remodels the logical device hierarchies from the TMF814 discovery results. This processor removes the TMF814 TPLayer Generic objects from the logical device tree from each DeviceInterface entity and then remaps specifications and attributes. This processor also corrects VC3/VC12 layers.

Assimilate Huawei Optical Circuits Action

The Assimilate Huawei Optical Circuits action assimilates the results from the Discover Enhanced Huawei U2000 action and forms end-to-end synchronous digital hierarchy (SDH) circuits.

This assimilation action extends the Assimilate Optical Circuits action (from the Optical Circuit Assimilation cartridge) and inherits all its processors. For information about the inherited processors, see *Network Integrity Optical Circuit Assimilation Cartridge Guide*.

The Assimilate Huawei Optical Circuits action contains the following processors run in the following order:

1. Layer Rate Initializer (inherited)
2. Optical Assimilation Initializer (inherited)
3. Optical VC4 HOT HOP Assimilator (inherited)
4. Optical VC3 LOT LOP Assimilator (inherited)

5. Optical VC12 LOT LOP Assimilator (inherited)
6. Optical Assimilation Circuit Matcher (inherited)
7. Optical Assimilation SDH Circuit Matcher
8. Page Initialization for Circuit (inherited)
9. Optical Assimilation Modeler (inherited)
10. Optical Circuit Remodeler
11. Optical Assimilation Persister (inherited)
12. Link Modeler (inherited)
13. Link Persister (inherited)
14. Cleanup Processor (inherited)

Figure 2–3 illustrates the processor workflow of the Assimilate Huawei Optical Circuits action.

Figure 2–3 Assimilate Huawei Optical Circuits Action Processor Workflow

Optical Assimilation SDH Circuit Matcher

This processor matches assimilated data with your inventory system. Cross-connect and topological link object naming can often vary over a network. When this processor matches an assimilated circuit with an inventory circuit, it applies the inventory circuit name to the assimilated circuit.

The Assimilate Huawei Optical Circuits action is configured with the IsUIMHuaweiOpticalCircuit condition. When this condition is met, this processor is run and the inherited Optical Assimilation Circuit Matcher processor is not run.

This processor has the same functionality as the Optical Assimilation Circuit Matcher processor, but also contains logic to collect and model partially-protected circuits in the UIM model.

Optical Circuit Remodeler

This processor combines pipes to form complete paths for partially-protected circuits. This processor operates on both transport paths and circuit trail paths.

Import Logical Optical from UIM Action

The Import Logical Optical from UIM scan imports logical optical data entities from UIM and models them in the Network Logical Device Model. Also, this import action provides extensibility for features specific to SDH that you want to add.

Table 2–1 lists the values that are used when configuring the filters in the base class.

Table 2–1 Filter Values

Filter	Value
Query Physical Devices	False
Import Related Physical or Logical Device	False
Logical Device Specification	Network Device

This import action extends the Abstract Import from UIM action (from the UIM Integration cartridge) and inherits all its processors. For information about the processors inherited from the Abstract Import from UIM action, see *Network Integrity UIM Integration Cartridge Guide*.

The Import Logical Optical from UIM action contains the following processors run in the following order:

1. Import UIM Initializer (inherited)
2. Scan Parameters Optical UIM Initializer
3. Logical Device UIM Finder (inherited)
4. Physical Device UIM Finder (inherited)
5. Logical Device UIM Importer (inherited)
6. Linked Physical Device UIM Importer (inherited)
7. Logical Device UIM Persister (inherited)
8. Physical Device UIM Importer (inherited)
9. Physical Device UIM Persister (inherited)

Figure 2–4 illustrates the processor workflow of the Import Logical Optical from UIM action.

Figure 2–4 Import Logical Optical from UIM Action Processor Workflow

Scan Parameters Optical UIM Initializer

This processor initializes the scan parameters configured by the Network Integrity user.

Import Optical from UIM Action

The Import Optical from UIM action imports physical devices, logical devices, and channelized connectivities from UIM. Channelized connectivities are modeled into the Network Integrity Model according to their rate code. For example, synchronous transport module (STM) connectivities are modeled as topological links; VC4 connectivities are modeled as transport circuits; E1, E3, and E4 connectivities are modeled as customer circuits. See *Network Integrity Information Model Reference* for more information on the Network Integrity model.

For each channelized connectivity, only the most recent design version with a status of COMPLETED is imported.

The Optical UIM Import Parameters scan parameter group allows Network Integrity users to specify the scope of the import scan at run time:

- Equipment only: imports physical and logical devices
- Equipment and STM Links only: imports physical and logical devices and their channelized connectivities (topological links)

- Equipment, STM Links, and Circuits: imports physical and logical devices and their channelized connectivities (topological links) and TDM facilities and connectivity trails

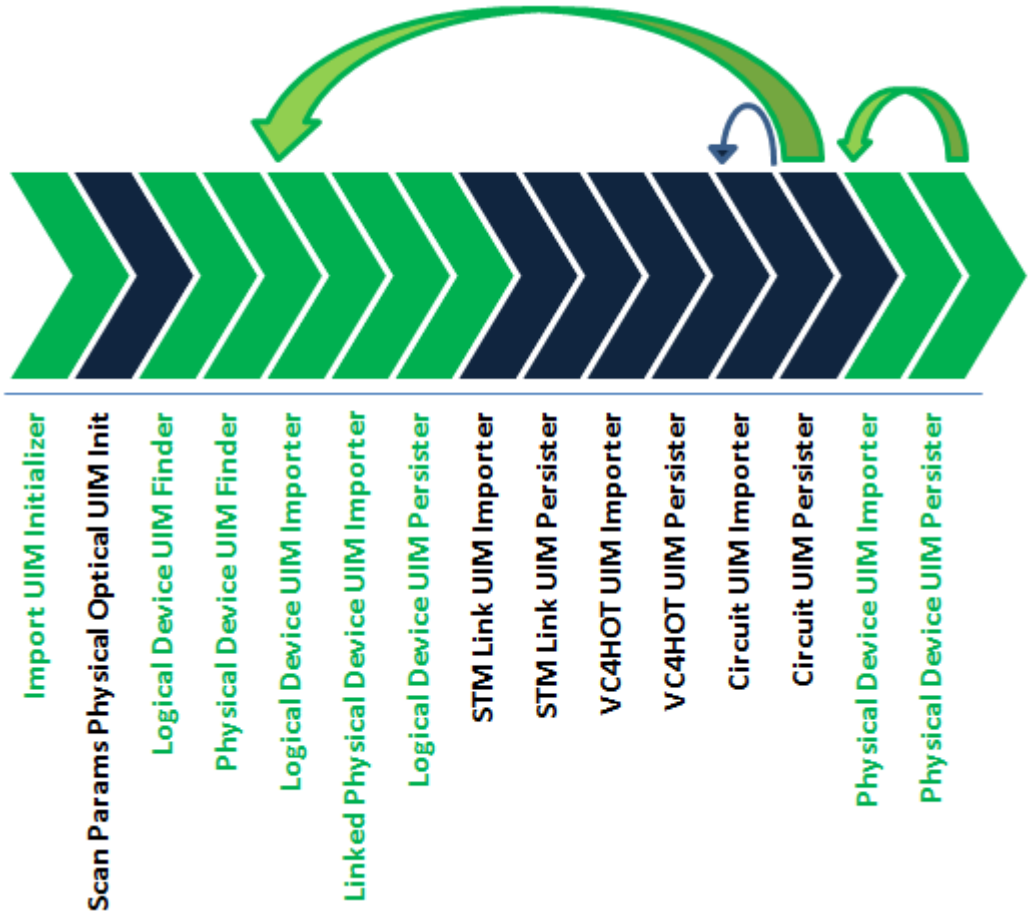
This import action extends the Abstract Import from UIM action (from the UIM Integration cartridge) and inherits all its processors. For information about the processors inherited from the Abstract Import from UIM action, see *Network Integrity UIM Integration Cartridge Guide*.

The Import Optical from UIM action contains the following processors run in the following order:

1. Import UIM Initializer (inherited)
2. Scan Params Physical Optical UIM Init
3. Logical Device UIM Finder (inherited)
4. Physical Device UIM Finder (inherited)
5. Logical Device UIM Importer (inherited)
6. Linked Physical Device UIM Importer (inherited)
7. Logical Device UIM Persister (inherited)
8. STM Link UIM Importer
9. STM Link UIM Persister
10. VC4HOT UIM Importer
11. VC4HOT UIM Persister
12. Circuit UIM Importer
13. Circuit UIM Persister
14. Physical Device UIM Importer (inherited)
15. Physical Device UIM Persister (inherited)

Figure 2–5 illustrates the processor workflow of the Import Optical from UIM action.

Figure 2–5 Import Optical from UIM Action Processor Workflow



Scan Params Physical Optical UIM Init

This processor initializes the scan parameters configured by the Network Integrity user.

STM Link UIM Importer

This processor imports channelized connectivities with the STM rate code for each logical device.

STM Link UIM Persister

This processor takes each STM channelized connectivity and models it in the Optical Model as an optical link. The modeled connectivities are then saved to the device result category.

VC4HOT UIM Importer

This processor imports channelized connectivities with the VC4 rate code for each logical device.

VC4HOT UIM Persister

This processor takes each VC4 channelized connectivity and models it in the Optical Model as a VC4 HOT transport circuit. The modeled connectivities are then saved to the device result category.

Circuit UIM Importer

This processor imports E1, E3, and E4 rate code channelized connectivities from UIM for each logical device. When the circuit originates on one device and terminates on another, the circuit is made the child of the first device in alphabetical order.

Circuit UIM Persister

This processor takes each channelized connectivity and models it in the Optical Model as a circuit. The modeled circuits are then saved to the device result category.

Circuits with one path are modeled as primary path circuits. Circuits with multiple paths are modeled with numbered path values (for example, path 1, path 2, path 3, and so on).

UIM Detect Huawei Device Discrepancies Action

The UIM Detect Huawei Device Discrepancies action detects device-level physical and logical discrepancies while filtering and removing unused attributes and characteristics from the logical and physical device models.

This discrepancy detection action extends the Abstract Detect UIM Discrepancies action (from the Network Integrity UIM Integration cartridge) and inherits all its processors. For information about the processors inherited from the Abstract Detect UIM Discrepancies action, see *Network Integrity UIM Integration Cartridge Guide*.

This action also extends the Auto Resolve Discrepancies action (from the NetworkIntegritySDK cartridge) to provide automatic discrepancy resolution. For information about the processors inherited from the Auto Resolve Discrepancies action, see *Network Integrity Developer's Guide*.

The UIM Detect Huawei Device Discrepancies action contains the following processors run in the following order:

1. UIM Discrepancies Filter Initializer (inherited)
2. Optical UIM Huawei DD Filters
3. Discrepancy Detector (inherited)
4. Check Auto Resolution Selected (inherited)
5. UIM Auto Resolve Selected Discrepancies
6. Identify Auto Resolving Discrepancies (inherited)
7. Prepare Resolving Discrepancies (inherited)

Figure 2–6 illustrates the processor workflow of the UIM Detect Huawei Device Discrepancies action.

Figure 2–6 UIM Detect Huawei Device Discrepancies Action Processor Workflow

Optical UIM Huawei DD Filters

This processor applies filters to ignore the following types of discrepancies:

- Missing equipment holder
- Missing physical port
- Missing physical device with a TMF814 specification
- Missing equipment card with a TMF814 specification
- Missing cross-connects
- Missing topological links

UIM Auto Resolve Selected Discrepancies

This processor contains the automatic resolution Java class. The Java implementation class determines the types of discrepancies to be automatically resolved and the resolution logic.

See *Network Integrity Developer's Guide* for more information about completing the Java implementation class.

UIM Detect Optical Circuit Discrepancies Action

The UIM Detect Optical Circuit Discrepancies action detects discrepancies between assimilated circuits and imported channelized connectivities and circuits from UIM.

The name-matching logic compares assimilated circuit paths with imported circuit paths. When it finds a match, the name given during circuit assimilation is discarded and the imported circuit path name is used.

This discrepancy detection action extends the Abstract Optical Circuit Discrepancy Detection action (from the Network Integrity Optical Circuit Assimilation cartridge) and inherits all its processors. For information about the inherited processors in this action, see *Network Integrity Optical Circuit Assimilation Cartridge Guide*.

The UIM Detect Optical Circuit Discrepancies action contains the following processors run in the following order:

1. Circuit Discrepancy Name Filter Initializer (inherited)
2. Missing Entity Filter Initializer (inherited)
3. Circuit Discrepancy Filters Initializer
4. Discrepancy Detector (inherited)

Figure 2–7 illustrates the processor workflow of the UIM Detect Optical Circuit Discrepancies action.

Figure 2–7 UIM Detect Optical Circuit Discrepancies Action Processor Workflow

Circuit Discrepancy Filters Initializer

This processor initializes the following discrepancy detection filters:

- Attributes Filter: prevents discrepancy detection on the ID, physical location, description, rerouted, partial, sequence, aEnd, and zEnd attributes.
- Channel Attribute Filter: changes the channel attribute mismatch discrepancy severity from minor to major.

- Partial Circuit Filter: sets the status on partial circuit discrepancies to Ignore.
- Ignore Container Level Discrepancy Filter: sets the status on container-level discrepancies to Ignore.

UIM Detect TMF814 Device Discrepancies Action

The UIM Detect TMF814 Device Discrepancies action detects discrepancies while filtering and removing unused attributes and characteristics from the logical and physical device models.

This discrepancy detection action extends the Abstract Detect UIM Discrepancies action (from the UIM Integration cartridge) and inherits all its processors. For information about the inherited processors in this action, see *Network Integrity UIM Integration Cartridge Guide*.

The UIM Detect TMF814 Device Discrepancies action contains the following processors run in the following order:

1. UIM Discrepancies Filter Initializer (inherited)
2. Optical UIM TMF DD Filters
3. Discrepancy Detector (inherited)

Figure 2–8 illustrates the processor workflow of the UIM Detect TMF814 Device Discrepancies action.

Figure 2–8 UIM Detect TMF814 Device Discrepancies Action Processor Workflow

Optical UIM TMF DD Filters

This processor applies filters to ignore the following types of discrepancies:

- Missing device interface with a TMF814 specification

- Media interface-specific attributes when comparing for connection termination points. For physical termination point interfaces, it compares as a media interface.

Resolve Optical in UIM Action

The Resolve Optical in UIM action resolves logical and physical device and circuit discrepancies between discovered data and the data imported from UIM.

For each channelized connectivity, only the most recent design version is resolved:

- When the design status is IN_PROGRESS, this action updates the intermediate segment with network trail paths and sets the status to COMPLETED.
- When the design status is COMPLETED or CANCELLED, this action creates a new intermediate segment using network trail paths and sets the status to COMPLETED.
- For new entities, this action creates the first design versions and sets the status to COMPLETED.

This discrepancy resolution action cannot delete channelized connectivities from UIM when there exists multiple versions with the COMPLETED or CANCELLED status. Therefore, to resolve Missing Entity discrepancies on channelized connectivities, this discrepancy resolution action creates a new design version with a COMPLETED status and clears all intermediate segments.

This discrepancy resolution action extends the Abstract Resolve in UIM action (from the UIM Integration cartridge) and inherits all its processors. For information about the inherited processors in this action, see *Network Integrity UIM Integration Cartridge Guide*.

This action contains the following processors run in the following order:

1. UIM Resolution Framework Initializer
2. UIM Resolution Initializer
3. UIM Resolution Optical Initializer
4. UIM Resolution Framework Dispatcher

Figure 2–9 illustrates the processor workflow of the Resolve Optical in UIM action.

Figure 2–9 Resolve Optical in UIM Action Processor Workflow

UIM Resolution Optical Initializer

This processor initializes the following handlers to resolve discrepancies on channelized connectivities:

- Pipe Termination Point Handler
- Trail Path Handler
- Entity Circuit Handler

About Recording Mode

You can configure the Optical UIM Integration cartridge to record all discovered managed elements (MEs), topological links, and cross-connects. The recorded files (*ME_Name*.**me** for MEs, *EMS_Name*.**ems** for topological links, and *EMS_Name*.**cc** for cross-connects) are saved to the *Domain_Home*/**corbaData/***Scan_Name/EMS_Name* directory, where:

- *ME_Name* is the name of the ME.
- *EMS_Name* is the name of the element-management system (EMS).
- *Domain_Home* is the Network Integrity WebLogic Server domain.
- *Scan_Name* is the name of the scan.

If the TMF814 scan action type has been configured to not discover MEs, topological links, or cross-connects, the corresponding file is not generated.

The recording processor reads this file each time it is run.

Enabling Recording Mode

To enable recording mode:

1. Open the *Domain_Home*/**config/corbaConfig/tmf814.properties** file.
2. Search for the following line:

   ```
   MODE=NORMAL
   ```

3. Change **NORMAL** to **RECORD**.
4. Save and close the file.

3

Using the Cartridge

This chapter provides instructions for using the Oracle Communications Network Integrity Optical UIM Integration cartridge. This chapter includes the following examples:

Creating a Discover Enhanced Huawei U2000 Scan

The Discover Enhanced Huawei U2000 scan discovers logical device hierarchies and models them as Network Device model hierarchies. This discovery scan also remodels the physical device hierarchy into a Huawei OptiX OSN 3500 physical device hierarchy by changing the specification on the equipment objects from TMF814 specifications to Huawei OptiX OSN specifications. When a Huawei specification is not found during remodeling, the original specification is retained.

To create a Discover Enhanced Huawei U2000 scan:

1. Create a new scan.

   See the Network Integrity online Help for more information.

2. On the **General** tab of the Create Scan page, do the following:

   a. From the **Scan Action** list, select **Discover Enhanced Huawei U2000**.

      The **Scan Type** field displays **Discovery**. The Scan Action Parameters area displays the **TMF814Parameters** scan parameter group.

   b. Set the following scan action parameters:

      – In the **Username** field, enter the user name for the target element-management system (EMS) or network-management system (NMS).

      – In the **Password** field, enter the password for the target EMS or NMS.

      – In the **EMS Naming Service** field, enter the EMS session factory CORBA object name.

- From the **EMS Naming Service Format** list, specify whether the EMS session factory CORBA object name uses the plain or the stringified format.
- (Optional) To pass custom object request broker (ORB) properties to the scan, enter name/value pairs in the **ORB Properties** field, separated by a semicolon. For example:

  ```
  Property_1=value_1;Property_2=value_2;Property_n=value_n
  ```

- (Optional) To pass custom ORB arguments to the scan, enter name/value pairs in the **ORB Arguments** field, separated by a semicolon. For example:

  ```
  Argument_1=value_1;Argument_2=value_2;Argument_n=value_n
  ```

- (Optional) To filter the discovered managed elements (MEs) by name, enter a name in the **Managed Element Name(s)** field and set the **Managed Element Name Qualifier** list.
- (Optional) To filter the discovered network elements (NEs) by name, enter a name in the **Network Element Name(s)** field and set the **Network Element Name Qualifier** list.
- From the **Collect Equipment** list, specify whether you want to collect equipment holder objects.
- (Optional) To set the number of equipment objects to retrieve with each EMS call, enter a value in the **Equipment Fetch Size** field. Leave this field blank to retrieve all equipment objects in a single EMS call.
- From the **Collect TP** list, specify the type of termination points (TPs) you want to collect. To not collect any TPs, select **None**.
- (Optional) To set the number of TPs to retrieve with each EMS call, enter a value in the **Termination Point Fetch Size** field. Leave this field blank to retrieve all TPs in a single EMS call.
- From the **Collect CTP** list, specify the type of connection TPs you want to collect. To not collect any connection TPs, select **None**.
- (Optional) To set the depth to which contained TPs are collected, enter a value in the **Contained TP Collection Depth** field. Leave this field blank to retrieve all contained TPs.
- From the **Cross Connect Collection Type** list, select **None**.
- From the **Topological Link Collection Type** list, select **None**.

For all other fields, use the default values.

See *Network Integrity Optical TMF814 CORBA Cartridge Guide* for more information.

3. On the **Scope** tab of the Create Scan page, do one of the following:
   - Enter the EMS CORBA Loc URL, and click the **Add Address** icon.
   - Click the **Import** icon, and import the IOR file.
   - Paste the content of the IOR file and click the **Add Address** icon.

   Note: All entries on the **Scope** tab must be unique. All entries are validated against the CorbaURLAddressHandler address handler.

4. Make any other required configurations.
5. Save the scan.

Creating a Discover Enhanced TMF814 Scan

The Discover Enhanced TMF814 scan discovers logical device hierarchies and remodels them as Network Device model hierarchies.

To create a Discover Enhanced TMF814 scan:

1. Create a new scan.

   See the Network Integrity online Help for more information.

2. On the **General** tab of the Create Scan page, do the following:

   a. From the **Scan Action** list, select **Discover Enhanced TMF814**.

      The **Scan Type** field displays **Discovery**. The Scan Action Parameters area displays the **TMF814Parameters** scan parameter group.

   b. Set the following scan action parameters:

      – In the **Username** field, enter the user name for the target EMS or NMS.

      – In the **Password** field, enter the password for the target EMS or NMS.

      – In the **EMS Naming Service** field, enter the EMS session factory CORBA object name.

      – From the **EMS Naming Service Format** list, specify whether the EMS session factory CORBA object name uses the plain or the stringified format.

      – (Optional) To pass custom object request broker (ORB) properties to the Discover Abstract TMF814 scan, enter name/value pairs in the **ORB Properties** field, separated by a semicolon. For example:

        ```
        Property_1=value_1;Property_2=value_2;Property_n=value_n
        ```

      – (Optional) To pass custom ORB arguments to the Discover Abstract TMF814 scan, enter name/value pairs in the **ORB Arguments** field, separated by a semicolon. For example:

        ```
        Argument_1=value_1;Argument_2=value_2;Argument_n=value_n
        ```

      – (Optional) To filter the discovered managed elements (MEs) by name, enter a name in the **Managed Element Name(s)** field and set the **Managed Element Name Qualifier** list to a matching parameter value against collected MEs.

      – (Optional) To filter the discovered network elements (NEs) by name, enter a name in the **Network Element Name(s)** field and set the **Network Element Name Qualifier** list to a matching parameter value against collected NEs.

      – From the **Collect Equipment** list, select **False**.

      – From the **Collect TP** list, specify the type of termination points (TPs) you want to collect. To not collect any TPs, select **None**.

      – (Optional) To set the number of TPs to retrieve with each EMS call, enter a value in the **Termination Point Fetch Size** field. Leave this field blank to retrieve all TPs in a single EMS call.

- From the **Collect CTP** list, specify the type of connection TPs (CTPs) you want to collect. To not collect any CTPs, select **None**.
- (Optional) To set the depth to which contained TPs are collected, enter a value in the **Contained TP Collection Depth** field. Leave this field blank to retrieve all contained TPs.
- From the **Cross Connect Collection Type** list, select **None**.
- From the **Topological Link Collection Type** list, select **None**.

For all other fields, use the default values.

See *Network Integrity Optical TMF814 CORBA Cartridge Guide* for more information.

3. On the **Scope** tab of the Create Scan page, do one of the following:
   - Enter the EMS CORBA Loc URL, and click the **Add Address** icon.
   - Click the **Import** icon, and import the IOR file.
   - Paste the content of the IOR file and, click the **Add Address** icon.

   Note: All entries on the **Scope** tab must be unique. All entries are validated against the CorbaURLAddressHandler address handler.

4. Make any other required configurations.
5. Save the scan.

Creating an Assimilate Huawei Optical Circuits Scan

The Assimilate Huawei Optical Circuits scan assimilates the results from the Discover Enhanced Huawei U2000 scan and forms end-to-end synchronous digital hierarchy (SDH) circuits.

To create an Assimilate Huawei Optical Circuits scan:

1. Create a new scan.

   See the Network Integrity online Help for more information.

2. On the **General** tab of the Create Scan page, do the following:
   a. From the **Scan Action** list, select **Assimilate Huawei Optical Circuits**.

      The **Scan Type** field displays **Assimilation**. The Scan Action Parameters area displays the **OpticalAssimilationParameters** scan parameter group.

   b. Set the following scan action parameters:
      - To assimilate VC12 circuits, select **Assimilate VC12**.
      - To assimilate VC3 circuits, select **Assimilate VC3**.
      - To convert the input results to the Intermediate Assimilation Model, select **Process Discovery Results**.

        Also, select **Process Discovery Results** when you run the first scan of a hierarchical set of assimilations scans.
      - To model partial circuits (in addition to complete circuits) from the Intermediate Assimilation Model, select **Model Incomplete Circuits**.

Also, select **Model Incomplete Circuits** when you run the last scan of a hierarchical set of assimilation scans.

- To specify that the scan is being run on the top and final level in a hierarchical set of assimilation scans, select **Is Top Level Assimilation**. The circuit matcher attempts to name all partial and complete circuits. When **Is Top Level Assimilation** is deselected, the circuit matcher attempts to name complete circuits only.

For all other fields, use the default values.

3. On the **Scope** tab, do the following:
   - Add one or more scans as input for the Assimilation scan.
   - From the **Assimilate Input Scan Results** list, specify how input scan results are assimilated:
     - To process input discovery scans simultaneously for all scan address and result groups for all scan runs, select **All Scans, All Scan Addresses**.
     - To process input discovery scans in parallel for all scan addresses and result groups by scan run, select **Single Scan, All Scan Addresses**.
     - To process input discovery scans in parallel for each scan address by scan run, select **Single Scan, Single Scan Address**.
   - From the **Automatically Run Input Scans** list, specify whether input scans are automatically re-run before the Assimilation scan is run. Choose one of the following options:
     - To not re-run input discovery scans before the assimilation scan, no matter how old the scan results, select **Never**.
     - To re-run all input discovery scans before the assimilation scan, no matter how recent the scan results, select **Always**.
     - To re-run input discovery scans before the assimilation scan only if the scan results are older than a specified value, select **If Older than** *X*.
     - To re-run input discovery scans before the assimilation scan only if the scan results are older than a custom value, select **If Older than a Custom Age** and enter a value in hours, days, or weeks.
4. Make any other required configurations.
5. Save the scan.

Creating an Import Logical Optical from UIM Scan

The Import Logical Optical from UIM scan imports logical optical data entities from UIM and models them in the Network Logical Device Model.

To create an Import Logical Optical from UIM scan:

1. Create a new scan.

   See the Network Integrity online Help for more information.

2. On the **General** tab of the Create Scan page, do the following:
   a. From the **Scan Action** list, select **Import Logical Optical from UIM**.

      The **Scan Type** field displays **Import**. The Scan Action Parameters area displays the **Logical Optical UIM Import Parameters** scan parameter group.

b. In the Scan Action Parameters area, use the default values.

3. Make any other required configurations.
4. Save the scan.

Creating an Import Optical from UIM Scan

The Import Optical from UIM action imports physical devices, logical devices, and channelized connectivities from UIM. Channelized connectivities are modeled into the Network Integrity Model according to their rate code.

To create an Import Optical from UIM scan:

1. Create a new scan.

   See the Network Integrity online Help for more information.

2. On the **General** tab of the Create Scan page, do the following:

   a. From the **Scan Action** list, select **Import Optical from UIM**.

      The **Scan Type** field displays **Import**. The Scan Action Parameters area displays the **Optical UIM Import Parameters** scan parameter group.

   b. Select **Import Logical Devices**.

   c. Deselect **Import Physical Devices**.

   d. From the **Scope** list, select one of the following:

      – Select **Equipment only** to import physical and logical devices.

      – Select **Equipment and STM Links only** to import physical and logical devices and their channelized connectivities (topological links).

      – Select **Equipment, STM Links, and Circuits** to imports physical and logical devices and their channelized connectivities (topological links), and TDM facilities and connectivity trails.

   For all other fields, use the default values.

3. Make any other required configurations.
4. Save the scan.

Working with Discrepancies

The Optical UIM Integration cartridge allows you to detect and resolve discrepancies between your discovered data and your imported UIM data, including logical and physical device discrepancies and optical circuit discrepancies. When you resolve a discrepancy, the resolution is submitted to UIM by Network Integrity. See the Network Integrity online Help for more information about working with discrepancies.

Discrepancies on optical entities must be resolved in a specific order:

1. Begin by detecting and resolving discrepancies on link entities.
2. Next, it is possible to detect and resolve discrepancies on transport entities. A transport entity is an assimilated entity.
3. Finally, it is possible to detect and resolve discrepancies on circuit entities. A circuit entity is an assimilated entity.

When the Optical UIM Integration cartridge is deployed to your run-time application, you can use Network Integrity for:

Detecting Physical Device Discrepancies for the Huawei OptiX OSN 3500

To detect physical device discrepancies for the Huawei OptiX OSN 3500:

1. Create a Discover Huawei U2000 scan that discovers equipment data for Huawei OptiX OSN 3500 devices.
2. (Optional) To run automatic discrepancy resolution, select the **AutoResolutionParameter** scan parameters and select **Auto Resolve Discrepancies**.
3. Create an Import from UIM scan.
4. Configure your import scan with the **Detect Discrepancies** option enabled.
5. In the Scan Action Parameters area, filter the scan to import equipment data for Huawei OptiX OSN 3500 devices.
6. Run the scans: first the discovery scan, then the import scan.

   The scan with **Detect Discrepancies** enabled must be run last. Discrepancy detection runs automatically after the import scan completes.
7. Review and resolve any reported discrepancies. See "Resolving Discrepancies in UIM" for more information.

Detecting Optical Circuit Discrepancies for the Huawei OptiX OSN 3500

To detect optical circuit discrepancies for the Huawei OptiX OSN 3500:

1. Create a Discover Huawei U2000 scan that discovers optical data for Huawei OptiX OSN 3500 devices.
2. Create an Assimilate Optical Circuits scan that assimilates discovered optical data.
3. Create an Import Optical from UIM scan that imports optical data for Huawei OptiX OSN 3500 devices.
4. Configure your import scan with the **Detect Discrepancies** option enabled.
5. Run the scans: first the discovery scan, then assimilation scan, then the import scan.

   The scan with **Detect Discrepancies** enabled must be run last. The assimilation scan must proceed the discovery scan. Discrepancy detection runs automatically after the import scan completes.
6. Review and resolve any reported discrepancies. See "Resolving Discrepancies in UIM" for more information.

Detecting Device Discrepancies for Network Logical Devices

To detect device discrepancies for network logical devices:

1. Create a Discover Enhanced TMF814 scan.

2. In the Scan Action Parameters area, filter the discovery scan to return network logical devices.
3. (Optional) To run automatic discrepancy resolution, select the **AutoResolutionParameter** scan parameters and select **Auto Resolve Discrepancies**.
4. Create an Import from UIM scan.
5. Configure your import scan with the **Detect Discrepancies** option enabled.
6. Save the scan.
7. Run the scans: first the discovery scan, then the import scan.

   The scan with **Detect Discrepancies** enabled must be run last. Discrepancy detection runs automatically after the import scan completes.
8. Review and resolve any reported discrepancies. See "Resolving Discrepancies in UIM" for more information.

Resolving Discrepancies in UIM

To resolve discrepancies in UIM:

1. Review the scan results for a scan with **Detect Discrepancies** enabled.
2. On the Scan Details page, click **Review Discrepancies**.
3. For every discrepancy you want to resolve, right-click the discrepancy and select **Correct in UIM**.
4. Click **Submit**.

   The Optical UIM Integration cartridge calls the appropriate API to resolve the discrepancy in UIM.

Note: When an Extra Entity and Missing Entity discrepancy are detected on a channelized connectivity entity with a single trail path, you cannot submit both discrepancies for resolution at the same time. UIM requires a connectivity to have at least one path. Therefore, you must first resolve the Entity+ discrepancy (which adds a trail path to the connectivity) and submit to UIM. Then you can resolve the Entity- discrepancy (which removes a trail path) and submit to UIM.

4

About Collected Data

This chapter describes how data that is collected by the Oracle Communications Network Integrity Optical UIM Integration cartridge is treated.

About Collected Data

The Optical UIM Integration cartridge uses a standard TMF814 common object request broker architecture (CORBA) interface, which models network elements using the Multi Technology Network Management (MTNM) standard.

For information about MTNM objects, properties, and TMF814 APIs, see *Network Integrity Optical TMF814 CORBA Cartridge Guide*.

5

About Cartridge Modeling

This chapter describes how the Oracle Communications Network Integrity Optical UIM Integration cartridge is modeled in Oracle Communications Design Studio.

About the Oracle Communications Information Model

All entities in the Optical UIM Integration cartridge comply with Oracle Communications Information Model 7.3.1 for static fields. The dynamic fields (sometimes referred to as characteristics) are application-specific.

You must first model inventory (UIM) specifications in an inventory cartridge using Design Studio, define the cartridge dependency such that the Network Integrity cartridge is dependent on the inventory cartridge, and then use the inventory cartridge specifications in the Network Integrity cartridge model.

Field Mapping

The TMF814 discovery device model is mapped to the common Network Integrity and Oracle Communications Unified Inventory Management (UIM) device model.

The attributes of the **Native EMS Name** and **Name** fields are reversed between the discovered TMF814 results and the required UIM naming. In the TMF814 discovery results, the names of objects are the TMF814 naming tuple.

Logical Mapping

Specifications are mapped from the TMF814 specification assigned during discovery to the Network Device specification. For any objects that cannot be mapped to a new specification, the original specification is retained.

Table 5–1 shows TMF814 specifications mapped to Network Logical Device specifications.

Table 5–1 Logical Mapping

Network Integrity Entity	TMF814 Specification	Network Logical Device Specification	Notes
LogicalDevice	TMF814 Device Generic	Network Device	N/A
MediaInterface	TMF814 TPInterface Generic	E1 Interface	If a child TPLayer has the value 5
MediaInterface	TMF814 TPInterface Generic	E3 Interface	If a child TPLayer has the value 7
MediaInterface	TMF814 TPInterface Generic	E4 Interface	If a child TPLayer has the value 8
MediaInterface	TMF814 TPInterface Generic	STM-1 Interface	If a child TPLayer has the value 73

Table 5–1 (Cont.) Logical Mapping

Network Integrity Entity	TMF814 Specification	Network Logical Device Specification	Notes
MediaInterface	TMF814 TPInterface Generic	STM-4 Interface	If a child TPLayer has the value 74
MediaInterface	TMF814 TPInterface Generic	STM-16 Interface	If a child TPLayer has the value 76
MediaInterface	TMF814 TPInterface Generic	STM-64 Interface	If a child TPLayer has the value 77
DeviceInterface	TMF814 TPInterface Generic	VC4 Interface	If a child TPLayer has the value 15
DeviceInterface	TMF814 TPInterface Generic	VC3 Interface	If a child TPLayer has the value 13
DeviceInterface	TMF814 TPInterface Generic	VC12 Interface	If a child TPLayer has the value 11

The Optical UIM Integration cartridge supports the following logical mappings:

- Logical Device
- Device Interface

Logical Device

Table 5–2 shows characteristics for the Logical Device specification.

Table 5–2 Logical Device Characteristics

Characteristic	Information Model Support	Field Type
nativeEmsName	Static	Text
nativeEmsAdminServiceState	Static	List
nativeEmsServiceState	Static	List
physicalLocation	Static	Text

Device Interface

Table 5–3 shows characteristics for the Device Interface specification.

Table 5–3 Device Interface Characteristics

Characteristic	Information Model Support	Field Type
nativeEmsName	Static	Text
nativeEmsAdminServiceState	Static	List
nativeEmsServiceState	Static	List
physicalLocation	Static	Text
ifType	Static	List
minSpeed	Static	Float
maxSpeed	Static	Float
nominalSpeed	Static	Float
physicalAddress	Static	Text
mtuCurrent	Static	Integer
mtuSupported	Static	Float
nativeEmsConnectorPresent	Static	Text

Physical Mapping

Specifications are mapped from the TMF814 specification assigned during discovery to the Huawei-specific specification. For any objects (Equipment Card specification) that cannot be mapped to a new specification, the original specification remains.

Table 5–4 shows TMF814 specifications mapped to Huawei specifications.

Table 5–4 Physical Mapping

Network Integrity Entity	TMF814 Specification	Huawei Specification	Notes
PhysicalDevice	TMF814 ME Generic	Huawei OptiX OSN 3500	N/A
Equipment (Shelf)	TMF814 Equipment Generic	Huawei OptiX OSN 3500 Shelf	N/A
EquipmentHolder	TMF814 Equipment Holder Generic	Huawei OptiX OSN 3500 Auxiliary Slot	For slot 37
EquipmentHolder	TMF814 Equipment Holder Generic	Huawei OptiX OSN 3500 Fan Slot	For slot 38-40
EquipmentHolder	TMF814 Equipment Holder Generic	Huawei OptiX OSN 3500 Slot	For slots 1-8, 11-16, 19-26, and 29-36
EquipmentHolder	TMF814 Equipment Holder Generic	Huawei OptiX OSN 3500 GSCC Slot	For slots 17-18
EquipmentHolder	TMF814 Equipment Holder Generic	Huawei OptiX OSN 3500 Power Interface Unit Slot	For slots 27 and 28
EquipmentHolder	TMF814 Equipment Holder Generic	Huawei OptiX OSN 3500 XCS Slot	For slots 9-10
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN AUX	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN D12S	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN D34S	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN EU08	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN FAN	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN FANA	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN FANB	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN GSCC	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN N1OU08	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN N1SLD64	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN N1SLH1	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN N1SLQ16	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN N1SLQ4	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN N2PQ1	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN N2PQ3	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN PIU	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN Q2PIU	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN Q2SLN	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN SCXL	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN SXCSA	N/A

Table 5–4 (Cont.) Physical Mapping

Network Integrity Entity	TMF814 Specification	Huawei Specification	Notes
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN T2SL64	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN UCXL	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN N1SL4	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN N1SL16	N/A
Equipment (Card)	TMF814 Equipment Generic	Huawei OptiX OSN N1SL64	N/A
PhysicalPort	TMF814 Port Generic	Huawei OptiX OSN D12S Port	If parent card is D12S
PhysicalPort	TMF814 Port Generic	Huawei OptiX OSN N1OU08 Port	If parent card is N1OU08
PhysicalPort	TMF814 Port Generic	Huawei OptiX OSN N1SLD64 Port	If parent card is N1SLD64
PhysicalPort	TMF814 Port Generic	Huawei OptiX OSN N1SLQ16 Port	If parent card is N1SLQ16
PhysicalPort	TMF814 Port Generic	Huawei OptiX OSN N1SLQ4 Port	If parent card is N1SLQ4
PhysicalPort	TMF814 Port Generic	Huawei OptiX OSN D34S Port	If parent card is D34S
PhysicalPort	TMF814 Port Generic	Huawei OptiX OSN EU08 Port	If parent card is EU08
PhysicalPort	TMF814 Port Generic	Huawei OptiX OSN N1SL4 Port	If parent card is N1SL4
PhysicalPort	TMF814 Port Generic	Huawei OptiX OSN N1SL16 Port	If parent card is N1SL16
PhysicalPort	TMF814 Port Generic	Huawei OptiX OSN N1SL64 Port	If parent card is N1SL64

The Optical UIM Integration cartridge supports the following physical mappings.

- Physical Device
- Equipment Shelf
- Equipment Holder
- Equipment Card
- Physical Port

Physical Device

Table 5–5 shows characteristics for the Physical Device specification.

Table 5–5 Physical Device Characteristics

Characteristic	Information Model Support	Field Type
nativeEmsName	Static	Text

Equipment Shelf

Table 5–6 shows characteristics for the Equipment Shelf specification.

Table 5–6 Equipment Shelf Characteristics

Characteristic	Information Model Support	Field Type
nativeEmsName	Static	Text

Table 5–6 (Cont.) Equipment Shelf Characteristics

Characteristic	Information Model Support	Field Type
physicalLocation	Static	Text

Equipment Holder

Table 5–7 shows characteristics for the Equipment Holder specification.

Table 5–7 Equipment Holder Characteristics

Characteristic	Information Model Support	Field Type
nativeEmsName	Static	Text
physicalLocation	Static	Text

Equipment Card

Table 5–8 shows characteristics for the Equipment Card specification.

Table 5–8 Equipment Card Characteristics

Characteristic	Information Model Support	Field Type
nativeEmsName	Static	Text
physicalLocation	Static	Text

Physical Port

Table 5–9 shows characteristics for the Physical Port specification.

Table 5–9 Physical Port Characteristics

Characteristic	Information Model Support	Field Type
nativeEmsName	Static	Text
physicalLocation	Static	Text
serialNumber	Static	Text
physicalAddress	Static	Text

6

About Model Correction

This chapter describes how some discovered data is corrected to conform to the Oracle Communications Information Model. Model correction occurs when the data discovered by the discovery actions does not conform to the Information Model. The Oracle Communications Network Integrity Optical UIM Integration cartridge performs model corrections for the following:

- TMF814 Rack
- TMF814 TPLayer Generic Objects
- Slots

TMF814 Rack

Discovered TMF814 racks are removed from the physical device hierarchy.

TMF814 TPLayer Generic Objects

TMF814 TPLayer Generic objects are removed from the logical device hierarchy.

Slots

Slots with slot number higher than 40 are removed from the logical device and physical device hierarchies. The model supports a Huawei single-shelf implementation, which uses only the first 40 equipment slots returned in the discovery results.

7

About Design Studio Construction

This chapter describes how the Oracle Communications Network Integrity Optical UIM Integration cartridge is built from the Oracle Communications Design Studio perspective.

Model Collections

Table 7–1 displays the logical device specifications in this cartridge.

Table 7–1 Logical Device Specifications

Specification Name	UIM Entity Type
Network Device	LogicalDevice
E1 Interface	DeviceInterface
E3 Interface	DeviceInterface
E4 Interface	DeviceInterface
STM-1 Interface	DeviceInterface
STM-4 Interface	DeviceInterface
STM-16 Interface	DeviceInterface
STM-64 Interface	DeviceInterface
VC3 Interface	DeviceInterface
VC4 Interface	DeviceInterface
VC12 Interface	DeviceInterface

Table 7–2 displays the physical device specifications in this cartridge.

Table 7–2 Physical Device Specifications

Specification Name	UIM Entity Type
Huawei OptiX OSN 3500	PhysicalDevice
Huawei OptiX OSN 3500 Shelf	Equipment (Shelf)
Huawei OptiX OSN 3500 Auxiliary Slot	EquipmentHolder
Huawei OptiX OSN 3500 Fan Slot	EquipmentHolder
Huawei OptiX OSN 3500 Slot	EquipmentHolder
Huawei OptiX OSN 3500 GSCC Slot	EquipmentHolder

Table 7–2 (Cont.) Physical Device Specifications

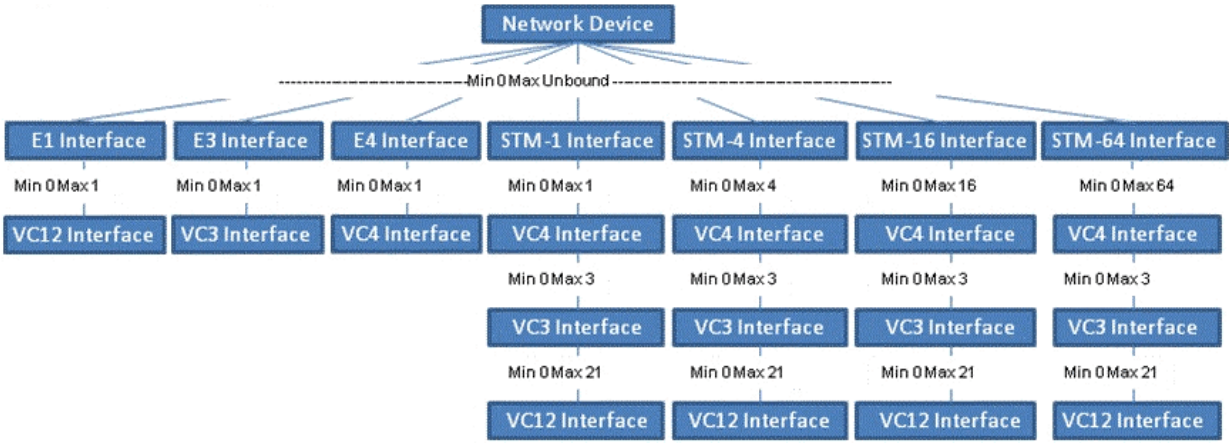
Specification Name	UIM Entity Type
Huawei OptiX OSN 3500 Power Interface Unit Slot	EquipmentHolder
Huawei OptiX OSN 3500 XCS Slot	EquipmentHolder
Huawei OptiX OSN AUX	Equipment (Card)
Huawei OptiX OSN D12S	Equipment (Card)
Huawei OptiX OSN D34S	Equipment (Card)
Huawei OptiX OSN EU08	Equipment (Card)
Huawei OptiX OSN FAN	Equipment (Card)
Huawei OptiX OSN FANA	Equipment (Card)
Huawei OptiX OSN FANB	Equipment (Card)
Huawei OptiX OSN GSCC	Equipment (Card)
Huawei OptiX OSN N1OU08	Equipment (Card)
Huawei OptiX OSN N1SLD64	Equipment (Card)
Huawei OptiX OSN N1SLH1	Equipment (Card)
Huawei OptiX OSN N1SLQ16	Equipment (Card)
Huawei OptiX OSN N1SLQ4	Equipment (Card)
Huawei OptiX OSN N2PQ1	Equipment (Card)
Huawei OptiX OSN N2PQ3	Equipment (Card)
Huawei OptiX OSN PIU	Equipment (Card)
Huawei OptiX OSN Q2PIU	Equipment (Card)
Huawei OptiX OSN Q2SLN	Equipment (Card)
Huawei OptiX OSN SCXL	Equipment (Card)
Huawei OptiX OSN SXCSA	Equipment (Card)
Huawei OptiX OSN T2SL64	Equipment (Card)
Huawei OptiX OSN UCXL	Equipment (Card)
Huawei OptiX OSN N1SL4	Equipment (Card)
Huawei OptiX OSN N1SL16	Equipment (Card)
Huawei OptiX OSN N1SL64	Equipment (Card)
Huawei OptiX OSN D12S Port	PhysicalPort
Huawei OptiX OSN N1OU08 Port	PhysicalPort
Huawei OptiX OSN N1SLD64 Port	PhysicalPort
Huawei OptiX OSN N1SLQ16 Port	PhysicalPort
Huawei OptiX OSN N1SLQ4 Port	PhysicalPort
Huawei OptiX OSN D34S Port	PhysicalPort
Huawei OptiX OSN EU08 Port	PhysicalPort
Huawei OptiX OSN N1SL4 Port	PhysicalPort
Huawei OptiX OSN N1SL16 Port	PhysicalPort
Huawei OptiX OSN N1SL64 Port	PhysicalPort

Logical Specification Lineage

This section describes the Device Interface specification hierarchy under a network device that supports the synchronous digital hierarchy (SDH). The discovered TMF814 logical device is mapped to these Logical Device specifications.

Figure 7–1 shows the Logical specification lineage.

Figure 7–1 Logical Specification Lineage



Physical Specification Lineage

This section describes the Huawei Physical Device specification hierarchy. The discovered TMF814 physical device is mapped to these Physical Device and Equipment specifications. The device that has the TMF814 value **<tmf:productName>OptiX OSN 3500</tmf:productName>** is modeled physically.

The following example shows the Physical specification hierarchy:

```
Huawei OptiX OSN 3500 (Physical Device)
  Huawei OptiX OSN 3500 Shelf (Equipment)
    Huawei OptiX OSN 3500 Auxiliary Slot (EquipmentHolder)
    Huawei OptiX OSN 3500 Fan Slot (EquipmentHolder)
    Huawei OptiX OSN 3500 Slot (EquipmentHolder)
    Huawei OptiX OSN 3500 GSCC Slot (EquipmentHolder)
    Huawei OptiX OSN 3500 Power Interface Unit Slot (EquipmentHolder)
    Huawei OptiX OSN 3500 XCS Slot (EquipmentHolder)
```

This cartridge is modeled using Design Studio for Inventory specifications, using a visual equipment model to represent the shelf and slots of the device.

Figure 7–2 shows the visual model of a Huawei slot distribution.

Figure 7–2 Visual Model of Huawei Slot Distribution

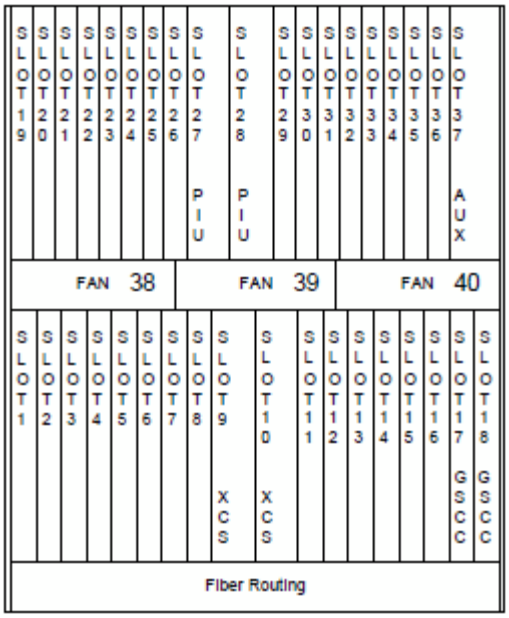


Table 7–3 shows how slots in a Huawei device are distributed.

Table 7–3 Huawei OptiX OSN Board Slot Range Distribution

Board Type	Distributed Slot Ranges
Service interface boards	19 to 26 and 29 to 36
Service processing boards	1 to 8 and 11 to 17
XCS boards	9 to 10
GSCC boards	17 to 18 (slot 17 can also hold a service processing board)
Power interface boards	27 to 28
Auxiliary interface boards	37

There are many different cards that the OSN 3500 can support. The Optical UIM Integration cartridge uses a subset of cards. You can add more cards by extending the cartridge. The cartridge also does not restrict placement of cards in specific slot types.

Actions

Table 7–4 outlines the Design Studio construction of the Optical UIM Integration cartridge actions.

Table 7–4 Actions Design Studio Construction

Action	Result Category	Address Handler	Scan Parameter Groups	Processors
Discover Enhanced Huawei U2000	Device	CorbaURLAddress Handler	TMF814Parameters and AutoResolutionParameter. See *Network Integrity Optical TMF814 CORBA Cartridge Guide*.	▪ Processors inherited from the Discover Huawei U2000 action ▪ Huawei Logical Device Remodeler ▪ Huawei Physical Device Remodeler
Discover Enhanced TMF814	Device	CorbaURLAddress Handler	TMF814Parameters and AutoResolutionParameter. See *Network Integrity Optical TMF814 CORBA Cartridge Guide*.	▪ Processors inherited from the Discover TMF814 action ▪ Enhanced TMF814 Property Customizer ▪ Logical Network Device Remodeler
Assimilate Huawei Optical Circuits	Device	CorbaURLAddress Handler	OpticalAssimilationParameters. See *Network Integrity Optical Circuit Assimilation Cartridge Guide*.	▪ Processors inherited from the Assimilate Optical Circuits action ▪ Optical Assimilation SDH Circuit Matcher ▪ Optical Circuit Remodeler
Import Logical Optical from UIM	Device	N/A	Logical Optical UIM Import Parameters. See Table 7–5.	▪ Processors inherited from the Abstract Import from UIM action ▪ Scan Parameters Optical UIM Initializer
Import Optical from UIM	Device	N/A	Optical UIM Import Parameters. See Table 7–6.	▪ Processors inherited from the Abstract Import from UIM action ▪ Scan Params Physical Optical UIM Init ▪ STM Link UIM Importer ▪ STM Link UIM Persister ▪ VC4HOT UIM Importer ▪ VC4HOT UIM Persister ▪ Circuit UIM Importer ▪ Circuit UIM Persister
UIM Detect Huawei Device Discrepancies	Device	N/A	N/A	▪ Processors inherited from the Abstract Detect UIM Discrepancies action ▪ Processors inherited from the Auto Resolve Discrepancies action ▪ Optical UIM Huawei DD Filters ▪ UIM Auto Resolve Selected Discrepancies

Table 7–4 (Cont.) Actions Design Studio Construction

Action	Result Category	Address Handler	Scan Parameter Groups	Processors
UIM Detect Optical Circuit Discrepancies	Device	N/A	N/A	▪ Processors inherited from the Abstract Optical Circuit Discrepancy Detection action ▪ Circuit Discrepancy Filters Initializer
UIM Detect TMF814 Device Discrepancies	Device	N/A	N/A	▪ Processors inherited from the Abstract Detect UIM Discrepancies action ▪ Optical UIM TMF DD Filters
Resolve Optical in UIM	Device	N/A	N/A	▪ Processors inherited from the Abstract Resolve in UIM action ▪ UIM Resolution Optical Initializer

Scan Parameter Groups

The Assimilate Huawei Optical Circuits action uses the OpticalAssimilationParameters scan parameter group. See *Network Integrity Optical Circuit Assimilation Cartridge Guide* for more information.

The Discover Enhanced Huawei U2000 action and the Discover Enhanced TMF814 action use the TMF814Parameters and AutoResolutionParameter scan parameter groups. See *Network Integrity Optical TMF814 CORBA Cartridge Guide* for more information.

The Import Logical Optical from UIM action uses the Logical Optical UIM Import Parameters scan parameter group. Table 7–5 outlines the Design Studio construction of this scan parameter group.

Table 7–5 Logical Optical UIM Import Parameters Scan Parameter Group Design Studio Construction

Characteristic Name	Parameter Type	Description	UI Label
adminState	Dropdown	The status of the device in the inventory system	Inventory State
name	String	The device name. This field supports wildcard characters.	Name
networkLocationEntityCode	String	The network or entity location code. This field supports wildcard characters.	Network/Entity Location

The Import Optical from UIM action uses the Optical UIM Import Parameters scan parameter group. Table 7–6 outlines the Design Studio construction of this scan parameter group.

Table 7–6 Optical UIM Import Parameters Scan Parameter Group Design Studio Construction

Characteristic Name	Parameter Type	Description	UI Label
adminState	Dropdown	The status of the device in the inventory system	Inventory State
importLogicalDevices	Check box	Use this check box to indicate whether to import logical devices. By default, this check box is checked in the UI.	Import Logical Devices
importPhysicalDevices	Check box	Use this check box to indicate whether to import physical devices. By default, this check box is checked in the UI.	Import Physical Devices
logicalDeviceSpecification	String	The specification name for logical devices. This field supports wildcard characters.	Logical Device Specification
name	String	Use to filter imported devices by device name. This field supports wildcard characters.	Name
networkLocationEntityCode	String	The network or entity location code. This field supports wildcard characters.	Network/Entity Location
physicalDeviceSpecification	String	The specification name for physical devices. This field supports wildcard characters.	Physical Device Specification
scope	Dropdown	The scope of the data to import from UIM: ■ Equipment only ■ Equipment and STM Links only ■ Equipment, STM Links, and Circuits The default is **Equipment only**.	Scope

Processors

The tables in this section list the Design Studio construction for all processors in the Optical UIM Integration cartridge:

- Table 7–7, " Discover Enhanced Huawei U2000 Action Processors Design Studio Construction"
- Table 7–8, " Discover Enhanced TMF814 Action Processors Design Studio Construction"
- Table 7–9, " Assimilate Huawei Optical Circuits Action Processors Design Studio Construction"
- Table 7–10, " Import Logical Optical from UIM Action Processors Design Studio Construction"
- Table 7–11, " Import Optical from UIM Action Processors Design Studio Construction"
- Table 7–12, " UIM Detect Huawei Device Discrepancies Action Processors Design Studio Construction"
- Table 7–13, " UIM Detect Optical Circuit Discrepancies Action Processors Design Studio Construction"
- Table 7–14, " UIM Detect TMF814 Device Discrepancies Action Processors Design Studio Construction"
- Table 7–15, " Resolve Optical in UIM Action Processors Design Studio Construction"

Table 7–7 Discover Enhanced Huawei U2000 Action Processors Design Studio Construction

Processor	Context Parameter
Huawei Logical Device Remodeler	Input: ■ customProperties ■ logicalTree ■ physicalTree Output: None
Huawei Physical Device Remodeler	Input: ■ customProperties ■ logicalTree ■ physicalTree ■ managedElement Output: None

Table 7–8 Discover Enhanced TMF814 Action Processors Design Studio Construction

Processor	Context Parameter
Enhanced TMF814 Property Customizer	Input: tmf814Properties Output: None
Logical Network Device Remodeler	Input: ■ logicalTree ■ physicalTree Output: None

Table 7–9 Assimilate Huawei Optical Circuits Action Processors Design Studio Construction

Processor	Context Parameter
Optical Assimilation SDH Circuit Matcher	Input: scanInScope Output: None
Optical Circuit Remodeler	Input: devicePipeMap Output: None

Table 7–10 Import Logical Optical from UIM Action Processors Design Studio Construction

Processor	Context Parameter
Scan Parameters Optical UIM Initializer	Input: filters Output: None

Table 7–11 Import Optical from UIM Action Processors Design Studio Construction

Processor	Context Parameter
Scan Params Physical Optical UIM Init	Input: filters Output: None
STM Link UIM Importer	Input: ■ uimImportContext ■ uimLogicalDeviceID Output: topologicalLinks
STM Link UIM Persister	Input: ■ ldev ■ topologicalLinks Output: None
VC4HOT UIM Importer	Input: ■ uimImportContext ■ uimLogicalDeviceID Output: transports
VC4HOT UIM Persister	Input: ■ ldev ■ transports Output: None
Circuit UIM Importer	Input: ■ uimImportContext ■ uimLogicalDeviceID Output: niCircuits
Circuit UIM Persister	Input: ■ ldev ■ niCircuits Output: None

Table 7–12 UIM Detect Huawei Device Discrepancies Action Processors Design Studio Construction

Processor	Context Parameter
Optical UIM Huawei DD Filters	Input: None Output: None
UIM Auto Resolve Selected Discrepancies	Input: autoResolutionManager Output: None

Table 7–13 UIM Detect Optical Circuit Discrepancies Action Processors Design Studio Construction

Processor	Context Parameter
Circuit Discrepancy Filters Initializer	Input: None Output: None

Table 7–14 UIM Detect TMF814 Device Discrepancies Action Processors Design Studio Construction

Processor	Context Parameter
Optical UIM TMF DD Filters	Input: None Output: None

Table 7–15 Resolve Optical in UIM Action Processors Design Studio Construction

Processor	Context Parameter
UIM Resolution Optical Initializer	Input: ■ baseResolutionElement ■ uimResolutionContext Output: None

8

About Design Studio Extension

This chapter provides examples for extending certain aspects of the Oracle Communications Network Integrity Optical UIM Integration cartridge using Oracle Communications Design Studio.

You can modify any part of the code to customize the cartridge for your business and operational requirements. For more information about cartridge extension, see *Network Integrity Developer's Guide*.

For guidelines and best practices for extending cartridges, see *Network Integrity Concepts*.

This chapter describes the following examples:

- Discovering Entities from a Different Vendor
- Adding Support for SONET Devices
- Adding Support for SONET Circuits
- Adding Support for Inter-Vendor SDH Links and Circuits
- Adding Additional Huawei OptiX OSN Cards
- Supporting an Extended Subrack

Discovering Entities from a Different Vendor

To extend a cartridge to discover entities from a different vendor:

1. Create a new discovery action.
2. Add the Discover Enhanced TMF814 action as a processor to your new action.
3. Create the following discovery processors and add them to your new action:
   - *vendor* Logical Device Remodeler (where *vendor* is the name of the vendor whose entities you want to discover), which calls the **LogicalNetworkDeviceRemodelerHelper** class.
   - *vendor* Physical Device Remodeler, which remodels the TMF814 equipment model into your vendor-specific equipment specifications.
4. Move the new processors before the TMF814 Device Persister processor.
5. Add the result source from your new action to the appropriate discrepancy resolution action(s).

Adding Support for SONET Devices

Table 8–1 shows the specifications that can be added to the cartridge to support SONET devices.

Table 8–1 SONET Device Specifications

Specification	Entity
DS1 Interface	DeviceInterface
DS3 Interface	DeviceInterface
OC-3 Interface	DeviceInterface
OC-12 Interface	DeviceInterface
OC-48 Interface	DeviceInterface
OC-192 Interface	DeviceInterface
STS-1 Interface	DeviceInterface
VT1.5 Interface	DeviceInterface

The device interface hierarchy can be added to network device to extend the device to support SONET.

The following example demonstrates the device interface hierarchy:

```
Network Device
  DS1 Interface
  DS3 Interface
    STS-1 Interface
      VT1.5 Channel Interface
    OC-3 Interface
      STS-1 Interface
        VT1.5 Interface
    OC-12 Interface
      STS-1 Interface
        VT1.5 Interface
    OC-48 Interface
      STS-1 Interface
        VT1.5 Interface
    OC-192 Interface
      STS-1 Interface
        VT1.5 Interface
```

To extend the Optical UIM Integration cartridge to support SONET devices:

1. Add the specifications from Table 8–1 to the **ora_uim_network_device** model project.
2. In the Optical UIM Integration cartridge, add the specifications to the model collection.
3. Add new device interface specifications to the list in the **replaceSpec** method of **LogicalNetworkDeviceRemodelerHelper.java**.
4. Add any additional model corrections if required.

Adding Support for SONET Circuits

Table 8–2 shows the specifications that can be added to the cartridge to support SONET circuits.

Table 8–2 SONET Circuit Specifications

Specification	Entity
STS-1 Link	Pipe
STS-3 Link	Pipe
DS1 Circuit	Pipe
DS3 Circuit	Pipe

To extend the Optical UIM Integration cartridge to support SONET circuits:

1. Add the specifications from Table 8–2 to the **Optical_Model** model project.
2. In the Optical UIM Integration cartridge, extend the Assimilate Huawei Optical Circuits action to assimilate SONET circuit entities. See the discussion about SONET assimilation in *Network Integrity Optical Circuit Assimilation Cartridge Guide*.
3. Extend the UIM Sample Web Service to support SONET rate code connectivity.
4. Extend an import action that imports entities from UIM to also import SONET channelized connectivity entities. Model the SONET entities into the Optical Model.
5. Create or extend a discrepancy detection action to compare the assimilated and imported result categories.
6. Create or extend a discrepancy resolution action that extends the Resolve Optical in UIM action to support resolution on SONET circuits.

Adding Support for Inter-Vendor SDH Links and Circuits

This section describes how to extend the Optical UIM Integration cartridge to discover and assimilate devices, entities and circuits from multiple vendors or EMSs.

This example explains how to develop support for SDH entities. However, this example could also be used to achieve SONET support.

1. In the Optical UIM Integration cartridge, add new discovery and assimilation actions for each desired EMS or vendor.
2. Extend the Assimilate Huawei Optical Circuits action to assimilate both complete and partial circuits for SONET circuits. See the discussion about network boundary partial circuit correction in *Network Integrity Optical Circuit Assimilation Cartridge Guide*.
3. Create an assimilation action to assimilate all SDH partial circuits passing through multiple EMS into complete circuits. This assimilation action should take all the individual EMS assimilation results having partial SDH circuits.
4. Enhance the UIM Sample Web Service cartridge project to support SDH rate code channelized connectivities.
5. Extend an import action that imports entities from UIM to also import SDH channelized connectivity entities. Model the SDH entities into the Optical Model.

6. Create or extend a discrepancy detection action to compare the assimilated and imported result categories.
7. Create or extend a discrepancy resolution action that extends the Resolve Optical in UIM action to support resolution on SDH links and circuits.

Adding Additional Huawei OptiX OSN Cards

To add additional Huawei OptiX OSN cards:

1. Add an equipment (type card) specification.

   If the card has ports, add physical port specifications to the **ora_uim_huawei_tdm_network_device** cartridge with proper specification relationships between the card and port.
2. Add new card and port specifications to the Optical UIM model collection.
3. Add a new card specification to the list in **HuaweiOptiXOSN3500EquipSpecHelper.java**.
4. Add a new physical port specification to the list in **HuaweiOptiXOSN3500SpecificationMapper.java**.

Supporting an Extended Subrack

The cartridge can be extended to include support for the Huawei OptiX OSN 3500 extended subrack. This section describes slot distribution for the extended shelf. The subrack is modeled as another shelf under the physical device.

Table 8–3 shows how slots in a Huawei device are distributed.

Table 8–3 Slot Distribution of Huawei OptiX OSN 3500 Extended Subrack

Board Type	Distributed Slot Ranges
Service interface boards	69 to 76 and 79 to 86
Service processing boards	51 to 55 and 63 to 66
XCS boards	59 to 60
Power interface boards	77 to 78
Auxiliary interface boards	87
Fans	88-90
Virtual slots	■ 50 (CAU slot) ■ 101 to 102 (COA slots)

Figure 8–1 shows slot distribution for an extended subrack of Huawei OptiX OSN 3500.

Figure 8–1 Extended Subrack of Huawei OptiX OSN 3500