Oracle® Communications Network Integrity

RAN and MW FTP Discovery and UIM Integration Cartridge Guide

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Preface

This guide explains the functionality and design of the Oracle Communications Network Integrity RAN and MW Discovery Cartridge.

Audience

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

Developers should have a good working knowledge of FTP operations, specifications, Network Integrity, UIM, and the use of Oracle Communications Design Studio for Network Integrity.

You should be familiar with the following documents included with this release:

- *Oracle Communications Network Integrity Concepts*
- *Oracle Communications Network Integrity Developer's Guide*
- *Oracle Communications Network Integrity File Transfer and Parsing Guide*
- *Oracle Communications Network Integrity UIM Integration Cartridge Guide*

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

- Radio Access Network (RAN) standards and terminology.
- Microwave technology standards and terminology.
- Development and extensibility of Network Integrity cartridge.

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1
Overview

This chapter provides an overview of the Oracle Communications Network Integrity RAN and Microwave Discovery cartridge.

This chapter contains the following sections:

- About the RAN and Microwave Discovery Cartridge
- About Cartridge Dependencies
- Opening the Cartridge Files in Design Studio
- Building and Deploying the Cartridge

About the RAN and Microwave Discovery Cartridge

The RAN and Microwave Discovery cartridge supports of modelling of RAN (Radio Access Network) and Microwave devices in the network.

The RAN and Microwave Discovery cartridge provides functionality including:

- Read and collect data from files provided using FTP.
- Generic RAN and Microwave logical discovery and modeling.
- Generic RAN and Microwave physical discovery and modeling.
- Discrepancy detection and resolution on modeled data.

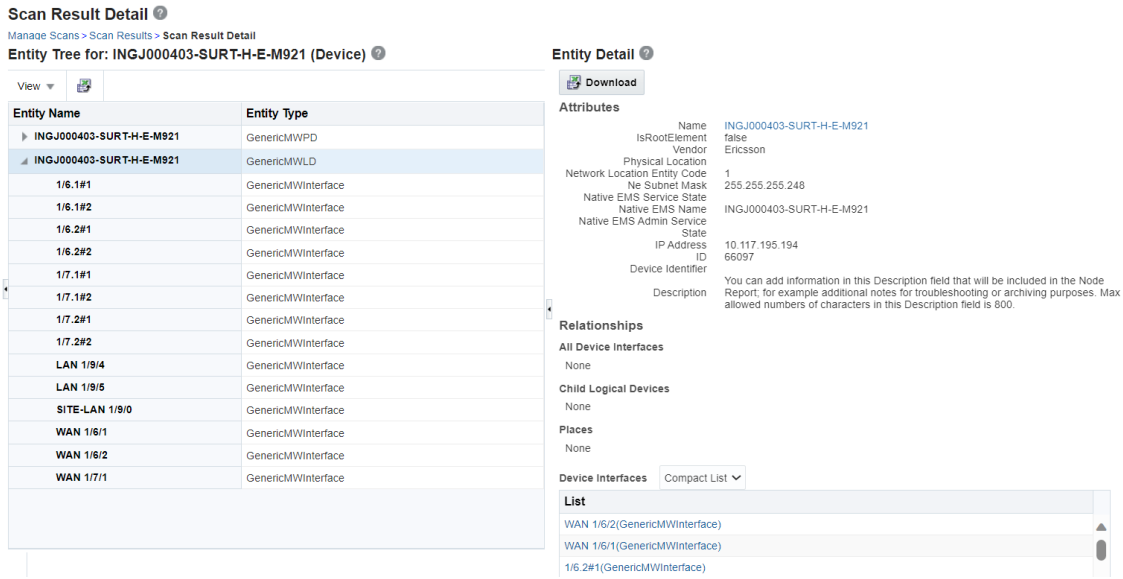
This cartridge produces both logical and physical device hierarchies that represent a discovered device. The logical hierarchy includes a logical device and child interfaces. The physical hierarchy includes physical devices, equipments, equipment holders, and physical ports. In addition, this cartridge creates associations between the physical and logical hierarchies. The first association is at the device level, between the physical device and the logical device, and the second association is at the interface level between physical ports and Interfaces.

The cartridge will discover the following network entities:

- NE
- Rack
- Shelf
- Card
- Port
- Interface

Figure 1-1 shows a sample Microwave logical device hierarchy.

Figure 1-1 Sample Microwave Logical Device Hierarchy



This cartridge is designed to be used on a standalone basis displaying the model hierarchy in Network Integrity. It provides no integration with other products but may be extended. It is designed to discover RAN and Microwave devices only, and any attempts to discover other devices results in a scan failure.

In addition to a discovery action, the cartridge provides discrepancy detection and discrepancy resolution for integration with Unified Inventory Management (UIM).

Discrepancy detection provides the mechanism to allow a filtered comparison of logical and physical device trees between what is discovered and what is imported from UIM. For more information about discrepancy detection actions and processors, see "About Discrepancy Detection Actions" in *Network Integrity Developer's Guide*.

The discrepancy resolution action enables the discovered logical and physical device trees to be created and updated in UIM.

About Cartridge Dependencies

This section provides information on dependencies that the RAN and Microwave Discovery cartridge has on other entities.

Run-Time Dependencies

This cartridge requires that the Address_Handlers cartridge be deployed to Network Integrity.

Design-Time Dependencies

The RAN and Microwave Discovery cartridge has the following dependencies:

- Address_Handlers
- NetworkIntegritySDK
- ora_uim_model

- ora_ni_uim_ran_microwave
- UIM Integration Web Service
- ora_ni_uim_ocim

Opening the Cartridge Files in Design Studio

To review and extend the SDH Discovery cartridge, you must first download the Oracle Communications RAN and Microwave Discovery Cartridge software from the Oracle software delivery website:

https://edelivery.oracle.com

The software contains the RAN and Microwave Discovery cartridge ZIP file, which has the following structure:

- \UIM_Cartridge_Projects\
- \Network_Integrity_Cartridge_Projects\
- RAN-and-Microwave-Discovery-Cartridge-R7.iar

For more information about opening files in Design Studio, see "Getting Started with Design Studio for Network Integrity (1)" in *Design Studio Online Help* and "Using Design Studio to Extend Network Integrity" in *Network Integrity Developer's Guide*.

Building and Deploying the Cartridge

For more information about building and deploying cartridges, see "Getting Started with Design Studio for Network Integrity (1)" in *SCD Design Studio Modeling Network Integrity*.

2

About the Cartridge Components

This chapter provides information about the components of the Oracle Communications Network Integrity RAN and Microwave Discovery cartridge.

This cartridge contains the following actions:

- RAN and Microwave File Collector
- Discover RAN Devices
- Discover Microwave Devices
- Detect Discrepancies for RAN and Microwave Devices
- Resolve RAN and Microwave Devices in UIM

RAN and Microwave File Collector

The RAN and Microwave File Collector action is an abstract action that collects the required input files over FTP/SFTP and processes them to model the logical and physical device hierarchies.

All the modeling is done over different files as discussed below:

- RAN Files:
  - **ran_device.csv:** Contains the network element information. It is used for modeling logical device and physical device.
  - **ran_equipment.csv:** Contains the equipment level information. It is used for modeling racks, shelves, and cards.
  - **ran_port.csv:** Contains the port level information. It is used for modeling device interfaces and physical ports.
- Microwave Files:
  - **microwave_ne_inventory.csv:** Contains the network element information.
  - **microwave_hw_module_inventory.csv:** Contains equipment information and their positioning.
  - **microwave_sw_module_inventory.csv:** Contains software information of the equipment.
  - **microwave_eth_config_data.csv**: Contains ethernet related configuration data of the network elements.
  - **microwave_ospf_config_data.csv:** Contains the OSPF related configuration data of the network elements.
  - **microwave_generic_config_data.csv:** Contains other generic configuration data of the network elements.
  - **microwave_license.csv:** Contains license information of the network elements.

Scan Parameter Group

The RAN and Microwave File Collector action contains the following scan parameter groups:

- RAN and Microwave Discovery Parameters

Table 2-1 RAN and Microwave Discovery Parameters

Parameter	Default Value	Mandatory	Description
Password	N/A	No	The password to connect to the remote location.
Port	N/A	No	The port used to connect to the remote server. The default is 21 for FTP and 22 for SFTP.
Rename Suffix	processed	No	The suffix to add to the source file if the source file management characteristic has a value of *Rename*.
Session Timeout (sec)	60	No	The amount of time in seconds before an idle connection is timed out. The valid range is from 1 to 3600.
Source File Management	Rename	No	Select the action to take on source files when the file transfer is complete. Options are: Delete, Rename, Nothing.
Transfer Type	SFTP	No	Select how files should be transferred: FTP, SFTP, Local.
User Name	N/A	No	The user name to connect to the remote location.
Network Element Name Qualifier	EQUALS	No	List: EQUALS, EQUALS_IGNORE_CASE, CONTAINS, CONTAINS_IGNORE_CASE, STARTS_WITH, STARTS_WITH_IGNORE_CASE, ENDS_WITH, ENDS_WITH_IGNORE_CASE This parameter works in combination with network element name to filter the collected NEs by name and qualifier.

Table 2-1 (Cont.) RAN and Microwave Discovery Parameters

Parameter	Default Value	Mandatory	Description
Network Element Name	N/A	No	Name of network element. This parameter works in combination with Network Element Name Qualifier. It helps to filter the scan.
Network Element Type Qualifier	EQUALS	No	List: EQUALS, EQUALS_IGNORE_CASE, CONTAINS, CONTAINS_IGNORE_CASE, STARTS_WITH, STARTS_WITH_IGNORE_CASE, ENDS_WITH, ENDS_WITH_IGNORE_CASE This parameter works in combination with Network Element Type to filter the collected NEs by name and qualifier.
Network Element Type	N/A	No	Type of Network Element. This parameter works in combination with Network Element Type Qualifier. This parameter helps to filter the scan.

RAN and Microwave File Collector Processor

The RAN and Microwave File Collector Processor collects the CSV files required for discovery and places them in the **ranAndMicrowaveFileCollectorFileCollection** collection.

Discover RAN Devices

The Discover RAN Devices action reads the RAN files and processes them to model the logical and physical device hierarchies.

Scan Parameter Group

The Discover RAN Devices action contains the following scan parameter groups:

- RAN and Microwave Discovery Parameters

Table 2-2 Discover RAN Devices action RAN and Microwave Discovery Parameters scan parameter group

Parameter	Default Value	Mandatory	Description
Password	N/A	No	The password to connect to the remote location.
Port	N/A	No	The port used to connect to the remote server. The default is 21 for FTP and 22 for SFTP.
Rename Suffix	processed	No	The suffix to add to the source file if the source file management characteristic has a value of Rename.
Session Timeout (sec)	60	No	The amount of time in seconds before an idle connection is timed out. The valid range is from 1 to 3600.
Source File Management	Rename	No	Select the action to take on source files when the file transfer is complete. Options are: Delete, Rename, Nothing.
Transfer Type	SFTP	No	Select how files should be transferred: FTP, SFTP, Local.
User Name	N/A	No	The user name to connect to the remote location.
Network Element Name Qualifier	EQUALS	No	List: EQUALS, EQUALS_IGNORE_CASE, CONTAINS, CONTAINS_IGNORE_CASE, STARTS_WITH, STARTS_WITH_IGNORE_CASE, ENDS_WITH, ENDS_WITH_IGNORE_CASE This parameter works in combination with Network Element Name to filter the collected NEs by name and qualifier.
Network Element Name	N/A	No	Name of Network Element. This parameter works in combination with Network Element Name Qualifier. This parameter helps to filter the scan.

Table 2-2 (Cont.) Discover RAN Devices action RAN and Microwave Discovery Parameters scan parameter group

Parameter	Default Value	Mandatory	Description
Network Element Type Qualifier	EQUALS	No	List: EQUALS, EQUALS_IGNORE_CASE, CONTAINS, CONTAINS_IGNORE_CASE, STARTS_WITH, STARTS_WITH_IGNORE_CASE, ENDS_WITH, ENDS_WITH_IGNORE_CASE This parameter works in combination with Network Element Type to filter the collected NEs by name and qualifier.
Network Element Type	N/A	No	Type of Network Element. This parameter works in combination with Network Element Type Qualifier. This parameter helps to filter the scan.

The Discover RAN Devices action contains the following processors run in the following order:

- RAN and Microwave File Collector (inherited)
- RanDiscoveryInitializer
- Device CSV Parser
- Equipment CSV Parser
- Port CSV Parser
- RanDeviceModelPersister

RANDiscoveryInitializer Processor

The RanDiscoveryInitializer processor iterates over the **ranAndMicrowaveFileCollectorFileCollection** collection to arrange the files into 3 categories: **deviceFiles**, **equipmentFiles** and **portFiles**. This processor outputs these as collections of files along with the logical device and physical device object maps i.e., **logicalDeviceObjectMap** and **physicalDeviceObjectMap.**

Device CSV Processor

The Device CSV Parser processor iterates over the **deviceFiles** collection, parses the files and models the Logical and Physical Device Objects to place them in **logicalDeviceObjectMap** and **physicalDeviceObjectMap respectively**. This processor also filters the network element devices based on name-matching and type-matching criteria provided through scan parameters. Only those devices that are matched by specified criteria are considered for further processing.

Equipment CSV Parser Processor

The Equipment CSV Parser processor iterates over the **equipmentFiles** collection, parses the files, and models the Rack Equipment Objects, Shelf Equipment Objects and Card Equipment Objects and associates them with the corresponding Physical Device Objects present in **physicalDeviceObjectMap**.

Port CSV Parser Processor

The Port CSV Parser processor iterates over the **portFiles** collection, parses the files, and models the Physical Port Object and associates them with the Card Equipment Object with the help of **physicalDeviceObjectMap**.

RanDeviceModelPersister Processor

The RanDeviceModelPersister processor iterates over the **logicalDeviceObjectMap** and **physicalDeviceObjectMap** collections and models the logical and physical hierarchies.

Discover Microwave Devices

The Discover Microwave Devices action reads the Microwave files and processes them to model the logical and physical device hierarchies.

Scan Parameter Group

The Discover Microwave Devices action contains the following scan parameter groups:

- RAN and Microwave Discovery Parameters

Table 2-3 Discover Microwave Devices action RAN and Microwave Discovery Parameters scan parameter group

Parameter	Default Value	Mandatory	Description
Password	N/A	No	The password to connect to the remote location.
Port	N/A	No	The port used to connect to the remote server. The default is 21 for FTP and 22 for SFTP.
Rename Suffix	processed	No	The suffix to add to the source file if the source file management characteristic has a value of *Rename*.
Session Timeout (sec)	60	No	The amount of time in seconds before an idle connection is timed out. The valid range is from 1 to 3600.

Table 2-3 (Cont.) Discover Microwave Devices action RAN and Microwave Discovery Parameters scan parameter group

Parameter	Default Value	Mandatory	Description
Source File Management	Rename	No	Select the action to take on source files when the file transfer is complete. Options are: *Delete*, *Rename*, *Nothing*.
Transfer Type	SFTP	No	Select how files should be transferred: FTP, SFTP, Local.
User Name	N/A	No	The user name to connect to the remote location.
Network Element Name Qualifier	EQUALS	No	List: EQUALS, EQUALS_IGNORE_CASE, CONTAINS, CONTAINS_IGNORE_CASE, STARTS_WITH, STARTS_WITH_IGNORE_CASE, ENDS_WITH, ENDS_WITH_IGNORE_CASE This parameter works in combination with Network Element Name to filter the collected NEs by name and qualifier.
Network Element Name	N/A	No	Name of Network Element. This parameter works in combination with Network Element Name Qualifier. This parameter helps to filter the scan.
Network Element Type Qualifier	EQUALS	No	List: EQUALS, EQUALS_IGNORE_CASE, CONTAINS, CONTAINS_IGNORE_CASE, STARTS_WITH, STARTS_WITH_IGNORE_CASE, ENDS_WITH, ENDS_WITH_IGNORE_CASE This parameter works in combination with Network Element Type to filter the collected NEs by name and qualifier.
Network Element Type	N/A	No	Type of Network Element. This parameter works in combination with Network Element Type Qualifier. This parameter helps to filter the scan.

The Discover RAN Devices action contains the following processors run in the following order:

- RAN and Microwave File Collector (inherited)
- Microwave Files Parser
- MicrowaveDeviceModelPersister

Microwave Files Parser Processor

The Microwave Files Parser processor iterates over the **ranAndMicrowaveFileCollectorFileCollection** collection, parses the files, and models the network element Objects and places them in the **neObjects** collection. The processor also filters the network element devices based on name-matching and type-matching criteria provided through scan parameters. Only those devices that are matched by specified criteria are considered for further processing.

MicrowaveDeviceModelPersister Processor

The MicrowaveDeviceModelPersister processor iterates over the **neObjects** collection and models the logical and physical hierarchies.

Detect Discrepancies for RAN and Microwave Devices

The Detect Discrepancies for RAN and Microwave Devices action detects discrepancies between discovery scan results of Discover RAN Devices action or Discover Microwave Devices and data imported from UIM.

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

The Detect Discrepancies for RAN and Microwave Devices action contains the following processors run in the following order:

1. UIM Discrepancies Filter Initializer (inherited)
2. Discrepancy Detector (inherited)

Resolve RAN and Microwave Devices in UIM

The Resolve RAN and Microwave Devices in UIM action resolves discrepancies on logical and physical hierarchies and associations between logical and physical entities in UIM.

The 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, see "Overview" in *Network Integrity UIM Integration Cartridge Guide*.

The Resolve RAN and Microwave Devices in UIM action contains the following processors run in the following order:

1. UIM Resolution Framework Initializer (inherited)
2. UIM Resolution Initializer (inherited)
3. UIM Resolution Framework Dispatcher (inherited)

3
Using the Cartridge

This chapter provides instructions for using the Oracle Communications Network Integrity RAN and Microwave Discovery Cartridge in Network Integrity.

Creating a Discover RAN Devices Discovery Scan

The Discover RAN Devices scan is used to discover and model data of RAN devices.

The Discover RAN Devices discovery scan discovers network information and creates network entities such as physical devices, logical devices, racks, shelves, cards, ports and interfaces.

To create a Discover RAN Devices discovery scan:

1. Create a new scan.

   See "Creating a Scan" in *Network Integrity Online Help* for more information.
2. On the General tab, from the Scan Action list, select **Discover RAN Devices**.

   The Scan Type field displays *Discovery*.

   a. In the Scan Action Parameters section, configure the scan with appropriate parameters.

   b. **(Optional)** To filter the discovered Network elements by name, enter a name in the Network Element Name field and set the Network Element Name Qualifier list.

   c. **(Optional)** To filter the discovered Network elements by type, enter the type in the Network Element Type field and set the Network Element Type Qualifier list.
3. On the Scope tab, specify path to the file directory.

   Save and run the scan.
4. The scan discovers and models logical and physical devices.

The scan creates a device model for each logical and physical device.

Populating UIM with Discovered Data for RAN Devices

This procedure describes steps to populate UIM with network data discovered by the Discover RAN Devices action.

To populate UIM with discovered network data:

1. Create a new scan.

   See "Creating a Scan" in *Network Integrity Online Help* for more information.
2. On the General tab of the Create Scan page, from the Scan Action list, select **Discover RAN Devices**.

   The Scan Type field displays *Discovery*.

   a. Select **Detect Discrepancies**.

   b. In the Scan Action Parameters area, make any necessary configurations.

3. Save the scan.
4. Run the discovery scan.

   The scan generates Entity+ discrepancies for each discovered device.
5. Right-click on the discrepancies you want to populate into UIM and select **Resolve RAN and Microwave devices into UIM**.
6. Click Submit.
7. Verify that UIM is populated with the discovered data.

> **Note:**
>
> The import action **Import from UIM** available in the UIM_Integration_Cartridge, can be used to import data from UIM.

Creating a Discover Microwave Devices Discovery Scan

Discover Microwave Devices scan is used to discover and model data of Microwave devices.

The Discover Microwave Devices discovery scan discovers network information and creates network entities Physical device, Logical device, shelf, card, direct card. port, interface.

To create a Discover Microwave Devices discovery scan:

1. Create a new scan.

   See "Creating a Scan" in *Network Integrity Online Help* for more information.
2. On the General tab, from the Scan Action list, select **Discover Microwave Devices**.

   The Scan Type field displays *Discovery*.

   a. In the Scan Action Parameters section, configure the scan with appropriate parameters.

   b. (Optional) To filter the discovered Network elements by name, enter a name in the Network Element Name field and set the Network Element Name Qualifier list.

   c. (Optional) To filter the discovered Network elements by type, enter the type in the Network Element Type field and set the Network Element Type Qualifier list.
3. On the Scope tab, specify path to the file directory.

   Save and run the scan.
4. The scan discovers and models logical and physical devices.

The scan creates a device model for each logical and physical device.

Populating UIM with Discovered Data for Microwave Devices

This procedure describes steps to populate UIM with network data discovered by the Discover Microwave Devices action.

To populate UIM with discovered network data:

1. Create a new scan.

   See "Creating a Scan" in *Network Integrity Online Help* for more information.

2. On the General tab of the Create Scan page, from the Scan Action list, select **Discover Microwave Devices**.

   The Scan Type field displays *Discovery*.

   a. Select **Detect Discrepancies**.

   b. In the Scan Action Parameters area, make any necessary configurations.

3. Save the scan.
4. Run the discovery scan.

   The scan generates Entity+ discrepancies for each discovered device.

5. Right-click on the discrepancies you want to populate into UIM and select **Resolve RAN and Microwave devices into UIM**.
6. Click Submit.
7. Verify that UIM is populated with the discovered data.

> **Note:**
>
> The import action **Import from UIM** available in the UIM_Integration_Cartridge can be used to import data from UIM.

4

About Cartridge Modeling

The Oracle Communications Network Integrity RAN and Microwave Discovery Cartridge models the collected data according to the Oracle Communications Information Model. The collected data is modeled into the following entities:

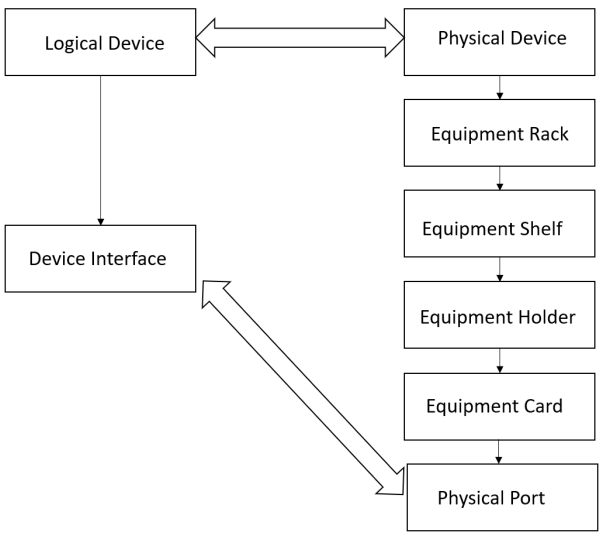
- Equipment
- EquipmentHolder
- EquipmentEquipmentRel
- EquipmentHolderEquipmentRel
- LogicalDevice
- MediaInterface
- PhysicalDevice
- PhysicalDeviceEquipmentRel
- PhysicalPort

See *Oracle Communications Information Model Reference* for more information about the Information Model.

RAN and Microwave Discovery Cartridge Representation

Figure 4-1 displays a diagram depicting the object relationship rendered for RAN devices.

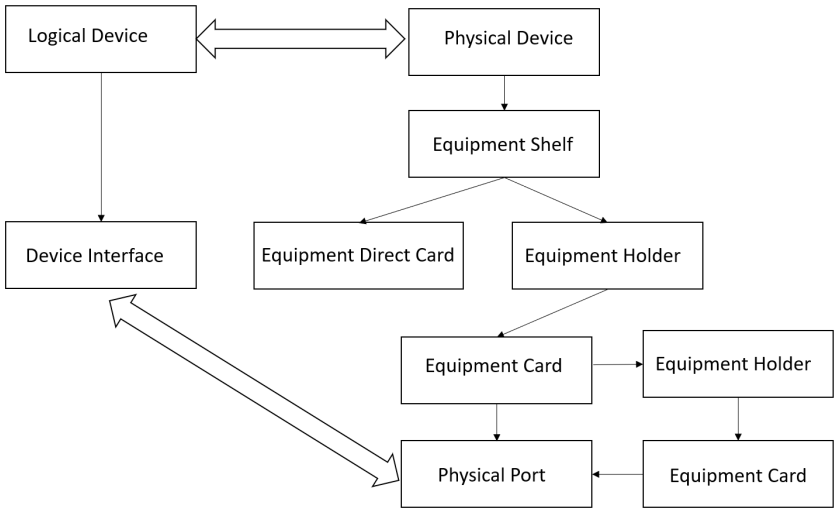
Figure 4-1 Object Relationship Rendered for RAN Devices



OBJECT RELATIONSHIP FOR RAN DEVICES

Figure 4-2 displays a diagram depicting the object relationship rendered for Microwave devices.

Figure 4-2 Object Relationship Rendered for Microwave Devices



OBJECT RELATIONSHIP FOR MICROWAVE DEVICES

Specifications

This section lists the specifications included in the ora_ni_uim_ran_microwave cartridge for devices.

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

Specifications shared with Oracle Communications Unified Inventory Management (UIM) are defined in the ora_ni_uim_device cartridges. These cartridges are used to directly deploy specifications to UIM.

Physical Device

Table 4-1 shows the list of physical device specifications.

Table 4-1 Physical Device Specifications

Specification	Cartridge	Intended Usage
GenericRANPD	ora_ni_uim_ran_microwave	Used to model RAN physical devices
GenericMWPD	ora_ni_uim_ran_microwave	Used to model Microwave physical devices

Table 4-2 shows the characteristics applied to the physical device characteristics.

Table 4-2 Physical Device Characteristics

Characteristics	Field Type	Field Content
areaId	string	Text
areaType	string	Text
btsType	string	Text
connectivityType	string	Text
description1	string	Text
description2	string	Text
fingerprint	string	Text
hardwareVersion	string	Text
hostServer	string	Text
ipAddress	string	Text
ipId	string	Text
ipName	string	Text
latestUnlockedPeriod	string	Text
leftUnlockedTime	string	Text
licenseState	string	Text
licenseType	string	Text
licenseValidity	string	Text
nativeEmsName	string	Text
neAcronym	string	Text
neAddedTime	string	Text
neAlias	string	Text
neGatewayIP	string	Text
neId	string	Text
neLastManagedUnmanagedTime	string	Text
neLastModifiedTime	string	Text
neLastStartedStoppedTime	string	Text
neLicensingMode	string	Text
neLocation	string	Text
neSiteId	string	Text
neSiteName	string	Text
neState	string	Text
neSubnetMask	string	Text
neType	string	Text
nodeType	string	Text
ntpServerIP	string	Text
ntpStatus	string	Text
operationalStatus	string	Text
operator	string	Text
ospfNetAddress	string	Text
ospfSubnetMask	string	Text
ossName	string	Text
parentBscId	string	Text
parentBscName	string	Text

Table 4-2 (Cont.) Physical Device Characteristics

Characteristics	Field Type	Field Content
parentRncId	string	Text
parentRncName	string	Text
productionDate	string	Text
RanCircle	string	Text
region	string	Text
rxPower	string	Text
serverName	string	Text
softwareVersion	string	Text
technology	string	Text
txPower	string	Text
unlockedReason	string	Text
Vendor	string	Text

Equipment

Table 4-3 shows the list of equipment specifications.

Table 4-3 Equipment Specifications

Specification	Cartridge	Intended Usage
GenericRANCard	ora_ni_uim_ran_microwave	Used to model RAN card equipment
GenericRANRack	ora_ni_uim_ran_microwave	Used to model RAN rack equipment
GenericRANShelf	ora_ni_uim_ran_microwave	Used to model RAN shelf equipment
GenericMWCard	ora_ni_uim_ran_microwave	Used to model Microwave card equipment
GenericMWDirectCard	ora_ni_uim_ran_microwave	Used to model Microwave direct card equipment
GenericMWShelf	ora_ni_uim_ran_microwave	Used to model Microwave shelf equipment

Table 4-4 shows the characteristics applied to the equipment characteristics.

Table 4-4 Equipment Characteristics

Characteristics	Field Type	Field Content
activeSW	String	Text
biosVer	String	Text
bomCode	String	Text
hardwareVersion	String	Text
manufactureDate	String	Text
manufacturer	String	Text
minimumSWVersion	String	Text

Table 4-4 (Cont.) Equipment Characteristics

Characteristics	Field Type	Field Content
numberOfPorts	String	Text
ossName	String	Text
partnumber	String	Text
productionDate	String	Text
RanCircle	String	Text
slotId	String	Text
swProductNumber	String	Text
technology	String	Text
unit	String	Text
Vendor	String	Text

Equipment Holder

Table 4-5 shows the list of equipment holder specifications.

Table 4-5 Equipment Holder Specifications

Specification	Cartridge	Intended Usage
GenericRANEquipmentHolder	ora_ni_uim_ran_microwave	Used to model RAN equipment holders
GenericMWEquipmentHolder	ora_ni_uim_ran_microwave	Used to model Microwave equipment holders

Table 4-6 shows the characteristics applied to the equipment holder characteristics.

Table 4-6 Equipment Holder Characteristics

Characteristics	Field Type	Field Content
mountingPosition	String	Text

Physical Port

Table 4-7 shows the list of physical port specifications.

Table 4-7 Physical Port Specifications

Specification	Cartridge	Intended Usage
GenericRANPort	ora_ni_uim_ran_microwave	Used to model RAN physical ports
GenericMWPort	ora_ni_uim_ran_microwave	Used to model Microwave physical ports

Table 4-8 shows the characteristics applied to the physical port characteristics.

Table 4-8 Physical Port Characteristics

Characteristics	Field Type	Field Content
bandwidth	String	Text
farEndNEIP	String	Text
farEndNEName	String	Text
farEndPort	String	Text
ifIndex	String	Text
ipAddress	String	Text
layerRate	String	Text
meId	String	Text
neId	String	Text
operationalStatus	String	Text
speed	String	Text
subnet	String	Text
type	String	Text
unit	String	Text

Logical Device

Table 4-9 shows the list of logical device specifications.

Table 4-9 Logical Device Specifications

Specification	Cartridge	Intended Usage
GenericRANLD	ora_ni_uim_ran_microwave	Used to model RAN logical devices
GenericMWLD	ora_ni_uim_ran_microwave	Used to model Microwave logical devices

Table 4-10 shows the characteristics applied to the logical device characteristics.

Table 4-10 Logical Device Characteristics

Characteristics	Field Type	Field Content
ipAddress	String	Text
nativeEmsName	String	Text
neId	String	Text
neSubnetMask	String	Text
ossName	String	Text
RanCircle	String	Text
Vendor	String	Text

Device Interface

Table 4-11 shows the list of device interface specifications.

Table 4-11 Device Interface Specifications

Specification	Cartridge	Intended Usage
GenericRANInterface	ora_ni_uim_ran_microwave	Used to model RAN logical devices
GenericMWInterface	ora_ni_uim_ran_microwave	Used to model Microwave logical devices

Table 4-12 shows the characteristics applied to the device interface characteristics.

Table 4-12 Device Interface Characteristics

Characteristics	Field Type	Field Content
macAddress	String	Text
mtu	String	Text

5

About Design Studio Construction

This chapter provides information on the composition of the Oracle Communications Network Integrity Discovery RAN and Microwave Discovery cartridge from the Oracle Communications Service Catalog and Design – Design Studio perspective.

Table 5-1 shows the RAN and Microwave Discovery Cartridge model collection.

Table 5-1 Model Collections

Specification	Information Model Entity Type	Intended Usage/Notes
GenericRANLD	LogicalDevice	Represents root object of the RAN device discovered on the network.
GenericRANInterface	DeviceInterface	Represents the interface discovered under GenericRANLD. Device interfaces discovered and modeled are modeled into GenericRANInterface.
GenericRANPD	PhysicalDevice	Represents any RAN physical device discovered on the network.
GenericRANEquipmentHolder	EquipmentHolder	Represents board piece of equipment.
GenericRANShelf	Equipment	Represents shelf piece of equipment.
GenericRANRack	Equipment	Represents rack piece of equipment.
GenericRANCard	Equipment	Represents module piece of equipment.
GenericRANPort	PhysicalPort	Represents any physical port associated with the RAN devices.
GenericMWLD	LogicalDevice	Represents root object of the Microwave device discovered on the network.
GenericMWInterface	DeviceInterface	Represents interface discovered under GenericMWLD. Device Interfaces discovered and modeled are modeled into GenericMWInterface.
GenericMWPD	PhysicalDevice	Represents any Microwave physical device discovered on the network.
GenericMWEquipmentHolder	EquipmentHolder	Represents board piece of equipment.
GenericMWShelf	Equipment	Represents shelf piece of equipment.

Table 5-1 (Cont.) Model Collections

Specification	Information Model Entity Type	Intended Usage/Notes
GenericMWDirectCard	Equipment	Represents module piece of equipment. Direct cards do not require any equipment holders to mount them.
GenericMWCard	Equipment	Represents module piece of equipment.
GenericMWPort	PhysicalPort	Represents any physical port associated with the Microwave devices.

Logical Specification Lineage for Devices

The example below shows a logical specification lineage for RAN and Microwave logical devices. This lineage shows the intended relationship between specifications.

Example logical specification lineage for RAN devices:

```
GenericRANLD
    [0..*] GenericRANInterface
```

Example logical specification lineage for Microwave devices:

```
GenericMWLD
    [0..*] GenericMWInterface
```

Physical Specification Lineage for Devices

The below examples show the physical specification lineage for physical devices. This lineage shows the intended relationship between specifications for both RAN and Microwave devices.

Example physical specification lineage for RAN devices:

```
GenericRANPD
    GenericRANRack
        [0..*] GenericRANShelf
                [0..*] GenericRANEquipmentHolder
                        [0..1] GenericRANCard
                               [0..*] GenericRANPort
```

Example physical specification lineage for Microwave devices:

```
GenericMWPD
    GenericMWShelf
    [0..*] GenericMWDirectCard
    [0..*] GenericMWEquipmentHolder
        [0..1]  GenericMWCard
                        [0..*]  GenericMWPort
                                [0..*] GenericMWEquipmentHolder
```

```
[0..1] GenericMWCard
       [0..*]  GenericMWPort
```

Discovery Action

RAN and Microwave Discovery Cartridge supports the following discovery actions:

1. RAN and Microwave File Collector
2. Discover RAN Devices.
3. Discover Microwave Devices

Table 5-2 RAN and Microwave File Collector

Result Category	Address Handler	Scan Parameters	Model	Processors
N/A	N/A	RAN and Microwave Discovery Parameters **Note:** These scan parameters must be added for the Create Scan web service request even if the values are left empty.	RAN_and_Microwave_Discovery_Cartridge	RAN and Microwave File Collector

Table 5-3 Discover RAN Devices

Result Category	Address Handler	Scan Parameters	Model	Processors
Device	FileTransferAddressHandler	RAN and Microwave Discovery Parameters **Note:** These scan parameters must be added for the Create Scan web service request even if the values are left empty.	RAN_and_Microwave_Discovery_Cartridge	List of processors: • Processors inherited from the RAN and Microwave File Collector • RanDiscoveryInitializer • Device CSV Parser • Equipment CSV Parser • Port CSV Parser • RanDeviceModelPersister

Table 5-4 Discover Microwave Devices

Result Category	Address Handler	Scan Parameters	Model	Processors
Device	FileTransferAddressHandler	RAN and Microwave Discovery Parameters **Note:** These scan parameters must be added for the Create Scan web service request even if the values are left empty.	RAN_and_Microwave_Discovery_Cartridge	List of processors: • Processors inherited from the RAN and Microwave File Collector • Microwave Files Parser • MicrowaveDeviceModelPersister

Discovery Processors

Table 5-5 RAN and Microwave File Collector Action Processors

Processor Name	Variable
RAN and Microwave File Collector	Input: N/A Output: ranAndMicrowaveFileCollectorFileCollection Collection of files read from the scope provided.

Table 5-6 Discover RAN Devices Action Processors

Processor Name	Variable
RanDiscoveryInitalizer	Input: ranAndMicrowaveFileCollectorFileCollection Collection of files read from the scope provided. Output: • deviceFiles • equipmentFiles • portFiles • logicalDeviceObjectMap • physicalDeviceObjectMap
Device CSV Parser	Input: • deviceFiles • logicalDeviceObjectMap • physicalDeviceObjectMap Output: N/A
Equipment CSV Parser	Input: • equipmentFiles • logicalDeviceObjectMap • physicalDeviceObjectMap Output: N/A

Table 5-6 (Cont.) Discover RAN Devices Action Processors

Processor Name	Variable
Port CSV Parser	Input: • portFiles • logicalDeviceObjectMap • physicalDeviceObjectMap Output: N/A
RANDeviceModelPersister	Input: • logicalDeviceObjectMap • physicalDeviceObjectMap Output: N/A

Table 5-7 Discover Microwave Devices Action Processors

Processor Name	Variable
Microwave Files Parser	Input: ranAndMicrowaveFileCollectorFileCollection Collection of files read from the scope provided. Output: neObjects
MicrowaveDeviceModelPersister	Input: neObjects Output: N/A

Discrepancy Detection Action

Detect Discrepancies for RAN and Microwave Devices is the action used to perform discrepancy detection.

Table 5-8 Detect Discrepancies for RAN and Microwave Devices

Result Category	Results Source	Scan Parameters	Model	Processors
All	List of sources: • Discover RAN Devices • Discover Microwave Devices	N/A	RAN_and_Microwave_Discovery_Cartridge	This action extends the Abstract Detect UIM Discrepancies action included in the UIM Integration cartridge. For more information, see "Abstract Detect UIM Discrepancies Action" in *Network Integrity UIM Integration Cartridge Guide*.

Discrepancy Resolution Action

Resolve RAN and Microwave Devices in UIM is the action used to perform discrepancy resolution.

Table 5-9 Resolve RAN and Microwave Devices in UIM

Result Category	Result Source	Processors
All	• Discover RAN Devices • Discover Microwave Devices	This action extends the Abstract Resolve in UIM action included in the Network Integrity UIM Integration cartridge. For more information, see "Abstract Resolve in UIM Action" in *Network Integrity UIM Integration Cartridge Guide*.