O-RAN Information Model (from Eclipse/Papyrus)

Updates in this release include:

- PolicyError and related entities
- PolicyList and related entities
- PolicyNotification and related entities

1 Diagrams

1.1 Overview

Qualified Name: ORAN::Diagrams

Description:

This IOC represents the logical function CU-CP of gNB and en-gNB

1.1.1 Diagrams

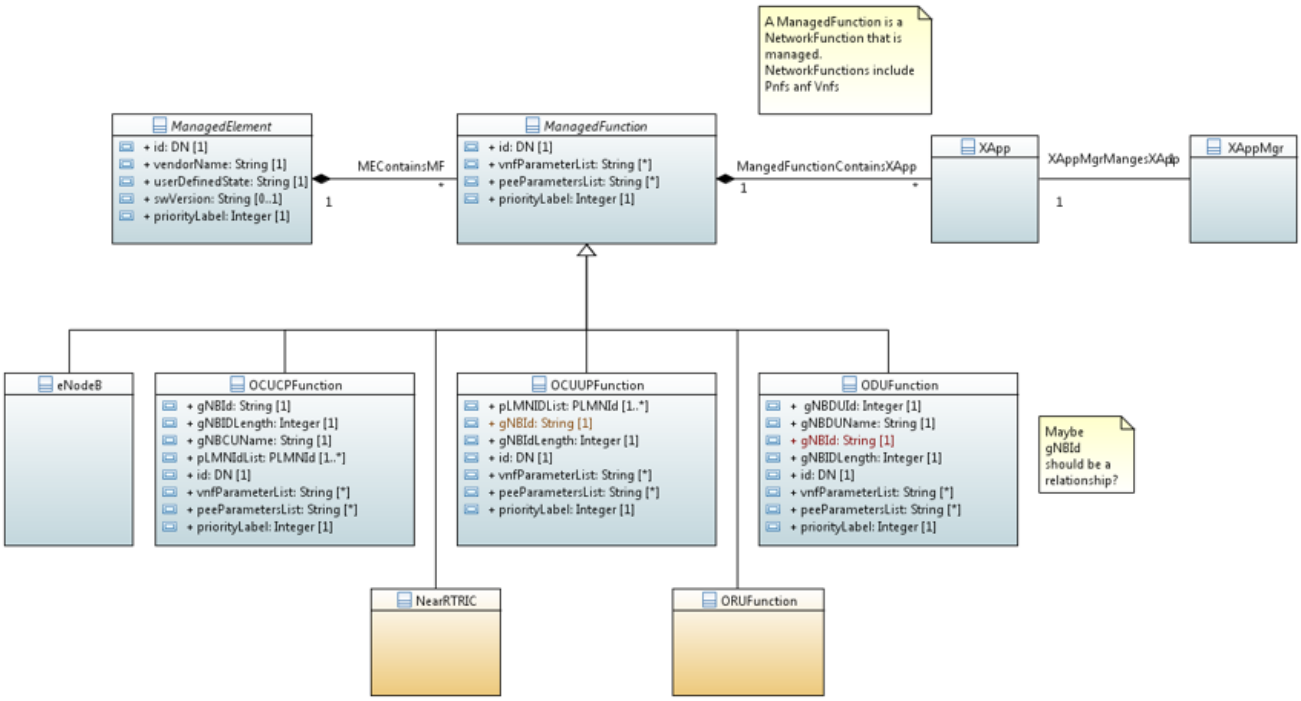

Figure 11: Diagram ORAN Class Diagram

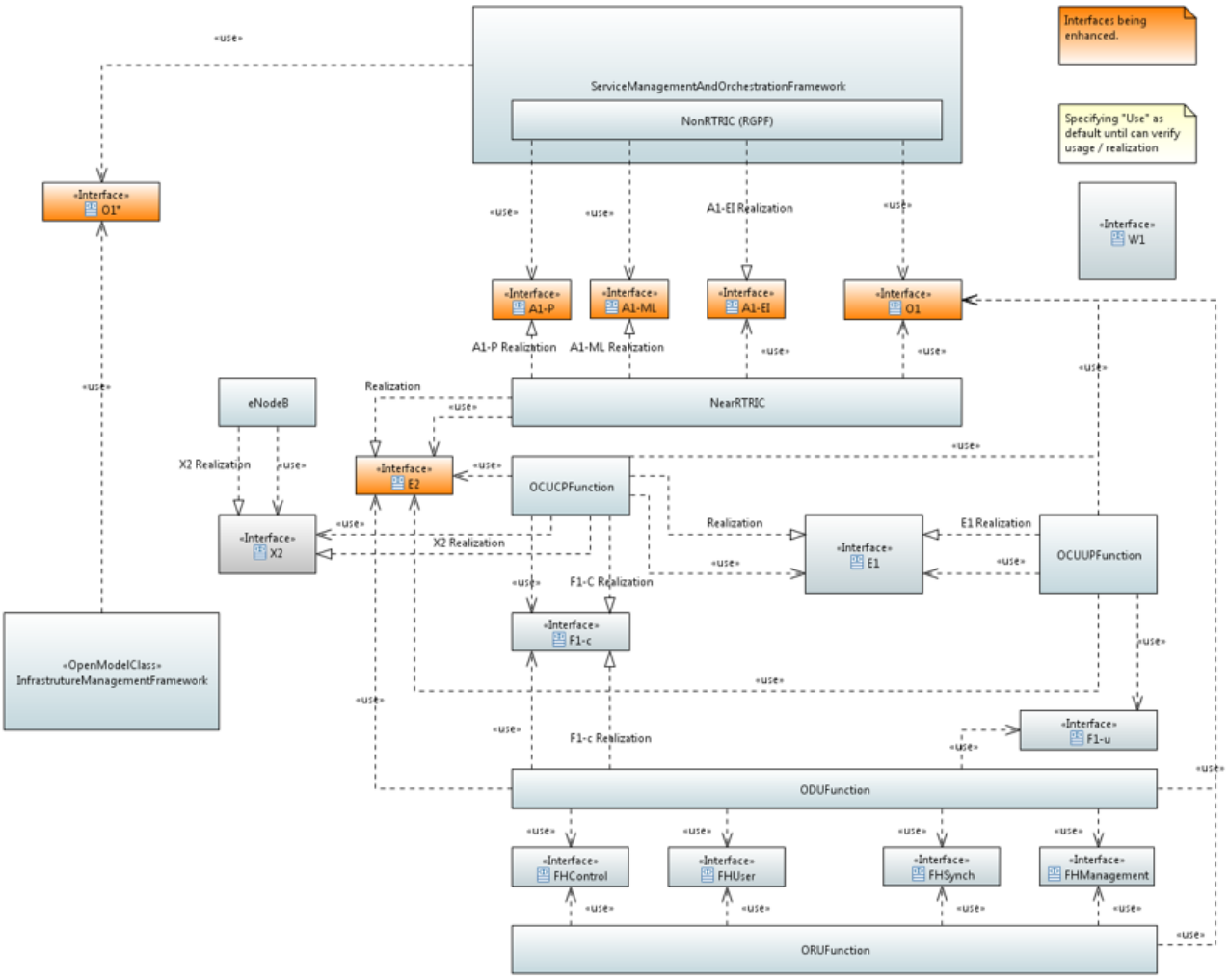

Figure 12: Diagram ORAN Component Diagram

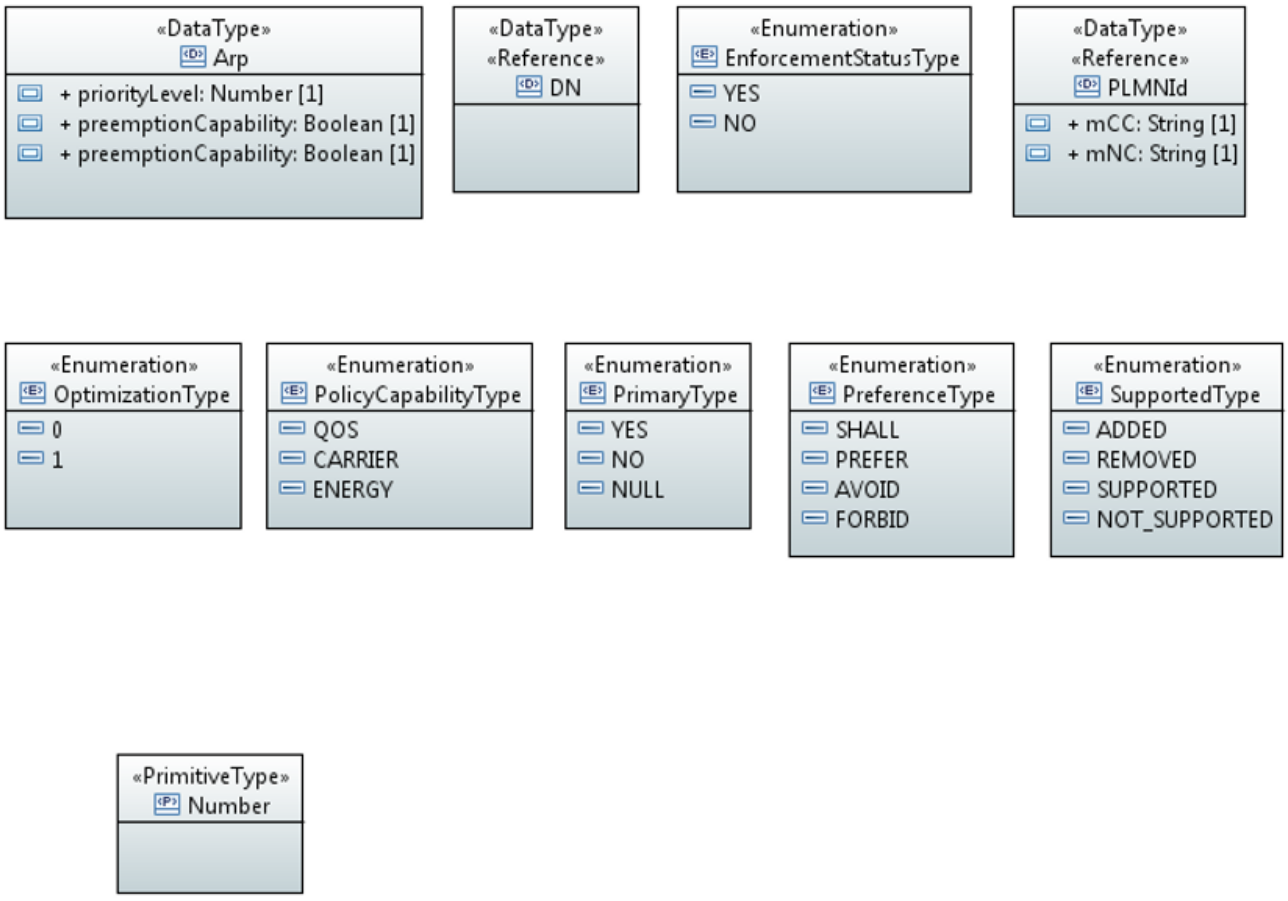

Figure 13: Diagram ORAN Datatypes

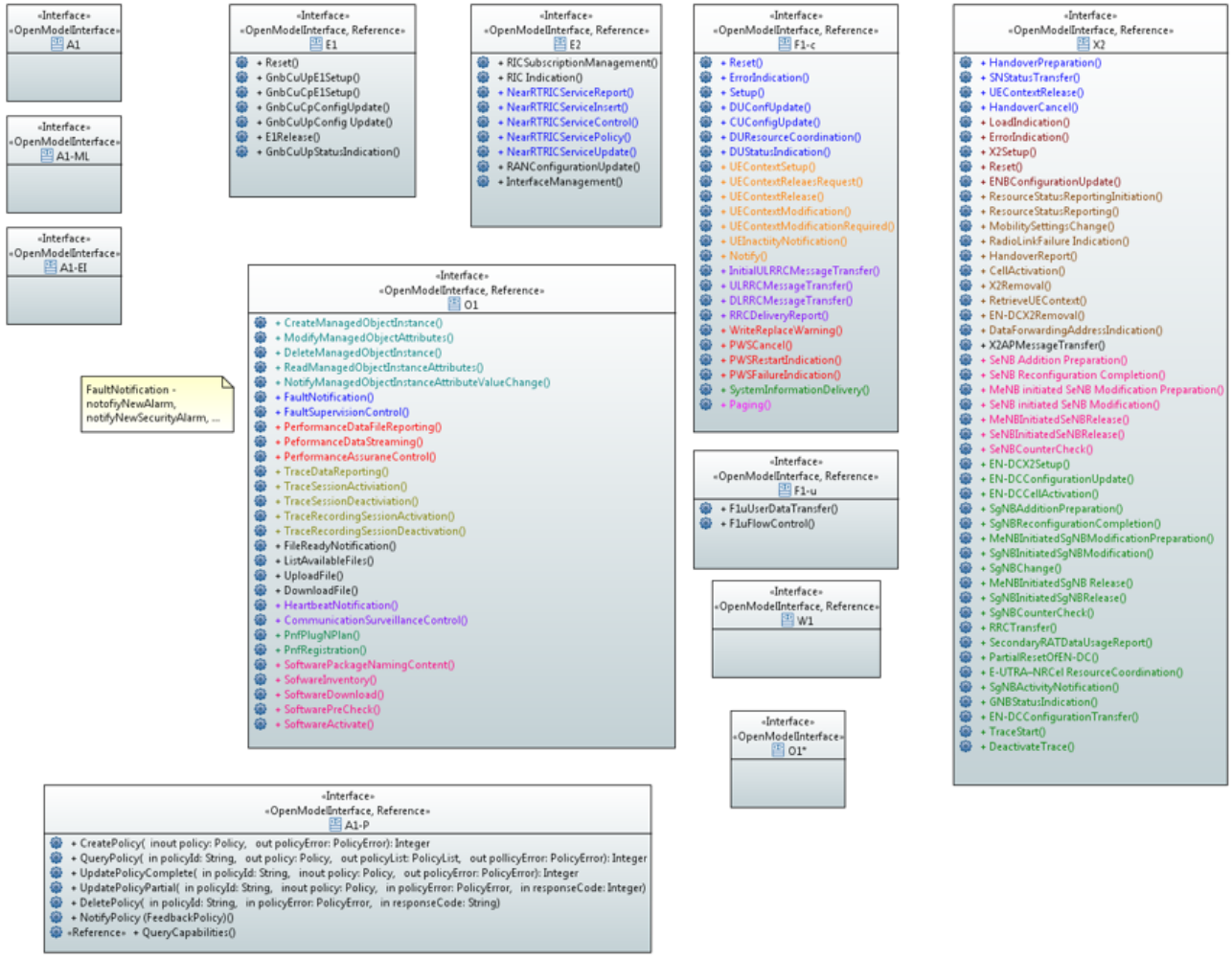

Figure 14: Diagram ORAN Interfaces

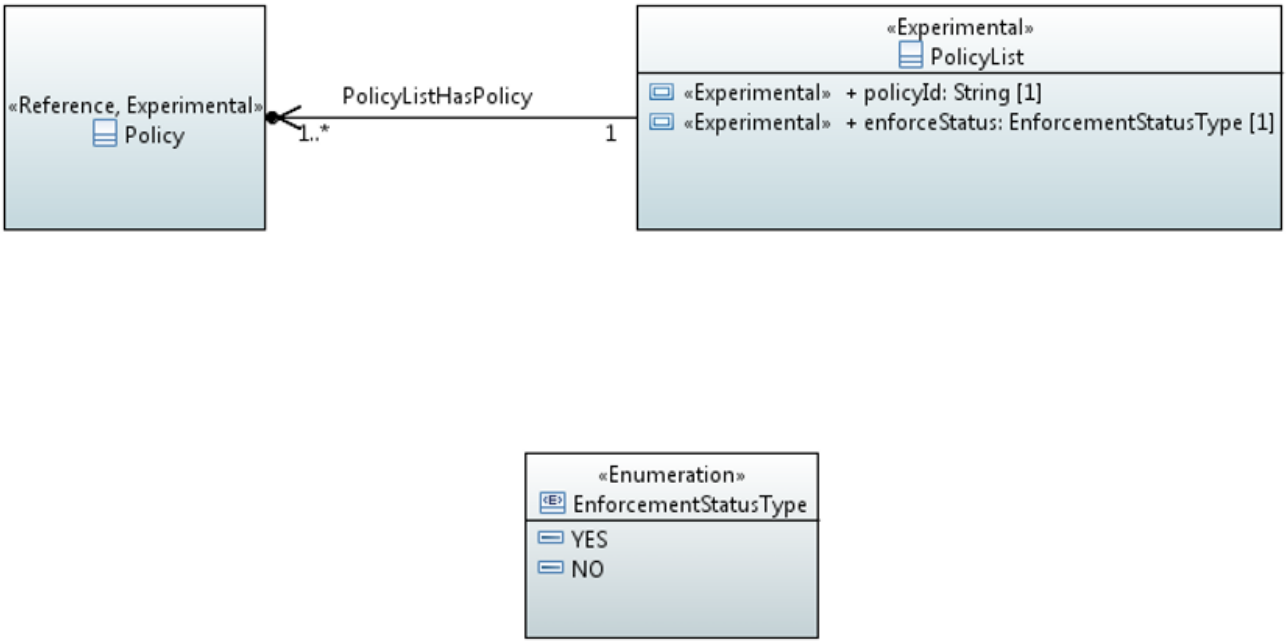

Figure 15: Diagram PolicyList

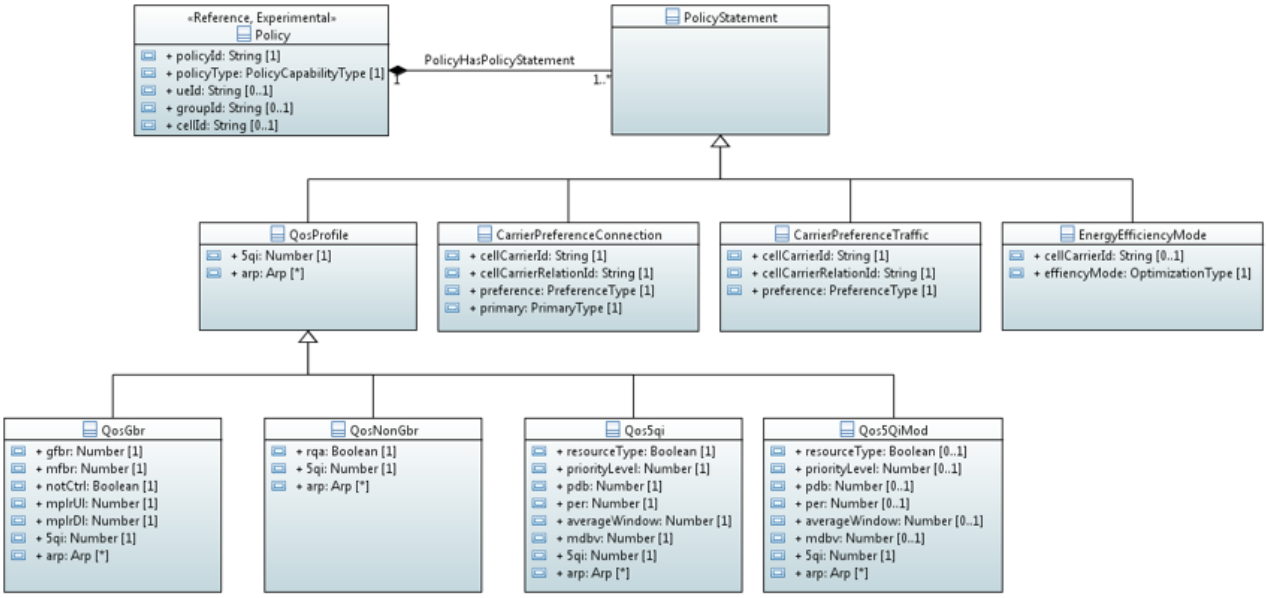

Figure 16: Diagram Policy

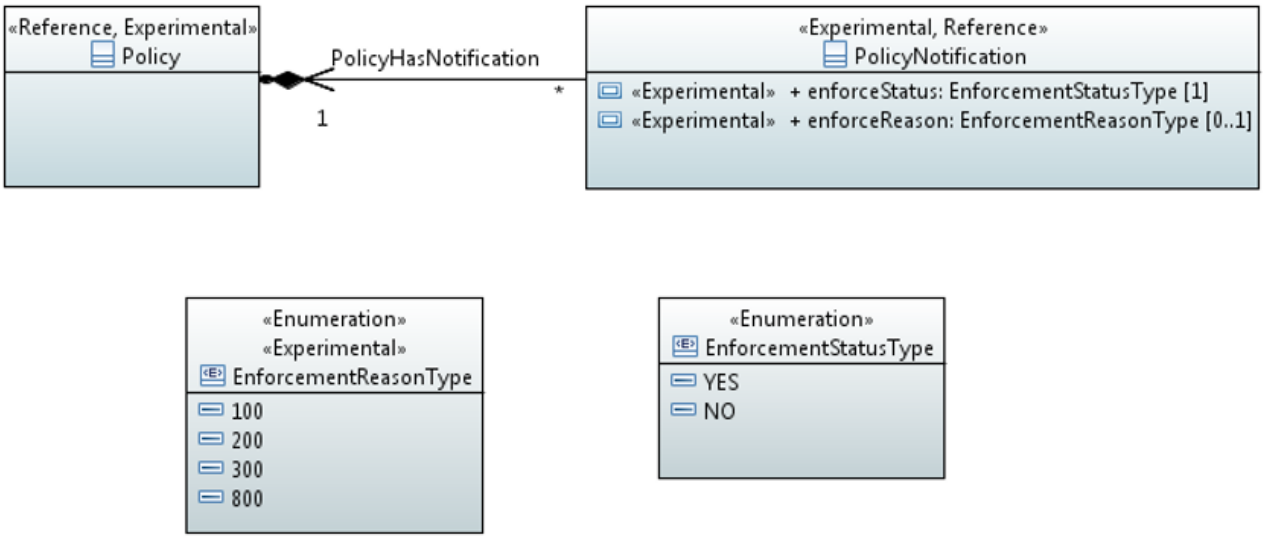

Figure 17: Diagram Policy Notification

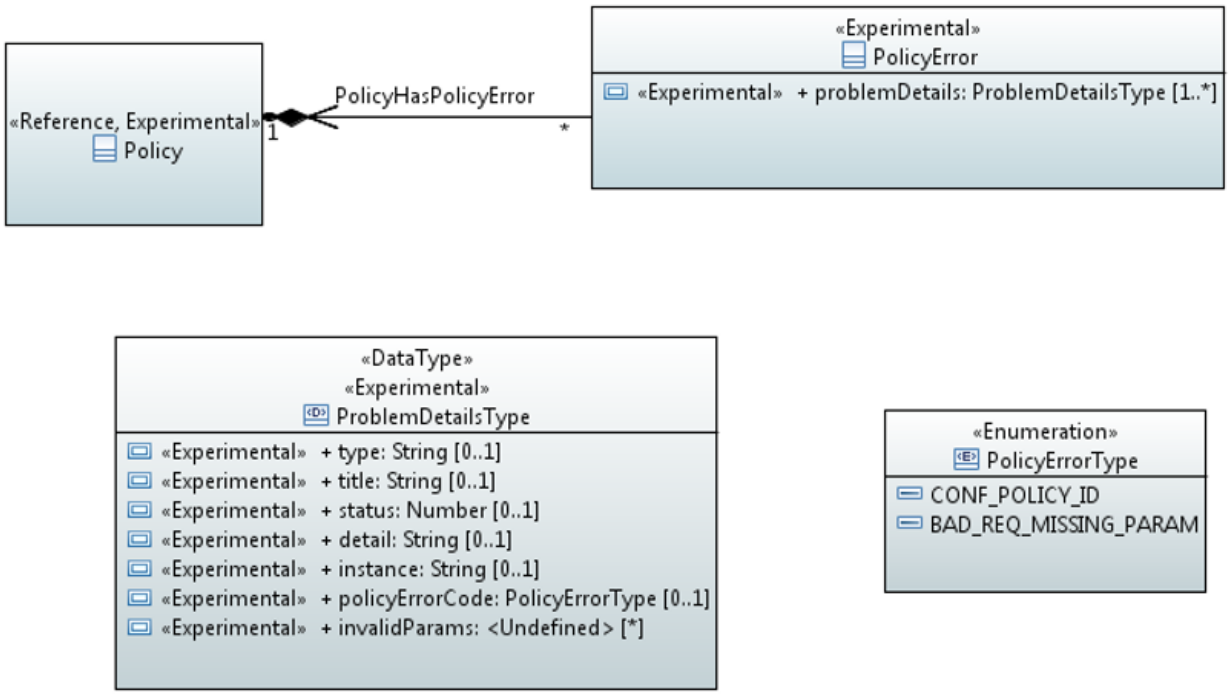

Figure 18: Diagram Policy Error

2 Interfaces

2.1 Overview

Qualified Name: ORAN::Interfaces

2.1.1 Interfaces

2.1.1.1 A1 interface

Qualified Name: ORAN::Interfaces::A1

Description:

The A1 interface is between the Non Real-Time RIC (RGPF) and the Near Real-Time RIC. This is a streaming interface.

The interface is used to provide the following:

- Enrichment Information

- Policy Objectives

- Policy Resources

- Machine Learnings (Feedback)

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY

2.1.1.2 A1-EI interface

Qualified Name: ORAN::Interfaces::A1-EI

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY

2.1.1.3 A1-ML interface

Qualified Name: ORAN::Interfaces::A1-ML

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY

2.1.1.4 A1-P interface

Qualified Name: ORAN::Interfaces::A1-P

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY
- Reference
- reference: 08.14-oRAN.WG2-A1AP_v00.00.01

Table 51 Operations for Interface A1-P

Operation Name	Parameters	Description	Stereotypes
CreatePolicy	policy - type: Policy - direction: inout policyError - type: PolicyError - direction: out responseCode - type: Integer - direction: return - Note: Return code on the CreatePolicy operation with the following values: 201- Created 204 - No content 4xx - An error case.	Create a policy for a single UE or for multiple UEs.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

QueryPolicy	policyId - type: String - direction: in policy - type: Policy - direction: out policyList - type: PolicyList - direction: out returnCode - type: Integer - direction: return - Note: Return code with the following values 200 - Ok 4xx - Error pollicyError - type: PolicyError - direction: out	The operation to read a policy ofr a single UE or a group of UEs.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
UpdatePolicyComplete	policyId - type: String - direction: in policy - type: Policy - direction: inout policyError - type: PolicyError - direction: out responseCode - type: Integer - direction: return - Note: Response codes area s follows: - 201 - Created - 204 - No conent - 4xx - Error	The operation to completely update a policy for a single UE or a group of UEs.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

UpdatePolicyPartial	policyId - type: String - direction: in policy - type: Policy - direction: inout policyError - type: PolicyError - direction: in responseCode - type: Integer - direction: in - Note: responseCode values include: 201 - Created 204 - No conent 4xx - error	The operation to partially update a policy for a single UE or a group of UEs.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
DeletePolicy	policyId - type: String - direction: in - Note: Policy to be deleted. policyError - type: PolicyError - direction: in responseCode - type: String - direction: in - Note: response codes are as follows: 204 - No Content 4xx - Error	The operation to delete a policy for a single UE or a group of UEs.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
NotifyPolicy (FeedbackPolicy)			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
QueryCapabilities			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY Reference · reference: From 2019.08.14-oRAN.WG2-A1AP_v00.00.01

2.1.1.5 E1 interface

Qualified Name: ORAN::Interfaces::E1

Description:

The E1 interface specifications facilitates the inter-connection of a gNB-CU-CP and a gNB-CU-UP supplied by different manufacturers.

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY
- Reference
- reference: 3GPP TS 38.460

Table 52 Operations for Interface E1

Operation Name	Parameters	Description	Stereotypes
Reset			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
GnbCuUpE1Setup			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
GnbCuCpE1Setup			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
GnbCuCpConfigUpdate			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
GnbCuUpConfig Update			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

E1Release			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
GnbCuUpStatusIndication			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

2.1.1.6 E2 interface

Qualified Name: ORAN::Interfaces::E2

Description:

The purpose of the E2 interface is to allow the RIC to communicate with a RAN to provide guidance, optimization and value added services. The RIC is assumed to consist of a RIC Platform that includes the "E2 Termination" and one or more xApps, including the "E2 Manager" which is also responsible for terminating E2 Global Procedures (E2 SETUP, etc.)

Interface connecting the near-RT RIC and one or more O-CU-CPs, one or more O-CU-UPs, and one or more O-DUs.

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY
- Reference
- reference: ORAN-WG3.E2GAP.0-v0.1

Table 53 Operations for Interface E2

Operation Name	Parameters	Description	Stereotypes
RICSubscriptionManagement		Used to establish E2 subscriptions on the E2 node consisting of an event trigger and a sequence of actions.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

RIC Indication		Used to carry messages from a specific RAN Function to the RIC resulting from a REPORT or INSERT Action	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
NearRTRICServiceReport		Near-RT RIC requests that E2 NODE sends a REPORT message to Near-RT RIC and the associated procedure continues in E2 NODE after each occurrence of a defined SUBSCRIPTION The REPORT service involves following steps: 1. Near-RT RIC configures a SUBSCRIPTION in the E2 NODE with information used to configure an INDICATION (Report) that is to be performed by E2 NODE with each occurrence of trigger event 2. During normal functioning of the E2 NODE, a trigger event is detected. 3. E2 NODE sends INDICATION to Near-RT RIC containing requested REPORT information along with originating Request ID. 4. Normal functionality continues on the E2 NODE.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
NearRTRICServiceInsert		Near-RT RIC requests that E2 NODE sends an INSERT message to Near-RT RIC and suspends the associated procedure in E2 NODE after each occurrence of a defined SUBSCRIPTION The INSERT service involves following steps: 1. Near-RT RIC configures a SUBSCRIPTION in the E2 NODE with information used to configure an INDICATION (Insert) along with a wait timer that is to be performed by E2 NODE with each occurrence of EVENT 2. During normal functioning of the E2 NODE, a trigger event is detected. 3. E2 Node sends INDICATION to Near-RT RIC containing requested INSERT information along with originating Request ID. 4. E2 Node suspends or halts the associated procedure after a defined Wait period (wait may be set to zero). This process may then be followed by either: - Near-RT RIC sends a CONTROL message to trigger a new associated procedure or resume suspended procedure using modified call state or information - Wait timer associated for suspended procedure expires, and original associated procedure continues or halted	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
NearRTRICServiceControl		Near-RT RIC sends a Control message to E2 Node to initiate or resume the suspended associated procedure in the E2 Node The CONTROL service involves following steps: 1. Near-RT RIC detects a trigger event. This step may be either triggered by a previous INDICATION sent by E2 Node or internal to Near-RT RIC 2. Near-RT RIC performs action 3. Near-RT RIC sends CONTROL request to E2 Node. This step may contain an information used to identify a previous suspended call process and may request acknowledgement 4. E2 NODE initiates or resumes a call process 5. If requested, E2 Node sends a CONTROL Acknowledgement	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
NearRTRICServicePolicy		Near-RT RIC requests that E2 Node executes a specific POLICY during functioning of the E2 Node after each occurrence of a defined SUBSCRIPTION The POLICY service involves following steps: 1. Near-RT RIC configures a SUBSCRIPTION in the E2 NODE with information used to configure a POLICY that is to be performed by E2 NODE with each occurrence of trigger event 2. During normal functioning of the E2 NODE, a trigger event is detected. 3. E2 NODE modifies ongoing call process according to information contained in the POLICY description statement 4. Normal functionality continues on the E2 NODE.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

NearRTRICServiceUpdate		a E2 NODE initiated procedure to inform Near-RT RIC of changes to list of supported Near-RT RIC services and mapping of services to functions.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
RANConfigurationUpdate		a E2 node-initiated procedure to inform Near-RT RIC of changes to RAN configuration information.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
InterfaceManagement		E2 set-up, E2 reset, Reporting of General Error Situations	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

2.1.1.7 F1-c interface

Qualified Name: ORAN::Interfaces::F1-c

Description:

The F1 interface provides means for interconnecting a gNB-CU and a gNB-DU of a gNB within an NG-RAN, or for interconnecting a gNB-CU and a gNB-DU of an en-gNB within an E-UTRAN.

F1 User plane interface

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY
- Reference
- reference: 3GPP TS 38.470

Table 54 Operations for Interface F1-c

Operation Name	Parameters	Description	Stereotypes

Reset			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
ErrorIndication			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
Setup			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
DUConfUpdate			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
CUConfigUpdate			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
DUResourceCoordination			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
DUStatusIndication			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

UEContextSetup			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
UEContextReleaesRequest			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
UEContextRelease			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
UEContextModification			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
UEContextModificationRequired			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
UEInactiityNotification			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
Notify			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

InitialULRRCMessageTransfer			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
ULRRCMessageTransfer			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
DLRRCMessageTransfer			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
RRCDeliveryReport			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
WriteReplaceWarning			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
PWSCancel			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
PWSRestartIndication			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

PWSFailureIndication			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
SystemInformationDelivery			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
Paging			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

2.1.1.8 F1-u interface

Qualified Name: ORAN::Interfaces::F1-u

Description:

The F1 interface provides means for interconnecting a gNB-CU and a gNB-DU of a gNB within an NG-RAN, or for interconnecting a gNB-CU and a gNB-DU of an en-gNB within an E-UTRAN.

F1 User plane interface

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY
- Reference
- reference: 3GPP TS 38470

Table 55 Operations for Interface F1-u

Operation Name	Parameters	Description	Stereotypes
F1uUserDataTransfer			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

F1uFlowControl			OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

2.1.1.9 FHControl interface

Qualified Name: ORAN::Interfaces::FHControl

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY

2.1.1.10 FHManagement interface

Qualified Name: ORAN::Interfaces::FHManagement

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY

2.1.1.11 FHSynch interface

Qualified Name: ORAN::Interfaces::FHSynch

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY

2.1.1.12 FHUser interface

Qualified Name: ORAN::Interfaces::FHUser

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY

2.1.1.13 O1 interface

Qualified Name: ORAN::Interfaces::O1

Description:

The O1 interface is a batch interface betwen the NonRTRIc and the NearRTRIC. It also is a means to take information collected by the RPGF that is then distributed to the NearRTRIC. It is also used for file uploads and config updates.

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY
- Reference
- reference: NOK-2019-07-01 O-RAN WG1 O1 Specification v1.0

Table 56 Operations for Interface O1

Operation Name	Parameters	Description	Stereotypes
CreateManagedObjectInstance		Provisioning MnS Consumer sends synchronous provisioning updates to Provisioning MnS Provider to create a Managed Object Instance (MOI) on the Provisioning MnS Provider and set its attribute values.	OpenModelOperation. isOperationIdempotent: false. isAtomic: false. support: MANDATORY
ModifyManagedObjectAttributes		Provisioning MnS Consumer sends synchronous provisioning updates to Provisioning MnS Provider to modify the attributes of a MOI on the Provisioning MnS Provider.	OpenModelOperation. isOperationIdempotent: false. isAtomic: false. support: MANDATORY

DeleteManagedObjectInstance		Provisioning MnS Consumer sends synchronous provisioning updates to Provisioning MnS Provider to delete a MOI and its children on the Provisioning MnS Provider.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY
ReadManagedObjectInstanceAttributes		Provisioning MnS Consumer sends synchronous provisioning request to Provisioning MnS Provider to return the values of attributes of its MOI(s) on the Provisioning MnS Provider.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY

NotifyManagedObjectInstanceAttributeValueChange		Provisioning MnS Provider sends an asynchronous notifyMOIAttributeValueChange Notification to the Provisioning MnS Consumer to report a configuration change on the Provisioning MnS Provider .	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY
FaultNotification		Fault Supervision MnS Provider sends asynchronous Fault3gpp notification event to Fault Supervision MnS Consumer when an alarm occurs, is cleared, changes state or priority, etc.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY

FaultSupervisionControl		Starting with 3GPP Release 16, dedicated operations for Management Services Use Cases will be replaced by IOCs with attributes that can be read and/or set using generic provisioning mechanisms. For Fault Supervision, O-RAN requires the ability to Get Alarm List and Clear Alarm.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY
PerformanceDataFileReporting		Performance Assurance MnS Provider sends asynchronous FileReady notification event to Performance Assurance MnS Consumer sent when PM File is ready for upload. The FileReady notification contains one parameter indicating the location at which the file can be retrieved. Performance Assurance MnS Consumer uploads Bulk PM File from Performance Assurance MnS Provider via secure file transfer protocol, triggered by FileReady event.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY

PeformanceDataStreaming		Performance Assurance MnS Provider steams high volume asynchronous Real Time Performance Measurement (RTPM) data to Performance Assurance MnS Consumer at a configurable frequency.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY
PerformanceAssuraneControl		Starting with 3GPP Release 16, dedicated operations for Performance Assurance Control will be replaced by IOCs with attributes that can be read and/or set using generic provisioning mechanisms. For Performance Assurance, this includes operations such as Create Measurement Job, Terminate Measurement Job and Query Measurement Job. Measurement jobs can be created, terminated and queried by setting and/or getting attributes in the MeasurementControl and MeasurementReader IOCs.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY

TraceDataReporting		High volume asynchronous streaming of Subscriber and Equipment Trace data (e.g. Call, Cell, UE, MDT) from Trace MnS Provider to Trace MnS Subscriber sent upon triggering event.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY
TraceSessionActiviation			OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY

TraceSessionDeactivation			OpenModelOperation.isOperationIdempotent: false .isAtomic: false .support: MANDATORY
TraceRecordingSessionActivation			OpenModelOperation.isOperationIdempotent: false .isAtomic: false .support: MANDATORY

TraceRecordingSessionDeactivation			OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY
FileReadyNotification		The File Ready Notification notifies a File Management MnS Consumer that a file is available for upload from the File Management MnS Provider. In general, File Management MnS Provider sends a FileReady notification for files that the File Management MnS Consumer has configured the File Management MnS Provider to collect on a periodic basis, such as file-based Trace Data or PM Measurement Reports.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY

ListAvailableFiles		File Management MnS Consumer queries the File Management MnS Provider to identify files that are available on the File Management MnS Provider. Upon receipt of the available files and their locations, the File Management MnS Consumer can determine the next appropriate action.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY
Upload File		The Upload File Service provides the capability for a File Management MnS Consumer to upload files from the location provided by the File Management MnS Provider. The File Management MnS Consumer may perform this action as a result of a FileReady notification from the File Management MnS Provider informing the File Management MnS Consumer that a file is now available to upload, such as a Performance Management Report (see section 2.5.1) or the File Management MnS Consumer may perform this function after querying the File Management MnS Provider to provide the list of available files for upload (see section 2.5.2). In any case, the file upload is performed using a secure file transfer protocol (SFTP or FTPeS) from the location provided by the File Management MnS Provider.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY

DownloadFile		The File Management MnS Consumer has a file that needs to be downloaded to the File Management MnS Provider such as: • Software file to upgrade software version executed on the File Management MnS Provider • Beamforming configuration file (Opaque Vendor specific data) • Machine Learning • Certificates The File Management MnS Consumer triggers the file download. The File Management MnS Provider uses a secure file transfer protocol to download the file from the location specified by the File Management MnS Consumer and then notifies the File Management MnS Consumer of the result of the download.	OpenModelOperation . is OperationIdempotent: false . is Atomic: false . support: MANDATORY
HeartbeatNotification		Communication Surveillance MnS Provider sends asynchronous heartbeat event to Communication Surveillance MnS Consumer at a configurable frequency to allow Communication Surveillance MnS Consumer to supervise the connectivity to the Communication Surveillance MnS Provider.	OpenModelOperation . is OperationIdempotent: false . is Atomic: false . support: MANDATORY

CommunicationSurveillanceControl			OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY
PnfPlugNPlan		PNF Plug-n-Play (PnP) scenario enables a PNF ME to obtain the necessary start-up configuration to allow it to register with a PNF Startup and Registration MnS Consumer for subsequent management.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY

PnfRegistration		PNF Startup and Registration MnS Provider sends an asynchronous pnfRegistration event to a PNF Startup and Registration MnS Consumer after PnP to notify PNF Startup and Registration MnS Consumer of new PNF Startup and Registration MnS Provider to be managed	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY
SoftwarePackageNamingContent		PNF Software Package naming, content and format are vendor specific and do not require standardization in O-RAN. A PNF Software Package may contain one or more files. Some of the files in the Software Package may be optional for the PNF (example: a file that has not changed version). The PNF is aware of the content and format of its available Software Packages and can determine which files it needs to download. The softwarePackage Managed Object Class (MOC) contains attributes about a software package such as: software package name, version, fileList, integrityStatus (valid, invalid, empty), runningState (active, passive), vendor, productName, softwareType (operational, factory), etc. This MOC is applicable to VNFs and PNFs and is a generic term that O-RAN will use to refer to the software available on the PNF rather than the legacy term of software slot. On a PNF, a softwarePackage MOI corresponds to a hardware software slot. The PNF creates one instance of softwarePackage for each software package supported concurrently on the PNF. Typically, a PNF will have two softwarePackage MOIs for operational software; one with runningState = active and one with runningState = passive. Some PNFs also have a softwarePackage MOI for the factory software which would be read only. O-RAN may have PNFs that support more than one passive slot. In this case the inventory query result would show multiple MOIs with runningState=passive.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY

SofwareInventory		The PNF Startup and Registration MnS Consumer sends a Software Inventory Request and retrieves information about the software packages on the PNF Software MnS Provider.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY
SoftwareDownload		Software Download triggers the download of a specific software package to the PNF Software MnS Provider. This download service includes integrity checks on the downloaded software and the installation of the software into the software slot corresponding to the softwarePackage MOI.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY

SoftwarePreCheck		Software Pre-check is an optional Use Case that the Service Provider may choose to utilize to confirm that the PNF Software MnS Provider is in a good state to activate the new software and provide information needed for planning the timing of the software replacement--such as whether a reset or a data migration is required.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY
SoftwareActivate		PNF Software MnS Consumer triggers the activation of a software package on the PNF Software MnS Provider including data migration and reset if needed.	OpenModelOperation . isOperationIdempotent: false . isAtomic: false . support: MANDATORY

2.1.1.14 O1* interface

Qualified Name: ORAN::Interfaces::O1*

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY

2.1.1.15 W1 interface

Qualified Name: ORAN::Interfaces::W1

Description:

: interface between an eNB-CU and an eNB-DU, providing an interconnection point between the eNB-CU and the eNB-DU.

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY
- Reference
- reference: 3GPP TS 37.470

2.1.1.16 X2 interface

Qualified Name: ORAN::Interfaces::X2

Description:

The X2 interfa ce supports the exchange of signalling information between two eNBs. In addition, the interfae supports the forwarding of PDUs to the respecdtive tunnel endpoints.

Applied Stereotypes:

- OpenModelInterface
- support: MANDATORY
- Reference
- reference: 3GPP TS 36.423

Table 57 Operations for Interface X2

Operation Name	Parameters	Description	Stereotypes
HandoverPreparation		This procedure is used to establish necessary resources in an eNB for an incoming handover. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

SNStatusTransfer		The purpose of the SN Status Transfer procedure is to transfer the uplink PDCP SN and HFN receiver status and the downlink PDCP SN and HFN transmitter status either, from the source to the target eNB during an X2 handover, between the eNBs involved in dual connectivity and/or LWA, or between MeNB and en-gNB involved in EN-DC, for each respective E-RAB for which PDCP SN and HFN status preservation applies.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
UEContextRelease		For handover, the UE Context Release procedure is initiated by the target eNB to indicate to the source eNB that radio and control plane resources for the associated UE context are allowed to be released.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
HandoverCancel		The Handover Cancel procedure is used to enable a source eNB to cancel an ongoing handover preparation or an already prepared handover.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

LoadIndication		The purpose of the Load Indication procedure is to transfer load and interference co-ordination information between eNBs controlling intra-frequency neighboring cells, and additionally between eNBs controlling inter-frequency neighboring cells for TDD.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
ErrorIndication		The Error Indication procedure is initiated by an eNB to report detected errors in one incoming message, provided they cannot be reported by an appropriate failure message.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
X2Setup		The purpose of the X2 Setup procedure is to exchange application level configuration data needed for two eNBs to interoperate correctly over the X2 interface. This procedure erases any existing application level configuration data in the two nodes and replaces it by the one received. This procedure also resets the X2 interface like a Reset procedure would do.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

Reset		The purpose of the Reset procedure is to align the resources in eNB1 and eNB2, or the resources in eNB and en-gNB involved in the EN-DC in the event of an abnormal failure. The procedure resets the X2 interface. This procedure doesn't affect the application level configuration data exchanged during, e.g., the X2 Setup procedure, EN-DC X2 Setup procedure.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
ENBConfigurationUpdate		The purpose of the eNB Configuration Update procedure is to update application level configuration data needed for two eNBs to interoperate correctly over the X2 interface.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
ResourceStatusReportingInitiation		This procedure is used by an eNB to request the reporting of load measurements to another eNB. The procedure uses non UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

ResourceStatusReporting		This procedure is initiated by eNB2 to report the result of measurements admitted by eNB2 following a successful Resource Status Reporting Initiation procedure. The procedure uses non UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
MobilitySettingsChange		This procedure enables an eNB to negotiate the handover trigger settings with a peer eNB controlling neighbouring cells. The procedure uses non UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
RadioLinkFailure Indication		The purpose of the Radio Link Failure Indication procedure is to transfer information regarding RRC re-establishment attempts, or received RLF Reports, between eNBs. The signalling takes place from the eNB at which a re-establishment attempt is made, or an RLF Report is received, to an eNB to which the UE concerned may have previously been attached prior to the connection failure. This may aid the detection of radio link failure and handover failure cases (TS 36.300 [15]). The procedure uses non UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

HandoverReport		The purpose of the Handover Report procedure is to transfer mobility related information between eNBs. The procedure uses non UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
CellActivation		The purpose of the Cell Activation procedure is to request to a neighbouring eNB to switch on one or more cells, previously reported as inactive due to energy saving reasons. The procedure uses non UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
X2Removal		The purpose of the X2 Removal procedure is to remove the signaling connection between two eNBs in a controlled manner. If successful, this procedure erases any existing application level configuration data in the two nodes. The procedure uses non UE-associated signaling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

RetrieveUE Context		The purpose of the Retrieve UE Context procedure is to retrieve the UE context from the eNB where the RRC connection has been suspended (old eNB) and transfer it to the eNB where the RRC Connection has been requested to be resumed (new eNB) or to retrieve the UE context for a UE which attempts to re-establish its RRC connection in an eNB (the new eNB) different from the eNB (the old eNB) where the RRC connection failed, e.g. due to RLF. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
EN-DCX2Removal		The purpose of the EN-DC X2 Removal procedure is to remove the signaling connection between eNB and en-gNB in a controlled manner. If successful, this procedure erases any existing application level configuration data in the two nodes. NOTE: In case the signalling transport is shared among several X2-C interface instances, and the TNL association is still used by one or more X2-C interface instances, the initiating node should not initiate the removal of the TNL association. The procedure uses non UE-associated signaling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
DataForwardingAddressIndication		The purpose of the Data Forwarding Address Indication procedure is to allow the new eNB to provide data forwarding addresses to the old eNB in case the RRC connection has been re-established, as specified in TS 36.300 [15]. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

X2APMessageTransfer		The purpose of the X2AP Message Transfer procedure is to allow indirect transport of an X2AP message (except the X2AP MESSAGE TRANSFER message) between two eNBs and to allow an eNB to perform registration.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
SeNB Addition Preparation		The purpose of the SeNB Addition Preparation procedure is to request the SeNB to allocate resources for dual connectivity operation for a specific UE. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
SeNB Reconfiguration Completion		The purpose of the SeNB Reconfiguration Completion procedure is to provide information to the SeNB whether the requested configuration was successfully applied by the UE. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

MeNB initiated SeNB Modification Preparation		This procedure is used to enable an MeNB to request an SeNB to modify the UE context at the SeNB. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
SeNB initiated SeNB Modification		This procedure is used by the SeNB to modify the UE context in the SeNB. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
MeNBInitiatedSeNBRelease		The MeNB initiated SeNB Release procedure is triggered by the MeNB to initiate the release of the resources for a specific UE. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

SeNBInitiatedSeNBRelease		This procedure is triggered by the SeNB to initiate the release of the resources for a specific UE. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
SeNBCounterCheck		This procedure is initiated by the SeNB to request the MeNB to execute a counter check procedure to verify the value of the PDCP COUNTs associated with SCG bearers established in the SeNB. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
EN-DCX2Setup		The purpose of the EN-DC X2 Setup procedure is to exchange application level configuration data needed for eNB and en-gNB to interoperate correctly over the X2 interface. This procedure erases any existing application level configuration data in the two nodes and replaces it by the one received. This procedure also resets the X2 interface like a Reset procedure would do. NOTE: If X2-C signalling transport is shared among multiple X2-C interface instances, one EN-DC X2 Setup procedure is issued per X2-C interface instance to be setup, i.e. several X2 Setup procedures may be issued via the same TNL association after that TNL association has become operational. The procedure uses non UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

EN-DCConfigurationUpdate		The purpose of the EN-DC Configuration Update procedure is to update application level configuration data needed for eNB and en-gNB to interoperate correctly over the X2 interface. The procedure uses non UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
EN-DCCellActivation		The purpose of the EN-DC Cell Activation procedure is to enable an eNB to request a neighbouring en-gNB to switch on one or more cells, previously reported as inactive due to energy saving reasons. The procedure uses non UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
SgNBAdditionPreparation		The purpose of the SgNB Addition Preparation procedure is to request the en-gNB to allocate resources for EN-DC connectivity operation for a specific UE. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

SgNBReconfiguration Completion		The purpose of the SgNB Reconfiguration Completion procedure is to provide information to the en-gNB whether the requested configuration was successfully applied by the UE. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
MeNBInitiatedSgNBModificationPreparation		This procedure is used to enable an MeNB to request an en-gNB to modify the UE context at the en-gNB, or to query the current SCG configuration for supporting delta signalling in MeNB initiated SgNB change, or to provide the S-RLF-related information to the en-gNB. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
SgNBInitiatedSgNBModification		This procedure is used by the en-gNB to modify the UE context in the en-gNB. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

SgNBChange		This procedure is used by the en-gNB to change to another en-gNB. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
MeNBInitiatedSgNBRelease		The MeNB initiated SgNB Release procedure is triggered by the MeNB to initiate the release of the resources for a specific UE. The procedure uses UE-associated signalling'	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
SgNBInitiatedSgNBRelease		This procedure is triggered by the en-gNB to initiate the release of the resources for a specific UE. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

SgNBCounterCheck		This procedure is initiated by the en-gNB to request the MeNB to execute a counter check procedure to verify the value of the PDCP COUNTs associated with SN terminated bearers. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
RRCTransfer		The purpose of the RRC Transfer procedure is to deliver a PDCP-C PDU encapsulating an LTE RRC message to the en-gNB so that it may then be forwarded to the UE, or from the en-gNB, if it was received from the UE. Delivery status may also be provided from the en-gNB to the MeNB using the RRC Transfer. The procedure is also to enable transfer of the NR RRC message container with the NR measurements from the MeNB to the en-gNB, when received from the UE. The procedure is also to enable transfer of the NR RRC message container with the NR failure information from the MeNB to the en-gNB, when received from the UE. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
SecondaryRATDataUsageReport		This procedure is initiated by the en-gNB to report secondary RAT data volume. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

PartialResetOfEN-DC		This procedure is triggered by the en-gNB or the MeNB to initiate the reset of the resources for selected UEs. The procedure uses non UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
E-UTRA–NRCellResourceCoordination		The purpose of the E-UTRA – NR Cell Resource Coordination procedure is to enable coordination of radio resource allocation between an eNB and an en-gNB that are sharing spectrum and whose coverage areas are fully or partially overlapping. During the procedure, the eNB and en-gNB shall exchange their intended resource allocations for data traffic, and, if possible, converge to a shared resource. The procedure is only to be used for the purpose of E-UTRA – NR spectrum sharing. The procedure uses non-UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
SgNBActivityNotification		The purpose of the SgNB Activity Notification procedure is to allow an en-gNB to send a notification to an eNB concerning user data traffic activity of already established E-RABs. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

GNBStatus Indication		The purpose of the gNB Status Indication procedure is to inform the eNB that the en-gNB is overloaded so that overload reduction actions can be applied. The procedure uses non-UE associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
EN-DCConfigurationTransfer		The purpose of the EN-DC Configuration Transfer procedure is to transfer the EN-DC SON Configuration container, either from the eNB to the en-gNB or from the en-gNB to the eNB, in the context of en-gNB X2 TNL address discovery as described in TS 36.300 [15]. The procedure uses non UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY
TraceStart		The purpose of the Trace Start procedure is to allow the MeNB to request the en-gNB to initiate a trace session for a UE. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

Deactivate Trace		The purpose of the Deactivate Trace procedure is to allow the MeNB to request the en-gNB to stop the trace session for the indicated trace reference. The procedure uses UE-associated signalling.	OpenModelOperation · isOperationIdempotent: false · isAtomic: false · support: MANDATORY

3 ObjectClasses

3.1 Overview

Qualified Name: ORAN::ObjectClasses

3.1.1 Classes

3.1.1.1 XAppMgr class

Qualified Name: ORAN::ObjectClasses:: XAppMgr

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

3.1.1.2 CarrierPreferenceConnection class

Qualified Name: ORAN::ObjectClasses::CarrierPreferenceConnection

Description:

to select the carrier to use in a different way than what would be through default behavior

Parent class: PolicyStatement

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

Table 61 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes

cellCarrierId	String	1	the identity of a carrier in a cell for which policy is applicable	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
cellCarrierRelationId	String	1	the identifier of a cell relation (Neighbour Cell Relattion [36.300])	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
preference	PreferenceType	1	the preference of carrier usage [shall/prefer/avoid/forbid].	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
primary	PrimaryType	1	indicates if the carrier is used as primary connection [Yes, No, null]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.3 CarrierPreferenceTraffic class

Qualified Name: ORAN::ObjectClasses::CarrierPreferenceTraffic

Description:

to schedule traffic on available carriers in a different way than what would be through default behavior

Parent class: PolicyStatement

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

Table 62 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
cellCarrierId	String	1	the identity of a carrier in a cell for which policy is applicable []	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
cellCarrierRelationId	String	1	the identifier of a cell relation (Neighbour Cell Relattion [36.300])	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
preference	PreferenceType	1	the preference of carrier usage [shall/prefer/avoid/forbid].	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.4 EnergyEfficiencyMode class

Qualified Name: ORAN::ObjectClasses::EnergyEfficiencyMode

Description:

to optimize operation for energy efficiency

An energy efficiency policy is to apply either for a specific cell, or for the whole system (all cells). In a cell it can apply to a specific carrier or to all carriers.

Parent class: PolicyStatement

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

Table 63 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
cellCarrierId	String	0..1	the identity of a carrier in a cell for which policy is applicable	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
effiencyMode	OptimizationType	1	the preference for efficiency [full capacity/energy efficient	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.5 InfrastrutureManagementFramework class

Qualified Name: ORAN::ObjectClasses::InfrastrutureManagementFramework

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

3.1.1.6 ManagedElement class

Qualified Name: ORAN::ObjectClasses::ManagedElement

Description:

This IOC (Information Object Class) represents telecommunications equipment or TMN entities within the telecommunications network providing support and/or service to the subscriber.

An ME communicates with a manager (directly or indirectly) over one or more management interfaces for the purpose of being monitored and/or controlled. MEs may or may not additionally perform element management functionality.

An ME contains equipment that may or may not be geographically distributed. An ME is often referred to as a "Network Element".

A telecommunication equipment has software and hardware components. The IOC described above represents the case when the software component is designed to run on dedicated hardware component. In the case when the software is designed to run on ETSI NFV defined NFVI [15], the IOC description would exclude the NFVI component supporting the above mentioned subject software. A ManagedElement may be contained in either a SubNetwork or in a MeContext instance. A single ManagedElement may also exist stand-alone with no parent at all.

The ManagedElement IOC may be used to represent combined ME functionality (as indicated by the managedElementType attribute and the contained instances of different functional IOCs).

Single function ManagedElement IOC instances will have a 1..1 containment relationship to a function IOC instance (in this context a function IOC instance is an instance of an IOC derived from the ManagedFunction IOC). Multiple function ManagedElement instances will have a 1..N containment relationship to function IOC instances.

NOTE: For some specific functional IOCs a 1..N containment relationship is permitted. The specific functional entities are identified in the NRMs that define subclasses of ManagedFunction.

This class is abstract.

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY
- Reference
- reference: 3GPP TS 28622

Table 64 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
id	DN	1	An attribute whose "name+value" can be used as an RDN when naming an instance of the object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
vendorName	String	1	The name of the vendor.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

userDefinedState	String	1	An operator defined state for operator specific usage.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
swVersion	String	0..1	The software version of the ManagementNode or ManagedElement (this is used for determining which version of the vendor specific information is valid for the ManagementNode or ManagedElement).	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
priorityLabel	Integer	1	This is a label that consumer would assign a value on a concrete instance of the managed object. The management system takes the value of this attribute into account. The effect of this attribute value to the subject managed entity is not standardized	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.7 ManagedFunction class

Qualified Name: ORAN::ObjectClasses::ManagedFunction

Description:

This IOC is provided for sub-classing only. It provides attribute(s) that are common to functional IOCs. Note that a ManagedElement may contain several managed functions. The ManagedFunction may be extended in the future if more common characteristics to functional objects are identified.

This IOC can represent a telecommunication function either realized by software running on dedicated hardware or realized by software running on NFVI. Each ManagedFunction instance communicates with a manager (directly or indirectly) over one or more management interfaces exposed via its containing ME instance.

This class is abstract.

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY
- Reference
- reference: 3GPP TS 28622

Table 65 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
id	DN	1	An attribute whose "name+value" can be used as an RDN when naming an instance of the object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
vnfParameterList	String	0..*	This attribute contains the parameter set of the VNF instance(s) corresponding to an NE. Each entry in the list contains: - vnfInstanceId - vnfdId (optional) - flavourId (optional) - autoScalable	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

peeParametersList	String	0..*	This attribute contains the parameter list for the control and monitoring of power, energy and environmental parameters of ManagedFunction instance(s).	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
priorityLabel	Integer	1	This is a label that consumer would assign a value on a concrete instance of the managed object. The management system takes the value of this attribute into account. The effect of this attribute value to the subject managed entity is not standardized	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.8 NearRTRIC class

Qualified Name: ORAN::ObjectClasses::NearRTRIC

Parent class: ManagedFunction

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

3.1.1.9 NonRTRIC (RGPF) class

Qualified Name: ORAN::ObjectClasses::NonRTRIC (RGPF)

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

3.1.1.10 OCUCPFunction class

Qualified Name: ORAN::ObjectClasses::OCUCPFunction

Description:

This IOC represents the logical function CU-CP of gNB and en-gNB defined in 3GPP TS 38.401 [4].

Parent class: ManagedFunction

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY
- Reference
- reference: 3GPP TS 28541

Table 66 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
gNBId	String	1	It identifies a gNB within a PLMN. The gNB ID is part of the NR Cell Identifier (NCI) of the gNB cells.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
gNBIDLength	Integer	1	This indicates the number of bits for encoding the gNB ID	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

gNBCU Name	String	1	It identifies the Central Entity of a NR node	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
pLMNId List	PLMNId	1..*	List of unique identities for PLMN.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
id	DN	1	An attribute whose "name+value" can be used as an RDN when naming an instance of the object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

vnfParameterList	String	0..*	This attribute contains the parameter set of the VNF instance(s) corresponding to an NE. Each entry in the list contains: - vnfInstanceId - vnfdId (optional) - flavourId (optional) - autoScalable	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
peeParametersList	String	0..*	This attribute contains the parameter list for the control and monitoring of power, energy and environmental parameters of ManagedFunction instance(s).	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
priorityLabel	Integer	1	This is a label that consumer would assign a value on a concrete instance of the managed object. The management system takes the value of this attribute into account. The effect of this attribute value to the subject managed entity is not standardized	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.11 OCUUPFunction class

Qualified Name: ORAN::ObjectClasses::OCUUPFunction

Description:

This IOC represents the logical function CU-UP of gNB or en-gNB defined in 3GPP TS 38.401 [4].

Parent class: ManagedFunction

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY
- Reference
- reference: 3GPP TS 28541

Table 67 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
pLMNIDList	PLMNId	1..*	List of unique identities for PLMN.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
gNBId	String	1	It identifies a gNB within a PLMN. The gNB ID is part of the NR Cell Identifier (NCI) of the gNB cells.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

gNBIdLength	Integer	1	This indicates the number of bits for encoding the gNB ID	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
id	DN	1	An attribute whose "name+value" can be used as an RDN when naming an instance of the object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
vnfParameterList	String	0..*	This attribute contains the parameter set of the VNF instance(s) corresponding to an NE. Each entry in the list contains: - vnfInstanceId - vnfdId (optional) - flavourId (optional) - autoScalable	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

peeParametersList	String	0..*	This attribute contains the parameter list for the control and monitoring of power, energy and environmental parameters of ManagedFunction instance(s).	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
priorityLabel	Integer	1	This is a label that consumer would assign a value on a concrete instance of the managed object. The management system takes the value of this attribute into account. The effect of this attribute value to the subject managed entity is not standardized	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.12 ODUFunction class

Qualified Name: ORAN::ObjectClasses::ODUFunction

Description:

This IOC represents the logical function DU of gNB or en-gNB defined in 3GPP TS 38.401 [4].

Parent class: ManagedFunction

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY
- Reference
- reference: 3GPP TS 28541

Table 68 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes

gNBDUId	Integer	1	It uniquely identifies the DU at least within a gNB.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
gNBDUName	String	1	It identifies the Distributed Entity of a NR node	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
gNBId	String	1	It identifies a gNB within a PLMN. The gNB ID is part of the NR Cell Identifier (NCI) of the gNB cells.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

gNBIDLength	Integer	1	This indicates the number of bits for encoding the gNB ID	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
id	DN	1	An attribute whose "name+value" can be used as an RDN when naming an instance of the object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
vnfParameterList	String	0..*	This attribute contains the parameter set of the VNF instance(s) corresponding to an NE. Each entry in the list contains: - vnfInstanceId - vnfdId (optional) - flavourId (optional) - autoScalable	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

peeParametersList	String	0..*	This attribute contains the parameter list for the control and monitoring of power, energy and environmental parameters of ManagedFunction instance(s).	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
priorityLabel	Integer	1	This is a label that consumer would assign a value on a concrete instance of the managed object. The management system takes the value of this attribute into account. The effect of this attribute value to the subject managed entity is not standardized	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.13 ORUFunction class

Qualified Name: ORAN::ObjectClasses::ORUFunction

Parent class: ManagedFunction

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

3.1.1.14 Policy class

Qualified Name: ORAN::ObjectClasses::Policy

Description:

A policy object always contains one or more sets of:

- one policy identifier (PolicyID);
- one policy type identifier (TypeID);
- one scope identifier;

and

- one or more policy statements.

Applied Stereotypes:

- Experimental
- OpenModelClass
- support: MANDATORY
- Reference
- reference: 08.14-oRAN.WG2-A1AP_v00.00.01

Table 69 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
policyId	String	1	policy identifier assigned by the A1-P Producer when a policy is created	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
policyType	PolicyCapabilityType	1	policy type identifier	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
ueId	String	0..1	UE identifier	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
groupId	String	0..1	identifer of a pre-defined group of UEs, either NSSAI [23.501] or SPID [25.401]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

cellId	String	0..1	cell identifier [23.003]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.15 PolicyError class

Qualified Name: ORAN::ObjectClasses::PolicyError

Applied Stereotypes:

- Experimental
- OpenModelClass
- support: MANDATORY

Table 610 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
problemDetails	ProblemDetailsType	1..*	In case a policy request is not accepted, additional information can be provided.	Experimental OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
_policy	Policy	1	Policy that this error is associated with.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.16 PolicyList class

Qualified Name: ORAN::ObjectClasses::PolicyList

Description:

The policy list object is a representation of the collection of policies

Applied Stereotypes:

- Experimental
- OpenModelClass
- support: MANDATORY

Table 611 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
policyId	String	1	policy identifier assigned by the A1-P Producer when a policy is created	Experimental OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
enforceStatus	EnforcementStatusType	1		Experimental OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
_policy	Policy	1..*	List of policies specified by the PolicyList	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.17 PolicyNotification class

Qualified Name: ORAN::ObjectClasses::PolicyNotification

Description:

The policy notification object is the A1 policy feedback message

Applied Stereotypes:

- Experimental
- OpenModelClass
- support: MANDATORY
- Reference
- reference: ATT-2019.09.16-ORAN.WG2-CR-A1_AP_policyNotifications_v2

Table 612 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
enforceStatus	EnforcementStatusType	1	indicating if policy is being enforced or not	Experimental OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
enforceReason	EnforcementReasonType	0..1	Indicating the reason why a policy is no longer being enforced	Experimental OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
_policy	Policy	1	The policy that this notification is for.	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.18 PolicyStatement class

Qualified Name: ORAN::ObjectClasses::PolicyStatement

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

3.1.1.19 Qos5QiMod class

Qualified Name: ORAN::ObjectClasses::Qos5QiMod

Description:

Part of QoS profile for change of QoS characteristic(s) of a standard 5QI value

Parent class: QosProfile

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

Table 613 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
resourceType	Boolean	0..1	Resource Type, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
priorityLevel	Number	0..1	Priority Level, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
pdb	Number	0..1	Packet Delay Budget, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

per	Number	0..1	Packet Error Rate, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
averageWindow	Number	0..1	Averaging Window, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
mdbv	Number	0..1	Maximum Data Burst Volume, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
5qi	Number	1	5G QoS Identifier, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
arp	Arp	0..*	Allocation and Retention Priority, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.20 Qos5qi class

Qualified Name: ORAN::ObjectClasses::Qos5qi

Description:

Part of QoS profile containing all QoS charateristics a for non-standard 5QI value

NOTE: Including this statement in a policy is conditionally mandatory for a policy object where the 5QI parameter in the qos_profile statement has a non-standard value.

Parent class: QosProfile

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

Table 614 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
resourceType	Boolean	1	Resource Type, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
priorityLevel	Number	1	Priority Level, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
pdb	Number	1	Packet Delay Budget, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

per	Number	1	Packet Error Rate, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
averageWindow	Number	1	Averaging Window, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
mdbv	Number	1	Maximum Data Burst Volume, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
5qi	Number	1	5G QoS Identifier, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
arp	Arp	0..*	Allocation and Retention Priority, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.21 QosGbr class

Qualified Name: ORAN::ObjectClasses::QosGbr

Description:

Part of QoS profile specific to GBR profiles

Parent class: QosProfile

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

Table 615 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
gfbr	Number	1	Guaranteed Flow Bit Rate, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
mfbr	Number	1	Maximum Flow Bit Rate, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
notCtrl	Boolean	1	Notification control, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

mplrUl	Number	1	Maximum Packet Loss Rate – Up Link, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
mplrDl	Number	1	Maximum Packet Loss Rate – Down Link, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
5qi	Number	1	5G QoS Identifier, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
arp	Arp	0..*	Allocation and Retention Priority, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.22 QosNonGbr class

Qualified Name: ORAN::ObjectClasses::QosNonGbr

Description:

Part of QoS profile specific to non-GBR profiles

Parent class: QosProfile

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

Table 616 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
rqa	Boolean	1	Reflective QoS Attribute, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
5qi	Number	1	5G QoS Identifier, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
arp	Arp	0..*	Allocation and Retention Priority, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.23 QosProfile class

Qualified Name: ORAN::ObjectClasses::QosProfile

Description:

Common part of all QoS profiles

Parent class: PolicyStatement

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

Table 617 Attributes for Package ObjectClasses

Attribute Name	Type	Mult.	Description	Stereotypes
5qi	Number	1	5G QoS Identifier, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
arp	Arp	0..*	Allocation and Retention Priority, see [23.501]	OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

3.1.1.24 ServiceManagementAndOrchestrationFramework class

Qualified Name: ORAN::ObjectClasses::ServiceManagementAndOrchestrationFramework

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

3.1.1.25 XApp class

Qualified Name: ORAN::ObjectClasses::XApp

Description:

An xAPP is a (collection of) microservice(s) that extend the functionality of a managed function.

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

3.1.1.26 eNodeB class

Qualified Name: ORAN::ObjectClasses::eNodeB

Parent class: ManagedFunction

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4 Sandbox

4.1 Overview

Qualified Name: ORAN::Sandbox

4.1.1 Associations

4.1.1.1 association

Qualified Name:

Warning: violation of modeling guidelines: association has not been named.

Table 71 Member ends for Association

Attribute Name	Aggreg.	Navig.	Mult.	Type	Description	Stereotypes
rapp	composite	Not navig.	0..*	RApp		OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
nearrtric	none	Not navig.	1	NearRtRic		OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

4.1.1.2 association

Qualified Name:

Warning: violation of modeling guidelines: association has not been named.

Table 72 Member ends for Association

Attribute Name	Aggreg.	Navig.	Mult.	Type	Description	Stereotypes

xapp	composite	Not navig.	0..*	Xapp		OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
managedunction	none	Not navig.	1	NonRtRic (RGPF)		OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

4.1.1.3 association

Qualified Name:

Warning: violation of modeling guidelines: association has not been named.

Table 73 Member ends for Association

Attribute Name	Aggreg.	Navig.	Mult.	Type	Description	Stereotypes
managedunction	composite	Not navig.	0..*	ManagedFunction		OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

managedelement (service)	none	Not navig.	1	ManagedElement (Service)		OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

4.1.1.4 association

Qualified Name:

Warning: violation of modeling guidelines: association has not been named.

Table 74 Member ends for Association

Attribute Name	Aggreg.	Navig.	Mult.	Type	Description	Stereotypes
xapp	none	Not navig.	1	Xapp		OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY
rapp	none	Not navig.	1	RApp		OpenModelAttribute · partOfObjectKey: 0 · uniqueSet: · isInvariant: false · unsigned: false · counter: NA · support: MANDATORY

4.1.2 Diagrams

Figure 71: Diagram Class Hiearchy

4.1.3 Classes

4.1.3.1 CloudAppliance class

Qualified Name: ORAN::Sandbox::CloudAppliance

Parent class: ManagedFunction

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.2 CuCp class

Qualified Name: ORAN::Sandbox::CuCp

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.3 CuUp class

Qualified Name: ORAN::Sandbox::CuUp

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.4 Du class

Qualified Name: ORAN::Sandbox::Du

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.5 ManagedElement (Service) class

Qualified Name: ORAN::Sandbox::ManagedElement (Service)

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.6 ManagedFunction class

Qualified Name: ORAN::Sandbox::ManagedFunction

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.7 NearRtRic class

Qualified Name: ORAN::Sandbox::NearRtRic

Parent class: Pnf

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.8 NonRtRic (RGPF) class

Qualified Name: ORAN::Sandbox::NonRtRic (RGPF)

Parent class: Pnf

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.9 Pnf class

Qualified Name: ORAN::Sandbox::Pnf

Parent class: ManagedFunction

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.10 RApp class

Qualified Name: ORAN::Sandbox::RApp

Description:

An RApp takes in messages from the O1 interface, processes the message, and send it through the model. The model replies with an action or additional information that the RApp then sends back out via the A1 interface.

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.11 Ru class

Qualified Name: ORAN::Sandbox::Ru

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.12 Vnf class

Qualified Name: ORAN::Sandbox::Vnf

Parent class: ManagedFunction

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

4.1.3.13 Xapp class

Qualified Name: ORAN::Sandbox::Xapp

Description:

An XApp takes in messages from the E2 interface, processes the message, and send it through the model. The model replies with an action or additional information that the XApp then sends back out via the E2 interface.

Applied Stereotypes:

- OpenModelClass
- support: MANDATORY

5 TypeDefinitions

5.1 Overview

Qualified Name: ORAN::TypeDefinitions

5.1.1 Datatypes

5.1.1.1 Arp datatype

Qualified Name: ORAN::TypeDefinitions::Arp

Description:

Allocation and Retention Priority, see [23.501]

Table 81 Attributes for Data Type Arp

Attribute Name	Type	Mult.	Description	Stereotypes
priorityLevel	Number	1	defines the relative importance of a resource request, see [23.501]	OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY
preemptionCapability	Boolean	1	defines whether a service data flow may get resources that were already assigned to another service data flow with a lower priority level, see [23.501]	OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY
preemptionCapability	Boolean	1		OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY

5.1.1.2 DN datatype

Qualified Name: ORAN::TypeDefinitions::DN

Description:

A Distinguished Name (DN) is used to uniquely identify a MO within a name space.

Applied Stereotypes:

- Reference
- reference: 3GPP TS 32300

5.1.1.3 DateTime primitive type

Qualified Name: ORAN::TypeDefinitions::DateTime

Description:

DateTime - RFC 2822 standard date/time format.

RFC 2822 format

day-of-week, dd MM yyyy HH':'mm':'ss 'GMT'

e.g. Tue, 21 Jun 2016 14:05:20 GMT

5.1.1.4 Number primitive type

Qualified Name: ORAN::TypeDefinitions::Number

Description:

This primitive type is a superset of the standard UML numbering primitives, e.g. Integer and Real.

5.1.1.5 PLMNId datatype

Qualified Name: ORAN::TypeDefinitions::PLMNId

Description:

This <<dataType>> represents the information of a PLMN identification.

Applied Stereotypes:

- Reference
- reference: 3GPP TS 28658

Table 82 Attributes for Data Type PLMNId

Attribute Name	Type	Mult.	Description	Stereotypes
mCC	String	1	This is the Mobile Country Code (MCC) of the PLMN identifier.	OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY
mNC	String	1	This is the Mobile Network Code (MNC) of the PLMN identifier.	OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY

5.1.1.6 ProblemDetailsType datatype

Qualified Name: ORAN::TypeDefinitions::ProblemDetailsType

Description:

In case a policy request is not accepted, additional information can be provided.

Applied Stereotypes:

- Experimental

Table 83 Attributes for Data Type ProblemDetailsType

Attribute Name	Type	Mult.	Description	Stereotypes
type	String	0..1	A URI reference according to IETF RFC 3986 [6] that identifies the problem type.	OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY Experimental
title	String	0..1	A short, human-readable summary of the problem type. It should not change from occurrence to occurrence of the problem.	OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY Experimental
status	Number	0..1	The HTTP status code for this occurrence of the problem.	OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY Experimental
detail	String	0..1	A human-readable explanation specific to this occurrence of the problem.	OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY Experimental

instance	String	0..1	A URI reference that identifies the specific occurrence of the problem.	OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY Experimental
policyErrorCode	PolicyErrorType	0..1	A machine-readable application error cause specific to this occurrence of the problem This IE should be present and provide application-related error information, if available.	OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY Experimental
invalidParams		0..*		OpenModelAttribute · isInvariant: false · valueRange: no range constraint · support: MANDATORY Experimental

5.1.1.7 URI primitive type

Qualified Name: ORAN::TypeDefinitions::URI

Description:

Uniform resource identifier

5.1.2 Enumerations

5.1.2.1 EnforcementReasonType enumeration

Qualified Name: ORAN::TypeDefinitions::EnforcementReasonType

Description:

The enumeration enforcement_reason_type represents the reson why notification is sent (e.g. why enforcement status has changed).

Applied Stereotypes:

- Experimental

Contains Enumeration Literals:

- 100
  - Policy object syntax error
  - One or more fields in policy object (scope or statements) cannot be interpreted
- 200
  - The scope identifier in the policy object is no longer valid, and policy cannot be enforced
  - Policy scope id is invalid

- 300
  - The policy statement(s) can no longer be enforced for given scope
  - Policy statements not applicable for associated scope
- 800
  - Default
  - Generic default reason for to capture non-specified reasons

5.1.2.2 EnforcementStatusType enumeration

Qualified Name: ORAN::TypeDefinitions::EnforcementStatusType

Contains Enumeration Literals:

- YES
- NO

5.1.2.3 OptimizationType enumeration

Qualified Name: ORAN::TypeDefinitions::OptimizationType

Description:

The enumeration optimization_type represents the system resource to optimize for.

Contains Enumeration Literals:

- 0
  - equals that system should be optimized for full capacity (e.g. optimizing spectral efficiency)
- 1
  - equals that system should be optimized for energy efficiency

5.1.2.4 PolicyCapabilityType enumeration

Qualified Name: ORAN::TypeDefinitions::PolicyCapabilityType

Description:

The enumeration policy_capability_type represents the type of policy.

Contains Enumeration Literals:

- QOS
  - equals a policy that includes QoS related statement(s)
- CARRIER
  - equals a policy that includes carrier preference statement(s)
- ENERGY
  - equals a policy that includes energy efficiency statement(s)

5.1.2.5 PolicyErrorType enumeration

Qualified Name: ORAN::TypeDefinitions::PolicyErrorType

Description:

The enumeration policy_error_type represents error information that can be provided in addition to the HTTP response error code.

Contains Enumeration Literals:

- CONF_POLICY_ID
  - Policy instance with requested ID already exists
  - In case a create policy request could not be accepted due to existing policy instance with same policy id
- BAD_REQ_MISSING_PARAM
  - In case a create policy request could not be accepted due to malformed syntax (missing policy ID or scope ID)
  - Bad request due to missing attributes in policy object header (e.g. missing policy ID or scope ID)

5.1.2.6 PolicyErrorType enumeration

Qualified Name: ORAN::TypeDefinitions::PolicyErrorType

Contains Enumeration Literals:

- CONF_POLICY_ID
  - In case a create policy request could not be accepted due to existing policy instance with same policy id
  - Policy instance with requested ID already exists
- BAD_REQ_MISSING_PARAM
  - Bad request due to missing attributes in policy object header (e.g. missing policy ID or scope ID)

- In case a create policy request could not be accepted due to malformed syntax (missing policy ID or scope ID)

5.1.2.7 PreferenceType enumeration

Qualified Name: ORAN::TypeDefinitions::PreferenceType

Contains Enumeration Literals:

- SHALL
  - select the carrier regardless if connection retainability might be at risk
  - equals to select the resource
- PREFER
  - favor the selection of the carrier even if it is not with the best radio quality if the connection retainability is not at risk.
  - equals to favor the selection of the resource
- AVOID
  - equals to avoid selecting the resource
  - avoid selecting the carrier unless the connection retainability is at risk
- FORBID
  - equals to not select the resource
  - not select the carrier under any conditions

5.1.2.8 PrimaryType enumeration

Qualified Name: ORAN::TypeDefinitions::PrimaryType

Description:

The enumeration primary_type represents if the resource is used as primary resource (e.g. carrier is used as primary connection).

Contains Enumeration Literals:

- YES
  - the CellCarrier is used as primary cell
  - equals that the resource is used as primary
- NO
  - equals that the resource is not used as primary
  - the CellCarrier may be used as primary or non-primary cell
- NULL
  - the CellCarrier may be used as primary or non-primary cell
  - equals that the resource may be used as primary or non-primary

5.1.2.9 SupportedType enumeration

Qualified Name: ORAN::TypeDefinitions::SupportedType

Description:

The enumeration supported_type represents the support of a capability (e.g. policy type).

Contains Enumeration Literals:

- ADDED
  - equals that support for a specific capability has been added
- REMOVED
  - equals that support for a specific capability has been removed
- SUPPORTED
  - equals that support for a specific capability is supported
- NOT_SUPPORTED
  - equals that support for a specific capability is not supported