<config>  
<output path=’C:\Users\ndavis\git\OnfInfoModelOutput\ModelDescriptions\TR-512.FE\_OnfCoreIm-FutureEnhancements.docx' />  
</config>

<context model=’C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreModel.uml' element=’{0}’ importedBundles='gmf;papyrus' searchMetamodels='true'/>

<gendoc><drop/>

Change path substrings above from “{path for output files}\” to your local path for the output files and “{path for CoreModel}\” to your local path for the Core Model. <drop/>

DELETE: Prior to publishing this –gd.docx (including for review), change path substrings above from “C:\Users\ndavis\git\OnfInfoModelOutput\” to “{path for output files}\” and from “C:\Users\ndavis\git\ONFInfoModel\OnfModel\” to “{path for CoreModel}\” <drop/>



Core Information Model (CoreModel)

TR-512.FE

Future Enhancements

Version 1.5

September 2021

ONF Document Type: Technical Recommendation

ONF Document Name: Core Information Model version 1.5

**Disclaimer**

THIS SPECIFICATION IS PROVIDED “AS IS” WITH NO WARRANTIES WHATSOEVER, INCLUDING ANY WARRANTY OF MERCHANTABILITY, NONINFRINGEMENT, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY WARRANTY OTHERWISE ARISING OUT OF ANY PROPOSAL, SPECIFICATION OR SAMPLE.

Any marks and brands contained herein are the property of their respective owners.

Open Networking Foundation  
1000 El Camino Real, Suite 100, Menlo Park, CA 94025  
[www.opennetworking.org](http://www.opennetworking.org)

©2018 Open Networking Foundation. All rights reserved.

Open Networking Foundation, the ONF symbol, and OpenFlow are registered trademarks of the Open Networking Foundation, in the United States and/or in other countries. All other brands, products, or service names are or may be trademarks or service marks of, and are used to identify, products or services of their respective owners.

**Important note**

This Technical Recommendations has been approved by the Project TST, but has not been approved by the ONF board.  This Technical Recommendation is an update to a previously released TR specification, but it has been approved under the ONF publishing guidelines for ‘Informational’ publications that allow Project technical steering teams (TSTs) to authorize publication of Informational documents.  The designation of ‘-info’ at the end of the document ID also reflects that the project team (not the ONF board) approved this TR.

Finalizing this document once generated… delete this text prior to publication:

* Replace “{{..}}” with square brackets (which trip up Gendoc)
* Select text in document from beginning of table of contents (first line) to end of document
  + Click menu item “Update Field” (on this large block of text)
    - if “Update Table…” dialogue appears select “Update entire table”
  + Repeat “update fields” 2 more times (on the same large block of text)
    - if “Update Table…” dialogue appears select “Update entire table”
* Remove reviewer comment

Note that the table of contents and figures need to be updated several times as the table length changes the page numbering and the cross references will need to be re-updated.

Table of Contents

[Disclaimer 2](#_Toc434403079)

[Open Networking Foundation 2](#_Toc434403080)

[Document History 5](#_Toc434403081)

[1 Introduction 5](#_Toc434403082)

[2 References 6](#_Toc434403083)

[3 Definitions 8](#_Toc434403084)

[3.1 Terms defined elsewhere 8](#_Toc434403085)

[3.2 Terms defined in this TR 8](#_Toc434403086)

[4 Abbreviations and acronyms 8](#_Toc434403087)

[5 Conventions 10](#_Toc434403088)

[5.1 UML modeling conventions 10](#_Toc434403089)

[5.2 Lifecycle Stereotypes 10](#_Toc434403090)

[5.3 Diagram Keys 11](#_Toc434403091)

[6 Overview of the CoreModel Fragment 13](#_Toc434403092)

[6.1 Overview of the CoreNetworkModule of the CoreModel 15](#_Toc434403093)

[6.1.1 LogicalTerminationPoint (LTP) and LayerProtocol (LP) 17](#_Toc434403094)

[6.1.2 ForwardingDomain (FD) 18](#_Toc434403095)

[6.1.3 ForwardingConstruct (FC), EndPoint (EP), FcRoute and FcSwitch 18](#_Toc434403096)

[6.1.4 Link and LinkEnd 18](#_Toc434403097)

[6.1.5 NetworkElement, NetworkControlDomain and SdnController 19](#_Toc434403098)

[6.2 CoreFoundationModule 19](#_Toc434403099)

[6.2.1 Naming and identifiers 19](#_Toc434403100)

[6.2.2 States 22](#_Toc434403101)

[6.2.2.1 Relationship between states in Provider context 22](#_Toc434403102)

[6.2.2.2 Relationship between states in the client and provider context 23](#_Toc434403103)

[6.3 Termination Fragment 24](#_Toc434403104)

[6.4 Forwarding Fragment 27](#_Toc434403105)

[6.4.1 Basic Forwarding 27](#_Toc434403106)

[6.4.2 Forwarding Construct Specification and other details of Forwarding 28](#_Toc434403107)

[6.5 Topology Fragment 32](#_Toc434403108)

[6.5.1 Basic Topology 35](#_Toc434403109)

[6.5.2 Topology and views 40](#_Toc434403110)

[6.5.3 View boundaries and intermediates 46](#_Toc434403111)

[6.5.4 More on views and names/identifiers 47](#_Toc434403112)

[6.5.5 Off-network reference and the clients view 50](#_Toc434403113)

[6.5.6 Physical Port reference 51](#_Toc434403114)

[6.5.7 Detailed properties of Topology 53](#_Toc434403115)

[6.6 Directionality 55](#_Toc434403116)

[7 Future CoreModel areas 60](#_Toc434403117)

[8 UML model files 60](#_Toc434403118)

[8.1 Papyrus File 60](#_Toc434403119)

[9 Data Dictionary 62](#_Toc434403120)

[9.1 Core Network Module data dictionary 62](#_Toc434403121)

[9.1.1 Classes 62](#_Toc434403122)

[9.1.1.1 {{cl.name/}} 62](#_Toc434403123)

[9.1.2 Data Types 65](#_Toc434403124)

[9.1.2.1 {{dt.name/}} 65](#_Toc434403125)

[9.1.3 Enumeration Types 67](#_Toc434403126)

[9.1.3.1 {{dt.name/}} 67](#_Toc434403127)

[9.1.4 Primitive Types 68](#_Toc434403128)

[9.1.4.1 {{dt.name/}} 68](#_Toc434403129)

[9.2 Core Foundation Module data dictionary 68](#_Toc434403130)

[9.2.1 Classes 68](#_Toc434403131)

[9.2.1.1 {{cl.name/}} 68](#_Toc434403132)

[9.2.2 Data Types 71](#_Toc434403133)

[9.2.2.1 {{dt.name/}} 71](#_Toc434403134)

[9.2.3 Enumeration Types 73](#_Toc434403135)

[9.2.3.1 {{dt.name/}} 73](#_Toc434403136)

[9.2.4 Primitive Types 74](#_Toc434403137)

[9.2.4.1 {{dt.name/}} 74](#_Toc434403138)

[9.3 Core Enhancements data dictionary 74](#_Toc434403139)

[9.3.1 Classes 74](#_Toc434403140)

[9.3.1.1 {{cl.name/}} 74](#_Toc434403141)

[9.3.2 Data Types 77](#_Toc434403142)

[9.3.2.1 {{dt.name/}} 77](#_Toc434403143)

[9.3.3 Enumeration Types 79](#_Toc434403144)

[9.3.3.1 {{dt.name/}} 79](#_Toc434403145)

[9.3.4 Primitive Types 80](#_Toc434403146)

[9.3.4.1 {{dt.name/}} 80](#_Toc434403147)

[9.4 Core Enhancement Fragments data dictionary 80](#_Toc434403148)

[9.4.1 Classes 80](#_Toc434403149)

[9.4.1.1 {{cl.name/}} 80](#_Toc434403150)

[9.4.2 Data Types 83](#_Toc434403151)

[9.4.2.1 {{dt.name/}} 83](#_Toc434403152)

[9.4.3 Enumeration Types 85](#_Toc434403153)

[9.4.3.1 {{dt.name/}} 85](#_Toc434403154)

[9.4.4 Primitive Types 86](#_Toc434403155)

[9.4.4.1 {{dt.name/}} 86](#_Toc434403156)

[10 Additional figures related to potential extensions 87](#_Toc434403157)

[10.1 State extensions 87](#_Toc434403158)

[10.2 LTP Specification 87](#_Toc434403159)

[10.3 Model structure rules 88](#_Toc434403160)

[11 Addendum Translation table 91](#_Toc434403161)

[12 Back matter 93](#_Toc434403162)

[12.1 Editors 93](#_Toc434403163)

[12.2 Contributors 93](#_Toc434403164)

List of Figures

[Figure 1-1 Methodology of IM and DS Development 6](#_Toc430780029)

Document History

| **Version** | **Date** | **Description of Change** |
| --- | --- | --- |
| 1.0 | March 30, 2015 | Initial version of the base document of the “Core Information Model” fragment of the ONF Common Information Model (ONF-CIM). |
| 1.1 | November 24, 2015 | Version 1.1 |
| 1.2 | September 20, 2016 | Version 1.2 {{Note Version 1.1 was a single document whereas 1.2 is broken into a number of separate parts}} |
| 1.3 | September 2017 | Document name changed. Was TR-512.10 in Version 1.2. {{Published via wiki only}} |
| 1.3.1 | January 2018 | Addition of text related to approval status. |
| 1.4 | November 2018 | Alignment with release content. |
| 1.5 | September 2021 | Enhancements to model structure |

# Introduction to the document suite

This document is an addendum to the TR-512 ONF Core Information Model and forms part of the description of the ONF-CIM. For general overview material and references to the other parts refer to [TR-512.1](../TR-512.1_OnfCoreIm-Overview.pdf).

## References

For a full list of references see [TR-512.1](../TR-512.1_OnfCoreIm-Overview.pdf).

## Definitions

For a full list of definition see [TR-512.1](../TR-512.1_OnfCoreIm-Overview.pdf).

## Conventions

See [TR-512.1](../TR-512.1_OnfCoreIm-Overview.pdf) for an explanation of:

* UML conventions
* Lifecycle Stereotypes
* Diagram symbol set

## Viewing UML diagrams

Some of the UML diagrams are very dense. To view them either zoom (sometimes to 400%), open the associated image file (and zoom appropriately) or open the corresponding UML diagram via Papyrus (for each figure with a UML diagram the UML model diagram name is provided under the figure or within the figure).

## Understanding the figures

Figures showing fragments of the model using standard UML symbols as well as figures illustrating application of the model are provided throughout this document. Many of the application-oriented figures also provide UML class diagrams for the corresponding model fragments (see [TR-512.1](../TR-512.1_OnfCoreIm-Overview.pdf) for diagram symbol sets). All UML diagrams depict a subset of the relationships between the classes, such as inheritance (i.e. specialization), association relationships (such as aggregation and composition), and conditional features or capabilities. Some UML diagrams also show further details of the individual classes, such as their attributes and the data types used by the attributes.

# Introduction to the Further Enhancements

The focus of this document is areas of ongoing work that are not represented in other TR-512 documents.

A data dictionary that sets out the details of all classes, data types and attributes is also provided ([TR-512.DD](TR-512.DD_OnfCoreIm-DataDictionary.pdf)).

# Summary of some further enhancements

## Future work areas

Future work is covered in [Planning & Work Items](https://wiki.opennetworking.org/pages/viewpage.action?pageId=265846900). The items below provide further details on potential future areas of work in the CoreModel. The list is not in any particular order (document numbers within the TR-512 series are highlighted where appropriate):

* LTP Port and LP Port model (.2)
* Spec model pattern generalization (.7 and A.10)
  + Generalize the spec models of LTP, FC, FD, etc. and scheme/system spec to have a general spec pattern
  + Refactor LTP Spec to be Component-System Spec
    - In v2.n, refactor the LTP spec to be a full generalized Component-System spec with constraints on what components can be used. Depends on LTP Port work.
* Interaction and management-control messaging (.8, .A.6 and .A.7)
  + Developing models for interaction/messaging in the context of ECC/DCN and protection
    - This leads to the need to develop support for basic IP networking
  + Developing message sequence diagram (for operation sequences)
* Interaction patterns for advancement of TAPI etc (.10 and .A.7)
  + Completion of the generalized operations pattern covering range of cases including intend and CRUD
    - Support operations patterns including intent
    - Support TOSCA and policy
    - Operations interaction model
    - Operations temporality
  + Understand the relationship with Dynamic APIs and Strategic Mediation
  + Operation pattern for general task
    - Use TAPI OAM as the seed to investigate using the Operation Pattern to support general task, taking the G.8052 On-demand measurement job requirement into account as input.
    - Use of Job Task to improve operation patterns
* Support for specific interface development in TAPI (various)
  + More layer examples (.A.4, .A.5 and .A.6)
* OAM functions (.9, .A.7 and new .A.n)
  + Generalization of OAM functions, e.g., generalized MEPs
  + Consider use cases and scenarios to guide development of the generalized model
* Assurance (.10 and .A.7)
  + Modeling of events and the reporting of events
* Patterns and architectures (.A.2)
  + Continue construction of models that explore the pattern underlying Link/FC/FD and minimally represent that pattern and show derivation of Link/FC/FD from that pattern.
* Dependency graph representation of telecommunications technology including flow semantics (.A.2)
  + For expression of detailed processes of a telecommunications technology to enable interpretation of a new technology
* Profiles, Templates and Specifications (.7 and .A.10)
  + Completion of spec model and addition of profiles model in the spec context
  + Further development of constraint models (also covering policy)
  + Complete pattern and migrate model to use pattern
  + Develop class based rule mechanism and consider more fluid approach to Core model
  + Provide further examples of usage
  + Develop detailed rules
  + Refine model to deal with rule interaction
  + Consider FD/FC spec convergence
    - FdPort added in V1.3 will help here
  + When dealing with Compound Links we need to consider whether rules are necessary for Link (the same structure will apply but an additional association from Link to FD will be necessary)
  + Development of a specification toolkit including standardized rules and structures
  + DSGL (Domain Specific Graphical Language to ease spec construction)
  + Model v specification (see also notes in .7):
    - Implication of the work so far is that the specification structure is the model structure and that the schema for any particular case has some parts of the structure in compile time form and other parts in runtime only form where the runtime form may have static parts only in the spec form
    - Is a replication of the model structure in formal model but that formal model should be decoupled at various points and extensible in a constrained way at various points.
    - Considerations of “model viscosity” (all models are fluid over some timeframe)
  + Dealing with LTP and LP formal sub-structuring challenge
    - Related to the previous bullet… should the LP sub structuring of the spec model be part of the LP model
  + Migration of operations from non-spec to spec
    - Continuum of usage approaches from “phrase book user” to “orator”
  + FcSpec refinements
    - Should the FC spec be rationalized to recognise that MSUF is essential an FC (implications etc)?
  + Moving to the generalized spec
    - How should constraints on each class spec be expressed in the context of a generalized spec?
  + Understanding the relationship to Dynamic APIs, Strategic Mediation and the Operations Patterns
  + Enhance the extension mechanism
  + Development of the scheme specification
    - Generalization to deal with specification of any network structure
    - Enhance the application to protection
* Resilience (.5 and .A.11)
  + Further development of the scheme specifications for resilience schemes
  + Carry out further work on the unexpected flow query
  + Use of partition v route and use in combination (see .5 for some notes)
  + Build on the model of signalling to deal specifically with resilience schemes (see .5 for some detailed considerations). This will be related to work in
    - .8 as this will be part of the MCC work as the C&SC is a controller and general messaging and signalling will be covered in .8
    - .7 as there is a specification aspect
  + Refine documentation on relationship to protectionGroups (see notes in .5)
  + Complete route feeds port relationship
  + Complete route lifecycle documentation (see .5)
  + Indication of encapsulated resilience on FC and Link
  + Further examples including dual homed cases
* Control and Interaction (.8, .11, .A.7 and .A.9)
  + Constraint Domain split (separating basic grouping from constraint application)
* Timing and Synchronization model including frequency and time/phase (.2 and .A.8)
  + Complete work and examples
* Physical Equipment (.6 and potentially a new .A.n)
  + Enhancements to the equipment model
  + Enhancements to the expectation v actual model approach (see detailed notes in .6)
  + Progress attribute details to «Preliminary» or «Mature»
  + Rationalize attribute groupings
  + Look for formal sources for physical properties and work towards a P&R relationship to these sources
  + Strengthen linkage and improve decoupling wrt other model areas
    - For functional work wrt ProcessingConstruct (.11 and .A.9) and OAM functions (.9 and .A.7)
      * Also see detail notes in .6
  + Separate out Management-Control parts into Management-Control model (.8 and .A.7)
  + Refine and move specification model detail from Physical model document to Specification model document and move model as appropriate (.7 and .A.10).
  + Addressing of ports (see .6 for some details)
* Software model enhancements (.12 and .A.13)
  + Representation of software and relationship to physical (.6) and functional (.11) models
* ProcessingConstruct (.11 and .A.9)
  + Document relationship to:
    - TOSCA meta-model
    - Component
    - VNF
  + Degree of specialization (related to .A.2)
    - PC v ControlComponent v C&SC
    - PC v FC
    - CD v FD
  + Component-System recursion and projecting views
  + PC emergence from software (see also Software in this list)
  + CD/PC spec
* FC, FD, Link and Topology (.2, .4)
  + Various detailed enhancements including considerations of merging of FC and Link
  + Consider merging FD and Link
  + Improve derivation of FD/FC/Link from Component-System pattern (.A.2)
    - Consider FC/Link convergence (.4)
  + Further clarification of off-network “things” (could be a link topology)
  + Various illustration of FD/Link lifecycle
    - Consider generalized lifecycle state and state interaction
  + Cost algorithm
  + Illustrate use of model for inverse multiplexing cases (.A.4, .A.5 and .A.6)
  + Media Multipoint (A.4)
  + Improve documentation on terminationState
  + Stating detailed properties on topology
  + Rationalize use of NearEnd/FarEnd, Input/Output, Ingress/Egress etc
  + Further develop Transitional Link examples (in .A.5 and .A.6) to cover complex Links (see .4)
  + Further develop non-orthogonal FDs (see .4) and provide examples (in .A.4, .A.5 and .A.6)
* View abstraction (.4, .8)
  + Enhancements to view abstraction examples and cases, including FD view, FC view, Call view, Service view, Connection view
  + Further work on rules for virtualization (e.g. what from one view can be grouped in the same link from another view)
* Mapping to other models (.TM)
  + Enhancements to the mapping to OpenFlow
  + Development of mappings to IETF models (e.g. TEAS)
  + Mapping to TOSCA
  + Aim for convergence of industry models
* Temporal properties (new .n and .A.n document)
  + Determining how to inject temporal aspects into the model process
  + Temporal expression model
* Stating rules and constraints (various including .2, .4)
  + Method for statement of inter-attribute and inter-association rules
  + See also subsections below
* Model restructuring (.1 and new .A.n)
  + Decoupling for improved modularity and independent working (new .A.n)
  + Model federation (new .A.n)
  + Model patterns (new .A.n)
* Model backward compatibility (new .W.2)
  + “W” series are white papers. .W.1 will be an introduction document
  + Develop from material originally targeted for a white paper
  + Semantic compatibility
* Event driven solution investigation
  + Improve documentation on streaming in .8
* Compute model (.15, .16, A.14)
  + CPU storage
  + Instance data store
* Identity model investigation (.3)
  + Investigate the identify model (Global class & Local class). Instead of inheriting from Global or Local class, the tool will generate the necessary identifier attributes from the Global and Local classes and add to the entity classes at design/compile/run time.
* Application (L4 and above) examples (A.12)
* Security Audit
* Location examples (A.16)
* Power model
* Controller zero-trust hardening (A.15)
* Catalog Inventory storage application
* Minor enhancements
  + Rename the LayerProtocol class
* Documentation
  + Ongoing improvements
* Tooling (not in TR-512)
  + Enhancement to UML YANG to cover specification models
  + Enhancements to pruning and refactoring process and tooling

## Some detailed notes on future work

### Model structure rules

Some of the associations in the model are interrelated by some pattern. The following figure explores ways of expressing the patterns and interrelationships.

Diagram, schematic

Description automatically generated

CoreModel diagram: HighLevelSkeltonOverviewWithLoopsHighlighted-Altenative1

Figure 6-2 Association interrelationship rules

Diagram

Description automatically generatedFigure 6-2 Highlighting loops and spirals – FC, FcPort and FcSwitch example

Diagram

Description automatically generated

Figure 6-2 Highlighting loops and spirals – FD/Link example

### Lifecycle dependency

The approach uses a stereotype to identify degree of dependency. In the model below reporting the FC without its FcPorts is not useful.

Diagram

Description automatically generated

Figure 6-2 Highlighting lifecycle dependency

More complex cases where lifecycle is dependent upon at least one of a particular set of classes existing is more challenging.

### Multiplicity restrictions

Many multiplicity ranges have subtle case based restrictions that are not reflected in the model. The following figure provides a view of a simple approach to recording multiplicity restrictions.

CoreModel diagram: MultiplicityRuleExampes

Figure 6-2 Multiplicity rule example

**End of Document**

</gendoc><drop/>

To take latest template: <drop/>

* delete text from “Template version…” to end of file <drop/>
* insert a line in “Normal” style<drop/>
* insert text (Insert 🡪 Object 🡪 Text from File… (alt njf)) from: <drop/>
  + TR-512.GT\_OnfCoreIm-CommonGendocTemplate-Fragments.docx <drop/>

Template version 0.0.10 17 September 2017 <drop/>

# Fragment: Insert class <drop/>

<fragment name=’insertClass’ importedBundles=’commons;gmf;papyrus’><drop/>  
<arg name=’cl’ type=’uml::Class’/><drop/>  
<arg name=’className’ type=’String’/><drop/>  
<arg name=’packageName’ type=’String’/><drop/>  
[if (not cl.qualifiedName.contains(packageName))]<drop/>  
[else] <drop/>  
[if(cl.name.contains(className))]<drop/>

Qualified Name: [cl.qualifiedName/]

[for (co:Comment | cl.ownedComment)]<drop/>

<dropEmpty>[cleanAndFormat(co.\_body.clean())/]</dropEmpty>

[/for]<drop/>  
[if (cl.isAbstract)]<drop/>

This class is abstract.

[/if]<drop/>

[if (cl.oclAsType(uml::Class).general ->notEmpty())]<drop/>

Inherits properties from:

[for (gen:Class | cl.oclAsType(uml::Class).general)]<drop/>

* [gen.name/]

[/for]<drop/>

[/if]<drop/>

[for (st:Stereotype | cl.getAppliedStereotypes())]<drop/>  
[if(not st.name.contains(‘OpenModelClass’))]<drop/>

This class is [st.name/].

[else] <drop/>  
[/if]<drop/>  
[/for]<drop/>  
[else] <drop/>  
[/if]  
[/if]  
</fragment><drop/>

# Fragment: Insert standard diagram <drop/>

<fragment name=’insertStandardDiagram’ importedBundles=’commons;gmf;papyrus’><drop/>  
<arg name=’p’ type=’uml::Package’/><drop/>  
<arg name=’diagramName’ type=’String’/><drop/>  
<arg name=’diagramTitle’ type=’String’/><drop/>

[for (d:Diagram|p.getPapyrusDiagrams())]<drop/>

[if d.name.contains(diagramName)]

<drop/>

<image object='[d.getDiagram()/]' maxW='true' keepH='false' keepW = ‘false’></image>

CoreModel diagram: [d.name/]

Figure 6-2 [diagramTitle/]

[else]<drop/>

[/if]<drop/>

[/for]<drop/>  
</fragment><drop/>

# Fragment: Insert small diagram <drop/>

<fragment name=’insertSmallDiagram’ importedBundles=’commons;gmf;papyrus’><drop/>  
<arg name=’p’ type=’uml::Package’/><drop/>  
<arg name=’diagramName’ type=’String’/><drop/>  
<arg name=’diagramTitle’ type=’String’/><drop/>

[for (d:Diagram|p.getPapyrusDiagrams())]<drop/>

[if d.name.contains(diagramName)]

<drop/>

<image object='[d.getDiagram()/]' maxW='true' keepH='false' keepW = ‘false’></image>

CoreModel diagram: [d.name/]

Figure 6-2 [diagramTitle/]

[else]<drop/>

[/if]<drop/>

[/for]<drop/>  
</fragment><drop/>

# Fragment: Insert attribute row brief not Obsolete<drop/>

<fragment name=’insertAttributeRowBriefNotObsolete’ importedBundles=’commons;gmf;papyrus’><drop/>

Does not work unless we have Mature stereotype… <drop/>  
<arg name=’p’ type=’uml::Property’/><drop/>

[for (st:Stereotype | p.getAppliedStereotypes())]<drop/>

[if(not st.name.contains(‘OpenModelAttribute’))]

[if(not st.name.contains(‘Obsolete’))]

| [p.name/] | [for (st:Stereotype | p.getAppliedStereotypes())]<drop/>  [if(not st.name.contains(‘OpenModelAttribute’))] [st.name/]  [/if]<drop/>  [/for]<drop/>  Do NOT remove the previous line as word throws an error if the cell is empty <drop/> | [if p.ownedComment->notEmpty()]<drop/>  [for (c:Comment | p.ownedComment)] <drop/>  [cleanAndFormat(c.\_body.clean())/]  [/for]  [else] [if (p.name.contains (‘\_’))]See referenced class  [else]To be provided  [/if]<drop/>  [/if]<drop/>  Do NOT remove the previous line as word throws an error if the cell is empty <drop/> |
| --- | --- | --- |

[/if]<drop/>

[/if]<drop/>

[/for]<drop/>  
</fragment><drop/>

# Fragment: Insert attribute row brief <drop/>

<fragment name=’insertAttributeRowBrief’ importedBundles=’commons;gmf;papyrus’><drop/>  
<arg name=’p’ type=’uml::Property’/><drop/>

| [p.name/] | [for (st:Stereotype | p.getAppliedStereotypes())]<drop/>  [if(not st.name.contains(‘OpenModelAttribute’))] [st.name/]  [/if]<drop/>  [/for]<drop/>  Do NOT remove the previous line as word throws an error if the cell is empty <drop/> | [if p.ownedComment->notEmpty()]<drop/>  [for (c:Comment | p.ownedComment)] <drop/>  [cleanAndFormat(c.\_body.clean())/]  [/for]  [else] [if (p.name.contains (‘\_’))]See referenced class  [else]To be provided  [/if]<drop/>  [/if]<drop/>  Do NOT remove the previous line as word throws an error if the cell is empty <drop/> |
| --- | --- | --- |

</fragment><drop/>

# Fragment: Start attribute table brief <drop/>

<fragment name=’insertAttributeTableHeader’ importedBundles=’commons;gmf;papyrus’><drop/>  
<arg name=’cl’ type=’uml::Class’/><drop/>

|  |  |  |
| --- | --- | --- |
| **Attribute Name** | **Lifecycle Stereotype (empty = Mature)** | **Description** |

</fragment><drop/>

# Fragment: Insert Attribute table brief <drop/>

<fragment name=’insertAttributeTableBrief’ importedBundles=’commons;gmf;papyrus’ importedFragments='insertAttributeTableHeader;insertAttributeRowBrief’><drop/>  
<arg name=’cl’ type=’uml::Class’/><drop/>  
[if cl.ownedAttribute->notEmpty()]<drop/>

Table 1: Attributes for [cl.name/]

<table><drop/>

[cl.insertAttributeTableHeader ()/]

[for (p:Property|cl.ownedAttribute)]<drop/>

[if (not p.name.contains(‘\_’))]<drop/>

[p.insertAttributeRowBrief ()/]

[/if]<drop/>

[/for]<drop/>

[for (p:Property|cl.ownedAttribute)]<drop/>

[if (p.name.contains(‘\_’))]<drop/>

[p.insertAttributeRowBrief ()/]

[/if]<drop/>

[/for]<drop/>

</table><drop/>

[/if]<drop/>

</fragment><drop/>

# Fragment: Insert Ten Specified Attribute table brief <drop/>

<fragment name=’insertTenSpecifiedAttributeTableBrief’ importedBundles=’commons;gmf;papyrus’ importedFragments='insertAttributeTableHeader;insertAttributeRowBrief’><drop/>  
<arg name=’cl’ type=’uml::Class’/><drop/>

<arg name=’p1’ type=‘String’/><drop/>

<arg name=’p2’ type=‘String’/><drop/>  
<arg name=’p3’ type=‘String’/><drop/>  
<arg name=’p4’ type=‘String’/><drop/>  
<arg name=’p5’ type=‘String’/><drop/>  
<arg name=’p6’ type=‘String’/><drop/>  
<arg name=’p7’ type=‘String’/><drop/>  
<arg name=’p8’ type=‘String’/><drop/>  
<arg name=’p9’ type=‘String’/><drop/>  
<arg name=’p10’ type=‘String’/><drop/>  
[if cl.ownedAttribute->notEmpty()]<drop/>

Table 1: Attributes for [cl.name/]

<table><drop/>

[cl.insertAttributeTableHeader ()/]

[for (p:Property|cl.ownedAttribute)]<drop/>

[if (p.name.contains(p1) or p.name.contains(p2) or p.name.contains(p3) or p.name.contains(p4) or p.name.contains(p5) or p.name.contains(p6) or p.name.contains(p7) or p.name.contains(p8) or p.name.contains(p9) or p.name.contains(p10))]<drop/>

[if (not p.name.contains(‘\_’))]<drop/>

[p.insertAttributeRowBrief ()/]

[/if]<drop/>

[/if]<drop/>

[if (p.name.contains(p1) or p.name.contains(p2) or p.name.contains(p3) or p.name.contains(p4) or p.name.contains(p5) or p.name.contains(p6) or p.name.contains(p7) or p.name.contains(p8) or p.name.contains(p9) or p.name.contains(p10))]<drop/>

[if (p.name.contains(‘\_’))]<drop/>

[p.insertAttributeRowBrief ()/]

[/if]<drop/>

[/if]<drop/>

[/for]<drop/>

</table><drop/>

[/if]<drop/>

</fragment><drop/>

# Fragment: Insert DataType <drop/>

<fragment name=’insertDataType’ importedBundles=’commons;gmf;papyrus’><drop/>  
<arg name=’dt’ type=’uml::DataType’/><drop/>  
<arg name=’dataTypeName’ type=’String’/><drop/>  
<arg name=’packageName’ type=’String’/><drop/>  
[if (dt.qualifiedName.contains(packageName))]<drop/>  
[if(dt.name.contains(dataTypeName))]<drop/>

Qualified Name: [dt.qualifiedName/]

[for (co:Comment | dt.ownedComment)]<drop/>

<dropEmpty>[cleanAndFormat(co.\_body.clean())/]</dropEmpty>

[/for]<drop/>  
[if (dt.oclAsType(uml::DataType).general ->notEmpty())]<drop/>

Inherits properties from:

[for (tp:DataType | dt.oclAsType(uml::DataType).general)]<drop/>

* [tp.name/]

[/for]<drop/>

[for (gen:Class | dt.oclAsType(uml::DataType).general)]<drop/>

* [gen.name/]

[/for]<drop/>

[/if]<drop/>

[for (st:Stereotype | dt.getAppliedStereotypes())]<drop/>  
This class is [st.name/].

[/for]<drop/>  
[else] <drop/>  
[/if]  
[/if]  
</fragment><drop/>

# Fragment: Start Data Type attribute table brief <drop/>

<fragment name=’insertDataTypeAttributeTableHeader’ importedBundles=’commons;gmf;papyrus’><drop/>  
<arg name=’dt’ type=’uml::DataType’/><drop/>

|  |  |  |
| --- | --- | --- |
| **Attribute Name** | **Lifecycle Stereotype (empty = Mature)** | **Description** |

</fragment><drop/>

# Fragment: Insert Data Type Attribute table brief <drop/>

<fragment name=’insertDataTypeAttributeTableBrief’ importedBundles=’commons;gmf;papyrus’ importedFragments='insertDataTypeAttributeTableHeader;insertAttributeRowBrief’><drop/>  
<arg name=’dt’ type=’uml::DataType’/><drop/>  
[if dt.ownedAttribute->notEmpty()]<drop/>

Table 1: Attributes for [dt.name/]

<table><drop/>

[dt.insertDataTypeAttributeTableHeader ()/]

[for (p:Property|dt.ownedAttribute)]<drop/>

[p.insertAttributeRowBrief ()/]

[/for]<drop/>

</table><drop/>

[/if]<drop/>

</fragment><drop/>

# Fragment: Insert enums <drop/>

<fragment name=’insertEnums’ importedBundles=’commons;gmf;papyrus’><drop/>  
<arg name=’dt’ type=’uml::DataType’/><drop/>

#### [dt.name/]

Qualified Name: [dt.qualifiedName/]

[for (co:Comment | dt.ownedComment)]<drop/>

<dropEmpty>[cleanAndFormat(co.\_body.clean())/]</dropEmpty>

[/for]<drop/>

Applied stereotypes:

[if dt.getAppliedStereotypes()->notEmpty()] <drop/>

[for (st:Stereotype | dt.getAppliedStereotypes())]<drop/>

* [st.name/]

[/for]<drop/>

[else] No stereotypes applied

[/if]<drop/>

[if (dt.oclAsType(uml::DataType).general ->notEmpty())]<drop/>

Inherits literals from:

[for (tp:DataType | dt.oclAsType(uml::DataType).general)]<drop/>

* [tp.name/]

[/for]

[/if]<drop/>

[if (dt.oclAsType(Enumeration).ownedLiteral->notEmpty())]<drop/>

Contains Enumeration Literals:

[for (e:EnumerationLiteral|dt.oclAsType(Enumeration).ownedLiteral)]<drop/>

* [e.name/]:
  + [for (co:Comment | e.ownedComment)]<drop/>
  + <dropEmpty>[cleanAndFormat(co.\_body.clean())/]
  + </dropEmpty>[/for]<drop/>
  + [if dt.getAppliedStereotypes()->notEmpty()] <drop/>
  + Applied stereotypes:
    - [for (st:Stereotype | e.getAppliedStereotypes())]<drop/>
    - [st.name/]
    - [/for]<drop/>
  + [/if]<drop/>

[/for]<drop/>

[/if]<drop/>

</fragment><drop/>