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Core Information Model (CoreModel)

TR-512.DD

Data Dictionary

Version 1.4

November 2018

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**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.

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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-512.8 in Version 1.2. {{Published via wiki only}} |
| 1.3.1 | January 2018 | Addition of text related to approval status. |
| 1.4 | November 2018 | Aligned with 1.4 model content. |

# Introduction

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](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\TR-512.1_OnfCoreIm-Overview.pdf).

## References

For a full list of references see [TR-512.1](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\TR-512.1_OnfCoreIm-Overview.pdf).

## Definitions

For a full list of definition see [TR-512.1](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\TR-512.1_OnfCoreIm-Overview.pdf).

## Conventions

See [TR-512.1](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\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](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\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.

# Data Dictionary

The data dictionary provides details of all classes, attributes and types in the model. The data dictionary is divided up into sections based upon the division of the CoreModel and maturity of work.

* Section 2.1 Core Network Model: includes Forwarding, Termination, Topology and Resilience (see [TR-512.2](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\ModelDescriptions\TR-512.2_OnfCoreIm-ForwardingAndTermination.pdf), [TR-512.4](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\ModelDescriptions\TR-512.4_OnfCoreIm-Topology.pdf) and [TR-512.5](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\ModelDescriptions\TR-512.5_OnfCoreIm-Resilience.pdf))
* Section 2.2 Core Foundation Model: includes naming, identification and states (see [TR-512.3](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\ModelDescriptions\TR-512.3_OnfCoreIm-Foundation.pdf))
* Section 2.3 Core Physical Model: includes including Equipment and Connector (see [TR-512.6](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\ModelDescriptions\TR-512.6_OnfCoreIm-Physical.pdf))
* Section 2.4 Core Specification Model: covers specification (see [TR-512.7](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\ModelDescriptions\TR-512.7_OnfCoreIm-Specification.pdf))
* Section 2.5 General Processing Model: covers the generalized representation of processing capability (see [TR-512.11](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\ModelDescriptions\TR-512.11_OnfCoreIm-ProcessingConstruct.pdf))
* Section 2.6 General Control Model: covers the generalized representation of control functionality (see [TR-512.8](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\ModelDescriptions\TR-512.8_OnfCoreIm-Control.pdf))
* Section 2.7 Core Operations Model: covers the generalized, outcome oriented, operations pattern (see [TR-512.10](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\ModelDescriptions\TR-512.10_OnfCoreIm-OperationPatterns.pdf))
* Section 2.8 Core Software Model data dictionary: covers the software model (see [TR-512.12](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\ModelDescriptions\TR-512.12_OnfCoreIm-Software.pdf))
* Section 2.9 Model Patterns data dictionary (see [TR-512.A.2](file:///C:\Users\ndavis\git\ONFInfoModel\OnfModel\CoreGendoc\ModelDescriptions\TR-512.A.2_OnfCoreIm-Appendix-ModelStructurePatternsAndArchitecture.pdf))

## Core Network Model data dictionary

This section provides the model details for Forwarding, Termination, Topology and Protection.

### Classes

[for (cl:Class | Class.allInstances()->sortedBy(name))]<drop/>

[if (cl.qualifiedName.contains(’CoreNetworkModel’))]<drop/>

[if (not cl.qualifiedName.contains(’SdnController’))]<drop/>

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[/if]<drop/>

[/if]<drop/>

[/if]<drop/>

[/if]<drop/>

[/for]<drop/>

### Data Types

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### Enumeration Types

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### Primitive Types

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[else] [/if]<drop/>

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## Core Foundation Model data dictionary

This section provides the model details for the foundation.

### Classes

[for (cl:Class | Class.allInstances()->sortedBy(name))]<drop/>

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### Primitive Types

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[else] <drop/>

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[/if]<drop/>

[else] [/if]<drop/>

[/for]<drop/>

## Core Physical Model data dictionary

This section provides the details for the model of physical things including equipment and connectors.

### Classes

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### Data Types

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### Enumeration Types

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### Primitive Types

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[if (dt.qualifiedName.contains(‘CorePhysicalModel’))]<drop/>

[dt.insertPrimitiveTypesDd()/]

[/if]<drop/>

[else] [/if]<drop/>

[/for]<drop/>

## Core Specification Model data dictionary

This section provides the details for the model of Specification.

### Classes

[for (cl:Class | Class.allInstances()->sortedBy(name))]<drop/>

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### Primitive Types

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[/if]<drop/>

[else] [/if]<drop/>

[/for]<drop/>

## General Processing Model data dictionary

This section provides the model details for generalized model of processing.

### Classes

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[if (cl.qualifiedName.contains(’ProcessingConstructModel’))]<drop/>

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### Data Types

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### Enumeration Types

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### Primitive Types

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[if (dt.qualifiedName.contains(‘ProcessingConstructModel’))]<drop/>

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[/if]<drop/>

[else] [/if]<drop/>

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## General Control Model data dictionary

This section provides the model details for Control model (other than specific control classes used in modeling of resilience).

### Classes

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[if (cl.qualifiedName.contains(’GeneralControllerModel’))]<drop/>

[if (not cl.qualifiedName.contains(’Explanatory’))]<drop/>

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[/for]<drop/>

### Data Types

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### Enumeration Types

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### Primitive Types

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[if (dt.qualifiedName.contains(‘GeneralControllerModel’))]<drop/>

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[/if]<drop/>

[else] [/if]<drop/>

[/for]<drop/>

## Core Interactions Model data dictionary

This section provides the model details for Interactions model supporting the generalized operations pattern, notification patterns, etc..

### Classes

[for (cl:Class | Class.allInstances()->sortedBy(name))]<drop/>

[if (cl.qualifiedName.contains(’CoreOperationsModel’))]<drop/>

[if (not cl.qualifiedName.contains(’Example’))]<drop/>

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### Data Types

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[/if]<drop/>

[/if]<drop/>

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### Enumeration Types

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[if (not dt.qualifiedName.contains(’Example’))]<drop/>

[dt.insertEnumsDd()/]

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[/if]<drop/>

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### Primitive Types

[for (dt:DataType | DataType.allInstances()->sortedBy(name))]<drop/>

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[if (dt.qualifiedName.contains(‘CoreOperationsModel’))]<drop/>

[dt.insertPrimitiveTypesDd()/]

[/if]<drop/>

[else] [/if]<drop/>

[/for]<drop/>

## Core Software Model data dictionary

This section provides the model details for Software model supporting modeling of file systems, running software, software containers and virtual machines.

### Classes

[for (cl:Class | Class.allInstances()->sortedBy(name))]<drop/>

[if (cl.qualifiedName.contains(’CoreSoftwareModel’))]<drop/>

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### Data Types

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### Enumeration Types

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[else] [/if]<drop/>

[/for]<drop/>

### Primitive Types

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[if (dt.qualifiedName.contains(‘CoreSoftwareModel’))]<drop/>

[dt.insertPrimitiveTypesDd()/]

[/if]<drop/>

[else] [/if]<drop/>

[/for]<drop/>

## Model Patterns data dictionary

This section provides a view of the Classes related to the patterns that underpin the model. These classes are experimental and are provided for rough guidance only.

### Component-System pattern

This section provides the classes for the Component-System pattern.

#### Classes for Management/Control modeling

[for (cl:Class | Class.allInstances()->sortedBy(name))]<drop/>

[if (cl.qualifiedName.contains(’ComponentSystemPattern’))]<drop/>

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[/if]<drop/>

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* insert a line in “Normal” style<drop/>
* insert text (Insert 🡪 Object 🡪 Text from File… (alt njf)) from: <drop/>
  + TR-512.GT\_OnfCoreIm-CommonGendocTemplate-FragmentsDD.docx <drop/>
* Validate the DD pages are in Landscape, if not then correct to landscape. <drop/>

Template version 0.0.10 17 September 2017 <drop/>

# Fragment: Insert classes (DD only) <drop/>

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

#### [cl.name/]

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/>

Applied stereotypes:

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

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

* [st.name/]

[for (oa:Property|st.ownedAttribute)]<drop/>

* + [if (not oa.name.contains('base'))][oa.name/]: [if (not cl.getValue(st, oa.name).oclIsUndefined())][if oa.name.contains('condition')][cl.getValue(st, oa.name).oclAsType(String)/] [else][cl.getValue(st, oa.name).oclAsType(EnumerationLiteral).name/][/if][else]<drop/>[/if]

[/if] <drop/>

[/for]<drop/>

[/for]<drop/>

[else] No stereotypes applied

[/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/>

[if cl.ownedAttribute->notEmpty()]<drop/>

<drop/>

Table 1: Attributes for [cl.name/]

<table><drop/>

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |

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

| [p.name/]  [if(not p.qualifiedName.contains(cl.name))]Inherited[/if] | [if p.type.name->notEmpty()]<drop/>  [p.type.name/]  [else]<drop/>  To be defined  [/if]<drop/>  Do NOT remove the previous line as word throws an error if the cell is empty (note that in this case the else is not working).<drop/> | [if(p.lower=p.upper)]1[else][p.lower/]..[if(p.upper=-1)]\*[else][p.upper/][/if][/if] | [if(not(p.isReadOnly))]RW[else]R[/if] | [for (st:Stereotype | p.getAppliedStereotypes())]<drop/>  [st.name/]  [for(oa:Property|st.ownedAttribute)]<drop/>   * [if oa.name.contains('attribute')]AVC: [p.getValue(st, oa.name).oclAsType(EnumerationLiteral).name/]   [else]<drop/>   * [if oa.name.contains('invariant')]isInvariant: [p.getValue(st, oa.name).oclAsType(Boolean)/]   [else]<drop/>   * [if oa.name.contains('value')]valueRange: [if (not p.getValue(st, oa.name).oclIsUndefined())][p.getValue(st, oa.name).oclAsType(String)/][else]no range constraint[/if]   [else]<drop/>   * [if oa.name.contains('support')]support: [p.getValue(st, oa.name).oclAsType(EnumerationLiteral).name/]   [else]<drop/>   * [if oa.name.contains('condition')][if (not p.getValue(st, oa.name).oclIsUndefined())]condition: [p.getValue(st, oa.name).oclAsType(String)/][else] <drop/> [/if]   [else]<drop/>  [/if]<drop/>  [/if]<drop/>  [/if]<drop/>  [/if]<drop/>  [/if]<drop/>  [/for]<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/> |
| --- | --- | --- | --- | --- | --- |

[/for]<drop/>

</table><drop/>

[else][/if]<drop/>

</fragment><drop/>

# Fragment: Insert data types (DD only) <drop/>

<fragment name=’insertDataTypesDd’ 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 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/>

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

<drop/>

Table 1: Attributes for [dt.name/]

<table><drop/>

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |

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

| [p.name/] | [if p.type.name->notEmpty()]<drop/>  [p.type.name/]  [else]<drop/>  To be defined  [/if]<drop/>  Do NOT remove the previous line as word throws an error if the cell is empty (note that in this case the else is not working).<drop/> | [if(p.lower=p.upper)]1[else][p.lower/]..[if(p.upper=-1)]\*[else][p.upper/][/if][/if] | [if(not(p.isReadOnly))]RW[else]R[/if] | [for (st:Stereotype | p.getAppliedStereotypes())]<drop/>  [st.name/]  [for(oa:Property|st.ownedAttribute)]<drop/>   * [if oa.name.contains('attribute')]AVC: [p.getValue(st, oa.name).oclAsType(EnumerationLiteral).name/]   [else]<drop/>   * [if oa.name.contains('invariant')]isInvariant: [p.getValue(st, oa.name).oclAsType(Boolean)/]   [else]<drop/>   * [if oa.name.contains('value')]valueRange: [if (not p.getValue(st, oa.name).oclIsUndefined())][p.getValue(st, oa.name).oclAsType(String)/][else]no range constraint[/if]   [else]<drop/>   * [if oa.name.contains('support')]support: [p.getValue(st, oa.name).oclAsType(EnumerationLiteral).name/]   [else]<drop/>   * [if oa.name.contains('condition')][if (not p.getValue(st, oa.name).oclIsUndefined())]condition: [p.getValue(st, oa.name).oclAsType(String)/][else] <drop/> [/if]   [else]<drop/>  [/if]<drop/>  [/if]<drop/>  [/if]<drop/>  [/if]<drop/>  [/if]<drop/>  [/for]<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/> |
| --- | --- | --- | --- | --- | --- |

[/for]<drop/>

</table><drop/>

[else][/if]<drop/>

</fragment><drop/>

# Fragment: Insert enums (DD only) <drop/>

<fragment name=’insertEnumsDd’ 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/>

# Fragment: Insert primitive types (DD only) <drop/>

<fragment name=’insertPrimitiveTypesDd’ 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/>

</fragment><drop/>