



# Core Information Model (CoreModel)

TR-512.10

## Further Enhancements

Version 1.2  
September 20, 2016



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Open Networking Foundation  
2275 E. Bayshore Road, Suite 103, Palo Alto, CA 94303  
[www.opennetworking.org](http://www.opennetworking.org)

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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 Introduction

This document is an addendum to the TR-512\_v1.2 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 ONF Core IM - Overview](#).

## 1.1 References

For a full list of references see [TR-512.1](#).

## 1.2 Definitions

For a full list of definition see [TR-512.1](#).

## 1.3 Conventions

See [TR-512.1](#) for an explanation of:

- UML conventions
- Lifecycle Stereotypes
- Diagram symbol set

## 1.4 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).

## 1.5 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](#) 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.

# 2 Introduction to the Further Enhancements

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

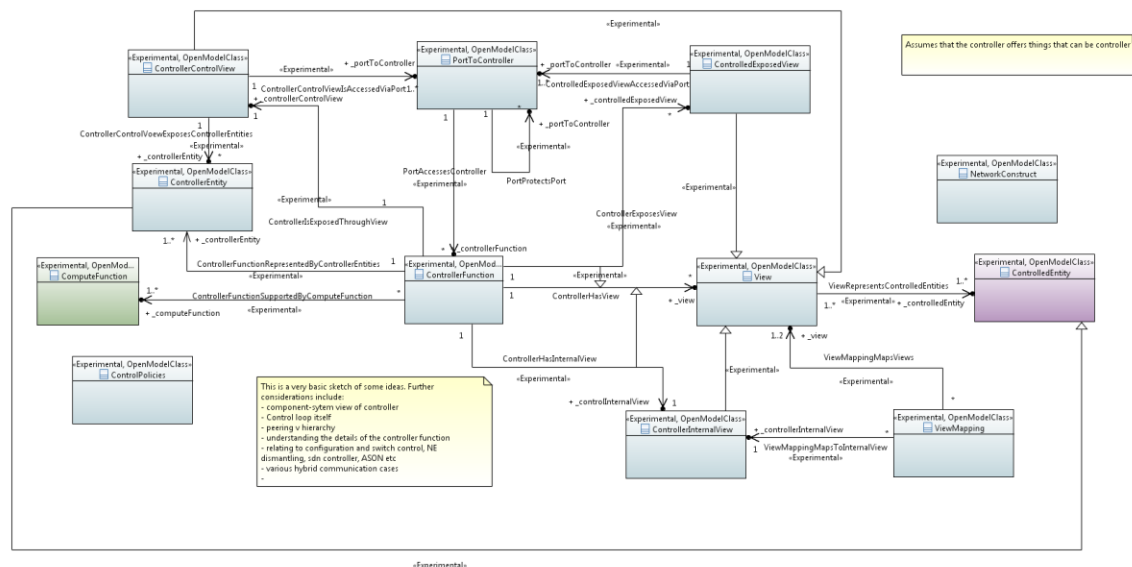
A data dictionary that sets out the details of all classes, data types and attributes is also provided ([TR-512.8](#)).

## 3 Summary of some further enhancements

### 3.1 Controller model

Work is underway to develop a model of management-control that replaces the SdnController, NetworkControlDomain and the NetworkElement with a unified model of control that also includes the ConfigurationAndSwitchController discussed in [TR-512.5 ONF Core IM - Resilience](#).

Initial work led to the figure below.

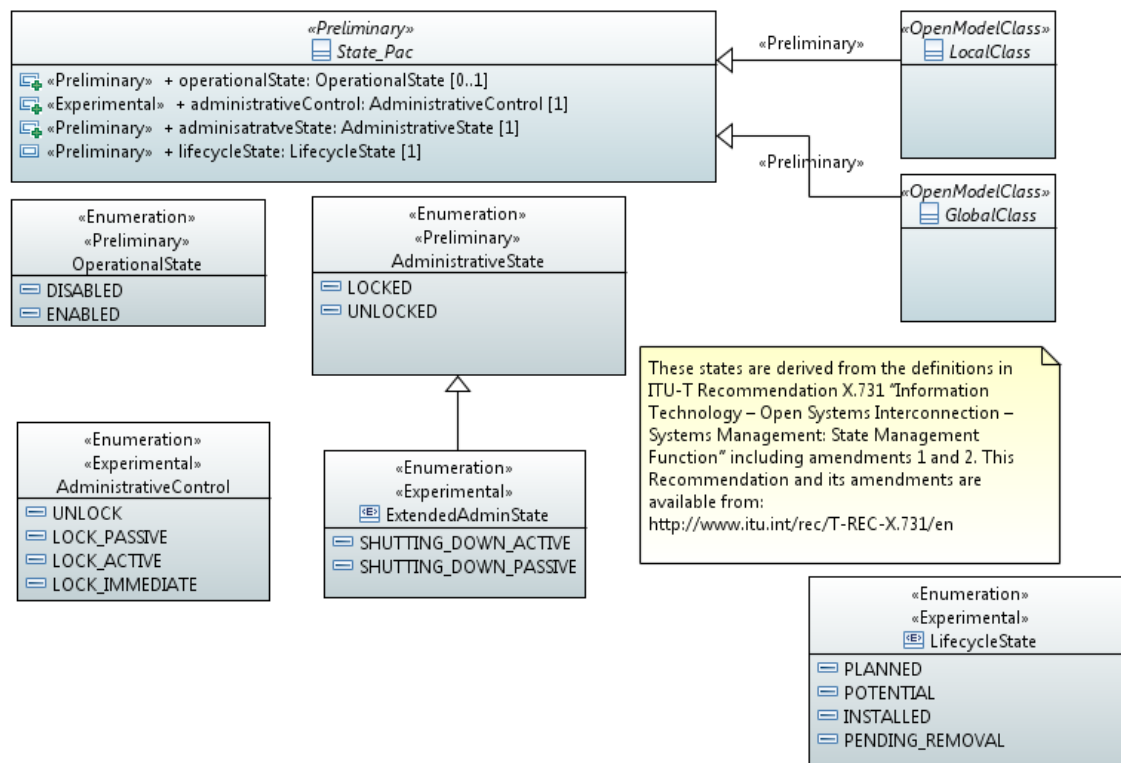


CoreModel diagram: ControllerModel

Figure 3-1 Sketch of key considerations in the modeling of the controller

### 3.2 State extensions

There are a number of experimental items in the state model as shown below. These are included in the main data dictionary.

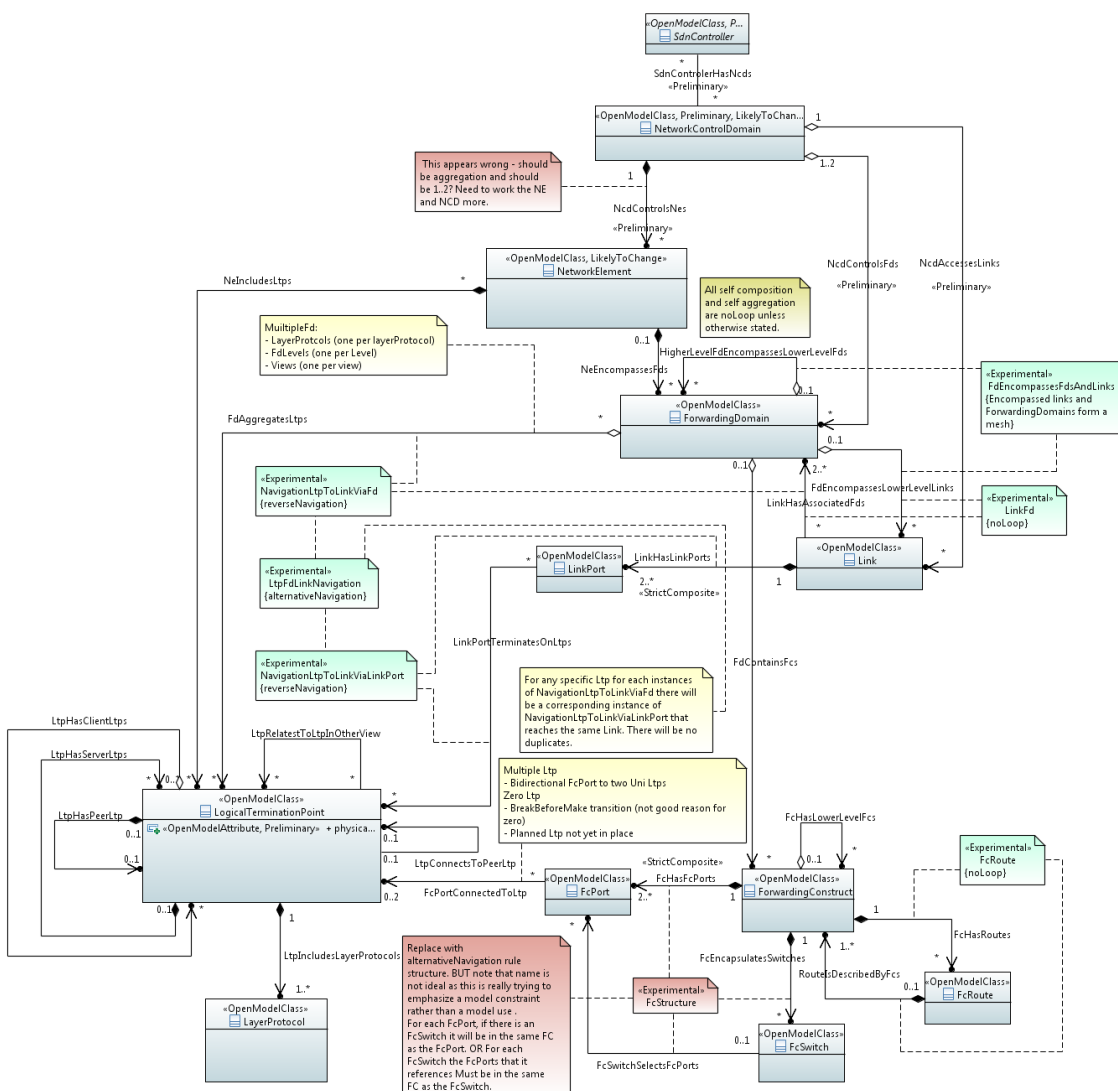


CoreModel diagram: EnhancedStates

Figure 3-2 State model with enhancements

### 3.3 Model structure rules

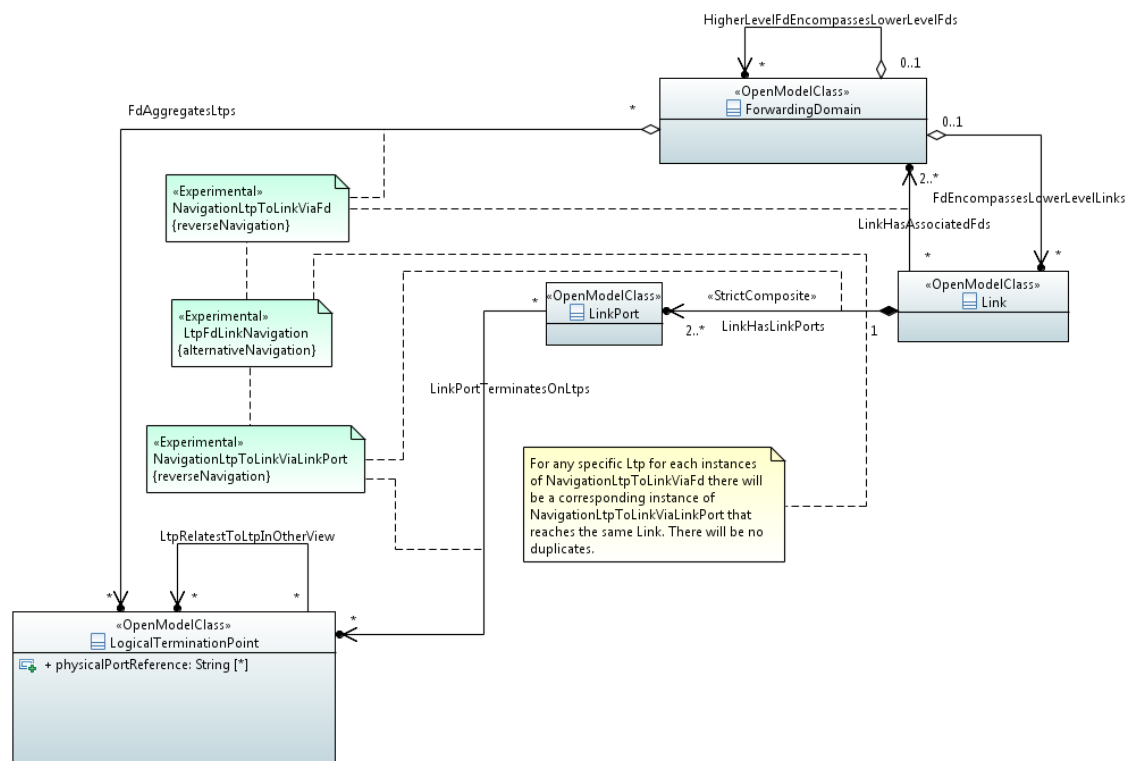
Some of the associations in the model are interrelated by some pattern. The following figures explore ways of expressing the patterns and interrelationships.



CoreModel diagram: HighLevelSkeltonOverviewWithLoopsHighlighted-Alternative1

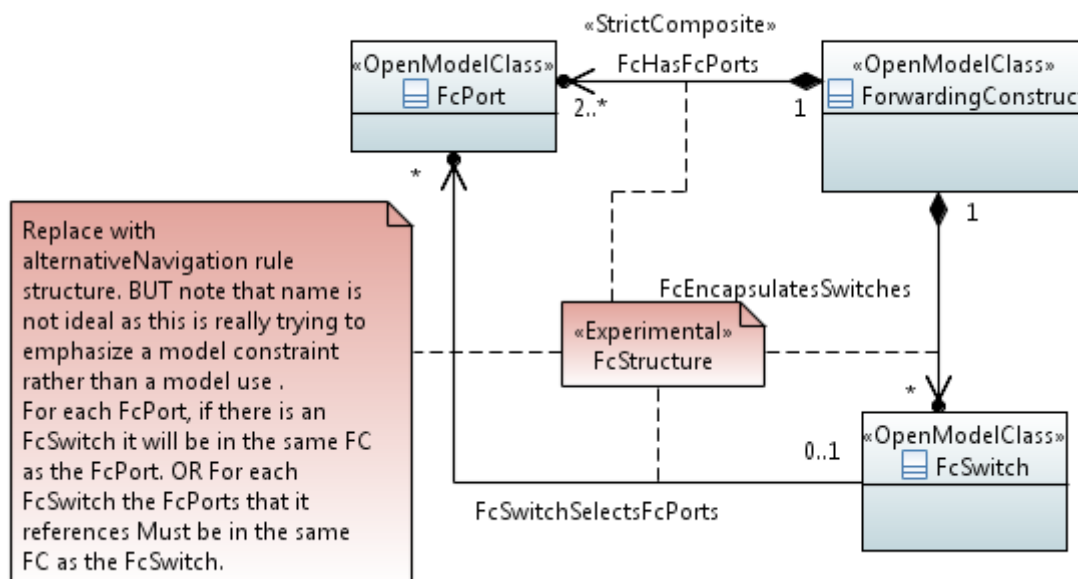
Figure 3-3 Association interrelationship rules alternative 1





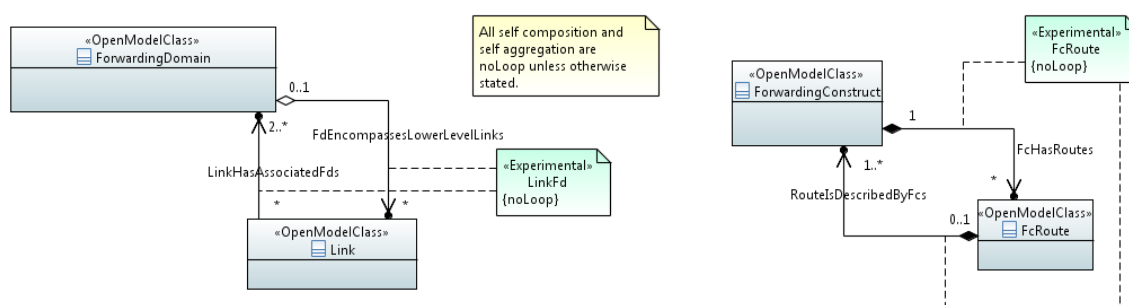
CoreModel diagram: AlternativeNavigationRuleExample-LinkFdLtp

Figure 3-4 Highlighting loops and spirals



CoreModel diagram: AlternativeNavigationRuleExample-FcPort

Figure 3-5 Highlighting loops and spirals



CoreModel diagram: NoLoopRuleExample-FdLinkAndFcFcRoute

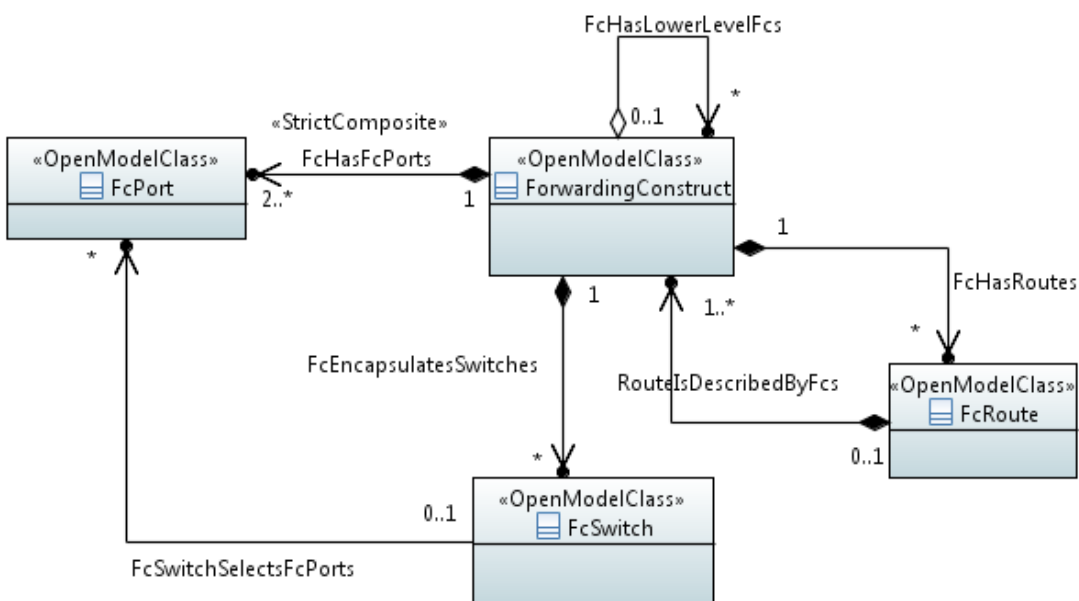
Figure 3-6 No Loops Rule

### 3.4 Strict Composition

Although the concept is now relatively stable there are some potential enhancements. The Strict Composite form is shown below.

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

A route has a life bounded by that of the containing FC as does an FcPort

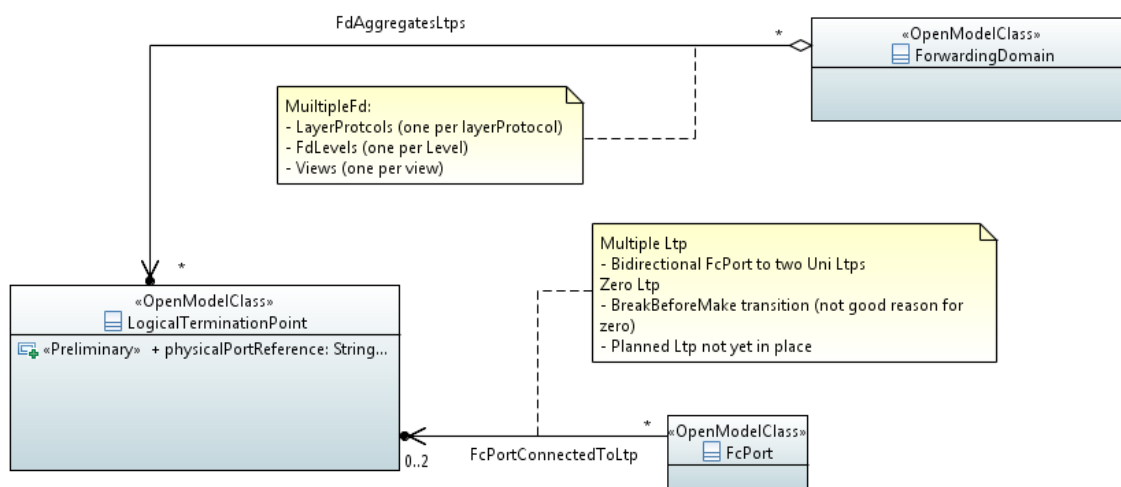


CoreModel diagram: StrictCompositionFcDetailExample

**Figure 3-7 Strict Composite**

### 3.5 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: MultiplicityRuleExamples

**Figure 3-8 Multiplicity rule example**

**End of Document**