Welcome to the World of Standards

ETSI World Class Standards

NFV(16)000364r1
For information

ETSI ISG NFV – MSDO IM WORKSHOP

8-9 Dec. 2016

ETSI ISG NFV

Outline

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  - Key milestones and overview of IM specifications
  - Transition from Release 1 to Release 2
  - Information Modelling: from Release 1 to Release 2, and Stage 3 DM specifications
  - Release 2 IFA specs vs. MAN001 example: VNF Descriptor (VNFD) differences

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  - Principles of Domain Driven Design
  - What to do and not to do
  - Status after Louisville workshop
  - ETSI ISG NFV work
  - Proposed touchpoints
  - Further directions
  - Deriving data model from federated model

PART 1: ETSI ISG NFV OVERVIEW

Joan Triay, Diego López, Bruno Chatras

Key milestones and overview of IM specifications

Jan'13
- ETSI NFV ISG created

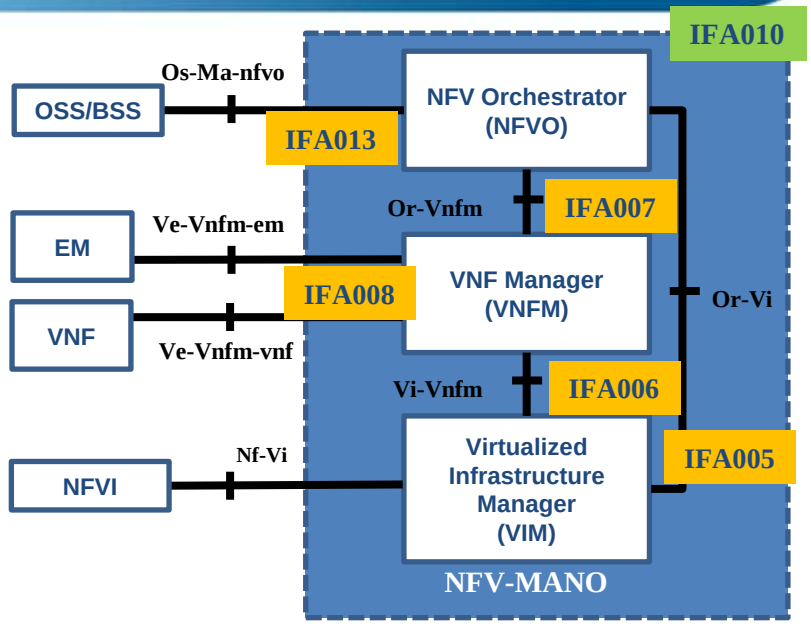
Dec'13
- ETSI NFV Architectural Framework v1.1.1 published

Nov'14
- Release 1 specifications completed
- Release 2 Work Program started

Jan'15
- Release 1 spec. published

Apr'16
- First set of Release 2 spec. published: IFA002, IFA003, IFA004, IFA005, IFA006, and IFA010 v2.1.1
- Release 3 Work Program started

Sept'16
- Remaining Release 2 requirements, interfaces and information model (Stage 2) specifications completed: IFA007, IFA008, IFA010 v2.2.1, IFA011, IFA013, IFA014, IFA015 (*)
- Release 2 protocol and data models (Stage 3) work items underway



Acceleration	IFA002 IFA003 IFA004
Functional Requirements	IFA010
VNF Package and VNFD	IFA011
Network Service Template	IFA014
NFV Information Model Report	IFA015

Plus many other specifications addressing **Security, Reliability, Use Cases and other Features**

(*) IFA015 completed in Nov'16

Transition from Release 1 to Release 2

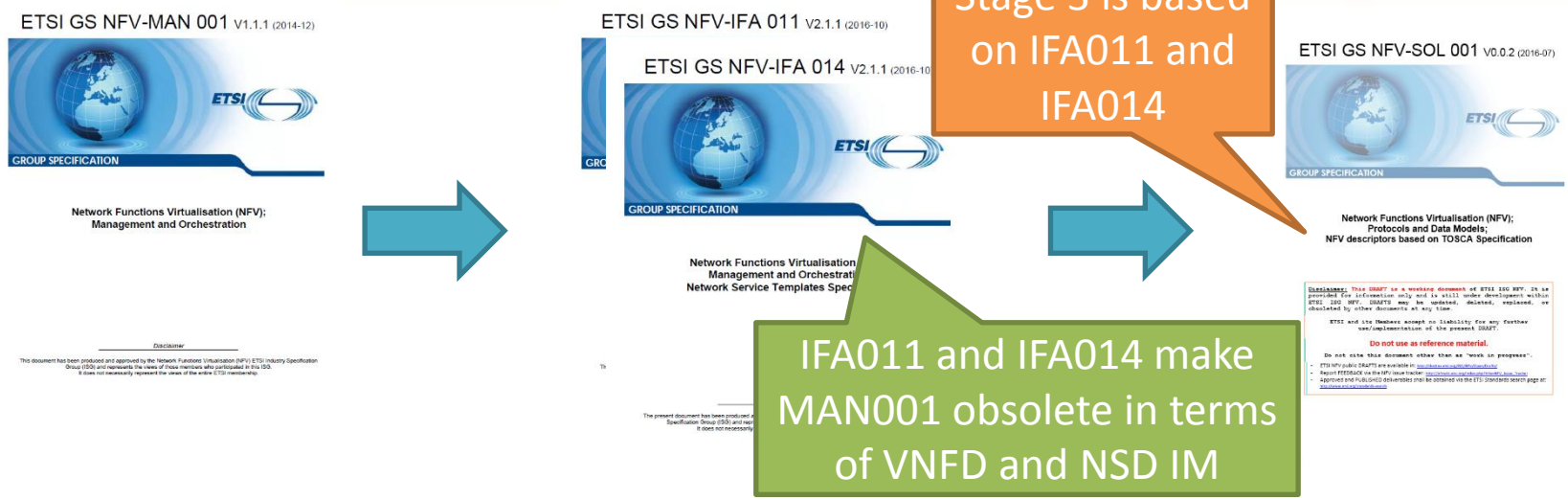
Release 1

- Focused on analyzing the feasibility of NFV.
- Delivered the baseline studies and specifications.
- Set the NFV Architectural Framework covering:
  - Infrastructure,
  - Virtualized network functions (VNF),
  - Integration of the VNFs into Network Services (NS), and
  - NFV Management and Orchestration (NFV-MANO) aspects at different layers.

Release 2

- Focuses on interoperability of NFV solutions.
- Details requirements and specification of interfaces and descriptors.
- Realizes the interoperability of solutions based on the NFV Architectural Framework, detailing
  - Certain infrastructure aspects (e.g., acceleration),
  - Description of VNF,
  - Description of NS, and
  - Internal and external NFV-MANO interfaces.

IM from Release 1 to Release 2, and Stage 3 DM specifications



MAN001

- Strawman of information elements to describe VNF and NS

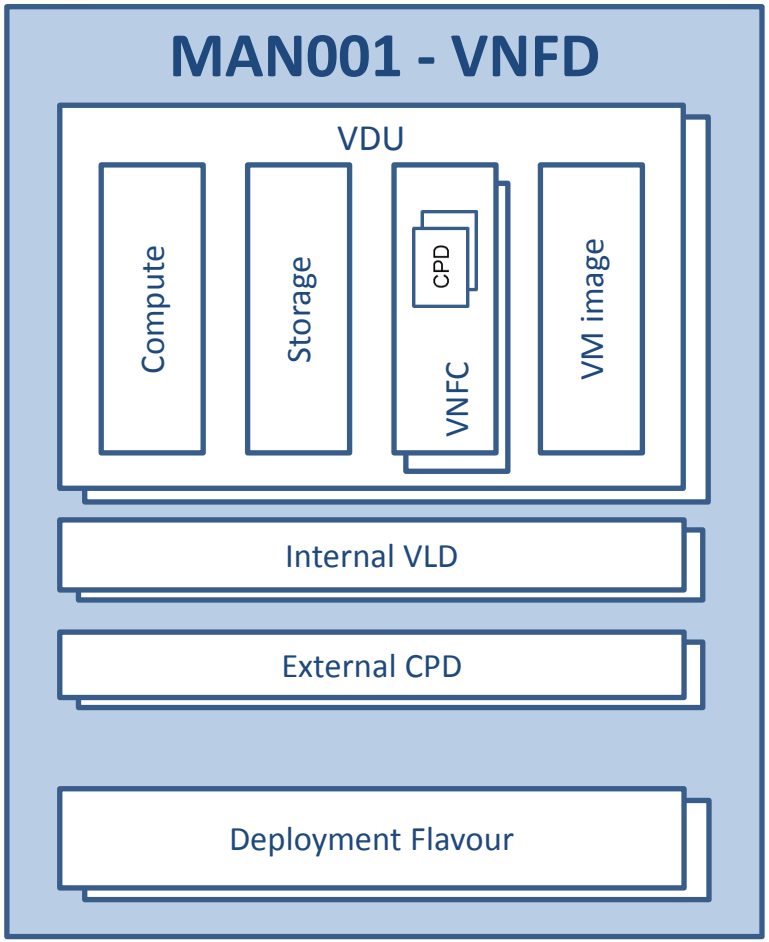
IFA011 **IFA014** **IFA015**

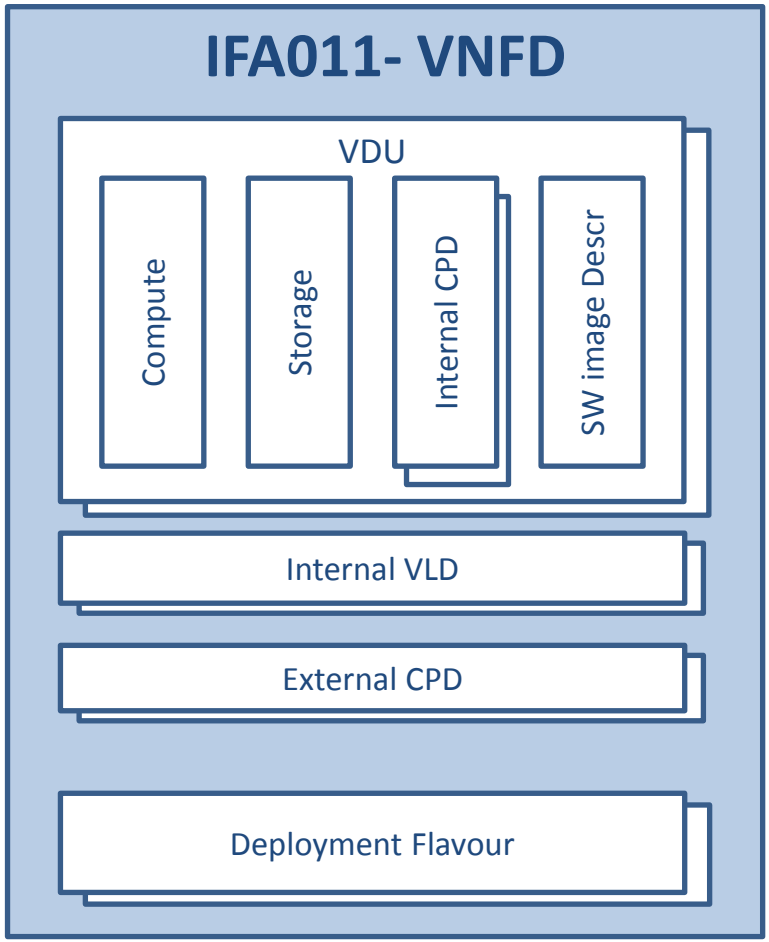
- Formalizes the requirements and the information modeling of VNF and NS descriptors, and interfaces IM

SOL001

- Data models for VNF and NS descriptors.
- SOL001 is based on TOSCA
- Others under discussion

Release 2 IFA specs vs. MAN001 example: VNF Descriptor (VNFD) differences





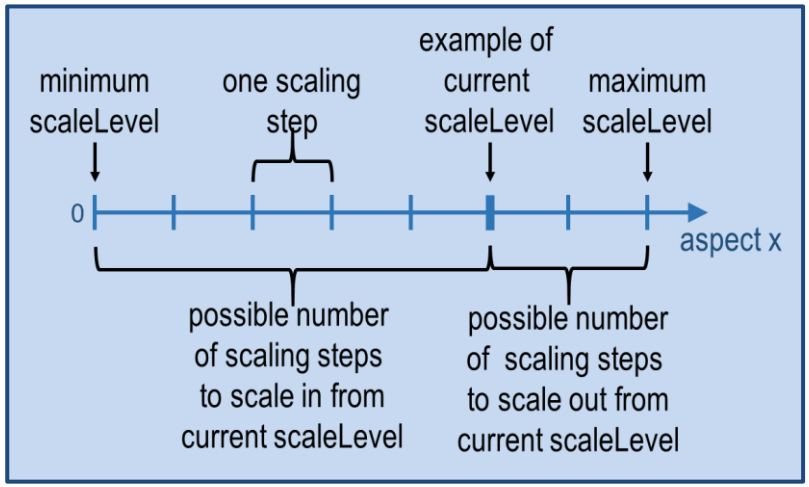
- Similar high level structure but … many differences inside.

Release 2 IFA specs vs. MAN001 example: VNF Descriptor (VNFD) differences – Flavours, Profiles and Levels

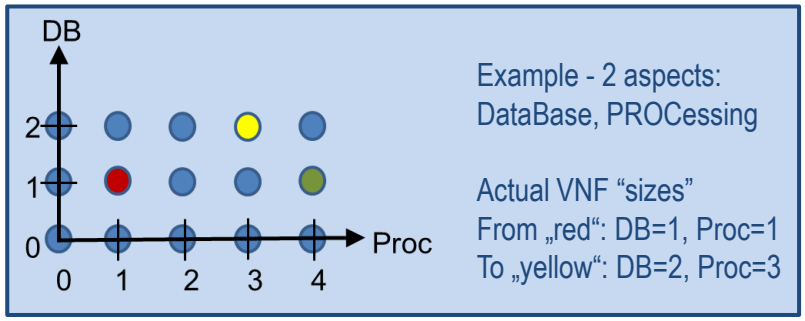
Topic		MAN001	IFA011
Flavour(s)	VNF Deployment Flavour	• List of constituent VDUs.	• Selects profiles for each constituent VDU & VLD. • Defines support for specific monitoring parameters, scaling aspects, VNF LCM operations, etc. specific to a VNF deployment flavour.
	VL Flavour	• Not defined (assumes a single default flavour).	• Specifies bit rates and QoS.
Profile(s)		• VNF: Not defined, but the scaling parameter specifies the min & max number of instances per VDU.	• VDU profile specifies min & max boundaries for the number of instances and provides affinity/anti-affinity rules. • VL profile selects a VL Flavour within a VLD and provides affinity/anti-affinity rules.
Instantiation Level		• Not defined.	• Specifies a number of VNFC instances to be created per VDU (and for each scale aspect the corresponding scale level).

Release 2 IFA specs vs. MAN001 example: VNF Descriptor (VNFD) differences - Scaling out & in

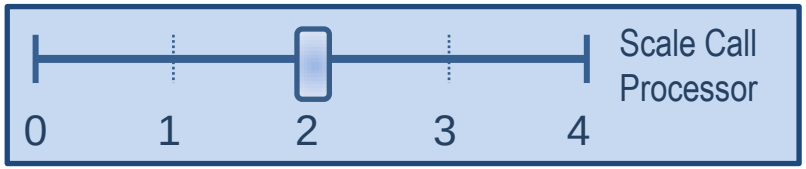
One scaling aspect with scale levels



The scaling space (all scaling aspects)



Operating experience



- MAN001: Basic support. Based on increasing/decreasing the number of instances per VDU within specified boundaries.
- IFA011: A VNF may be scaled in multiple independent aspects
  - A scaling aspect describes in an abstracted manner what "property" of the VNF to scale.
  - A scaling aspect maps to a set of VDUs and VLDs.
  - Each scale level of a scaling aspect defines a valid size of the VNF w.r.t to that aspect.
  - Scaling takes place in discrete steps, i.e., changing the size from one level to another one.
  - Operating experience: E.g. slider model.

Release 2 IFA specs vs. MAN001 example: VNF Descriptor (VNFD) differences – Other items (I)

Topic	MAN001	IFA011
Relationship between CP & VL	• External CPD references an internal VLD. • Internal VLD references a list of external or internal CPDs (with both items, circular references are created).	• External CPD references either an internal VLD or an internal CPD. • No circular reference.
Affinity/Anti-affinity rules	• Not addressed in VNFD.	• Applicable between VNFCs and between VLs. • Applicable between instances of the same object type or between instances of different object classes (affinity / anti-affinity groups). • Specified at VDU/VL profile level.

Release 2 IFA specs vs. MAN001 example: VNF Descriptor (VNFD) differences – Other items (II)

- Other IFA011 additions not supported in MAN001:
  - VNF indicators: The VNF provider can declare a set of VNF-specific indicators whose values can serve as criteria to trigger auto-scaling and/or life-cycle management scripts.
  - VNF configurable properties and modifiable attributes.
  - Many more identifiers in IFA011 than in MAN001.

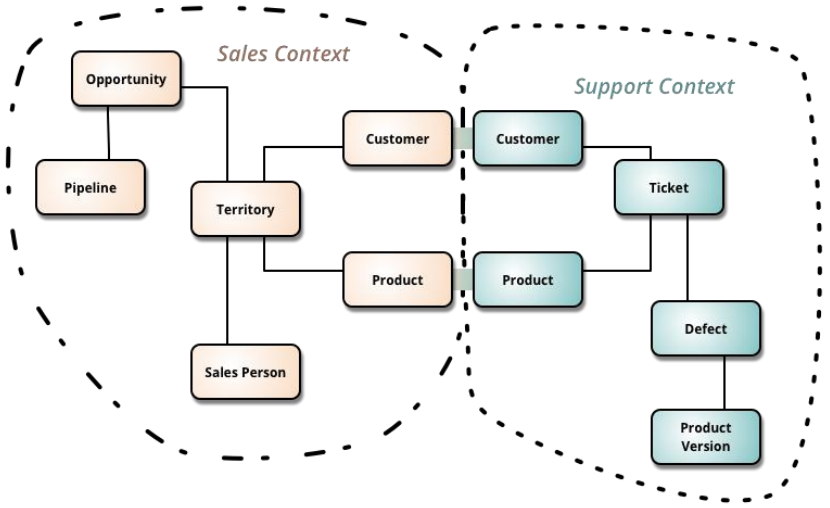
vnfdId	Identifier of the VNFD and the associated VNF Package. This attribute shall be globally unique. It is also used in interfaces.
vnfProvider	Provider of the VNF and of the VNFD.
vnfProductName	Name to identify the VNF Product. Invariant for the VNF Product lifetime.
vnfSoftwareVersion	Software version of the VNF. This is changed when there is any change to the software that is included in the VNF Package.
vnfdVersion	Identifies the version of the VNFD.
vnfProductInfoName	Human readable name for the VNF Product. Can change during the VNF Product lifetime.
vnfProductInfoDescription	Human readable description of the VNF Product. Can change during the VNF Product lifetime.

PART 2: NFV MODEL FEDERATION STATUS

Marc Flauw

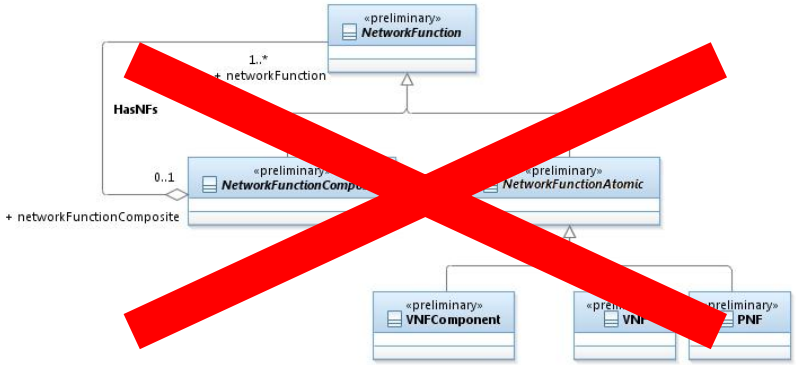
Principles of Domain Driven Design

- Derived from Domain Driven Design, by Eric Evans
  - Based on the fact that total unification of the model for a large complex system will not be feasible or cost-effective
- Define domains as bounded contexts
  - Cohesion within a context
  - Insulation between contexts
- Using a shared kernel/ approach
- Mapping strategy between contexts

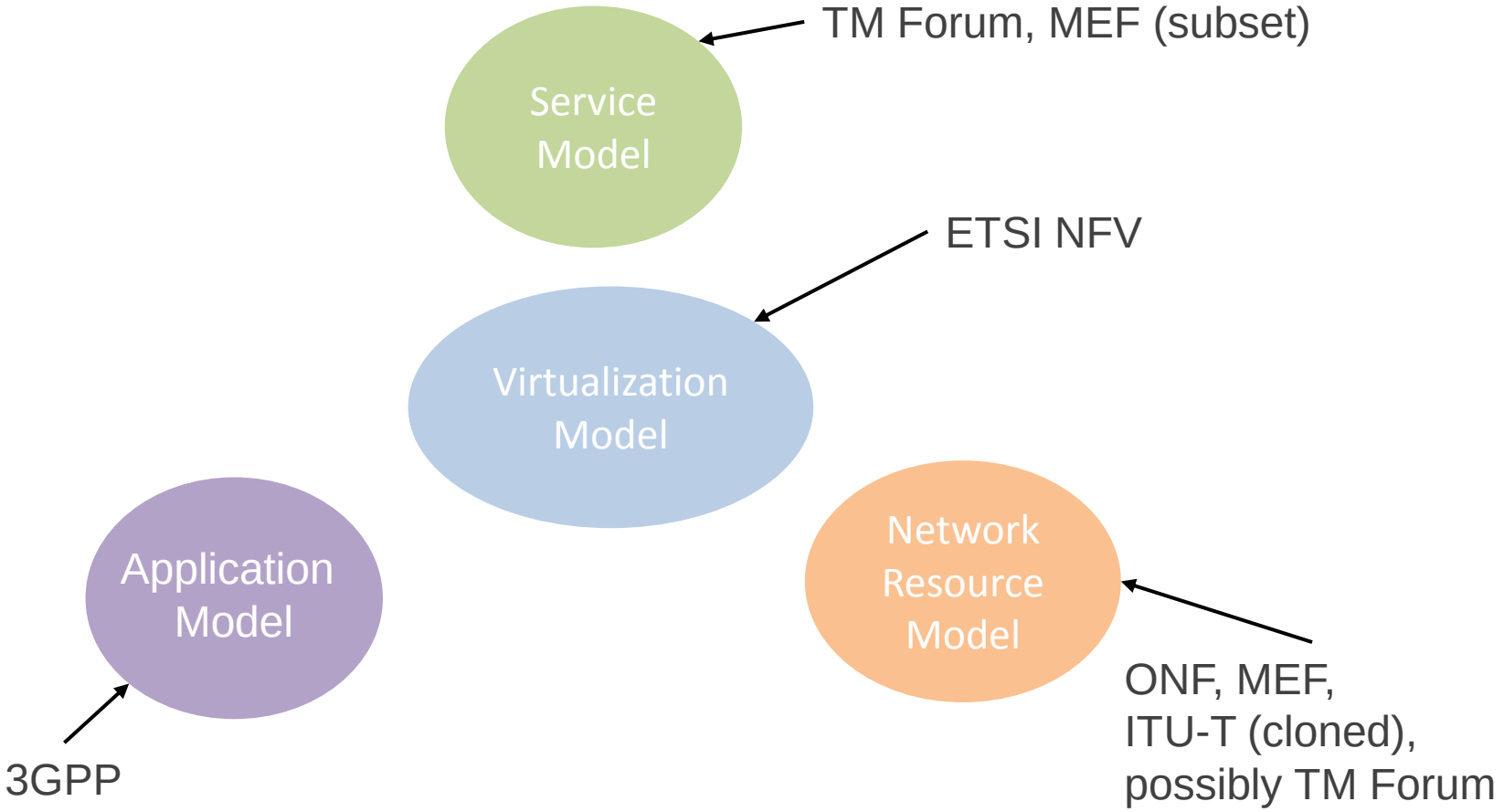


What to do and not to do

- An IM can cover multiple domains
- Use patterns for the mapping between contexts
  - Direct mapping (IsA relationship), proxy, mediator…
- Recognize domain boundaries, i.e. when to stop modeling
- Avoid NIH, re-modeling what is already defined in another domain



Status after Louisville workshop

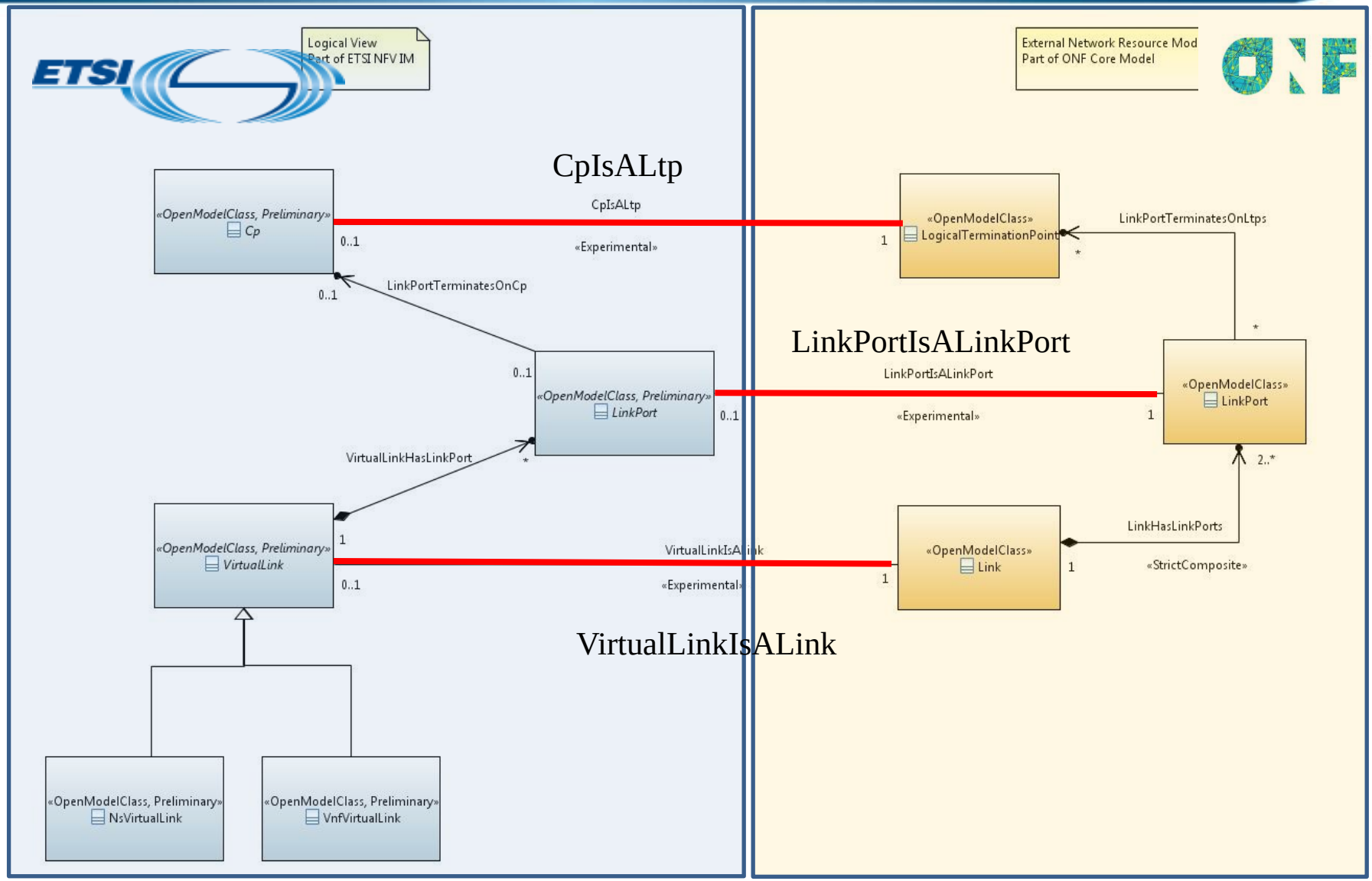


A number of possible touchpoints identified in the Multi-SDO workshop in January

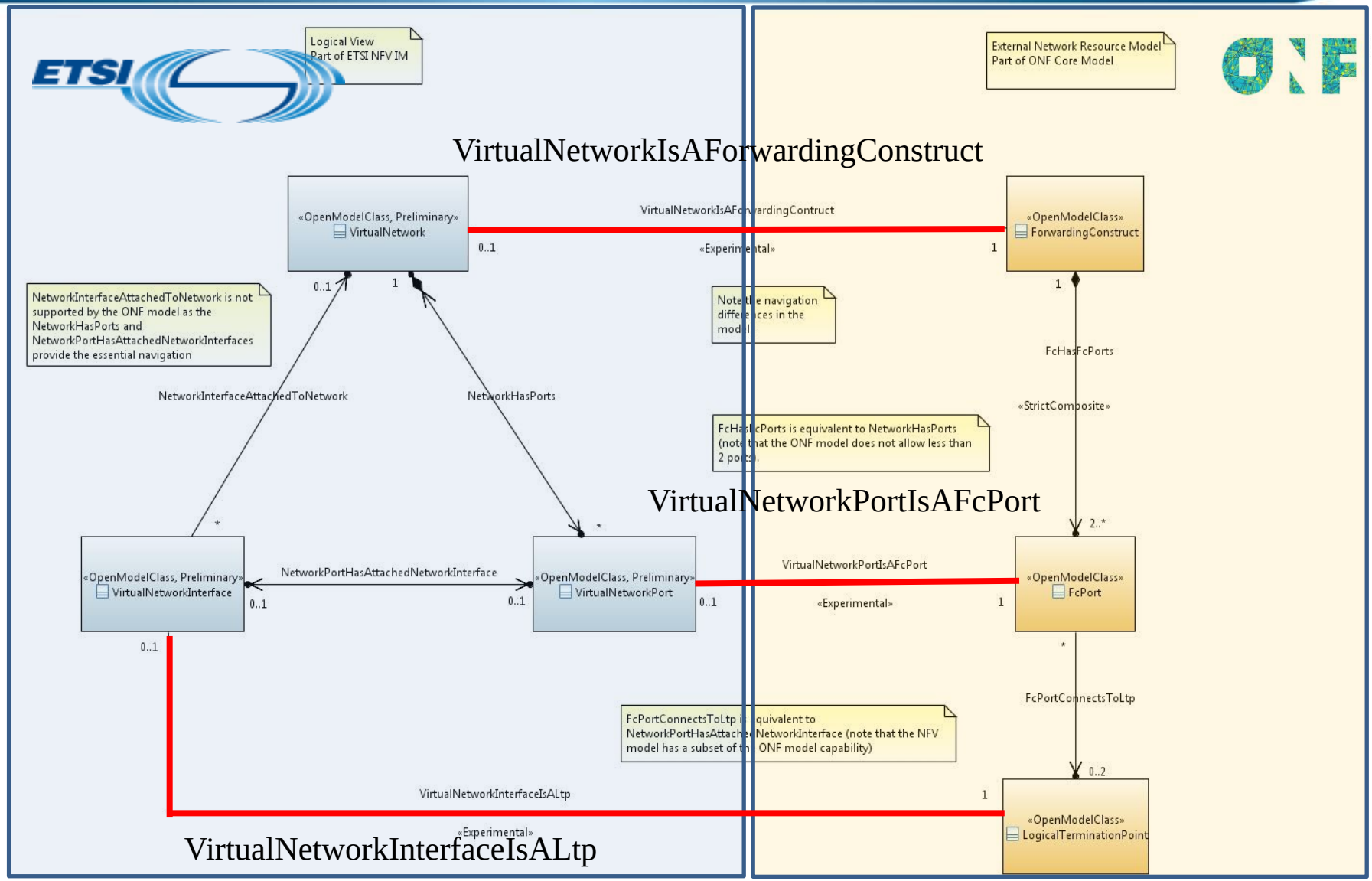
ETSI ISG NFV work

- Status after the Multi-SDO workshop in January
  - A number of touchpoints identified in the Multi-SDO workshop in January
  - Informal discussion started to detail these touchpoints
- Specific WI, IFA024 NFVIM External touchpoints, created
- IFA024 Draft v0.2.1 available
- Touchpoints defined between Virtualization model (NFV IM) and
  - Network Resource model (ONF Core model)
  - Service model (TM Forum SID)
  - Application model (3GPP NRM)

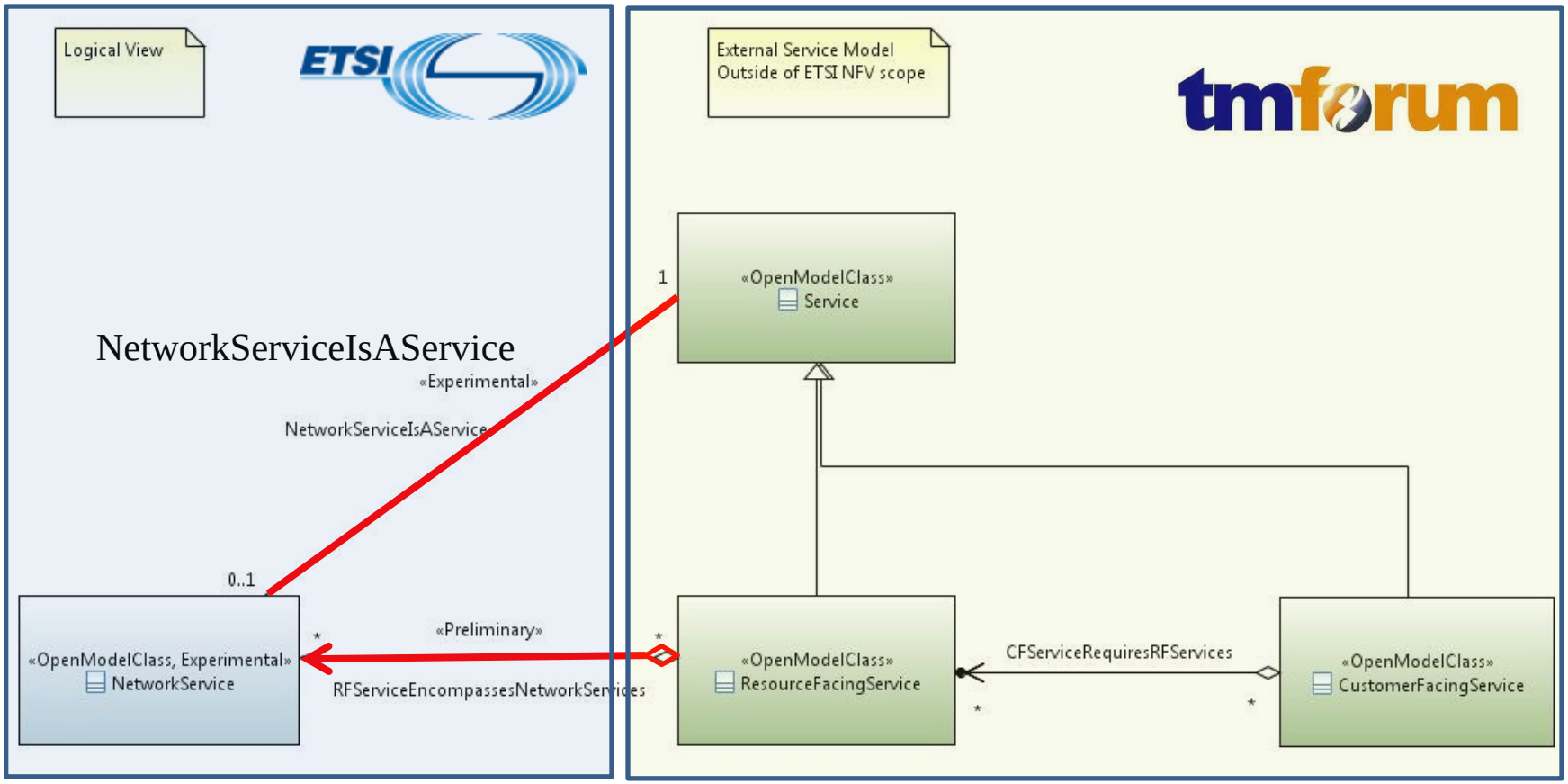
Touchpoints
with Network Resource Model – Link level



Touchpoints
with Network Resource Model – Network level

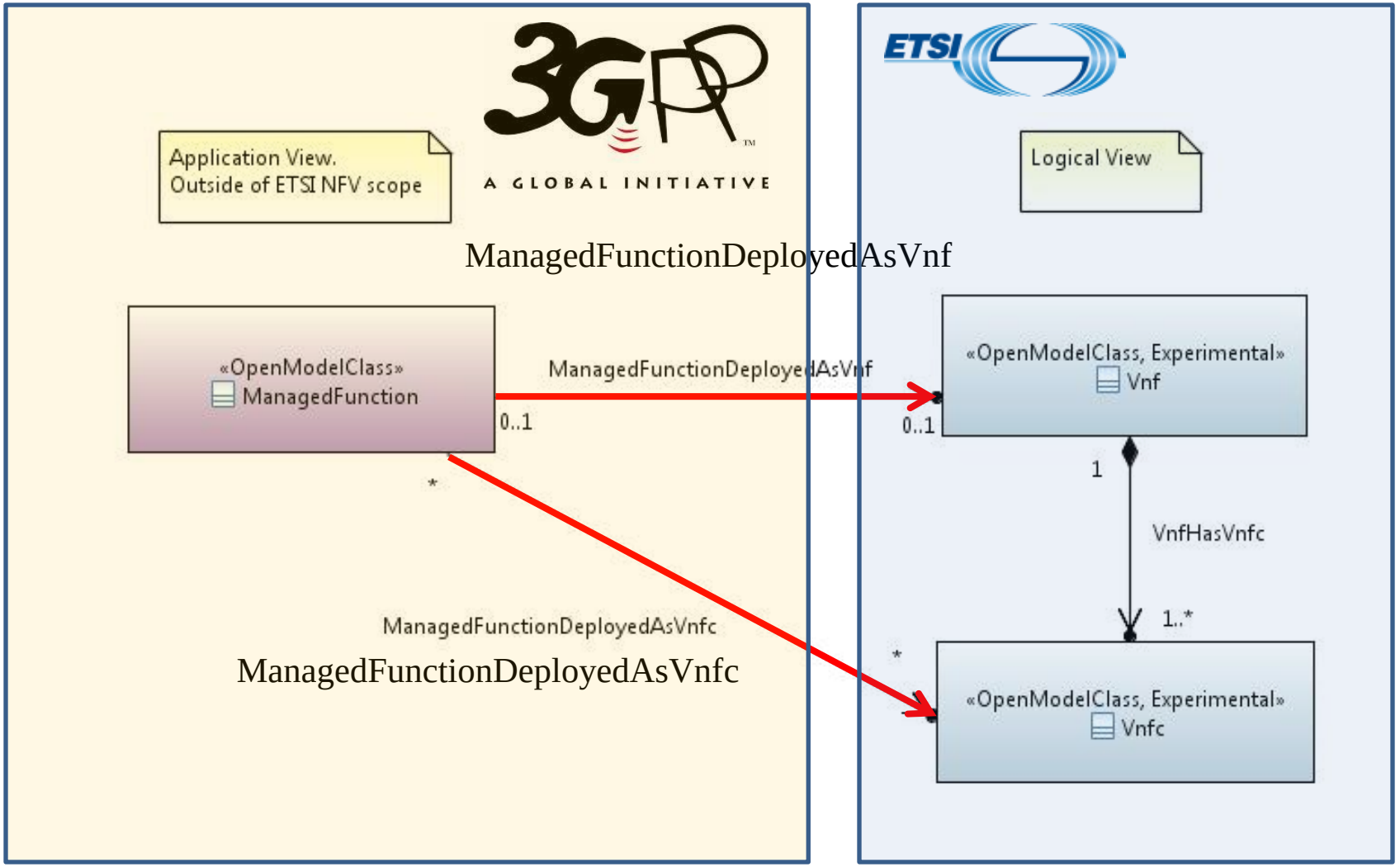


Touchpoints
with External Service Model



RFServiceEncompassesNetworkService

Touchpoints
with External Application Model

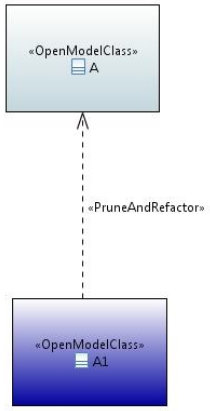


Further directions

- Possible touchpoints at VNF, VNFC… with TM Forum Zoom model
  - Once Zoom VNF model is fixed
- Lack of common parenting and common objects is an obstacle to deeper harmonization
- Different naming scheme per domain

Deriving data model from federated model

- Data model can be derived from IM by “Prune and refactor”



- Pruning can be done from several domains