

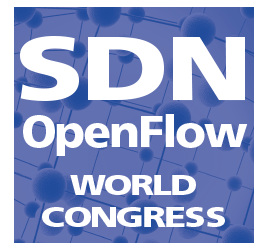


Welcome to the World of Standards



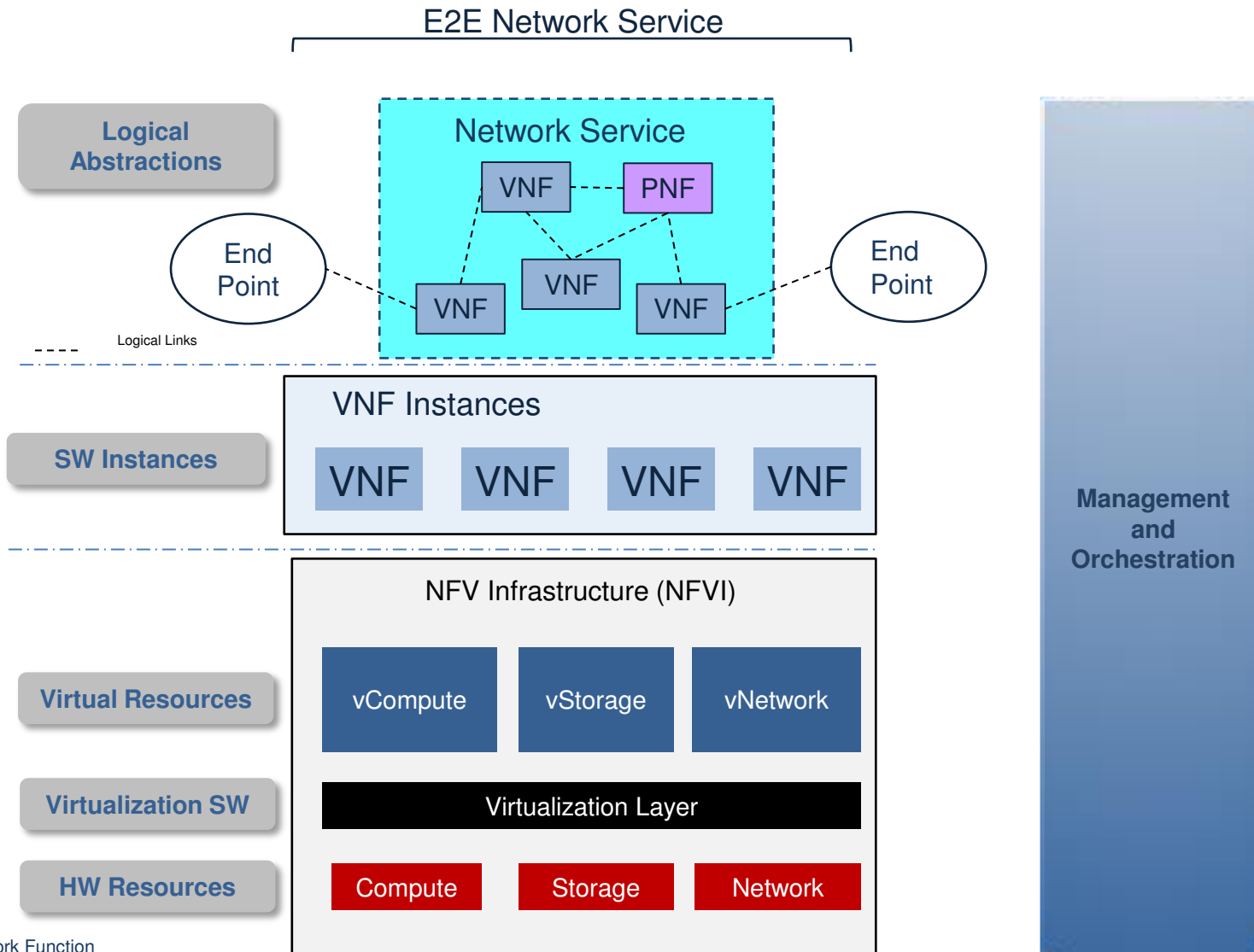
ETSI NFV IFA WG – ARCHITECTURE AND INTERFACES

Raquel Morera: IFA WG Chair, Verizon
Mehmet Ersue: IFA WG Vice-chair, Nokia
Peter Wörndle: IFA WG Rapporteur, Ericsson



MANO ARCHITECTURAL FRAMEWORK

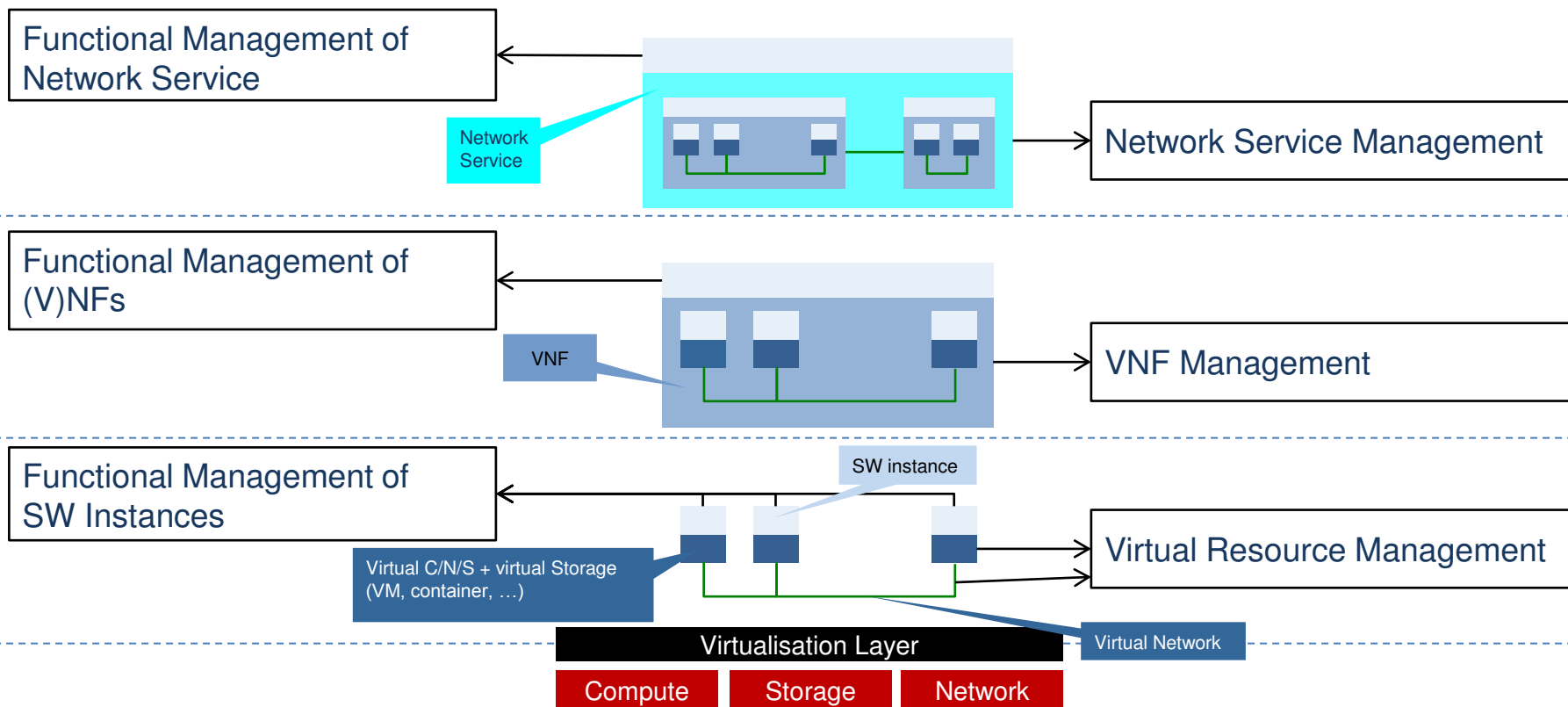
Network Functions Virtualisation: Layered view



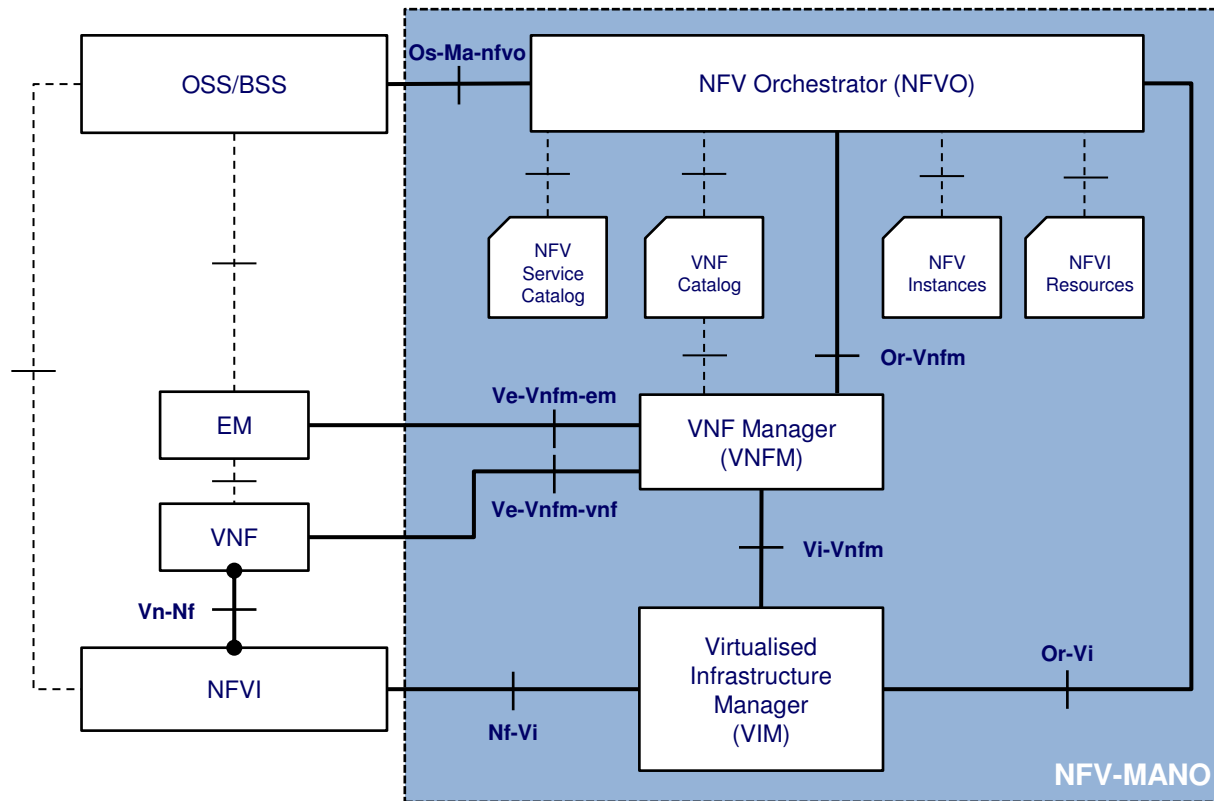
Network Functions Virtualisation: Management of NFV Components

Application & Functional Management

NFV Management & Orchestration



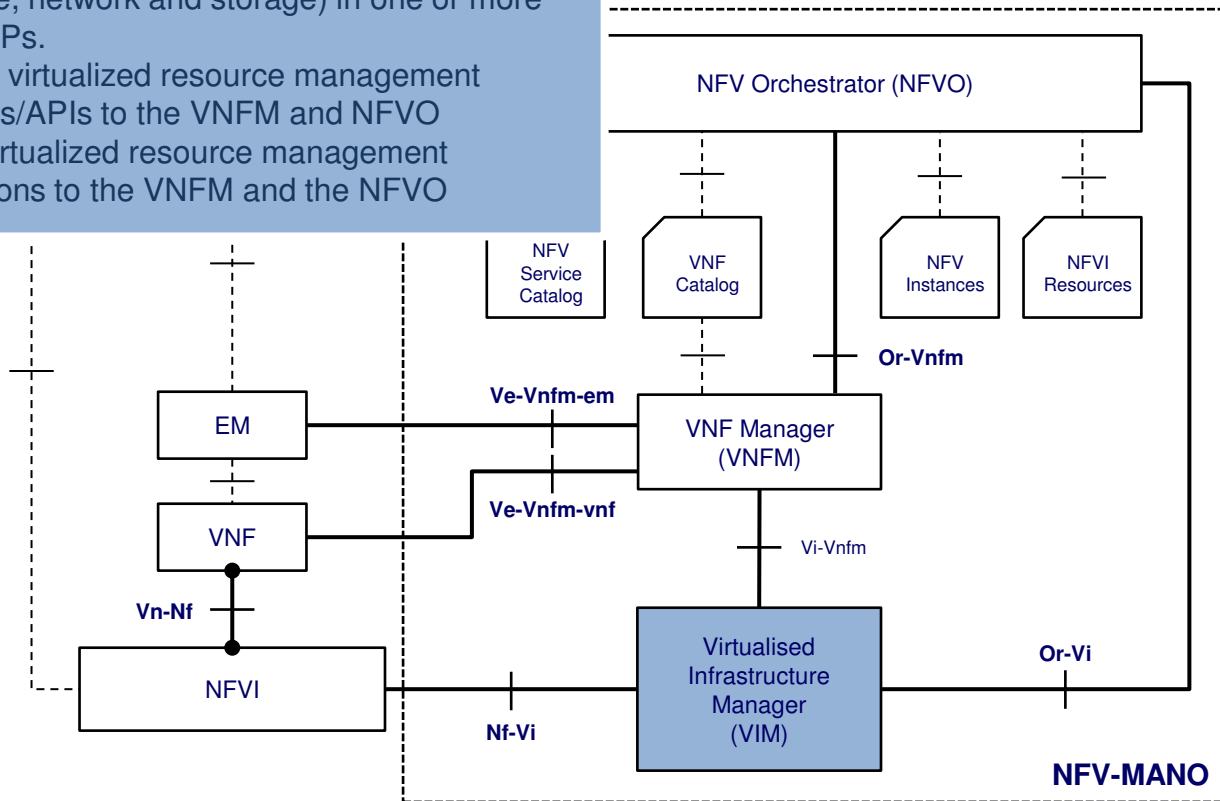
Management and Orchestration: Architecture



Virtualised Infrastructure Manager (VIM)

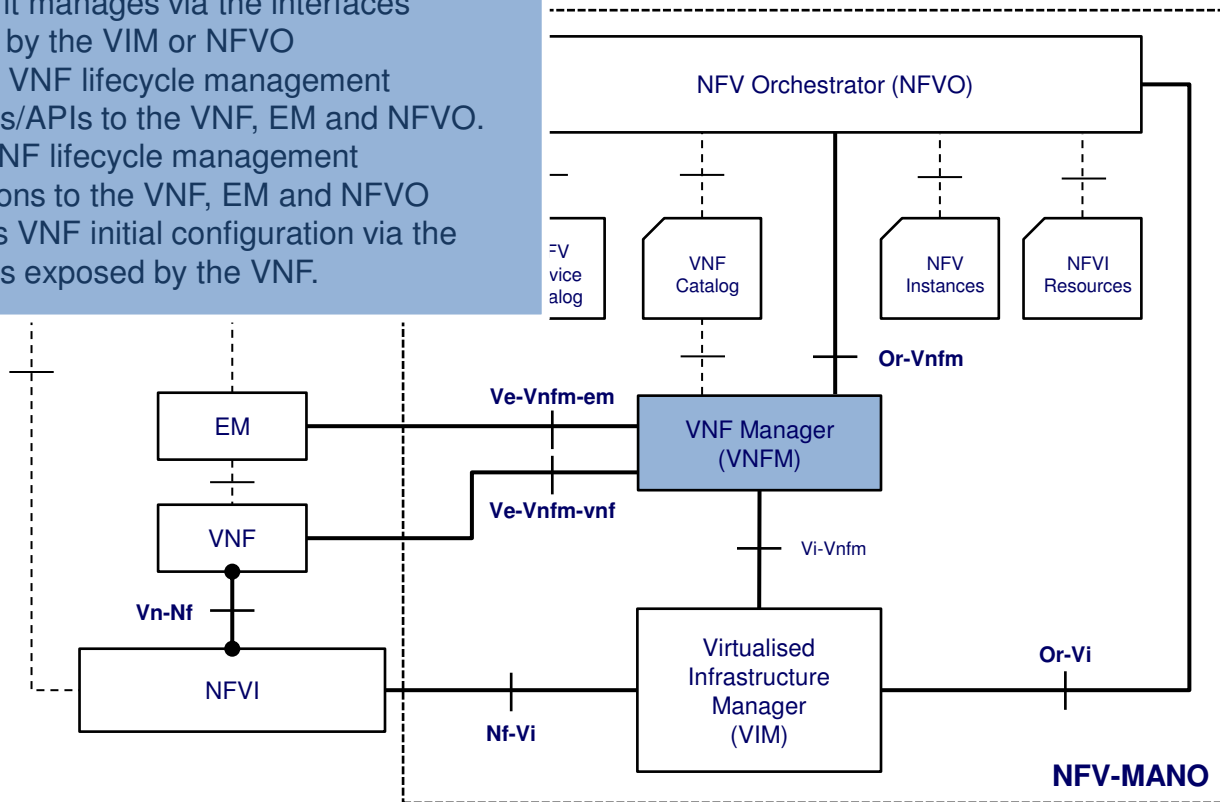


- Manages the NFV infrastructure resources (compute, network and storage) in one or more NFVI-PoPs.
- Exposes virtualized resource management interfaces/APIs to the VNFM and NFVO
- Sends virtualized resource management notifications to the VNFM and the NFVO

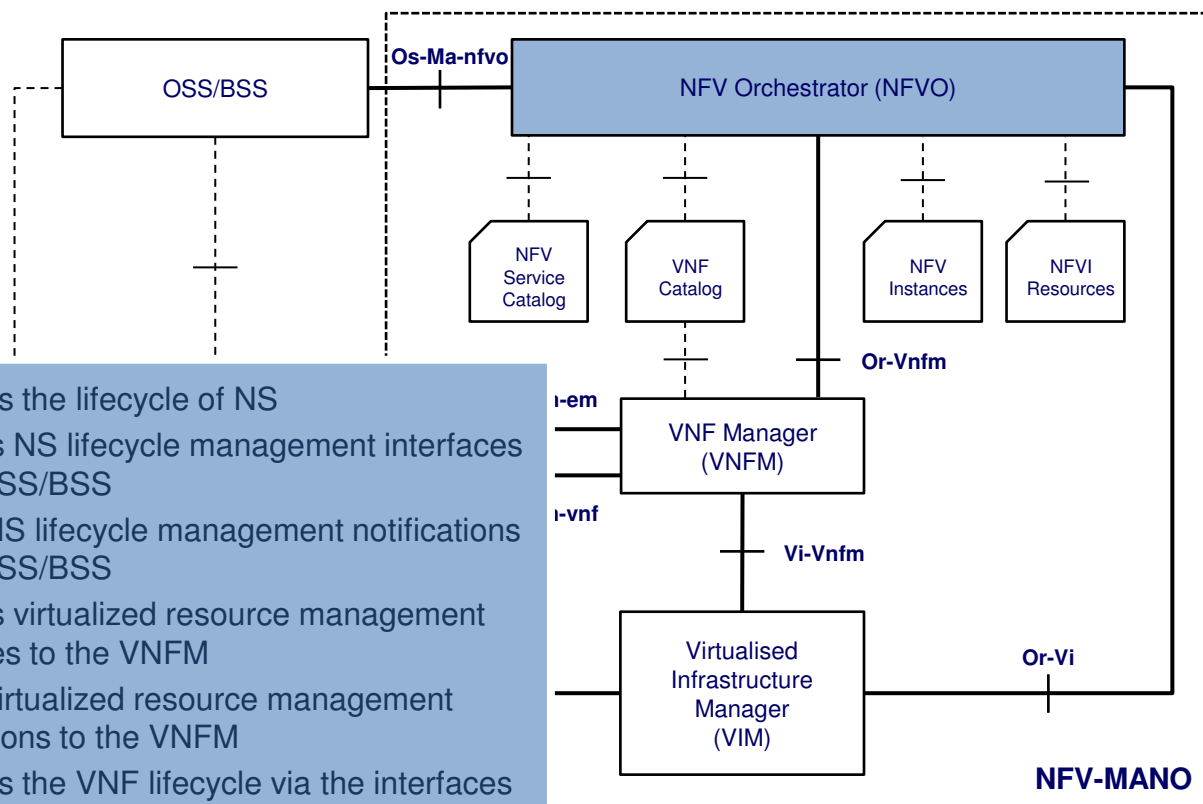


VNF Manager (VNFM)

- Manages the lifecycle of VNFs
- Manages virtualized resources associated to the VNF it manages via the interfaces exposed by the VIM or NFVO
- Exposes VNF lifecycle management interfaces/APIs to the VNF, EM and NFVO.
- Sends VNF lifecycle management notifications to the VNF, EM and NFVO
- Manages VNF initial configuration via the interfaces exposed by the VNF.



NFV Orchestrator (NFVO)



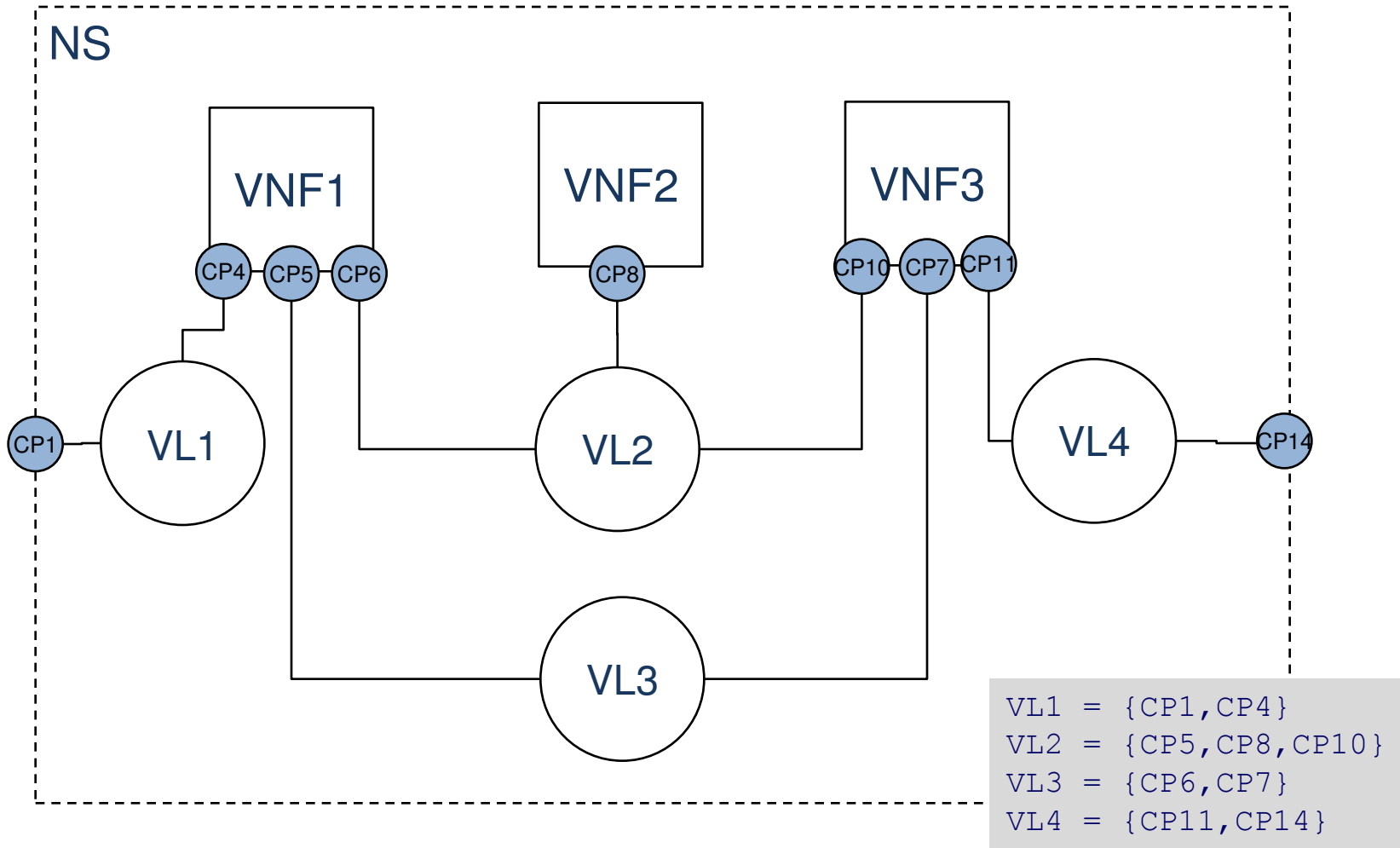
- Manages the lifecycle of NS
- Exposes NS lifecycle management interfaces to the OSS/BSS
- Sends NS lifecycle management notifications to the OSS/BSS
- Exposes virtualized resource management interfaces to the VNFM
- Sends virtualized resource management notifications to the VNFM
- Manages the VNF lifecycle via the interfaces exposed by the VNFM
- Manages virtualized resources via the interfaces exposed by the VIM.

MANO INFORMATION MODEL

Network connection topology of a Network Service using VNFs, VLs, and Connection Points



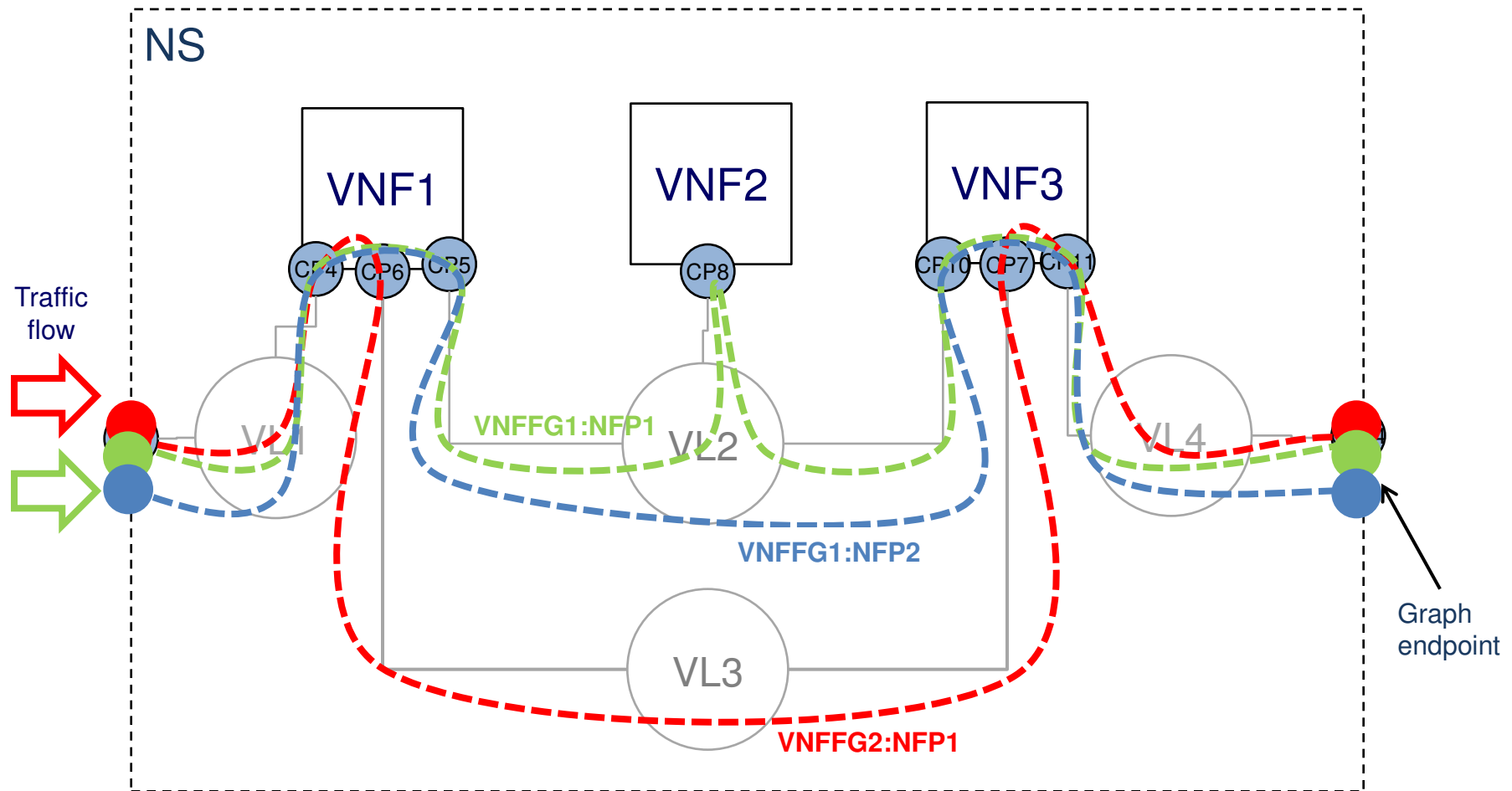
CP = connection point, VL = Virtual Link



VNF Forwarding Graph and Network Forwarding Path on top of a Network Service



CP = connection point, VL = Virtual Link

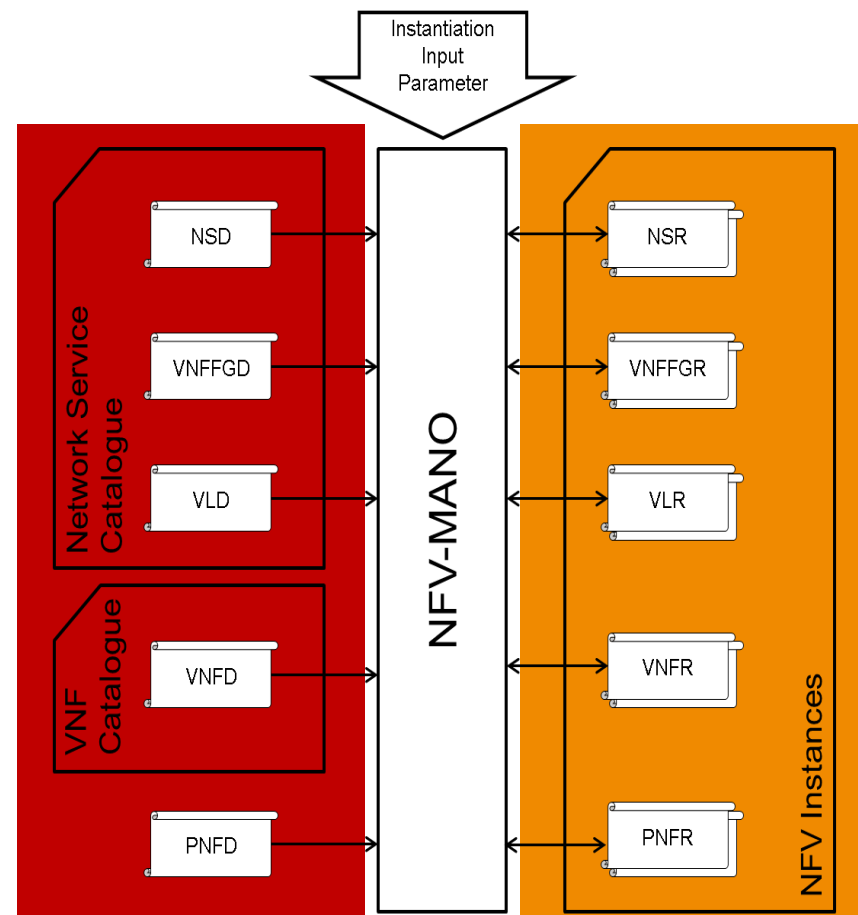


🌐 Descriptors associated to

- Network Service (NS)
- Virtual Network Function (VNF)
- Virtual Links (VL)
- VNF Forwarding Graph (VNFFG)
- Physical Network Function (PNF)

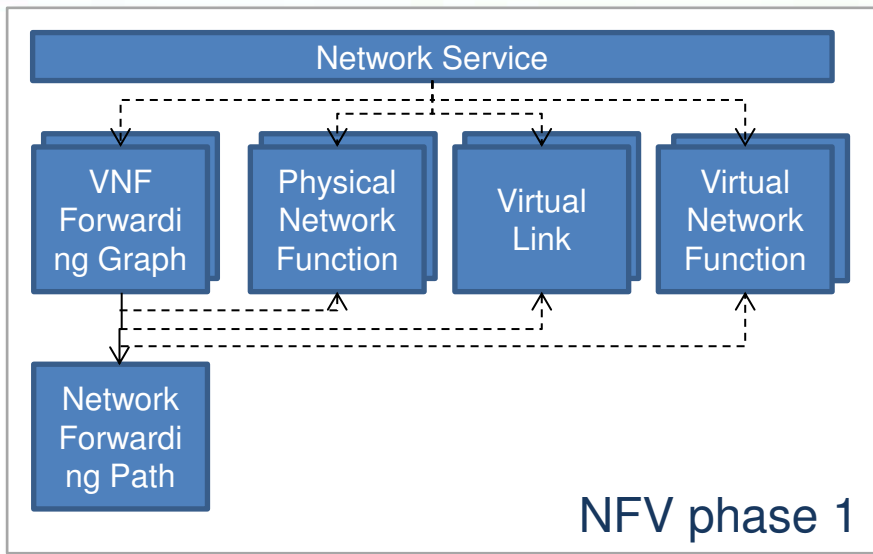
🌐 Static & Runtime

- **Design** = Descriptor (e.g. VNFD)
- **Runtime** = Record (e.g. VNFR)

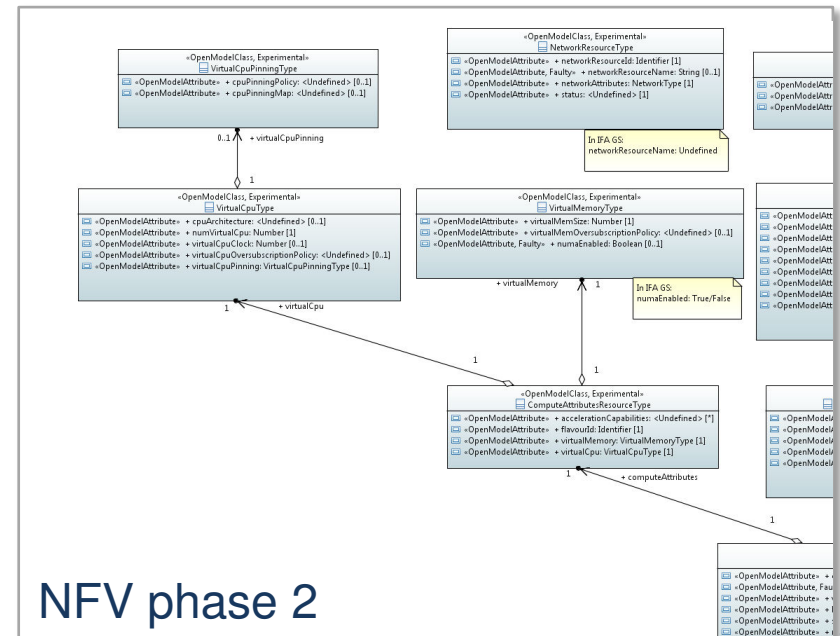


Records stores the current state of MANO constructs

Base Information Elements



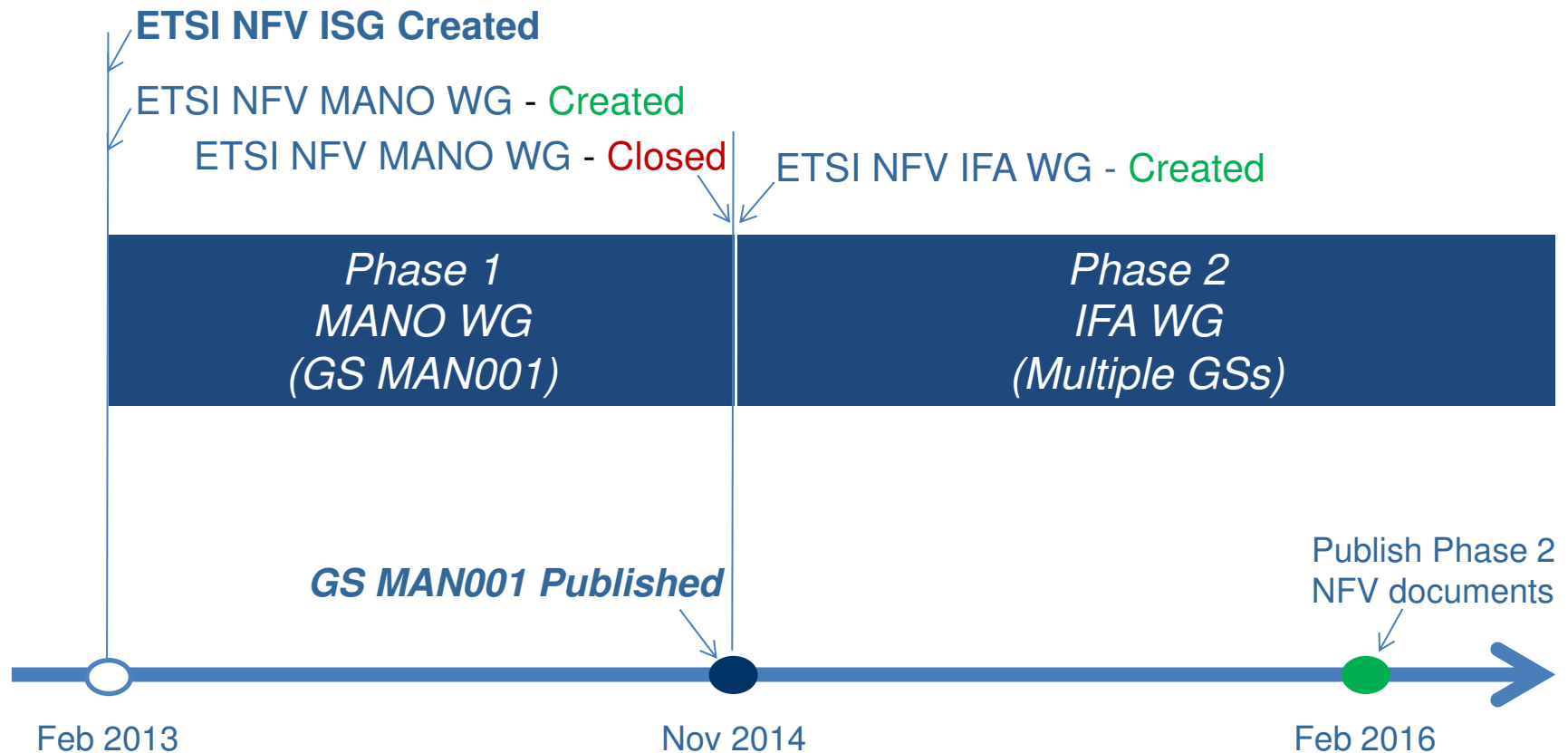
from information elements in phase 1...
 ... to UML information model in phase 2





FROM MANO TO IFA WG

FROM MANO WG to IFA WG



- MANO = Management and Orchestration
- IFA = Interfaces and Architecture (builds on top of GS MAN001)

MANO WG Accomplishments and Current IFA WG Development



Phase 1 MANO WG (GS MAN001)

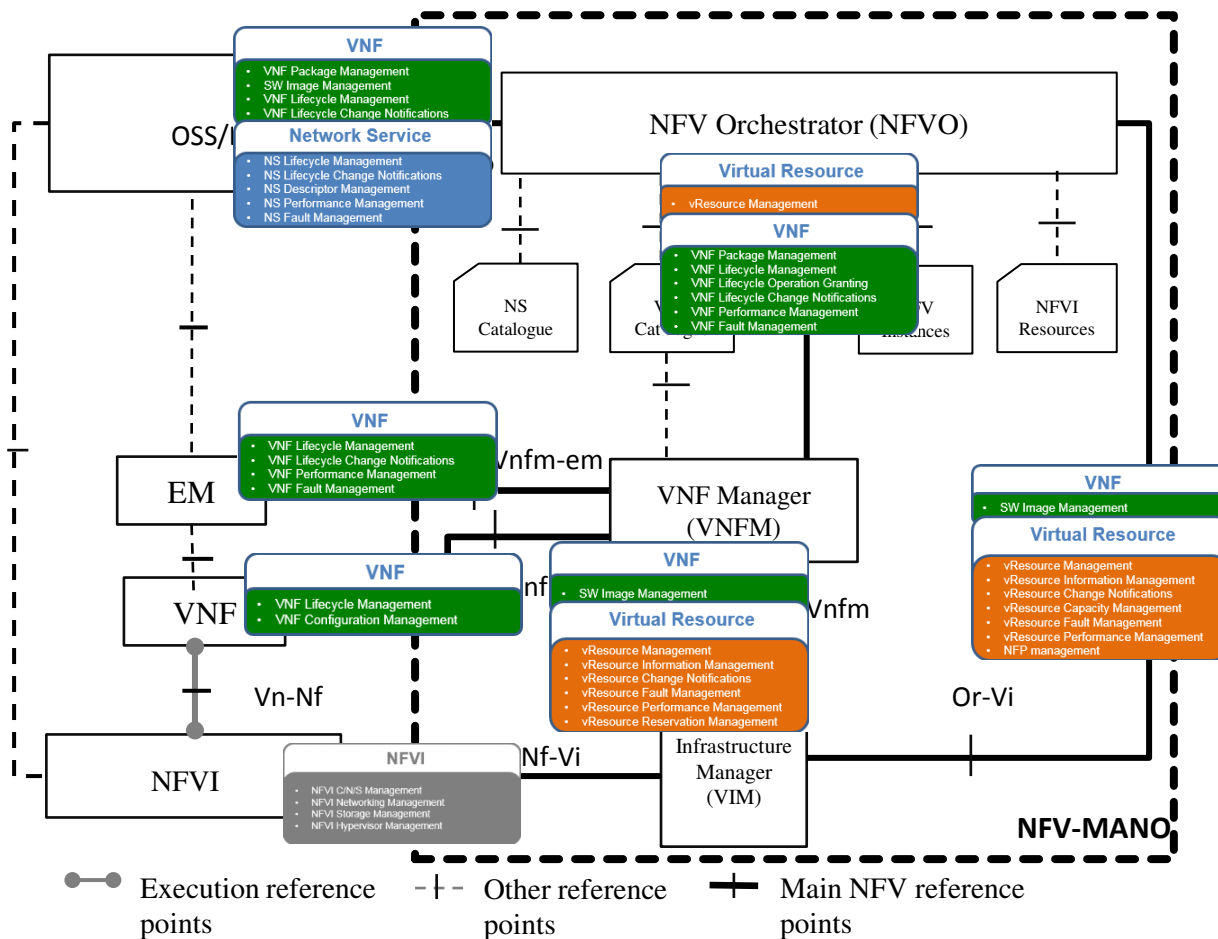
- 🌐 **NFV-MANO architectural framework**
- 🌐 *Interfaces Description*
- 🌐 *Information Elements Description*
- 🌐 *Information Flows*
- 🌐 *Industry/Technology Gaps*

Phase 2 IFA WG (Multiple GSs)

- 🌐 **Interface Specifications**
- 🌐 *Information Element Specifications*
- 🌐 *NFV Descriptor (VNFD, NSD)
Specifications*
- 🌐 *Acceleration Specifications*
- 🌐 *Report on architecture deployment options*
- 🌐 ***Report on NFV Information Model***

Liaison's with other SDO and Open source Projects to coordinate work

MANO Reference points and Interfaces



Network Service

- NS Lifecycle Management
- NS Lifecycle Change Notifications
- NS Descriptor Management
- NS Performance Management
- NS Fault Management

VNF

- VNF Package Management
- SW Image Management
- VNF Lifecycle Management
- VNF Lifecycle Operation Granting
- VNF Lifecycle Change Notifications
- VNF Configuration Management
- VNF Performance Management
- VNF Fault Management

Virtual Resource

- vResource Management
- vResource Information Management
- vResource Capacity Management
- vResource Change Notification
- vResource Fault Management
- vResource Performance Management
- vResource Reservation Management
- NFP Management

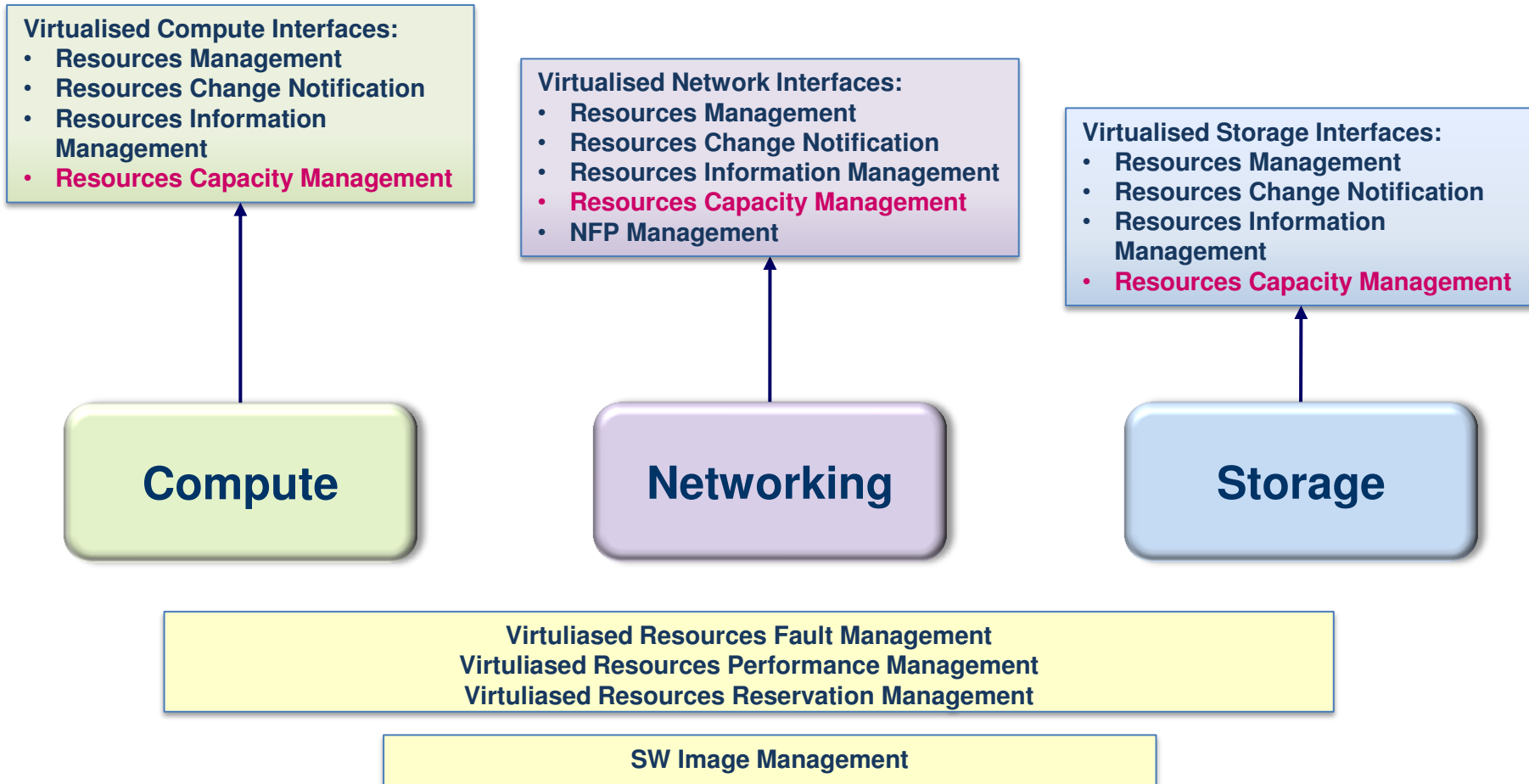
NFVI

- NFVI C/N/S Management
- NFVI Networking Management
- NFVI Storage Management
- NFVI Hypervisor Management

RESOURCE MANAGEMENT

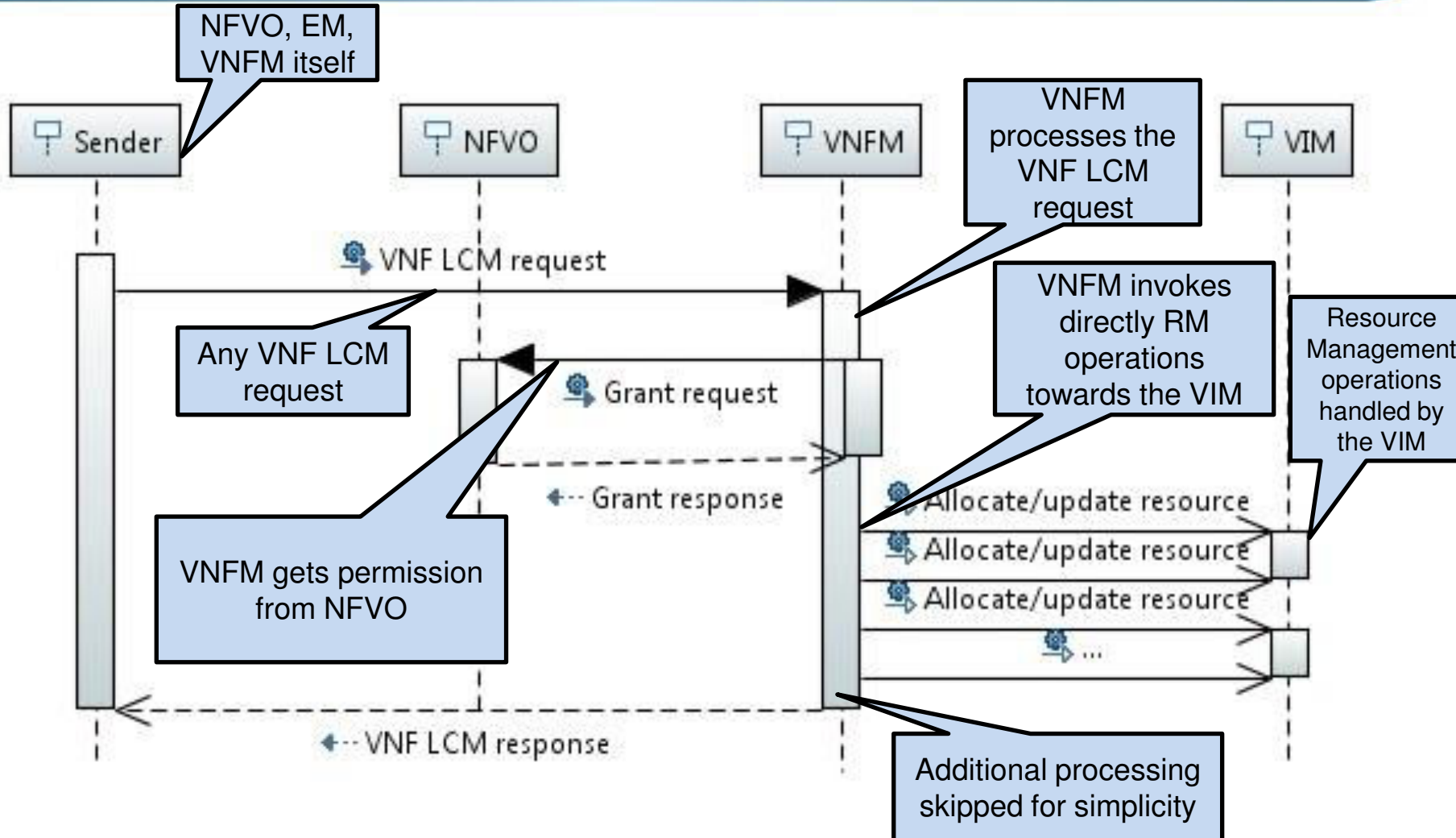
(Developed in 2015)

VIM Northbound Interfaces on Or-Vi and Vi-Vnfm Reference Points



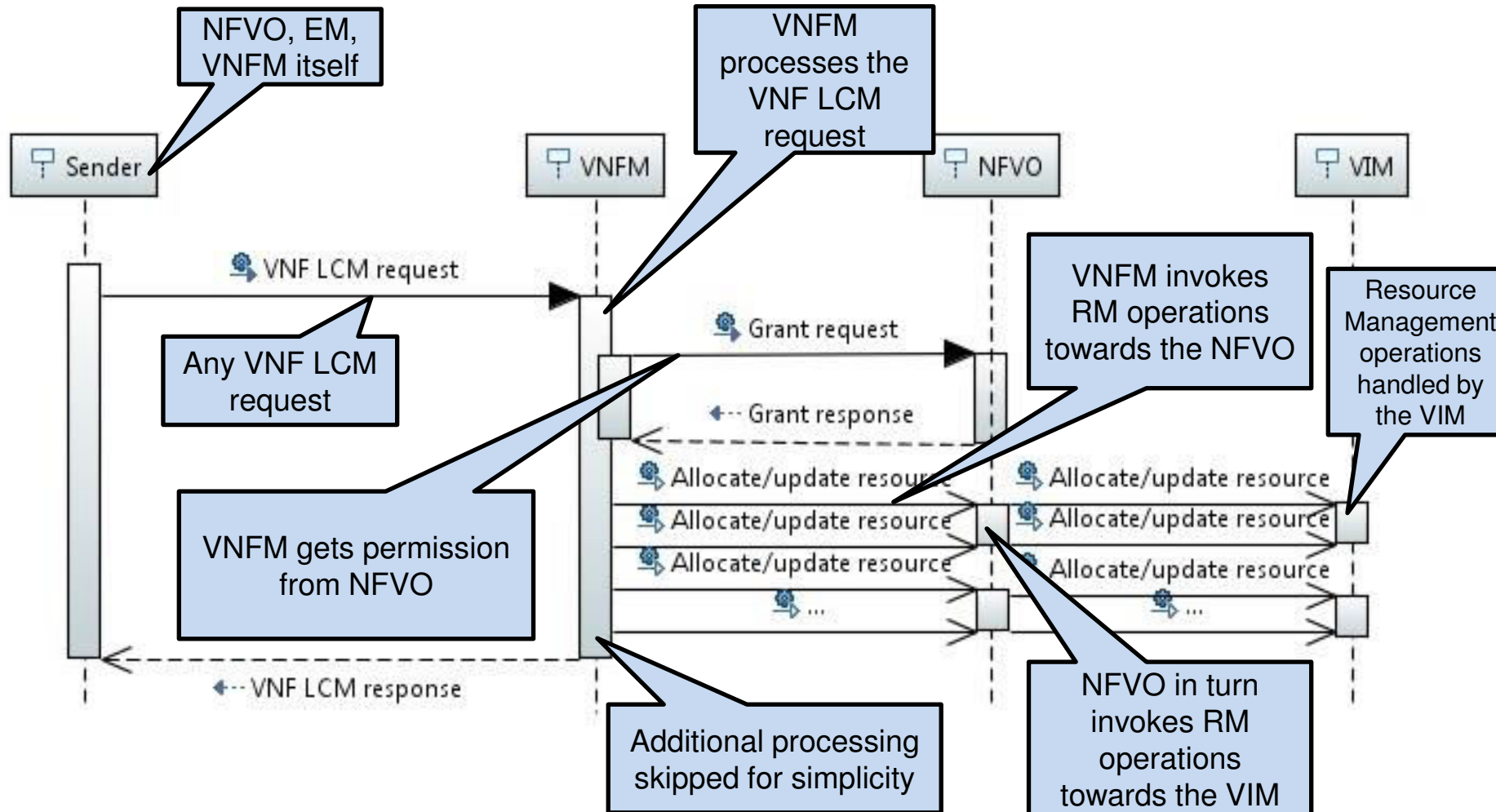
Only relevant for Or-Vi reference point

VNF related resource management done by VNFM (Direct mode)



Simplified flow, focusing only on Resource Management

VNF related resource management done by NFVO (Indirect mode)



Simplified flow, focusing only on Resource Management

IFA WG Phase 2 Work Plan



IFA010 Functional Requirements

IFA011 VNF Package & VNFD

IFA014 NSD

IFA015 NFV Information Model (Report)

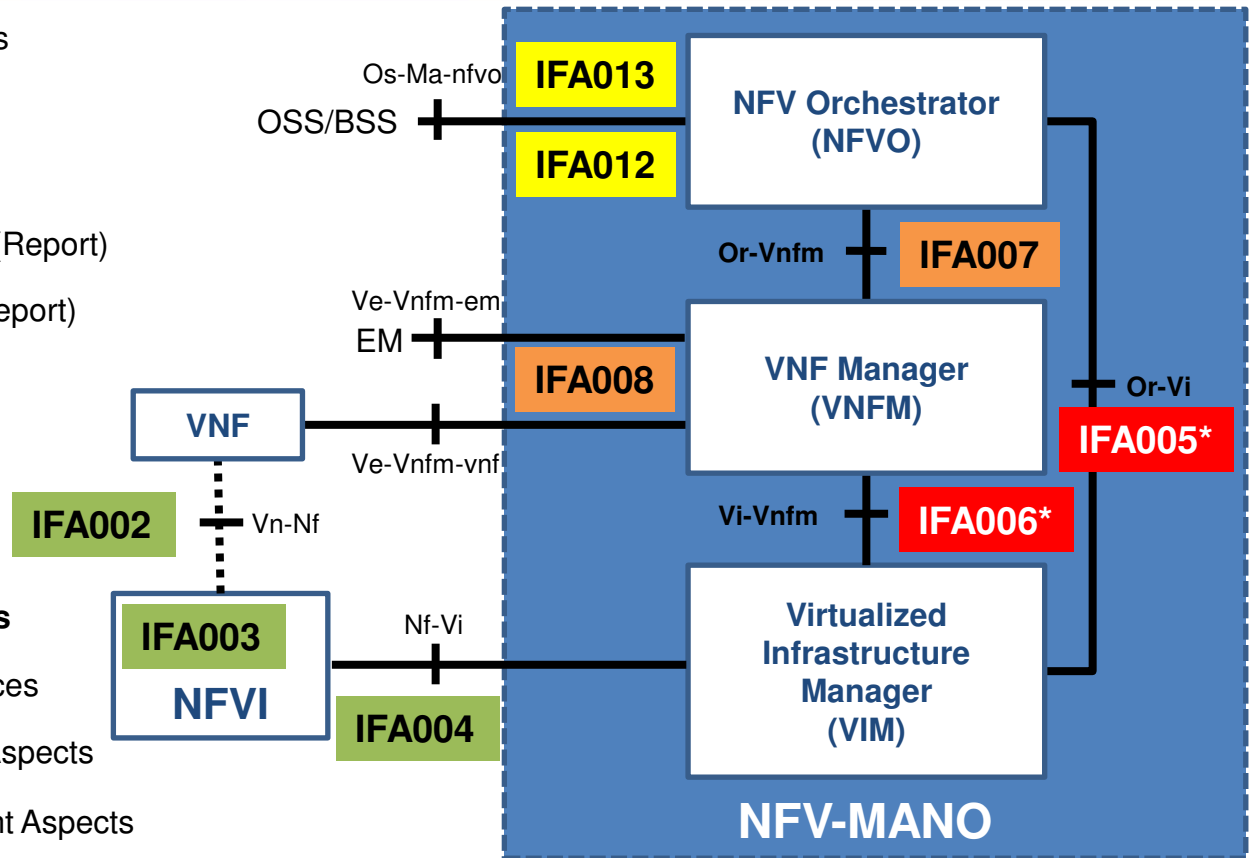
IFA009 Architectural Options (Report)

IFA001* Acceleration Use Cases

IFA002 Acceleration VNF Interfaces

IFA003 Acceleration Switching Aspects

IFA004 Acceleration Management Aspects



ETSI NFV Open Area:

- Draft GS documents: <http://docbox.etsi.org/ISG/NFV/Open/Drafts/>
- Issue tracker: http://nfwiki.etsi.org/index.php?title=NFV_Issue_Tracker

*) Recently finalized