



Welcome to the World of Standards



ETSI NFV INTERFACES AND ARCHITECTURE

Presented by Dr. Raquel Morera, Verizon, chair of the IFA Working Group in ETSI NFV

- Intro to IFA WG
- MANO Architectural Framework
 - MANO Basic Concepts
 - MANO Architectural Framework
 - Information Model
- Reference points, interfaces, operations
- Resource Management
- Overview of IFA work items

ETSI NFV ISG Interfaces and Architecture WG (IFA) WG



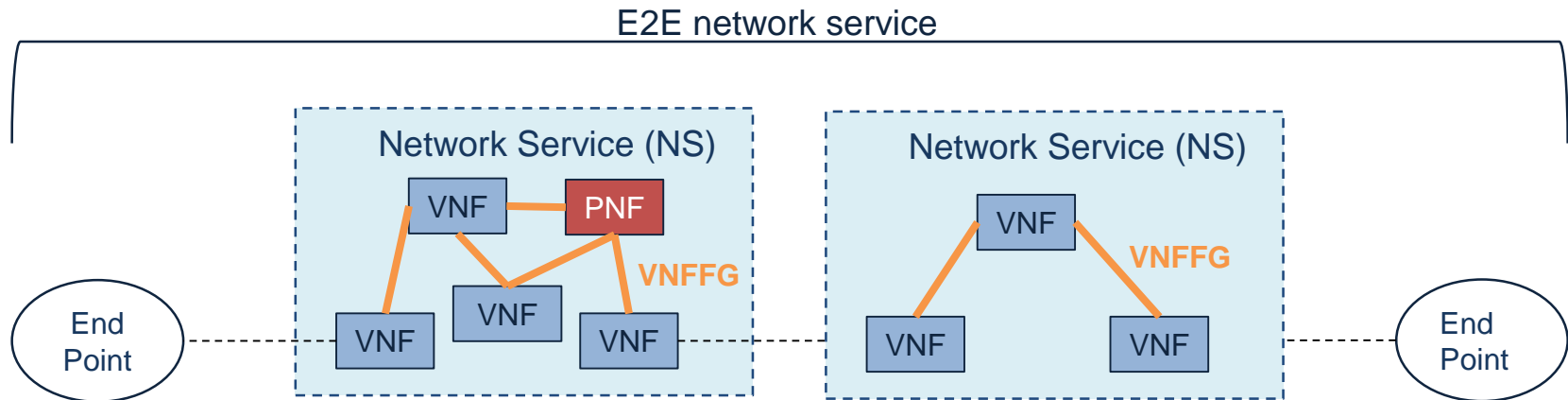
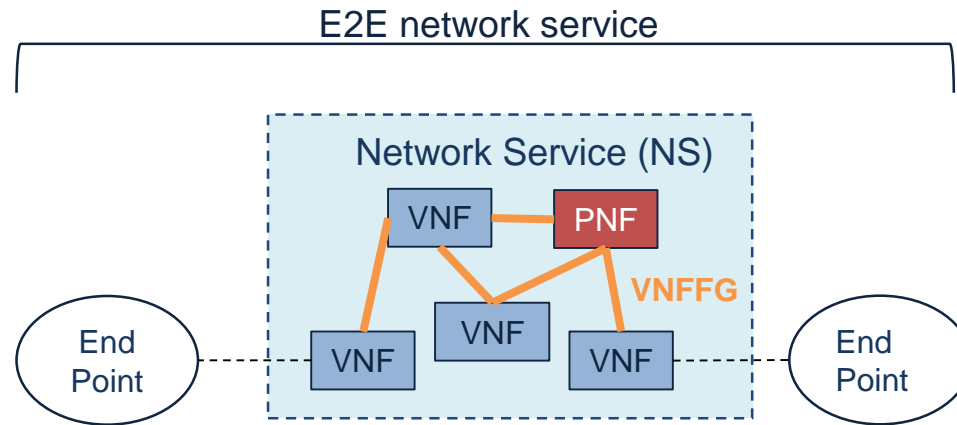
Feb'12	<ul style="list-style-type: none">ETSI NFV ISG CreatedETSI NFV Management and Orchestration (MANO) WG Created
Dec'13	<ul style="list-style-type: none">ETSI NFV Architectural Framework Published
Nov'14	<ul style="list-style-type: none">ETSI NFV MANO WG ClosedETSI NFV IFA Created ←Release 2 work starts
Jan'15	<ul style="list-style-type: none">MAN001 - ETSI NFV Management and Orchestration Report – Published
Jan'16	<ul style="list-style-type: none">First IFA WG Release 2 specifications published
Apr'16	<ul style="list-style-type: none">Release 3 work starts
Jun'16	<ul style="list-style-type: none">Finalization of Release 2 work on interfaces and descriptors
Sep'16	<ul style="list-style-type: none">Finalization of information model
Soon	<ul style="list-style-type: none">Publication of IFA WG Release 2 specifications

IFA WG Scope

- Normative Interface Specifications
- Normative Information Element Specifications
- Normative NFV Descriptors Specifications
- Acceleration Use cases, Specifications and Reports
- Informative Reports on new features evaluating interface and architecture impacts

MANO ARCHITECTURAL FRAMEWORK

Network Functions Virtualization: VNFs, NS and E2E Network Service

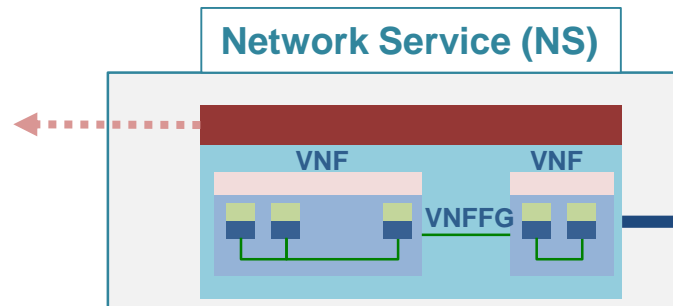


Network Functions Virtualisation: Management of NFV Components

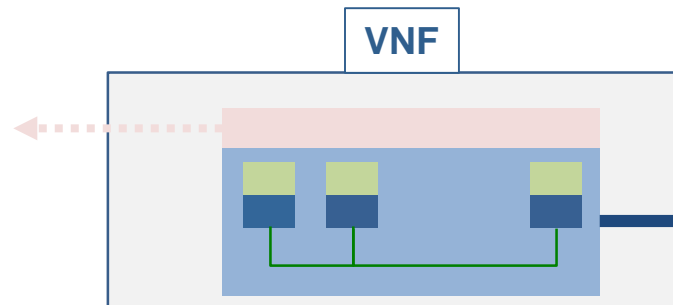


Application & Functional Management

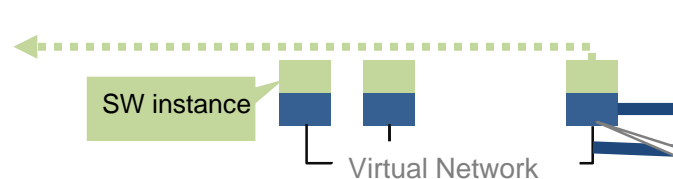
Functional Management of Network Service



Functional Management of (V)NFs



Functional Management of SW Instances



NFV Management & Orchestration

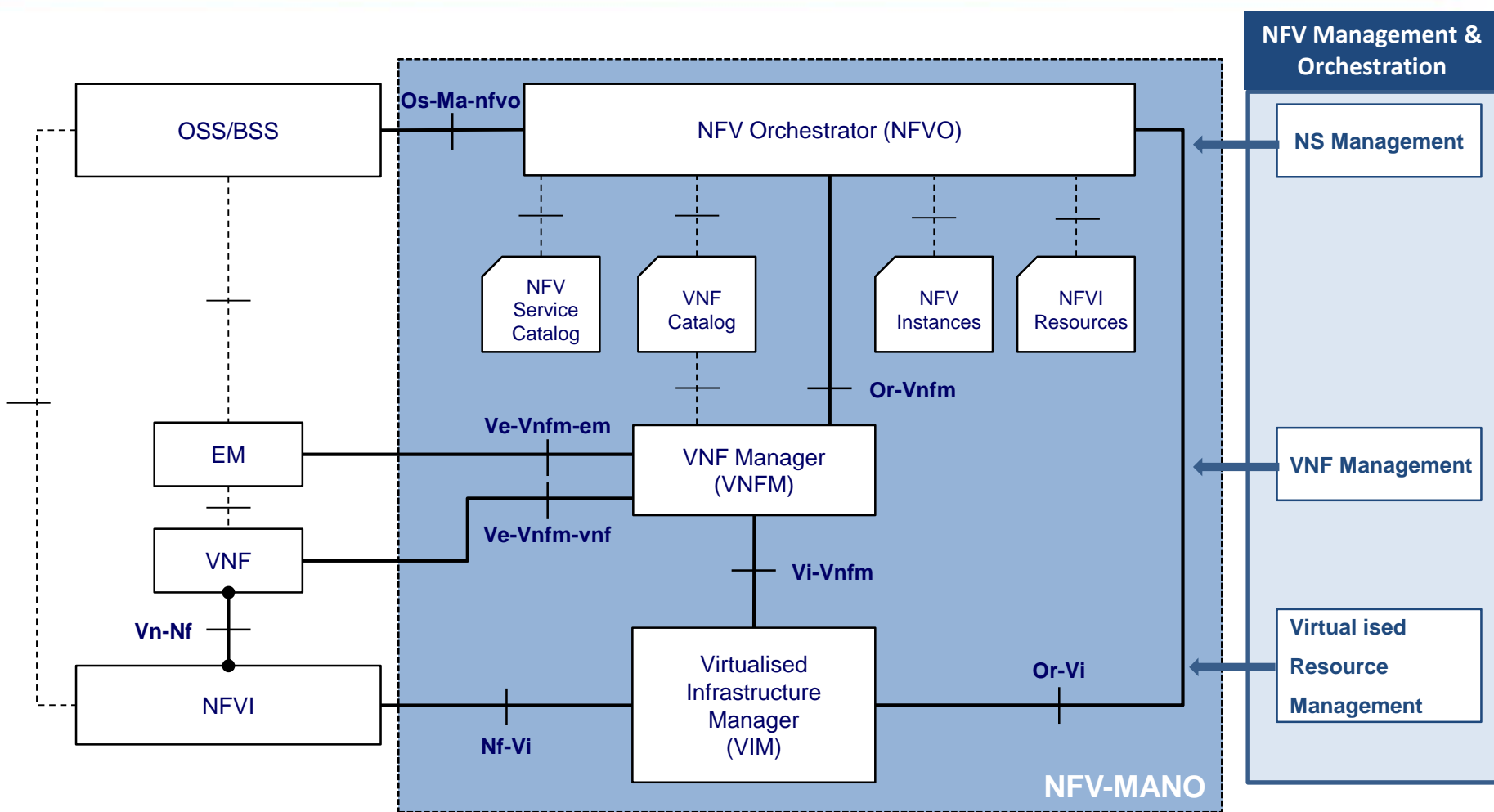
Network Service (NS) Mgmt.

VNF Management

Virtualised Resource Mgmt.

Virtual C/N/S + virtual Storage (VM, container, ...)

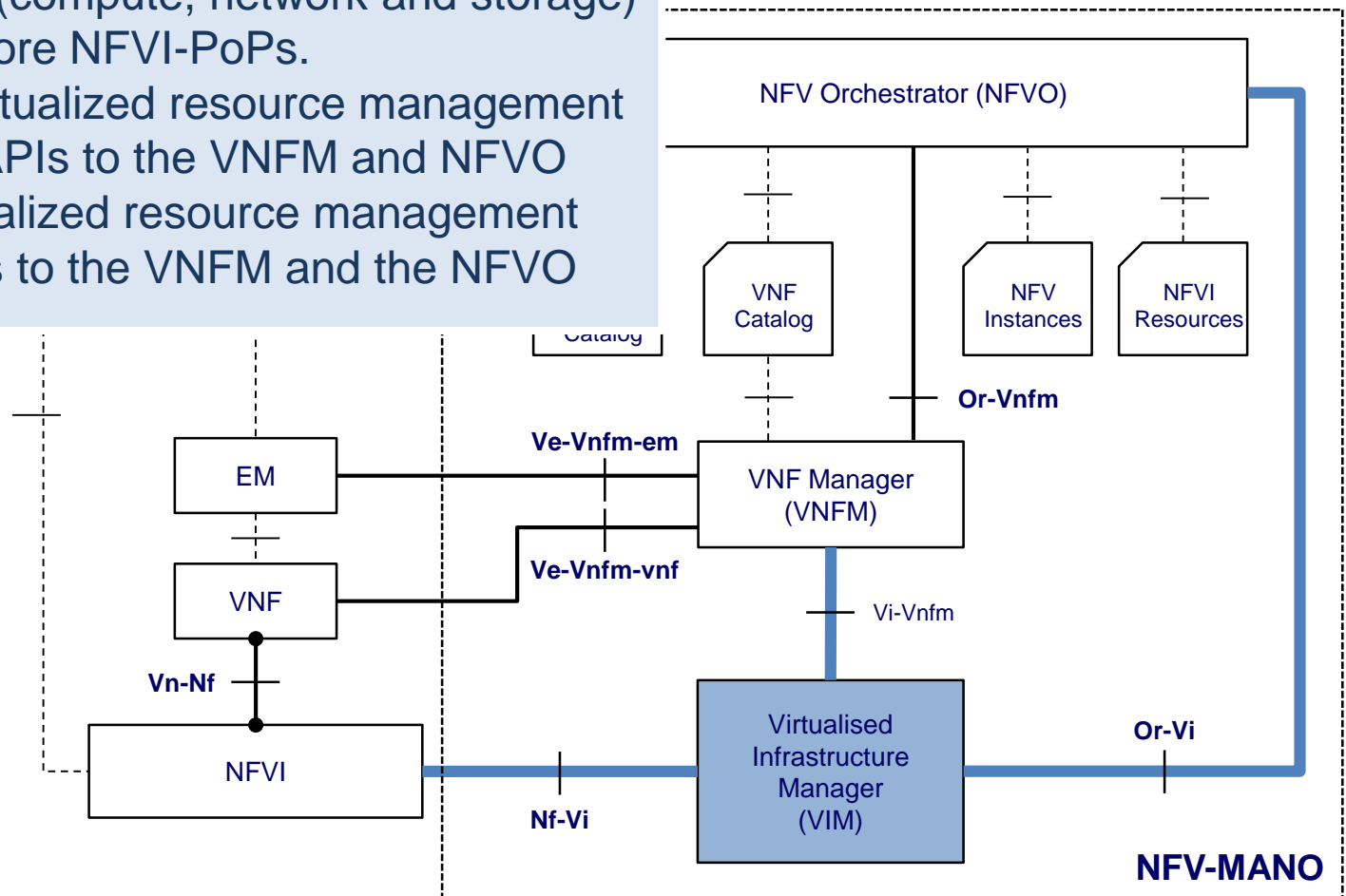
Management and Orchestration: Architecture



Virtualised Infrastructure Manager (VIM)

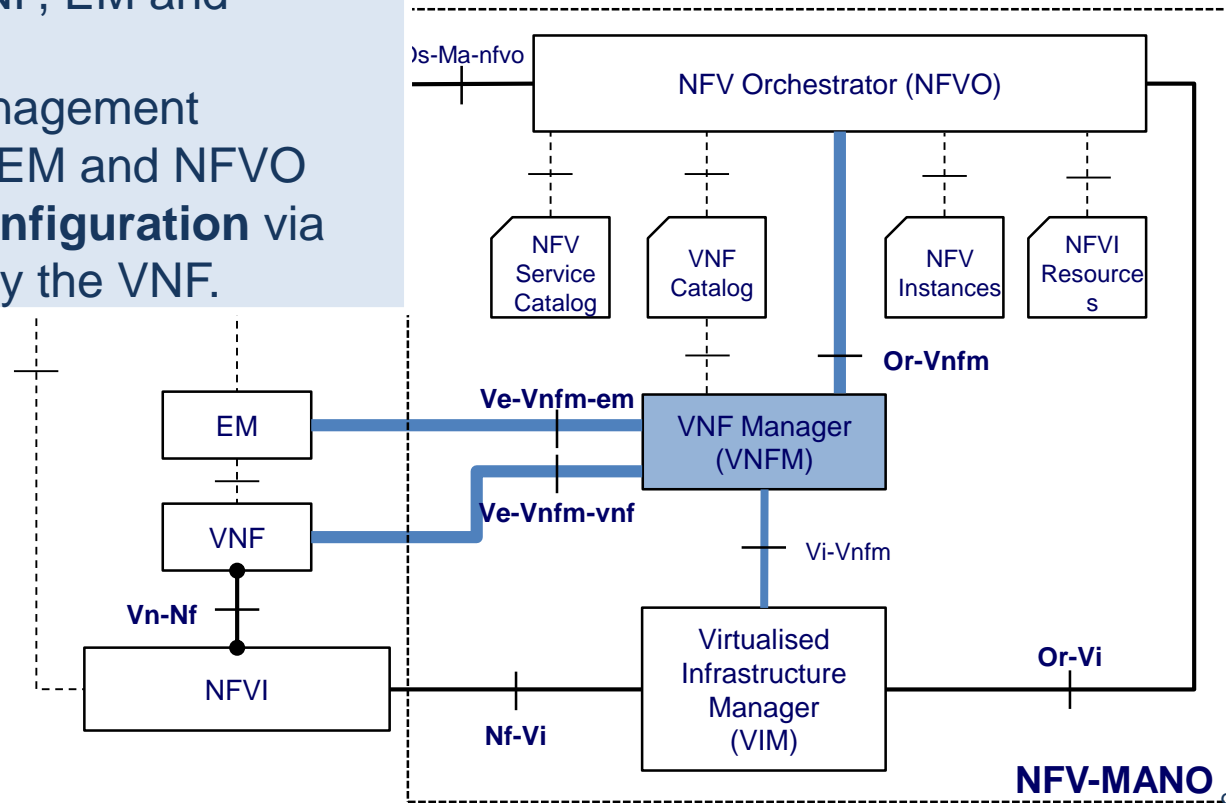


- Manages the NFV infrastructure resources (compute, network and storage) in one or more NFVI-PoPs.
- Exposes virtualized resource management interfaces/APIs to the VNFM and NFVO
- Sends virtualized resource management notifications to the VNFM and the NFVO



VNF Manager (VNFM)

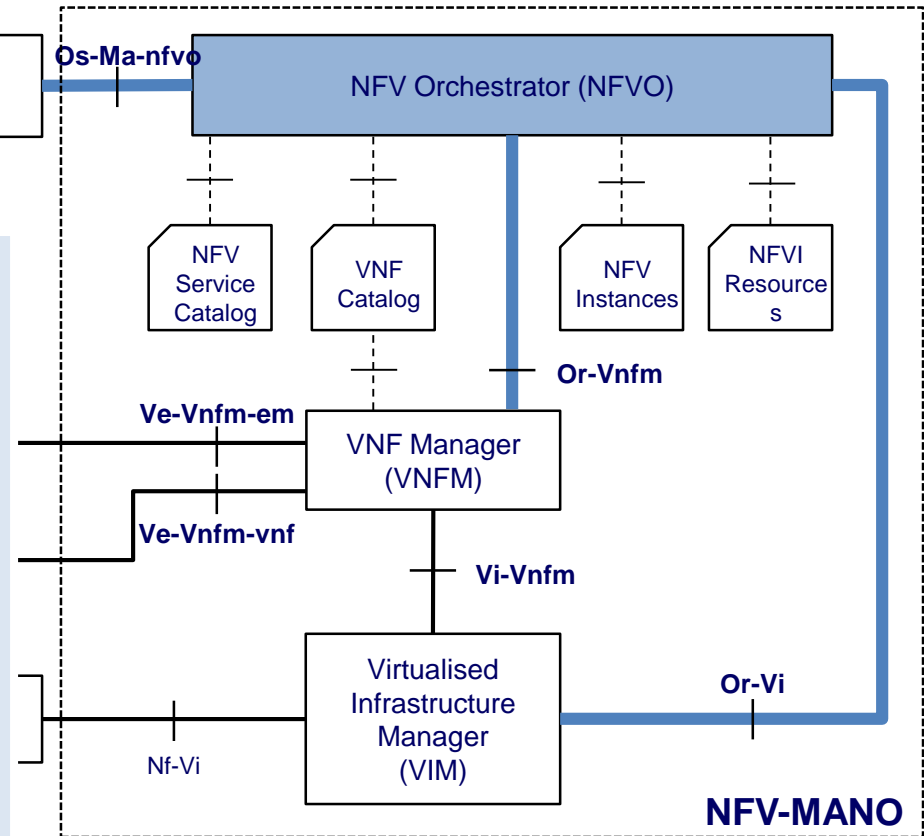
- **Manages the lifecycle of VNFs**
- **Manages virtualized resources associated to the VNF it manages via the interfaces exposed by the VIM or NFVO**
- **Exposes VNF lifecycle management interfaces/APIs to the VNF, EM and NFVO.**
- **Sends VNF lifecycle management notifications to the VNF, EM and NFVO**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

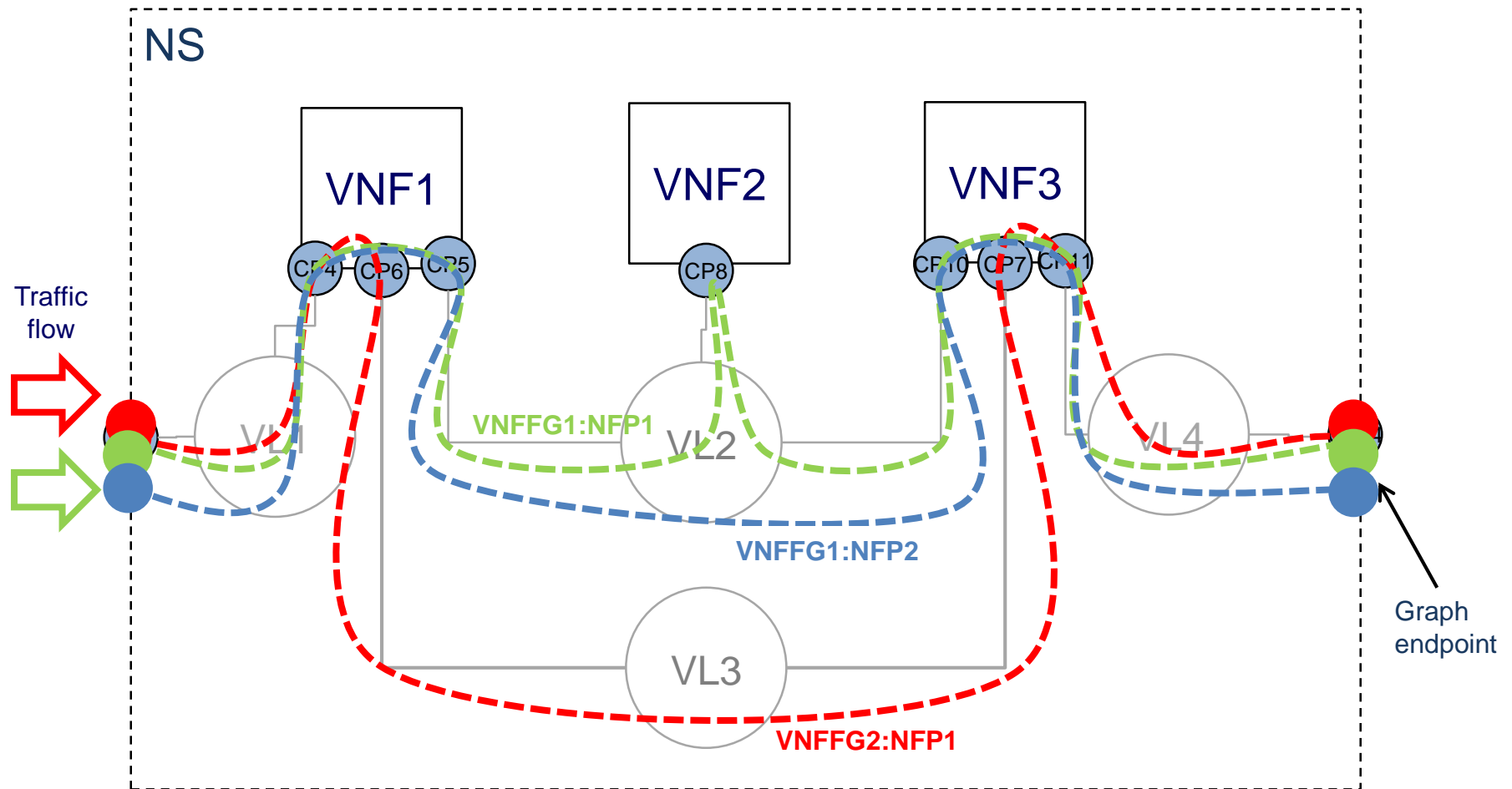




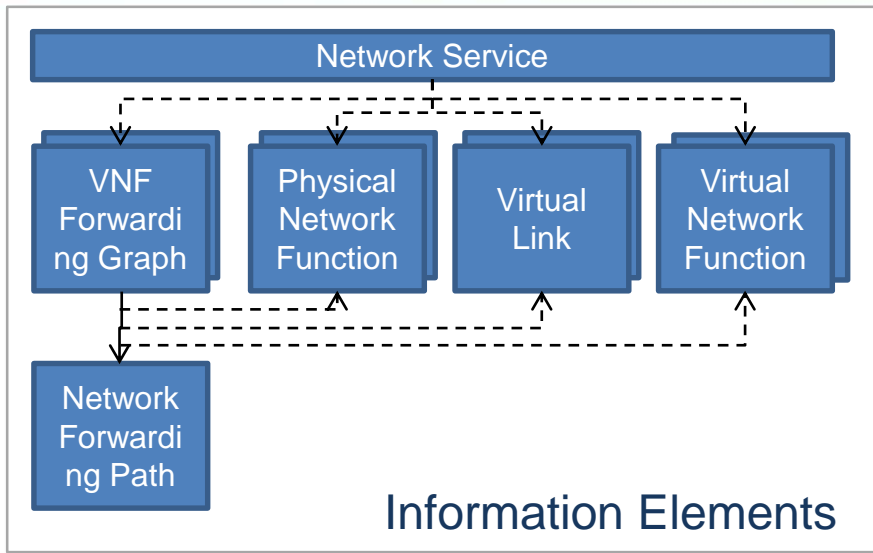
MANO INFORMATION MODEL

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

CP = connection point, VL = Virtual Link, VNFFG = VNF Forwarding Graph, NFP = Network Forwarding Path

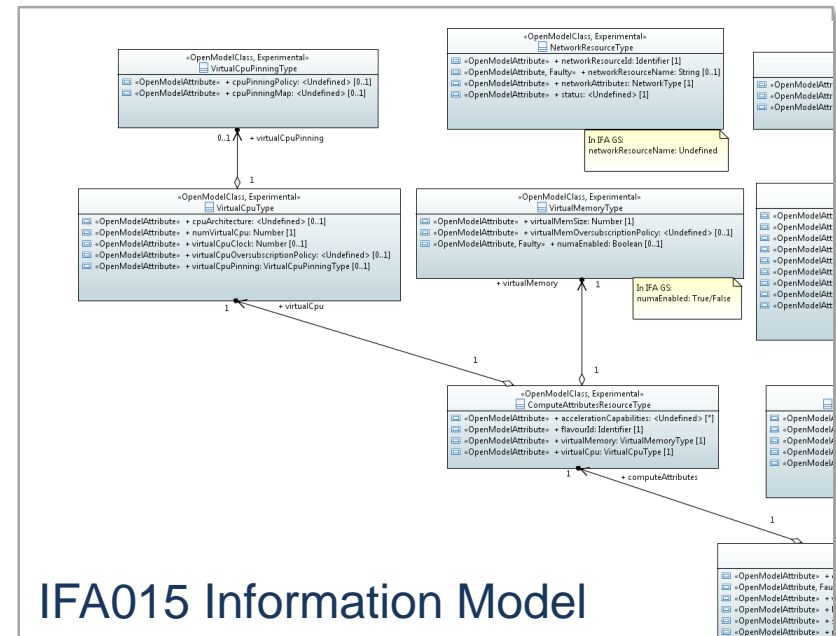


Base Information Elements



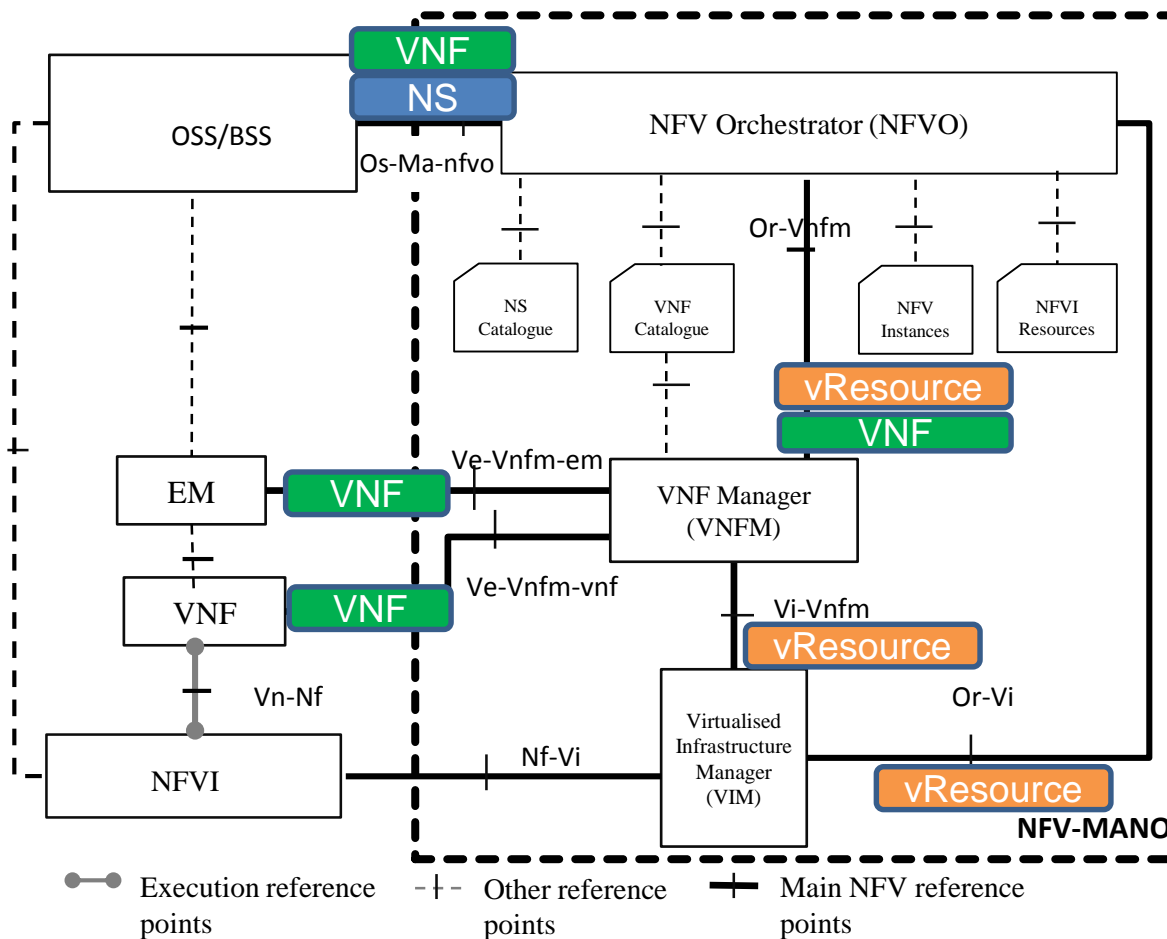
from information elements...
... to UML information model

https://docbox.etsi.org/ISG/NFV/Open/Drafts/IFA015_NFV_Information_Model



MANO REFERENCE POINTS AND INTERFACES

MANO Reference points and Interfaces



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

- ### VNF
- VNF Package Management
 - VNF Lifecycle Management
 - VNF Lifecycle Operation Granting
 - VNF Lifecycle Change Notifications
 - VNF Configuration Management
 - VNF Performance Management
 - VNF Fault Management
 - VNF Indicator

- ### Virtualised Resource
- vResource Management
 - vResource Information Management
 - vResource Quota Management
 - vResource Capacity Management
 - vResource Change Notification
 - vResource Fault Management
 - vResource Performance Mgmt.
 - vResource Reservation Mgmt.
 - NetworkForwardingPath Mgmt.
 - SW Image Management



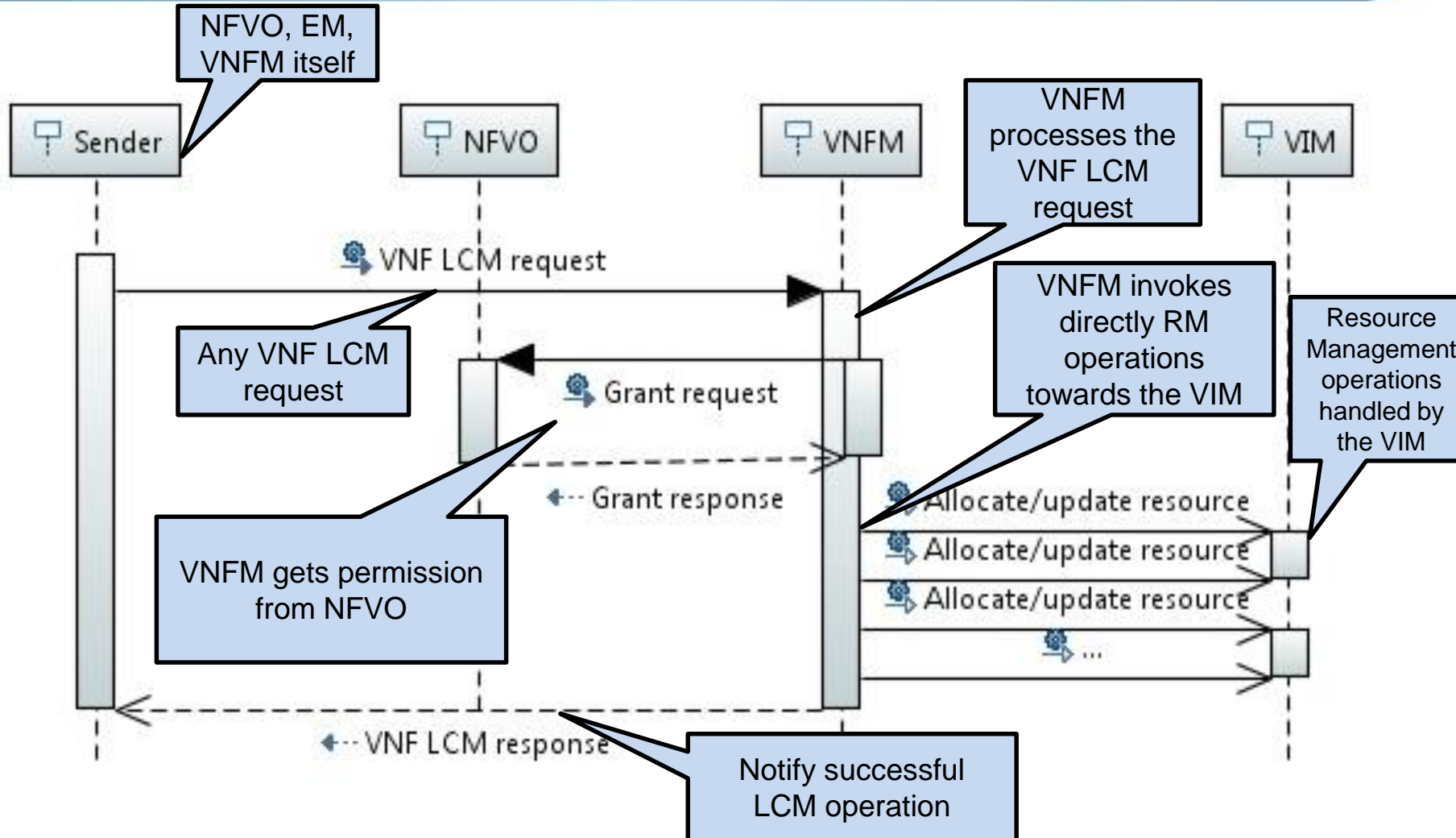
RESOURCE MANAGEMENT

Virtualised Resource

- vResource Management
- vResource Information Management
- vResource Change Notification
- vResource Fault Management
- vResource Performance Management
- vResource Reservation Management
- vResource Reservation Change Notification
- vResource Capacity Management*
- vResource Quota Management*
- Network Forwarding Path Management
- Software Image Management

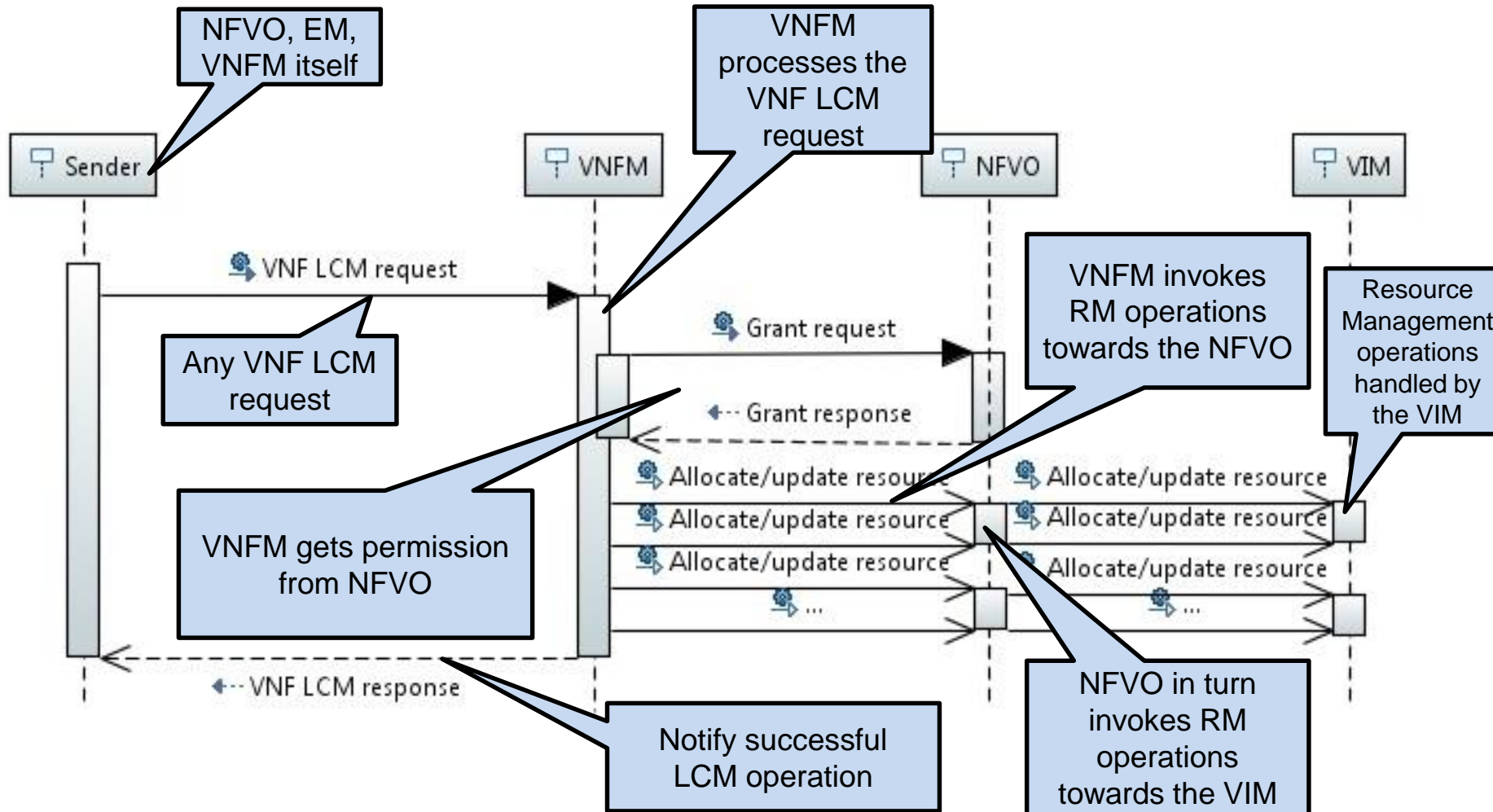
*Only applicable to Or-Vi Reference Point

VNF related resource management done by VNFM (Direct mode)



Simplified flow, focusing only on Resource Management

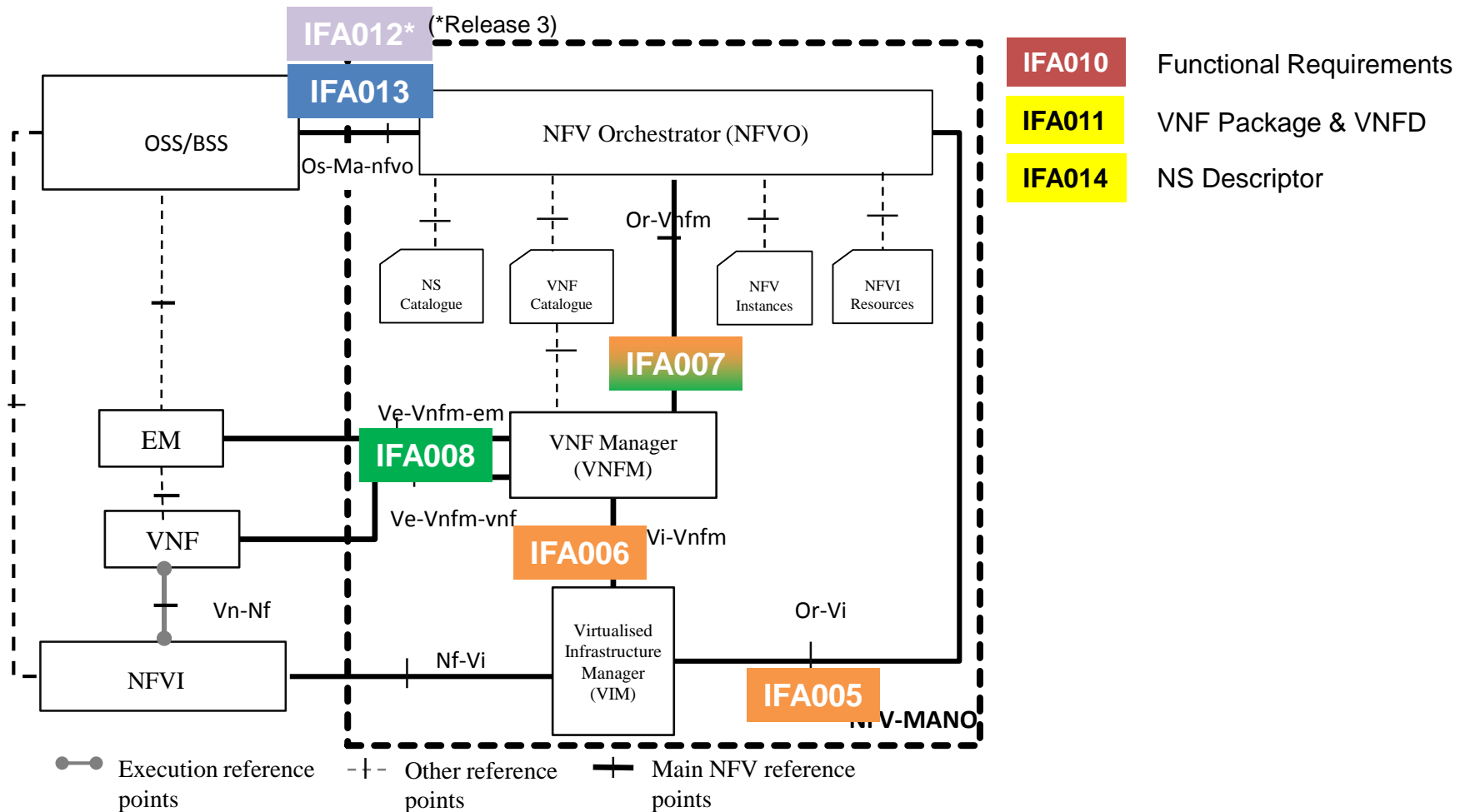
VNF related resource management done by NFVO (Indirect mode)



Simplified flow, focusing only on Resource Management

OVERVIEW OF IFA WORK ITEMS

ETSI NFV IFA WG Group Specifications



<http://docbox.etsi.org/ISG/NFV/Open/Drafts/>

<http://www.etsi.org/nfv>

http://nfvwiki.etsi.org/index.php?title=NFV_Issue_Tracker

- 🌐 IFA009 – Architectural Options
- 🌐 IFA015 – NFV Information Model
- 🌐 IFA016 – Papyrus Guidelines
- 🌐 IFA017 – UML Modeling Guidelines
- 🌐 IFA020 – NFVO Decomposition Options (Release 3)
- 🌐 IFA021 – MANO and Automated Deployment (Release 3)
- 🌐 IFA022 – Multi Site Services (Release 3)
- 🌐 IFA023 – Policy Management in MANO (Release 3)
- 🌐 IFA024 – External Touchpoints related to NFV Information Model

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<http://www.etsi.org/nfv>
http://nfvwiki.etsi.org/index.php?title=NFV_Issue_Tracker

- IFA001 –Acceleration Overview & use Cases
- IFA002 –VNF acceleration interface specifications
- IFA003 –vSwitch Requirements
- IFA004 –Acceleration Management Aspects
- IFA018 –Resource Management Acceleration
- IFA019 –Acceleration Interface

- Reminder: Next webinar coming soon
- NFV Acceleration Technology Overview and Standards Update
- 29 September 2016, 12noon EDT, 16.00 UTC, 18.00 CEST
- Speaker: Ning Zong, Principal Engineer in Network Research at Huawei Technologies and vice-chair of ETSI NFV IFA

- Register now at:
 - <https://www.brighttalk.com/webcast/12761/223025>



More information:

Drafts (Open Area) <http://docbox.etsi.org/ISG/NFV/Open/Drafts/>
Issue tracker http://nfvwiki.etsi.org/index.php?title=NFV_Issue_Tracker

NFV Technology Page (information)
<http://www.etsi.org/nfv>

NFV Portal (working area)
<http://portal.etsi.org/nfv>

NFV Proofs of Concept (information)
<http://www.etsi.org/nfv-poc>

NFV Plugtest (information & registration)
<http://www.etsi.org/nfvplugtest>

ANY
QUESTIONS
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