ETSI NFV Conference

Evolving NFV towards the Next Decade
Celebrating the 10th Anniversary of ETSI NFV

NFV Release 6
Summary of Proposals

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- Overview of proposals
- Decision process
- Reminder: Intended Schedule
- Presentation of first set of features

Overview Release 6 proposals

4 groups of proposals:

A. MANO API enhancements (5 input proposals)
Probably 1 in recommendations
   - A.5 Less imperative APIs

B. MANO Capabilities and general topics (9 input proposals)
1 feature ready, 1 small enhancement in discussion
   - B.7 Physical Infrastructure Manager
   - B.9 Latency aspects for VNF deployment

C. Infrastructure and technologies (5 input proposals)
3 features ready
   - C.1 New Infrastructure
   - C.2 New application virtualization forms
   - C.3 Deterministic communication technologies

D. Processes and structures (4 input proposals)
Will probably not create features, but changed working methods
   - D.4 Base MANO APIs on Open Source

Decision process

- Brainstorming sessions during NFV#39 and NFV#40

  Proposals were very different in level of detail and in form;
  Need more open discussion than is possible in TSC

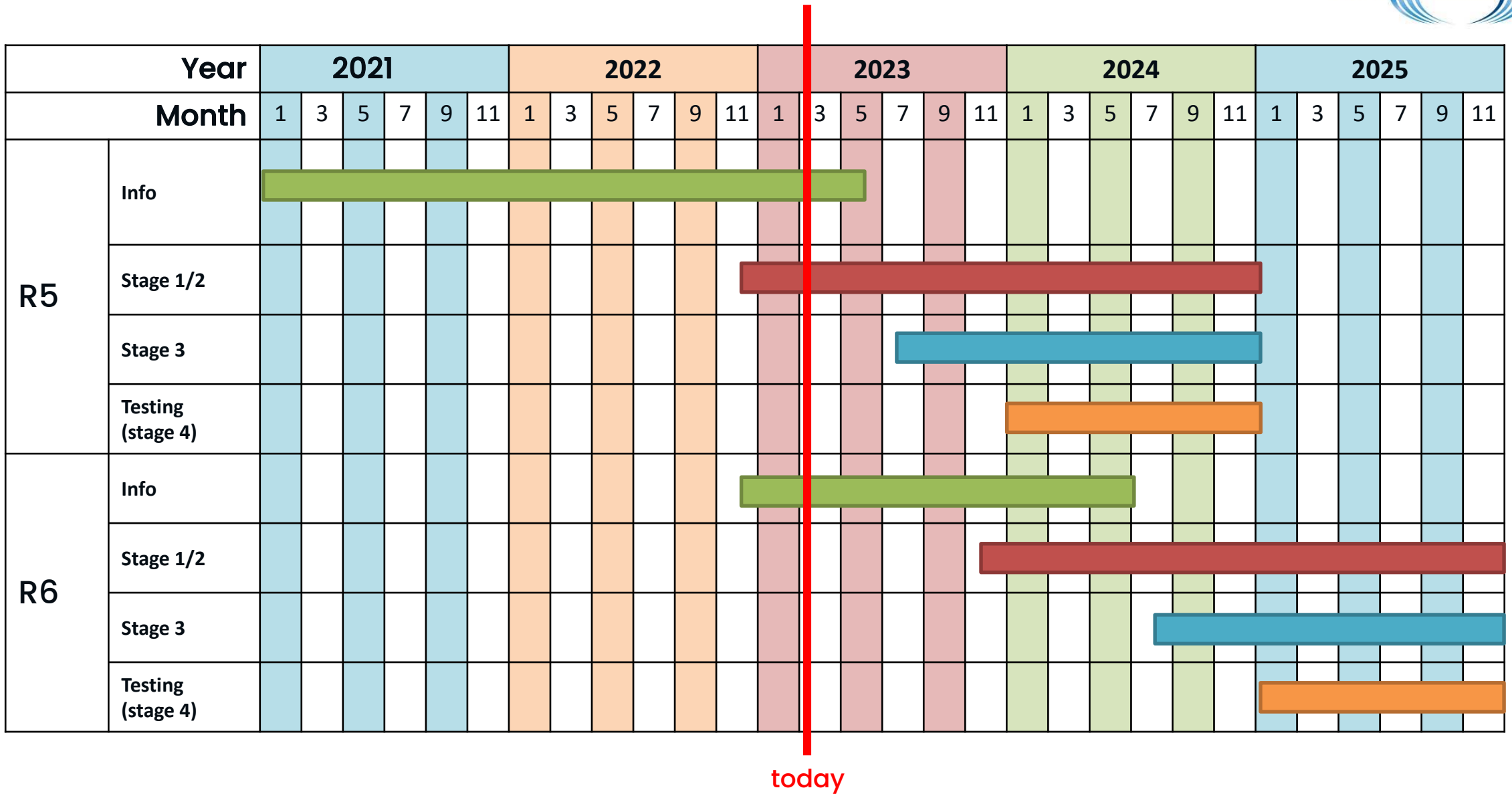
- EVE working group is tasked to improve proposals:
  - Collect more details from authors
  - Identify overlaps and merge where appropriate
  - Review feature proposal templates
  - Provide a recommendation

  Overview and current state on ETSI Etherpad:
  https://pad-private.etsi.org/mypads/?/mypads/group/isg-nfv-rel6-nl1qk3ch/pad/view/overview-proposals-331rk3dh

- TSC will approve features
  Most features will require new studies or specifications

- ISG will approve new work items derived from the features

Intended Schedule



Proposal C.1
New Infrastructure

Scope
New types of infrastructure and telecom resources, infrastructure at “new” (also extreme) locations and from providers (Hyperscalers) other than the Service Provider.

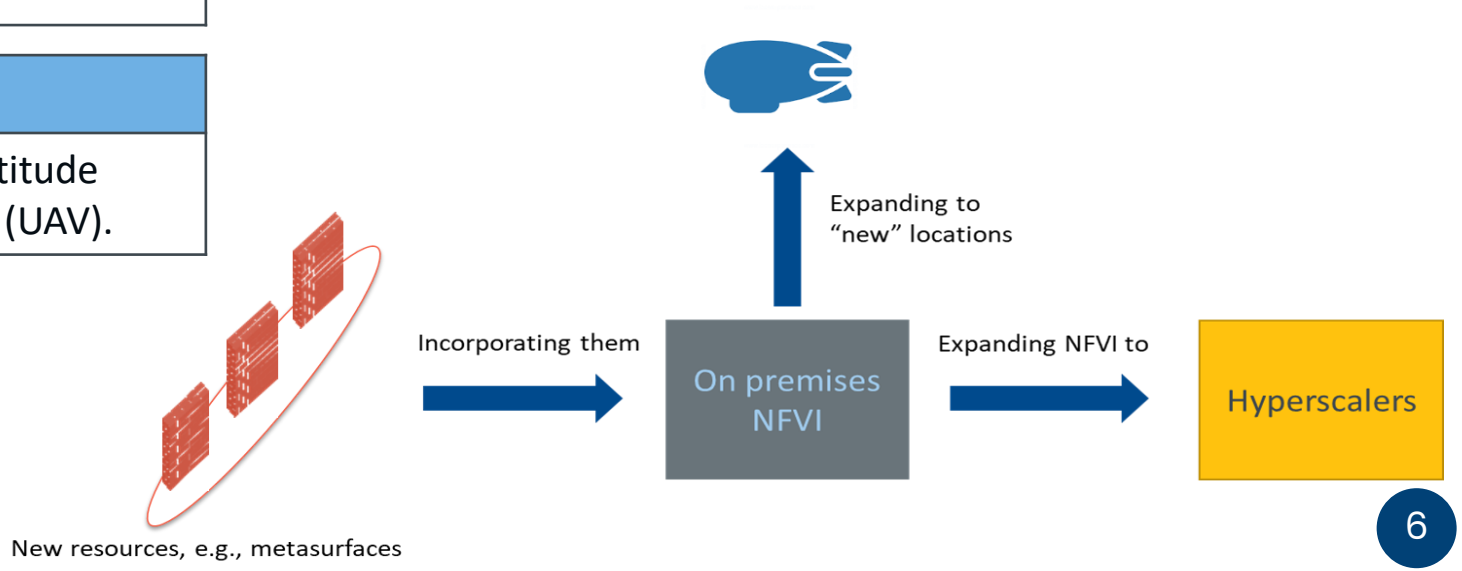
Targets
Extend virtualization scope leveraging new infrastructure technologies. Include new ways of programmability and cloud technology

Objectives
Expand infrastructure to other domains, optimal use of resource assets, improve efficiency of resources sharing and usage, delivery new services to consumers.

Challenges
Accessability, high distribution, interoperability, security

Examples
Non-terrestrial-networks (NTN) making use of high-altitude platform stations (HAPS) or unmanned aerial vehicles (UAV).

Status
Feature proposal endorsed by EVE NFV(22)000165r1



Proposal C.2
New application virtualization forms

Scope
New forms of application virtualization and cloudification.

Targets
Extend virtualization scope and capability of resource sharing Include new ways of programmability and cloud technology

Objectives
Increase programmability, decoupling of software from infrastructure, further shortening development and testing efficiency, .

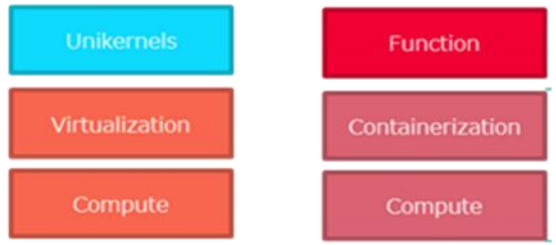
Challenges
Complex architectural aspects

Examples
Unikernels, such as clickOS, MirageOS. Serverless / Function-as-a-Service (FaaS) In-kernel VMs, such as extended Berkeley Packet Filter (eBPF)

Status
Feature proposal endorsed by EVE NFV(22)000166

Current forms of virtualization/cloudification

Additional new forms of virtualization/cloudification



Proposal C.3
Deterministic communication technologies

Scope
Deterministic communication technologies injected and applied to NFV-based deployments.

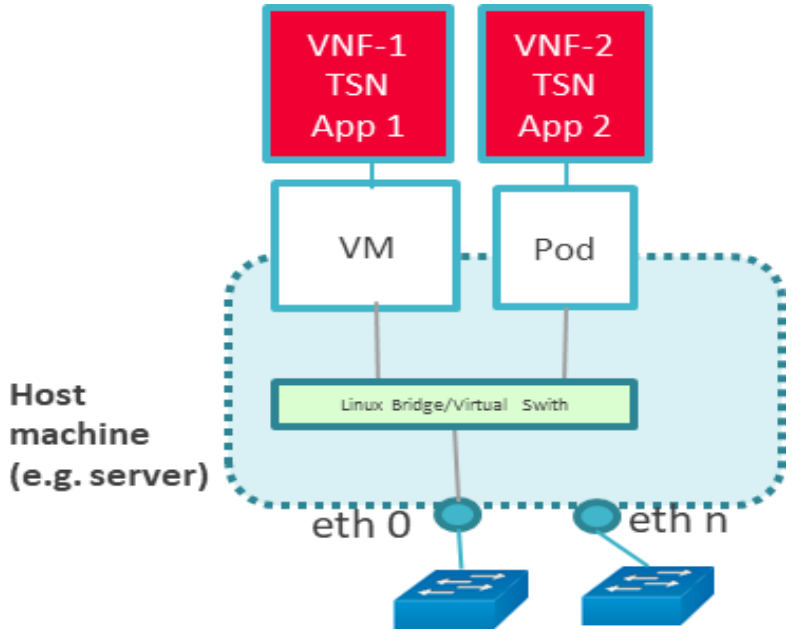
Objectives
Providing common precision time synchronization, capability to deploy time-sensitive/deterministic communication aware VNF, toward the realization of deterministic communication needed in domains such as RAN.

Examples
IEEE TSN (Time Sensitive Networking), IETF Detnet Connectivity requirements in vRAN

Status
Review ongoing in EVE NFV(22)000167

Targets
Improve connectivity for new service. Address QoS (latency, jitter) requirements

Challenges
MANO of TSN technoloty in NFVI, Implications on VNFs



Proposal B.7 (1/2)
Physical Infrastructure Manager (PIM)

Scope
Extend scope of NFV to include hardware management. Support LCM and FCAPS for consumers of bare-metal resources (compute, storage and network).

Objectives
Provide common solution for NFV consumers using de-facto solutions like DTMF Redfish, Openstack Ironic, metal[3] Align with requirements in Anuket RM, GSMA OPG SBI-CR

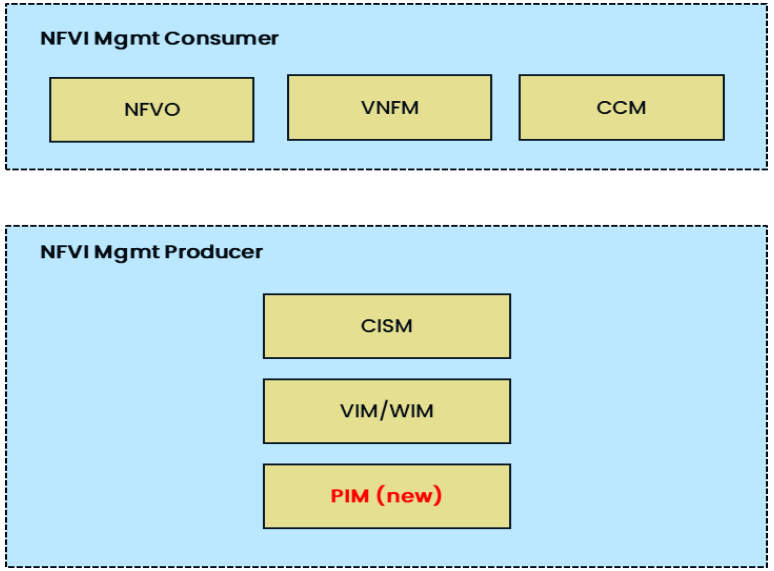
Examples
CCM southbound, Energy-saving, NFV-supported vRAN

Status
Feature proposal endorsed by EVE NFV(22)000255r2

May be advanced to Release 5

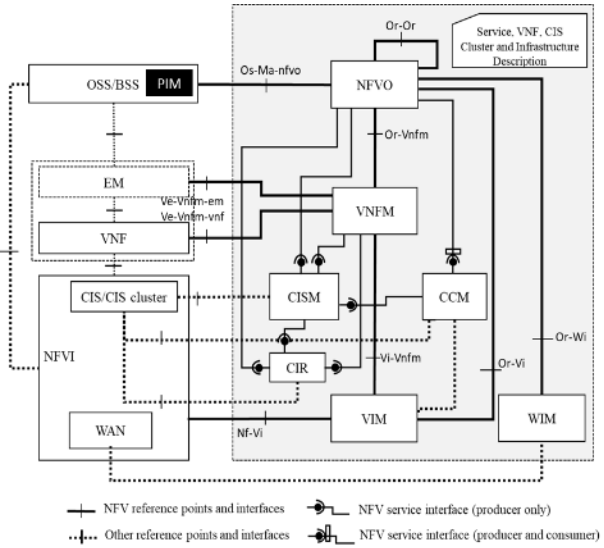
Targets
Profile Reference-point/API definition for de facto standards

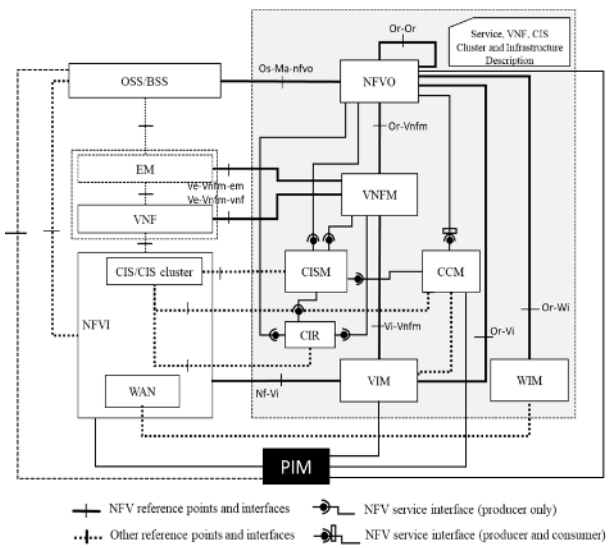
Challenges
Heterogenous hardware, variety of GPU/NPU, acceleration hardware, like Smart NICs, Architectural implications, Reliability and Security support

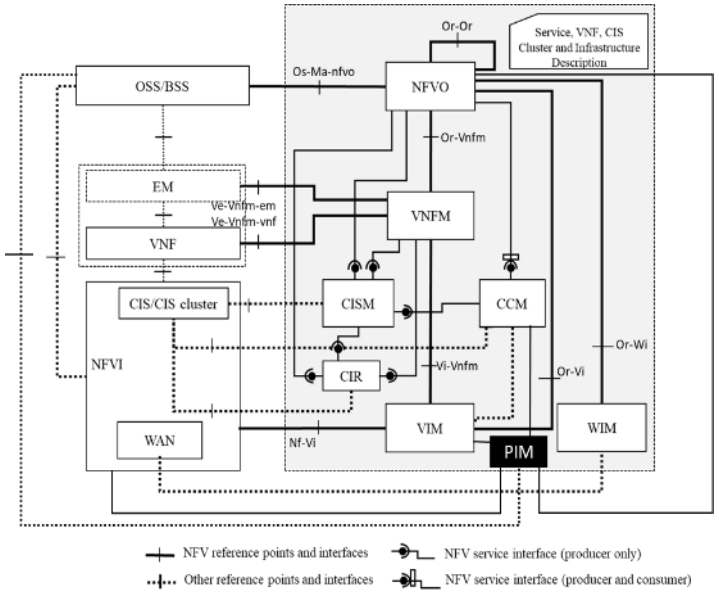


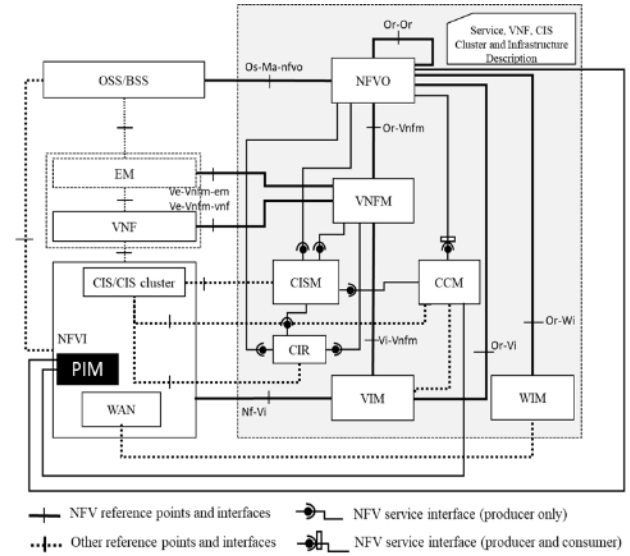
Proposal B.7 (2/2)
Physical Infrastructure Manager (PIM) Architectural Options

Option 1	Option 2	Option 3	Option 4
PIM as part of OSS	PIM outside OSS and MANO	PIM as part of NFV-MANO	PIM as part of NFVI









Proposal B.9
Latency aspects for VNF deployment

Scope
Improve QoS support by supporting end-to-end latency requirements

Objectives
Better support ETSI ISG MEC and other use cases with high QoS aspect.

Examples
Gaming, V2X use cases

Status
Discussion ongoing in EVE (NFVEVE(23)000015) Parts to merge into C.3, rest may be a small enhancement

Targets
Better alignment with ETSI ISG MEC Improve QoS

Challenges
End-to End view not well covered in NFV In relation to C.3: Not all network resources will support deterministic networks

Proposal D.4
Base MANO APIs on Open Source

Scope
Proposal to change specification process in stage 3 and generate normative specifications from code (preferably open source de-facto standard).

Idea
Create stage 3 specifications mainly from coded APIs, using tools, input can be existing APIs from de-facto standards In case of gaps, ISG NFV should first create coded APIs, and then specifications using tools To reduce overlap, stage 2 normative work can be simplified (reduce level of details, e.g. for model and parameter description)

Status
Drafting call Discussion ongoing in EVE

Background
Use result of IFA051 „Report on VNF management gap analysis with open source projects“. Details on WI in Annex; good progress since then.

Objectives
Faster process. Use tools for document creation

Challenges
Change of process requires careful planning and probably a pilot as well as a transition planning

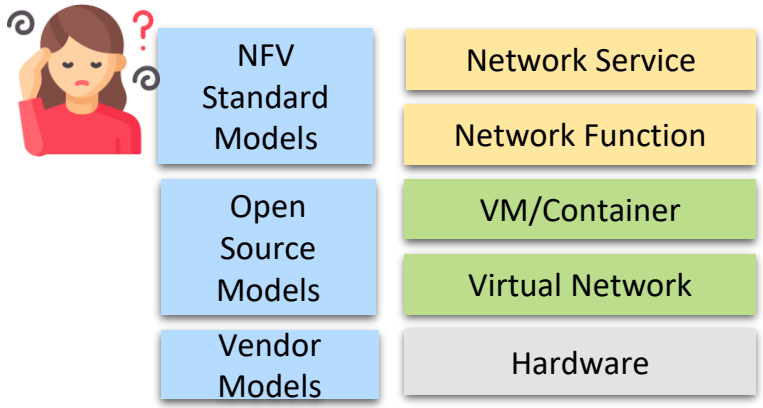
Proposal A.5
Less imperative APIs

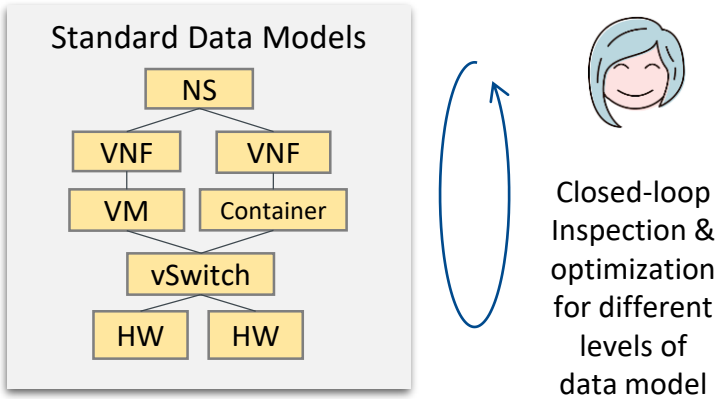
Scope
Improve NFV API structure by providing declarative intent driven APIs and unified data models.

Objectives
Simplifying the interaction by mapping intent into MANO APIs. Declarative API: Tell your network what desired status is, instead of how to achieve it command by command. Unified data models help visualizing/simplifying networks.

Nowadays

Scatted Data Model & Data Sources





Status
At the beginning

Future

Unified Data Models:
Programmable and Inter-operable

Conclusion

- A first set of features is ready to be approved in the TSC.
- First study work items can be started.
- Additional features for release 6 are still welcome.

Thank you for your attention

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