Introduction of ETSI ISG NFV

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ITU Headquarters, Geneva, Switzerland

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Outline

- Introduction to NFV: NFV concepts and architecture
- ETSI NFV working methods and Releases

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NFV concepts

Network Functions Virtualization (NFV) is about

- Decoupling network functions functionality from infrastructure and relocating the network functions from dedicated appliances to pools of resources leveraging commodity-of-the-shelf (COTS) hardware.
- "Softwarization" of the network enabling automation of deployment and operations.

Enablers

- General purpose processor (GPP) advances enabling COTS.
- Compute, storage and network virtualization technologies.
- Cloud computing.
- Artificial intelligence/machine learning, policy management, etc.
- Model-driven management, etc.

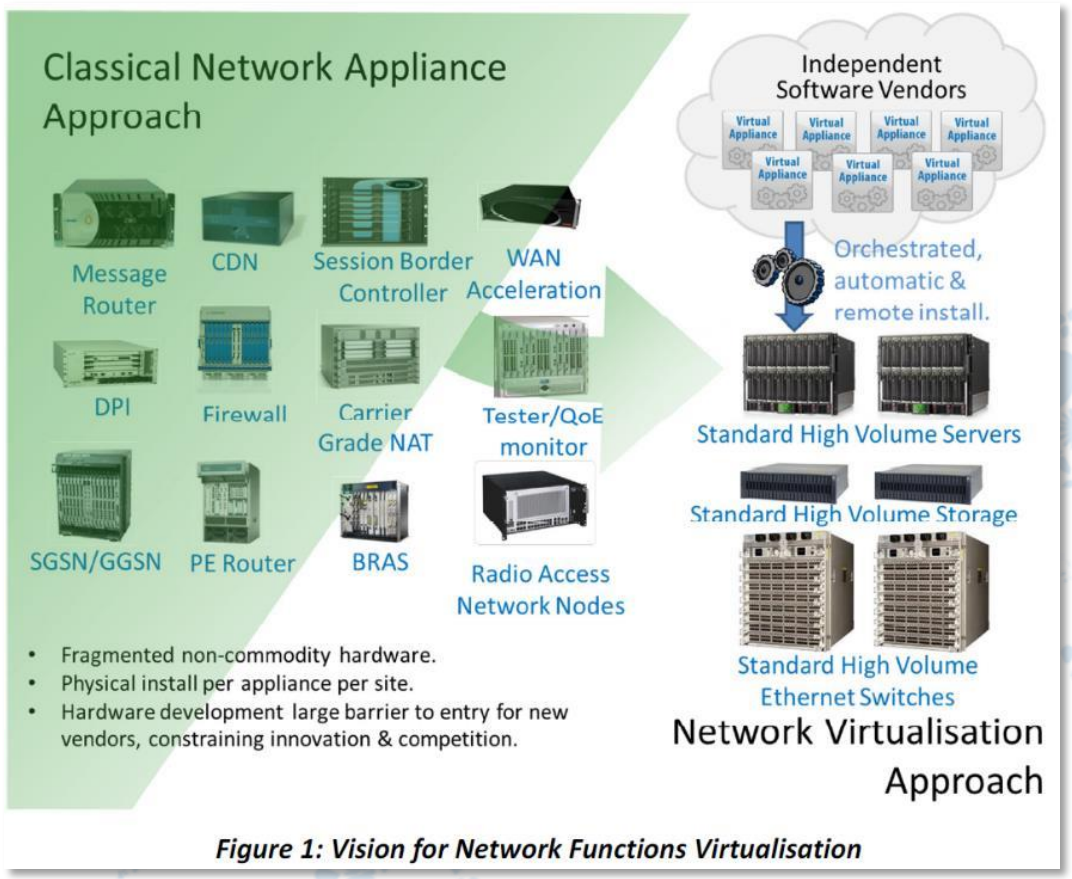

Figure 1: Vision for Network Functions Virtualisation

Source : "Network Functions Virtualisation" white paper [Online: https://docbox.etsi.org/ISG/NFV/Open/Publications_pdf/White%20Papers/NFV_White_Paper1_2012.pdf]

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NFV journey with partners and communities

NFV ZSM

NFV MEC

Home of
NFV

NFV ISG

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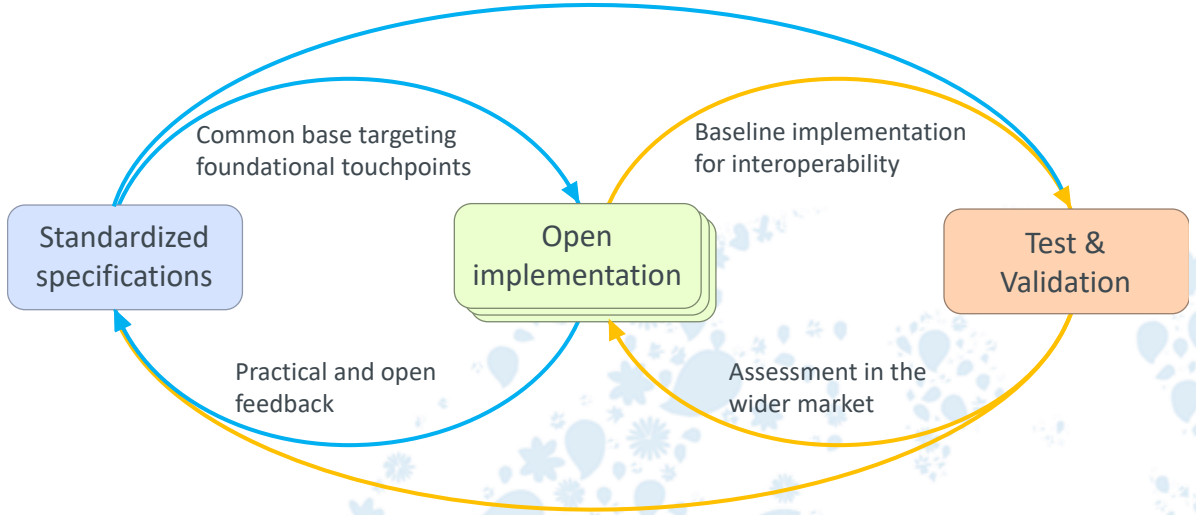
NFV in the network transformation landscape: what can ETSI NFV offer you

A unified architectural framework enabling an open ecosystem where virtualised network functions can be

- Lifecycle-managed by independently developed management and orchestration systems
- Hosted on independently deployed and operated NFV infrastructure platforms,
  - multiple virtualisation technologies
  - resources distributed across various locations (e.g. centralised data centres, edge clouds, end user premises, etc.)
- Dynamically composed into network services and function chains



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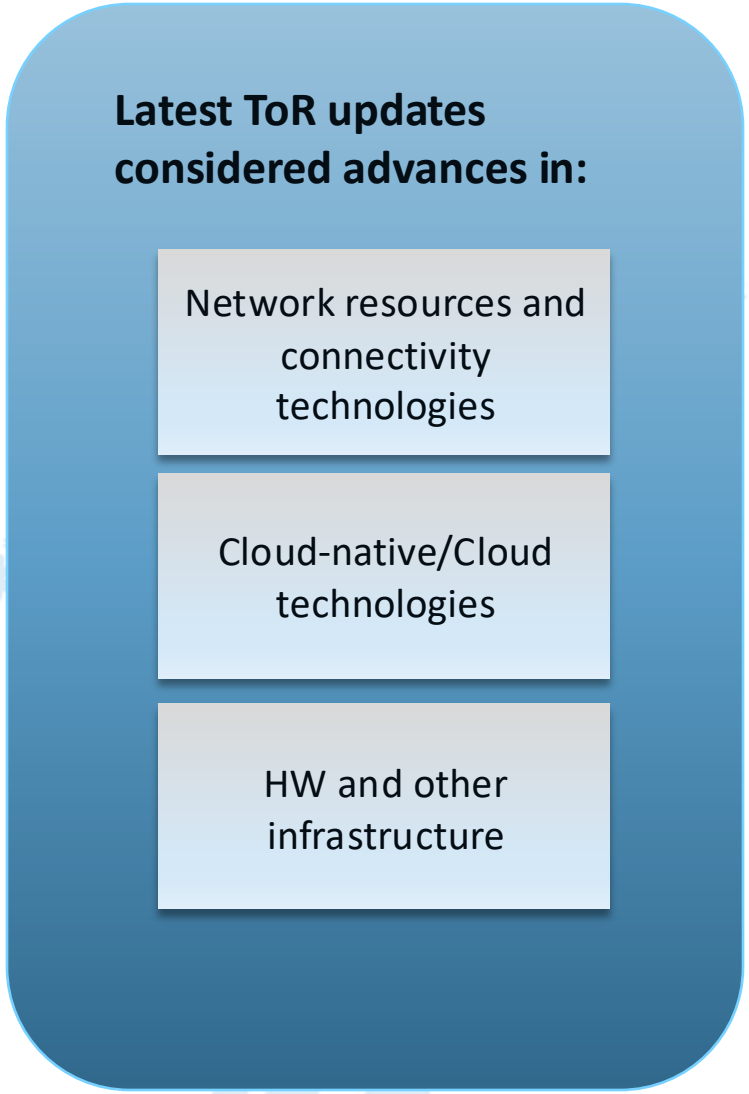
ETSI NFV key areas of activity

Based on the Terms of Reference (ToR) of the ETSI NFV (last updated Dec. 8, 2022):

- Resource virtualization (storage, compute, network),
- Hardware and software acceleration,
- Network slicing,
- Management and orchestration,
- Performance, reliability and resiliency,
- Security, trust, attestation, and regulation,
- Testing, benchmarking, CI/CD processes, and
- Architecture, interfaces, information modeling, protocols, API and data modeling.



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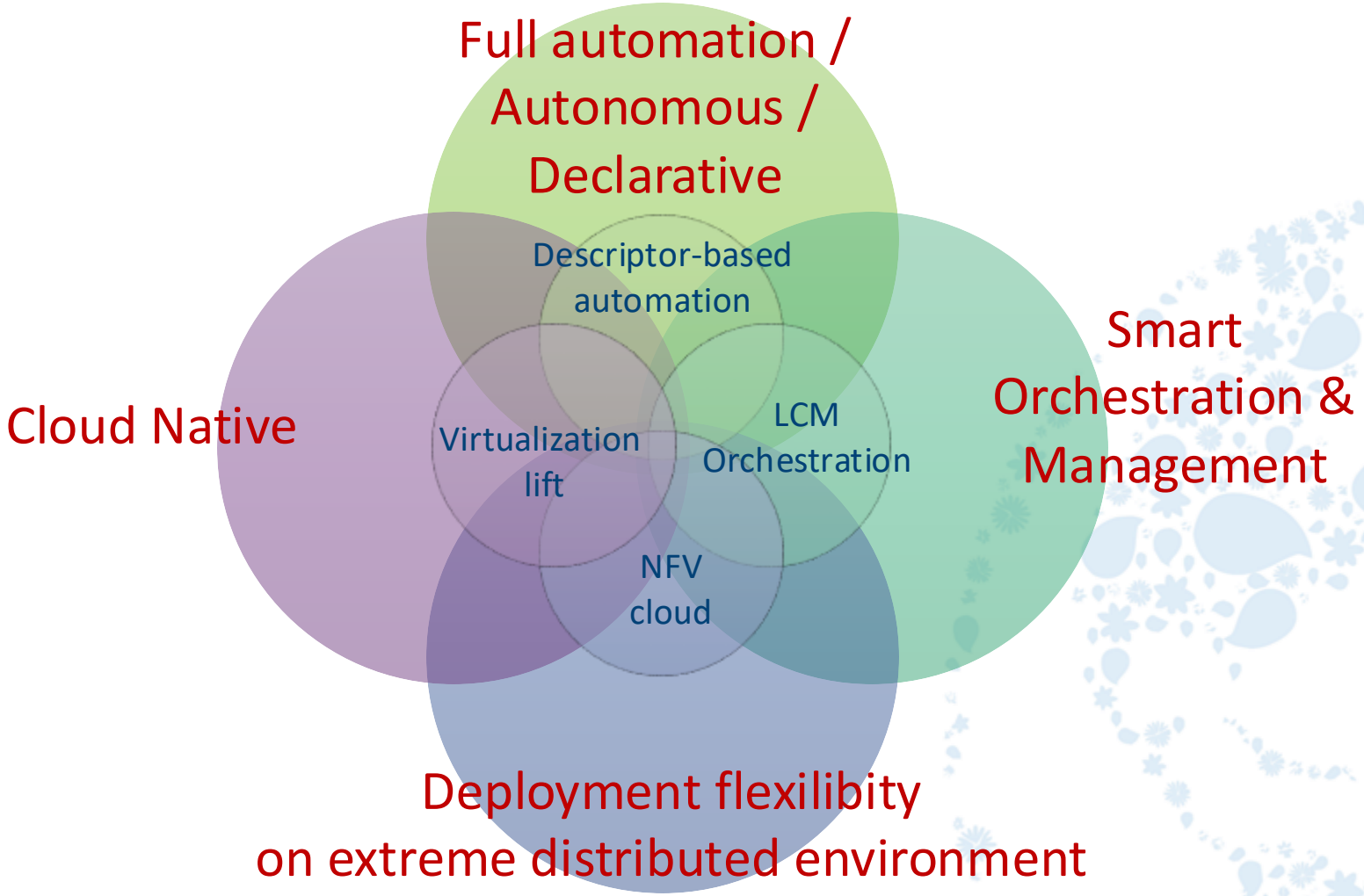
NFV is key to realize network transformation



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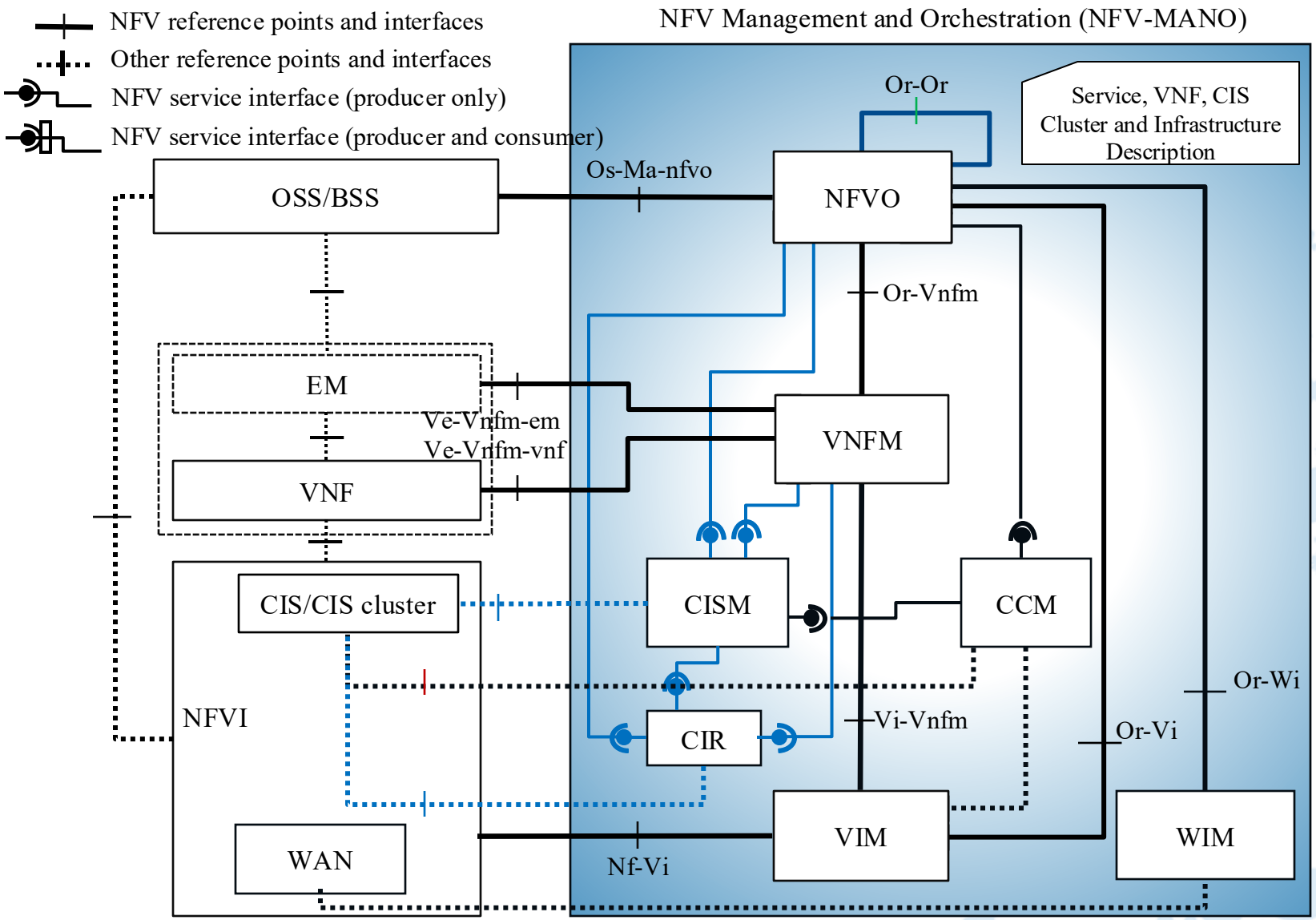
NFV after 10 years: Reference Architecture (Release 5)



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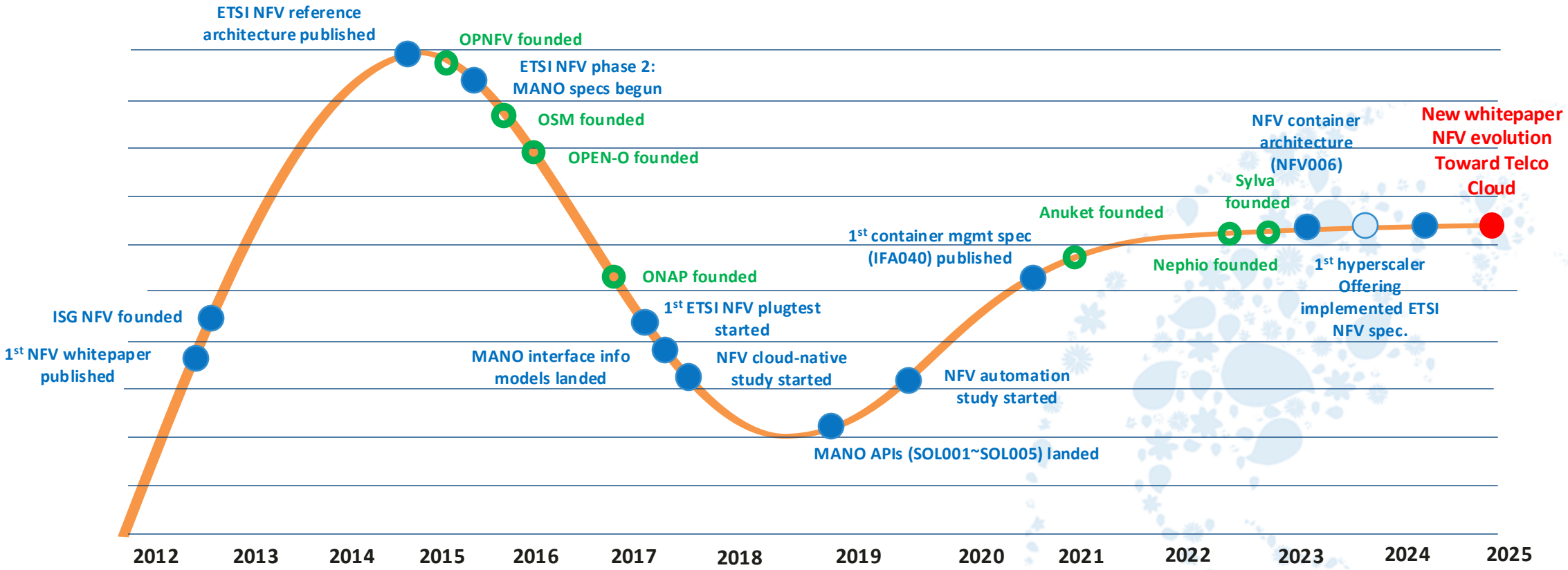
Major Milestones of NFV



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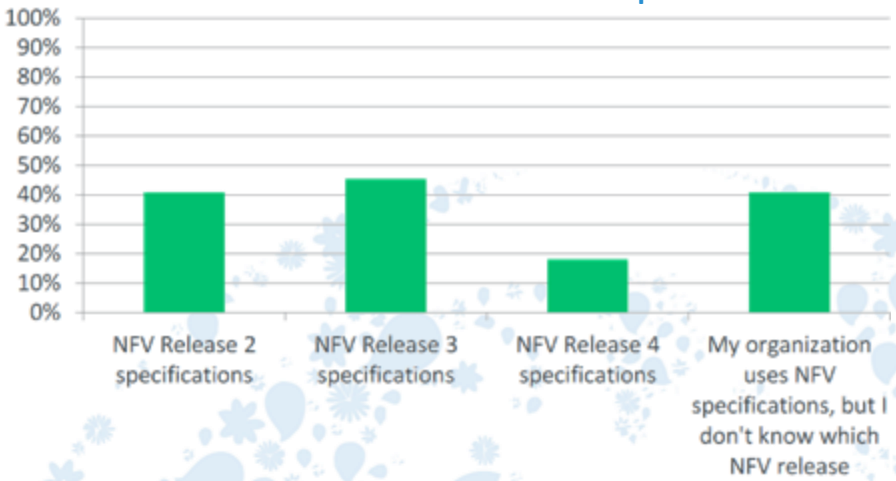
Adoption of NFV (survey in September 2021)

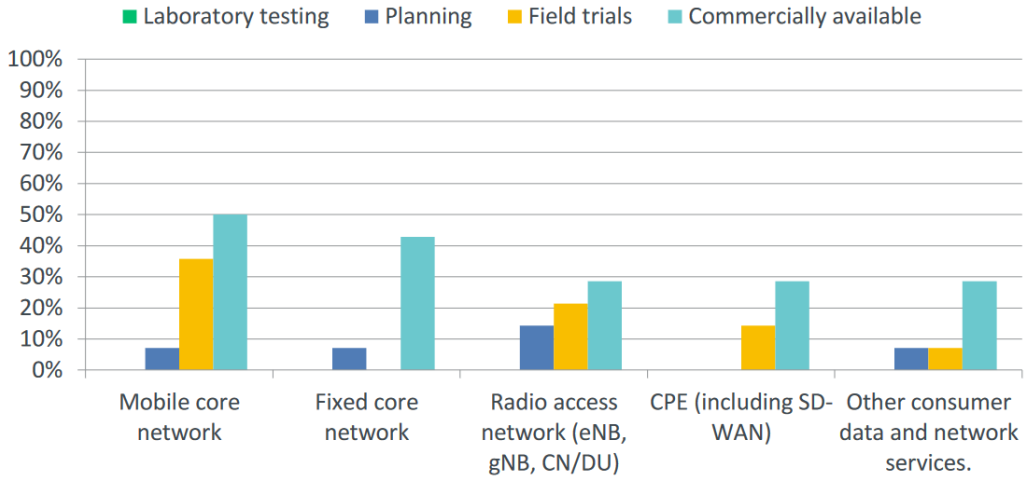
NFV commercial deployments exist in all network domains, most in mobile/fixed core and radio access networks.

- Higher-than-expected results in avoiding vendor lock-in, fast failover of service, automation and speeding up service deployment.
- Specifications from all developed NFV Releases are being leveraged.

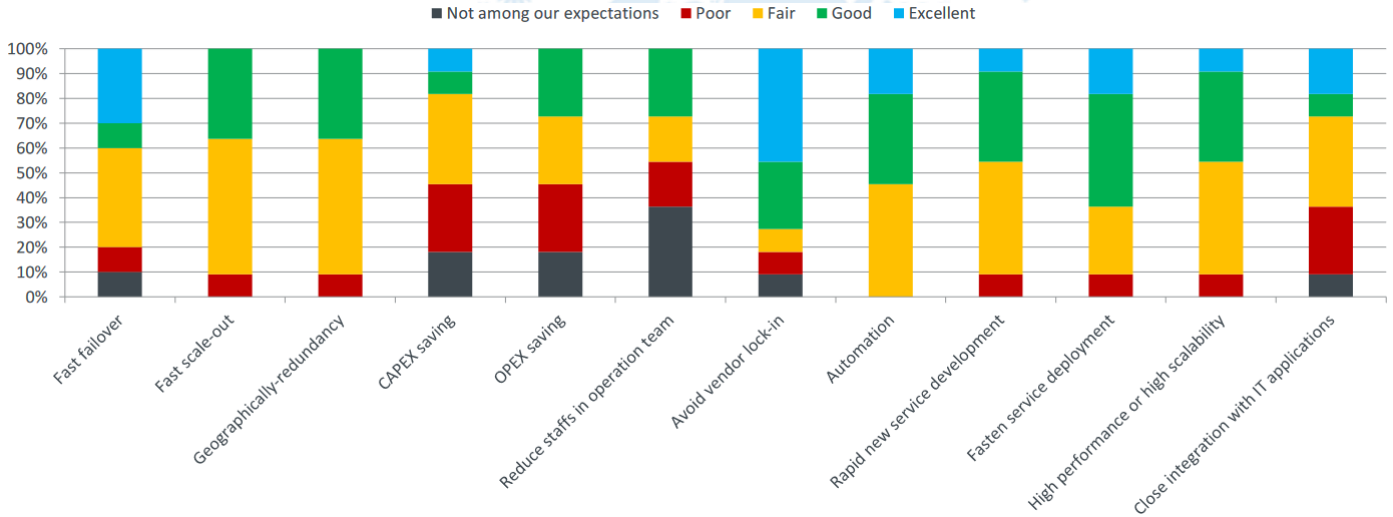
NFV Releases adoption



Deployments in network service providers



Expectations achieved by network service providers



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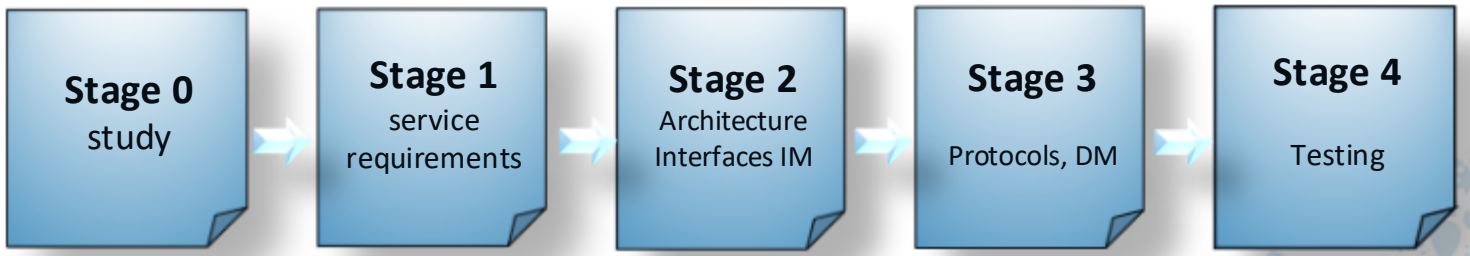
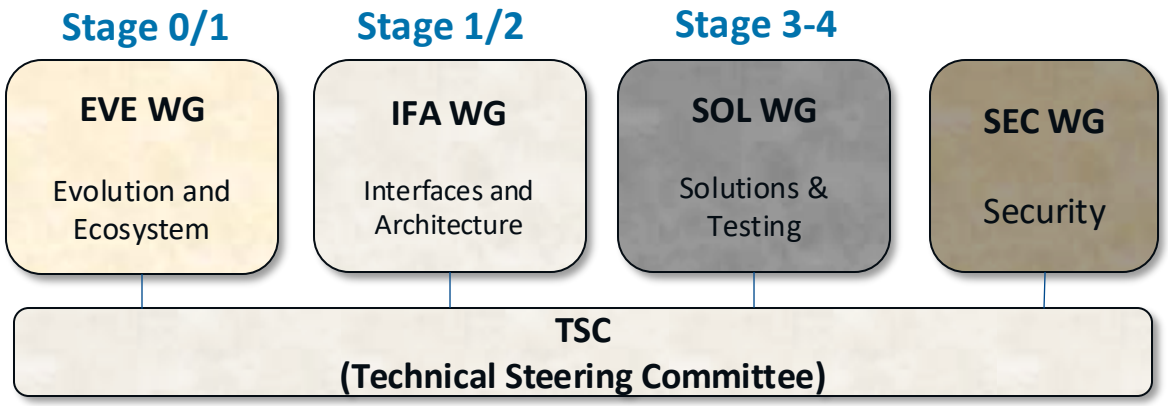
ETSI NFV: overview of the ISG

ETSI NFV follows (practically) a staged specification approach in the development of the standards:



ETSI NFV is comprised of the following working groups:



ETSI ISG NFV Specifications

Deliverables are named as "ETSI GS/GR NFV[-WG] YYY"

- NFV-EVE: produced by the EVE WG
- NFV-IFA: produced by the IFA WG
- NFV-SOL: produced by the SOL WG
- NFV-SEC: produced by the SEC WG

GS: Group Specification. It includes normative provisions.
GR: Group Report. It includes informative descriptions.
YYY: A number that identifies a specific deliverable.

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Today ETSI NFV Releases

Release 1

- Focus: the feasibility of NFV.
- Delivered the baseline studies and specifications.
- Set the NFV Architecture:
  - Infrastructure (NFVI),
  - 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

- Focus: interoperability of NFV solutions.
- Details requirements and specification of interfaces and descriptors.
- Realizes the interoperability of solutions based on the NFV Architecture, detailing
  - VNF Package and VNF and NS Descriptors,
  - Acceleration,
  - Internal and external NFV-MANO interfaces.

Release 3

- Focus: feature enriching the NFV Architectural Framework, readying NFV for deployment and operation.
- Interfaces, modeling, etc. to support new features such as (not exhaustive list):
  - **Policy framework,**
  - VNF snapshot,
  - NFV-MANO management,
  - Multi-site,
  - Cloud-native, etc.

Release 4

- Focus: orchestration, cloudification and simplification of network deployment and operations.
- Interfaces, modeling, etc. to support new features such as (not exhaustive list):
  - Container-based deployments,
  - Further 5G support,
  - **Autonomous management and automation,**
  - Generic OAM functions, etc.

Release 5

- Focus: consolidation and ecosystem.
- Interfaces, modeling, etc. to extend current features and new features such as (not exhaustive list):
  - VNF configuration,
  - **Green NFV,**
  - NFV for vRAN,
  - Flexible VNF deployments,
  - Service-based architecture concepts,
  - Cloud-native VNF reliability, etc.

Release 6

- Focus: **new architecture and infrastructure**
- Interfaces, modeling, etc. to extend current features and new features such as (not exhaustive list):
  - Architecture evolution and simplification
  - New infrastructure
  - New virtualization forms
  - Latency aspects

Specification stages state	Release 1	Release 2	Release 3	Release 4	Release 5	Release 6
Study work	Closed	Closed	Closed	Closed	Open	Open
Stage 1/2	Closed	Closed	Closed	Closed	Open	Open
Stage 3	Closed	Closed	Closed	Closed	Open	Not started

Standards, industry challenges, and way forward

Collaboration in standards is key

- It is perceived that other organizations and ETSI NFV have several common activites.
- To achieve consistency between other organizations and ETSI NFV standardization, vendor and network operator implementation, selection and discussion based on existing standards are efficient methods.

Challenges

- Understand the scope of each SDO and open source project related to virtualization and cloudification of telecom networks.
- Identify common working areas.

Way forward

- Establish collaboration to discuss and align common use cases and requirements.
- Evaluate gap analysis study work done by each SDO and open source project.
- Determine reusable specifications from preceding standards and identify working areas for collaboration.

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Where to find further information

NFV Bits on YouTube:
https://www.youtube.com/user/ETSIstandards

ETSI NFV drafts and Releases documentation:
https://docbox.etsi.org/ISG/NFV/Open/

ETSI NFV published standards:
https://www.etsi.org/committee/1427-nfv

ETSI NFV blog:
https://www.etsi.org/newsroom/blogs/blog-nfv

ETSI NFV webpage:
https://www.etsi.org/technologies/nfv

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Thank you for your attention

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Any further questions?

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