

# Multi-domain Network Virtualization

draft-bernardos-nfvrg-multidomain-00

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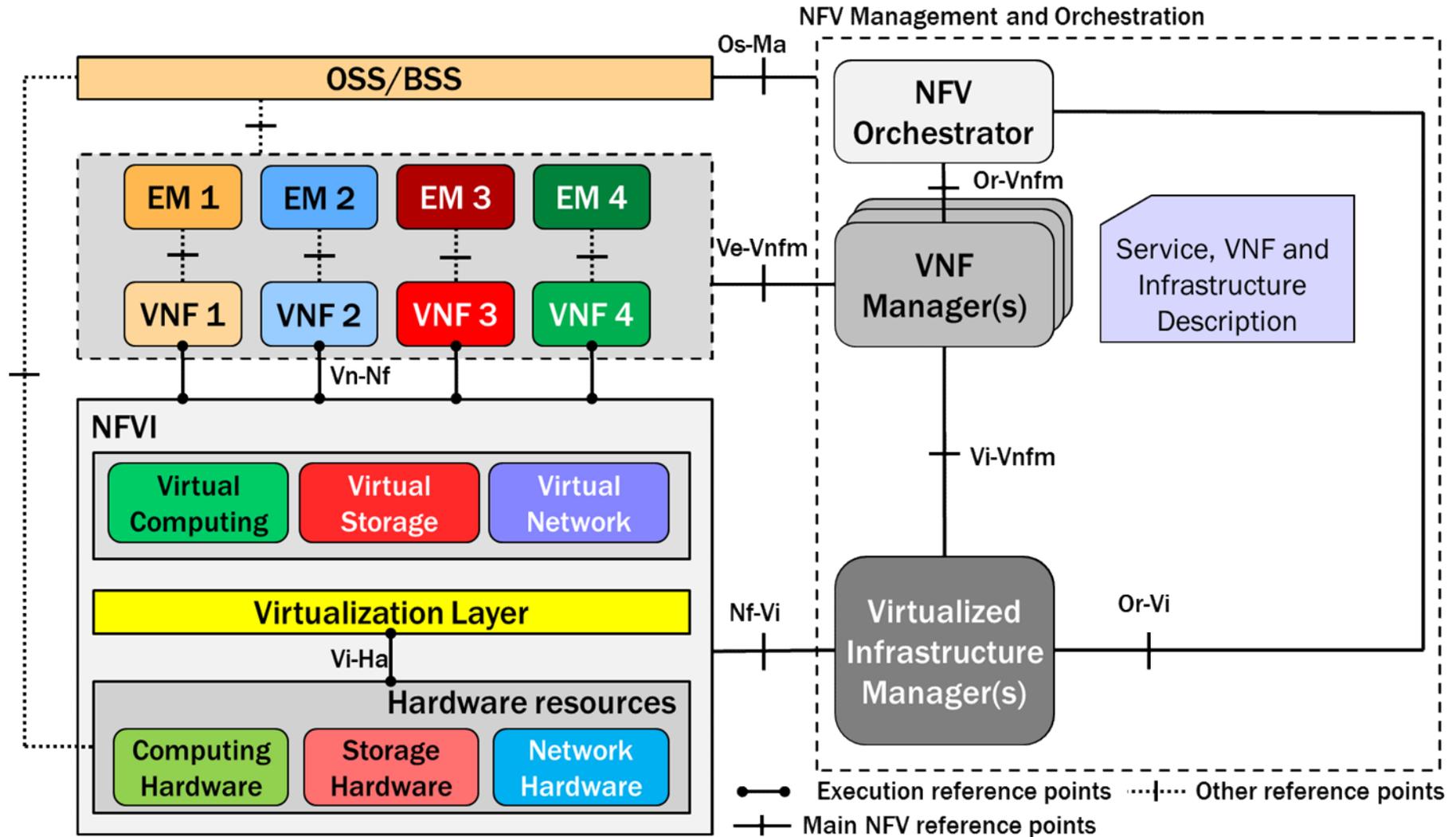
Róbert Szabó  
*Ericsson Research*

Berlin, NFV RG, July 2016

# Rationale

- Network Function Virtualization has not been yet addressed in scenarios where multiple administrative domains are involved
  - Pure infrastructure scenario: usage of network, computing and storage resources of different administrative domains
  - More complex scenario: Operation of network functions instantiated in different administrative domains
- Goal: to permit programmability, flexibility and automation, but also agile contracting of services (including VNFs)
  - Significant reduction of the time for provision when invoking and settling of services exceeding the border of a single administrative domain

# NFV reference framework

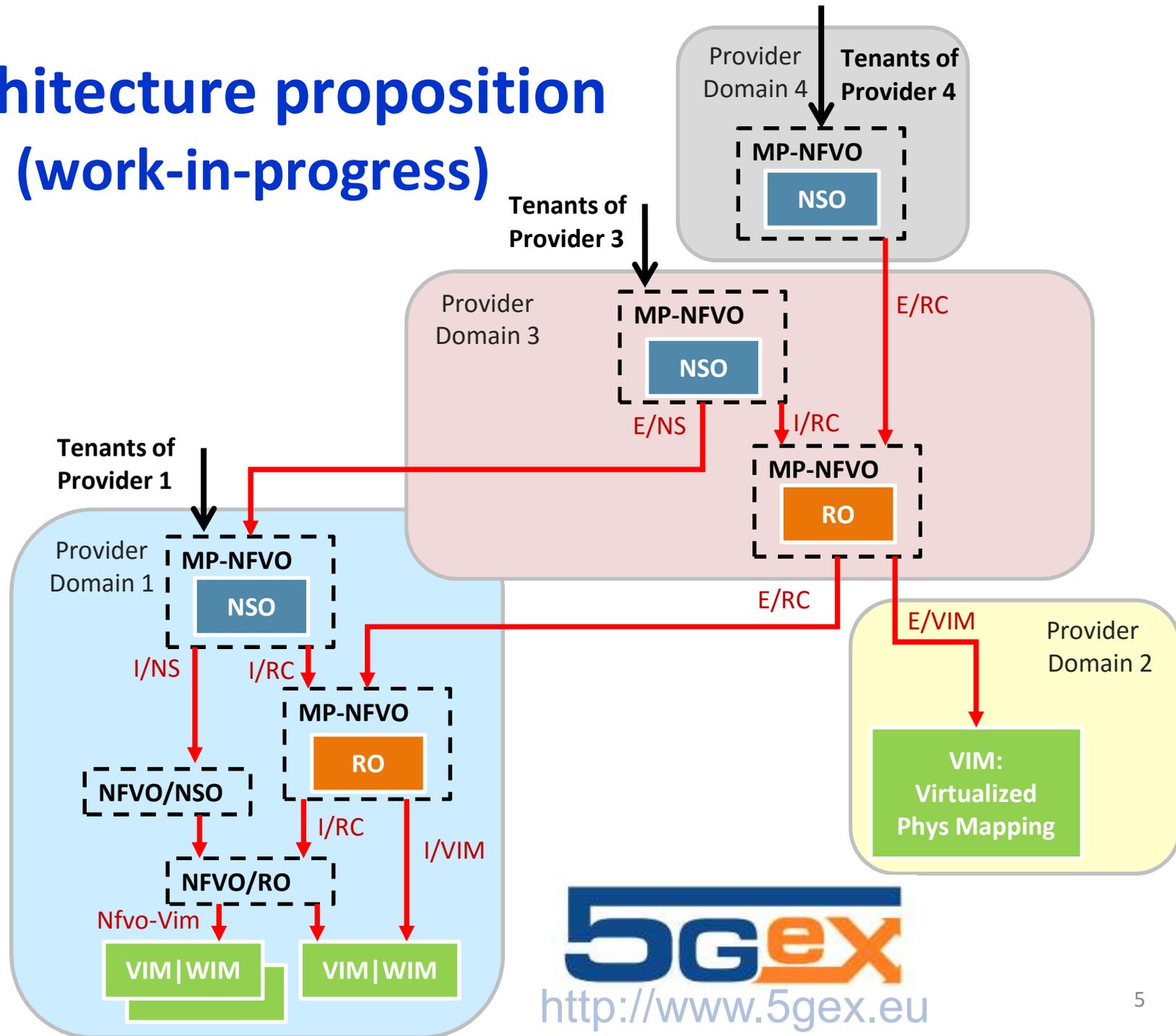


- Multi-domain interfaces not present in original ETSI NFV architecture

# Multi-domain Problem Statement

- Availability of different infrastructure environments pertaining to distinct administrative domains
  - In consequence, being operated and managed by distinct providers
  - Going beyond infrastructure by exploiting VNFaaS
- There are no established mechanisms for providing access to multi-domain environments in an standardized way
  - E.g., to facilitate portability of VNFs among NFVI PoPs independently of the owner of such infrastructure

# Architecture proposition (work-in-progress)



## Next steps

- Keep working and improving the draft
  - Gap analysis considering latest developments in ETSI NFV -> identifying missing pieces
  - Include evolved architectural proposals from 5GEx and other relevant efforts
- Implement concepts and obtain early experimental results (from 5GEx project)
  - To be released as Open Source implementation
- Gather feedback from the group

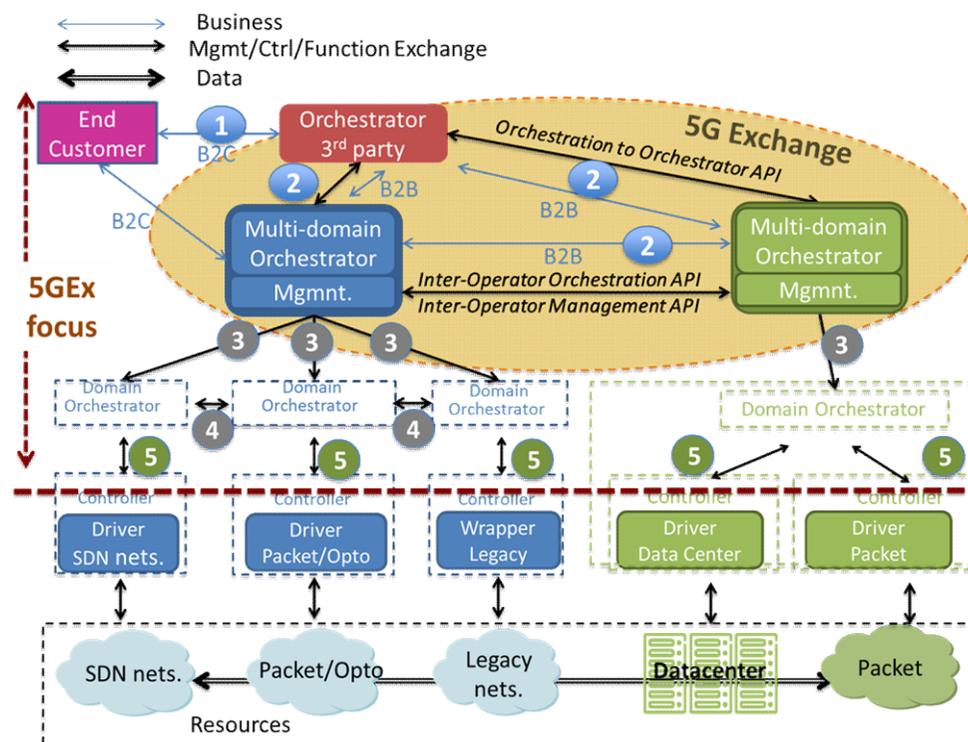
# Backup slides

# 5G Exchange



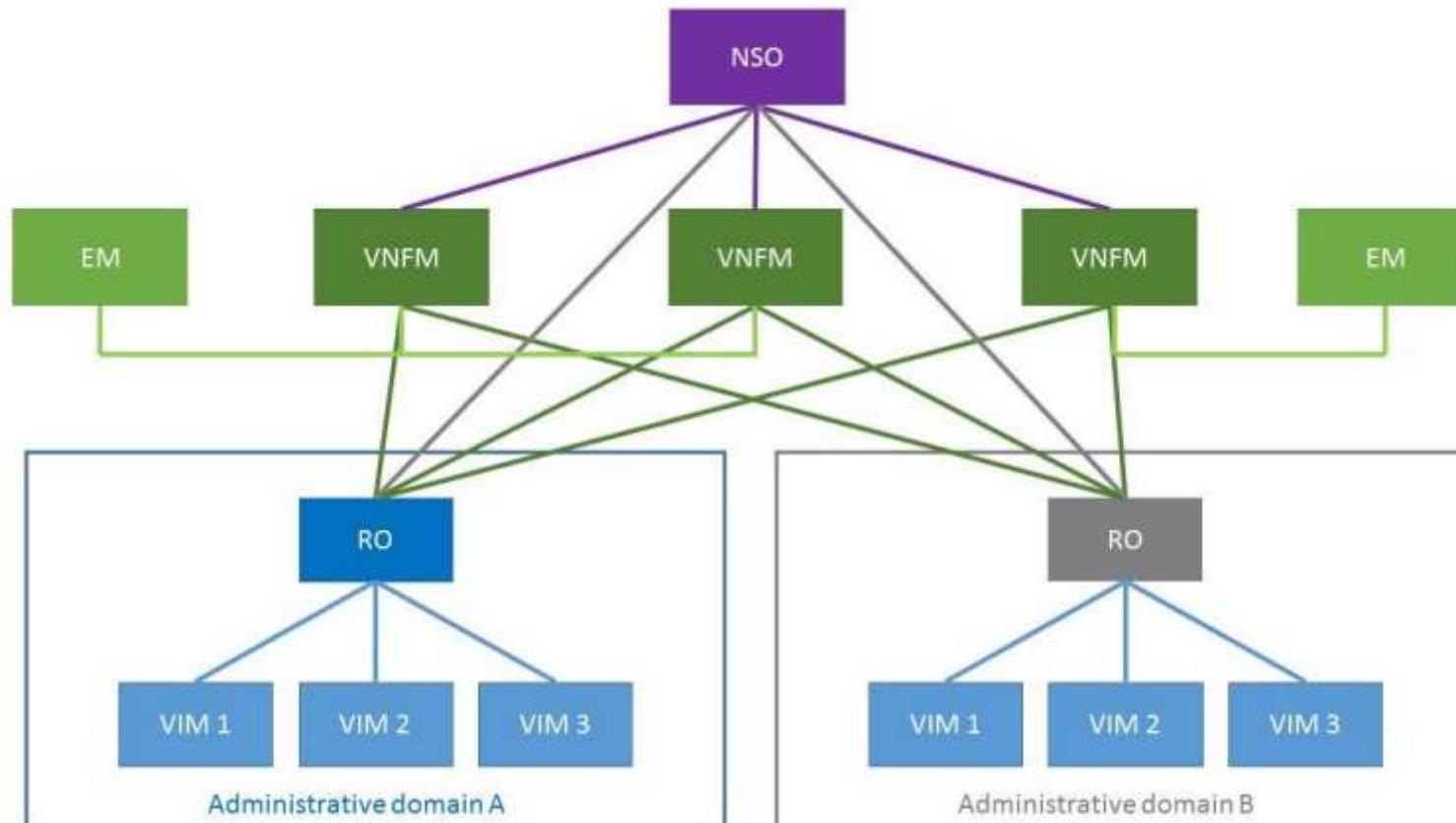
Mission:

- enable business and technical **cross-domain service orchestration** over multiple administrations,
- realize **composite services** by combining cross-domain network, computing and storage resources,
- develop suitable **business models** for operators to optimally buy, sell, and integrate 5GEx services,
- build and deploy a proof-of-concept **system prototype**, implementing the “Sandbox Exchange”,
- contribute to relevant **standard forums** and Open Source communities.



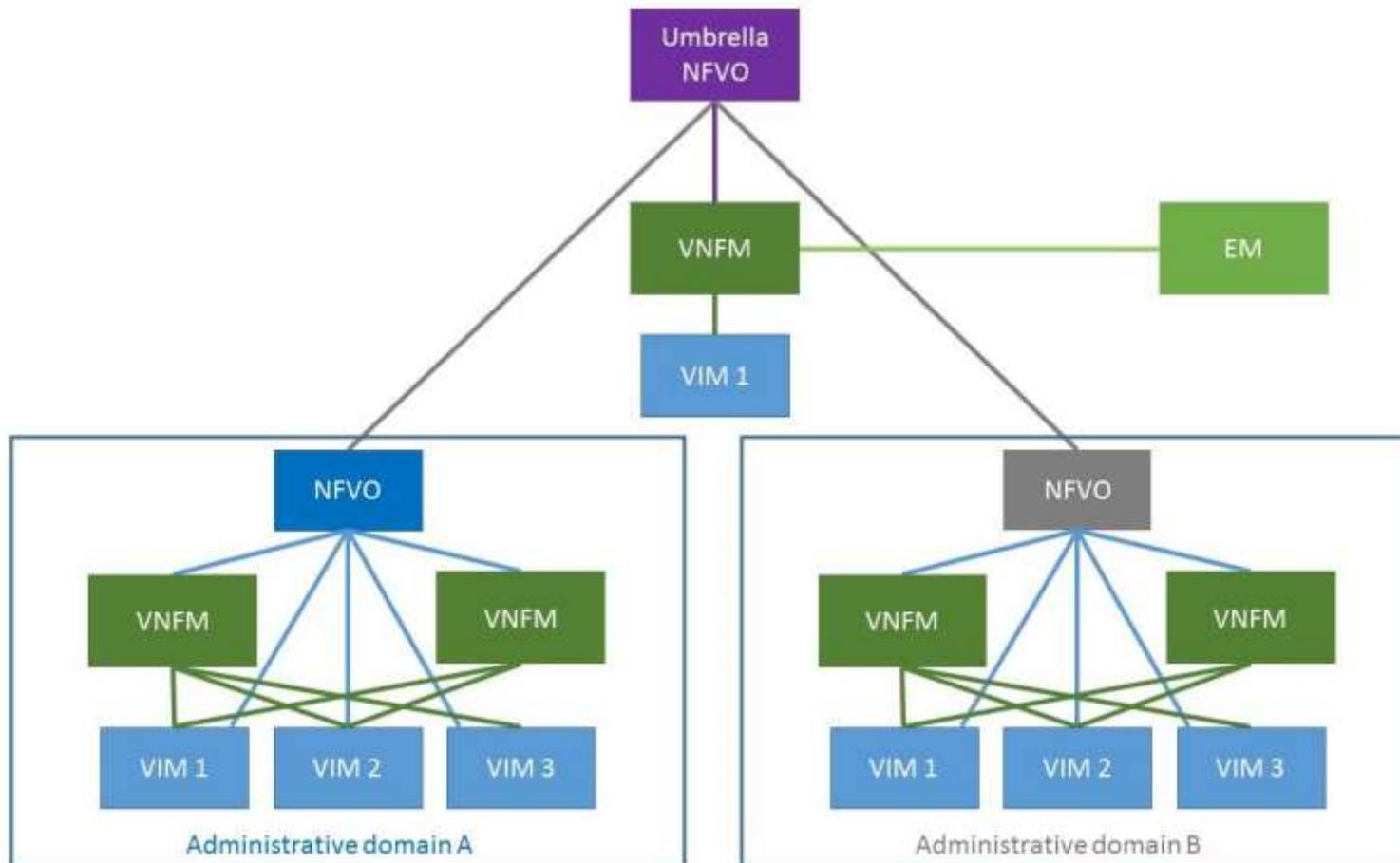
Duration: Oct., 2015 – Mar., 2018

# Related work by ETSI NFV



**Infrastructure provided using multiple administrative domains.  
From: ETSI GS NFV-IFA 009 V1.1.1 (2016-07)**

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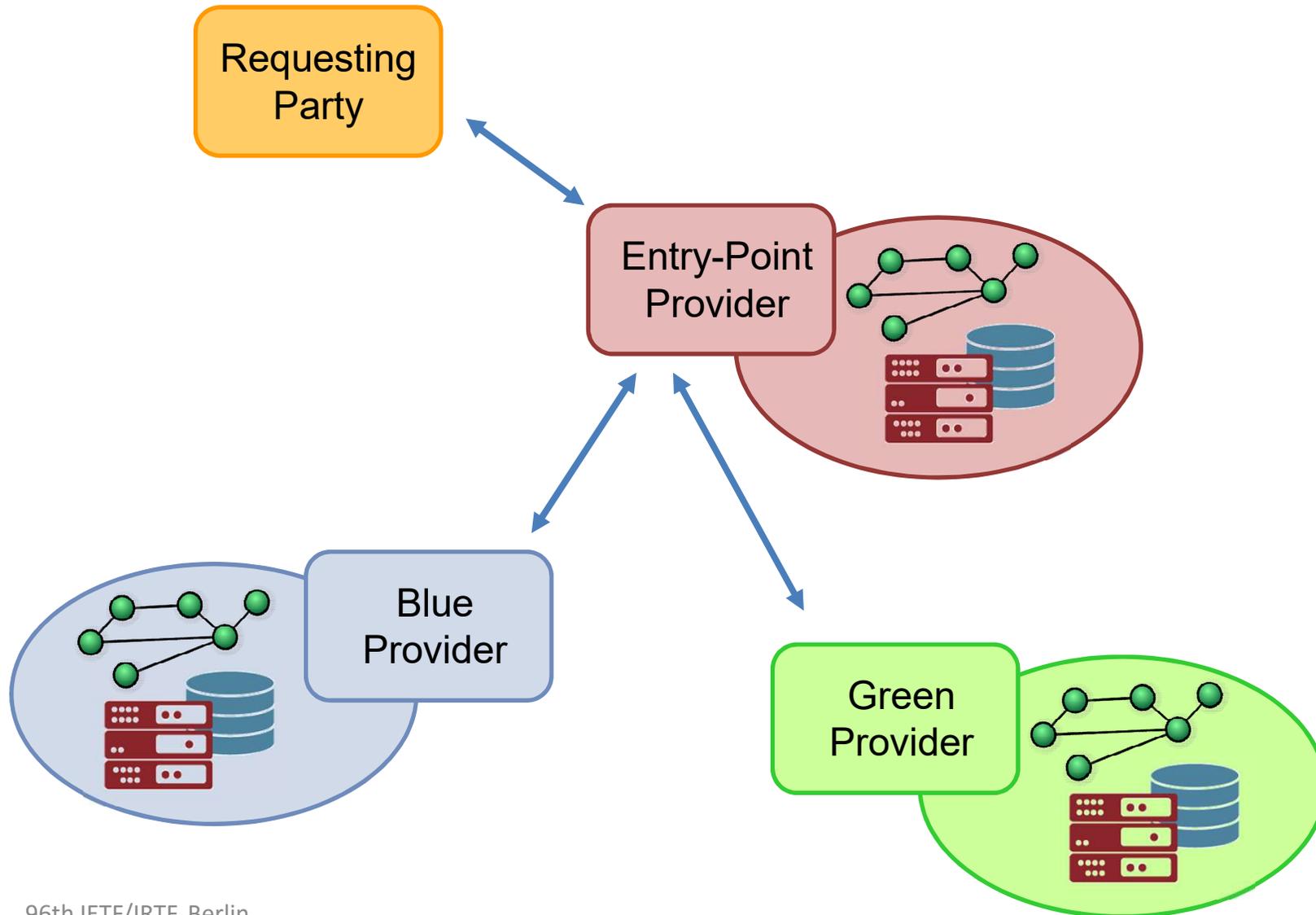


**Network services provided using multiple administrative domains.  
From: ETSI GS NFV-IFA 009 V1.1.1 (2016-07)**

# Multi-domain approaches

- Hierarchical
  - The provider facing the customer as a single entry point for the service request will maintain relationships with other providers in order to complete the service.
  - The Entry-Point Provider (EPP) will produce the service split among parties, ensuring adequate levels of coordination to offer the service as provided by a single domain to the customer.
- Cascading
  - The EPP partially satisfies the service request but complements the service by using resources external to its own domain.
  - The EPP will trade such resources with some other provider's offering capabilities at disposal of external domains.

# Hierarchical



# Cascading

