

Multi-domain Network Virtualization

draft-bernardos-nfvrg-multidomain-01

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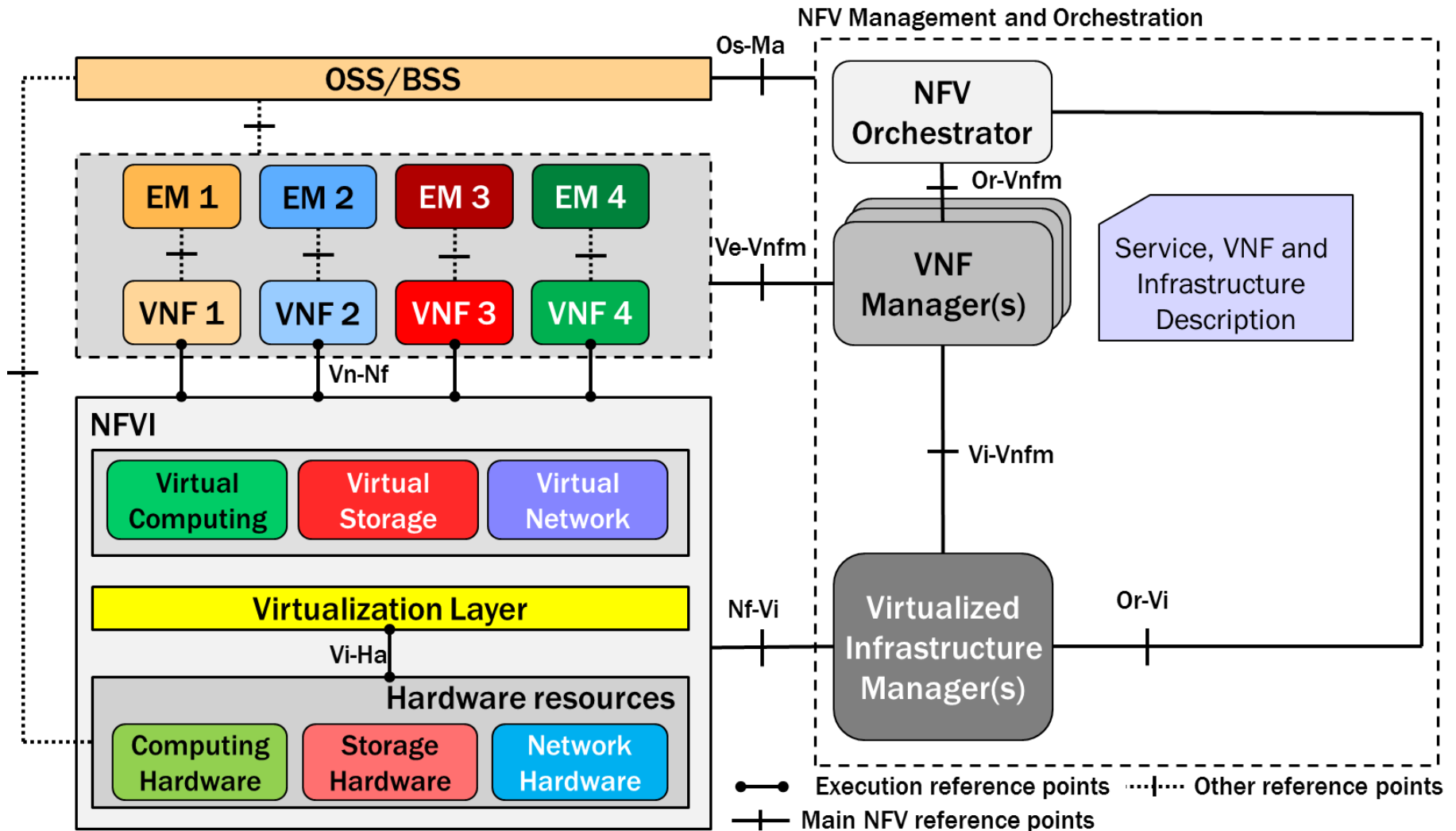
Róbert Szabó (*Ericsson Research*)

Seoul, NFV RG, November 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

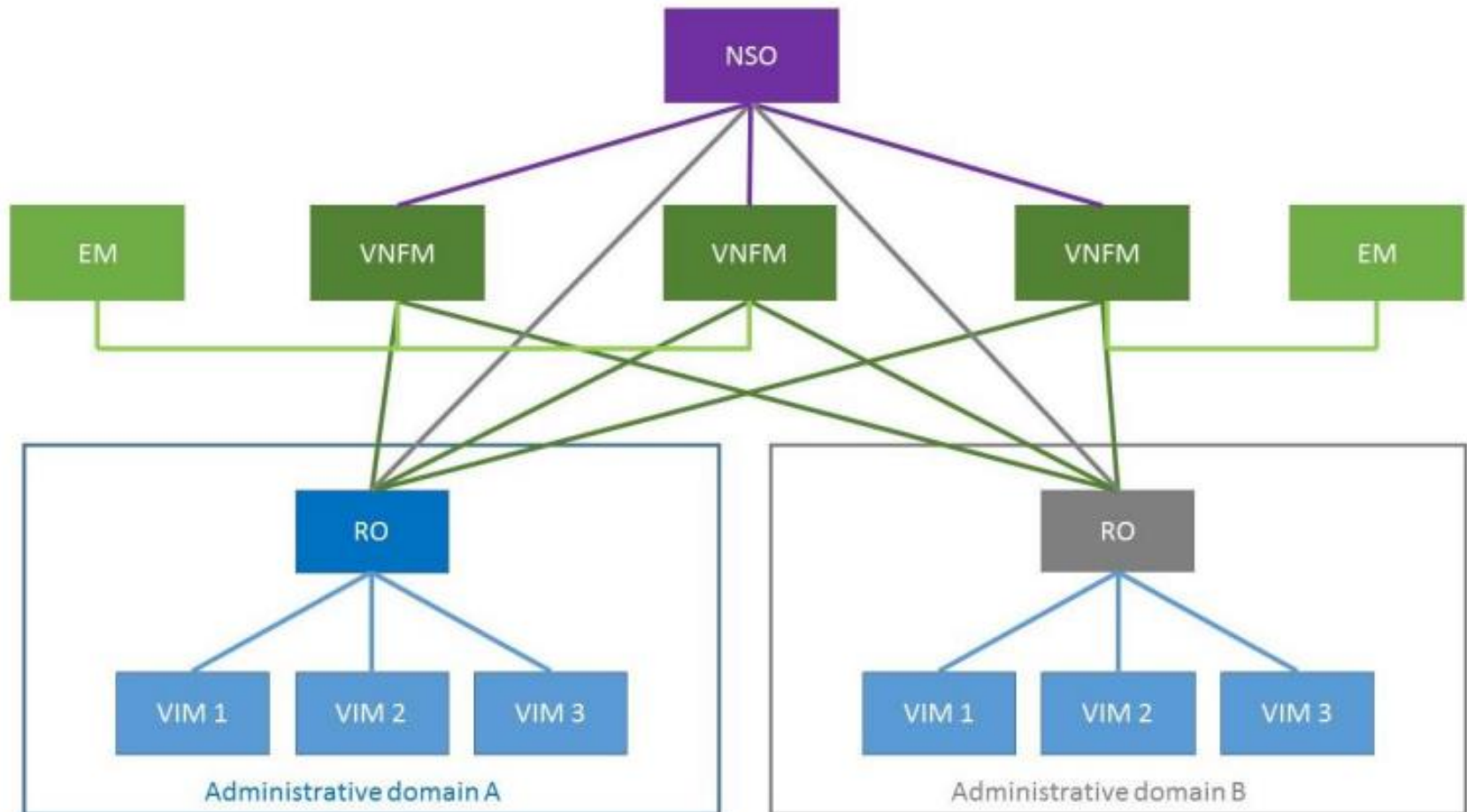


- Multi-domain interfaces not present in original ETSI NFV architecture

Multi-domain Problem Statement

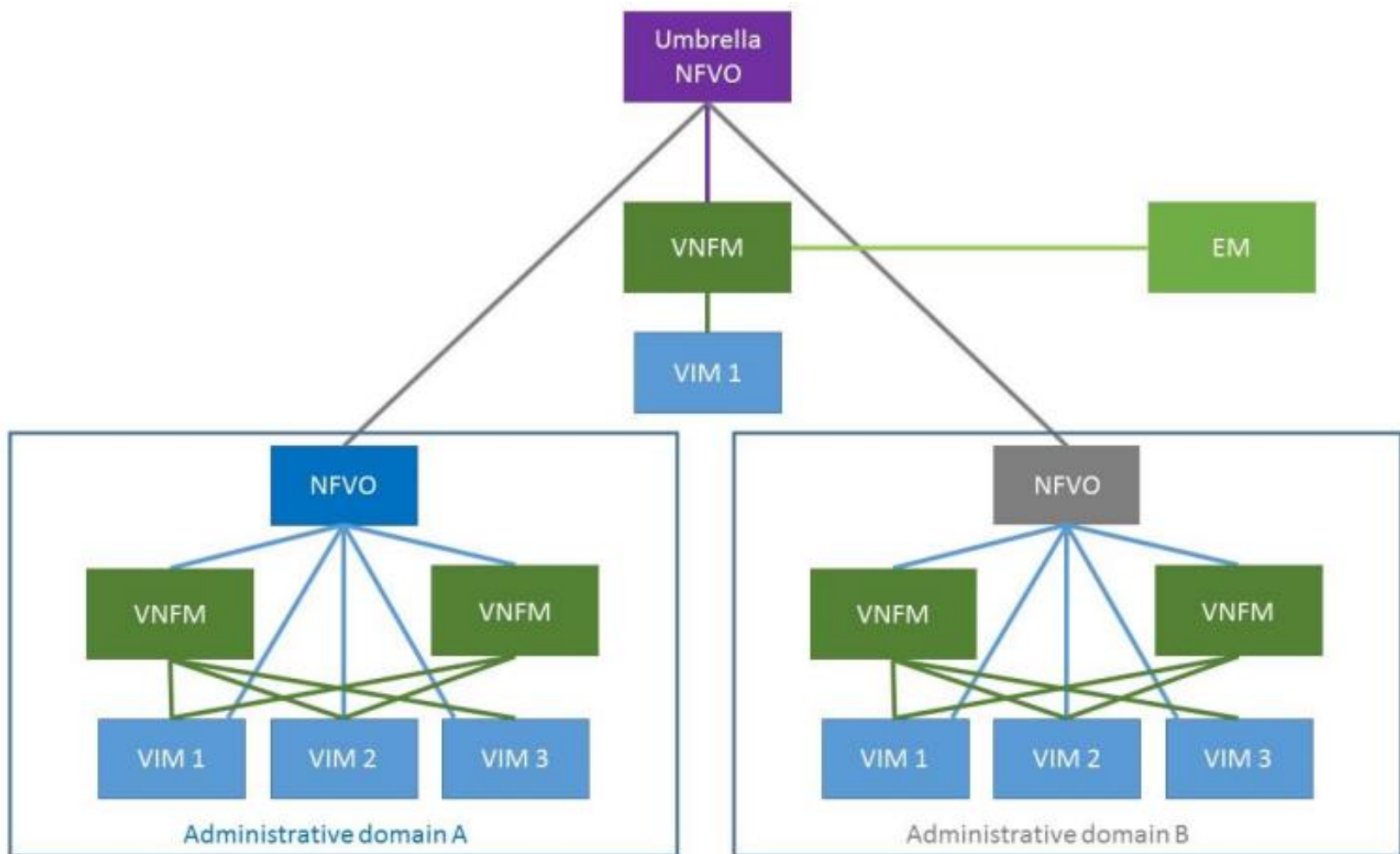
- Availability of different infrastructure environments pertaining to distinct administrative domains
 - In consequence, being operated and managed by distinct providers
- There are no established mechanisms for providing access to multi-domain environments in an standardized way
 - E.g., to facilitate portability among NFVI PoPs independently of the owner of such infrastructure
 - A solution is needed to deal with both multi-operator and (single operator) multi-domain problem

Multi-domain arch approaches: ETSI NFV



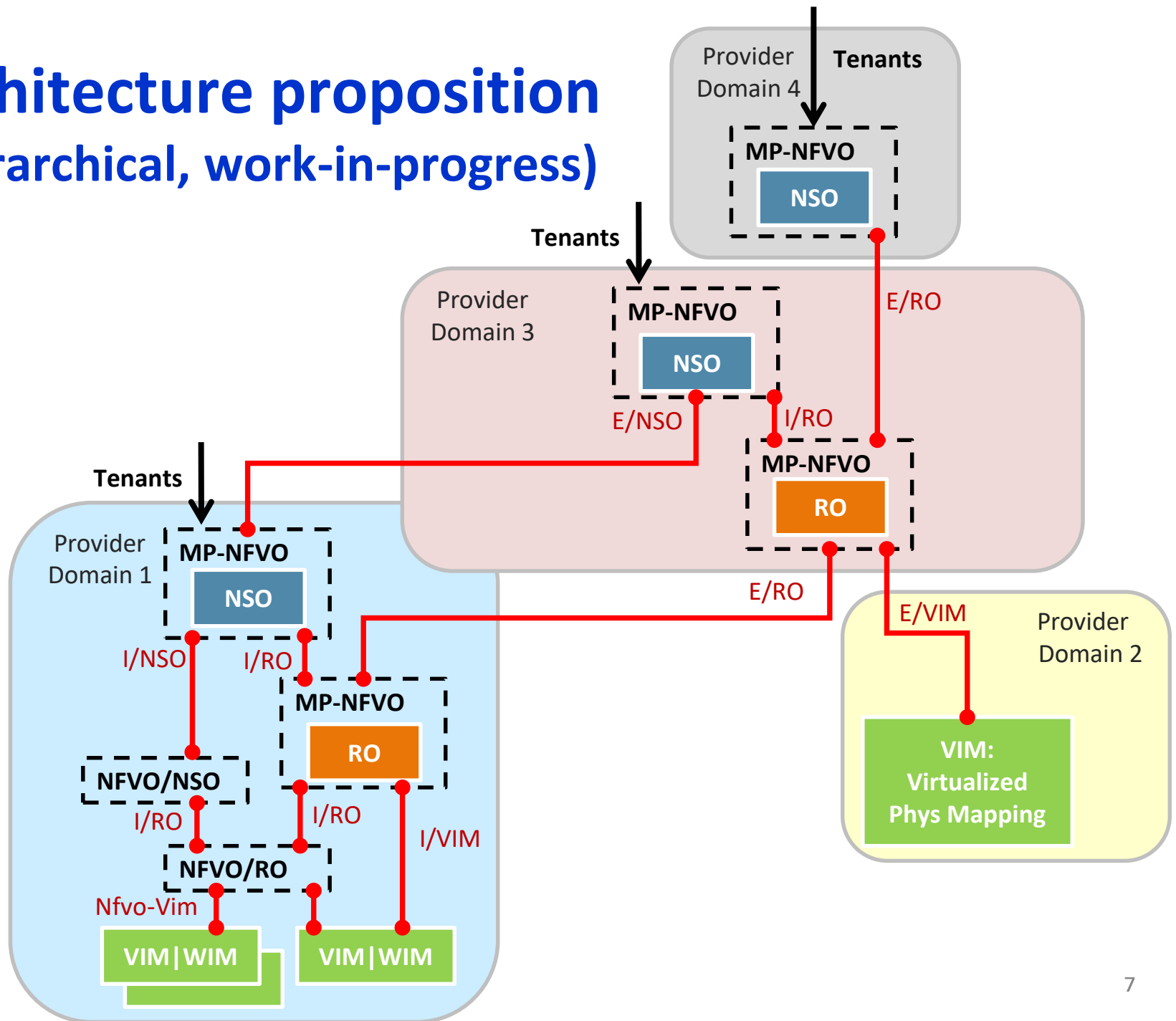
Infrastructure provided using multiple administrative domains.
From: ETSI GS NFV-IFA 009 V1.1.1 (2016-07)

Multi-domain arch approaches: ETSI NFV



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

Architecture proposition (hierarchical, work-in-progress)

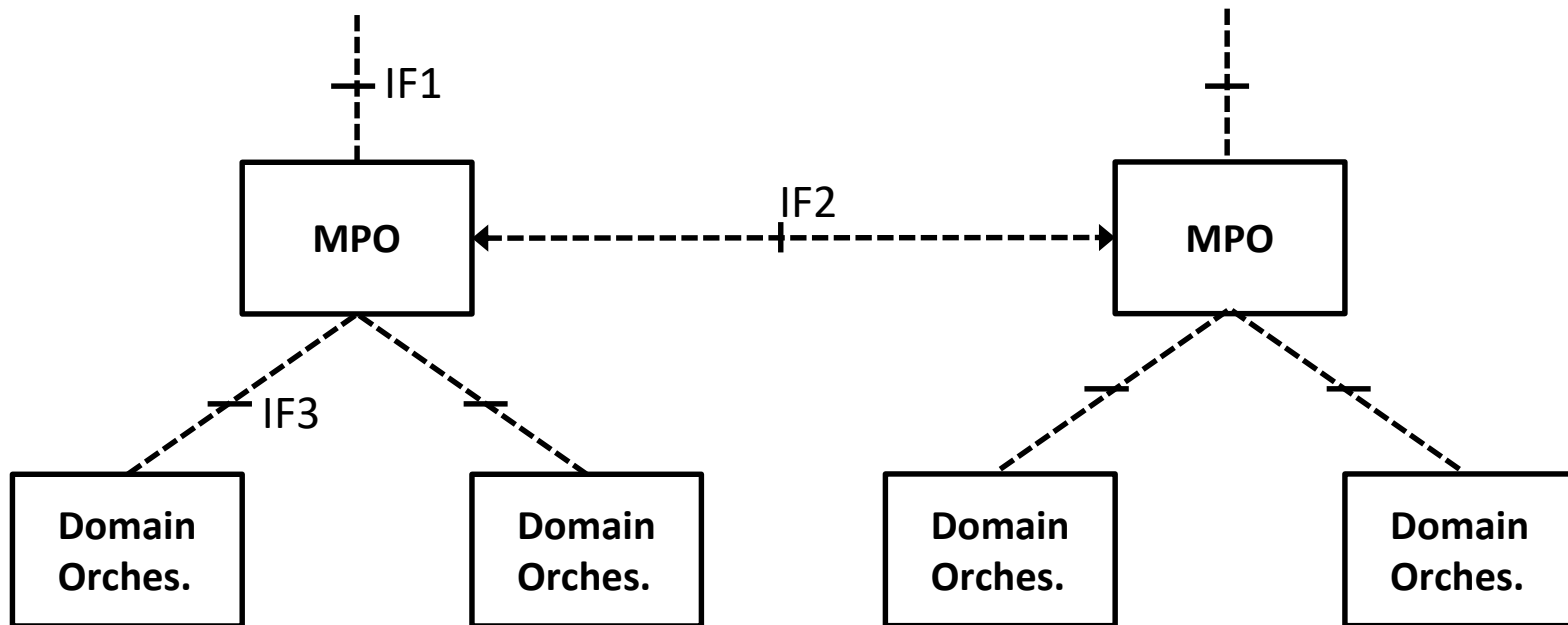


Virtualization and Control for Multi-Provider Multi-Domain

- Multi-domain different from single-domain
 - Single-domain:
 - The orchestrator is aware of the entire topology and resource availability within its domain
 - The orchestrator has complete control over the resources
 - Multi-domain:
 - Solutions required to enable the exchange of relevant information across orchestrators
 - This Exchange needs to be standardized

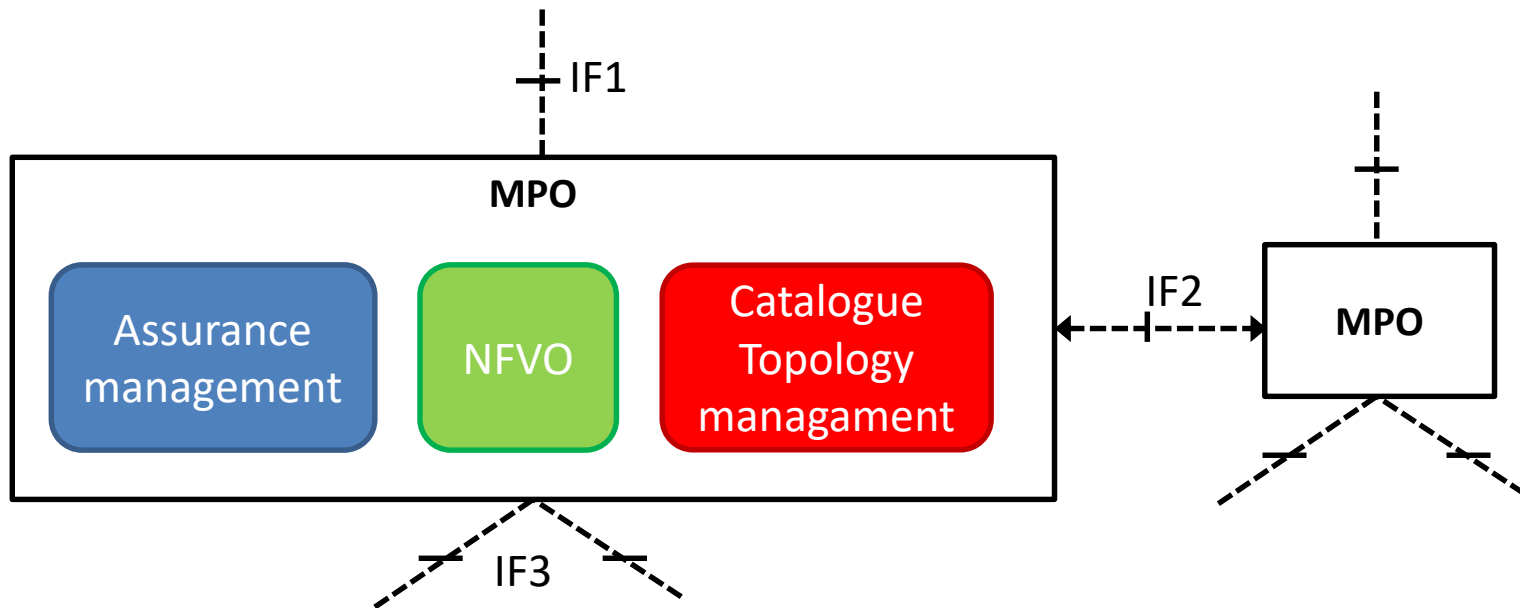
Virtualization and Control for Multi-Provider Multi-Domain

- Multi-provider orchestrator (MPO) exposes 3 interfaces:
 - IF1 to the tenant
 - IF2 to other multi-provider orchestrators
 - IF3 to individual domain orchestrators



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Next steps

- Continue evolving the architecture definition
 - Interface (IF1, IF2, IF3) specification
- Implement and validate architecture
 - 5GEx PoC and Sandbox
- Gather feedback from the group

This work is supported by 5G-PPP 5GEx, an innovation action project partially funded by the European Community under the H2020 Program (grant agreement no. 671636)



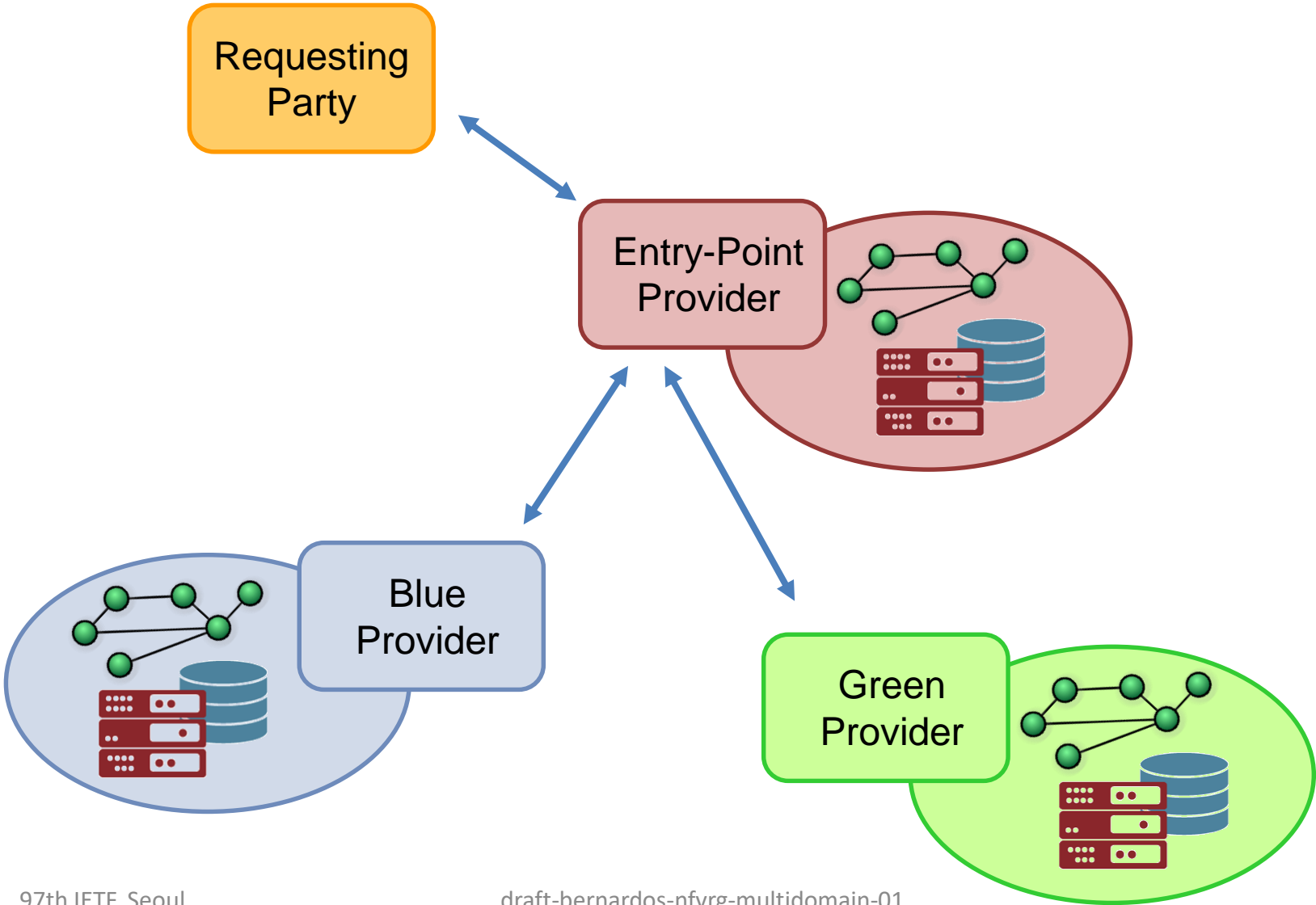
<http://www.5gex.eu>

BACKUP SLIDES

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

