Problem Statement and Architecture of COMS

draft-geng-coms-problem-statement-01

draft-geng-coms-architecture-01

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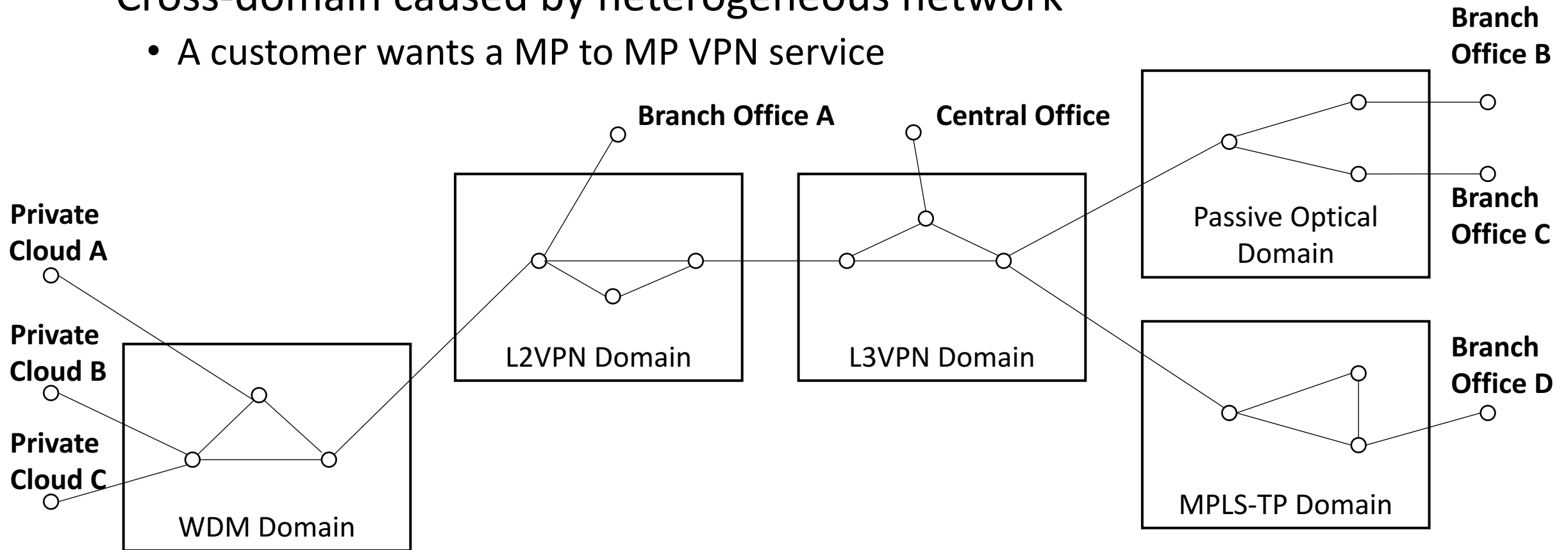D. Lopez Telefonica I+D

Recap of COMS

- **Focused Problem Scope**
  - Focus moved to common operation an management of network slicing (COMS)
  - Data plane remains or evolves as-is
- A Proof-of-Principle Demo in IETF100
  - Portal for service model in customer language
  - NSaaS delivered to COMS (network slice orchestrator)
  - Mapping to underlay technology domains

Concepts

- **Network Slice** - A set of infrastructure resources and service functions that has attributes specifically designed to meet the needs of an industry vertical or a service.

- **Network Slicing** - A management mechanism that Network Slice Provider can use to allocate dedicated infrastructure resources and service functions to Network Slice Tenant.

- **Network Slice Provider** - A network slice provider (NSP), typically a telecommunication service provider, is the owner or tenant of the infrastructures from which network slices can be created..

- **Network Slice Tenant** - A network slice tenant (NST) is the user of specific network slice, in which customized services are hosted. Network slice tenants can make requests of the creation of new network slice through a COMS service model.
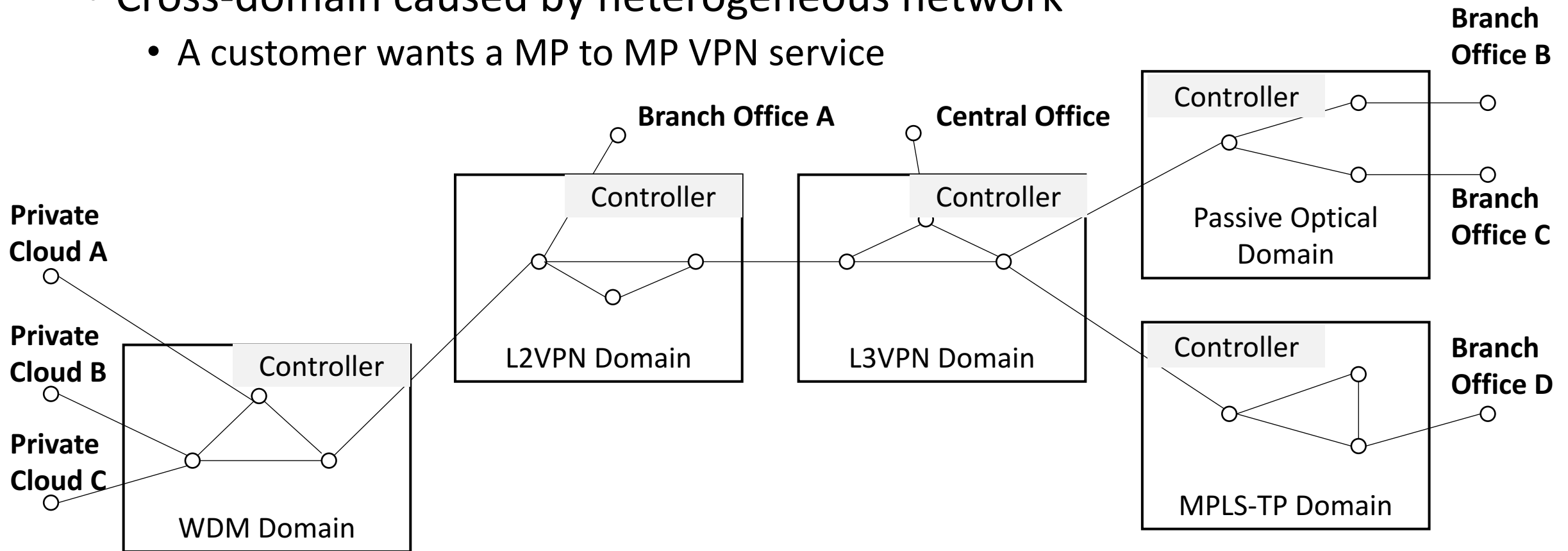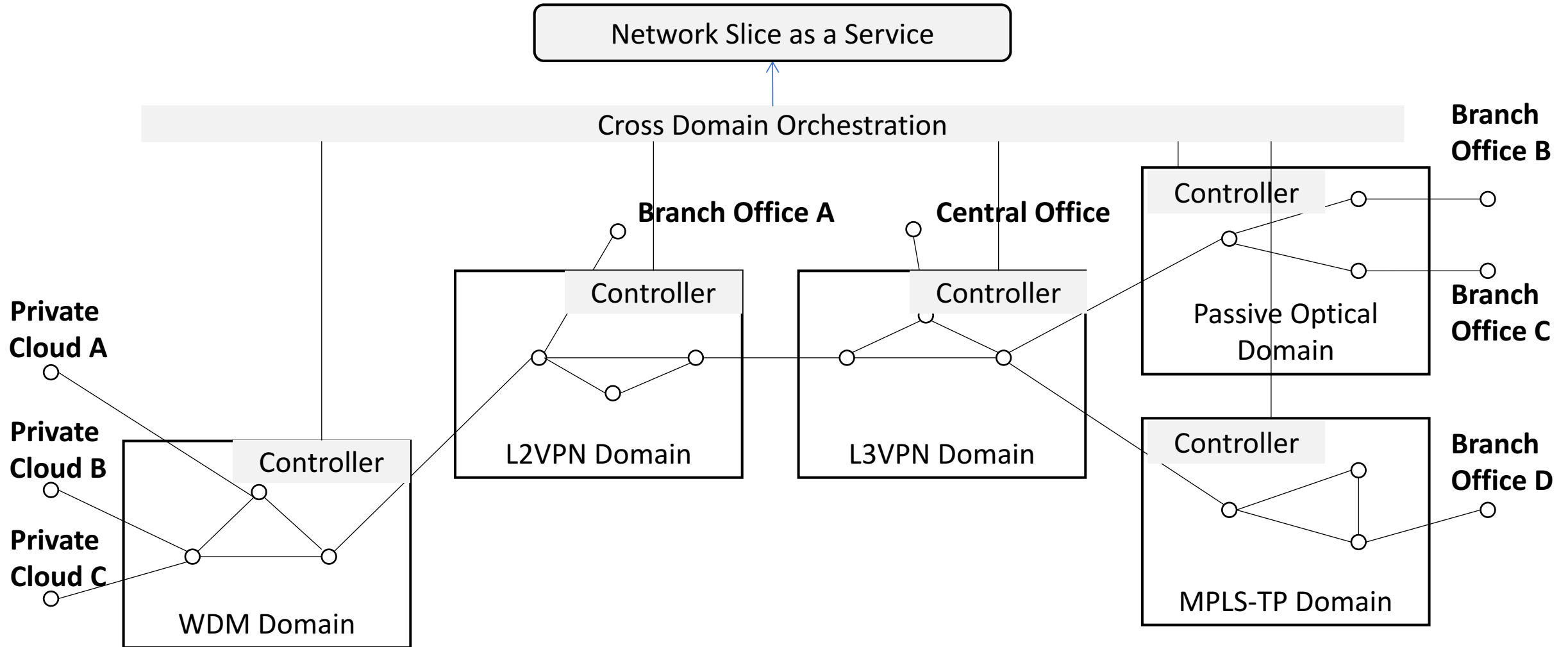
The Problem – a cross-domain approach

- Cross-domain caused by heterogeneous network
  - A customer wants a MP to MP VPN service

The Problem – a cross-domain approach

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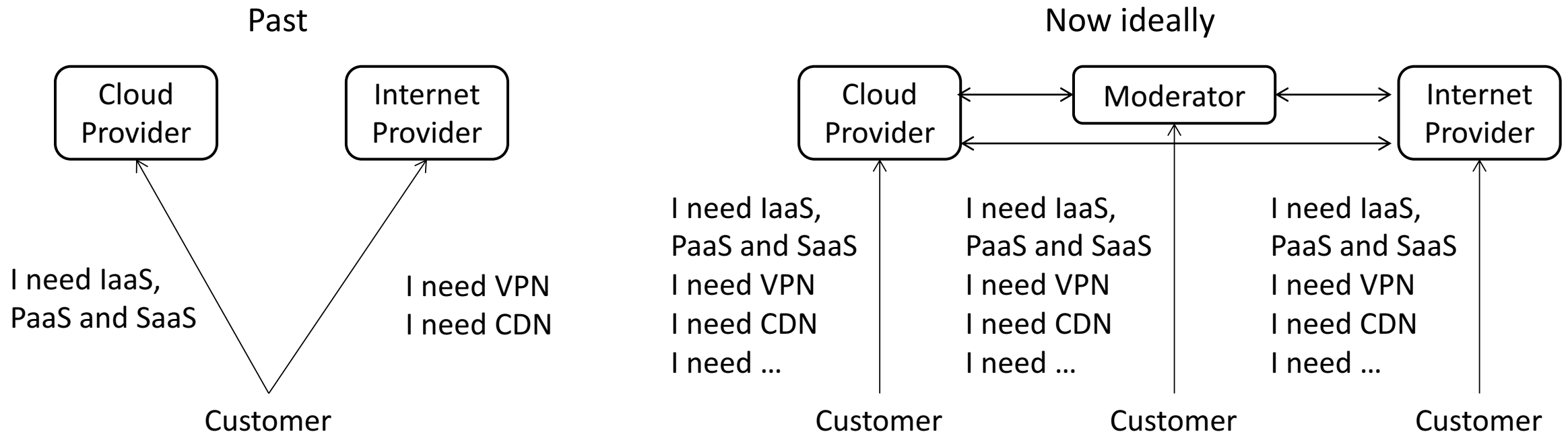 - A customer wants a MP to MP VPN service

The Problem – a cross-domain approach

Network Slice as a Service

Cross Domain Orchestration

Branch Office B

Controller

Branch Office A

Central Office

Passive Optical Domain

Branch Office C

Private Cloud A

Controller

Controller

Controller

Branch Office D

Private Cloud B

L2VPN Domain

L3VPN Domain

Controller

Private Cloud C

Controller

MPLS-TP Domain

WDM Domain

The Problem – a cross-domain approach

- Cross-domain caused by integration of network and computing
  - A customer wants a Turn-Key network

Past

| Cloud Provider | | Internet Provider |

I need IaaS, PaaS and SaaS

I need VPN
I need CDN

Customer

Now ideally

| Cloud Provider | Moderator | Internet Provider |

I need IaaS, PaaS and SaaS
I need VPN
I need CDN
I need …

I need IaaS, PaaS and SaaS
I need VPN
I need CDN
I need …

I need IaaS, PaaS and SaaS
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I need …

Customer   Customer   Customer

The Problem – a cross-domain approach

- Cross-domain caused by integration of network and computing
 - A customer wants a Turn-Key network
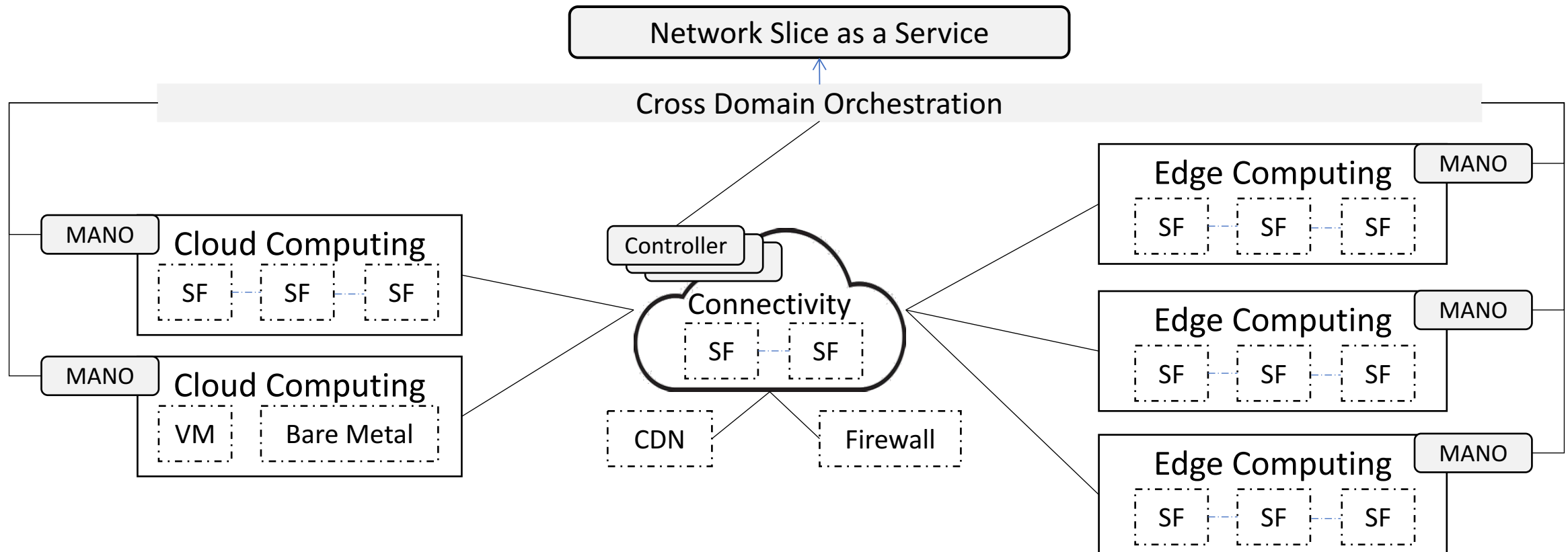
What is COMS

- A management mechanism where an NSP can use to allocate dedicated network infrastructures and service functions to an NST

Well, what exactly?

- Technology-independent and resource-centric
- Integrated management of resources for NSaaS
- Well-defined network slice profile
- Specify NSP operational guidance
- Provide management capability exposure to NST
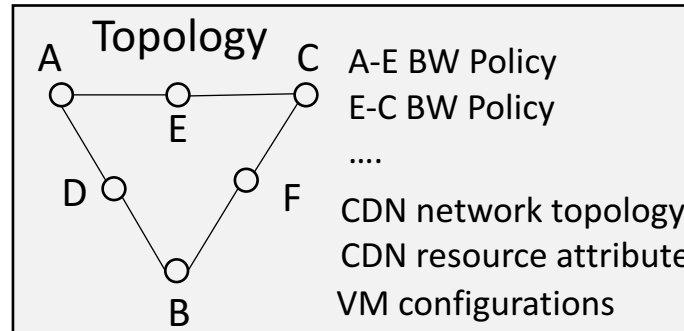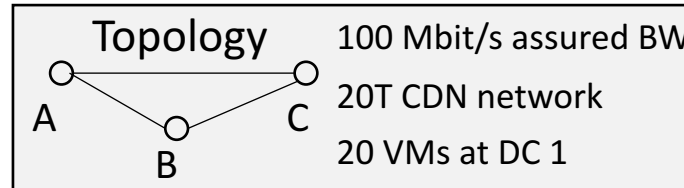
What is COMS
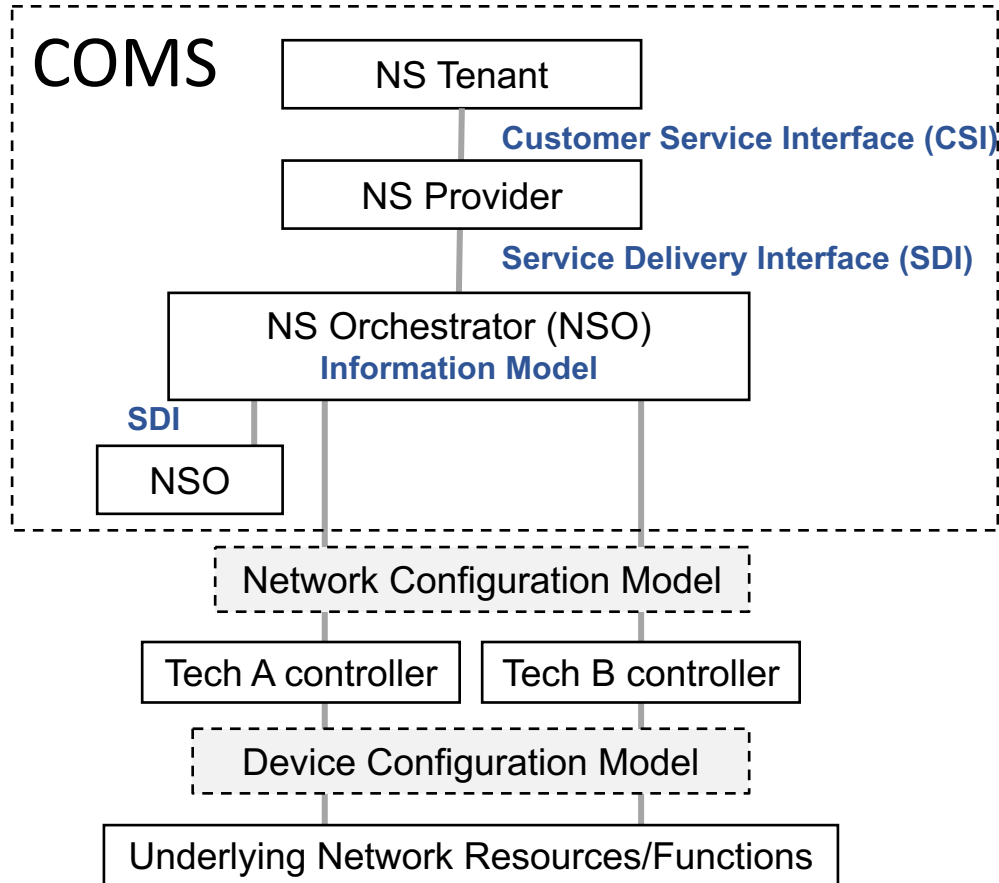
- **Service Delivery Interface (SDI)**
  - SDI explicitly describe a NSaaS in network language. SDI can also be used between network slice orchestrators, enabling hierarchical management through the notion of network slice subnets

- **Customer Service Interface (CSI)**
  - CSI is exposed by the network slice orchestrator to run management tasks within their slice instance under certain policies.

- **COMS Information Model**
  - Information model explicitly describes network slice entities in terms of resource components and characteristic attributes.
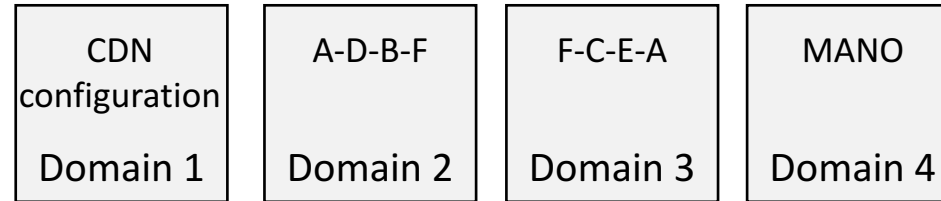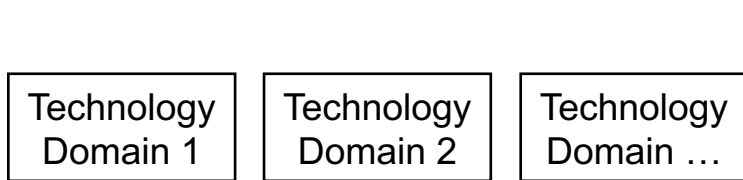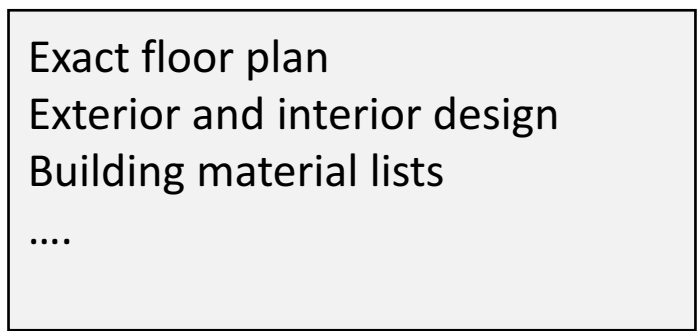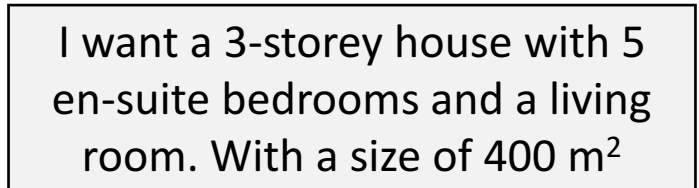
What is COMS – A Top-Down Example
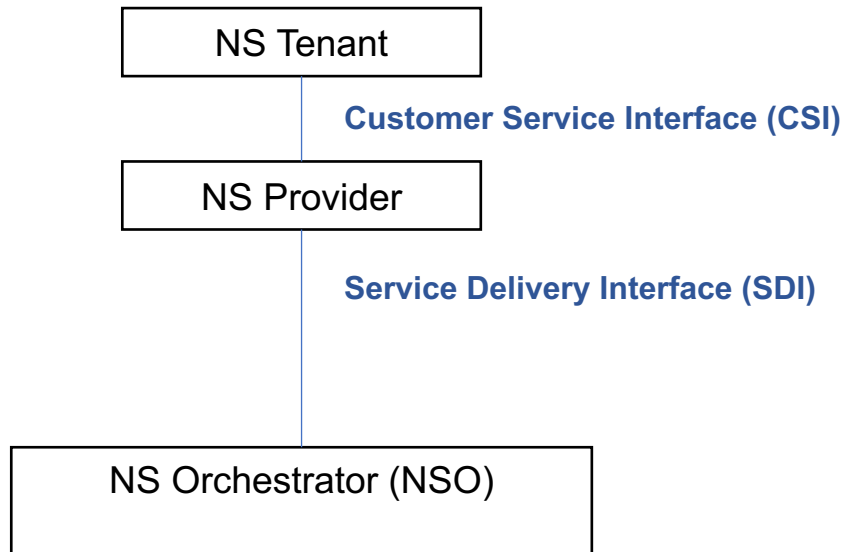
A NST is requesting a NSaaS

Someone is building a house

NS Tenant

Customer Service Interface (CSI)

NS Provider

Service Delivery Interface (SDI)

NS Orchestrator (NSO)

Topology

A   C
   B

100 Mbit/s assured BW
20T CDN network
20 VMs at DC 1

Topology

A   C
    E
D   F

   B

A-E BW Policy
E-C BW Policy
....
CDN network topology
CDN resource attribute
VM configurations

I want a 3-storey house with 5 en-suite bedrooms and a living room. With a size of 400 m^2

Exact floor plan
Exterior and interior design
Building material lists
....

Technology Domain 1

Technology Domain 2

Technology Domain …

CDN configuration

Domain 1

A-D-B-F

Domain 2

F-C-E-A

Domain 3

MANO

Domain 4

Building Design Studio

Construction Contractor

B&Q

What is COMS

- A precise description of the resources COMS is supervising

Connectivity	Computing/Storage	Service Functions

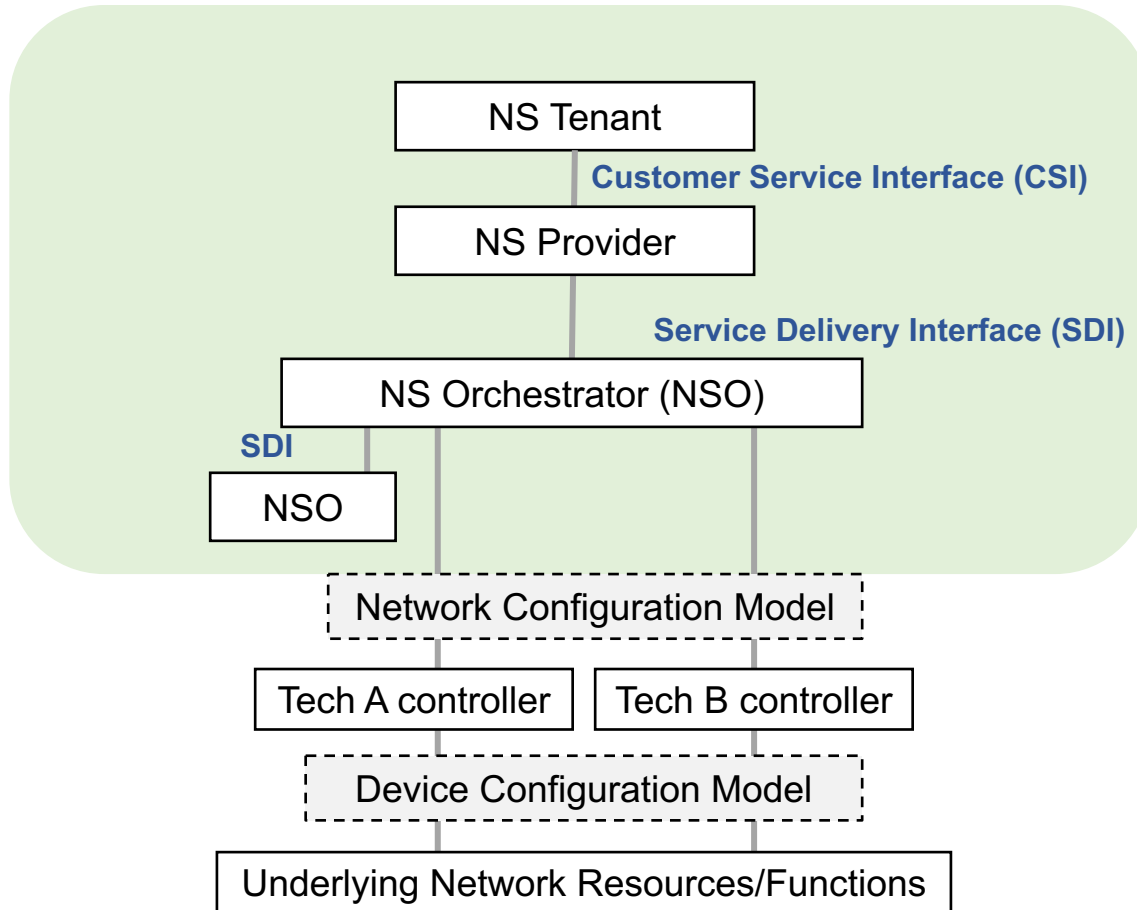**Connectivity**
- Node
- Link
- Topology
- Bandwidth
- …

Computing/Storage
- Bare Metal
- VMs
- Storage
- Other forms of Computing infrastructure
- …

Service Functions
- PNF/VNF including
  - NAT
  - DHCP
  - Firewall
  - CDNs
  - Customer SDN-Controllers/ slice manager

What is in Scope

- Customer Service Interface (CSI)
- Service Delivery Interface (SDI)

Each may consisted of several data models. Corresponding operation model and guidelines are also in scope

- COMS information model (in progress)
- Other operation enablement (interconnection, gateway etc.)

What is not in Scope
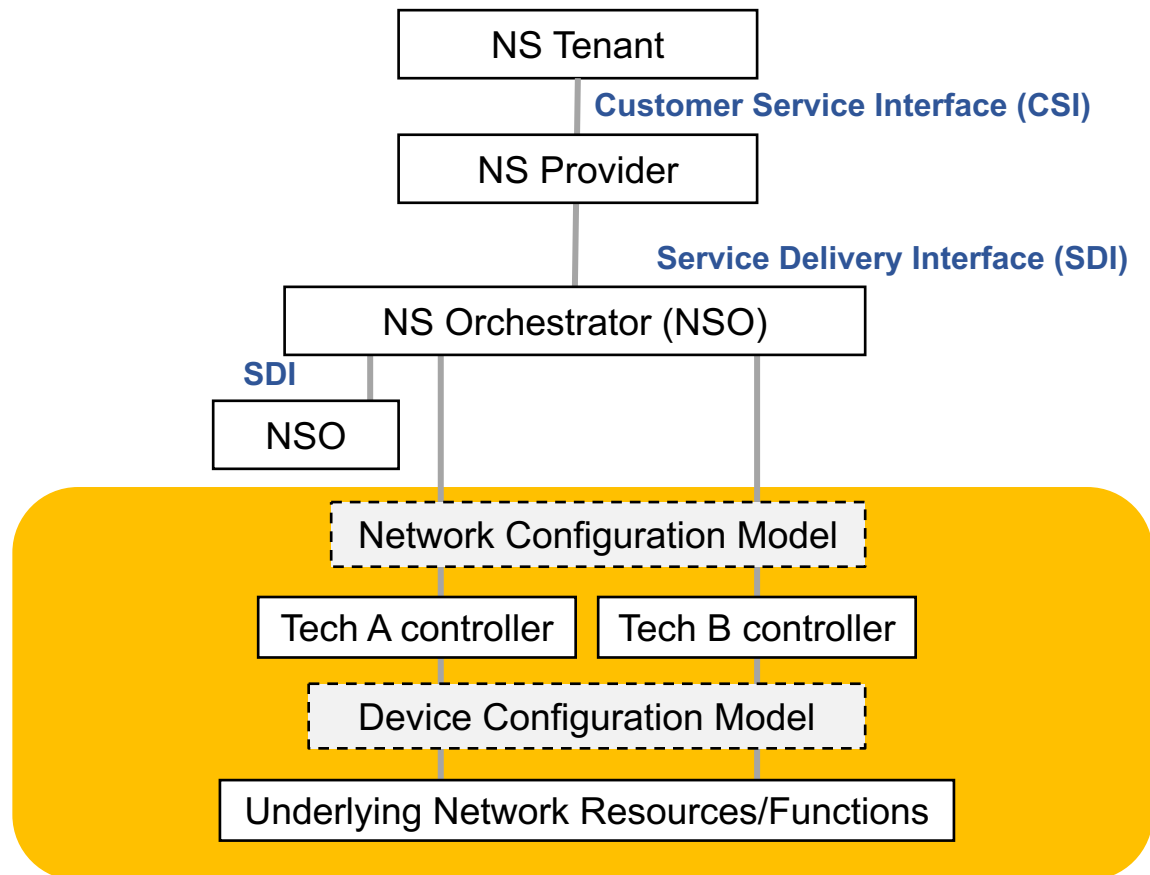
- Network configuration model
- Device configuration model
- Others?

Conclusion

- Focus on common operation an management of network slicing (COMS) - inter-operative, single and multi-domain management mechanisms for adoption in a system with heterogeneous network infrastructures and services functions.

- Mapping to underlay technology domains

- Data plane remains or evolves as-is

Spaire Sliceds

What is COMS-NFV integration

- TBD