Problem Statement and Architecture of COMS

draft-geng-coms-problem-statement-01
draft-geng-coms-architecture-01

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Recap of COMS

• **Focused Problem Scope**
  • Focus moved to common operation and 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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The Problem – a cross-domain approach

Network Slice as a Service

Cross Domain Orchestration

Controller

L2VPN Domain

L3VPN Domain

Controller

Passive Optical Domain

MPLS-TP Domain

Branch Office A

Central Office

Controller

Private Cloud A

Private Cloud B

Private Cloud C

WDM Domain

Controller

Controller

Controller

Controller

Controller

Controller

Branch Office B

Branch Office C

Branch Office D

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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

Customer

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

Now ideally

Cloud Provider

Moderator

Internet Provider

Customer

Customer

Customer

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
I need VPN
I need CDN
I need ...

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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

Topography

CDN configuration

Domain 1

A-D-B-F

Domain 2

F-C-E-A

Domain 3

MANO

Domain 4

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

A-E BW Policy
E-C BW Policy

CDN network topology
CDN resource attribute
VM configurations

Someone is building a house

I want a 3-storey house with 5 en-suite bedrooms and a living room. With a size of 400 m²

Exact floor plan
Exterior and interior design
Building material lists

…. 

CDN

Configuration

Domain 1

A-D-B-F

Domain 2

F-C-E-A

Domain 3

MANO

Domain 4

Technology
Domain 1

Technology
Domain 2

Technology
Domain …

NS Tenant

Customer Service Interface (CSI)

NS Provider

Service Delivery Interface (SDI)

NS Orchestrator (NSO)
What is COMS

• A precise description of the resources COMS is supervising

<table>
<thead>
<tr>
<th>Connectivity</th>
<th>Computing/Storage</th>
<th>Service Functions</th>
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<tbody>
<tr>
<td>• Node</td>
<td>• Bare Metal</td>
<td>• PNF/VNF including</td>
</tr>
<tr>
<td>• Link</td>
<td>• VMs</td>
<td>• NAT</td>
</tr>
<tr>
<td>• Topology</td>
<td>• Storage</td>
<td>• DHCP</td>
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<tr>
<td>• Bandwidth</td>
<td>• Other forms of</td>
<td>• Firewall</td>
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<td>• ...</td>
<td>Computing</td>
<td>• CDNs</td>
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<tr>
<td></td>
<td>infrastructure</td>
<td>• Customer SDN-Controllers/slice manager</td>
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<td></td>
<td>• ...</td>
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</tbody>
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What is in Scope

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

Each may consist 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