COMS Architectural Design Enablers & Artefacts -II
Network Slice Interconnection

https://tools.ietf.org/html/draft-defoy-coms-subnet-interconnection-03 - https://tools.ietf.org/html/draft-homma-coms-slice-gateway-01

X. de Foy, A. Rahman InterDigital
A. Galis, University College London
K. Makhijani, L. Qiang, Huawei Technologies
S. Homma, NTT
P. Martinez-Julia, NICT

S. Homma, NTT
X. de Foy, InterDigital
A. Galis, University College London

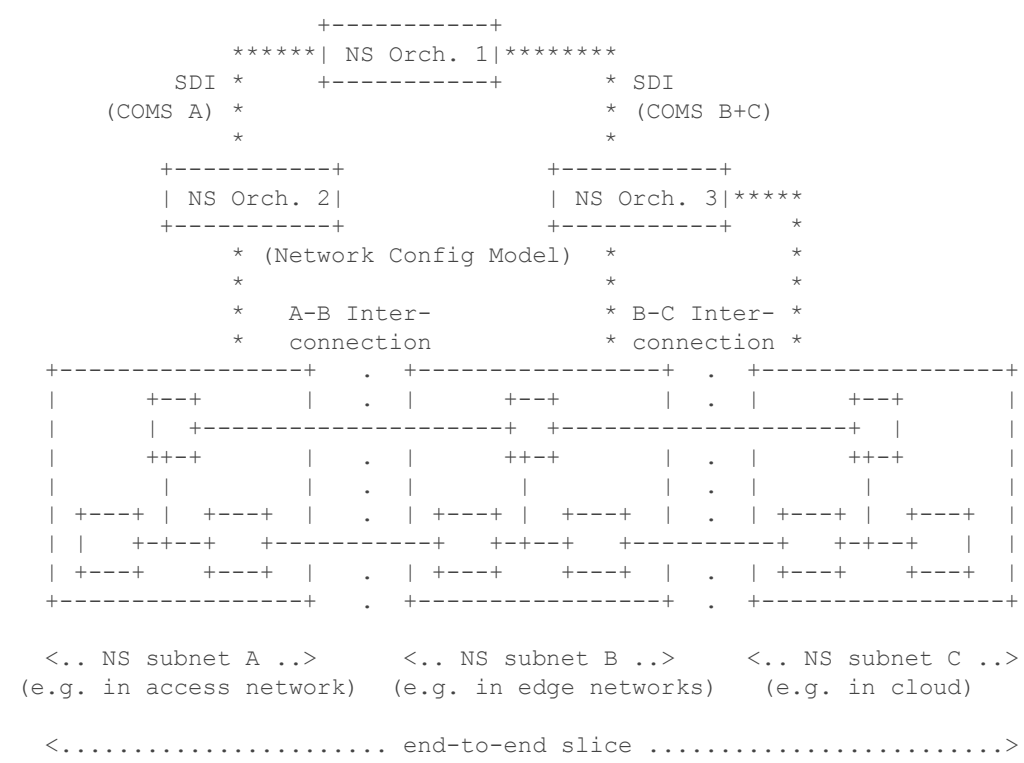
COMS @ IETF 101 – London

Slice Interconnection

There are several possible reasons to split an end-to-end network slice for management, including:

- To cross administrative domain boundaries
- To interconnect parts deployed over different infrastructure technologies
- To split a sliced system into smaller parts for sharing, reuse, scaling or facilitating management.

All or some of those cases may be managed using subnets and stitching operations, which enable hierarchical/recursive management of slices.



Subnets and Stitching

A NS subnet has the characteristics of a network slice, but cannot be activated in isolation – it must be interconnected with other subnets to form a composite subnet or end-to-end slice.

- To describe a NS subnet, we augment a base NS data model, which itself is based on the IETF network topology model.

Stitching is the operation consisting in creating a composite subnet or end-to-end slice from input NS subnets.

- In the data plane, stitching may use gateways, or in simple cases a simple node-to-node connections.
- Stitching may occur at the time of NS subnet instantiation, or later.
- A stitching operation can (1) produce a new composite model and/or (2) update the input NS subnets with interconnection information.

Subnet Model

Interconnection anchors – represent interconnection points *prior* to the stitching operation

➔ *Described using anchor termination points and anchor nodes.*

➔ *Anchor TP/nodes and cross-subnet links do not have a corresponding data plane instance in general.*

Interconnection instances – represent interconnection points *after* the stitching operation.

➔ *Interconnection instance nodes and termination points* can represent data plane gateway function(s) between NS subnets, or direct links between nodes from different NS subnets.

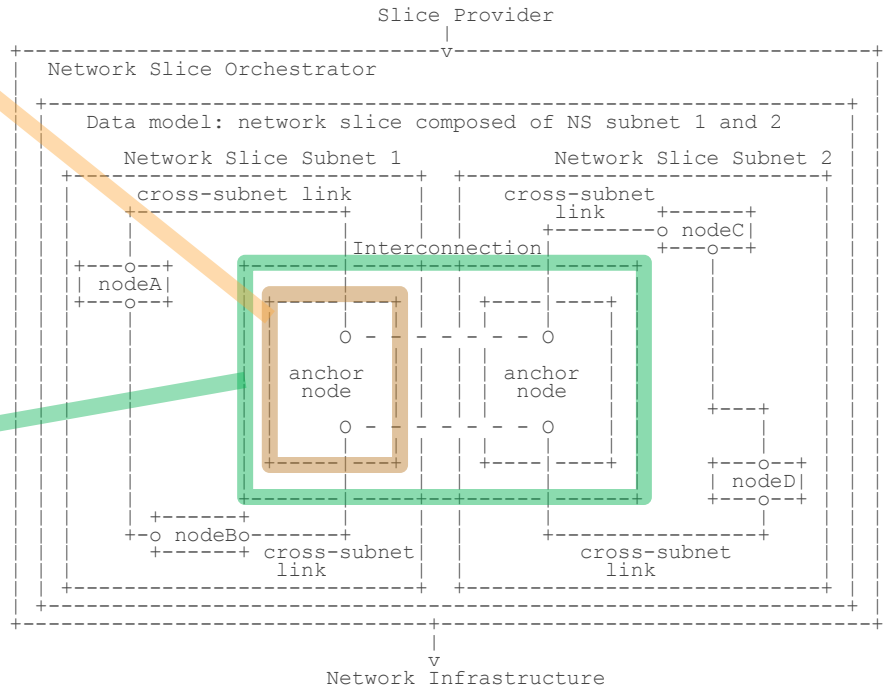


Figure: interconnection management model concepts

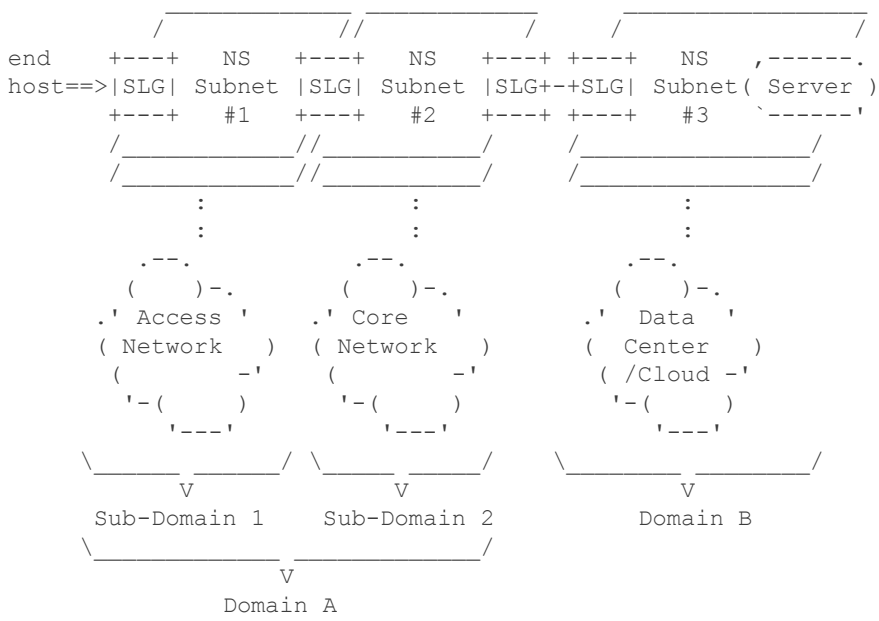
Slice Gateway Function

Slice Gateway Function – a data plane function (or group of functions) that connects NS subnets together – can also be an edge function.

- It is composed of existing technologies (we are NOT defining new data plane technologies).

Functions of an SLG may include:

- Identification/ classification of customer and service traffic,
- Transport/forwarding/service chaining, encapsulation, address resolution/routing, translation between technologies/encapsulations,
- Access control, QoS policy enforcement,
- Fault and performance monitoring for underlay and overlay networks.



Summary

- A NS interconnection model based on subnets can enable hierarchical management of slices:
  - Across multiple administrative domains,
  - Across multiple underlying technologies,
  - For other reasons such as subnet sharing, reuse, scaling or to facilitate management.

- The stitching operation manages data plane gateways, which are used to extend network slices beyond a single domain or beyond a single underlying technology.

- Future work include:
  - Get feedback on the listed issues and on the general approach proposed (subnets, stitching and gateways). Look for alternative methods.
  - On the model: continue defining parameters for subnet models (for anchors, interconnection instances) and their visibility to slice operators and tenants.
  - On the gateway: study slice gateways to understand which components need to be managed by NS operators and tenants, and which parameters are relevant to configure/describe those components.