Proposal of SwitchingService (SS)

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Agenda

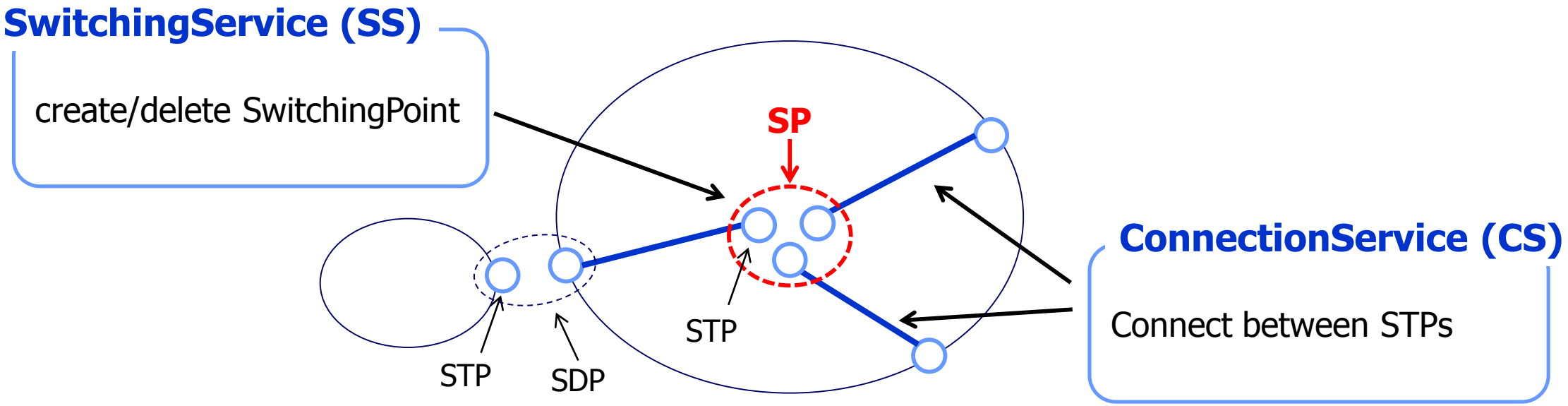
- The goal of this presentation is to introduce a new SwitchingService (SS) to NSI in addition to ConnectionService (CS).

- Agenda
  - Overview of SwitchingService
  - Operations and Parameters
  - Appendix. Comparisons with alternatives

SwitchingService (NSI-SS)

- Be a new NSI service to realize multipoint network.
- Introduce a new endpoint called Switching Point (SP).
  - SP is similar to **"SDP"**.
  - SP has multiple STPs.

In OGF35, SP is similar to **"STP"**.



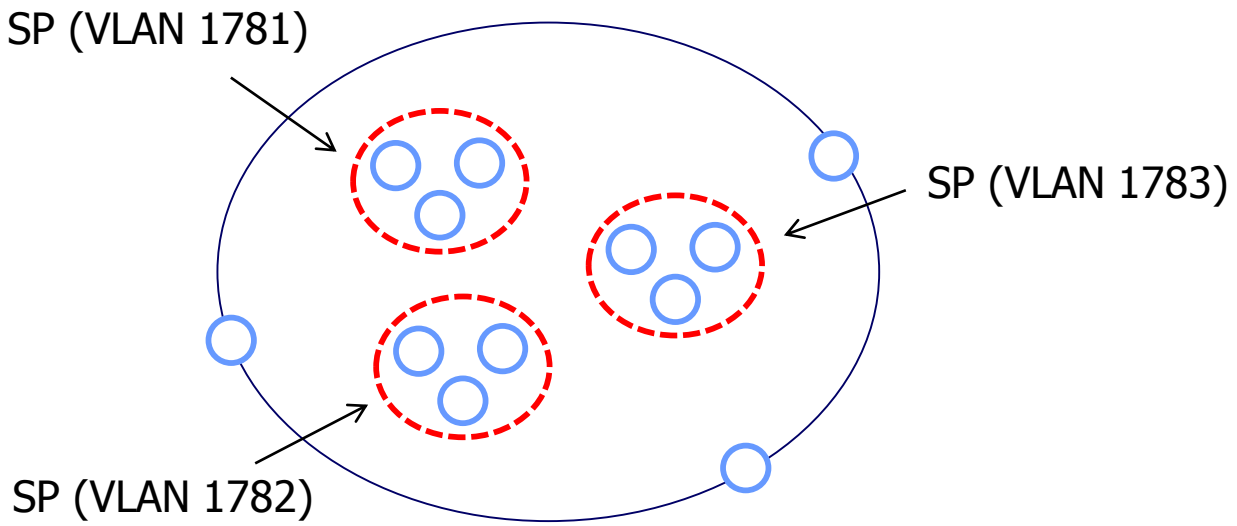
In / Out-of Scopes

- In scope
  - Architecture for multiple network
  - Interfaces to handle switching point.

- Out-of scope
  - Path finding (Implementation issue)
  - Bandwidth calculation (Implementation issue)

Definitions of SwitchingPoint (SP)

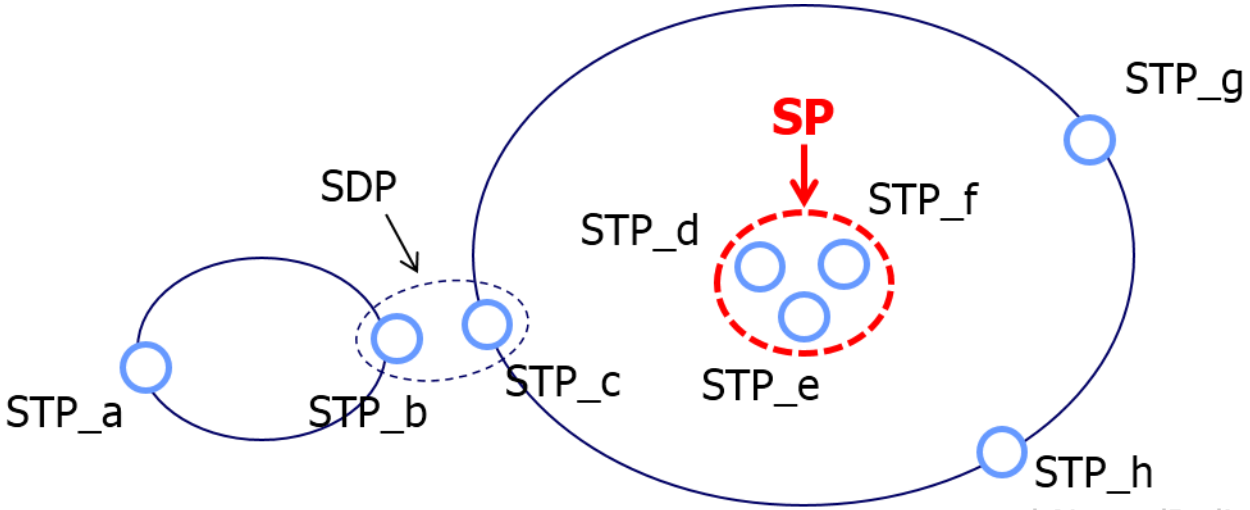
- SP has multiple internal STPs.
  - The number of the internal STPs is equal to the number of external STPs.
- SP is non-blocking.
- SP and internal STPs don’t need to map physical network equipment.
- SP is assigned to a requester agent.
  - The other requester agent cannot find the SP.
- A requester agent can create multiple SPs in a domain.



SwitchingService operations

Openration	IN/OUT	Parameter	Value
create	IN	SwitchingCapability	ETHERNET, IP, …
	OUT	URN	urn:ogf:network:<networkname>:2012:sp:…
		OWL	OWL topology file
delete	IN	URN	urn:ogf:network:<networkname>:2012:sp:…
query	IN	URN	urn:ogf:network:<networkname>:2012:sp:…
	OUT	URN	urn:ogf:network:<networkname>:2012:sp:…
		OWL	OWL topology file

OWL example



Existing tags

```
<owl:NamedIndividual rdf:about="urn:ogf:network:kddi-labs.net:2012:bi-kddi-labs-jgnx"/>
<owl:NamedIndividual rdf:about="urn:ogf:network:jgnx.net:2012:topology"/>
<owl:NamedIndividual rdf:about="urn:ogf:network:kddi-labs.net:2012:bi-kddi-labs-None"/>
<rdf:Description rdf:about="http://schemas.ogf.org/nml/2012/10/ethernet#vlans"/>
<owl:NamedIndividual rdf:about="urn:ogf:network:kddi-labs.net:2012:nsa"/>
```

New tags for SS

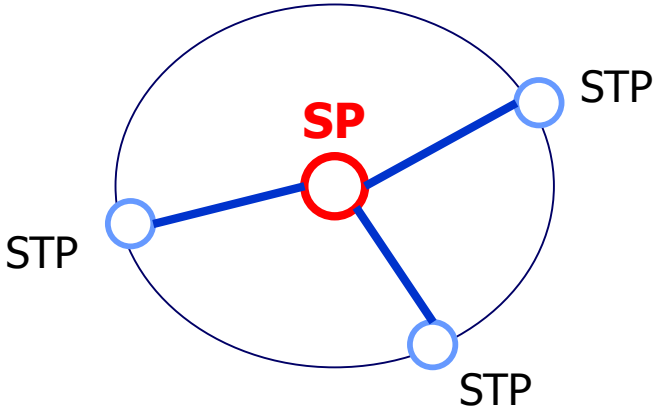
```
<owl:NamedIndividual rdf:about="urn:ogf:network:kddi-labs.net:2012:switchingpoint">
  <rdf:type rdf:resource="http://schemas.ogf.org/nml/2012/10/base#SwitchingService"/>
  <nml:hasOutboundPort rdf:resource="urn:ogf:network:kddi-labs.net:2012:stp_d_out"/>
  <nml:hasInboundPort rdf:resource="urn:ogf:network:kddi-labs.net:2012:stp_d_in"/>
  <nml:hasOutboundPort rdf:resource="urn:ogf:network:kddi-labs.net:2012:stp_e_out"/>
  <nml:hasInboundPort rdf:resource="urn:ogf:network:kddi-labs.net:2012:stp_e_in"/>
  <nml:hasOutboundPort rdf:resource="urn:ogf:network:kddi-labs.net:2012:stp_f_out"/>
  <nml:hasInboundPort rdf:resource="urn:ogf:network:kddi-labs.net:2012:stp_f_in"/>
</owl:NamedIndividual>
```

Appendix.

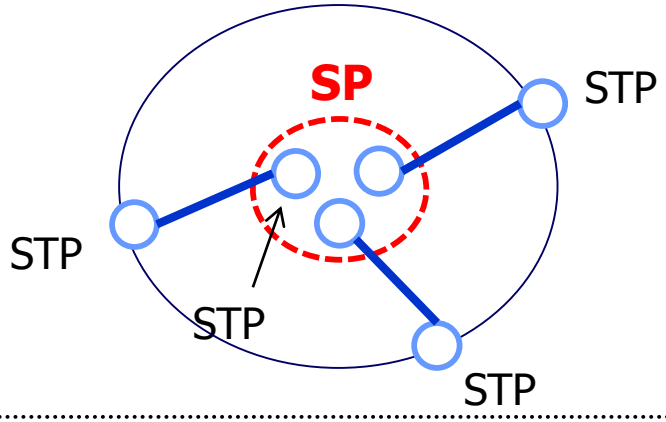
Alternatives

	Model1	Model2	Model3	Model4
SP is …	STP	STP	SDP	SDP
Be created …	Statically	Dynamically	Statically	Dynamically
Handle multiple network	No	Yes	No	Yes
Act as Ethernet switch	Yes	Yes	Yes	Yes
Act as Router	No?	No?	Yes	Yes
Act as OpenFlow switch	No	No	Yes	Yes

"SP is STP" model



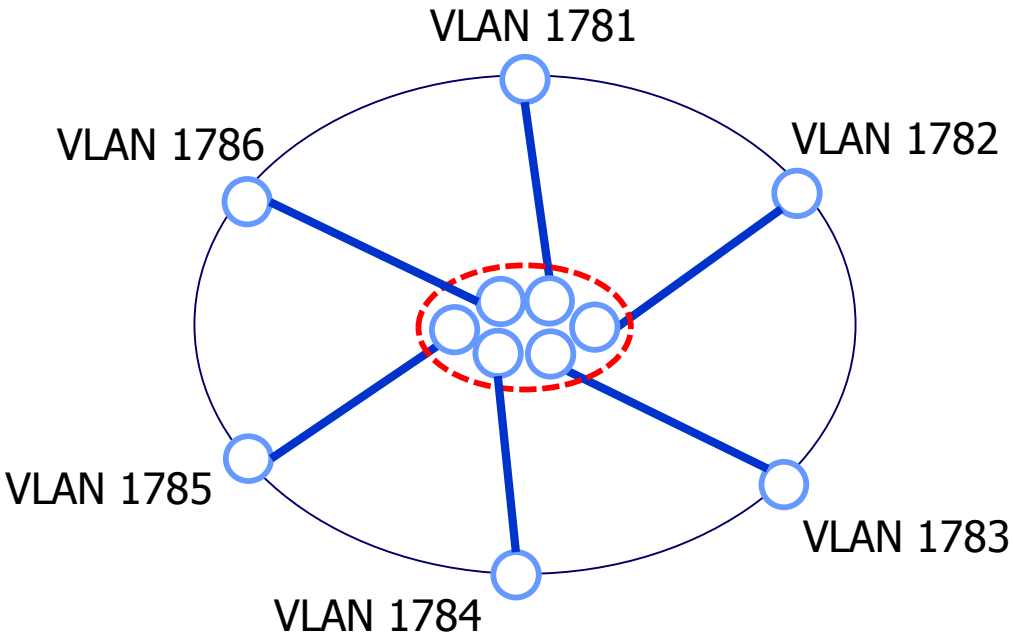
"SP is SDP" model

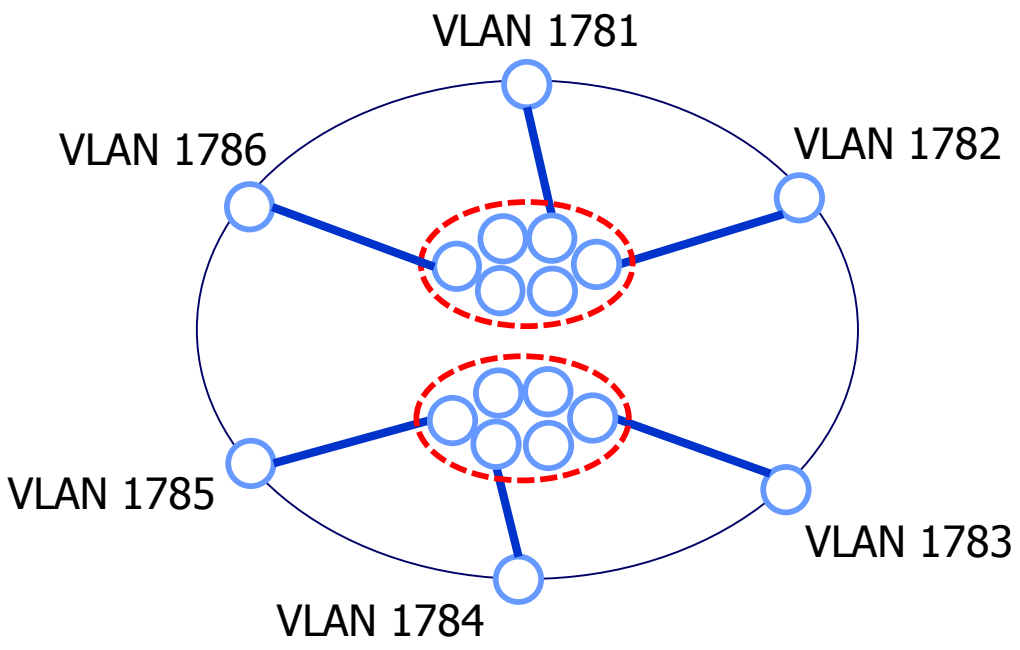


Handle multiple network

Different VLANs are able to communicate among STPs within a SP.

- If there is only a SP, …
  - All VLAN traffic is transferred.
- If there are multiple SPs, …
  - Arbitrary network separation is achieved.





Router / OpenFlow switch

This feature is future extension (SSv2?).

- "SP is STP" model
  - It is difficult to recognize "Interfaces" of SP.

- "SP is SDP" model
  - SP is virtual router / OpenFlow switch.
  - It is easy to map "Interfaces".

urn:ogf:network:example.com:2012:stp_a ➔ port 1
urn:ogf:network:example.com:2012:stp_b ➔ port 2
urn:ogf:network:example.com:2012:stp_c ➔ port 3