Attributes of NSI Service Definition

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General service definition

[ServiceDefinitionType: General Service attributes]

NAME	DECRIPTION	TYPE
ServiceName	The Service Name is an agreed upon textual title for the service. The Service Name is used to distinguish different services definitions. The schema of the service definition should be specified at the attribute.	xsd:string
Route	The Route attributes describes a list of STPs. At least, two STPs must be designated. The first and last STPs mean the "connection termination points". When more than two STPs are designated, the STPs between "connection termination points" mean the explicit route of the connection.	array of STPType

[STPType: General STP attributes]

NAME	DECRIPTION	TYPE
NetworkID	Global unique ID	xsd:string
LocalID	Local unique ID	xsd:string
Bandwidth	Bandwidth	xsd:int

Ethernet service definition

[Ethernet Service attributes]

NAME	DECRIPTION	TYPE
ServiceMTU	The ServiceMTU means the MTU size of frames that the connection can transfer. Must be less than or equal to minimum of InterfaceMTU sizes. The additional header size to encapsulate (e.g. IEEE 802.1ad, IEEE 802.1ah and EoMPLS) is not included. [byte]	xsd:int
VLANIDPreservation	true: VLAN ID must not modified. false: VLAN ID may be translated.	xsd:boolean

[Ethernet STP attributes]

NAME	DECRIPTION	TYPE
AccessFraming	When the AccessFraming is designated, the STP is encapsulated interface. In this case, The VLANID means Service VLAN. IEEE802.1ad / IEEE802.1ah / RFC4448	ENUMERATION
InterfaceMTU	MTU of Interface [byte]	xsd:int
VLANID		xsd:int

Optical service definition

[Optical Service attributes]

NAME	DECRIPTION	TYPE
Directionality	Unidirectional / Bidirectional	ENUMERATION

[Optical STP attributes]

NAME	DECRIPTION	TYPE
EncodingType	SDH ITU-T / SONET ANSI / ODUk / OCh / Ethernet IEEE PHY	ENUMERATION

Possible scenario

- A user requests a Ethernet connection between KDDI R&D and Internet2 domain.
  - KDDI R&D domain provides optical service only.
  - JGN-X domain provides Ethernet service.
    - also supports encapsulation with IEEE802.1ah.
  - PacificWave domain provides Ethernet service.
    - but accepted VLAN IDs are 1001-1009 only.
  - Internet2 domain provides Ethernet service.
    - also supports encapsulation with IEEE802.1ah.
- To handle the request, the encapsulation between JGN-X and Internet2 domain is required.

KDDI R&D domain   JGN-X domain   PacificWave domain   Internet2 domain

Optical service   Ethernet service   Ethernet service   Ethernet service
(supports encapsulation)   (VID = 1001-1009 only)   (supports encapsulation)
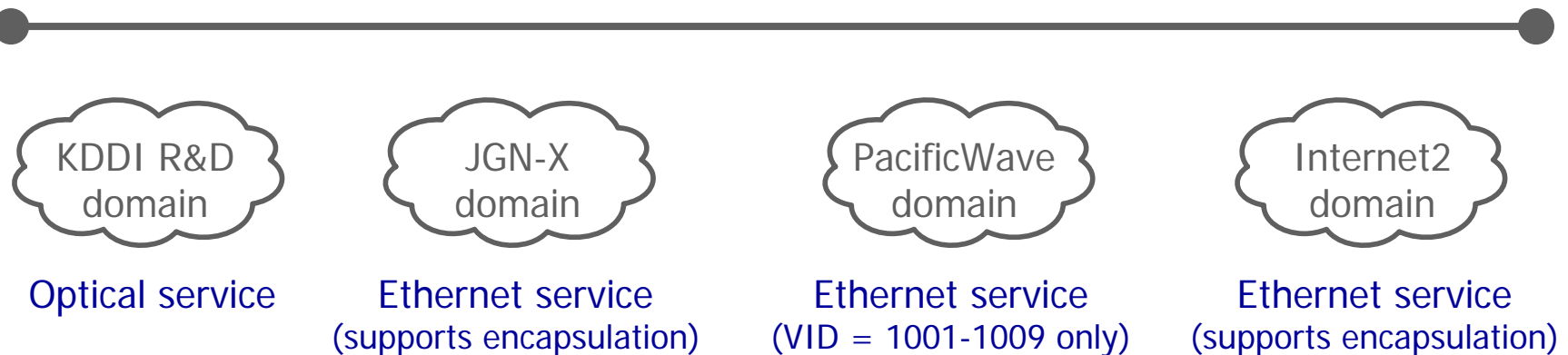
Request message

<tag>: defined in general service definition schema
<tag>: defined in service-specific service definition schema

```
<ethernet:EthernetServiceDefinition>
 <general:ServiceName uri="http://schemas.ogf.org/nsi/connection/v1_0/ethernet">Ethernet Service</general:ServiceName>
 <general:Route>
  <ethernet:EthernetServiceTerminationPoint>
   <general:NetworkID>KDDIRD-A</general:NetworkID>
   <general:LocalID>KDDIRD-A</general:LocalID>
   <general:Bandwidth>1000</general:Bandwidth>
   <ethernet:InterfaceMTU>1500</ethernet:InterfaceMTU>
   <ethernet:VLANID>25</ethernet:VLANID>
  </ethernet:EthernetServiceTerminationPoint>
  <ethernet:EthernetServiceTerminationPoint>
   <general:NetworkID>INTERNET2-Z</general:NetworkID>
   <general:LocalID>INTERNET2-Z</general:LocalID>
   <general:Bandwidth>1000</general:Bandwidth>
   <ethernet:InterfaceMTU>1500</ethernet:InterfaceMTU>
   <ethernet:VLANID>25</ethernet:VLANID>
  </ethernet:EthernetServiceTerminationPoint>
 </general:Route>
 <ethernet:ServiceMTU>1500</ethernet:ServiceMTU>
 <ethernet:VLANIDPreservation>true</ethernet:VLANIDPreservation>
</ethernet:EthernetServiceDefinition>
```

Original STP

Destination STP

| KDDI R&D domain | JGN-X domain | PacificWave domain | Internet2 domain |

Optical service

Ethernet service
(supports encapsulation)

Ethernet service
(VID = 1001-1009 only)

Ethernet service
(supports encapsulation)

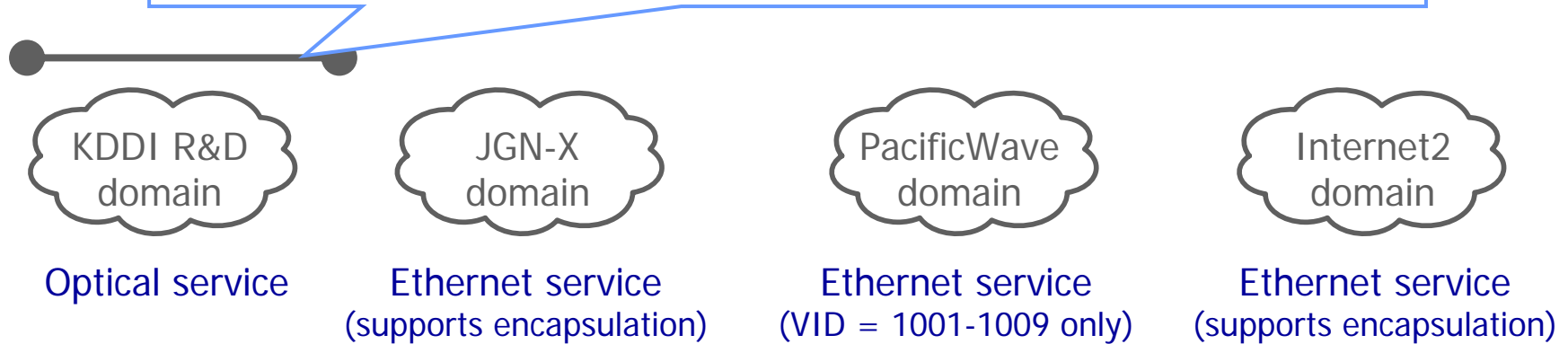# Request for KDDI R&D domain

<tag>: defined in general service definition schema
<tag>: defined in service-specific service definition schema

```
<?xml version="1.0" encoding="UTF-8"?>
<optical:OpticalServiceDefinition>
 <general:ServiceName uri="http://schemas.ogf.org/nsi/connection/v1_0/optical">Optical Service</general:ServiceName>
 <general:Route>
  <optical:OpticalServiceTerminationPoint>
   <general:NetworkID>KDDIRD-A</general:NetworkID>
   <general:LocalID>KDDIRD-A</general:LocalID>
   <general:Bandwidth>1000</general:Bandwidth>
   <optical:Encoding>IEEE PHY</optical:Encoding>
  </optical:OpticalServiceTerminationPoint>
  <optical:OpticalServiceTerminationPoint>
   <general:NetworkID>KDDIRD-Z</general:NetworkID>
   <general:LocalID>KDDIRD-Z</general:LocalID>
   <general:Bandwidth>1000</general:Bandwidth>
   <optical:Encoding>IEEE PHY</optical:Encoding>
  </optical:OpticalServiceTerminationPoint>
 </general:Route>
 <optical:Directionality>Bidirectional</optical:Directionality>
</optical:OpticalServiceDefinition>
```

Original STP

Destination STP

KDDI R&D
domain

JGN-X
domain

PacificWave
domain

Internet2
domain

Optical service

Ethernet service
(supports encapsulation)

Ethernet service
(VID = 1001-1009 only)

Ethernet service
(supports encapsulation)

Request for JGN-X domain

<tag>: defined in general service definition schema
<tag>: defined in service-specific service definition schema

```xml
<?xml version="1.0" encoding="UTF-8"?>
<ethernet:EthernetServiceDefinition>
  <general:ServiceName uri="http://schemas.ogf.org/nsi/connection/v1_0/ethernet">Ethernet Service</general:ServiceName>
  <general:Route>
    <ethernet:EthernetServiceTerminationPoint>
      <general:NetworkID>JGNX-A</general:NetworkID>
      <general:LocalID>JGNX-A</general:LocalID>
      <general:Bandwidth>1000</general:Bandwidth>
      <ethernet:InterfaceMTU>1500</ethernet:InterfaceMTU>
      <ethernet:VLANID>25</ethernet:VLANID>
    </ethernet:EthernetServiceTerminationPoint>
    <ethernet:EthernetServiceTerminationPoint>
      <general:NetworkID>JGNX-Z</general:NetworkID>
      <general:LocalID>JGNX-Z</general:LocalID>
      <general:Bandwidth>1000</general:Bandwidth>
      <ethernet:InterfaceMTU>1500</ethernet:InterfaceMTU>
      <ethernet:VLANID>1001</ethernet:VLANID>
      <ethernet:AccessFraming>IEEE802.1ah</ethernet:AccessFraming>
    </ethernet:EthernetServiceTerminationPoint>
  </general:Route>
  <ethernet:ServiceMTU>1500</ethernet:ServiceMTU>
  <ethernet:VLANIDPreservation>true</ethernet:VLANIDPreservation>
</ethernet:EthernetServiceDefinition>
```
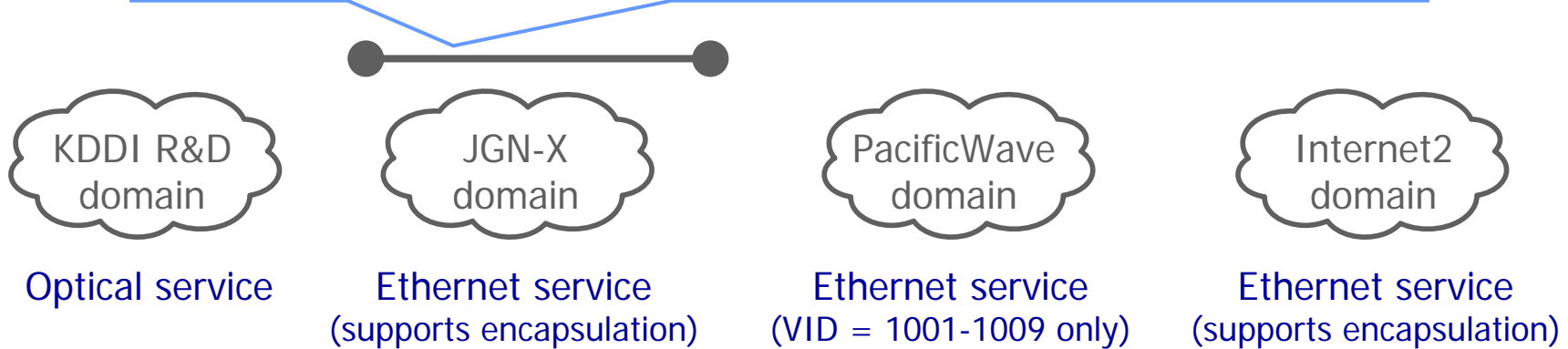
Original STP

Destination STP

VLANID is changed to service VLANID.

To encapsulate frames, AccessFraming parameter is designated.

KDDI R&D domain

JGN-X domain

PacificWave domain

Internet2 domain

Optical service

Ethernet service
(supports encapsulation)

Ethernet service
(VID = 1001-1009 only)

Ethernet service
(supports encapsulation)

Request for PW domain

<tag>: defined in general service definition schema
<tag>: defined in service-specific service definition schema

```xml
<?xml version="1.0" encoding="UTF-8"?>
<ethernet:EthernetServiceDefinition>
 <general:ServiceName uri="http://schemas.ogf.org/nsi/connection/v1_0/ethernet">Ethernet Service</general:ServiceName>
 <general:Route>
  <ethernet:EthernetServiceTerminationPoint>
   <general:NetworkID>PW-A</genera
   <general:LocalID>PW-A</general:L
   <general:Bandwidth>1000</general:Bandwidth>
   <ethernet:InterfaceMTU>1530</ethernet:InterfaceMTU>
   <ethernet:VLANID>1001</ethernet:VLANID>
  </ethernet:EthernetServiceTerminationPoint>
  <ethernet:EthernetServiceTerminationPoint>
   <general:NetworkID>PW-Z</general:NetworkID>
   <general:LocalID>PW-Z</general:LocalID>
   <general:Bandwidth>1000</general:Bandwidth>
   <ethernet:InterfaceMTU>1530</ethernet:InterfaceMTU>
   <ethernet:VLANID>1001</ethernet:VLANID>
  </ethernet:EthernetServiceTerminationPoint>
 </general:Route>
 <ethernet:ServiceMTU>1530</ethernet:ServiceMTU>
 <ethernet:VLANIDPreservation>true</ethernet:VLANIDPreservation>
</ethernet:EthernetServiceDefinition>
```
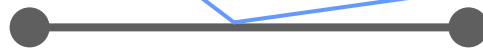
MTU size includes the header size of IEEE802.1ah.

Don't care of AccessFraming.

KDDI R&D domain

JGN-X domain

PacificWave domain

Internet2 domain

Optical service

Ethernet service (supports encapsulation)

Ethernet service (VID = 1001-1009 only)

Ethernet service (supports encapsulation)

Request for Internet2 domain

```xml
<?xml version="1.0" encoding="UTF-8"?>
<ethernet:EthernetServiceDefinition>
 <general:ServiceName uri="http://schemas.ogf.org/nsi/connection/v1_0/ethernet">Ethernet Service</general:ServiceName>
 <general:Route>
  <ethernet:EthernetServiceTerminationPoint>
   <general:NetworkID>INTERNET2-A</general:NetworkID>
   <general:LocalID>INTERNET2-A</general:LocalID>
   <general:Bandwidth>1000</general:Bandwidth>
   <ethernet:InterfaceMTU>1500</ethernet:InterfaceMTU>
   <ethernet:VLANID>1001</ethernet:VLANID>
   <ethernet:AccessFraming>IEEE802.1ah</ethernet:AccessFraming>
  </ethernet:EthernetServiceTerminationPoint>
  <ethernet:EthernetServiceTerminationPoint>
   <general:NetworkID>INTERNET2-Z</general:NetworkID>
   <general:LocalID>INTERNET2-Z</general:LocalID>
   <general:Bandwidth>1000</general:Bandwidth>
   <ethernet:InterfaceMTU>1500</ethernet:InterfaceMTU>
   <ethernet:VLANID>25</ethernet:VLANID>
  </ethernet:EthernetServiceTerminationPoint>
 </general:Route>
 <ethernet:ServiceMTU>1500</ethernet:ServiceMTU>
 <ethernet:VLANIDPreservation>true</ethernet:VLANIDPreservation>
</ethernet:EthernetServiceDefinition>
```

<tag>: defined in general service definition schema
<tag>: defined in service-specific service definition schema

Original STP

Destination STP

KDDI R&D domain

JGN-X domain

PacificWave domain

Internet2 domain

Optical service

Ethernet service
(supports encapsulation)

Ethernet service
(VID = 1001-1009 only)

Ethernet service
(supports encapsulation)