SAP Updates (Med)

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Current Structure

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
         +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
      +--rw service-attachment-point* [attachment-id]
         +--rw attachment-id
                                     nt:tp-id
                                     identityref
         +--ro interface-type?
         +--rw admin-status?
                                    boolean
         +--rw oper-status?
                               boolean
         +--rw encapsulation-type?
                                     identityref
         +--rw sap-type*
                                     identityref
         +--rw service-description?
                                     string
```

Multi-Service SAPs

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
                          identityref
         +--rw sap-type*
    augment /nw:networks/nw:network/nw:node:
      +--rw service-attachment-point* [attachment-id]
         +--rw attachment-id
                                      nt:tp-id
                                      identityref
         +--ro interface-type?
         +--rw admin-status?
                                      boolean
         +--rw oper-status?
                                      boolean
         +--rw encapsulation-type?
                                      identityref
         +--rw sap-type*
                                      identityref
         +--rw service-description?
                                      string
```

Indicates which services are supported in a network

However, we can't easily display SAPs per service

Per-Service SAPs

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
         +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
      +--rw service-attachment-point* [attachment-id]
      +--rw service* [sap-type]
                                            identityref
         +--rw sap-type
         +--rw service-attachment-point* [attachment-id]
            +--rw attachment-id
                                          nt:tp-id
                                          identityref
            +--ro interface-type?
                                          boolean
            +--rw admin-status?
                                          boolean
            +--rw oper-status?
            +--rw encapsulation-type?
                                          identityref
            +--rw sap-type*
                                          <u>identityref</u>
            +--rw service-description?
                                          string
```

One the saps that are listed under the network level

Interface Hierarchy

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
         +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
      +--rw service* [sap-type]
                                           identityref
         +--rw sap-type
         +--rw service-attachment-point*
                                          [attachment-i
            +--rw attachment-id
                                         nt:tp-id
            +--ro interface-type?
                                         identityref
            +--rw admin-status?
                                         boolean
                                         boolean
            +--rw oper-status?
            +--rw encapsulation-type?
                                         identityref
            +--rw service-description?
                                          string
```

Distinct services can be available via the same physical port, but on distinct subinterfaces

Interface Hierarchy

```
module: ietf-sap-ntw
         augment /nw:networks/nw:network/nw:network-types:
"ietf-sap-ntw:service-attachment-point": [
   "attachment-id": "GE0/6/1",
   "service-description": "No service is enabled via GEO/6/1."
   "attachment-id": "GE0/6/4",
   "service-description": "Enable L3VPN and L2VPN services via GE0/6/4"
   "attachment-id": "GE0/6/4.1",
   "service-description": "L3VPN service has been activated via GE0/6/4.1"
   "attachment-id": "GE0/6/4.2",
   "service-description": "L2VPN service has been deactivated via GE0/6/4.2"
```

There is no structured information that allows to link the various interfaces between them

Interface Hierarchy

```
module: ietf-sap-ntw
         augment /nw:networks/nw:network/nw:network-types:
"ietf-sap-ntw:service-attachment-point": [
   "attachment-id": "GE0/6/1",
   "service-description": "No service is enabled via GE0/6/1."
   "attachment-id": "GE0/6/4",
   "service-description": "Enable L3VPN and L2VPN services via GE0/6/4"
   "attachment-id": "GE0/6/4.1",
   "parent-termination-point": "GEO/6/4",
   "service-description": "L3VPN service has been activated via GEO/6/4.1"
   "attachment-id": "GE0/6/4.2",
   "parent-termination-point": "GE0/6/4",
   "service-description": "L2VPN service has been deactivated via GE0/6/4.2"
```

Explicit Interface Hierarchy

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
     +--rw sap-network!
        +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
     +--rw service* [sap-type]
                                          identityref
        +--rw sap-type
        +--rw service-attachment-point* [attachment-id]
           +--rw attachment-id
                                       nt:tp-id
           +--rw parent-termination-point? nt:tp-id
           +--ro interface-type?
                                       identityref
           +--rw admin-status?
                                       boolean
           +--rw oper-status?
                                       boolean
           +--rw encapsulation-type?
                                       identityref
           +--rw service-description?
                                        string
```

Interface Types

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
         +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
      +--rw service* [sap-type]
                                           identity
         +--rw sap-type
         +--rw service-attachment-point* [attachment-n
            +--rw attachment-id
                                         nt:tp-id
            +--rw parent-termination-point?
                                             nt:tp-id
                                         identityref
            +--ro interface-type?
            +--rw admin-status?
                                         boolean
                                         boolean
            +--rw oper-status?
            +--rw encapsulation-type?
                                         identityref
            +--rw service-description?
                                         string
```

if:interface-type and may require new identities to be defined

Interface Types

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
         +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
      +--rw service* [sap-type]
                                          identityref
         +--rw sap-type
         +--rw service-attachment-point* [attachment-id]
            +--rw attachment-id
                                        nt:tp-id
            +--rw parent-termination-point? nt:tp-id
            +--ro interface-type?
                                        identityref
            +--rw admin-status?
                                        boolean
                                        boolean
            +--rw oper-status?
            +--rw encapsulation-type?
                                        identityref
            +--rw service-description?
                                         string
```

Define a new identity with these values: phy, loopback, irb, local-bridge, lag, logical

Interface Role

```
C N#1 N#2
```

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
         +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
      +--rw service* [sap-type]
                                           identity
         +--rw sap-type
         +--rw service-attachment-point* [attachment-r
            +--rw attachment-id
                                         nt:tp-id
            +--rw parent-termination-point?
                                              nt:tp-id
                                         identityref
            +--ro interface-type?
            +--rw admin-status?
                                         boolean
                                         boolean
            +--rw oper-status?
            +--rw encapsulation-type?
                                         identityref
            +--rw service-description?
                                         string
```

How to identify whether an interface is UNI or NNI?

Interface Role

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
         +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
      +--rw service* [sap-type]
                                          identityref
         +--rw sap-type
         +--rw service-attachment-point* [attachment-id]
           +--rw attachment-id
                                        nt:tp-id
           +--rw parent-termination-point? nt:tp-id
                                        Identityref
           +--ro interface-type?
           +--rw interface-role?
                                             identityref
           +--rw admin-status?
                                        boolean
           +--rw oper-status?
                                        boolean
           +--rw encapsulation-type?
                                        identityref
           +--rw service-description?
                                        string
```

Can be set to uni or nni

```
Service Correlation
```

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
         +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
      +--rw service* [sap-type]
                                                          This is not supported in
                                            identity
         +--rw sap-type
                                                           the current model
         +--rw service-attachment-point* [attachment-re
            +--rw attachment-id
                                         nt:tp-id
            +--rw parent-termination-point? nt:tp-id
            +--ro interface-type?
                                         Identityref
            +--rw interface-role?
                                               identityref
                                         boolean
            +--rw admin-status?
            +--rw oper-status?
                                         boolean
            +--rw encapsulation-type?
                                         identityref
                                         String
            +--rw service-description?
```

Customer

Service Correlation

```
Bind C to a provider's SAP?
```

SAP Topo

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
         +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
      +--rw service* [sap-type]
                                          identityref
         +--rw sap-type
         +--rw service-attachment-point* [attachment-id]
           +--rw attachment-id
                                        nt:tp-id
           +--rw parent-termination-point? nt:tp-id
           +--ro interface-type?
                                        Identityref
           +--rw interface-role?
                                             identityref
           +--rw admin-status?
                                        boolean
           +--rw oper-status?
                                        boolean
                                        identityref
           +--rw encapsulation-type?
                                        String
           +--rw service-description?
           +--rw peer-customer-sap-id?
                                             string
```

Can be a CE or a peer PE

Service Activation vs. SAP Status

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
         +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
      +--rw service* [sap-type]
                                          identityref
         +--rw sap-type
         +--rw service-attachment-point* [attachment-id]
                                        nt:tp-id
           +--rw attachment-id
           +--rw parent-termination-point? nt:tp-
           +--ro interface-type?
                                        Identityref
                                             identity
           +--rw interface-role?
           +--rw admin-status?
                                        boolean
                                        boolean
           +--rw oper-status?
                                        identityref
           +--rw encapsulation-type?
           +--rw service-description?
                                        String
           +--rw peer-customer-sap-id?
                                             string
```

A SAP may be active but the service over that SAP may not

Service Activation vs. SAP Status

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
                           identityref
         +--rw sap-type*
    augment /nw:networks/nw:network/nw:node:
      +--rw service* [sap-type]
         +--rw sap-type
                                            identityref
         +--rw service-attachment-point* [attachmen
            +--rw attachment-id
                                         nt:tp-i
            +--rw parent-termination-point?
            +--ro interface-type?
                                         ....ltyref
            +--rw interface-role
                                               identityref
            +--rw status-
               +--rw admin-status
               +--rw oper-status
            +--ro service-status
            +--rw encapsulation-type?
                                         identityref
            +--rw service-description?
                                          String
            +--rw peer-customer-sap-id?
                                               string
```

Service status: Can be used in to know where a service is currently delivered, but also where a service can be delivered

SAP status

Reuse Common VPN Types

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
      +--rw sap-network!
         +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
      +--rw service* [sap-type]
         +--rw sap-type
                                            identityref
         +--rw service-attachment-point* [attachment-id]
            +--rw attachment-id
                                         nt:tp-id
            +--rw parent-termination-point?
                                              nt:tp-id
            +--ro interface-type?
                                         Identityref
            +--rw interface-role?
                                               identityref
            +--rw status
               +--rw admin-status
               +--rw oper-status
            +--ro service-status
            +--rw encapsulation-type?
                                          identityref
            +--rw service-description?
                                          String
            +--rw peer-customer-sap-id?
                                               string
```

Does not track changes

Reuse Common VPN Types

```
module: ietf-sap-ntw
    augment /nw:networks/nw:network/nw:network-types:
     +--rw sap-network!
        +--rw sap-type* identityref
    augment /nw:networks/nw:network/nw:node:
     +--rw service* [sap-type]
                                         identityref
        +--rw sap-type
        +--rw service-attachment-point* [attachment-id]
           +--rw attachment-id
                                       nt:tp-id
           +--rw parent-termination-point?
                                            nt:tp-id
           +--ro interface-type?
                                       Identityref
           +--rw interface-role?
                                            identityref
           +--rw status
              +--rw admin-status
              +--rw status?
                                    identityref
               +--rw last-change?
                                     yang:date-and-time
              +--ro oper-status
                +--ro status?
                                    identityref
                                     yang:date-and-time
                 +--ro last-change?
           +--ro service-status
              +--ro status?
                                identityref
              +--ro last-change? yang:date-and-time
```