

# SAP Updates (Med)

02/2022

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

Distinct services  
can be available  
via the same  
physical port, but  
on distinct sub-  
interfaces

# Interface Hierarchy

```
module: ietf-sap-ntw
  augment /nw:networks/nw:network/nw:network-types:
    +--rw sap-network!
```

```
{
  "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",
      "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:
    +--rw sap-network!
```

```
{
  "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": "GE0/6/4",
      "service-description": "L3VPN service has been activated via GE0/6/4.1"
    },
    {
      "attachment-id": "GE0/6/4.2",
      "parent-termination-point": "GE0/6/4",
      "service-description": "L2VPN service has been deactivated via GE0/6/4.2"
    }
  ]
}
```

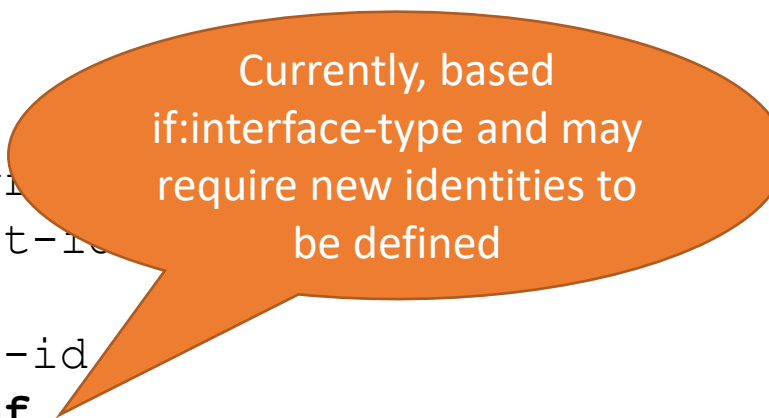
# Explicit Interface Hierarchy

```
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]
      +--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 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]
      +--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 admin-status? boolean
      +--rw oper-status? boolean
      +--rw encapsulation-type? identityref
      +--rw service-description? string
```



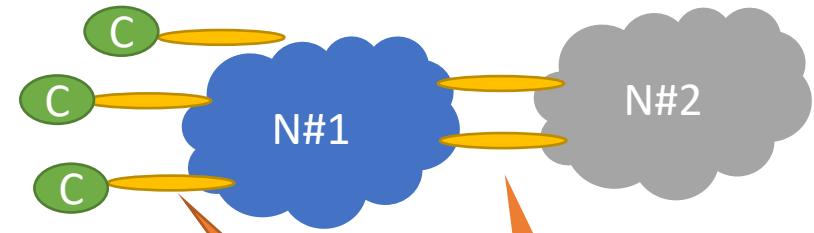
Currently, based  
if:interface-type and may  
require new identities to  
be defined

# 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]
      +--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 admin-status? boolean
        +--rw oper-status? boolean
        +--rw encapsulation-type? identityref
        +--rw service-description? string
```

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

# Interface Role

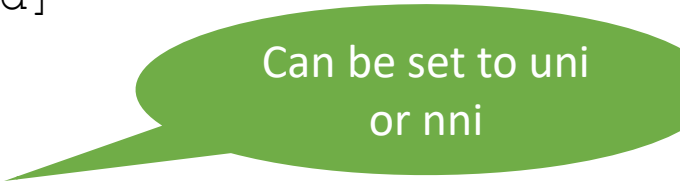


```
module: ietf-sap-ntw
  augment /nw:networks/nw:network/nw:network-types:
    +--rw sap-network!
      +--rw sap-type* identityref
  augment /nw:networks/nw:network/nw:node:
    +--rw service* [sap-type]
      +--rw sap-type identityref
      +--rw service-attachment-point* [attachment-id]
      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

How to identify whether  
an interface is UNI or  
NNI?

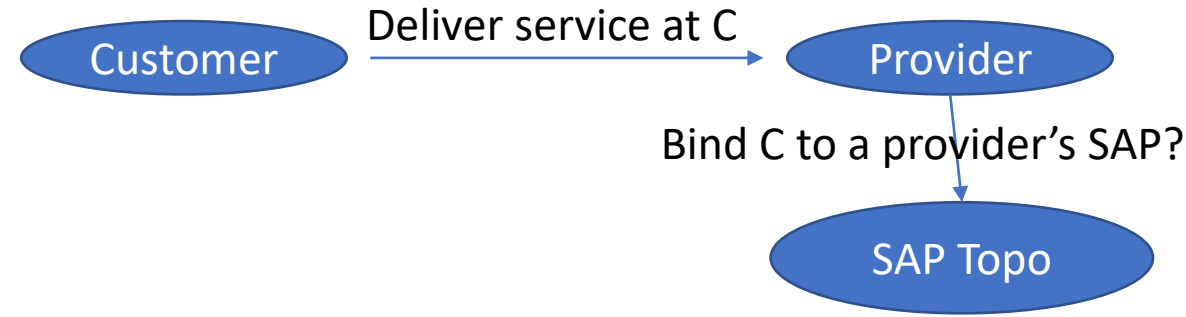
# Interface Role

```
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]
      +--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 admin-status? boolean
        +--rw oper-status? boolean
        +--rw encapsulation-type? identityref
        +--rw service-description? string
```



Can be set to uni  
or nni

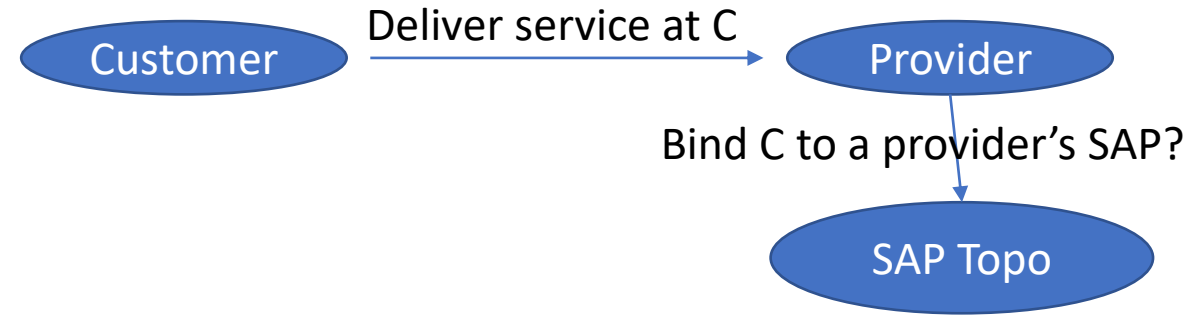
# Service Correlation



```
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]
      +--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 admin-status? boolean
        +--rw oper-status? boolean
        +--rw encapsulation-type? identityref
        +--rw service-description? String
```

This is not supported in  
the current model

# Service Correlation

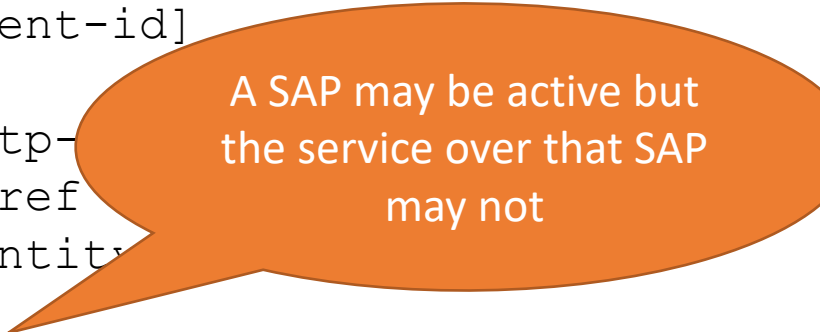


```
module: ietf-sap-ntw
  augment /nw:networks/nw:network/nw:network-types:
    +--rw sap-network!
      +--rw sap-type* identityref
  augment /nw:networks/nw:network/nw:node:
    +--rw service* [sap-type]
      +--rw sap-type identityref
      +--rw service-attachment-point* [attachment-id]
      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

SAP status

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



# 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]
      +--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 status? identityref
        | | +--rw last-change? yang:date-and-time
        | +--ro oper-status
        |   +--ro status? identityref
        |   +--ro last-change? yang:date-and-time
      +--ro service-status
        | +--ro status? identityref
        | +--ro last-change? yang:date-and-time
```