A Network Inventory Management Model

draft-wzwb-opsawg-network-inventory-management

IVY WG, IETF#117

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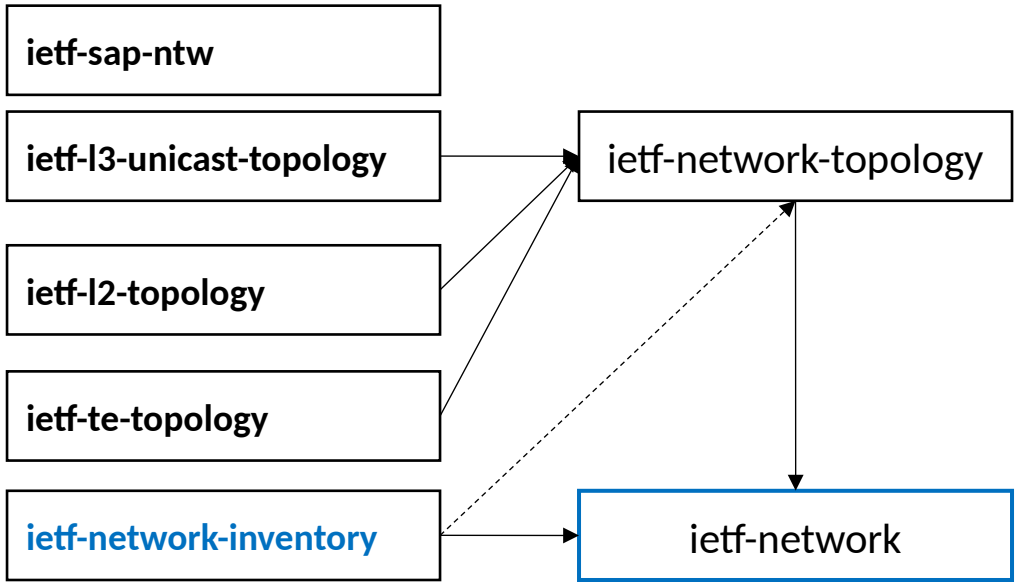
‘ietf-network-inventory’: Model Overview

- The Network Inventory Model is designed to complement the existing topology models to provide physical network information, e.g., device components and physical interfaces.

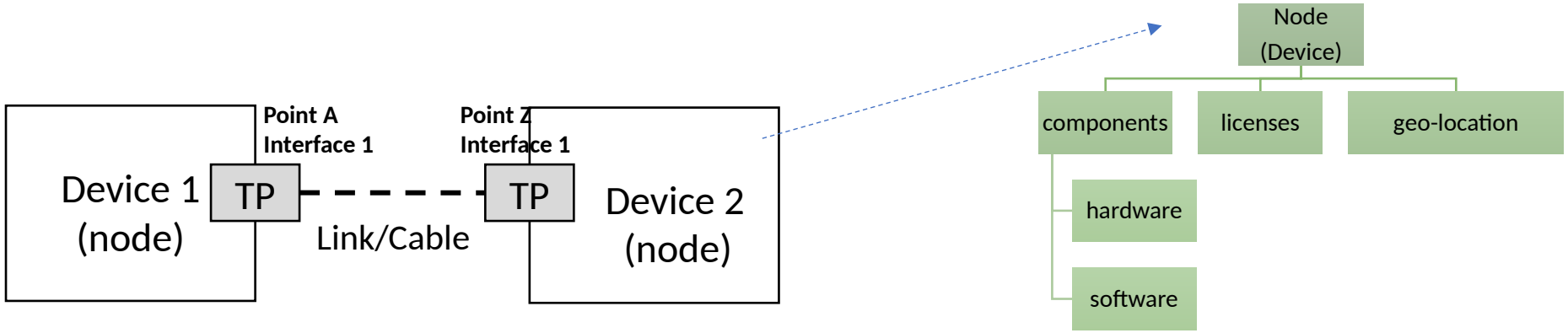



```
module: ietf-network-inventory
  augment /nw:networks/nw:network/nw:network-types:
    +--rw network-inventory!
  augment /nw:networks/nw:network/nw:node:
    +--rw name?                          string
    +--ro node-type?                     identityref
    +--ro is-virtual?                    boolean
    +--ro mud-url?                       inet:uri
    +--ro transparency-info?             inet:uri
    |      ...
    +--rw site?                          string
    +--ro hardware-rev?                  string
    +--ro asset-id?                      string
    +--rw components
    |  +--rw component* [name]
    |          ...
     +--ro licenses
    |  +--ro license* [license-id]
    |       ...
    +--rw geo-location
       +--rw reference-frame
       |     ...
       +--rw (location)?
       |     ...
       +--rw velocity
       |     ...
       +--rw timestamp?          yang:date-and-time
       +--rw valid-until?        yang:date-and-time

augment /nw:networks/nw:network/nw:node/nt:termination-point:
    +--ro tp-name?           string
    +--ro tp-description?    string
    +--ro tp-type?           string
    +--ro oper-state?        oper-state
```

How This Model Meets IVY Needs?

- The model is designed to provide physical devices, physical interfaces, and physical link/cable status from a network domain
- A goal of this model is to ease correlation with the existing topology models. As such, available network resources can be queried during service provisioning, and validating network configurations and forwarding state during service assurance, etc.

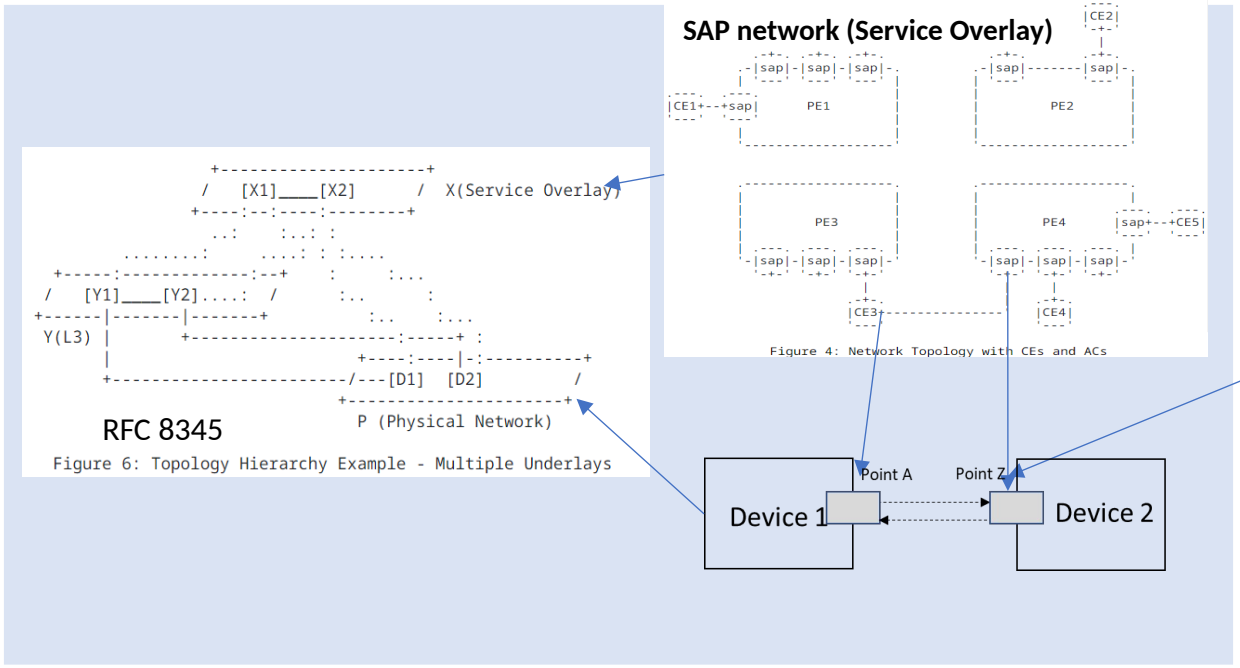


IVY Need	ietf-network-inventory
Hardware/Software components, including licenses	RFC 8345 'ietf-network:node' augmentation with both hardware/software components and licenses
Mapping and correlation	RFC 8345 by nature
Physical locations	Geo-location, 'site', 'rack-ref' (future)

A Correlation Example of Network Inventory Model

- Service Attachment Points (SAP, RFC 9408) network model maintains an inventory of customer-facing SAPs
- A network inventory model based on RFC 8345 can provide concrete physical interface/TP for SAP network to reference.

SAP topology contains all the UNI and NNI termination points (used and unused) of the network

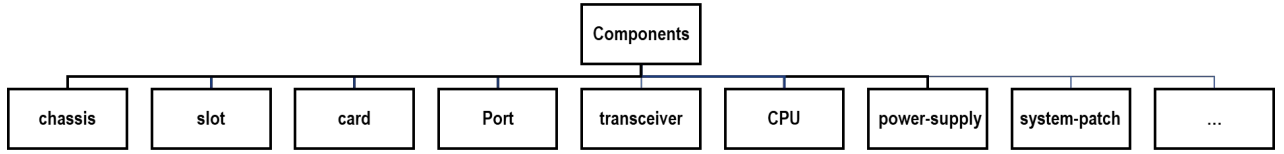


'**parent-termination-point**' refers to a physical interface, not abstract one (RFC 9408)

```
augment /nw:networks/nw:network/nw:node:
  +--rw service* [service-type]
    +--rw service-type                identityref
    +--rw sap* [sap-id]
      +--rw sap-id                    string
      +--rw description?              string
      +--rw parent-termination-point?  nt:tp-id
      +--rw attachment-interface?     string
```

Why is Interface/Termination Point Necessary?

- The ‘port’ component of a device has model information of an interface
- The component attributes **do not** provide sufficient information about the interface used and unused status for SAPs
- Interface specific attributes are needed, e.g.
  - Interface type: fiber, cable, microwave, wireless
  - Interface speed
  - Interface configuration




```
+--rw components
   |  +--rw component* [name]
   |     +--rw name               string
   |     +--ro class?             union
   |     +--ro parent?            -> ../../component/name
   |     +--ro parent-rel-pos?    int32
   |     +--ro is-fru?            boolean
   |     +--ro hardware-rev?      string
   |     +--ro firmware-rev?      string
   |     +--ro software-rev?      string
   |     +--ro serial-num?        string
   |     +--ro mfg-name?          string
   |     +--ro model-name?        string
   |     +--ro alias?             string
   |     +--ro asset-id?          string
   |     +--ro mfg-date?          yang:date-and-time
   |     +--ro uri*               inet:uri
   |     +--ro uuid?              yang:uuid
   |     +--ro oper-state?        oper-state
   |     +--ro usage-state?       hw:usage-state
   |     +--ro alarm-state?       hw:alarm-state
   |     +--ro standby-state?     hw:standby-state
```

What is Within the **Core** Network Inventory Model?

- We think “node” (device) and “termination-point” (interface) attributes and operational status are core components of Network Inventory

Next Steps

- Solicit WG adoption as the core network inventory model
- Review and comments are always welcome