An Inventory Management Model for Enterprise Networks

draft-wzwb-opsawg-network-inventory-management

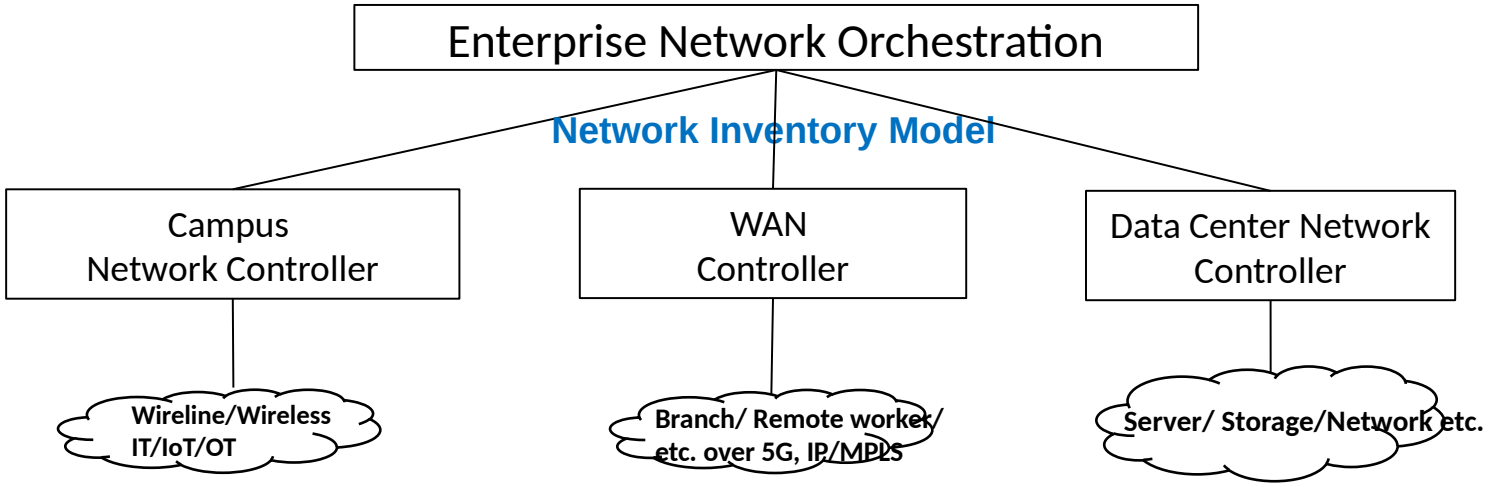
OPSAWG

Mar. 2023

Bo Wu (Presenting), Qin Wu (Huawei)
Chen zhou (China Mobile)
Mohamed Boucadair (Orange)

Background Recap

- Network inventory is a fundamental functionality in network management. Determining devices on an network and the **hardware and software information** is critical to network lifecycle management.
- The **network endpoints** (e.g. Video camera, BYOD devices) information in the network inventory is helpful for consistent ***security and QoS policies*** on the entire network.



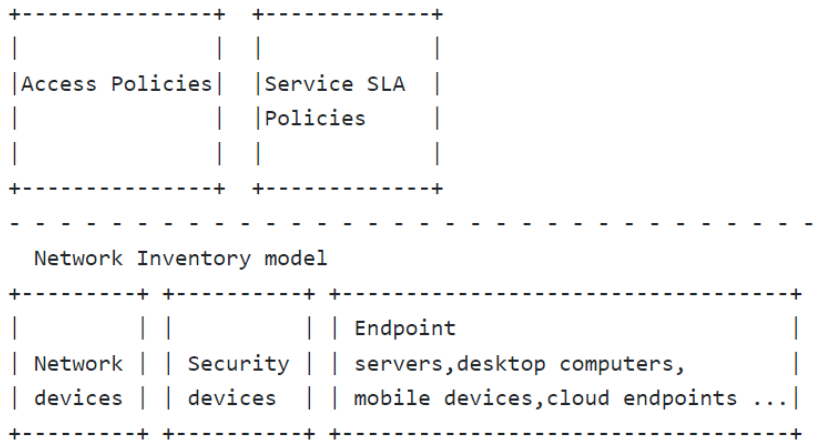
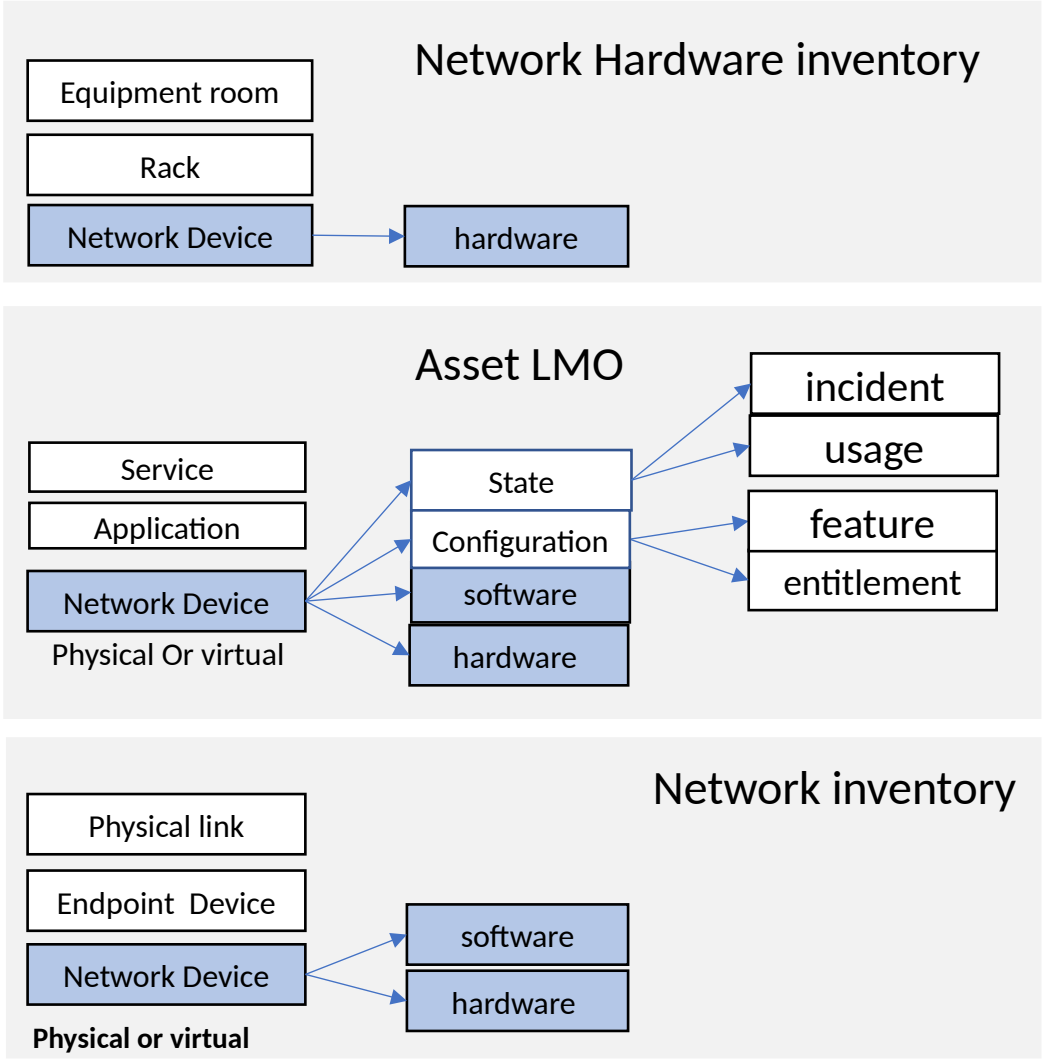


Figure 2: Enterprise Network Abstraction

Network inventory and Asset modelling Analysis

WG	Draft name	Core Modelling approach
CCAMP **Network hardware inventory**	draft-ietf-ccamp-network-inventory-yang	Hardware component list
OPSAWG **Asset management**	draft-palmero-opsawg-dmlmo	Lmo-class based Lmo instance lists
OPSAWG **Network inventory**	draft-wzwb-opsawg-network-inventory-management	Generalized component list covering both software and hardware



Open issues

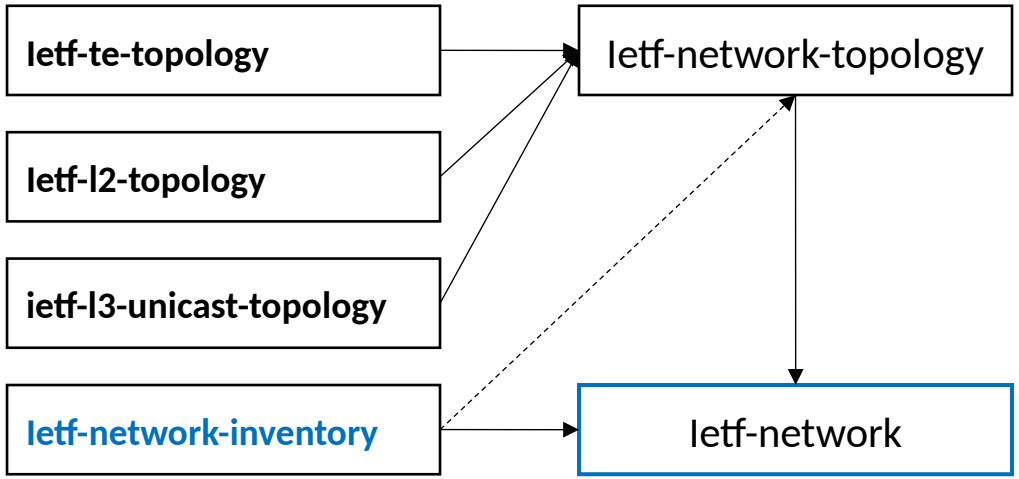
- The Network **Inventory Attributes** relating to the **hardware and software components of the devices** have **overlap**, describing the same attributes but named differently. Therefore issues to consider:
- Should we define generalized **inventory component list?**
  - **E.g. “components-grouping”**
- Should we define common inventory **hardware and software attributes to be reused by other models, such as draft-asset-lmo?**
  - **E.g. “inventory-device-attributes-grouping”**
- Should **RFC8345** be the **base model** of the network inventory? E.g., apart from the network node list, **physical cable connections** between devices can be supported.

Next Step

- WG adoption
- Solicit review and comments

Network-Centric Inventory Mode

- The Network Inventory Model describes **network infrastructure information** retrieved by a network controller and provides the **network nodes and endpoints** found in the network together with additional information concerning IP address, MAC address, software and discovered endpoints ports




```
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]
    |        ...
    +--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/nt:link:
    +--ro link-name?           string
    +--ro link-description?    string
    +--ro link-type?           string
    +--ro oper-state?          oper-state
  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
```

Network Node

Network endpoint

Physical or virtual

Inventory definition overlap

1. Hardware inventory component can be generalized to include software components
2. Cable connection may need topology extension, so better based on RFC 8345 modeling

	draft-ietf-ccamp-network-inventory-yang	draft-wzwb-opsawg-network-inventory-management	Analysis
Overlap part	Device hardware Component	Device hardware **&software** component	1. Hardware inventory also cover IP network devices, IP devices can be physical or virtual, component can be generalized to include software components as “openconfig-platform” do 2. Optical network also has Controller network elements
Future extension	Cable connection between devices	Network topology showing physical link connection	1.Cable definition need topology relationship 2. draft-ietf-opsawg-sap, draft-boro-opsawg-ntw-attachment-circuit need 'parent-termination-point‘ reference