

An Inventory Management Model for Enterprise Networks

[draft-wzwb-opsawg-network-inventory-management](#)

OPSAWG

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I E T F

Problem Statement

- Network inventory is a fundamental functionality in network management. Determining devices on a network and the hardware and software information is critical to network lifecycle management.
- For **physical** network devices, RFC 8348 IETF Hardware YANG model can provide necessary information for the **inventory**. But network controllers, VNFs (virtual router, virtual firewall, etc.), and network endpoints (e.g. IoT, BYOD, etc.) also need to be identified and mapped to the network.
- The network endpoints information in the network inventory is helpful for consistent **security and QoS policies** on the entire network.

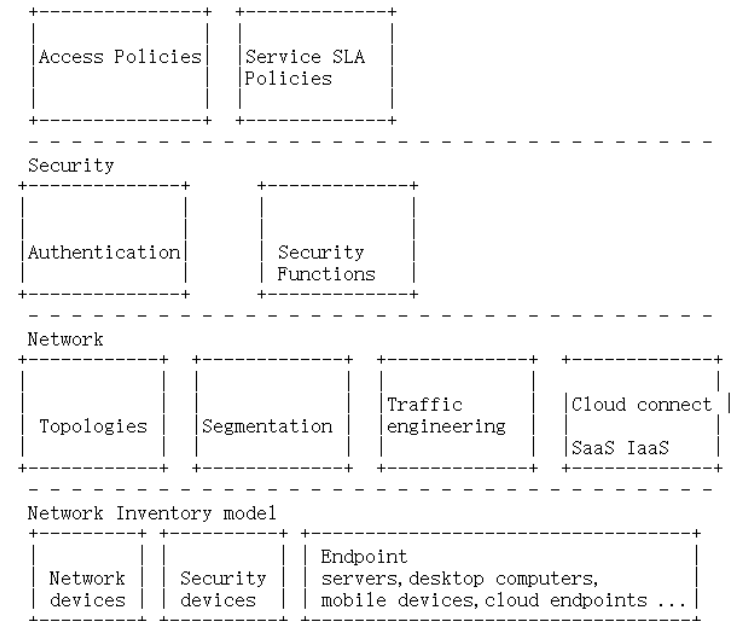
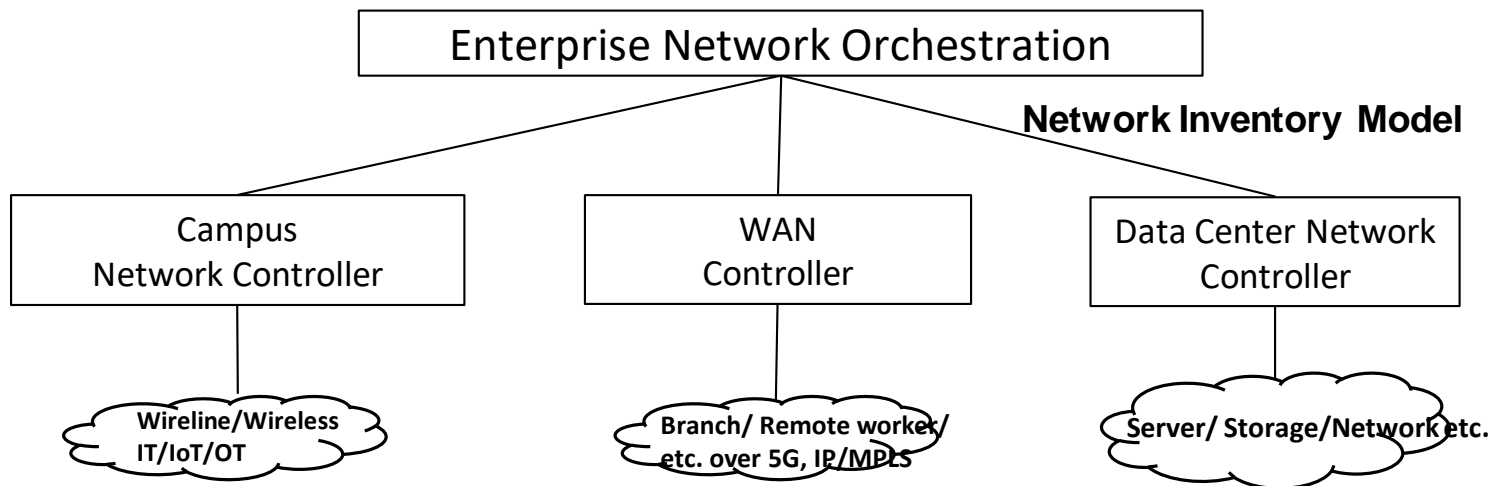
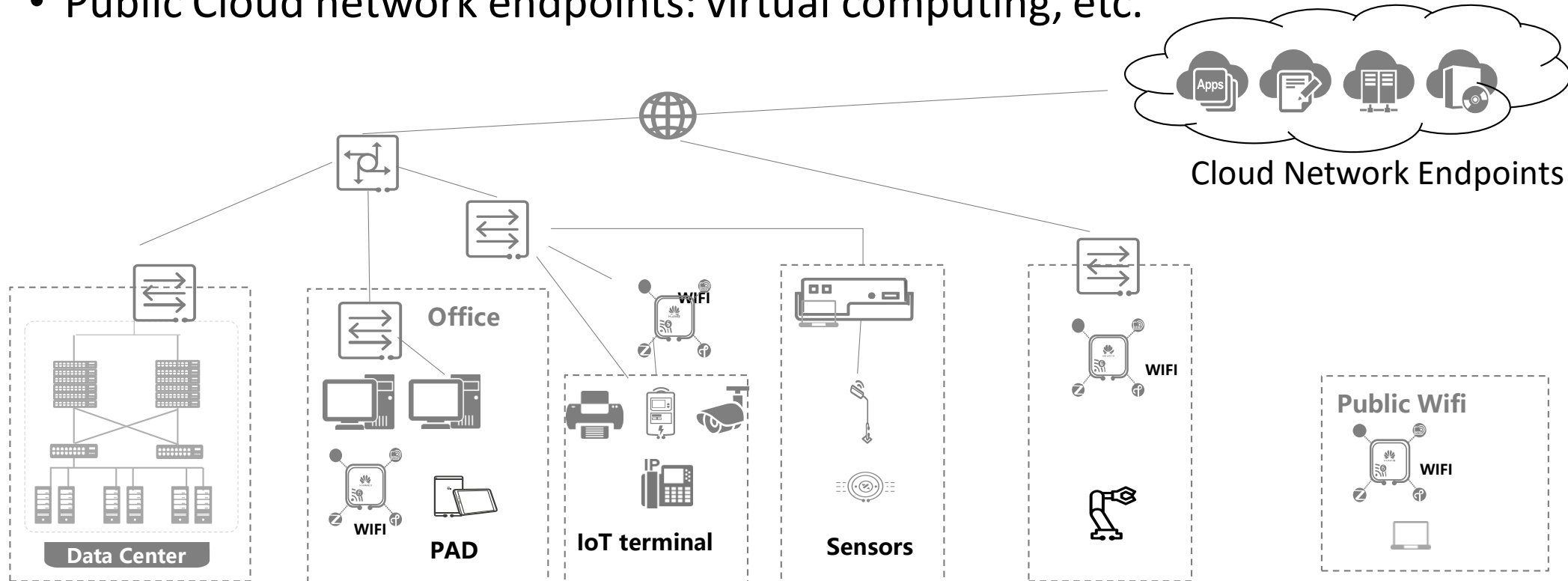


Figure 2: Enterprise Network Abstraction

Enterprise network endpoint examples

- Data Center network endpoints: Server, storage
- Campus network endpoints: PC, IoT terminals, sensors, Wifi BYOD devices, etc.
- Remote worker endpoints
- Public Cloud network endpoints: virtual computing, etc.

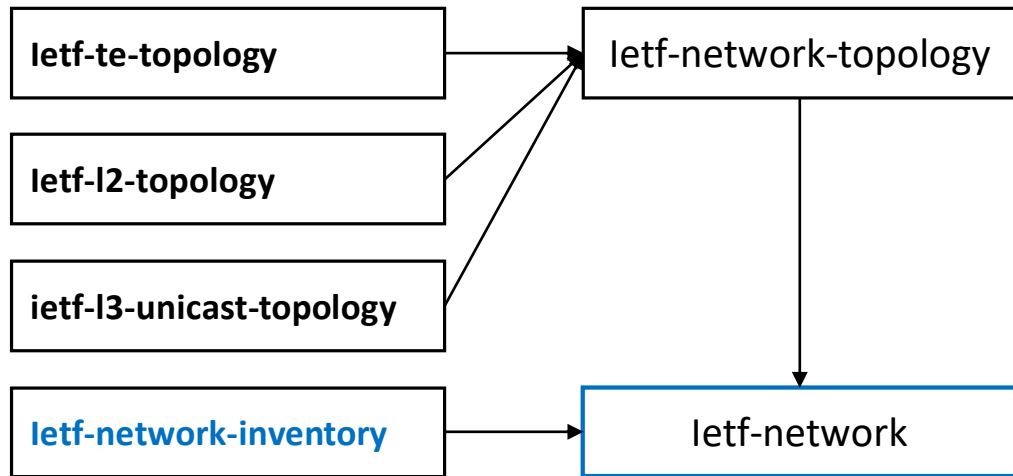


Network inventory Gap Analysis

- Service Attachment Points inventory
 - draft-ietf-opsawg-sap A YANG Network Model for Service Attachment Points (SAPs)
- Physical network devices inventory
 - draft-yg3bp-ccamp-network-inventory-yang-02 A YANG Data Model for Network Hardware Inventory
- Asset centric life cycle management
 - draft-palmero-opsawg-dmlmo-08 Data Model for Lifecycle Management and Operations

Network-Centric Inventory Modelling

- 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:node ← Network Node
    +--ro node-type?          identityref ← Physical or virtual
    ...
    +--ro physical-component
    ...
    +--ro software-component
    | +--ro software-instance* [software-type version]
    |   +--ro software-type    identityref
    |   +--ro version          string
    |   +--ro last-changed?    yang:date-and-time
    +--ro licenses
    | +--ro license* [name]
    |   +--ro name              string
    |   +--ro description?     string
    ...
    +--rw geo-location
    | | ...
    +--ro endpoints ← Network endpoints
      +--ro endpoint* [endpoint-id]
      +--ro endpoint-id      string
      +--ro endpoint-type?   identityref
      +--ro endpoint-ip-address? inet:host
      +--ro endpoint-mac-address? yang:mac-address
      +--ro port?            inet:port-number

      +--ro hardware-components
      | ...
      +--ro software-component
      | ...
  
```

Next Step

- Solicit review and comments