# Network Inventory Management Side Meeting

IETF 116 Yokohama 2nd Side Meeting (Hybrid) 27/03/2023
Meeting **Room: G313 – Monday**
**Conferencing Link: https://welink.zhumu.com/j/0212833418**

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- BCP 25 (Anti-Harassment Procedures)
- BCP 54 (Code of Conduct)
- BCP 78 (Copyright)
- BCP 79 (Patents, Participation)
- https://www.ietf.org/privacy-policy/ (Privacy Policy)

Also see: http://www.ietf.org/about/note-well.html:

# Recap

- The 1st side meeting on inventory management was organized on Tuesday in IETF 115 London meeting
  - Review three relevant drafts and Highlight existing IETF I-Ds that cover devices (optical, enterprise, IoT, et al.), services and network;
    - draft-palmero-opsawg-dmlmo (IT software asset management)
    - draft-wzwb-opsawg-network-inventory-management (Physical, Virtual Network Inventory)
    - draft-yg3bp-ccamp-network-inventory-yang (Physical Network Inventory)
  - General agreement of 1st side meeting is:
    - Survey work including openconfig relevant effort should be aligned
    - Duplication across documents should be avoided
    - Cook book (e.g., Digital twin network, closed loop) on how models work together to build automated management system should be coordinated

# Recap

- non-WG mailing list (Inventory-yang@ietf.org) was created in November 15 2022 since IETF 115 for work coordination and alignment

- CCAMP Inventory management draft was adopted in January 17 2023
  - The focus has been scoped down to network hardware inventory based on agreement during the adoption call and CCAMP weekly meeting
  - 33 issues have been raised and 26 issues has been closed during CCAMP design team call
    - E.g., IP use case, MW Use case, relation with network topo model, schema mount support
    - https://github.com/ietf-ccamp-wg/ietf-network-inventory/issues?page=2&q=is%3Aissue+is%3Aopen
  - Several relevant drafts have been reviewed and compared
    - https://github.com/ietf-ccamp-wg/ietf-network-inventory/issues/26

- draft-palmero-opsawg-dmlmo-01 and draft-wzwb-opsawg-network-inventory-management are both in the stage which is ready for call for adoption.

- The model design issues for draft-palmero-opsawg-dmlmo-01 and draft-wzwb-opsawg-network-inventory-management has been discussed in opsawg mailing list separately
  - E.g., License vs Entitlement
  - Physical port vs Termination point
  - Asset characteristic class vs User experience

# Goal

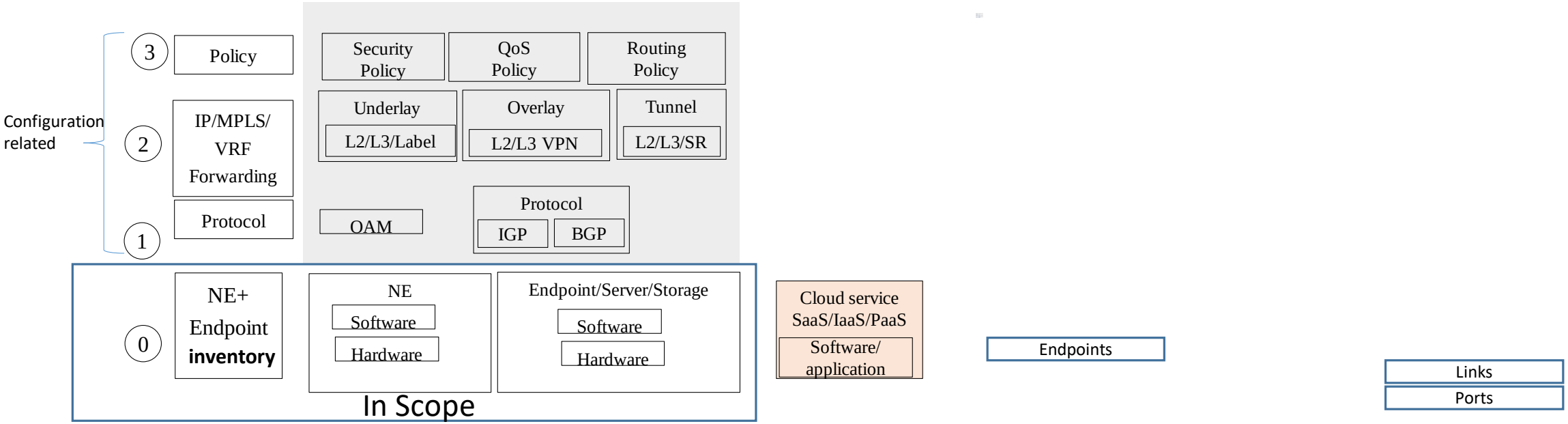
- Provide a Survey for all existing work
- Establish common understanding on the terminologies definition
- Reach an agreement on the scope boundary for three relevant drafts

# Network Inventory Survey

| | Service/Network /Device Level | HW/SW Coverage | Main Use Cases | Mark |
|---|---|---|---|---|
| openconfig-platform.yang | Device Level | HW/SW | Hardware/Software components management, introduce component and sub component concept | Published |
| draft-palmero-opsawg-dmlmo | Network Level | HW/SW | Asset Lifecycle Management for maximized asset utilization, license management, asset can be SW/HW, Service, Application | IT asset related |
| draft-wzwb-opsawg-network-inventory-management | Network Level | HW/SW | Network Inventory component Unified Management and Security Risk Analysis, Network inventory including Network device and Network endpoint Device， such as PC、BYOD、IoT device such as printer， camera | Align with openconfig |
| draft-ietf-ccamp-network-inventory-yang | Network Level | HW | physical plan process and hardware component management including Site, Rack, shelves, Power-supply, Fan, backplane, line card, etc | |
| draft-ietf-opsawg-sap | Network Level | HW | Link service attachment point with physical interface or logical interface of a specific network node | RFC Queue |
| RFC8345 | Network Level | N/A | Base network inventory model Contain a inventory of nodes in the network, the node can be router, switch | |
| draft-ietf-opsawg-sbom-access | Device Level | SW | discover the software running on the device and retrieve known vulnerabilities for this software | Ready for publication |
| RFC8348 | Device Level | HW | Hardware management | |
| draft-claise-opsawg-collected-data-manifest | Device Level | N/A | The contextual information includes identifying what kinks of data produced by device and how should the client collect this data from device. | I-D |
| TR547 TAPI v2.1.3 | Network Level | HW | Support filtering by part number, manufacturer<br>Support request full inventory of devices or components within the devices such as chassis, slot, port,etc | Published |

# Network Inventory Scope

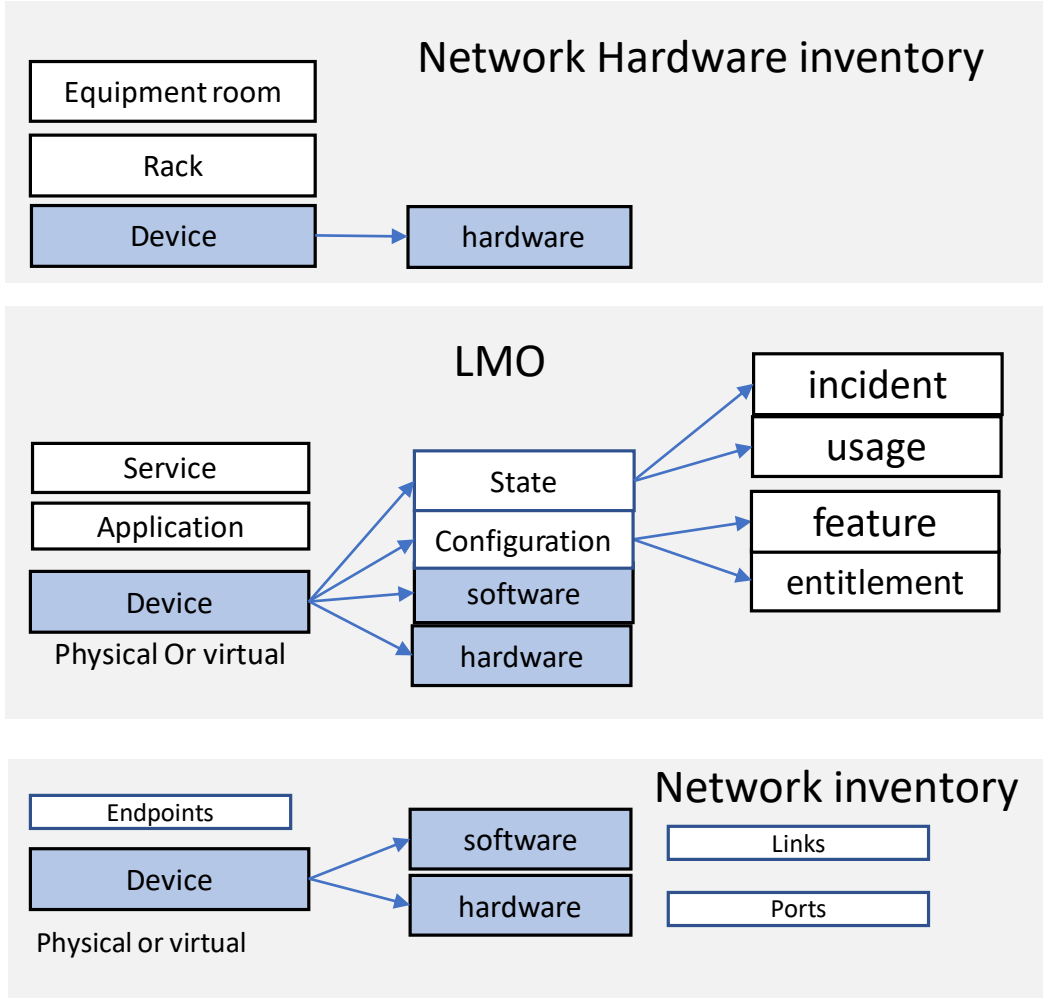
Common building blocks of three relevant work:
Software component/Hardware component




Software/Hardware components defined in draft-wzwb-opsawg-network-inventory-management aligns with openconfig-plaftform model design and can be defined as common building block

# Network inventory and Asset modelling Analysis

| WG | Draft name | UC |
|---|---|---|
| CCAMP | draft-ietf-ccamp-network-inventory-yang | Network hardware inventory |
| OPSAWG | draft-palmero-opsawg-dmlmo | asset lifecycle management |
| OPSAWG | draft-wzwb-opsawg-network-inventory-management | Organization device (physical or virtual) inventory |



# Inconsistent terminology, when describing device hardware and software

- Suggest to define common inventory attributes to be reusable by other models, such as Asset module

| Attributes in Asset LMO | Attributes in inventory model | |
|---|---|---|
| Role<br>Boarder-router, access, control-plane, edge, core, datacenter, branch | site | ? |
| aggregation | | Inventory to cover |
| number-of-instances | | Inventory to cover |
| platform-dependency-os | operating-system | better consistent |
| install-location | location | |
| deployment-mode<br>Primary/secondary, cloud, virtual, container, undeployed | is-virtual? | Inventory to cover?<br>Asset specific? |
| activation-date | | asset specific? |
| software-version | software-rev | |
| Hotfixes | operating-system-patch | |
| software-type | software-component type | |
| sign-of-life-timestamp | | asset specific? |

# 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” does<br>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 |

# Open issues

- Network inventory modelling
  - Option A: Two inventory: 1)CCAMP Network hardware inventory 2) OPSAWG Network hard and software inventory
  - Option B: A unique network inventory, as both modelling based on augmentation of RFC 8348 (ietf-hardware) and RFC 8345 (ietf-network-topology)
  - Option C: factor out common building block from opsawg hardware and software inventory and reuse it in both ccamp network hardware inventory model and opsawg hardware software inventory model draft.
- Asset lifecycle management
  - Device model reuse network inventory definitions to keep consistency

# Comments, Questions, Concerns?