Updates to Entitlement Inventory YANG Model

IETF 123, IVY WG Meeting

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Entitlements as extension of Base Network Inventory

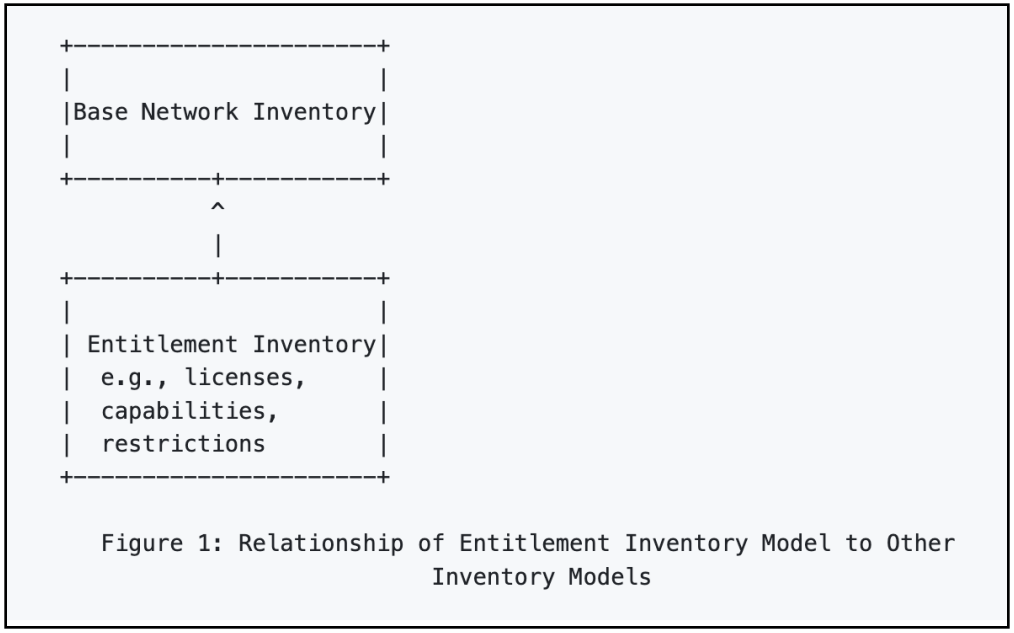
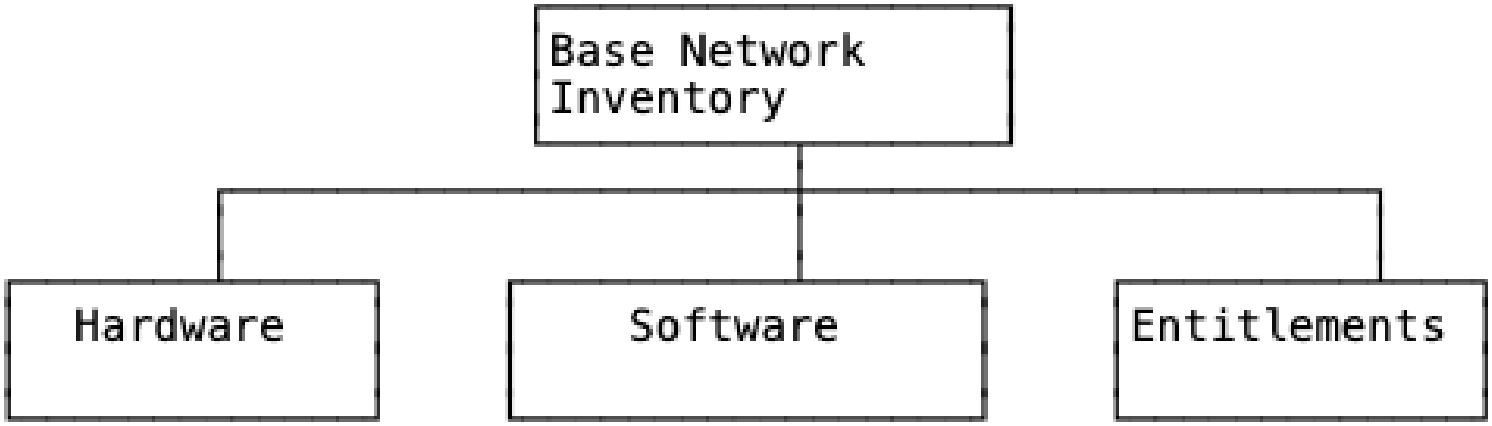


Figure 1: Relationship of Entitlement Inventory Model to Other Inventory Models



Key Feedback from v00 (IETF #122)

- Need for real-world examples
- Capability-entitlement binding unclear
- Clarify auto-discovery vs pre-provisioned intent
- All nodes marked 'rw'; request for 'ro' where appropriate
  - Well, this was easy to address…

Need for real-world examples

Added section with use cases and examples:

4. Use cases and Examples 10
4.1. MPLS Capability License on a Network OS 11
4.2. Bandwidth Upgrade via License 11
4.3. Floating License Managed by License Server 12

It shows how entitlements map to capabilities and components

Capability-entitlement binding unclear

Reverse Mapping from Entitlements to Capabilities

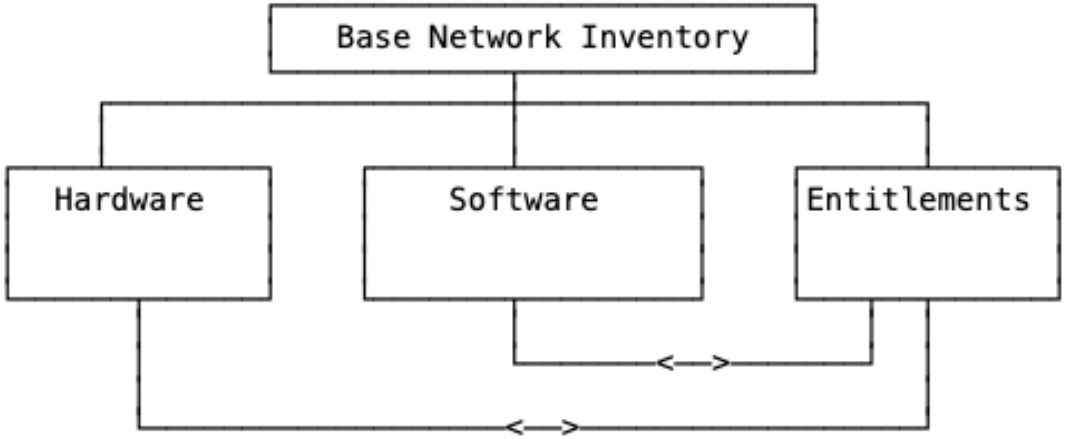
While the model includes links from capabilities to supporting entitlements, some inventory operators may need to evaluate entitlements independently and identify the capabilities they enable.

To support this, implementers may use the `product-id` or `capability-class` metadata along with external references or catalogs. A reverse mapping structure may be introduced in a future version of the model, once a reliable binding syntax for entitlement to capability is standardized.

Also addressed by the example “MPLS Capability License on a Network OS”

```
"capability": {
  "capability-id": "mpls-routing",
  "capability-class": "routing",
  "supporting-entitlements": {
    "entitlement": [
      {
        "entitlement-id": "mpls-license-001",
        "allowed": true,
        "in-use": true
      }
    ]
```

Entitlements relationships to Network Element(NE)



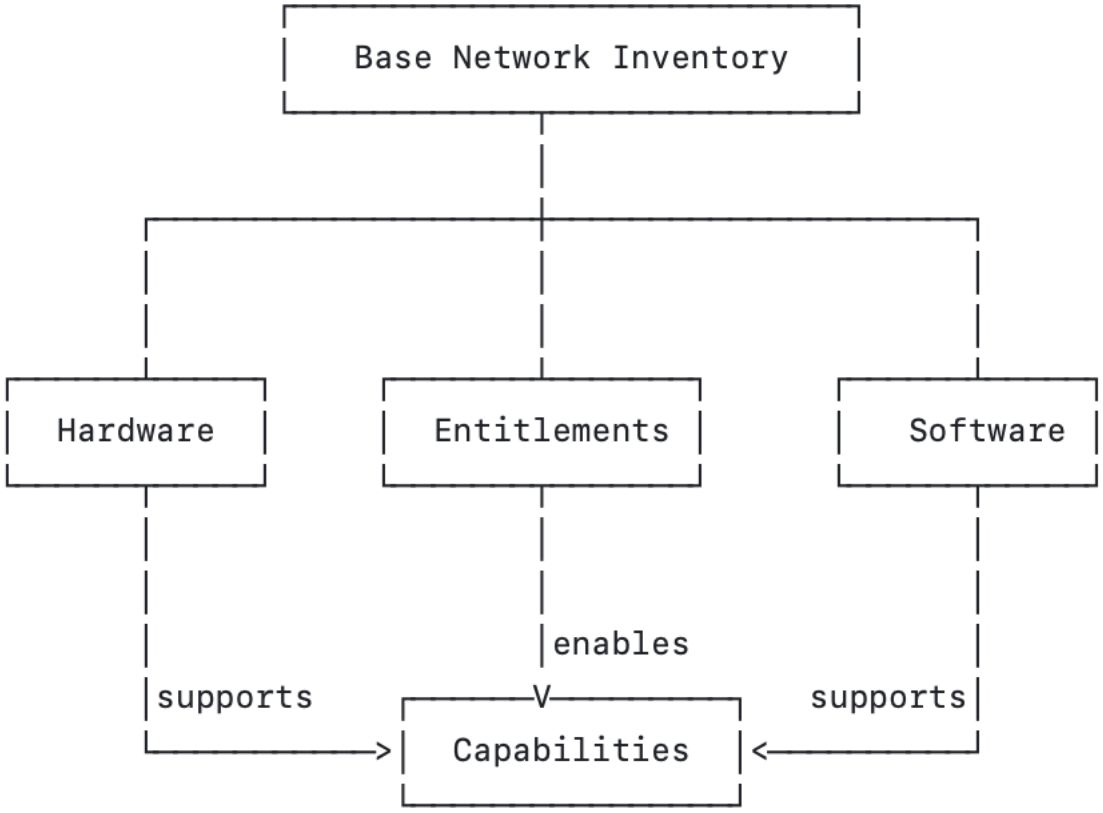
Two ways:

1. Entitlements **attached** to NE
2. Entitlements **installed** on the NE

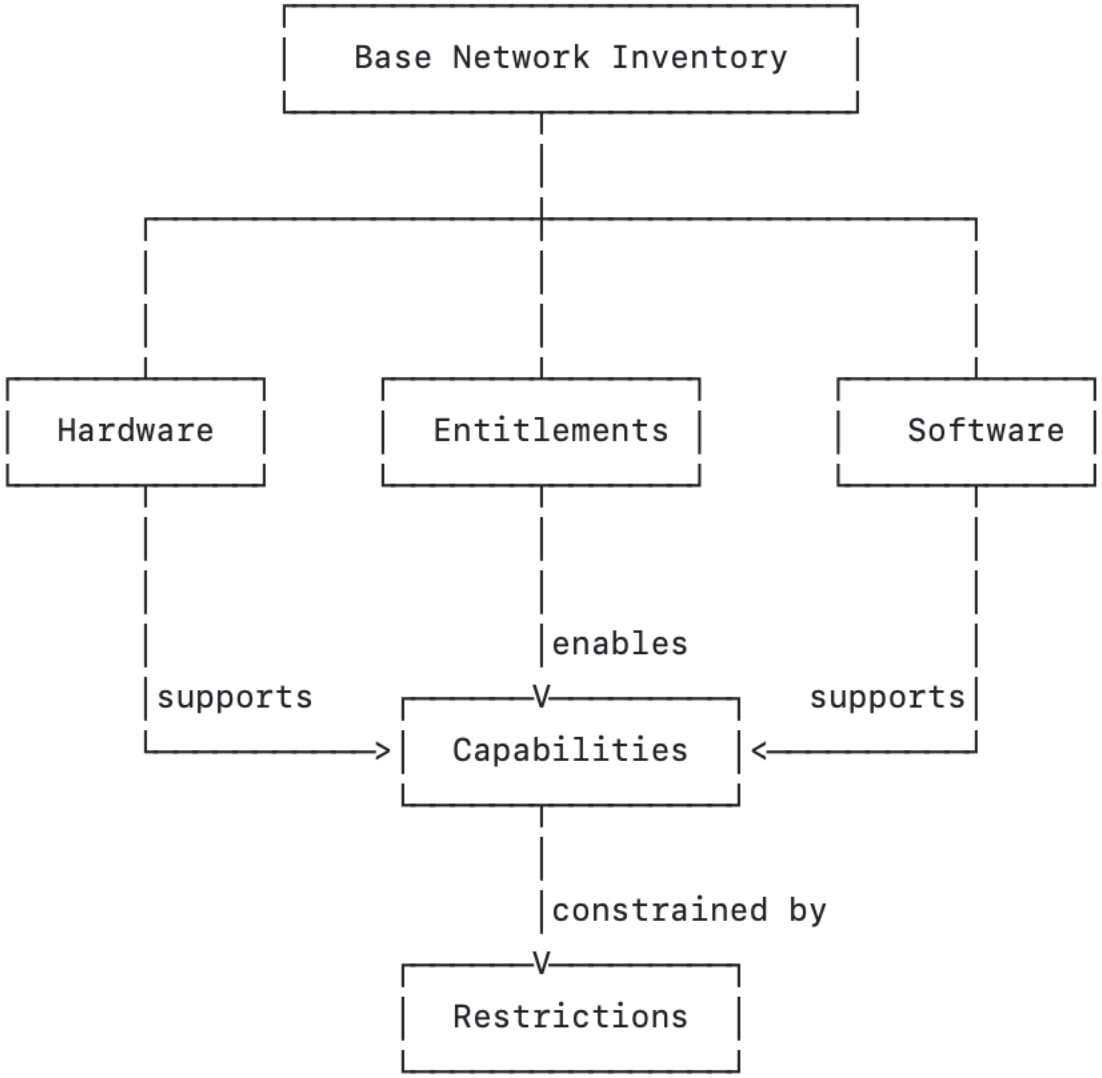
Entitlement Modelling

- Listing entitlements
  - Simple, but not enough to understand what network element/component can or not do.
- Entitlements with capabilities
  - Capable of modeling tiered licensing model
- Entitlements with capabilities and restrictions
  - Required for pay-as-you-grow models

Entitlement Model and Capabilities



Entitlement Model with Capabilities and Restrictions



Clarify auto-discovery vs pre-provisioned intent

Pre-Provisioned vs. Discovered Entitlements

This model is not intended for automatic discovery of entitlements or capabilities through the network elements themselves. Instead, it assumes that entitlements and their associations are either:

- Provisioned in a license server or asset database;
- Installed on individual devices and reported through management interfaces; or
- Manually configured as part of an inventory process.

Future augmentations may explore capability discovery or telemetry driven models, but they are out of scope for the current version.

- Goal of the model:
  - YANG model to describe *entitlements*
  - Extension of Base Network Inventory
- Not a goal:
  - Planning services or licensing policy
  - Auto-discovery or enforcement

Next Steps

- Incorporate additional feedback
- Prepare for potential WG adoption call

New Version(02):

https://datatracker.ietf.org/doc/draft-mcd-ivy-entitlement-inventory/

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