Virtual Network Management Information Model

draft-okita-ops-vnetmodel-01

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Contents

Contents

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1-1 About the proposed model

- The proposed model is presented at the 75th meeting.

- Contents
  - An information model for managing virtual networks in data centers that are using server virtualization

- Comments after Stockholm
  - Necessity and applicability of the proposed model
  - Relationships to the existing standard MIBs

- Contents of this presentation
  - The existing MIBs related to the proposed model
  - Remained issues of the existing standards
  - How to resolve the issues by the proposed model

- Why standard?
  - A data center system is normally composed of multi-vendor platforms.

- Why IETF?
  - The IETF has more experience of standardization of network-related models than IEEE or DMTF.

- Why opsawg?
  - This is the focused work for a management model for the limited target.

- Why information model?
  - Datamodels like MIB or an XML datamodel can be easily developed from an abstract information model.

Comments about existing MIBs

- Relationship to the Entity-MIB
  - "The informational model in the proposed model is similar to the information model that is implicit in the ENTITY-MIB data model design. "
  - "I could imagine a MIB module based on the ENTITY MIB that realizes the information model for virtual entities in SMI."

- Connection information
  - "Topology detection of an IP network is well supported by other MIB modules."
    - LLDP-MIB or Bridge-MIB for layer-2 MAC bridges
    - OSPF-MIB for layer-3 IP routers

Contents

Existing Standard: Entity MIB

- Standardized as the RFC4133 "Entity MIB (Version3)" by the entmib WG.

- Defined for managing multiple entities by a SNMP agent.

- Composed of 5 tables.
  - Physical entities (chassis, module, port, etc…)
  - Logical entities (OSPF, dot1dBridge, etc…)
  - Logical-to-Physical mappings
  - Physical-to-Logical mappings
  - Physical containment tree

- Widely supported by routers/switches.
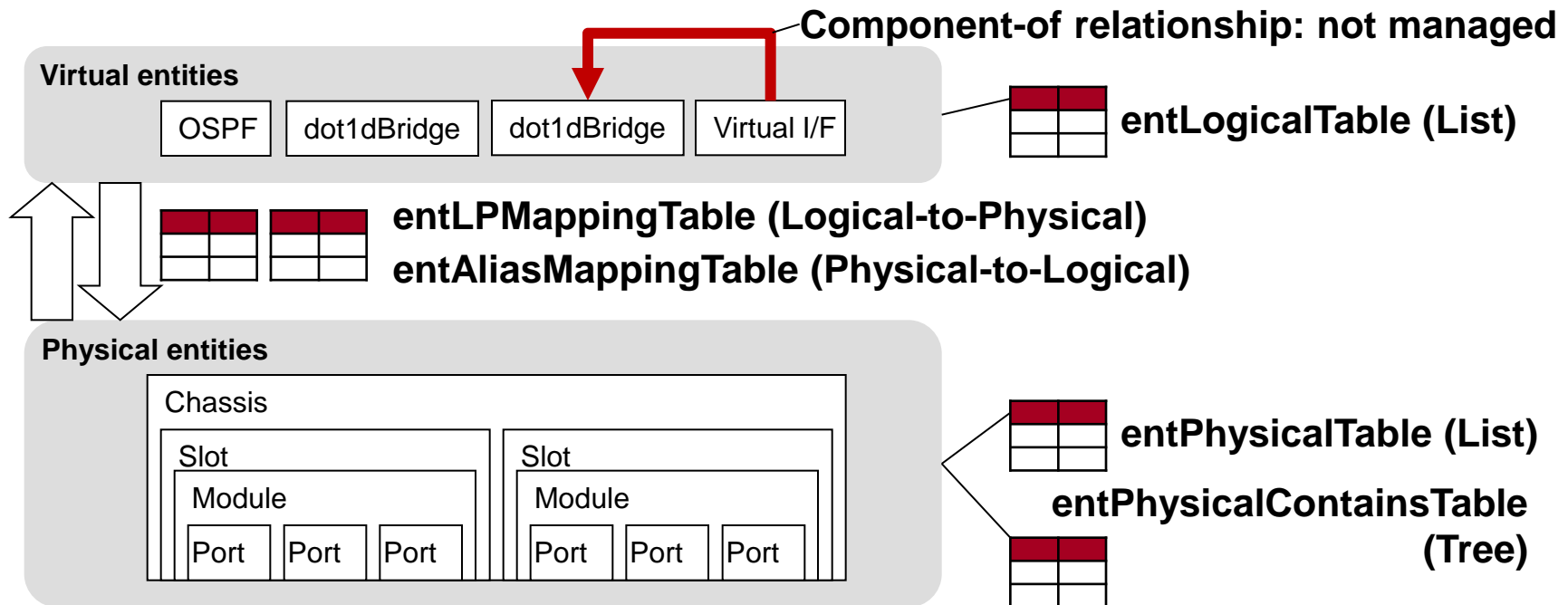
Existing Standard: LLDP-MIB

- Standardized as a part of IEEE802.1AB "Link Layer Discovery Protocol."

- Defined for managing connection information between IEEE802.1D MAC bridges.

- Composed of 4 groups.
  - Configuration group
  - Statistics group
  - LocalSystemData group
  - RemoteSystemData group

- Widely supported by layer-2/layer-3 switches and utilized for layer-2 topology management.

Contents

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- The ENTITY-MIB can list the physical entities and virtual entities. And, it can describe the component tree of the physical entities.

- It can also describe the mappings between physical entities and virtual entities for both direction.

- However, it cannot describe the component-of relationships between a virtual switch and their virtual interfaces in the virtual entities.

Component-of relationship: not managed

Virtual entities

| OSPF | dot1dBridge | dot1dBridge | Virtual I/F |

entLogicalTable (List)

entLPMappingTable (Logical-to-Physical)
entAliasMappingTable (Physical-to-Logical)

Physical entities

Chassis

Slot

Module

| Port | Port | Port |

Slot

Module

| Port | Port | Port |

**entPhysicalTable (List)**

entPhysicalContainsTable (Tree)

Issue: Virtual Connection

- LLDP-MIB can describe the connections between physical switches.
- However, it cannot describe the connections between virtual switches and network switches.
- Therefore, operators cannot manage the virtual network that each connection between virtual entities belongs to.
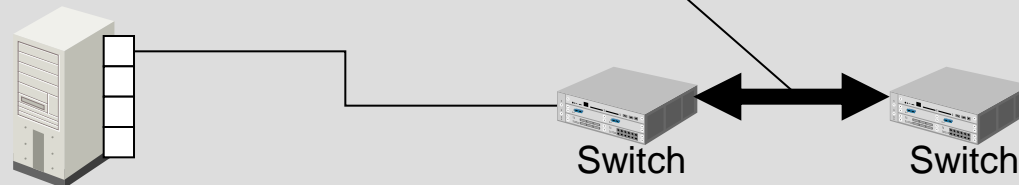
Virtual entities

Virtual connection: not managed

Virtual switch

Virtual interface

Physical connection: LLDP-MIB
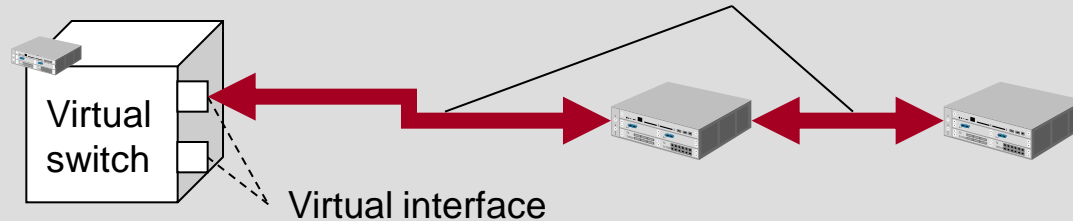
Server virtualization platform

Physical entities

Switch   Switch

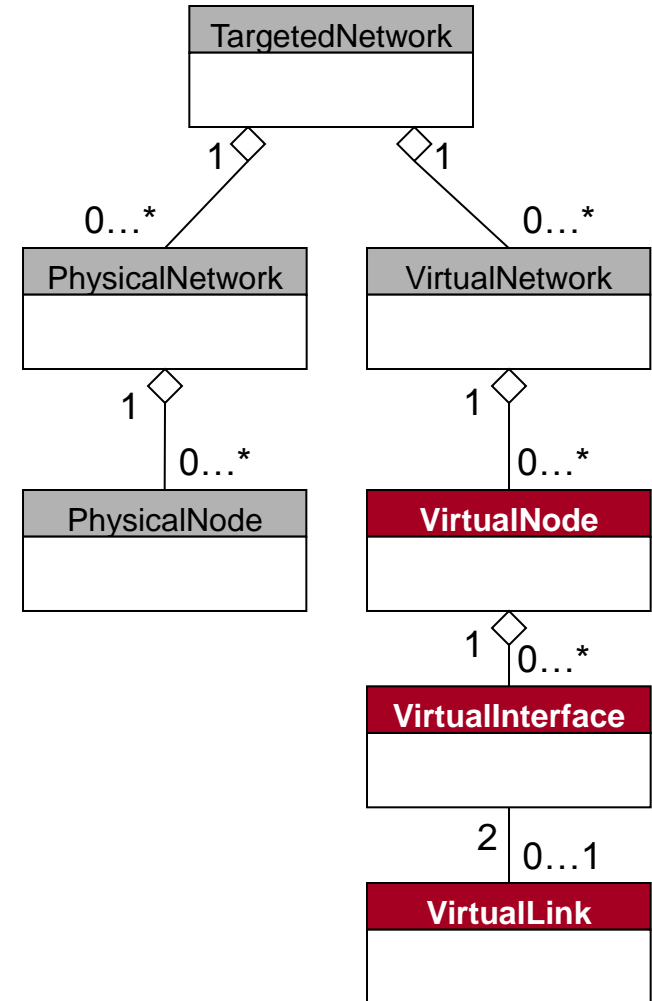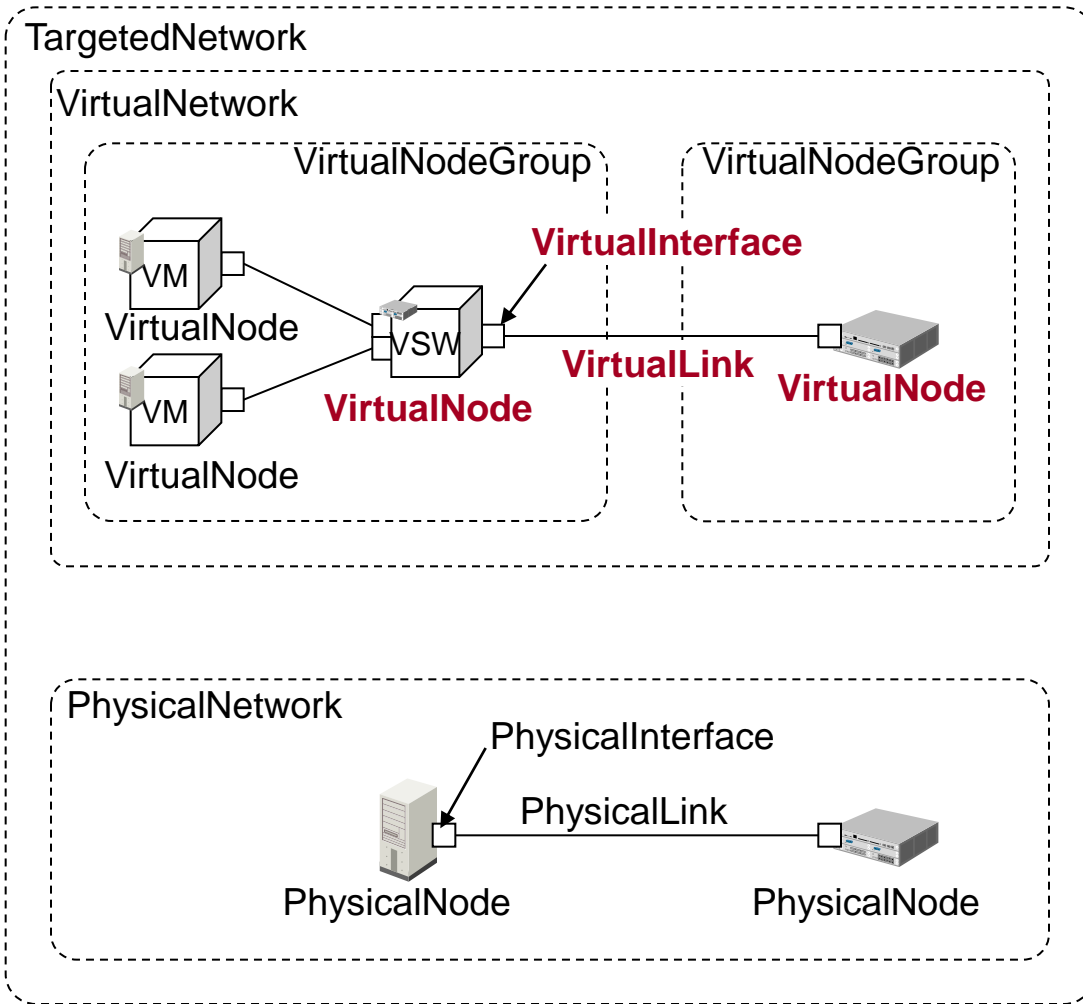opsawg meeting, IETF76, Hiroshima, November 10, 2009

Contents

uVALUE

- The VirtualNode object and VirtualInterface object enable the management of the relationship among virtual switch and virtual I/Fs.
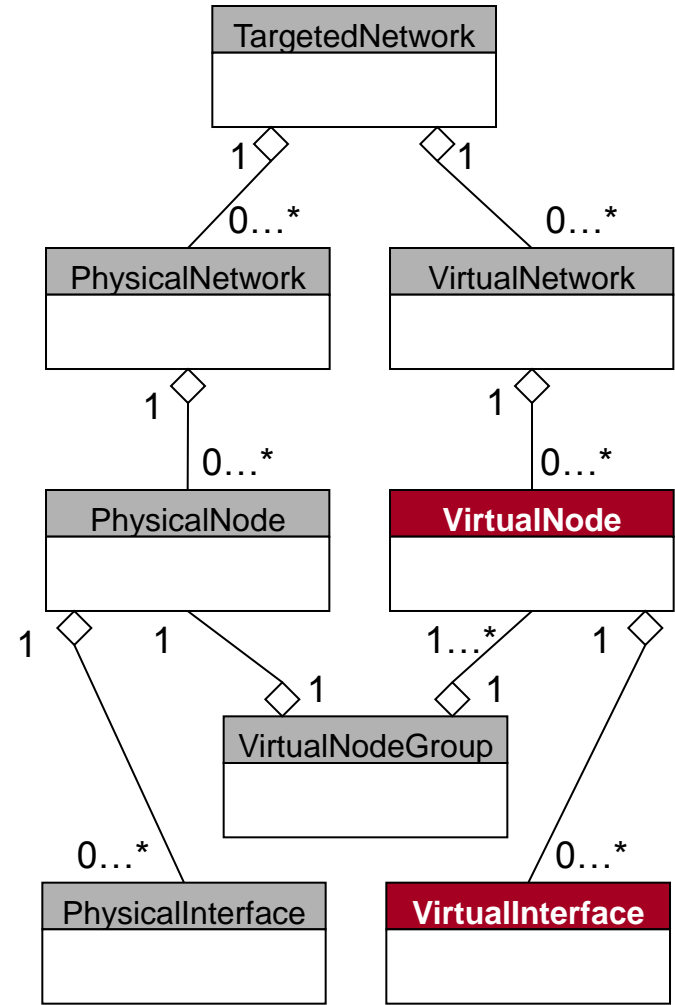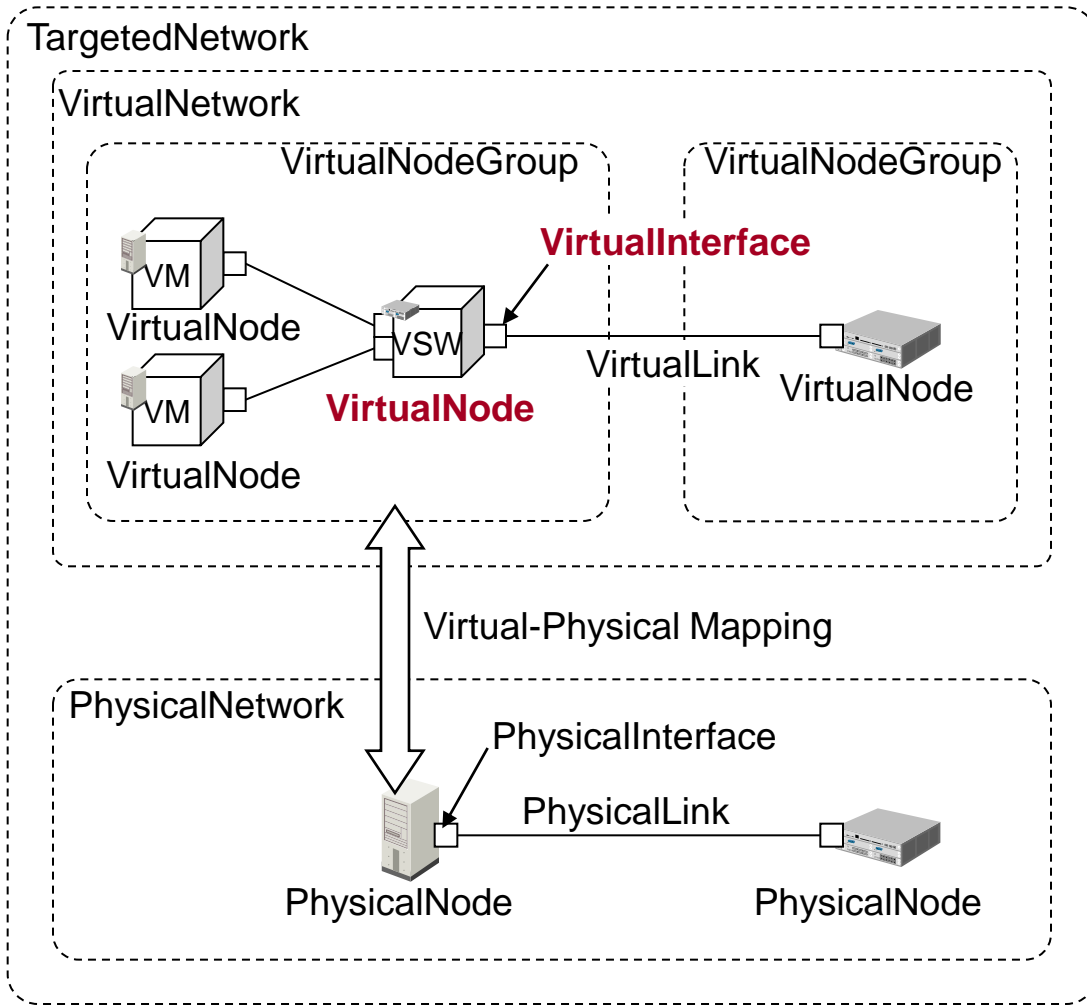
- The VirtualInterface object and VirtualLink object enable the virtual connection management.

Contents

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- Summary
  - After the Stockholm meeting, comments about the relationships to the existing MIBs arose from ML.
  - However, the existing MIBs lack the capability to describe the relationships between virtual entities.
  - We will update our draft based on the comments after the Hiroshima meeting.
  - We'd like to propose the standardization of a new virtual network management model based on our proposed model as a new work of opsawg.
- Questions
  - Is there interest in the virtual network management model?
  - If yes, is it an opsawg work?
  - If yes, is the extension of ENTITY-MIB sufficient for the requirements?