A YANG Data Model for Fabric Topology in Data Center Network
draft-zhuang-i2rs-yang-dc-fabric-network-topology-00

IETF 96, Berlin, Germany

Yan Zhuang (zhuangyan.zhuang@huawei.com)
Danian Shi (shidanian@huawei.com)
Fabric Topology for Data Center network management

• Objective
  – Define a fabric topology on top of existing physical infrastructures to ease the management of dc networks for administrators

• Motivation
  – With the scale of data centers (DCs) and the increase of overlay technologies, network nodes and applied technologies for a DC network scales, which causes the complexity of network management.
  – Since DC networks are composed of fabrics, by defining a fabric topology, administrators can manage fabrics on top of underneath physical topologies to ease the workload and complexity of network management and control.

What do we want here

• Ease the DC network management while providing capacity scalability and technology extensibility.
• Build an abstract fabric topology for dc overlay which maps to physical topologies.
• Ease the network configurations based on user requests over data center networks.
Reference model for fabric-based topology management for Data Center
Relationship to existing topology models

- network model
  - network topology model
    - L1 topology model
    - L2 topology model
    - L3 topology model
    - Fabric topology model
Potential models for DC fabrics

- ietf-network
  - ietf-network-topology
    - fabric-topology
      - vxlan-fabric-topology
      - trill-fabric-topology
      - foo-fabric-topology

I2RS models
Fabric-based DC topology management

Fabric-based network management

Fabric Layer

Fabric Topology model

L2/L3 topology

Physical network Layer

compose fabric

node

node

node

node
Tree hierarchy

augment /nw:networks/nw:network/nw:network-types:
  +--rw fabric-network!
augment /nw:networks/nw:network:
  +--rw fabric-network-attributes
    +--rw name?     string
    +--rw fabric-id? fabric-id
    +--rw type?     fabric-type:underlayer-network-type
    +--rw description?     string
    +--rw options
      +--rw gateway-mode?     enumeration
      +--rw traffic-behavior?     enumeration
augment /nw:networks/nw:network/nw:node:
  +--rw node-ref?     fabric-type:node-ref
  +--rw role?     fabric-type:device-role
augment /nw:networks/nw:network/nt:link:
  +--rw link-ref?     fabric-type:link-ref
augment /nw:networks/nw:network/nw:node/nt:termination-point:
  +--rw lport-attributes
    +--rw lport-uuid?    yang:uuid
    +--rw name?     string
    +--rw role?     port-role
    +--rw layer-1-info
      | +--rw location?     tp-ref
    +--rw layer-2-info
      | +--rw access-type?     access-type
      | +--rw access-segment?     uint32
    +--rw layer-3-info
      | +--rw ip?     inet:ip-address
      | +--rw network?     inet:ip-prefix
      | +--rw mac?     yang:phys-address
      | +--rw forward-enable?     boolean
    +--rw fabric-acl* [fabric-acl-name]
      | +--rw fabric-acl-name     string
    +--rw underlayer-ports* [port-ref]
                        network-ref]/node[nd:node-id=current()]/..node-ref]/lnk:termination-point/tp-id
      +--rw node-ref?     --> /nd:networks/network[nd:network-id=current()]/
                           ..network-ref]/node/node-id
Questions?