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

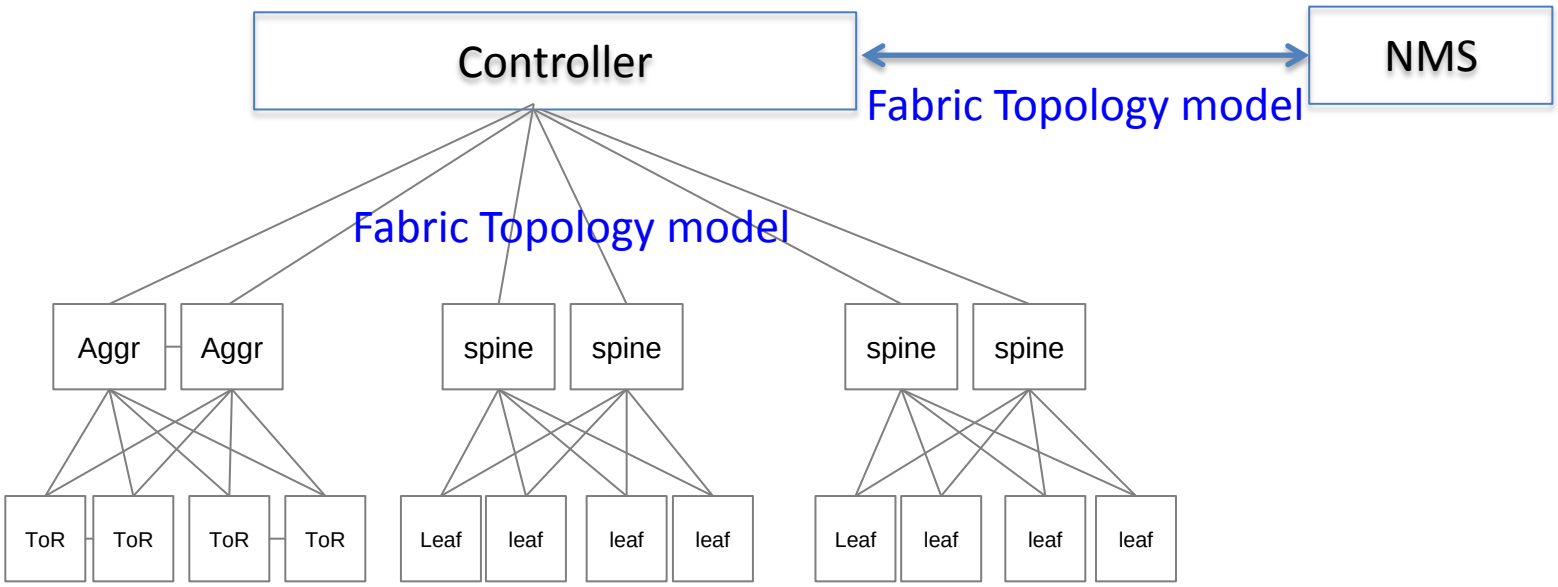
- Objective
  - Define a fabric topology on top of existing physical infrastructures to ease the management of dc networks for administrators
- Motivation
  - With the scale of data centers (DCs) and the increase of overlay technologies, network nodes and applied technologies for a DC network scales, 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.

Please refer to the topology requirement in “Network operator Challenges for Commercial SDN Environments” https://tools.ietf.org/html/draft-gu-sdnrg-network-management-consideration-01 in SDNRG.

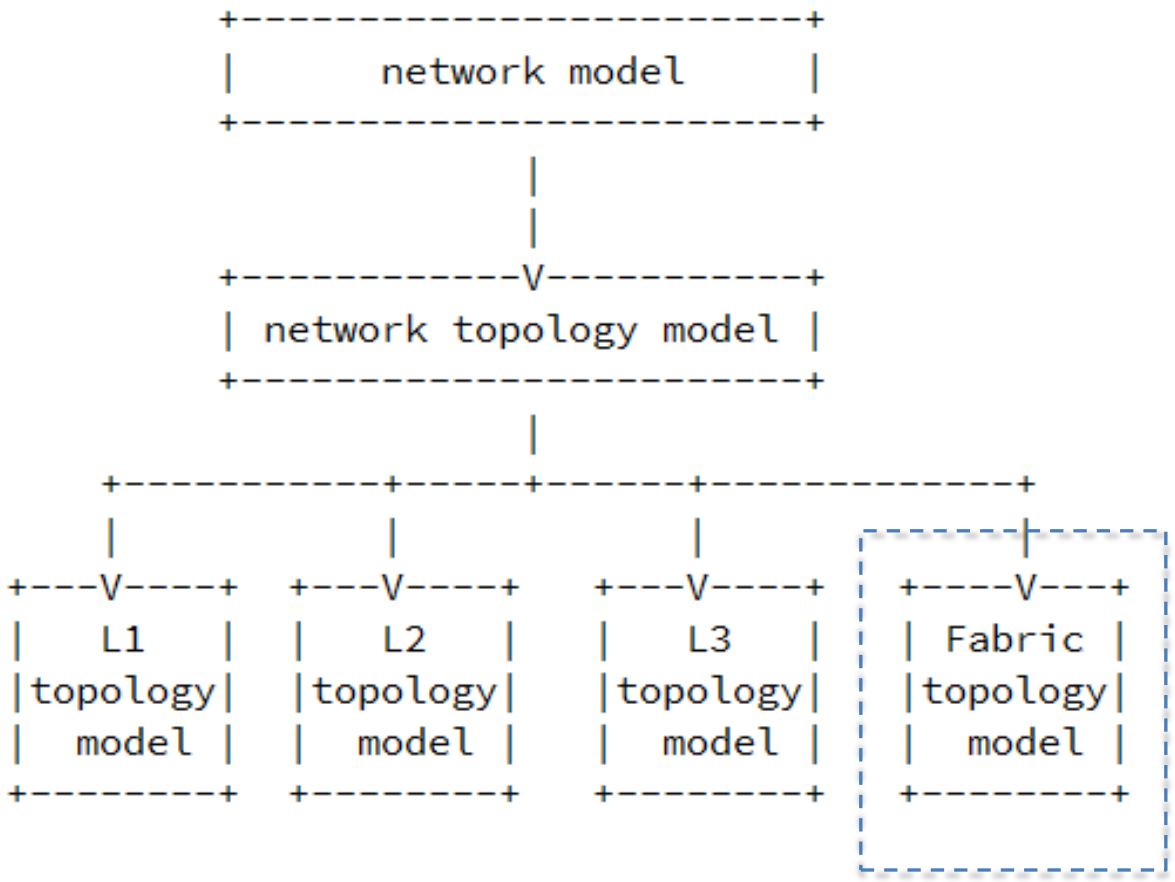
What do we want here

- 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.

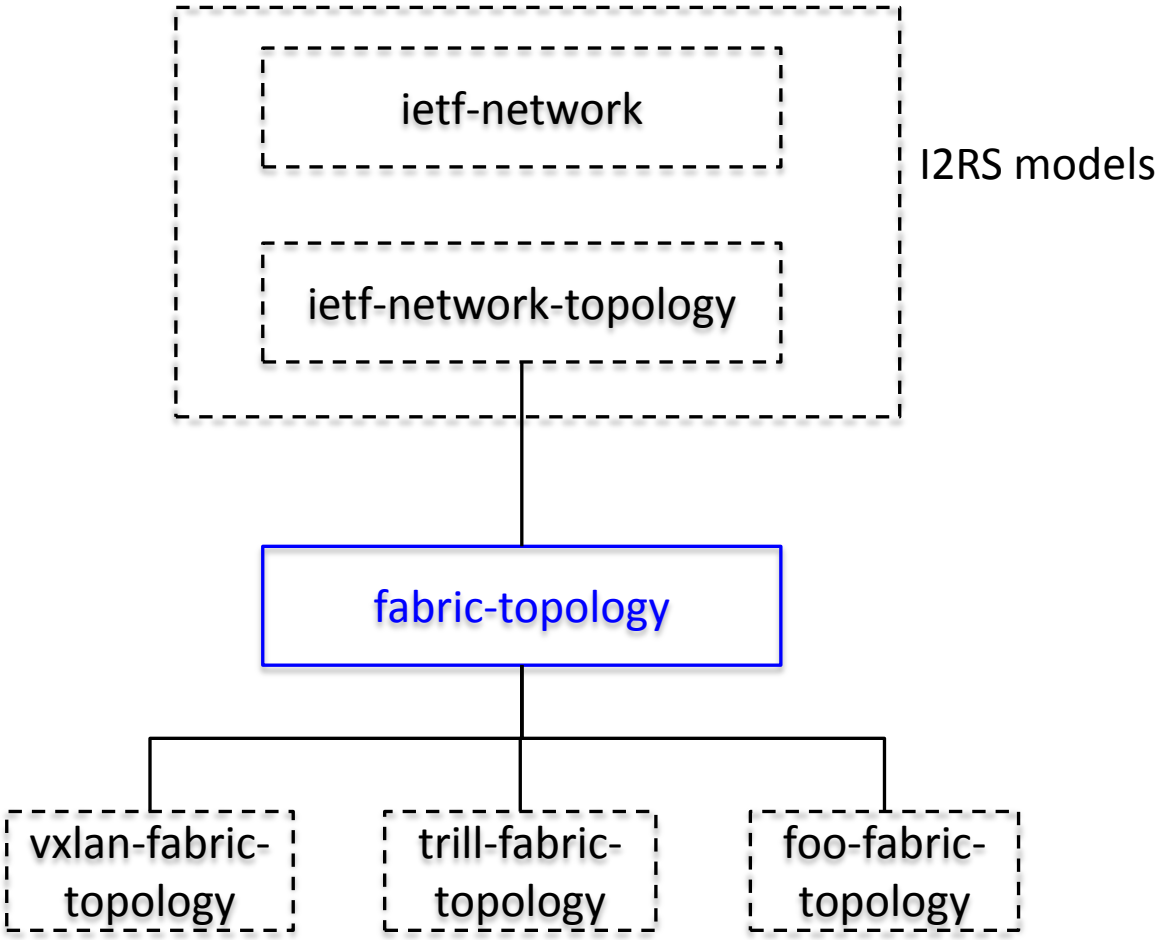
Reference model for fabric-based topology management for Data Center



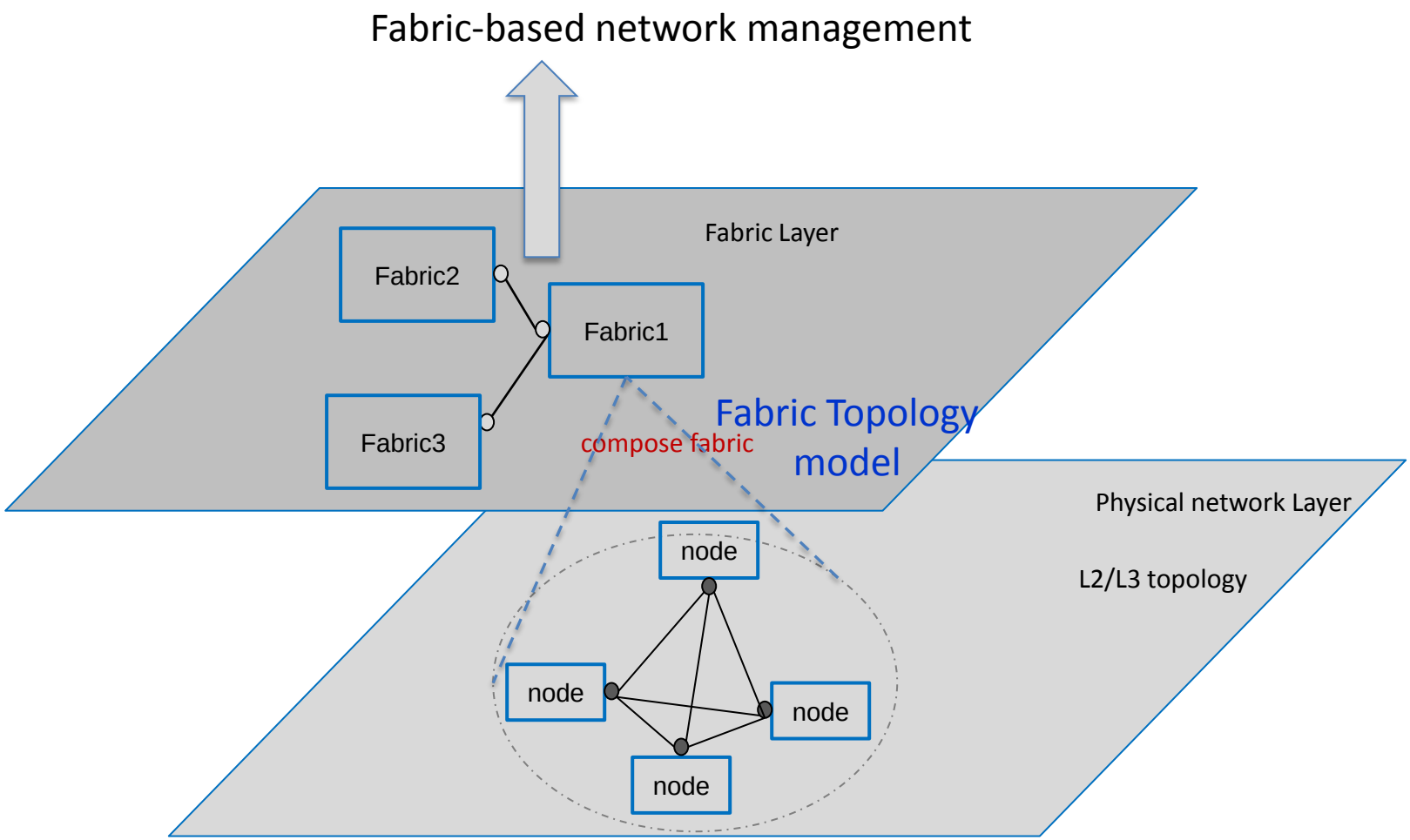
Relationship to existing topology models



Potential models for DC fabrics



Fabric-based DC topology management



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?          fabrictype: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?   fabrictype:node-ref
   +--rw role?       fabrictype:device-role
augment /nw:networks/nw:network/nt:link:
   +--rw link-ref?   fabrictype: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]
         +--rw tp-ref?        -> /nd:networks/network[nd:network-id=current()/../
                 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
         +--rw network-ref?   -> /nd:networks/network/network-id
```

Questions?