

Network Topology Models

draft-clemm-i2rs-yang-network-topo

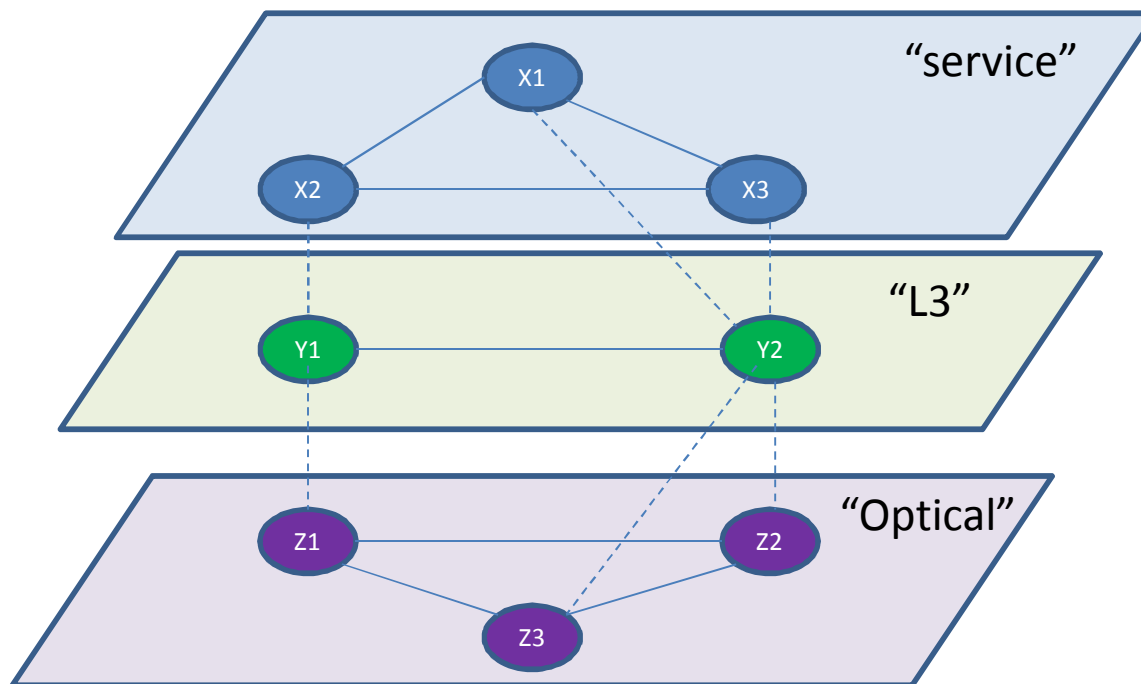
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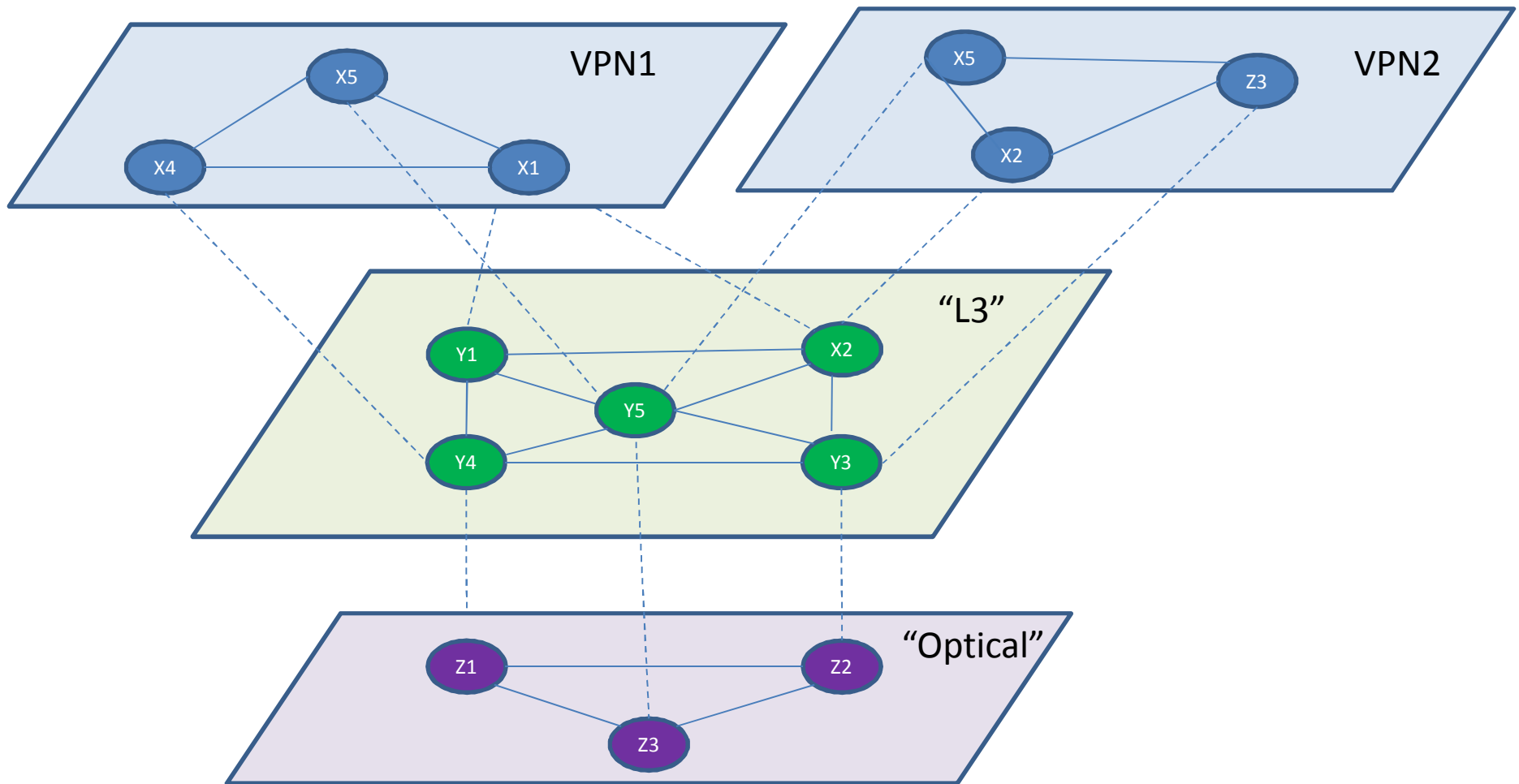
Purpose

- “ Provide YANG data models to represent topology
 - . Represent horizontal and vertical layering
 - . Extract commonalities between different topology types
 - . Allow for easy extension, derivation of additional topology types
- “ Applications
 - . draft-ietf-i2rs-architecture-09 (Protocol Independent Topology Management)
 - . Data nodes capture and reconcile their understanding of network topology, propagate topology info
 - . Network controllers represent controller network topology
- “ Note: original work included draft-liu-yang-abstract-te-topo
 - . TEAS group is doing the basic TE topology for configuration and status
 - . Will align with TEAS WG config and status work

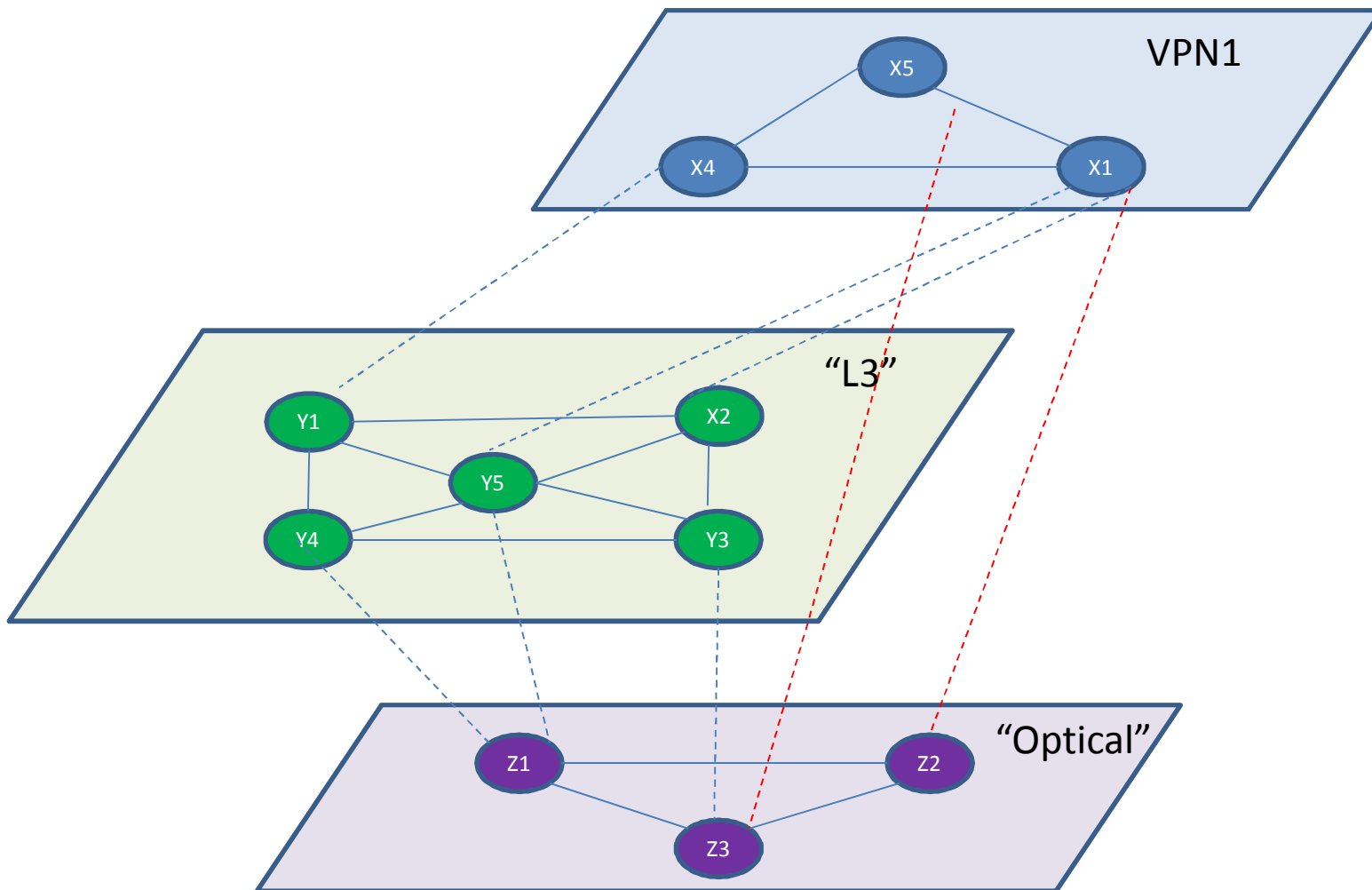
Horizontal and vertical layering



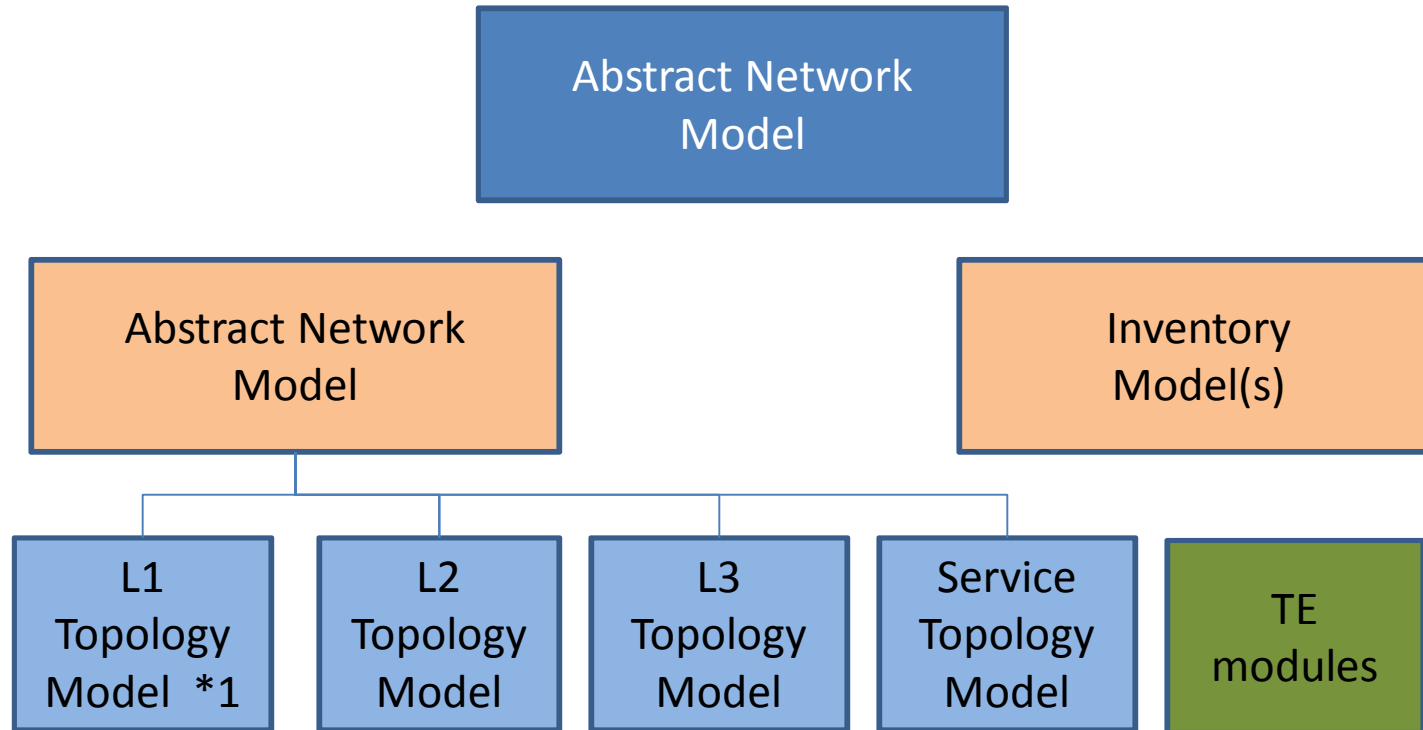
Stack Example



Multiple Underlays

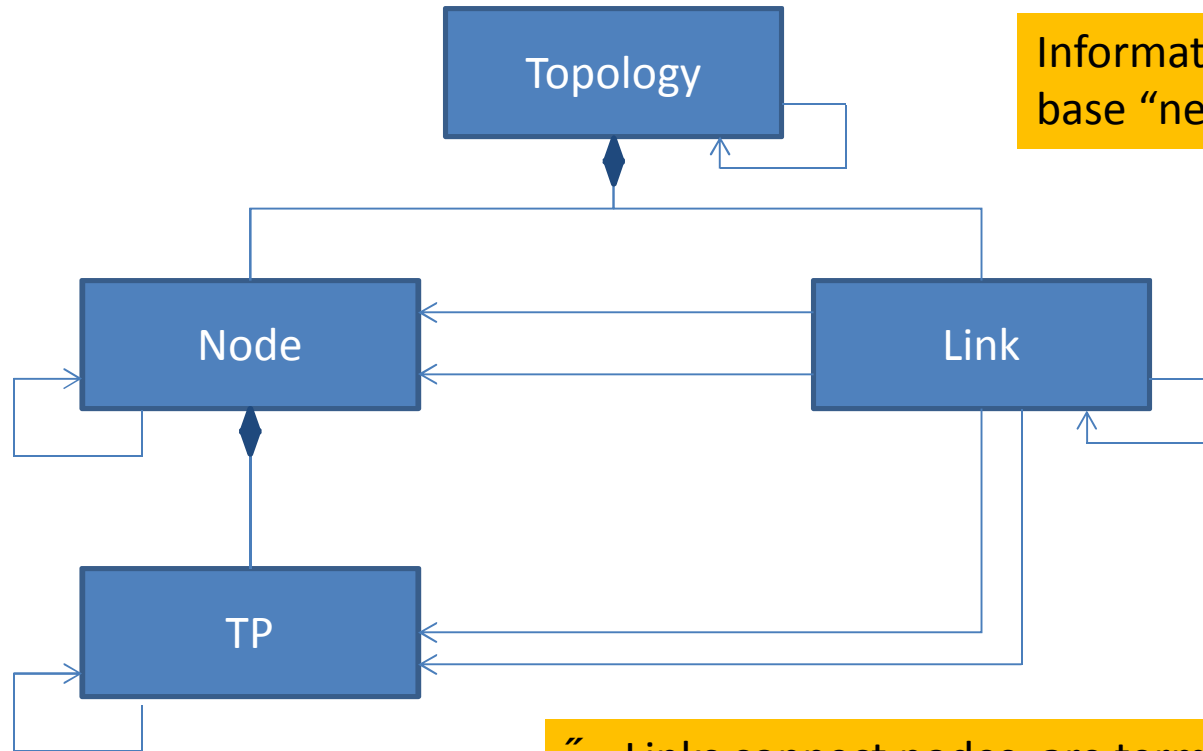


Abstract Topology



*1 – not in draft -03

Data model structure (contd.)



Information model underlying base “network topology” YANG module

- “ Links connect nodes, are terminated by termination points
- “ Topologies can refer to underlay topologies
- “ Links can refer to underlay links
- “ Nodes can refer to underlay nodes
- “ Unidirectional, point-to-point links
represent non-ptp through hierarchies of nodes, links

module: **network-topology**

```
+--rw network-topology
  +--rw topology* [topology-id]
    +--rw topology-id          topology-id
    +--ro server-provided?     boolean
    +--rw topology-types
    +--rw supporting-topology* [topo-ref]
      | +--rw topo-ref      leafref
    +--rw node* [node-id]
      | +--rw node-id          node-id
      | +--rw supporting-node* [network-ref node-ref]
      | | +--rw network-ref    leafref
      | | +--rw node-ref      leafref
      | | +--rw lnk:termination-point* [tp-id]
      | |   +--rw lnk:tp-id          tp-id
      | |   +--rw lnk:supporting-termination-point*
      | |     [network-ref node-ref tp-ref]
      | |   +--rw lnk:network-ref    leafref
      | |   +--rw lnk:node-ref      leafref
      | |   +--rw lnk:tp-ref        leafref
    +--rw lnk:link* [link-id]
      +--rw lnk:link-id          link-id
      +--rw lnk:source
      | +--rw lnk:source-node    leafref
      | +--rw lnk:source-tp?    leafref
      +--rw lnk:destination
      | +--rw lnk:dest-node     leafref
      | +--rw lnk:dest-tp?     leafref
      +--rw lnk:supporting-link* [network-ref link-ref]
        +--rw lnk:network-ref    leafref
        +--rw lnk:link-ref      leafref
```


Discussion

- “ Network topology focuses on what’s truly common
 - . Generic, optional features:
augment separately
(e.g. connectivity matrix, schedule info)
 - . Topology specifics: augment separately
- “ Read-only vs read-write topology
 - . Server-provided flag as opposed to “read-only” vs “configured” state”
- “ Model has considerable traction, multi-vendor support
- “ Implementations exist
- “ **Ask:** Adopt as WG document