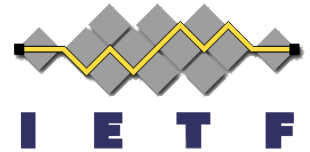


Routing Area Yang Architecture Design Team Update

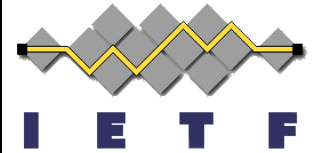
Members: Acee Lindem, Anees Shaikh, Christian Hopps,
Dean Bogdanovic, Lou Berger, Qin Wu,
Rob Shakir, Stephane Litkowski, Yan Gang

Wiki: <http://trac.tools.ietf.org/area/rtg/trac/wiki/RtgYangArchDT>

Repo: <https://github.com/ietf-rtg-area-yang-arch-dt/>



High Level Status



DT identified four “work” topics:

1. YANG Device Model Structure
2. YANG Relationship of Config and Operational State (and intended)
 - Requirements generally accepted by NetMod
3. YANG support for reusable objects (containers) that are augmentable
 - like grouping only augmentable
4. Standard solution to the YANG versioning problem that is compatible with the RFC process and some degree of agility

Discussion Focus

DT not recommending a specific solution

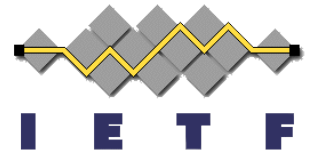
Network Device YANG Organizational Model

draft-rtgyangdt-rtgwg-device-model-01

Authors: Acee Lindem, Christian Hopps, Dean Bogdanovic,
Lou Berger (Ed.)

Contributors: Anees Shaikh, Kevin D'Souza, Luyuan Fang, Qin Wu,
Rob Shakir, Stephane Litkowski, Yan Gang

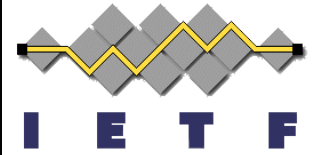
Repo: <https://github.com/ietf-rtg-area-yang-arch-dt/meta-model/>



Topics

- Changes since -00
- Open issues
- Next steps

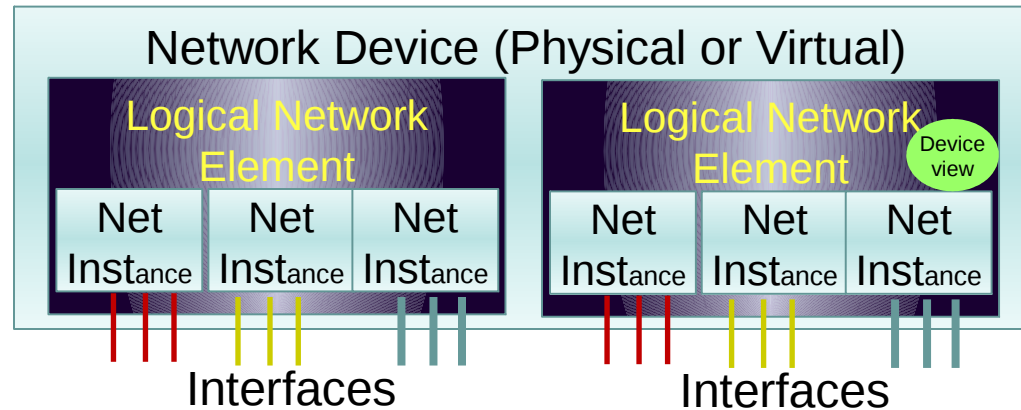
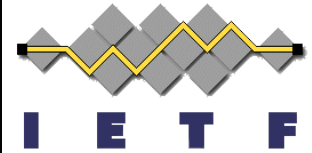
Changes: /device



- Top level /device was overly contentious → *Dropped*
- No top level container subsuming entire device
- Interfaces now at top
- Still have representation of logical partitions

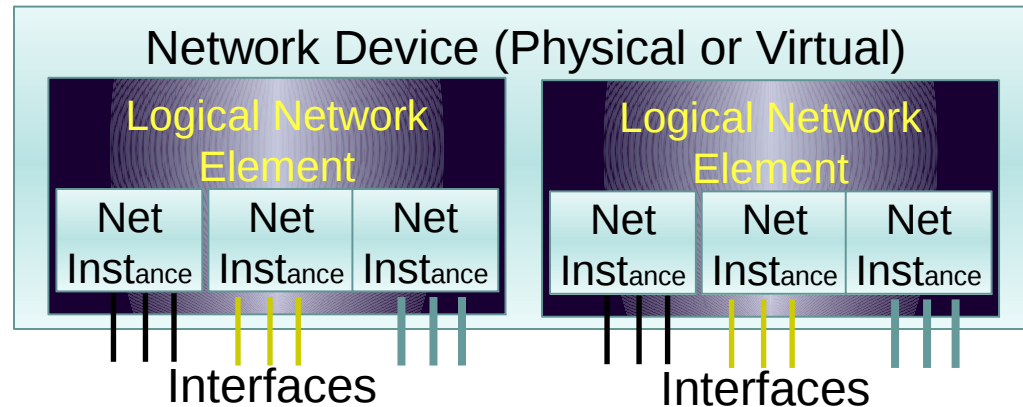
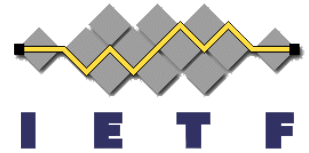
```
module: network-device
  +--rw info
  |   +--rw device-type?    enumeration
  +--rw hardware
  +--rw qos
  +--rw logical-network-elements
  |   ...
  augment /if:interfaces/if:interface:
    ...
```

Logical Network Elements



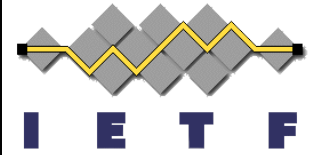
- Separate management sub-domains
 - Sub-domains can be managed independently and by a top level manager (device-view=true)
- Differs from multiple virtual devices and VMs
 - Where top level management of subdomains not supported

Network Instances



- Separate routing / switching domains
- Can represent of an RFC 4364 VRF or a Layer 2 Virtual Switch Instance (VSI) or a bridge/router (i.e., both)
- General virtualized instance implying a separate L2, L3, or L2/L3 context.
 - For L3, this implies a unique IPv4/IPv6 address space.

Changes: Interface Augmentations

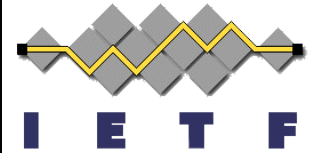


Provides linkage of interfaces to:

- Logical Network Elements
 - For e.g., physical interfaces
 - References provided by uint8 value
- Networking Instances
 - For e.g., logical interfaces on a physical interface
 - References provided by name string
- Leafref may be a better choice for references

```
augment /if:interfaces/if:interface:
  +--rw bind-network-element-id?      uint8
augment /if:interfaces/if:interface:
  +--rw bind-networking-instance-name? string
augment /if:interfaces/if:interface/ip:ipv4:
  +--rw bind-networking-instance-name? string
augment /if:interfaces/if:interface/ip:ipv6:
  +--rw bind-networking-instance-name? string
```


Changes: Identities

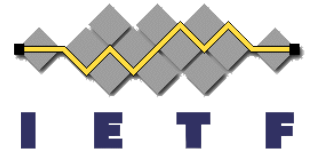


- Identities for classes of protocols/services rather than attempting to list them all
 - Impacts: oam-protocols, control-plane-protocols, networking-services
- For example, control-plane-protocols:

```
module: network-device
  +--rw logical-network-elements
    +--rw networking-instances
      +--rw networking-instance* [...name]
        +--rw control-plane-protocols
          +--rw control-plane-protocol* [type]
            +--rw type      identityref
            +--rw policy
```

```
Example types = bgp, is-is, ospf, rsvp, segment-
                routing, ldp, pim, igmp, mld,
                static-routes
```

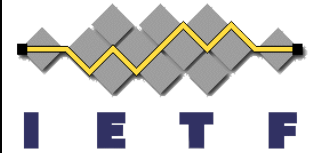
Open issues



- Main issue is representation of Logical Network Elements
 - Current approach is formal hierarchy that future models augment
- Alternatives are possible, e.g.:
 - Follow the Interface precedent with lists and references to LNE/NI in *all* models
 - Local mount based on draft-clemm-netmod-mount
 - With client directed mounts, and new data (sub) store on mount
 - Tools-Based approach?
- Working this off line with DT and mount authors
 - DT open to discussing other alternatives

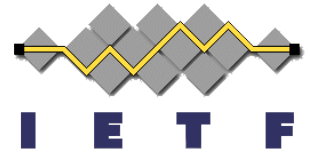
Organizational Model

Impact



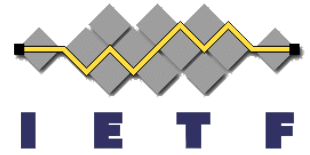
- Provides a predictable context for routing/router, bridging/bridge related configuration information
- Ensures support for wide range of possible implementations
 - With and without logical partitions (LNEs)
 - With and without VRF/VSIs
- Beneficial for emerging models
 - LNEs and NIs need not be addressed per model
- Beneficial for operational use
 - Straightforward to delineate / reference per LNE/NI information

Impact on ietf-routing



- Need to align draft-ietf-netmod-routing-cfg with draft
- Notably
 - No LNEs
 - Routing vs network instances
 - No L2 / VSI allowed
- Interface references are to routing instances
 - No Ipv4 vs v6 mapping of interfaces to instance
- Leafrefs not strings used for YANG *pointers*
 - Minor issue, but this may be something to change in meta-model

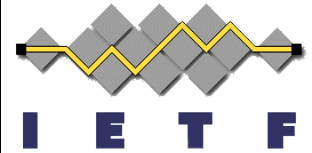
Design Team Future Plans



- Continue work on organizational model draft
 - Agree on solution to LNEs
 - Align with opstate solution once available
- Better coordination with OpenConfig including draft-openconfig-rtgwg-network-instance-00.
- Dove-tail with draft-ietf-netmod-routing-cfg
- Agree on when organization model draft should become a RTGWWG draft
- See if there are other areas of concern for RTG area

Reminder:

Current DT Topics



DT current topic list:

1. YANG Device Model Structure
2. YANG Relationship of Config and Operational State (and intended)
 - Requirements generally accepted by NetMod
3. YANG support for reusable objects (containers) that are augmentable
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4. Standard solution to the YANG versioning problem that is compatible with the RFC process and some degree of agility

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