

# IETF YANG Models Inventory, status and observation

QIN WU

# Base model vs Model extension

- Base model: Technology independent model or a model providing common building blocks for technology specific models.
  - ietf-routing defined in draft-ietf-netmod-routing-cfg-20
- Model extension: Technology specific model or a model which either augments from a base model or reuses common building blocks defined in a base model.
  - ietf-ospf defined in draft-ietf-ospf-yang-03
  - ietf-ospf is extension of ietf-routing

# YANG Model drafts in IETF

- See **Routing Area WG Draft Table** in the **RTGYANGCoordSummary** wiki page:

<https://trac.tools.ietf.org/area/rtg/trac/wiki/RtgYangCoordSummary>

26 IETF YANG model WG drafts, 5 from OPS area, 1 from Internet Area, the other 20 from Routing area

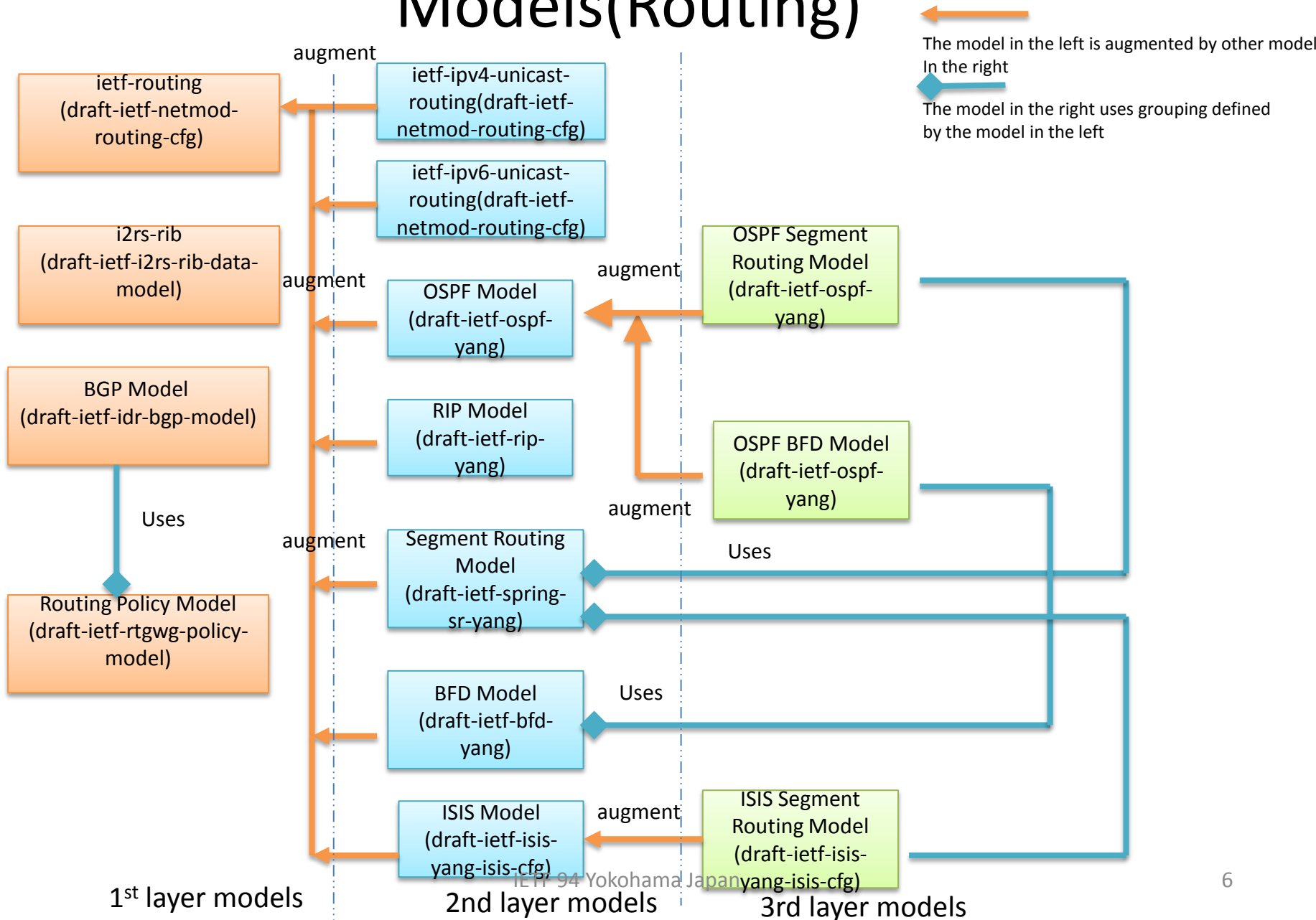
# YANG Model drafts Statistics in OPS Area and Internet Area

	Draft name	title	Creation date
OPS Area  We have 6 base models, they are L3VPN service model, ACL model, SYSLOG model, LMAP model, LIME model	draft-ietf-l3sm-l3vpn-service-model-01	YANG Data Model for L3VPN service delivery	03/08/15
	draft-ietf-netmod-routing-cfg-20	A YANG Data Model for Routing Management	16/10/15
	draft-ietf-netmod-acl-model-05	Network Access Control List (ACL) YANG Data Model	17/10/15
	draft-ietf-netmod-syslog-model-05	SYSLOG YANG model	16/10/15
	draft-ietf-lmap-yang-01	YANG Data Model for LMAP Measurement Agents	07/03/15
	draft-ietf-lime-yang-oam-model-00	Generic YANG Data Model for Operations, Administration, and Maintenance (OAM)	29/08/15
Internet Area	draft-ietf-dhc-dhcpv6-yang-00	YANG Data Model for DHCPv6 Configuration	16/10/15

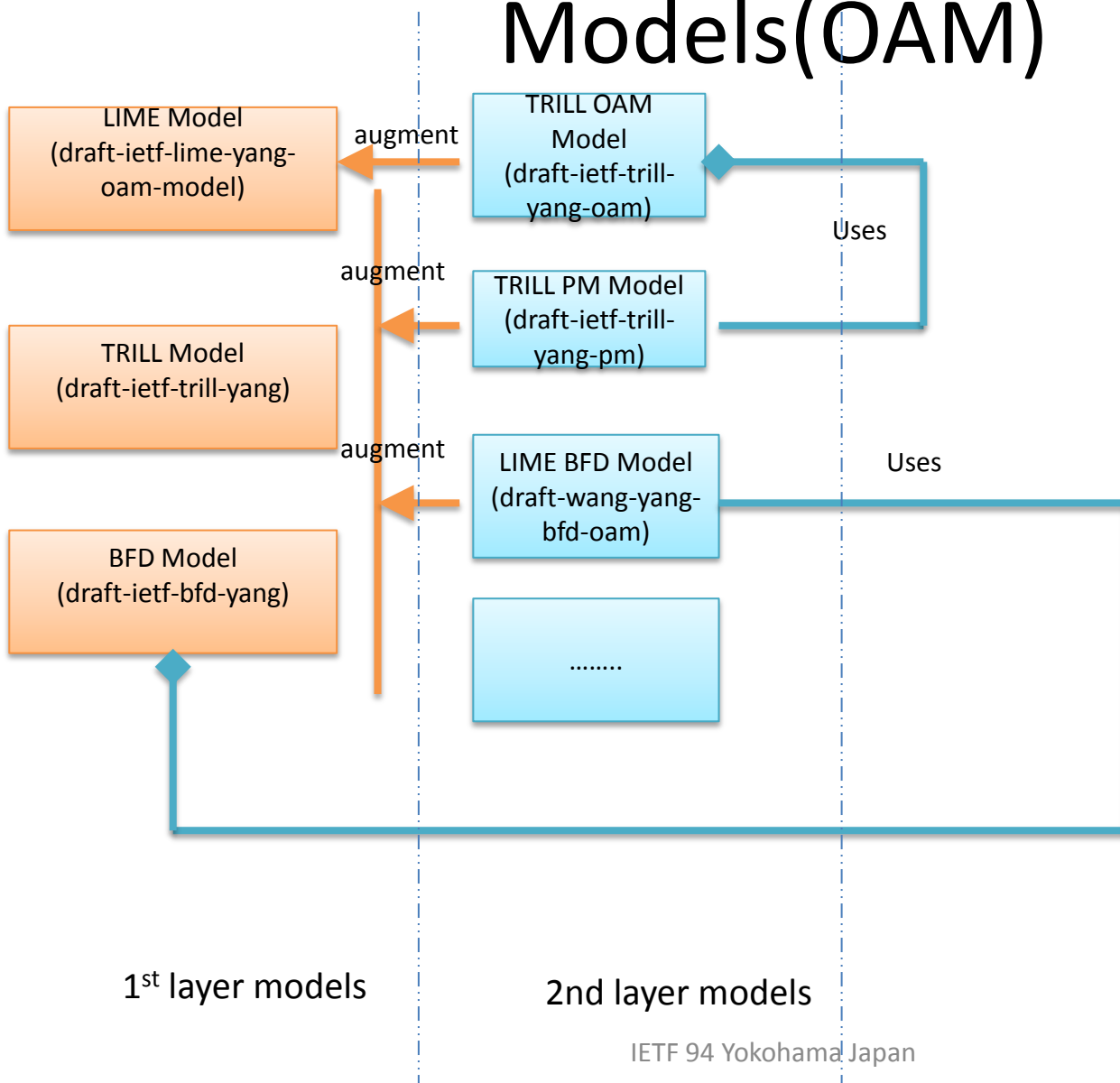
# YANG Model drafts Statistics in Routing Area

	Draft name	title	Creation date
<p><b>Routing Area</b></p> <p>We have 3 trill YANG drafts, 4 i2rs YANGdrafts,3 teas YANG drafts, 2 rtgwg YANG drafts, 7 other YANG drafts in different WGs</p> <p>In20 Routing Area YANG model drafts, we have 7 base models, they are:</p> <p>a. Routing policy model  b. Trill model  c. TE model  d. Network topo model  e. LISP model  f. BGP model  g. RSVP model</p>	<p>1.draft-ietf-isis-yang-isis-cfg-04  2.draft-ietf-ospf-yang-00  3.draft-ietf-idr-bgp-model-00  4.draft-ietf-rtgwg-policy-model-00  5.draft-ietf-rtgwg-yang-rip-00  6.draft-ietf-spring-sr-yang-00  7.draft-ietf-lisp-yang-00</p> <p>8.draft-ietf-bfd-yang-00</p> <p>9.draft-ietf-trill-yang-oam-00  10.draft-ietf-trill-yang-pm-00  11.draft-ietf-trill-yang-00</p> <p>12.draft-ietf-i2rs-yang-network-topo-01  13.draft-ietf-i2rs-yang-l3-topology-00  14.draft-ietf-i2rs-yang-l2-network-topology-01  15.draft-ietf-i2rs-rib-data-model-00</p> <p>16.draft-ietf-teas-yang-te-00  17.draft-ietf-teas-yang-te-topo-01  18.draft-ietf-teas-yang-rsvp-00</p> <p>19. draft-ietf-l2tpext-keyed-v6-tunnel-yang-00</p>	<p>1.YANG Data Model for ISIS protocol  2.Yang Data Model for OSPF Protocol  3.BGP Model for Service Provider Networks  4.Routing Policy Configuration Model for Service Provider Networks  5.A YANG Data Model for Routing Information Protocol (RIP)  6.YANG Data Model for Segment Routing  7.LISP Configuration YANG Model</p> <p>8.Yang Data Model for Bidirectional Forwarding Detection (BFD)</p> <p>9.YANG Data Model for TRILL Operations, Administration, and Maintenance (OAM)  10.YANG Data Model for TRILL Operations, Administration, and Maintenance (OAM) Performance Management  11.TRILL YANG Data Model</p> <p>12.A Data Model for Network Topologies  13.A YANG Data Model for Layer 3 Topologies  14.A YANG Data Model for Layer-2 Network Topologies  15.A YANG Data Model for Routing Information Base (RIB)</p> <p>16.A YANG Data Model for Traffic Engineering Tunnels and Interfaces  17.YANG Data Model for TE Topologies  18.A YANG Data Model for Resource Reservation Protocol (RSVP)</p> <p>19.A YANG Data Model for Keyed IPv6 Tunnels</p>	

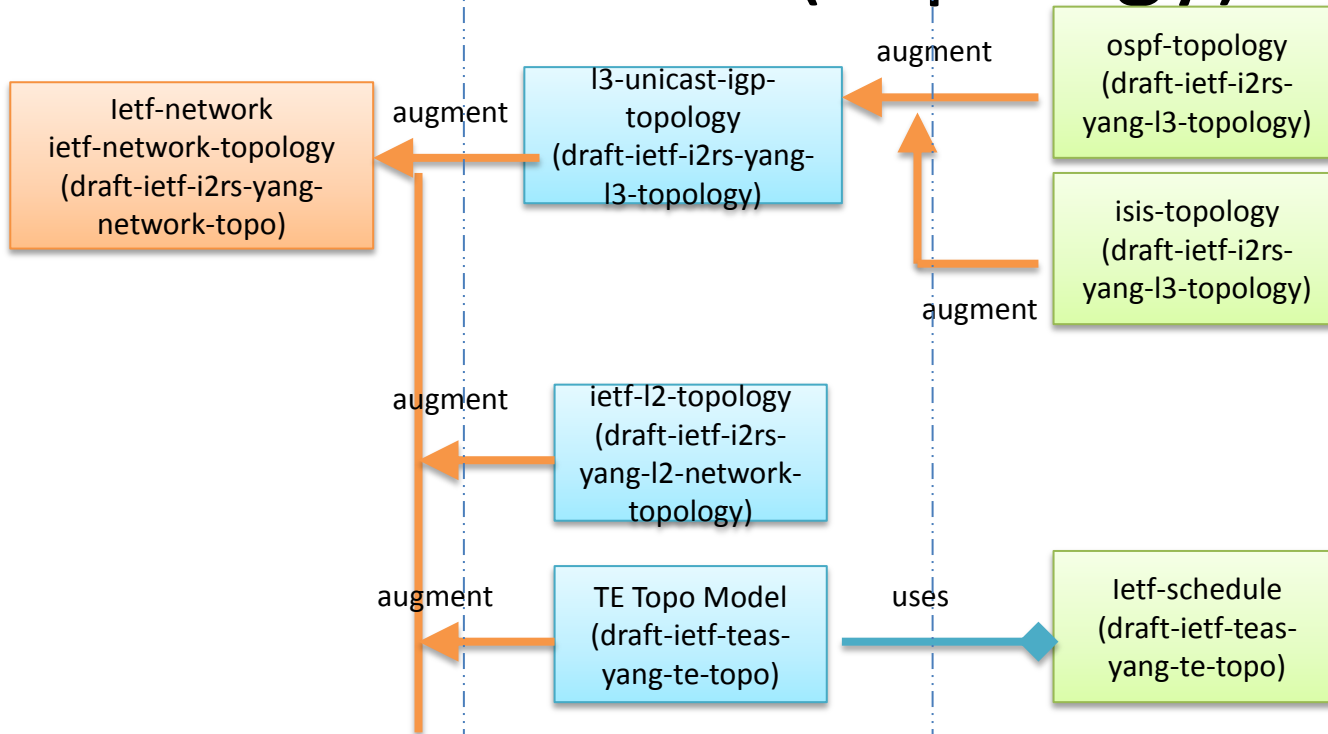
# Interrelation between YANG Models(Routing)



# Interrelation between YANG Models(OAM)



# Interrelation between YANG Models(Topology)



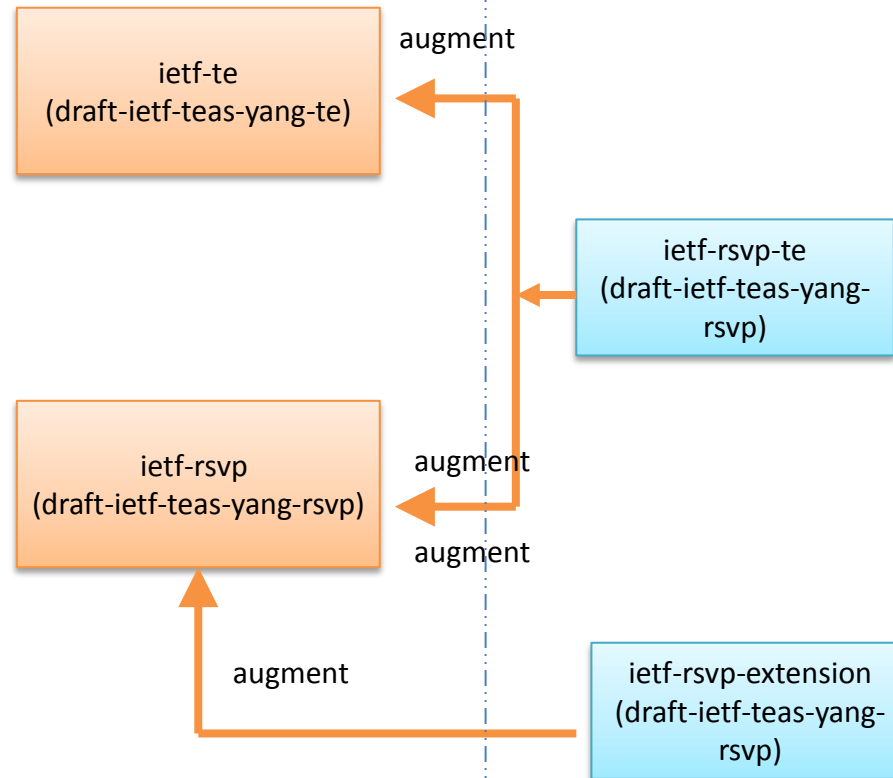
1<sup>st</sup> layer models

2nd layer models

3rd layer models



# Interrelation between YANG Models(TE)



# What is missing?

- Base model for Tunnel
  - draft-ietf-teas-yang-te defines TE tunnel configuration model, TE Tunnel operation model, TE Tunnel RPC model, TE Tunnel Notification model, how TE tunnel is related to base Tunnel model?
  - How TE Tunnel is different from IP Tunnel? How much commonality do they have?
- Base model for QoS
  - DT team uses draft-asechoud-netmod-diffserv-model-03 as starting point and works on expanding Diffserv model to QoS model.
    - The new version will come soon.
  - Do we need base QoS model? Is there commonality among diffserv and inteserv, best effort?

# What things overlap

- BGP model is developed as a standalone model and add no dependency on ietf-routing module.
- Should LIME model extension for TRILL try to reuse grouping defined in TRILL model?
- Why TRILL model or LISP model does not augment from ietf-routing model?

# What is other problem

- Do we need to model different network Element(e.g., PE, CE, NVE)
- or do we model different protocol, technology, feature, put models for protocol, technology, feature together to create any device we want?

# How they build together

- Three options were proposed and ready for discussion.
  - [draft-rtgyangdt-rtgwg-device-model](#)
    - Provide static structure to make models to fit together.
  - [draft-bierman-netmod-yang-package](#)
    - Provide dynamic structure to make different model work together
  - [draft-openconfig-netmod-model-catalog](#)
    - a model catalog for new model to register in
    - Provide consistent name space for each model or a group of models
    - Provide a service bundle to register all the models that are used to deliver the same service

# Next Step

- Comments and suggestions are welcome.
- Propose to have a tool that automatically generate relations between models?
  - E.g., analyzes module imports and what is augmented where, which groupings are imported used etc.
- Propose to have a tool that automatically generate the number of YANG models, WGs, I-Ds in the YANG model summary wiki page.
- Propose to have a tool that automatically extracts identity, feature, grouping from YANG models
- Propose to have a tool that automatically generates service catatog?