

IETF 92 Dallas, TX
Yang Data Model for OSPF Protocol
draft-ietf-ospf-yang-00

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Goals

- Define OSPF data model that work for multiple vendors
- Support various configuration options for different vendors
- Support OSPFv2 & OSPFv3 in one model
- Support optional features
 - augment
 - feature
- Alignment among routing models
 - Look & Feel, e.g. ISIS
 - Common groupings/constructs

Change since IETF91

- Used to be:
 draft-yeung-netmod-ospf-yang-02.txt
- Moved to OSPF WG:
 draft-ietf-ospf-yang-00

Change since IETF91 (Cont)

- Addressed comments
- Added authentication container

New draft: Key Chain YANG Data Model

draft-acee-rtg-yang-key-chain-03: will be presented by
Acee on Thursday afternoon at Routing Area
Working Group

```
container authentication {
  description "Authentication configuration.";
  choice auth-type-selection {
    description
      "Options for expressing authentication setting";
    case auth-ipsec {
      ..
    }
    case auth-trailer-key-chain {
      leaf key-chain {
        type key-chain:key-chain-ref;
        ..
      }
    }
    case auth-trailer-key {
      leaf key {
      }
      container crypto-algorithm {
        uses key-chain:crypto-algorithm-types;
      }
    }
  }
}
```

- Align operation and configuration hierarchy

Old:

```
+--ro ospf
  +--ro instance
    +--ro neighbor*
    +--ro interface*
    +--ro area*
    +--ro databases
    | +--ro link-scope-lsas*
    | +--ro area-scope-lsas*
    | +--ro as-scope-lsas*
```

Now:

```
+--ro ospf
  +--ro instance
    | +--ro af
    | +--ro area*
    | | +--ro interface*
    | | | ..
    | | | +--ro neighbors*
    | | | +--ro link-scope-lsa*
    | | +--ro area-scope-lsas*
  +--ro as-scope-lsas*
```

Next Steps

- More configurations/Operation state
 - IPFRR
 - Local rib
 - Segment Routing

**draft-litkowski-spring-sr-yang-00: will be presented
Thursday afternoon at SPRING**

Next Steps (Cont)

- Await feedback on
 - Protocol vs VRF centric
- Continue alignment with ISIS

Data Model OSPF Config

```
module: ospf
  +-rw routing
module: ospf
  +-rw routing-instance [name]
  +-rw routing-protocols
  +-rw routing-protocol {hostname}
  +-rw ospf-protocols
  +-rw routing-protocol [name]
  +-rw ospf

  +-rw all-areas-inherit {routing-instance} inheritance??
  | ..
  +-rw instances {routing-instance}
  .
  +-rw all-areas-inherit {area-inheritance}??
  | .
  +-rw all-interfaces {interface} inheritance??
  | .
  | +-rw all-interfaces {interface} inheritance??
  | .
  | +-rw topology {name} [face]
```

Data Model OSPF Operation

```

+--ro routing-protocols
  +--ro routing-protocol [name]
    +--ro ospf
      +--ro instance [routing-instance af]
        +--instance-operation;
        .
        +--area [area-id interface]

          +---+-rw interface* [interface]
            +- interface-operation;

          +--neighbor
          +--neighbor
            +--link-scope-lsa;
          +--ro ospf:area-scope-lsas* [area-id lsa-type]
          .

      +--ro ospf:as-scope-lsas* [lsa-type]
      .

```

Data Model OSPF Notification

```
+---n lsdbs-approaching-overflow  
+---n lsdbs-overflow  
+---n nssa-translator-status-change  
+---n restart-status-change
```

Thanks!

Data Model Config: ospf

`+--rw operation-mode?`

`identityref`

Data Model Config: instance

```
+--rw ospf
+--rw ospf
  +--rw instance* [routing-instance af]
    +--rw instance {instance} instance-ref
      +--rw routing-instance id {instance-ref}
      +--rw router-id? id {router-id}?
      +--rw admin-distance admin-distance {router-id}?
      +--rw admin-distance
      +--rw nsr {nsr}?
      +--rw nsr {nsr}?
      +--rw graceful-restart {graceful-restart}?
      +--rw graceful-restart {graceful-restart}?
      +--rw protocol-shutdown {protocol-shutdown}?

    +--rw auto-cost auto-cost {auto-cost}?
      +--rw auto-cost {auto-cost}?
      +--rw maximum
      +--rw maximum
      +--rw mpls
      +--rw mpls
      +--rw all-areas-inherit {area-inheritance}?
      +--rw all-areas-inherit {area-inheritance}?
      | +--rw area
```

Data Model Config: area

```
+--rw ospf
  +--rw instance* [routing-instance af]
+--rw ospf
  +--rw area* [area-id]
    +--rw instance* [routing-instance af] area-id-type
      +--rw area* [area-id]
        | +--rw area-id                area-id-type
        | +--rw default-type?         uint8?tyref
        | +--rw summary?              boolean
        | +--rw default-cost?         uint32
        | +--rw virtual-link* [router-id]
        | .
        | +--rw sham-link* [local-id remote-id]
        | .
        | +--rw range* [prefix]
        | .
```


Data Model Config: interface (Cont)

```
|      +--rw ttl-security {ttl-security} {ttl-security} {ttl-security}?
|      +--rw prefix-suppression?      boolean {prefix-suppression}?
|      +--rw protocol-shutdown {protocol-if-shutdown}?
|      +--rw authentication {authentication}?
|      +--rw authentication
|      +--rw protocol-shutdown {protocol-if-shutdown}?
|      +--rw topology* [name] Boolean
|      +--rw authentication {authentication}
|      .+--rw cost?      uint32
|      +--rw topology* [name]
|          +--rw name      rt:rib-ref
|          +--rw cost?     uint32
```

Data Model Config: MTR

```
+--rw ospf
  +--rw instance* [routing-instance af]
    +--rw area* [area-id]
+--rw ospf
  +--rw interface* [interface]
+--rw instance*rw topology* [name] af]
  +--rw area*+{arwaname rt:rib-ref
    +--rw+inrwcost? [uint32]
+--rw topology*rwnameology* [name]
  +--rw name--rwrnameb-reft:rib-ref
    +--rw cost? uint32
```

Data Model Op: neighbor

```
+--ro instance* [instance-id] --instance af]
```

```
+--ro interface* [interface]
```

```
+--ro neighbor* [neighbor-id]
```

```
| +--ro neighbor-id      inet:ipv4-address
```

```
| +--ro address?        inet:ip-address
```

```
| +--ro dr?             inet:ipv4-address
```

```
| +--ro bdr?            inet:ipv4-address
```

```
| +--ro state?          nbr-state-type
```

```
| +--ro state?          nbr-state-type
```

Data Model Op: interface

```
+--ro ospf
  +--ro instance* [routing-instance af]
    +--ro area* [area-id]
      +--ro area-id area-id-type
+--ro ospf
  +--ro interface* [area-id interface]
+--ro instance interface routing-instance af:interface-ref
  +--ro area network-type? enumeration
  +--ro passive? area-id-type boolean
  +--ro interface* [area-id interface]
    | +--ro interface if:interface-ref
    |
    | +--ro retransmit-interval? uint16
    | +--ro transmit-delay? uint16
```

Data Model Op: interface (Cont)

```
| +--ro mtu-ignore?          boolean {mtu-ignore}?
| +--ro lls?                 boolean {lls}?
| +--ro prefix-suppression? boolean {prefix-suppression}?
| +--ro mtu-ignore?         boolean {mtu-ignore}?
| +--ro bfd?                 boolean {bfd}?
| +--ro ttl-security {ttl-security} boolean {lls}?
| +--ro prefix-suppression? boolean {prefix-suppression}?
| +--ro protocol-shutdown {protocol-if-shutdown}?
| +--ro protocol-shutdown? {protocol-if-shutdown}?
| +--ro authentication
| +--ro protocol-shutdown {protocol-if-shutdown}?
| +--ro state-shutdown?     Boolean if-state-type
| +--ro authentication     uint32
| +--ro wait-timer?        uint32
| +--ro drate?             if-state-type
| +--ro hello-timer?       uint32
| +--ro neighbor?         uint32
| +--ro.dr?                inet:ipv4-address
| +--ro link-scope-lsas* [lsa-type]:ipv4-address
| +--ro.neighbor*
| +--ro.topology* [name]
| +--ro link-scope-lsas {lsa-type}
```

Data Model Op: area

```
| +--ro interface* [interface]
```

```
..
```


Data Model Op: LSA (Cont)

```
| |      +---:(ospfv3)
| |      +---ro ospfv3
| |      +---ro header
| |      .
| |      +---:(ospfv3)body
| |      +---ro ospfv3router
| |      +---ro header
| |      +---ro network
| |      +---ro body
| |      +---ro interarea-prefix
| |      .
| |      +---ro network
```


Data Model OSPF Notification Example

notifications:

```
+---n if-state-change
  | +--ro routing-instance?      rt:routing-instance-ref
  | +--ro routing-protocol-name? string
  | +--ro instance-af
  | | +--ro af? identityref
  | +--ro link-type?            identityref
  | +--ro interface
  | | +--ro interface? if:interface-ref
  | +--ro virtual-link
  | | +--ro area-id?            uint32
  | | +--ro neighbor-router-id? yang:dotted-quad
  | +--ro sham-link
  | | +--ro area-id?            uint32
  | | +--ro local-ip-addr?      inet:ip-address
  | | +--ro remote-ip-addr?     inet:ip-address
  | +--ro state?                if-state-type
```

Configuration Style

- **Protocol centric**

```
router ospf 1
  vrf red
  ...
router ospf 2
  vrf blue
  ...
```

- **VRF centric**

```
vrf red
  router ospf 1
  ...
vrf blue
  router ospf 2
  ...
```

Inheritance

```
router ospfv3 201
  area 1 stub
  address-family ipv4 unicast
    router-id 4.1.1.4
  address-family ipv6 unicast
    router-id 4.1.1.6
  address-family ipv4 unicast vrf red
    router-id 4.1.2.4
```