YANG Data Model for OSPF Protocol

draft-ietf-ospf-yang-07
draft-ietf-ospf-sr-yang-00

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Changes in draft-ietf-ospf-yang-07

• Primarily involve aligning with other models
  • Models that OSPF imports and depends on
    • ietf-routing-types.yang
    • ietf-key-chain.yang
  • ISIS YANG model
Align with Routing Types and Key Chain Models

• Use of ietf-routing-types.yang
  • From ietf-yang-types.yang dotted-quad to ietf-routing-types.yang router-id

• Align with updated ietf-key-chain.yang
  • See next slide
augment /rt:routing/rt:control-plane-protocols/rt:control-plane-protocol:
  +--rw instance* [af]
    +--rw areas
      +--rw area* [area-id]
        +--rw interfaces
          +--rw interface* [name]
            +--rw name    if:interface-ref
              .
              .
            +--rw authentication
              |  +--rw (auth-type-selection)?
              |     +--:(auth-ipsec)
              |     |   {ospfv3-authentication-ipsec}?
              |     |  +--rw sa?                 string
              |     +--:(auth-trailer-key-chain)
              |     |  +--rw key-chain?
              |     |        key-chain:key-chain-ref
              |     +--:(auth-trailer-key)
              |        +--rw key?              string
              |        +--rw crypto-algorithm?   identityref
              |            +--:(algorithm)?
              |            +--:(hmac-sha-1-12) {crypto-hmac-sha-1-12}?
              |            |  +--rw hmac-sha1-12?   empty
              |            +--:(md5)
              |            |  +--rw md5?                    empty
              |            +--:(sha-1)
              |            |  +--rw sha-1?                  empty
              |            +--:(hmac-sha-1)
              |            |  +--rw hmac-sha-1?            empty
              |            +--:(hmac-sha-256)
              |            |  +--rw hmac-sha-256?          empty
              .
              .
              /* more algorithms */
From ietf-key-chain.yang:
identity crypto-algorithm {
  description
  "Base identity of cryptographic algorithm options.";
}
identity hmac-sha-1-12 {
  base crypto-algorithm;
  if-feature "crypto-hmac-sha-1-12";
}
identity aes-cmac-prf-128 {
  base crypto-algorithm;
  if-feature "aes-cmac-prf-128";
}
/* more algorithms defined as identities*/
Align with ISIS

• Removed less common functionality
  • Removed optional feature LDP-IGP autoconfig
  • Removed the ability to implicitly configure a TE Router-ID by referencing an interface

• Added newer features
  • Added optional feature ietf-spf-delay (to support draft-ietf-rtgwg-backoff-algo)
  • Added optional feature node-tag and encoding in LSA

• Added several RPCs
  • clear-neighbor
  • clear-database

• Moved BFD configuration back into the model as an optional feature
  • Only enable/disable BFD

• Renamed several identifiers such that OSPF and ISIS models match
  • network-type -> interface-type
  • admin-distance -> preference
ISIS Model Alignment:
ietf-spf-delay

Modeled after
draft-ietf-rtgwg-backoff-algo

Previous version
augment /rt:routing/rt:control-plane-protocols/rt:control-plane-protocol:
  +--rw ospf
  .
  .
  +--rw instance* [af]
    +--rw af identityref
  .
  .
  +--rw spf-control
    |  +--rw paths? uint16 {max-ecmp}?

New version
augment /rt:routing/rt:control-plane-protocols/rt:control-plane-protocol:
  +--rw ospf
  .
  .
  +--rw instance* [af]
    +--rw af identityref
  .
  .
  +--rw spf-control
    |  +--rw paths? uint16 {max-ecmp}?
      |  +--rw ietf-spf-delay {ietf-spf-delay}?
      |      |  +--rw initial-delay? uint16
      |      |  +--rw short-delay? uint16
      |      |  +--rw long-delay? uint16
      |      |  +--rw hold-down? uint16
      |      |  +--rw time-to-learn? uint16

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ISIS Model Alignment:
New node-tag and LSA encoding additions

```
augment /rt:routing/rt:control-plane-protocols/rt:control-plane-protocol:
  +--rw ospf
  
  +--rw instance* [af]
    +--rw af identityref

  +--rw node-tags {node-tag}
    | +--rw node-tag* [tag]
    |   +--rw tag uint32

  +--ro header
  | +--ro option bits
  | +--ro lsa-id inet:ip-address

  +--ro body
    +--ro opaque
      +--ro node-tag-tlvs*
        | +--ro node-tag* 
        |   +--ro tag? uint32
```

LSA encoding

```
+--ro header
  | +--ro option bits
  | +--ro lsa-id inet:ip-address
  | .

  +--ro body
    +--ro opaque
      +--ro node-tag-tlvs*
        | +--ro node-tag* 
        |   +--ro tag? uint32
```
ISIS Model
Alignment:
New RPCs

rpcs:
  +----x clear-neighbor
   |    +----w input
   |    |    +----w routing-protocol-name   -> /rt:routing/control-plane-protocols/control-plane-protocol/name
   |    |    |    +----w interface? if:interface-ref
  +----x clear-database
   +----w input
       +----w routing-protocol-name   -> /rt:routing/control-plane-protocols/control-plane-protocol/name
augment /rt:routing/rt:control-plane-protocols/rt:control-plane-protocol:
  +--rw instance* [af]
  +--rw areas
    |  +--rw area* [area-id]
    |    +--rw interfaces
    |    |    +--rw interface* [name]
    |    |    |    +--rw name if:interface-ref
    |    |    +    .
    |    +    .
    |    +--rw bfd bfd
    |    |    +--rw enable? boolean
    |    +    .
    |    +    .
Current Status: draft-ietf-ospf-yang-07

• Edits pending
  • Virtual link constraint error
  • Static neighbor identification
  • OSPF and ISIS final alignment on LSDB/SPF logging
• At least one implementation in progress
• Functionality mostly complete for both config and operational states
  • Details in next slide
Dependencies

• All YANG module dependencies are in RFC or Last Call stage with two exceptions
  • ietf-routing-types.yang is an exception
    • Routing YANG Design Team will prioritize to expedite standardization
  • Route policy for redistribution is another exception
    • draft-ietf-rtgwg-policy-model expired in April 2016

• Datastore
  • Still no decision on combined config-state tree vs. separate
Next Steps: draft-ietf-ospf-yang

• Make pending edits
• YANG doctor review
• Last call for publication
  • Wait for some or all dependencies?
Changes in draft-ietf-ospf-sr-yang-01

• Align with segment routing specification
  • Added the P-bit persistent flag to Adjacency SID Sub-TLV
• Xpath corrections
Next Steps: draft-ietf-ospf-sr-yang

- Pending changes
  - Prefix SID Sub-TLV flags currently defined to begin at position 1
  - Binding TLV consists of one or more ERO Sub-TLVs

- Decide where to place OSPFv3 SR extensions for IPv6 data plane
  - Within OSPF-SR draft or in a separate draft specific to IPv6 data plane

- YANG doctor review