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September 4, 2019

YANG Data Model for Dynamic Flooding
draft-dontula-lsr-yang-dynamic-flooding-01

Abstract

This document defines YANG data models that can be used to configure and manage Dynamic Flooding for IS-IS and OSPF.

Status of This Memo

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1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

2. Introduction

This document defines a YANG [RFC7950] data model for IS-IS [ISO10589] and OSPF [RFC2328] routing protocols.

3. OSPF Data Model

```
module ietf-dynamic-flooding-ospf {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-dynamic-flooding-ospf";

  prefix ospf-df;

  import ietf-ospf {
    prefix "ospf";
    reference "RFC XXXX - YANG model for Open Shortest Path First (OSPF)";
    Please replace XXXX with published RFC number for draft-
    ietf-ospf-yang-21.";
  }
  import ietf-yang-types {
    prefix "yang";
    reference "RFC 6991: Common YANG Data Types";
  }

  import ietf-routing {
    prefix "rt";
    reference "RFC 8349 - A YANG Data Model for Routing Management (NMDA Version)";
  }

  organization
    "IETF LSR - Link State Routing Working Group";
```

```
contact
"
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    <https://datatracker.ietf.org/group/lsr/about/>
  WG List:
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description
"
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  This version of this YANG module is part of RFC XXXX
  (https://www.rfc-editor.org/info/rfcXXXX); see the RFC itself
  for full legal notices.
";

revision 2019-08-16 {
  description
    "Initial draft version.";
  reference
    "RFC XXXX: A YANG data model for OSPF Dense topology";
}
```

```

    feature dynamic-flooding-ospf {
        description
            "support for OSPF dynamic flooding";
        reference " RFC XXXX - Dynamic Flooding on Dense Graphs";
    }

/*
*     identity ospfv2-dynamic-flooding-opaque-lsa {
*         base ospf:ospfv2-area-scope-opaque-lsa;
*         description
*             "OSPFv2 dynamic-flooding-opaque-lsa. RFC XXX- Replace XX
XX with published RFC number for draft-ietf-lsr-dynamic-flooding ";
*     }
*
*     identity ospfv3-dynamic-flooding-opaque-lsa {
*         base ospf:ospfv3-lsa-type;
*         description
*             "OSPFv3 dynamic-flooding-opaque-lsa. RFC XXX- Replace XX
XX with published RFC number for draft-ietf-lsr-dynamic-flooding ";
*     }
*/

    identity ospfv2-dynamic-flooding-opaque-lsa {
        base ospf:ospfv2-opaque-lsa-type;
        description "OSPFv2 Dynamic Flooding Opaque LSA - Type TBD";
    }

    identity ospfv3-dynamic-flooding-opaque-lsa {
        base ospf:ospfv3-lsa-type;
        description "OSPFv3 Dynamic Flooding LSA - Type TBD";
    }

    grouping ospf-area-leader-tlv {
        description "Area leader TLV for OSPFv2/OSPFv3. A TLV of RI LSA"
;
        leaf priority {
            type uint8;
            description "Router's priority for Area leader";
        }
        leaf Algorithm {
            type uint8;
            description "Routers Algorithm to calculate Flooding Top
ology.";
        }
    }

    grouping dynamic-flooding-tlv {
        description "Dynamic-flooding TLV for OSPFv2/OSPFv3. A TLV of RI
LSA";
        leaf-list algorithm {

```

```

        type uint8;
        description "List of Algorithm's supported by the advert
ising node";
    }
}

grouping ospfv2-area-router-id-tlv-entry {
    description "ospfv2 area router ID TLV enties";
    leaf connection-type {
        type uint8;
        description "Defines the connection type ";
    }
    leaf number-of-ids {
        type uint16;
        description "the number of ID present in this TLV entry"
;
    }
    leaf-list originating-router-id {
        type yang:dotted-quad;
        description "list of the originating-router-ids";
    }
}

grouping ospfv2-area-router-id-tlv {
    description "definition for OSPFv2 Dynamic flooding area router-
ID TLV";
    leaf start-index {
        type uint16;
        description "Starting index of the first router/designat
ed router ID";
    }
    leaf last-flag {
        type bits {
            bit last-router-designated-router-id {
                description "when set, this TLV is the l
ast Index in the full list of router IDs for the area";
                reference "RFC XXXX- Dynamic flooding on
Dense graphs; Replace XXXX with published RFC number for
draft-ietf-lsr-d
ynamic-flooding-03";
            }
        }
        description "last flag";
    }
    list ospfv2-router-id-tlv-entry {
        description "list of ospfv2 router-ID TLV entries";
        uses ospfv2-area-router-id-tlv-entry;
    }
}

grouping ospfv3-area-router-id-tlv-entry {
    description "ospfv3 area router ID TLV enties";
    leaf connection-type {
        type uint8;

```

```

        description "Defines the connection type ";
    }
    leaf number-of-ids {
        type uint16;
        description "the number of ID present in this TLV entry"
;
    }
    choice originating-router-id {
        description "list of the originating-router-ids";
        container router-id {
            when "derived-from(..connection-type,'router') "
{
                description "Only applies when connectio
n type is Router";
            }
            description "originating-router-id";
            leaf-list originating-router-id {
                type yang:dotted-quad;
                description "list of the originating-rou
ter-ids";
            }
        }
        container designated-router-id {
            when "derived-from(..connection-type,'designate
d-router') " {
                description "Only applies when connectio
n type is designated Router";
            }
            description "originating-router-id";
            list originating-router-id-list {
                description "originating-router-id";
                leaf originating-router-id{
                    type yang:dotted-quad;
                    description "originating-router-
ids";
                }
                leaf interface-id{
                    type yang:dotted-quad;
                    description "interface-ids";
                }
            }
        }
    }
}

grouping ospfv3-area-router-id-tlv {
    description "definition for OSPFv3 Dynamic flooding area router-
ID TLV";
    leaf start-index {
        type uint16;
        description "Starting index of the first router/designat
ed router ID";
    }
    leaf last-flag {
        type bits {
            bit last-router-designated-router-id {
                description "when set, this TLV is the 1
ast Index in the full list of router IDs for the area";
            }
        }
    }
}

```

```

        reference "RFC XXXX- Dynamic flooding on
Dense graphs; Replace XXXX with published RFC number for draft-ietf-lsr-dynamic
-flooding-03";
    }
    }
    description "dynamic flooding area router-ID flag defini
tions";
}
list ospfv3-router-id-tlv-entry {
    description "list of OSPFv3 router-ID TLV entries";
    uses ospfv3-area-router-id-tlv-entry;
}
}

grouping flooding-path-tlv {
    description "definition for OSPFv2/OSPFv3 Flooding Path TLV";
    leaf start-index {
        type uint16;
        description "Starting index of the first router/designat
ed router ID";
    }
    leaf-list indices {
        type uint16;
        description "index of the next router ID in the path";
    }
}

grouping flooding-request-bit{
    description "definition for adding Flooding request bit (FR-bit)
to LLS type-1 extended options. Need to be defined";
}

grouping link-attribute-bits-tlv{
    description "definition for link-attribute-bits-tlv, a sub-tlv f
or OSPFv2 Extended link TLV and a sub-tlv for OSPFv3 router-link TLV";
    leaf link-attributes-bits{
        type bits {
            bit LEEF {
                description "when set, conveys which edg
es are currently enabled in the flooding topology";
            }
        }
        description "link-attributes-bits";
    }
}

/*
* Dynamic flooding config augmentation to OSPF Module
*/
augment "/rt:routing/rt:control-plane-protocols/rt:control-plane-protoco
l/ospf:ospf/ospf:areas/ospf:area" {
    if-feature dynamic-flooding-ospf;
    description "Dynamic-flooding config model augmentation";
    container dynamic-flooding {
        description "to Enable/Disable dynamic flooding for this
specific OSPF area";
    }
}

```

```

        leaf enable {
            type boolean;
            description "Enable/Disable dynamic-flooding";
        }
    }

/*
 * Dynamic flooding state augmentation to OSPF2 module
 */

    augment "/rt:routing/rt:control-plane-protocols/rt:control-plane-protoco
l/ospf:ospf/ospf:areas/ospf:area/ospf:database/ospf:area-scope-lsa-type/ospf:are
a-scope-lsas/ospf:area-scope-lsa/ospf:version/ospf:ospfv2/ospf:ospfv2/ospf:body/
ospf:opaque" {
        if-feature dynamic-flooding-ospf;
        description "dynamic flooding TLVs augmentation";
        container area-leader-tlv {
            description "Area-leader-tlv";
            uses ospf-area-leader-tlv;
        }
        container dynamic-flooding-tlv {
            description "dynamic-flooding-tlv";
            uses dynamic-flooding-tlv;
        }
    }

    augment "/rt:routing/rt:control-plane-protocols/rt:control-plane-protoco
l/ospf:ospf/ospf:areas/ospf:area/ospf:database/ospf:area-scope-lsa-type/ospf:are
a-scope-lsas/ospf:area-scope-lsa/ospf:version/ospf:ospfv2/ospf:ospfv2/ospf:body"
    {
        if-feature dynamic-flooding-ospf;
        description "ospfv2-dynamic-flooding-opaque-lsa augmentation";
        container ospfv2-dynamic-flooding-opaque-lsa {

            description "OSPFv2 Dynamic flooding opaque LSA.";
            uses unknown-tlvs;
            container ospfv2-area-router-id-tlv {
                description "ospfv2-area-router-id-tlv";
                uses ospfv2-area-router-id-tlv;
            }
            container flooding-path-tlv {
                description "ospf flooding-path-tlv";
                uses flooding-path-tlv;
            }
        }
    }

    augment "/rt:routing/rt:control-plane-protocols/rt:control-plane-protoco
l/ospf:ospf/ospf:areas/ospf:area/ospf:database/ospf:area-scope-lsa-type/ospf:are
a-scope-lsas/ospf:area-scope-lsa/ospf:version/ospf:ospfv2/ospf:ospfv2/ospf:body/
ospf:opaque/ospf:extended-link-opaque/ospf:extended-link-tlv" {
        if-feature dynamic-flooding-ospf;
        description "ospf-link-attributes-bits-tlv augmentation";
        container ospf-link-attributes-bits-tlv {
            description "ospf link attributes bits tlv. RFC XXXX- Dy
namic flooding on Dense graphs; Replace XXXX with published RFC number for draft
-ietf-lsr-dynamic-flooding-03";
            uses link-attribute-bits-tlv;

```



```

    }
  }

/*
 * Dynamic flooding state augmentation to OSPF3 module
 */
    augment "/rt:routing/rt:control-plane-protocols/rt:control-plane-protoco
l/ospf:ospf/ospf:areas/ospf:area/ospf:database/ospf:area-scope-lsa-type/ospf:are
a-scope-lsas/ospf:area-scope-lsa/ospf:version/ospf:ospfv3/ospf:ospfv3/ospf:body/
ospf:router-information" {
        if-feature dynamic-flooding-ospf;
        description "dynamic flooding TLVs augmentation";
        container area-leader-tlv {
            description "Area-leader-tlv";
            uses ospf-area-leader-tlv;
        }
        container dynamic-flooding-tlv {
            description "dynamic-flooding-tlv";
            uses dynamic-flooding-tlv;
        }
    }

    augment "/rt:routing/rt:control-plane-protocols/rt:control-plane-protoco
l/ospf:ospf/ospf:areas/ospf:area/ospf:database/ospf:area-scope-lsa-type/ospf:are
a-scope-lsas/ospf:area-scope-lsa/ospf:version/ospf:ospfv3/ospf:ospfv3/ospf:body"
    {
        if-feature dynamic-flooding-ospf;
        description "ospfv3-dynamic-flooding-opaque-lsa augmentation";
        container ospfv3-dynamic-flooding-opaque-lsa {

            description "ospfv3-dynamic-flooding-opaque-lsa definiti
on";
            //
            uses unknown-tlvs;
            container ospfv3-area-router-id-tlv {
                description "ospfv3-area-router-id-tlv";
                uses ospfv3-area-router-id-tlv;
            }
            container flooding-path-tlv {
                description "ospf flooding-path-tlv";
                uses flooding-path-tlv;
            }
        }
    }
}

```

4. IS-IS Data Model

This data model augments the IS-IS YANG model [I-D.ietf-isis-yang-isis-cfg] with extensions to support Dynamic Flooding [I-D.ietf-lsr-dynamic-flooding].

```

module ietf-isis-dynflood {
    yang-version 1.1;

```

```
// IETF:
namespace "urn:ietf:params:xml:ns:yang:ietf-isis-dynflood";
// OpenConfig:
// namespace "http://openconfig.net/yang/openconfig-isis-dynflood";

prefix isis-dynflood;

// OpenConfig:
// import openconfig-network-instance {
//   prefix oc-netinst;
// }

// NB: This module is currently under development and is intended to augment
// the IETF IS-IS module (currently draft-ietf-isis-yang-isis-cfg-35).
// While that is in process, we are developing against the openconfig model, a
nd
// references to IETF paths are commented out.

// IETF:
import ietf-routing {
  prefix "rt";
  reference "RFC 8349 - A YANG Data Model for Routing Management (NMDA Version
)";
}

import ietf-isis {
  prefix "isis";
  reference "https://tools.ietf.org/id/draft-ietf-isis-yang-isis-cfg-35.txt";
}

organization "IETF LSR Working Group";
contact "WG List: <mailto:lsr@ietf.org>";
description "
```

First draft of a YANG model for IS-IS dynamic flooding.

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 <mailto:tony.li@tony.li>;

```

revision 2019-08-22 {
  description "Initial revision";
  reference "RFC XXXX";
}

// OpenConfig:
// typedef extended-system-id {
//   type string {
//     pattern
//       '[0-9A-Fa-f]{4}\.[0-9A-Fa-f]{4}\.[0-9A-Fa-f]{4}\.'
//       +'[0-9][0-9]';
//   }
//   description
//     "This type defines IS-IS system-id using pattern. The extended
//     system-id contains the pseudonode number in addition to the
//     system-id.
//     An example system-id is 0143.0438.AEF0.00";
// }

feature area-leader {
  description "Election of a leader for the area.";
}

feature dynamic-flooding {
  if-feature area-leader;
  description "Compute a reduced flooding topology.";
}

grouping area-leader-global-cfg {
  description "Enable area leader capability";
  leaf value {
    type boolean;
    default false;
    description "Enable area leader capability";
  }
}

```

```
}

grouping area-leader-priority-cfg {
  description "Set the area leader priority";
  leaf value {
    type uint8;
    default 200;
    description "Area leader priority";
  }
}

grouping area-leader-algorithm-cfg {
  description "Select the flooding topology computation algorithm";
  leaf value {
    type uint8;
    default 0;
    description "Dynamic flooding algorithm selection";
  }
}

grouping area-leader-parameters {
  description "Area leader configuration parameters";
  container area-leader {
    description "Area leader configuration parameters";
    container config {
      description "Area leader configuration";
      container enable {
        if-feature area-leader;
        description "Area leader global enable configuration";
        uses area-leader-global-cfg;
        container level-1 {
          description "level-1 specific configuration";
          uses area-leader-global-cfg;
        }
        container level-2 {
          description "level-2 specific configuration";
          uses area-leader-global-cfg;
        }
      }
    }

    container priority {
      if-feature area-leader;
      description "Area leader priority configuration";
      uses area-leader-priority-cfg;
      container level-1 {
        description "level-1 specific configuration";
        uses area-leader-priority-cfg;
      }
    }
  }
}
```

```
        container level-2 {
            description "level-2 specific configuration";
            uses area-leader-priority-cfg;
        }
    }

    container algorithm {
        if-feature dynamic-flooding;
        description "Area leader algorithm configuration";
        uses area-leader-algorithm-cfg;
        container level-1 {
            description "level-1 specific configuration";
            uses area-leader-algorithm-cfg;
        }
        container level-2 {
            description "level-2 specific configuration";
            uses area-leader-algorithm-cfg;
        }
    }
}

grouping dynamic-flooding-global-cfg {
    description "Enable dynamic flooding capability";
    leaf value {
        type boolean;
        default false;
        description "Enable dynamic flooding capability";
    }
}

grouping dynamic-flooding-parameters {
    description "Dynamic flooding configuration parameters";
    container dynamic-flooding {
        description "Dynamic flooding configuration parameters";
        container config {
            description "Dynamic flooding configuration";
            container enable {
                if-feature dynamic-flooding;
                description "Dynamic flooding global enable configuration";
                uses dynamic-flooding-global-cfg;
                container level-1 {
                    description "level-1 specific configuration";
                    uses dynamic-flooding-global-cfg;
                }
                container level-2 {
                    description "level-2 specific configuration";
```

```
        uses dynamic-flooding-global-cfg;
    }
}
}
}

// IETF:
augment "/rt:routing/rt:control-plane-protocols/"
+ "rt:control-plane-protocol/isis:isis" {
// OpenConfig:
// augment "/oc-netinst:network-instances/oc-netinst:network-instance/oc-netin
st:protocols/oc-netinst:protocol/oc-netinst:isis/oc-netinst:global" {
    description "Area leader and dynamic flooding configuration additions";
    uses area-leader-parameters;
    uses dynamic-flooding-parameters;
}

grouping dynamic-flooding-paths {
    description "List of paths in the topology";
    list paths {
        config false;
        description "A list of paths";
        leaf-list path {
            type uint16;
            description "A list of node indicies";
        }
    }
}

grouping dynamic-flooding-topology {
    description "List of paths in the topology";
    list paths {
        config false;
        description "A list of paths";
        leaf-list path {
            type string;
            description "A list of node names";
        }
    }
}

grouping dynamic-flooding-interfaces {
    description "List of flooding topology interfaces";
    list interfaces {
        config false;
        description "List of interfaces and their temporary status";
        leaf interface {
            type string;
        }
    }
}
```

```
        description "Interface name";
    }
    leaf temporary {
        type boolean;
        description "Set for partition repair or new adjacencies";
    }
}

grouping area-leader-state {
    description "Area leader state information";
    container area-leader-state {
        description "Area leader election result";
        leaf area-leader {
            type string;
            description "Hostname of the area leader";
        }
    }
}

grouping dynamic-flooding-state {
    description "State information for dynamic flooding";
    container area-node-ids {
        if-feature dynamic-flooding;
        description "Area node ids and indices";
        container area-node-ids {
            description "List of nodes and indices";
            list node-index {
                key index;
                description "List of nodes and their indices";
                leaf index {
                    type uint16;
                    description "Index for the node";
                }
                leaf node-id {
                    // OpenConfig:
                    // type extended-system-id;
                    // IETF:
                    type isis:extended-system-id;
                    description "Node id for the node";
                }
            }
        }
    }
    container dynamic-flooding-paths {
        if-feature dynamic-flooding;
        description "Flooding topology with explicit paths";
        uses dynamic-flooding-paths;
    }
}
```



```
    }
    container dynamic-flooding-topology {
        if-feature dynamic-flooding;
        description "Flooding topology with system names";
        uses dynamic-flooding-topology;
    }
    container dynamic-flooding-interfaces {
        if-feature dynamic-flooding;
        description "Interfaces on the flooding topology";
        uses dynamic-flooding-interfaces;
    }
}

// IETF:
augment "/rt:routing/rt:control-plane-protocols/"
    + "rt:control-plane-protocol/isis:isis" {
// OpenConfig:
// augment "/oc-netinst:network-instances/oc-netinst:network-instance/oc-netinst:protocols/oc-netinst:protocol/oc-netinst:isis/oc-netinst:levels/oc-netinst:level/oc-netinst:state" {
    description "Area leader and dynamic flooding state additions";
    uses area-leader-state;
    uses dynamic-flooding-state;
}

grouping subtlv27-area-leader {
    description "Router capability subTLV for area leader capability";
    container area-leader {
        description "Area leader subTLV for router capabilities";
        leaf priority {
            type uint8;
            description "Area leader priority";
        }
        leaf algorithm {
            type uint8;
            description "Algorithm index for computing the flooding topology";
        }
    }
}

grouping subtlv28-dynamic-flooding {
    description "Dynamic flooding capability subTLV";
    container dynamic-flooding {
        description "Dynamic flooding capability subTLV";
        leaf-list algorithms {
            type uint8;
            description "Supported algorithm indices for distributed mode";
        }
    }
}
```

```
// OpenConfig:
// augment "/oc-netinst:network-instances/oc-netinst:network-instance/oc-netinst:protocols/oc-netinst:protocol/oc-netinst:isis/oc-netinst:levels/oc-netinst:level/oc-netinst:link-state-database/oc-netinst:lsp/oc-netinst:tlvs/oc-netinst:tlv/oc-netinst:router-capabilities/oc-netinst:capability/oc-netinst:subtlvs/oc-netinst:subtlv" {
// IETF:
augment "/rt:routing/rt:control-plane-protocols"
  +"/rt:control-plane-protocol/isis:isis"
  +"/isis:database/isis:levels/isis:lsp/isis:router-capabilities/isis:router-capability" {
  description "Additional router capability subTLVs for dynamic flooding";
  uses subtlv27-area-leader;
  uses subtlv28-dynamic-flooding;
}

grouping tlv17-area-node-ids {
  description "TLV 17: Area Node IDs";
  container area-node-ids {
    description "Dynamic flooding node id assignment TLV";
    leaf starting-index {
      type uint8;
      description "Starting index for the node ids in this TLV.";
    }
    leaf flags {
      type bits {
        bit last {
          position 0;
          description "Set if this is the highest set of indices in the area."
        }
      }
    }
    description "Flags field in the TLV.";
  }
  leaf-list nodes {
    // OpenConfig:
    // type extended-system-id;
    // IETF:
    type isis:extended-system-id;
    description "Nodes being assigned indices";
  }
}

grouping tlv18-flooding-path {
  description "Flooding topology path TLV";
  container flooding-path {
    description "Dynamic flooding path TLV";
    leaf-list nodes {
      type uint16;
      description "Nodes in the path";
    }
  }
}
```

```
// OpenConfig:
// augment "/oc-netinst:network-instances/oc-netinst:network-instance/oc-netinst:protocols/oc-netinst:protocol/oc-netinst:isis/oc-netinst:levels/oc-netinst:level/oc-netinst:link-state-database/oc-netinst:lsp/oc-netinst:tlvs/oc-netinst:tlv" {
// IETF:
augment "/rt:routing/rt:control-plane-protocols"
  +"/rt:control-plane-protocol/isis:isis/isis:database/isis:levels/isis:lsp" {
    description "Additional TLVs for dynamic flooding";
    uses tlv17-area-node-ids;
    uses tlv18-flooding-path;
  }
}
```

5. Acknowledgements

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6. Security Considerations

This document introduces no new security issues.

7. Normative References

- [I-D.ietf-isis-yang-isis-cfg]
Litkowski, S., Yeung, D., Lindem, A., Zhang, Z., and L. Lhotka, "YANG Data Model for IS-IS Protocol", draft-ietf-isis-yang-isis-cfg-35 (work in progress), March 2019.
- [I-D.ietf-lsr-dynamic-flooding]
Li, T., Psenak, P., Ginsberg, L., Chen, H., Przygienda, T., Cooper, D., Jalil, L., and S. Dontula, "Dynamic Flooding on Dense Graphs", draft-ietf-lsr-dynamic-flooding-03 (work in progress), June 2019.
- [ISO10589]
International Organization for Standardization, "Intermediate System to Intermediate System Intra-Domain Routing Exchange Protocol for use in Conjunction with the Protocol for Providing the Connectionless-mode Network Service (ISO 8473)", ISO/IEC 10589:2002, Nov. 2002.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [RFC2328] Moy, J., "OSPF Version 2", STD 54, RFC 2328, DOI 10.17487/RFC2328, April 1998, <<https://www.rfc-editor.org/info/rfc2328>>.

[RFC7950] Bjorklund, M., Ed., "The YANG 1.1 Data Modeling Language",
RFC 7950, DOI 10.17487/RFC7950, August 2016,
<<https://www.rfc-editor.org/info/rfc7950>>.

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