

```
module ietf-dots-signal-channel {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-dots-signal-channel";
  prefix signal;

  import ietf-inet-types {
    prefix inet;
    reference
      "Section 4 of RFC 6991";
  }
  import ietf-yang-types {
    prefix yang;
    reference
      "Section 3 of RFC 6991";
  }
  import ietf-dots-data-channel {
    prefix ietf-data;
    reference
      "RFC 8783: Distributed Denial-of-Service Open Threat Signaling
        (DOTS) Data Channel Specification";
  }
  import iana-dots-signal-channel {
    prefix iana-signal;
  }
  import ietf-yang-structure-ext {
    prefix sx;
    reference
      "RFC 8791: YANG Data Structure Extensions";
  }

  organization
    "IETF DDoS Open Threat Signaling (DOTS) Working Group";
  contact
    "WG Web:   <https://datatracker.ietf.org/wg/dots/>
      WG List: <mailto:dots@ietf.org>

      Editor:  Konda, Tirumaleswar Reddy.K
               <mailto:TirumaleswarReddy\_Konda@McAfee.com>

      Editor:  Mohamed Boucadair
               <mailto:mohamed.boucadair@orange.com>

      Author:  Prashanth Patil
               <mailto:praspati@cisco.com>

      Author:  Andrew Mortensen
               <mailto:amortensen@arbor.net>

      Author:  Nik Teague
               <mailto:nteague@ironmountain.co.uk>";
  description
    "This module contains YANG definition for the signaling
```

messages exchanged between a DOTS client and a DOTS server.

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This version of this YANG module is part of RFC 8782; see the RFC itself for full legal notices.";

```
revision 2020-07-02 {
  description
    "Updated revision.";
  reference
    "RFC xxxx: A YANG Data Model for Distributed Denial-of-Service
      Open Threat Signaling (DOTS) Signal Channel";
}
```

```
revision 2020-05-28 {
  description
    "Initial revision.";
  reference
    "RFC 8782: Distributed Denial-of-Service Open Threat
      Signaling (DOTS) Signal Channel Specification";
}
```

```
/*
 * Groupings
 */
```

```
grouping mitigation-scope {
  description
    "Specifies the scope of the mitigation request.";
  list scope {
    key "euid-mid"; "mid";
    description
      "The scope of the request.";
```

```
    leaf edid {
```

```
      type string;
```

```
      description
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      "The edid should be included by a server-domain
        DOTS gateway to propagate the client domain
        identification information from the
        gateway's client-facing side to the gateway's
        server-facing side, and from the gateway's
        server-facing side to the DOTS server.
```

```
      It may be used by the final DOTS server
```

```

_____ for policy enforcement purposes.";
_____ }
_____ leaf cuid {
_____     type string;
_____     description
_____     "A unique identifier that is
_____     generated by a DOTS client to prevent
_____     request collisions. It is expected that the
_____     cuid will remain consistent throughout the
_____     lifetime of the DOTS client.";
_____ }
_____ leaf mid {
_____     type uint32;
_____     description
_____         "Mitigation request identifier.
_____
_____         This identifier must be unique for each mitigation
_____         request bound to the DOTS client.";
_____ }
_____ uses ietf-data:target;
_____ leaf-list alias-name {
_____     type string;
_____     description
_____         "An alias name that points to a resource.";
_____ }
_____ leaf lifetime {
_____     type int32;
_____     units "seconds";
_____     default "3600";
_____     description
_____         "Indicates the lifetime of the mitigation request.
_____
_____         A lifetime of '0' in a mitigation request is an
_____         invalid value.
_____
_____         A lifetime of negative one (-1) indicates indefinite
_____         lifetime for the mitigation request.";
_____ }
_____ leaf trigger-mitigation {
_____     type boolean;
_____     default "true";
_____     description
_____         "If set to 'false', DDoS mitigation will not be
_____         triggered unless the DOTS signal channel
_____         session is lost.";
_____ }
_____ }
_____ choice direction {
_____     description
_____         "Indicates the communication direction in which the
_____         attributes can be included.";
_____     case server-to-client {
_____         description
_____             "These attributes appear only in a mitigation message

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```
    sent from the server to the client.";
  leaf mitigation-start {
    type uint64;
config false;
    description
      "Mitigation start time is represented in seconds
       relative to 1970-01-01T00:00:00Z in UTC time.";
  }
  leaf status {
    type iana-signal:status;
config false;
    description
      "Indicates the status of a mitigation request.
       It must be included in responses only.";
  }
  container conflict-information {
config false;
    description
      "Indicates that a conflict is detected.
       Must only be used for responses.";
    leaf conflict-status {
      type iana-signal:conflict-status;
      description
        "Indicates the conflict status.";
    }
    leaf conflict-cause {
      type iana-signal:conflict-cause;
      description
        "Indicates the cause of the conflict.";
    }
    leaf retry-timer {
      type uint32;
      units "seconds";
      description
        "The DOTS client must not resend the
         same request that has a conflict before the expiry of
         this timer.";
    }
    container conflict-scope {
      description
        "Provides more information about the conflict scope.";
      uses ietf-data:target {
        when "/dots-signal/scope/conflict-information/"
          + "conflict-cause = 'overlapping-targets'";
      }
      leaf-list alias-name {
        when "../..//conflict-cause = 'overlapping-targets'";
        type string;
        description
          "Conflicting alias-name.";
      }
      list acl-list {
        when "../..//conflict-cause = 'conflict-with-acceptlist'";
```

```
key "acl-name";
description
  "List of conflicting ACLs as defined in the DOTS data
  channel. These ACLs are uniquely defined by
  cuid and acl-name.";
leaf acl-name {
  type leafref {
    path "/ietf-data:dots-data/ietf-data:dots-client/"
      + "ietf-data:acls/ietf-data:acl/ietf-data:name";
  }
  description
    "Reference to the conflicting ACL name bound to
    a DOTS client.";
}
leaf acl-type {
  type leafref {
    path "/ietf-data:dots-data/ietf-data:dots-client/"
      + "ietf-data:acls/ietf-data:acl/ietf-data:type";
  }
  description
    "Reference to the conflicting ACL type bound to
    a DOTS client.";
}
}
leaf mid {
  when "../..//conflict-cause = 'overlapping-targets'";
  type leafref {
path "../..//../mid";
} uint32;
  description
    "Reference to the conflicting 'mid' bound to
    the same DOTS client.";
}
}
}
leaf bytes-dropped {
  type yang:zero-based-counter64;
  units "bytes";
config false;
  description
    "The total dropped byte count for the mitigation
    request since the attack mitigation was triggered.
    The count wraps around when it reaches the maximum value
    of counter64 for dropped bytes.";
}
leaf bps-dropped {
  type yang:gauge64;
config false;
  description
    "The average number of dropped bits per second for
    the mitigation request since the attack
    mitigation was triggered. This should be over
    five-minute intervals (that is, measuring bytes
```

```

        into five-minute buckets and then averaging these
        buckets over the time since the mitigation was
        triggered).";
    }
    leaf pkts-dropped {
        type yang:zero-based-counter64;
config false;
        description
            "The total number of dropped packet count for the
            mitigation request since the attack mitigation was
            triggered. The count wraps around when it reaches
            the maximum value of counter64 for dropped packets.";
    }
    leaf pps-dropped {
        type yang:gauge64;
config false;
        description
            "The average number of dropped packets per second
            for the mitigation request since the attack
            mitigation was triggered. This should be over
            five-minute intervals (that is, measuring packets
            into five-minute buckets and then averaging these
            buckets over the time since the mitigation was
            triggered).";
    }
    leaf attack-status {
        type iana-signal:attack-status;
        description
            "Indicates the status of an attack as seen by the
            DOTS client.";
    }
}
}
}

grouping config-parameters {
    description
        "Subset of DOTS signal channel session configuration.";
    container heartbeat-interval {
        description
            "DOTS agents regularly send heartbeats to each other
            after mutual authentication is successfully
            completed in order to keep the DOTS signal channel
            open.";
choice direction {
description
    "Indicates the communication direction in which the
    attributes can be included.";
case server-to-client {
description
    "These attributes appear only in a mitigation message
    sent from the server to the client.";

```

```
    leaf max-value {
        type uint16;
        units "seconds";
config false;
        description
            "Maximum acceptable heartbeat-interval value.";
    }
    leaf min-value {
        type uint16;
        units "seconds";
config false;
        description
            "Minimum acceptable heartbeat-interval value.";
    }
}
leaf current-value {
    type uint16;
    units "seconds";
    default "30";
    description
        "Current heartbeat-interval value.

        '0' means that heartbeat mechanism is deactivated.";
}
}
container missing-hb-allowed {
    description
        "Maximum number of missing heartbeats allowed.";
    choice direction {
        description
            "Indicates the communication direction in which the
            attributes can be included.";
        case server-to-client {
            description
                "These attributes appear only in a mitigation message
                sent from the server to the client.";
            leaf max-value {
                type uint16;
config false;
                description
                    "Maximum acceptable missing-hb-allowed value.";
            }
            leaf min-value {
                type uint16;
config false;
                description
                    "Minimum acceptable missing-hb-allowed value.";
            }
        }
    }
}
leaf current-value {
    type uint16;
```

```
        default "15";
        description
            "Current missing-hb-allowed value.";
    }
}
container probing-rate {
    description
        "The limit for sending Non-confirmable messages with
        no response.";
    choice direction {
        description
            "Indicates the communication direction in which the
            attributes can be included.";
        case server-to-client {
            description
                "These attributes appear only in a mitigation message
                sent from the server to the client.";
            leaf max-value {
                type uint16;
                units "byte/second";
config false;
                description
                    "Maximum acceptable probing-rate value.";
            }
            leaf min-value {
                type uint16;
                units "byte/second";
config false;
                description
                    "Minimum acceptable probing-rate value.";
            }
        }
    }
    leaf current-value {
        type uint16;
        units "byte/second";
        default "5";
        description
            "Current probing-rate value.";
    }
}
container max-retransmit {
    description
        "Maximum number of retransmissions of a Confirmable
        message.";
    choice direction {
        description
            "Indicates the communication direction in which the
            attributes can be included.";
        case server-to-client {
            description
                "These attributes appear only in a mitigation message
                sent from the server to the client.";
```



```
    leaf max-value {
      type uint16;
config false;
      description
        "Maximum acceptable max-retransmit value.";
    }
    leaf min-value {
      type uint16;
config false;
      description
        "Minimum acceptable max-retransmit value.";
    }
  }
}
leaf current-value {
  type uint16;
  default "3";
  description
    "Current max-retransmit value.";
}
}
container ack-timeout {
  description
    "Initial retransmission timeout value.";
  choice direction {
    description
      "Indicates the communication direction in which the
        attributes can be included.";
    case server-to-client {
      description
        "These attributes appear only in a mitigation message
          sent from the server to the client.";
      leaf max-value-decimal {
        type decimal64 {
          fraction-digits 2;
        }
        units "seconds";
config false;
        description
          "Maximum ack-timeout value.";
      }
      leaf min-value-decimal {
        type decimal64 {
          fraction-digits 2;
        }
        units "seconds";
config false;
        description
          "Minimum ack-timeout value.";
      }
    }
  }
}
leaf current-value-decimal {
```

```
    type decimal64 {
      fraction-digits 2;
    }
    units "seconds";
    default "2";
    description
      "Current ack-timeout value.";
  }
}
container ack-random-factor {
  description
    "Random factor used to influence the timing of
    retransmissions.";
  choice direction {
    description
      "Indicates the communication direction in which the
      attributes can be included.";
    case server-to-client {
      description
        "These attributes appear only in a mitigation message
        sent from the server to the client.";
      leaf max-value-decimal {
        type decimal64 {
          fraction-digits 2;
        }
config false;
        description
          "Maximum acceptable ack-random-factor value.";
      }
      leaf min-value-decimal {
        type decimal64 {
          fraction-digits 2;
        }
config false;
        description
          "Minimum acceptable ack-random-factor value.";
      }
    }
  }
  leaf current-value-decimal {
    type decimal64 {
      fraction-digits 2;
    }
    default "1.5";
    description
      "Current ack-random-factor value.";
  }
}
}

grouping signal-config {
  description
    "DOTS signal channel session configuration.";
```

```

leaf sid {
  type uint32;
  mandatory true;
  description
    "An identifier for the DOTS signal channel
    session configuration data.";
}
container mitigating-config {
  description
    "Configuration parameters to use when a mitigation
    is active.";
  uses config-parameters;
}
container idle-config {
  description
    "Configuration parameters to use when no mitigation
    is active.";
  uses config-parameters;
}
}

grouping redirected-signal {
  description
    "Grouping for the redirected signaling.";
  choice direction {
    description
    "Indicates the communication direction in which the
    attributes can be included.";
    case server-to-client {
      description
      "These attributes appear only in a mitigation message
      sent from the server to the client.";
      leaf alt-server {
        type string;
config false;
        mandatory true;
        description
          "FQDN of an alternate server.";
      }
      leaf-list alt-server-record {
        type inet:ip-address;
config false;
        description
          "List of records for the alternate server.";
      }
    }
  }
}

/*
 * Main Container for DOTS Signal Channel
 */

```

~~container~~

```
sx:structure dots-signal {
  description
    "Main container for DOTS signal message.

    A DOTS signal message can be a mitigation, a configuration,
    or a redirected signal message.";
  choice message-type {
    description
      "Can be a mitigation, a configuration, or a redirect
      message.";
    case mitigation-scope {
      description
        "Mitigation scope of a mitigation message.";
      uses mitigation-scope;
    }
    case signal-config {
      description
        "Configuration message.";
      uses signal-config;
    }
    case redirected-signal {
      description
        "Redirected signaling.";
      uses redirected-signal;
    }
    case heartbeat {
      description
        "DOTS heartbeats.";
      leaf peer-hb-status {
        type boolean;
        mandatory true;
        description
          "Indicates whether a DOTS agent receives heartbeats
          from its peer. The value is set to 'true' if the
          DOTS agent is receiving heartbeat messages
          from its peer.";
      }
    }
  }
}
```