

YANG model for NETCONF Event Notifications

draft-ahuang-netconf-notif-yang-04

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YANG model for NETCONF Event Notifications

Context - Netconf Notification

```
<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2022-09-02T10:59:55.32Z</eventTime>
  <push-update xmlns="urn:ietf:params:xml:ns:yang:ietf-yang-push">
    <id>101</id>
    <datastore-contents>
      <interfaces xmlns="urn:ietf:params:xml:ns:yang:ietf-interfaces">
        <interface>
          <name>eth0</name>
          <oper-status>up</oper-status>
        </interface>
      </interfaces>
    </datastore-contents>
  </push-update>
</notification>
```

```
{
  "ietf-notification:notification": {
    "eventTime": "2017-10-25T08:00:11.22Z",
    "ietf-yang-push:push-update": {
      "id": 101,
      "datastore-contents": {
        "ietf-interfaces:interfaces": [
          "interface": {
            "name": "eth0",
            "oper-status": "up"
          }
        ]
      }
    }
  }
}
```

RFC 5277 - Netconf Event Notifications

RFC 8641 - YANG Push

YANG encodings:

- RFC 7950 - YANG XML
- RFC 7951 - YANG JSON
- RFC 9254 - YANG CBOR

YANG model for NETCONF Event Notifications

Proposal

- Definition of the notification structure in a YANG
- Updates RFC5277 (NETCONF Notifications)
- Uses the same XML URI as RFC5277
- “eventTime” in CamelCase following model defined in RFC5277

```

sx:structure notification {
  leaf eventTime {
    type yang:date-and-time;
    mandatory true;
    description
      "The date and time the event was generated by the event source.
      This parameter is of type dateTime and compliant to [RFC3339].
      Implementations must support time zones.
      The leaf name in camel case matches the name of the XSD element
      defined in Section 4 of RFC5277.";
  }
}

```

```

module: ietf-notification

structure notification:
  +-- eventTime yang:date-and-time

```

YANG model for NETCONF Event Notifications

Current status

- Asks for SID Range for YANG-CBOR using YANG-SID (draft-ietf-core-sid)
- Added XML example
- Propose SID file in the appendix

YANG model for NETCONF Event Notifications

Next steps

- Request more feedback from the WG
- **Working Group Adoption?**
- Solve inconsistencies in the Notification definition in YANG-JSON and YANG-CBOR
 - “Notification” well defined in RFC9750 (YANG 1.1)
 - “Notifications” not explicitly defined in RFC7951 (YANG-JSON) and RFC9254 (YANG-CBOR)
 - Issue raised in *draft-netana-nmop-yang-kafka-integration-00*
 - Welcoming feedback on this issue & proposals to resolve them

Notifications encoded in XML/YANG-JSON/YANG-CBOR

- RFC5277 (NETCONF Event Notifications) Defines the structure of the Notification and XML examples:

```
<notification
  xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2007-07-08T00:02:00Z</eventTime>
  <event xmlns="http://example.com/event/1.0">
    <eventClass>fault</eventClass>
    <reportingEntity>
      <card>Ethernet2</card>
    </reportingEntity>
    <severity>critical</severity>
  </event>
</notification>
```

- RFC7950 (YANG 1.1) Section 4.2.10, defines how Notifications should be encoded when modeled in YANG:

YANG Example:

```
notification link-failure {
  description
    "A link failure has been detected.";
  leaf if-name {
    type leafref {
      path "/interface/name";
    }
  }
  leaf if-admin-status {
    type admin-status;
  }
  leaf if-oper-status {
    type oper-status;
  }
}
```

NETCONF XML Example:

```
<notification
  xmlns="urn:ietf:params:netconf:capability:notification:1.0">
  <eventTime>2007-09-01T10:00:00Z</eventTime>
  <link-failure xmlns="urn:example:system">
    <if-name>so-1/2/3.0</if-name>
    <if-admin-status>up</if-admin-status>
    <if-oper-status>down</if-oper-status>
  </link-failure>
</notification>
```

Notifications encoded in XML/YANG-JSON/YANG-CBOR

- RFC7951 (YANG-JSON):
 - Notifications are **not explicitly** covered
 - Example in Section 5.5 covering how “anydata” statements should be encoded:

Example: For the anydata definition

```
anydata data;
```

the following is a valid JSON-encoded instance:

```
"data": {  
  "ietf-notification:notification": {  
    "eventTime": "2014-07-29T13:43:01Z",  
    "example-event:event": {  
      "event-class": "fault",  
      "reporting-entity": {  
        "card": "Ethernet0"  
      },  
      "severity": "major"  
    },  
  },  
}
```

eventTime as defined in RFC5277 present

```
}
```

Notifications encoded in XML/YANG-JSON/YANG-CBOR

- RFC9254 (YANG-CBOR):
 - Notifications are **not explicitly** covered
 - Defines a Notification as a “container-like” structure:

container-like instance:

An instance of a container, a YANG data structure, notification contents, RPC input, RPC output, action input, or action output ([Section 4.2](#)); a list entry in a list ([Section 4.4](#)); or an anydata node ([Section 4.5](#)).

- An example of a “notification” statement is in Section 4.5 covering “anydata” statements

```
module example-port {
  ...

  notification example-port-fault { // SID 60200
    leaf port-name { // SID 60201
      type string;
    }
    leaf port-fault { // SID 60202
      type string;
    }
  }
}
```

```
{
  60123 : { // last-event (SID 60123) /
    47(60200) : { // event-port-fault (SID 60200) /
      1 : "0/4/21", // port-name (SID 60201) /
      2 : "Open pin 2" // port-fault (SID 60202) /
    }
  }
}
```

Using YANG-SID

```
{
  "event-log:last-event" : {
    "example-port:example-port-fault" : {
      "port-name" : "0/4/21",
      "port-fault" : "Open pin 2"
    }
  }
}
```

ietf-notification:notification container missing
eventTime leaf missing

Using names in keys

BACK UP: Difference with *draft-ietf-netconf-notification-messages*

draft-ahuang-netconf-notif-yang

```
module: ietf-notification
  structure notification:
    +-- eventTime yang:date-and-time
```

draft-ietf-netconf-notification-messages

```
structure message
  +--ro message!
    +--ro message-header
      | +--ro message-time yang:date-and-time
      | +--ro message-id? uint32
      | +--ro message-generator-id? string
      | +--ro notification-count? uint16
    +--ro notifications*
      | +--ro notification-header
      | | +--ro notification-time yang:date-and-time
      | | +--ro yang-module? yang:yang-identifier
      | | +--ro subscription-id* uint32
      | | +--ro notification-id? uint32
      | | +--ro observation-domain-id? string
      | +--ro notification-contents?
      | +--ro notification-footer!
      | | +--ro signature-algorithm string
      | | +--ro signature-value string
      | | +--ro integrity-evidence? string
    +--ro message-footer!
      +--ro signature-algorithm string
      +--ro signature-value string
      +--ro integrity-evidence? string
```