                       Base Notifications for NMDA
                draft-wu-netconf-base-notification-nmda-01

Abstract

   The Network Configuration Protocol (NETCONF) provides mechanisms to
   manipulate configuration datastores. NMDA introduces additional
   datastores for systems that support more advanced processing chains
   converting configuration to operational state. However, client
   applications are not able to be aware of common events pertaining to
   additional datstores, such as a data validation state change in
   NETCONF server, that may impact management applications. This
   document updates [RFC6470] to allow a NETCONF client to receive
   additional notifications for some common system events pertaining to
   the Network Management Datastore Architecture (NMDA) defined in
   [RFC8342].

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1. Introduction

   The Network Configuration Protocol (NETCONF) [RFC6470] provides
   mechanisms to manipulate configuration datastores. NMDA introduces
   additional datastores (e.g., <intended>, <operational>) for systems
   that support more advanced processing chains converting configuration
   to operational state. However, client applications are not able to
   be aware of common events pertaining to additional datastores, e.g.,
   there are many background activities that happen during the time that
   configuration is committed to <running> to the time that the
   configuration is actually applied to <operational>. It is possible
   that some configuration could not be applied to <operational> due to
   either validation issues, or missing resource etc. There is a need
   for user to know the validation result of <intended> data-store and
   the reason why the configuration were not applied.

   This document updates [RFC6470] to allows a NETCONF client to receive
   additional notifications for some common system events pertaining to
   the Network Management Datastore Architecture (NMDA) defined in
   [RFC8342]. These notification are not specific to any network
   management protocols such as NETCONF and RESTCONF.

   The solution presented in this document is backwards compatible with
   [RFC6470].

1.1. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

The following terms are defined in [RFC8342] and are not redefined here:

o operational state datastore

o running configuration datastore

o intended configuration datastore

2. Summary of Updates to RFC 6470

This document is intended to provide an extension of notifications initially defined within [RFC6470], with the development of NMDA architcture and data model. Key relationships between these two documents include:

o The existing notifications defined in [RFC6470] are remain unchanged, no additional information is added.

o A new event notification is defined in this document to overcome the shortcoming of [RFC6470] for supporting NMDA.

3. NETCONF Base Notifications YANG Model extension for NMDA

3.1. Overview

The YANG module in NETCONF Base Notifications [RFC6470] specifies the following 5 event notifications for the 'NETCONF' stream to notify a client application that the NETCONF server state has changed:

o netconf-config-change

o netconf-capability-change

o netconf-session-start

o netconf-session-end

o netconf-confirmed-commit

These event notifications used within the 'NETCONF' stream are
accessible to clients via the subscription mechanism described in
[RFC5277].

This document extends the YANG module defined in [RFC6470] to include
NMDA specific extension which allows a NETCONF client to receive
notifications for additional common system event as follows:

nmda-data-validate: Generated when a server with network management
    protocol support detects that a data validation event has occurred
    from the time that configuration is committed to <running> to the
    time that the configuration is actually applied to <operational>
    during management session. Indicates the event and the current
    state of the data validation. A server MAY report events for non-
    NETCONF management sessions (such as RESTCONF,gPRC), using the
    'session-id' value of zero.

These notification messages are accessible to clients via either the
subscription mechanism described in [RFC5277] or dynamic subscription
mechanism and configured subscription mechanism described in [I-
D.ietf-netconf-netconf-event-notifications].

The following are examples of a nmda-data-validation notification
message:

```
<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
 <eventTime>2017-06-16T16:30:59.137045+09:00</eventTime>
 <nmda-data-validate xmlns="urn:ietf:params:xml:ns:yang:ietf-nmda-notifications"
>
     <username>admin</username>
     <session-id>0</session-id>
     <source-host>10.251.93.83</source-host>
     <validate-event>start<validate-event>
     <validate-result>partial-fail</validate-result>
     <validate-fail-taget>
      <datastore>intended</datastore>
      <target> /ietf-interfaces:interfaces-state </target>
     </validate-fail-target>
     <validate-fail-taget>
      <datastore>intended</datastore>
      <target> /ietf-system:system </target>
     </validate-fail-target>
 </nmda-data-validate>
</notification>
```

3.2. Definitions

   This section presents the YANG module defined in this document. This
   module imports data types from the 'ietf-netconf' module defined in
   [RFC6241] and 'ietf-inet-types' module defined in [RFC6021].

```
   <CODE BEGINS> file "ietf-nmda-notifications@2018-04-01.yang"
 module ietf-nmda-notifications {
   namespace "urn:ietf:params:xml:ns:yang:ietf-nmda-notifications";
   prefix nmdan;

   import ietf-datastores {
     prefix ds;
   }
   import ietf-inet-types { prefix inet; }
   organization
     "IETF NETCONF (Network Configuration Protocol) Working Group";
   contact
     "WG Web:   <http://tools.ietf.org/wg/netconf/>
      WG List:  <mailto:netconf@ietf.org>
      WG Chair: Kent Watsen
                <mailto:kwatsen@juniper.net>
      WG Chair: Mahesh Jethanandani
                <mailto:mjethanandani@gmail.com>
      Editor:   Qin Wu
                <mailto:bill.wu@huawei.com>
      Editor:   Rohit R Ranade
                <mailto:rohitrranade@huawei.com>";
   description
     "This module defines a YANG data model for use with the
      NETCONF protocol that allows the NETCONF client to
      receive additional common NETCONF base event notifications
       related to NMDA.
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      the document authors.  All rights reserved.
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      set forth in Section 4.c of the IETF Trust's Legal Provisions
      Relating to IETF Documents
      (http://trustee.ietf.org/license-info).
      This version of this YANG module is part of RFC xxxx; see
      the RFC itself for full legal notices.";

   revision 2018-04-01 {
     description
       "Initial version.";
     reference "RFC xxx: NETCONF Base Notifications for NMDA";
```

```
    }
    typedef session-id-or-zero-type {
      type uint32;
      description
        "NETCONF Session Id or Zero to indicate none";
    }

    grouping common-session-parms {
      description
        "Common session parameters to identify a
         management session.";

      leaf username {
        type string;
        mandatory true;
        description
          "Name of the user for the session.";
      }

      leaf session-id {
        type session-id-or-zero-type;
        mandatory true;
        description
          "Identifier of the session.
           A NETCONF session MUST be identified by a non-zero value.
           A non-NETCONF session MAY be identified by the value zero.";
      }

      leaf source-host {
        type inet:ip-address;
        description
          "Address of the remote host for the session.";
      }
    }
    notification nmda-data-validate {
      description
        "Generated when a NETCONF server detects that a
         Data validation event has occurred.  Indicates the event
         and the current state of the data validation procedure
         in progress.";
      reference "RFC 8342, Section 5";
      uses common-session-parms;
      leaf validate-event {
        type enumeration {
          enum "start" {
            description
              "The data validate procedure has started.";
          }
```

```
      enum "complete" {
        description
          "The data validation procedure has been completed.";
      }
    }
    mandatory true;
    description
      "Indicates the event that caused the notification.";
  }
  leaf validate-result {
    when "../validate-event = 'complete'";
    type enumeration {
      enum "fail" {
        description
          "The <intended> configuration fails to be validated
           before being applied to <operational>, e.g., resources
           are not available or otherwise not physically present
           leads to the whole set of <intended>are not applied.";
      }
      enum "partial-fail" {
        description
          "The <intended> configuration partially fails to be
           validated before being applied to <operational>,e.g.,
           resources are not available or otherwise not physically
           present leads to parts of <intended>are not applied";
      }
      enum "success" {
        description
          "The <intended> configuration is successfully validated
           before being applied to <operational>.";
      }
    }
    description
      "Result of validate";
  }
  list fail-validate-target {
    leaf datastore {
      type identityref {
        base ds:datastore;
      }
      default "ds:operational";
      description
        "Indicates which datastore has changed or which datastore is
         target of edit-data operation.";
    }
    leaf target {
      type instance-identifier;
      description
```

```
           "Topmost node associated with the configuration change.
            A server SHOULD set this object to the node within
            the datastore that is being altered.  A server MAY
            set this object to one of the ancestors of the actual
            node that was changed, or omit this object, if the
            exact node is not known.";
       }
       description
         "List for fail validate targets";
     }
   }
 }
 <CODE ENDS>
```

4. Security Considerations

The YANG module defined in this memo is designed to be accessed via
the NETCONF protocol [RFC6241]. The lowest NETCONF layer is the
secure transport layer and the mandatory-to-implement secure
transport is SSH, defined in [RFC6242].

Some of the readable data nodes in this YANG module may be considered
sensitive or vulnerable in some network environments. It is thus
important to control read access (e.g., via get, get-config, or
notification) to these data nodes. These are the subtrees and data
nodes and their sensitivity/vulnerability:

/nmda-data-validate/validate-event:

    Indicates the specific validate-event state change that occurred.
    A value of 'complete' probably indicates that data validation
    procedure has completed.

5. IANA Considerations

This document registers one XML namespace URN in the 'IETF XML
registry', following the format defined in [RFC3688]:

    URI: urn:ietf:params:xml:ns:yang:ietf-nmda-notifications

    Registrant Contact: The IESG.

    XML: N/A, the requested URI is an XML namespace.

This document registers one module name in the 'YANG Module Names'
registry, defined in [RFC7950]:

    name: ietf-nmda-notifications

    prefix: ncdn

    namespace: urn:ietf:params:xml:ns:yang:ietf-nmda-notifications

    RFC: xxxx

6. Acknowledgements

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