Bulk Subscription to YANG Event Notification
draft-wang-netconf-bulk-subscribed-notifications-00

Abstract

This document defines a YANG data model and associated mechanism that allows subscriber applications to bulk subscribe to publishers’ event streams based on their requirements. And it also allows the publishers to report multiple event streams or subscriptions into a single notification message based on group identifier affiliation.

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1. Introduction

The Subscription to YANG Notifications specification [RFC8639] uses a "stream" name in dynamic subscription protocol operation for identifying the targeted event stream against which the subscription is applied. Notification Message Headers and Bundles [I-D. ietf-netconf-notification-messages] uses subscription-id for identifying the targeted subscription. However the dynamic subscription protocol operation lack the capability to identify a set of event streams or a set of subscriptions which have a common characteristic. A group identifier associated with an event stream enables the ability to perform protocol operation on a set of event stream via a single transaction. The group identifier provides a more optimal mechanism for protocol operation which would otherwise require multiple atomic transactions on a per event stream basis. Following are some of the use-cases where such identifier can be used.

- For establishing a Dynamic Subscription, the subscriber may send a single request the creation of a subscription for each of event stream’s groups and perform creation of a subscription for all event steam’s that are part of that group.
- The subscriber in dynamic subscription domain may choose to delete a dynamic subscription or end a dynamic subscription that is not associated with the specific transport session and domain. In such case, the subscriber can perform delete-subscription or kill-subscription signaling using the group ID associated with a specific set of event streams.
- Multiple notifications (e.g., multiple notifications associated with creation of a subscription or decomission of subscription) bundled into one transportable message
This document defines a YANG data model and associated mechanism that allows subscriber applications to bulk subscribe to publishers’ event streams based on their requirements. And it also allows the publishers to report multiple event streams or subscriptions into a single notification message based on group identifier affiliation.

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.

This document uses the following terms:

Event: Something that happens which may be of interest or trigger the invocation of the rule. A fault, an alarm, a change in network state, network security threat, hardware malfunction, buffer utilization crossing a threshold, network connection setup, an external input to the system, for example [RFC3877].

Client: Defined in [RFC8342].

Configuration: Defined in [RFC8342].

Configured subscription: Defined in [RFC8639]

Configuration datastore: Defined in [RFC8342].

Event record: A set of information detailing an event [RFC8639].

Event stream: A continuous, chronologically ordered set of events aggregated under some context [RFC8639].

Notification message: Information intended for a receiver indicating that one or more events have occurred [RFC8639].

Publisher: An entity responsible for streaming notification messages per the terms of a subscription [RFC8639].

Receiver: A target to which a publisher pushes subscribed event records. For dynamic subscriptions, the receiver and subscriber are the same entity [RFC8639].

Subscriber: A client able to request and negotiate a contract for the generation and push of event records from a publisher. For
dynamic subscriptions, the receiver and subscriber are the same entity [RFC8639].

Subscription: A contract with a publisher, stipulating the information that one or more receivers wish to have pushed from the publisher without the need for further solicitation [RFC8639].

2. Model Overview

The YANG data model for the Bulk Subscriptions and Notifications has been split into two modules:

- The ietf-bulk-subscription.yang module defines a list for classifying different event streams into groups. Each group is associated with a group identifier and a set of event streams. A stream group is identified by a "group-id" string. This string is used both as an index within the bulk subscription module and to associate subscription with a group of streams, as shown in the subscription augmentation.

- The ietf-bulk-notification.yang module augment the YANG structure of ietf-notification-messages.yang [draft-ietf-netconf-notification-messages], a "group-id" is added to the "message-header" of the ietf-notification-messages.yang to identify the group to which a set of notifications belongs.

The following tree diagrams [RFC8340] provide an overview of the data model for "ietf-bulk-subscription.yang" module and the "ietf-bulk-notification.yang" module.

module: ietf-bulk-subscription
  +--rw groups
    +--rw group* [group-id]
      +--rw group-id    string
      +--rw stream*     string

augment /sn:subscriptions/sn:subscription/sn:target:
  +--:(stream-group)
    +--rw group-id?   -> /groups/group/group-id

module: ietf-bulk-notification
  augment-structure /nm:message/nm:message-header:
    +--rw message-type identityref
    +--rw group-id?   string
3. Bulk Subscription YANG Module

```yang
<CODE BEGINS> file "ietf-bulk-subscription@2019-10-14.yang"
module ietf-bulk-subscription {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-bulk-subscription";
  prefix bs;

  import ietf-subscribed-notifications {
    prefix sn;
  }
  import ietf-yang-types {
    prefix yang;
  }

  organization
    "IETF NETCONF (Network Configuration) Working Group";
  contact
    "";
  description
    "NETCONF Protocol Data Types and Protocol Operations."
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  revision 2019-10-14 {
    description
      "Initial revision";
    reference
      "FOO";
  }

  container groups {
    list group {
      key "group-id";
      leaf group-id {
        type string;
        description
        
```
4. Bulk Notification YANG Module

<CODE BEGINS> file "ietf-bulk-notification@2019-09-23.yang"
module ietf-bulk-notification {
  yang-version 1.1;
}
namespace "urn:ietf:params:xml:ns:yang:ietf-bulk-notification";

prefix bn;

import ietf-yang-structure-ext {
    prefix sx;
}
import ietf-notification-messages {
    prefix nm;
}

organization
    "IETF NETCONF (Network Configuration) Working Group";
contact
    "*

description
    "NETCONF Protocol Data Types and Protocol Operations."

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the RFC itself for full legal notices.*;

revision 2019-09-23 {
    description
        "Initial revision";
    reference
        "FOO";
}

sx:augment-structure "/nm:message/nm:message-header" {
    leaf group-id {
        type string;
        description
            "to identify the group to which a set of notifications belongs.";
    }
    description
        "Group related informations are added to the ‘message-header’ of the ietf-notification-messages
to identify the group to which a set of notifications belongs.";
}
</CODE ENDS>
5. IANA Considerations

5.1. Updates to the IETF XML Registry

This document registers two URIs in the IETF XML registry [RFC3688]. Following the format in [RFC3688], the following registrations are requested to be made:

---------------------------------------------------------------------
Registrant Contact: The IESG.
XML: N/A, the requested URI is an XML namespace.

Registrant Contact: The IESG.
XML: N/A, the requested URI is an XML namespace.
---------------------------------------------------------------------

5.2. Updates to the YANG Module Names Registry

This document registers two YANG modules in the YANG Module Names registry [RFC7950]. Following the format in [RFC6020], the following registration has been made:

----------------------------------------
Name:         ietf-bulk-subscription
Prefix:       trig
Reference:    RFC xxxx

Name:         ietf-bulk-notification
Prefix:       evt
Reference:    RFC xxxx
----------------------------------------

6. Security Considerations

The YANG module specified in this document defines a schema for data that is designed to be accessed via network management protocols such as NETCONF [RFC6241] or RESTCONF [RFC8040]. The lowest NETCONF layer is the secure transport layer, and the mandatory-to-implement secure transport is Secure Shell (SSH) [RFC6242]. The lowest RESTCONF layer is HTTPS, and the mandatory-to-implement secure transport is TLS [RFC8446].

The NETCONF Configuration Access Control Model (NACM) [RFC8341] provides the means to restrict access for particular NETCONF or
RESTCONF users to a preconfigured subset of all available NETCONF or RESTCONF protocol operations and content.

There are a number of data nodes defined in this YANG module that are writable/creatable/deletable (i.e., config true, which is the default). These data nodes may be considered sensitive in some network environments. Write operations (e.g., edit-config) to these data nodes without proper protection can have a negative effect on network operations. These are the subtrees and data nodes and their sensitivity/vulnerability:

- /groups/group/group-id
- /groups/group/stream

7. References

7.1. Normative References


7.2. Informative References


Authors' Addresses