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Subscription and Notifications Overview
draft-voit-netconf-subscription-and-notif-overview-00

Abstract

Provides an introductory context for NETCONF WG drafts on subscriptions and notifications. Through this document, a reader can understand the scope of each draft, as well as the relationships between each draft.

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[1.](#) Introduction

This document provides an overview of a set of documents that define mechanisms that allow client applications to subscribe to and receive notifications and datastore updates. Specifically, this includes the following documents:

- o [draft-ietf-netconf-subscribed-notifications](#)
- o [draft-ietf-netconf-yang-push](#)
- o [draft-ietf-netconf-netconf-event-notifications](#)
- o [draft-ietf-netconf-restconf-notif](#)
- o [draft-ietf-netconf-notification-messages](#)

[1.1.](#) Phasing of drafts

This set of drivers has two themes:

1. an evolved subscription configuration data model and state transition messages, which, when paired with the existing [\[RFC5277\]](#) encoded one-way operation, provides a solution for yang push.
2. a new one-way notification operation that can provide robustness, flexibility, and extensibility.

For theme 1, drafts [\[subscribed-notifications\]](#), [\[yang-push\]](#), [\[netconf-event-notifications\]](#), and [\[restconf-notif\]](#) provide solutions for an evolved subscription data model, pushing of YANG datastore changes as they happen, and periodic reporting of YANG datastore state. Also enabled is the use of the evolved subscription model and subscription state transition messages on publisher based event streams.

For theme 2, solutions are in the early stages for:

- o automatic determination of which common headers to use, and selection of if/what transport bundling to use without requiring any change to YANG's 'notification' statement
- o continuing, transparent support for [RFC5277](#)-encoded notifications from legacy clients
- o general strategy to introduce new behavior where a server advertises support for new headers and encodings, and client selects them when available

These items are listed so they are explicitly shown not be covered by Theme 1.

[1.2. Terminology](#)

The terms publisher, receiver, and subscriber are defined in [[subscribed-notifications](#)].

[2. Scope of Drafts](#)

This section describes the intent and contents of each draft.

[2.1. draft-ietf-netconf-subscribed-notifications](#)

This document defines the YANG module, RPCs, and Notifications for the customized establishment of subscriptions upon a publisher's event streams. Also defined are delivery mechanisms for instances of the resulting events. Effectively this allows a subscriber to request and receive a continuous, custom influx of publisher-generated information. Included are:

- o Dynamic and configured subscriptions
- o Multiple subscriptions / transport
- o Multiple configured receivers
- o Establish, modify, delete, kill RPC
- o State change notifications
- o Suspend/resume
- o Filtering full notifications
- o Stream discovery
- o Replay (and start time negotiation)
- o Prioritization
- o Monitoring / reporting
- o QoS
- o Error responses

2.2. [draft-ietf-netconf-yang-push](#)

This document extends the YANG module, RPCs, and Notifications from [[subscribed-notifications](#)] to enable the customized establishment of subscriptions to updates from YANG datastores. Using the definitions of this document, a subscriber application may request a continuous, customized stream of updates from a YANG datastore. Included are:

- o Datastore on-change and periodic triggers
- o Selecting objects within a datastore to subscribe to
- o Authorization model per object
- o RPC for datastore resynchronization
- o Sending of full YANG trees or yang-patch
- o Tagging of partial updates
- o Tagging of on-change object support
- o Negotiation of filters and period lengths
- o Datastore-specific error responses and datastore-subscription specific monitoring

2.3. [draft-ietf-netconf-netconf-event-notifications](#)

This document provides a NETCONF binding for [[subscribed-notifications](#)]. Included are:

- o Transport mappings for subscription RPCs and state change notifications
- o Transport mapping for [RFC-5277](#) event transport

2.4. [draft-ietf-netconf-restconf-notif](#)

This document provides RESTCONF, HTTP2, and HTTP1.1 bindings for the subscribed-notifications. Included are:

- o Transport mapping for subscription protocol messages
- o Transport mappings for [RFC-5277](#) one-way operation
- o Heartbeats and clean-up

2.5. [draft-ietf-netconf-notification-messages](#)

This document defines a new notification message format, using yang-data. Included are:

- o a new notification mechanism to replace the one way operation of [RFC-5277](#)
- o a set of common, transport agnostic message header objects to support functionality such as event severity, message signing, message loss discovery, message de-duplication, originating process identification.

- o how to bundle multiple event records into a single notification message.
- o how to ensure these new capabilities are only used with capable receivers.

This mechanism could have future applicability for updates to [\[RFC7950\]](#) and [\[RFC8040\]](#).

3. Relationships between Drafts

This section describes the relationships between subscription drafts.

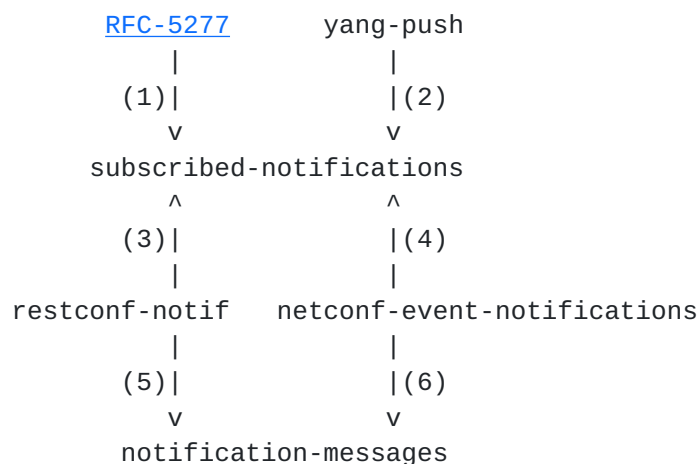


Figure 1: Relationships between drafts

A few notes on the figure above. The initial of text leading text of each name has been removed to make the figure more readable. Numbered arrows indicate a relationship of one draft with another. The nature of each arrow is described below.

Relationship (1) Until [\[notification-messages\]](#) becomes available, draft [\[subscribed-notifications\]](#) needs [RFC-5277](#)'s mechanism for encoding one way notifications.

Relationship (2) The draft [\[subscribed-notifications\]](#) provides the technical foundation upon which YANG datastore specific push mechanisms are layered as specified in [\[yang-push\]](#). Key here are:

- * replacement of event streams with on-change or periodic triggers upon a YANG Datastore.
- * replacement of event filters with datastore selectors

- Relationship (3) The [[restconf-notif](#)] draft supports [[subscribed-notifications](#)] by defining transport specific guidance where some form of HTTP is used underneath. Key here are:
- * bindings for RPC communications over RESTCONF
 - * bindings for one-way notifications transported over HTTP2 and HTTP1.1
 - * end-to-end deployment guidance for Call Home and TLS Heartbeat
- Relationship (4) The [[netconf-event-notifications](#)] draft supports [[subscribed-notifications](#)] by defining NETCONF transport specifics. Key are:
- * bindings for RPC communications over NETCONF
 - * bindings for one-way notifications transported over NETCONF
- Relationship (5) The [[netconf-event-notifications](#)] draft will not initially have available to it the replacement of [RFC-5277](#) one way operation. When [[notification-messages](#)] becomes available, it will be possible to replace the [RFC-5277](#) one-way operation with a solution which includes common headers and the ability to bundle many notifications into a single transportable message.
- Relationship (6) The [[restconf-notif](#)] draft will not initially have available to it the replacement of [RFC-5277](#) one way operation. When [[notification-messages](#)] becomes available, it will be possible to replace the [RFC-5277](#) one-way operation with a solution which includes common headers and the ability to bundle many notifications into a single transportable message.

[4.](#) Security Considerations

Not applicable.

[5.](#) Acknowledgments

For his valuable comments framing the value and purposed of this document: Kent Watsen.

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