Restconf subscription and HTTP push for YANG datastores
draft-voit(-netconf)-restconf-yang-push-00

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Overview

• Extend YANG pub-sub to RESTconf and HTTP/2 transport
• Update delivery: Push messages over HTTP/2
• Subscription control:
  – Allow subscription configuration for new transport
  – Add support for configuration of transport-specific features (QoS, Priorization)
3 Subscription Models in 2 drafts

**NETCONF**
(Dynamic & Static)

- **Subscriber**
  - YANG
  - XML
  - Netconf Client
  - SSH Client
  - TCP

- **Publisher**
  - YANG
  - XML
  - Netconf Server
  - SSH Server
  - TCP

Subscribing to datastore push updates
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**RESTCONF**
(Dynamic & Static)

- **Subscriber**
  - YANG
  - JSON
  - Restconf Client
  - HTTP Client
  - TLS Client
  - TCP

- **Publisher**
  - YANG
  - JSON
  - Restconf Server
  - HTTP Server
  - TLS Server
  - TCP

Restconf subscription and HTTP object push for YANG datastores
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**Direct HTTP Push**
(Static)

- **Publisher**
  - YANG
  - JSON
  - HTTP2 Server
  - TLS Server
  - TCP

- **HTTP Receiver**
  - YANG
  - JSON
  - HTTP2 Client
  - TLS Client
  - TCP

Direct HTTP Push
Static
Why Separate Drafts?
A single complex draft makes the following harder

• Avoids having multiple models for a first-time reader
• Avoids overloading a single draft with multiple options, simplifies conformance
• Doesn’t include QoS Augmentation in the base spec
• Sets the stage for modular extensions
  - Additional encodings and transport options (Multicast? QUIC? IPFIX?)
  - Separation of subscriber from receiver (security model implications)
  - Extensions of subscription control model
  - Language & taxonomy for advanced filters and queries (beyond xPath)
  - Multiple receivers
HTTP/2 Transport QoS

• Multiple subscriptions to one destination = Benefits of HTTP/2
  - Prioritized Subscriptions
  - No Head-of-line blocking from Elephant flows/subscriptions
  - Per-subscription flow control
  - Reduced Latency

• Getting Subscription Flow info → HTTP/2 Stream
  - Straight forward where there is no Restconf
  - Should Restconf support HTTP/2 Streams?
Draft’s QoS Augmentations

Two new YANG objects augment draft-ietf-netconf-yang-push. Purpose: control transport-dependent options available when HTTP/2 transport is selected.

- **subscription-priority (8bit integer, optional)** priority of a subscription
- **subscription-dependency (string, optional)** points to single parent subscription
- **Weight (8bit integer)** enables proportional bandwidth when there are multiple streams to same TCP Peer
- **Stream Dependency (31bit integer)** preempts the marshalling of updates for any dependent streams
- **(re)Transmit frames at rate consumable into destination**
- **Prioritize and rate shape**
- **Dequeue**

Diagram:
- Publisher
- Subscription
- Subscription
- Subscription
- Stream
- Stream
- Stream
- HTTP2 Client
- TLS
- TCP
- IP
- Phys
- NMS
- Controller
- Subscriber
- Subscriber
Next Steps

• Input from WG
• Ask: Adopt by WG as companion draft to draft-netconf-yang-push