Subscribing to datastore push updates
draft-netmod-clemm-datastore-push-00.txt

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Motivation

- Å Many applications require continuous updates to datastore contents
  - ï Mount clients (peer mount): caching of remote data
  - ï Service assurance: continuous monitoring
  - ï Big Data: analyze network state
- Å Periodic polling has limitations (known from SNMP)
  - ï Additional load on network and devices
  - ï Lack of robustness, dealing with missed polling cycles
  - ï Difficult calibration, synchronization of polling cycles across network (makes polled data difficult to compare)
- Å Current interactions with datastore are request/response based
  - ï RFC 6470 defines configuration change notifications
  - ï YANG datastores contain increasingly operational data

Solution Requirements (1/2)

Å Provide push mechanism as alternative to polling

Å Configuration and management of subscriptions

- ï Create/Delete
- ï Subscription scope
    - Å Operational data
    - Å Subtrees and filters
- ï Subscription policy
    - Å Periodic
    - Å On change (with dampening)
- ï Optional: subscription monitoring
- ï Optional: suspend/resume

Solution Requirements (2/2)

Å Negotiation capability

ï Resource limitations: not every subscription may be supported

ï Implementation limitations (on change may be difficult)

ï Negotiate update frequency, size, policy (on change vs periodic)

Å Tie-in with security

ï RFC 6536/NACM – receive updates only for authorized data

Å Work in conjunction with Netconf/RESTconf/YANG framework

ï Leverage RFC 5277 notification capability

ï Possibility to decouple transport and subscriptions
Allow for pub/sub, multicast transports at a later point, outside scope

Subscription Model

```
module: ietf-datastore-push
     +--rw datastore-push-subscription
        +--rw stream                       string
        +--rw subscription-id              subscription-identifier
        +--rw (filter)?
        |  +--:(subtree)
        |  |  +--rw subtree-filter
        |     +--rw xpath-filter           yang:xpath1.0
        +--rw (notification-trigger)
        |  +--:(periodic)
        |  |  +--rw period                 yang:timeticks
        |  +--:(on-change)
        |     +--rw (change-policy)
        |        +--:(update-dampening)
        |        |  +--rw period           yang:timeticks
        |        +--:(delta-policy)
        |           +--rw delta            uint32
        +--rw start-time?                  yang:date-and-time
        +--rw stop-time?                   yang:date-and-time
```

(next revision)

Selected discussion items

Å RW vs RO and create method (edit vs. <create-subscription>)

Å On-change subpolicies options or choices

Å “on-change” feature

Å Delta policy

Subscription Negotiation

- Leverage RFC 5277 <create-subscription>
- Server may reject a subscription request
  - Implementation limitations (e.g. on-change)
  - Resource limitations
    (e.g. update size, frequency)
- Response to include “acceptable” parameter settings (no guarantee)
- Additional notifications to indicate if server cannot keep “subscription promise)
- Optional: client throttling of subscription via suspend/resume

Selected discussion items

- <create-subscription> vs edit-config
- Subscription throttling via suspend/resume

Push Data Stream and Transport

Å Push-update notifications

ï Subscription correlator

Å Ties update to a specific subscription

ï Data node with datastore update

Å Per subscription

Å Filtered per NACM rules

Å Leverage <notification> element (per RFC 5277)

Å Alternative transport mappings conceivable but outside scope

Conclusion

Å There is a need for a mechanism for datastore push updates, and subscribing to such updates

Å Drivers

ï Peer Mount

ï Service Assurance

ï Operational data increasingly part of YANG data models

ï Move beyond SNMP-style polling-based management

Å Properties of the solution

ï Data model at its core → Netmod

ï Fits in with YANG/Netconf/RESTconf framework

ï Addresses subscription, negotiation, transport

ï Addresses requirements, PoC exists

Ask: Adopt as WG Document