Smart filters for Push Updates – Problem Statement
draft-clemm-netconf-push-smart-filters-ps-00

Alexander Clemm, Eric Voit, Xufeng Liu, Igor Bryskin, Tianran Zhou, Guangying Zhen, Henk Birkholz
Purpose

• YANG-Push filters allow clients to select which nodes to subscribe to
• Many monitoring applications are based on observing values
  • “Is utilization above 90%?”; “Has critical range been reached?”
• However, filtering based on values currently not covered
• Why not included in basic YANG-Push?
  • Do not stretch implementation complexity
  • To be useful, frequently also state may be required
    • Example TCAs: update once when breached, once when cleared
    • On-change update semantics: object created/deleted vs object in/out of range
• Smart filters addresses this gap
  • Transition from update notifications to simple events
  • Send update only if object’s value may require attention
  • Basis for many Service Assurance applications
  • Required for network automation: one source of events for Event-Conditions-Actions rules
## Relationship to other drafts

<table>
<thead>
<tr>
<th>Updates</th>
<th>Subscribing to YANG datastore push updates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>ietf-netconf-yang-push</em></td>
</tr>
<tr>
<td>Notifications</td>
<td>Subscribing to Event Notifications</td>
</tr>
<tr>
<td></td>
<td><em>ietf-netconf-subscribed-notifications</em></td>
</tr>
<tr>
<td>Transport</td>
<td>Netconf Transport</td>
</tr>
<tr>
<td></td>
<td><em>ietf-netconf-netconf-even-notifications</em></td>
</tr>
<tr>
<td></td>
<td>Restconf + HTTP</td>
</tr>
<tr>
<td></td>
<td><em>ietf-netconf-restconf-notif</em></td>
</tr>
</tbody>
</table>

**Foundation**
Relationship to other drafts

Automation

Subscribing to YANG datastore push updates
ietf-netconf-yang-push

Updates

Subscribing to Event Notifications
ietf-netconf-subscribed-notifications

Notifications

Netconf Transport
ietf-netconf-netconf-even-notifications

Restconf + HTTP
ietf-netconf-restconf-notif

Transport

UDP binary transport
ietf-netconf-udp-pub-channel

Foundation

Extensions

Action Automation
Bryskin-netconf-automation-framework

Multiple stream originators (telemetry streaming)
Zhou-netconf-multi-stream-originators

Notification Message Headers
ietf-netconf-notification-messages
Smart + stateful filters

- Filter based on values
  - Match filters
  - Comparators
- Stateful filters
  - Threshold Crossings
  - Recent High Water Marks
  - Object in/out of filter
  - Other
- Aggregates over time
- Aggregates across objects
  - Full RMONification + Expression-MIBification
- Additional condition checks (out of scope)
  - Bryskin-netconf-automation-framework

Simple filter extensions
Updated on-change update semantics:
- Semantics of object omission/inclusion
  - “on-change” = “on-change w/ filter”

Addl. stateful filter config: threshold, hysteresis threshold, time horizon
Separate notifications – designated TCA, HWA
Proposed scope of smart filters

• Refined on-change update semantics:
  distinguish whether objects were omitted or included because object was created or deleted, or because value fell inside/outside filter range (requires additional update notifications)

• Selected stateful filters:
  • Threshold crossing / in-range alerts
    (incl clears: hysteresis / counter filters)
  • Multi-level thresholds?
  • Recent High-Water Marks

• Outside of scope:
  • Aggregates that process information over time (or move inside scope?)
  • Comparisons / processing across objects
  • Freely programmable logic
  • Not intended as event+expression or script MIB
Conclusion

• Logical extension of YANG-Push / Notifications work
• Enabler for Service Assurance applications
• A building block for network automation

Assess interest of the working group to define a solution for this problem

Thank you!