Smart filters for Push Updates – Problem Statement

draft-clemm-netconf-push-smart-filters-ps-00

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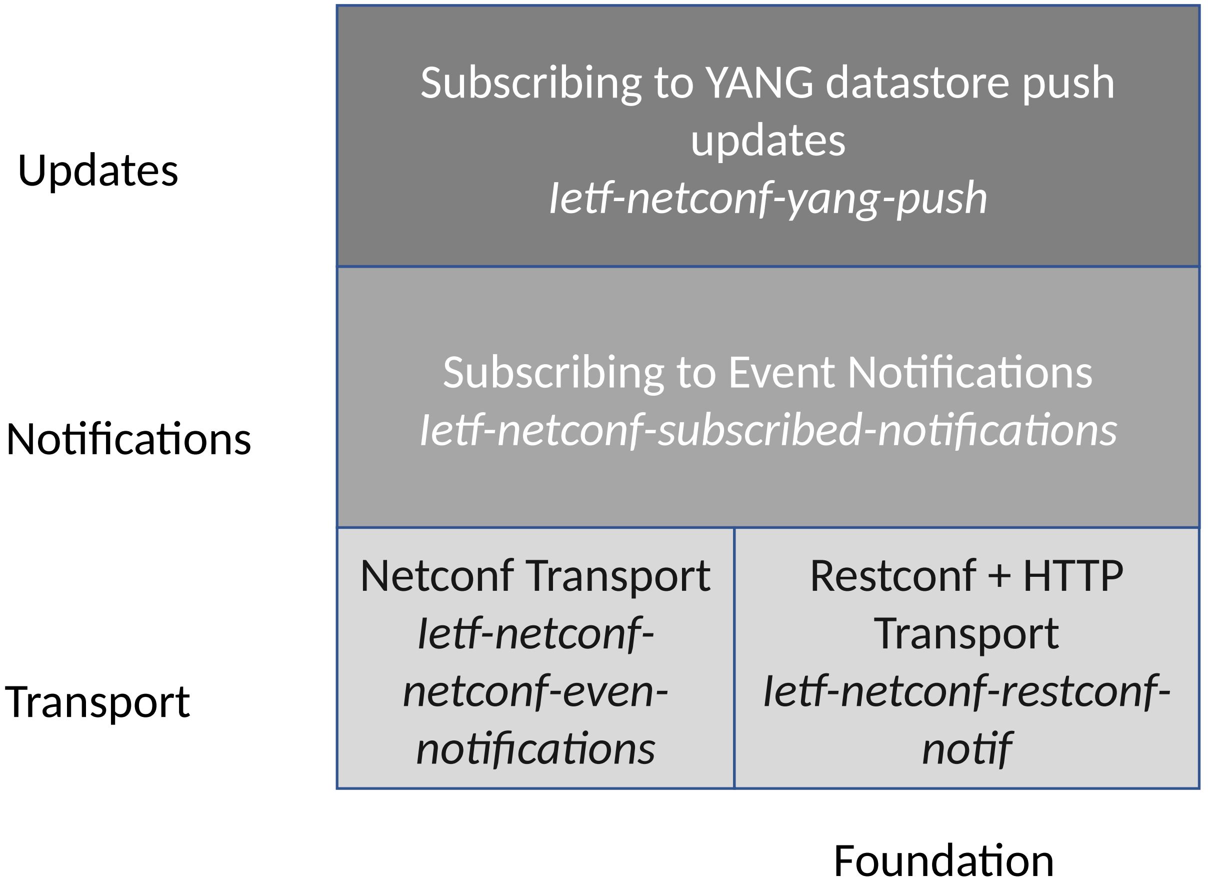
Purpose

- 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



Updates

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

Notifications

Subscribing to Event Notifications
Ietf-netconf-subscribed-notifications

Transport

Netconf Transport
Ietf-netconf-netconf-even-notifications

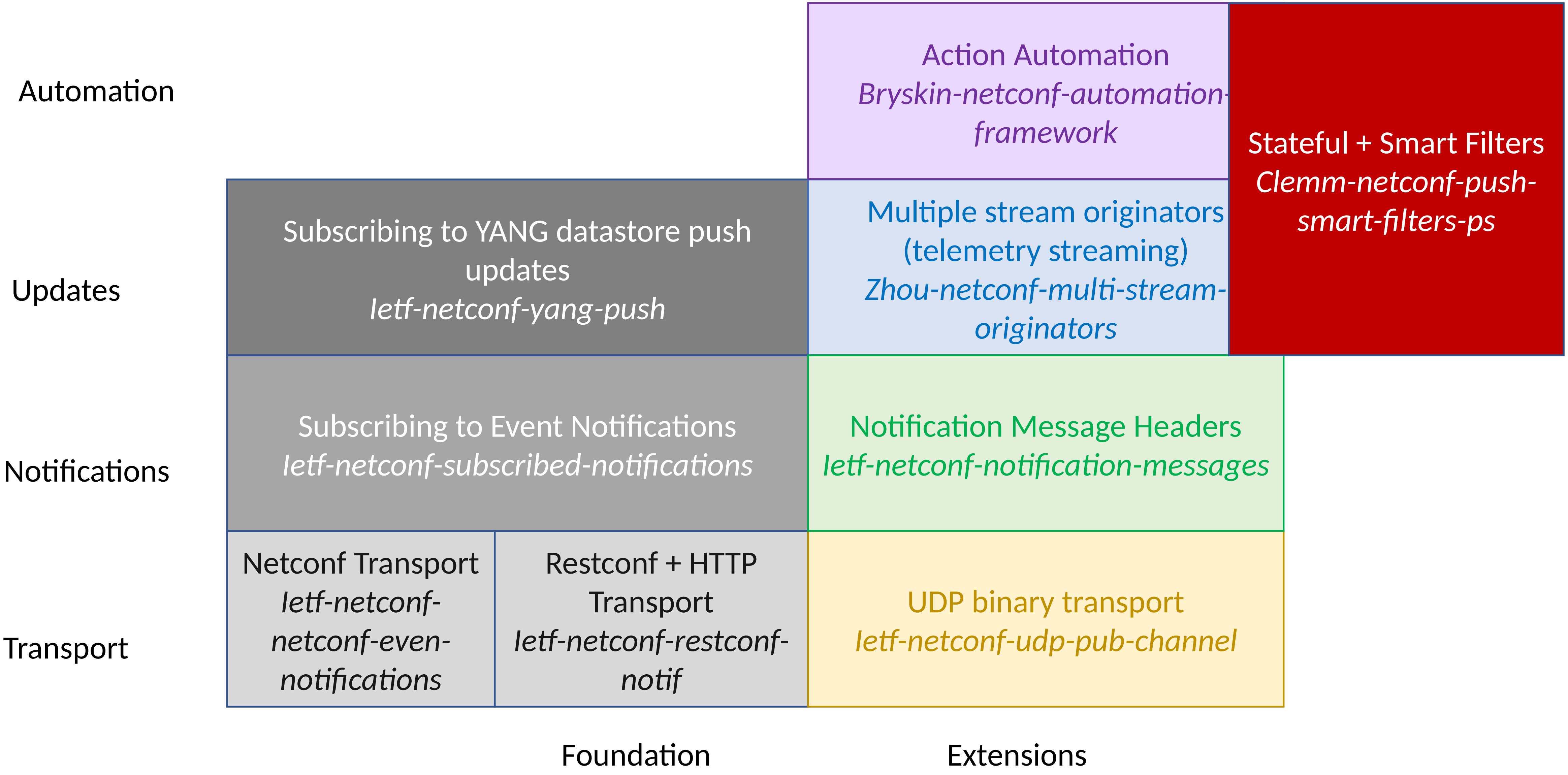
Restconf + HTTP Transport
Ietf-netconf-restconf-notif

Foundation

Relationship to other drafts

	Foundation		Extensions
Automation			Action Automation *Bryskin-netconf-automation-framework*
Updates	Subscribing to YANG datastore push updates *Ietf-netconf-yang-push*		Multiple stream originators (telemetry streaming) *Zhou-netconf-multi-stream-originators*
Notifications	Subscribing to Event Notifications *Ietf-netconf-subscribed-notifications*		Notification Message Headers *Ietf-netconf-notification-messages*
Transport	Netconf Transport *Ietf-netconf-netconf-even-notifications*	Restconf + HTTP Transport *Ietf-netconf-restconf-notif*	UDP binary transport *Ietf-netconf-udp-pub-channel*

Relationship to other drafts



Automation

Updates

Notifications

Transport

Action Automation
Bryskin-netconf-automation-framework

Stateful + Smart Filters
Clemm-netconf-push-smart-filters-ps

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

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

Subscribing to Event Notifications
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Notification Message Headers
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Netconf Transport
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UDP binary transport
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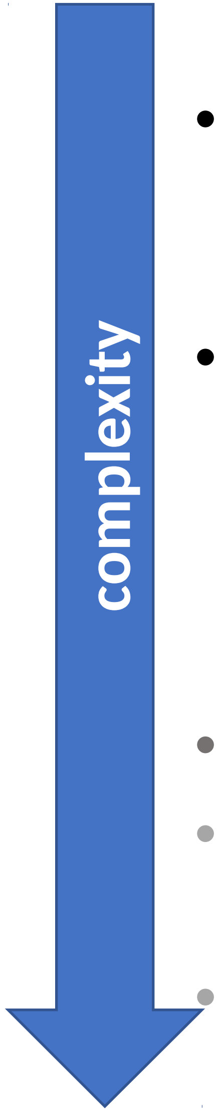
Foundation

Extensions

Smart + stateful filters



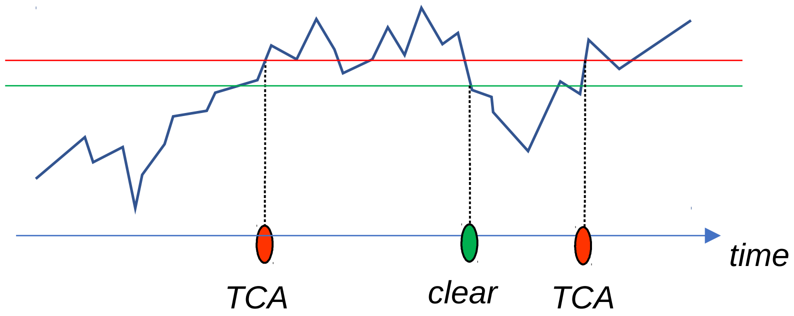
- Filter based on values
  - Match filters
  - Comparators
- Stateful filters
  - Threshold Crossings
  - Recent High Water Marks
  - Object in/out of filter
  - Other
- Aggregates over time
- Aggregates across objects
  - Full RMONification + Expression-MIBification
- Additional condition checks (out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