Adaptive Subscription to YANG Notification
draft-wang-netconf-adaptive-subscription-03

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Recap

• YANG-Push subscriptions [RFC8641] allow client applications to subscribe to continuous datastore updates without needing to poll.

• Two subscription modes are supported: periodical subscription vs on-change subscription.

• In some cases, there is a need for a service to configure both collectors and publishers with multiple period intervals and automatically switch to different period intervals according to resource usage,
  • e.g., when the wireless signal strength falls below a configured low watermark, the subscribed data can be streamed at a higher rate
  • while when the wireless signal strength crosses a configured high watermark, the subscribed data can be streamed at lower rate.

• Therefore a new subscription mode is proposed

• A YANG data model and associated mechanism are defined to enable subscriber's adaptive subscriptions to a publisher's event streams.
  • allows publisher to automatically adjust the volume of telemetry traffic sent from publisher to the receivers.
Document Status

• draft-wang-netconf-adaptive-subscription
  – v-02 was secondly presented in the IETF 109 meeting, and the relation between this work and ECA has been clarified and reach common understanding
  – Two issues were raised during IETF 109
    • Is there any alternative solution such as prioritize Telemetry data collection and allow low priority telemetry data to be dropped
    • How client initiated modify-subscription is different from adaptive subscription in this draft
      – Setup a meeting with Thomas Graf after IETF 109 and reach agreement with proposed changes.

• The latest update is v-(03), changes compared to the previous versions:
  – Clarify the difference between low priority telemetry data dropping and collection rate switching in the introduction section;
  – Update the abstract and introduction section to focus on collection rate switching in the server without interaction with the remote client;
  – Format usage example and change ssid into rssi in the appendix;
  – Use boilerplate and reuse the terms in the terminology section.
Issue 1: Prioritize telemetry data collection

• When the data collection rate is too high, it becomes more likely that a burst of streamed data may temporarily overwhelm a receiver and consume expensive network resource (e.g., radio resource).

• When the rate at which we can collect a stream of data is set too low, these telemetry data are not sufficient to detect and diagnose problems and verify correct network behavior.

• Is there any alternative solution?
  • Getting lower priority telemetry data dropped
    • Pro: using fixed telemetry data collection rate or fixed update interval
    • Con: not sufficient to detect and diagnose problems and verify correct network behavior
  • Using client Initiated establish-subscription/modify-subscription RPC
    • Pro: Augment establish-subscription RPC to allow the client switch the update interval
    • Con: Slow response to the network condition change, the current establish-subscription RPC doesn’t support update interval switching

• This issue has been resolved in the current version.
Next Steps

• Key values of adaptive subscription:
  • Address performance bottleneck on the device when facing Massive Data Collection and Processing
  • Automatically adjust the volume of telemetry traffic sent from publisher to the receiver
    • Greatly reduce the amount of data to be exported

• Address any comments received in the meeting.

• Request adoption call?
When condition A is met, report period interval sets to $\alpha$; when condition B is met, report period interval sets to $\beta$.

Adaptive Subscription Model Overview

- **Name**
  - The name of the condition to be matched

- **Xpath-external-eval**
  - An evaluation criteria
  - Be used to trigger update interval switch

- **Watermark**
  - The threshold value of the targeted data object

- **Period**
  - The new duration for push updates
  - Can be changed based on trigger condition

- **Anchor-time**
  - update intervals fall on the points in time that are a multiple of a “period” from an “anchor-time”