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.

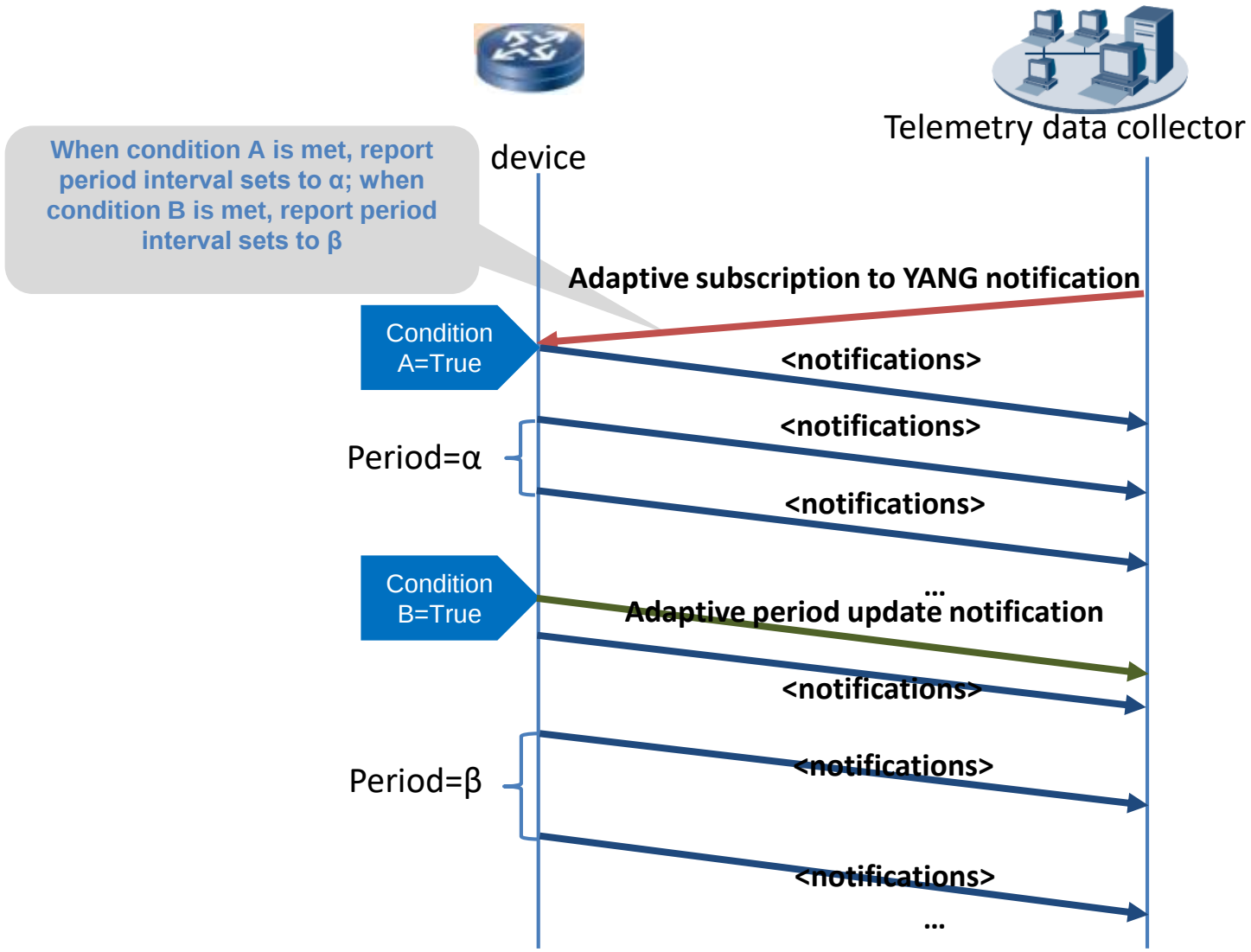
Issue 1: Prioritize telemetry data collection

- 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?

Adaptive-Subscription Model Overview




```
module: ietf-adaptive-subscription
  augment /sn:subscriptions/sn:subscription/yp:update-trigger:
    +--rw (adaptive-subscription)?
       +--:(adaptive-subscriptions)
          +--rw adaptive-subscriptions
             +--rw adaptive-period* [name]
                +--rw name                        string
                +--rw xpath-external-eval         string
                +--rw watermark?                  uint32
                +--rw period                      centiseconds
                +--rw anchor-time?                yang:date-and-time
  augment /sn:establish-subscription/sn:input/yp:update-trigger:
    +-- (adaptive-subscription)?
       +--:(adaptive-subscriptions)
          +--rw adaptive-subscriptions
             +--rw adaptive-period* [name]
                +--rw name                        string
                +--rw xpath-external-eval         string
                +--rw watermark?                  uint32
                +--rw period                      centiseconds
                +--rw anchor-time?                yang:date-and-time
  notifications:
    +---n adaptive-period-update
       +--ro id?                                  sn:subscription-id
       +--ro period                               centiseconds
       +--ro anchor-time?                         yang:date-and-time
       +--ro (selection-filter)?
          +--:(by-reference)
          |  +--ro selection-filter-ref           selection-filter-ref
          +--:(within-subscription)
             +--ro (filter-spec)?
                +--:(datastore-subtree-filter)
                |  +--ro datastore-subtree-filter?   <anydata> {sn:subtree}?
                +--:(datastore-xpath-filter)
                   +--ro datastore-xpath-filter?     yang:xpath1.0 {sn:xpath}?
```

- 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”