

Adaptive Subscription to YANG Notification

draft-wang-netconf-adaptive-subscription-02

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Document Status

- draft-wang-netconf-adaptive-subscription
 - v-00 was first presented in the IETF 107 meeting, and it was suggested to setup design team to progress this work.
 - It was suggested to align with ECA model (draft-wwx-netmod-event-yang-08)
 - provision a ratio of the new measurement interval
 - provision "5" means do it five times faster than the original period
 - The characterization of on-change subscription as a degenerative case of periodic should be clarified
- The latest update is v-(02), changes compared to the previous versions:
 - Removal of datapath and target definition in YANG module
 - Clarify xpath-external-eval node in YANG model
 - Rewrite usage example to align the YANG model parameter change

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.

Adaptive-Subscription Model Overview

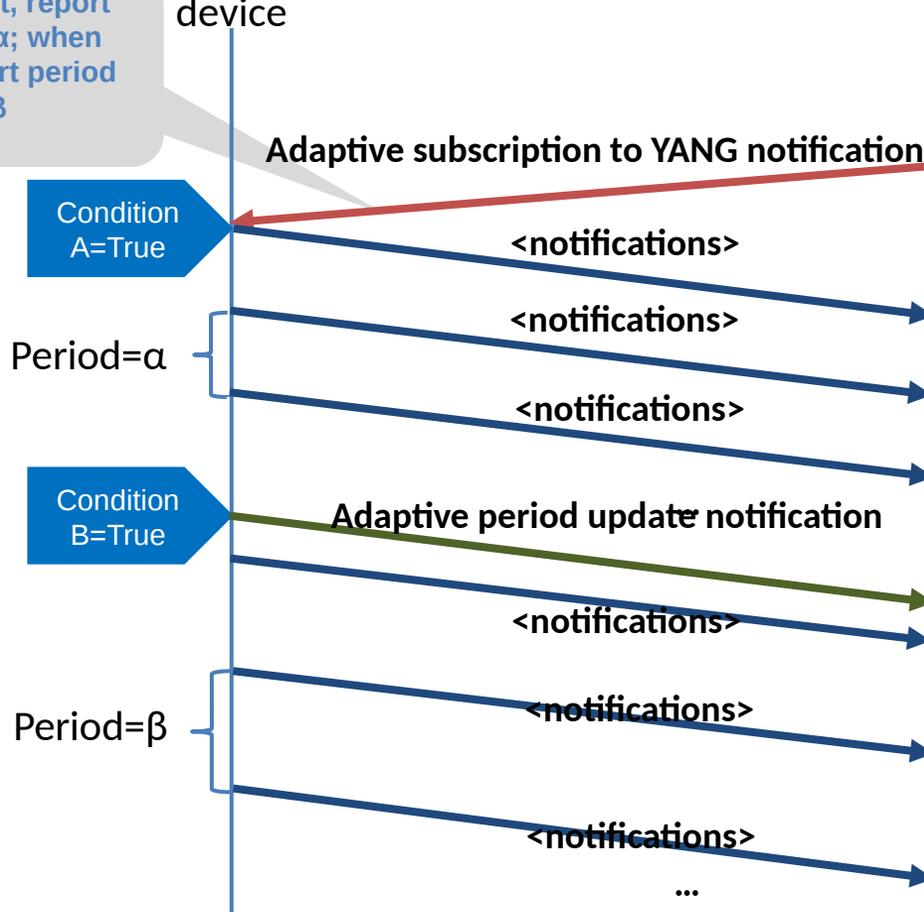


device



Telemetry data collector

When condition A is met, report period interval sets to α ; when condition B is met, report period interval sets to β



```
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}?
```

- **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”
- **Watermark**
 - The threshold value of the targeted data object
- **Xpath-external-eval**
 - An evaluation criteria
 - Be used to trigger update interval switch

Open issue: Filter and trigger

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```
module: ietf-adaptive-subscription
augment /sn:subscriptions/sn:subscription/yp:update-trigger:
  +--rw (adaptive-subscription)?
    +--:(adaptive-subscriptions)
      +--rw adaptive-subscriptions
        +--rw data-path?          yang:xpath1.0
        +--rw target?            <anydata>
        +--rw adaptive-period* [condition-expression]
          +--rw condition-expression string
          +--rw watermark?        uint32
          +--rw period            centiseconds
          +--rw count?           uint16
          +--rw anchor-time?     yang:date-and-time
```

Take out in v-02

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```
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
```

- Support multiple intervals with different watermark
 - ratio of the new measurement interval is not desirable since multiple interval supported by the server are usually fixed.
- a "xpath-external-eval" represents an Evaluation criteria that may be applied against event records in an event stream, which is used to trigger update interval switch. It contains comparisons of datastore node with specific threshold (i.e., watermark) and associated logical operations in the XPath format.
 - Different from stream-xpath-filter defined in [\[RFC8639\]](#) and filter defined in ECA model draft, it doesn't influence the event records output generation from a publisher.

Next Steps

- Key value of adaptive subscription:
 - Address performance bottleneck on the device when facing Massive Data Collection and Processing
 - Automatically adjusts the volume of telemetry sent from
 - and Greatly reduce the amount of data to be exported
- Address any comments received in the meeting.
- Request adoption call?