

Adaptive Subscription to YANG Notification

draft-wang-netconf-adaptive-subscription-06

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Recap: Adaptive Subscription

- 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
 - Periodical subscription: Send subscribed data periodically
 - On-change subscription: trigger by subscribed data value change or datastore change type
- 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 network resource usage,
 - Massive data collection and processing
 - Expensive data management cost,
 - High Frequency data collection Lead to more resource Consumption while low frequency data collection Lead to no enough data For fault localization
- Therefore adaptive subscription mode is proposed
 - Allow the server or publisher support multiple fixed update intervals and switch among them based on network condition change
 - Condition can be described using external xpath expression as part of subscription policy
 - External xpath expression is used to track the monitored data object change (such as wifi signal strength change)
 - Send update interval change event notification to the subscriber
 - During each fixed update interval, the subscribed data is sent in the same way as periodical subscription

Change 04 - 06

- Remove "modify-subscription" RPC usage.
 - Add no change to modify-subscription.
 - Support Client initiated update interval change but can not provide prompt response to the network change
- Replace example-wifi-mac module definition in the Appendix with example-wifi-network-diagnostic using WIFI statistics specified in CHIP specification.
- Add reference to CHIP Specification for wifi example module.
- Update adaptive subscription Example to align with WIFI example module change.

```

<netconf:rpc message-id="101"
xmlns:netconf="urn:ietf:params:xml:ns:netconf:base:1.0">
<establish-subscription
  xmlns="urn:ietf:params:xml:ns:yang:ietf-subscribed-notifications"
  xmlns:yp="urn:ietf:params:xml:ns:yang:ietf-yang-push">
  <yp:datastore
    xmlns:ds="urn:ietf:params:xml:ns:yang:ietf-datastores">
    ds:running
  </yp:datastore>
  <yp:datastore-xpath-filter
    xmlns:wnd="https://example.com/sample-data/1.0">
    /wnd:example-wifi-network-diagnostic
  </yp:datastore-xpath-filter>
  <as:adaptive-subscriptions
    xmlns:as="urn:ietf:params:xml:ns:yang:ietf-adaptive-subscription">
  <as:adaptive-period>
    <as:xpath-external-eval>wnd:server[rssi < -65]
    </as:xpath-external-eval>
    <as:watermark>-65</as:watermark>
    <as:period>5</as:period>
  </as:adaptive-period>
  <as:adaptive-period>
    <as:xpath-external-eval>wnd:server[rssi >= -65]
    </as:xpath-external-eval>
    <as:watermark>-65</as:watermark>
    <as:period>60</as:period>
  </as:adaptive-period>
  </as:adaptive-subscriptions>
</establish-subscription>
</netconf:rpc>

```

```

module: example-wifi-network-diagnostic
  +--rw server
  |   +--rw bssid?                yang:mac-address
  |   +--rw security-type?       enumeration
  |   +--rw wifi-version?        enumeration
  |   +--rw channel-num?         int8
  |   +--rw rssi?                int8
  |   .....

```

Adaptive subscription policy
Install using establish-subscription



```

<as:xpath-external-eval>wnd:server[rssi < -65]
</as:xpath-external-eval>
<as:watermark>-65</as:watermark>
<as:period>5</as:period>

```



When RSSI < -65dBm, switch update interval to 5 seconds

```

<as:xpath-external-eval>wnd:server[rssi >= -65]
</as:xpath-external-eval>
<as:watermark>-65</as:watermark>
<as:period>60</as:period>

```



When RSSI >= -65dBm switch update interval to 60 seconds

Next Step

- Request adoption as workgroup document
- Received support on last IETF
- Received support and comments on the mailing list

Adaptive-Subscription Model Overview

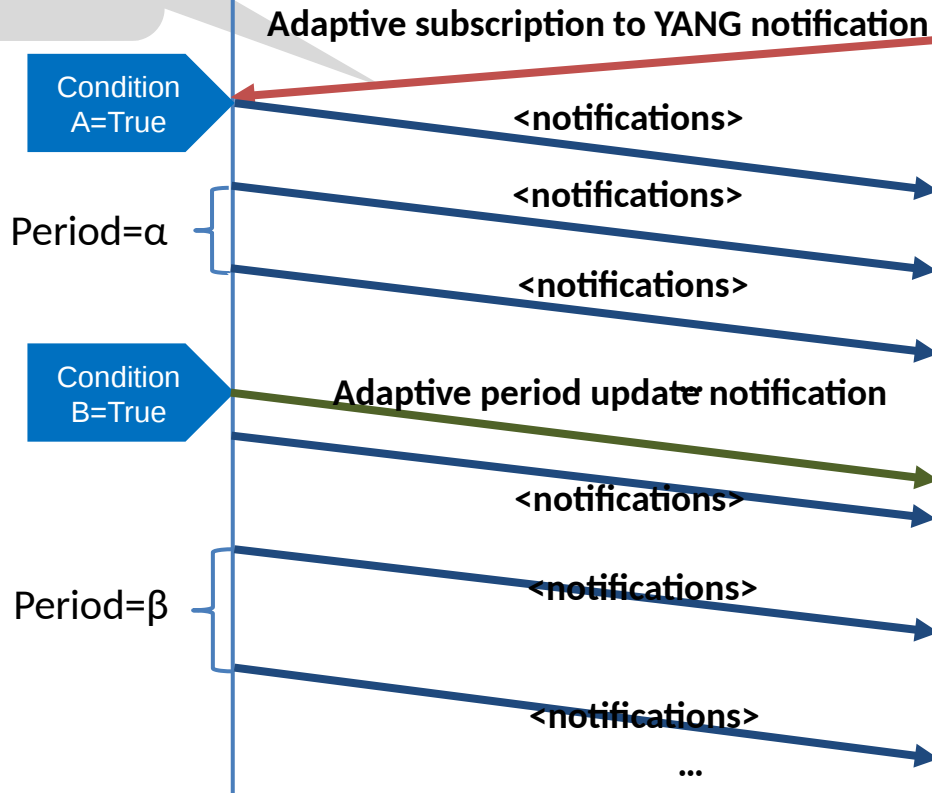


device



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
```

```
+--rw xpath-external-eval
```

```
+--rw watermark?
```

```
+--rw period
```

```
+--rw anchor-time?
```

string

string

uint32

centiseconds

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