Support of Versioning in YANG Notifications Subscription
draft-ietf-netconf-yang-notifications-versioning-01

Adds semantics to the subscription process and notification message to enable automated data mesh integration
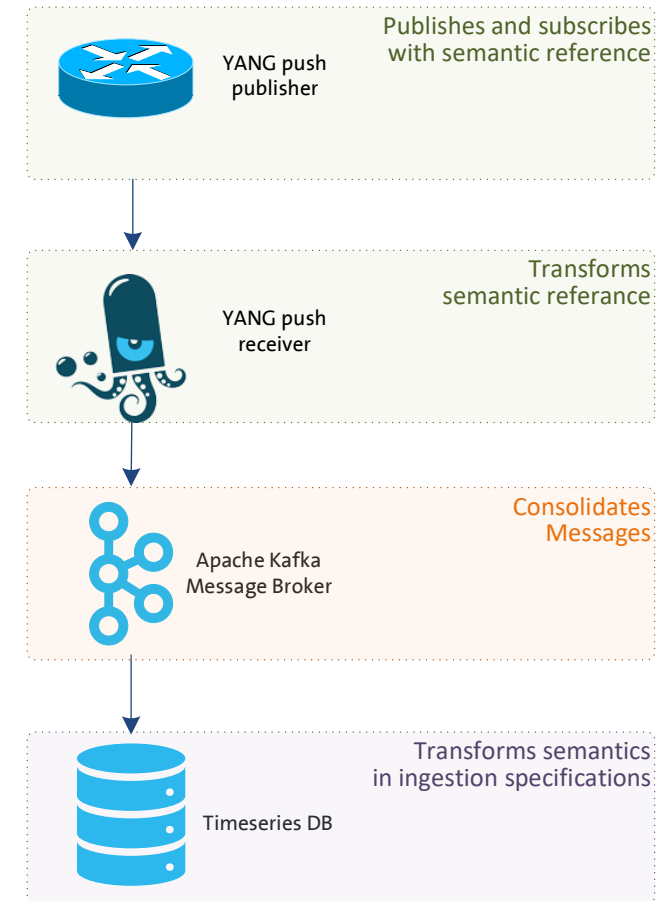
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6. July 2023

Versioning in YANG Notifications Subscription
Status and Next Steps

- **-03 NETCONF adoption call concluded**

- **Feedback from Andy during adoption call**
    - xpath can refer to more than one YANG module
    - subscription section 2 is not fully aligned with section 4.1
    - Instead of sn:target, sn:stream-filter, sn:within-subscription and yp:within-subscription should be augmented

- **All addressed in -01 revision
-> Requesting feedback and comments.**

YANG push publisher — Publishes and subscribes with semantic reference

YANG push receiver — Transforms semantic referance

Apache Kafka Message Broker — Consolidates Messages

Timeseries DB — Transforms semantics in ingestion specifications

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Extend Datastore Selection and Subscription State Change Notifications with module name, revision and revision-label

```
module: ietf-yang-push-revision

  augment /sn:establish-subscription/sn:input/sn:target/sn:stream
          /sn:stream-filter/sn:within-subscription:
    +-- module-version* [module-name]
       +-- module-name      yang:yang-identifier
       +-- revision?        rev:revision-date-or-label
       +-- revision-label?  ysver:version
  augment /sn:establish-subscription/sn:input/sn:target/yp:datastore
          /yp:selection-filter/yp:within-subscription:
    +-- module-version* [module-name]
       +-- module-name      yang:yang-identifier
       +-- revision?        rev:revision-date-or-label
       +-- revision-label?  ysver:version

  augment /sn:subscription-started/sn:target/sn:stream
          /sn:stream-filter/sn:within-subscription:
    +--ro module-version* [module-name]
       +--ro module-name      yang:yang-identifier
       +--ro revision         rev:revision-date-or-label
       +--ro revision-label?  ysver:version
  augment /sn:subscription-started/sn:target/yp:datastore
          /yp:selection-filter/yp:within-subscription:
    +--ro module-version* [module-name]
       +--ro module-name      yang:yang-identifier
       +--ro revision         rev:revision-date-or-label
       +--ro revision-label?  ysver:version
```

```
{
    "ietf-restconf:notification" : {
      "eventTime": "2023-01-03T10:00:00Z",
      "ietf-subscribed-notifications:subscription-modified": {
        "id": 101,
        "stream-xpath-filter": "/ietf-interfaces:interfaces",
        "stream": "NETCONF",
        "ietf-yang-push-revision:module-version": [{
          "module-name": "ietf-interfaces"
          "revision": "2014-05-08",
          "revision-label": "1.0.0",
        }],
      }
    }
}
```

- **Network operators need to control semantics in its data processing pipeline. That includes YANG push.**

- This is today only possible during YANG push subscription but not when nodes are being upgraded or messages are being published for configured subscription.

- **draft-tgraf-netconf-yang-notifications-versioning** extends the YANG push subscription and publishing mechanism defined in RFC8641:

  - **By adding the ability to subscribe to a specific revision** or latest-compatible-semversion of one or more yang modules.

  - **By extending the YANG push Subscription State Change Notifications Message** so that the YANG push receiver learns beside the xpath and the sub-tree filter also the yang module name, revision and revision-label.

3

Backup

When Big Data and Network becomes one
Marrying two messaging protocols

Data Mesh
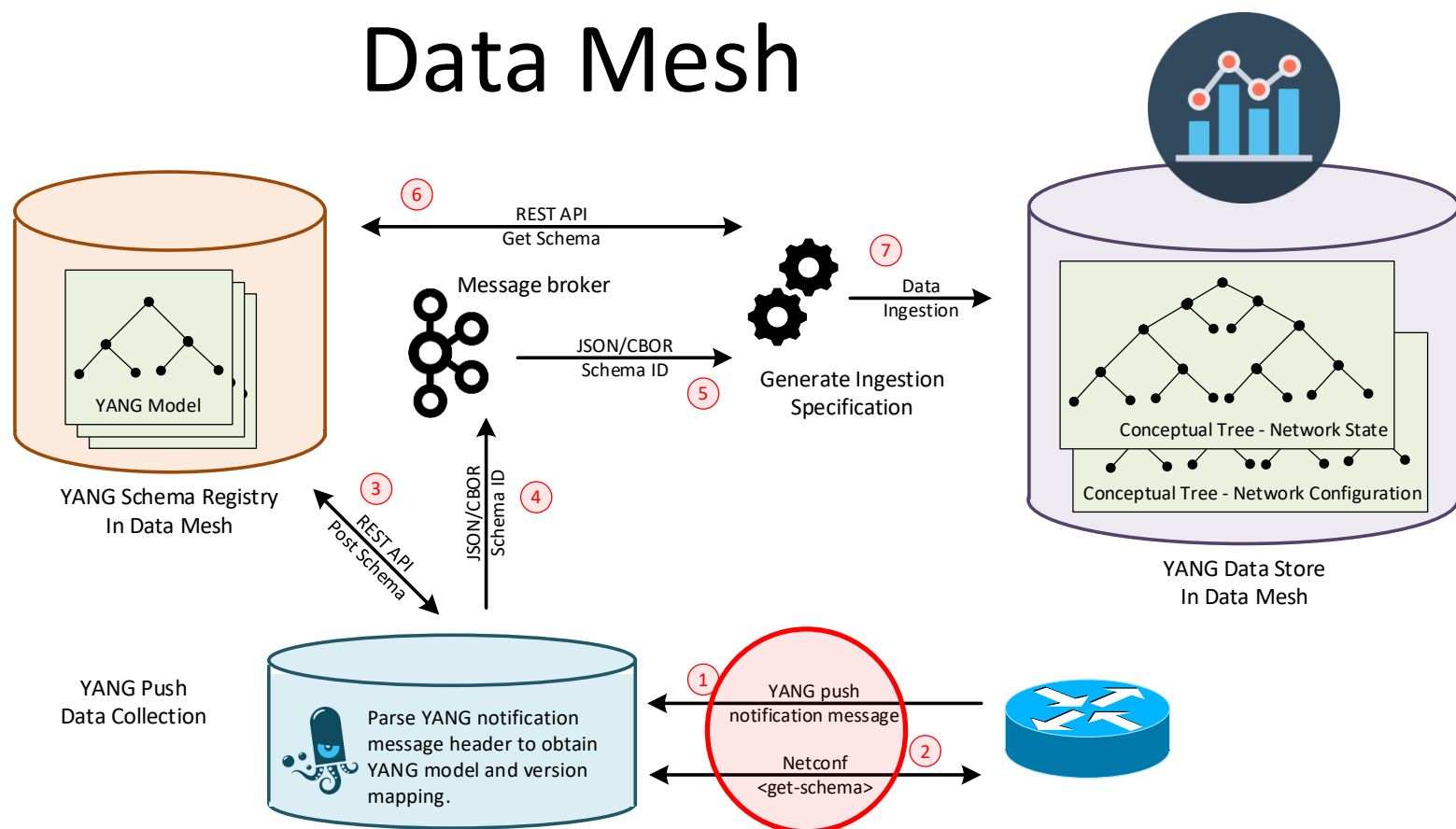
- **Data Mesh** is a big data architecture where different domains can exchange data with a **bounded context and SLO's** are defined in Data Products. **Same principle as in networks.**
- **Semantics** are needed to describe the data. **A gauge32 is not the same as counter32.** Values can increase or decrease. Needs monotonic increasing counter normalization or not.
- **Versioning** is needed to not only understand that the semantic has changed, but also wherever the new semantic is backward compatible or not. **Preventing to break the data processing pipeline.**
- **Hostname, publisher ID, sequence numbers and observation timestamping** are needed to **measure loss and delay for SLO's.**
- **YANG push as defined in RFC8641 is missing** hostname, sequence numbers, observation timestamping and versioning**.** draft-ahuang-netconf-notif-yang, draft-tgraf-netconf-notif-sequencing, draft-tgraf-netconf-yang-push-observation-time and draft-tgraf-netconf-yang-notifications-versioning addresses this.