

# Support of Versioning in YANG Notifications Subscription

draft-tgraf-netconf-yang-notifications-versioning-00

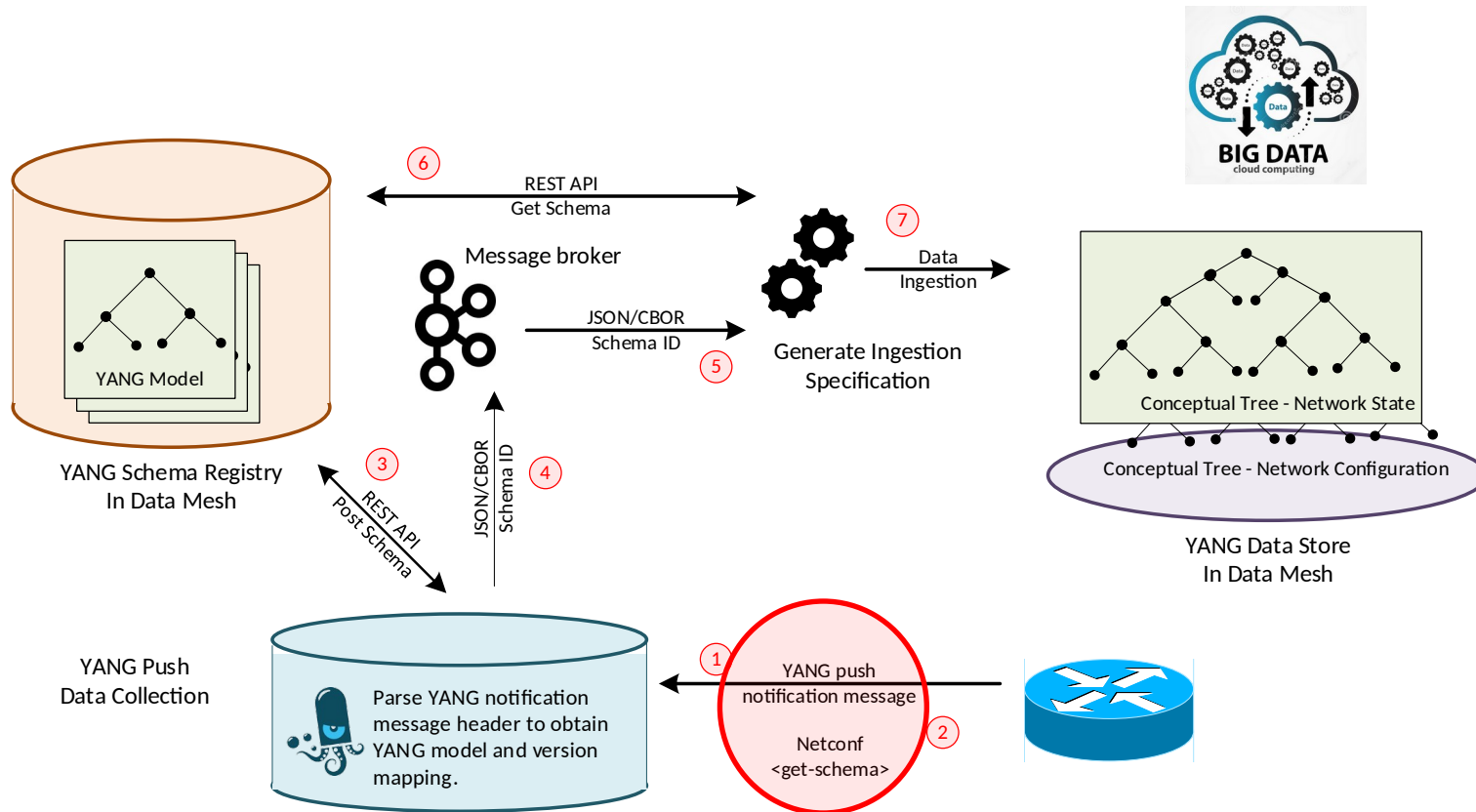
Adds semantics to the subscription process and notification message to enable automated data mesh integration

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29. October 2022

# YANG push with semantics reference and versioning

Enabling automated data processing and data mesh integration



- **Data Mesh** is a big data architecture where different domains can exchange data with a bounded context. **Same principle as in networks.**
- **Bounded context** relies that data always has semantics and versioning.
- 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.**
- YANG push as defined in RFC8641 is **missing semantics and versioning.** **draft-tgraf-netconf-yang-notifications-versioning** addresses both.

# Extending the Datastore Selection and Notification Message Metadata

## Draft Introduction

module: ietf-yang-push-metadata

```
augment /yp:push-update:
  +--ro module?           string
  +--ro namespace?       string
  +--ro revision?        rev:revision-date-or-label
  +--ro revision-label?  ysver:version
  +--ro datastore-xpath-filter? yang:xpath1.0 {sn:xpath}?
  +--ro datastore-subtree-filter? <anydata> {sn:subtree}?
augment /yp:push-change-update:
  +--ro module?           string
  +--ro namespace?       string
  +--ro revision?        rev:revision-date-or-label
  +--ro revision-label?  ysver:version
  +--ro datastore-xpath-filter? yang:xpath1.0 {sn:xpath}?
  +--ro datastore-subtree-filter? <anydata> {sn:subtree}?
augment /sn:establish-subscription/sn:input/sn:target:
  +-- revision?          rev:revision-date-or-label
  +-- revision-label?    ysver:version
augment /sn:modify-subscription/sn:input/sn:target:
  +-- revision?          rev:revision-date-or-label
  +-- revision-label?    ysver:version
augment /sn:subscription-started/sn:target:
  +-- revision?          rev:revision-date-or-label
  +-- revision-label?    ysver:version
augment /sn:subscription-modified/sn:target:
  +-- revision?          rev:revision-date-or-label
  +-- revision-label?    ysver:version
augment /sn:subscriptions/sn:subscription/sn:target:
  +--rw revision?        rev:revision-date-or-label
  +--rw revision-label?  ysver:version
```

- **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.
- draft-tgraf-netconf-yang-notifications-versioning extends the YANG push subscription and publishing mechanism defined in RFC8641:
  - **By extending the YANG push header** so that the YANG push receiver learns the semantic reference in the notification message directly.
  - **By adding the ability to subscribe to a specific revision** or latest-compatible-semversion.

# Example Notification Message

In JSON and XML encoding

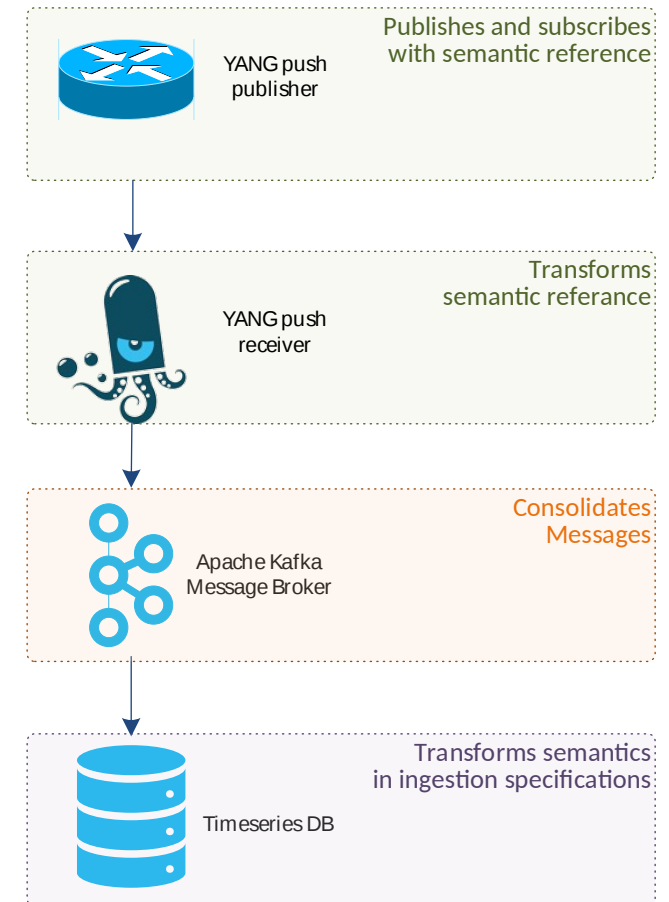
```
{
  "ietf-notification:notification": {
    "eventTime": "2022-09-02T10:59:55.32Z",
    "ietf-yang-push:push-update": {
      "id": 101, {
        "module": "ietf-interfaces", {
          "namespace": "urn:ietf:params:xml:ns:yang:ietf-interfaces", {
            "revision": "2014-05-08", {
              "revision-label": "1.0.0", {
                "datastore-xpath-filter": "ietf-interfaces:interfaces",
                "datastore-contents": {
                  "ietf-interfaces:interface": {
                    "name": {
                      "eth0": {
                        "oper-status": "up",
                      }
                    }
                  }
                }
              }
            }
          }
        }
      }
    }
  }
}
```

```
<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2022-09-02T10:59:55.32Z</eventTime>
  <push-update xmlns="urn:ietf:params:xml:ns:yang:ietf-yang-push">
    <id>101</id>
    <module>ietf-interfaces</module>
    <namespace>urn:ietf:params:xml:ns:yang:ietf-interfaces</namespace>
    <revision>2014-05-08</revision>
    <revision-label>1.0.0</revision-label>
    <datastore-xpath-filter>ietf-interfaces:interfaces</datastore-xpath-filter>
    <datastore-contents>
      <interfaces xmlns="urn:ietf:params:xml:ns:yang:ietf-interfaces">
        <interface>
          <name>eth0</name>
          <oper-status>up</oper-status>
        </interface>
      </interfaces>
    </datastore-contents>
  </push-update>
</notification>
```

# Versioning in YANG Notifications Subscription

## Next steps

- **Do you recognize the problem statement?**
- **Network operators need to control semantics** in its data processing pipeline and therefore want to
  - Persist the revision or semantic-version also on upgrade.
  - Have a semantic reference in the notification message.
- A sample open-source and a vendor implementation will be shown at the IETF 116 hackathon.
- **-> Requesting feedback and comments.**



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