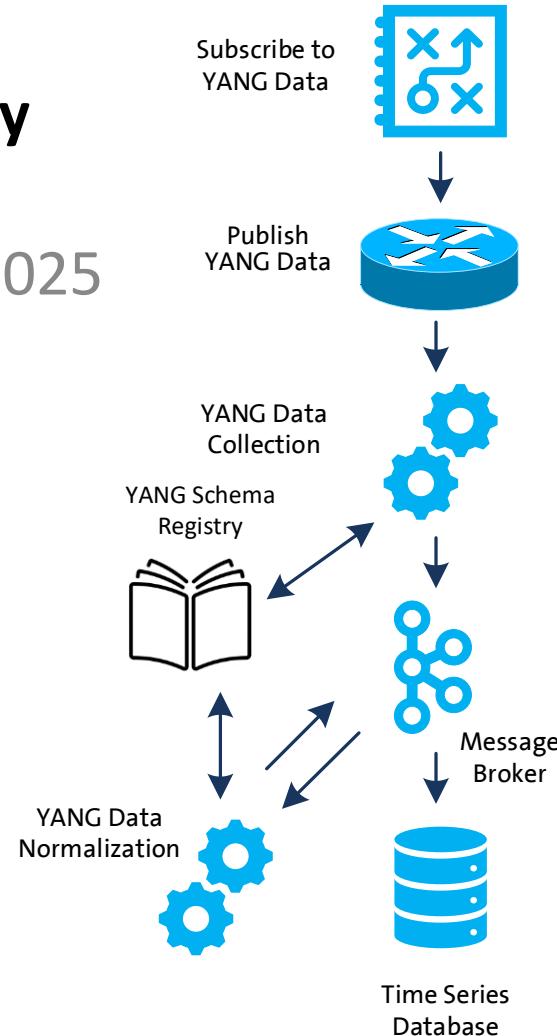


# Validate Network Telemetry Messages Implementations

IETF 124 Hackathon, November 1-2nd 2025



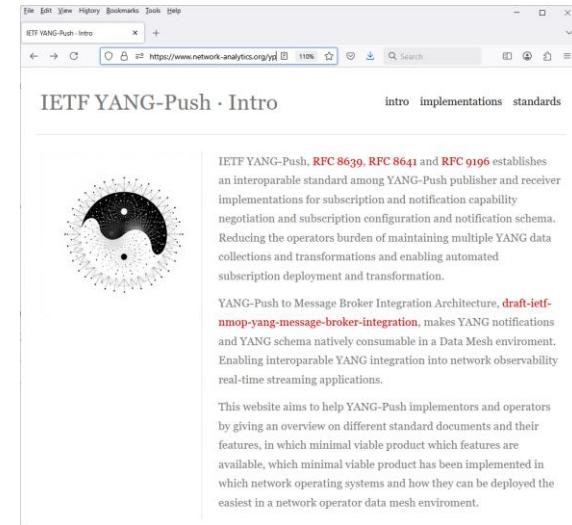
# Hackathon Plan, Software and Website

## Test Plan

- **Message Broker integration**
  - Validate [draft-ietf-nmop-message-broker-telemetry-message](#) for [draft-ietf-nmop-yang-message-broker-integration](#) integration against YANG schema with [yanglint](#)

## Software

- YANG-Push Publisher - Cisco IOS XR
- YANG-Push Publisher - 6WIND VSR
- YANG-Push Publisher - Huawei NE (Router) and MA (OLT)
- **YANG-Push Receiver – [Netgauze](#)**
- **YANG-Push Receiver – [Pmacct](#)**
- udp-notif dissector - Wireshark



<https://www.network-analytics.org/yp/how-to-deploy.html>

# Hackathon – Repositories

## YANG-Push Test Result Repository

- <https://github.com/network-analytics/ietf-network-analytics-document-status/tree/main/123/Hackathon>
  - Packet capture on the wire
  - Netconf RPCs and YANG-Push JSON and CBOR encoded messages

## Telemetry Message Test Result Repository

- <https://github.com/network-analytics/ietf-network-analytics-document-status/tree/main/124/Hackathon>
  - Pmtelemetryd configuration and JSON telemetry messages
  - YANG schemas for validation

## Apache Kafka Integration

- <https://github.com/network-analytics/yang-kafka-integration>
  - YANG Serializer
  - YANG Schema Registry Plugin

Name	Last commit message	Last commit date
..		
ipf-zbl1243-r-daisy-21_huawei_ma5800t_2025071...	YANG-Push MVP1 Test Results	1 minute ago
ipf-zbl1243-r-daisy-21_huawei_vrp_ne_20250716_...	YANG-Push MVP1 Test Results	1 minute ago
ipf-zbl1327-r-daisy-91_cisco_iosxr_20250716_1652...	YANG-Push MVP1 Test Results	1 minute ago
ipf-zbl1843-r-daisy-58_6wind_20250716_165518	YANG-Push MVP1 Test Results	1 minute ago

gra3net netgauze and fixes a00c3d2 · 1 hour ago

Name	Last commit message	Last commit date
..		
yang-modules	fixed	1 hour ago
cheat-sheet.txt	fixed	1 hour ago
pmtelemetryd.conf	pmacct config and json output	6 hours ago
pmtelemetryd_log.json	pmacct config and json output	6 hours ago
yp210-push-update.json	json splitted	6 hours ago
yp210-subscription-started.json	Update yp210-subscription-started.json	5 hours ago
yp210-subscription-started2.json	netgauze and fixes	1 hour ago
yp210-subscription-started3.json	netgauze and fixes	1 hour ago
yp210-subscription-started4.json	netgauze and fixes	1 hour ago
yp210-subscription-terminated.json	json splitted	6 hours ago
yp211-push-update.json	json splitted	6 hours ago
yp211-subscription-started.json	json splitted	6 hours ago
yp211-subscription-terminated.json	json splitted	6 hours ago

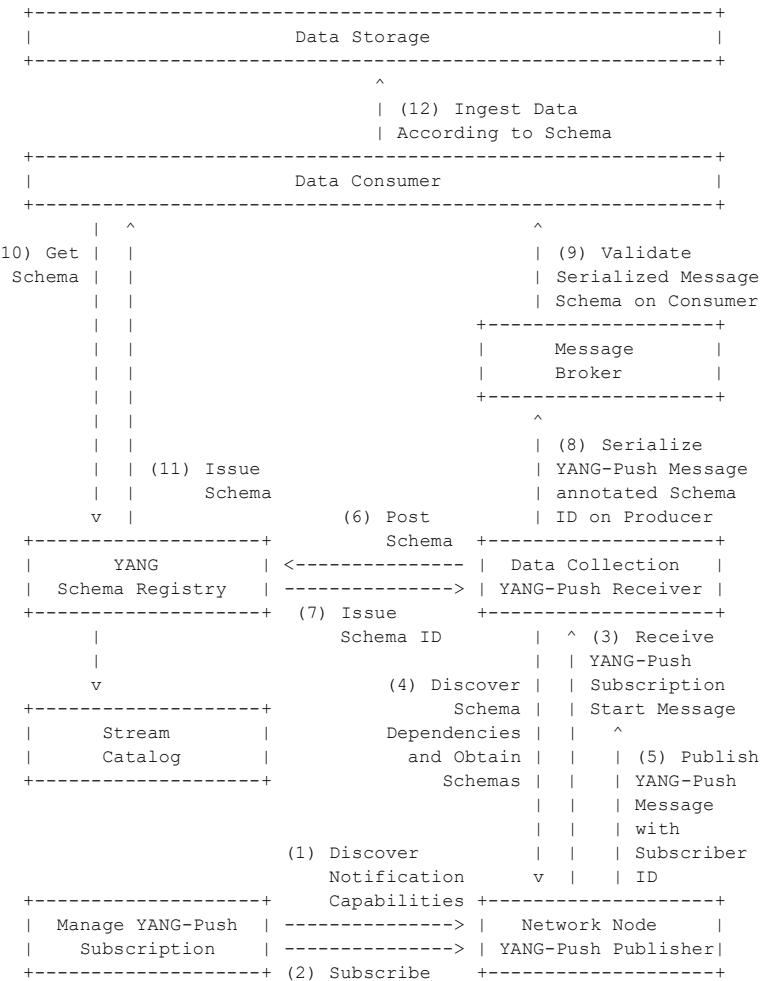
# An Architecture for YANG-Push to Message Broker Integration

[draft-ietf-nmop-yang-message-broker-integration](#)

[draft-ietf-nmop-message-broker-telemetry-message](#)

[draft-netana-nmop-yang-message-broker-message-key](#)

- Subscription to YANG Notifications  
[RFC 8639](#)
- Subscription to YANG Notifications for Datastore Updates  
[RFC 8641](#)
- UDP-based Transport for Configured Subscriptions  
[draft-ietf-netconf-udp-notif](#)
- Subscription to Distributed Notifications  
[draft-ietf-netconf-distributed-notif](#)
- Extensible YANG Model for YANG-Push Notifications  
[draft-ietf-netconf-notif-envelope](#)
- Support of Versioning in YANG Notifications Subscription  
[draft-ietf-netconf-yang-notifications-versioning](#)
- YANG Modules Describing Capabilities for Systems and Datastore Update Notifications  
[RFC 9196](#)
- YANG Notification Transport Capabilities  
[draft-ietf-netconf-yp-transport-capabilities](#)
- YANG Library  
[RFC 8525](#)
- Augmented-by Addition into the IETF-YANG-Library  
[draft-ietf-netconf-yang-library-augmentation](#)
- Validating anydata in YANG Library context  
[draft-netana-nmop-yang-anydata-validation](#)
- Encoding of Data Modeled with YANG in the CBOR  
[RFC 9254](#)



# Libyang – Anydata Validation Support

```
root@daisy-playground-rh8 [ /tmp/hackathon ] () # yanglint-devel -i -t ext yang-modules/ietf-subscribed-notifications.yang yang-modules/ietf-yang-push-revision.yang yang-modules/ietf-yang-push.yang yang-modules/ietf-datastores.yang yang-modules/ietf-udp-notif-transport.yang yang-modules/ietf-yang-push-telemetry-message.yang yang-modules/ietf-telemetry-message.yang yang-modules/ietf-yang-types.yang yang-modules/ietf-yang-revisions.yang yang-modules/ietf-yang-semver.yang yang-modules/ietf-yang-structure-ext.yang yang-modules/ietf-yp-notification.yang yang-modules/ietf-inet-types.yang yang-modules/ietf-yang-types.yang yp210-subscription-started.json -f json -k ietf-telemetry-message:structure:message
libyang err : Expecting JSON name/object but anydata "anydata-values" is represented in input data as
name/number. (/ietf-telemetry-message:message/network-operator-metadata/labels[name='seq']) (line 41)
YANGLINT[E]: Parsing of extension data failed.
YANGLINT[E]: Failed to parse input data file "yp210-subscription-started.json".
```

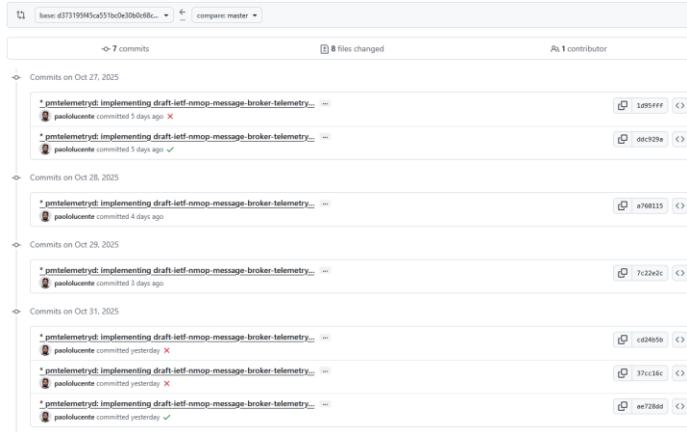
- [Section 7.10 of RFC 7950](#) describes anydata but doesn't specify how content can be validated against YANG schema. [draft-netana-nmop-yang-anydata-validation](#) describes how YANG validation can be performed.
- Libyang is currently missing anydata validation support. [Section 6 of draft-netana-nmop-yang-anydata-validation](#) describes in libyang implementation.

# Pmacct – Telemetry Message Support

```
yanglint -d dev1 -i ext yang-modules/ietf-subscribed-notifications.yang yang-modules/ietf-yang-push-revision.yang yang-modules/ietf-yang-push.yang yang-modules/ietf-datastores.yang yang-modules/ietf-udp-notif-transport.yang yang-modules/ietf-yang-push-telemetry-message.yang yang-modules/ietf-telemetry-message.yang yang-modules/ietf-yang-types.yang yang-modules/ietf-yang-revisions.yang yang-modules/ietf-yang-server.yang yang-modules/ietf-yang-structure-ext.yang yang-modules/ietf-yp-notification.yang yang-modules/ietf-yang-types.yang yp210-subscription-started2.json -f json -k ietf-telemetry-message:structure:message
```

```
{
  "ietf-telemetry-message": {
    "telemetry-message-metadata": {
      "collection-timestamp": "2023-01-01T01:00:30+01:00",
      "notification-event": "log",
      "session-protocol": "yang-push",
      "export-address": "71.19.157.107",
      "export-port": 31513
    },
    "data-collection-manifest": {
      "name": "default",
      "vendor": "pmacct",
      "software-version": "1.7.10-git",
      "software-flavor": "20251029-0 (7c22e2cf)"
    },
    "network-operator-metadata": {
      "labels": [
        {
          "name": "seq",
          "string-value": "1"
        },
        {
          "name": "serialization",
          "string-value": "json"
        }
      ]
    },
    "payload": {
      "ietf-yp-notification-envelope": {
        "sent-time": "2025-07-18T09:50:49.505Z",
        "hostname": "ipf-5b1327-r-daisy-91",
        "sequence-number": 0,
        "contents": {
          "ietf-subscribed-notifications:subscription-started": {
            "id": 210,
            "ietf-yang-push: datastore": "ietf-datastores:operational",
            "ietf-yang-push: datastore-xpath-filter": "openconfig-interfaces:interfaces/interface/state/counters",
            "transport": "ietf-udp-notif-transport:udp-notif",
            "ietf-yang-push:revision:module-version": [
              {
                "module-name": "openconfig-interfaces",
                "revision": "2022-10-25"
              }
            ],
            "ietf-yang-push:revision:yang-library-content-id": "6d13baf8fd1dc21aa8932d1199b369794881393",
            "encoding": "encode-json",
            "ietf-yang-push:periodic": {
              "period": 3000,
              "anchor-time": "2025-01-01T00:00:30+00:00"
            }
          }
        }
      }
    }
  }
}
```

- [draft-ietf-nmop-message-broker-telemetry-message](#) support [has been implemented in Pmacct](#) for IETF 124 hackathon.
- Libyang supports YANG data structures as of [RFC 8791](#) as of version 4.0.14. This came as improvement from the IETF 123 YANG-Push validation activities.

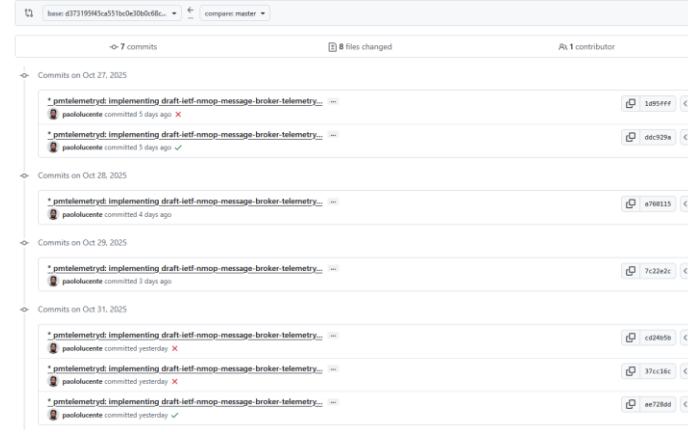


# NetGauze – Telemetry Message Support

```
yanglint-devel -i -e ext yang-modulesietf-subscribed-notifications.yang yang-modulesietf-yang-push-revision.yang yang-modulesietf-yang-push.yang yang-modulesietf-datastores.yang yang-modulesietf-udp-notif-transport.yang yang-modulesietf-yang-push-telemetry-message.yang
yang-modulesietf-telemetry-message.yang yang-modulesietf-yang-types.yang yang-modulesietf-yang-revisions.yang yang-modulesietf-yang-semver.yang yang-modulesietf-yang-structure-ext.yang yang-modulesietf-yp-notification.yang yang-modulesietf-inet-types.yang
modulesietf-yang-types.yang ypx210+subscription-started4.json -f json -k ietf-telemetry-message:structure:message
```

```
{
  "ietf-telemetry:telemetry-message": {
    "telemetry-message-metadata": {
      "node-extracted-timestamp": "2025-07-18T11:50:49.505020Z",
      "collection-timestamp": "2025-07-18T11:50:49.50356119+02:00",
      "notification-event": "llo",
      "session-protocol": "yang-push",
      "export-address": "203.0.113.91",
      "export-port": 31513,
      "ietf-yang-push-telemetry-message:yang-push-subscription": {
        "id": 210,
        "xpath-filter": "openconfig-interfaces:interfaces/interface/state/counters",
        "datastore": "ietf-datastores:operational",
        "transport": "ietf-udp-notif-transport:udp-notif",
        "encoding": "ietf-subscribed-notifications:encode-json",
        "period": 3000,
        "periodic": true,
        "anchor-time": "2025-01-01T00:00:00Z"
      },
      "yang-library-content-id": "6d13bafdf8fd1dc21as8932d1199b369794881393"
    },
    "data-collection-manifest": {
      "name": "netgauze-yang-push#ietf-col-left01",
      "version": "Netgauze",
      "software-version": "0.7.0 (cba5eb90)",
      "software-flavor": "release",
      "os-version": "8.10",
      "os-type": "Red Hat Enterprise Linux"
    },
    "network-operator-metadata": {
      "labels": [
        {
          "name": "mkey",
          "string-value": "unknown"
        },
        {
          "name": "mkey",
          "string-value": "unknown"
        }
      ]
    },
    "payload": {
      "ietf-yp-notification:envelope": {
        "contents": {
          "ietf-subscribed-notifications:subscription-started": {
            "end": "2025-07-18T11:50:49.505020Z",
            "id": 210,
            "ietf-yang-push-revision:module-version": [
              {
                "module-name": "openconfig-interfaces",
                "revision": "2022-10-25"
              }
            ],
            "ietf-yang-push-revision:library-content-id": "6d13bafdf8fd1dc21as8932d1199b369794881393",
            "ietf-yang-push:datasource": "ietf-datastores:operational",
            "ietf-yang-push:datasource:xpath-filter": "openconfig-interfaces:interfaces/interface/state/counters",
            "ietf-yp-notification:periodic",
            "anchor-time": "2025-01-01T00:00:30Z",
            "period": 3000
          },
          "transport": "ietf-udp-notif-transport:udp-notif"
        },
        "event-time": "2025-07-18T09:50:49.505Z",
        "hostname": "1pzb11327r-daisy-91",
        "sequence-number": 0
      }
    }
  }
}
```

- [draft-ietf-nmop-message-broker-telemetry-message](#) support [has been implemented in Netgauze](#) for IETF 123 hackathon.
- Libyang supports YANG data structures as of [RFC 8791](#) as of version 4.0.14. This came as improvement from the IETF 123 YANG-Push validation activities.



# Next Steps from IETF 123 Hackathon...

- [Yanglint](#), fix YANG extension's structure support 
- [Pmacct](#) supporting Network Telemetry Message 
- [YANG schema registry](#) supporting YANG features
- [NetGauze](#) supporting
  - netconf <get> to obtain YANG library content,
  - YANG validation for YANG-Push notifications,
  - YANG schema registration.

# Thanks to...

- Paolo Lucente – Pmacct
- Maxence Younsi – INSA Lyon
- Reshad Rahman - Equinix
- Rob Wilton – Cisco
- Dan Voyer – Cisco
- Holger Keller – DT
- Nils Warnke – DT
- Benoit Claise - Everything OPS SRL
- Yannick Buchs – Swisscom
- Ahmed Elhassany – Swisscom
- Thomas Graf – Swisscom



**Want to know more than join us at...**

- NMOP on **Monday 14:30-16:30** at Viger for Message Broker, Telemetry Message and Message Key.
- NMOP on **Wednesday 14:30 – 15:30** at Agora for more on Telemetry Message integration and validation.
- NETMOD on **Friday 09:30 – 11:00** at Van Horne for more on YANG anydata validation.