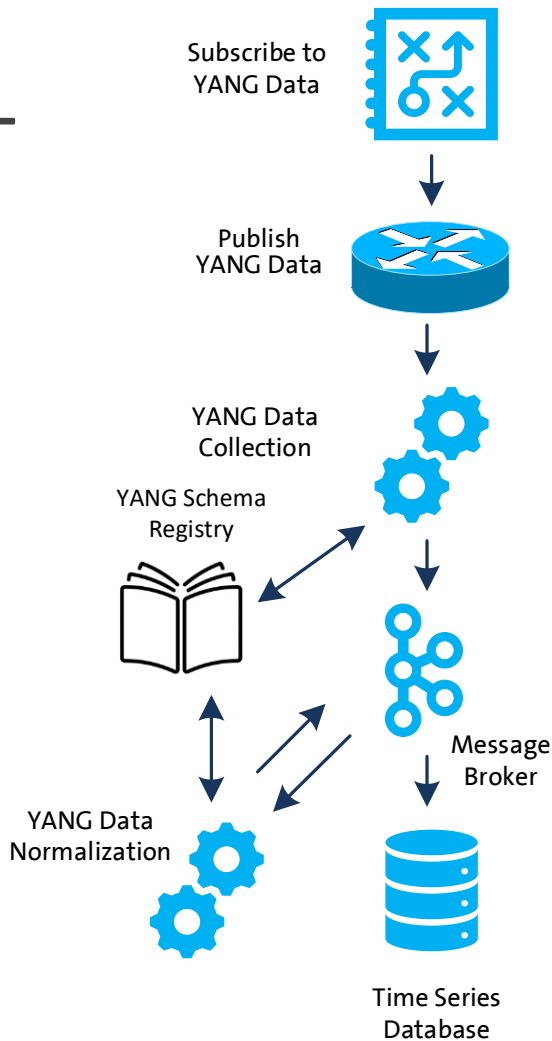


# Validate Configured Subscription YANG-Push Publisher Implementations

IETF 123 Hackathon, July 19-20th 2025



# Hackathon Plan, Software and Website

## Test Plan

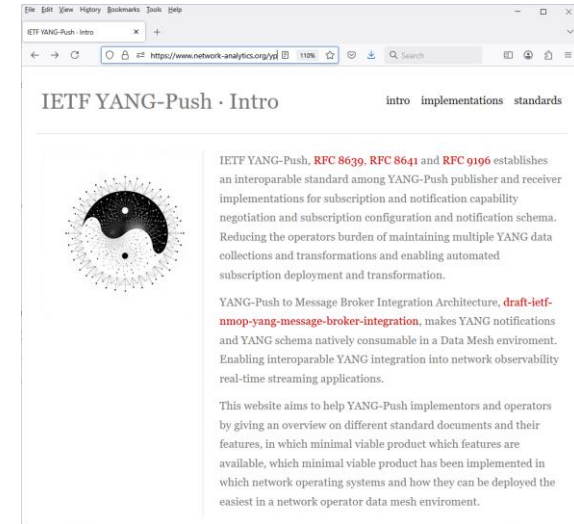
- **Subscription automation**
  - Discover YANG-Push systems and notifications capabilities and configure periodical and on-change subscriptions with netconf.
- **Notification integration**
  - Validate subscription state change and push-update and push-change-update notifications against schema with yanglint
  - Validate [draft-ietf-nmop-message-broker-telemetry-message](#) for [draft-ietf-nmop-yang-message-broker-integration](#) integration

## Development Plan

- MVP 1 – Basic Requirements (9)
- MVP 2 – Scale and Secure (3)
- MVP 3 – Optimizations (2)

## 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
- udp-notif dissector - Wireshark



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

# Hackathon – Repositories


## 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


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

## Test Tool Repository

- [https://github.com/network-analytics/yp\\_test](https://github.com/network-analytics/yp_test)
  - YANG-Push Test Automation Tool
  - Vendor deviations configuration

 ahassany Update readme ✓		
.github/workflows	add back con	
yang-cbor-schema-serde	Use proper st	
yang-cbor-schema-serializer	Use proper st	
yang-json-schema-serde	Use proper st	
yang-json-schema-serializer	Use proper st	
yang-schema-registry-plugin	Use proper st	
.gitignore	Add YANG Ct	
LICENSE	Use apache li	
README.md	Update readme	2 months ago
pom.xml	Use proper semver version 0.0.3	2 months ago

 ybugit Merge pull request #1 from network-analytics/push_to_net... df3b55f · 1 hour ago		
config	push_code	1 hour ago
tests	push_code	1 hour ago
utils	push_code	1 hour ago
vendors	push_code	1 hour ago
LICENSE	Initial commit	yesterday
cli.py	push_code	1 hour ago
device.py	push_code	1 hour ago
main.py	push_code	1 hour ago
readme.md	push_code	1 hour ago
requirements.txt	push_code	1 hour ago
results.py	push_code	1 hour ago
runner.py	push_code	1 hour ago
tee.py	push_code	1 hour ago

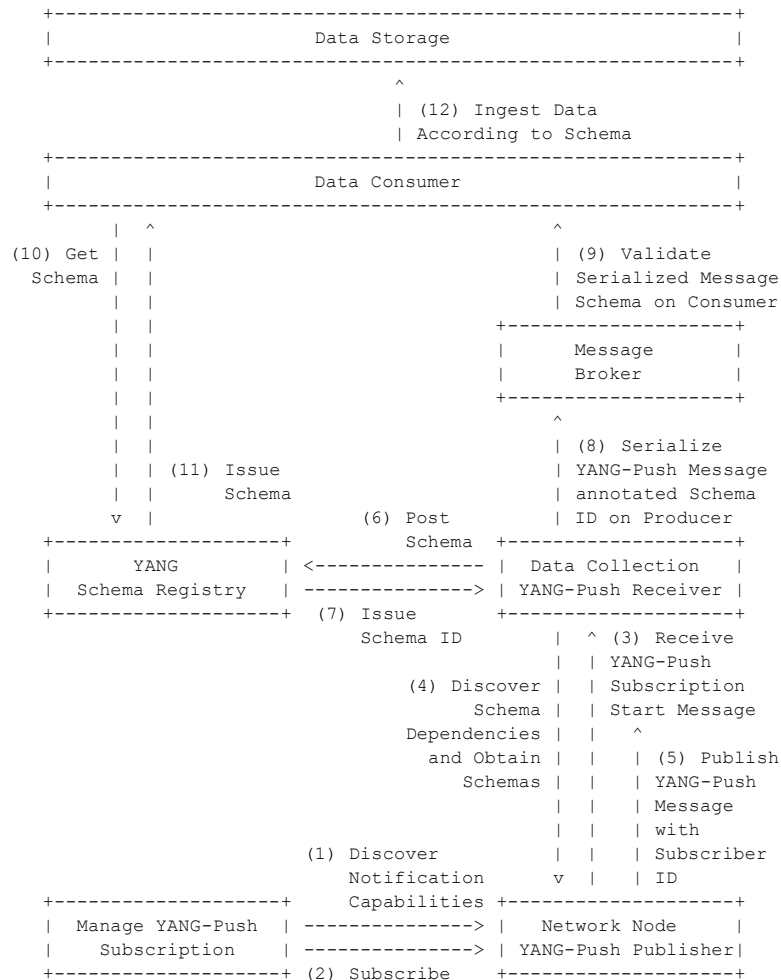
## Apache Kafka Integration

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

# An Architecture for YANG-Push to Message Broker Integration

draft-ietf-nmop-yang-message-broker-integration  
draft-ietf-nmop-message-broker-telemetry-message

- 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](#)
- Encoding of Data Modeled with YANG in the CBOR  
[RFC 9254](#)



# Register new YANG schema - Payload

The same rest API as other formats such as AVRO, JSON, and ProtoBuf is used to register new YANG schemas.

```
{  
  "schemaType": "YANG",  
  "references": [  
    {  
      "name": "other-module-name",  
      "subject": "registered subject name",  
      "version": "registered version",  
    }  
  ],  
  "schema": "... yang schema text"  
}
```

**my-module-request.json**

```
curl -X POST \  
  -H "Content-Type: application/vnd.schemaregistry.v1+json"  
  -d @my-module-request.json \  
  http://localhost:8081/subjects/my-module/versions
```

# Retrieve new YANG schema

- Retrieve all registered schemas  
curl <http://localhost:8081/subjects/>
- Retrieve all registered version of a given subject  
curl <http://localhost:8081/subjects/my-module>
- Retrieve a specific version of a schema registry  
curl <http://localhost:8081/subjects/my-module/versions/1>
- Retrieve a schema by ID  
<http://localhost:8081/schemas/ids/1>

```
{  
  "schemaType": "YANG",  
  "subject": "my-module",  
  "version": 1,  
  "id": 1,  
  "references": [  
    {  
      "name": "other-module-name",  
      "subject": "registered subject name",  
      "version": "registered version",  
    }  
  ],  
  "schema": "... yang schema text"  
}
```

Result of getting schema from schema registry

# Apache Kafka wire format

- Data is encoded in native YANG format (json, cbor, xml).
- Schema ID is included in the header.
- Content type is encoded in the header using the standard allocated in IANA (RFC8040 and RFC9254)

```
{  
  "headers": [  
    "schema-id": 1, // schema id registered  
    "content-type": "application/yang-data+json"  
  ]  
  "payload": ..json encoded YANG,  
}
```

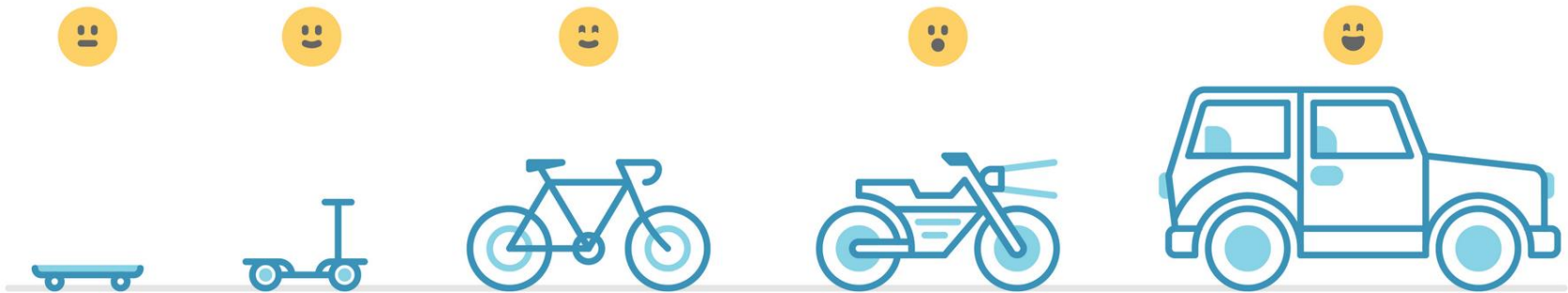
**Apache Kafka message value and headers**

# Thanks to...

- Rob Wilton – Cisco
- Nick Corran – Cisco (remote)
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- Jiale Li – Huawei (remote)
- Jian Ping– Huawei (remote)
- Xiao Chen– Huawei (remote)
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- Nils Warnke - DT
- Alex Huang-Feng – INSA Lyon
- Yannick Buchs – Swisscom (remote)
- Thomas Graf – Swisscom







Today, subscribing to a YANG datastore, publishing a YANG modeled notifications message from the network and viewing the data in a time series database, **manual labor is needed to perform data transformation** to make a message broker and its data processing components with YANG notifications interoperable.

# State of the Union

From data **mess** to data **mesh**