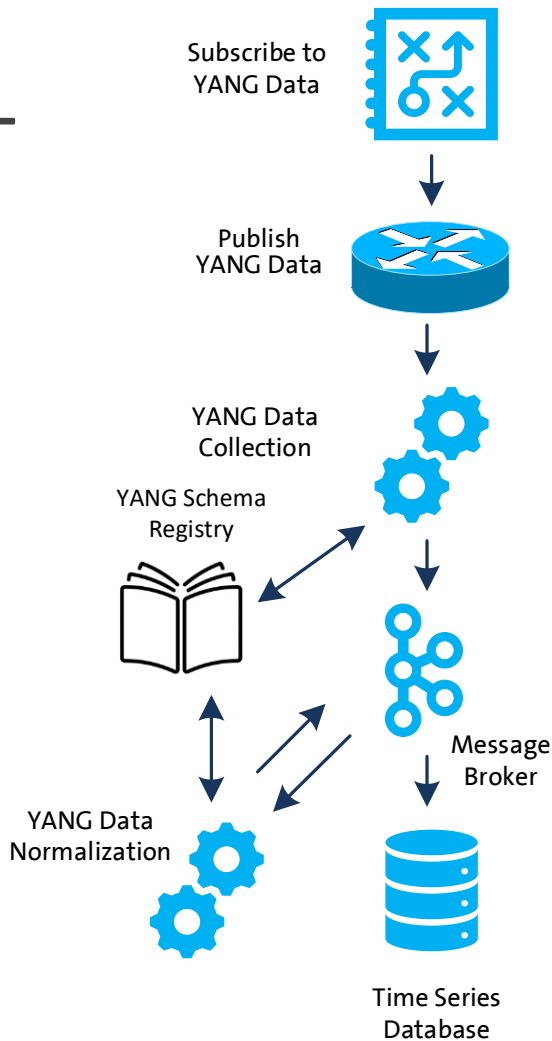


Validate Configured Subscription YANG-Push Publisher Implementations

IETF 123 Hackathon, July 19-20th 2025



Hackathon Plan, Software and Website

Test Plan

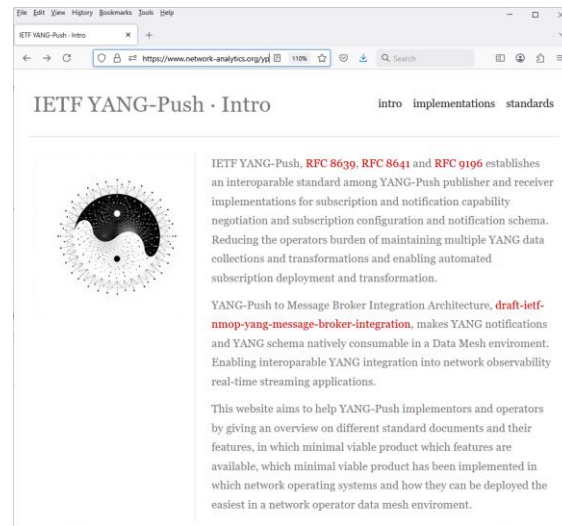
- **Subscription automation**
 - Discover YANG-Push systems and notifications capabilities and configure periodical and on-change subscriptions with netconf.
- **Notification integration**
 - Validate subscription state change and push-update and push-change-update notifications against schema with yanglint
 - 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
 - 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

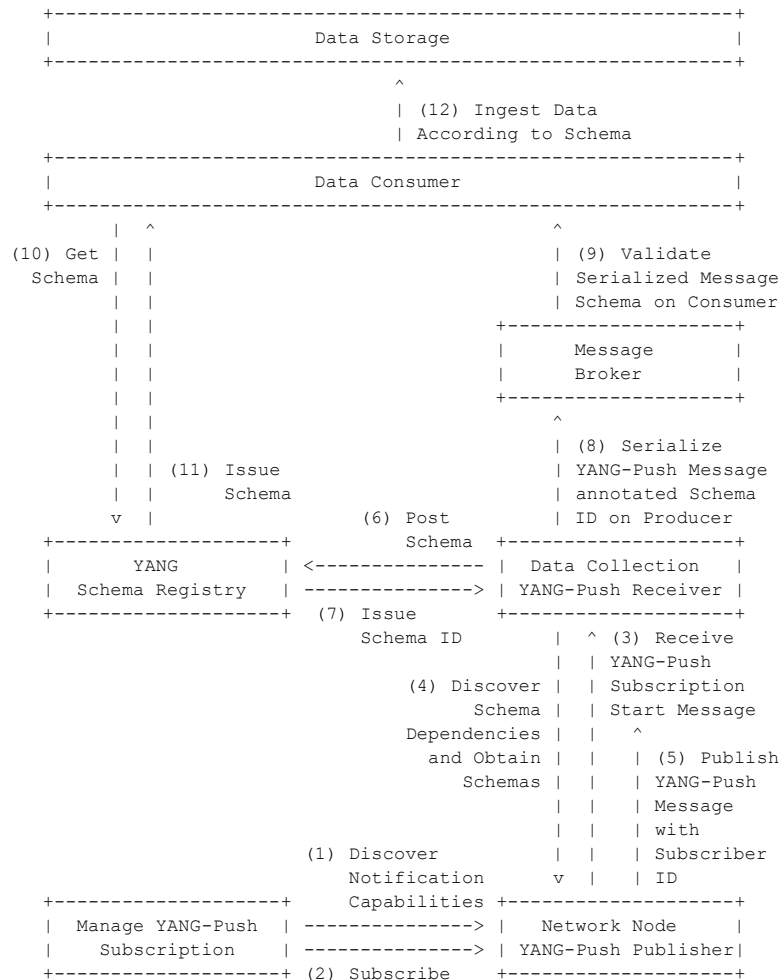
Apache Kafka Integration

- <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

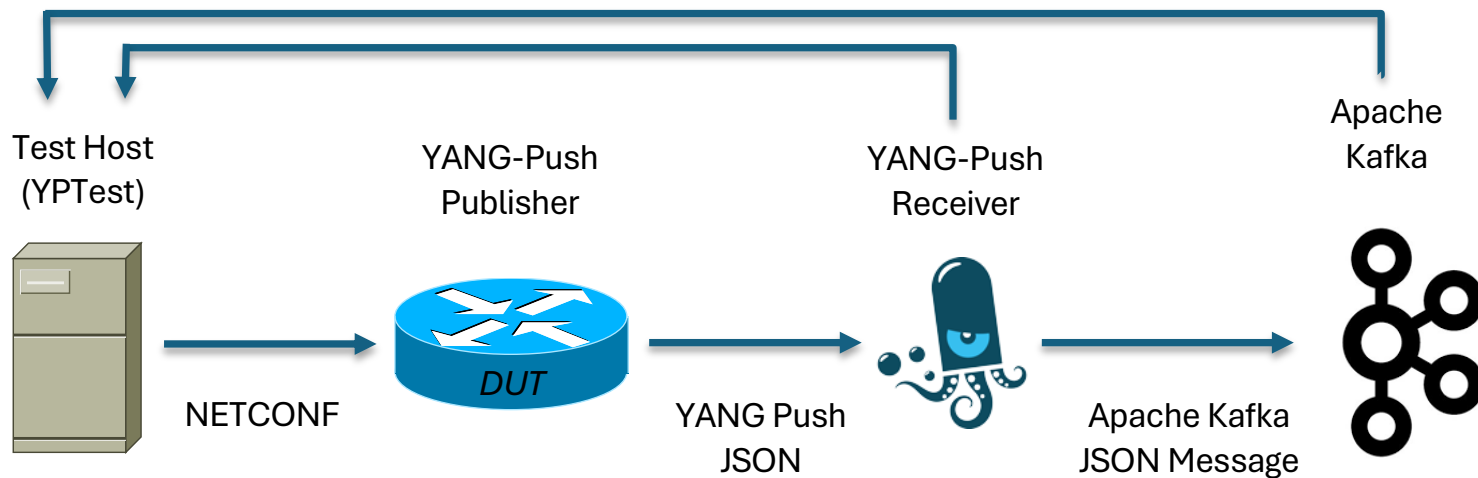
Apache Kafka wire format

- Data is encoded in native YANG format (json, cbor).
- Schema ID is included in the header.
- Content type is encoded in the header using the standard allocated in IANA ([RFC 8040](#) and [RFC 9254](#))

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

Apache Kafka message value and headers

YANG-Push Test Setup



YANG-Push Test Automation Tool – Usage 1

```
python3 main.py --config config/yp_test_config.yml --vendor cisco_iosxr --help
usage: yp_test [-h] --vendor {6wind,cisco_iosxr,huawei_vrp_ne} -c CONFIG [-u RECEIVER_USERNAME] [-i
RECEIVER_INSTANCE_NAME] [--subscriptions] [--all] [--override_timer OVERRIDE_TIMER] [-v] [-vv]
               [--tests TESTS [TESTS ...]] [--list-tests]
```

YANG Push Test Suite (modular, multivendor version)

optional arguments:

```
-h, --help            show this help message and exit
--vendor {6wind,cisco_iosxr,huawei_vrp_ne}
                        Vendor name (choices: 6wind, cisco_iosxr, huawei_vrp_ne)
-c CONFIG, --config CONFIG
                        YAML config file
-u RECEIVER_USERNAME, --receiver-username RECEIVER_USERNAME
                        user used for SSH connection (overrides config file)
-i RECEIVER_INSTANCE_NAME, --receiver-instance-name RECEIVER_INSTANCE_NAME
                        YANG-Push receiver-instance-name (overrides config file)
--subscriptions
--all
--override_timer OVERRIDE_TIMER
-v, --verbose
-vv, --very_verbose
--tests TESTS [TESTS ...]
                        Select one or more tests or test sequences to run in order. Use --list-tests to see the choices.
--list-tests          List all available tests and sequences, then exit.
```

enjoy

YANG-Push Test Automation Tool – Usage 2

```
python3 main.py --config config/yp_test_config.yml --vendor cisco_iosxr --list-tests
```

Available tests:

```
yangpush_delete_subscriptions
yangpush_delete_receivers
netconf_get_discover_yang
netconf_get_ietf_notification_capabilities
netconf_get_ietf_system_version
netconf_get_ietf_yang_library_augmentedby
netconf_get_system_capabilities
netconf_get_yang_library
netconf_get_schema_ietf_notification_transport_capabilities
netconf_get_schema_ietf_udp_notif_transport
netconf_get_schema_ietf_yang_library_augmentedby
netconf_get_schema_ietf_yang_push
netconf_get_schema_ietf_yang_push_revision
netconf_get_schema_ietf_yp_notification
netconf_get_schema_ietf_yp_observation
netconf_get_schema_ietf_yp_transport_capabilities
netconf_get_schema_ietf_system_capabilities_yang
yangpush_add_receiver
yangpush_ietf_interface
yangpush_vendor_interface
netconf_get_schema_ietf_interfaces_yang
yangpush_get_subscriptions
yangpush_post_test_cleanup
```

Available test sequences:

YANG-Push Test Automation Tool – Usage 3

```
python3 main.py --config config/yp_test_config.yml --vendor cisco_iosxr --tests netconf_get_discover_yang
netconf_get_ietf_system_version
```

```
+-----+
| Running tests for vendor: cisco_iosxr and hostname: 203.0.113.91 |
+-----+
...Excmpted for brevty...
```

```
=====
=== Test Results:
```

Test	Status	Duration	Error
netconf_get_discover_yang	PASS	1.36s	
netconf_get_ietf_system_version	FAIL	0.02s	Received empty response for get-ietf-sys...

```
Selected test sequences: []
```

```
Results saved in ./results/ipf-zbl1327-r-daisy-91_cisco_iosxr_20250627_201714
```

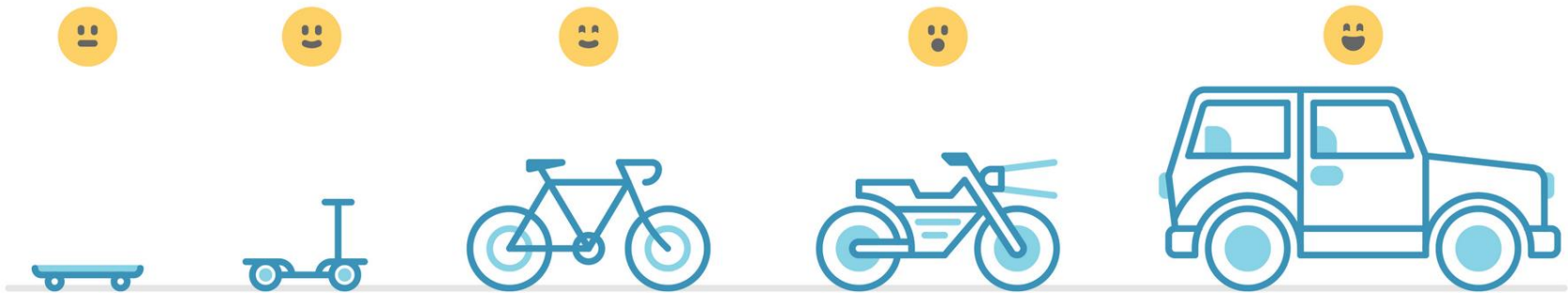
```
Results directory tree:
```

```
ipf-zbl1327-r-daisy-91_cisco_iosxr_20250627_201714/
  stdout.log
  yp_config_backup.xml
  get-discover-yang.txt
  yp_test.log
```

Thanks to...

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- Ahmed Elhassany - Swisscom
- 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**