YANG Message Keys for Message Broker Integration

draft-ietf-nmop-yang-message-broker-message-key-01

A mechanism to define a unique message key for a
YANG to message broker integration and a topic addressing scheme
based on YANG-Push subscription type and a YANG index

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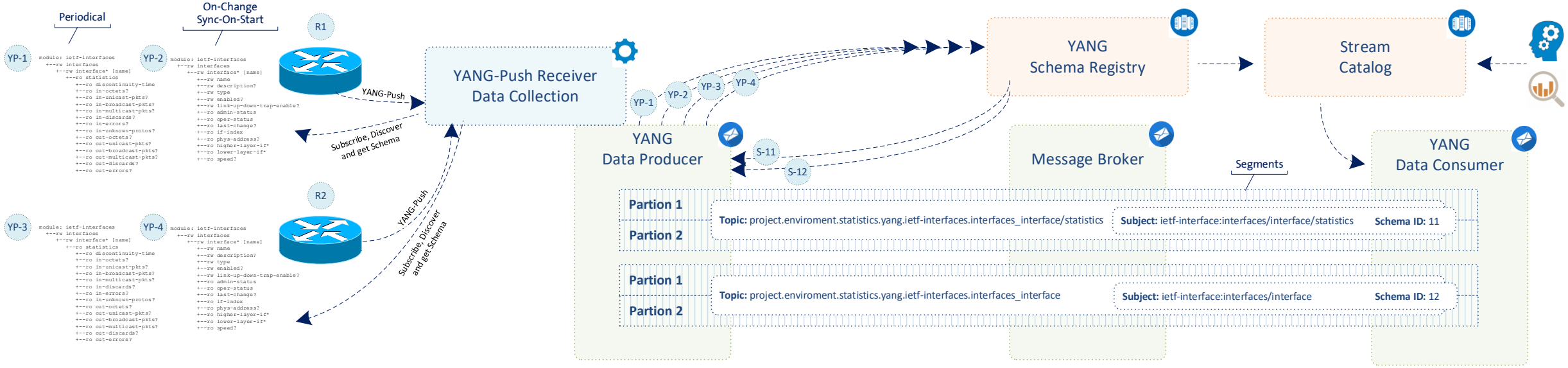
We aim for a fully YANG aware Data Pipeline

From network nodes to message broker nodes



- **At the YANG data producer,** thanks to the YANG awareness to the YANG data producer and the YANG schema registry, **for each unique YANG schema tree a message broker topic and subject is being created, and messages are being indexed and hashed according to the message key**.
- **At the message broker,** thanks to the dedicated topic per YANG schema and its message key, **YANG state metrics can be compacted to the latest state; reducing the number of stored messages.**
- **At the YANG data consumer,** thanks to the YANG awareness of the stream catalog and consumer, a specific topic, partition and subject can be consumed for the interested YANG metrics; **reducing the number of messages to be consumed.**

Message Broker Integration

Document Relationships

These are the documents related to the Message Broker integration:

- draft-ietf-nmop-yang-message-broker-integration defines the YANG-Push to message broker integration architecture.
- draft-ietf-nmop-message-broker-telemetry-message defines the message schema being used between YANG data producer and consumer.
- **Adopted:** draft-ietf-nmop-yang-message-broker-message-key defines how YANG-Push metrics can be indexed and addressed efficiently and therefore reduce the number of consumed messages and reduce the number of stored metrics with topic compaction.
- **New:** draft-netana-nmop-message-broker-bmp-telemetry-msg defines the message schema extensions for BMP transformation and how message keys and topic names are derived.

At the IETF 124 NMOP session we introduced the working group to the differences between topics, partitions, subjects, segments, messages and message keys and how the apply to topic naming and compaction and how YANG-Push capabilities and YANG catalogs facilitate YANG metrics subscription in the network and data mesh.

Covering the following Use Cases

From network engineer to network controller to network management

A network engineer performs a SQL query on a set of message broker topics to obtain the current state and statistics of a given network dimension to verify a maintenance window or perform troubleshooting instead of logging into each network node to perform a show command.

A network controller performs a SQL query on a set of message broker topics to obtain the current state and statistics of a given network dimension to verify before and after the SRv6 traffic engineering configuration change instead of obtaining the metrics from the network. See: Section 3.8 of draft-ietf-nmop-simap-concept.

A network management or network anomaly detection system

- Obtains the current YANG management plane state metrics from project.enviroment.states.yang.* for building a network inventory model and its state See: Section 3.2 from draft-ietf-nmop-simap-concept.
- From project.enviroment.statistis.yang.* it obtains statistics and maps them to the previously obtained network inventory model.

Status and Next Steps

Working Group Adoption Feedback, Proof of Concept, Implementation

Working group adoption call concluded successfully. Many thanks for the support on the mailing list and especially to Olga Havel, Rob Wilton and Michael Mackey for their reviews.

We started to address the reviews as following:

- Added YANG Schema ID, YANG Schema Registry, YANG Data Consumer and YANG data node as terms.
- Removed the RFC 9254 dependency on YANG schema identifiers
- Removed the definition of YANG index and the requirement that the YANG module name or prefix needs to be used for generating the message key since the topic addressing already takes care of global uniqueness.
- The "absolute-schema-nodeid" Section 6.5 of RFC 7950 with the hostname and the name of the datastore is therefore enough.
- **Changed from module name to prefix for the topic name** to reduce the length of the topic name. We believe that the content of the topic should be deducted from the subject, the semantics of the YANG schema. **What is the opinion from the working group?**

Maxence Younsi volunteered to implement a message key and topic name proof of concept at IETF 125 hackathon. Many thanks! See next presentation.

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