

Hackathon Results

NMOP
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YANG Message Keys for Message Broker Integration
draft-ietf-nmop-yang-message-broker-message-key-02

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Goal of the draft

using a yang-push-subscription contained in an ietf-telemetry-message

map the yang subscription type and subscription filter to

- a unique broker topic name
- a broker message key

Current document proposal: Broker Topic Naming

- take the xpath-filter $\Rightarrow$ `/ietf-interface:interfaces/interface[type='ethernetCsdmacd']`
- find the absolute-schema-nodeid $\Rightarrow$ `interfaces/interface`
- replace “/” by “_” $\Rightarrow$ `interfaces_interface`
- prepend the `project`, `environment`, `subscription type`, “yang”, and `module prefix`

`netana.prod.statistics.yang.if.interfaces_interface`

Current document proposal: Broker Message Keying

- take the xpath-filter $\Rightarrow$ `/ietf-interface:interfaces/interface[type='ethernetCsmacd']`
- find the absolute-schema-nodeid $\Rightarrow$ `interfaces/interface`
- if node is list, append the list key identifier $\Rightarrow$ `interfaces/interface/name`
- append the key value $\Rightarrow$ `interfaces/interface/name/eth0`

List of issues found

- [1] broker topic naming restrictions*
- [2] subtree-filter issues*
- [3] key format is not fully defined*
- [4] key derivation for lists is underspecified*
- [5] xpath is more expressive than just a simple path*
- [6] topic derivation with module prefixes in xpath
- [7] key derivation with xpath attribute select “@”
- [8] no mention of yang module revisions and features
- [9] yang module prefix overrides

Github issues references:

- [1] <https://github.com/network-analytics/draft-netana-nmop-yang-message-broker-message-key/issues/13>
<https://github.com/network-analytics/draft-netana-nmop-yang-message-broker-message-key/issues/2>
- [2] <https://github.com/network-analytics/draft-netana-nmop-yang-message-broker-message-key/issues/14>
<https://github.com/network-analytics/draft-netana-nmop-yang-message-broker-message-key/issues/8>
- [3] <https://github.com/network-analytics/draft-netana-nmop-yang-message-broker-message-key/issues/12>
- [4] <https://github.com/network-analytics/draft-netana-nmop-yang-message-broker-message-key/issues/11>
- [5] <https://github.com/network-analytics/draft-netana-nmop-yang-message-broker-message-key/issues/9>
- [6] <https://github.com/network-analytics/draft-netana-nmop-yang-message-broker-message-key/issues/12>

Issues found

[1] broker topic naming restrictions

- kafka:
 - Length of a topic string must be ≤ 249
 - `topic = *(ALPHA / DIGIT / "_" / "-" / ".")`
 - SHOULD NOT have both `_` and `.` in the topics
- yang identifier (rfc7950#section-14)
 - `identifier = (ALPHA / "_") *(ALPHA / DIGIT / "_" / "-" / ".")`
- safely mapping in the general case is impossible
- collision avoidance must be proposed
 - `/some/module` and `/some_module` map to the same topic name!

Issues found

[2] subtree-filter issues (@ahassany)

- topic name derivation is not specified for subtree-filter
- subtree-filter can return results with multiple roots, what is the absolute-node-id then?

Issues found

[3] message key format is not fully defined (@ahassany)

- should yang module prefix be included in the key?
- separator is not specified explicitly. implicitly it is “/”
- missing datastore in the key

Issues found

[4] key derivation for lists is underspecified (@ahassany)

- key format for lists in lists?
- key format for multi-key lists?
- key name sanitization

Issues found

[5] xpath is more expressive than just a simple path (@ahassany)

- union expressions
 - `//interfaces/interface | //routing/ribs`
- descent-or-self-axis
 - `//interface`
- filter predicates w/ functions
 - `interface[starts-with(name,'eth')]`
- compound predicates filtering non-key leaves
 - `interface[oper-status='up']`

Issues found

[6] topic derivation with module prefixes in xpath

- RFC7950#section-14
 - `absolute-schema-nodeid = 1*("/") node-identifier`
 - `node-identifier = [prefix ":" ] identifier`
- and some brokers (kafka) topics cannot contain “:”

Issues found

[7] key derivation with xpath attribute select “@”

- xpath allows /a/b[@name='some_name']
- behaviour is not specified here

Issues found

[8] no mention yang module revisions and features

- no mentions of the impact of the yang module version and features of a module on
 - broker topic name derivation
 - message key derivation

Issues found

[9] yang module prefix overrides

- on module import, the defined prefix of the imported module can be overridden
- rfc8497bis tells us not to, unless there are collisions
- needs to be discussed in the document

Conclusion

- a few gaps found
 - keys are usually just byte arrays $\Rightarrow$ fixable
 - topics name are usually restrictive $\Rightarrow$ hard issue
- potential solutions discussed
 - reducing the scope of features supported
 - support everything in xpath and subtree? or just a defined subset?
 - non-human readable topic names?
 - hashes or based on numerical schema tree ids?
- possible optimization
 - is absolute-schema-nodeid useful in the key?