Semantic Metadata Annotation for Network Anomaly Detection

draft-netana-nmop-network-anomaly-semantics-03

Helps to annotate operational data, refine outlier detection, supports supervised and semi-supervised machine learning development, enables data exchange among network operators, vendors and academia, and make anomalies for humans apprehensible

thomas.graf@swisscom.com
wanting.du@swisscom.com
alex.huang-feng@insa-lyon.fr
vincenzo.riccobene@huawei-partners.com
antonio.roberto@huawei.com

06. September 2024

Semantic Metadata Annotation for Network Anomaly Detection

draft-netana-nmop-network-anomaly-semantics

Goal: Enable the exchange of labelled dataset for network anomaly detection between operators, vendors and academia

```
module: ietf-symptom-semantic-metadata
  +--rw symptom* [event-id]
     +--rw id?                          yang:uuid
     +--rw event-id                     yang:uuid
     +--rw description?                 string
     +--rw start-time?                  yang:date-and-time
     +--rw end-time?                    yang:date-and-time
     +--rw confidence-score?            score
     +--rw concern-score?               score
     +--rw tags* [key]
     |  +--rw key      string
     |  +--rw value?   string
     +--rw (pattern)?
     |  +--:(drop)
     |  |  +--rw drop?                  empty
     |  +--:(spike)
     |  |  +--rw spike?                 empty
     |  +--:(mean-shift)
     |  |  +--rw mean-shift?            empty
     |  +--:(seasonality-shift)
     |  |  +--rw seasonality-shift?     empty
     |  +--:(trend)
     |  |  +--rw trend?                 empty
     |  +--:(other)
     |     +--rw other?                 string
     +--rw annotator* [name]
        +--rw (annotator-type)?
        |  +--:(human)
        |  |  +--rw human?          empty
        |  +--:(algorithm)
        |     +--rw algorithm?      empty
        +--rw name                  string
```

- **Symptom ID and description** uniquely identifies the detected symptom with its start and end time, how confident the system identified the anomaly and how concerned an operator should be.
- **Tags** describe the semantic metadata of the symptom).
- **Pattern** describes the identified pattern of the anomaly.
- **Annotator Name, Type,** describes wherever the anomaly was detected by a human or algorithm and uniquely identifies the entity who/which detected.

Semantic Metadata Annotation

Status, Summary and Next steps

Status

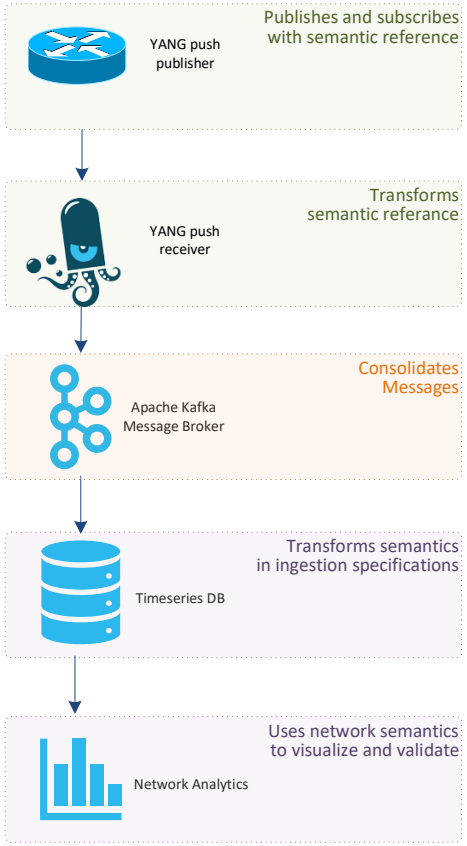
- Addressed comment from Reshad Rahman.

Summary

- Symptom is now a list instead of a container.
- ietf-interfaces-with-symptoms example only augments "/if:interfaces/if:interface" to be NMDA compliant.
- **Do you realize the benefit of having standardized semantic metadata annotation for Network Anomaly Detection and how it helps network operators, vendor and academia to collaborate?**
- **-> What are your thoughts and comments?**

Next Steps

- **-> We request NMOP working group adoption.**
- **-> Work on example implementation in IETF 121 hackathon.**



thomas.graf@swisscom.com
wanting.du@swisscom.com
alex.huang-feng@insa-lyon.fr
vincenzo.riccobene@huawei-partners.com
antonio.roberto@huawei.com

06. September 2024