YANG-based Time Series Telemetry

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Really Nice Graphs
- What is included?
- Traceability?
- Measurement Units?
- Precision?

Compare numbers and graphs?
Between systems? Vendors?
Use as input for decisions?
Philatelist Framework

**PROVIDER**
- Let's not implement Yet-Another-
- Scattered Sensors already abundant
- Pointers and Metadata

**COLLECTOR**
- Collect from all kinds of sources
- Add YANG + Metadata as needed

**AGGREGATOR**
- Transform and aggregate data flows
- Deliver TSDB buckets with traceable, vendor agnostic, well defined data
Collectors

Input:
• YANG-modeled data
• Non-YANG data

Output:
• YANG-modeled data

Transport format:
• Whatever (gNMI, Redfish, YANG Push, RESTCONF, SNMP, ...)

DESTINATION

YANG-BASED PROVIDER
- sensor 1
- sensor 2
- sensor 3

NON-YANG PROVIDER
- sensor 1
- sensor 4
- sensor 7

YANG

COLLECTOR

Stream 1
Stream 2
Stream 3
Aggregators

Input:
• YANG-modeled data

Output:
• YANG-modeled data

Transport format:
• TSDB tagged
  (see next slide)
YANG to Time Series Database Mapping

Original YANG Instance-Identifier:
/interfaces/interface[name='eth0']/statistics/in-unicast-pkts

• Metric: interfaces_interface_statistics_in_unicast_pkts
• Value: 5432100
• Labels:
  • host = router-01
  • interfaces_interface_name = eth0
YANG to Time Series Database Mapping

• A mapping of YANG-modelled data into label-set centric Time Series Databases
  • Convert NETCONF XML or RESTCONF JSON payload to store in TSDB
• All data automatically has a valid & deterministic TSDB representation
  • Otherwise, very common with custom, ad-hoc schemas written by hand
• Self-describing, so no strict reliance on YANG for visualizations
  • But extra metadata can be retrieved using YANG model
  • Dashboards and navigation can be built / organized with metadata from YANG model
    • Like show all temperature sensors on one dashboard, grouped by geography
Queries

• SP scale order of magnitude
  • Thousands large PE routers
  • Hundreds of thousands / millions CPE
  • Billions of metrics

• Programmatic queries of TSDB data

To retrieve incoming unicast packets for the interface eth0:

  *InfluxQL*: SELECT * FROM interfaces_interface_statistics_in_unicast_pkts WHERE interfaces_interface_name = 'eth0'

  *PromQL*: interfaces_interface_statistics_in_unicast_pkts{interfaces_interface_name="eth0"}

• Use YANG model as rich index to get overview of data
Thank you