

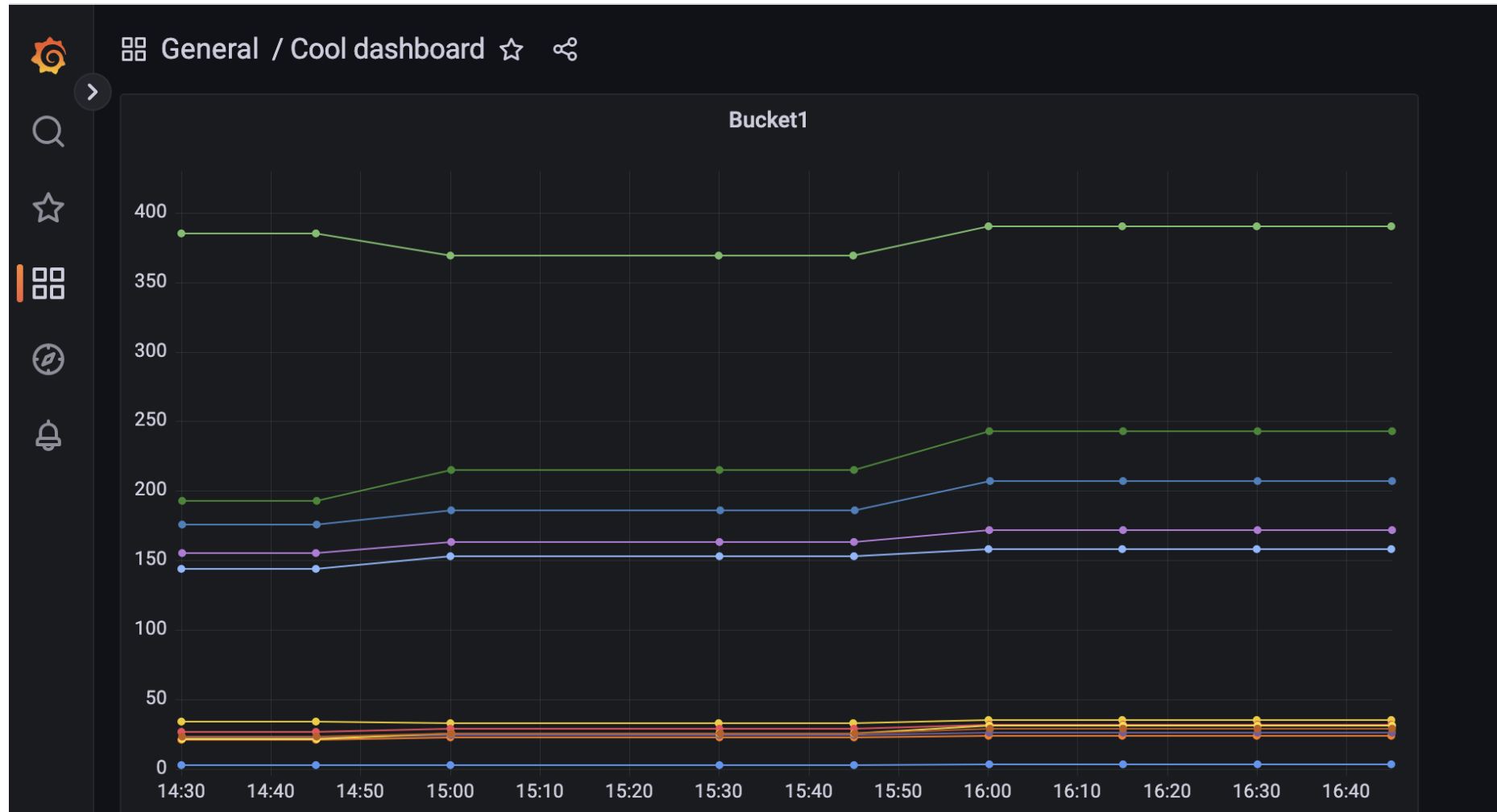
YANG-based Time Series Telemetry

Nov 2023, IETF 118

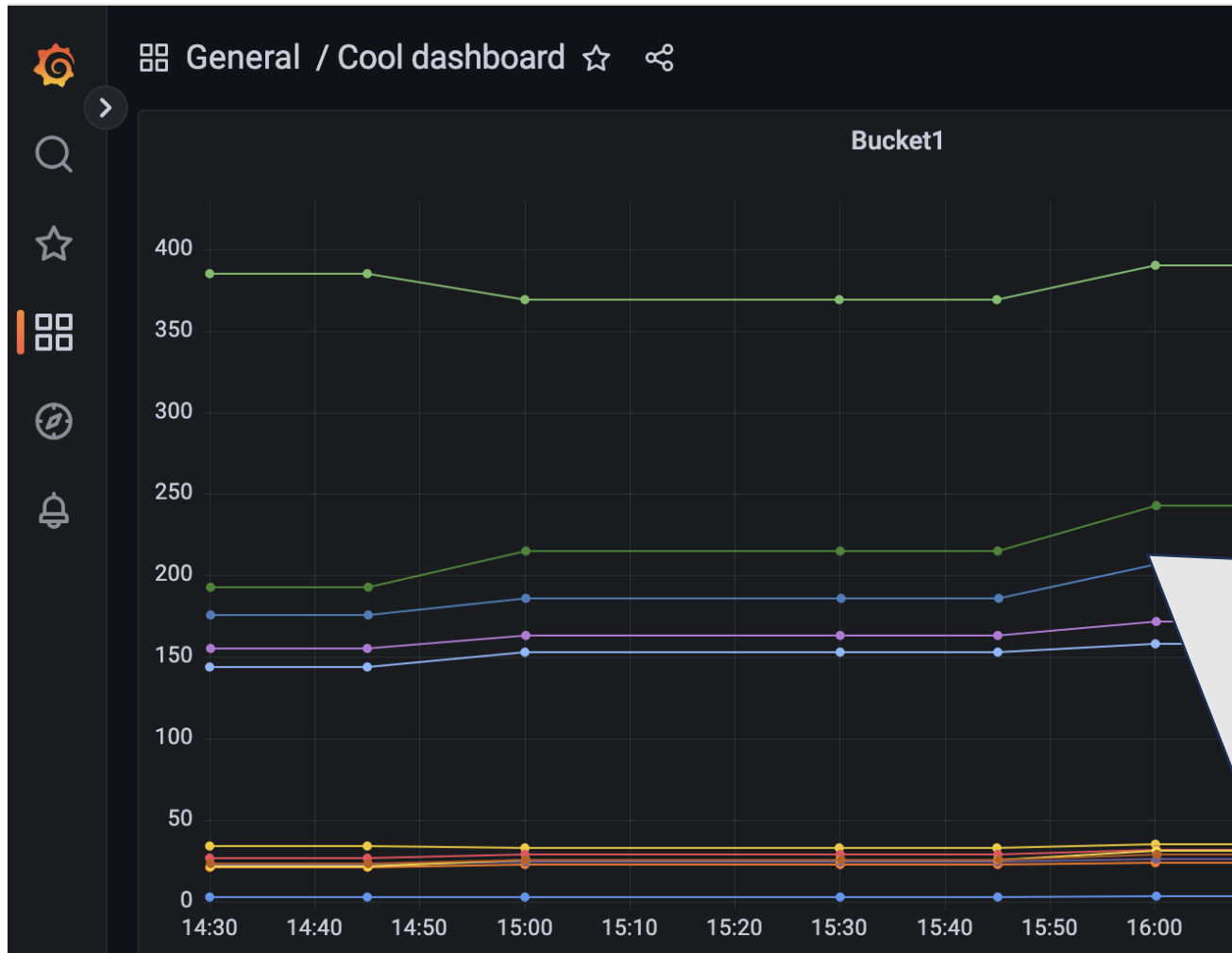
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YANG-based Time Series Telemetry



YANG-based Time Series Telemetry



? 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

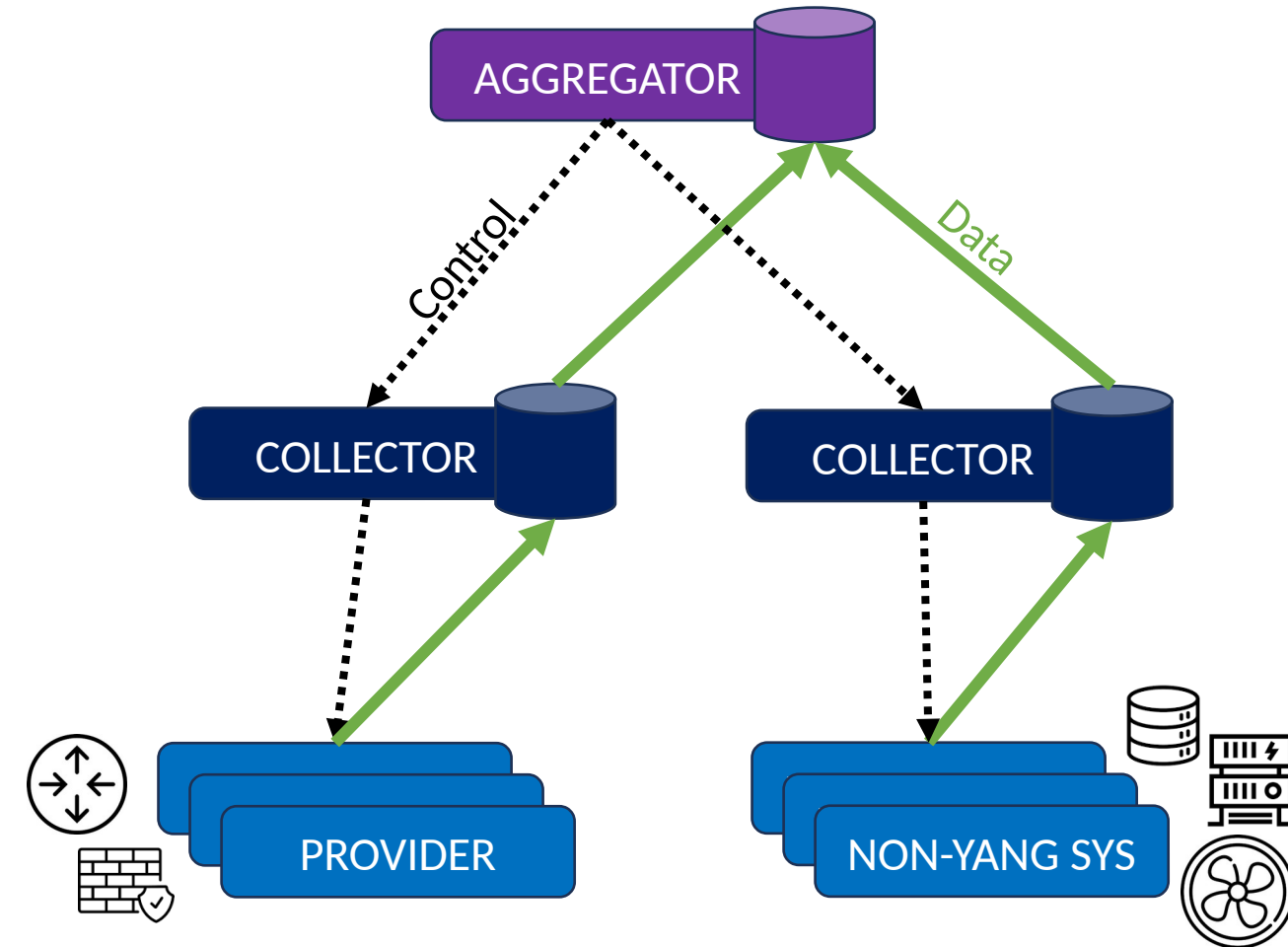
- Let's not implement Yet-Another-
- Scattered Sensors already abundant
- Pointers and Metadata

COLLECTOR

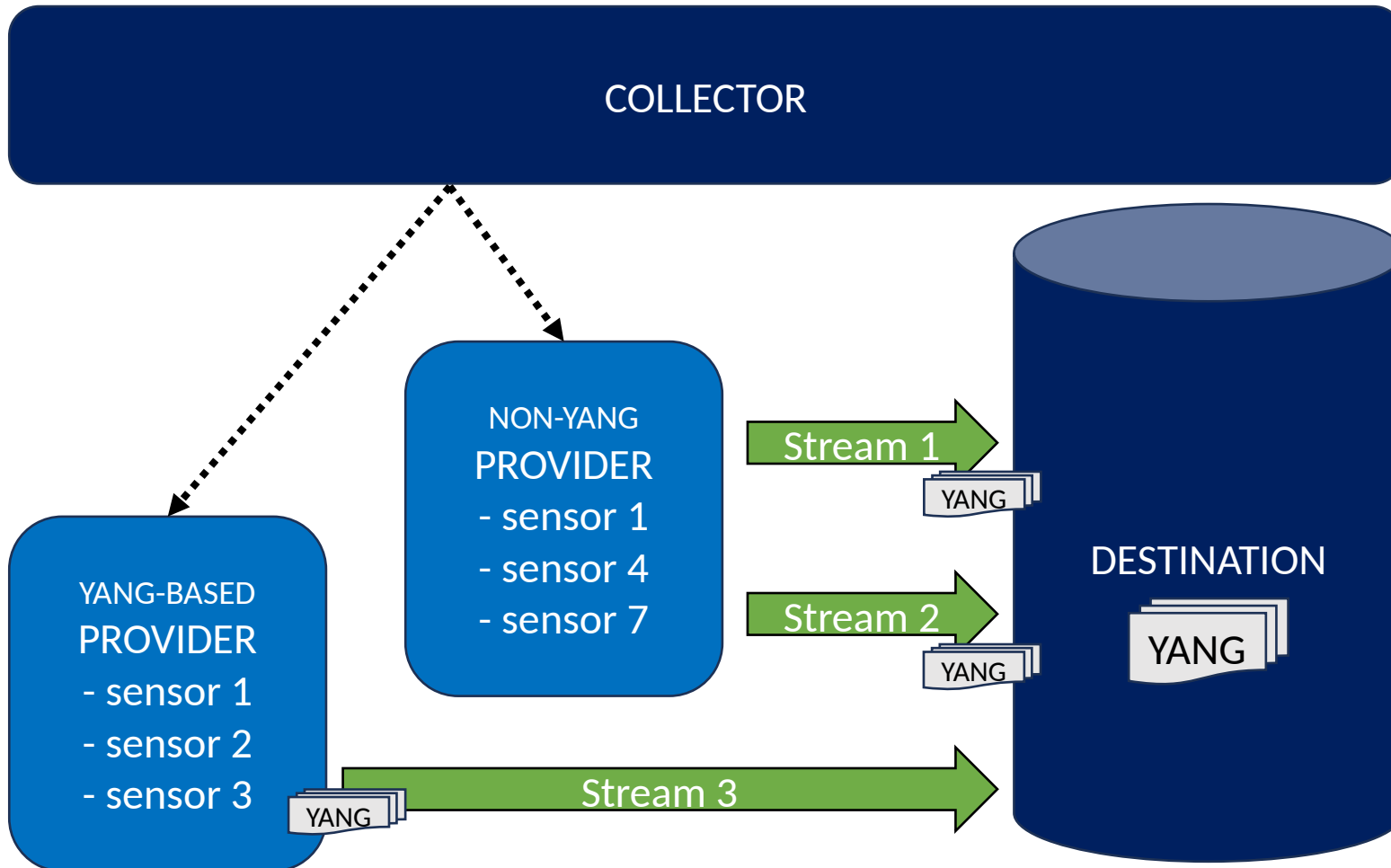
- Collect from all kinds of sources
- Add YANG + Metadata as needed

AGGREGATOR

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



Collectors



Input:

- YANG-modeled data
- Non-YANG data

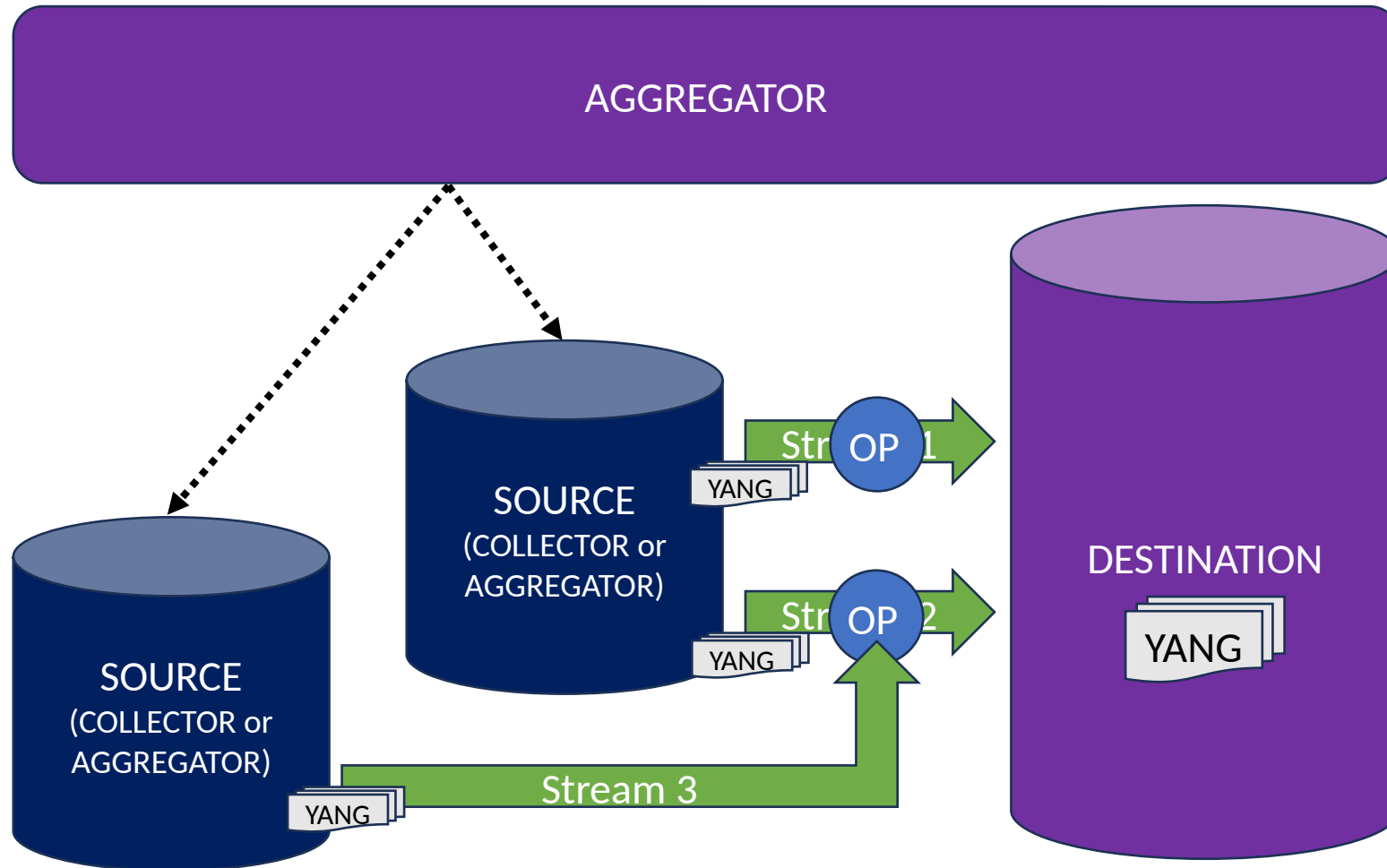
Output:

- YANG-modeled data

Transport format:

- Whatever (gNMI, Redfish, YANG Push, RESTCONF, SNMP, ...)

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