

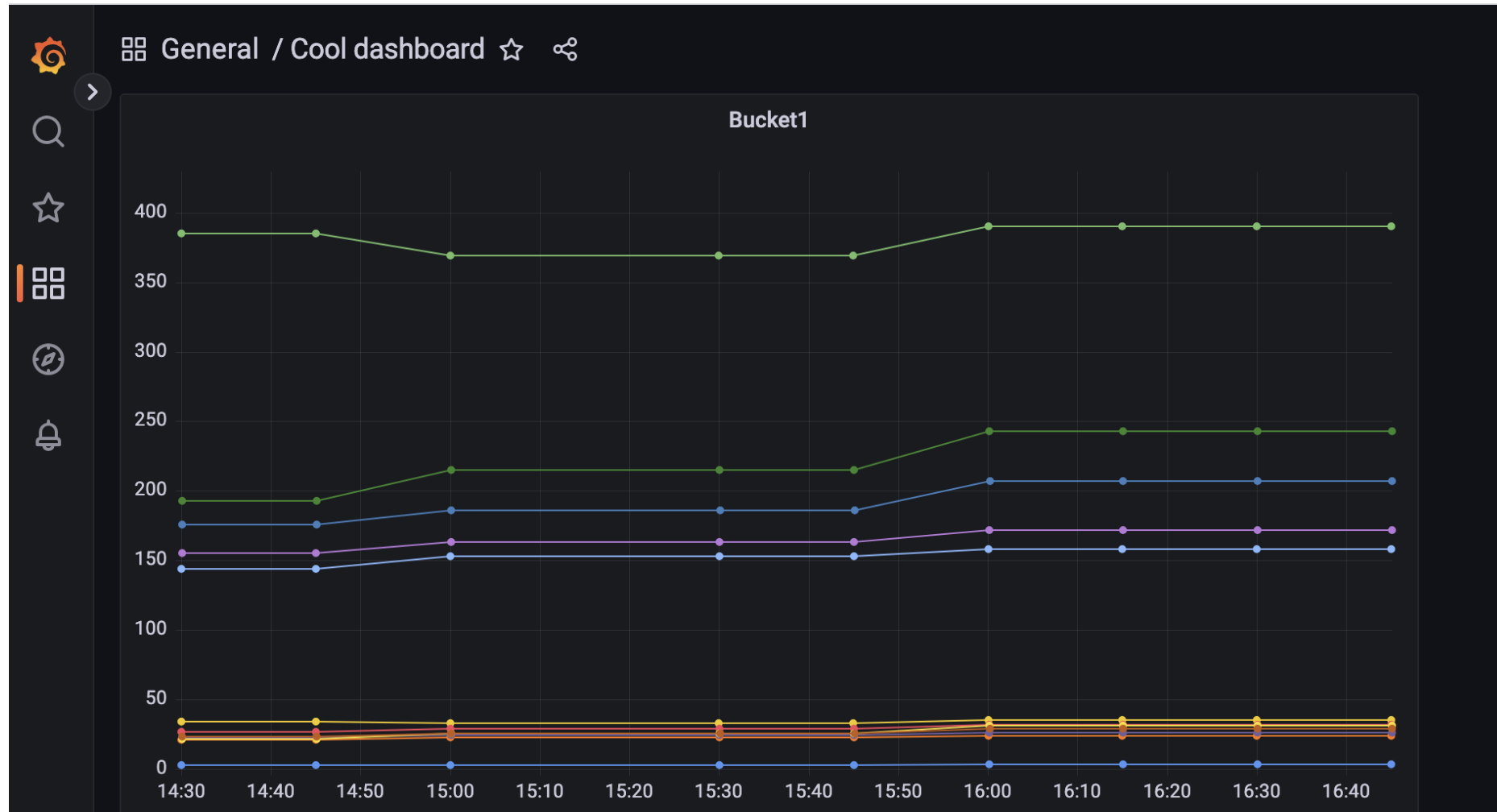
# YANG-based Time Series Telemetry

Nov 2023, IETF 118

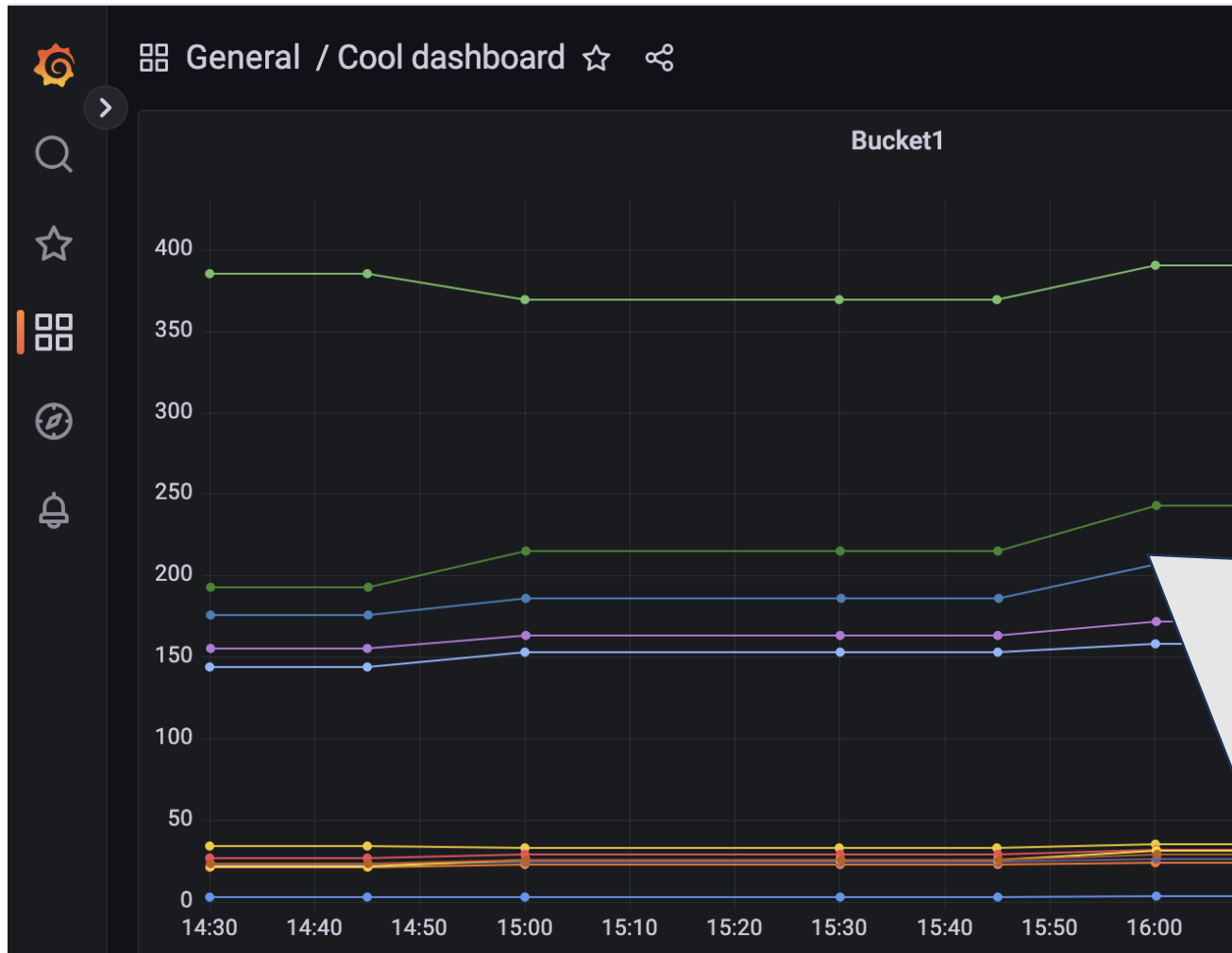
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# YANG-based Time Series Telemetry



# 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

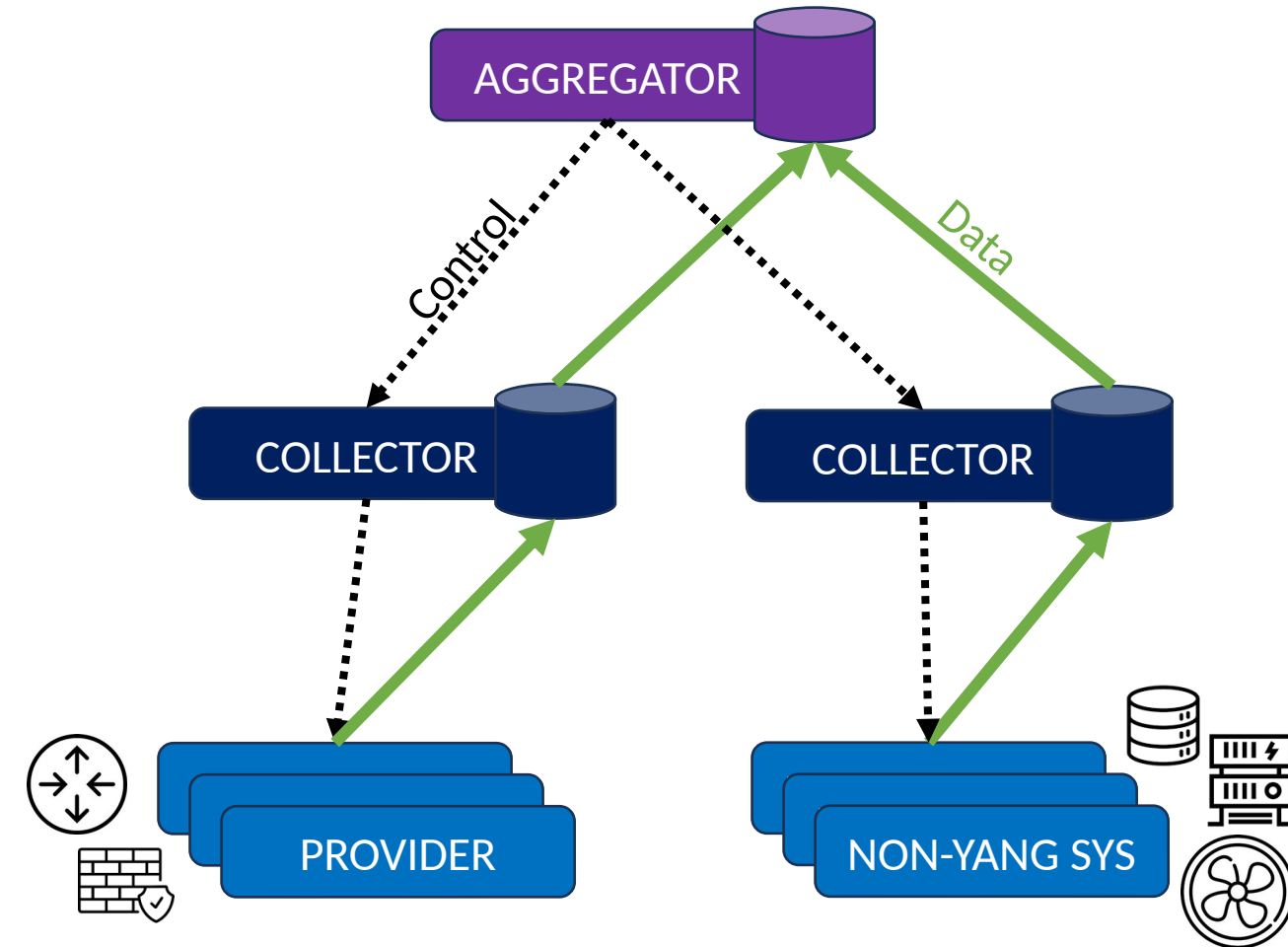
- Let's not implement Yet-Another-
- Scattered Sensors already abundant
- Pointers and Metadata

## COLLECTOR

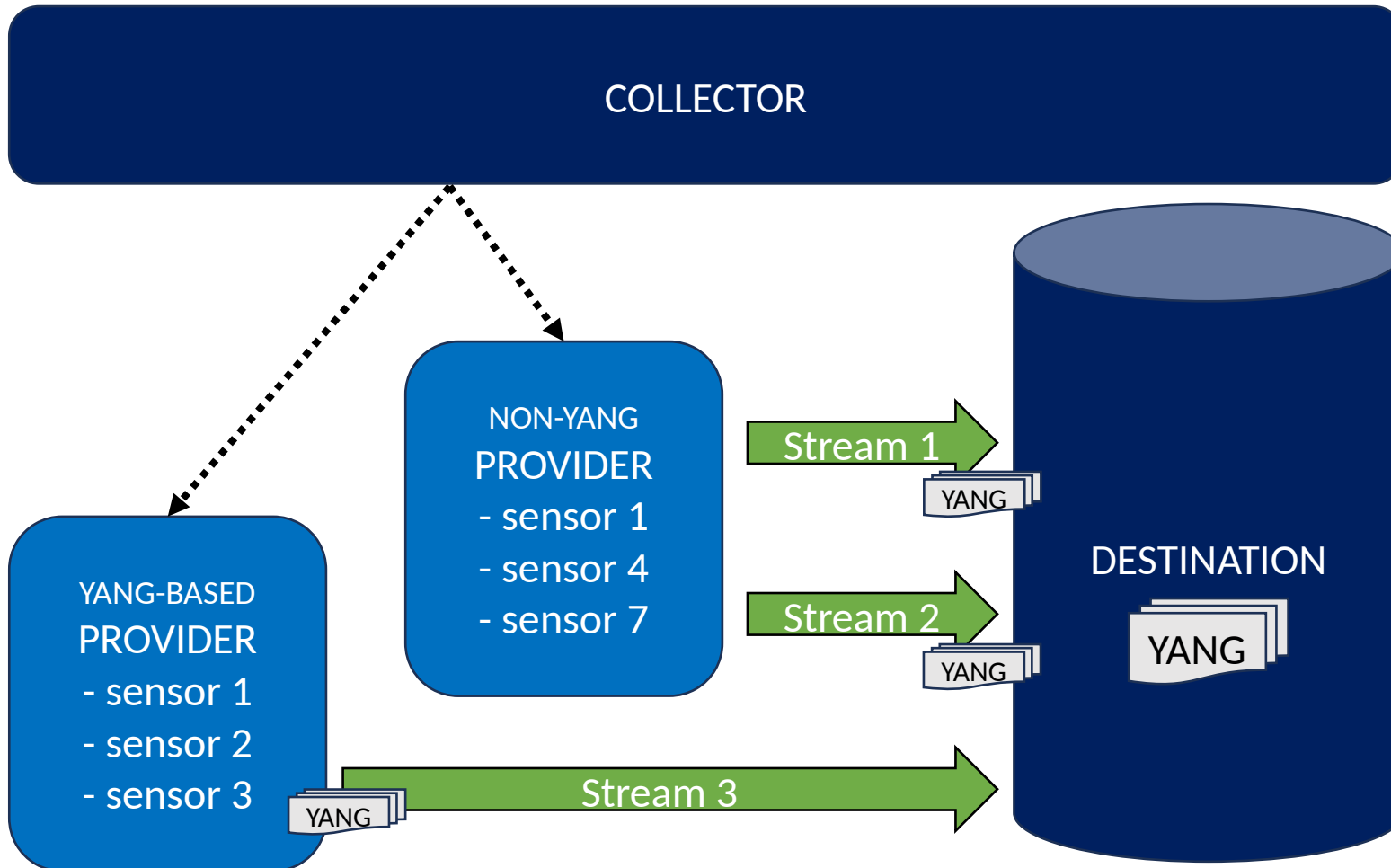
- Collect from all kinds of sources
- Add YANG + Metadata as needed

## AGGREGATOR

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



# Collectors



Input:

- YANG-modeled data
- Non-YANG data

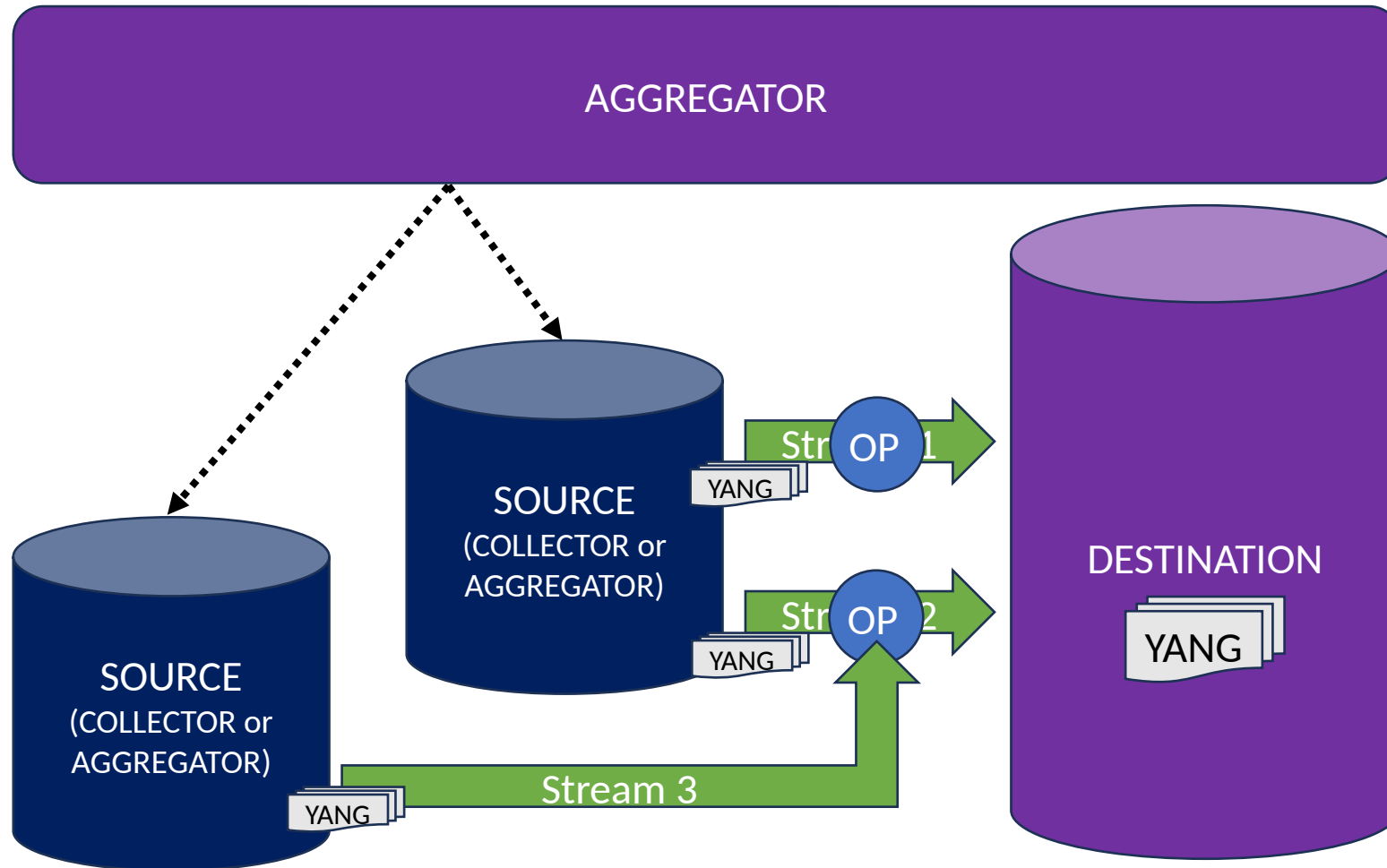
Output:

- 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