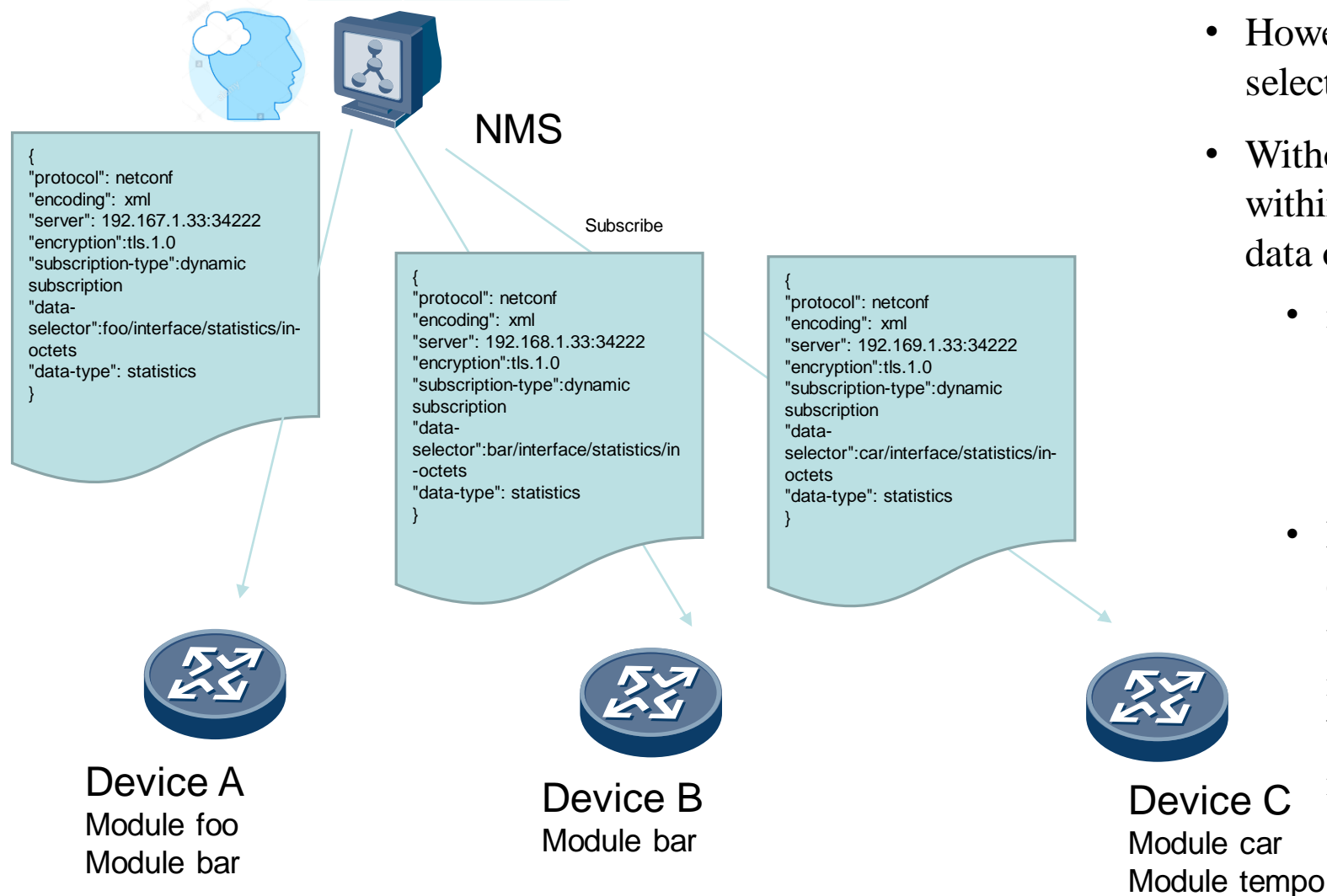# Hackathon Plan

- Self explanatory YANG data node telemetry tagging

- Project(s)

  ❑ Use YANG data node tag to filter different discrete categories of YANG data node within YANG modules supported by a device and provide consistent representation and reporting for the same category of YANG data nodes

- Specifications:

  ❑ draft-tao-netmod-module-node-tags-telemetry-00

  ❑ draft-tao-netconf-notification-node-tag-capabilities-00

HUAWEI

Challenging of monitoring operation state

Device Name	Data Model List
Device A	Foo,bar
Device B	bar
Device C	Car,tempo

NMS

{
"protocol": netconf
"encoding": xml
"server": 192.167.1.33:34222
"encryption":tls.1.0
"subscription-type":dynamic
subscription
"data-
selector":foo/interface/statistics/in-
octets
"data-type": statistics
}

Subscribe

{
"protocol": netconf
"encoding": xml
"server": 192.168.1.33:34222
"encryption":tls.1.0
"subscription-type":dynamic
subscription
"data-
selector":bar/interface/statistics/in
-octets
"data-type": statistics
}

{
"protocol": netconf
"encoding": xml
"server": 192.169.1.33:34222
"encryption":tls.1.0
"subscription-type":dynamic
subscription
"data-
selector":car/interface/statistics/in-
octets
"data-type": statistics
}

Device A
Module foo
Module bar

Device B
Module bar

Device C
Module car
Module tempo

- YANG PUSH telemetry provides a mechanism to select and subscribe to operational state data objects based on selection filter [RFC8341].

- However there is no document to discuss how selection filter is specified.

- Without self-explanation information on data node within the data model or device indicating which data object can be collected,
  - it is hard for NETCONF clients to automatically select which data objects are of interest,
    - e.g., extract feature from management data objects such as performance metric

- Management object collection grows exponentially with rate of 10~50 times faster than before, filtering 99% raw data deemed as noise data or not useful data wastes network bandwidth between the management system and managed device;

Self Explanation Data Node Tag Example

Device Name	telemetry data node	xpath	Self-explanation tag	Statistics operation
Device A	Node A	foo/A	Performance metric	min
Device A	Node C	foo/C	Performance metric	average
Device B	Node E	bar/E	Performance metric	max
Device C	Node H	car/H	Performance metric	mix

NMS

Self Explanation Tag function:
1. Indicate which data object can be selected as of interests if retrieved from Offline document
2. Indicate whether the network device Support specific data object collection if retrieved from the live server.

2. Automatically learn
Tag from live server in device or from offline server

3. Subscribe interested data based on self explanation tag indication and xpath of data node

1.Tag data node in each device model
to indicate data that has common characteristic
Tagging information can be stored in network element or controller/ website

Module foo {
Node A //performance metric;min
   Node B
Node C//performance
metric;average
}

Module bar {
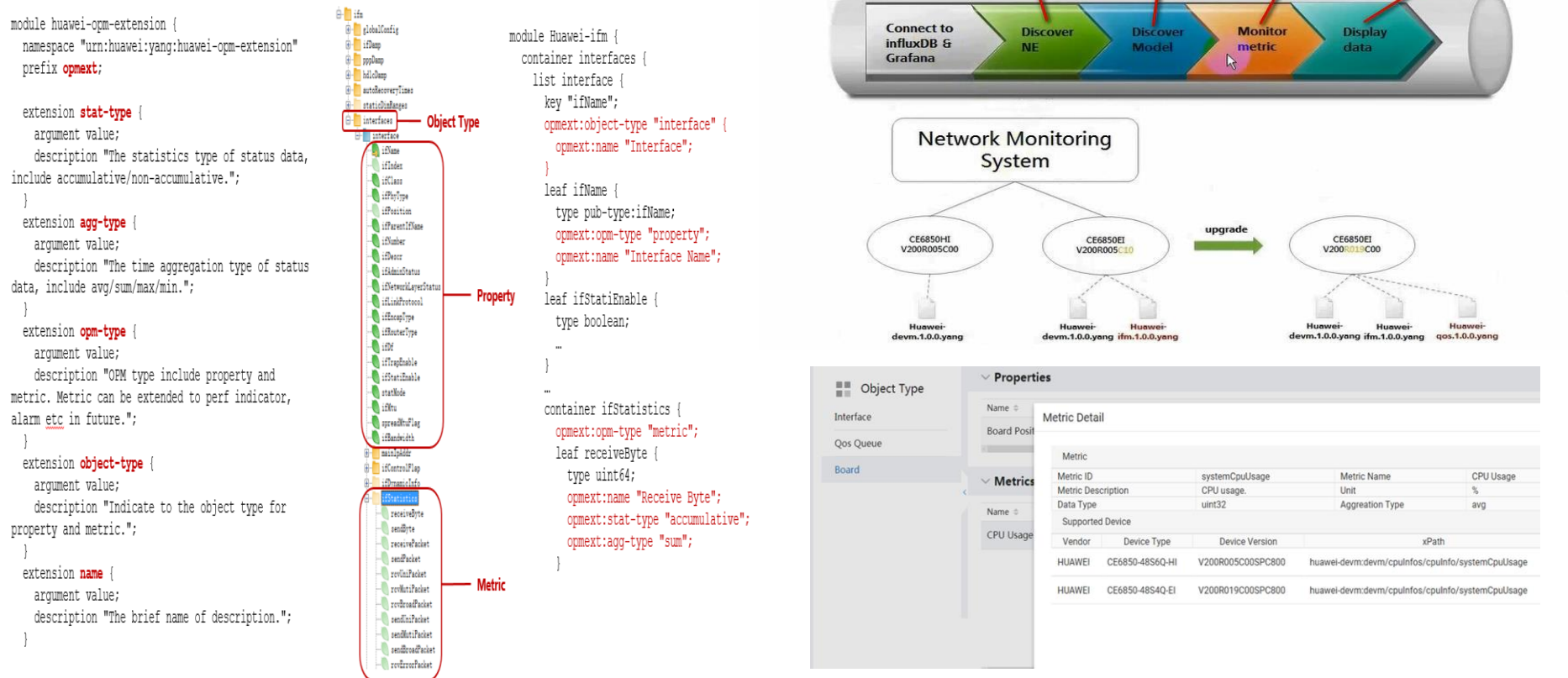Node E //performance metric;max
   Node F
   Node G
               }

Module car {
Node H //performance metric;min
   Node I
   Node J
               }

Device A
Module foo

Device B
Module bar

Device C
Module car

What got done

- Develop a running code and deploy in the telemetry collector and Provide module data node automatic tagging, automatic learning, automatic subscription mechanism.

NE Discover
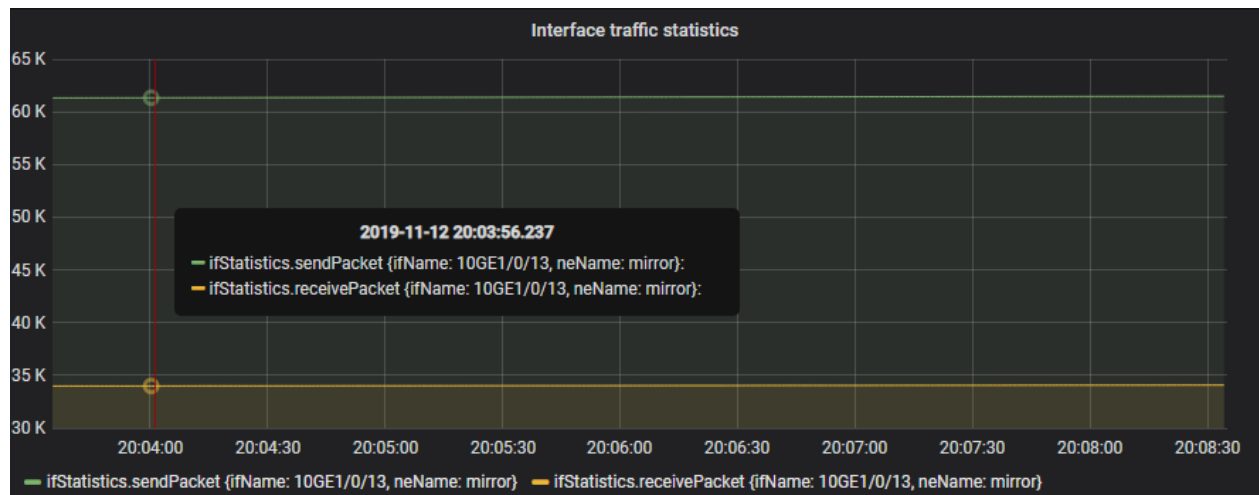
Model Discover

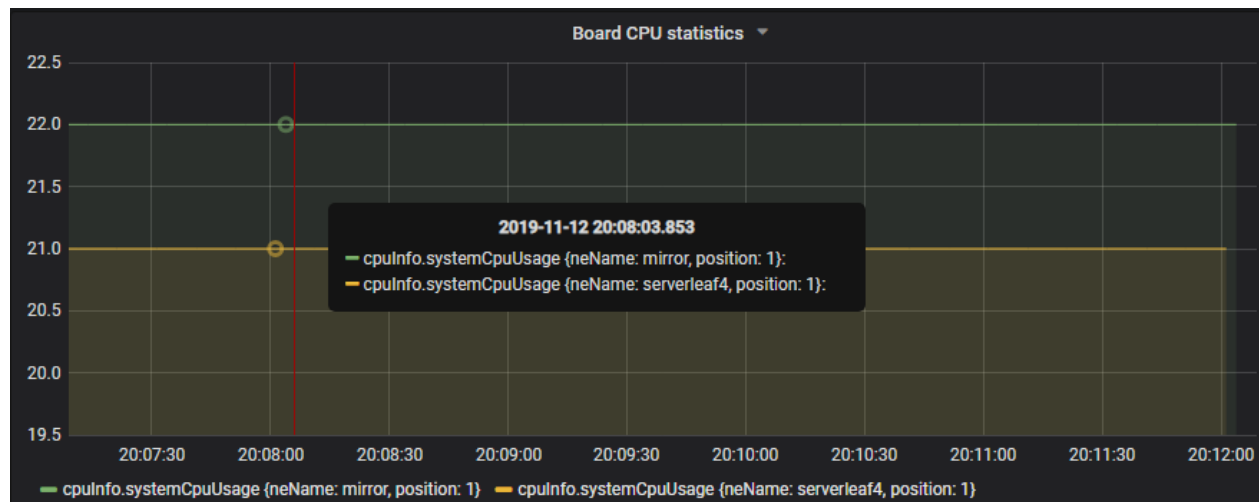**Metric Subscribe**

Data Display

What got done

Using collected data as data source to InfluxDB
Process and analyze telemetry characteristics data using Grafana

Interface sent packet &
received packet

CPU usage mirror &
CPU usage serverleaf4

What we learned

- **Better understand the key value of telemetry tagging:**
  - » filter queries of operational state on a server based on server capabilities
  - » correlate data node across models that share common characteristics or are of same object types.
  - » reduce the amount of data to be streamed out to the destination
- **It is important to have more developers to implement it and more service providers to deploy it.**

Wrap up

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