BMP & YANG
GROW and NETCONF WG

IETF 109
November 9-13th, 2020
Virtual Hackathon
BMP Hackathon - Plan

Functionality

• Test BMP BGP Local RIB to IPFIX metric correlation and interoperability between router and data-collection for peer and route monitoring for message type extensions defined in
  • draft-ietf-grow-bmp-local-rib (BGP Local RIB)
  • draft-grow-bmp-tlv (TLV support for BMP Route Monitoring and Peer Down Messages)
  • draft-lucente-grow-bmp-tlv-ebit (Support for Enterprise-specific TLVs)
  • draft-cppy-grow-bmp-path-marking-tlv (Path Marking TLV)
  • draft-xu-grow-bmp-route-policy-attr-trace (BGP Route Policy and Attribute Trace)

• Test BMP BGP Local RIB to IPFIX metric correlation with IE90 (BGP route-distinguisher).

Performance

• Test performance impact of BMP on router CPU/Memory resources and BGP route propagation with YANG push.
YANG Hackathon - Plan

Functionality

• Develop and test UDP-based Transport for Configured Subscriptions data export and collection.
• Collect the YANG schema tree of a YANG subscription, convert to JSON and register at Confluent JSON schema registry.
  • draft-ietf-netconf-udp-notif (UDP-based Transport for Configured Subscriptions)
  • draft-ietf-netconf-distributed-notif (Subscription to Distributed Notifications)
Hackathon – Software

Software

- `pmacct` nfacctd for IPFIX and BMP data collection
- `pmacct` udp-notif for YANG push data collection
- `ncclient` to create subscription and collect YANG schema
- Apache Kafka as message broker
- Apache Druid as timeseries DB
- Pivot as user interface
- Wireshark BMP dissector for packet analysis
- Spirent Testcenter for BGP VPnv4/6 route and IPV4/6 traffic generation

Tutorial

- [https://imply.io/post/add-bgp-analytics-to-your-imply-netflow-analysis](https://imply.io/post/add-bgp-analytics-to-your-imply-netflow-analysis)
Hackathon - Network
Swisscom – lab environment

Achievements
• Cisco IOS XR and XE, Juniper Junos and frrouting in the topology for IPFIX and BMP added
• YANG recursive schema collection with netconf <get-schema>, JSON conversion and schema registration.

Gaps Identified
• Big Data test setup needs to be scaled to accommodate peaks at BMP and YANG push stress tests.

Next Steps
• Optimize and increase the parallelization of time series data ingestion.
BMP Achievements
• 3 of 5 TLV's decoded of draft-xu-grow-bmp-route-policy-attr-trace
• 1 of 1 TLV decoded of draft-cppy-grow-bmp-path-marking-tlv
• BMP BGP Local RIB to IPFIX data correlation with IPFIX IE90 (BGP route-distinguisher) attribute.

YANG Achievements
• Support of draft-ietf-netconf-udp-notif

https://github.com/pmacct/pmacct/
BMP route-policy attribute tracing

On a MPLS PE router for a particular VPNv4 prefix which route-policies and attachment points were involved
UDP Testflow between two IPv4 Addresses with BMP BGP Local RIB dimensions measured on MPLS PE in a VRF
BMP BGP Local RIB with Path Marking

On a MPLS PE router for a particular VPNv4 prefix how it is installed in the RIB in a VRF
Huawei - VRP

Achievements

- Supporting latest path status of `draft-cppy-grow-bmp-path-marking-tlv-07`
- Supporting latest route-policy attribute tracing `draft-xu-grow-bmp-route-policy-attr-trace-05`
- Supporting `draft-ietf-netconf-udp-notif-01` and `draft-ietf-netconf-distributed-notif-01`
- Test and compare CPU and memory usage with and without BMP in stress tests with 100'000, 500'000 and 1'000'000 BGP VPNv4 routes.
BMP Stress Test – CPU usage

Dataset:
- Dataset 1: 100K routes from Spirent
- Dataset 2: 500K routes from Spirent

CPU usage monitoring of 192.0.2.52
BMP Stress Test – Memory Usage

Dataset:
- Dataset 1: 100K routes from Spirent
- Dataset 2: 500K routes from Spirent

Memory usage monitoring of 192.0.2.52
Wireshark – Dissector

Achievements
• Ongoing work on supporting draft-cppy-grow-bmp-path-marking-tlv-07
• Ongoing work on supporting draft-ietf-netconf-udp-notif

Next Steps
• Validate dissector and commit in next Wireshark release.
What we learned

• Good
  • With the 4\textsuperscript{th} hackathon, nice team collaboration and good spirit.
  • Slack helped to keep connected through different time zones.

• Bad
  • Yet again, missing beers and cocktails after 😊
Thanks to...

- Alexis La Goutte – Wireshark
- Uli Heilmeier – Wireshark
- Pierre Francois – INSA
- Stephane Frenot – INSA
- Tom Sampic – INSA
- Axel Rosennstiehl – INSA
- Anurag Prakash - Ciena
- Kian Jones - CENGN
- Yunan Gu - Huawei
- Binyang Huang – Huawei
- Tianran Zhou - Huawei
- Paolo Lucente – NTT
- Marco Tollini - Swisscom
- Raphaël Barazzutti - Swisscom
- Matthias Arnold - Swisscom
- Thomas Graf - Swisscom

...Imply for providing us the big data and Huawei for the network environment.