BMP

BGP Monitoring Protocol
GROW WG

IETF 108

July 20-24th, 2020

Virtual Hackathon

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)

Performance

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

Hackathon – Software

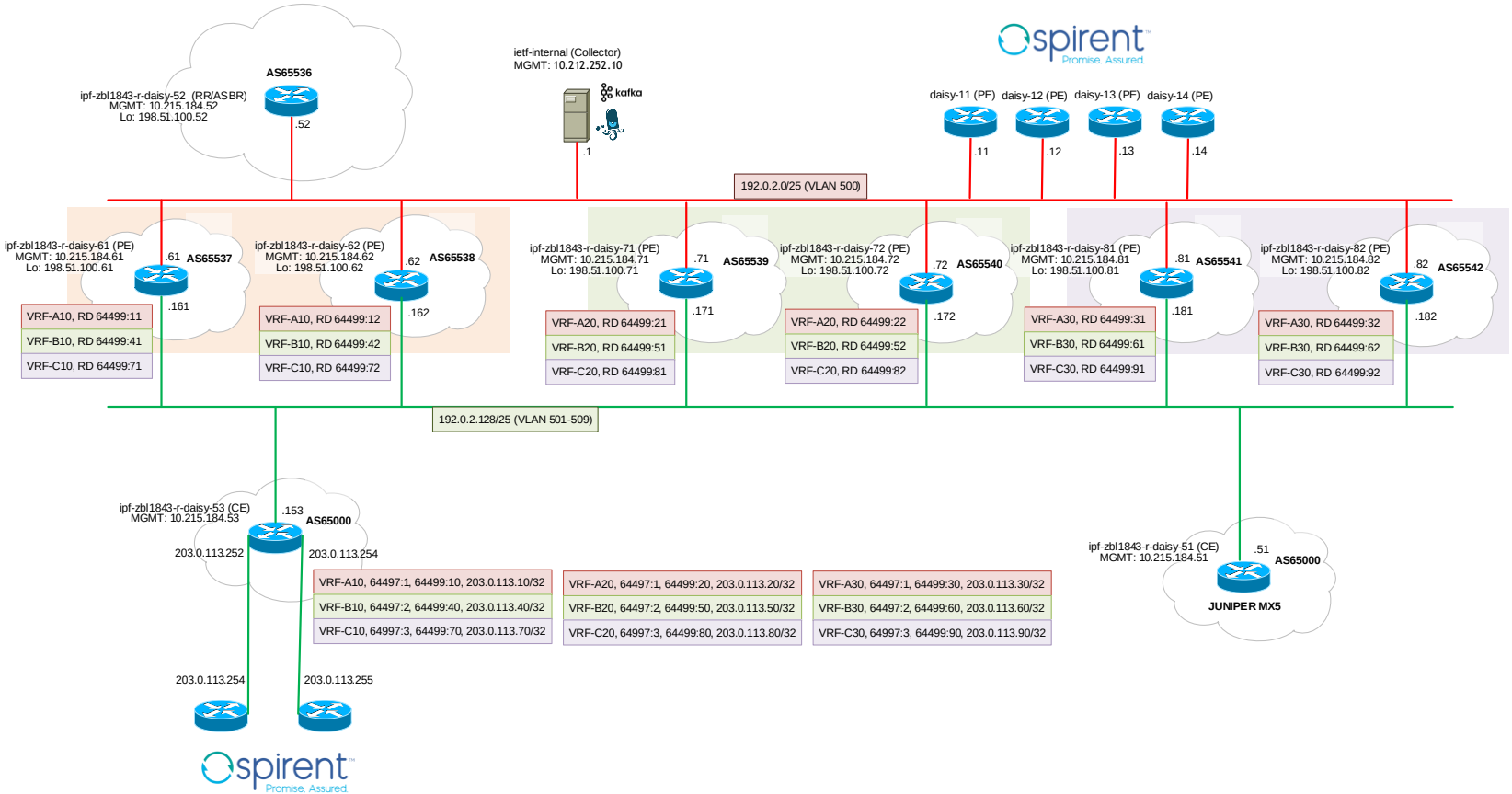
Software

- pmacct nfacctd for IPFIX and BMP data collection
- pmacct pmgrpcd for YANG push data collection
- 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

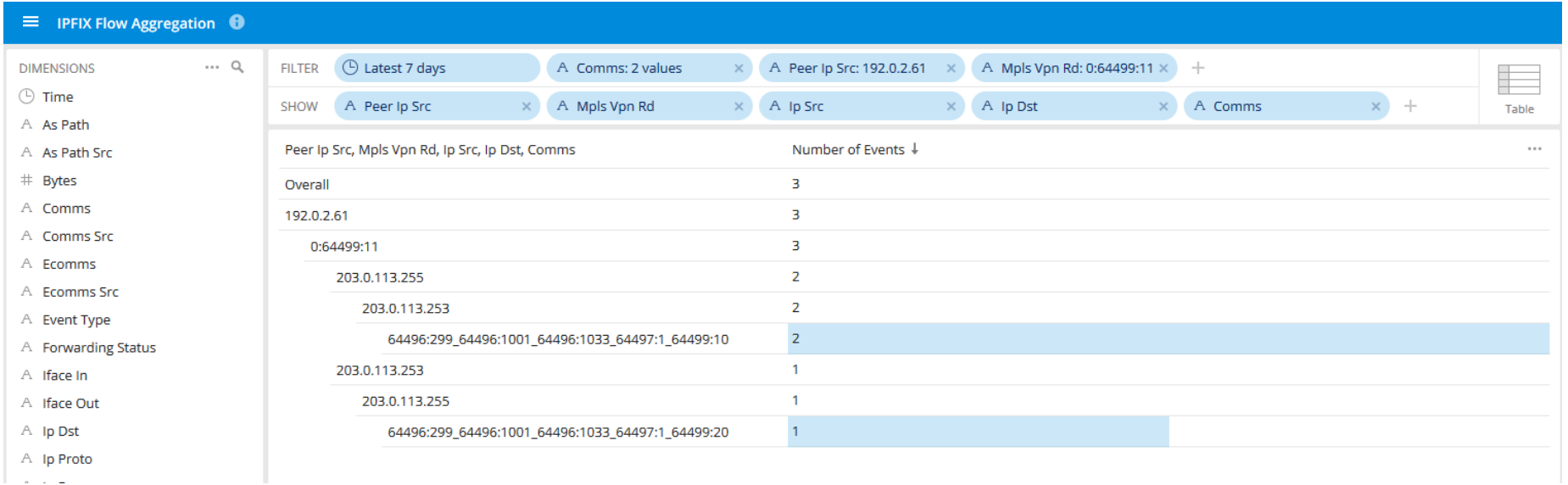
Tutorial

- https://imply.io/post/add-bgp-analytics-to-your-imply-netflow-analysis

Hackathon - Network



BMP BGP Local RIB with IPFIX Correlation



UDP Testflow between two IPv4 Addresses with
BMP BGP Local RIB dimensions measured on MPLS PE in a VRF

Pmacct – nfacctd/pmbmpd

Achievements

- BMP BGP Local RIB to IPFIX correlation now works for prefixes with BGP route-distinguisher as well.
- 2 of 5 TLV's decoded of draft-xu-grow-bmp-route-policy-attr-trace

Gaps Identified

- Path Marking TLV could be optimized if contained paths would have been indexed. Input for draft-cppy-grow-bmp-path-marking-tlv-04

https://github.com/pmacct/pmacct/

Swisscom – lab environment

Achievements

- Spirent Testcenter added for IPv4/6 traffic generation
- YANG push data collection for CPU and memory

Gaps Identified

- Test verification needs to be further automatized to improve efficiency

Next Steps

- BMP BGP RIB update flow delay heatmap to facilitate convergence delay RCA
- Improve testbed to measure the impact on network convergence with BMP
- Validate BGP router reset notification PDU for Adj-RIB In/Out and consequent action in correlator

Huawei - VRP

Achievements

- Supporting draft-grow-bmp-tlv-00 and draft-lucente-grow-bmp-tlv-ebit-00
- Supporting path status of draft-cppy-grow-bmp-path-marking-tlv-04
  Supporting draft-xu-grow-bmp-route-policy-attr-trace-04
- Stress tests showing expected CPU and memory usage increase but no BGP propagation delay.

Next Steps

- Redo the BGP propagation delay tests with improved testbed.

Wireshark – BMP Dissector

Achievements

- Supporting draft-xu-grow-bmp-route-policy-attr-trace-04 in latest code commit

Next Steps

- Support draft-grow-bmp-tlv-00 and draft-grow-bmp-tlv-ebit-00
- Support draft-cppy-grow-bmp-path-marking-tlv-04

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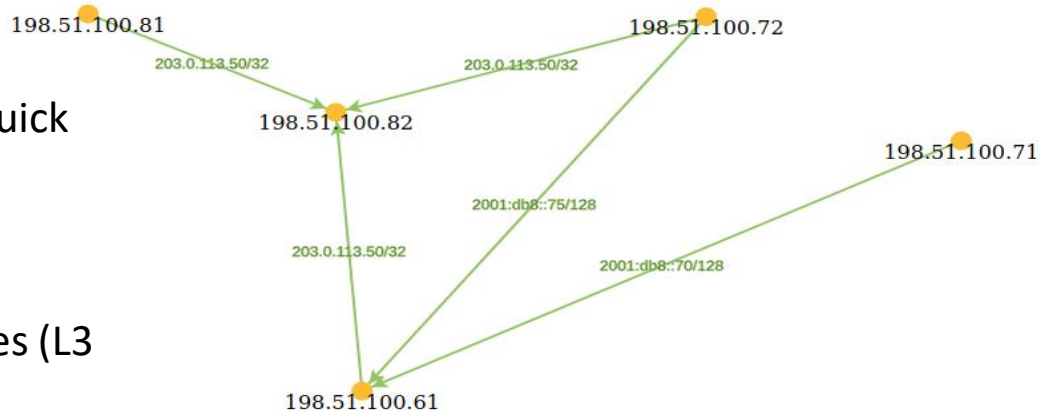
Achievements

- Setting up of end-to-end export/collection/visualization pipeline based on time-series database Druid
- D3.js visualization front-end for quick prototyping

Next Steps

- Testing new visualization use-cases (L3 topology, VPN abstraction, control/data plane correlation, incorporating data from new drafts supplied by pmacct)

D3.js Front-end



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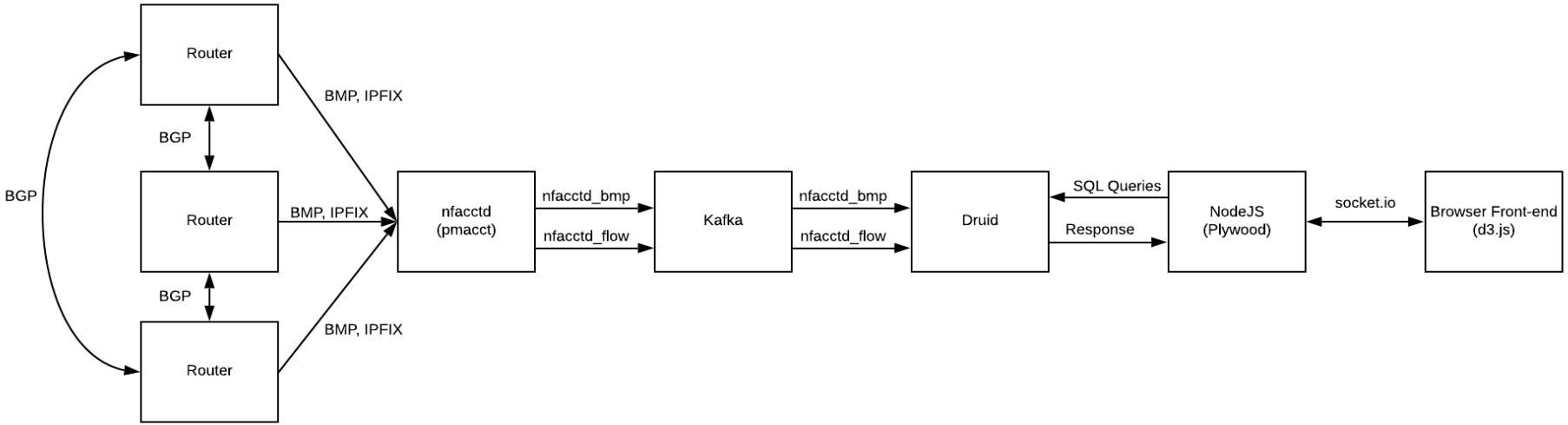

End-to-End export/collection/visualization pipeline

What we learned

- Good
  - Being virtual makes the BMP project more accessible to people
  - Newcomers bring a fresh mindset and wonderful ideas into the team
    - BFD correlation to BMP peer_up/down message type
  - YANG push CPU and memory with a 10 second, BMP with a second granularity improved insights into the performance impact
- Bad
  - The missing beers and cocktails after ☺

Thanks to…

- Prakash Anurag - Ciena
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