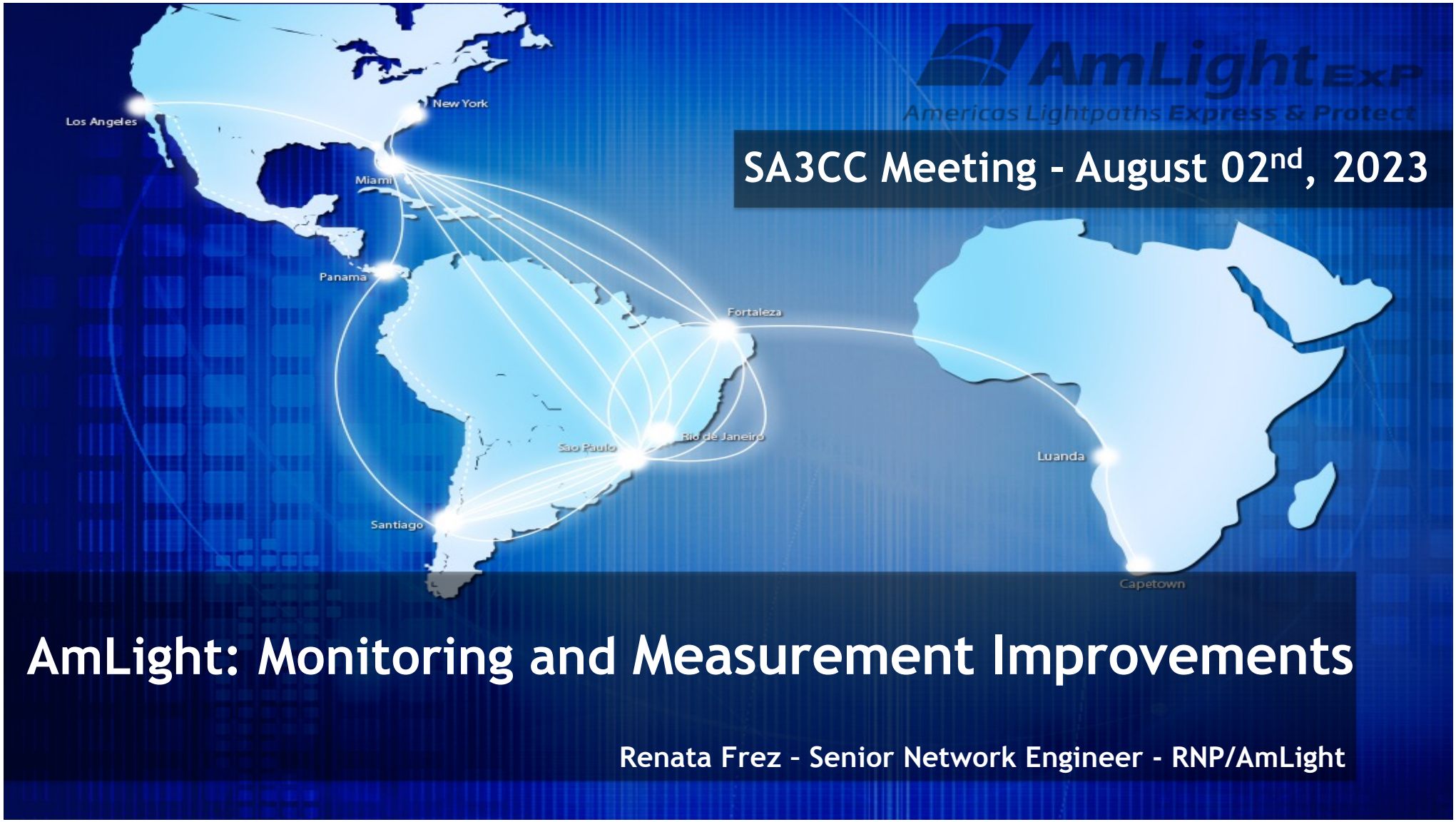


AmLight: Monitoring and Measurement Improvements

Renata Frez - Senior Network Engineer - RNP/AmLight

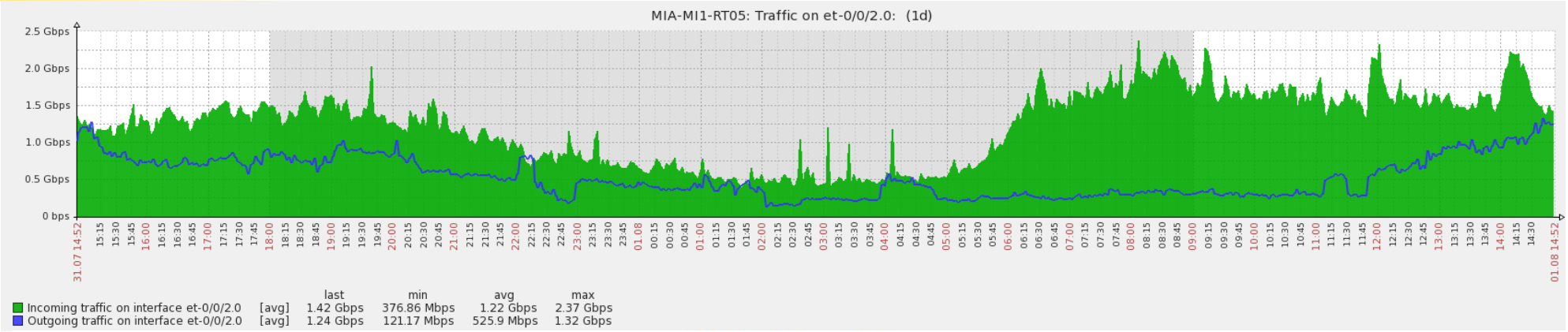
Tools/Frameworks in use at AmLight [1]

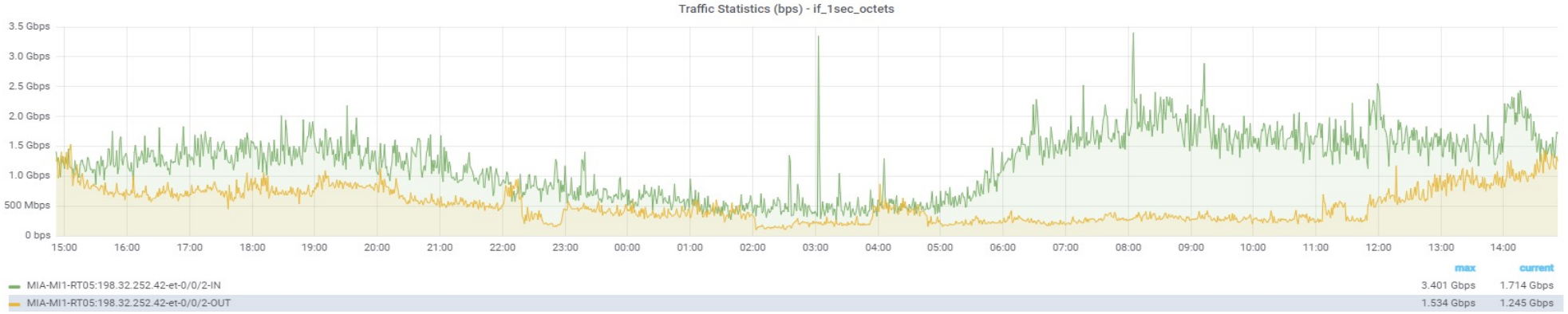
- AmLight has a rich set of tools to monitor its infrastructure and measure its performance.
- A Zabbix server that monitors the entire network and IT infrastructure.
- A dedicated Zabbix server for Rubin Observatory was set up, and it is continuously updated: https://lsst.amlight.net/zabbix/zabbix.php?action=dashboard.view.
- The perfSONAR results can be accessible at https://dashboard.ampath.net/maddash-webui/index.cgi.
  - More nodes will be deployed soon: Boca Raton, San Juan, Atlanta, São Paulo (new server).
- A Status page is available for the community to inform any ongoing events quickly and directly: https://status.amlight.net.
- Interfaces' utilization can be found on https://my.amlight.net.

Tools/Frameworks in use at AmLight [2]

Tool/Framework	Used for:
SNMP	➢ General monitoring.
sFlow	➢ Troubleshooting unusual events. ➢ TOP N reports.
Juniper Telemetry Interface (JTI)	➢ Environments that require more granular information. Juniper devices only.
In-band Network Telemetry (INT)	➢ Troubleshooting short-time events.

SNMP x Juniper Telemetry Interface (JTI)





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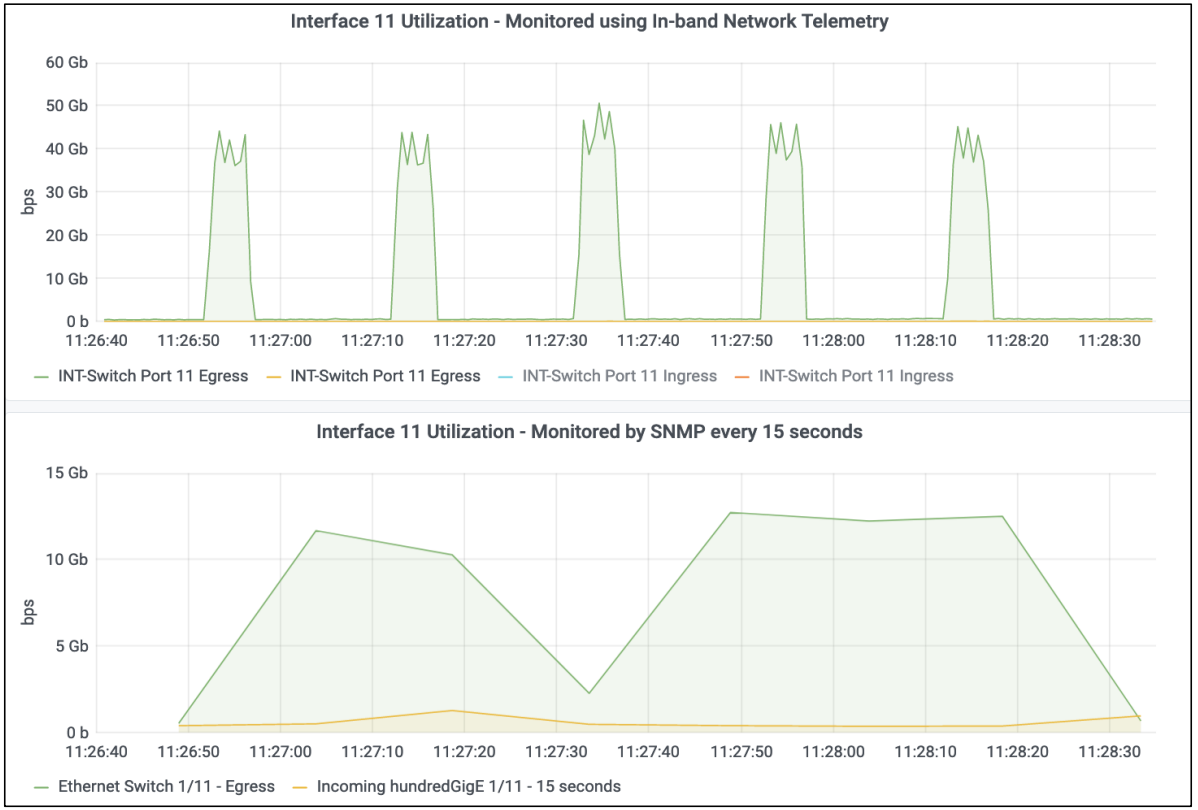
In-band Network Telemetry (INT)



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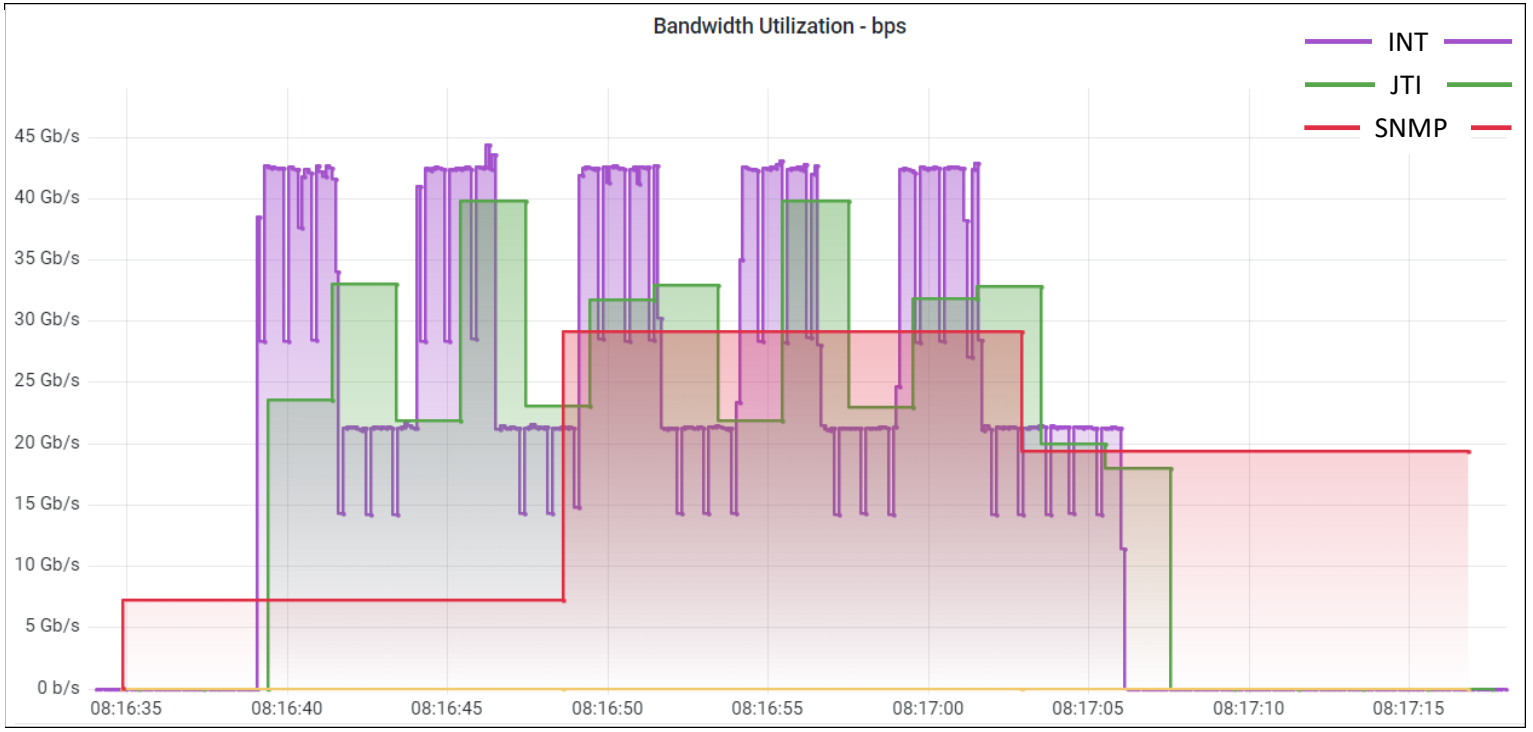
Comparing SNMP x JTI x INT -

- Dell (Switch OpenFlow) = SNMP polling every **14s** (lowest possible value).
- Juniper (Router) = JTI enabled sending telemetry every **2s** (lowest possible value).
- Noviflow (P4 Programmable Switch) = INT enabled for all packets, i.e., **real-time**. Database stores information every **100ms**.



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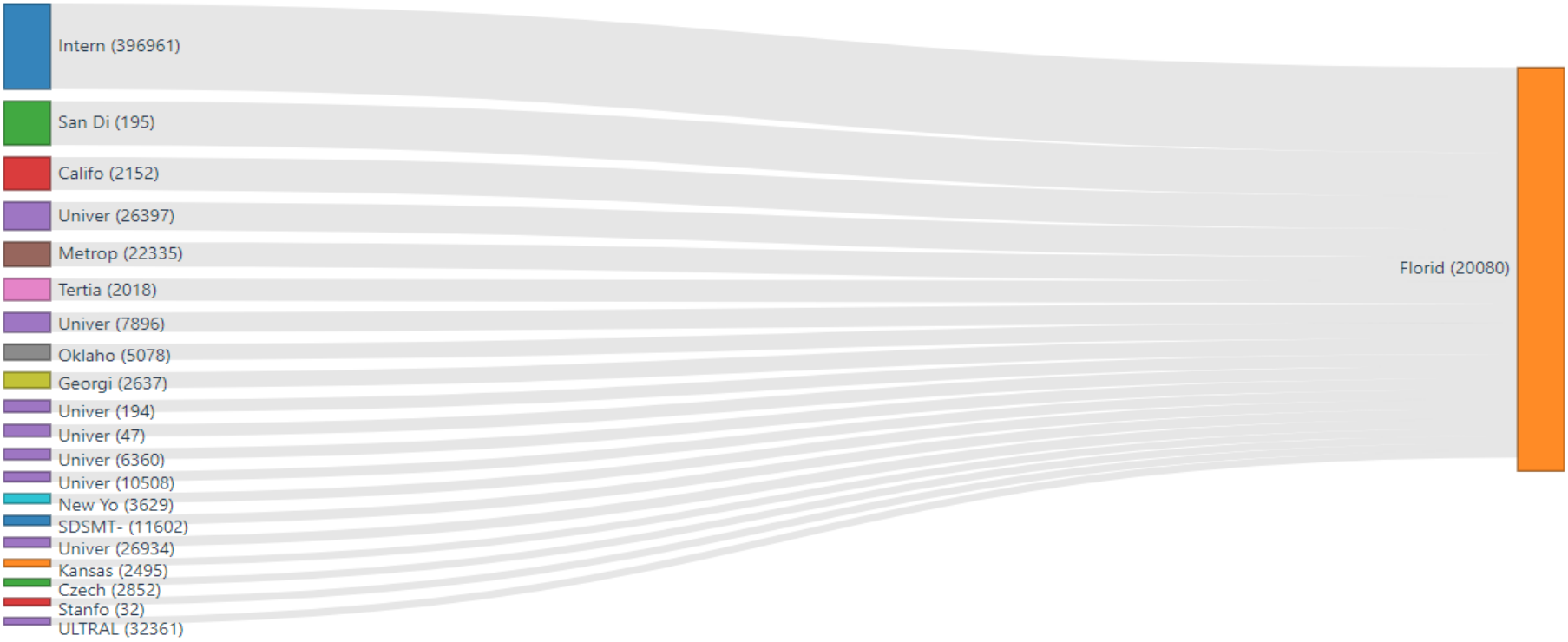
sFlow - Report

TOP 20 – ACADEMIC – ASN x AMPATH/AmLight



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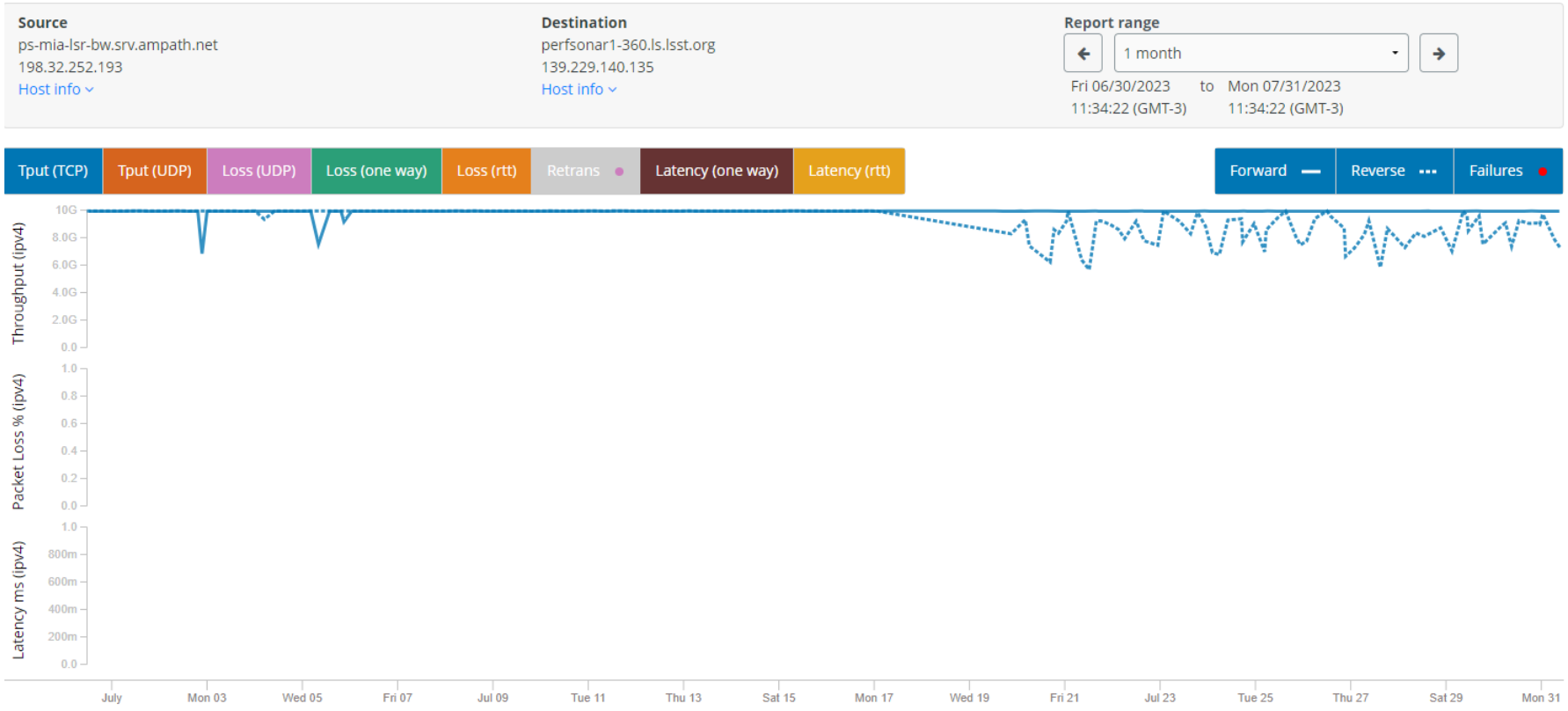
perfSONAR – Throughput – Miami x La Serena



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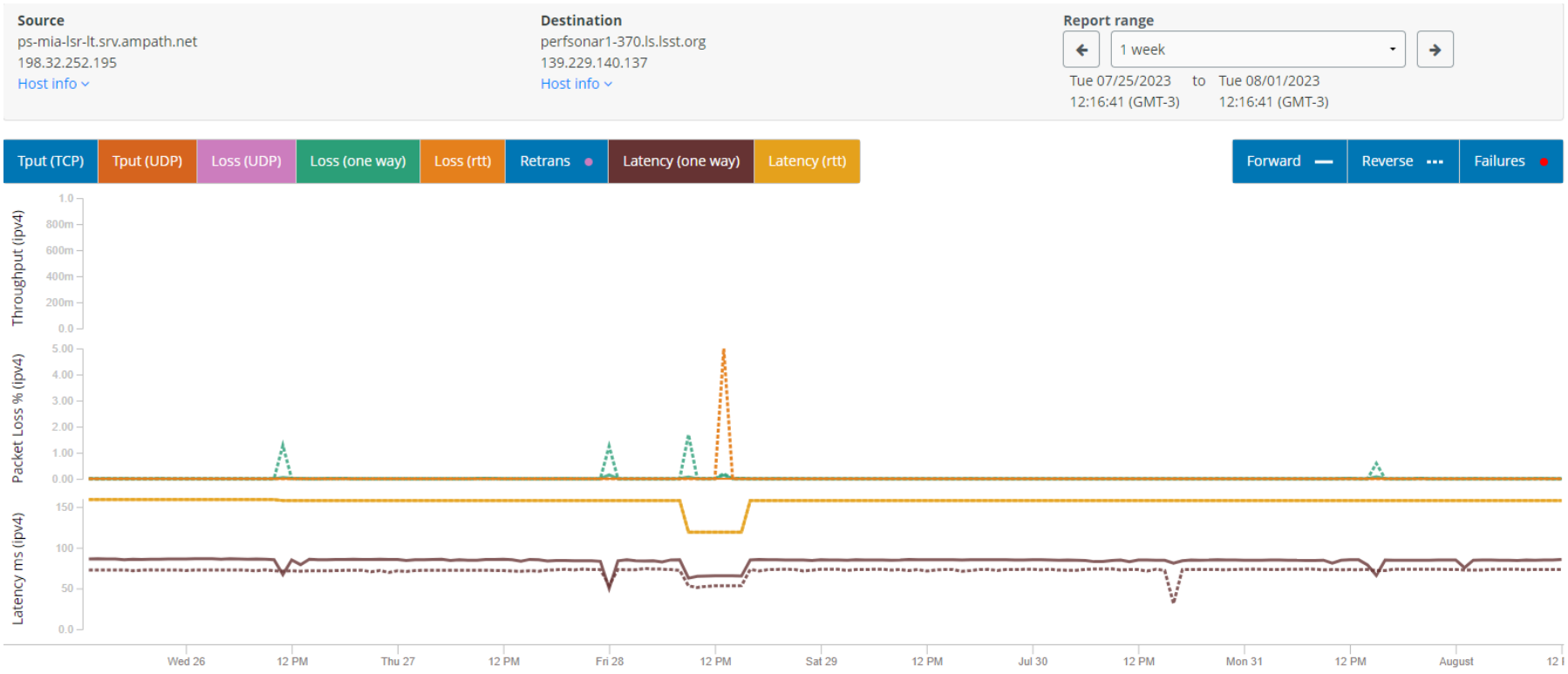
perfSONAR – Latency and Loss - Miami x La Serena



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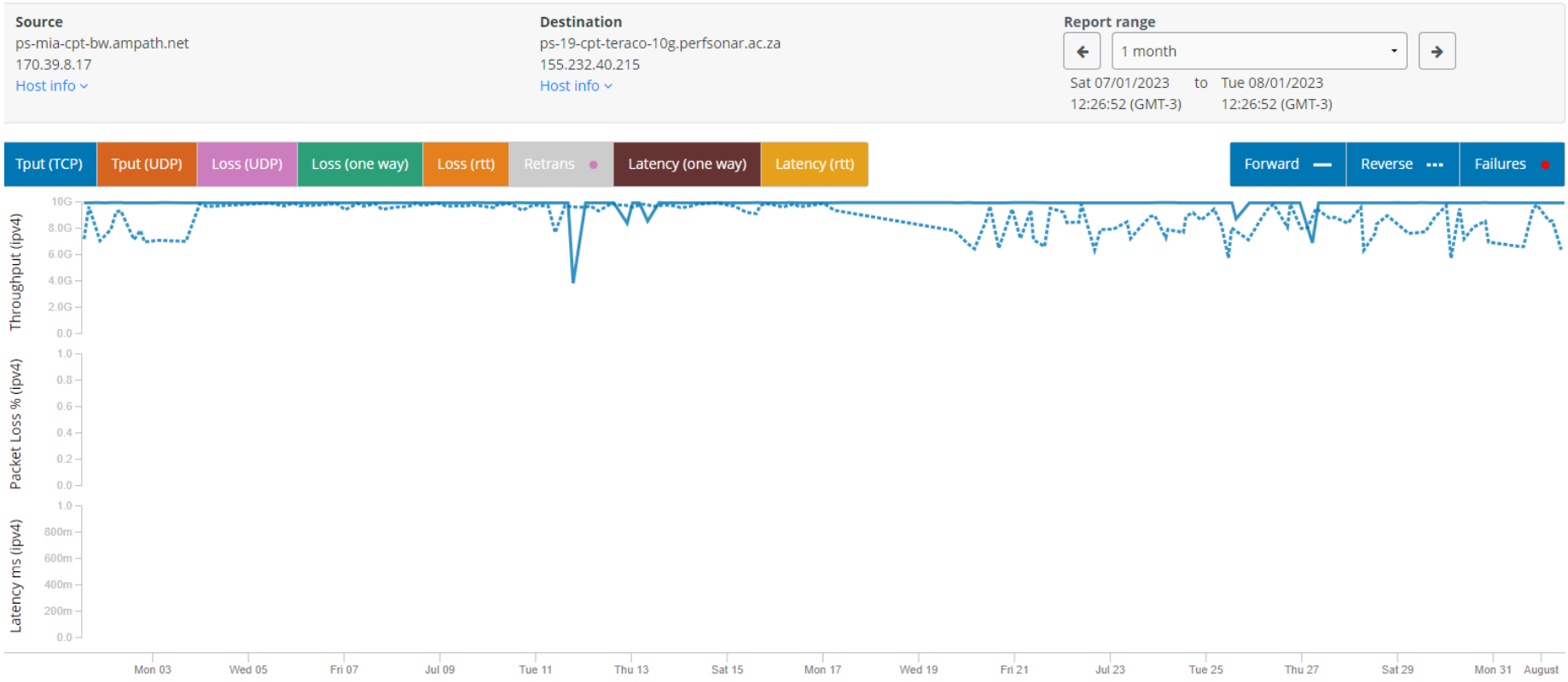
perfSONAR – Throughput – Miami x Cape Town



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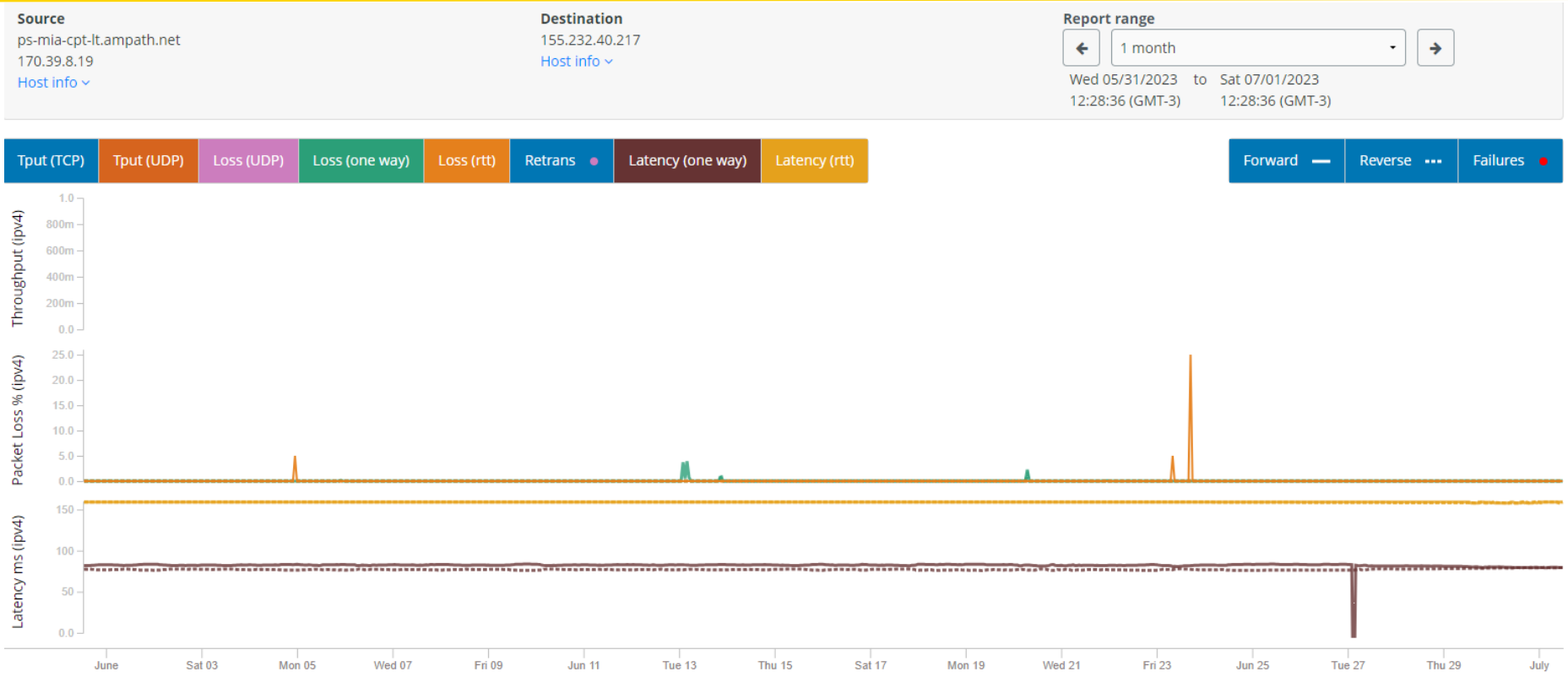
perfSONAR – Latency and Loss – Cape Town



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Final Comments

- Monitoring every and any packet is possible with In-band network telemetry! INT has increased the network visibility beyond our expectations.
- JTI expanded the visibility of the Juniper devices.
- The perfSONAR tests help us to check the user experience between two points.
- Each tool has its pros and cons.
  - Combining all monitoring tools enables AmLight to track performance issues and user complaints.
- Monitoring security is a must nowadays.
- We continue studying new ways of monitoring our environment.
- If you want to request monitoring of something specific, feel free to reach us!

AmLight: Monitoring and Measurement Improvements

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