



SA3CC Meeting - May 20th, 2026



AmLight: Monitoring and Measurement Improvements

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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 monitors the entire network and IT infrastructure.
- [New] BER tests running on demand (BERToD).
- The perfSONAR results can be accessed at <https://dashboard.ampath.net/maddash-webui/index.cgi>
 - We have been working on a new dashboard, using perfSONAR 5.1.4 with Grafana for visualization: <https://ps-cma.amlight.net/grafana/d/feh19rrki0lq8a/amlight-perfsonar-matrix>
- A Status page is available for the community to inform about any ongoing events quickly and directly: <https://status.amlight.net>.
- Links' utilization can be found on <https://my.amlight.net>.

Tools/Frameworks in use at AmLight [1]

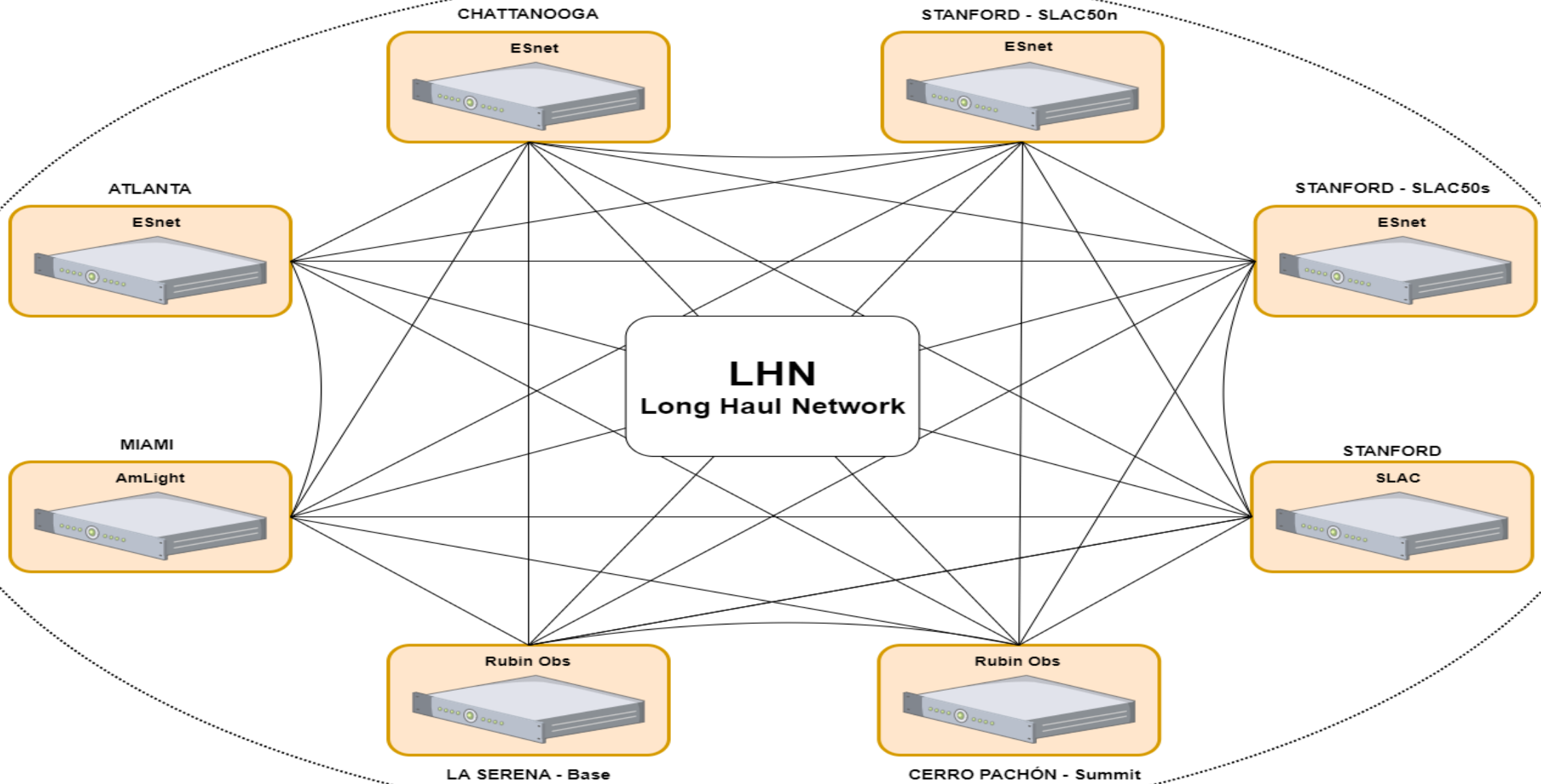
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Tools/Frameworks in use at AmLight [2]

Tool/Framework	Used for:
SNMP	➤ General monitoring.
sFlow	➤ Troubleshooting unusual events. ➤ TOP N reports.
perfSONAR	➤ Testing user perspective.
Juniper Telemetry Interface (JTI)	➤ Environments that require more granular information. Juniper devices only.
In-band Network Telemetry (INT)	➤ Troubleshooting short-time events.
Bit Error Rate Test on Demand (BERToD)	➤ Testing infrastructure. ➤ Fault isolation.

LHN perfSONAR Infrastructure

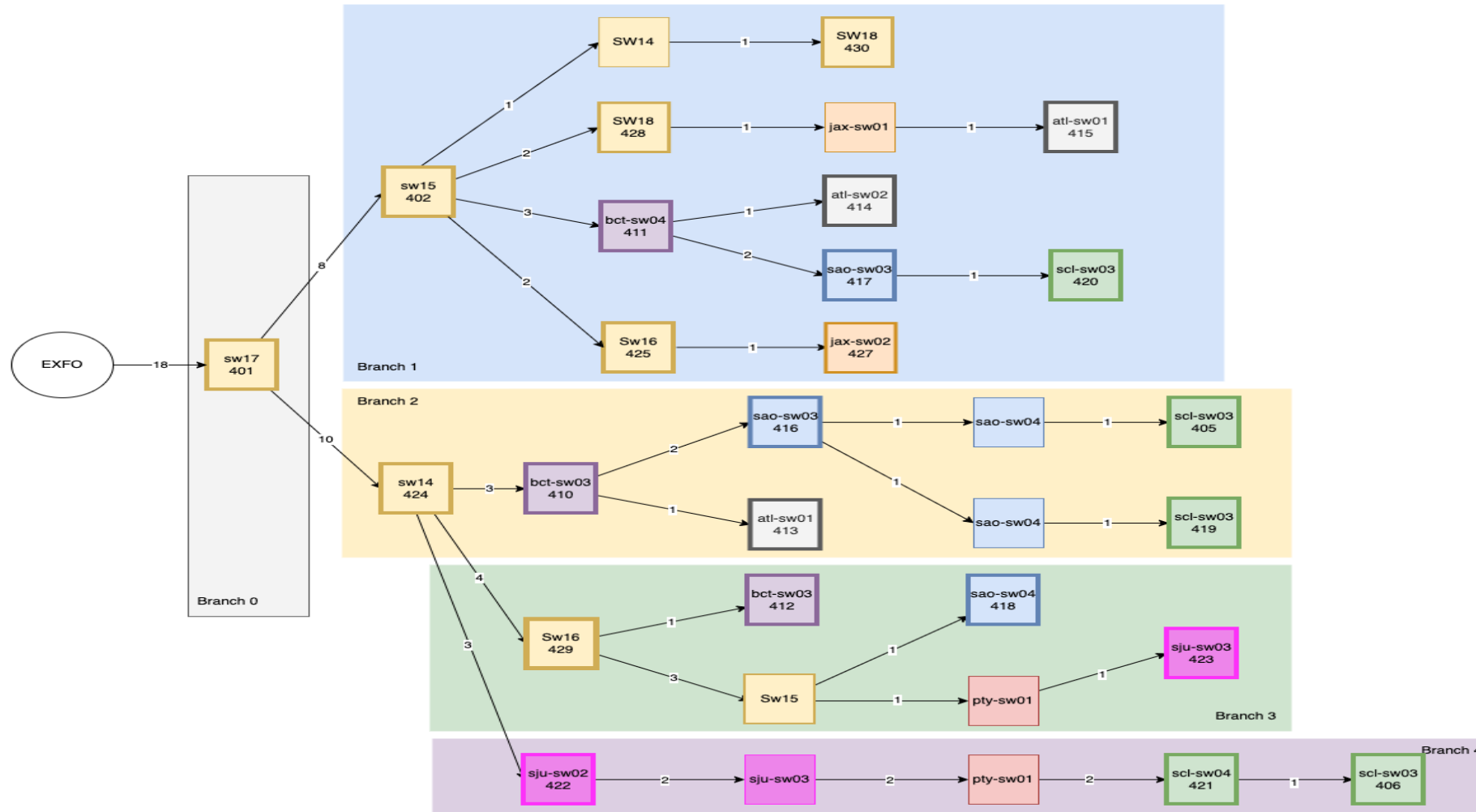
May 2025



ps-CMA (perfSONAR Central Management Archive)

- New server running perfSONAR 5.1.4 (Finished work)
 - Grafana for visualization
 - OpenSearch + Logstash for archiving
- Public Dashboards:
 - AmLight Matrix: <https://ps-cma.amlight.net/grafana/d/feh19rrki0lq8a/amlight-perfsonar-matrix>
 - Vera Rubin Observatory Matrix: <https://ps-cma.amlight.net/grafana/d/aaatqaA0QfVk/vera-rubin-observatory-perfsonar-matrix>
- Maddash (old server) is running in parallel - It will be deactivated soon:
<https://dashboard.ampath.net/>

BERTO - Bit Error Rate Test on Demand [1]



BERTO D - Bit Error Rate Test on Demand [2]

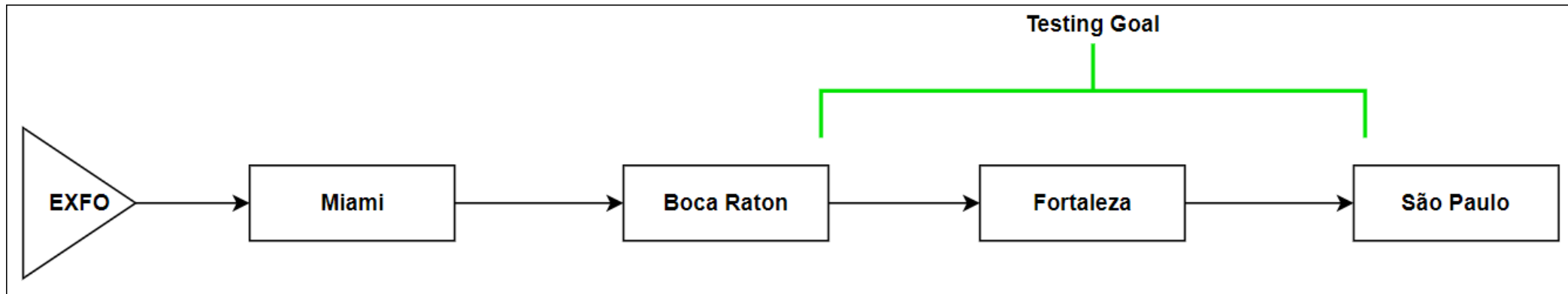
- Test every possible link every 30 min:
 - Latency, jitter, frame loss, and out-of-sequence tests
 - Multiple frame sizes: 68, 256, 512, 1024, 1518, 9000 bytes
 - Each test runs for up to 10 seconds, and we send up to 500,000 frames
 - In case a test fails, run it again with a multiplier metric (for instance, 3)
 - Choice for max bandwidth comes from BAPM
 - Up to 50% of the available bandwidth based on the last 30 seconds (and up to 40 Gbps)
- Displaying results:
 - Last hour, Last 7 days, heatmap, and text outputs
- Grafana Annotations are used to document known topology events and actions to help correlate events.

Use case - Bit Error/Packet Loss Troubleshooting [1]

➤ Initial case:

- We must test the new Monet Channel before moving services.
- We will leverage the Traffic Generator to create the traffic and test each one of the 6x 100G links, using the mode “BERT tests”, i.e., focused on bit errors and signal integrity.

➤ Simplified topology:



➤ Result: **Bit error found in all of them!**

Summary

Alarms/Errors

Traffic

Logger

Sort By

ID


Time Mode

Absol...

Closure Format

Durati...

Save to CSV

ID	Start Time	Event	Duration	Details
1	05/07 09:45:08 AM	Test Started		2026-05-07
2	05/07 09:48:09 AM	Bit Error	00:00:01	1.2378E09/1.2378E09
3	05/07 09:48:10 AM	Pattern Loss	00:00:02	
4	05/07 09:51:46 AM	Pattern Loss	00:00:01	
5	05/07 10:43:43 AM	Pattern Loss	00:00:01	
6	05/07 10:45:08 AM	Bit Error > 1.0E-12		1.9E-05
7	05/07 10:45:08 AM	Test Stopped		 FAIL

EXFO

[1] - FTBx-88260
NetBlazer

FAIL

0d 01:00:00

Start

Save
Load

Report

Discover
Remote

Reset



Laser



Inject

Setup

Results

Functions



ht



A2 100GE

LINK

Power

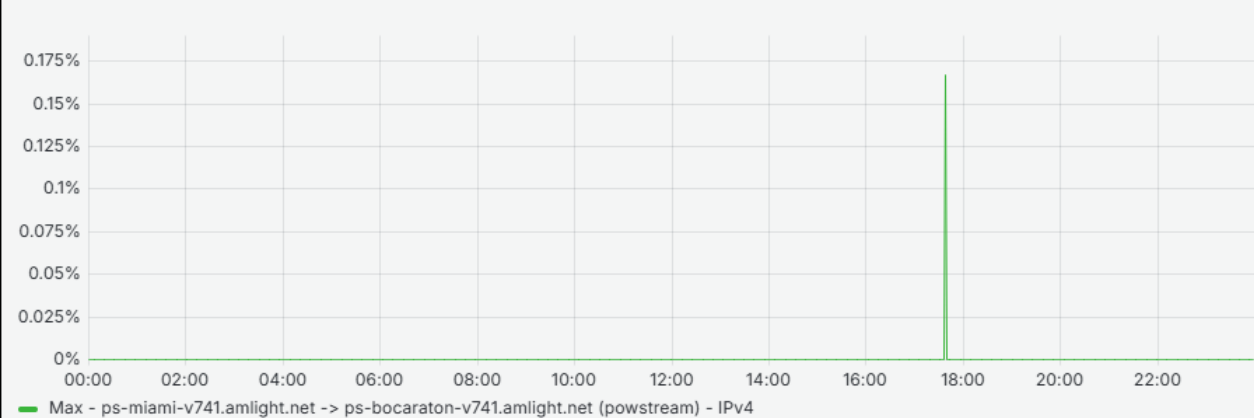


INT

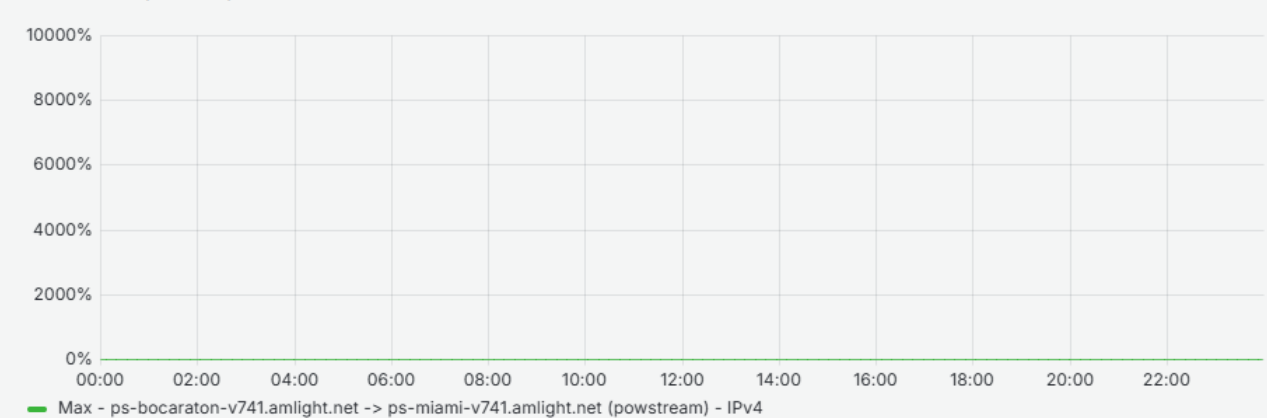
Use case - Bit Error/Packet Loss Troubleshooting [2]

- Step 1: Narrow down the issue as much as possible:
 - After many tests using the **Traffic Generator**, we found that the Miami x Boca Raton segments were the ones responsible for the bit error.
- Step 2: Check **Zabbix** graphs for errors, drops, etc: we found CRC in some interfaces, but minimal. Couldn't explain what was happening.
- Step 3: Check the **BERTO D** tests (running Traffic Gen - focused on Layer 2/3 service and traffic performance test): no packet loss was detected.
- Step 4: Check **INT** results: no queue/buffer high utilization found.
- Step 5: Check **perfSONAR** tests:
 - For the last 24 hours, nothing was found.
 - For the last 7 days, we saw some packet loss.
 - For the last 90 days, we have seen some random but frequent packet loss.

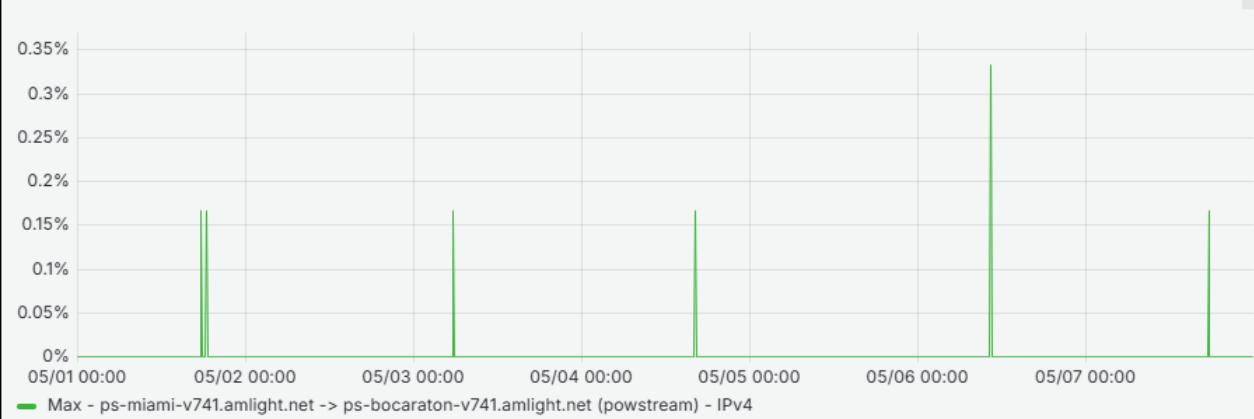
Packet Loss



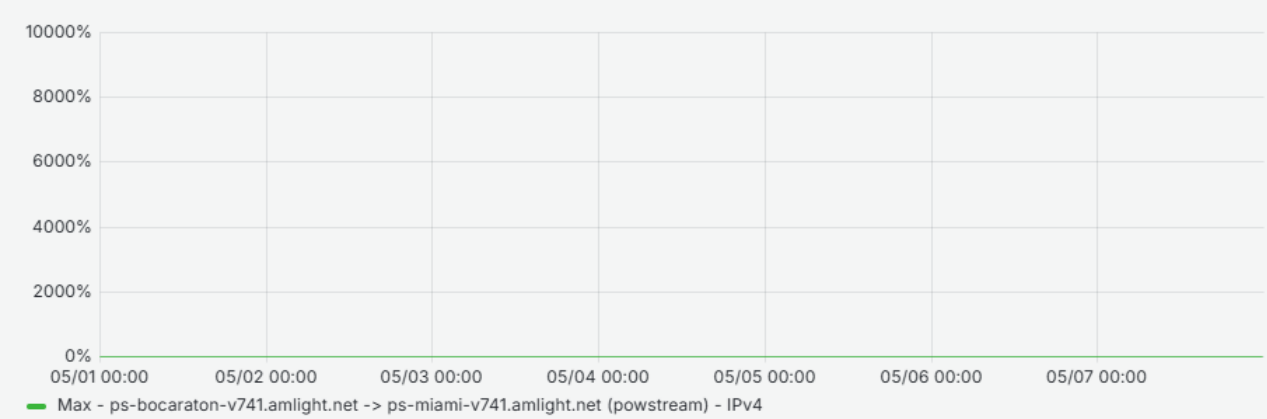
Packet Loss (Reverse)



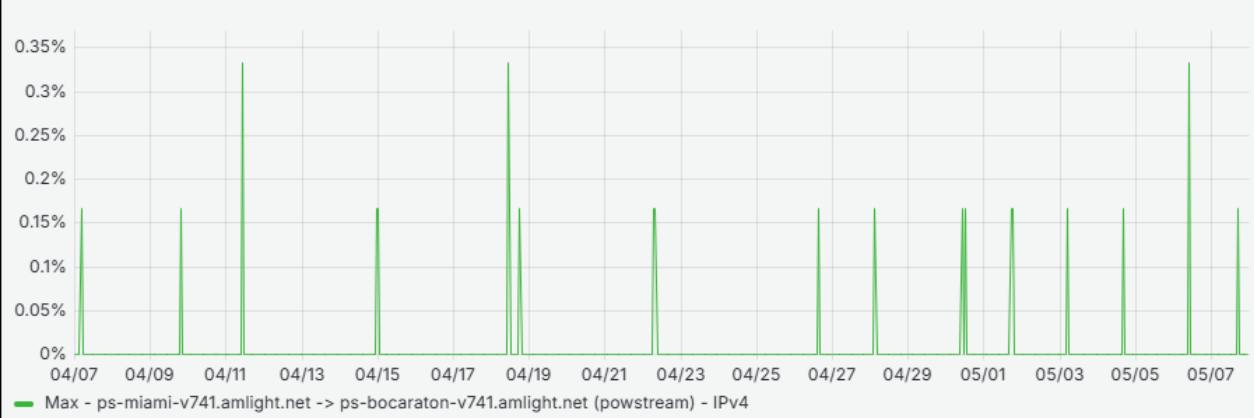
Packet Loss



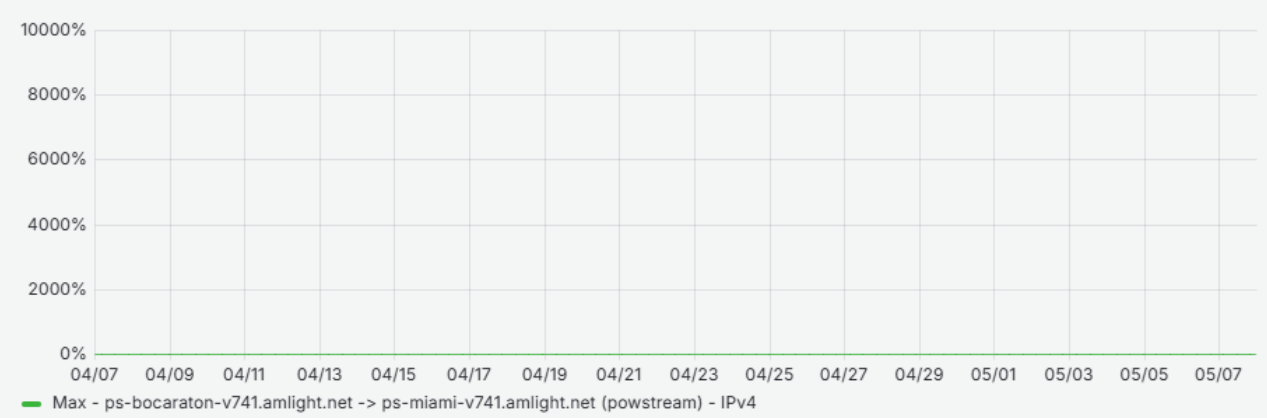
Packet Loss (Reverse)



Packet Loss



Packet Loss (Reverse)



Use case - Bit Error/Packet Loss Troubleshooting [3]

➤ Next steps:

- Confirm correlation between the **perfSONAR** packet loss results and the BERT bit errors.
- Narrow down even more the topology. Remove all switches and test only the optical layer.
 - Which requires a maintenance window, moving devices, and travel to a remote datacenter.
- Clean and scope all fibers, transceivers, and Patch Panels. If necessary, replace the item.
- Re-run all the tests.
 - Depending on the results, contact the provider for further testing.

Use case - Bit Error/Packet Loss Troubleshooting [4]

➤ Lessons learned:

- Type, duration, profile, visualization... all these variables can impact your analysis.
- Change the test duration whenever it is possible.
- Simplify your testing topology.
- Do not mistake a frequent issue with sporadic ones (easier said than done!)
- Go deeper into an issue before any impact on your partners' services.
- Remember the lifespans of items such as fibers and transceivers.
- Check data from all tools available.
 - This is a difficult and lengthy task. Automating part of the analysis becomes essential (*Refer to Jeronimo's presentation*)

THANK YOU

