

# AmLight's SDN Looking Glass - Central monitoring system for SDN

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## I. INTRODUCTION

The AmLight network was migrated to SDN in 2014 [1], and since then, most efforts were focused on creating an “operable” network. Up to now, monitoring and troubleshooting are still complicated activities, and the lack of tools and procedures are the main reason for this complexity.

In past presentations at Internet2, TNC, and GLIF, AmLight presented its set of in-house developed tools and methodologies to operate and troubleshoot its SDN network in the intra-domain context. Another tool presented was the inter-domain data plane tracing solution. The feedback received from these conferences showed that the academic community is very interested in topics related to troubleshooting of SDN networks.

Our goal with this presentation is to share our experience on the SDN operation and show the newly developed SDN Looking Glass to the academic community, describing how this tool fits into our SDN troubleshooting Swiss Army Knife for both control and data planes. We are also interested in interacting with the audience to understand possible next steps for operation, auditing, and security in SDN networks.

## II. DESCRIPTION

In 2016, AmLight network engineers decided to enhance its operational environment developing a single centralized Network Monitoring System (NMS) focused on the requirements of OpenFlow networks.

The idea is to consolidate all SDN tools created in-house into a single tool that would be a single point of view to understand the network behavior and automate troubleshooting activities.

This tool developed at AmLight is called SDN Looking Glass [2]. At the 2017 Internet2 Technology Exchange conference, AmLight launched the first version of SDN Looking Glass as an open source project, incorporating some of the troubleshooting tools developed and presented in past conferences, with the addition of real-time flow statistics and alarms. Among these tools, we have the AmLight OpenFlow Sniffer with web visualization and the AmLight SDNTrace capable of running intra- and inter-domain trace paths.

## III. FUTURE WORK

For TNC 2018, AmLight team plan to present new functionalities in SDN-LG, like historical data persistence, automated trace paths for important flows with alerts when a failure is found, network configuration snapshots at a certain point in time, a new web interface with customizable web dashboard and full support to OpenFlow 1.3. The AmLight team also plan to show it running in the production environment.

## REFERENCES

- [1] Ibarra, J.; Bezerra, J.; Alvarez, H.; Cox, D.; Stanton, M.; Machado, I.; Grizendi, E.: "Benefits brought by the use of OpenFlow/SDN in the AmLight intercontinental research and education network". 14th IFIP/IEEE Symposium on Integrated Network and Service Management, Ottawa, Canada, 11-15 May, 2015
- [2] AmLight's SDN Looking Glass: <https://github.com/amlight/SDN-LG>

## Author Biographies

Antonio João F. Francisco, MSc in Computer Science, is the IT Manager at the Academic Network at São Paulo (ANSP), Brazil, responsible for software development and IT infrastructure. He is currently involved with SDN software development with AmLight.

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Julio E. Ibarra, PhD, is the Assistant Vice President for Technology Augmented Research at Florida International University (FIU). Dr. Ibarra is responsible for furthering the mission of the Center for Internet Augmented Research and Assessment (CIARA) – to contribute to the pace and the quality of research at FIU through the application of advanced Cyberinfrastructure. He is responsible for strategic planning and development of advanced research networking services, including the development and management of the AMPATH International Exchange Point for Research and Education networks. He is the Principal Investigator of multiple NSF International Research Networks Connection funded projects (ACI-0963053; ACI-1451018; ACI-1451024), involving the development and operations of high-throughput international network connections to enhance U.S. e-science initiatives in Latin America, and the Caribbean.

Heidi L. Morgan, PhD., is a Sr. Computer Scientist Internet & Networked Systems of the Information Sciences Institute at University of Southern California. She is a Co-PI for several NSF funded projects including SwitchOn - Exploring and Strengthening US-Brazil Collaborations in Future Internet Research ([switchon.ampath.net](http://switchon.ampath.net)), PIRE: Training and Workshops in Data Intensive Computing Using The Open Science Data Cloud ([www.opensciencedatacloud.org](http://www.opensciencedatacloud.org)), Americas Lightpaths: Increasing the Rate of Discovery and Enhancing Education across the Americas ([amlight.net](http://amlight.net)) and the AMPATH International Exchange Point in Miami. Heidi enjoys working to advance research and education networking initiatives in the Caribbean, Mexico, Central and South America and collaborating with likeminded professionals in the US and around the world.

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