A Decade of Backbone Evolution of the Brazilian Academic Network: observations from the perspective of the routers

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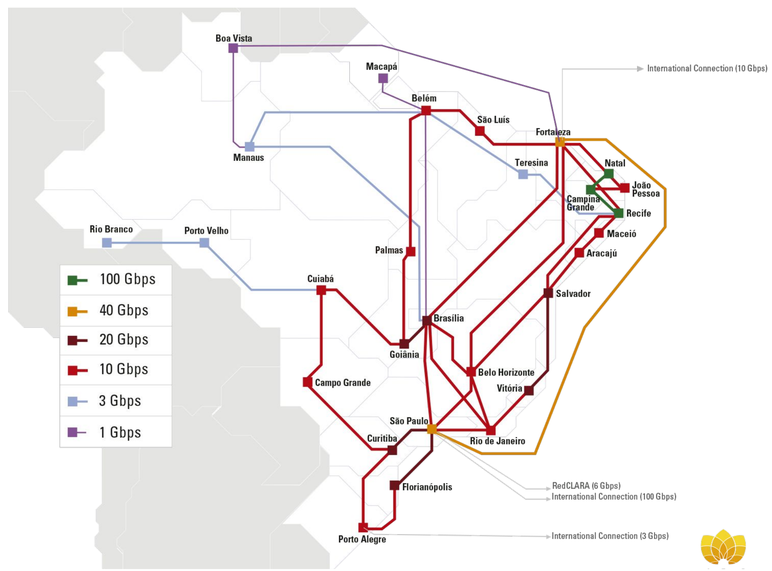
Motivation and Problem

How routers are configured directly influences the **performance** and **security** of a network. The set of configurations can provide **useful information**, but has been rarely used to analyze the structure of a network, and never for a large network longitudinally over a period of several years.

Previous work study networks with **distinct purposes** and for a **shorter period** of time [1-3]

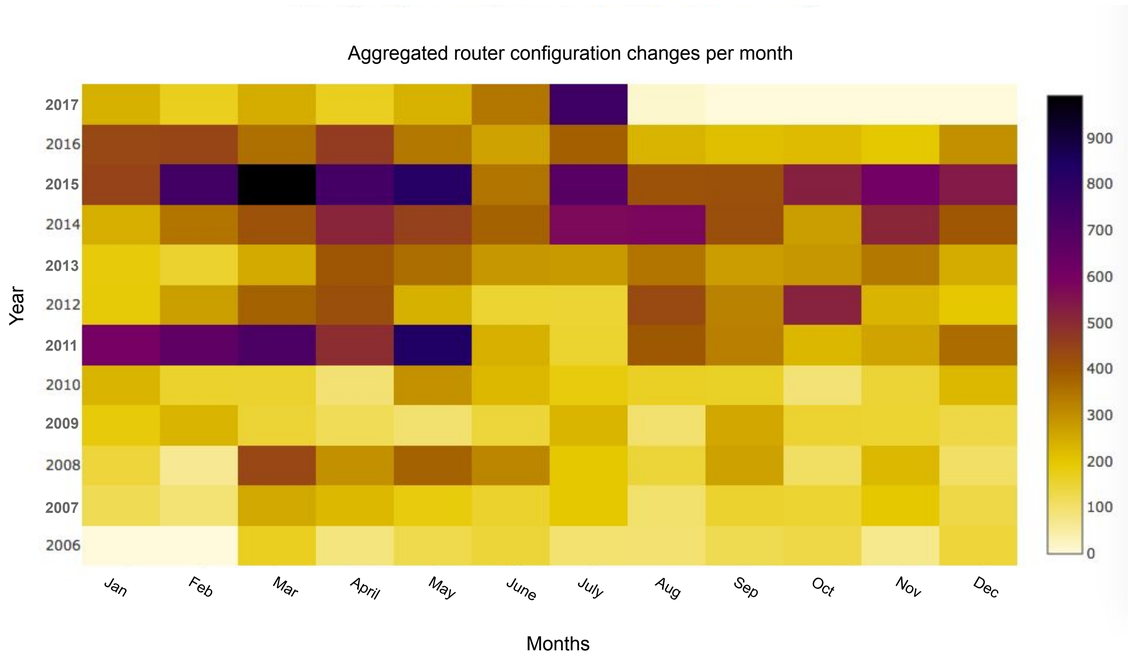


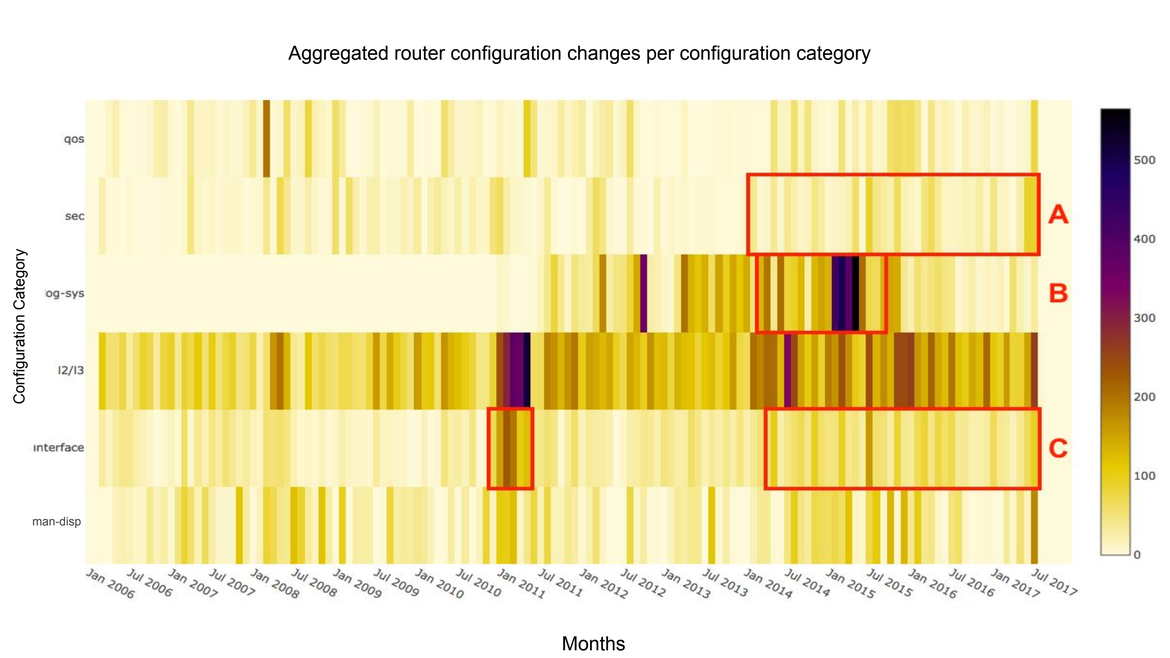
Dataset. Configuration files of **64 routers** of the Ipê Network Backbone from **2006 to 2017**

Research Goals

1. **Understand** the evolution of the Brazilian academic network through the lens of routers
2. Identify network **management challenges** in underdeveloped scenarios such as Brazil
3. Perform a **ten-year analysis** of configuration changes in the Brazilian academic network
4. Establish **best practices** to be followed by operators when configuring their routers

Analysis of the Backbone Evolution





Ongoing Work

Correlate router configuration with different data sources (e.g., *syslog*, *flows*) to obtain a **dynamic view** of the network and **improve fault detection**.

Propose a method to **identify security breaches** through router configuration changes and network measurements**.**

References

[1] Sung et al. Extracting Network-Wide Correlated Changes from Longitudinal Configuration Data. In PAM, 2009

[2] Turner et al. California fault lines: understanding the causes and impact of network failures. In SIGCOMM, 2010.

[3] Kim et al. The evolution of network configuration: a tale of two campuses. In IMC, 2011.

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