



RINIP

Educação, Pesquisa  
e Inovação em Rede

perfSONAR Deployments in  
RNP

Daniel Neto  
[daniel.neto@rnp.br](mailto:daniel.neto@rnp.br)

# — What is RNP?

# RNIP

Rede Nacional de Ensino e Pesquisa

## National Research and Education Network



Higher Education  
and Research  
Institutions



Research Funding  
Agencies



Museums and  
Cultural  
Institutions



Innovative  
Companies



Health  
Establishments



Innovation  
Promoting  
Environments

Ministry of  
Culture

Ministry of  
Defense

Ministry of  
Health

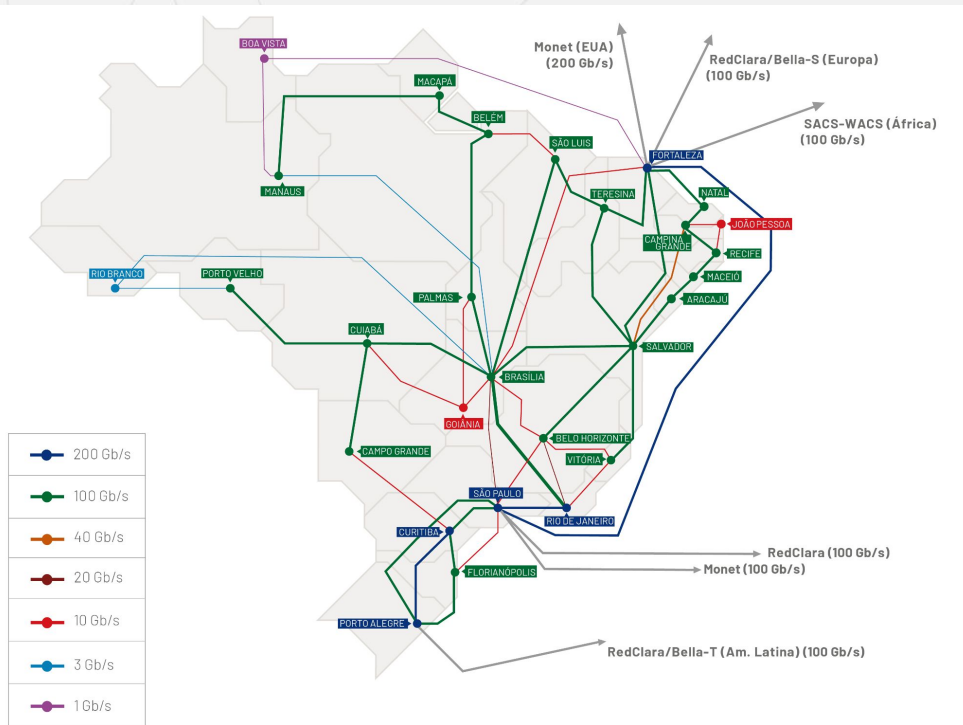
Ministry of  
Communications

Ministry of  
Education

Ministry of  
Science, Technology  
and Innovation



# IPÊ Network



Ipê Amarelo Flor-de-algodão

— MonIPÊ Service

# MonIPÊ Service



## Backbone Monitoring

- perfSONAR Testpoint
- perfSONAR Archive
- Dashboards/Grafana
- PWA

### Measurements

- RTT/packet loss
- One-way latency
- Traceroute
- Bandwidth (cubic and BBR)



## Network Performance Tester

- Web server (Laravel)
- Ansible
- perfSONAR Tools

Client networks SLA Testing  
Used by RNP/PoP Engineers

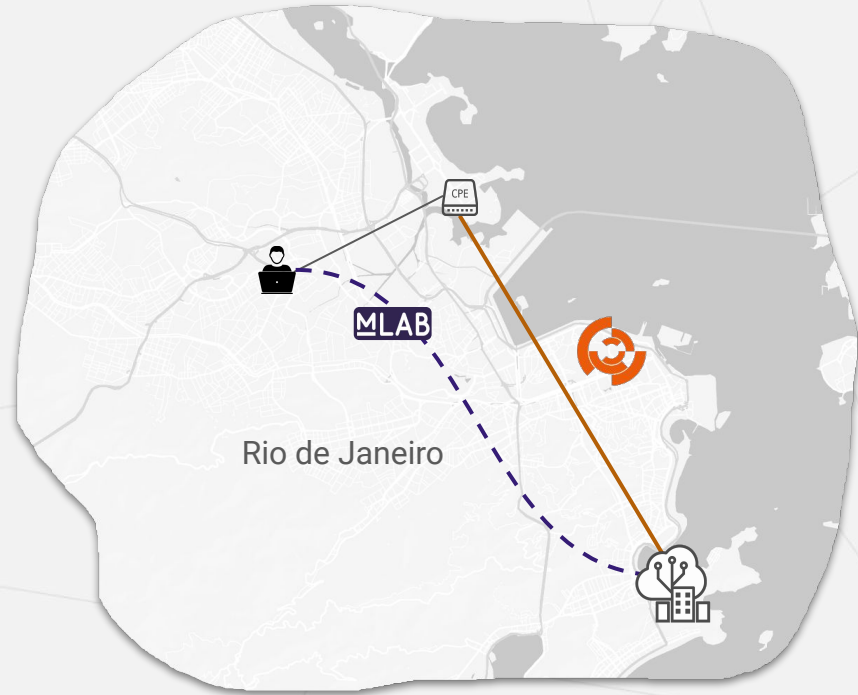
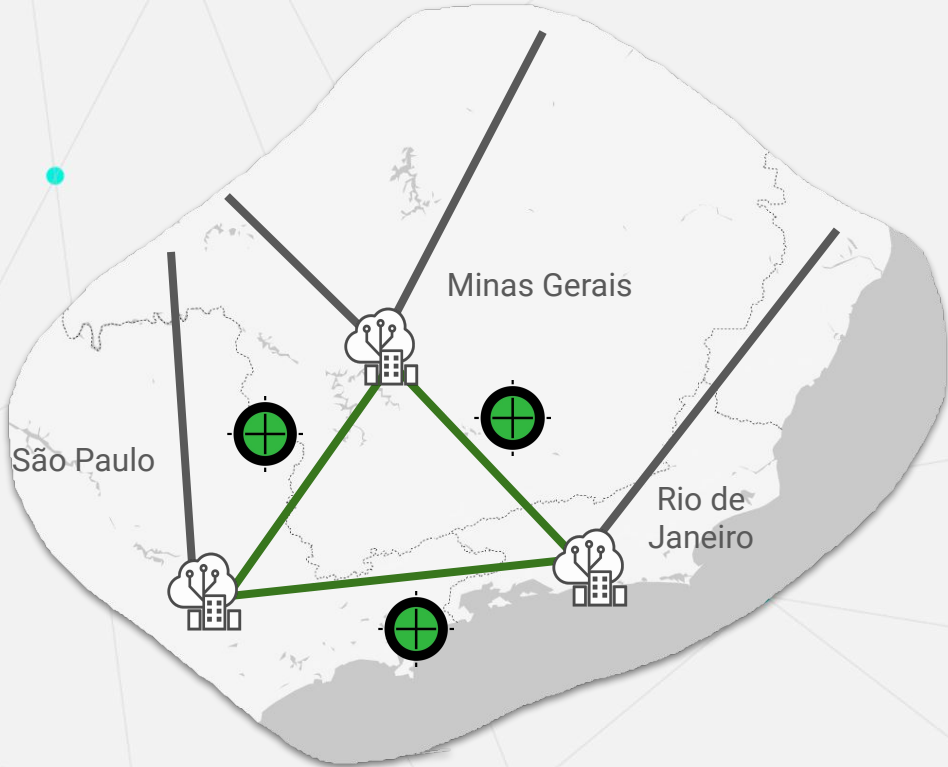


## Speed Test

- NDT 7 server
- Web GUI

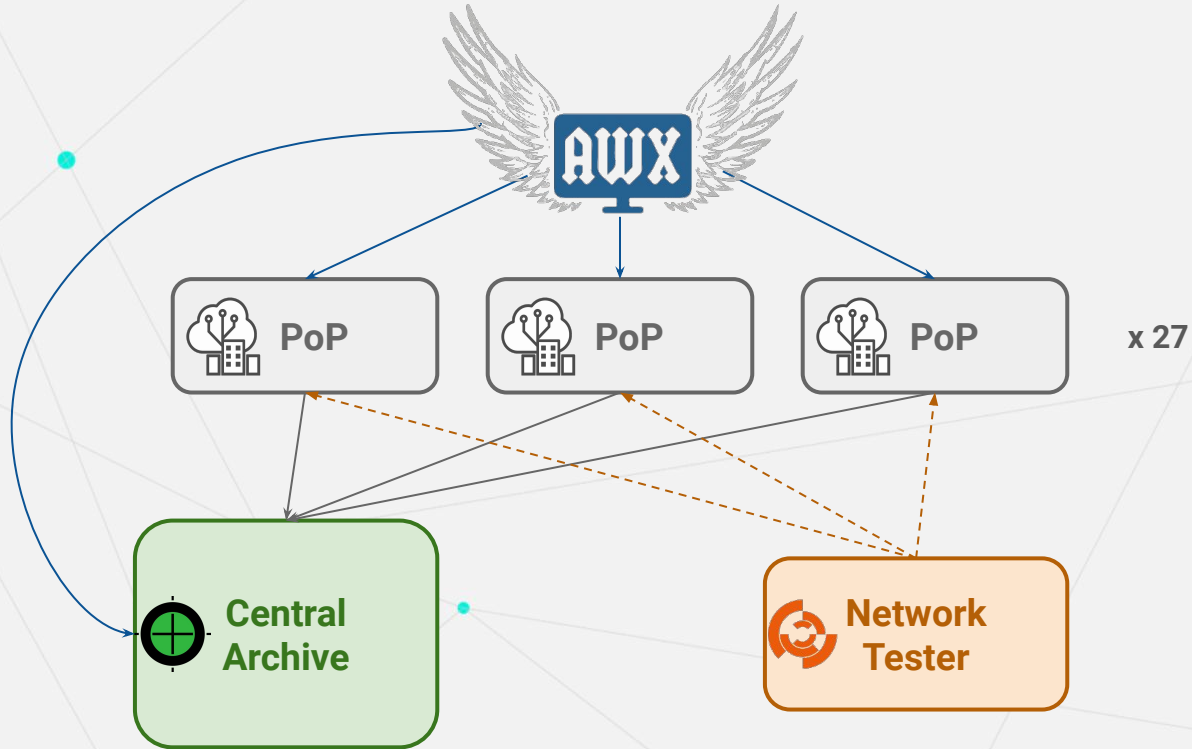
TCP statistics from tcp-info  
BBR TCP congestion control algorithm  
Websockets  
Collaboration with M-Lab  
Publish measurements to BigQuery

—●— MonIPÊ Service



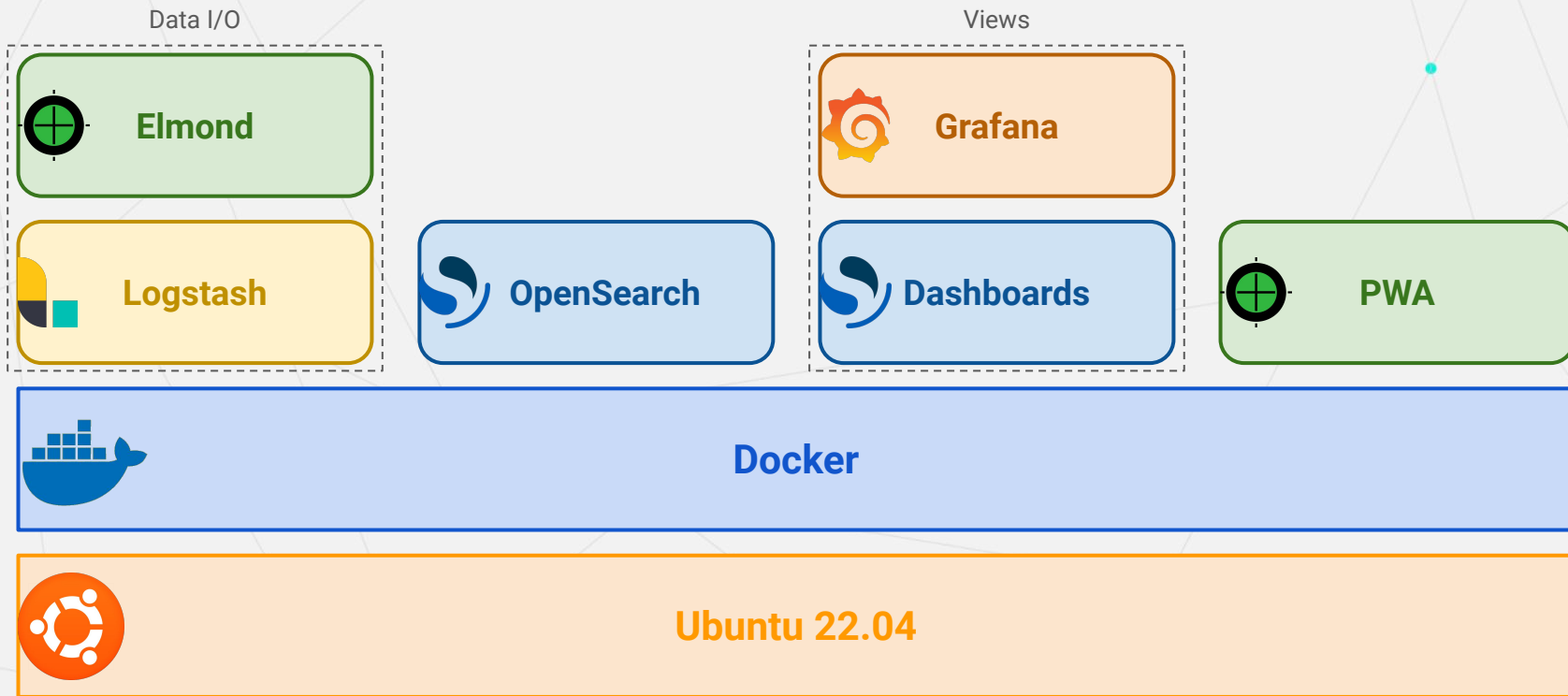
# — MonIPÊ Architecture

# Overall Architecture

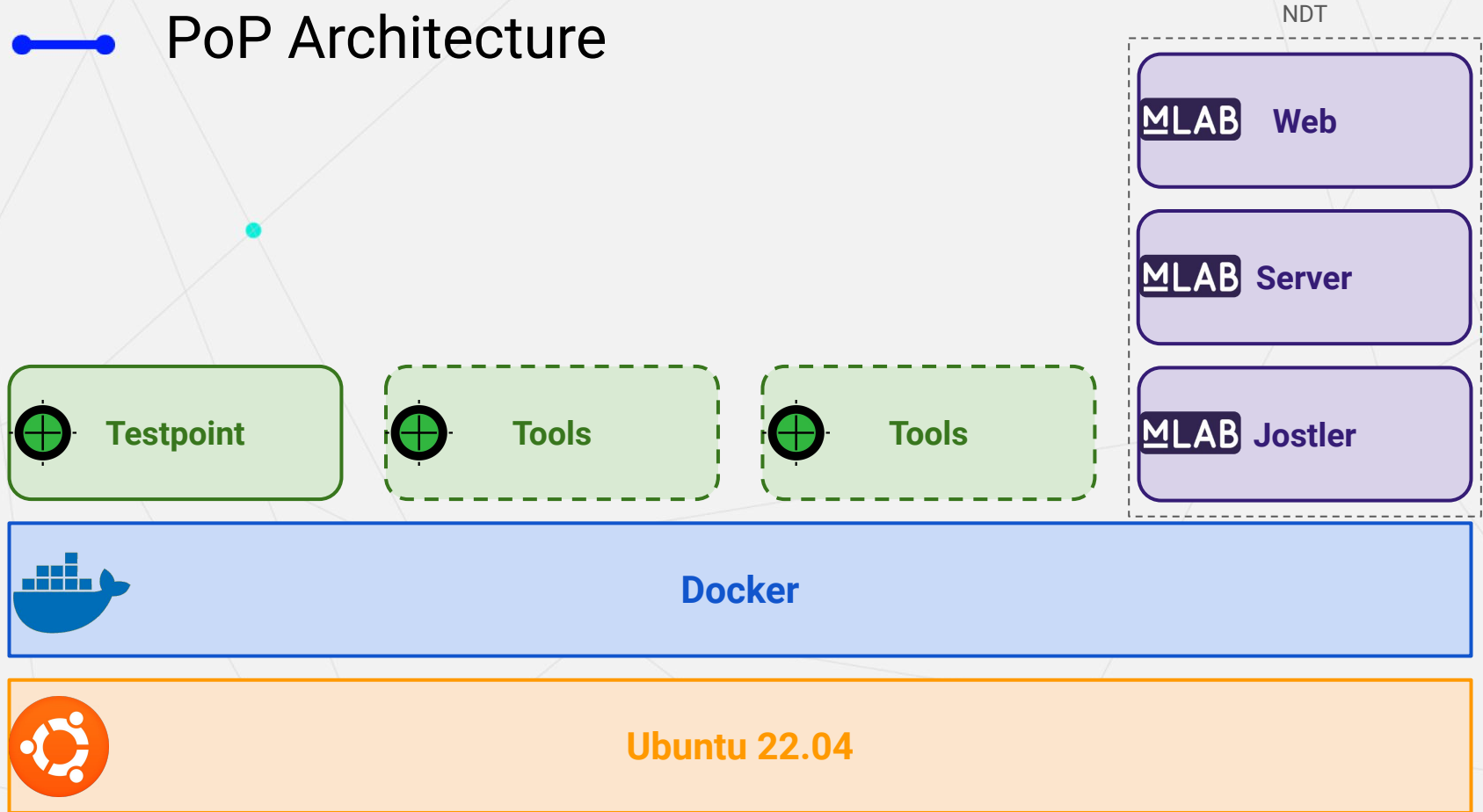




# Central Archive Architecture



# PoP Architecture



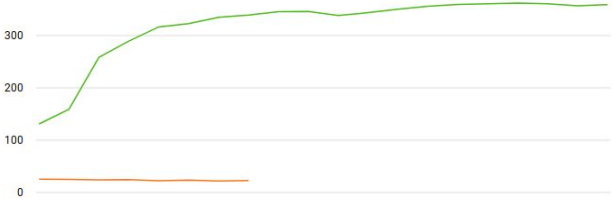
# Speed Test NDT

## RNP Speed Test

Start Test

## RNP Speed Test

359.3 Mbps      21.8 Mbps



Legend  
■ Download ■ Upload

## RNP Speed Test

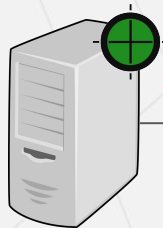
Start Test

Results	
Download:	359.3 Mbps
Upload:	19.4 Mbps
RTT:	139.91 ms
Jitter:	10.02 ms
Retransmissions	0.00%
IP:	.5.220

— Network Performance Tester

# Network Performance Tester

Testpoint



Access router



Connection  
to be tested



CPE



Not managed by RNP

Iperf  
client

10.1.100.1/24

Iperf  
server

10.2.100.1/24

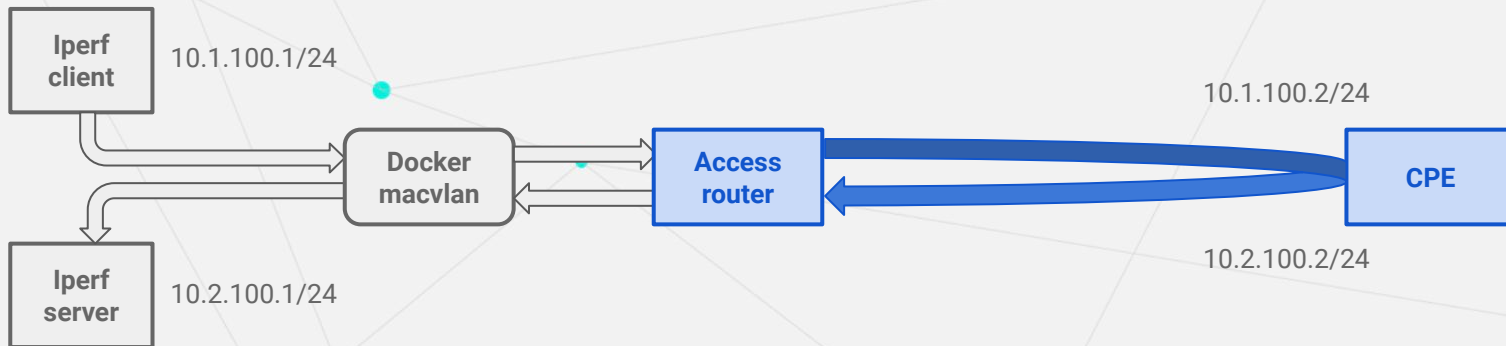
Docker  
macvlan

Access  
router

10.1.100.2/24

CPE

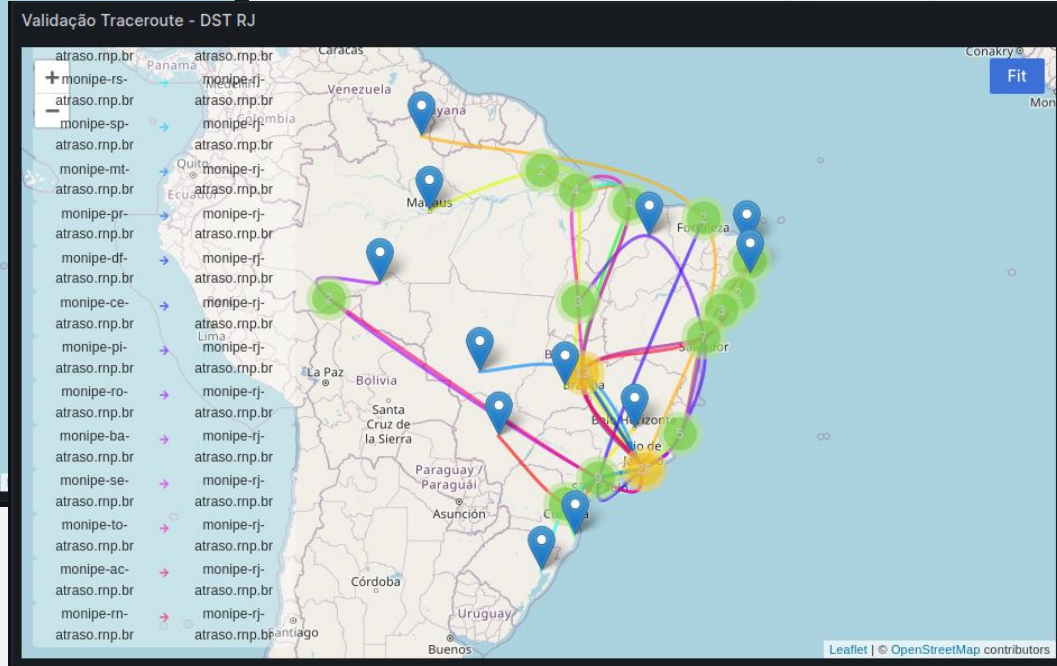
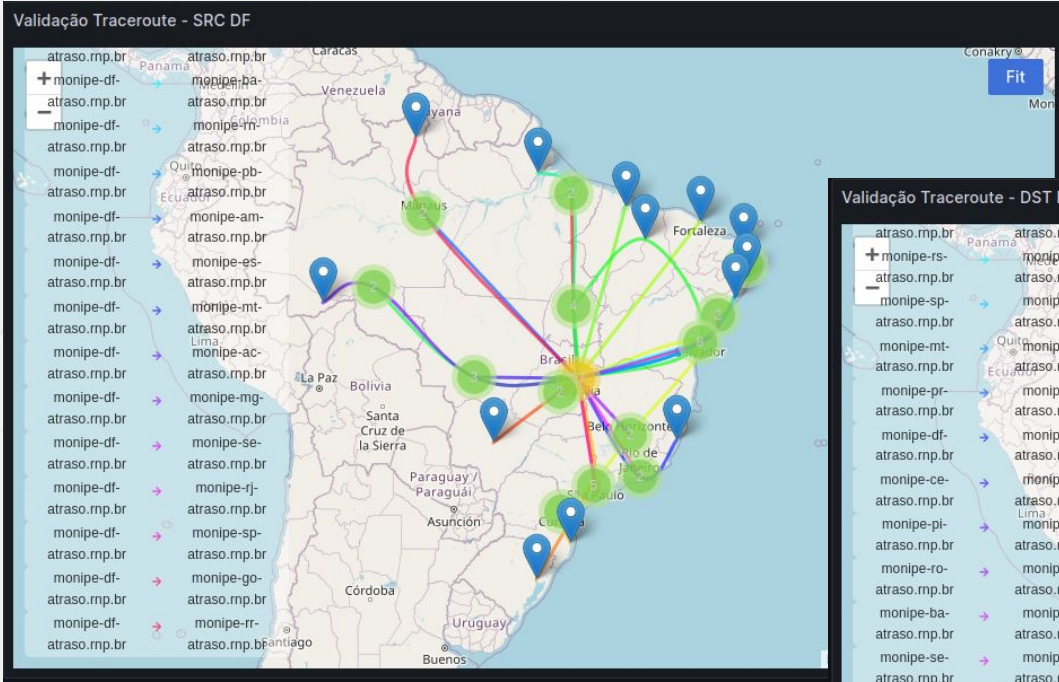
10.2.100.2/24



— Dashboards project

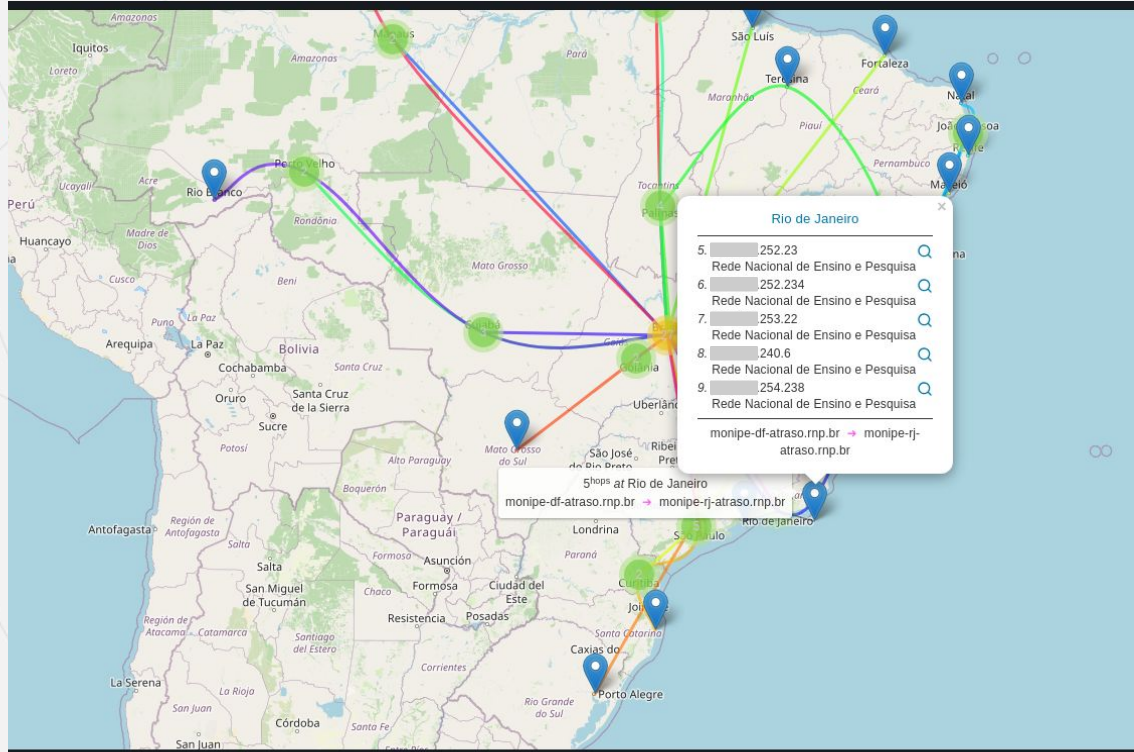


# Grafana Dashboards





# Grafana Dashboards





Daniel Neto  
daniel.neto@rnp.br



MINISTÉRIO DA  
CULTURA

MINISTÉRIO DA  
DEFESA

MINISTÉRIO DA  
SAÚDE

MINISTÉRIO DAS  
COMUNICAÇÕES

MINISTÉRIO DA  
EDUCAÇÃO

MINISTÉRIO DA  
CIÊNCIA, TECNOLOGIA  
E INOVAÇÃO

