RNP Educação, Pesquisa e Inovação em Rede

RNP updates

SA3CC 2025

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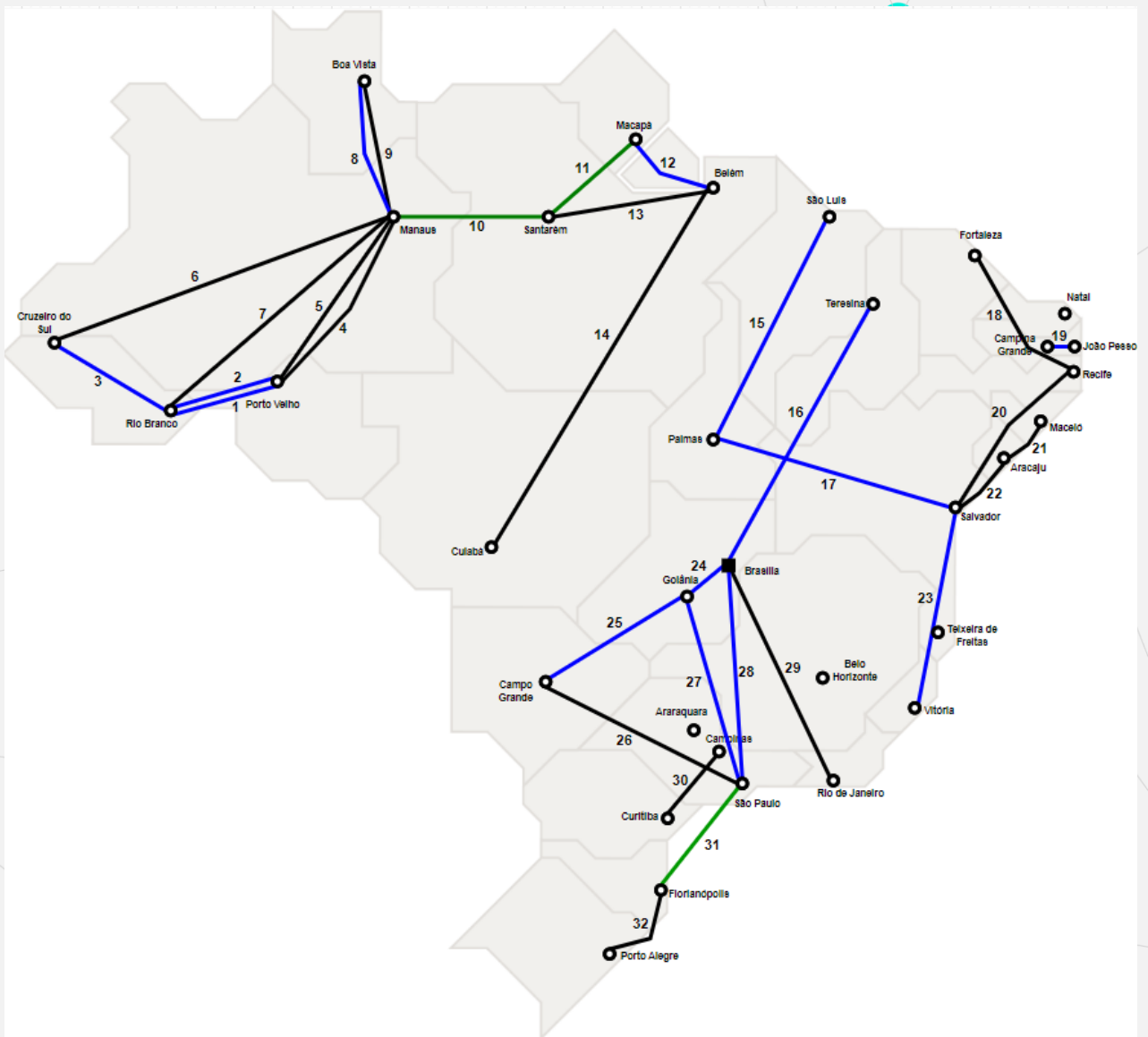
RNP

- RNP – Brazilian Academic Network
  - Non-profit private association
  - Funded by a inter Ministry program
- 1,800 customer sites connected
  - 180k researchers
  - 4k postgraduate programs
  - 4M end users
- 15.000 km of fibers illuminated in own DWDM
  - More than 20.000 km by 2026

https://www.rnp.br/en

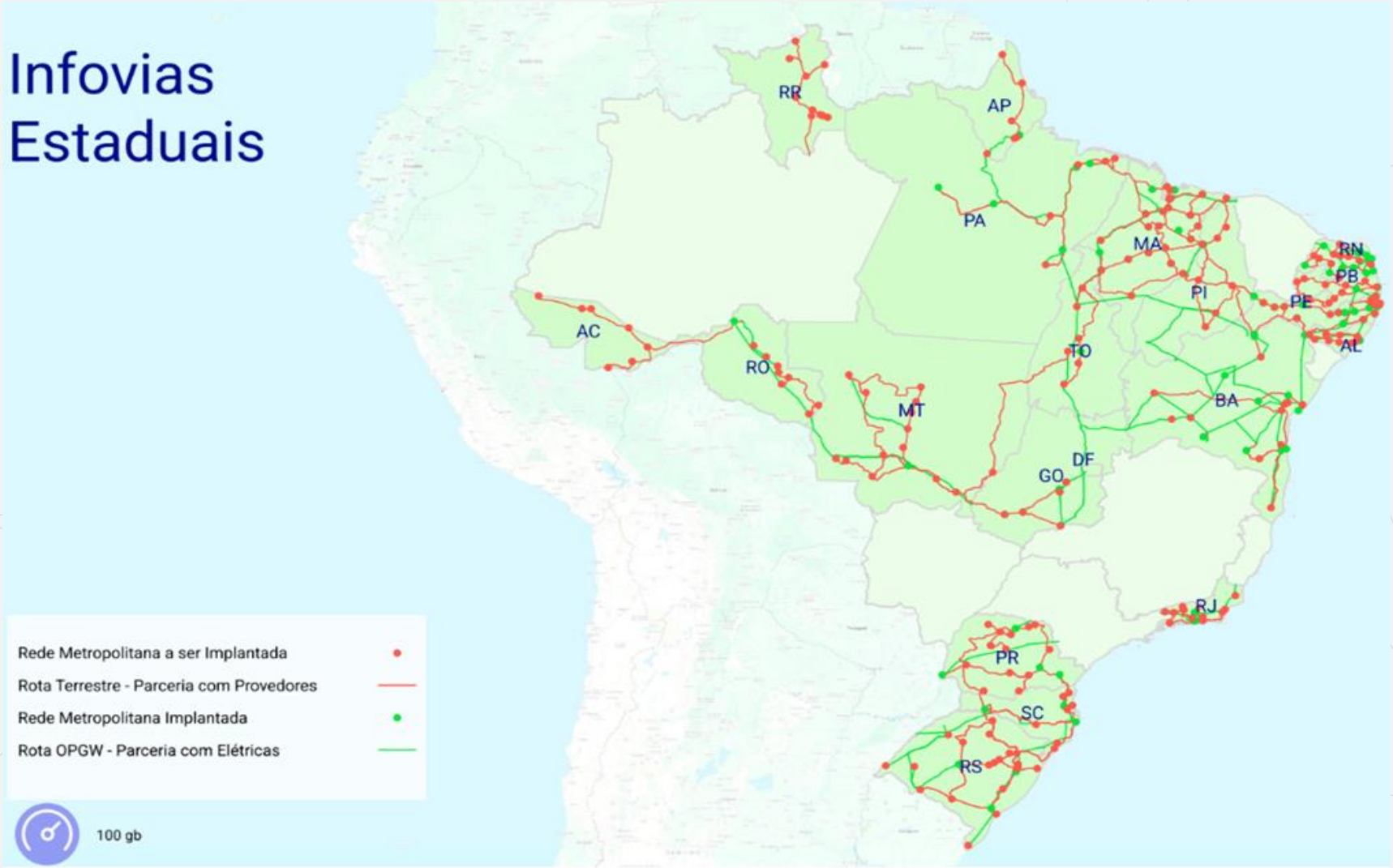
Infovia Nacional (upgrade of Ipê Network)

- 32 x 100G backbone circuits
  - Balacing between OPGW fiber lit up and optical channel swapping in the market.
  - Resource optimization between projects both for SWAP and aquisitions
- 9 PoP facilities being revitalized. All from public univerties.
- New equipment all over the network
  - New arquitecture was proposed. Final design will depend on RFP result (some ideas includes redundant standalone boxes instead of large chassis, role-specific layers instead of collapsed ones, etc).
  - RFI – done
  - RFP is being written.
  - All equipment in RNP PoPs connected by our mission-critical network.



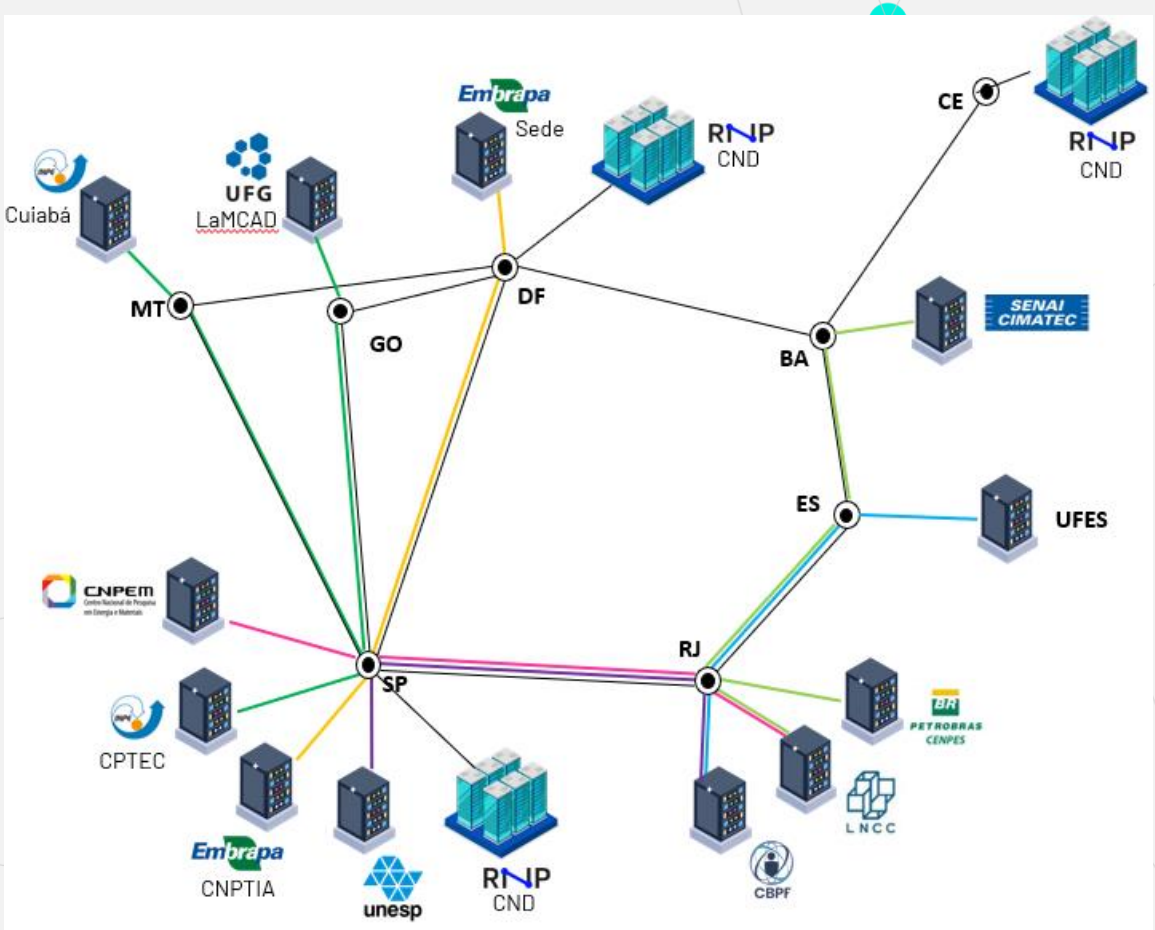
Infovias Estaduais (high-speed network throughout states)

- Highspeed networks throughout 19 states, with 8 of them completed by 2026 (AC, AL, AP, MA, PB, RN, RO, and TO)
- ~ 42,000 kilometers of network paths deployed, with 30,000 completed by 2026
- Deployment of 79 new metropolitan networks



e-Science project

- The network shares equipment with the Ipê Network (RNP's IP backbone) but has a dedicated* capacity of 100G.
- 15 universities and research institutions are involved: 12 were selected from a call for proposals, and 3 are from a legacy project with a similar idea/goal.
- Security by design:
  - No internet access
  - Point-to-point (P2P) connections with 1+1 redundancy implemented between pre-established points (at least in the current phase).
  - End-to-end (E2E) encryption is planned to be supported (MAC-SEC will be tested between DTNs).
  - Mission-critical control and management network



2024 e-Science network topology (update in progress to include the 6 institutions selected last month)

* Whenever viable from both technical and cost perspectives

Mission-critical network

- RNP is deploying a mission-critical control and management network
- It is a evolution from the out-of-band network deployed last year using Cisco Meraki MX sd-wan routers.
- The key features are:
  - HW high availability (warm spare solution)
  - WAN Connectivity high availability (wired inband, oob and mobile)
  - In-band and out-of-band IPsec tunneled site-to-site connections
  - North/South and East/West protection
  - Hub-spoke architecture
    - Multiple hubs (>=5)
    - Regionalized spokes connected to at least 2 hubs.
  - Services:
    - Equipment monitoring and telemetry (all monitoring system are migrating to MCN umbrella)
    - Equipment access (management and console ports)
    - continuous pentesting
    - IaaC - hardering, vulnerability scanning, service provisioning (L2 and L3)

Customer connection upgrades

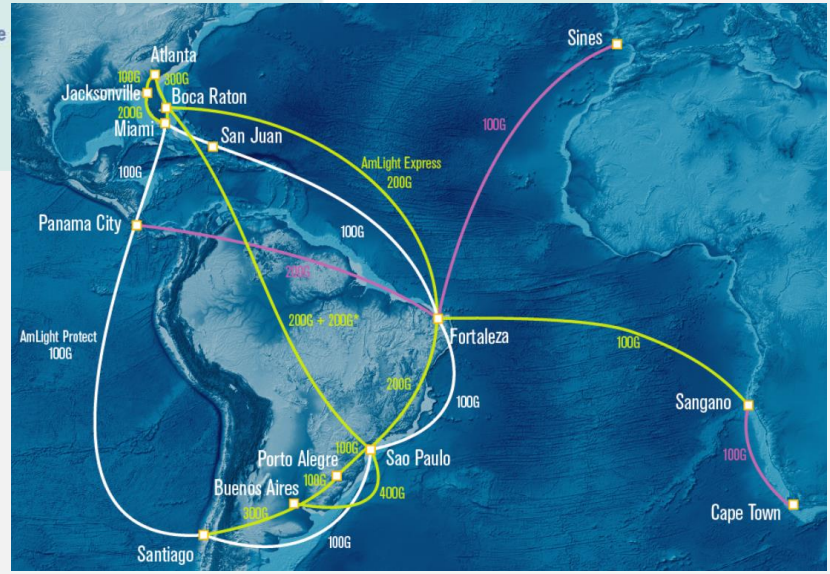
- Planned connection upgrade to RNP's customers from brazilian astronomy community (outside of e-Science network scope):

- LIneA (Interinstitutional Laboratory of e-Astronomy):
  - Independent Data Access Center (IDAC) to Vera C. Rubin observatory
  - Connection upgrade to >=100G planned to this year (2025).

- ON (Brazilian National Observatory):
  - Connection upgrade to 100G planned by 2026.

International connections and collaborations

- Partnership with academic initiatives:
  - Bella (RedCLARA + Geánt)
  - AmLight
- Points of connections:
  - Fortaleza – RedCLARA (Bella-S) + AmLight
  - São Paulo – RedCLARA + AmLight
  - Porto Alegre – RedCLARA
- Currently doubling the Monet capacity to 800G in a joint effort with FIU.
- Supported Amlight's new connection "São Paulo - Buenos Aires" (Tannat cable) with colocation and other local services in SP.



OBRIGADO!

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