



RI **IP**

Educação, Pesquisa
e Inovação em Rede

CONNECTIVITY IN
BRAZILIAN AMAZON

PAIS - SUSTAINABLE INTEGRATED
AMAZON PROGRAM

RNP

- RNP – Brazilian Academic Network
 - Non-profit private associatin
 - Annual funding: USD 120 million
 - 1.800 point connecteds
 - 180.000 researchers
 - 4.000 postgraduate programs
- 15.000 km of fibers illuminated in own DWDM
- More than 20.000 km by 2026



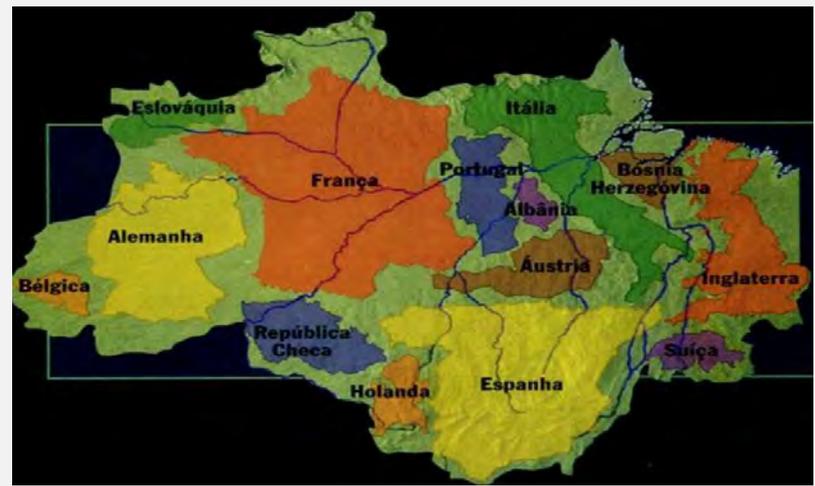
<https://www.rnp.br/en>



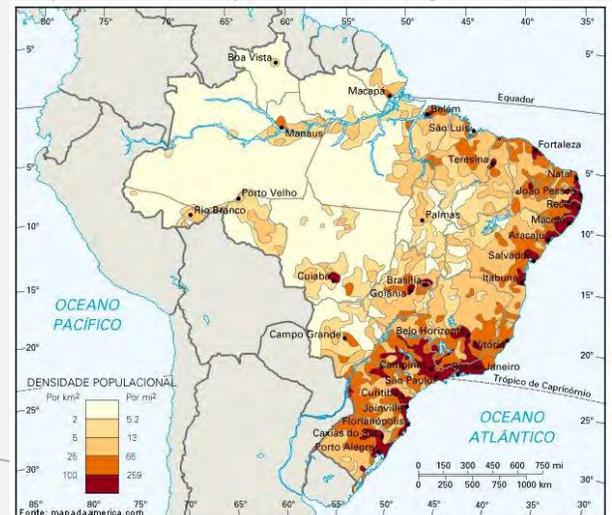
Brazilian Amazon Region



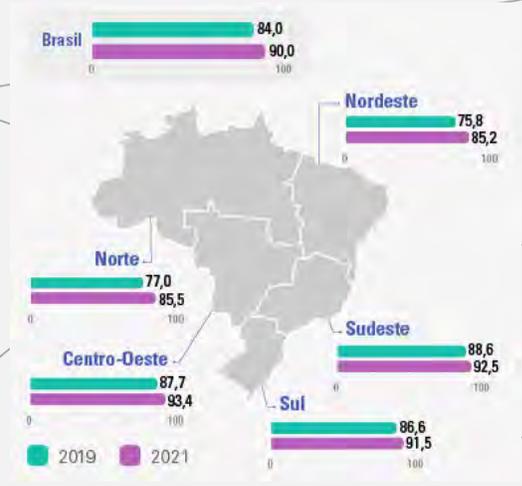
Area: 5,015,067 km²



The size of half of Europe



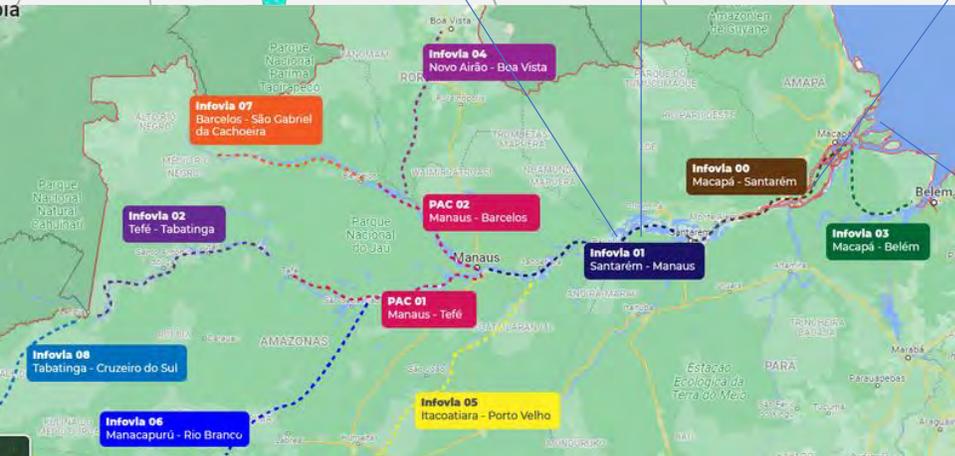
Area: 8,516,000 km²



Home internet use

- 58.9% of the Brazilian territory.
- 772 municipalities, in 9 states.
- 28 million Brazilians
- 13% of the country's population
- Low demographic density (5.6 inhabitants per km²)
- Lowest rate of digital inclusion in a rural environment in the country
- If it were a separate country, it would be the sixth largest in the world

Project

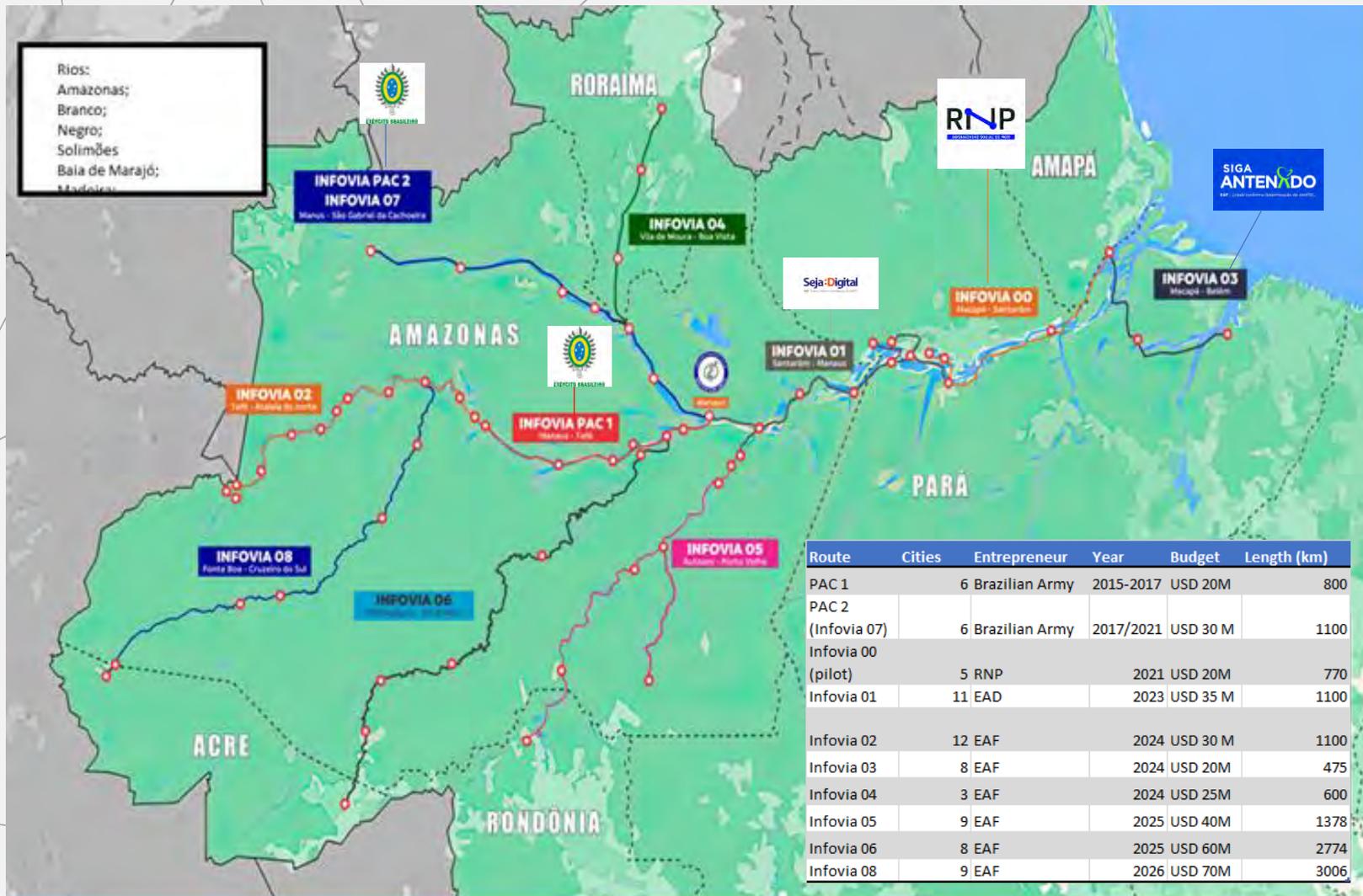


PAIS – Sustainable Integrated Amazon Program was created by the Ministry of Communications (MCOM) with the mission of expanding communications infrastructure in the Amazon Region. Through the implementation of a fiber optic backbone under the rivers of the Amazon region.

RNP launched the pilot project, Infovia 00, which connects five cities: Macapá, Almeirim, Monte Alegre, Alenquer and Santarém. Infovia 00 was the first among the eight infovias in the program.

In this Pilot was created the Neutral Operator model for the program - Infrastructure Sustainability Model

PAIS - Sustainable Integrated Amazon Program



USD 350M



10 M



77 Cities



2015 - 2026



12.000 km



68 M trees preserved

- DWDM System - Initial 400G and up to 8Tb/s
- 48 Fibers on the Subriver cable

Cable Launch

Execution

- 1) Technical Visit- DTS – RPL – ERA – MAGPI - RTF
- 2) Environmental Licensing – IBAMA e órgãos anuentes
- 3) Right to use land
- 4) Transshipment
- 5) Landing Station
- 6) Containers Data Centers
- 7) River Launch
- 8) Ground launch
- 9) DWDM System
- 10) IP Systema
- 11) Metropolitan networks



Regional Launch Company



Projeto Piloto Infovia 00

Cable



- Submarine cable without connection and underwater amplifier.
- **Double Armour**
- Maximum diameter of 27 mm, with single or double frame.
- **48 Optical Fibers**

BMH – Beach Manhole and Data Center Container



- Structure for interconnection of submarine and terrestrial optical cable.
- 6m² structure, underground, made of concrete and cast iron cap.
- External underground interconnection
- Location on public or private lands.
- **Regional Builders**



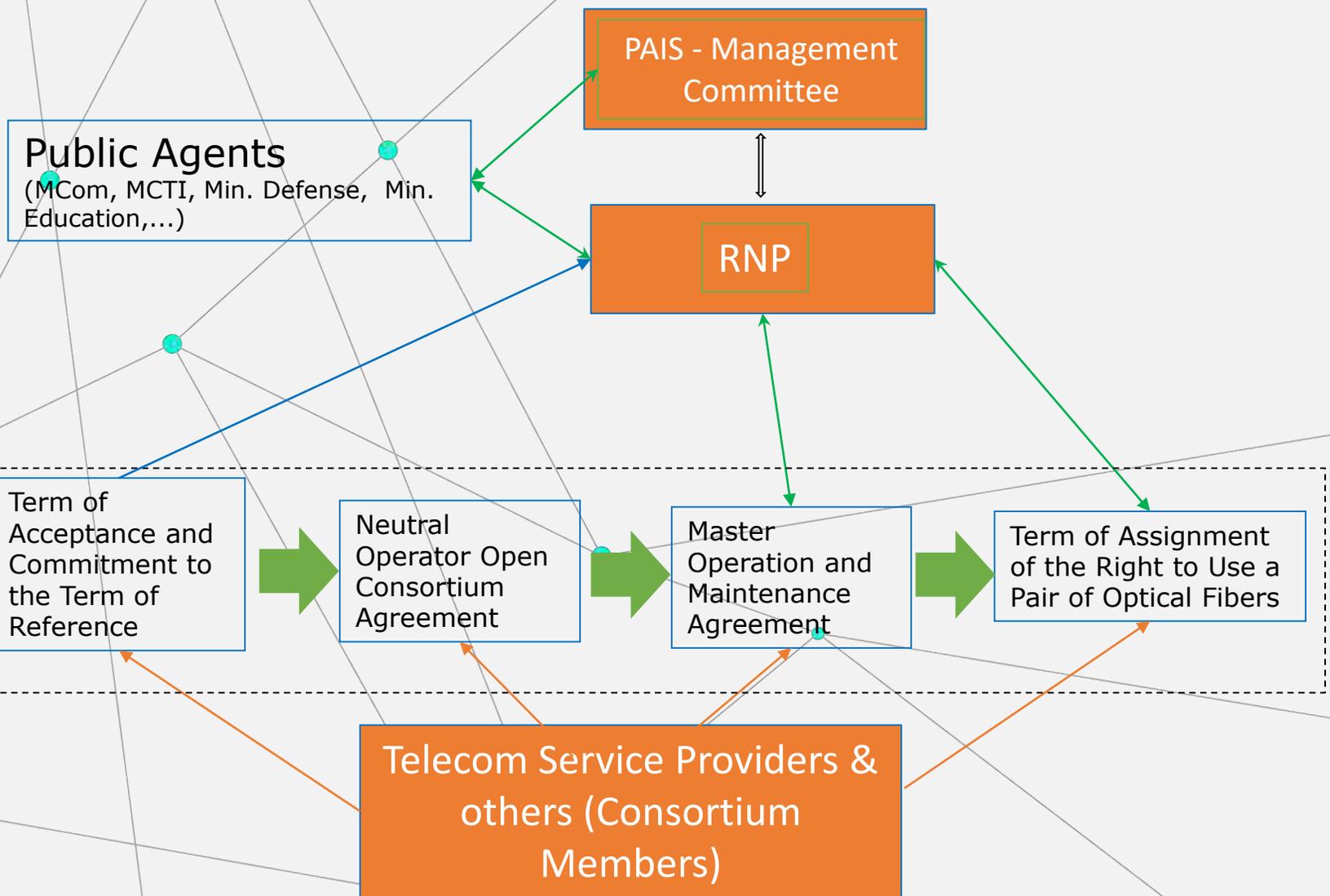
- Structure that will house telecommunications equipment.
- Container type 10 or 20 feet
- Includes Electrical Power system
- One for city
- **Production by regional company - Manaus free zone**

Telecom System



- Set of active and passive optical equipment.
- **DWDM System – Brazilian Product**
- Switches and router

The Neutral Operator Model of Infovias 00 and 01



- **Innovative model of Open Consortium with Operators and Providers (ISPs), which takes over O&M**
- Modeled for Infovia 00 and Infovia 01, and must be adopted by all other infovias in the program
- **12 consortium member**
- **One fiber pair per consortium member for 20 years** and one optical channel in DWDM System for 36 months
- **In return, the consortium operates and maintains the infrastructure**
 - Commercial exploitation is individual - companies compete with each other
 - Approved by CADE - Administrative Council for Economic Defense

Next Week Launch Begins— Infovia 03



USD 20M



1,5 M



450 km of optical cable



Apr/2024



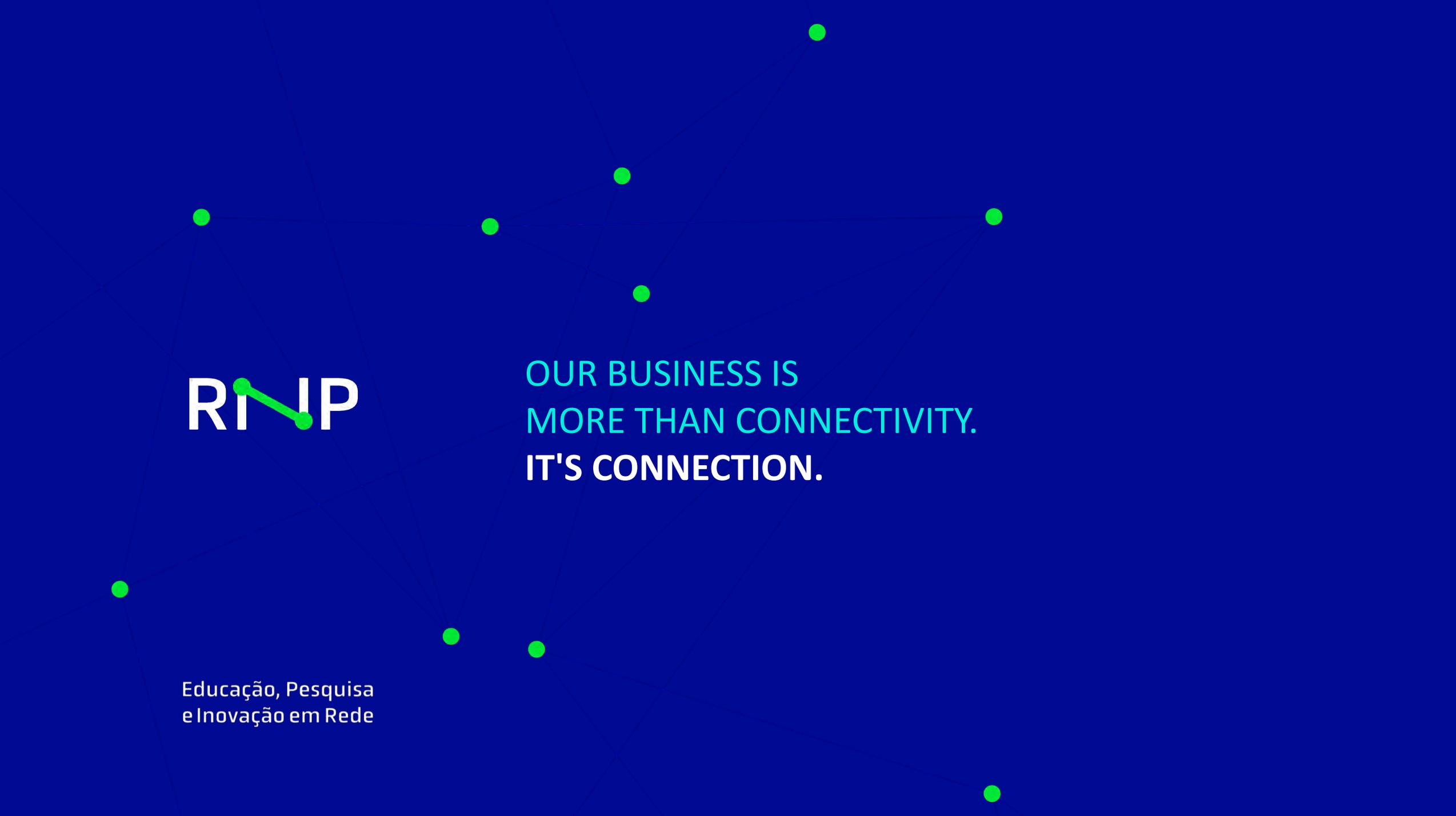
Other ways to connect on Amazonia



- ISP Networks – Small and Medium ISP Are launching cable cross the rivers to connect more points
- Radio links
- Satellites - Geostationary
- Satellites – Constalations No - GEO
 - Low orbit – Starlink, Swarm and Amazon Project Kuiper
 - Medium orbit – O3b, Oneweb, Kepler and others
 - High orbit – Globalstar, OrbcommO3B and E- Space

— Infovia 00 Documentary

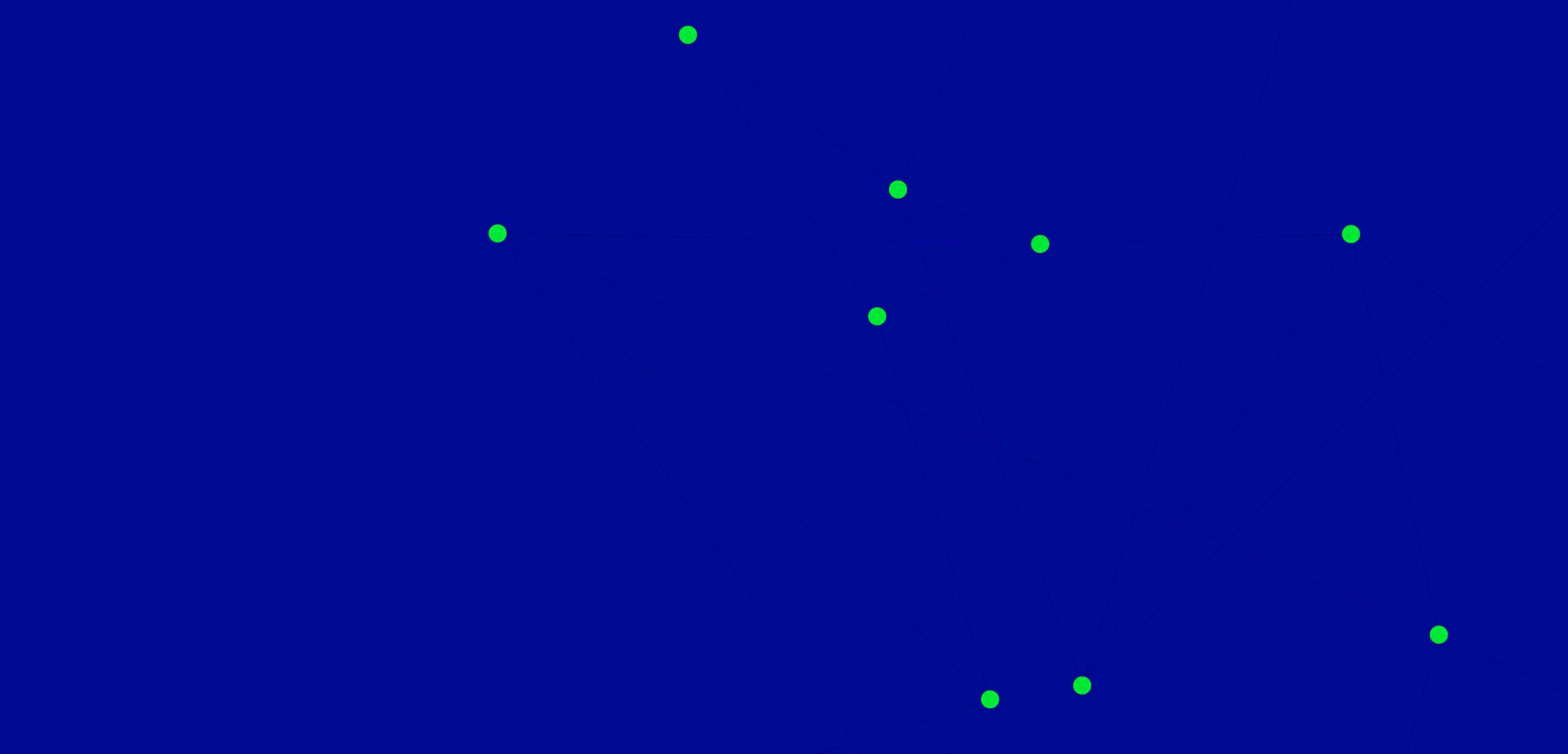




RI **IP**

OUR BUSINESS IS
MORE THAN CONNECTIVITY.
IT'S CONNECTION.

Educação, Pesquisa
e Inovação em Rede



RINIP

MINISTÉRIO DA
CULTURA

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DEFESA

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SAÚDE

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GOVERNO FEDERAL
BRASIL
UNIÃO E RECONSTRUÇÃO