

# **RNP - the brazilian national academic & research network infrastructure update**

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**RNP** – a nonprofit, non government organization, to run the network and promote the use of it.

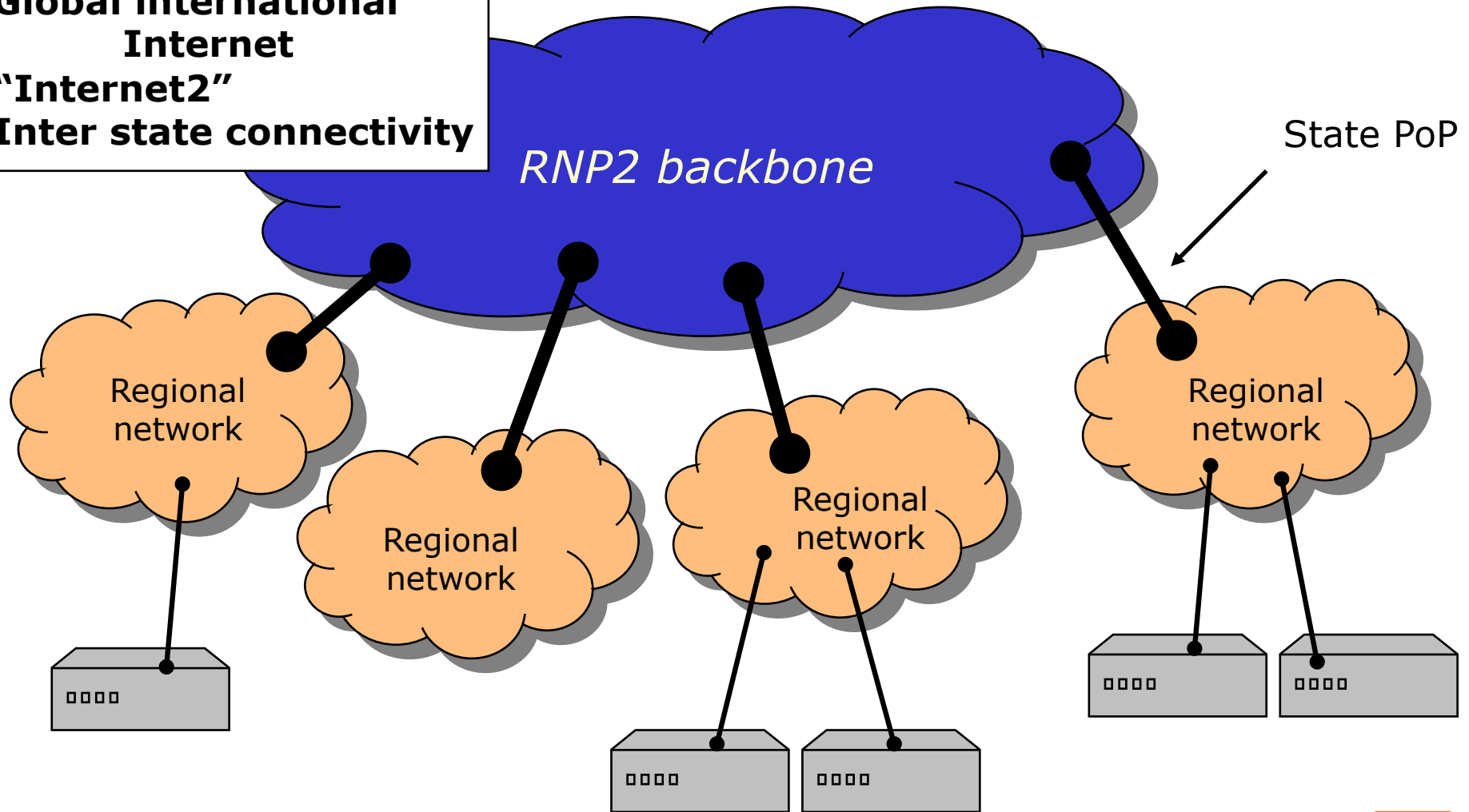
**RNP2** – a national backbone devised in 2000 to support advanced applications.



# A 2 tiered network

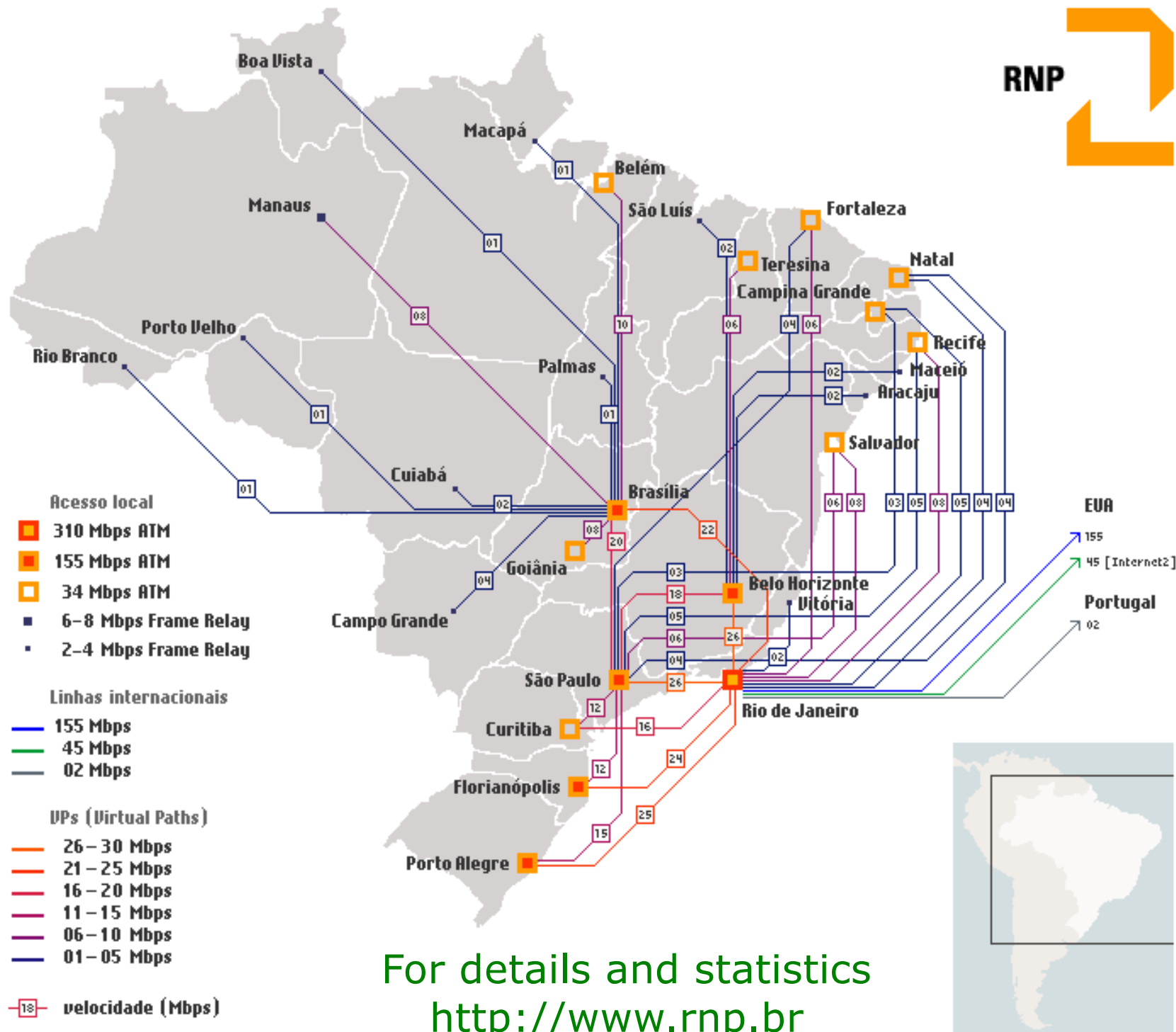


- Peering
- Global international Internet
- "Internet2"
- Inter state connectivity



Customers (connected academic & research institutions)

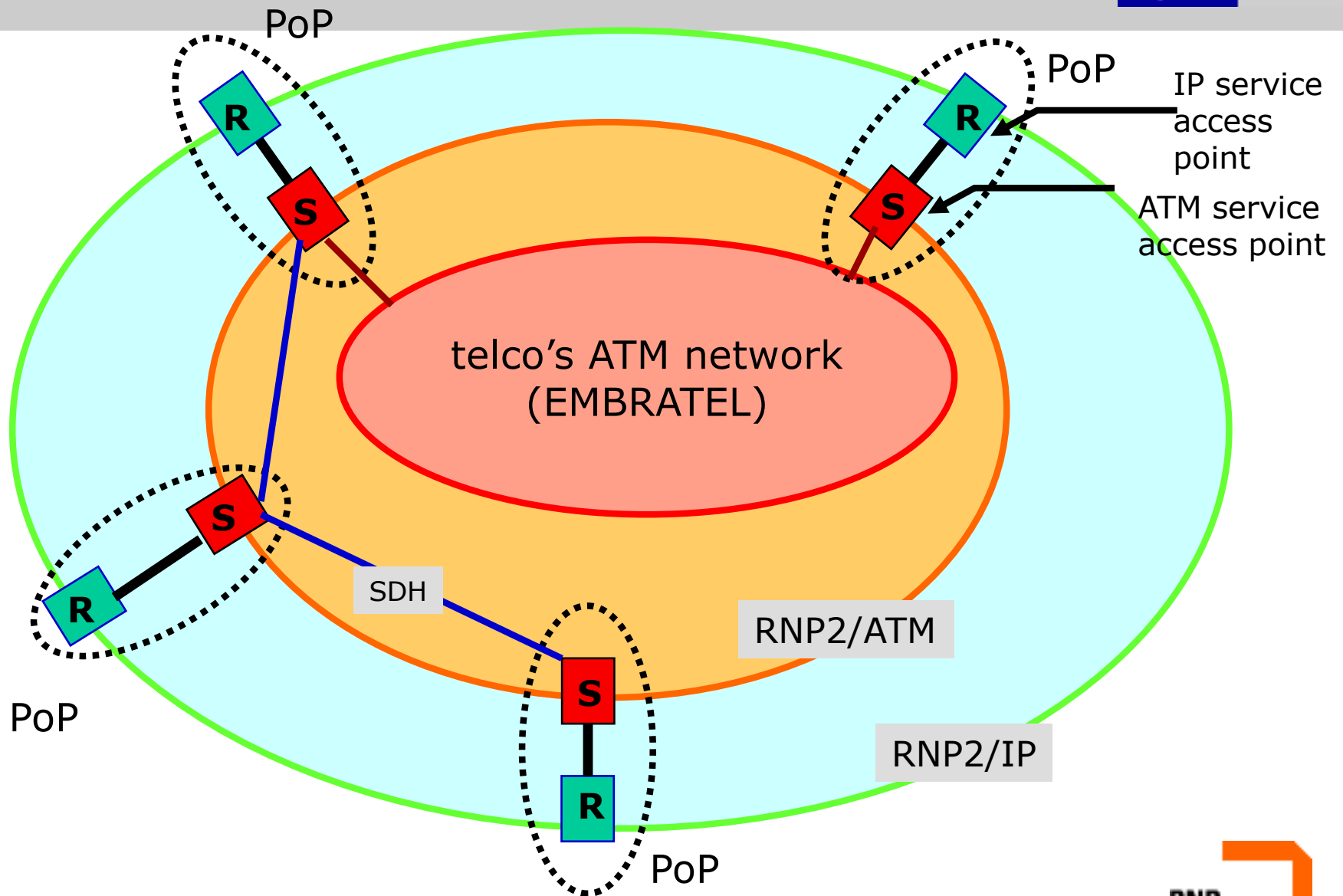




For details and statistics  
<http://www.rnp.br>



# RNP2 backbone service structure (2001)





- 8.3 M dollars/year
- most visible action of RNP
- enough bandwidth for daily usage
- Total bandwidth adds up to 330 Mbps
- increased 35% last year





- 27 state POPs
- more than 300 institutions (users)
- 1 main POP per state, operated by partnership agreement with selected customers (mainly federal universities)
- Limited multicast and IPv6 native routing (few selected POPs)
- 6Bone connectivity (tunnels)





- Presently based on leased ATM VP's from a major telco (most of them heavily used)
- ATM technology is becoming a problem as bandwidth demands increase





## External connectivity:

- 155 Mbps to global Internet (US ISP) 100% traffic load in busy hours)
- 120 Mbps of traffic exchange (peering points) with brazilian commercial ISP's
- 45 Mbps to AmPATH/"Internet2" ( 70% used)
- 2 Mbps line to Portugal

# Metropolitan high speed networks



## ReMAVs

- 2 years grant (by the end of the 90's)
- Some more succesfull than others
- Based on ATM OC3/OC12
- Not yet interconnected by a true high speed national network



*"Promoting the innovative use of advanced networking in Brazil."*

How much important is providing infrastructure?

Infrastructure: IP switched network?  
mesh of optical paths?  
mesh of assured quality VC's?

- Advanced infrastructure means high costs without partnership
- hard to obtain partnership from industry
- even harder from telcos !!
- keep operating the infrastructure, but no longer the main goal (but it takes the largest part of our budget)
- missing large deployment of BW demanding app's
- Still missing a true high speed national network

THE END



Q&A

