

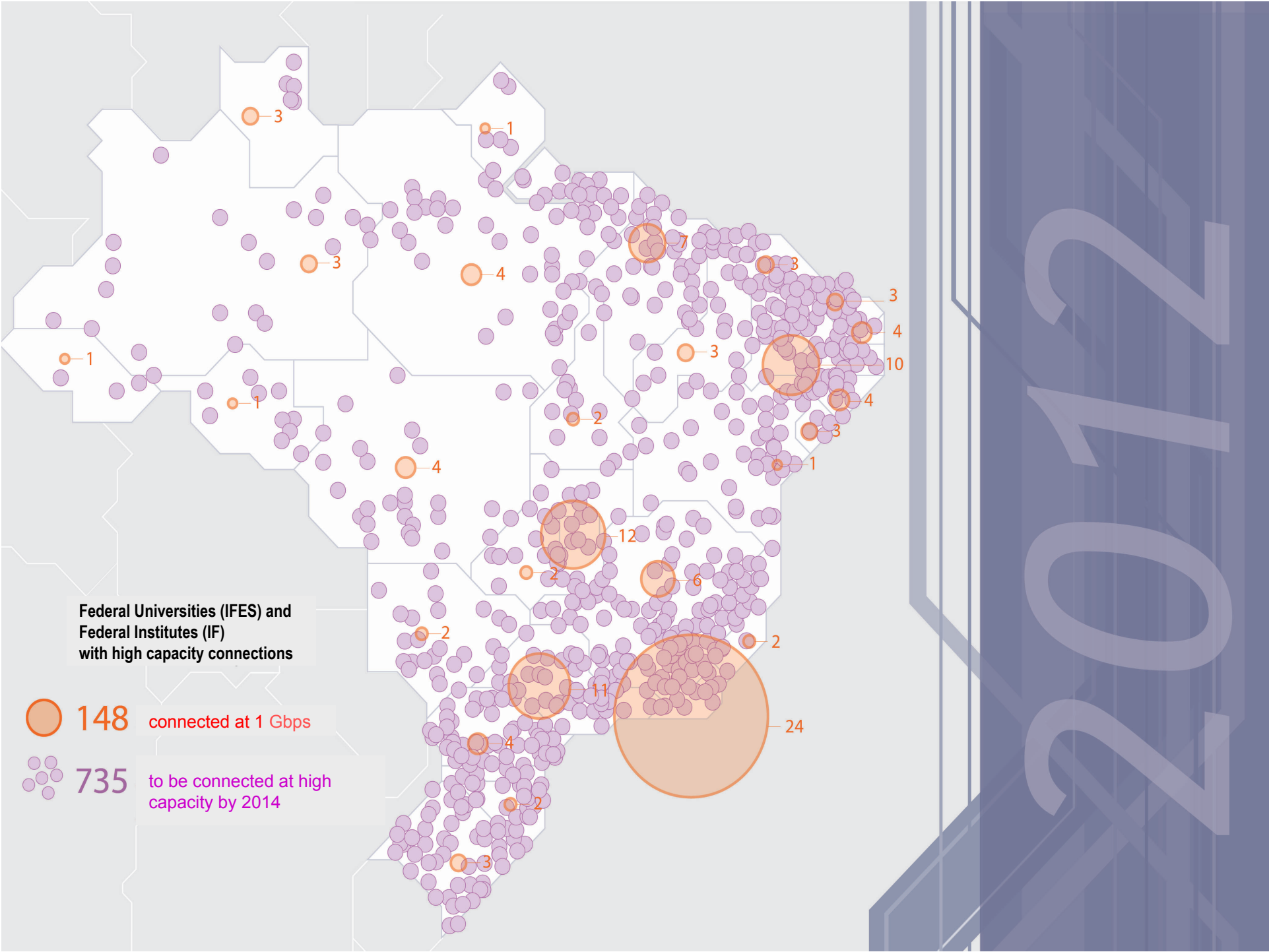


Brazil update

GLIF Americas
Chicago, 10 Oct 2012

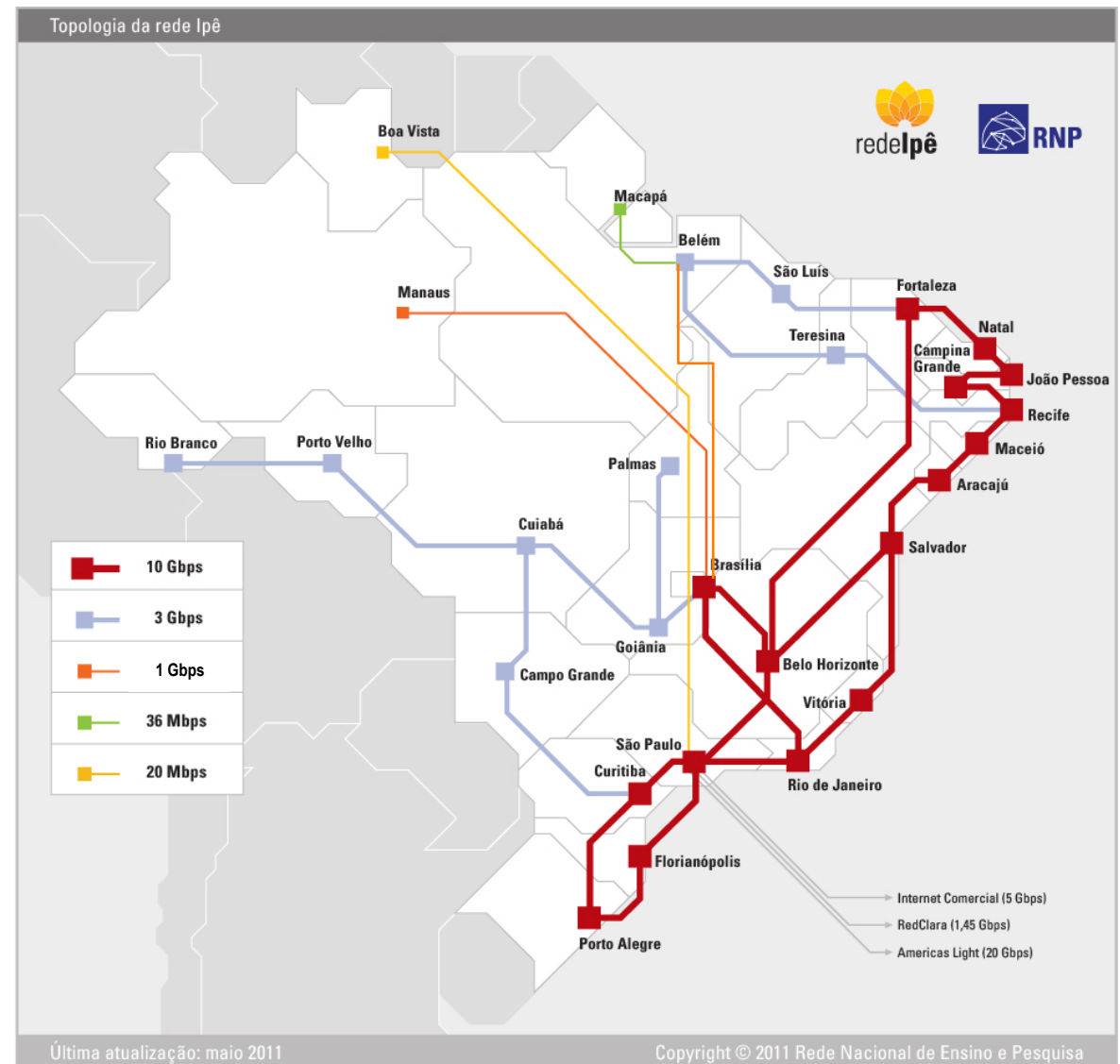
Michael Stanton
Brazil's Research and Education Network – RNP
michael@rnp.br

- RNP clients (now and 2014)
- RNP backbone (upgrades to links to northern Brazil)
- RedCLARA has a new backbone
- US-Brazil links (aka Amlight East): soon 4x10G (RNP + ANSP)
- Future submarine cables
- GLIF-related applications
 - APAN33
 - Tri-continental opera



RNP backbone upgrades (northern Brazil)

- **Phase 6 (MPLS) backbone deployed in 2011 (mostly 10 and 3 Gbps) using Oi infra.**
 - Links state capitals, state networks (e.g. ANSP) + metro nets
- **2 new 1 Gbps links in 2012:**
 - Manaus (upgrade from 200 Mbps)
 - Belém (second protection link)
- **New telco partner Telebras (govt) providing 100M and 1G access links to upcountry sites.**



RedCLARA2 (after ALICE2)

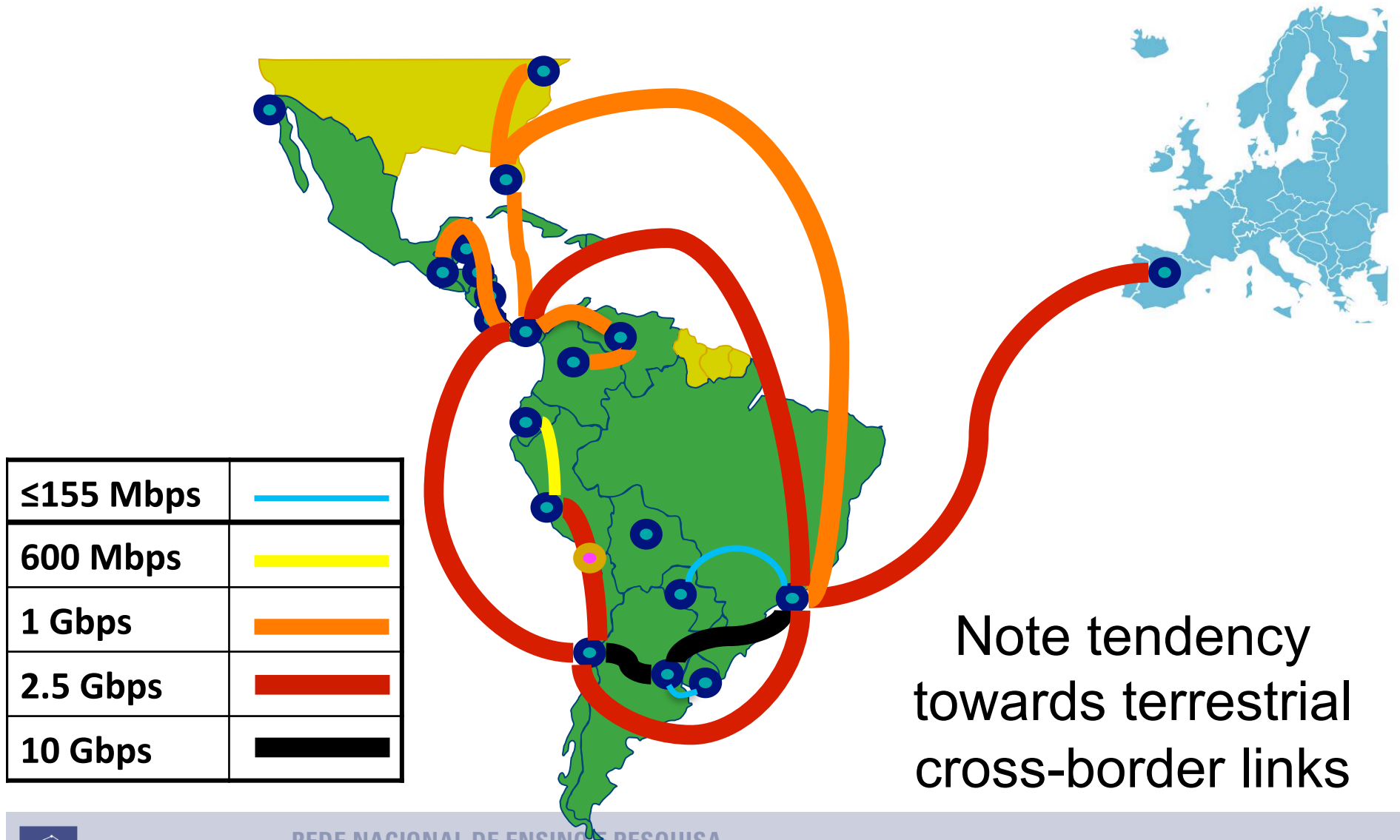
4Q2012

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New links Latam-US in 2013

- 1. ANSP: 2x 10G links**
S Paulo – Miami
 - (W) via Santiago (SAC)
 - (E) direct (SAM)
- 2. RNP: 2x 10G links**
S Paulo – Miami
 - (W) direct (SAM)
 - (E) via Rio de Janeiro & Fortaleza (SAC)
(+ redundant terrestrial links)
- 3. RedCLARA:**
 - 1G link Panama – Miami (SAC)
 - 10G terrestrial link Santiago – S Paulo

SAC: Level3 (US) / Latin America Nautilus (IT)
SAM: Telefonica (ES)



Much greater redundancy than before due to use of separate cables

Trans South Atlantic cables and projects

Existing:

- ATLANTIS-2

Planned or under construction

- 1.WASACE (Brazil – Nigeria)
- 2.SAEx (Brazil – South Africa)
- 3.BRICS (Brazil – South Africa)

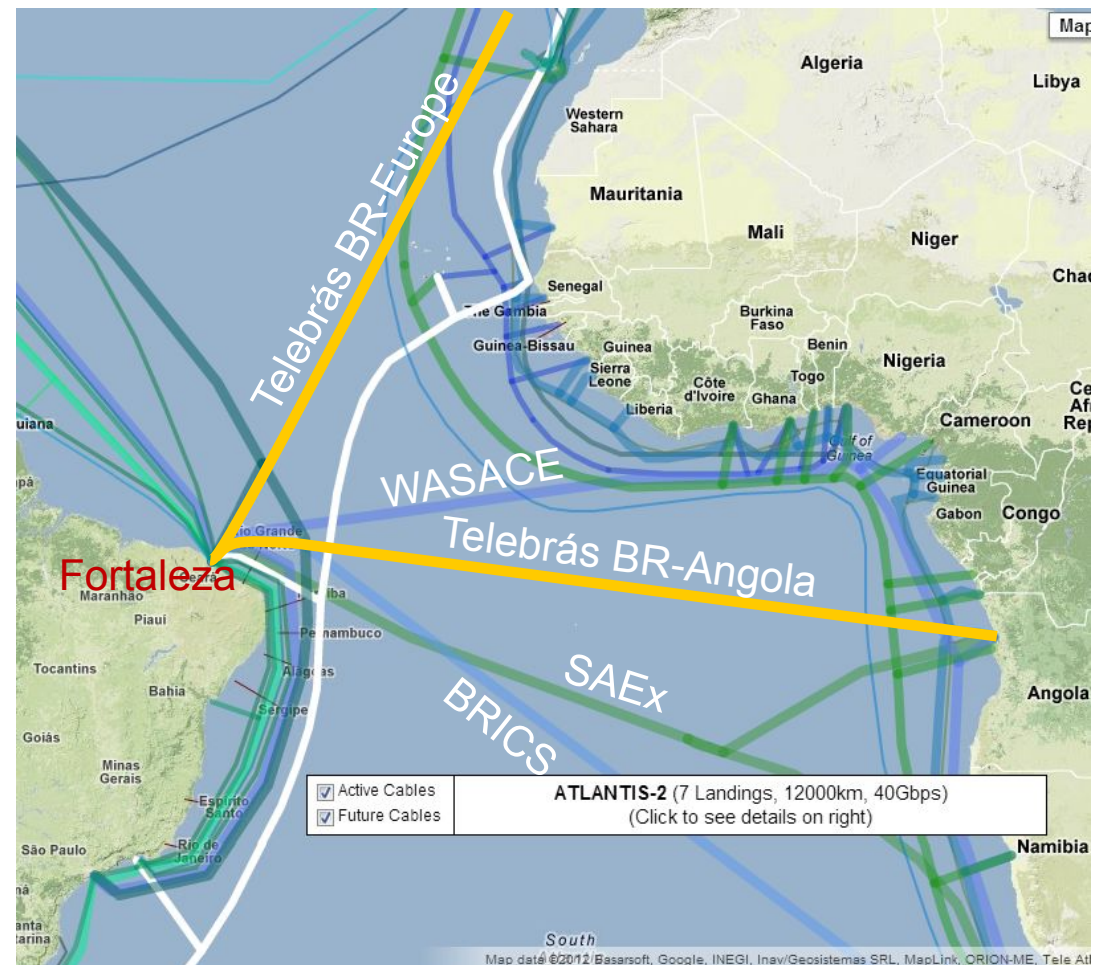
also Telebrás plans:

- 4.Brazil – Europe
- 5.Brazil – Angola

- Clearly, not all of these will be funded, but some will!
- Fortaleza strategically located, with several cables also to North America (USA), and to SE Brazil and Argentina
- Cross S Atlantic links will make significant changes to global topology

Greg's Cable Map

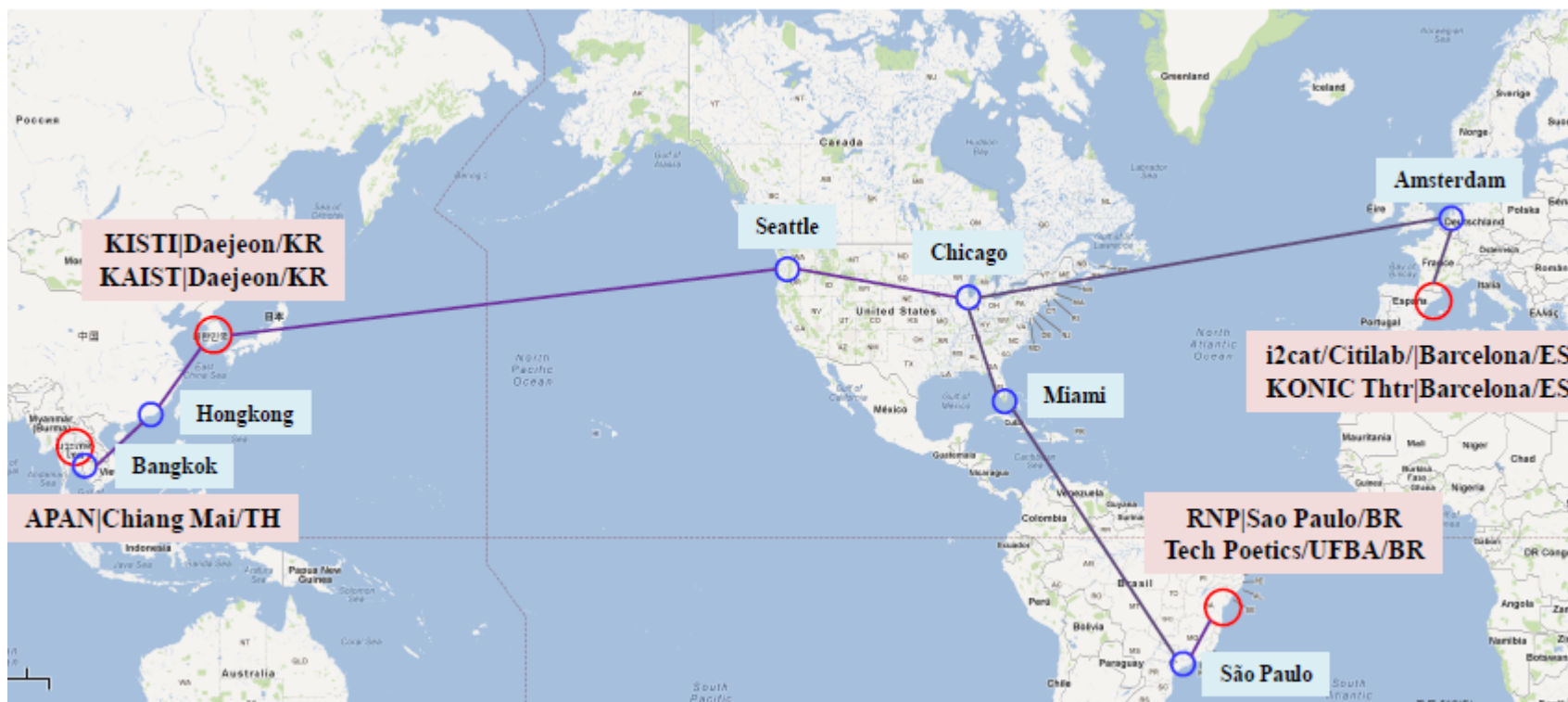
<http://www.cablemap.info/>



1. CineGrid participation (December 2011)
 - Streaming of 4K content from UFPB (NE Brazil) to UCSD
2. Extension of HPDMnet to labs at several universities to serve as persistent testbed for media applications (2012)
3. Live participation in telematic dance performance at APAN33 in Thailand (February 2012)
 - Use of HPDMnet plus extensions for streaming from i2Cat and UFBA (NE Brazil) to Korea and Thailand
4. Streaming of 4K media from UFPB to Brazilian Cinemateque using HPDMnet (May 2012)

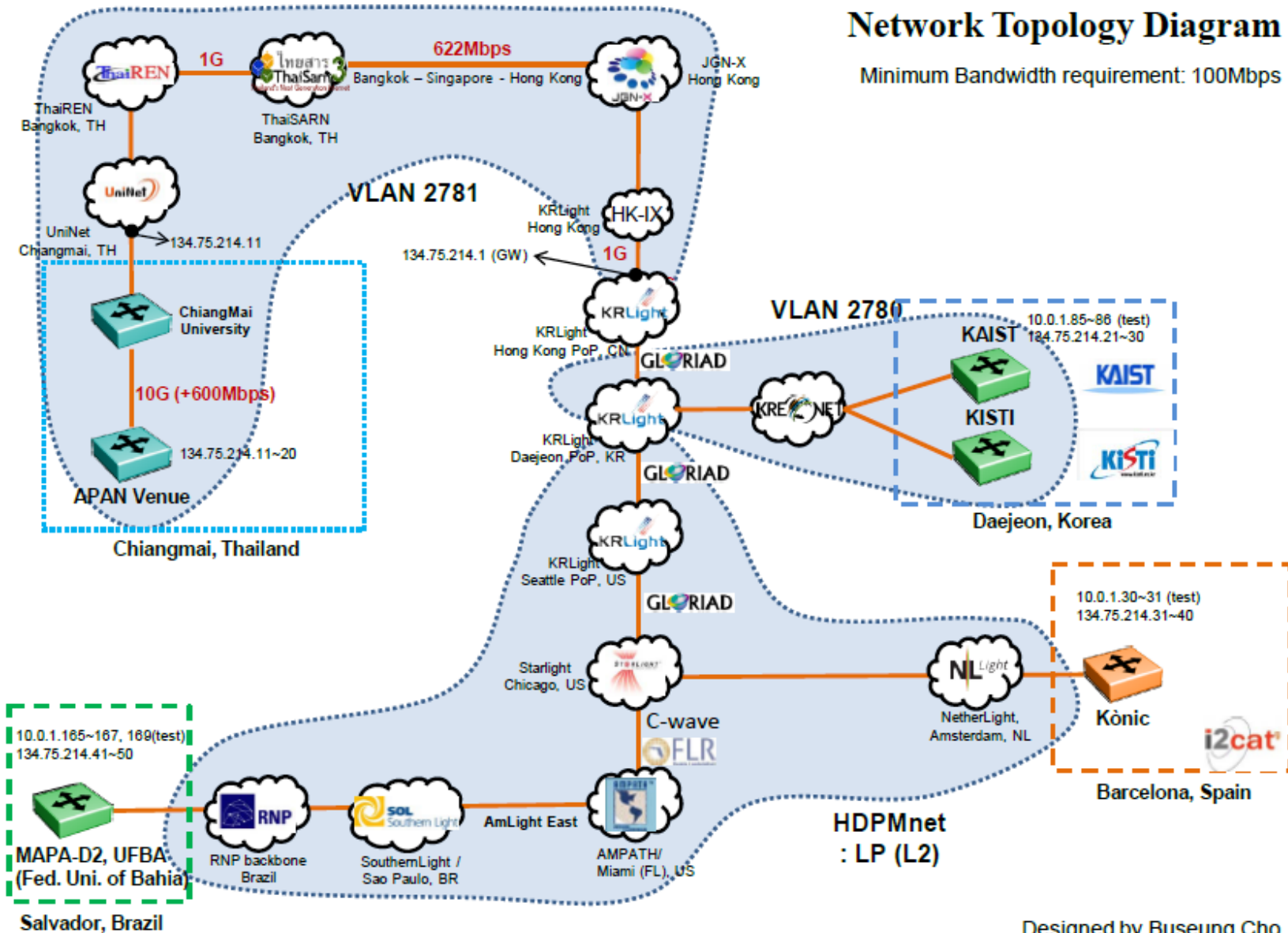
5. Planning for 4K surgery streaming using HPDMnet (November 2012)
 - From João Pessoa Hospital) to UFRN (visualization lab)
6. Planning for interactive opera in October 2013 between Rio de Janeiro, London and Cape Town
 - For now, involves non-GLIF partners (Dante, Ubuntunet Alliance, TENET) plus Internet2 and Janet
7. Support for interconnection of Future Internet and OpenFlow testbeds in the US, Europe and (soon) Australia, Japan and Korea.

Network path: Brazil and Spain to Thailand



APAN33 Telematic Dance Performance

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Designed by Buseung Cho
Modified at Feb 7th 2012

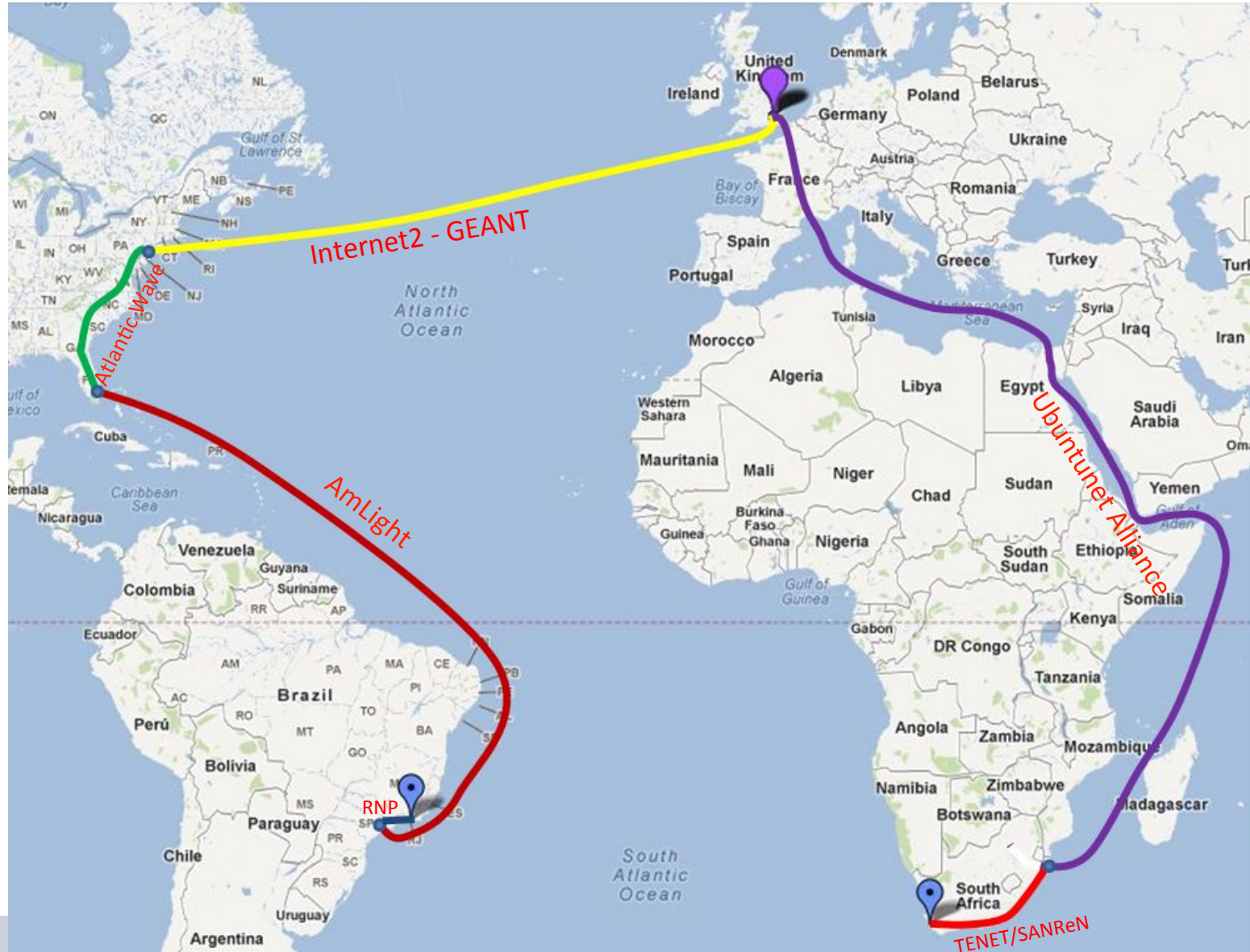


Tri-continental opera project Oct/2013

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Connections Rio-London-Cape Town



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Thank you!

(acknowledgments to partners from all over the world,
as well as ANSP, AMPATH, Brazilian universities,
RedCLARA and RNP)