FIU | Florida International University
Division of Information Technology

CIARA
Center for Internet Augmented Research & Assessment

RNP
REDE NACIONAL DE ENSINO E PESQUISA

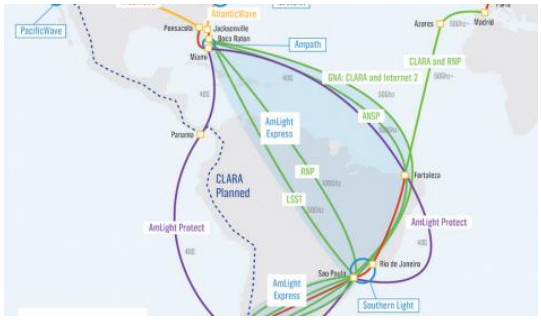
AmLight ExP
Americas Lightpaths Express & Protect

The Brazilian National Research and Educational Network (Rede Nacional de Ensino e Pesquisa - RNP) announced **100 Gbps international connections between Brazil and the United States are activated**

On July 7, two 100 Gbps connections between São Paulo and Miami were activated, which expand the international output of the Brazilian academic network. The links, which go through submarine cables in the Atlantic and Pacific oceans, are maintained by the Amlight consortium, which manages the connections between the United States and Latin America for teaching and research purposes.

The new interconnections are part of the Amlight Express and Protect project (Award #1451018), financed by the National Science Foundation (NSF), by the Research Support Foundation of the State of São Paulo (FAPESP) and by the Brazilian National Research and Educational Network (RNP). According to network engineer Jeronimo Bezerra, from the Florida International University (FIU), who participates in the Amlight consortium, six other links with the same capacity between Miami and Latin America are expected to enter into production in 2017.

According to the FIU, the 100 Gbps international connection sets new high-performance connectivity parameters in the Americas and enables opportunities for scientific collaboration. One of the benefitted initiatives shall be the international Astronomy project Large Synoptic Survey Telescope (LSST), which features the participation of 50 Brazilian researchers. The LSST is a telescope under construction in Cerro Pachón, in Chile, and is expected to enter into operation in 2022. It shall be able to map almost half of the sky for a ten-year period.



So the 100 Gbps capacity is used in full by the academic network, RNP also works to elevate the capacity of its national backbone, which serves universities and research institutes in the entire country. Only in São Paulo, the channel may benefit institutions connected to the academic network of the state of São Paulo (ANSP), as well as those connected to RNP, responsible for over 40% of the national scientific production. "*With this international 100 Gbps capacity, we shall be prepared for the demand that is shaping up for the next three years*", said the RNP's Engineering and Operations Director, Eduardo Grizendi.

One of the main challenges for the activation of this high-performance infrastructure was cleaning the optical fiber cables in the land connections, since any vestige of dirt and oiliness in the interface between the fibers may melt with the heat propagated by data traffic, damaging the physical integrity of the network. "*Dirt may not only ruin the signal, it may make the fiber burn*", explained Jeronimo Bezerra, stressing that the problem is more common in connections between telecommunications and last mile operators, up to the users, or even within data centers.

Another challenge shall be traffic monitoring in extremely high speed, which shall depend on complex computational resources. One of these resources habilitated in the international connection between Brazil and the United States is the Software Defined Networking (SDN), which allows more flexibility, robustness, and the possibility to program traffic operation.

About CIARA: Florida International University's Center for Internet Augmented Research and Assessment (CIARA), in the Division of IT, has developed an international, high-performance research connection point in Miami, Florida, called AMPATH (AMericasPATH; www.ampath.net). AMPATH extends participation to underrepresented groups in Latin America and the Caribbean, in science and engineering research and education through the use of high-performance network connections. AMPATH is home to the Americas Lightpaths (AmLight) high-performance network links connecting Latin America to the U.S., funded by the National Science Foundation (NSF), award #ACI-0963053 and the Academic Network of São Paulo (award #2003/13708-0) (http://ciara.fiu.edu/)

About ANSP: The Academic Network of São Paulo (ANSP) provides connectivity to the top R&E institutions, facilities and researchers in the State of São Paulo, Brazil, including the University of São Paulo, the largest research university in South America. ANSP directly connects to AmLight in Miami at 20G. ANSP also provides connectivity to Kyatera, a 9-city dark-fiber-based optical network infrastructure linking 20 research institutions in the state and a number of special infrastructure projects like GridUNESP, one of the largest computational clusters in Latin America, supporting interdisciplinary grid-based science (www.ansp.br).

About RNP: The Brazilian Education and Research Network (RNP), qualified as a Social Organization (OS) by the Brazilian government, is supervised by the Ministry of Science, Technology and Innovation (MCTI), and is maintained through the inter-ministerial RNP program, which also includes the Ministries of Education (MEC), Health (MS) and Culture (MinC). The first Internet provider in Brazil with national coverage, RNP operates a high-performance nationwide network, with points of presence in all 26 states and the national capital, providing service to over 1200 distinct locations. RNP's more than four million users are making use of an advanced network infrastructure for communication, computation, and experimentation, which contributes to the integration of the national systems of Science, Technology and Innovation, of Higher Education, of Health and of Culture (www.rnp.br/en)

About LSST: Large Synoptic Survey Telescope (LSST) project activities are supported through a partnership between the National Science Foundation (NSF) and the Department of Energy. NSF supports LSST through a Cooperative Agreement managed by the Association of Universities for Research in Astronomy (AURA). The Department of Energy funded effort is managed by the SLAC National Accelerator Laboratory (SLAC). Additional LSST funding comes from private donations, grants to universities, and in-kind support from Institutional Members of LSST(http://www.lsst.org/lsst/).

Original press release by RNP published here.

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