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Collaborative opportunity to leverage network infrastructure in the southern hemisphere between Africa, Brazil, and the U.S.

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Linking South and North America via a South Atlantic high-performance Research & Education Network (REN) with the nations of Africa's researchers, students, and knowledge sharing communities has become an increasingly strategic priority. Africa offers research and education communities with unique biological, environmental, geological, anthropological, and cultural resources. Research challenges in atmospheric and geosciences, materials sciences, tropical diseases, biology, astronomy, and other disciplines will benefit by enhancing the technological and social connections between the research and education communities of the U.S., Brazil / Latin America, and Africa. For many years, we have seen the dramatic benefits of high-performance networking in all areas of science and engineering.

The Americas Africa Research and eduCation Lightpaths (AARCLight) project (NSF OAC-1638990) provided support for a grant to plan, design, and define a strategy for high capacity research and education network connectivity between the U.S. and West Africa. The study indicated a high level of enthusiasm to engage in collaborative research between the U.S., Brazil, and the African communities. There is collaborative interest in sharing network infrastructure resources in the US at AMPATH in Miami, in Fortaleza and Sao Paulo, Brazil where RedClara and ANSP connect at SouthernLight, and in Cape Town, South Africa. There is strong evidence of multiple ongoing domain science projects between the U.S., Brazil, and Africa that would benefit from a new South Atlantic link. The results of this planning grant successfully supported the need to light a 100G pathway using the South Atlantic Cable System (SACS) connecting to AmLight-ExP in Fortaleza, Brazil, and via the West African Cable System (WACS) cable to the Cape Town, South Africa open exchange point.

Based on these findings, AmLight-ExP , a high-performance R&E network supported by a consortium of participants and funding from the NSF is the steward of the SACS 100G link. With collaborative support from UbuntuNet Alliance, RNP, SANReN, and others, AmLight is taking steps to make this first South Atlantic R&E network path available to connect all three continents.
This critical infrastructure establishes a new South Atlantic route to integrate with AmLight-ExP, adding resiliency to the global R&E network fabric by adding a new path to Africa and Europe from the southern hemisphere. The SACS cable, shown on Figure 1 as a purple dashed line between Fortaleza, Brazil, and Luanda, Angola, is the first east - west subsea cable in the South Atlantic.

We will leverage network infrastructure in the southern hemisphere that is available to the R&E community including spectrum on Monet committed to the AmLight-ExP linking Miami, Fortaleza and São Paulo; a 100G Ethernet link on SACS; TENET's capacity on WACS; the R&E exchange point in Cape Town-ZAOXI operated by SANReN (South African National Research Network) and TENET connected to WACS and the Ubuntunet Alliance Network connecting East Africa; and the South America eXchange R&E exchange point (SAX) in Fortaleza, operated by RNP and connected via AmLight-ExP via Monet to São Paulo and Miami.

The paper will present 1) the key partners in the AmLight-SACS collaboration, 2) the activation plan, 3) how the network will be instrumented for performance measurements, and to capture data for network analytics, and 4) science drivers that will benefit from the use of a South Atlantic network route between the U.S., South America and West Africa.

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