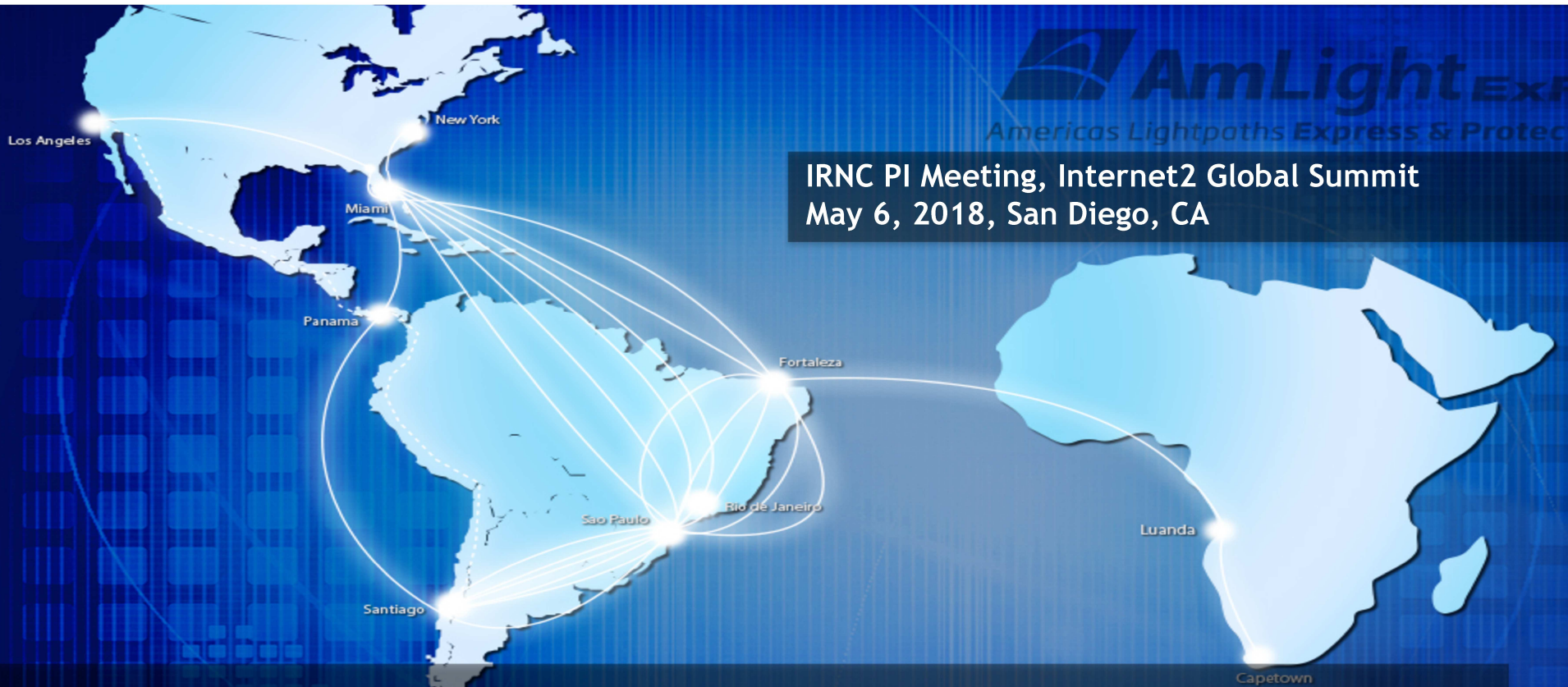


IRNC PI Meeting, Internet2 Global Summit
May 6, 2018, San Diego, CA



Americas Africa Research and eduCation Lightpaths (AARCLight) Study: Year 1 findings

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AARCLight: Americas Africa Research and eduCation Lightpaths, Award #OAC-1638990

- Planning activity that aims to
 - Define a strategy for research and education network connectivity between the US and West Africa
 - Coordinate planning efforts among stakeholders in the U.S., Africa, and Brazil
 - Create economies of scale
 - Making use of the offered spectrum
 - Towards serving the broadest communities of interest in research and education



Collaborative Partners

- UbuntuNet Alliance
- WACREN: West and Central African Research and Education Network
- TENET: The Tertiary Education and Research Network of South Africa
- SANReN: The South African National Research Network
- SABEN: South African Broadband Education Networks
- ANSP: Academic Network of São Paulo
- RNP: Rede Nacional de Ensino e Pesquisa
- CLARA: Cooperation of Advanced Research and Education Networks in Latin America
- Internet2
- Florida LambdaRail



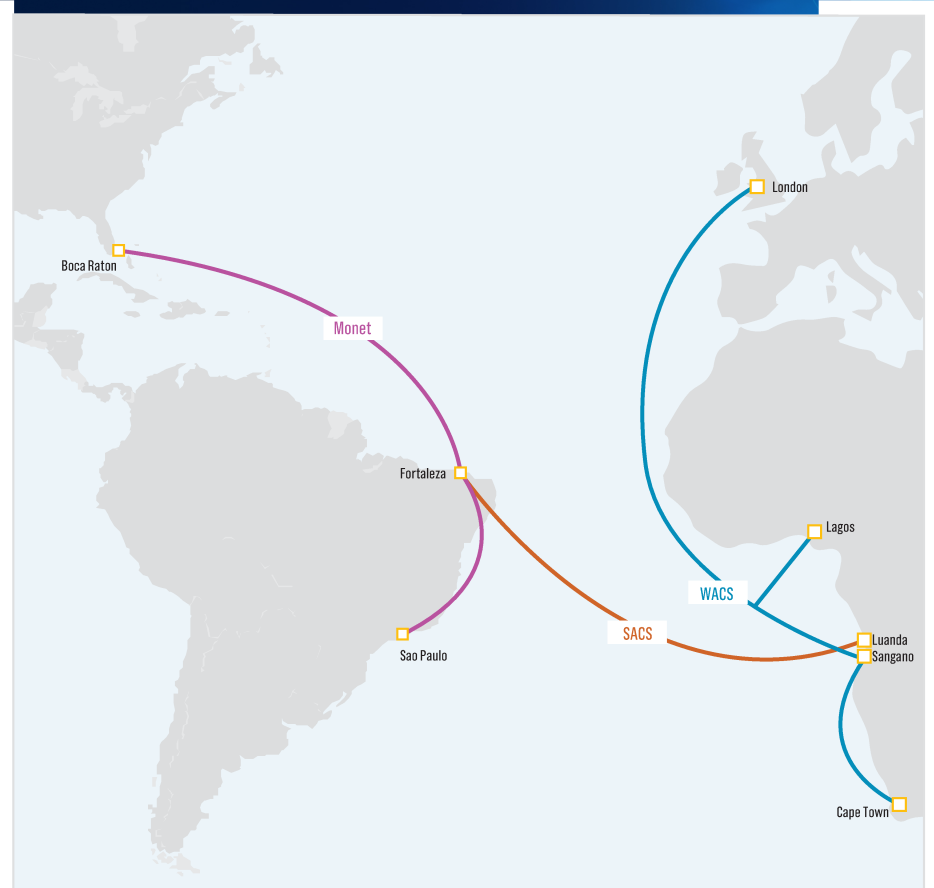
Science Drivers involving US and SSA organizations

- **MeerKAT radio telescope** is a precursor to the Square Kilometre Array (SKA) telescope:
 - It will be integrated into the mid-frequency component of SKA.
 - MeerKAT generates data at a rate of 4.7 Gbps.
 - Data is either being transferred via tapes or scientists are travelling to South Africa to do research.
- **Square Kilometre Array** is an international effort to build the world's largest radio telescope:
 - SKA is estimated will generate an exabyte of raw data per day when fully operational
- **South African Large Telescope (SALT)** is the largest optical telescope in the southern hemisphere
 - 2017: 5-50 GB/night
 - 2019: ~250 GB/night
- **Biological Sciences:** Field stations depend on computer networks to support biologists conducting experiments in the field. Africa has 116 biological field stations.
- **Earth Sciences: AfricaArray (AA) Seismic Network** has 53 seismic stations deployed in 17 countries. AA participates in UNAVCO, which manages thousands of GPS sites worldwide.

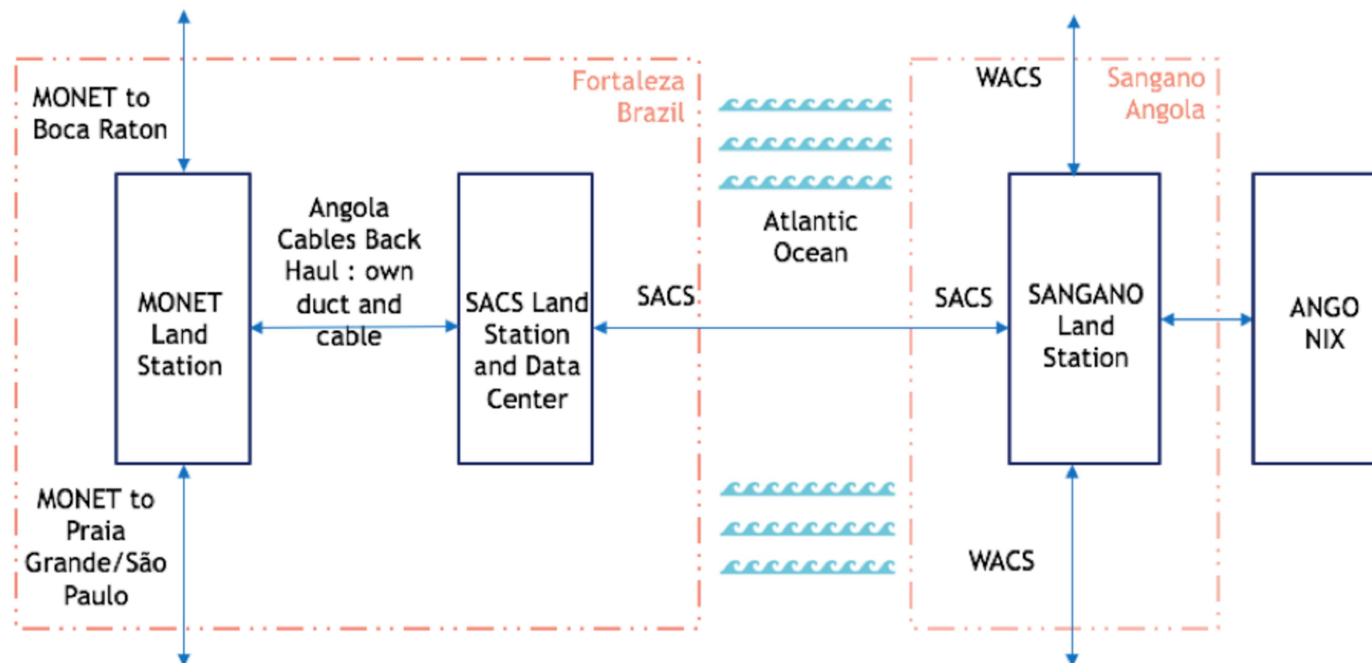


Network infrastructure resources in the Southern Hemisphere

- 225GHz linear spectrum on Monet committed in the AmLight-Exp
- 37.5GHz of spectrum on SACS is available to the R&E community
- South Atlantic eXchange point (SAX) is under development in Fortaleza, led by RNP
- R&E exchange point in Cape Town operated by SANREN and TENET
- R&E exchange point in Lagos, operated by WACREN



Network infrastructure capacity in the Southern Hemisphere



- In Fortaleza Brazil, SACS and Monet submarine cable systems interconnect via backhaul
- In Luanda, SACS and Monet meet in the Sangano cable landing station



Findings in Year 1

- Data volume will be increasing from science drivers in Sub-Saharan Africa (SSA)
- Network infrastructure capacity is increasing in the Southern Hemisphere
- Linking the R&E communities in the US, Africa and Brazil is realizable via Monet and SACS submarine cable systems
- Human resource development in several science, engineering and technology areas is lacking



A dark blue world map with white lines representing flight paths. The paths originate from Miami and connect to Los Angeles, New York, Panama, Santiago, Sao Paulo, Rio de Janeiro, and Luanda. The text "THANK YOU!" and the email address "julio@fiu.edu" are centered over the map.

THANK YOU!
julio@fiu.edu



More Slides Follow



Year 2 Goals

- Develop a plan for the activation of the offered spectrum on SACS
- Study locations for interconnections with partners' R&E networks in Africa
- Develop a new network design with AARCLight partners
- Develop an assessment plan to measure the level of engagement by communities of interest with the potential new network infrastructure

