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RNP on supporting thematic testbeds for the R&E Community
Objective:
Create a common space between the EU and Brazil for Future Internet (FI) experimental research into network infrastructure and distributed applications, by building and operating a federated EU-Brazil Future internet experimental facility

• Shared Future Internet research facility between Brazil and Europe, supporting the joint Future Internet experimentation of European and Brazilian researchers.
FUTURE INTERNET TESTBEDS
EXPERIMENTATION BETWEEN
BRAZIL AND EUROPE

http://www.fibre.org.br
Partners

**FIBRE-EU**
- i2Cat, Coordinator
- Nextworks (NXW),
- Universite Pierre et Marie Curie (UPMC)
- University of Essex (UESSEX)
- University of Thessaly (UTH)
- National ICT Australia Limited (NICTA)

**FIBRE-BR**
- Federal University of Pará (UFPA), Coordinator
- Brazil’s National Education and Research Network (RNP)
- Telecommunications Research and Development Centre (CPqD)
- Fluminense Federal University (UFF)
- Federal University of Goiás (UFG)
- Federal University of Sao Carlos (UFSCar)
- Federal University of Rio de Janeiro (UFRJ)
- Salvador University (UNIFACS)
- University of Sao Paulo (USP)
- University of Pernambuco (UFPE)
Typical FIBRE island

Pica8 Pronto Switch

IBM server (VMs, LDAP)

Icarus node #1

Icarus node #8

Datacom OpenFlow switch (FIBREnet border router)

Top of Rack Datacom OpenFlow switch

Wireless Network (OMF domain)

NetFPGA #1

NetFPGA #2

NetFPGA #3

Control plane link

Data plane link

Data + Control plane
Experiment workflow

- Dataset
- Aggregate Manager
- Testbed

Registration
- Register
- User
- Password

Reservation
- Calendar for July 2007

Console

User
- 1st Step
- 2nd Step
- 3rd Step
Services provided to FIBRE by RNP (brazilian NREN)

- FIBRENet
  - Overlay network on top of RNP production network
  - Integrates the islands of the project
  - Offers a fast and secure way to build experiments at various levels of network and media (wired or wireless).
  - SDN based
    - programmability, virtualization and separate data and control planes
FIBREnet

- Two overlay networks:
  - Data Plane
    - Overlay network point-to-point
    - Static VLANs
  - Control Plane
    - Multipoint-multipoint
    - VPLS
Federation

- FIBRE was born federated
- MySlice – SFA based
  - Federate all FIBRE aggregate managers
- Authentication using CAFé (Shib federation) or LDAP
- Authorization
  - Access rules are in definition
    - PI role to authorize slice and account creation
Operations

• NOC in Brazil
  – Using PerfSonar and ZenOSS
  – Monitoring all AM and the components of Federation
  – Ticket system
  – Local administrators
  – Distributed operation
Beyond FIBRE project

• Results of project
  – An federated infrastructure for experimentation connecting 10 institution in Brazil plus 3 in Europe

• Next steps
  – operated, managed, financed, disseminated, polices
  – Federate with others testbed
  – Hum! It seems very similar with NRENs doing to provide services to users

• Why NRENs?
  – Academic network traditionally provides connectivity services to research, students, teachers, staff
  – Network researchers has the network itself as their research object
  – NRENs should add in its portfolio a service to allow network scientists to research the network itself.
    • Testbed as a Service!

• If is not a service ….
Thank you!
¡Gracias!
Obrigada!

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