FIRE Testbeds: Cooperation with South Africa

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Overview

• Policy context

• Flagship testbed activities
  – South African National Research Network
    • Leveraging NREN as testbed for FIRE
  – Internet of Things Testbed (CSIR Meraka)
    • Smart and green infrastructure
  – Future Wireless Internet Research Testbed (CSIR Meraka)
    • Next generation of rural broadband solutions

• South Africa – EU cooperation
South African Policy Context

• National ICT Research and Innovation Strategy
• ICT R&D and Innovation Roadmap
  – 32 market opportunities
  – 6 clusters, including:
    • Broadband infrastructure and services
    • Service economy
  – Horizontal focus Future Internet as network and service architecture for all ICT
Special challenges for FIRE in Africa

• Broadband access / services to under-developed rural areas
  – Services innovation
  – User-driven innovation
  – Trust in services
  – End-to-end services

• Service delivery local governments
  – Smart city applications
Special challenges for FIRE in Africa (2)

- Enhancing robustness, energy efficiency and reducing carbon footprint of infrastructure
- Protection of critical infrastructure
- Enhancing competitiveness interventions manufacturing
- Lowering cost of logistics and increase reliability (Internet of Things)
- Participation in large-scale global science projects – e.g. astronomy
South African National Research Network (SANREN)

- High-speed backbone research and education institutions
  - Million users when complete
  - Assets include dark fiber metro rings
- Interconnection of scientific infrastructures such as Centre for High Performance Computing and SA Grid
- Strong interest FIRE international cooperation, e.g. Identity Federation Models
Undersea Cable connectivity to Africa

Sub-Saharan Undersea Cables
- SAT3/SAFE (360 gigabits, Active)
- GLO1 (645 gigabits, Q4 2009)
- TEAMS (1280 gigabits, Q3 2009)
- Seacom (1280 gigabits, Q2 2010)
- Lion (330 gigabits, Active)
- EASSy (1400 gigabits, Q2 2010)
- ACE (1920 gigabits, 2011)
- MaIn OnE (1920 gigabits, Q4 2010)
- WACS (120 gigabits, Q2 2011)
The Hartbeesthoek Radio Astronomy Observatory

Location

The Hartbeesthoek Radio Astronomy Observatory (HartRAO) is the only major radio astronomy observatory in Africa. It is located in a valley in the Magaliesberg hills, 50 km west of Johannesburg.

The main reflecting surface of the telescope (below) is 26 metres in diameter. The telescope has a mass of 240 tons. It is equipped with radio receivers operating in microwave bands wavelengths of 18m, 13m, 6m, 5m, 4.6m, 3.5m and 2.2m. For maximum sensitivity but one of these receivers are cooled to 10° above absolute zero (~25° Celsius). All obses is controlled by computer.

The European VLBI Network

The EVN is a collaboration of the major radio astronomical institutes in Europe, Asia and South Africa and performs high angular resolution observations of cosmic radio sources. An overview of the EVN can be found in our Introduction to the EVN. The EVN is a large scale astronomical facility that is open to astronomers from all over Europe and the rest of the world. You can consult the current Call for Proposals and the EVN User Guide for help with proposing, scheduling, observing and reducing EVN data.
Internet of Things Testbed (CSIR Meraka)

• Goal:
  – Leverage broadband connectivity, wider presence
  – Leverage “Living Labs” to measure applications
    • Smart environments in different contexts
    • Focus both built (smart city) and natural (pollution monitoring) environments

• Focus international cooperation:
  – Validating standards for Internet of Things
  – Selection criteria industrial deployment novel applications
  – Global validation and testing partnerships
Focus of Internet of Things Engineering Group

- Focus on sweet spot between “Internet”, “Things” and “People”
Future Wireless Internet Research Testbed (CSIR Meraka)

• Wireless mesh network platform
  – Full support for IPv6
  – Edge networks based on IPv4 interconnected over core IPv6 network

• Research focus:
  – Integrating next-generation network technologies with mesh networks
  – Realize Future Internet infrastructures in rural areas
Next Generation Wireless Technology Research Infrastructure – NRF-RISP proposal

7 SA Universities listed as Co-Users for Research & Human Capital Development and 3 International Partners
South Africa-EU ICT research and innovation cooperation

• South Africa – EU Strategic Partnership
  – S&T Cooperation Agreement
  – Information Society Dialogue
  – More than 200 South African FP7 participations
  – Bilateral relations with various Member States
  – Partnerships with ICT multinationals

• South Africa own investments cooperation
  – Dedicated National Contact Point FP7 ICT
  – FP7 Seed and Strategic Co-Investment Funding
  – Office in Brussels
Ambitions for future

• June 2011 SA-EU Information Society Dialogue agreed to explore more strategic cooperation instruments
  – Possible “Coordinated Call” between DST and DG INFSO (e.g. Brazilian model)

• South Africa –EU FIRE and IPv6 Working group
  – First meeting at EuroAfrica-ICT Forum, Cape Town, 14-15 November 2011
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www.esastap.org.za (European South African Science and Technology Advancement Programme)

www.dst.org.za (Department of Science and Technology)

www.csir.co.za (Council for Scientific and Industrial Research: Meraka)