The “Broadband For All” Cluster

Status Report: 2003 - 2007

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Who was involved

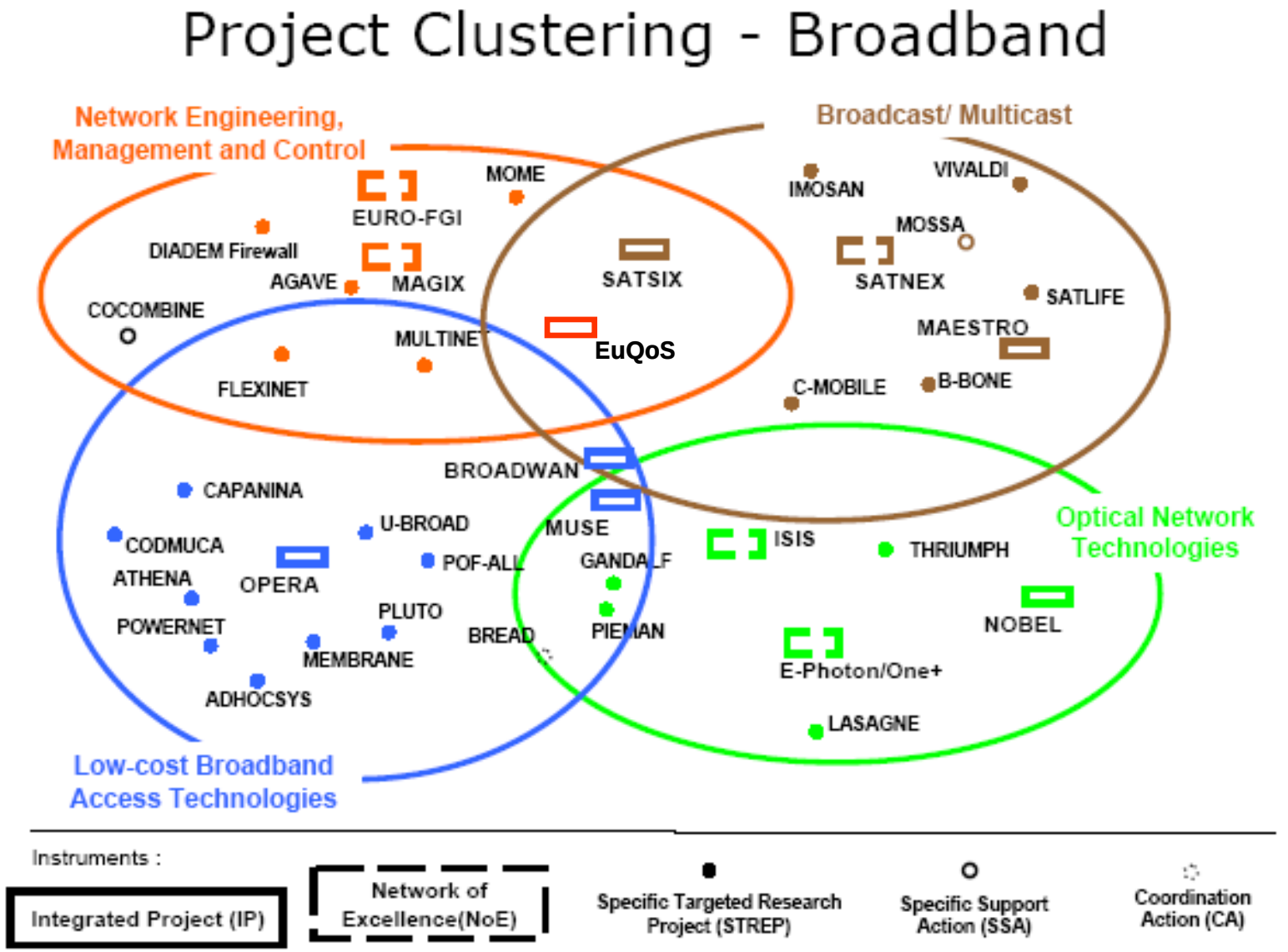
Main topics

Overall Achievements

Project-specific Achievements

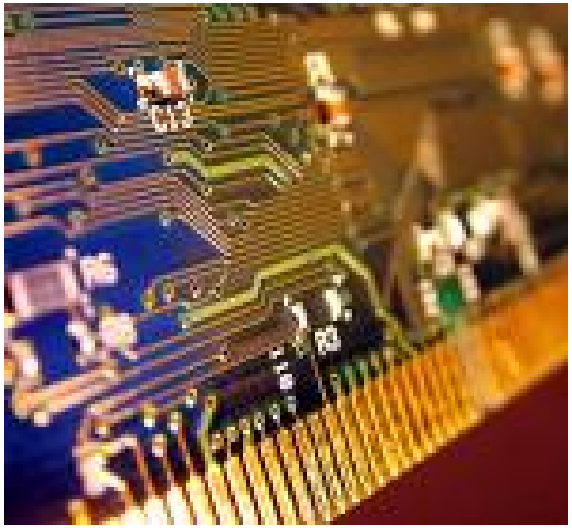
Next Steps

BB4All Cluster



2 main trends:

- **Broadband (faster …. and cheaper)**
- **Next Generation Networks (NGNs)**



State of the art at the start of FP6 (Broadband)

- **Demand for Broadband was outstripping supply (IPTV, gaming, VoD, *VoIP*, …)**
- **“Digital Divide” problem (especially in rural areas – line length for ADSL, no CATV)**
- **Impact on GDP**
- **A-BARD project: “40% of Europeans have no affordable access to Broadband”**

State of the art at the start of FP6 (NGN)

- Telco services were “silo-ed”
- Research network operators (NRENs, GEANT) had got the message about converging on IP for everything
- Telcos recognised the promise of lower CAPEX and OPEX, but were being cautious. They needed to be convinced

Why did we need a BB4All Cluster?

- Many technologies (optics, WLAN, Cable, powerline, radio, satellite) were offering cheaper Broadband. Bringing them together would make it easier to compare
- Different projects were considering components, systems, architectures (all layers)
- Avoid duplication
- Joint effort towards standards

Achievements:

- **Workshops at each Concertation meeting on specific themes:**
  - **Quality of Service**
  - **Monitoring and measurement**
  - **Bridging the ICT divide**
  - **Socio-economic evaluation of solutions for broadband**
  - **Optical broadband systems**
  - **Fixed-mobile convergence**
  - **…. etc.**
- **BREAD “BBEurope” conferences/exhibitions**

Achievements (Optical network technologies):

- eXtra Large PONs (long distance, high splitting ratios) – also space/energy savings
- CWDM optical ring for the access network
- Hybrid fibre radio access

Achievements (Low-cost Broadband access):

- Laying infrastructure in rural areas is expensive => WiMAX and WLAN mesh or sharing ADSL lines and WLANs
- Powerline (and its integration with WiFi, WiMAX, UWB, …)
- Improving the bandwidth of the ADSL that is available
- Diversity of solutions leads to competition and lower prices

Achievements (NGN):

- Separation of Services from Control and Transport
- Multi-service networks based on IP (“parallel Internets”, “virtualisation”)
- How to support QoS, end-to-end … and how to simplify the reservation of QoS (eg. by using policies)

Specific project achievements:

- **MUSE: The eXtra Large PON system was tested at a world record rate of 2.5 Gbit/s burst mode transmission over an optical attenuation equivalent to a 512-way split and 70 kms of fibre.**
- **NOBEL: Applicability of Ethernet in core and metro networks (standards) and concepts for advanced optical packet/burst switching**
- **ADHOCSYS: WiMAX/WLAN Mesh wireless adhoc system trialled in a “digitally-divided” mountain village in Northern Italy – available under GPL license**

Specific project achievements:

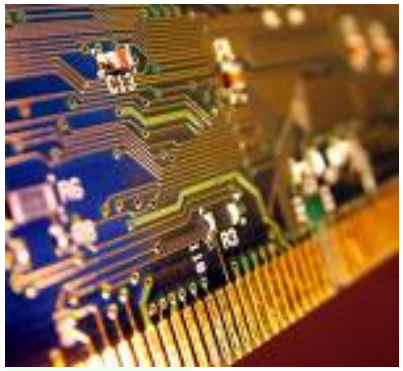
- **GANDALF: A cheap optical feeder component for the concurrent optical/radio system was tested at data rates of 1Gbit/s**
- **POF-ALL: Symmetrical data transfer at 100Mbit/s over 200 meters over low-cost large core Plastic Optical Fibre**
- **OBAN: Seamless mobility for users roaming between adjacent WLAN cells operated by different service providers**

Specific project achievements:

- **POWERNET: Multi-carrier modulation techniques have been demonstrated as a means of solving EMC issues in powerline communications**
- **EuQoS: Resource reservation mechanisms were developed for specific access network technologies such as Ethernet (fixed and wireless), DSL and UMTS**
- **MOME: Practical support for collecting, storing, anonymising and retrieving measurement data**

Specific project achievements:

- **NoEs: Reduction of the fragmentation of European research (ePhoton/One, ISIS, EuroNGI/FGI)**
- **More than 100 patents**
- **Many of the results have been featured on the “IST Results” site of Cordis**



Next Steps:

- Many BB4All projects are still continuing and fit with the FP7 topic of the “Network of the Future” (optics, network “slices”, low-cost Broadband access, faster rates, …)
  - Architectures
  - Protocols
  - Technologies
  - Systems
  - …..
- Convergence/Interoperability between technologies will always be an issue