ΘΕΜΑΤΙΚΟ ΣΥΝΕΔΡΙΟ Κ.Ε.Δ.Κ.Ε.
Θεσσαλονίκη 22-23 Νοεμβρίου 2007
Συνεδριακό Κέντρο «Ιωάννης Βελλίδης»
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ΠΕΜΠΤΗ 22 ΝΟΕΜΒΡΙΟΥ 2007

17:00 - 20:00 Χαιρετισμοί:
- Βασίλης Παπαγεωργίουλος, Α'. Αντιπρόεδρος ΚΕΔΚΕ – Δήμαρχος Θεσσαλονίκης
- Μαριγιάνη Τέμις, Υπουργός Μακεδονίας Θρακίας
- Βασίλης Ανδρανάκης, Γενικός Γραμματέας Δημόσιας Διοίκησης και Ηλεκτρονικής Διαχείρισης
- Κωνσταντίνος Μουσουράλης, Γενικός Γραμματέας Υπουργείου Ανάπτυξης
- Βασίλης Ασπιάκοπουλος, Ειδικός Γραμματέας Ψηφιακού Σχεδιασμού
- Νίκης Αλεξανδράδης, Πρόεδρος της Εθνικής Επιτροπής Τηλεπικοινωνιών και Ταχυδρομείων
- Κωνσταντίνος Δώκας, Πρόεδρος της «Κοινωνίας της Πληροφορίας Α.Ε.»
- Χαιρετισμοί και κήρυξη έναρξης εργασίας από τον Υπουργό Εσωτερικών, Καθηγητή Προκόπη Παυλόπουλο
- Εισήγηση Διοικητικού Συμβουλίου της Κ.Ε.Δ.Κ.Ε. από τον Πρόεδρο της κ. Νίκης Κακαλιάκη

ΠΑΡΑΣΚΕΥΗ 23 ΝΟΕΜΒΡΙΟΥ 2007

10:00 - 12:30 «Ευρυζωνικότητα και Τοπική Ανάπτυξη»

10:00 - 11:00 Προεδρείο:
Μιχάλης Τσιμός, Πρόεδρος Επιτροπής Νέων Τεχνολογιών & Τοπικής Διαχείρισης – Μέλος Δ.Σ. ΚΕΔΚΕ

Εισηγητές:
- Βασίλης Παπαγεωργίουλος, Α'. Αντιπρόεδρος ΚΕΔΚΕ – Δήμαρχος Θεσσαλονίκης
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11:00 - 12:30 Συζήτηση A: στρογγυλής τραπέζης

12:30 - 13:00 Διαλέγεια
The BREAD Roadmap

BREAD

BROADband in EUROpe for ALL: a multi-DISciplinary approach

Contact: peter.vandaele@intec.ugent.be
1. BREAD introduction
2. The BB context
3. Network challenges
4. BREAD methodology
5. Where are we now?
6. Conclusions
BREAD Introduction

- IMEC (co-ordinator) B
- University of Essex UK
- Research Center COM / CTI DK
- Groupe des Ecoles des Télécommunications F
- FhG/HHI D
- TELSCOM consulting CH
- JRC - Institute of Prospective Technological Studies E
- JCP - Consult F

Project duration: 01/01/2004 – 31/12/2006

Newsletter continued, website active & updated
BREAD Objectives

• Develop a **multi-disciplinary** view for the realisation of ‘**broadband for all**’

• Combine forces in the area of
  - state-of-the-art results in R&D on the **technological** level
  - expertise towards the **economic** sustainability and the in-time adoption of adequate business models
  - expertise and study towards the **regulatory** aspects on EU level and the re-conciliation of customers’ and industries’ interests

• Develop a more **holistic** vision encompassing technical, as well as economical and regulatory aspects

• Identify **roadblocks** on European, national/regional level

• Share visions and best practices on national level to EU level (**ERA**) **Benchmarking** the EU situation with US & AP develop.
The BREAD Project

Develop a multi-disciplinary view for the realisation of ‘broadband for all’

www.ist-bread.org

www.bbeurope.org

Call for Papers

Submission deadline September 1st 2007

Electronic submission only via www.bbeurope.org

... New policies

... New products

... New prospects

Papers are solicited in all areas related to BroadBand Drivers & Applications, Costant, Standardisation, Smith- and Techno-economic Impact, Monitoring, Measurement, Regional projects & Deployment, National strategies and Broadband technologies such as FTTH, Cables, Satellites, Wireless, PLC, ...
Context of the analysis

• 1\textsuperscript{st} phase: broadband for all as a pre-requesite (applications unknown)
• 2\textsuperscript{nd} phase (1995-2005):
  - Deregulation effective
  - DSL/cable broadband deployments, Wimax emergence, FTTX
  - WLAN
• 3\textsuperscript{rd} phase: feedback on the usage; some interesting tendencies:
  - Applications where the user plays a role (besides communicative services):
    • Long Tail model, user generated content
    • PtP for non real time content exchange
    • PODcast to compensate for limited bandwidth and mobility
  - User becomes a content producer for fixed and mobile network
  - Functionalities begin to be deployed:
    • Seamless services over fixed and mobile
    • Session mobility
    • Broadcast-broadband
  - Users consume the bandwidth they are allocated
  - Content protection legacy models about to change:
    • Content exchange, republishing
    • PTP exchange

(after J.-C. Point, JCP-Consult, FP6-BREAD Deliverable)
The long tail

- **Professional Content Creators**: Commercial content (people pay to consume)
- **Prosumers**: Semi-professionals (people pay to share)
- **End-users = Everybody**

**One-to-Many**
- Professional Broadcasts (news, sports, shows, ...)
- VOD, Gaming, IPTV, Govt related

**One-to-'A Few'**
- Home Video shows and Video Diaries

**Everybody-to-'A Few'**
- Regional & Local Community TV
- VRT Ketnet Kick
- Children create content shown on TV
- Personal TV: birthday videos, ...
- Photo sharing
- Blogging
Challenges to the network

From “Telecom” services to “Lifestyle Infrastructure”

Telecommunications

- Voice call
- Mail
- Web browsing
- Videophone
- Poc

Useful for every aspect of daily business/life

- Credit card
- Commuter pass
- Wallet
- Music/Broadcast
- Safety & Security

(after Dr. J. Schwarz da Silva, EU Commission)
Challenges to the network

Number of Devices connected to the Internet

- 2005: 750 million
- 2010: 14 Billion
- Future: Add Tags and Sensors - over 1 trillion

Source: Forrester Research, as cited in BusinessWeek.com, 20/02/05

(after J. Oberstar, Cisco Optics)
Traffic Growth in Amsterdam Internet Exchange

Source: “End user perspective on higher speed Ethernet” by Henk Steenman, IEEE Higher Speed Interest Group meeting, Knoxville, TN, Sept 2006

(after M. Wale, Bookham)

x5 every 18 months
Is this what 2 Petabits will look like?

(after J. Oberstar, Cisco Optics)
Challenges to the network

• Very high growth rates in IP traffic might stimulate to reconsider:
  - Network architectures
  - Components
  - Transmission
  - …

… or we will might encounter an optical bottleneck
Greater bandwidth needed for new revenues

• …but cost rises faster

• …and margins reduce

Drive for new technologies

Traffic grows - driven by new, high bandwidth services

Network cost rise (CAPEX + OPEX)

Revenues lower in real terms

(after P. Ghiggino, Ericsson)
BREAD Methodology

High level vision
Gap analysis
Common fields in access
SOA in different technologies
Implementation Roadmap
Technology roadmap
End to End topics

Available through www.ist-bread.org

(after J.-C. Point, JCP-Consult)
Technical part

- Covers the different areas of BB4ALL
- Includes detailed reports on
  - video on Broadband
  - FTTX
  - Home Network
  - Metro
  - Backbone
  - Signalling and management
- Covers gaps and roadmap per technologies

(after J.-C. Point, JCP-Consult, FP6-BREAD Deliverable)
Technical part

General outcome:

Home:
- Explosion of bit rate and wireless in the home
- Inclusion of home network in an end to end offer
- Apparition of decentralised architectures with storage

Access:
- Evolution of physical layers
- Downstream AND Upstream capacity increase (P2P and AV services)
- Common IP infrastructure

(after J.-C. Point, JCP-Consult, FP6-BREAD Deliverable)
Technical part

Metro/backbone
- Evolution from SDH -> NG SDH
- Spread of Ethernet from LANs to MANs
- MPLS deployment in core
- Optical Cross Connects and Optical Add Drop Multiplexers to add all optical overlay in both
- Long term evolution towards optical burst and packet switching
- automatic compensation of propagation impairment including new modulation format and regeneration

Security
- Adaptation to convergence processes and new business model (B2B, C2B, C2C)
- Interoperability between heterogeneous architectures

(after J.-C. Point, JCP-Consult, FP6-BREAD Deliverable)
Global trends

Applications:
- Merging of communicative & audiovisual into rich media
- Paradigm evolution from centralised to « long tail »
- Requirement for:
  • Network hosted service creation environment
  • User related service creation environment

Convergence:
- Network convergence/cooperation:
  • Broadcast-broadband (mobile and fixed)
  • Fixed-mobile
  • Integration of the Home network
- Service:
  • AV integration, merge of services
  • Service continuity through different network and terminals

(after J.-C. Point, JCP-Consult, FP6-BREAD Deliverable)
Factors influencing broadband development

- Country configuration
  - GDP per capita
  - Population density (Canada vs Belgium)
  - Demography of a country
  - Climate
  - Cultural characteristics
    - Open to foreign influences (Belgium, Netherlands),
    - Embracing new technologies (South Korea, Japan)
    - Not much weight on hierarchy (Iceland, Denmark) -> higher take-up
  - Knowledge of the English language

→ highest take-up:
rich country with fairly equally income distribution, high population density where a relatively young population is concentrated in urban areas rather than suburbs, bad weather and widespread knowledge of English – 

..........

(FP6-BREAD Deliverable)
Emerging Internet uses

- Voice, video chat
- Peer-to-Peer file sharing
  - Estimated >100 Petabytes/month
- Blogging, photo sharing, user generated content
  - “Uploading your Life”
  - Estimated 32M blog sites worldwide
  - Flickr! – 120M photos, adding 500k/day
- Video clip search
  - YouTube sold to Google for $1.65B (€ 1.5B)
  - 100M videos viewed each day, 72M users
  - Most popular video clips downloaded 7M times
- Massively multi-player online role play games
  - Estimated 1.8M players in UK

Major growth areas are not always the ones that are expected

Source: DAIWA EuroTelco Snapshot, April 2006
(after M. Wale, Bookham)
**Time to transmit files**

- **Postal Service**
- **Modem 56kb/s**
- **ADSL down 2Mb/s**
- **FTTC (VDSL 53) 3MB/s**
- **FTTP 100Mb/s cust port**
- **FTTP 1Gb/s cust ports**

- **Physical transport faster!**
- **Delay a major barrier**
- **Customers get impatient**
- **Customers accept delay**
- **“Instantaneous”**

*(after D. Payne, BT Exact)*
Integrated access and backhaul with photonic core

Longer Term Vision – Flexible wavelength assignment & DBA

Big Business Customer

FTTP Customers

Cabinet

MSAN

Cabinet

Network Reduced to ~100 exchanges

Tunable & self install ONU (for residential customers)

New amplifier technology (e.g. quantum dot) enables operation across all the fibre spectrum

Power splitter (not WDM splitter) to enable any $\lambda$ or combination of $\lambda$s to any customer

(after D. Payne, BT Exact)
Based on Ipswich Exchange serving ~15,000 customers

<table>
<thead>
<tr>
<th>Today</th>
<th>21C MSAN</th>
<th>Long Reach PON</th>
</tr>
</thead>
<tbody>
<tr>
<td>900 racks</td>
<td>20 racks</td>
<td>&lt;1 rack</td>
</tr>
<tr>
<td>826 kw</td>
<td>50-100 kw</td>
<td>100W</td>
</tr>
</tbody>
</table>

1 per ~1000 customers

(after D. Payne, BT Exact)
FTTx subscribers by the end of September 2005

<table>
<thead>
<tr>
<th>Country</th>
<th>Subscribers</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Belgium</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Denmark</td>
<td>50,000</td>
<td>0.1%</td>
</tr>
<tr>
<td>Finland</td>
<td>100,000</td>
<td>0.2%</td>
</tr>
<tr>
<td>France</td>
<td>150,000</td>
<td>0.3%</td>
</tr>
<tr>
<td>Germany</td>
<td>200,000</td>
<td>0.4%</td>
</tr>
<tr>
<td>Italy</td>
<td>250,000</td>
<td>0.5%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>300,000</td>
<td>0.6%</td>
</tr>
<tr>
<td>Spain</td>
<td>350,000</td>
<td>0.7%</td>
</tr>
<tr>
<td>Sweden</td>
<td>400,000</td>
<td>0.8%</td>
</tr>
<tr>
<td>UK</td>
<td>8</td>
<td>0.0%</td>
</tr>
<tr>
<td>Others EU17</td>
<td>72</td>
<td>69.9%</td>
</tr>
<tr>
<td>Iceland</td>
<td>14</td>
<td>13.6%</td>
</tr>
<tr>
<td>Norway</td>
<td>9</td>
<td>8.7%</td>
</tr>
<tr>
<td>Housing companies &amp; Other</td>
<td>14</td>
<td>13.6%</td>
</tr>
</tbody>
</table>

- Table 1: Players involved in FTTx initiatives in Europe

(FP6-BREAD Deliverable)
Where are we now?

Who is (not) deploying (in Europe)?

Who’s not?
- Traditional telecom operators
- Cable operators

Who is?
- Housing corporations
- Utility companies
- City and local communities

*Organizations that are close to the end-user!*

Why?
- Their future is linked to the success of the community
- They can transform the benefit of fiber to return-on-investment
- They have a long term vision

*(after G. van den Hoven, Genexis)*
The key to high penetration ...

Business case is only successful at high penetration rates
- Cost of infrastructure is divided over the active users
- “Homes passed” don’t bring in any money!

3-step marketing model
1. Offer broadband internet for free
2. When all is up and running, offer voice and TV at competitive prices
3. Start charging for internet (again at competitive prices)

... user addiction!

(after G. van den Hoven, Genexis)
What is Broadband?
The bottleneck: a moving object

(after M. Ulbrich, JRC/IPTS, FP6-BREAD Deliverable)
Conclusions

The Orient Express

- VoIP
- IPTV
- Blogs & social networks
- Rich content & P2P & user-generated content
- Geographical information
  - Convergence
  - Requirements for network

(after M. Ulbrich, JRC/IPTS, FP6-BREAD Deliverable)