Summary of Technical Sessions

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Overview papers

- Network Technology: 11
- NGN/Digital Divide: 9
- QoS: 5
- Applications/users 3
- Security 3
- Misc: 8

Session A1: Access infrastructures and networks
Chair: Wim van der Bijl

- Summary
  - Keynote
    - Main gaps regarding the Digital Agenda targets:
      - 100 % coverage of > 30 Mbit/s in 2020 – (now only 30%)
      - 50 % households have subscrriptions > 100 Mbit.s (now < 10 %)
    - Main Gaps to achieve these objectives:
      - Revenues Online Services and Connectivity
      - Culteral Gap (pick up rate)
      - Geography Gap: (only payback I some years in hig density areas)
    - Possible Solutions: GPON & changes Internet Access Business model
  - New technologies for Building FTTH: 1 daydig
  - New technology for PON: WDM PON
  - Analysis which technologies to use for 100% roll-out
    - Multiple technologies: DOCSIS/VDSL/4G
  - Analysis of impact of earthquakes on availability of telecom service

Session A1: Access infrastructures and networks
Chair: Wim van der Bijl

- Main conclusion
  - The digital agenda set ambitious goals, much work required to build the NGN required.
  - Main challenge is how to economically justify the roll out of NGN
- Discussion items
  - Technologies are/or will be available to provide Gbit/s per households,
    - but are users really needing 100 Mbit/s per households?
    - Can we afford the investments, especially in rural areas?
  - Clear Regulatory required, how to enable this ?
  - Can we find the right balance between private/public financing?

Session A2 : Business models
Chair : José Van 0oteghem

- Summary
  - A new technical and economical approach for a business model enabling broadband provisioning in DD areas.
    - Areas with DD well known.
    - According to reduce the digital divide, NGN could be deployed much faster and cheaper by reusing existing infrastructure
  - Techno-Economic comparison of Next-Generation Optical Access Network Architectures.
    - Different scenario's are presented – calculating the cost of new FTTx networks to ensure a reasonable ROI
  - How to measure the success rate of fiber-based access networks ?
    - Structured methodology has been developed to compare FTTH networks
    - Applied for different European City- or Regional networks (e.g. Stockholm, Amsterdam,...)
    - Useful to define the success factors –from different perspectives

Session A2 : Business models
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- Conclusions
  - Issue of ROI because of the huge investments :
  - only (more or less) reasonable in areas with high density population (cities)
  - need to define “economical interesting area”s’ (cherry-picked areas) : only there a positive ROI is possible
  - Rural areas & islands (Greece) : probably only FTTC (with DSL) economically possible
  - Reuse of TV-infrastructure : bus. cases for BB-roll-out : savings up to 15 % possible
  - Regional/City networks survey : successful FTTH networks are existing
- Discussion items
  - Hugh cost in rural areas to provide broadband : funding issue
  - End-user interest for BB services and PC-penetration : low in some DD areas – possible actions ?
  - Reuse of transmission & pylons TV-network : need to upgrade also backbone network, ... ?
  - Pylons in rural areas can be reused - which technology to connect the end-users (Wimax, DSL, fiber, ...)
  - Regional/City networks survey : are the expectations of the end-users always well known ?

Session 3: Network development
Chair: George Agapiou

- Agent based modeling and the viability of NGNs (Mauro Ugolini)
- A novel algorithm for dynamic admission control of elastic flows by (Pier Luca Montessoro)

Summary

- The Agent-Based Model (ABM) is an emerging tool in modeling / analyzing the behavior of complex systems, using a “ground-up” approach and a simulation / modeling technique based on “agents”
- An ABM associates the changes in individual components (input) to the changes of the resulting system (output)
- Through computational tools based on OOP languages, ABM is a tool to understand the “emergent phenomena” – a feature shown by complex systems, due to the non-linearity in interactions between system’s individual entities

- REBOOK is an algorithm that performs:
  - a scalable framework for per-flow resource reservation
  - Fair and optimal bandwidth allocation
  - Keeping into account new and terminating flows
  - Simple and powerful tuning parameters

Session 3: Network development
Chair: George Agapiou

- Main conclusions
  - Algorithms based on agent modeling (ABM) are proved to be an effective means for analysis, evaluation, and definition of business strategies in complex NGN networks
  - Complex NGN networks can bring profits thru the use of the ABM algorithms.
  - New algorithms such as the REBOOK cab be very useful in designing networks since they can provide support for per-flow bandwidth reservation
  - Fairness in optimally resource allocation networks can be achieved when the REBOOK algorithm is applied
- Discussion item
  - Algorithms and their role in optimizing and improving the network performance

Session 4: Quality of service
Artan Halami

- Summary
  - The main focus of the session was focused on Quality of Service topics from network operator point of view, valuing of quality of experience, user centric QoS standards and QoS in the future
  - New networks and services architectures
    - The Network Architecture is influenced by the Operator's Strategy
    - Operators strategy is to define the main role in the future for concerning BIT carrier, service enabler and service operator
  - Valuing Quality of Experience
    - Quality of Service (QoS) is the dominant framework for
      - Evaluating network characteristics
      - Guarantee a certain level of network performance
      - Optimizing data flows
  - User centric QoS standards and challenges for the future
    - Privatization and liberalization of 1980s have led to users demanding QoS pertinent to their requirements
      - Users have more than one supplier to choose this has an impact to increased pressure on SPs to provide QoS required by users and need to optimize QoS and ARPU
  - Which way to QoS in future networks: distributed or centralized decision logic?

Session 4: Quality of service
Artan Halami

- Main conclusions
  - Complexity of network environment will dramatically increase
  - Quality of Experience framework plays a central role in the multimedia field
  - Identification of key issues of customer's QoS concerns
  - Education of the customers on QoS
  - Encouraging SPs to report delivered QoS data to the public
  - Encourage harmonization of terms and definitions in use of 'QoS' !
- Discussion items
  - Network operator costs for providing QoS and impact to the quality of experience topics

Session A5: Security and applications
Chair: Barry Reynolds

Summary

- Keynote Presentation – European Initiatives in the fight against cybercrime
  - EU law on cyber crime before 2005 made it very difficult to get an EU Wide agreed approach.
  - EU law on Cyber crime after 2009 has a better framework but still a distance to go before an EU wide approach.
  - **Main issue** is difficulty in getting agreement within Europe makes agreement with non European Countries very difficult.
- Analysis of Web-based Video Delivery
  - Analysis of buffering methods in ensuring web video delivery is optimal.
  - 6 methods of buffering examined which produced different results in video delivery.
  - **Main issue** is that advanced buffering method required with growth of web video services.

Session A5: Security and applications
Chair: Barry ReynoldS

- Network Neutrality
  - Examined the main developments in the Network Neutrality debate.
  - No EU wide policy on this, and innovation inhibition no longer an argument in the debate.
  - **Main issue**: Govts are acting ad hoc with Network neutrality and implementing local laws to deal with premium services over IP e.g Skype
- Spam and Fraud Detection in VOIP networks
  - VOIP networks are very vulnerable to all sorts of cyber attacks.
  - A method of User Profiling to detect non standard behaviour was presented.
  - Proved in lab trials to detect such non standard behaviour.
  - **Main issue:** Such User Profiling in not yet Used in VOIP User behaviour.
- Personalised Disease Management (Griet Verhenneman)
  - Move towards a personal disease management for indiviual patients will have major implication on costs of health care.
  - Use of ICT in personal disease management more advanced than Europe.
  - Availability of personal genome health analysis on the horizon.
  - Ongoing legal debate and policy directive discussion in Europe.
  - **Main issue:** Major legal difficulties in balancing the need for personal health information privacy and the need for health insurers to get access tro personal health information.

Session A6: User experience (Teleworking & Telemedicine)
Chair: Guntram Kraus

- Summary
  - Teleworking & Telemedicine (Home Health) are different issues but are linked by ICT
- Main Conclusions
  - Teleworking
    - You work at home and you come to the office only if there is a need for.
    - Employees need a secure access to the company datacenter (not facebook etc)
    - These access systems are hungry for higher bandwidths
  - Home Healthcare
    - Need for an effective set of home equipment, devices and service Platform
    - Facilitate the use of “Plug and Play” to increase the acceptance of elderly people
    - Bring the doctor to the patient
- Discussion items
  - Can Teleworking replace the normal tasks in the office?
  - Are the saving of Home Health Realistic.

Session B1: Multimedia application and services
Chair:Antonio Iera

- Summary
  - The Social Internet of Things": from objects that communicate to objects that socialize in the Internet
  - "Backhauling and access means through a 60 GHz developed prototype"
  - "A semantic-driven Integer Programming Approach for QoS-aware Dynamic Service Composition"
  - "An MHP Based Solution for Assistive Home Automation"
- Conclusions
  - The Social Applications of Internet are quickly growing up, then the new paradigm of internet is
  - The Social Internet of Things.
  - Regarding to continues diffusion of web semantic technologies and applications, a new programming approach was presented in order to guarantee a robust software composition based on Quality of Services awareness.
  - In the last years we assisted to an full implementation of customer promises equipment (CPE) with high complexity and able to deliver a wide range of new digital services: we talk about Assistive Home Automation

Session B1: Multimedia application and services
Chair:Antonio Iera

- Summary
  - "The Social Internet of Things": from objects that communicate to objects that socialize in the Internet", during which the basic ideas standing behind the novel IoT paradigm and the different visions from the literature of the IoT have been presented . Also a novel idea of migrating from the "IoT" to a "Social IoT" idea, according to which typical features of the Social Networks of human beings are extended to Social Networks of smart objects has been introduced.

- Discussion items:
  - Robust radio Backhauling network
    - the reasons why presented solution for 60GHz result to be faster than Fiber optic based ones to reach the break-even point
    - the likely variability of the presented parameters figures due to change in weather conditions that could cause loss in performance at 60GHz.
  - New approach for software development
    - . the complexity of the algorithm adopted and the computational burden that would be required when using the proposed methodologies.
  - An MHP Based Solution for Assistive Home Automation focusing on an interactive MHP application
    - the actual possibility of implementing the proposed solution in DVB-T set top box that actually are currently embedded into the TV equipments.

Session B2: Internet and Next-Generation Networks Chair: Marco Vari

- Summary
  - In this session concerning NGN it was talked about:
    - algorithms to improve the performance of UMTS networks for video streaming.
    - To measure the performance of broadband access networks
    - A system to introduce security for the authentication of scanned documents
    - A novel system to control the manufacturing process via Internet
- Main Conclusions
  - NGN could enable new services but
    - Novel algorithm should control the performances and also enabling the control of the quality by users and policies to give to the telco's margin for profits.

Session B3: Reliability and Performance Modelling
Chair: Mauro Ugolini

- Summary
  - Main subjects presented were:
    - Performance aspects of IP networks and how these are incorporated in overall service frameworks available to customers
    - Evaluation methods of cyber failures in power grid control networks and performance measures of the impact of accidental / malicious attacks on telecontrol traffic
    - A new algorithm for allocation of WiMAX network resources, giving better results compared to the state of the art
    - QoS and regulatory aspects related to Internet access via copper
- Main Conclusions
  - Availability measurements are critical, together with performance measurements, to assess quality of services delivered through IP networks (particularly with reference to commercial aspects of SPs offerings)
  - More than bandwidth, additional requirements like security, packet loss rate, packet authentication, etc., are getting more and more important in the development of today's power grid control networks

Session B3: Reliability and Performance Modelling
Chair: Mauro Ugolini

- Main Conclusions (cont'd)
  - Effective modeling and development of advanced algorithms for network allocation resources are powerful tools to manage the expected increase in complexity of telecom networks – WiMAX technology included
  - Practical approaches to determine optimal (not real) bit rates for single copper line are a powerful tool to regain control of copper network topologies often "blurred" by today's increase in complexity levels
- Discussion items
  - Enough capacity bought by customers to meet performance expectations in commercial services. Availability is rapidly becoming one of the most critical service requirements
  - Greater efforts needed to inter-relate quality of services delivered through different telecom technologies with emerging requirements of tomorrow's power grid control networks
  - Impact on research activities of the limited commercial adoption of a communication technology like WiMAX on specific areas of a given territory
  - Growing interest for practical approaches addressing QoS issues faced by Internet users accessing advanced services via copper networks

Session B4: Comm. Systems & Signal Proc.- I
Chair: Giovanni Garbo

- Summary
  - Session introduced by Prof. Chiani, who presented his relevant new contribution in the field of Multi-user Channel Access
  - The presentations, brilliant and exhaustive, dealt with channel coding techniques relevant to the deployment of 3G Wireless Networks and about the possible advantages, from a network operator point of view, of synergic cooperation between network operators and utility operators.

Session B5: Comm. Systems & Signal Proc.- II
Chair: Giovanni Garbo

- Summary
  - The session focused on theoretical aspects of communications technologies for current and future mobile wireless networks.
  - The presentations, brilliant and exhaustive, dealt with channel coding techniques and performance evaluation of multicarrier digital transmissions.

Session B6: Wireless and Mobile Networks
Chair: Alessandro Vizzarri

- Summary
  - Throughput enhancement in Wireless sensor network (WSN)
  - Business case for WSN
  - 802.11p: New standard for wireless vehicular transmission
  - WSN and power consumption: new techniques
  - Diffusion of mobile technologies (1G, 2G, 3G,..)
- Main Conclusions
  - WSN technologies are ready for several applications : ehealth, geographical, etc…
  - Vehicular applications fo 802.11p have been studied and analysed: technologies are ready bu there is not yet an efficient business case since it's very difficult to manage the investments in car market
  - Power constraints in WSN was very reduced with modern techniques
- Discussion items
  - It's very important to make a profitable business case for success of WSN in many applications.
  - WSN are a very important instrument to fight digital divide, especially to provide links in those areas without network connectivity.
  - Different people has the same attitudes to pay for mobile services, but a large diffusion of them depends on several factors : economic, social, cultural, etc…

Round Table discussion

- Summary
  - Digital Agenda is driving the development and roll-out of NGN's
    - It is important to create the usage on internet to leverage our european economy, especially taken into account the global perspective.
  - Customer will be happy with the impact of the digital agenda
  - However Network Operators will have big challenges to keep the business positive, especially in non high urban areas.
  - The regulators need also to define the way forward
- Discussion items
  - Are the objectives,
    - e.g 100 Mbit/s per house hold too high
    - Culterally we will not achieve 100% usage of internet
  - Should we not imply a tax on users to enable the investments in NGNs?
  - How can we encourage other sectors (e.g. healthcare) to really use broadband.
  - Can we achieve the digital agenda with working with 200 competing Telco's in europe?