FITCE Forum

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Newsletter of the Federation of Telecommunications Engineers of the European Union

October 2004

Congress 2005: For advance information, see page 8

The yardstick for evaluating new ICT services is 'Quality of Life'

Technical session

FITCE's 43rd Congress which took place from 8–11 September 2004 in Ghent, Belgium. The Congress, with the theme 'To boldly go ...on-line any time, anywhere. A vision for the future of ICT services' was an outstanding success with more than 250 participants.

The focus of the Congress was on the evolution of broadband for fixed as well as for existing and new mobile networks. The topic was approached from different angles: the associated vision, technology, infrastructure, services and applications, as well as marketing and socio-economic aspects.

The trend of convergence between information, communication and entertainment is confirmed by recent developments. Marc Verbruggen, Chairman of the International Paper Selection Committee of FITCE said: 'The conclusions of the Congress are that now the new challenge is to put the user even more in the centre. Questions that must be raised when evaluating new services are: Does the user like the service? Does he/she need the service? And is he/she willing to pay? As such, the yardstick for evaluating new services will be its contribution to the "Quality of Life". ...' During the Congress the important role that the regulator has to play was highlighted, as well as the issues about security and trust that service providers have to address.

The paper presented by Jeroen Hoebeke, a Ph.D. researcher at the Ghent University, on applications and challenges of mobile ad hoc networks was awarded the Best Paper award by the international jury. The paper describes this new alternative for mobile communications, in which mobile devices form a self-creating, self-organising and self-administering wireless network. Its intrinsic flexibility, lack of infrastructure, ease of deployment, auto-configuration, low costs and potential applications make it an essential part of future pervasive computing environments.

A full report of the Ghent Congress, together with images from the event, will be published in the next edition of the *Forum*. FITCE members can access the presentations and photographs from the event at www.fitce.org (follow the link to the post-Congress web page). Members will need to use the membership password.

Next stop—Vienna

In 2005 the FITCE annual Congress goes to Vienna in Austria. The theme for the Congress, which will take place from 25–27 August 2005 is 'The Magic Potion to Meet Customers' Desires!' See page 8 for details.


José Van Ooteghem, Congress president


Gala dinner

FITCE Forum

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Chair COIT-UPM

This article introduces the Chair in 'Regulation and Public Policies for Information Society' of the Colegio Oficial de Ingenieros de Telecomunicación/Asociación Española de Ingenieros de Telecomunicación (COIT/AEIT, Spain) at Universidad Politécnica de Madrid (UPM).

Inauguration ceremony of Chair COIT-UPM: (left–right) Mr. Enrique Gutiérrez Bueno (Dean/President of COIT/AEIT), Dr. José Manual Páez Borrallo (Dean of ETSI Telecomunicación-UPM), Dr. Claudio Feijóo (Director of Chair COIT-UPM)

The Chair in 'Regulation and Public Policies for Information Society' was created by initiative of the Spanish Association of Electronics and Telecommunications Engineers (COIT/AEIT) and of the Telecommunication Engineering School (ETSI Telecomunicación) belonging to Madrid's Polytechnic University (UPM) in November 2003, as a continuation of the long trajectory of mutual collaboration in research activities, education and issuing of studies and reports within the scope of the information and communications technologies (ICT) and markets.

One of the main objectives of the Chair is proving how an association can successfully collaborate with other institutions (in this case, a university), using a number of initiatives of common interest for both institutions, to achieve a deep impact on ICT sector by means of exposing publicly the perspectives of professional direct experience.

Among the main activities of the Chair, currently directed by Professor Claudio Feijóo, stand out the coordination of the Group for Telecommunications Regulation ('Grupo de Regulación de las Telecomunicaciones', GRETEL), the publication of several books and studies derived from the activity of this group, and the contributions to Spanish and European forums, and in particular, to the activities developed by FITCE.

GRETEL consists of a multidisciplinary group of experts who, summoned by the Colegio Oficial de Ingenieros de Telecomunicación and coordinated by the staff of the Chair, periodically meet with the objective of analysing the evolution of the ICT sector from the point of view of the regulation, proposing solutions and new approaches to emerging areas. Among the members of GRETEL is the current President of FITCE, Carlos González Mateos, contributing to the consideration of professional opinion of European engineers within this work group.

The main results of GRETEL activities have been published regularly in different volumes: *Competition and Regulation in the Markets of the Telecommunications, Audiovisuals and the Internet* (1998), *Competition, Convergence and Regulation in the Markets of the Telecommunications, Audiovisuals and the Internet* (2000) and lately *New European Design for Telecommunications, Audiovisuals and the Internet* (2002), where GRETEL analyses in detail the new European regulatory framework for electronic communications in what was the first book published in Europe dedicated to the new regulatory framework for electronic communications and Information Society.

Currently, GRETEL has just released a new work, made up of three different documents, on 'The new European framework for electronic communications and its implantation in Spain'. At the same time, it is examining the impact of the different regulatory models for voice over IP (VoIP) (its next publication), as well as a document on the trends and recommendations for the regulation of the audiovisual sector in general.

With the support of GRETEL, the Chair has also contributed recently to a series of public consultations in order to express publicly the opinion and criteria of engineers and professionals belonging to the ICT sector. Among the main contributions are: 'Public consultation on secondary trading of rights to use radio spectrum' (Radio Spectrum Policy Group—RSPG—available at http://rspg.groups.eu.int/consultations/responses_secondarytrading/index_en.htm, February 2004), 'Public consultation on provision of voice services by means of technologies IP (VoIP)' (Spanish NRA, May 2004) and 'Public preconsultation on procedure developed by the CMT to analyse and to define relevant markets in the field of electronic communications' (Spanish NRA, July 2004).

The Chair has also participated in diverse conferences and, as a consequence, published several international papers. Among them can be highlighted the recent invitation of FITCE to speak about 'New Perspectives on Broadband and Public Policies' at the colloquium 'The Role of Communications Regulation in the Digital Age' organised by The Communications Network in conjunction with FITCE UK in February 2004. This paper, adapted and modified appropriately, has appeared as a paper in *The Journal of The Communications Network*, Volume 3 Part 1, January–March 2004. Also a contribution in the area of secondary spectrum trading, mobile Internet and relevant markets in the EU was presented at the 43rd FITCE Congress at Ghent (Belgium, September 2004), with the title of 'Barriers to Widespread Use of Mobile Internet in Europe. An overview of the new regulatory framework market competition analysis'.

Ana González
GTIC-UPM
ETSI Telecomunicación
Madrid (Spain)

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Intelligent optical networking enables cost-effective IP core networks

by **Walter Kailbach and Dr. Wolfgang Frohberg**
Alcatel, Optical Networking Division, D-70430 Stuttgart

Today, IP/MPLS backbones are growing with immense pace. Operators must expand their networks quickly, but availability of the network and scalability of today's core routers are big issues.

This paper examines aspects of multi-layer architectures with the aim to decrease the overall costs in IP backbones by introducing intelligent optical switches and a migration of IP backbone towards a flatter network architecture, using a multi-layer environment (IP/MPLS, SDH/SONET, WDM).

Introduction

With the move towards services beyond best-effort Internet access like virtual private networks (VPNs), traditional problems of IP networks like quality of service (QoS), availability, and traffic engineering need to be overcome. The introduction of multiprotocol label switching (MPLS) is seen as the enabling technology to boost the performance of Internet protocol (IP) networks.

From an architectural standpoint the trend in IP/MPLS networks today is to provide a direct fibre or lambda connection between routers without the usage of a flexible transport layer in between, such as synchronous digital hierarchy/synchronous optical network (SDH/SONET) or asynchronous transfer mode (ATM).

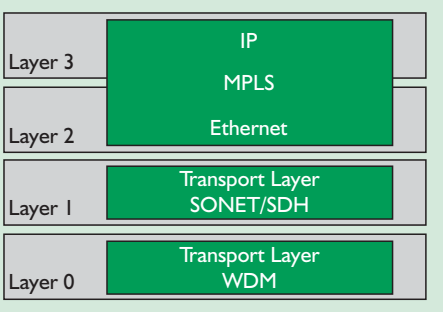
The network architecture of IP/MPLS backbones has been set-up in a hierarchical way, in order to groom traffic on the IP/MPLS layer (L3/L2) most efficiently. This introduces several hops between source and destination of IP packets, and a considerable amount of transit traffic. The level of meshing in core networks is rather limited. Transit traffic can take up to 60% of the total capacity in core router locations.

Transit traffic is very costly as no IP functionality is necessary for this kind of traffic, but a simple path through would be sufficient. This situation can be overcome by a more meshed network.

Currently, a nationwide IP/MPLS backbone network is typically made of two or three hierarchical levels of IP routers (metro, regional and national levels). The consequence is that inter-regional traffic has to transit through regional and national routers. On the other hand, such architectures require a small number of links.

Current state of the art regarding transport network is de-layering; that is, routers are interconnected using packet-over-SONET (POS) interfaces with contiguous concatenated payloads directly over wavelength division multiplex (WDM) systems. Hierarchical architecture and packet granularity allow a good filling ratio of those links to be achieved. In case of failure, traffic is re-routed at the IP level, as described above, and no protection is expected from the optical layer.

Figure 1: IP/MPLS backbone network protocol layering



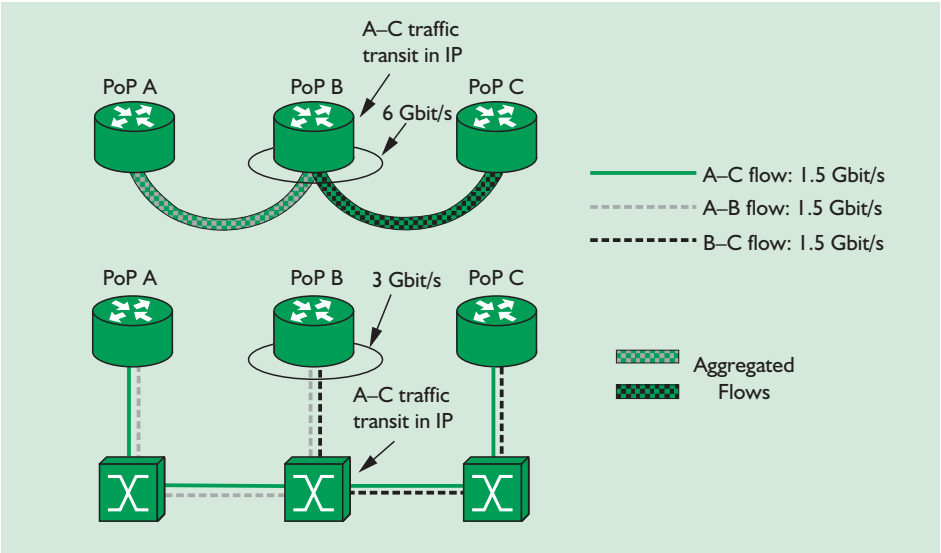
Rationales for alternative architectures

Communication networks are divided into domains for several reasons: due to political and organisational constraints into national and different service provider domains, due to area specific and topological constraints into for example access, metro and core domains. Furthermore, network domains are structured hierarchically on the one hand to simplify network management, and on the other hand to use the technical resources in an efficient way. Traffic aggregation and grooming are commonly used means to optimise transport.

A highly structured architecture, however, is tantamount to many hops as well as to a high amount of transit traffic in the network.

IP traffic still is growing in the order of a factor of two per year. Network service providers will consider scalability of their routers at the start-up installation. When the maximum configuration 4

Figure 2: Transit traffic remains in the transport layer



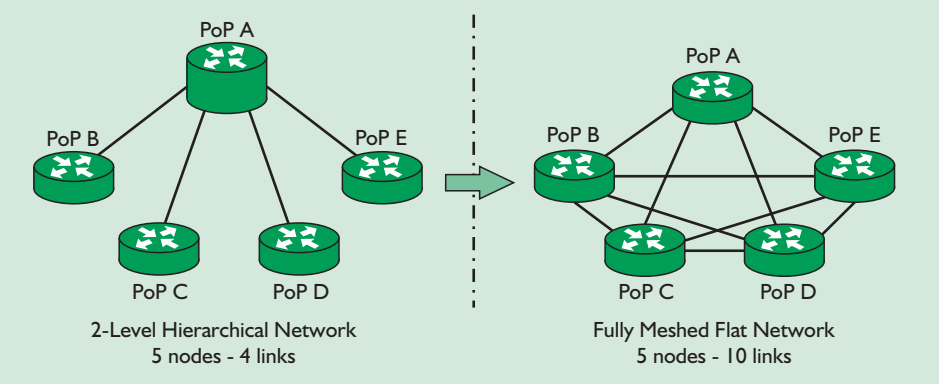


Figure 3: From hierarchical to meshed network

3 is reached there are two possibilities: to replace routers by high-capacity routers (terabit routers), or to build router clusters. However, the more routers are clustered, the more capacity is wasted by intra-cluster communication, and, in addition, blocking effects increase.

Measures and effects

The way to achieve the objectives described above consists in migrating current hierarchical IP architecture into a flat IP network and to introduce a flexible transport layer able to switch and groom the traffic at a granularity that optimises the filling ratio of optical links, resulting in reduced global network costs.

The transformation from a current hierarchical architecture to a more flat IP network is realised by adding new links between points of presence (PoPs); that is, increasing the degree of meshing between IP routers. With those new links, the IP transit traffic and its associated delay is removed from the intermediate routers. In an extreme case, the network is a full mesh made of $N \times (N-1)/2$ direct links between the N routers.

However, adding a link does not necessarily mean deploying new fibres but reusing optical infrastructures in a different way. This results, on the one hand, in a need for routers with reduced switching capacity, but on the other hand in a need for more WDM channels with a low filling ratio, resulting in a less-cost-effective usage of transmission resources.

The SDH/SONET layer provides the capability to groom several sub-lambda containers into the same optical channel, and so to build a highly meshed IP network on a poorly meshed physical topology consuming the same or even less WDM resources.

IP/MPLS-backbone case study

The measures to improve IP backbone architectures described above have been benchmarked in a case study, based on a typical large European national IP/MPLS backbone network. Basically three architectures were considered:

- The three-level IP hierarchy network architecture of today, using direct DWDM links as a transport layer (reference).
- A partially meshed IP network topology optimised for a given transport infrastructure based on SDH/SONET and WDM.
- A fully meshed IP layer network on the same SDH/SONET-over-WDM transport topology as in the case above.

All scenarios were calculated on the same assumptions. The traffic demand matrix with relations between all PoPs was derived from a real-world situation of 2003 and forecast until 2006. The overall unidirectional network traffic demand was approximately 200 Gbit/s in 2003 increasing to slightly above 2 Tbit/s in 2006. For all scenarios a green-field approach was assumed. The cost for all components was taken into account. Only fibres were assumed to be available. Alternative architectures were optimised with focus on cost.

Scenario 1: Reference

The reference scenario is a currently deployed architecture with three hierarchy levels in the IP layer. It consists of three inner core, seven outer core, and many regional core locations summing up to more than 70 backbone PoPs. Each of these PoPs hosts duplicated backbone routers and several metro label edge routers (LER) acting as access points to the backbone. The routers are interfaced by means of point-to-point concatenated POS links. For long-haul transport, links below VC-4-16c are mapped on 2.5 Gbit/s WDM wavelengths whereas VC4-64c links are carried over 10 Gbit/s WDM wavelengths.

Scenario 2: Transport optimised IP/MPLS layer

In this scenario, the degree of meshing in the IP/MPLS layer is increased in order to relieve the core routers from transit traffic. At some point, increasing the number of links, and in the same way decreasing the link capacities, requires an efficient transport layer. In other words, removing traffic grooming from the IP/MPLS layer requires that it must be done in the transport layer, in this case on SDH/SONET. Of course, on the DWDM layer well-filled high-capacity links remain.

Scenario 3: Fully meshed IP/MPLS layer

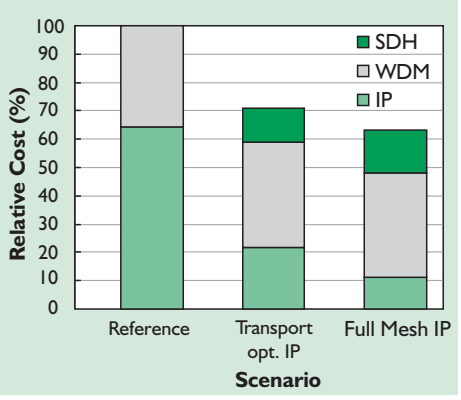
The full mesh between all backbone routers completely eliminates transit traffic from the backbone network, which was evaluated in this scenario. Variations of this case have been calculated limiting the number of physical ports per router on the one hand by channelised POS ports mapping the label switched paths (LSPs) into separate virtual containers in the router, and, on the other hand, by providing layer 2 grooming in the layer 1 cross-connects.

Comparison

The cost comparison of the different solutions shows that all variants have advantages in almost all traffic demand conditions compared to the reference scenario. Elimination of the transit traffic makes sense, and the cost for the additional SDH/SONET layer is low compared to the savings in the IP/MPLS layer. Interfacing has an important impact on the cost profile; GbE interfacing gives cost benefits in most conditions versus POS interfacing.

The cost comparison diagram in Figure 4 shows the cost of the alternate architecture scenarios in comparison to the reference. The bars are subdivided in order to indicate how the different technologies contribute to the costs. The figure describes the cost relations for 2 Tbit/s network. It is clearly visible that the transit traffic reduction already in the transport-optimised IP solution is significant, leading to an overall cost reduction of almost 30%. The complete elimination of IP/MPLS transit in a full mesh results in an 5

Figure 4: Cost comparison



4 overall cost saving of 37%, although the SDH cost increases slightly due to the layer 2 capability.

The required router capacities differ significantly in the three scenarios. The average capacity in the reference case is 200 Gbit/s, going down to 80 Gbit/s in the transport optimised scenario and further to 45 Gbit/s in the full mesh. The difference is even more drastic with respect to the capacity of the largest router in the network. Costly forklift upgrades of core routers can be reduced to a minimum or at least postponed.

Further aspects of improvement

The common use of the SDH/SONET infrastructure has two more positive effects. Traffic development forecasts show that the IP traffic is doubling per year, while the overall data traffic increases at a lower rate. Therefore cannibalising effects can be expected not only between voice over IP (VoIP) versus switched voice traffic, but as well between IP and legacy data traffic after some years. Building up a completely separate IP network sooner or later leads to an inefficiently loaded SDH/SONET network. With a commonly used SDH/SONET layer for both traffic types this will not occur.

The second positive effect comes from the well known SDH/SONET grooming; that is, the better filling of DWDM transport pipes by aggregation of low-capacity containers. In a low-hierarchy multilayer IP architecture, many LSPs of low capacity are transported in SDH/SONET containers. Separate SDH/SONET networks for IP and legacy transport would result in cut-off-losses in both networks, again avoidable in a commonly used SDH/SONET layer. The summary of these effects makes the results of the study cases even more attractive for incumbent carriers' scenarios.

Note from the Editor

We are always pleased to receive contributions of articles for publication in the Forum.

Articles can be on any topic of interest to European ICT professionals, they do not need to be very long, but they should be illustrated wherever possible. Topics might include discussion of industry issues, activities in your local FITCE association, achievements of members, etc. Authors should also supply a colour photograph of themselves for publication alongside their articles.

Please send your articles to the editor at forum@fitce.org.

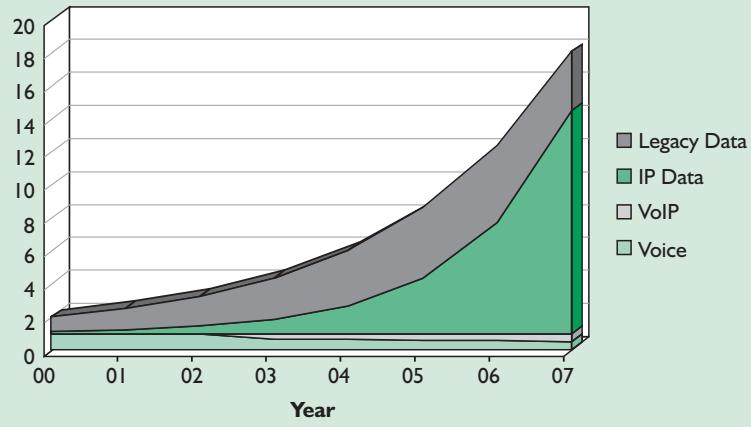


Figure 5: IP versus legacy traffic

Authors

Walter Kailbach has been advisor for network strategy of Alcatel's Optical Networks Division since 2001, with focus on multi-service network architectures and network resilience. He received a Master degree in Communications Engineering (Dipl.-Ing.) at the Technical University of Karlsruhe, Germany. From 1983–1992 he was designing and developing radar systems at Alcatel SEL AG. Between 1992 and 2000 he was involved in systems engineering of air traffic control related projects at Airsys Air Navigation Systems GmbH. He was a member of EUROCAE WG 41 'Surface Movement Guidance and Control Systems (SMGCS)' and a member of the DGON association WG 'Aeronautical Data Communication'. As head of the Air Traffic Systems Planning Group he was co-author of the 'SMGCS programme plan study' for the German Air Traffic Control Agency (DFS), Technical Director of the EC project DEFAMM (Demonstration Facilities for Airport Movement Management) and Technical Project Manager of ASMSS (Airport Surface Movement Surveillance System) for the International Airport Warsaw.

Dr. Wolfgang Frohberg is advisor for network strategy of Alcatel's Optical Networks Division. He was formerly an Assistant Professor at the University of Transport and Telecommunications, Dresden, Germany, and a visiting Scientist at Delhi University and Indian Institute of Science in Bangalore, India. Between 1991 and 1996 he was also a system planning engineer at The Research Center of Alcatel, Stuttgart, Germany. In 1996, he held the position of Senior Visitor at the International Computer Science Institute (ICSI) in Berkeley, CA. From 1997–1999, he was a consultant for Network and Service Strategies at Alcatel. Later he assumed the position of Head of Unit, Service Strategies as well as Technology Watch and Intelligence Manager, CTO organisation of Alcatel Headquarters, Paris, France. Since 2000 he has been Director Advanced Technology at the CTO organisation of Alcatel. In addition, he has been an Auditor and Evaluator for telecommunications oriented research programmes of the European Community since 1996. He is author and publisher of several textbooks in the field of telecommunications. He holds a teaching position at the University of Co-operative Education in Stuttgart, Germany. He is Deputy Chairman of the Federal Board of IfKom, the German telecommunications engineers organisation.

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Connecting Europe at high speed: national broadband strategies

The EU Commission has adopted a report 'Connecting Europe at High Speed: National Broadband Strategies'. In this report it examines the EU members' national broadband strategies, establishes the common ground between them and highlights possible next steps when they come up for review in 2005.

by **Filip Geerts**
Secretary General
FITCE

Broadband services potentially create new markets, increase workers' productivity, and add value to business performance, public efficiency and quality of life. Harnessing the broadband benefits is crucial to consolidate progress towards a knowledge-based economy and ensure growth through improved competitiveness. The successful deployment, take-up and use of broadband are therefore of central importance to the future prosperity of the European economy and to its social cohesion. Recognising the benefits of broadband, at the 2003 Spring European Summit Member States agreed to draw up national broadband strategies by the end of the year. The EU-15 Member States have now made available coherent plans indicating the objectives and roadmaps that have been reviewed in this Communication.

Availability of infrastructure varies across countries, as it is driven by geographical features, population density, technological developments, coverage of cable TV networks, level of competition, and other factors. As a result, strategies describe initiatives with varying emphasis according to the state of coverage, but all adopt a common approach. Several Member States have signalled the need for national strategies to be adjusted and updated, taking into account new technological and market developments. Particular attention should be paid to the following issues:

(a) On the supply side:

(i) Mapping of broadband availability is a useful starting point for the identification of under-served areas and needs to be continuously monitored and updated given the rapid development of broadband throughout the Union.

(ii) Public funding should take account of the Guidelines on the use of Structural Funds in electronic communications not to distort competition nor private commercial incentives.

(b) On the demand side:

(i) Promoting the development of open and interoperable public services.

(ii) Proposing all necessary operational measures to enhance connectivity of public administrations, schools, hospitals and public health centres.

(iii) Implementing demand aggregation policies taking into account competition concerns.

(iv) Improving the efficiency of financial incentives for broadband take-up.

In the short-term, given the strong focus on coverage of remote and rural areas, national strategies are most likely to have an immediate impact on the deployment of infrastructure. For this reason they are considered an important contribution to the Growth Initiative. A first assessment of their achievements will contribute to the progress report on the Growth Initiative to be submitted to the European Council in Spring 2005.

Further actions on the supply- and the demand-side of the broadband market have been proposed by the Commission Communications 'Connecting Europe at High Speed: Recent Developments in the Sector of Electronic Communications' and 'eEurope 2005 Action Plan: An Update'. These actions aim at accelerating coverage of under-served areas, overcoming barriers to the development of innovative content and services to stimulate demand, obtaining greater insights on the reasons for the current lag in demand, and facilitating deployment of the new Internet protocol (IPv6) to widen the range of innovative services and applications. These actions are complemented by the following:

- Technological developments, growth of the broadband market, exchange of experiences and lessons from implementation require an update of national broadband strategies. Member States should complete a comprehensive update by the end of 2005.
- New Member States should adopt national broadband strategies by the end of 2004.
- Monitoring progress in the implementation of national broadband strategies will contribute to the assessment of the eEurope 2005 objectives of widespread availability and use of broadband in the EU. The Commission will review progress and developments in the first half of 2006 as part of the evaluation of eEurope 2005.

Planning starts for Liverpool 2008!

FITCE UK has volunteered to host the FITCE Congress in 2008 and, although it may seem a long way off, FITCE UK Secretary and CD Member, Jeremy Randles, has already initiated the planning process.

'The reason for the early start,' says Jeremy, 'is because Liverpool will be European Capital of Culture in 2008 and the organising team for those events is already in place, booking venues and looking for contributions. So if we don't act soon, we may find that all the conference venues and dates are fully booked.

'Linking up with the European Capital of Culture is something that worked well for FITCE UK in Glasgow in 1990 and we're already working with Liverpool's "Merseyside Partnership" team to identify potential venues, hotels and evening events.' Liverpool's St George's Hall, one of the finest neoclassical building in Europe, is a strong possibility for the venue for the 2008 Congress.'

More information about Liverpool, European Capital of Culture, is available at http://www.liverpoolculture.com/, and St George's Hall itself at http://www.stgeorgeshall.org/

If you are able to help the FITCE UK Congress Planning team with any aspect of Liverpool 2008 or you'd just like to get involved, please contact Jeremy Randles, tel: +44 20 7777 6126, email:jeremy.randles@bt.com

FITCE is pleased to support the following event organised by Vision in Business:

'OSS/BSS in Telecoms' 19–20 January 2005, Madrid, Spain

A 10% discount for the event is available to FITCE members. FITCE members should use the special application form available at www.fitce.org/members/fitceprv/oss.pdf, which also gives details of the event and its programme (Members' password required).

For further information, please contact Vision in Business:
telephone: +44 (0) 20 7098 0400;
email: events@visioninbusiness.com;
web: http://www.visioninbusiness.com

Trends in IT and telecommunications

On 24 May 2004 FITCE Austria organised a high-level congress for its members, sponsored by Siemens Austria and hosted by Dietmar Appeltauer, Director, Head of Information and Communication Mobile Business Unit.

Munich resident Ulrich Skrypalle, Managing Director and proprietor, designaffairs, one of Siemens' major designers of mobile phones gave his opinion on how to forecast trends in his presentation 'How Trends Affect the Development of Products—Case Study Mobile Phones'. Designers have to know the upcoming trends at least five years in advance to plan production. They get their input from magazines, trend scouts and their own experiences as well as lifestyle trends from Europe, the USA and Asia. With mobile phones the design trend at the moment is in the direction of new, authentic materials such as covers made of leather.

In his presentation 'Co-Sourcing—Methods and Solutions', Josef Janitsch, who develops co-sourcing solutions for his company ProIn, demonstrated to the audience how to reduce costs and concentrate on core competences by co-sourcing of PABX, IT networks, provider services and help desks.

The fact that private and professional communication is moving together is a given phenomenon and was on the agenda of Peter Tschulik's (Siemens) presentation 'LifeWorks—Communication of the Future Starts Today'. Lifeworks is the communication broker of the future. This software assists people in organising their communication to arrange the way in which someone would like to be contacted by whom.

The picture of future management requirements was drawn by Andreas Landgrebe, partner of the personnel consultant Jenewein & Partner. In his presentation 'Time changes management—future requirements for ITC management', he described that 'the requirements for top management will be a cultural shock for the established professionals.' After years of consolidation when managers' skills had to focus on meeting their cost reduction aims, managers must now have other talents. In an upcoming period of growth and expansion the new top managers must be leaders with charisma, visions and strategies, and with only a smattering of basic operational knowledge.

Susanne Blaha
(FITCE Austria)

United Kingdom stages Ghent presentations

Five presentations from the FITCE Congress in Ghent will be given at an afternoon Colloquium staged by The Communications Network, in conjunction with FITCE UK, at the famous and auspicious Royal Institution of Great Britain, 21 Albemarle Street, London W1, United Kingdom, on 29 November 2004.

The Royal Institution (www.rigb.org) has been famous for over 200 years for scientific research. It is home to many major scientific discoveries, including, for example, electro-magnetic induction by Michael Faraday in 1831.

The Colloquium is entitled 'European Networks of the 21st Century' and the presentations from the 2004 Congress will be:

- 'Unified Personal Services: Market Drivers and Technologies' by Marc Roelands, Siemens, Belgium;
- 'Evolving Architectures and Technologies to Address Operators' NGN Challenges' by Phil Healy, Network Strategy Lead, Chief Technology Office, Marconi;
- 'Enabling Flexible Working Using Hybrid IP VPNs' by Tim Hubbard, Nortel Networks;
- 'A Vision on Wireless Mesh Networks' by Peter Zwinkels, Nortel Networks; and
- 'Future Residential Services—Lessons from the past, models for the future' by Barry Reynolds, eircom, Ireland.

The Colloquium will be chaired by Professor Andy Valdar from University College London, who is the deputy CD member for the UK. The afternoon event will close with a round-table discussion and an opportunity to network will speakers and delegates over a buffet.

Members of FITCE are welcome to attend the event at the rate applicable to members of The Communications Network: £30 if booked before 15 November, £45 thereafter. Book by calling The Communications Network office on +44 1932 788861.

Award-winning paper

Jeroen Hoebeke came to the UK recently to present his paper from the Ghent Congress. The paper, 'An Overview of Mobile Ad Hoc Networks: Applications and Challenges', was awarded the Best Paper award at the Congress.

Jeroen presented his paper in two locations, firstly in Oswestry, Wales, for **the communications network**, and then in London at the Annual General Meeting of FITCE UK. On both occasions Jeroen had large and appreciative audiences.

Said Jeremy Randles, CD member for FITCE UK: 'We are very pleased to able to offer authors from the FITCE Congress the opportunity to present their papers in the UK. Jeroen's presentation was very well received, and we are looking forward to an interesting and lively Colloquium. No doubt there will be other opportunities in the future to welcome European speakers to the UK.'

44th FITCE Congress 2005 Vienna
www.fitce.org August 25-27

The Magic Potion to Meet Customers' Desires!

Welcome to the...

44th FITCE Congress
25–27 August 2005
Vienna, Austria

We would like to invite you to the 44th FITCE Congress in Vienna. FITCE Austria is delighted to show you not only Vienna's traditional, historical and cultural highlights, but also to present Vienna's leading developments in the field of technology as well as its pivotal role at the gateway between 'old' and 'new' Europe.

Those members and ICT professionals who participated in the FITCE Congress in Vienna in 1996 will experience how Vienna has been able to develop into a future-oriented economical and industrial centre in the heart of Europe.

In cooperation with Austria's ICT industry, the ministries and universities, we have composed a programme encompassing the newest ICT trends and strategies: convergence, interactivity and service innovation.

This will be the strategic triangle for success in the next evolution step of the Information Society.

It is a distinguished asset of the FITCE Congress that experts from vendors and telcos are presenting their experiences and visions in a very comprehensive way!

FITCE Austria is already looking forward to welcoming you in August 2005.

CU in Vienna!

Alois Miedl
President, FITCE Austria

Congress Topics

The topics of the 2005 Congress are:

- **convergence**
- **interactivity**
- **service innovation**

They will be covered vertically by:

Vision Media technologies are changing continuously leading to consumption of different service offers provided by various infrastructures and devices. The phenomenon of convergence is not only shown in the merger of technical infrastructures but also of different media services.

Technology/Infrastructure The different nature of voice and data networks is the actual challenge for network operators, especially incumbents. Technical convergence describes the convergence of networks and end devices and stands for the interchangeability and merger of various network platforms on the one hand, and the development towards multifunctional end devices on the other.

Services/Applications One noticeable change is that people want to be selectively connected—anytime and anywhere via any device. In other words, they want personalised and context-based ubiquitous services. Context-based means that services behave according to location, preferences or situation.

Marketing/Socio-economics From an economic point of view, communication markets are driven by 'new services'. Nowadays, services such as voice communication, television, radio and other similar network-based services can be delivered over various fixed or wireless networks. Convergence actually describes the merger of the telecommunications, broadcasting and information technology sectors.

Key information

The 44th FITCE Congress will take place on 25–27 August 2005 at the Telekom Austria conference hall, Lassallestraße 9, Vienna, Austria.

The call for papers will be available at ww.fitce.org, and will be published in the next edition of the *Forum*.

The deadline for the submission of abstracts is 15 February 2005. Papers of accepted abstracts will be published in the Proceedings.

The deadline for early registration is 1 June 2005.

A number of hotel rooms in different price categories have been booked for the delegates of the Congress. Reservations can be made on the registration form which will be distributed later.

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