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Eurescom and the European Telecommunications by 2005

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Zusammenfassung

Eurescom und die europäische Telekommunikation im Jahre 2005

Das europäische Forschungs- und Strategieinstitut für Telekommunikation[1] (Eurescom) — welches am 14. März 1991 von den europäischen Netzbetreibern gegründet wurde und seinen Sitz in Heidelberg, Deutschland, hat — stellte einen Überblick über die möglichen Entwicklungsperspektiven und die unterschiedlichen Szenarien der europäischen Telekommunikation für das nächste Jahrtausend dar. Diese längerfristigen Perspektiven wurden in einem Eurescomprojekt erarbeitet. Der Beitrag geht auf diese europäischen Telekommunikationsvisionen im Jahre 2005 ein und stellt die europäischen Bemühungen in einem grösseren Zusammenhang dar.

Résumé

Eurescom et les télécommunications européennes en l'an 2005

L'Institut européen de recherche et de stratégie en télécommunications[1] (Eurescom), fondé le 14 mars 1991 par les opérateurs de réseaux européens, et dont le siège se trouve à Heidelberg, Allemagne, a élaboré un aperçu des diverses perspectives de développement ainsi que des scénarios distincts pour les télécommunications européennes du siècle prochain. Les perspectives à long terme ont été récapitulées dans un projet Eurescom esquissant une vision globale des télécommunications européennes en l'an 2005 et montrent les efforts entrepris à grande échelle. Perfectionnement des technologies de base dans le domaine des télécommunications.

Riassunto

Eurescom e le telecomunicazioni europee nel 2005

L'istituto di strategia e di ricerca europeo per le telecomunicazioni[1] (Eurescom) — che è stato fondato il 14 marzo 1991 dai gestori di rete europei e che ha sede a Heidelberg, in Germania — ha delineato le possibili prospettive di sviluppo e i diversi scenari che caratterizzeranno le telecomunicazioni europee nel prossimo secolo. Le prospettive a lunga scadenza sono state elaborate in un progetto Eurescom. Nell'articolo viene descritta la situazione in cui potrebbero trovarsi le telecomunicazioni nel 2005 e vengono presentati gli sforzi compiuti a livello europeo.

Summary

Eurescom and the European Telecommunications by 2005

The European Institute for Research and Strategic Studies in telecommunications[1] (Eurescom) — established on 14 March 1991, formed by European public network operators and having the head office located in Heidelberg, Germany — has given a summary of possible visions and different scenarios for European telecommunications for the beginning of the next century. A longer term vision for Pan-European telecommunications has been outlined by a Eurescom project on overall strategic studies that described what might be the situation in the European telecommunications environment by 2005.

Main Objectives of Eurescom

- Harmonize services and infrastructures at a Pan-European level
- Coordinate and stimulate participation in common projects in the research area
- Coordinate and stimulate realization of pilot projects
- Contribute to international standardization activities

[1] The initiative to establish Eurescom was taken by Deutsche Telekom, which made corresponding proposals at a telecommunications meeting of CEPT and a meeting of the EC Council of Postal and Telecommunications Ministers in the autumn of 1989. Currently the following European Public Network Operators are members of Eurescom: Austria, Belgium, Danmark, Finland (Telecom and Association of Telephone Companies), Germany, Czech Republic, Great Britain (BT and Mercury Communications), Hungary, Iceland, Ireland ann Italy, Greece, Luxemburg, Netherlands. Norway, Portugal (Telefonos de Lisboa e Porto and Companhia Portuguese Radio Marconi), Slovak Republic, Spain, Sweden, Switzerland.

The Eurescom projects fall into three different temporal categories:

- short-term projects, in which the results are likely to be implemented in one to three years' time
- medium-term projects, in which the results are likely to be implemented in three to five years' time
- long-term projects in which the results are likely to be implemented in five to seven years' time

Features

A decisive spreading of the B-ISDN and full exploitation of N-ISDN features are expected in this long term evolutionary scenario:

- The transmission platform will be characterized by an almost complete deployment of the SDH technology.
- The introduction of ATM switching could be the outstanding breakthrough of this period, but only if

new switched services could be provided in a cost effective way.
- Interworking functions between narrow band networks and B-ISDN speed up an integration process that affects network accesses, services as well as transmission and switching resources.
- Universal Mobile Telecommunications Service (UMTS) enables full integration of the mobile and fixed network providing full mobility (i.e. personal mobility, terminal mobility and service mobility).

Scenario 2005

In summary, by 2005 a situation is envisaged where among other things:

The boundaries between information and telecommunication technologies (IT&T) and entertainment industries will blur as digital technology dominates and information services grow. Public Network Operators (PNOs) will be involved in the collection, management, processing and storage information, not just its transportation. Multimedia applications will become a major driving force.

Customer will demand access to their own range of services independent of country and network operator boundaries, resulting in the separation of services and network infrastructure. Service independent network platforms will develop built upon a consistent network architecture. Mobility in terms of personal mobility and terminal mobility will be offered on a Pan-European basis.

The residential market will provide a significant source of new revenues in addition to voice. Mass market demand for teleworking, entertainment and information services will drive broadband networking on a Pan-European scale, to add to the earlier broadband business growth.

Liberalization across Europe will generate a multiplicity of competing service providers and network operators, particularly for Pan-European value-added services. PNOs will learn when to compete and when to cooperate. Competition will take place at the higher service and application levels, and cooperation at the generic services and logical and physical network levels.

Pan-European public services will be presented to the customer in a harmonized way.

A common 'look and feel' – independent of location or network operator. Userfriendly and easy to use services will be the norm, tailored to individual tastes and presented in the customer's preferred language.

Provision of a complete portfolio of services will be available from independent agents or PNOs. Customers will have personalized account management and be able to remotely manage their service portfolio from anywhere in Europe.

Customers routine requests to order new services, check status of existing services, interrogate usage information will be dealt with automatically through integrated network management systems. Customers will have the perception of managing their 'own' public network resource.

Network operators will develop reliable and failure resistant networks recognizing the need to provide customer telecommunication services under all circumstances.

People's greater awareness of environmental issues will provide new opportunities for the telecommunication sector. Environmental regulation and customer pressure will force many industries to reconsider their business activities, fuelling movement to telecommunication equipment and services as environmentally friendly alternative substitutes.

Network operators and service providers will have to guarantee the security and privacy of information accessible across Europe, especially as financial transactions and personal profile information grows. The integrity of information and networks will critically depend on the technical solutions adopted.

Europewide initiatives

In conformity with the Title XII of the Treaty of Maastricht – which aims at the creation of Europewide telecommunications, energy and transport networks in a territorial development – the European PNOs are preparing several initiatives such as Global European Network (GEN), Managed European Transmission Network (Metran) and the European Asynchronous Transfer Mode (ATM) Pilot Network.

Global European Network

GEN is a initiative of five PNOs (of Bonn, London, Madrid, Milan, London) to provide faster and better quality of leased lines services cross Europe. Using identical equipment in the member networks and a central control and management centre, it provides 64 kbit/s, 2 Mbit/s and 34 Mbit/s leased lines to the customers of the five PNOs. The service support system is based on crossconnectors at the networks on which the routes are being switched under control of the one control centre. The network is probably not visible to a customer, as it mainly serves the PNOs among themselves and leaves the direct customer relations to the individual PNO.

Managed European Transmission Network

The Metran initiative[2] comprises 22 PNOs of Europe in their aim to establish a system of cooperation allowing for better and faster provisioning of network services on the path layer level among themselves. Metran is not intended to provide direct service to any enduser, it more will enable the network providers to support their customers with high quality

[2] Metran's planning phase is currently completed and allows joint operation from 1994. Evolution of management capabilities will start with manual processes and information exchange first and will gradually evolve towards fully automatized techniques later.

of service in many respect. Subject of Metran is the international network between PNOs. By establishing advanced processes for planning, provisioning, maintenance, accounting and charging, the Quality of Service offered to customers will improve. Definition of related processes will allow for it without a need for a centralized control.

European ATM Pilot Network

The Synchronous Digital Hierarchy (SDH) has been wholeheartedly embraced by European PNOs. It allows more efficient management of the operators network and also provides a platform for high bitrate services. As far as the transmission part of the equation is concerned the building of national high bitrate networks complete with interconnection to neighbouring countries is well under way.

When it comes to the necessary switching platforms, however, it is a different story. Most PNOs have been testing ATM in their laboratories for several years by now. Across Europe ATM will come out of the R & D laboratories and into networks to be trialed by real traffic. While many PNOs will start their own national trials or expanding existing ones. This ATM pilot network will involve an ATM node in almost every western European country with the exception of Iceland, Luxembourg and Greece. In total 18 PNOs have signed the corresponding Memorandum of Understanding (MoU). To a large extend the success on the trial will depend upon the common specifications developed by Eurescom, based on ITU recommendations and ETSI standards. The ATM network will use benchmark services to validate the technical and standards issues internationally. The following have been identified as benchmark services:

- Frame Mode Bearer Service/Frame Relay
- Computer-Based Data Services/Switched Multi-megabit Data Services
- CBR circuit emulation

The basic elements of the network architecture which the MoU signatories have agreed to implement are as follows:

- initial transmission infrastructure will consist of a mashed structure based on PDH 34 Mbit/s links
- extra links (PDH or SDH) will be added for additional functionality as necessary
- each participant will implement at least one interoperator node as a gatewaty national ATM trials or pilot networks

IN Rollout in Europe

The intelligent network (IN) may be regarded as one of the most innovative and evolutionary architectural concept of the present decade, specifically conceived for Telecom Operators to facilitate and accelerate the introduction of new advanced telecommunications services in a cost effective way. From this perspective, the implementation of an IN architecture represents a key strategic objective to pursue, which will enable the Telecom Operators to compete in this challenging, evolutionary telecommunications environment. It is within this framework that a lot of initiatives and projects aiming the utilisation of IN technology have been developed all over Europe or are in process of starting.

Customers continue to look to telecommunications to provide competitive advantage in their own marketplace and to meet the needs of individuals for convenience in their communications, for business and personal purposes. They are seeking services that save time and costs, are intuitive and consistent in use, give customers control and can be used whenever and wherever they are required with payment at the point of use. These expectations have given rise to a need for a range of services to meet the needs of both organizations and individuals. To achieve and retain a competitive edge in light of these needs, it is essential to be able to define and implement services while responding quickly to customer demands and allowing customers to tailor services to meet their individual needs. These requirements demand a flexible network that enables complex new services to be quickly prototyped, launched and supported at lowest cost.

The emergence of the IN architecture presents an opportunity to better meet these customer needs to the mutual benefit of customers and telecommunications network operators. However, IN architecture will be introduced into a complex network that already provides some services.

The IN is developing to enable communications network operators to meet customer needs in a commercially viable manner. These needs are meet by introducing services that save the customer time or money, are easy to use, are available wherever they are required, and interact with each other in a predictable and controllable way. In addition, the need to compete with other operators or even non-telecommunications operations requires solutions that are cost effective and facilitate the rapid introduction of services and customisation.

The progress made toward the vision of IN can be assessed against three key attributes: support of standard interfaces at appropriate points, provision of advanced service creation under control of the network operator and separation of the logic for advanced services from underlying switch control.

The IN has been, and will continue to be, a major plank of network strategy to meet both customer requirements and operator's commercial needs. The timely development of equipment, software and international recommendations are essential to enable this strategy to be fulfilled. The initial steps toward IN provide a sound basis of experience as well as network platforms for continued evolution to the target IN architecture. The benefits of IN already are present to a considerable extent; further development is in hand to fully achieve the objectives.

IN Eurescom Activities[3]

Based on the general framework, the following six work areas have been defined in the 1992 through 1996 work program:

- strategic studies
- infrastructure and switched networks
- intelligent networks
- telecommunications management networks
- services
- software

Being of the major architectural innovations of the past decade, IN represents a key strategic tool for the public network operators to meet new market requirements and to be ready for the challenges of the 1990s. The transition from the current networks configuration, to an advanced international IN operating all over the Europe must follow some evolutionary lines taking into account technology advances, customer demands and regulatory, economical, and standard constraints. The different national initiatives must therefore be harmonized and future evolution must be coordinated.

[3] EU-P-101-VPN aims to provide the definition of a Pan-European VPN service as soon as possible. EU-P-102-UPT runs in parallel with the previous project and intends to provide the definition of a Pan-European UPT service, based on pragmatic interconnection of existing platforms. EU-P-201-IN and TMN service testing – addresses interfaces, end-to-end service testing and the development of testing models applicable to IN and TMN. EU-P-230 – enabling Pan-European services by cooperation between PNOs' IN platforms – aims to identify and define a set of Pan-European services to be supported by PNOs» IN platforms. Management issues will be dealt with by the parallel Eurescom project EU-P-226 related to the TMN area. The long-term project currently active is the EU-P-103 evolution of IN. New projects are envisaged to define method and tools for IN-based network dimensioning, optimization of network topologies and service performance evaluation. It is also expected that project related to the software area and service creation will emerge.

Titu I. Bajenesco, M. Sc., MBA, MQRA, Prof. Eng. – Member of the New York Academy of Sciences, Senior Member IEEE, International Expert and Consultant – was involved in the management of international and national telecommunications projects, in the feasibility studies, development and design of advanced telematic systems, systems integration with LANs, MANs and WANs, in joint ventures, liberalization and privatization, master plan for the future development of national telecoms, etc. His previous experience includes reliability and quality engineering of microelectronic components and complex telematic systems, especially in the field of advanced telecommunications systems. He holds two patents, is author of many technical books and papers written in six different languages, and has received international managerial citations for his work.