

# networks 2002

>> 10<sup>th</sup> International Telecommunication  
Network Strategy and  
Planning Symposium

June 23 – 27, 2002

Hilton München Park, Munich, Germany



## Programme



# PROGRAMME

**10<sup>th</sup> International Telecommunication  
Network Strategy and Planning Symposium**

**June 23 – 27, 2002  
Hilton München Park, Munich, Germany**

**Networks 2002**  
CONFERENCE, TUTORIALS AND  
TOOL DEMONSTRATIONS

## **Organised by**

*ITG Information Technology Society of VDE  
VDE Association for Electrical, Electronic and  
Information Technologies*

## **Sponsored by**

*ALCATEL  
CISCO SYSTEMS  
DEUTSCHE TELEKOM  
ERICSSON  
LUCENT TECHNOLOGIES  
NORTEL NETWORKS  
SIEMENS*

# Chairman's Message

For network operators network strategy and planning are very important tasks. Correct decisions at the right time have great influence on success. In this field are a lot of opportunities to differentiate between competitors. With the new available techniques e.g. UMTS, WLAN, IP, the planning tasks will become more and more complex. Especially the integration of the existing network infrastructure and the migration of new and old techniques are big requirements of network strategy and planning.

The International Network Strategy and Planning Symposium allows all experts and decision makers to look at the newest research and development. Besides, the symposium provides the best discussion platform for all international experts.

Networks2002 in Munich will continue the tradition of this very successful symposium.

Wolfgang Gross  
*General Chairman*

# Programme Chairman's Message

Networks 2002, The International Telecommunication Strategy and Planning Symposium, will be held for the tenth time world-wide and for the first time in Germany. Whereas in the 1980s, Networks solely concentrated on questions of networks planning, it has now become the most important telecommunications conference focussing not on systems but on the entire network.

Networks 2002 will feature over 90 presentations covering topics such as

- Network Planning for Fixed and Wireless Networks
- Quality of Service, Resilience, Security
- Business Models, Strategies, and Cost Analysis
- Network Technologies and Interworking Issues
- Convergence of Voice, Data, and Multimedia Services
- Evolution towards Next Generation Networks

The convergence of voice, data and multimedia services, reliability and security, innovative network services and mobile internet, and networks of future generations are the topics of the main sessions. For example network strategists trying to assess the networks of future generations find information in the technical conferences about business models and pricing, network architectures from a service point of view, optical components and architectures, traffic estimation, interworking. Parallel sessions take place about network operation and quality, network planning and mobile networks.

The Programme structure and the contents of Networks 2002 thus provide an excellent forum for the exchange of experience and the best source of information that is possible for individuals and companies working in this field.

Eckart Wollner  
*Programme Chair*

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## **Attachments:**

Programme Overview

Conference Registration Form

Hotel Registration Form

Conference Centre Floor Plan

Map of Munich

Munich Subway Plan

# Networks 2002

## Organizing Committees

### International Scientific Committee IMSC

Wolfgang Gross	T-Systems Nova, Germany (General Chairman)
Michael Donohoe	Eircom, Ireland
Oscar Gonzalez-Soto	Alcatel, France
Joachim Gross	Arcor, Germany
Akiya Inoue	NTT, Japan
Bernard Jarry-Lacombe	France Telecom, France
Sang-Baeg Kim	Korea Telecom, Korea
Hussein T. Mouftah	University of Toronto, Canada
Andreas Neuherz-Welser	Cisco Systems, Austria
Lawrence Paratz	Telstra Corporation, Australia
Pietro Parente	Telecom Italia Mobile, Italy
Gyula Sallai	Budapest University, Hungary
Rati C. Thanawala	Lucent Technologies, USA
Andy Valdar	University College London, UK

### National Organizing Committee

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Wilfried Kaufmann	Deutsche Telekom AG, Germany (Chairman NOC)
Peter Conrad	Alcatel, Germany
Jörg Eberspächer	Technical University Munich, Germany
Claudia Kreuels	Lucent Technologies, Germany
Tina Leitmeyer,	T-Systems Nova, Germany
Detlev Lohmüller	Ericsson, Germany
Stephanie Mägerlein	Cisco Systems, Germany
Marion Mann	Siemens AG, Germany
Bettina Neuser	Nortel Networks, Germany
Anton Riedl	Technical University Munich, Germany
Rupert Rompel	VDE, Germany
Volker Schanz	ITG/VDE, Germany
Eckart Wollner	T-Systems Nova, Germany

# Tutorials

Sunday, June 23

14:00 – 15:30

Tutorial 1

Room "Rumford"

## **Next Generation Networks (NGN) – Convergence towards Multi-Service Networks**

Definition of NGN Quality of Services,  
Control Protocols Network Architectures, Migration Scenarios  
*H. Orlamünder, Alcatel, Germany*

What we call Next Generation Networks had its origin in the Voice over IP (VoIP) hype which was triggered by new business opportunities. These were given e.g. by the fact that VoIP allowed a by-passing of established service provider monopolies. But least-cost international calls were falsely taken as indicators that voice packet technologies must be more cost effective than traditional circuit switched networks. In fact, the so-called cost differences were actually caused by monopoly market structures and the related international-settlement scheme.

After a phase of disillusion it turns out that VoIP does not fulfil the above expectations. It does nevertheless represents a catalyst for the introduction of Next Generation Networks. This is the reincarnation of the old requirement to create converged voice and data networks – as attempted by ISDN 20 years ago, but taking the voice network as a basis. Today the evolution envisaged is to integrate voice into the dominant IP network.

In this tutorial an overview of the technologies behind the buzzwords like "NGN", "VoIP" or "Voice over Packet" in general is given. The following issues are presented in the main part of the seminar:

- What is an NGN? – The missing definition.
- How to provide quality in IP networks – Is it Intserv, Diffserv or MPLS?
- What are necessary control protocols? – Something new in the IP-world.
- How to build networks? – We need architectures and introduction scenarios.

Several applications which have adopted NGN ideas like Packet Cable and UMTS as well as some new service ideas enabled by the new technology, will be described.

## Presenter Biography

Harald Orlamünder, born in 1952, joined the research centre of SEL AG (today Alcatel SEL AG) in Stuttgart in 1979 after a study in Telecommunications at the University of Stuttgart. His first tasks centered around multi-microcomputer systems. In 1985, he changed to the network strategy and standardization department dealing with the emerging broadband technologies (e.g. B-ISDN, ATM, MAN). The subjects related mainly to networking aspects like evolution and interworking. Today, he is an expert in the "Solution Design and Integration" Department performing external and internal consulting. He is active in the international standardization and is the author of many publications and books.

**14:00 – 15:30**

**Tutorial 2**

Room "van Gogh"

### **Multi-Service Network Planning and Engineering**

Fundamental Teletraffic Theory, Traffic Planning, Network Dimensioning, Optimized Network Operation – Traffic Engineering

*T. Bauschert, Siemens AG, Germany*

Compared to the traditional telephone teletraffic engineering and network planning methodology which has been developed over the last century, the planning of data networks and especially IP networks still is largely based on empirical rules of thumb. However, as Telco operators move towards a converged network, based on IP technology handling multiple voice and data traffic streams with different quality of service (QoS) requirements on the same infrastructure, it is becoming urgent to extend the current network design practices to allow adequate QoS provisioning for this multi-service traffic. Keeping this in mind we want to address the fundamental concepts of multiservice IP network planning in our tutorial.

We begin with giving an overview of traffic and resource control mechanisms used for QoS differentiation in multi-service IP networks. Afterwards we discuss essential traffic characteristics which leads to the identification of mainly two traffic types: stream traffic and elastic traffic. For both traffic types we present suitable performance and dimensioning models. The tutorial proceeds with a survey of traffic-planning methods covering the topics of traffic demand estimation and forecasting, as well as traffic-matrix generation. Lastly, we address dimensioning issues for different network scenarios and discuss possible solutions.

## Presenter Biography

Thomas Bauschert has a diploma degree in electrical engineering and information technology and a doctorate, both from the Munich University of Technology (TUM). Since graduating, he has worked in the field of network planning and engineering, first as a member of the research staff at the Institute of Communication Networks (Munich University of Technology) and since 1997 as a senior consultant within the Network Engineering Department of Siemens, Information and Communication Networks (ICN). Recently, he joined the Mobile Networking Division (ICM N), where he is responsible for strategic product planning related to the introduction of IP technology in next generation mobile networks. His current research areas include, among other things, network dimensioning and traffic engineering of fixed and mobile communication networks based on IP technology.

**14:00 – 15:30**

**Tutorial 3**

Room "Cézanne"

### **Optical Networks – Bandwidth without Limits ?**

Linear and Non-Linear Fibre Effects, Introduction in Dispersion, Non-linearity and Noise Management Design Issues for High Bit rate Transmission, Future Transmission Systems  
*B. Schmauss, Lucent Technologies, Germany*

Today's and future optical backbones, metro and local networks are based on low-distortion propagation of signals in optical fibres and optical components. The increasing complexity of optical networks in terms of channel count, channel bit rate, transmission distance, and configuration flexibility, require careful physical design and specific know-how about component behaviour, fibre propagation effects and their mutual interaction.

The tutorial reviews the most important propagation effects, like linear fibre effects (attenuation, group velocity dispersion, polarisation mode dispersion), non-linear fibre effects (self phase modulation, cross phase modulation, four wave mixing, stimulated Raman scattering), and amplifier noise. An introduction to dispersion management, non-linearity management and noise management is given to emphasize the importance of balancing the propagation effects.

Also the impact of link design on system performance is addressed. Design issues regarding high channel bit rates such as 40Gbit/s and above are discussed, as well as techniques to increase the spectral efficiency of DWDM systems

using by new modulation formats. A review of recent research experiments provides a perspective on future optical networks.

To illustrate the impact of propagation effects on network engineering and design, the tutorial covers a few examples of DWDM links and how those links are engineered based on the concepts introduced and what equipment is needed to overcome some of the issues. In the examples, the cost trade-offs, e.g. shorter span distance vs additional equipment or fewer lambdas vs more expensive fibre are illustrated. The examples cover different scenarios along the following dimensions: channel count, link distance, bit rate, and fibre type.

### **Presenter Biography**

B. Schmauss was born in Weiden, Germany in 1963. He received the Dipl.-Ing. and Dr.-Ing. degrees in electrical engineering from the University Erlangen-Nuernberg in 1989 and 1995, respectively.

In 1995, he joined Philips Kommunikations Industrie, now Lucent Technologies, in Nuernberg. He has been working on modelling and simulation of high bit rate optical communication systems in several research and product-development projects.

Currently, he is guest professor on optical communication at the University Erlangen-Nuernberg.

Dr. Schmauss is member of IEEE Communication Society, IEEE LEOS and VDE ITG (Informationstechnische Gesellschaft im Verband der Elektrotechnik, Elektronik und Informationstechnik).

**15:30 – 16:00**

**Coffee break**

**16:00 – 17:30**

**Tutorial 4**

Room "Rumford"

### **From 2G to 3G: The General Packet Radio Services (GPRS)**

GPRS Architecture and Services, Session Management, Mobility Management, Routing Protocol Architecture, Security EDGE, UMTS & Future

*J. Eberspächer, C. Bettstetter, Technical University Munich, Institute of Communication Networks, Germany*

The *General Packet Radio Service* (GPRS) is a data bearer service for GSM and IS-136 cellular networks. Its packet-ori-

ented radio transmission technology enables efficient and simplified wireless access to Internet Protocol-based networks and services. With GPRS-enabled mobile devices, users benefit from higher data rates (up to approx. 50 kbit/s), shorter access times, an "always on" wireless connectivity, and volume-based billing. Considering the network evolution of second-generation cellular networks (2G) to third generation (3G), GPRS enables a smooth transition path from GSM/TDMA networks toward the Universal Mobile Telecommunication System (UMTS). Especially, the IP backbone network of GPRS forms the basis for the UMTS core network.

This tutorial discusses various network as well as transmission-related aspects of GPRS. After giving an overview of the evolution from 2G to 3G, we discuss the system architecture and services as defined in the standard. Next, we explain the principles for session management, mobility management, and routing. Another main topic is the GPRS physical layer at the air interface, including channel coding. Moreover, an overview of the protocol architecture, security, and charging aspects is presented. Finally, we give an outlook on enhanced GPRS, UMTS, and future wireless mobile communication systems.

### **Presenter Biography**

Joerg Eberspächer earned the Dipl.-Ing. and Dr.-Ing. degrees in 1970 and 1976 from the University of Stuttgart, Germany. From 1977 to 1990 he was with Siemens AG, where he was responsible for research and development in the fields of high speed and intelligent networks. For many years he was active contributor to international standardization bodies. Since 1990, Prof. Eberspächer is a full professor at the Technische Universität München. He is also a guest professor at the Tongji University in Shanghai, China. Prof. Eberspächer is co-author of the book "GSM Global System for Mobile Communication", a senior member of IEEE, and member of VDE. He is currently chairman of the German Information Technology Society of VDE.

Christian Bettstetter is a research and teaching staff member at the Institute of Communication Networks at the Technische Universität München (TUM). His interests are mobile communication networks, wireless ad hoc networking, and protocols for a future mobile Internet. He received the Dipl.-Ing. degree in electrical engineering and information technology from TUM in 1998. Furthermore, he is co-author of the Wiley book "GSM – Switching, Services and Protocols (2nd ed.)."

Room "van Gogh"

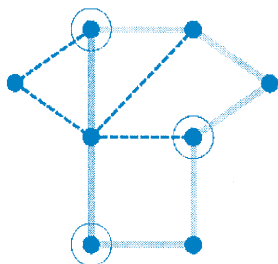
### **Combinatorial Optimization at Work: How to find the Needle in the Haystack?**

Mathematical Methods for Telecommunication Networks  
Design, Step by Step Combinatorial Solution Finding Process  
for a Given Problem

*M. Oellrich, T-Systems Nova, Berlin, Germany*

Telecommunications network design most often aims at specified technical solutions at the lowest possible cost. Discrete mathematics can greatly help achieving this goal. The technical system is modelled in mathematical language and solved by suitable methods. It lies in the nature of those problems that they have a vast multitude of possible solutions. Singling out one with lowest cost among all of them is just like searching for a needle in a haystack.

As it is a typical example for a telecommunication design problem, we will work out step-by-step the solution process of the Disjoint Routing Problem of Virtual Private Networks (VPN): a number of given demands must be routed through a given network such that their paths do not share any common nodes or links, and cause minimal cost among all possible solutions.



Along the way, the participants will be enabled to understand the solution process and the way of thinking involved in Combinatorial Optimization. They will see how to bring a clever system into the search for the optimum and how to transfer these ideas to their own design projects. No deep mathematical prerequisites are necessary.

### **Presenter Biography**

Martin Oellrich studied Mathematics and Applied Mathematics in Bonn, Berlin (Germany), and Madison, WI (USA) and graduated 1997 from TU Berlin with degree Dipl.-Math. Since then he has been a member of the Network Optimization group at T-Systems. His PhD work is currently in progress.

Room "Cézanne"

## **Network and Service Management**

Architectures, Network Management, Service Management, Selected Problems

*K.-P. Zeffler, T-Systems Nova, Germany*

This tutorial will give a survey of the current status of network and service management and will show current problems and some possible solutions.

As the presentation is looking at the aspects from a network operator's perspective, it is the implications and usage of technology that stands more in the foreground than the technology itself.

The tutorial starts with explaining TMN architecture, according to ITU M.3000 as an international accepted standard, and TOM architecture, according to TMF – which gains more and more acceptance by network operators.

Based on these architectures, a network operator's view on current network management developments will be given.

Aspects of general technological and strategic implications of these developments will also be shown.

Defining, implementing, providing and administering services to the customers are the key tasks of any network operator and is the aim of service management. So the tutorial will focus on service management aspects, showing the basic elements of such a system. By applying the model of event-controlled process chains, a practical approach is given to define business processes and tie them together to service-management systems.

Accepting this framework, service-level agreements and quality of service are no longer isolated problem areas, but integrate themselves seamlessly into their environment. This integration and its implications to the lower-layer technical equipment will be explained.

The tutorial will finish by highlighting some selected problems (e.g. performance, accounting, billing), clarifying the problem areas and providing some possible solutions in the domain of network and service management systems.

The tutorial is aimed at a target audience of experts coming from the development of network equipment and network element management systems, even if they are not fully familiar with the current state of network and service management. Some basic knowledge is assumed of the principles of network management. After having listened to this tutorial, the audience should be able to understand current

discussions on network and service management, and the underlying architecture models. The audience should also get a general understanding how network operators are implementing network and service management systems and what the operators expect in general from their suppliers.

### **Presenter Biography**

After studying at University of Hannover and receiving the Dipl.-Ing. in communication technology in 1981, Mr. Klaus-Peter Zeffler held an position as an assistant professor and afterwards as an associate professor at the University of Hannover. His area of interest were switching system controllers, digital PABX development and service interaction, ISDN system and protocol development and ATM switching matrices. In 1992, he entered the former Forschungsinstitut der Deutschen Telekom (Research Institute of Deutsche Telekom) and became head of a research group for IN and TMN research in 1995. Whilst there he was involved in the development of ATM management standards and international research projects in ATM Xcoop interfaces and in the management of all-optical networks. He is now head of a development department called "Architectures, Tools and Methods for Network and Service Management" at T-Systems, one of the strategic divisions of Deutsche Telekom AG. His department is heavily involved in supporting national and international projects for the development and integration of network and service management solutions for Deutsche Telekom and its subsidiaries. He is the co-author of several publications and holds several patents in the area of network and service management.

**17:30 – 19:00**

**Get together**

at Hotel Hilton Park, Foyer

# Technical Sessions

Monday, June 24

**09:00 – 10:30**

Ballroom A, B+C

## **Opening of the Conference**

W. Gross, General Chairman, T-Systems Nova, Germany

## **Opening Speech**

G. Tenzer, Member of the Board, Deutsche Telekom AG,  
President of VDE, Germany

## **Welcome Speech**

E. Huber, State Minister, Head of Bavarian State  
Chancellery, Germany

**10:30 – 11:00**

**Coffee break**

**11:00 – 12:30**

**Keynote Session 1**

Ballroom A, B+C

## **Innovative Network Services and Mobile Internet**

*Chair: A. Inoue, NTT Service Integration Laboratories, Tokyo, Japan*

### **Mobile Internet Service**

*K. Imai, NTT-Docomo, Japan*

### **Innovated Network Services**

*B. Schmidt-Smylla, Lucent Technologies, Germany*

### **Mobile Internet**

*I. Gedeon, Nortel Networks, Ottawa, Canada*

**12:30 – 14:00**

**Lunch**

**14:00 – 15:30**

**Technical Session 1**

Ballroom A

## **Network Planning: Dimensioning Methods**

*Chair: M. Donohoe, Eircom, Dublin, Ireland*

## **Dimensioning GPRS Backbone Links with Analytical Methods**

*F. Hartleb, T-Systems Nova; W. Urmoneit, T-Mobil, Darmstadt, Germany*

## **Joint Routing and Bandwidth Allocation for Protected Elastic Traffic**

*T. Cinkler, P. Laborczi, Budapest University, Hungary*

## **The Design of Optimal Multi-Service MPLS Networks**

*A. Arvidsson, Ericsson Network, Ronneby, S; A.-E. Krzesinski, University of Stellenbosch, South Africa*

## **Designing an Efficient and Modular Tool for Multi-Purpose Transport Network Planning: TRITONIS**

*M. Bettin, M. De Sio, M. Baj, Telecom Italia, Turin, Italy*

**14:00 – 15:30**

**Technical Session 2**

Ballroom B

### **UMTS: Mobile Network Design**

*Chair: N. Matthes, T-Mobil, Bonn, Germany*

### **A Modular Approach for the Design and Planning of UMTS Core Networks**

*S. Stevenson, H.-G. Widder, Lucent Technologies, Nürnberg, Germany*

### **Planning of UMTS Networks Containing Stratosphere Platforms**

*Z. Pándi, T. Van Do, C. Király, Budapest University, Hungary*

### **Multi User Services in IMT-2000**

*T. Lohmar, F. Hundscheidt, R. Keller, R. Tönjes, Ericsson Eurolab Deutschland GmbH, Herzogenrath, Germany*

### **UMTS Packet Service Infrastructure: Distributed Is Cheaper**

*S. G. Strickland, G. W. Atkinson, M. C. Chuah, Lucent Technologies, Holmdel, USA*

**14:00 – 15:30**

**Technical Session 3**

Ballroom C

### **Network Operation: Cost Studies and Other Regulatory Aspects**

*Chair: R.C. Thanawala, Lucent Technologies, Holmdel, USA*

### **A Cost Allocation Algorithm for Transmission Networks**

*J. von Puttkamer, Deutsche Telekom AG, Darmstadt, Germany*

## **Cost Allocation for IP-based Services with ISK-IP (Integrated Service Calculation – Internet Protocol)**

*V. Ernst, M. Tewes, T-Systems Nova; P. Gotthold, Deutsche Telekom AG, Bonn, Germany*

## **Relationship between Interconnection Regulation and Investment Behaviour of the US Local Operating Companies**

*P. Gomez, Coventry University, Coventry, UK; R. Casanova, Universidad Simon Bolivar, Caracas, Venezuela*

## **Designing Cost-Effective UTRAN Transport**

*G.W. Atkinson, B. Samadi, N. Blackwood, S. Jothipragsam, B. Ramana, Lucent Technologies, Holmdel, USA*

**15:30 – 16:00**

**Coffee break**

**16:00 – 17:30**

**Technical Session 4**

Ballroom A

### **Network Planning: Modeling and Simulation**

*Chair: M. Donohoe, Eircom, Dublin, Ireland*

### **Stochastic Modeling of Urban Access Networks**

*C. Gloaguen, P. Coupe, France Telecom, Issy-Moulineaux, F;  
R. Maier, V. Schmidt, University of Ulm, Germany*

### **Multicast as a Traffic Variance Smoother for IP Streaming Service**

*S. Ohta, S. Tani, T. Miyazaki, NTT Network Innovation Laboratories, Kanagawa, Japan*

### **Centroid-Based Movement Algorithm for Mobile Base Station in Topology-Less Wireless Cellular Networks**

*M. Unhawiwat, K. Wipusitwarakun, Thammasat University, Thailand*

**16:00 – 17:30**

**Technical Session 5**

Ballroom B

### **UMTS: Mobile Network Performance**

*Chair: D. Lohmüller, Ericsson, Düsseldorf, Germany*

### **Evolving 3G Networks with MPLS**

*St. Koerner, Nortel Networks, France*

## **New Approach to End-to-End UMTS Network Reliability Testing**

*C. Kin Chan, P. Haerter, E. Lambert, R. Martín Fernández, S. Schneider, Lucent Technologies, New York, USA*

## **End-to-end UMTS Network Performance Modeling**

*D. Houck, B. H. Kim, J.-H. Kim, Lucent Technologies, Holmdel, USA*

**16:00 – 17:30**

**Technical Session 6**

Ballroom C

### **Future Network: Traffic Estimation**

*Chair: G. Potel, France Telecom, Paris, France*

### **Future Telecommunication Traffic – A Methodology for Estimation**

*L. Krank, H. Orlamünder, Alcatel, Stuttgart, Germany*

### **Traffic Forecast Models for the Transport Network**

*K. Stordahl, K. O. Kalhagen, B. T. Olsen, J. Lydersen, B. Olufsen, N. K. Elnegaard, Telenor Network, Oslo, Norway*

### **Traffic Matrix Inference in IP Networks**

*N. Benameur, J. W. Roberts, France Telecom, Issy Les Moulineaux, France*

**18:30 – 22:00**

**Welcome Reception**

at the "Deutsches Museum"

## **Tuesday, June 25**

**09:00 – 10:30**

**Keynote Session 2**

Ballroom A, B+C

### **Convergence: Opportunities and Risks**

*Chair: G. Sallai, Budapest University, Hungary,*

### **IP Convergence**

*A.-H. Schaaf, Siemens AG, München, Germany*

### **New Regulatory Regime in EU**

*P. Scott, European Union-EC (DG 13), Brussels, Belgium*

## **New Revenue for Network Operator**

*T. Wolter, DTAGT-Systems Nova, Essen, Germany*

**10:30 – 11:00**

**Coffee break**

**11:00 – 12:30**

**Plenary Session 1**

Ballroom A, B+C

### **Business Strategies**

*Chair: O. Gonzalez-Soto, Alcatel, Paris, France*

### **Modeling the Value Proposition for Core Switching**

*E. M. Aguilar, A. Ionescu-Graff, A. Saleh, A. Zhu, Lucent Technologies; N. Farber, AT&T, Freehold, Holmdel, USA*

### **Impact of Mobile Business Model on Firm Competitiveness'**

*A. Sahay, London Business School; J. Ramesan, M. Bass, Lucent Technologies, London, UK*

### **Service Costs in a Convergent Network**

*R. Lange, DETECON Consulting GmbH, Dresden; N. Matthes, T-Mobile, Bonn, Germany*

**12:30 – 14:00**

**Lunch**

**14:00 – 15:30**

**Technical Session 7**

Ballroom A

### **Network Planning: General Issues in Network Planning**

*Chair: E. Wollner, T-Nova Systems, Darmstadt, Germany*

### **Enhanced Methods for Planning Multi-Service Networks**

*M. Hammer, G. Erpenbeck, K. Wirl, Lucent Technologies, Nürnberg, Germany*

### **A Framework for Multi-Service IP Network Planning**

*A. Riedl, TU München; T. Bauschert, J. Frings, Siemens AG, München, Germany*

### **TELKOM Indonesia PMVIS: Winning Through Partnership the New Initiatives**

*A. Sutanto, PT Telekomunikasi RI, Bandung, Indonesia*

### **INDT Studio: User Friendly Network Planning Tools**

*C. A. Funka-Lea, S. Z. Shaikh, M. Sharma, Lucent Technologies, Holmdel, USA*

**14:00 – 15:30**

**Technical Session 8**

Ballroom B

**Network Operation: QoS managed IP-Networks**

*Chair: P. Combescure, France Telecom, Paris, France*

**Dimensioning QoS-enabled IP Networks for High-Quality Telephony and Videphony**

*J. Janssen, D. De Vleeschauwer, M. J. C. Büchli, Alcatel, Antwerp, Belgium; R. E. Kooij, KPN Research, Leidschendam, The Netherlands*

**An Analysis of IP Resource Reservation Protocols**

*K. Németh, P. Füzési, Budapest University, Budapest, Hungary*

**An Equipment Provider's Approach to assuring Service Quality in Network Applications**

*S.H. Richman, R. Vasireddy, Lucent Technologies, New York, USA; K. Feyzi, Lucent Technologies, Nürnberg, Germany*

**An Optimal Recovery LSP Assignment Scheme for MPLS Fast Reroute**

*H. Saito, M. Yoshida, NEC, Chiba, Japan*

**14:00 – 15:30**

**Technical Session 9**

Ballroom C

**Future Networks: Business Models and Pricing**

*Chair: A. Inoue, NTT Service Integration Laboratories, Tokyo, Japan*

**A Novel Pricing Method Satisfying User Fairness for QoS Guaranteed Services in IP Networks**

*N. Kamiyama, NTT Service Integration Laboratories, Tokyo, Japan*

**Cost-based Pricing for Multicast Streaming Services**

*E. Takhashi, Y. Tanaka, T. Ohara, Waseda University; T. Miyoshi, Shibaura Institute of Technology, Tokyo, Japan*

**How New Technologies and Architectures will Change the Business Model of Carriers and Service Providers – Impact of Control Architectures in The Next Generation Networks**

*M. Riebl, Siemens AG, München, Germany*

## How Risky is this Business of Networks?

*D. P. Mongeau, Lucent Technologies, Holmdel, USA*

**15:30 – 16:00**

**Coffee break**

**16:00 – 17:30**

**Technical Session 10**

Ballroom A

### **Network Planning: MPLS Routing Optimization**

*Chair: A. Valdar, University College London, UK*

#### **Guaranteeing Service Continuity in Traffic Engineered Networks**

*S. van den Bosch, G. van Hoey, N. Degrande, P. de la Vallée-Poussin, H. de Neve, Alcatel, Antwerp, Belgium*

#### **Heuristic Solutions to the LSP-Design for MPLS Traffic Engineering**

*S. Schnitter, G. Haßlinger, T-Systems NovaGmbH, Darmstadt, Germany*

#### **Global Shortest Path Solutions for the Traffic Engineering Problem**

*M. Franzke, T-Systems Nova, Darmstadt;  
A. Pönitz, HTW Mittweida, Germany*

#### **Combining Node and Link Dimensioning for MPLS Networks**

*L. Cardoso, Portugal Telecom Inovacao; J. Patrao, A. de Sousa, R. Valadas, University of Aveiro, Aveiro, Portugal*

**16:00 – 17:30**

**Technical Session 11**

Ballroom B

### **Network Operation: Cost Comparison of Network Architectures**

*Chair: O. Gonzalez-Soto, Alcatel, Paris, France*

#### **Economics of Ethernet versus ATM-based Access Networks for Broadband IP Services**

*T. Monath, T-Systems Nova Innovationsgesellschaft mbH, Berlin, D; N. K. Elnegaard, K. Stordahl, Telenor AS, Norway;  
P. Cadro, P. Devoldere, France Telecom S.A., France*

#### **How to Justify Next Generation Network Architecture for an Emerging Operator – Cost Evaluator –**

*H. E. Weik, Alcatel, Stuttgart, Germany*

## **Cost Modelling of Network Convergence Scenarios with Rembrandt**

*B. Jakobs, M. Rogenski, M. Holdenried, T-Systems Nova, Darmstadt, Germany*

## **Comparing TDM Telephony Networks with Next Generation IP Networks: A Model Study**

*R. Stademann, W. Wimmreuter, Siemens AG, München, Germany*

**16:00 – 17:30**

**Technical Session 12**

Ballroom C

### **Future Networks: Interworking Issues**

*Chair: A. Neuherz-Welser, CISCO Systems GmbH, Vienna, Austria*

### **A VoIP Platform Based on MGCP/H.323 Interworking, QoS Management and Lightweight**

*P. Galiotos, T. Dagiuklas, Intracom SA, Athens, Greece*

### **NGN not only Require Number Portability but also Offer New Addressing Opportunities**

*W. Lautenschlager, Alcatel, Stuttgart, Germany*

### **The Role of L2 VPN's in the Evolution and Convergence of Broadcast/Data/Switching Networks**

*L. Augustus, Ian Jones, Nortel Networks UK, Maidenhead, UK*

### **The Voice over IP Solution for all Different Kind of Access Techniques Using SURPASS Soft Circuit Model**

*I. Romanski, Siemens AG, München, Germany*

**Wednesday, June 26**

**09:00 – 10:30**

**Keynote Session 3**

Ballroom A, B+C

### **Network Reliability and Security**

*Chair: R. C. Thanawala, Lucent Technologies, Holmdel, USA*

### **Global Networks Activities of DTAG**

*W. Püschner, Deutsche Telekom AG, Bonn, Germany*

### **Network Reliability**

*P. J. Aduskewicz, AT&T, USA*

## **Network Reliability**

K. Rauscher, Lucent Technologies, Nürnberg, Germany

**10:30 – 11:00**

**Coffee break**

**11:00 – 12:30**

**Plenary Session 2**

Ballroom A, B+C

### **The Challenge of the Last Mile**

*Chair: J. Gross, Arcor, Eschborn, Germany*

### **Wireless Access Networks for Broadband Service Provisioning**

*D. von Hugo, T-Systems Nova, Darmstadt; A. Kapovits, EURESCOM GmbH, Heidelberg, Germany*

### **Competition Distortion in the Local Access Market**

*Th. Plückebaum, ISIS Multimedia Net GmbH, Düsseldorf, Germany*

### **Complementing GPRS and UMTS with Wireless LAN**

*R. Keller, T. Boström, T. Goldbeck-Löwe, Ericsson Eurolab, Herzogenrath, Germany*

**12:30 – 14:00**

**Lunch**

**14:00 – 15:30 Technical Session 13**

Ballroom A

### **Network Planning: Routing and Protection**

*Chair: J. Eberspächer, Technical University Munich, Germany*

### **The Limited Version of the Mille Feuilles: a Routing Algorithm for Packet Networks and Circuit Switched Networks with a Constraint Number of Paths**

*M. Rombaut, G. Hébuterne, M. Priem, Steria, Velizy, France*

### **The Benefits of Reconfiguration in Intelligent Optical Networks**

*N. Geary, N. Parnis, E. Drakopoulos, Lucent Technologies; A. Antonopoulos, RHK; J. O'Reilly, University College London, UK*

### **Survivable Capacited Networks – Comparison of Shared Protection Mechanisms**

*H. Kerivin, B. Liau, T.-T.-L. Pham, France Telecom, Issy-les-Moulineaux, France*

## **Capacity-efficient Planning of Resilient Networks with p-Cycles**

*C. G. Gruber, D. A. Schupke, Technical University Munich, Germany*

**14:00 – 15:30**

**Technical Session 14**

Ballroom B

### **Network Operation: QoS System Capabilities**

*Chair: J. Gross, Arcor, Eschborn, Germany*

### **Traffic Engineering Capabilities of a Multiserve Network Migrating from ATM to MPLS**

*G. Dox, Nortel Networks, France*

### **A Design of the Security Management Platform for an Internet Service Provider**

*C.-W. Kim, S. Park, H. Moon, Korea Telecom, Taejeon, Korea*

### **NAIS – Network Architecture for Inter-Domain Services**

*N. Borg, R. Holmberg, Telia Research AB, Farsta, Sweden;  
P. Fűzesi, K. Németh, Budapest University, Hungary*

### **Model and Expert System Based Event Correlation in Multi Vendor Network Environments**

*G. Carls, B. Frohnhoff, Arcor, Eschborn, Germany*

**14:00 – 15:30**

**Technical Session 15**

Ballroom C

### **Future Networks: Network Architectures from a Service Perspective**

*Chair: P. Conrad, Alcatel, Stuttgart, Germany*

### **Digital Video Over All**

*M. Jenisch, Alcatel, Stuttgart, Germany*

### **Building your DSL Networks to a Full Service Network**

*P. Finke, Lucent Technologies, Bonn, Germany;  
G.-J. Eenhoorn, A. Bodzinga, Lucent Technologies, Hilversum, NL;  
H. Borutta, Lucent Technologies, Nürnberg, Germany*

### **The Evolution of the Communications Network Infrastructure**

*T. Yamada, G. Lambertsen, Ritsumeikan University, Kasatsu City, Japan*

### **Overview of a Next Generation Cable/MSO Network Architecture**

*T. J. Ott, Nortel Networks, Friedrichshafen, Germany*

**15:30 – 16:00**

**Coffee break**

**16:00 – 17:30**

**Technical Session 16**

Ballroom A

**Network Planning: Resilience and Restorations**

*Chair: G. Sallai, Budapest University, Hungary*

**Protection and Restoration based Resilience in Automatic Switched Optical Networks**

*T. Jakab, Zs. Lakatos, Budapest University, Hungary*

**Ultra-fast Restoration in Meshed Networks**

*B.X. Weis, Alcatel, Stuttgart, Germany*

**Network Planning for Fast Restoration in General Mesh Optical Networks**

*R. Nagarajan, A. Alfakih, G.W. Atkinson, C. Janczewski, K. Murti, Lucent Technologies, Holmdel, USA*

**Impact of Shared Protection Strategies on Network Design**

*T. Cinkler, M. Pióro, Budapest University, Hungary*

**16:00 – 17:30**

**Technical Session 17**

Ballroom B

**Network Operation: Performance Issues in Data Networks**

*Chair: A. Riedl, Technical University Munich, Germany*

**A Distributed Congestion Control Scheme for Carrier-Scale VoIP Services**

*S. Nogami, T. Abe, H. Yamamoto, NTT Service Integration Laboratories, Tokyo, Japan*

**Stability Margins of TCP with a Proportional AQM Controller**

*E. Plasser, Th. Ziegler, Telecommunications Research Center, Vienna, Austria*

**Performance Tradeoffs for Header Compression in MPLS Networks**

*M. Menth, O. Rose, University Würzburg, Germany*

**16:00 – 17:30**

**Technical Session 18**

Ballroom C

**Future Networks: Optical Components and Architectures**

*Chair: H.T. Mouftah, Queens University, Canada*

**Evolutionary Trends in Transmission Network Architectures**

*M. Herzberg, Lightscape Networks Ltd., Petach Tikva, Israel*

**OADM's in Optical Networks: Architecture and Algorithms**

*B. Doshi, D. Einstein, R. Nagarajan, G. N. Srinivasa Prasanna, N. Raman, Lucent Technologies, Holmdel, USA*

**Network Strategies for Next-Generation Value-Added Transport Service**

*S. Neidlinger, Siemens AG, Munich, Germany*

**All-Optical Network Simulations**

*C. Fenger, Technical University of Denmark, Lyngby, Denmark*

**18:30 h – 23:00 h**

**Conference Dinner**

A Pure Bavarian Taste at the "Hofbräukeller"

**Thursday, June 27**

**09:00 – 10:30**

**Keynote Session 4**

Ballroom A, B+C

**Next Generation Networks – What and Why?**

*Chair: B. Jarry-Lacombe, France Telecom, Paris, France*

**The Future of Networks – What Comes, What Stays?**

*H. W. Kreuzer, Alcatel, Stuttgart, Germany*

**The Technology Drivers of the High Performance Networks**

*P. Hargrave, Nortel Networks, Harlow, UK*

**Which NGN for an Incumbent Operator?**

*P. Coatanea, France Telecom, Paris, France*

**10:30 – 11:00**

**Coffee break**

**11:00 – 12:30**

**Plenary Session 3**

Ballroom A, B+C

**Optical Network Evolution**

*Chair: H. T. Mouftah, Queens University, Canada*

**Ever Higher Bit Rate per Wavelength, Ultra Long Haul DWDM Systems, Optical Transparency, and Sub Rate Grooming: A Complex Multi-Dimensional Puzzle**

*B. Doshi, G. N. Srinivasa Prasanna, R. Nagarajan, N. Raman, Lucent Technologies, Holmdel, USA*

**Network Operator Perspectives on Optical Networks – Evolution towards ASON**

*B. Caignou, France Telecom, Issy les Moulineaux, France; R. Clemente, Telecom Italia Lab, Torino, Italy; J. Robaday, Swisscom, Berne, Switzerland; L. Jerev, Matav, Budapest, Hungary; Z. Ioannidis, OTE, Athens, Greece; J. Santos, Portugal Telecom Inovação, Aveiro, Portugal*

**A Comprehensive End-to-End Reliability Design of Optical Networks**

*C.-H. Kelvin Chu, M. Mezhoudi, Lucent Technologies, Holmdel, USA; Z. Picel, Lucent Technologies, Paris, France; F. Tillerot, V. Chandrakumar, FTR&D, Lannion, France*

**12:30 – 14:00**

**Lunch**

**14:00 – 15:30**

**Keynote Session 5**

Ballroom A, B+C

*Chair: A. Valdar, University College London, UK*

**The Role of Optical Networks in NGN**

*C. Coltro, Alcatel, Vimercate, Italy*

**CTO's View**

*P. Maxwell, Eircom, Dublin, Ireland*

**Local Loop**

*H. Kremling, Arcor AG & Co., Eschborn, Germany*

**Communication Infrastructure is an Essential Base for Economic Growth**

*T. Marklund, LM Ericsson International AB, Bonn, Germany*

**Imagine New Technologies for NGN**

*P. Hargrave, Nortel Networks, Harlow, UK*

**Round Table**

*Accelerating the Move to Next Generation Networks:  
Suppliers and Adopters Perspective*

**15:30 – 16:00**

**Coffee break**

**16:00 – 17:30**

**Awards Ceremony and Closing Session**

Ballroom A, B+C

# GENERAL INFORMATION

## NETWORKS 2002 SECRETARIAT

*Until June 21, 2002*

### **VDE**

**Conference Department  
Stresemannallee 15  
60596 Frankfurt  
Germany**

**Phone:** +49-(0)69-63 08-202  
**Fax:** +49-(0)69-96 31-5213  
**E-mail:** vde-conferences@vde.com  
**URL:** www.vde.com

*From June 23, 2002*

### **VDE Conference Secretariat**

**Phone/Fax :** +49-(0)89-3845-2912  
**E-mail :** vde\_tagungen@compuserve.com

## NETWORKS 2002 WEB SITE

NETWORKS 2002 has prepared a homepage presenting the latest information related to the conference:  
[www.networks2002.de](http://www.networks2002.de)

## NETWORKS 2002 VENUE

Hilton München Park  
Am Tucherpark 7  
80538 München  
Germany

**Phone:** +49-(0)89-3845-0  
**Fax:** +49-(0)89-3845-2588

The Hilton Munich Park Hotel is located in the north-eastern part of Munich and on the eastern side of the "Englischer Garten" (English Garden) with "Schwabing", Munich's restaurant and nightlife district, and the famous shopping alley "Leopoldstrasse" a short walking distance through the English Garden. The nearest Underground Station is "Giselastrasse", which can be easily accessed by bus No 54, which

stops right in front of the hotel. Although a downtown hotel, the Hilton München Park offers a peaceful and quiet atmosphere to hold meetings and conferences.

## MUNICH

Munich (München) is the Bavarian mother lode. It is the capital of the state of Bavaria, home to its finest museums, dotted with castles and one of Germany's most prosperous cities. Only since reunification has it become the nation's second most popular destination, after Berlin.

Munich has been the capital of Bavaria since 1503, but it really achieved prominence under the guiding hand of "Ludwig I" in the 19th century. The city has seen many turbulent times, but this century has been particularly rough. WWI practically starved the city to death, and WWII (which in many ways began here with the infamous Munich Agreement) brought bombing and more than 200,000 deaths.

Whether you see the city during the tourist-packed summer, the madness of "Oktoberfest" or the cold stillness of a February afternoon, Munich offers the chance to see Bavarians and the values and attitudes that so dominate the exported image of Germany.

For many visitors to Germany, Bavaria (Bayern) is a microcosm of the whole country. Here you will find, in abundance, the "old-world" German stereotypes of Lederhosen, beer halls, oompah bands and romantic castles. But it also has a modern dimension: home to powerful companies such as BMW and Siemens, Bavaria is also Germany's most fertile breeding ground for new technologies. These contrasts heighten the Bavarian's sense of otherness – many feel like citizens of a separate country, only tenuously linked to the rest of Germany.

Today, Munich is a thriving capital city, thanks to unshakeable industries such as Siemens (electronics and computers as well as industrial equipment), BMW, Bayer pharmaceuticals and MAN (automotive and truck production). The area around Munich is a cradle of new technologies, too, with generous state backing. With the 1992 opening of Franz-Josef Strauss Airport, Munich became the country's number two air hub after Frankfurt.

Weather is generally fine at the time of the conference. In June the average temperature is around 20 °C (68°F).

More detailed information about Munich, its surroundings and cultural events may be taken from [www.muenchen.de](http://www.muenchen.de).

## TUTORIALS

Networks 2002 offers a set of six tutorials giving a comprehensive introduction of knowledge-update in specific technological or operational network aspects.

The speakers are well-known telecommunication experts from industry leading companies or technical universities.

The tutorials are divided into two parts. Part 1 deals with Network Evolution with special focus on Next Generation Networks (NGN), Mobile Networks and Optical Backbone Networks.

Part 2 is dealing with Operator oriented topics like Network Planning, Network Optimisation and Network & Service Management.

## TOOL Demonstration

A tool demonstration is being held in the foyer in front of the Ballrooms A, B and C. At the time of printing this programme the following companies have already announced that they will demonstrate software tools related to various topics of the conference:

ERICSSON  
DETECON  
DEUTSCHE TELEKOM AG  
LUCENT TECHNOLOGIES  
SIEMENS AG

The demonstration area is open to all interested parties free of charge.

Alongside the conference sessions the demonstrations will be open Monday through Thursday to allow for extensive visit of the presenting companies. An actual and updated list of the exhibitors presenting at NETWORKS 2002 may be seen at <http://www.networks2002.de>

## EXHIBITION HOURS

Mon, June 24, 2002	10:00 h – 17:30 h
Tue, June 25, 2002	09:00 h – 17:30 h
Wed, June 26, 2002	09:00 h – 17:30 h
Thu, June 27, 2002	09:00 h – 16:00 h

## Internet Café

An Internet Café will be located next to the tool demonstration area in the foyer of the Ballroom, as well. It offers the possibility of direct internet access for Networks 2002 participants.

## REGISTRATION

To register for Networks 2002 please fill in the registration form attached to this programme and return it to the Conference Secretariat. To enjoy the "early-bird-discount", the Networks 2002 Secretariat must receive the form before May 24, 2002. Full payment or credit card information must accompany all registrations in order for them to be accepted.

The registration desk on site will be open at the following duty hours:

Sun, June 23, 2002	12:00 h – 17:30 h
Mon, June 24, 2002	08.00 h – 17:30 h
Tue, June 25, 2002	08.00 h – 17:30 h
Wed, June 26, 2002	08.00 h – 17:30 h
Thu, June 27, 2002	08.00 h – 17:30 h

Completed registration forms may be sent by fax, surface mail or e-mail. A separate registration is necessary for attendance at the tutorials as registration for the conference does not include access to the tutorials.

For questions about the conference please contact the NETWORKS 2002 Conference Secretariat at VDE.

## REGISTRATION FEES

	<i>Before May 24, 2002</i>	<i>From May 24, 2002</i>
Regular Registration	EURO 850.–	EURO 950.–
Student*	EURO 450.–	EURO 500.–
Accompanying Person	EURO 100.–	EURO 120.–
Additional Proceedings	EURO 50.–	EURO 50.–
Conference Dinner (extra)	EURO 70.–	EURO 80.–
Tutorial	EURO 200.–	EURO 250.–

\* A student's certification form has to be endorsed by a supervisor or Head of department and a photocopy of the student card must be included.

- **Presenting authors, co-authors, committee members and session chairs are not exempt from paying registration fees.**

### **Regular Symposium Registration and Student Registration**

Includes admission to all plenary and technical sessions and to the Daily Luncheons, Reception at "Deutsches Museum" and the Conference Dinner, one copy of the proceedings and a CD-ROM.

### **Additional copies of the Proceedings**

Additional copies may be purchased on-site or by prepayment on the registration form.

### **Accompanying Persons**

Accompanying persons may register in conjunction with a full delegate. Includes admission to the Reception at Deutsches Museum and the Conference Dinner.

### **Tutorials**

Please tick appropriate boxes on the registration form.

## **PAYMENT**

Payment for registration, including bank charges and processing fees, must be made in Euro.

The conference fee has to be fully paid in advance.

**Confirmation of registration will be sent after full payment has been received at the Conference Secretariat.**

The following **methods of payment** are accepted:

- Cheque in EURO (€) payable to VDE and **sent together** with the registration form by mail.
- By **credit card authorisation** as per registration form. The 16 digit card number, expiry date and holder's name must be indicated on the registration form.
- **Cash payment on-site** in EURO (€)

## **CANCELLATION**

In case of cancellation, provided that written notice is received at the Conference Secretariat before May 24, 2002, the registration fee will be fully refunded less a handling fee of Euro 60.–. After May 24, 2002 no refund will be made. Proceedings and CD-ROM will then be sent to the registrant after the conference.

## PROCEEDINGS

All papers accepted for presentation at the conference will be published with the proceedings and a CD-ROM. The proceedings will be handed on-site to all delegates attending the event.

Additional proceedings and CD-ROM are on sale during the conference (upon availability) at Euro 50.–.

## OFFICIAL LANGUAGE

All sessions will be held in English, only.

## MESSAGES

Messages for delegates may be sent to the registration counter on-site.

Phone/Fax:+49-(089)-3845-2912

or by e-mail: [VDE\\_Tagungen@compuserve.com](mailto:VDE_Tagungen@compuserve.com)

## SOCIAL PROGRAMME

- A Get together will be held at the conference centre on Sunday, June 23, 2002.
- The Conference Welcome Reception will be organized on Monday, June 24, 2002 at the "Deutsches Museum" which is said to be the world's largest science and technology museum. Eight floors with different sections present a wide range of technical exhibits such as automobiles, railways, aeronautics, microelectronics and telecommunication.
- Networks 2002 Conference Dinner at the "Hofbräu-Keller" will take place on Wednesday, June 26, 2002. While dining, you will enjoy real Bavarian music and heel-slapping dances on stage.

The attendance to these events is included in the full conference fee. Additional tickets may be ordered with the registration form within the given deadline.

The recommended attire for all Networks 2002 social events is business casual.

## INSURANCE

The organisers may not be held responsible for any injury to participants or damage, theft and loss of personal belongings. Participants should therefore make their own insurance arrangements.

## PASSPORT AND VISA REQUIREMENTS

Foreign visitors entering Germany have to present a valid Identity Card or Passport. Delegates who need a visa should contact the German consular offices or embassies in their home countries. Please note that the conference secretariat or the supporting bodies are not able to extend any "Invitation" for application of visa.

## TRANSPORT

### **Munich Airport:**

approximately 35 kms away from conference hotel. Below the central building of the airport the "S-Bahn S 8" (Urban Railway) leaves for the Central Station "Hauptbahnhof" in Munich.

### **Munich Railway Station "Hauptbahnhof":**

coming from the Central Station "Hauptbahnhof" please take Tramway No.17 direction "Effnerplatz"; exit "Tivolistrasse". From there follow hotel-sign (approx.. 5 min by foot)

### **Access by Car:**

the Hotel Park Hilton is located close to the end of Highway A 9, exit "München-Schwabing". Follow the signs "Mittlerer Ring" direction "Salzburg" and leave at exit "Tucherpark".

For more information on the subway system of Munich see the attached plan.

## SHOPPING

Most shops are located in the area around the Marienplatz (center of Munich). You will find exquisite shops on the "Kaufingerstrasse" and "Neuhauserstrasse". Usually, shops are open from Monday to Friday 9:00 h – 20:00 h, on Saturday 9:00 to 16:00 h. Shops are generally closed on Sunday.

## CURRENCY

The official currency in Germany is the Euro (€). Usual credit cards (Eurocard/Mastercard, American Express, Visa) are accepted in hotels, department stores and restaurants. Currently (March 2002) the exchange rate is 1 Euro ~ 0,86 US\$.

## ELECTRICITY/ PHONE PATCH

The mains power supply is 230 V AC, 50 Hz. Authors and participants using their laptop are kindly asked to have connectors available for the mains and Texas or TAE 6 (German phone standard) to connect the phone grid.

Connectors are available at most international airports or department stores. Most hotels have TAE 6 plug ins in the rooms or business center.

## HOTEL RESERVATION / Official Travel Agency

Hotels in a wide range of rates and different city locations are being offered.

Hotel accommodation may be booked through the official booking agency "FCI".

You may book your hotel either via FCI's web site: <http://www.fci.de> or by filling in the registration form and send it by fax to

**FCI GmbH & Co. KG**  
**Rosenstrasse 17**  
**20095 Hamburg**

**Phone: +49 40 3001 4554**  
**Fax: +49 40 3001 4325**

**e-mail: [muk@fci.de](mailto:muk@fci.de)**  
**<http://www.fci.de>**

When using the VDE-web site please check for "Coming Events" and search for "NETWORKS 2002", click for "Hotel booking".

*(All quoted prices are per room / per night, breakfast and VAT are included.)*

### **Hilton München Park\*\*\*\*+**

Distances to :

Airport: ca. km 30

Central Station: ca. km 4

Public Transport: ca. km 0.2

\* Price per double room EUR 256.16

\* Price per single room EUR 204.01

### **Renaissance Hotel\*\*\*\***

Distances to:

Park Hilton:	approx. km 4
Airport:	approx. km 20
Central Station:	approx. km 4
Public Transport:	approx. km 0.2
* Price per single room	EUR 156.00
* Price per double room	EUR 171.00

### **Park Plaza Hotel\*\*\*\***

Distances to:

Park Hilton:	approx. km 3
Airport:	approx. km 30
Central Station:	approx. km 4
Public Transport:	approx. km 0.4
* Price per single room	EUR 91.00
* Price per double room	EUR 118.00

### **Marriott Hotel\*\*\*\*+**

Distances to:

Park Hilton:	approx. km 1.5
Airport:	approx. km 30
Central Station:	approx. km 4
Public Transport:	approx. km 0.5
* Price per double room	EUR 180.00
* Price per single room	EUR 197.00

### **Best Western Atrium Hotel\*\*\*+**

Distances to:

Park Hilton:	approx. km 8
Airport:	approx. km 40
Central Station:	approx. km 0.3
Öffentl. Verkehrsmittel:	approx. km 0.3
* Price per single room	EUR 95.00
* Price per double room	EUR 125.00

### **Best Western Hotel Cristal\*\*\*+**

Distances to:

Park Hilton:	approx. km 7
Airport:	approx. km 40
Central Station:	approx. km 0.3
Öffentl. Verkehrsmittel:	approx. km 0.3
* Price per single room	EUR 128.00
* Price per double room	EUR 152.00.

### **Deadline for reservations:**

As June is the beginning of the holiday season in Germany, it is highly recommended to place hotel reservations as early as possible. Reservations after April 30, 2002 may be subject to availability.

## BOOKING CONDITIONS

### Changes of reservations and cancellations

Reservations, changes and cancellations must be made in writing and forwarded to FCI by fax: +49-40-3001-4325.

Changes of reservations made after the deadline (April 30, 2002) will cause a EUR 30.– charge per person. This is in addition to any fees the hotel may charge. Please note that the hotels may charge up to 100 % for late cancellations or no-shows and that these charges would be forwarded to you. This offer is subject to availability and the hotel booking conditions at the time of reservation.

### Payment

All payments related to accommodation have to be made directly on departure in the hotel. *In any case a credit card is required for guarantee when booking, otherwise no booking confirmation will be returned.*

### Liability

FCI Geschäftsreise GmbH invariably acts merely as an agent and, as such, is liable only for errors made in the usual context of travel agency activities.

## EXCURSION PROGRAMME

Time schedule of NETWORKS 2002 has been concentrated and, as a result, the common excursions on Wednesday afternoon have been skipped. Therefore, a selection of tours in and around Munich have been listed for those participants or accompanying persons who intend to experience Munich on their own. In the following we like to give you a taste of Munich and suggest tours that invite you to discover the city:

### Local Attractions

English Garden Recreation Area, 0.25 km. W  
Beer Garden Hilton Munich Park, 0.1 km. S  
Beer Garden Seehaus, 1 km. NW  
Beer Garden Chinesischer Turm, 0,5 km. SW  
Monopteros Monument English Garden, 1 km. W  
Haus der Kunst/Art Gallery, 2.5 km. SW  
Bavarian National Museum, 2.5 km. W  
Shopping Area Münchner Freiheit, 1.5 km. W  
Bars, Restaurants in Schwabing, 1.5 km. W  
Friedensengel/Angel of Peace, 2 km. SE  
Olympic Stadion and Sports area, 4 km. SW  
BMW Museum, 4 km. SW

## **Recommended guided tours to discover Munich and the surroundings**

### **1) Royal Castle Tour (Linderhof and Neuschwanstein)**

every day, 08:30 h – 19:00 h

Price: € 53.- (incl. bus transfer, English-speaking guide, lunch, admission fee)

### **2) City tour of Munich with visit to Nymphenburg Palace**

every day 14:30 h , duration 2.5 h

Price: € 19.- (incl. bus transfer, English-speaking guide, admission fee)

### **3) Excursion to Zugspitze**

Sundays, 10:00 h – 18:00 h

Price: € 78.- (incl. bus transfer, English-speaking guide, lunch, cable car, admission fee)

### ***For booking tour 1 to 3 or further excursion programmes please contact***

Panorama Tours

Arnulfstr. 8

D-80335 München

Phone: +49-89-5490-7560

Fax: +49-89-5490-7570

Email: [Panoramatours@autobusoberbayern.de](mailto:Panoramatours@autobusoberbayern.de)

### **4) Historical walking tour to the town centre**

This covers Munich's history from the Middle Ages through the 20th century with strong emphasis at certain stops on the post-WW I era of anarchy, despair and tyranny (rise and fall of the Third Reich, Communist Räterepublik of 1919) 10:15 h and 14:15 h

**Meet:** Just outside the Tourist Information Office at the Central Train Station (Hauptbahnhof)

**Price:** € 11.- (incl. English-speaking guide, 3 hours, non strenuous)

**Organizer:** M-unique Walking Tours: Phone: +49-(0)89-25543987, Fax: +49-(0)89-25543988

### **5) Rikscha Mobil (Bike-Taxi-Guide)**

This is a very relaxed way to enjoy the beauty of Munich. Choose your own individual trip to places of interest. Discover the English Garden, Victuals Market, Hofbräuhaus, Royal Residence.... **Join Rikscha Guides at Marienplatz (Fischbrunnen).**

### **Approx. prices per Rikscha-Taxi (2 Persons)**

30 min.-tour            EUR 20.00

45 min.-tour            EUR 30.00

60 min.-tour            EUR 38.00

**Organizer: Rikscha- Mobil,** Tel: +49-(0)89-1 29 48 08,  
Mobile: +49-(0)1 71-2 87 30 32

**6) City Tour including a visit to the Olympic Parc and Olympic Tower**

**Duration:** 2.5 hours. Daily at 10:00 h and 14:30 h

**Price:** EUR 17.00

**7) City tour including a visit to the Bavarian Filmstudios/Movie Town**

**Duration:** 2.5 hours. Saturday, Sunday, Monday at 10:00 h.

**Price:** EUR 20.00

***For Tours 6 and 7 please contact:***

Münchner Stadt-Rundfahrten OHG:

Tel: +49-(0)89-55 02 89 95, Fax +49-(0)89-54 90 75 70

(Admission included, German and English guide), Departure:  
Bahnhofplatz, in front of the department store "Hertie".

# Organizing and sponsoring societies

## Networks is organized by:

ITG Informationstechnische Gesellschaft im VDE  
(Information Technology Society of VDE)

VDE Verband der Elektrotechnik Elektronik Informationstechnik  
(Association for Electrical, Electronic and Information Technologies)

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