

networks 2004

>> 11th International Telecommunications
Network Strategy
and Planning Symposium

June 13 – 16, 2004

Arcotel Wimberger, Vienna, Austria



Programme





networks 2004

**11th International Telecommunications
Network Strategy and Planning Symposium**

**June 13 –16, 2004
Arcotel Wimberger, Vienna, Austria**

**TECHNICAL PROGRAMME, TUTORIALS
AND TOOLS DEMONSTRATIONS**

Organized by

*OVE Austrian Electrotechnical Association
GIT Information- and Communication-
Technology Society within OVE
VDE Association for Electrical, Electronic
and Information Technologies
ITG Information Technology Society
within VDE*

Sponsored by

*mobilkom austria
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Chairman's Message

networks 2004 offers all network operators, system and software manufacturers, service providers, system integrators and research and development departments an ideal international platform for information, discussion and knowledge-share in the heart of Europe, in Vienna.

High-end presentations will provide you with the latest research findings and up-to-date experiences in the field of network strategy, planning, management and optimization.

Necessary consolidation on the one hand, the converging worlds between private and business life and increasing demand for information anytime, anyhow and anywhere on the other hand makes a clear network strategy more and more important. A highest demand on mobility makes the interoperability of networks and technologies necessary.

The network operators and providers face a constant growth in traffic, but also permanent competition, therefore to create a stable added value they need to optimize their networks constantly while keeping the investment and maintenance effort low by providing the high quality of service.

networks 2004 provides an excellent forum for an exchange of experience and the best possible source of information for all individuals working in this field.

Franz Geiger
General Chairman

Programme Chair's Message

Welcome to the 11th International Telecommunications Network Strategy and Planning Symposium (networks 2004) in beautiful Vienna!

The technical programme is preceded by one day of tutorials selected from submitted tutorial proposals. The main part of networks 2004 features more than seventy technical papers selected from the submissions by a thorough peer review process. Each paper was reviewed by at least two and up to six different reviewers assigned on the basis of topic areas. In addition to several IMSC members, these reviewers included more than 100 members of the Programme Committee.

Let me thank all those who spent their time and energy for these reviews! Thanks are also due to VDE, which provided support and the infrastructure for organizing the review process.

The accepted papers are jointly published by VDE and IEEE. In addition to being included in the printed Proceedings, these papers will also be available electronically from IEEE Xplore, the digital library of the IEEE. This makes them both easily accessible and truly archival.

The authors of the accepted papers being presented at networks 2004 come from many different countries. So, this is indeed an international event.

networks 2004 covers a wide variety of topics, from fixed to mobile networks and from network planning to migration and evolution. The objective of networks 2004 is to help put all the pieces together!

Hermann Kaindl
Programme Co-Chair

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Attachments:

Programme Overview

Conference Registration Form

Location of Arcotel Wimberger

Networks 2004

Organizing Committees

International Scientific Committee IMSC

Franz Geiger (Chairman)	Siemens AG, Austria
Alberto Ciarniello	Telecom Italia Mobile, Italy
Joachim Gross	Arcor, Germany
Wolfgang Gross	T-Systems Nova, Germany
Oscar Gonzalaz-Soto	Spain
Akiya Inoue	NTT, Japan
Bernard Jarry-Lacombe	France Telecom, France
Sang-Baeg Kim	Korea Telecom, Korea
Hussein T. Mouftah	University of Toronto, Canada
Lawrence Paratz	Telstra Corporation, Australia
Pietro Parente	Telecom Italia Mobile, Italy
Rati C. Thanawala	Lucent Technologies, USA
Gyula Sallai	Budapest University, Hungary
Andy Valdar	University College London, UK

National Organizing Committee

Karl Stanka	OVE, Austria
Richard Valenta	OVE, Austria

Programme Co-Chairs

Dietmar Dietrich	Vienna University of Technology, Austria
Hermann Kaindl	Institute of Computer Technology, Austria

Tutorials

Sunday, June 13

09:30 – 11:00 Tutorial 1

Room: Ernani

Evaluation, Optimisation Strategies and Advanced QoS Assessment of UMTS Networks, New Challenges

Z. Altmann, France Telecom, Issy les Moulineaux, France

The success of the UMTS deployment presents a major challenge to mobile operators. The prohibitive cost of network infrastructures enhances the necessity to optimally use the available radio resources and to provide a high quality of service (QoS) to the customers. This tutorial aims at presenting a comprehensive overview on network evaluation and QoS assessment, planning techniques, and optimisation strategies that allow the operator to optimally use the available network resources. The following items will be discussed in detail: - Network evaluation and the prediction models that are best suited for this task. A special focus will be given to quality criteria as perceived by the user such as the probability to access the network, the probability to maintain communication with a given quality etc. Strategies for automatic design and cell planning. Cell planning consists in optimising network performance by adjusting antenna parameters and common channel powers.

Three important optimisation strategies will be presented: quality and capacity, capacity and coverage and steered optimisation strategies. Auto-tuning of Radio Resource Management (RRM) parameters. Auto-tuning aims at dynamically adjusting RRM parameters (such as load target thresholds for admission control or macrodiversity add and drop windows) to improve network performance and to adapt the network to traffic variations.

Presenter Biography



Z. Altmann received the B.Sc. and M.Sc. degrees in electrical engineering from the Technion-Israel Institute of Technology, Haifa, in 1986 and 1989 respectively, and the Ph.D. degree in electronics from the Institut National Polytechnique de Toulouse, France, in 1994. He was a Laureate of the Lavoisier scholarship of the French Foreign Ministry in 1994, and from 1994 to 1996 a Post-Doctoral Research Fellow in the Elec-

tromagnetic Communication Laboratory at the University of Illinois at Urbana Champaign. In 1996 he joined FTR&D, the R&D center of France Telecom where he currently directs a project for developing new engineering methods for 3G mobile networks. Dr. Altman was a member of the winning team of the 2003 Innovation Prize of France Telecom. He is an IEEE senior member and a past associate editor in this society.

09:30 – 11:00 Tutorial 2

Room: Hamlet

Reliable Packet Transport Technologies for MPLS Networks

R. Nagarajan, Lucent Technologies, Holmdel, USA

Diverse applications in emerging data services demand flexibility of tradeoffs between resiliency and cost rather than a “one size fits all” approach. In this tutorial, we discuss Resilient Packet Mesh (RPM), a platform of packet transport technologies that provides a set of resiliency services for IP/MPLS-based networks, including two innovative resiliency services: packet 1+1 and real-time shared mesh. These resiliency services cover a whole spectrum of diverse user/application needs in resiliency and provide key tradeoffs in terms of recovery time, failure coverage, and required protection capacity. The packet 1+1 and shared mesh services, in particular, are architected so as to require support only at the network edge in their basic forms.

As a result, RPM allows for easy interoperability in a multi-vendor environment and enables service-providers to introduce new services without costly upgrades to their core networks. Also discussed are the building blocks of a working RPM advanced software implementation that is built with a common framework that enables the support of different services with minimal modifications and enhancements which makes it attractive from the system vendor standpoint. Finally, RPM implementation is designed for high-performance with scalability and introduces minimal overhead in packet processing, signaling and network bandwidth. We also discuss IETF and ITU standards activities in this area in general and highlight particular areas where RPM is being standardized.

Presenter Biography



Ramesh Nagarajan is a Technical Manager in the Network Technologies and Performance Department of Bell Labs, Lucent Technologies. He received his PhD in Electrical and Computer Engineering from University of Massachusetts, Amherst, in 1993. His interests and research are in the areas of data and optical transport network planning/design, architectures, protocols and resiliency mechanisms. Ramesh Nagarajan has published around 50 papers in leading conferences and journals and has filed for 15 patents. Ramesh Nagarajan is one of the principal architects of the highly successful Bell Labs Integrated Network Design (INDT) tool suite that was nominated for the Bell Labs Presidents award. His work on restoration mechanisms and protocols for data and optical networks is reflected in many Lucent products as well as adopted in ITU standards. Ramesh Nagarajan is a Senior Member of the IEEE. He has served on the technical and executive program committee of many ACM/IEEE conferences. He was international vice-chair for INFOCOM 2000.

He has also delivered tutorials and invited talks at leading conferences. He has also served as secretary of the Computer and Communications joint chapter of IEEE New Jersey Coast Section.

11:00 – 11:30 Coffee break

11:30 – 13:00 Tutorial 1

continued in Room Ernani

11:30 – 13:00 Tutorial 2

continued in Room Hamlet

13:00 – 14:00 Lunch break

Room: Ernani

The Optical Networking Roadmap

T. Cinkler, Budapest University, Hungary

The growth of the traffic in networks induced among others by new applications and the advance of optical technology have made clear that the networking of the forthcoming decades will definitively rely on optics. Not only the transmission links but also the network nodes as well as the metro and access parts are expected to become optical. This tutorial gives first an overview of optical networks in general, then it focuses on the transport (backbone) part starting from SONET and SDH through ATM/MPLS, ngSDH/SONET, OTN/DigitalWrapper, 10GbE, MPLambdaS/ASON and GMPLS/ASTN to OBS/OPS. The trends will be presented as well as the advantages and drawbacks of certain networking solutions, with special emphasis on common aspects and solutions reused by different techniques. Problems introduced by the networking evolution and the solution alternatives to these problems will be presented trying to answer among others the following questions: What is better: static, dynamic or adaptive routing? Should it be centralized, or distributed? Should network domains be used to make the routing scalable? How?

How to make this high capacity network more resistant to failures (Protection, restoration, fast reroute, RPR, p-cycle)? How can the performance be improved through traffic engineering? How can multilayer architectures be handled (overlay, peer and augmented models)? How do the layers impact granularity (e.g., sub-lambda granularity)? How do Traffic, Wavelength (Lambda) and Waveband grooming improve throughput? What about QoS and transparency? What is the role of User (Data), Control and Management Planes and how do they cooperate? What are the most promising services over these networks, e.g., (o)VPN, (o)VON?

Presenter Biography



Tibor Cinkler has received M.Sc.('94) and Ph.D.('99) degrees from the Budapest University of Technology and Economics, Hungary, where he is currently associate professor at the Department of Telecommunications and Media Informatics. His research interests focus on routing, design, configuration, dimensioning and resilience of IP, MPLS, ATM, ngSDH and particularly of WR-DWDM based multilayer net-

works. He has been involved in a few related European and Hungarian projects (ACTS METON and DEMON; COST 266, 291, 293; IP NOBEL; NoE e-Photon/ONe; ETIK; IKTA) and he is member of ONDM, DRCN, BroadNets (OptiComm), EUNICE, Networks, etc. Technical Committees. He is author of over 60 referred scientific publications and of 3 patents.

14:00 – 15:30 Tutorial 4

Room: Hamlet

IP-Oriented QoS in the Next Generation Networks: Application to Wireless Networks

P. Lorenz, Université de Haute Alsace, Colmar, France

Emerging Internet Quality of Service (QoS) mechanisms are expected to enable wide spread use of real time services for example, VoIP and videoconferencing. The "best effort" Internet delivery cannot be used for the new multimedia applications. New technologies and new standards are necessary to offer Quality of Service (QoS) for these multimedia applications. Therefore new communication architectures integrate mechanisms allowing to guarantee QoS services as well as high rate for the communications. The promising service level agreement to a mobile Internet user is hard to come by, since there may not be enough resources available in some parts of the IP/ATM networks as mobile terminal is moving into. The emerging QoS architectures, differentiated services and integrated services do not consider the network nodes are mobile. QoS mechanisms enforce a differentiated sharing of bandwidth among services and users. Thus, there must be mechanisms available to identify traffic flows with different QoS parameters, and to make it possible to charge the users based on requested quality.

Integration of fixed and portable wireless access into IP networks presents a cost effective and efficient way to provide seamless end-to-end connectivity and ubiquitous access in a market where demands on mobile Internet have grown rapidly and predicted to generate billions of dollars in revenue. The tutorial covers an introduction to QoS in heterogeneous networks, Internet delivery over future wireless networks, the ATM, MPLS, DiffServ, IntServ protocols, ... It addresses characteristics of the Internet and its mobility features and how it could guarantee QoS using wireless IP services. It also presents concepts of routing, quality-of-service provisioning and security, baseline architecture of the inter-networking protocols and end to end traffic management issues.

Presenter Biography



Pascal Lorenz [SM '00] received his PhD from the University of Nancy, France. Between 1990 and 1995 he was research engineer at WorldFIP Europe and at Alcatel-Alsthom. He is professor at the University of Haute-Alsace and responsible of the Network and Telecommunication Research Group. His research interests include QoS, wireless networks and high-speed networks. He was the Program and Organizing Chair of the IEEE ICATM'98, ICATM'99, ECUMN'00, ICN'01, ECUMN'02, ICT'03 conferences. Since 2000, he is Technical Editor of the IEEE Communications Magazine Editorial Board. He is the secretary of IEEE ComSoc Communications Systems Integration and Modeling Technical Committee. He is a member of many international committees programs and he has served as a guest editor for a number of special issues, including Telecommunication System, IEEE Communications Magazine and LNCS. He is member of many conferences technical program committees; he has organized and chaired several technical sessions. He has given tutorials in major international conferences.

He is the author of 2 books and 90 international publications in journals and conferences.

15:30 – 16:00 Coffee break

16:00 – 17:30 Tutorial 3

continued in Room Ernani

16:00 – 17:30 Tutorial 4

continued in Room Hamlet

17:30 – 18:30 Get together

in the Foyer of Arcotel Wimberger

Technical Sessions

Monday, June 14

09:00 – 10:30 Opening of the Conference

Hall: Arabella

Welcome Speech

A. Valdar, University College London, UK

Introduction to the Technical Programme

H. Kaindl, Vienna University of Technology, ICT, Austria

Opening Speech

H. Gorbach, Vice Chancellor, Federal Minister for Transport, Innovation and Technology, Austria

Opening Speech

F. Geiger, Member of the Managing Board, Siemens AG, Austria

Keynote Speech

R. Fischer, Director of the Management Board of Telekom Austria AG

10:30 – 11:00 Coffee break

11:00 – 12:30 Plenary Session 1

Hall: Arabella

Chairman: H. Kaindl, Vienna University of Technology, ICT, Austria

Keynote Speech

C. Carrelli, Director EURESCOM, Germany

K. H. Rosenbrock, ETSI, Nice

12:30 – 14:00 Lunch break

14:00 – 15:30 Technical Session 1

Hall: Arabella

Future Application – Access

Chair: J. Gross, Arcor, Germany

A Method of Bandwidth Dimensioning and Management for Aggregated TCP Flows with Heterogeneous Access Links

R. Kawahara, K. Ishibashi, T. Mori, S. Sumita, T. Abe, NTT Corporation, Tokyo; T. Ozawa, Komazawa University, Japan

Enabling Flexible Working Using Hybrid IP VPNs

T. Hubbard, Nortel Networks, Maidenhead, UK

Capex Cost Comparison between Link-by-Link and End-to-End Grooming in a European Backbone Network

S. Verbrugge, D. Colle, M. Pickavet, P. Demeester, Ghent University, Belgium

14:00 – 15:30 Technical Session 2

Hall: Boheme

Network Migration

Chair: K. Ward, University College of London, UK

Intelligent Network Services in the Time of Networks Migration

I. Miladinovic, Telecommunication Research Center; K. Umschaden, University of Technology, Vienna, Austria

Overlay NGN Migration Approach to Deliver Multimedia Services

C. de Courcy Bower, W. Franx, M. Hammer, Lucent Technologies, Nuremberg, Germany

Quantifying the Value Propositions of MPLS Evolution; Why and When to Migrate to a Converged MPLS Core?

A. M. Ionescu-Graff, F. Magee, S. Prakash, B. Tang, A. Zhu, Lucent Technologies, Holmdel, USA

14:00 – 15:30 Technical Session 3

Hall: Ernani

Network Economics I

Chair: G. Lajtha, Hungary

A Cost Analysis of the Transmission Backbone

M. Naldi, P. Pelusi, Università di Roma, Italy

Cost Evaluation of All-Optical Architectures for Backbone Networks

N. Kamiyama, NTT Corporation, Tokyo, Japan

Bandwidth Trading – a Business Case for ASON?

A. Iselt, A. Kirstädter, R. Chahine, Siemens, Munich, Germany

15:30 – 16:00 Coffee break

16:00 – 18:00 Technical Session 4

Hall: Arabella

NGN Performance Issues

Chair: H. Mouftah, University of Toronto, Canada

Considering End-to-End QoS in IP Network Design

E. Wille, M. Garetto, E. Leonardi, M. Ajmone Marsan, M. Mellia, Politecnico di Torino, Italy

Class Assigning Management for Stream Flows Considering Characteristics of Non-stream Flow Classes

K. Yasukawa, K. Yamaoka, Tokyo Institute of Technology; K. Baba, Osaka University, Japan

IP Network Expansion for Growing Traffic Demand with Shortest Path First Routing and Traffic Engineering

G. Haßlinger, St. Schnitter, T-Systems, Darmstadt, Germany

Distributed Proxy Cache Cluster Optimization Simulation System

K. E. A. Negm, Department of Computer Engineering, Etisalat College of Engineering, Sharja, UAE

16:00 – 18:00 Technical Session 5

Hall: Boheme

Wireless I

Chair: A. Ciarniello, TIM, Rome, Italy

Simultaneous Usage of WLAN and UTRAN for Improved Multimedia and Data Applications

J. Stadler, G. Pospischil, mobilkom austria AG & Co. KG, Vienna, Austria

A Novel Location Management Method Based on Ad Hoc Networking

S. M. Saeed Masajedian, Ferdowsi University of Mashhad; H. Khoshbin, Iran Telecommunication Research Center, Tehran, Iran

Roaming Dynamics in GPRS and Beyond: Options and Strategies

O.-P. Pohjola, Nokia Research Center; K. R. Renjish Kumar, H. Hämmäinen, Helsinki University of Technology, Finland

Mobile Multimedia Metropolitan Area Network; An Office LAN Extension to the 4G Mobile Network

T. Yamada, Ritsumeikan University, Japan

16:00 – 18:00 Technical Session 6

Hall: Ernani

Voice over IP

Chair: A. Inoue, NTT, Japan

Experimental Study of QoS Provisioning to Heterogeneous VoIP Sources in DiffServ

R. G. Garroppo, St. Giordano, S. Niccolini, G. Procissi, University of Pisa, Italy

Cost-optimal VPN based VoIP Network Design

D. Orincsay, G. B. Józsa, L. Tamási, Ericsson, Budapest, Hungary

Fractal Analysis and Modeling of VoIP Traffic

D. D. Trang, B. Sonkoly, S. Molnár, Budapest University of Technology and Economics, Hungary

Service Drivers for Selecting VoIP Protocols

B. Chatras, S. Garcin, France Télécom, Issy Moulineaux, France

19:30 Social Event with "Heuriger"

Tuesday, June 15

08:30 – 10:00 Plenary Session 2

Hall: Arabella

Network Integrity – Is it a risk?

Chair: R. Thanawala, Lucent Technologies, USA

„Netheads will argue that network integrity is not a big issue since the applications can make it all happen at the edges; the Bellheads certainly believe that network integrity is important and that without end-to-end operator control, users cannot get reliable, secure service. Interoperability across the Internet and the Public Switched Telecommunications Network poses many significant challenges as diverse philosophies on network design, architecture, control etc. are all brought into sharp focus. And then there is the issue of increasing amount of third party software in mobile phones and network application servers - are there processes for guaranteeing the quality of this software and can issues in this domain seriously impact the integrity of the network? Come listen to industry experts debate this important topic.“

A. Ciarniello, Architecture&Technology Development, TIM, Italy

G. Grammel, Optical Network Division – Network Strategy, Alcatel, Germany

A. Neuherz-Welser, Network Planning Division, Cisco, Austria

Tuesday, June 15

08:30 – 10:00 Plenary Session 2

Hall: Arabella

Chair: R. Thanawala, Lucent Technologies, USA

10:00 – 11:00 Coffee break

11:00 – 12:30 Technical Session 7

Hall: Arabella

Network Economics II

Chair: O. Gonzalez-Soto, Spain

An Analytical Business Performance Comparison of the IPv6 and IPv4 Protocols in Fixed and Mobile Communication Services

L.-F. Pau, Rotterdam School of Management, The Netherlands

Pricing for Efficient Usage in Wired and Wireless Networks

F. Zhang, Y. Yan, DePaul University, Chicago; A. Ahmad, Norfolk State University, USA

Balancing Network and Business Planning for Cabel Telephony

D. Doherty, M. Glapa, S. Kamat, F. Magee, S. Prakash, D. Ruffolo, Lucent Technologies, Holmdel, USA

Economic Benefits of Optical Transport Layer Reconfigurability and Tighter Coupling with the Service Layer

G. Atkinson, R. Nagarajan, J. Sax, S. Sheikh, Lucent Technologies, Holmdel, USA

11:00 – 13:00 Technical Session 8

Hall: Boheme

Cellular Network Planning

Chair: A. Ciarniello, Telecom Italia Mobile, Italy

A Novel Ad Hoc Routing Algorithm for Cellular Coverage Extension

I. Gruber, TU München; L. Hui, Siemens AG, München, Germany

Autonomous Frequency Planning for GSM Networks

N. Jalden, S. K. Wilson, Royal Institute of Technology (KTH), Stockholm, Sweden

Combined Coverage and Capacity Optimisation for UMTS Networks

S. Ben Jamaa, France Telecom, Issy les Moulineaux, France

An Approach for Network Data Provisioning in UMTS Networks

Chr. Fischer, Lucent Technologies, Germany, V. Bawa, Lucent Technologies, UK

11:00 – 13:00 Technical Session 9

Hall: Ernani

Survivable Networks

Chair: S. Schnitter, T-Systems, Darmstadt, Germany

Efficient Algorithms for Physically-Disjoint Routing in Survivable GMPLS/ASTN Networks

P. Laborczi, arsenal research, Vienna, Austria; T. Cinkler, Budapest University of Technology and Economics, Hungary

Capacity Assignment for NAC Budgets in Resilient Networks

M. Menth, J. Milbrandt. St. Kopf, University of Wuerzburg, Germany

The Cycle-Oriented Approach: A Pragmatic Concept for Resource Allocation in Multi-Service Survivable Networks

M. Herzberg, ECI Telecom, Petach Tikva, Israel

Infrastructure Simulations of Disaster Scenarios

G. P. O'Reilly, D. J. Houck, E. Kim, T. B. Morawski, D. D. Picklesimer, H. Uzunalioglu, Lucent Technologies, Murray Hill, USA

12:30 – 14:00 Lunch break

14:00 – 16:00 Technical Session 10

Hall: Arabella

QoS

Chair: J. Murphy, RMIT University, Melbourne, Australia

RMD – a Lightweight Application of NSIS

G. Karagiannis, University of Twente, Enschede, The Netherlands

**Selected Service Protection in Overload:
Differentiated Services or Per-flow Submission Control?**

*N. Benameur, A. Kortebi, S. Oueslati, J. W. Roberts,
France Télécom, Issy Moulineaux, France*

**On the Elasticity of Traffic Matrices and the Impact on
Capacity Expansion**

*O. Heckmann, R. Steinmetz, Darmstadt University of
Technology, Germany*

**Traffic Matrices for MPLS Networks with
LDP Traffic Statistics**

*St. Schnitter, T-Systems, Darmstadt; M. Horneffer, T-Com,
Münster, Germany*

14:00 – 16:00 Technical Session 11

Hall: Boheme

Wireless II

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

**Proposal and Application Aware Analysis of
Wireless Sensor Network Protocol**

*K. Kabitzsch, M. Neugebauer, Dresden University of
Technology, Germany*

**Efficiency of Network Initiated Detach of
Inactive Subscribers for GPRS**

St. Rugel, Siemens, Munich, Germany

**Policy Language Based Management Model for
Wireless Networks**

*E. Wallenius, Nokia Networks, Tampere, Finland; M. Grosse-
Kreul, Nokia Networks, Düsseldorf, Germany; T. Hämäläinen,
University of Jyväskylä, Finland*

**Optimum Packet Size and Throughput of TCP/IP Traffic
over Wireless ATM Links**

*H. C. Lee, B. S. Lee, Yuhan College, Puchon-City,
Rep. of Korea*

14:00 – 16:00 Technical Session 12

Hall: Ernani

New Methods for Emerging Issues

Chair: G. Sallai, Budapest University, Hungary

Multi-period Auctions for Networks Resources

St. Wrzaczek, P. Reichl, S. Bessler, FTW, Vienna, Austria

Network Data Discovery and Extraction from Heterogeneous Networks: The NetInventory(TM) and NetView Systems

D. Mongeau, A. Barshefsky, E. Bass, B. Erman, C. Martin, R. Peterson, R. Rastogi, P. P. S. Narayan, H. Trickey, C. Xie, M. Wu, Lucent Technologies, Holmdel, USA

Using ITU-T X.805 for Comprehensive Network Security Assessment and Planning

A. R. McGee, U. Chandrashekhar, S. H. Richman, Lucent Technologies, Holmdel, USA

Physical and Service Topology Discovery in Heterogeneous Networks: The NetInventory System

P. P. S. Narayan, Y. Brietbart, M. Garofalakis, S. K. Iyer, C. Martin, G. Prabhakar, R. Rastogi, A. Silberschatz, Lucent Technologies, Holmdel, USA

16:00 – 16:30 Coffee break

16:30 – 18:00 Technical Session 13

Hall: Arabella

MPLS Network Planning

Chair: H. Weinmann, T-Systems, Germany

An Optimization Model for MPLS Network Planning

M. S. Medrano, M.B. Trindade, N. S. A de Chaves, M. D. Fernandez, H.J. Malavazi Filho, CPqD Telecom & IT Solutions, Campinas, Brazil

A Novel DSPF Extension Including Node Architectural Constrains for GMPLS Networks

F. Cugini, N. Andriolli, P. Castoldi, Sant' Anna School of University Studies and Doctoral Research, Pisa, Italy

Stalled Information Based Routing in Multi-Domain Multilayer Networks

J. Szigeti, J. Tapolcai, T. Cinkler, Budapest University of Technology and Economics, Hungary

16:30 – 18:00 Technical Session 14

Hall: Boheme

Mobile Networking

Chair: tba

Tunnel Set-up Mechanism in Ethernet Networks for Fast Moving Users

F. Van Qickenborne, F. De Greve, P. Van Heuven, F. De Turck, B. Vermeulen, S. Van den Berghe, I. Moerman, P. Demeester, Ghent University, Belgium

An Economic Approach to Assess the Need for AAL2 Multiplexing and Switching in the UTRAN

B. H. Kim, C.-H. K. Chu, D.J. Houck, Lucent Technologies, Holmdel; I. Lee, University of Pennsylvania, Philadelphia, USA

Secure Mobile Code Computing in Distributed Remote Environment

K. E. A. Negm, W. Adi, Etisalat College of Engineering, Sharja, UAE

16:30 – 18:00 Technical Session 15

Hall: Ernani

Optical Transport Network

Chair: tba

Line System Design for DWDM Networks

St. Fortune, W. Sweldens, L. Zhang, Lucent Technologies, Murray Hill, USA

Impact of the Reach Distance of WDM Systems on the Cost of Translucent Optical Transport Networks

A. Morea, H. Nakajima, L. Chacon, Y. Le Louédec, France Télécom, Lannion; J. P. Sebille, France Télécom, Paris, France

A Two-Stage Simulated Annealing Logical Topology Reconfiguration in IP over WDM Networks

S. Xu, Y. Tanaky, Waseda University; K. Sezaki, The University of Tokyo, Tokyo, Japan

19:30 Conference Dinner, Lord Mayor's Reception

Wednesday, June 16

08:30 – 10:30 Technical Session 16

Hall: Arabella

Dimensioning of NGN Applications

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

An Economical Approach to Analyse and Design Mobile Services

O.-P. Pohjola, K. Kilkki, Nokia Research Center, Finland

Networks Services Using Service-Composition Technology

T. Oh-ishi, T. Iwata, S. Tokumoto, N. Shimamoto, NTT Network Service Systems Laboratories, Tokyo, Japan

Design and Implementation of an Application Server Load Balancing Architecture Supporting the End-to-End Provisioning Value-added Services

K. Vlaeminck, F. De Turck, P. Demeester, Ghent University, Belgium

Performance Evaluation Simulation for MANET Routing Protocols

K. E. A. Negm, W. Adi, Etisalat College of Engineering, Sharja, UAE

08:30 – 10:30 Technical Session 17

Hall: Boheme

Reliability Issues

Chair: A. Inoue, NTT, Japan

Reliable Packet Transport Technologies for MPLS Networks

R. Nagarajan, M. Akber Qureshi, Y. T. Wang, Lucent Technologies, Holmdel, USA

Network Design Optimization from an Availability Perspective

H. C. Cankaya, A. Lardies, G.W. Ester, Alcatel, Plano, USA

Incorporating the Downtime Due to Disaster Events in the Network Reliability Model

A. M. Jrad, C. K. Chan, T. B. Morawski, Lucent Technologies, Holmdel, USA

Reliability-Based Warehouse Inventory Sparing and Downtime Optimization

M. C. Chu, C.-H. K. Chu, V. Katkar, U. Chandrashekar, Lucent Technologies, Holmdel, USA

08:30 – 10:30 Technical Session 18

Hall: Ernani

Optical Networks Issues

Chair: W. Wieser, T-Systems, Darmstadt, Germany

Separate Wavelength Pools for Multiple-class Optical Channel Provisioning

N. Andriolli, L. Valcarengi, P. Castoldi, Sant' Anna School of University Studies and Doctoral Research, Pisa, Italy; T. Jakab, Budapest University of Technology and Economics, Hungary

DCM Selection on an Optical Line System

C. Chekuri, W. Lee, L. Zhang, Lucent Technologies, Murray Hill, USA

Inter-Domain Wavelength Routing in Optical WDM Networks

T. Saad, H. Mouftah, University of Ottawa, Canada

Integrating Network Quality, Performance and Cost Control through Reliability Analysis in Optical Network Design

M. Mezhoudi, C.-H. K. Chu, C. Jing, C. Y. Long, Lucent Technologies, Holmdel, USA

10:30 – 11:00 Coffee break

11:00 – 12:30 Technical Session 19

Hall: Arabella

Broadband Access Networks

Chair: tba

IEEE 802.11b Performance Evaluation: Convergence of Theoretical, Simulation and Experimental Results

R. G. Garroppo, St. Giordano, St. Lucetti, F. Russo, University of Pisa, Italy

Admission Region for Multimedia Services in IEEE 802.11e Systems

R. G. Garroppo, St. Giordano, St. Lucetti, University of Pisa, Italy

The Intelligent Broadband Access Network

S. White, R. Hernandez, A. Bodzinga, G.-J. Bocker, Lucent Technologies, Le Plessis Robinson, France

11:00 – 13:00 Technical Session 20

Hall: Boheme

Optimization Issues

Chair: G. Sallai, Budapest University, Hungary

Multi-Objective Optimization Model and Heuristic Algorithm for Dynamic Multicast Routing

Y. E. Donoso Meisel, Universidad del Norte, Barranquilla, Colombia; R. Fabregat, J. L. Marzo, Universidad de Girona, Spain

Large-scale Hierarchical Networks: How to Compute an Optimal Hierarchy

A. Bley, T. Koch, R. Wessäly, Zuse-Institute Berlin, Germany

Application of Rapid Spanning Tree Protocol for Automatic Hierarchical Address Assignment to Bridges

G. Ibáñez, Universidad Carlos III de Madrid, Spain

Optimization Problems in Metro Ring Network Design

R. A. Goudreault, R. Nagarajan, N. Raman, Lucent Technologies, Holmdel, USA

11:00 – 13:00 Technical Session 21

Hall: Ernani

Dynamic Optical Networks

Chair: T. Cinkler, Budapest University, Hungary

Robust Optical Burst Switching

A. Maach, G. von Bochmann, H. T. Mouftah, University of Ottawa, Canada

Optical Packet Switch Design with Relaxed Maximum Hardware Parameters and High Service-class Granularity for Flexible Switch Node Dimensioning

M. Nord, Technical University of Denmark, Lyngby, Denmark

The Interest of Optimizing Metrics in an Optical Cross-connect Meshed Network

A. Druault-Vicard, B. Decocq, France Télécom, Issy Moulineaux, France

12:30 – 14:00 Lunch break

14:00 – 15:00 Panel

Hall: Arabella

*J. Gross (Chair), Director Network Development,
Arcor, Germany*

*Chr. Laqué, Director Network Development,
tele.ring, Austria*

*H. Leopold, Director Platform and Technology
Management, Telekom Austria*

K. Probst, Director T-Systems GEI GmbH, Bonn, Germany

15:00 – 15:30 Awards, Closing Address

Hall: Arabella

J. Gross (Chair), Arcor, Germany

GENERAL INFORMATION

NETWORKS 2004 SECRETARIAT

Until June 11, 2004

VDE

**Conference Services
Stresemannallee 15
60596 Frankfurt
Germany**

Phone: +49-(0)69-63 08-229
Fax: +49-(0)69-96 31-5213
e-mail: vde-conferences@vde.com
URL: www.vde.com

From June 13, 2004

OVE Conference Secretariat at Arcotel Wimberger

Phone/Fax: +43-(1)521 65-688
e-mail : vde-conferences@gmx.de
networks2004@ove.at

NETWORKS 2004 WEB SITE

networks 2004 has prepared a homepage presenting the latest information related to the conference: www.networks2004.at

NETWORKS 2004 VENUE

Arcotel Wimberger
Neubaugürtel 34-36
1070 Wien
Austria

Phone: +43-(1)521 65-0
Fax: +43-(1)521 65 810
e-mail: wimberger@arcotel.at
url: www.arcotel.at

The conference venue is strategically located at the Neubaugürtel, near Urban-Loritz-Platz. It is one minute walking distance from the "Stadthalle" Vienna's biggest multifunctional hall for fairs, rock concerts and sports events; five

minutes from Marahilfer Straße, Austria's largest shopping boulevard; and five minutes from Westbahnhof. Underground stations are directly in front of the hotel and at the Westbahnhof, which also has a bus station for airport transfer.

VIENNA

Vienna, the capital of Austria has a 2000 years history that reaches back into the times of the Romans who built the outpost Vindobona. In 1155 during the 270-year reign of the Babenberg family, the court took up residence here and Vienna became the capital of Austria. At that time it was protected by high walls with six gateways and nineteen towers. Vienna was a Habsburg city which enjoyed the ongoing benefits of the benevolence of Maria Theresia in the 18th century and of Franz Josef a hundred years later. They laid the foundations for the cultural pre-eminence of the city. In the reign of Franz Josef the old defensive walls were pulled down and Europe's best architects came to the city to compete for the honour of designing the splendid buildings which now line the sweeping boulevard of the Ring.

Today Vienna offers the visitor a menu of cultural events and exhibitions unequalled in any other city of the world. It is one of the international capitals of opera, the home of European classical music tradition, renowned for its modern drama productions and it is a leading centre for new German literature. The city's numerous palaces, museums and galleries house the finest collections of historical items from prehistoric, Roman, medieval, and modern times as well as examples of the works of the worlds' greatest artists.

Besides this historic glory today's Vienna is a centre of progressive technology, modern vividness and its open mind points into the future with Vienna excelling as the heart of a new expanded Europe.

TUTORIALS

networks 2004 offers a set of 4 tutorials giving comprehensive introductions into specific technological or operational network aspects.

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

EXHIBITION/TOOLS DEMONSTRATION

An exhibition/tools demonstration is being held in the foyer of Arcotel Wimberger. 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:

T-Systems Nova
Detecon International
Lucent Technologies
VPI Systems
Symena
Siemens

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

Alongside the conference sessions the demonstrations will be open Monday through Wednesday to allow for extensive visit of the presenting companies. A current and updated list of the exhibitors presenting at networks 2004 can be found at www.networks2004.at

EXHIBITION HOURS

Mon, June 14, 2004	09:00 h – 17:30 h
Tue, June 15, 2004	09:00 h – 17:30 h
Wed, June 16, 2004	09:00 h – 15:30 h

INTERNET CAFÉ

An Internet Café is planned in the conference premises. It offers the possibility of direct internet access for networks 2004 participants.

REGISTRATION

To register for networks 2004 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 2004 Secretariat must receive the form before May 13, 2004. Full payment or credit card information must accompany all registrations in order for them to be accepted. All registrations will be in the name of and for the account of OVE, Austria.

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

Sun, June 13, 2004	08:00 h – 17:30 h
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Mon, June 14, 2004	08.00 h – 17:30 h
Tue, June 15, 2004	08.00 h – 17:30 h
Wed, June 16, 2004	08.00 h – 15:30 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 2004 Conference Secretariat at VDE.

REGISTRATION FEES

	<i>Before May 13, 2004</i>	<i>From May 13, 2004</i>
Regular Registration	€ 700.–	€ 800.–
Student	€ 300.–	€ 400.–
Tutorial 1, 2, 3, 4	€ 200.– each	€ 250.– each
Social Event with "Heuriger" (Monday 6/14)	€ 25.–	€ 30.–
Additional Proceedings	€ 80.–	€ 100.–

The Austrian VAT (10%) will be added to these fees separately!

* 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, the Conference Dinner Reception at Vienna Townhall, one copy of the proceedings and a CD-ROM.

Additional Copies of the Proceedings

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

Accompanying Persons

Accompanying persons have to register for the social events (Heuriger and Conference Diner) separately but this registration does not cover any access to the technical sessions.

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, security no 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 13, 2004, the registration fee will be fully refunded less a handling fee of € 60,—. After May 13, 2004 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 jointly published by VDE and IEEE. The proceedings (including a CD-ROM) 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 € 100,—. After the conference all accepted papers will also be available electronically from IEEE Xplore, the digital library of the IEEE.

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: +43-(1)521-65-688

or by e-mail: vde-conferences@gmx.de

SOCIAL PROGRAMME

- A get together will be held at Arcotel Wimberger on Sunday, June 13, 2004 (attendance included in conference fee).
- A typical Viennese evening event including snacks will be organized on Monday, June 14, 2004 (additional fee: EURO 25.– /30.–. Please book in advance on registration form).
- networks 2004 Conference Dinner at Vienna Townhall will take place on Tuesday 15, 2004 (attendance included in conference fee but additional tickets for accompanying persons may be ordered with the registration form).

The recommended dress for all networks 2004 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 Austria have to present a valid Identity Card or Passport. Delegates who need a visa should contact the Austrian consular offices or embassies in their home countries. Please note that neither the conference secretariat nor the supporting bodies are able to extend any "Invitation" for visa application.

TRANSPORT

From Vienna Airport

To get from the Vienna Airport at Schwechat, located outside the city limits, to the city centre, you can choose either the City Airport Train, an Airport Express bus, the “Schnellbahn” (City Train), the Vienna Airport Service, or a taxi.

The City Airport Train leaves every half hour from the city centre (Landstrasse / Wien Mitte) and the airport – the ride lasts 16 minutes (single ride 9.– Euro, round trip 16.– Euro). It is possible to check in and receive one’s boarding pass at Wien Mitte (3, Invalidenstrasse / Marxer Brücke) on a specially designated City Airport Train track.
Information: www.cityairporttrain.com

Airport Express Buses of the Vienna Airport Lines to/from the city centre and Westbahnhof train station (5 minutes walking distance from Arcotel Wimberger).
Every day from about 5:00 a.m. to midnight; runs every 30 minutes; charge: single ride 6.– EURO, round trip: 11.– EURO.
Information: www.viennaairport.com/bus.html and www.oebb.at (“Fahrplanabfrage” – train schedule).

With the **Airport City Train** (Schnellbahn) S 7 you ride to and from the airport. You only need to buy an additional “Aussonnen” (outer zone) ticket for 2.– Euro (1.50 Euro if bought in advance) and have it punched before entering the train. Without the Vienna Card, you need to pay two zones (4.– Euro, or 3.– Euro if bought in advance).

From Westbahnhof (arrival by train)

The Arcotel Wimberger is located within 5 minutes walking distance from Westbahnhof. Underground stations are directly in front of the hotel and at the Westbahnhof.

For more information on the public transport system of Vienna see the attached plan or visit www.wienerlinien.at

Arrival by car

Coming from Westautobahn: Follow the signs “Zentrum”, turn left into “Neubaugürtel” and go into town towards “Westbahnhof/Stadthalle”. The Arcotel Wimberger is located on the left hand side.

Coming from Südbahnhof: Take the exit “Gürtel/Zentrum”. Follow “Neubaugürtel” into town towards “Westbahnhof/Stadthalle” (Direction Prague). The Arcotel Wimberger is located on the right hand side.

The Arcotel Wimberger offers an indoor parking garage (2.20 EURO per hour; 15.50 EURO per day).

Important remark! Please pay attention to the inner districts of the city, or else your parking spot can become quite expensive!

You can listen to the Road Condition Report by calling Phone 0 800 120 120 (0-24) (German, English)

Note: Every conference attendant will find a 3 day ticket for Vienna transport included in his conference bag.

SHOPPING AND DINING

5 minutes walk to Mariahilfer Strasse, Austria's largest shopping boulevard: especially fashion stores abound, all famous labels are represented. And in between you can discover many nice restaurants and cafés (also in the side streets).

CURRENCY

The official currency in Austria is the Euro (€). Usual credit cards (Eurocard/Mastercard, American Express, Visa) are accepted in hotels, department stores and restaurants. Currently (April 2004) the exchange rate is 1 Euro \approx 1.22 US\$

ELECTRICITY/ PHONE PATCH

The mains power supply is 230 V AC, 50 Hz. Authors presenting from their laptop are kindly asked to have connectors available for the mains and Texas or TAE 6 (Austrian 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 centre.

HOTEL RESERVATION

Hotel accommodation may be booked directly at Arcotel Wimberger:

Arcotel Wimberger
Neubaugürtel 34-36
1070 Wien
Austria

Phone: +43-(1)521 65-0
Fax: +43-(1)521 65 810
e-mail: wimberger@arcotel.at
url: www.arcotel.at

Price per single room/night: 125.– EURO
Price per double room/night: 162.– EURO
(breakfast: 11.– EURO)

or at

Hotel Dorint
(Mercure Wien Westbahnhof)
Felberstrasse 4
1150 WIEN
AUSTRIA

The hotel is located directly at Westbahnhof near to the conference venue at Arcotel Wimberger.

Phone: +43-(1)98 111-0
Fax: +43-(1)98-111-930
e-mail: H5358@accor-hotels.com
url: www.accorhotels.com

Price per single room/night: 119.– EURO
Price per double room/night: 139.– EURO
(breakfast: 15.– EURO)

Further hotels with a wide range of rates and different city locations are being offered at www.wien.info

BOOKING CONDITIONS

Change of Reservation and Cancellation

Reservations, changes and cancellations must be made directly at Arcotel Wimberger or at Dorint Hotel.

Payment

All payments related to accommodation have to be made on departure in the hotel.

EXCURSION PROPOSALS

The Time Schedule of networks 2004 has been shortened compared to previous years and, as a result, no common excursions will be organised. Therefore, please find a list of recommended Viennese highlights to be visited on your own:

Local Attractions

St. Stephans Cathedral

Ringstrassen Boulevard surrounding the inner district of the city with the State Opera, Vienna Town Hall, Houses of Parliament and Museum of Fine Art and Natural History
Hofburg Palace with Imperial Treasury and Spanish Riding School

Schönbrunn Palace

Giant ferris wheel

Albertina Museum

Museums Quartier

For guided tours please contact Vienna Sightseeing Tours

Graf Starhembergasse 25,

1040 Wien, Austria

Tel: +43 (1) 712 46 83 - 0

Fax: +43 (1) 714 11 41

www.viennasightseeingtours.com

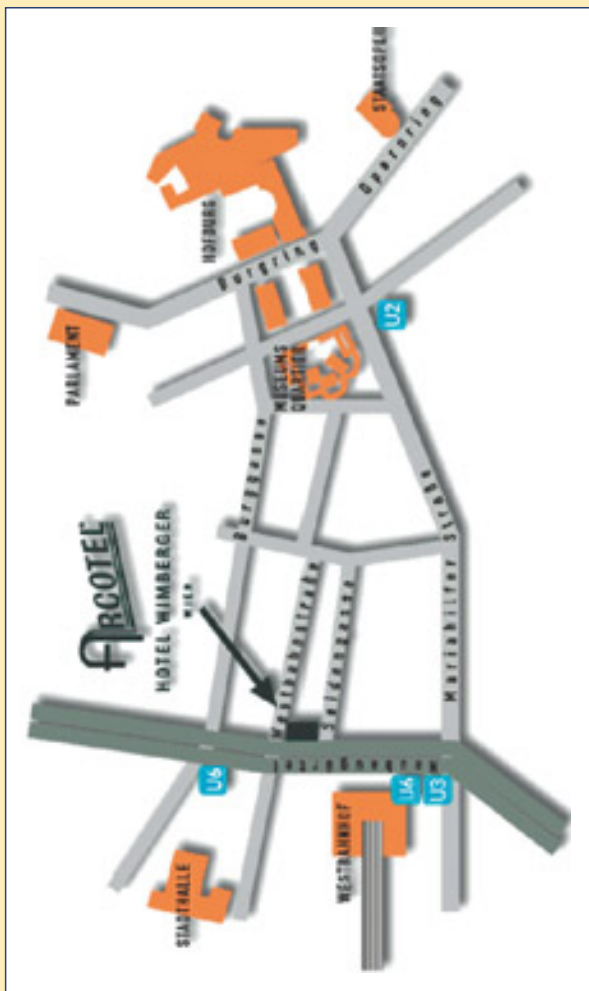
or contact the registration counter on-site.

We wish you a pleasant stay in Vienna!

Notes:

Notes:

Location of Hotel Wimberger



Cooperating Partners



Vienna University of Technology



Institute of Computer Technology



Telecommunications Research Center Vienna

Technical Sponsors



Sponsoring Societies

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SIEMENS

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Austrian Electrotechnical Association



Information- and Communication-Technology Society within OVE

VDE

Association for Electrical, Electronic & Information Technologies

ITG

Information Technology Society within VDE