

TERENA Networking Conference 2000 Programme

Monday 22 May 2000

12:30 - 14:00 Lunch

14:00 - 15:30 Room A
Plenary 1 **Opening Plenary Session**
Chair: Francisco Padinha, PT Prime, Portugal

Conference Introduction

Francisco Padinha, PT Prime, Portugal

Welcome Address

José Mariano Gago, Minister for Science and Technology, Portugal

Keynote Speech

"Internet for Everyone"

Vint Cerf, MCI WorldCom (video) with introduction by Eric Travis, Global Science & Technology, Inc., USA

Keynote Speech

"Content Services: Toward Layer 4 - Layer 7 Routing"

Silvano Gai, Cisco Systems Inc., USA

15:30 - 16:00 Refreshments Break - Sponsored by Cisco Systems, Inc.

SESSION 1

16:00 - 17:30 Room A
Session 1A Developments in Network Monitoring and Management Tools
Chair: Michael Walsh, University College Dublin, Ireland

This session will provide an insight into the development of tools for network monitoring. It will cover tools, useful for network managers, that measure raw-data performance, as well as tools that monitor and manage service levels as perceived by end users and applications.

- 1A1 Tracking a Metamorphic Infrastructure: observations on our (in)ability to accurately predict, analyze or even measure conditions on the global Internet**
K.C. Claffy, Cooperative Association for Internet Data Analysis (CAIDA), USA
- 1A2 Mobile Agent Technology for the Management of Distributed Systems - a Case Study**
Claudia Raibulet and Claudio Demartini, Politecnico di Torino, Italy
- 1A3 Service Level Management with Agent Technology**
Torsten Bissel, Manfred Bogen, Christian Bonkowski and Volker Hadamschek, German National Research Center for Information Technology (GMD), Germany

16:00 - 17:30 Room B
Session 1B Taking the Classroom to the Student: Teaching and Learning Through Internet Technologies
Chair: Dave Hartland, University of Newcastle upon Tyne, United Kingdom

It has been clear for a number of years that the application of Internet Technologies, such as videoconferencing, offers huge possibilities to Higher Education and to education in general. This session will explore innovative yet practical applications of this technology and look at how it might be used in the areas of distance learning, the distributed classroom, groupwork, student support and assessment.

1B1 An Experimental System for Distributed Classroom Education

Peter Ørbæk, University of Aarhus, Denmark

1B2 Supporting Group Learning and Assessment Through the Internet

Marlise Geller, Luciano Hack, Liane Tarouco and Antonio Rodrigo de Vit, Federal University of Rio Grande do Sul, Brazil

1B3 A New Quality of Chemical Education System based on the World Wide Web

Thomas Engel and Johann Gasteiger, University of Erlangen-Nuremberg, Germany

18:30 - 20:00 Opening Reception - Sponsored by Network Appliance, Inc.

Tuesday 23 May 2000

SESSION 2

09:00 - 10:30 Room A
Session 2A Security of Internet Applications
Chair: Antonio Lioy, Politecnico di Torino, Italy

If the Internet is to become everybody's preferred information and commercial channel, then security is a must, not an option. This session will try to address some of the current security problems with three papers focusing on different issues. First, recent advances in the foundations of security will be presented; that is the proposed protocols, formats, and architectures at the core of modern secure applications. Second, we will broaden our view to include important business topics, too often underestimated, such as risk analysis and security management, and their relation to a general quality framework. Finally, we will delve into a real application by looking at the security techniques employed by the electronic voting system for Italian universities.

2A1 Internet Security: where are we heading?

Wolfgang Schneider, German National Research Center for Information Technology (GMD), Germany

2A2 The Changing Role of IT Security in an Internet World - a business perspective

Hannes Lubich, Bank Julius Baer, Switzerland

2A3 The Italian Academic Community's Electronic Voting System

Pierluigi Bonetti, Stefano Ravaioli and Simone Piergallini, CINECA, Inter University Supercomputing Center, Italy

09:00 - 10:30 Room B
Session 2B E-Publishing
Chair: Manfred Bogen, German National Research Center for Information Technology (GMD), Germany

Under E-publishing we understand a continuous process where each document is planned, created, reviewed, revised, published, archived, indexed, and finally maintained only by means of computers, i.e. in electronic form. Digital libraries are very important sources of structured, well-organised and well-stored information in electronic format. E-publishing is part of the normal work in a digital library in order to link information producers, publishers, and consumers.

This session begins with a presentation about scientific publication in general. The next two talks address the management of a digital library by tools for content providers and librarians without special computer training and finally the construction of a digital library by means of agent technology.

- 2B1 Electronic Meets the Quill: Changes in Scientific Publication**
Frank Gannon, European Molecular Biology Organization (EMBO), Germany
- 2B2 Submission and Repository Management in Digital Libraries, Using the WWW**
Sarantos Kapidakis, National Documentation Centre / National Hellenic Research Foundation and Greg Karvounarakis, University of Crete and ICS-FORTH, Greece
- 2B3 An Agent Architecture for a Virtual Research Digital Library**
Pedro Isaias, The Portuguese Open University, Portugal

10:30 - 11:00 Refreshments Break

SESSION 3

11:00 - 12:30 Room A
Session 3A Practical Security
Chair: Rob Blokzijl, NIKHEF, The Netherlands

This is the all meat, no fat session about network security practice for network and system administrators. The first talk will describe how NTOP - a widely used freeware network monitor - can be applied to intrusion detection and security scanning. Next, a review of the major attacks at the network layer is presented, along with available countermeasures. Finally, the security problems posed by the DNS are examined, along with the proposed standard solution given by the DNSSEC standard.

- 3A1 Practical Network Security: Experiences with ntop**
Luca Deri, Finsiel SpA and University of Pisa and Stefano Suin, University of Pisa, Italy
- 3A2 Security Issues in Control, Management and Routing Protocols**
Madalina Baltatu, Antonio Lioy, Fabio Maino and Daniele Mazzocchi, Politecnico di Torino, Italy
- 3A3 DNS Security**
Marius Marian, Antonio Lioy, Fabio Maino and Daniele Mazzocchi, Politecnico di Torino, Italy

11:00 - 12:30 Room B
Session 3B The Campus Network - the next bottleneck
Chair: Mike Norris, HEAnet Ltd., Ireland

With the recent advances in high performance wide area networks, the campus network is emerging as the next bottleneck in the provision of quality end to end communications. While technologies such as Gigabit Ethernet may appear to simplify the design choices, many issues remain unresolved - the convergence of media, new developments in telephony services, the immaturity of solutions to the quality of service problem and the lack of common standards for security, authentication and access control. This session will explore some of the issues facing the campus network manager.

3B1 IP Telephony in the Next Generation Network Campus
Silvano Gai, Cisco Systems, Inc., USA

3B2 Broadband_Connection@home for students and employees
Tom Koppen, University of Twente, The Netherlands

3B3 Did MPOA Achieve Its Objective?
Eva Pless, Ferdinand Hommes and Lothar Zier, German National Research Center for Information Technology (GMD), Germany

12:30 - 14:00 Lunch - Sponsored by InfoLibra Ltd.

SESSION 4

14:00 - 15:30 Room A
Session 4A Internet2 and Europe
Chair: Karel Vietsch, TERENA

The next generation Internet is already here: Internet 2 activities, experimentation and new services are now emerging within North American Research Networks and their European partners. This session will include an update on current Internet2 activities in the US, two short presentations of next generation Internet projects taking place in Europe and a panel debate on how to exploit new ideas and projects.

4A1 Update on Internet2 Activities
Ted Hanss, Internet2, USA

4A2 The GRID Project
Fabrizio Gagliardi, CERN, Switzerland

4A3 The GigaPort Project
Frank Biemans, Telematics Institute, The Netherlands

4A4 Next Generation Internet in Europe Panel Debate
Confirmed panellists include:

- Frank Biemans, Telematics Institute, The Netherlands
- Dai Davies, DANTE
- Fabrizio Gagliardi, CERN, Switzerland
- Ted Hanss, Internet2, USA
- Kees Neggers, SURFnet, The Netherlands

14:00 - 15:30 Room B
Session 4B Practical Experiences with QoS Technology
Chair: Ladislav Lhotka, University of South Bohemia, Czech Republic

When providing QoS based on IP, network managers are faced with the problem of understanding and predicting how introducing new features on their equipment will influence the service they offer to their users. This section will focus on practical experimentation and evaluation of QoS technologies, with an insight into what performance variations can really be expected by users and network managers.

- 4B1 Differentiated Services: Design, Implementation and Validation in the Wide Area**
Tiziana Ferrari, CNAF/INFN, Italy
- 4B2 QoS in IP over ATM Networks**
Jorge Carapinha, PT Inovação, Portugal
- 4B3 A Differentiated Services Implementation for High-Performance TCP Flows**
Volker Sander, Ian Foster and Linda Winkler, Argonne National Laboratory and Alain Roy, The University of Chicago, USA

15:30 - 16:00 Refreshments Break

SESSION 5

16:00 - 17:30 Room A
Session 5A User Communities
Chair: Hans Döbbeling, European Molecular Biology Laboratory (EMBL), Germany

There are two different ways of looking at a network: on one hand the people providing the network service, on the other hand the people using the network for their daily work. For the latter group, the network is just one of many work tools, but often, the way they use the network is very different from how the people providing the service were imagining. In this session we see presentations by specific user communities and provide a chance for network developers and network users to converge and discuss the provision of better services for everyone.

- 5A1 The Canadian Bioinformatics Resource CBR-RBC**
Christoph Sensen, National Research Council, Institute for Marine Biosciences, Canada
- 5A2 Network Services for Biologists in the Genome Era: The Work of the European Bioinformatics Institute**
Rodrigo Lopez, The European Bioinformatics Institute (EBI), United Kingdom
- 5A3 An Activity for Agricultural Research and Educational Collaboration in Asia Pacific region by Asia Pacific Advanced Network (APAN)**
Akira Mizushima, Ministry of Agriculture, Forestry and Fishery, Japan

16:00 - 17:30 Room B
Session 5B **Managing QoS**
Chair: Dai Davies, DANTE

Session 4B focused on the technological aspects of QoS. This session addresses the management and organisational aspects in terms of interaction between different administrative domains that need to be tackled (set-up, monitoring, troubleshooting) in order to effectively offer end to end QoS. Many of the challenges are independent from the technology adopted to deliver QoS.

- 5B1** **Management Issues of the TEN-155 Managed Bandwidth Service**
Roberto Sabatino, DANTE
- 5B2** **QoS Management Scheme Based on OAM Performance Management**
Zhao Yang and Wang GuangXing, Northeastern University, Shenyang, China
- 5B3** **Dynamic Management for End-to-End IP QoS: from best-effort to personalized services**
Fayçal Bennani and Noémie Simoni, Telecom Paris, France

19:30 - 23:00 Gala Evening - Sponsored by Teleglobe International Corporation

Wednesday 24 May 2000

SESSION 6

09:00 - 10:30 Room A
Session 6A **Coming To A Monitor Near You Soon.....**
Chair: Egon Verharen, SURFnet, The Netherlands

The convergence of the Internet and traditional TV is being accelerated through the concept of streaming video (also known as video-on-demand). Having started at the size of a postage stamp, increased bandwidth and better compression techniques now enable full screen, CD-quality video and audio to be transmitted over today's advanced research networks. This session highlights some recent developments in the application of streaming technology.

- 6A1** **"Uni-TV" - Distributed TV Productions and Video-on-Demand Services at Universities**
Susanne Naegele-Jackson, Nadja Eschbaum, Michael Graeve and Peter Holleczeck, University of Erlangen-Nuremberg, Germany
- 6A2** **VIDOS - A System for Editing and Customizing Videos over the Web**
David M. Shotton and Thomas Boudier, University of Oxford, United Kingdom
- 6A3** **Advances in Medical Quality-Securing by new Network-Technologies - Using the Gigabit-Testbed South for Online Quality Control of Tumour Operations in Surgery**
Heinz Weber, Michael Graeve, Sven Schoolmann, Peter Holleczeck, and Werner Hohenberger, University of Erlangen-Nuremberg, Germany

09:00 - 10:30 Room B
Session 6B **Network Policy and Regulation**
Chair: Pedro Veiga, FCCN, Portugal

Today's technology is evolving very fast but there are several aspects that pose challenges and constraints to networks engineers. These range from the availability of circuits and their costs but also some legal and regulatory aspects. This sessions discusses some of these issues focussing on aspects related to, but not limited to, evolution in the European area. Special emphasis will be put on cost evolution and DNS administration.

- 6B1** **Evolution of Network Services in a Large University - an Italian case study: Padova**
Franco Bombi, University of Padova and Alberto de Petris, Infostrada, Italy
- 6B2** **Internet Governance and the CENTR Organisation**
Dennis Jennings, University College Dublin, Ireland
- 6B3** **Evolution of the Management of Top Level Domains: - a case study of the .it domain**
Stefano Trumpy, Vittore Casarosa, Maurizio Martinelli, Rita Rossi, and D. Vannozzi, CNR-IAT, Italy

10:30 - 11:00 Refreshments Break

SESSION 7

11:00 - 12:30 Room A
Session 7A **Video over IP**
Chair: Harri Salminen, FUNET, Finland

This session will take the style of a tutorial and provide participants with a practical, in-depth view of both streaming and H.323 conferencing technologies, or in short, both interactive and one-way video over the Internet. Come and learn!

- 7A1** **Streaming Technologies: under the hood**
Egon Verharen, SURFnet, The Netherlands
- 7A2** **Potential and Limitations of a Teleteaching Environment based on H.323 Audio-Visual Communication Systems**
Pantelis Balaouras, Ioannis Stavrakakis and Lazaros Merakos, University of Athens, Greece

11:00 - 12:30 Room B
Session 7B Charging Models for National Research Networks
Chair: Jan Gruntorád, CESNET, Czech Republic

Most, if not all, National Research Networks (NRNs) are facing the problem of ever-increasing demand for bandwidth (mainly international) to accommodate exponentially increasing traffic generated by their users and at the same time available funding resources being more or less static. This session will begin with a presentation about the pricing of networks in Europe followed by a case study from an NRN, discussing how they implemented a charging model for their national network. The session will conclude with a panel debate, in which the panellists will discuss measures to overcome the discrepancy between demand for additional bandwidth and available funds.

7B1 Pricing Networks
Dai Davies, DANTE

7B2 QoS and HEAnet's Charging Model: an administrative and technical overview
Mike Norris, HEAnet Ltd., Ireland

7B3 Panel Debate on Funding Networks
Confirmed panellists include

- Dai Davies, DANTE
- Mike Norris, HEAnet, Ireland
- Roman Tirlor, European Commission

12:30 - 14:00 Lunch

SESSION 8

14:00 - 15:30 Room A
Session 8A Internet Standardisation Update
Chair: Claudio Allocchio, GARR, Italy

We often hear the magic word "Internet Standard", sometimes to qualify a product or service, sometimes to validate a document. However, on many occasions this label is used inappropriately, and there is confusion both on the exact meaning and status of Internet Standardisation. More over, the debate between the Internet (IETF) Standardisation and the ITU / ISO Standardisation Process is still open.

This session and panel discussion will clarify the real situation, with a presentation of the up-to-date Internet Standardisation Status directly from the main actors, and giving the occasion to solve your doubts talking directly to the key people in the Application and Security fields.

8A1 Trying to Keep the Internet's Standards Setting Process in Perspective
Kai Jakobs, Technical University of Aachen, Germany

8A2 IETF Standards for Applications
Patrik Fältström, TELE2, Sweden

8A3 Panel Debate on Standardisation
Confirmed panellists include:

- Patrik Fältström, TELE2, Sweden
- Kai Jakobs, Technical University of Aachen, Germany
- Wolfgang Schneider, German National Research Center for Information Technology (GMD), Germany

14:00 - 15:30 Room B
Session 8B **TERENA Technical Programme**
Chair: Kees Neggers, SURFnet, The Netherlands

Research and Education has always had needs which might be considered more demanding than those of the average commodity Internet user. The TERENA Technical Programme is a vehicle for many new and exciting developments in networking, specifically aimed at the research and education community. In this session, the latest work of the TERENA Technical Programme will be presented in a number of short papers, which reflect a representative sample of the programme's activities.

- 8B1 IRT Co-ordination in Europe - an Update**
Brian Gilmore, University of Edinburgh, United Kingdom
- 8B2 Extended Cache Statistics Project**
Jens Vöckler and Helmut Pralle, University of Hanover, Germany
- 8B3 Update on TF-STREAM Activities**
Egon Verharen, SURFnet, the Netherlands
- 8B4 User-level Performance Monitoring Project**
Cees de Laat, Utrecht University, the Netherlands

15:30 - 16:00 Refreshments Break

SESSION 9

16:00 - 17:30 Room A
Session 9A **Tomorrow's Internet**
Chair: Stefano Trumpy, CNR-IAT, Italy

Today, many people, especially the non technical ones, consider the Internet as "the Web and E-mail", while a number of the 'old guys' still remember the TCP/IP protocol and the other application services. But where is the network going? What are the new ideas, the new services? Where are we heading? Some perspectives and discussions are the goal of this session.

- 9A1 The Internet in the Late 1900s**
Daniel Karrenberg, RIPE NCC, The Netherlands
- 9A2 The Interplanetary Internet: Challenges for the Internet's Evolution**
Eric Travis, Global Science & Technology, Inc., USA
- 9A3 Technological Issues toward 'Internet is for Everyone'**
Jun Murai, Keio University, Japan

16:00 - 17:30 Room B
Session 9B **Middleware - what it is and where it's at**
Chair: Henk Eertink, Telematics Institute, The Netherlands

The term "middleware" has been coined to describe the collection of distributed services which are required by networked applications in the Internet. These include security services, authentication, authorisation and directory services. Incompatible standards and non inter-operating technologies increase the cost and complexity of advanced network services. This session will review the current state and direction of developments in this area.

9B1 **Middleware**
Michael R Gettes, Georgetown University, USA

Thursday 25 May 2000

SESSION 10

09:00 - 10:30 Room A
Session 10A **High-Speed Networking**
Chair: Dai Davies, DANTE

The High-Speed Networking session will focus on the development and implementation of two national high-speed infrastructures. Both of these networks are at the very forefront of development and demonstrate the way forward at Gigabit speeds. They will focus on the architectures and provide some explanation of the rationale behind the choices made. In addition there will be a presentation on the use of ADSL to provide a high-speed access mechanism to the backbone.

10A1 **High-Speed Access in GigaPort**
Peter Valkenburg, SURFnet, The Netherlands

10A2 **G-WiN - the Gbit/s Infrastructure for the German Scientific Community**
Peter Kaufmann, DFN-Verein, Germany

10A3 **ATM over ADSL Probe in Telecom Italia Environment**
Stanislav Milanovic, Serco Group Plc. and Alessandro Maglianella, Telecom Italia, Italy

09:00 - 10:30 Room B
Session 10B Recent Results
Chair: Brian Gilmore, University of Edinburgh, United Kingdom

This session of the conference provides a forum in which the very latest developments from projects in progress can be presented. With less formal papers and presentations, the recent result session provides a forum for debate and exchange of ideas, and an opportunity to ask questions and give opinions on topical subjects in research networking.

- 10B1 Deploying MPLS on the Czech Academic Backbone**
Ladislav Lhotka, University of South Bohemia, Czech Republic
- 10B2 Making MBone Tools to be Widely Used by Non-Experienced People**
Pedro M. Ruiz Martinez, RedIRIS, Spain
- 10B3 People Power and the Web: Building Quality Controlled Portals**
Debra Hiom, Martin Belcher and Emma Place, Institute of Learning and Research Technology, University of Bristol, United Kingdom
- 10B4 Manchester University Tiny Network Element Monitor (MUTiny NEM) - a Network/Systems Management Tool**
Dave McClenaghan and George Neisser, Manchester Computing, University of Manchester, United Kingdom
- 10B5 Data Mining in Chemistry**
Markus C. Hemmer and Johann Gasteiger, Institute of Organic Chemistry, University of Erlangen-Nürnberg, Germany

10:30 - 11:00 Refreshments Break - Sponsored by Cisco Systems, Inc.

11:00 - 12:30 Room A
Plenary 2 Closing Plenary Session
Chair: David Williams, TERENA President, CERN, Switzerland

Keynote Speech

"Information Technology Research for the 21st Century, NSF Perspective"

Ruzena Bajcsy, Assistant Director of the Directorate for Computer and Information Science and Engineering, National Science Foundation, USA

Conference Summary and Highlights

Claudio Allocchio, TNC-2000 Programme Committee Chairman, GARR, Italy

Farewell Address

David Williams, TERENA President, CERN, Switzerland

Announcement of TERENA Networking Conference 2001

Michael Walsh, TERENA VP Conferences, University College Dublin, Ireland