

Preface

This book constitutes the refereed proceedings of the Second IFIP-TC6 Networking Conference, Networking 2002. Networking 2002 was sponsored by the IFIP Working Groups 6.2, 6.3, and 6.8. For this reason the conference was structured into three tracks: i) Networking Technologies, Services, and Protocols, ii) Performance of Computer and Communication Networks, and iii) Mobile and Wireless Communications.

This year the conference received 314 submissions coming from 42 countries from all five continents Africa (4), Asia (84), America (63), Europe (158), and Oceania (5). This represents a 50% increase in submissions over the first conference, thus indicating that Networking is becoming a reference conference for worldwide researchers in the networking community.

With so many papers to choose from, the job of the Technical Program Committee, to provide a conference program of the highest technical excellence, was both challenging and time consuming. From the 314 submissions, we finally selected 82 full papers for presentation during the conference technical sessions.

To give young researchers and researchers from emerging countries the opportunity to present their work and to receive useful feedback from participants, we decided to include two poster sessions during the technical program. Thirty-one short papers were selected for presentation during the poster sessions.

The conference technical program was split into three days, and included, in addition to the 82 refereed contributions, 5 invited papers from top-level researchers in the networking community.

The technical program also included a panel session, and three invited talks from worldwide leaders – Imrich Chlamtac “Managing Optical Networks in the Optical Domain”, Randy Katz “The Post-PC Era: It’s All About Service”, and Gerald Maguire “Personal Computing and Communication”. The panel session, organized by Andrew T. Campbell (Columbia University), was entitled “Post 9-11 Networking Challenge” and is devoted to the discussion on how to cope with the vulnerabilities of communications systems revealed by the World Trade Center attack on September 11.

This conference would not have been possible without the enthusiastic and hard work of a number of colleagues. First of all, I would like to thank the three track chairs – Andrew T. Campbell, Guy Omidyar, and Moshe Zukerman – for their valuable contribution in setting up the very high quality conference program. A special thanks to the TPC members, and all the referees, for their invaluable

help in reviewing the papers for Networking 2002. Finally, I would like to thank all the authors that submitted their papers to this conference for their interest and time.

March 2002

Marco Conti

Message from the General Chairs

Networking 2002 was organized by the Italian National Research Council (CNR) and Telecom Italia and was sponsored by the IFIP working groups WG 6.2 (Network and Internetwork Architectures), WG 6.3 (Performance of Communication Systems), and WG 6.8 (Wireless Communications). The program of the conference spanned on five days and included the main conference (three days), two tutorial days, and one day of thematic workshops.

The organization of such a complex event required a major effort and we wish to express our sincere appreciation to all the executive committee members for their excellent work.

We would like to express our special appreciation to the main conference technical program chair Marco Conti and to the special track chairs: Andrew T. Campbell, Moshe Zukerman, Guy Omidyar. The overall high quality of the conference technical sessions is the result of a complex evaluation process that they handled in an excellent way.

Special thanks goes to Giuseppe Anastasi and Stefano Basagni for the organization of an original and interesting tutorial program. The conference considered tutorials an important cultural event, and encouraged in several ways, the participation of young researchers in these tutorials. We decided to have a single, modest fee to provide access to all. The tutorial program included nine half-day tutorials organized in three parallel sessions.

Networking 2002 also decided to stimulate thematic events covering hot research topics in the networking field. Three thematic workshops were held: Web Engineering, Peer-to-Peer Computing, and IP over WDM. Hence our third word of thanks goes to the chairs of the thematic workshops: Fabio Panzieri, Ludmilla Cherkasova (Workshop on Web Engineering), Gianpaolo Cugola, Gian Pietro Picco (Workshop on Peer-to-Peer Computing), and Giancarlo Prati, Piero Castoldi (Workshop on IP over WDM).

We are also indebted to our supporters. First of all, CNR not only allowed Enrico Gregori and Marco Conti to dedicate considerable time to the organization of this event, but also financially supported the event through the sponsorship by the CNUCE and IIT institutes. A special thanks to Telecom Italia for joining us in the organization of this event. We are also indebted to our corporate sponsors (Cassa di Risparmio di Pisa, Compaq, Microsoft, and Softech) whose help removed much of the financial uncertainty, involved in the organization of such an event, and who also provided interesting suggestions for the program.

Our last word of gratitude goes to the Web manager Alessandro Urpi and the Web designer Patrizia Andronico. Alessandro created a very fancy and efficient system for the handling of electronic submissions. This system greatly facilitated the paper reviewing process, as well as the preparation of the proceedings. Patrizia was responsible for designing the Networking 2002 Web site that played an important role in the success of the event.

March 2002

Enrico Gregori
Ioannis Stavrakakis

Organizers



Sponsoring Institutions



Organization

Conference Executive Committee

General Chair:

Enrico Gregori, National Research Council, Italy

General Vice-Chair:

Ioannis Stavrakakis, University of Athens, Greece

Technical Program Chair:

Marco Conti, National Research Council, Italy

Special Track Chair for Networking Technologies, Services, and Protocols:

Andrew T. Campbell, Columbia University, USA

Special Track Chair for Performance of Computer and Communication Networks:

Moshe Zukerman, University of Melbourne, Australia

Special Track Chair for Mobile and Wireless Communications:

Guy Omidyar, National University of Singapore

Tutorial Program Co-chairs:

Giuseppe Anastasi, University of Pisa, Italy

Stefano Basagni, Northeastern University, USA

Workshop Chairs:

Workshop 1 — *Web Engineering*

Fabio Panzieri, Università di Bologna, Italy

Ludmilla Cherkasova, Hewlett Packard Labs, USA

Workshop 2 — *Peer to Peer Computing*

Gian Pietro Picco, Politecnico di Milano, Italy

Gianpaolo Cugola, Politecnico di Milano, Italy

Workshop 3 — *IP over WDM*

Giancarlo Prati, Scuola Superiore S. Anna, Italy

Piero Castoldi, Scuola Superiore S. Anna, Italy

Invited Speaker Chair:

Fabrizio Davide, PhD Telecom Italia S.p.A., Italy

Organization Chair:

Stefano Giordano, University of Pisa, Italy

Publicity Chair:

Silvia Giordano, Federal Inst. of Technology Lausanne (EPFL), Switzerland

Laura Feeney, SICS, Sweden

Steering Committee Chair:

Harry Perros, North Carolina State University, USA

Steering Committee Members:

Augusto Casaca, IST/INESC, Portugal

S. K. Das, The University of Texas at Arlington, USA

Erol Gelenbe, University of Central Florida, USA

Harry Perros, NCSU, USA (Chair)

Guy Pujolle, University of Paris 6, France

Harry Rudin, Switzerland

Jan Slavik, TESTCOM, Czech Republic

Hideaki Takagi, University of Tsukuba, Japan

Samir Thome, ENST, France

Adam Wolisz, TU-Berlin, Germany

Electronic Submission:

Alessandro Urpi, University of Pisa, Italy

Web Designer:

Patrizia Andronico, IAT-CNR, Italy

Local organizing Committee:

Renzo Beltrame, CNUCE-CNR, Italy

Raffaele Bruno, CNUCE-CNR, Italy

Willy Lapenna, CNUCE-CNR, Italy

Gaia Maselli, CNUCE-CNR, Italy

Renata Bandelloni, CNUCE-CNR, Italy

Technical Program Committee

Special Track for Networking Technologies, Services, and Protocols

Ian Akyldiz, Georgia Institute of Technology, USA

Andrea Basso, AT&T Labs Research, USA

Edoardo Biagioni, University of Hawaii at Manoa, USA

Giuseppe Bianchi, University of Palermo, Italy

Andrea Bianco, Politecnico di Torino, Italy

Claude Castelluccia, INRIA, France

Piero Castoldi, Scuola Superiore Sant'Anna, Italy

Piergiorgio Cremonese, Netikos, Italy

Jon Crowcroft, Cambridge University, UK
 Christophe Diot, Sprint, USA
 Serge Fdida, Université Pierre et Marie Curie, France
 Tiziana Ferrari, INFN-CNAF, Italy
 Luigi Fratta, Politecnico di Milano, Italy
 Maurice Gagnaire, Ecole Nationale Supérieure des Telecommunications,
 France
 Dieter Gantenbein, IBM Research Laboratory - Zurich, Switzerland
 Per Gunningberg, Uppsala University, Sweden
 Salim Hariri, The University of Arizona, USA
 David Hutchison, Lancaster University, UK
 Bijan Jabbari, George Mason University, USA
 Mohan Kumar, The University of Texas at Arlington, USA
 Alfio Lombardo, University of Catania, Italy
 Nicholas F. Maxemchuk, Columbia University, USA
 Derek McAuley, Marconi Labs, Cambridge, UK
 Refik Molva, Institut Eurécom, France
 Guido H. Petit, Alcatel, Belgium
 Chiara Petrioli, University “La Sapienza” Rome, Italy
 Luigi Rizzo, Univeristy of Pisa, Italy
 Roberto Sabella, Ericsson, Italy
 Michael I. Smirnov, FHI FOKUS, Germany
 Andras Valko, Ericsson, Sweden
 Giorgio Ventre, Università di Napoli Federico II, Italy
 Lars Wolf, University of Karlsruhe, Germany
 Stefano Zatti, ESA/ESRIN, Italy

Special Track for Performance of Computer and Communication Networks

Ron Addie, University of Southern Queensland, Australia
 Marco Ajmone, Marsan Politecnico di Torino, Italy
 Eitan Altman, INRIA, France
 Lachlan Andrew, The University of Melbourne, Australia
 Andrea Baiocchi, University “La Sapienza” Rome, Italy
 Chris Blondia, University of Antwerp, Belgium
 Herwig Bruneel, University of Ghent, Belgium
 Werner Bux, IBM Research Laboratory - Zurich, Switzerland
 Mariacarla Calzarossa, University of Pavia, Italy
 Olga Casals, Universitat Politècnica de Catalunya, Spain
 Nelson Fonseca, State University of Campinas, Brazil
 Peter Harrison, Imperial College, UK
 Farouk Kamoun, Tunisia
 Peter Key, Microsoft Research Ltd, Cambridge, UK
 Ulf Korner, Lund University, Sweden
 Demetres Kouvatsos, University of Bradford, UK

Debasis Mitra, AT&T Bell Laboratories, USA
Sandor Molnar, Budapest University of Technology and Economics, Hungary
Tim Neame, Telstra Research Laboratories, Australia
Ilkka Norros, VTT, Finland
Ramon Puigjaner, Universitat de les Illes Balears, Spain
Jim Roberts, France Telecom, France
Yutaka Takahashi, Kyoto University, Japan
Don Towsley, University of Massachusetts, USA
Phuoc Tran-Gia, University of Würzburg, Germany
Jorma Virtamo, Helsinki University of Technology, Finland
Maria C. Yuang, National Chiao Tung University, Taiwan
Bartek Wydrowski, The University of Melbourne, Australia

Special Track for Mobile and Wireless Communications:

Victor Bahl, Microsoft Research, USA
Roberto Battiti, University of Trento, Italy
Luciano Bononi, University of Bologna, Italy
Azzedine Boukerche, University of North Texas, USA
Franco Davoli, University of Genova, Italy
Khaled Elsayed, Cairo University, Egypt
Anthony Ephremides, University of Maryland, USA
Kari-Pekka Estola, Nokia Research Center, Finland
Laura M. Feeney, SICS, Sweden
Gabor Fodor, Ericsson, Sweden
Jerome Galtier, INRIA, France
Mario Gerla, University of California at Los Angeles, USA
Silvia Giordano, ICA-DSC-EPFL, Switzerland
Zygmunt Haas, Cornell University, USA
Pascal Lorenz, Université de Haute Alsace, France
Thomas Luckenback, FhG Fokus, Germany
Gerald Maguire, Royal Institute of Technology, Sweden
Stephan Olariu, Old Dominion University, USA
George Polyzos, Athens University of Economics and Business, Greece
Jiang Shengming, National University of Singapore, Singapore
Violet R. Syrotiuk, University of Texas at Dallas, USA
Ivan Stojmenovic, University of Ottawa, Canada
Terry Todd, McMaster University, Canada
Nitin Vaidya, Texas A&M University, USA
Roberto Verdone, CSITE - CNR, Italy
Jeff Wieselthier, Naval Research Laboratory, USA

Referees

Samuli Aalto
Ron Addie

Ian Akyldiz
Khalid Al-begain

Guido Albertengo
Eitan Altman

Lachlan Andrew
Csaba Antal
Panagiotis Antoniadis
Irfan Awan
Andrea Baiocchi
Dennis Baker
Mario Baldi
Mark Banfield
Chadi Barakat
Jose Barcelo
Novella Bartolini
Stefano Basagni
Andrea Basso
Roberto Battiti
Daniel Bauer
Sergio Beker
Sebastien Bertrand
Supratik Bhattacharyya
Edoardo Biagioni
Giuseppe Bianchi
Andrea Bianco
Michael Biggar
Jozsef Biro
Mats Bjorkman
Chris Blondia
Bernd Bochow
Rene Boel
Luciano Bononi
Tamas Borsos
Alessandro Bosco
Azzedine Boukerche
Onno Boxma
Rafik Braham
Hartmut Brandt
Alberto Bricca
Mauro Brunato
Raffaele Bruno
Sonja Buchegger
Laurent Bussard
Werner Bux
Mariacarla Calzarossa
Andrew Campbell
Roberto Canonico
Antonio Capobianco
Georg Carle

Olga Casals
Ramon Casellas
Claudio Casetti
Maurizio Casoni
Claude Castelluccia
Piero Castoldi
Nedo Celandroni
Llorenc Cerda
Walter Cerroni
Carla Chiasserini
Phil Chimento
Kwan-wu Chin
Chen-nee Chuah
Tibor Cinkler
Touati Corinne
Luis Costa
Piergiorgio Cremonese
Jon Crowcroft
Filippo Cugini
John Cushnie
Jeremy De Clercq
John Daigle
Olivier Dalle
Davide Dardari
Maurizio Darienzo
Bruce Davie
Franco Davoli
Stijn De Vuyst
Andrea De Vendictis
Christophe Deleuze
Francesco Delfino
Luca Dell'Uomo
Jing Deng
Ada Diaconescu
Gianluca Dini
Christophe Diot
Constantinos Dovrolis
Anca Dracinschi-sailer
Adam Dunkels
Martin Dunmore
Larry Dunn
Amre El-hoiydi
Didier Erasme
Christopher Edwards
Wolfgang Effelsberg

Viktoria Elek
Khaled Elsayed
Anthony Ephremides
Vincenzo Eramo
Alberto Escudero-Pascual
Marcello Esposito
Kari-pekka Estola
Nader Fahmy
Romano Fantacci
Laura Feeney
Meiping Feng
Tiziana Ferrari
Afonso Ferreira
Joe Finney
Paul Fitzpatrick
Gabor Fodor
Chuan Foh
Nelson Fonseca
Luigi Fratta
Laurent Frelechoux
Rod Fretwell
Hiroki Furuya
Philippe Godlewski
Dominique Grad
Maurice Gagnaire
Giulio Galante
Jerome Galtier
Dieter Gantenbein
Jorge Garcia
Rosario Garroppo
Michael Gau
Yu Ge
Mario Gerla
Vittorio Ghini
Marco Ghizzi
Paolo Giaccone
Giovanni Giambene
Chris Giblin
Silvia Giordano
Alessandra Giovanardi
Gaby Goldacker
Marcel Graf
Enrico Gregori
Fredrik Gunnarsson
Per Gunningberg

Gary Hanson	Koen Laevens	Enrico Milani
Robert Haas	Willy Lapenna	Jens Milbrandt
Stephen Hanly	John Larson	Debasis Mitra
Uli Harder	Pasi Lassila	Gergely Molnar
Salim Hariri	Gwendal Le Grand	Sandor Molnar
Jarmo Harju	Jean-Yves Le Boudec	Refik Molva
Richard Harris	Chris Lechie	Tim Moors
Peter Harrison	Sunj-Ju Lee	Giacomo Morabito
Dajiang He	Oscar Lepe	Sayandev Mukherjee
Jens Huenerberg	Yuhong Li	Rami Mukhtar
David Hutchison	Ben Liang	Maurizio Munafò
Esa Hyyti	Xinhua Ling	Pars Mutaf
Christian Hertnagl	Cati Llado	Gaurav Navlakha
Gianluca Iannaccone	Francesco Lo Presti	Tim Neame
Lengliz Ilhem	Alfio Lombardo	Giovanni Neglia
Sandor Imre	Rui Lopes	Marcel Neuts
Hazer Inalteki	Pascal Lorenz	Gam Nguyen
Veronique Inghelbrecht	Flaminia Luccio	Saverio Niccolini
Paola Iovanna	Stefano Lucetti	Ilkka Norros
Nando Iscra	Thomas Luckenback	Antonio Nucci
Milosh Ivanovich	Andrey Lyakhov	Eeva Nyberg
Bijan Jabbari	Joseph Macker	Stephan Olariu
Laura Jackson	Gerald Maguire	Ertan Ozturk
Yuming Jiang	Szabolcs Malomsoky	Dimitri Papadimitriou
Mai Jin	Dave Maltz	Fabrice Poppe
Josue Kuri	Roberto Mameli	Panagiotis Papadimitratos
Ahmed Kamal	Eleonora Manconi	Dina Papagianaki
Farouk Kamoun	Vincenzo Mancuso	Davide Parisi
Holger Karl	Petteri Mannersalo	Laurence Park
Gunnar Karlsson	Mario Marchese	Gianni Pasolini
Jouni Karvo	Chiani Marco	Andrea Passarella
Hiroyuki Kawano	Dan Marinescu	Tao Peng
Mitchell Ken	Cristina Martello	Antonio Pescapè
Csaba Keszei	Fabio Martignon	Fabien Petitcolas
Peter Key	Piergiulio Maryni	Alexandru Petrescu
Dr Khairy	Laurent Mathy	Chiara Petrioli
Kalevi Kilkki	Nicholas Maxemchuk	Dimitrios Pezaros
Andreas Kind	Derek Mcauley	Tom Pfeifer
Ulf Korner	Octavio Medina	George Polyzos
Demetres Kouvatsos	John Mellor	Francesco Potorti
Ferenc Kubinszky	Michael Menth	Fabio Pugini
Mohan Kumar	Michela Meo	Ramon Puigjaner
Pirkko Kuusela	Bernard Metzler	Guy Pujolle
Stefan Kehler	Pietro Michiardi	Rudesindo Queija
Chia Lee	Gyorgy Miklos	Nicholas Race

Andras Racz	Charles Shen	Zoltan Turanyi
Carla Raffaelli	Jiang Shengming	Kurt Tutschku
Jianqiang Rao	Kasahara Shoji	Alessandro Urpi
Christoph Reichert	Steven Simpson	Masafumi Usuda
Franklin Reynolds	Dorgham Sisalem	Peter Vetter
Jose Rezende	Tara Small	Mickey Vucic
Fabio Ricciato	Michael Smirnov	Francesco Vacirca
Ad Ridder	Paul Smith	Nitin Vaidya
Herve Rivano	Sergios Soursos	Luca Valcarenghi
Romeo Rizzi	Kathleen Spaey	Benny Van Houdt
Luigi Rizzo	Dirk Staehle	Vasos Vassiliou
Jim Roberts	George Stamoulis2	Giorgio Ventre
Vincent Roca	Burkhard Stiller	Roberto Verdone
Marco Rocchetti	Ivan Stojmenovic	Andras Veres
Hermann Rohling	Moon Sue	Rolland Vida
Simon Romano	Violet Syrotiuk	Attila Vidacs
Miklos Ronai	Csanad Szabo	Jorma Virtamo
Sean Rooney	Istvan Szabo	Thiemo Voigt
Yves Roudier	Robert Szabo	Hai Le Vu
George Rouskas	Wayne Szeto	Krzysztof Wajda
Alain Roy	Marco Tacca	Joris Walraevens
Romit Roychoudhury	Nina Taft	Eric Wang
Giuseppe Ruggeri	Yutaka Takahashi	Andreas Wespi
Jussi Ruutu	Christina Tavoularis	Jeff Wieselthier
Winston Seah	Ben Teitelbaum	Lars Wolf
Mike Sexton	David Thornley	Mike Woodward
Roberto Sabella	Neame Tim	Bartek Wydrowski
Stefano Salsano	Ilenia Tinnirello	Yang Xue
Elio Salvadori	Carsten Tittel	George Xylomenos
Prince Samar	Terry Todd	Miki Yamamoto
Volker Sander	Petia Todorova	Jackson Yin
Takashi Sasaki	Samir Tohme	Maria Yuang
Durga Satapathy	Samir Tohme2	Gergely Zaruba
Paolo Scotton	Don Towsley	Stefano Zatti
Nabil Seddigh	Velio Tralli	Artur Ziviani
Ahmed Sehrouchni	Phuoc Tran-gia	Moshe Zukerman
Faisal Shad	Linh Truong	
N. Shankaranarayanan	Jaidi Tuah	

NETWORKING 2002: Networking Technologies, Services,
and Protocols; Performance of Computer and
Communication Networks; Mobile and Wireless
Communications

Second International IFIP-TC6 Networking Conference,
Pisa, Italy, May 19-24, 2002 Proceedings

Gregori, E.; Conti, M.; Cambell, A.T.; Omidyar, G.;
Zukerman, M. (Eds.)

2002, XXVI, 1256 p., Softcover

ISBN: 978-3-540-43709-3