DECEMBER 6-9, 1992

ORLANDO

GLOBECOM '92

COMMUNICATION FOR GLOBAL USERS

IEEE GLOBAL TELECOMMUNICATIONS CONFERENCE • ORLANDO • FLORIDA

Including a Communications Theory Mini-Conference

Technical Program
Conference Record

<table>
<thead>
<tr>
<th>Volume</th>
<th>Day</th>
<th>Sessions</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MONDAY</td>
<td>1-18</td>
<td>1 - 648</td>
</tr>
<tr>
<td>2</td>
<td>TUESDAY</td>
<td>19-36B</td>
<td>649 -1254</td>
</tr>
<tr>
<td>3</td>
<td>WEDNESDAY</td>
<td>37-54</td>
<td>1255 -1920</td>
</tr>
</tbody>
</table>

Sponsored by the IEEE Communications Society and the Orlando IEEE Section

IEEE COMMUNICATIONS SOCIETY

IEEE
TABLE OF CONTENTS

Volume I

SESSION 01
Wireless Data Network in PCS

ORGANIZERS:  Yow-Jong Liu, GTE Laboratories, Inc., USA
K-C Chen, National Tsing Hua University, Taiwan

CHAIRPERSON:  Yow-Jong Liu
Don Fye, GTE Laboratories, USA

SPONSOR:  Data Communications Systems
Communication Theory

Oral Presentation

01.01 Analysis of Measurement Based Prioritization Schemes for Handovers in Cellular Networks
Sirin Tekinay, Bijan Jabbari, George Mason University, USA ................................. 1

01.02 Fair and Efficient Transmission Scheduling in Multihop Packet Radio Networks
Kwok-Wah Hung, Hong Kong Polytechnic, Hong Kong, T-S Yum, Chinese University of Hong Kong ................................. 6

01.03 Handover Protocols between Metropolitan Area Networks Gregory Pollini, Kathleen Meier-Hellstern, AT&T Bell Lab, U.S.A.,
David J. Goodman, Rutgers University, USA ................................. 11

01.04 Performance Evaluation of a Reservation Random Access Scheme for Packetized Wireless Systems With Call Control
Izhak Rubin, Shervin Shambayati, Univ of California-Los Angeles, USA ................................. 16

01.05 Multichannel ALOHA Data Network for Personal Communications Services (PCS)
Z. Zhang, Columbia University, USA, Yow-Jong Liu, GTE Laboratories Inc, USA ................................. 21

01.06 Voice Packet Losses and Data Integration in Reservation Random Access Protocols for Wireless Access Networks
Lazaros Merakos, Shrirang Jangi, Northeastern University, USA ................................. 26

SESSION 02
Coding and Equalization for Digital Subscriber Loops

ORGANIZER:  Joseph Lechleider, Bellcore, USA

CHAIRPERSON:  Ken Kerpez, Bellcore, USA

SPONSOR:  Communication Theory

Oral Presentation

02.01 Impulse Noise Performance of an Asymmetrical Digital Subscriber Lines Passband Transmission System
M. Barton, Bellcore, USA ................................. 32

02.02 An Adaptive Impulse Noise Canceler for Digital Subscriber Lines
J. W. Lechleider, Bellcore, USA ................................. 36
02.03 The Range of Baseband ADSLs as a Function of Bit Rate  
Kenneth Kerpez, Bellcore, USA ........................................ 40

02.04 Very High-Speed Digital Transport Capability of Passband ADSL  
M. Barton, Lora Chang, T. R. Hsing, Bellcore, USA .................. 45

02.05 Coordinated Transmission Without Power Variations  
Gregory J. Pottie, Univ of California-Los Angeles, USA, M. Vedat  
Eyuboglu, Motorola Codex, USA ......................................... 49

02.06 Optimal MMSE Transmission using Block Encoder/Decoder and DFE  
J. Yang, Sumit Roy, University of Pennsylvania, USA ............... 54

02.07 Bandwidth Optimization for High-Speed Data Transmission over Channels  
with Severe Intersymbol Interference  
Peter S. Chow, John M. Cioffi, Stanford University, USA .......... 59

02.08 HDSL Transceiver Performance Optimization  
Walter Y. Chen, Bellcore, USA ........................................... 64

SESSION 03  
Advances in Digital Mobile Networks

ORGANIZER: A. K. Kakaes, George Washington University, USA  
CHAIRPERSON: A. K. Kakaes  
SPONSOR: Communication Theory

Oral Presentation

03.01 CDMA Reverse Link Open Loop Power Control  
Samir Soliman, Charles Wheatley, Roberto Padovani, Qualcomm Inc., USA .................................................. 69

03.02 Power Amplification Techniques for Linear TDMA Base Stations  
R. J. Wilkinson, P. B. Kenington, J. D. Marvill University of  
Bristol, UK ........................................................................ 74

03.03 Evolution of NTT's Nationwide Mobile Communications Network  
Yusuke Noguchi, Masaki Shirota, NTT, Japan ........................... 79

03.04 A Study of Data Transmission and Related Performance Analyses through  
Cellular Communication Systems  
Chuan Wang, Jianli Wang, Yanhe Fan, Beijing Univ of Posts &  
Telecomm., P R China ......................................................... 84

03.05 Transmission Algorithms for a Multi-Channel Packet Radio System with  
Priority Users  
P. Papantoni-Kazakos, H. Delic, University of Virginia, USA, M.  
Paterakis, University of Delaware, USA, M. Liu, COMSAT Laboratories, USA ......................................................... 89

03.06 The Gaussian Non-Cooperative Multiple Access Channel with Rayleigh  
Fading  
Marcelo Alencar, University of Waterloo, Canada .................... 94

03.07 A Generic Model for Tetherless Access to the Telephone Network  
J. W. Lechleider, Bellcore, USA ........................................... 98
SESSION 05
ATM Switching Experiments and Future Research

ORGANIZER:  M. de Prycker, Alcatel Bell Telephone, Belgium
CHAIRPERSON: Sol Lederman, Bellcore, USA
SPONSOR:  Communication Switching

Oral Presentation

05.01 Datagram Switching Networks for Broadband Data Communications
M. Decina, P. Giacomazzi, A. Pattavina, E. Tombolini, Politecnico di Milano/CEFREL, Italy  ................................................................. 104

05.02 A High-Performance Prototype 2.5 Gb/s ATM Switch for Broadband Applications
K. Y. Eng, M. A. Pashan, R. A. Spanke, M. J. Karol, G. D. Martin, AT&T
Bell Laboratories, USA  ................................................................. 111

05.03 An Experimental ATM Network Featuring De-coupled Modular Control
David Giddy, Rob Palmer, Telecom Australia Research Lab, Australia  ................................................................. 118

05.04 High-Speed Switching Module for a Large Capacity ATM Switching System
Hiroshi Tomonaga, Naoki Matsuoka, Yuji Kato, Yuu Watanabe, Fujitsu
Laboratories Ltd, Japan  ................................................................. 123

05.05 Management of Cell Delay Variation in ATM Networks
Fabrice Guillemin, Wei Monin, CNET Lannion-A, France  ................................................................. 128

05.06 A Large Scale ATM Switching Network with Sort-Banyan Switch Modules
Joseph Hui, Rutgers University, U.S.A. T.-H. Lee, National Chiao-Tung
University, Taiwan  ................................................................. 133

05.07 A Practical Configuration of Very Large Scale ATM Switching Networks
Kaoru Sezaki, Y. Yasuda, University of Tokyo, Japan  ................................................................. 138

SESSION 06
Optical Subscriber Access Technologies

ORGANIZERS:  Steve Gorshe, NEC America, USA
William Stephens, Bellcore, USA

CHAIRPERSON: George Hawley, DSC Communications, Canada
H. L. Lemberg, Bellcore, USA

SPONSOR:  Transmission Systems
Optical Communications

Oral Presentation

06.01 SONET-Based TR-303 RDTs: Transitional Interoperability Concerns and Solutions
Henry M. Jabieck, Ram B. Misra, Bellcore, USA  ................................................................. 143

06.02 Local Area Service Node Based on SDH for Fiber-Optic Subscriber Network
Hisao Tsuji, I. Yamashita, NTT Transmission Systems Lab, Japan  ................................................................. 148

06.03 Active Node Location in Multiservice FTTH Networks
Hideyo Morita, Motoi Iwashita, Noriyuki Ikeuchi, NTT Telecomm.
Networks Lab, Japan  ................................................................. 153
06.04 6.3 Mb/s SONET-Based Lightwave Multiplexer
Surinder Latti, Mark Grimes, Hamid Rezaie, Mark Barratt, Fujitsu
Network Trans. Systems Inc., USA .................................................. 160

06.05 Fibre to the Residential Customer
Gerrard Gobi, Carl Lundquist, ELLEMTEL Utvecklings AB, Sweden, Bernd
Hüllerich, Daimler-Benz Research, Germany, Mark Perry, GEC-Marconi
Hirst Research Centre, UK .......................................................... 165

06.06 Transmission of STS-3c (155 Mbit/sec) SONET/ATM Signals over Unshielded
and Shielded Twisted Pair Copper Wire
W. E. Stephens, T. C. Banwell, G. R. Lalk, T. J. Robe, K. C. Young,
Bellcore, USA ........................................................................... 170

06.07 Discrete Time Dynamic Flow Model of DQDB Behavior
Janusz Filipiak, University of Mining & Metallurgy, Poland, Sayed
Nouh, University of Al-Azhar, Egypt .............................................. 175

SESSION 07
Interconnections Within High Speed Systems

ORGANIZER: Ken Young, Bellcore, USA
CHAIRPERSON: Ken Young
SPONSOR: Interconnections Within High-Speed Digital Systems

Oral Presentation

07.01 Interconnections/Micro-Networks for Integrated Microelectronics
S. K. Tewksbury, M. Uppulri, L. A. Hornak, West Virginia
University, USA ........................................................................... 180

07.02 Photonic Inter-Module Connector Using Silica-Based Optical Switches
Toshio Ito, Akira Himeno, NTT Communication Switching Lab, Japan,
Kazumasa Takada, Kuniharu Katoh, NTT Opto-electronics Laboratories,
Japan ......................................................................................... 187

07.03 A Novel Integrated-Optic WDM Cross-Connect for Wavelength Routing Networks
Mahmoud Tabiani, Mohsen Kavehrad, University of Ottawa, Canada,
Mansour I. Irshid, Jordan Univ.of Science & Technology, Jordan 192

07.04 A General-Purpose Link Interface Chipset for Gigabit Rate Data
Communication
C. Yen, R. Walker, C. Stout, B. Lai, J. Wu, Hewlett Packard, USA 197

07.05 User Perspectives on Intrasystem Optical Interconnection in SONET/SDH
Transmission Terminals
Gary J. Grimes, Byung H. Lee, Stephen Peck, AT&T Bell Laboratories,
USA ......................................................................................... 201

07.06 Implementation Issues for Very-Large-Capacity ATM Switching Fabrics
Optically Intra-Connected
Shigeki Hino, Shigeo Urushidani, Jun Nishikido, K. Yamasaki, NTT
Communication Switching Lab, Japan ......................................... 208
SESSION 08A
Networking for Multimedia Applications
HALF

ORGANIZERS: Mon-Song Chen, IBM, USA
              T. Chen, GTE Laboratories, Inc, USA
              S. S. Liu, GTE Laboratories, Inc, USA
CHAIRPERSON: Mon-Song Chen
SPONSOR: Multimedia Services & Terminals
          Computer Communications

Oral Presentation

08A.01 Designing a Distributed Collaborative Environment
Mon-Song Chen, IBM T.J. Watson Research Center, USA, Harrick M. Vin,
Univ of California-San Diego, USA, Tzipora Barzilai, IBM T.J. Watson
Research Center, USA ........................................... 213

08A.02 A Continuous Media Communication Service and its Implementation
D. Ferrari, Amit Gupta, Mark Moran, Int'l Computer Science Institute,
USA, Bernd Wolfinger, University of California-Berkeley, USA, .................. 220

08A.03 And Call Processing Signaling in a Desktop Multimedia Conferencing
System
Wan-teh Chang, University of California, USA, Ning Chang, Broadband
Network Service, USA, David G. Messerschmi, University of California,
USA ................................................................. 225

08A.04 Optimal Scheduling of Delayable Videos in Video Distribution Networks
Siu-Man Mok, Tak-Shing P. Yum, Chinese University of Hong Kong,
Hong Kong ............................................................ 230

SESSION 08B
Advances in Image Processing
HALF

ORGANIZER: Yeheskel Bar-Ness, New Jersey Institute of Technology, USA
CHAIRPERSON: Yeheskel Bar-Ness
SPONSOR: Communications System Engineering

Oral Presentation

08B.01 Wavelet-Coded Image Transmission over Land Mobile Radio Channels
Yow-Jong Liu, Ya-Qin Zhang, GTE Laboratories Inc, USA .......................... 235

08B.02 A Fixed-Rate Product Pyramid Vector Quantization Using a Bayesian Model
Pavel Filip, Michael J. Ruf, German Aerospace Research Est (DLR),
Germany .................................................................. 240

08B.03 Mixing and Playback of JPEG Compressed Packet Videos
Zon-Yin Shoe, Mon-Song Chen, IBM T.J. Watson Research Center, USA ....... 245

08B.04 A Novel Adaptive Subspace Distortion Measurement Technique for Image
Vector Quantization
Lai-man Po, Chok-ki Chan, City Polytechnic of Hong Kong, Hong Kong ........ 250
SESSION 09A
Application of Object-Oriented Technology to Telecommunications Systems HALF

ORGANIZER:  William Woodbury, Bellcore, USA
CHAIRPERSON:  Cheng C. Liu, Bellcore, USA
SPONSOR:  Communications Software

Oral Presentation

09A.01  A Study on Storing Managed Objects in Object Oriented Database for Local Fiber Optical Networks following Management Information Tree  
Kouzou Sakae, Makoto Kawashima, T. Yasushi, NTT Transmission Systems Lab, Japan ......................................................... 255

09A.02  Application of Object-Oriented Techniques to Subscriber Cable Network Management System  
Tetsuji Abe, Yutaka Mitsunaga, Yasuyuki Kato, Hiroaki Koga, NTT, Japan .......................................................... 260

09A.03  Experiences in Using Object-Oriented Technology in the Development of the Space™ System  
Susan K. K. Man, Bellcore, USA .................................................... 265

09A.04  Introducing Object-Orientation in a Mainframe Software Development Organization  
John Alfano, Paul Matthews, Bellcore, USA ........................................... 274

SESSION 09B
Users’ Tools for Services and Network Management HALF

ORGANIZER:  Roberto Saracco, CSELT, Italy  
CHAIRPERSON:  Roberto Saracco  
SPONSOR:  Network Operations & Management

Oral Presentation

09B.01  Towards Open Networks Supporting Customer Control Services  
Roberto Saracco, Valerie Bigaroni, Mario Calabrese, Daniela Long, N. Lumello, CSELT, Italy ..................................................... 279

09B.02  Effective Service Engineering Through Software Design Reuse  
Steven Whalley, Nicholas Kings, Paul Rea, British Telecom Research Lab, UK ...................................................... 284

09B.03  ATM Operating System: A Distributed Control for ATM Customer Premises Networks  
Faramak Vakil, Bellcore, USA ......................................................... 289

09B.04  Context Driven Call: Principles  
Valery Rancov, Bulgarian Academy of Sciences, Bulgaria, Rumen Stainov, Aachen University of Technology, Germany .............................................. 296
### SESSION 10
Integrated Data/Voice/Video Transport in ATM Networks

**ORGANIZER:** Ya-Qin Zhang, GTE Laboratories, Inc, USA  
**CHAIRPERSON:** Raymond Pickholtz, George Washington University, USA  
**SPONSOR:** Data Communications Systems

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.01</td>
<td>ATM Support in a Transparent Network</td>
<td>Inder Gopal, Roch Guerin, Jim Janniello, Vasilios Theoharakis, IBM</td>
<td>301</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T.J. Watson Research Center, USA</td>
<td></td>
</tr>
<tr>
<td>10.02</td>
<td>An ATM Queue Manager with Multiple Delay and Loss Priorities</td>
<td>H. J. Chao, Necdet Uzun, Polytechnic University, USA</td>
<td>308</td>
</tr>
<tr>
<td>10.03</td>
<td>On VBR Video Teleconferencing Over ATM Networks</td>
<td>Amy R. Reibman, Arthur W. Berger, AT&amp;T Bell Laboratories, USA</td>
<td>314</td>
</tr>
<tr>
<td>10.04</td>
<td>A Fast Feature Matching Algorithm of Multi-Resolution Motion Estimation</td>
<td>Xiaobing Lee, A. Leon-Garcia, University of Toronto, Canada</td>
<td>320</td>
</tr>
<tr>
<td>10.05</td>
<td>Modeling and Queueing Analysis of Variable-Bit-Rate Coded Video Sources in ATM Networks</td>
<td>Nasser Marafih, University of Qatar, India, Ya-Qin Zhang, GTE Laboratories Inc, USA, Raymond Pickholtz, George Washington University, USA</td>
<td>325</td>
</tr>
<tr>
<td>10.06</td>
<td>Analysis of Scheduling Algorithms for Integrated-Services Networks using a Semi-Fluid-Flow Model</td>
<td>Jon M. Peha, Carnegie Mellon University, USA</td>
<td>330</td>
</tr>
<tr>
<td>10.07</td>
<td>Optimal Routing in Mixed Media Networks with Integrated Voice and Data Traffic</td>
<td>Shihwei Chen, John S. Baras, University of Maryland, USA</td>
<td>335</td>
</tr>
</tbody>
</table>

### SESSION 11
Synchronization

**ORGANIZER:** H. Sari, SAT Telecommunications Division, France  
**CHAIRPERSON:** H. Sari  
**SPONSOR:** Communication Theory

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.01</td>
<td>Performance of A Frequency Detectors Based on the Maximum Likelihood Principle</td>
<td>A. N. D'Andrea, U. Mengali, Universita di Pisa, Italy</td>
<td>340</td>
</tr>
<tr>
<td>11.02</td>
<td>Simplified Versions of the Maximum-Likelihood Frequency Detector</td>
<td>G. Karam, F. Daffara, Hikmet Sari, SAT Telecommunications Division, France</td>
<td>345</td>
</tr>
<tr>
<td>11.03</td>
<td>Cycle Slipping Behavior of NDA Feedforward Carrier Synchronizers for Time-varying Frequency-none-selective Fading Channels</td>
<td>Geert De Jonghe, Marc Moeneclaey, University of Ghent, Belgium</td>
<td>350</td>
</tr>
</tbody>
</table>
11.04 ML-Oriented NDA Symbol Synchronizers for Time-Varying Nonselective Fading Channels  
*Kaj Goethals, Marc Moeneclaey, University of Ghent, Belgium* ........................................ 355

11.05 A Recursive Algorithm for the Estimation of Symbol Timing in PSK Burst Modems  
*L. P. Sabel, Tech. Org., W. G. Cowley, University of South Australia, Australia* .......................... 360

11.06 A Generalized Frame Synchronizer  
*Patrick Robertson, German Aerospace Research Est (DLR), Germany* ........................................ 365

11.07 Phase and Frequency Detectors for Clock Synchronization in High-Speed Optical Transmission Systems  
*Hikmet Sari, H. Houeix, G. Karam, SAT Telecommunications Division, France* .............................. 370

SESSION 12  
Network Element Initial Verification Tools and Methods

**ORGANIZER:** David B. Waechter, Bellcore, USA  
**CHAIRPERSON:** A. Fountoukidis, Bellcore, USA  
**SPONSOR:** Quality Assurance Management

**Oral Presentation**

12.01 Methods and Tools for ISDN and Intelligent Network Qualification  
*Giulio Brusasco, A. de Bosio, L. Gabrielli, P. Marchese, E. Viale, CSELT, Italy* .............................. 375

12.02 A Verification Method for Service Script of the Intelligent Network  
*Masahiro Hori, M. Ito, Yuji Fukunaga, T. Nagaishi, NTT Software Laboratories, Japan* .................. 380

12.03 Assuring Integrity in a Changing BT Network  
*Dave Turtle, Arthur Hiett, BT Worldwide Networks, UK* .............................................................. 385

12.04 Singapore Telecom's Digital Performance Monitoring System Implementation  
*Hui Ann Lim, Singapore Telecom, Singapore, KokKeong Chan, HengTian Choo, TELECOM, Japan* ....... 390

12.05 Testing of ISDN Protocols  
*Werner H. Mayer, Heinz E. Hastauer, Deutsche Bundespost Telekom, Germany* ............................. 394

12.06 A Methodology for Designing and Executing ISDN Feature Tests, Using Automated Test Systems  
*William B. Perkinson, Bellcore, USA* ................................................................. 399

12.07 From Islands to Interoperability:  
Technical Analysis of National ISDN-1 Capabilities  
*William J. Smith, Bellcore, USA, Daryl Roepke, Bell Atlantic, USA* ........................................ 404
SESSION 13
Advanced Satellite Communication Systems and Techniques

ORGANIZERS:  Norman Toms, MPR Teletech Ltd, Canada
               S. Kato, NTT, Japan

CHAIRPERSON:  R. Matyas, MPR Teletech Ltd., Canada

SPONSOR:      Satellite & Space Communications

Oral Presentation

13.01 Performance Evaluation of High Level Coded Modulation over Satellite Channels
P. Fines, A. H. Aghvami, King's College London, UK ......................... 417

13.02 A High Speed QPSK/OQPSK Digital Burst Modem for LSIC Implementation

13.03 Successive-Erasure Decoding of RS-Coded MPSK Schemes in a Rayleigh Fading Channel
S. H. Jamali, Tehran University, Iran, Tho Le-Ngoc, Concordia University, Canada .................................. 427

13.04 Viterbi Decoder Design and Performance Evaluation for Mobile Satellite Fading Channels
C. Y. Huang, H. Chalmers, COMSAT Corporation, USA ......................... 432

13.05 Broadband Mobile Satellite Communication System by LEO-SATs and Optical ISLs
M. Fujise, M. Nohara, K. Uehara, Wataru Chujo, ATR Communications System Res Lab, Japan ...................................... 437

13.06 Experimental Advanced Mobile Satellite Communications System in MM-Wave and Ka-Band Using Japan's COMETS
Makoto Takeuchi, S. Isobe, N. Hamamoto, Shingo Ohnori, Communication Research Laboratory, Japan, Minoru Yamamoto, Telecommunications Satellite Corp., Japan ....................................... 443

SESSION 14
DSP in Communications

ORGANIZER:  Dion M. Funderburk, Motorola Inc., DSP Applications, USA

CHAIRPERSON: Peter J. McLane, Queen's University, Canada
               Dion M. Funderburk

SPONSOR:      Signal Processing & Communication Electronics

Oral Presentation

14.01 Real-time Implementation of a 9.6 kbit/s ACELP Wideband Speech Coder
R. Salami, Claude Laflamme, J-P Adoul, University of Sherbrooke, Canada ............................................ 447

14.02 Rate-Distortion Function for Speech Coding based on Perceptual Distortion Measure
Aloknath De, McGill University, Canada, Peter Kabal, Universite du Quebec, Canada ........................................ 452
14.03 A Digital AM Radio with CQUAM Stereo
Sangil Park, Dion M. Funderburk, Motorola Digital Signal Processing, USA .................................................. 457

14.04 Digital Implementation of Radio
J. Lodge, V. Szwarc, Communications Research Centre, Canada ................................................................. 462

14.05 Pulse-Shaping Filters for Digital Transmission Systems
Markku Renfors, Tapio Saramaki, Tampere University of Technology, Finland ........................................ 467

14.06 Filter Coefficient Interpolated Timing Recovery in Sampled Coherent PSK Receivers
Peter J. McLane, W. Choy, T. Tay, Queen’s University, Canada ................................................................. 472

14.07 VLSI Video CODEC Using Programmable DSP
Tetsuo Tajiri, Yutaka Suzuki, Hiroshi Yoshimura, NTT Human Interface Labs, Japan .................................. 479

14.08 Bit-level Systolic Carry-Save Array Division
Herbert Dawid, Aachen University of Technology, Germany, Gerhard Fettweis, Teknekron Communications Systems, USA, .................................................. 484

SESSION 15
Broadband Switching Systems

ORGANIZER: Daryl Eigen, Siemens Stromberg-Carlson, USA
CHAIRPERSONS: Maurizio Decina, Politecnico di Milano - CEFRIEL, Italy
Bijan Jabbari, George Mason University, USA
SPONSOR: Communication Switching

Oral Presentation

15.01 AT&T Network Systems Service Net-2000 Broadband Networking Plans
Michael DeMaio, H. J. Kafka, R. P. Levy, M. D. Soneru, K. D. Tentarelli, AT&T Bell Laboratories, USA .................. 489

15.02 Control Architecture for ATM Based Switching Systems
N. Skaperda, Siemens AG, Germany ........................................... 494

15.03 A Flexible Switching Node Architecture for B-ISDN Options and Implementation Concept
Bengt Stavenow, Jan Rooth, ELLEMTEL Utvecklings AB, Sweden .................................................. 499

15.04 UK Switched High-Speed Data Service (SHDS) Trials & Experiences
T. J. King, BT Laboratories, UK ........................................... 506

15.05 A Novel Approach to Estimating the Cell Loss Probability of an ATM Multiplexer Loaded with Homogeneous Bursty Sources
Tao Yang, Technical University of Nova Scotia, Canada, Danny H. K. Tsang, Dalhousie University, Canada .................. 511

15.06 Blocking Performance of a Three-Stage Multicasting Network
M. Decina, G. Ferrari, A. Pattavina, Politecnico di Milano/CEFRIEL, Italy .................................................. 518
SESSION 16
Emerging Software Technologies for Services Support

ORGANIZERS: M. E. Nilson, Bellcore, USA
R. Sundaraman, AT&T Bell Laboratories, USA

CHAIRPERSON: M. E. Nilson

SPONSOR: Multimedia Services & Terminals
Communications Software

Oral Presentation

16.01 Structural Way of Thinking as Applied to Good Design (Part 3, Reducing Programming Errors)
Zeny Koono, Homayoun Far Behrouz and Yasukiyo Yamasaki, Saitama University, Japan ........................................ 525

16.02 SRSGEN - A Software Reuse Tool for Large Switching Projects
Bernard S. Ku, Terry B. Bollinger, NEC America, Inc., USA ................................................................. 532

16.03 Modeling Cooperative Agents for Customer Network Control using Planning and Agent-Oriented Programming
Robert Weihmayer, Ming Tan, GTE Laboratories Inc, USA ................................................................. 537

16.04 Diagnosing Intermittent Faults in Telecommunication Networks
Marco Blom, Ben Lippolt, PTT Research, The Netherlands ................................................................. 544

16.05 Evaluation of the Service Execution Environment & the Service Development Environment for AIN
Michio Ohara, Shuji Esaki, Tomoki Omiya, Naoki Shigematsu, NTT Communication Switching Lab, Japan ........................................ 549

16.06 Telecommunication Service Design Support using the Visual Service Description Language STR-GR
Mitsuhiro Nakamura, Yasuaki Inoue, Kazumasa Takami, Tadashi Ohta, ATR Communication Systems, Japan, Toyofumi Takenaka, NTT Communication Switching Labs., Japan ........................................ 554

SESSION 17
Network Planning, Management and Interconnection

ORGANIZERS: Bhumip Khasnabish, University of Windsor, Canada
Jonathan Wang, Bellcore, USA
Guy Omidyar, Computer Sciences Corporation, USA

CHAIRPERSON: Wen-Pai Lu, BellSouth, USA

SPONSOR: Computer Communications

Oral Presentation

17.01 A Framework for Learning and Inference in Network Management
Ying-Dar Lin, Mario Gerla, Univ of California-Los Angeles, USA ........................................ 560

17.02 State Dependent Routing for Multirate Loss Networks
RenHung Hwang, James F. Kurose, Don Towsley, University of Massachusetts, USA ........................................ 565

17.03 Routing in Virtual Path Based ATM Networks
Sanjay Gupta, Keith W. Ross, Magda E. Zarki, University of Pennsylvania, USA ........................................ 571
17.04 SC-TC Trade-off in Supra-High-Speed Packet Switched Networks
Bhumip Khasnabish, Majid Ahmadi, Myron Hlynka, University of Windsor, Canada. M. Shridhar, University of Michigan-Dearborn, USA ............................ 576

17.05 A Bandwidth Allocation-Based Priority Mechanism for High-Speed Unidirectional-Bus Networks
Gregory J. Miller, Michael Paterakis, University of Delaware, USA ....................... 581

17.06 On Packet Processes in Interconnected LANs
D. Manjunath, Kenneth S. Vastola, Rensselaer Polytechnic Inst, USA ....................... 587

17.07 Performance Analysis of the Ethernet under Conditions of Bursty Traffic
Tony Y. Mazraani, Sprint International, USA, G. M. Parulkar, Washington University, USA ............................. 592

17.08 The Effects of Bursty Traffic on the Performance of Local Area Networks
Khalid Khalil, Yeali S. Sun, Bellcore, USA .................................................. 597

SESSION 18
Advances in the Theory and Practice of Fault Tolerance with Applications to Information Networks

ORGANIZERS: Anindo Bagchi, Bellcore, USA
T. V. Lakshman, Bellcore, USA

CHAIRPERSON: Anindo Bagchi
T. V. Lakshman

SPONSOR: Network Operations & Management

Oral Presentation

18.01 Resource Recovery in a Distributed Processing Environment
Brian A. Coan, Takako M. Hickey, Bellcore, USA ........................................ 604

18.02 The Adapt2 On-Line Diagnosis Algorithm for in General Topology Networks
Ronald Bianchini Jr, Mark Stahl, Richard Buskens, Carnegie Mellon University, USA ............................. 610

18.03 Reliable Broadcast of Routing Information Using Diffusing Computations
J. J. Garcia-Luna-Aceves, SRI International, USA ......................................... 615

18.04 Scheduling Issues for Interfacing to High Speed Networks
K. K. Ramakrishnan, Digital Equipment Corporation, USA ............................... 622

18.05 Fault-Tolerant Multimesh Networks
Ellen L. Hahne, AT&T Bell Laboratories, USA, Terence D. Todd, McMaster University, Canada ........................................ 627

18.06 Case Studies of Survivable Ring, Mesh and Mesh-Arc Hybrid Networks
Wayne Grover, TR Labs & University of Alberta, Canada ............................... 633

18.07 ATM Self-Healing Ring
Yoshio Kajiyama, N. Tokura, K. Kikuchi, NTT Transmission Systems Lab, Japan ........................................ 639

18.08 Evaluating the Reliability of Telecommunication Networks with Multi-threshold Model
Youheng Liu, Weiming Xiong, Peking University, China .................................. 644

Author Index .............................................................................. Follows page 648.