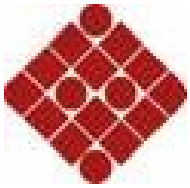
SIGCOMM 2004

Final Program and
Poster abstracts

ACM SIGCOMM 2004

Portland, Oregon, USA



A Data Communications Festival

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Conference Program

Main conference Venue: Portland Downtown Hilton Grand Ballroom

Registration Desk: Monday through Thursday, 08:00-17:00, Friday 08:00-noon, location: Grand Ballroom Foyer

Lunch: Pavilion Ballroom on Tues-Thurs and Grand Ballroom II on Mon-Fri

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MONDAY, AUGUST 30 TUTORIALS/WORKSHOPS/RECEPTION

9:00-12:30	**Tutorial T1:** Traffic Modeling 101	Hilton Broadway III / IV
13:30-17:00	**Tutorial T2:** Unwanted Traffic	Hilton Broadway III / IV
9:00-17:00	**Workshop W1**: Future Directions in Network Arch. (FDNA)	Hilton Galleria I / II / III
9:00-17:30	**Workshop W2:** Net. & Sys. Support for Games (NetGames)	Hilton Broadway I / II
18:00-20:00	**Welcome reception**	Oregon Historical Society Museum
19:30-	**Student dinner**	Greek Cucina Restaurant

TUESDAY AUGUST 31 *(all presentations at the Hilton Grand Ballroom)*

9:00-9:15 **Opening Welcome**

9:15-10:15 **Keynote Speech: SIGCOMM 2004 Award Winner**
Simon Lam, UT Austin Back to the Future Part 4: The Internet

11:00-12:30 **Session 1: Network geometry and design (chair: Ken Calvert)**

- A First-Principles Approach to Understanding the Internet's Router-level Topology
  Lun Li, David Alderson (CalTech), Walter Willinger (AT&T Labs--Research), John Doyle (CalTech)
- Vivaldi: A Decentralized Network Coordinate System
  Frank Dabek, Russ Cox, Frans Kaashoek, Robert Morris (MIT)
- Routing Design in Operational Networks: A Look from the Inside
  David Maltz, Geoff Xie, Jibin Zhan, Hui Zhang (CMU), Gisli Hjalmtysson, Albert Greenberg (AT&T Labs--Research)

14:00-15:30 **Session 2: Inference of network properties (chair: Constantinos Dovrolis)**

- Locating Internet Bottlenecks: Algorithms, Measurements, and Implications
  Ningning Hu (CMU), Li Erran Li (Bell Laboratories), Zhuoqing Morley Mao (U. Michigan), Peter Steenkiste (CMU), Jia Wang (AT&T Labs--Research)
- An Algebraic Approach to Practical and Scalable Overlay Network Monitoring
  Yan Chen (Northwestern University), David Bindel, Hanhee Song, Randy H. Katz (UC Berkeley)
- CapProbe: A Simple and Accurate Capacity Estimation Technique
  Rohit Kapoor (Qualcomm), Ling-Jyh Chen, Li Lao, Mario Gerla, M. Y. Sanadidi (UCLA)

16:00-17:30 **Session 3: Multihoming and overlays (chair: John Byers)**

- Optimizing Cost and Performance for Multihoming
  David K. Goldenberg (Yale), Lili Qiu (Microsoft Research), Haiyong Xie (Yale), Yang Richard Yang (Yale), Yin Zhang (AT&T Labs-Research)
- A Comparison of Overlay Routing and Multihoming Route Control
  Aditya Akella, Jeffrey Pang (CMU), Bruce Maggs (CMU/Akamai), Srinivasan Seshan (CMU), Anees Shaikh (IBM Research)
- The Feasibility of Supporting Large-Scale Live Streaming Applications with Dynamic Application End-Points
  Kunwadee Sripanidkulchai, Aditya Ganjam, Bruce Maggs (CMU/Akamai), Hui Zhang (CMU)

17:40-18:40 **SIGCOMM Business Meeting - open to all** *(Hilton Grand Ballroom)*

WEDNESDAY, SEPTEMBER 1 *(all presentations at the Hilton Grand Ballroom)*

9:00-11:00 **Session 4: Wireless and delay-tolerant networks (chair: Venkat Padmanabhan)**

- Link-level Measurements from an 802.11b Mesh Network
  Daniel Aguayo, John Bicket, Sanjit Biswas (MIT), Glenn Judd (CMU), Robert Morris (MIT)

- Comparison of Routing Metrics for Static Multi-Hop Wireless Networks
  Richard Draves, Jitendra Padhye, Brian Zill (Microsoft Research)
- Routing in a Delay Tolerant Network
  Sushant Jain (U. Washington), Kevin Fall (Intel Research), Rabin Patra (UC Berkeley)
- Turning the Postal System into a Generic Digital Communication Mechanism (position paper)
  Randolph Y. Wang, Sumeet Sobti, Nitin Garg, Elisha Ziskind, Junwen Lai (Princeton), Arvind Krishnamurthy (Yale)

WEDNESDAY SEPTEMBER 1 (cont'd)

11:00-12:30 **Poster session** *(Hilton Galleria I / II / III and Foyer at Ballroom level)*

14:00-15:30 **Session 5: Secure networks (chair: Paul Barford)**

- A System for Authenticated Policy-Compliant Routing
  Barath Raghavan, Alex C. Snoeren (UCSD)
- SPV: Secure Path Vector Routing for Securing BGP
  Yih-Chun Hu (UC Berkeley), Adrian Perrig, Marvin Sirbu (CMU)
- Shield: Vulnerability-Driven Network Filters for Preventing Known Vulnerability Exploits
  Helen J. Wang, Chuanxiong Guo, Daniel R. Simon, Alf Zugenmaier (Microsoft Research)

16:00-17:30 **Session 6: Network troubleshooting (chair: Nina Taft)**

- Locating Internet Routing Instabilities
  Anja Feldmann, Olaf Maennel (TU Muenchen), Z. Morley Mao (U. Michigan), Arthur Berger (MIT/Akamai), Bruce Maggs (CMU/Akamai)
- Diagnosing Network-Wide Traffic Anomalies
  Anukool Lakhina, Mark Crovella (Boston University), Christophe Diot (Intel Research)
- Network Sensitivity to Hot-Potato Disruptions
  Renata Teixeira (UCSD), Aman Shaikh (AT&T Labs--Research), Tim Griffin (Intel Research), Geoffrey Voelker (UCSD)

18:00- **Social event - Banquet** *(Tiffany Center, SW 14th & SW Morrison - 2 blocks north, 9 blocks west of the Hilton)*

THURSDAY, SEPTEMBER 2 *(all presentations at the Hilton Grand Ballroom)*

9:00-10:30 **Session 7: Router design (chair: Ion Stoica)**

- Building a better NetFlow
  Cristian Estan (UCSD), Ken Keys, David Moore (USCD/CAIDA), George Varghese (UCSD)
- Work-Conserving Distributed Schedulers for Terabit Routers
  Prashanth Pappu, Jonathan Turner, Ken Wong (Washington University)
- Exact GPS Simulation with Logarithmic Complexity, and its Application to an Optimally Fair Scheduler
  Paolo Valente (U. Pisa)

11:00-12:30 **Session 8: Congestion control (chair: Alex Snoeren)**

- Sizing Router Buffers
  Guido Appenzeller, Isaac Keslassy, Nick McKeown (Stanford)
- A Wavelet-Based Approach to Detect Shared Congestion
  Min Sik Kim, Taekhyun Kim, YongJune Shin, Simon S. Lam, Edward J. Powers (UT Austin)
- Delayed Stability and Performance of Distributed Congestion Control
  Yueping Zhang, Seong-Ryong Kang, Dmitri Loguinov (Texas A&M)

14:00-15:30 **Session 9: DNS and naming (chair: Srini Seshan)**

- Impact of Configuration Errors on DNS Robustness
  Vasileios Pappas, Zhiguo Xu, Songwu Lu (UCLA), Daniel Massey (Colorado State), Andreas Terzis (Johns Hopkins), Lixia Zhang (UCLA)
- The Design and Implementation of a Next Generation Name Service for the Internet
  Venugopalan Ramasubramanian, Emin Gun Sirer (Cornell)
- A Layered Naming Architecture for the Internet (position paper)
  Hari Balakrishnan (MIT), Karthik Lakshminarayanan (UC Berkeley), Sylvia Ratnasamy (Intel Research), Scott Shenker (ICIR & UC Berkeley), Ion Stoica (UC Berkeley), Michael Walfish (MIT)

16:00-17:30 **Session 10: Distributed information systems (chair: Antony Rowstron)**

- Mercury: Supporting Scalable Multi-Attribute Range Queries
  Ashwin R. Bharambe, Mukesh Agrawal, Srinivasan Seshan (CMU)
- Modeling and Performance Analysis of BitTorrent-Like Peer-to-Peer Networks
  Dongyu Qiu, R. Srikant (U. Illinois at Urbana-Champaign)
- A Scalable Distributed Information Management System
  Praveen Yalagandula, Mike Dahlin (UT Austin)

17:30-19:00 **Outrageous Opinions (chair: Michalis Faloutsos)**
Hilton Grand Ballroom

FRIDAY, SEPTEMBER 3 **TUTORIALS/WORKSHOPS**

9:00-17:00 Tutorial T3: Architectural Considerations for Unusual and Challenged Nets
(Hilton Galleria III)

9:00-17:00 Workshop W3: Practice and Theory of Incentives and Game Theory in Networked Systems (PINS)
(Hilton Pavilion West)

9:00-17:30 Workshop W4: Network Troubleshooting (NetTs)
(Hilton Galleria I / II)

Workshop Program

FDNA-04: Future Directions in Network Architecture

Hilton Galleria I / II / III

MONDAY, AUGUST 30

TECHNICAL PROGRAM

9:00-10:30 Routing

The Case for Separating Routing from Routers
Nick Feamster (MIT), Hari Balakrishnan (MIT), Jennifer Rexford (AT&T Labs--Research), Aman Shaikh (AT&T Labs--Research), Kobus van der Merwe (AT&T Labs--Research)

Simplified Layering and Flexible Bandwidth with TWIN
Indra Widjaja (Bell Laboratories, Lucent Technologies), Iraj Saniee (Bell Laboratories, Lucent Technologies)

Secure Routerless Routing
Vince Grolmusz (Eotvos University), Zoltan Kiraly (Eotvos University)

11:00-12:30 Half Layers

A Virtualized Link Layer with Support for Indirection
Richard Gold (Uppsala University), Per Gunningberg (Uppsala University), Christian Tschudin (University of Basel)

On Demand Label Switching for Spontaneous Networks
Vincent Untz (IMAG), Martin Heusse (IMAG), Franck Rousseau (IMAG), Andrzej Duda (IMAG)

NUTSS: A SIP-based Approach to UDP and TCP Network Connectivity
Saikat Guha (Cornell University), Yutaka Takeda (Cornell University), Paul Francis (Cornell University)

1:30-3:00 New Architectures

Steps Towards a DoS-resistant Internet Architecture
Mark Handley (UCL), Adam Greenhalgh (UCL)

Loose Source Routing as a Mechanism for Traffic Policies
Katerina Argyraki (Stanford University), David Cheriton (Stanford University)

Invariants: A New Design Methodology for Network Architectures
Bengt Ahlgren (Swedish Institute of Computer Science), Marcus Brunner (NEC Network Laboratories), Lars Eggert (NEC Network Laboratories), Robert Hancock (Siemens/Roke Manor Research), Stefan Schmid (NEC Network Laboratories)

3:30-5:00 Panel

Panel on "What's new? What's next?"
David Cheriton (Stanford), Jon Crowcroft (Cambridge), Steve McCanne (Riverbed), John Wroclawski (MIT), Hui Zhang (CMU)

NetGames-04: Network and System Support for Games

Hilton Broadway I / II

MONDAY, AUGUST 30

TECHNICAL PROGRAM

9:00-9:10 Welcoming remarks

9:10-10:30 Mobile games

A Mobile Gaming Platform for the IMS
Amjad Akkawi, Sibylle Schaller, Oliver Wellnitz, Lars Wolf

Lightweight QoS-Support for Networked Mobile Gaming
Marcel Busse, Bernd Lamparter, Martin Mauve, Wolfgang Effelsberg

Feedback, Latency, Accuracy: Exploring Tradeoffs in Location-Aware Gaming
Kieran Mansley, David Scott, Alastair Tse, Anil Madhavapeddy

11:00-12:30 Game infrastructure

Using Session Initiation Protocol to Build Context-Aware VoIP Support for Multiplayer Networked Games
Aameek Singh, Arup Acharya

Implementation of a Service Platform for Online Games
Anees Shaikh, Sambit Sahu, Marcel Rosu, Michael Shea, Debanjan Saha

OpenPING: A Reflective Middleware for the Construction of Adaptive Networked Game Applications
Paul Okanda, Gordon Blair

Zoned Federation of Game Servers: a Peer-to-Peer Approach to Scalable Multi-player Online Games
Takuji Iimura, Hiroaki Hazeyama, Youki Kadobayashi

1:30-3:00 Novel techniques and cheat detection

Realizing Bullet Time Effect in Multiplayer Games with Local Perception Filters *(Best Paper Award Winner)*
Jouni Smed, Henrik Niinisalo, Harri Hakonen

Scalable Peer-to-Peer Networked Virtual Environment
Shun-Yun Hu, Guan-Ming Liao

Is Runtime Verification Applicable to Cheat Detectiion?
Margaret DeLap, Bjorn Knutsson, Honghui Lu, Oleg Sokolsky, Usa Sammapun, Insup Lee, Christos Tsarouchis

A Cheat Controlled Protocol for Centralized Online Multiplayer Games
Bei Di Chen, Muthucumaru Maheswaran

3:30-5:00 User experience

The Effects of Loss and Latency on User Performance in Unreal Tournament 2003
Tom Beigbeder, Rory Coughlan, Corey Lusher, John Plunkett, Emmanuel Agu, Mark Claypool

Objective and Subjective Evaluation of the Influence of Small Amounts of Delay and Jitter on a Recent First Person Shooter Game
Peter Quax, Patrick Monsieurs, Wim Lamotte, Danny De Vleeschauwer, Natalie Degrande

Thoughts on Emulating Jitter for User Experience Trials
Grenville Armitage, Lawrence Stewart

Accuracy in Dead-Reckoning Based Distributed Multi-Player Games
Sudhir Aggarwal, Hemant Banavar, Amit Khandelwal, Sarit Mukherjee, Sampath Rangarajan

5:00-5:30 Poster session

A Distributed Proxy System for Provisioning Immersive Audio Communication to Massively Multi-player Games
Cong Duc Nguyen, Farzad Safaei, Paul Boustead

Analysis of Scalable Data Streams for Representations in Networked Virtual Environments
Tom Jehaes, Peter Quax, Wim Lamotte

A Transaction Execution Engine Architecture for Multiplayer Online Games
Ian Lintault

A Partition Detection System for Distributed Mobile Games
Hartmut Ritter, Rolf Winter, Jochen Schiller

A Self-similarity Traffic Analysis of an Internet-based Multiplayer Online Game
John C. McEachen

A Distributed Architecture for Massively Multiplayer Online Games
Chris GauthierDickey, Daniel Zappala, Virginia Lo

FreeMMG: A Hybrid Peer-to-Peer and Client-Server Model for Massively Multiplayer Games
Fabio Reis Cecin, Marcio Garcia Martins, Rafael de Oliveira Jannone, Jorge Luis Victoria Barbosa, Claudio Fernando Resin Geyer

PINS: Practice and Theory of Incentives in Networked Systems

Hilton Pavilion West

FRIDAY, SEPTEMBER 3

TECHNICAL PROGRAM

8:50-9:00 Welcoming Remarks

9:00-10:00 Invited Tutorial on Game Theory (Ramesh Johari, Stanford University)

10:00-10:30 Session 1: Experimental Study
Internet Congestion: A Laboratory Experiment (Full Paper)
Daniel Friedman (UCSC), Bernardo Huberman (HP Labs)

10:30-11:00 Break

11:00-12:30 Session 2: Incentives in Practice

Experiences Applying Game Theory to System Design (Full Paper)
Ratul Mahajan (U. Wash.), Maya Rodrig (U. Wash.), David Wetherall (U. Wash.), John Zahorjan (U. Wash.)

Rethinking Incentives for Mobile Ad Hoc Networks (Full Paper)
Elgan Huang (U. Cambridge), Jon Crowcroft (U. Cambridge), Ian Wassell (U.Cambridge)

On the Benefits and Feasibility of Incentive Based Routing Infrastructure (Full Paper)
Mike Afergan (MIT), John Wroclawski (MIT)

12:30-1:30 Lunch

1:30-2:30 Session 3: Working Papers

A Case for Taxation in Peer-to-Peer Streaming Broadcast (Working Paper)
Yang-hua Chu (CMU), John Chuang (UC Berkeley), Hui Zhang (CMU)

Near Rationality and Competitive Equilibria in Networked Systems (Working Paper)
Nicolas Christin (UC Berkeley), Jens Grossklags (UC Berkeley), John Chuang (UC Berkeley)

Faithfulness in Internet Algorithms (Working Paper)
Jeff Shneidman (Harvard), David Parkes (Harvard), Laurent Massoulie (Microsoft Research)

2:30-3:00 Session 4: Theory and Models

Free-Riding and Whitewashing in Peer-to-Peer Systems (Full Paper)
Michal Feldman (UC Berkeley), Christos Papadimitriou (UC Berkeley), Ion Stoica (UC Berkeley), John Chuang (UC Berkeley)

3:00-3:30 Break

3:30-4:00 Session 4: Theory and Models (Continued)
On Scheduling Fees to Prevent Merging, Splitting and Transferring of Jobs (Invited Talk)
Herve Moulin (Rice)

4:00-5:00 Panel Discussion
David Clark (MIT), Joan Feigenbaum (Yale), John Ledyard (Caltech), David Wetherall (U. Washington)

NetTS: Network Troubleshooting: Research, Theory and Operations Practice Meet Malfunctioning Reality

Hilton Galleria I / II

FRIDAY, SEPTEMBER 3

TECHNICAL PROGRAM

09:00-10:30 Miscellaneous I

H.323 Beacon Tool: An H.323 Application Related End-to-End Performance Troubleshooting Tool
Prasad Calyam (OARnet), Weiping Mandrawa (OARnet), Mukundan Sridharan (The Ohio State University), Arif Khan (OARnet), Paul Schopis (OARnet)

Experiences in Traceroute and Available Bandwidth Change Analysis
Connie Logg (Stanford Linear Accelerator Center), R. Les Cottrell (Stanford Linear Accelerator Center)

A Wavelet-Based Framework for Proactive Detection of Network Misconfigurations
Antonio Magnaghi (Fujitsu Laboratories of America), Takeo Hamada (Fujitsu Laboratories of America), Tsuneo Katsuyama (Fujitsu Laboratories Ltd.)

Path Diagnosis with IPMP
Matthew Luckie (University of Waikato / NLANR MNA), Tony McGregor (University of Waikato / NLANR MNA)

10:30-11:00 Break

11:00-12:30 Miscellaneous II

Distributed DNS Troubleshooting
Vasileios Pappas (UCLA), Patrik Fältström (Cisco), Daniel Massey (ISI), Lixia Zhang (UCLA)

Is Your Caching Resolver Polluting the Internet?
Duane Wessels (CAIDA and The Measurement Factory)

Mohonk: Mobile Honeypots to Trace Unwanted Traffic Early
Balachander Krishnamurthy (AT&T Labs--Research)

Identifying IPv6 Network Problems in the Dual-Stack World
Kenjiro Cho (Sony Computer Science Labs, Inc.), Matthew Luckie (University of Waikato), Bradley Huffaker (CAIDA)

12:30-1:30 Lunch

1:30-2:45 Routing I

Troubleshooting on Intra-Domain Routing Instability
Zhang Shu (National Institute of Information and Communications Technology, Japan), Youki Kadobayashi (Nara Institute of Science and Technology)

Fixing BGP, One AS at a Time
Jaideep Chandrashekar (University of Minnesota), Zhi-Li Zhang (University of Minnesota), Haldane Peterson (University of Minnesota)

Locating BGP Missing Routes Using Multiple Perspectives
Di-Fa Chang (USC/Information Sciences Institute), Ramesh Govindan (USC/Information Sciences Institute), John Heidemann (USC/Information Sciences Institute)

2:45-3:00 Break

3:00-3:45 Routing II

IP Forwarding Anomalies and Improving their Detection Using Multiple Data Sources
Matthew Roughan (School of Mathematical Sciences, University of Adelaide), Tim Griffin (Intel Research Cambridge), Z. Morley Mao (University of Michigan), Albert Greenberg (AT&T Research), Brian Freeman (AT&T Labs)

A Measurement Framework for Pinpointing Routing Changes
Renata Teixeira (UC San Diego), Jennifer Rexford (AT&T Labs -- Research)

3:45-4:00 Break

4:00-5:00 Panel: What Research is Really Needed to Troubleshoot Networks

5:00-5:30 Poster Session

Exploring the Subspace Method for Network-Wide Anomaly Diagnosis
Anukool Lakhina (Boston University), Mark Crovella (Boston University), Christophe Diot (Intel Research)