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# Distributed Computing and Networking

8th International Conference, ICDCN 2006  
Guwahati, India, December 27-30, 2006  
Proceedings

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Library of Congress Control Number: 2006938041

CR Subject Classification (1998): C.2, D.1.3, D.2.12, D.4, F.2, F.1, H.4

LNCS Sublibrary: SL 1 – Theoretical Computer Science and General Issues

ISSN	0302-9743
ISBN-10	3-540-68139-6 Springer Berlin Heidelberg New York
ISBN-13	978-3-540-68139-7 Springer Berlin Heidelberg New York

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[springer.com](http://springer.com)

© Springer-Verlag Berlin Heidelberg 2006  
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India  
Printed on acid-free paper      SPIN: 11947950      06/3142      5 4 3 2 1 0

## Message from the General Chairs

The *Eighth International Conference on Distributed Computing and Networking*, which was held in Guwahati, India in December 2006, is an outgrowth and a continuation of the sequence of workshops titled *International Workshop on Distributed Computing (IWDC)*". Since its modest start in 1999, this annual event has grown rapidly in scope, volume, quality and visibility. Being traditionally situated in the different academic centers in India, it has also reflected the high-level research carried out in India in the area of distributed computing, and has helped to nourish and strengthen research interconnections among researchers in India itself as well as with distributed computing researchers throughout the world.

During the seventh meeting of IWDC, held last December in Kharagpur, the Steering Committee noted with deep satisfaction how the once small workshop has gradually grown, through the efforts of a dedicated group of academics in the area, and acquired the stature and recognition of a leading international conference. Subsequently, the Steering Committee decided to reflect this development by changing the title of the meeting from a *Workshop* to a *Conference*. At the same time, it was also recognized that the recent shifts in research interests within the area of distributed computing, and particularly the recent focus on topics related to distributed networking and on links bridging between distributed computing and networking, should also be reflected in the new name. The conference was thus renamed the *International Conference on Distributed Computing and Networking (ICDCN)*. It should be stressed that while the new name entails a certain departure from the traditional track outlined by the seven previous IWDC meetings, with an eye towards further expansion in size, scope and competitiveness, the underlying intention is still to maintain and preserve the special character of IWDC, as well as many of the features that contributed to its past success, and particularly the pleasant and informal atmosphere, facilitating close interactions and academic discussions.

Organizing a large conference is not a trivial task, and we are indebted to many. First and foremost, we are thankful to our generous sponsors, IBM, HP India Ltd., The Department of Science and Technology and The Department of Information Technology of the Government of India, for their benevolent support which was vital to making the conference a success.

The Program Committee made arduous efforts in reviewing the numerous submissions and selecting an impressive collection of high-quality papers for presentation. Our sincere thanks are due to the Program Chairs, Soma Chaudhuri and Samir R. Das, for coordinating and leading this effort, culminating in an exciting and well-balanced program. We are grateful to the Keynote Chair, Sajal K. Das, for arranging five high-quality keynote talks by eminent leaders in the field. Following the tradition of previous years, we set up four advanced tutorials on topics of interest, relevant to the

realm between distributed computing and networking, namely, Modeling Biological Networks, Network Security, Algorithmic Issues in Wireless Sensor Networks, and Optical Networking. This was made possible by the efforts of the Tutorial Chairs, Sridhar Iyer and Pinaki Mitra.

The Organizing Committee worked hard to ensure that the participants enjoyed a comfortable stay and the technical meetings proceeded as smoothly as possible. We are grateful to the General Vice Chair, Sukumar Nandi, for arranging to hold the conference in Guwahati and for all he did to make the conference a success. Thanks are due to the Publicity Chairs, P. K. Das and Sriram V. Pemmaraju, for their great work in publicizing the event both locally and internationally, to the Publication Chairs, H. S. Paul and Srikanta Tirthapura, for their tremendous efforts in compiling the final proceedings, and to the Organizing Chair, D. Goswami, the Finance Chair, J. K. Deka, and the Scholarship Chair, S. V. Rao, for their hard work.

We are grateful to the Indian Institute of Technology Guwahati for extending the logistic support to the conference. We thank Sukumar Ghosh, the head of the ICDCN Steering Committee, for his guidance, continuous support and advice.

Last but not least, we extend our heartfelt thanks to the authors, reviewers and participants of the conference, for their vital contribution to the success of this conference. It is our sincere hope that this event becomes another invaluable link in the sequence of IWDC and ICDCN meetings and a useful outlet for knowledge dissemination within the distributed computing and networking communities.

December 2006

Gautam Barua  
IIT Guwahati  
Guwahati, India

David Peleg  
Weizmann Institute of Science  
Rehovot, Israel

# Message from the Technical Program Chairs

Welcome to the Proceedings of the Eighth *International Conference on Distributed Computing and Networking (ICDCN)*, 2006! This event was previously known as *IWDC* or *International Workshop on Distributed Computing*. It is great to see that a small workshop that grew out of the interests of a dedicated group of enthusiasts now has gained the stature of a truly international conference, covering most aspects of distributed computing and networking.

This year we received 245 paper submissions continuing on the growth trend that we observed in recent years. We received submissions from all over the world. The electronic submission system (WIMPE) registered authors from India, USA, China, Korea, UK, Canada, Iran, Germany, Greece, Netherlands, France, Italy, Israel, Lebanon, Turkey, Ireland, and Poland, reflecting a true international nature of the conference. A good fraction of submitted authors are from outside India, a fact also reflected in the conference program and the content of these proceedings.

Similar to the geographical diversity, the topical diversity of the submissions was noteworthy. All topics mentioned in the Call for Papers were covered. The 50 members of the Technical Program Committee along with a team of external reviewers worked hard on the reviews under a very strict timeline. At the end of the review period, the Program Chairs selected 29 regular papers and 30 short papers for inclusion in the proceedings and presentation in the conference.

We were also fortunate to have an array of keynote speakers – Faith Ellen (University of Toronto), Nicola Santoro (Carleton University), Eli Gafni (UCLA), Shay Kutten (Technion), Manindra Agrawal (IIT-Kanpur), Anurag Kumar (Indian Institute of Science). Their talks provided us with the unique opportunity to hear the leaders of their fields. Their papers related to the talks are also included in these proceedings.

The main conference program was preceded by a day of tutorial presentations. We had an array of four tutorials, presented by Kalyan Basu (University of Texas at Arlington), Indranil Sen Gupta (IIT, Kharagpur), Sriram Pemmaraju (University of Iowa) and Ashwin Gumaste (IIT, Bombay), on biological networks, network security, sensor networks and optical networks, respectively.

We thank all authors for their interest in ICDCN 2006, and all Program Committee members and external reviewers for their commitment in spite of a tight schedule and a high review load. We hope that you will find the ICDCN proceedings to be technically rewarding.

December 2006

Soma Chaudhuri  
Iowa State University  
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# Table of Contents

## Keynote Talk I

Distributed Security Algorithms by Mobile Agents .....	1
<i>Paola Flocchini and Nicola Santoro</i>	

## Session I A: Ad Hoc Networks I

A Real-Time Guarantee Scheme Based on the Runtime Message Scheduling and Error Control for the Dual Wireless Ad Hoc Sensor Network .....	15
<i>Mikyung Kang, Abhijit Saha, Junghoon Lee, Gyung-Leen Park, and Hanil Kim</i>	
ADIAN: A Distributed Intelligent Ad-Hoc Network .....	27
<i>Saeed Shahbazi, Gholamreza Ghassem-Sani, Hamidreza Rabiee, Mohammad Ghanbari, and Mehdi Dehghan</i>	
A Mobility Tolerant Cluster Management Protocol with Dynamic Surrogate Cluster-Heads for a Large Ad Hoc Network .....	40
<i>Parama Bhaumik and Somprokash Bandyopadhyay</i>	
Prediction Based QoS Routing in MANETs .....	46
<i>Shahram Mohrehkesh, Mahmoud Fathy, and Saleh Yousefi</i>	
MCDS Based Multicasting in Mobile Adhoc Networks .....	52
<i>M. Shukla, M. Rai, G.S. Tomar, and S. Verma</i>	

## Session I B: Distributed Computing and Algorithms I

Programmer-Centric Conditions for Itanium Memory Consistency .....	58
<i>Lisa Higham, LillAnne Jackson, and Jalal Kawash</i>	
A Group Quorum System of Degree $1 + \sqrt{1 + \frac{n}{m}}$ .....	70
<i>Fouad B. Chedid</i>	
An Efficient Non-intrusive Checkpointing Algorithm for Distributed Database Systems .....	82
<i>Jiang Wu and D. Manivannan</i>	
Adaptive Connected Dominating Set – An Exercise in Distributed Output Switching .....	88
<i>Ankur Jain, Sushanta Karmakar, and Arobinda Gupta</i>	

An Efficient and Scalable Checkpointing and Recovery Algorithm for Distributed Systems .....	94
<i>K.P. Krishna Kumar and R.C. Hansdah</i>	

## Keynote Talk II

On Distributed Verification .....	100
<i>Amos Korman and Shay Kutten</i>	

## Session II A: Security

The Price of Defense and Fractional Matchings .....	115
<i>Marios Mavronicolas, Vicky Papadopoulou, Giuseppe Persiano, Anna Philippou, and Paul Spirakis</i>	
Construction of Adaptive IDS Through IREP++ and ARM .....	127
<i>Ramakrishna Raju S. and Sreenivasa Rao</i>	
Proving Optimality of DWS (Distance-Weighted Sampling) Probability Function for FMS IP Trace-Back Technique .....	133
<i>Jeankyung Kim, Jinsoo Hwang, Byungryong Kim, and Kichang Kim</i>	
A Mechanism for Detection and Prevention of Distributed Denial of Service Attacks .....	139
<i>Jaydip Sen, Piyali Roy Chowdhury, and Indranil Sengupta</i>	

## Session II B: Grid and P2P Computing

Auction Based Resource Allocation in Grids .....	145
<i>Sai Rahul Reddy P. and Arobinda Gupta</i>	
MLBLM: A Multi-level Load Balancing Mechanism in Agent-Based Grid .....	157
<i>Mohsen Amini Salehi, Hossain Deldari, and Bahare Mokarram Dorri</i>	
Data Management for a Distributed Hash Table .....	163
<i>Reshma Sonar and D.M. Thakore</i>	
DRWT: An Efficient Random Walk Algorithm for Unstructured P2P Networks .....	169
<i>Yiming Zhang, Xicheng Lu, Dongsheng Li, and Nong Xiao</i>	

## A.K. Choudhury Memorial Lecture

Stochastic Models of IEEE 802.11e Wireless Networks with Multimedia Applications .....	175
<i>Anurag Kumar</i>	

### Keynote Talk III

Maintaining Information About Nearby Processors in a Mobile Environment .....	193
<i>Faith Ellen, Sivaramakrishnan Subramanian, and Jennifer Welch</i>	

### Session III A: Ad Hoc Networks II

Energy Aware Topology Management in Ad Hoc Wireless Networks ....	203
<i>T. Shiv Prakash, G.S. Badrinath, K.R. Venugopal, and L.M. Patnaik</i>	
On Maximizing Network Lifetime of Broadcast in WANETs Under an Overhearing Cost Model .....	215
<i>Guofeng Deng and Sandeep K.S. Gupta</i>	
On Maximizing Residual Energy of Actors in Wireless Sensor and Actor Networks .....	227
<i>Ka. Selvaradjou and C. Siva Ram Murthy</i>	
Locant: A Nature Inspired Location Service for Ad Hoc Networks .....	239
<i>R.C. Hansdah and Prashant Khanna</i>	

### Session III B: Performance Evaluation I

An Analytical Model for Capacity Evaluation of VoIP on HCCA and TCP File Transfers over EDCA in an IEEE 802.11e WLAN .....	245
<i>Sri Harsha, S.V.R. Anand, Anurag Kumar, and Vinod Sharma</i>	
Developing Analytical Framework to Measure Robustness of Peer-to-Peer Networks.....	257
<i>Bivas Mitra, Md. Moin Afaque, Sujoy Ghose, and Niloy Ganguly</i>	
Design and Implementation of a Network Processor Based 10Gbps Network Traffic Generator .....	269
<i>Sanket Shah, Tularam M. Bansod, and Amit Singh</i>	
Stochastic Spectral Density Analysis on Network Traffic Characterization .....	276
<i>Abhik Das and S.K. Ghosh</i>	
Negotiating Monitoring Task Allocation for Orbiters.....	282
<i>Doran Chakraborty, Sabyasachi Saha, Sandip Sen, and Bradley Clement</i>	

### Keynote Talk IV

Primality Tests Based on Fermat's Little Theorem .....	288
<i>Manindra Agrawal</i>	

## Session IV: Distributed Computing and Algorithms II

Efficient Distributed Handshake Using Mobile Agents . . . . .	294
<i>Bilel Derbel</i>	
Improved Distributed Exploration of Anonymous Networks . . . . .	306
<i>Shantanu Das, Shay Kutten, and Ayelet Yifrach</i>	
The Complexity of Updating Multi-writer Snapshot Objects . . . . .	319
<i>Hagit Attiya, Faith Ellen, and Panagiota Fatourou</i>	
Simultaneous Consensus Tasks: A Tighter Characterization of Set-Consensus . . . . .	331
<i>Yehuda Afek, Eli Gafni, Sergio Rajsbaum, Michel Raynal, and Corentin Travers</i>	
Database Summarization and Publishing in Wireless Environments . . . . .	342
<i>Anshul Gandhi and R.K. Ghosh</i>	

## Keynote Talk V

Read-Write Reductions . . . . .	349
<i>Eli Gafni</i>	

## Session V A: Internetworking Protocols and Applications

Large Scale Voice over IP Experiences on High Performance Intranets . . . . .	355
<i>Francesco Palmieri</i>	
Z!Stream: An Application Streaming System by Copy-on-Reference Block of Executable Files . . . . .	367
<i>Dongho Song</i>	
Supervised Grid-of-Tries: A Novel Framework for Classifier Management . . . . .	373
<i>Srinivasan T., Balakrishnan R., Gangadharan S.A., and Hayawardh V.</i>	
BGPsep_S: An Algorithm for Constructing IBGP Configurations with Complete Visibility . . . . .	379
<i>Feng Zhao, Xicheng Lu, Peidong Zhu, and Jinjing Zhao</i>	
Performance Enhancement in REM Using Adaptive Drop Policy for Protective and Best-Effort Traffic . . . . .	385
<i>Hyon-Young Choi and Sung-Gi Min</i>	

A New Precomputation Scheme for MPLS Traffic Engineering Routing .....	391
<i>Zhaowei Meng, Jinshu Su, and Vittorio Manetti</i>	

## Session V B: Ad Hoc Networks III

A Mobility Aware Technique for Clustering on Mobile Ad-Hoc Networks .....	397
<i>Charalampos Konstantopoulos, Damianos Gavalas, and Grammati Pantziou</i>	
Design and Analysis of Rate Aware Ad Hoc 802.11 Networks .....	409
<i>G. Sandhya and K. Gopinath</i>	
Tightly Packed IP Address Configuration (TPIA) Protocol in Small-Scale MANET .....	421
<i>Jin-Ok Hwang, Sung-Gi Min, and Young-Il Choi</i>	
TransMAN: A Group Communication System for MANETs .....	430
<i>Kulpreet Singh, Andronikos Nedos, and Siobhán Clarke</i>	

## Session VI A: Performance Evaluation II

On Fault Tolerance of Two-Dimensional Mesh Networks .....	442
<i>Soumen Maity, Amiya Nayak, and S. Ramsundar</i>	
Feedback Control with Prediction for Thread Allocation in Pipeline Architecture Web Server .....	454
<i>Peng Shao-Liang, Li Shan-Shan, Liao Xiang-Ke, Peng Yu-Xing, and Ye Hui</i>	
Variants of Priority Scheduling Algorithms for Reducing Context-Switches in Real-Time Systems .....	466
<i>Biju K. Raveendran, K. Durga Prasad, Sundar Balasubramaniam, and S. Gurunarayana</i>	

## Session VI B: Optical Networks and Multimedia

Dynamic Path Shared Protection for Survivable Differentiated Reliable WDM Optical Networks .....	479
<i>Lei Guo, Lemin Li, Jin Cao, Hongfang Yu, and Xuetao Wei</i>	
A Time Model for Distributed Multimedia Applications .....	491
<i>Winfried E. Kühnhauser and Martin Süßkraut</i>	

Destination Initiated Multi-wavelength Reservation Protocol (DIMRP) in WDM Optical Networks: Finding the Optimal Selectivity for Wavelength Assignment.....	497
<i>Malabika Sengupta, Swapan Kumar Mondal, and Debasish Saha</i>	
A Hybrid Transformation Technique for Video Coding .....	503
<i>M. Ezhilarasan and P. Thambidurai</i>	

## Session VII A: Sensor Networks

Location Verification Based Defense Against Sybil Attack in Sensor Networks .....	509
<i>Debapriyay Mukhopadhyay and Indranil Saha</i>	
A New Scheme for Establishing Pairwise Keys for Wireless Sensor Networks .....	522
<i>Abhishek Gupta, Joy Kuri, and Pavan Nuggehalli</i>	
Distributed Location and Lifetime Biased Clustering for Large Scale Wireless Sensor Network .....	534
<i>Biswanath Dey and Sukumar Nandi</i>	
Power Aware Duty Scheduling in Wireless Sensor Networks .....	546
<i>Umesh Bellur and Nishant Jaiswal</i>	
Data Forwarding Protocol for Reliable Delivery Service in Wireless Sensor Networks .....	552
<i>Joo-Sang Youn, Jihoon Lee, Seung-Joon Seok, and Chul-Hee Kang</i>	

## Session VII B: Wireless Networks

Synchronous and Asynchronous Auction Models for Dynamic Spectrum Access .....	558
<i>Shamik Sengupta and Mainak Chatterjee</i>	
A One-Pass Method of MIP Registration by WLAN Host Through GPRS Network .....	570
<i>Sibaram Khara, Iti Saha Mishra, and Debashis Saha</i>	
An Idea Bag Strategy to Discourage Selfish Behavior Under Random Token MAC Protocols for Wireless LANs .....	582
<i>Jerzy Konorski</i>	
A Signalling Technique for Disseminating Neighbouring AP Channel Information to Mobile Stations .....	594
<i>Gurpal Singh, Ajay Pal Singh Atwal, and B.S. Sohi</i>	



A Predictive Location Management Scheme by Extracting the Unique  
Sub-patterns from the Mobility Logs ..... 600  
    *Subrata Nandi and Sanjib Sadhu*

**Author Index** ..... 607