

# ATM Networks: Performance Modelling and Evaluation Volume 2

Edited by  
**Demetres Kouvatsos**



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# Performance Modelling And Evaluation Of Atm Networks

**Demetres D. Kouvatsos**



## **Performance Modelling And Evaluation Of Atm Networks:**

**Performance Modelling and Evaluation of ATM Networks** Demetres D. Kouvatsos, 2013-04-17 Asynchronous Transfer Mode ATM networks are widely considered to be the new generation of high speed communication systems both for broadband public information highways and for local and wide area private networks ATM is designed to integrate existing and future voice audio image and data services Moreover ATM aims to simplify the complexity of switching and buffer management to optimise intermediate node processing and buffering and to limit transmission delays However to support such diverse services on one integrated communication network it is most essential through careful engineering to achieve a fruitful balance amongst the conflicting requirements of different quality of service constraints ensuring that one service does not have adverse implications on another Over recent years there has been a great deal of progress in research and development of ATM technology but there are still many interesting and important problems to be resolved such as traffic characterisation and control routing and optimisation ATM switching techniques and the provision of quality of service This book presents thirty two research papers both from industry and academia reflecting latest original achievements in the theory and practice of performance modelling of ATM networks worldwide These papers were selected subject to peer review from those submitted as extended and revised versions out of fifty nine shorter papers presented at the Second IFIP Workshop on Performance Modelling and Evaluation of ATM Networks July 4 7 1994 Bradford University At least three referees from the scientific committee and externally were involved in the selection of each paper

**Performance Modelling and Evaluation of ATM Networks** Demetres D. Kouvatsos, 1995-06-30 Asynchronous Transfer Mode ATM networks are widely considered to be the new generation of high speed communication systems both for broadband public information highways and for local and wide area private networks ATM is designed to integrate existing and future voice audio image and data services Moreover ATM aims to simplify the complexity of switching and buffer management to optimise intermediate node processing and buffering and to limit transmission delays However to support such diverse services on one integrated communication network it is most essential through careful engineering to achieve a fruitful balance amongst the conflicting requirements of different quality of service constraints ensuring that one service does not have adverse implications on another Over recent years there has been a great deal of progress in research and development of ATM technology but there are still many interesting and important problems to be resolved such as traffic characterisation and control routing and optimisation ATM switching techniques and the provision of quality of service This book presents thirty two research papers both from industry and academia reflecting latest original achievements in the theory and practice of performance modelling of ATM networks worldwide These papers were selected subject to peer review from those submitted as extended and revised versions out of fifty nine shorter papers presented at the Second IFIP Workshop on Performance Modelling and Evaluation of ATM Networks July 4 7 1994 Bradford University At least three referees from the

scientific committee and externally were involved in the selection of each paper      **ATM Networks** Demetres D. Kouvatsos,2016-01-09 This book presents a selection of expanded research papers from the Fourth IFIP Workshop on the Performance Modelling and Evaluation of ATM Networks It provides a fundamental source of reference on the latest research techniques and tools concerning ATM networks worldwide A number of important topics are featured including traffic modelling and characterisation models of ATM switches network management high speed LANs and MANs and routing and optimization      Performance Analysis of ATM Networks Demetres D. Kouvatsos,2014-01-15      **Network Performance Engineering** Demetres D. Kouvatsos,2011-04-12 During recent years a great deal of progress has been made in performance modelling and evaluation of the Internet towards the convergence of multi service networks of diverging technologies supported by internetworking and the evolution of diverse access and switching technologies The 44 chapters presented in this handbook are revised invited works drawn from PhD courses held at recent HETNETs International Working Conferences on Performance Modelling and Evaluation of Heterogeneous Networks They constitute essential introductory material preparing the reader for further research and development in the field of performance modelling analysis and engineering of heterogeneous networks and of next and future generation Internets The handbook aims to unify relevant material already known but dispersed in the literature introduce the readers to unfamiliar and unexposed research areas and generally illustrate the diversity of research found in the high growth field of convergent heterogeneous networks and the Internet The chapters have been broadly classified into 12 parts covering the following topics Measurement Techniques Traffic Modelling and Engineering Queueing Systems and Networks Analytic Methodologies Simulation Techniques Performance Evaluation Studies Mobile Wireless and Ad Hoc Networks Optical Networks QoS Metrics and Algorithms All IP Convergence and Networking Network Management and Services and Overlay Networks      Performance Analysis of ATM Networks Demetres D. Kouvatsos,2013-06-05 Over recent years a considerable amount of effort has been devoted both in industry and academia towards the performance modelling evaluation and prediction of Asynchronous Transfer Mode ATM networks This book describes recent advances in ATM networks reflecting the state of the art technology and research achievements worldwide In addition it provides a fundamental source of reference in the ATM field Research topics discussed in detail include Traffic Modelling and Characterisation Routing Switch and Multiplexer Models Call Admission Control CAC Congestion Control Resource Allocation Quality of Service QoS Tools and Techniques This volume contains recently extended refereed papers of the 5th International Workshop on Performance Modelling and Evaluation of ATM Networks which was sponsored by the International Federation for Information Processing IFIP and held in Ilkley UK in July 1997 Performance Analysis of ATM Networks continues the tradition established by the first three IFIP volumes on the subject and it is ideal for personnel in computer communication industries as well as academic and research staff in computer science and electrical engineering      **ATM Networks** Demetres D. Kouvatsos,2016-01-09 Unlike many

books on Asynchronous Transfer Mode this text approaches the subject systematically and reflects the state of the art technology being applied throughout the world today In addition it provides a fundamental source of reference in the ATM research field The following topics are discussed in detail traffic modelling and characterisation traffic and congestion control bandwidth and admission control ATM switch architecture models of ATM switches routing and optimisation quality of service network management high speed LANs and MANs performance modelling studies

**Modeling and Simulation Tools for Emerging Telecommunication Networks** Nejat Ince,Ercan Topuz,2006-09-10 Modeling and Simulation Tools for Emerging Telecommunication Networks contains over 20 articles by well known scientists and engineers reflecting the advances in modeling and simulation for telecommunications in the last five years Their research covers a broad spectrum of topics including analytic and hybrid cores for quick solutions of network design performance evaluation problems multimedia traffic behavior in different time scales improvement of the quality of the statistical analysis tools imbedded in simulation products combining source and lower layer models into two layer or three layer traffic models mobile and satellite communications propagation models and wide band optical networks propagation models verification and validation problems rare event simulation and accelerated simulation methods The book covers four primary topics multilayer traffic and multimedia traffic behavior quality of simulations accelerated simulation methods and verification validation and credibility of simulations and will be an essential reference for practicing engineers and academic researchers

**Application of Petri Nets to Communication Networks** Jonathan Billington,Michel Diaz,1999-04-21 Petri nets offer a mathematically defined technique for the specification design analysis verification and performance evaluation of concurrent distributed systems Communications networks ranging from traditional telecommunication systems to advanced Internet based information services are inherently distributed and comprise systems with concurrently operating components This volume presents a selection of the latest advances in the use of Petri nets for the modeling analysis and management of communication networks and systems in the broadest sense of these terms

*Quantitative Methods in Parallel Systems* Francois Baccelli,Alain Jean-Marie,Isi Mitrani,2013-11-11 It is widely recognized that the complexity of parallel and distributed systems is such that proper tools must be employed during their design stage in order to achieve the quantitative goals for which they are intended This volume collects recent research results obtained within the Basic Research Action Qmips which bears on the quantitative analysis of parallel and distributed architectures Part 1 is devoted to research on the usage of general formalisms stemming from theoretical computer science in quantitative performance modeling of parallel systems It contains research papers on process algebras on Petri nets and on queueing networks The contributions in Part 2 are concerned with solution techniques This part is expected to allow the reader to identify among the general formalisms of Part I those that are amenable to an efficient mathematical treatment in the perspective of quantitative information The common theme of Part 3 is the application of the analytical results of Part 2 to the performance evaluation and optimization of parallel

and distributed systems Part 1 Stochastic Process Algebras are used by N Gotz H Hermanns U Herzog V Mertsiotakis and M Rettetbach as a novel approach for the structured design and analysis of both the functional behaviour and performance characteristics of parallel and distributed systems This is achieved by integrating stochastic modeling and analysis into the powerful and well investigated formal description techniques of process algebras

**Performance Modelling and Evaluation of ATM Networks** IFIP Working Group 6.4. Technical Committee 6 Task Force on the Performance of Communication Networks, 1994

**Local and Metropolitan Communication Systems** Toshiharu Hasegawa, Yukata Takahashi, Guy Pujolle, Hideaki Takagi, 2013-03-19 We are witnessing an ever increasing thrust toward the era of multimedia information networks largely spurred by the U S Government's proposal for the National Information Infrastructure in the fall of 1993 While more people are subscribing to the services of narrowband ISDN the implementation of broadband ISDN by means of Asynchronous Transfer Mode ATM has accelerated since the formation of the ATM Forum in 1993 In the meantime frame relay may prevail for inter LAN connections In the upper layer of the network commercial use of Internet is rapidly emerging To ensure the successful development of technology it is vital to use a judicious approach in assessing the architecture and performance of the systems that implement the technology It is this spirit that underlies the present conference which is intended to provide an international forum for the presentation of recent research results in the area of local and metropolitan communication systems This conference has two sets of predecessors It is the third in a series of international conferences on Local and Metropolitan Communication Systems LAN the first was held in Toulouse in 1986 and the second in Palma de Mallorca in 1991 It is also the fourth in a triennial series organized by Kyoto University and others on the performance of communication related systems the previous ones were held in Tokyo 1985 and Kyoto 1988 1991

**Routing, Flow, and Capacity Design in Communication and Computer Networks** Michal Pioro, Deep Medhi, 2004-07-21 In network design the gap between theory and practice is woefully broad This book narrows it comprehensively and critically examining current network design models and methods You will learn where mathematical modeling and algorithmic optimization have been under utilized At the opposite extreme you will learn where they tend to fail to contribute to the twin goals of network efficiency and cost savings Most of all you will learn precisely how to tailor theoretical models to make them as useful as possible in practice Throughout the authors focus on the traffic demands encountered in the real world of network design Their generic approach however allows problem formulations and solutions to be applied across the board to virtually any type of backbone communication or computer network For beginners this book is an excellent introduction For seasoned professionals it provides immediate solutions and a strong foundation for further advances in the use of mathematical modeling for network design Written by leading researchers with a combined 40 years of industrial and academic network design experience Considers the development of design models for different technologies including TCP IP IDN MPLS ATM SONET SDH and WDM Discusses recent topics such as shortest path routing and fair

bandwidth assignment in IP MPLS networks Addresses proper multi layer modeling across network layers using different technologies for example IP over ATM over SONET IP over WDM and IDN over SONET Covers restoration oriented design methods that allow recovery from failures of large capacity transport links and transit nodes Presents at the end of each chapter exercises useful to both students and practitioners Advances in Multimedia Information Processing - PCM 2004 Kiyoharu Aizawa, Yuichi Nakamura, Shin'ichi Satoh, 2004-11-23 Welcome to the proceedings of the 5th Pacific Rim Conference on Multimedia PCM 2004 held in Tokyo Waterfront City Japan November 30 December 3 2004 Following the success of the preceding conferences PCM 2000 in Sydney PCM 2001 in Beijing PCM 2002 in Hsinchu and PCM 2003 in Singapore the 5th PCM brought together the researchers developers practitioners and educators in the field of multimedia Theoretical breakthroughs and practical systems were presented at this conference thanks to the support of the IEEE Circuits and Systems Society IEEE Region 10 and IEEE Japan Council ACM SIGMM IEICE and ITE PCM2004 featured a comprehensive program including keynote talks regular paper presentations posters demos and special sessions We received 385 papers and the number of submissions was the largest among recent PCMs Among such a large number of submissions we accepted only 94 oral presentations and 176 poster presentations Seven special sessions were also organized by world leading researchers We kindly acknowledge the great support provided in the reviewing of submissions by the program committee members as well as the additional reviewers who generously gave their time The many useful comments provided by the reviewing process must have been very valuable for the authors work This conference would never have happened without the help of many people We greatly appreciate the support of our strong organizing committee chairs and advisory chairs Among the chairs special thanks go to Dr Ichiro Ide and Dr Takeshi Naemura who smoothly handled publication of the proceedings with Springer Dr Kazuya Kodama did a fabulous job as our Web master Proceedings of the Second International Network Conference (INC2000) Steven Furnell, 2012-06-27 This book contains the proceedings of the Second International Network Conference INC 2000 which was held in Plymouth UK in July 2000 A total of 41 papers were accepted for inclusion in the conference and they are presented here in 6 themed chapters The main topics of the book include Internet and WWW Technologies and Applications Network Technologies and Management Multimedia Integration Distributed Technologies Security and Privacy and Social and Cultural Issues The papers address state of the art research and applications of network technology arising from both the academic and industrial domains The book should consequently be of interest to network practitioners researchers academics and technical managers involved in the design development and use of network systems Voice over IP Networks Pramode K. Verma, Ling Wang, 2011-01-12 This book addresses three important issues in VoIP networks Quality of Service pricing and security In addressing Quality of Service QoS it introduces the notion of delay not exceeding an upper limit termed the bounded delay to measure the Quality of Service in VoIP networks Queuing models are introduced to measure performance

in terms of bounded delays Closed form solutions relating the impact of bounding delays on throughput of VoIP traffic are provided Traffic that exceeds the delay threshold is treated as lost throughput The results addressed can be used in scaling resources in a VoIP network for different thresholds of acceptable delays Both single and multiple switching points are addressed The same notion and analysis are also applied on jitter another important indicator of the VoIP QoS This book also develops a pricing model based on the Quality of Service provided in VoIP networks It presents the impact of quality of VoIP service demanded by the customer on the transmission resources required by the network using an analytical approach In addition it extends and applies the delay throughput analysis developed for VoIP networks in assessing the impact of risks constituted by a number of transportation channels where the risk associated with each channel can be quantified by a known distribution Finally the book explores areas for future research that can be built on the foundation of research presented

Multimedia Applications, Services and Techniques - ECMAS'T'98 David Hutchinson, Ralf Schäfer, 1998-05-18 This book constitutes the refereed proceedings of the Third European Conference on Multimedia Applications Services and Techniques ECMAS'T 98 held in Berlin Germany in May 1998 The 40 revised full papers presented were carefully selected for inclusion in the book by the program committee The topics covered include multimedia networks and protocols coded representation of images sound and data multimedia delivery on broadcast and telecom networks servers and storage architectures advanced multimedia terminals and in house networks multimedia services Internet and multimedia scenario and multimedia trials

*Networking - ICN 2001* Pascal Lorenz, 2003-06-29 The International Conference on Networking ICN01 is the first conference in its series aimed at stimulating technical exchange in the emerging and important field of networking On behalf of the International Advisory Committee it is our great pleasure to welcome you to the International Conference on Networking Integration of fixed and portable wireless access into IP and ATM networks presents a cost effective and efficient way to provide seamless end to end connectivity and ubiquitous access in a market where demands on Mobile and Cellular Networks have grown rapidly and predicted to generate billions of dollars in revenue The deployment of broadband IP based technologies over Dense Wavelength Division Multiplexing DWDM and integration of IP with broadband wireless access networks BWANs are becoming increasingly important In addition fixed core IP ATM networks are constructed with recent move to IP MPLS over DWDM More over mobility introduces further challenges in the area that have neither been fully understood nor resolved in the preceding network generation This first Conference ICN01 has been very well perceived by the International networking community A total of 300 papers from 39 countries were submitted from which 168 have been accepted Each paper has been reviewed by several members of the scientific Program Committee

**Broadband Communications** Paul J. Kühn, Roy Ulrich, 2013-06-29 New Services such as for Internet data and multimedia applications have caused a fast growing demand for broadband communications The fundamental technologies for the integration of these services have been developed in the last decade optical communications photonic switching high

speed local area networks Asynchronous Transfer Mode ATM ISDN and B ISDN Internet packet networks and mobile communications The development was possible through the dynamic progress in communication and computer technologies and through worldwide standardization activities within ITU T the ATM Forum the IETF IEEE ANSI ETSI and other bodies These developments have been supported by research and field trial programmes Past developments such as about LAN Internet or ISDN networking technologies have shown that it needs a time span of 10 years for a new technology from its research stage to its full application Broadband Communications is just at its onset for full deployment It will have a dramatic effect not only on the networking situation but on the whole development of information technology throughout our social and economic life which is expressed by the conference theme The Future of Telecommunications The Broadband Communications conference series of IFIP WG 6.2 addresses the fundamental technical and theoretical problems related with these technologies BC 98 is the fourth meeting in a series of conferences being held in Stuttgart Germany The previous conferences were held in Estoril Portugal in 1992 in Paris France in 1994 and in Montreal Canada in 1996 International Symposium on Computer and Information Sciences Erol Gelenbe, 2022-09-16 Papers from an October 2002 symposium describe research in areas including algorithms artificial intelligence computer graphics computer networks databases evolutionary computation graph theory image processing multimedia technology software engineering and software performance engineering

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