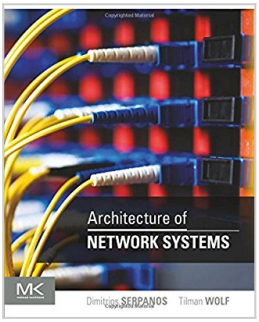

Architecture of Network Systems (The Morgan Kaufmann Series in Computer Architecture and Design)

By Dimitrios Serpanos, Tilman Wolf

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Architecture of Network Systems explains the practice and methodologies that will allow you to solve a broad range of problems in system design, including problems related to security, quality of service, performance, manageability, and more. Leading researchers Dimitrios Serpanos and Tilman Wolf develop architectures for all network sub-systems, bridging the gap between operation and VLSI.

This book provides comprehensive coverage of the technical aspects of network systems, including system-on-chip technologies, embedded protocol processing and high-performance, and low-power design. It develops a functional approach to network system architecture based on the OSI reference model, which is useful for practitioners at every level. It also covers both fundamentals and the latest developments in network systems architecture, including network-on-chip, network processors, algorithms for lookup and classification, and network systems for the next-generation Internet.

The book is recommended for practicing engineers designing the architecture of network systems and graduate students in computer engineering and computer science studying network system design.

- This is the first book to provide comprehensive coverage of the technical aspects of network systems, including processing systems, hardware technologies, memory managers, software routers, and more.
- Develops a systematic approach to network architectures, based on the OSI reference model, that is useful for practitioners at every level.
- Covers both the important basics and cutting-edge topics in network systems architecture, including Quality of Service and Security for mobile, real-time P2P services, Low-Power Requirements for Mobile Systems, and next generation Internet systems.

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Editorial Review

Review

"Designed for upper level undergraduate or graduate students in network engineering and architecture, this volume presents a comprehensive examination of major features of contemporary network systems and embedded network architectures. Topics discussed include network protocols, interconnects and switching, network adapters, bridges and routers, transport and application layer systems, QoS and security, network on chip architectures and next generation Internet architecture. Chapters include numerous illustrations and tables as well as concise summaries. Serpanos is a professor of electrical and computer engineering at the University of Petras, Greece and Wolf is a professor of computer engineering at the University of Massachusetts, Amherst."--*Book News, Reference & Research*

From the Back Cover

A structured approach to the technical aspects of network systems

Architecture of Network Systems Dimitrios Serpanos and Tilman Wolf

This is the most comprehensive book on network systems, covering design and evaluation techniques from the link layer to application layer. It beautifully blends networking with architecture and operating systems with just the right amount of detail. The book will serve as an outstanding text and reference for graduate students and researchers in the emerging area of architecture of networking systems.

- Laxmi Narayan Bhuyan, Distinguished Professor and Chair, Department of Computer Science and Engineering, University of California, Riverside

Architecture of Network Systems *is a very well-written book that covers fundamental concepts, principles, and protocols in networking/switching, as well as their real implementation solutions. I'd highly recommend it to people studying or working in computer networking.*

-H. Jonathan Chao, Head of Department and Professor, Department of Electrical & Computer Engineering, Polytechnic Institute of NYU

Network systems combine design principles and technologies from computer architecture, embedded systems, algorithms, and networking. *Architecture of Network Systems* explains the practice and methodologies that are necessary to solve a broad range of problems in network system design, including issues related to performance, scalability, security, and power efficiency. Leading researchers Dimitrios Serpanos and Tilman Wolf discuss network systems and their components at all layers of the protocol stack, bridging the gap between design and operation. This systematic treatment ranges from basic to advanced topics, exposing major challenges in network systems architecture and divulging their solutions.

Features

- Provides comprehensive coverage of the technical aspects of network systems, including system-on-chip technologies, embedded protocol processing and high-performance and low-power design.

- Develops a functional approach to network system architecture based on the OSI reference model, which is useful for practitioners at every level.
- Covers both fundamentals and the latest developments in network systems architecture, including network-on-chip, network processors, algorithms for lookup and classification, and network systems for the next-generation Internet.

Dimitrios Serpanos, Professor in the Department of Electrical and Computer Engineering, University of Patras, Greece and Director of the Industrial Systems Institute/R.C. Athena, Patras, Greece.

Tilman Wolf, Associate Professor in the Department of Electrical and Computer Engineering, University of Massachusetts, Amherst.

Download all the figures from the book at the author's web site.

http://www.ecs.umass.edu/ece/wolf/ansbook.html

About the Author

Dimitrios Serpanos is a Professor of Computer Architecture at the Department of Electrical and Computer of the University of Patras in Patras, Greece. He is also Director-elect of the Industrial Systems Institute (ISI) in Patras. Professor Serpanos holds a PhD in Computer Science from Princeton University (1990), an MA in Computer Science from Princeton (1988) and a Diploma in Computer Engineering and Informatics from the University of Patras (1985). Before joining the University of Patras, Professor Serpanos was a Professor (Assistant at first and Associate later) at the Department of Computer Science, University of Crete, Greece (1996-2000) and earlier, he was a Research Staff Member at IBM T.J. Watson Research Center, New York, USA. In addition to his faculty appointments, he has also been conducting research at research institutes, specifically ICS-FORTH, while in Crete, and ISI while in Patras.

Professor Serpanos has been a leader in the area of architecture of network systems, working on such systems for almost 20 years. He introduced the concept of specialized protocol processors (1992) and authored the first paper on multi-protocol, multiprocessor router architectures (1994). He has written more than 100 research papers in high quality conferences and research journals, addressing architectures and design issues of all types of network systems, from switches to routers and gateways. He has also worked on Quality-of-Service issues and has extensive activity in network and computer security. In addition to his research papers, Professor Serpanos holds 2 US patents and 7 invention disclosures in the area of network systems.

Professor Serpanos has received awards and distinctions as a graduate student, an IBM employee and as a faculty (2005 IBM Faculty Award). Furthermore, he is the General Chair of 2 IEEE Conferences, Technical Program Chair in 2 IEEE Conferences, organizer (twice) of an ACM Workshop, member of Technical Program Committees for conferences and workshops (over 25) and panel organizer for several conferences. He has served also in additional positions in conference organizing committees. In relevance to the subject of the book, Professor Serpanos is the leading Guest-Editor of a special issue of IEEE Network on Advances in Network Systems Architecture and the organizer and coordinator of a Task Force on Network Systems Architecture in the E-NEXT European Network of Excellence.

Professor Serpanos is a Senior Member of the IEEE; a member of ACM, IET, NYAS, and the Technical Chamber of Greece; he is also an educational member of USENIX.

Tilman Wolf is an associate professor in the Department of Electrical and Computer Engineering at the University of Massachusetts Amherst. He received a Diploma in informatics from the University of Stuttgart, Germany, in 1998. He also received a M.S. in computer science in 1998, a M.S. in computer engineering in 2000, and a D.Sc. in computer science in 2002, all from Washington University in St. Louis.

Dr. Wolf is engaged in research and teaching in the areas of computer networks, computer architecture, and embedded systems. His research interests include network processors, their application in next-generation Internet architectures, and embedded system security. His research has attracted substantial funding from both industry and the federal government, including an NSF CAREER award. He has taught graduate and undergraduate courses on computer networks, digital design, microcontroller laboratories, and capstone design projects.

Dr. Wolf is a senior member of the IEEE and member of the ACM. He has been active as program committee member and organizing committee member of several professional conferences, including IEEE INFOCOM and ACM SIGCOMM. He is currently serving as treasurer for the ACM SIGCOMM society. In 2004, he received the College of Engineering Outstanding Junior Faculty Award at the University of Massachusetts.

Users Review

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