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**Computer Networking: A Top Down Approach James F.Kurose, Keith W.Ross –  
Book Review**

**Dr. R.S. Kamath**

Department of Computer Studies, Chatrapati Shahu Institute of Business Education and Research,  
Kolhapur, India

[rs\\_kamath@rediffmail.com](mailto:rs_kamath@rediffmail.com)

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**Abstract**

In the field of communication, Computer Networking has much of attention. It has become an essential omnipresent technology with explosive growth. There are ample of books accessible for the study and design of computer networks. This paper addresses the review of book - Computer Networking: A Top Down Approach. This book provides the most balanced and uniform coverage of principles, architecture, practical insights of networks. This book can be a good reference suitable for computer professionals as well as students those with a computing background.

**Keywords:** book review; computer network; internet; layered architecture; protocols.

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**Introduction**

The Internet is a massive public spiderweb of computer connections. It has become a broadcast medium for the every person. In regard to this the book Computer Networking discusses technology behind network architecture with layered organization [1]. According to its specification A Top Down Approach, uses the Internet's architecture and protocols as prime medium for presenting fundamental computer networking concepts. The decision to use the TCP/IP model over the OSI model is appropriate considering the authors' intentions of focusing on the internet.

As the subject of Computer network is extremely complex, many of networking texts are organized as layered network architecture [2, 3, 4]. According to the experience of authors a layered approach is highly desirable. Authors found that the traditional approach of teaching from physical layer towards application layer is not the best approach for a modern course on computer networking. As it mentioned in the title A Top-Down Approach, authors provide chapters on the application, transport, network and data-link layers respectively. It enables teachers to introduce network application development at an early stage.

The style of the writing would be best described as clear, accessible and creates interest while reading. The authors make use of analogy and repetition to drive home the content which convinces concepts clearly to the learner. Especially we wanted to mention the "household analogy" presented in the chapter 3. This explains the relationship between transport and network layer effectively. Authors

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followed a true approach, in that they attempted to teach the building blocks of the major networking technologies [6].

**Authors of book**

The two authors, James F.Kurose and Keith W.Ross are researchers, practitioners in the in the field of computer networks. James Kurose is currently a Professor of Computer Science at the University of Massachusetts. His research interests include real-time and multimedia communication, network and operating system support for servers, and modeling and performance evaluation. He has been active in the program committees for IEEE Infocom, ACM SIGCOMM, and ACM SIGMETRICS conferences for a number of years. He is a recipient of various honors. Keith Ross is currently a Professor of the Computer Science and Engineering Department at NYU-Poly. His Ph.D. was in Computer and Control Engineering from the University of Michigan. Professor Ross has worked in security and privacy, peer-to-peer networking, Internet measurement, video streaming, multi-service loss networks, content distribution networks, queuing theory, and Markov decision processes. He has supervised more than ten Ph. D. theses. He has served on numerous journal editorial boards and conference program committees. He has received various honors and has published many papers.

This book is published by Addison-Wesley, Sixth Edition, February 2012, 864 pages, with ISBN No.:10: 0132856204 ISBN-13: 978-0132856201

### Organization of contents

There are a total of nine chapters, the first of which cover the big picture and lays out the nuts and bolts of internet [5]. The text of this presents a self contained overview of networking with the introduction of many key concepts and terminologies. All the other chapters directly depend on this chapter. A special historical section offered in this chapter and few historical sidebars spotted throughout the chapters. The tremendous amount of material covered concisely in this chapter. According to authors this chapter itself constitutes a mini-course in computer networking.

The book presents an analysis of each layer of the 5-layer TCP/IP model. In chapter 2, authors have elucidated many of the applications that rely on the protocols. Being academics, authors practice reveals that covering applications early provides motivation for the remainder of the text. Once a student understands the application, then he can understand the network services needed to support these applications [7]. The study of this chapter covers the conceptual and implementation aspects of network applications such as web, file transfer, e-mail, remote access, file sharing, multimedia applications etc. Chapter ends in the company of network application development with socket programming.

Equipped with the knowledge covered in chapter 2 about internet application structure and protocols lend a hand to go down the protocol stack. Critical role of transport layer that providing communication services directly to the application processes running on different hosts enlightened in chapter 3. The features of connection oriented service, segment structures of TCP & UDP etc are focused in-detail here. According to authors computer network can be partitioned into the “network edge” and the “network core”. Chapter 2 and 3 covers network edge where as network core covered in chapter 4 and 5. The host to host communication service of network layer dealt in detail in chapter 4. Intention of this chapter is to explain network layer functions, services, forwarding techniques, routing algorithms etc. Having completed study of the network layer, journey takes reader one step down the protocol stack, namely to the data link layer. Since the link layer involves a number of important and fascinating issues that can keep the reader busy for a long time. Different link layer channels and technologies are dealt in a well defined way. Coverage of the physical layer is spread

throughout all of the chapters in the book and presented on a "need-to-know" basis.

Following four chapters in the book cover wireless networking, multimedia networking, network security and network management. A solid foundation in all layers of the protocol stack is essential for the understanding of these chapters. By considering the revolution made by wireless and mobile networks, chapter 6 has focused on the principles, common technologies and network architecture for supporting wireless and mobile communication. A range of multimedia applications are explored in the chapter 7. Multimedia networking is one of the most exciting developments in the field of internet. In chapter 8, authors have covered security techniques with convincing illustrations [8, 9]. The text of book ends with the study of network management in chapter 9. This small unit enlightens important concepts of network management.

Following are the special features of this book which we want to enlighten,

- This book gives a good understanding of how networks work. The coverage of the TCP/IP layers is more standard, excellent and complete here.
- Each chapter elaborates the background, concepts, and functionalities in a descriptive, well-defined way.
- The flow of contents in the book helps the reader to understand the mechanics of TCP/IP architecture in a way that provides insight into the various networking issues.
- Due to the enormous relevance of the internet, study creates curious in students. The explanations are clear and well illustrated with diagrams.
- In addition to the theory authors have also added practical demonstrations of socket programming, construction of web server.
- At the end of each chapter challenging and interesting assignments are furnished to improve problem solving ability. It instills the readers a keen interest to think and ponder over issues.
- Each chapter presents ample details about the protocols, technologies, algorithms and standards that are used by each layer as it relates to the internet.

- Purchase of this book grants access to website, to retrieve interactive learning material, lab assignments, relevant online material etc.

This book is located in libraries such as Amazon, Infibeam, Flipkart, and Alibris etc. This book's Fourth and Fifth edition e-version is available in internet.

### Summary

This book offers a modern introduction to the dynamic field of computer networking, with the principles and practical approaches to understand today's networks. In our opinion it can be used as a reference for those who have to deal with some network issues. All of these chapters are quite long which may give readers the impression that the text drags on. The authors' wealth of experience has achieved interesting and informative read for the user. Readers especially students will likely appreciate reading of this book. According to us, this book provides the best introduction for computer students who have not had much exposure to network theory and are looking for a practical introduction to the subject.

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