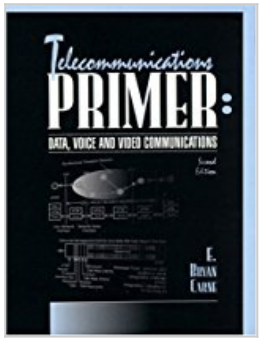

Telecommunications Primer: Data, Voice, and Video Communications (2nd Edition)

By E. Bryan Carne

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Completely updated: The telecommunications sourcebook for Knowledge Workers. The communications revolution continues to overwhelm users with wave after wave of innovation. Understanding these constantly evolving technologies is crucial for the knowledge workers-part business people, part computer scientists, and part engineers-who develop and implement communications strategies for businesses and governments around the world. Building on the groundwork of the first edition, Telecommunications Primer, Second Edition, has been fully updated and expanded by more than 40 percent to encompass all the latest advances in the field. Special sections have been added to cover: * Growth of Internet, intranet, and extranet applications. * Scalability and network management in distributed systems. * Advances in digital and cellular systems in North America, Europe, and Asia. *Intercontinental fiber optic networks with wavelength-division multiplexing. * Asynchronous Transfer Mode and developments in switching and routing protocols. * The 1996 Telecommunications Act. Like the first edition, Telecommunications Primer, Second Edition is organized in three parts: * Signals: The forms in which messa

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Editorial Review

From the Inside Flap

This, the second edition of Telecommunications Primer, has the same objective as the firstÑto be a sourcebook on telecommunication facilities and protocols for knowledge workers. Published in 1995, the first edition is fast becoming out-of-date in many areas. In the past three or four years, major advances have been made in technology, concepts, and operations. Among them are: Growth of Internet: from a network connecting some 50,000 networks containing 3 million hosts in 1994, Internet has grown rapidly. In 1998, it was estimated to connect some 2 million networks containing 40 million hosts. The growth of Internet has stimulated governments to plan national and global information infrastructures (NIIs and GIIs). Also, commercial users have invented intranets and extranets to share private information among employees, customers, and suppliers. Scalability and Network Management: the rapid growth of data traffic has caused all network providers to review their options for converting operations from a centralized format that is growth-limited, to a decentralized format that can grow indefinitely. As part of this strategy, they are establishing distributed management systems with automated agents. Deployment of Digital Cellular Radio Systems: North American time-division and code division multiple access systems (TDMA and CDMA) have been deployed that are compatible with earlier FM-AMPS. In Europe, Global System for Mobile Communications (GSM) has been expanded and updated. In Europe, Japan, and the United States, personal communication systems are being deployed in the 1.9-GHz personal communication services (PCS) band. Medium- and Low-Earth Orbit Satellite Constellations (MEO and LEO): several ambitious multisatellite systems are being deployed to provide worldwide communication services to mobile customers. Optical Fiber Cables Encircle the Globe: individual undersea cable systems that span the Atlantic, Indian, and Pacific basins have been interconnected. In addition, undersea cable systems are being deployed around Africa and South America. They all employ wavelength-division multiplexing. As a related matter, most fiber-optic network operators experienced fiber exhaust in 1977 and have adopted wave length division multiplexers (WDM) to increase capacity without laying new fibers. Asynchronous Transfer Mode: as the need for high-speed switching has become real, ATM has overcome early problems associated with flow control (and other operations) and is the heir apparent to the next generation switching machine. Digital Video: MPEG standards have created bandwidth efficient digital video and television signals. It has been deployed in direct broadcasting satellites and in terrestrial, high-definition television service. 1996 Telecommunications Act: among other things, the Act opens local service to competition, allows local exchange companies to enter the long-distance market, permits cable companies to offer telephone services, and permits telephone companies to offer television services.

Without doubt, on the eve of the second millennium, the first edition does not describe all of the technology of importance to the practicing knowledge engineer. To cover the new environment, new material has been added, existing material has been updated to reflect the developments of the last three to four years, and the text has been reorganized. Principally, the changes and additions are:

Introduction

Expansion of this section to two chapters to bring the soft topics together in one place. Signals

Additional discussion of several topics including: noise and the creation of errors, 2B1Q pulse formats, scrambling and unscrambling, Shannon-Fano coding, MPEG video coding and digital television, spread spectrum modulation, etc. Building Blocks

Addition of new chapter describing the characteristics of common bearersÑwire cables, optical fibers (including optical amplifiers and wavelength-division multiplexing), cellular radios, and communication satellites Addition of new chapter focusing on multiplexing, digital subscriber lines, and hybrid voice, data, and video connections Expanded discussion of open systems architecture and network management

procedures of the International Standards Organization (ISO) Expanded discussion of the relationship among packet switching, frame relay, and cell relay (SMDS, ATM) Additional discussion of modems, particularly higher-speed modems and cable modems Expanded discussion of automatic-repeat-request (ARQ) error correction, forward error correction coding and throughput Networks Addition of new chapter on transfer modes to emphasize the interdependence of switching/routing and multiplexing, including expanded discussion of relation among X.25, frame relay, SMDS, and ATM networks Inclusion of traffic engineering in discussion of local and long-distance networks Discussion of the use of ATM for high-speed networks, television distribution, and local-area networks (LANs) Description of GEO, MEO, and LEO satellite systems for mobile communications Additional discussion of NA-AMPS and GSM cellular radio systems New description of NA-TDMA and NA-CDMA cellular radio systems Additional description of PCS systems New chapter on LANs, MANs, and Internet; includes description of the operation of routers and gateways, intranets and extranets, and new initiatives such as Internet2 and vBNS Addition of discussion of national and global information infrastructure initiatives Inclusion of SNA in enterprise network discussion, including subarea and APPN operation Discussion of network management systems including SNMP, and management of non-OSI devices.
The result is a 40% larger book, with over 100 new diagrams. In addition, I have included review questions. Because my intent is to remind you of the information contained in each Section, they follow the sequence of the text and should present no difficulty for the reader.

For an author, the publication of a new edition is exciting. In my case it is tempered by the realization that it will all have to be done again in three or four years as the tempo of change continues to increase. I do hope you find the second edition of Telecommunications Primer a worthy addition to your technical library.

E. Bryan Carne
Peterborough, NH.

From the Back Cover

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The communications revolution continues to overwhelm users with wave after wave of innovation. Understanding these constantly evolving technologies is crucial for the knowledge workers-part business people, part computer scientists, and part engineers-who develop and implement communications strategies for businesses and governments around the world.

Building on the groundwork of the first edition, Telecommunications Primer, Second Edition, has been fully updated and expanded by more than 40 percent to encompass all the latest advances in the field. Special sections have been added to cover:

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- Asynchronous Transfer Mode and developments in switching and routing protocols.
- The 1996 Telecommunications Act.

Like the first edition, Telecommunications Primer, Second Edition is organized in three parts:

- Signals: The forms in which messages are exchanged.
- Building blocks: The devices and procedures that generate, transport, and receive signals, and
- Networks: The systems that transfer information between people, between machines, and between people and machines.

Telecommunications Primer, Second Edition presents a wealth of information in terms that make it accessible to readers from many different disciplines. Numerous illustrations, cross-references, and a complete glossary and reading guide make it an indispensable reference book for the knowledge workers of the 21st Century.

About the Author

E. BRYAN CARNE has more than 35 years of experience in engineering, manufacturing, and marketing for telecommunications. Since his retirement from GTE, he has served on the faculties of Northeastern University in Boston and Christian Brothers University in Memphis. He is also the author of Telecommunications Topics, Applications of Functions, and Probabilities in Electronic Communication (Prentice Hall PTR).

Users Review

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Dale Hollander:

A lot of people always spent all their free time to vacation or maybe go to the outside with them family or their friend. Do you realize? Many a lot of people spent these people free time just watching TV, or maybe playing video games all day long. If you would like try to find a new activity that's look different you can read any book. It is really fun for you. If you enjoy the book which you read you can spent all day long to reading a reserve. The book Telecommunications Primer: Data, Voice, and Video Communications (2nd Edition) it is rather good to read. There are a lot of folks that recommended this book. These were enjoying reading this book. In the event you did not have enough space to bring this book you can buy often the e-book. You can m0ore simply to read this book from a smart phone. The price is not to cover but this book provides high quality.

Louise Hawkins:

People live in this new day time of lifestyle always make an effort to and must have the spare time or they will get lot of stress from both lifestyle and work. So , if we ask do people have spare time, we will say absolutely sure. People is human not only a robot. Then we question again, what kind of activity have you got when the spare time coming to an individual of course your answer will probably unlimited right. Then do you ever try this one, reading ebooks. It can be your alternative within spending your spare time, typically the book you have read is Telecommunications Primer: Data, Voice, and Video Communications (2nd Edition).

Steven Hackett:

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