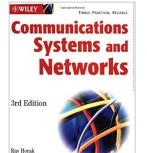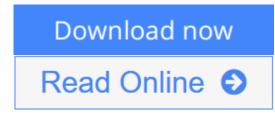# Communications Systems and Networks

*By Ray Horak*



**Communications Systems and Networks** By Ray Horak

* Convergence is confusing. Convergence is critical. And convergence is real. In this book, industry pundit Ray Horak describes how the merging of voice and data networks has evolved and is likely to evolve as we move toward an information-based economy.
* Beginning with the fundamentals of communications technology, the book grounds the reader in basic telecommunications concepts including circuits (dedicated, switched and virtual), switches (circuit, packet, and frame), and the issues involved in digital and analog transmission.
* Describes the rudiments of transmission media, from twisted pair and coaxial cable to satellite and fiber-optic transmission.
* Introduces the basics of voice systems, beginning with legacy networks like key telephone systems and including PBXs, Centrex, Automatic Call Distributors, and Computer Telephony Integration (CTI).
* Explains the fundamentals of data communications, including basic LAN and WAN engineering, modems and other forms of data communications equipment, broadband infrastructure and network services, and the protocols and equipment that make the global Internet a reality.
* Considers some of the emerging technologies and applications just now gaining widespread acceptance, including wireless networks and digital video networks, along with the economic and regulatory forces likely to determine the shape of the networked world of the 21st Century, as well as the speed with which we can expect to see it implemented.
* Previous edition sold 40,000+ copies.

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## Editorial Review

Amazon.com Review
Living in an era of instant communication has certain drawbacks. Not too long ago, the living was simpler. People had one or two telephone numbers, a street address, and access to four or five television channels. Now, we have phone numbers for home, work, mobile phone, fax machine, and pager. We have multiple e-mail addresses. We have access to unlimited information over the Internet. With digital cable or a personal satellite dish, we choose from hundreds of television channels. The communication technology behind this revolution continues to evolve--becoming faster, cheaper, and more prolific. What technology is behind the scenes, and how does all of this information get delivered? That is the question that's answered by this remarkable tome, Ray Horak's *Communications Systems & Networks*.

Horak explains communication technologies in 15 chapters, using the growing convergence of voice, data, and video as the narrative thread that holds the book together. He starts at the beginning--telegraph and early telephone--and details the progression from analog voice signals to modern high-speed digital networks. Along the way, he emphasizes technical breadth. For exhaustive detail on any one subject, Horak enumerates relevant sources and suggests additional reading at the end of each chapter. This feature makes this book the ideal place to start when researching any communications topic. Another good thing about this book is its pragmatic approach to communications. Horak blends a high-level view of the subject with implementation and deployment issues, as well as the relative costs of different technologies.

This book is valuable for both engineers and managers. It's a perfect resource for inquisitive engineers who are well versed about one area of communications and want to explore the rest of the communications world. For a manager who wants a technical overview of a given subject, the depth is perfect--just enough knowledge to become dangerous.

The conversational style of the book also is a welcome touch. In contrast to technical books that require a can of Jolt to stay awake, Horak presents complex material concisely. Historical perspective is integrated with technical details, and reflects the author's many years of experience. Topics such as the Telecommunication Act of 1996 are explained in the context of technological change, and give the reader a comprehensive overview of virtually all communication technologies. This book is the perfect complement to such industry mainstays as Perlman's *Interconnections*, Comer's *Internetworking with TCP/IP*, and Tanenbaum's *Computer Networks*. --Pete Ostenson

Review
Perfect for communications professionals and baffled novices...features plain-English explanations for all the technical fundamentals of networking... -- *Teleconnect magazine, June 2000*

From the Back Cover
A comprehensive overview of today's networked world, offering just the right amount of technical detail

Now updated to cover the latest wireless and broadband technologies, this lucid overview describes today's communications systems and networks-voice, data, video, and multimedia-and explains how they are likely to evolve and converge. Communications Systems and Networks delivers plain-English explanations of all the technical fundamentals-and puts everything in context by addressing standards, regulations, and the real-world outlook for legacy, contemporary, and emerging technologies. Whether you're a networking pro who wants to gain some perspective or you just want to understand our increasingly interconnected world, this is

the one book you need to see the big picture.

Inside, you'll find clear explanations of:
* Essential concepts such as circuits, switches, and digital and analog transmission
* Transmission media--from twistedpair to satellite, microwave, infrared, and fiber optics
* Data communications, from LANs and WANs to broadband and 3G wireless
* Recent and emerging voice technologies, including Voice over Frame Relay (VoFR), Voice over ATM (VoATM), Voice over IP (VoIP), and Voice over DSL (VoDSL)
* Broadband access technologies, including Digital Subscriber Line (DSL), cable modems, Free Space Optics (FSO), and Wireless Local Loop (WLL)
* Internet and Web standards, topology, technologies, and protocols, including WAP and i-Mode
* Video and multimedia networking, from HDTV to videoconferencing systems
* Network convergence issues, such as standards, regulation, addressing, and Quality of Service (QoS)
* The latest regulatory flash points, from line sharing to Internet wiretapping

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