

Understanding Voice over IP

Understanding Voice over IP is a comprehensive two-day course for non-engineering professionals who need to get up to speed on VoIP, understand the fundamentals, jargon and buzzwords, along with SIP, PBX replacement, convergence, carrier services and interconnect, implementation issues and solutions, VoIP system vendors, business and deployment cases and project management.

Taking this VoIP training course, you'll obtain a solid vendor-independent foundation, understanding IP telephony technologies, products and implementation choices... knowledge you can't get reading trade magazines or talking to salespeople, and career-enhancing knowledge that lasts a lifetime.

Every course comes with certification and a comprehensive 300-page student manual with copies of all graphics and detailed notes, sure to be a valuable reference for years to come. Register today!

Key Course Features

- ✓ **Build a Solid Understanding of VoIP**
 - Demystify jargon and buzzwords
 - Fundamental ideas, components, implementations
 - Voice packetization, codecs, softswitches, gateways
- ✓ **Learn All About SIP**
 - Understand how SIP works and IP call setup
 - How SIP fits in with soft switches and call managers
- ✓ **Understand VoIP Networks and Services**
 - PBX replacement vs. hosted PBX vs. IP Centrex
 - Connection to carriers, QoS, Service Level Agreements
 - MPLS, VPNs, Megaco and Session Border Controllers
- ✓ **How VoIP saves money and increases productivity**
 - Why phone companies are converting to VoIP
 - Cost savings for small, medium and large organizations
 - Converged applications and sophisticated call handling
- ✓ **Readiness assessment, case studies, vendors**
 - Identify and discuss key issues that must be evaluated
 - Business and deployment cases: PBX replacement, IP Centrex, multi-location networked cases
 - Vendor and product reviews
- ✓ **Project management**
 - Requirements analysis, RFPs, running trials, selecting a vendor, rollout, maintenance
 - Practical templates and checklists you can use

Who Should Attend

- Professionals who need to get up to speed on VoIP.
- Decision-makers and project managers who need to understand what the "techies" are saying.
- Anyone who wants to eliminate buzzword frustration, understand VoIP concepts and how it all fits together.
- Anyone willing to invest two days to obtain career-enhancing training, with certification and reference book.

Seven More Reasons To Attend

- ✓ **Designed for Non-Engineers**
Understand the jargon, buzzwords and technologies, underlying ideas and how it all works together, without bogging down on details.
- ✓ **Vendor Independent**
Core foundation knowledge that can be applied to any related project or system.
- ✓ **BOOT CAMP option**
Combine with core training Course 101 Telecom, Datacom and Networking for Non-Engineers for a full week of training. Covering everything from A-Z, you'll build a solid foundation and really get up to speed... while saving over \$500!
- ✓ **Technically-qualified professional instructors**
Our instructors hold Engineering degrees or equivalent and have decades of experience working in the field. They consistently receive the highest ratings and written praise on student evaluations.
- ✓ **High-quality course materials**
You will get a 300-page high-quality course book with copies of all diagrams plus detailed text notes. Up-to-date, bringing together all this information, impossible to find in one place anywhere else, sure to be a valuable reference for years to come.
- ✓ **Certification included**
You will receive a certificate attesting to your IP telecom knowledge suitable for framing.
- ✓ **Value Pricing**
This two-day course is value priced at only \$995. Compare to \$1499 for lower quality elsewhere.

Coverage of all major topics, high-quality course materials, certification and certificate suitable for framing, bonus free textbook and value pricing... don't miss this opportunity to invest in yourself and your career!

Here's What Seminar Attendees Like You Are Saying

Hundreds of people like you have benefited from Teracom's training. Many tell us their Teracom course was their best course ever; filled gaps in their knowledge and tied everything together... knowledge they've been needing for years. Here's a sampling of comments from Teracom alumni:

"Outstanding! The instructor had an outstanding knowledge and presentation."

- Larry Byrnes, NAVAIR, US Navy

"The instructor was very knowledgeable and explained things at a level that I could understand."

- K.J., Novozymes NA

"Thank you again for the great training you provided. I made my superiors aware of how helpful and integral your training was in developing my understanding of the communications world, not to mention putting me a step ahead of the competition."

- Nyles Stockton-Davis, The United Companies

"I sat in on a round table at a conference yesterday where VoIP was discussed by Time Warner Cable and Vonage – and I understood most of their diagrams and explanations – something that would have been 'Greek' to me two weeks ago. Thank you."

- Bob Sabin, Tel Control, Inc.

"Thank you! Thank you! I just spent an entire day talking about Session Initiation Protocol. Well - not talking so much as listening. With all of our remote locations going to VoIP, my old PBX skills are as useful as my old 45s. But, thanks to the course, and your instruction, I was actually able to follow the presenter (who spoke so quickly that I'm sure she must have had an oxygen tank nearby!)"

- Janette Murray, Communications Analyst, Landstar System Holdings

Whether you work for an organization that is moving to VoIP, or a company that produces IP telecom or networking products or services – or just have to get up to speed on what all the rest of them are talking about when they say "softswitch", "call manager", "RTP", "G.729", "SIP" or "Megaco"...

"Just wanted to drop you a quick note to let you know that Storm did a great job in our class. With material that can get "dry" sometimes, he made it interesting and applicable. He took the time to answer every question, and if he didn't know an answer, didn't try to fake it. (When he didn't know an answer, it was probably more a function that the question made no sense, versus lack of knowledge)."

- Jay Steinberg, GMAC Residential

"Gave me an overall understanding of the workings of VoIP. The instructor was very good – he was able to answer all questions and made the course interesting."

- Garry Waddell, Ricoh Corporation

"Made clear that which had previously been muddy."

- Nick Whittier, EPA

"New technology - installing in new sites soon, and I needed to know everything that was taught. Lots of new/good information, and it was presented in an understandable format."

- Sharon H. Eastman, Kentucky Dept. of Labor

"The seminar was a good overview, also detailed enough to gain a more in-depth knowledge of the various components of a VOIP network."

- C.M., State Farm Insurance

"The instructor was very knowledgeable and made sure you understood the subject matter."

- G.M., Naval Undersea Warfare Center Newport

"The instructor was excellent and presented a good, entertaining approach to the subject."

- John P. Spinks, Lockheed Martin

Why Take This Course

Teracom's courses have been taught to wide acclaim across North America since 1992 and are designed for the **professional** needing to fill in the gaps, build a solid base of knowledge... and understand how it all fits together.

1. Develop a clear understanding of VoIP systems, components, standards, jargon and buzzwords, including packetized voice concepts, codecs and compression, RTP protocol, softswitches, gateways, servers, how SIP works and more.
2. Cut through the jargon and vendor hype to get *unbiased* explanations of all of the mainstream choices for implementing VoIP, allowing you to make meaningful comparisons and informed decisions.
3. This course is specifically designed for non-engineers: learn the fundamentals, concepts and underlying ideas – in plain English – and fill the gaps in your knowledge, without bogging down on details.
4. Learn from the best. Not only do Teracom's instructors consistently receive highest ratings on student evaluations and specific praise of their ability to get *ideas* across, our instructors hold Bachelor of Engineering degrees or equivalent and have decades of experience working in the field.
5. Learn how to perform a readiness assessment, identifying potential problem areas and solutions, and obtain a detailed Readiness Assessment Checklist that you can put to immediate use.
6. Share practical insights, tips and tricks with other class members, discussing implementation issues in the context of the Readiness Assessment, Case Studies and Vendor Survey.
7. Get a comprehensive template for managing a VoIP project written by a Systems Engineer: how to do it the "right" way, from analyzing requirements to running trials, evaluating and selecting a vendor, rollout, acceptance testing and more. Packed with practical tips and checklists you can use immediately.
8. Get a 300-page high-quality bound student manual / textbook with detailed text notes, up-to-date and bringing together all of this information, impossible to find in one place anywhere else.
9. Get VoIP certification, complete with certificate attesting to your VoIP knowledge suitable for framing.

Without bogging down on unnecessary details, understand the ideas, concepts, technologies and solutions, increasing your confidence and allowing you to make informed choices and meaningful comparisons – knowledge you can't get on the job, reading trade magazines or talking to vendors.

Tuition Fees

This high-quality, up-to-date course is value priced at only \$995 for the two days, including certification test, certificate and 300-page course book. Compare to \$1499 and up for lower quality courses elsewhere.

BOOT CAMP Option

Course 130 Understanding Voice over IP is often scheduled in conjunction with Course 101 Telecom, Datacom and Networking for Non-Engineers. If you need to start at the beginning, take both courses to make a full week of training and benefit from a 15% discount on both! [details](#)

How to Register

Space in our seminars is limited, and may sell out, so please register as early as possible to reserve your place. You can register online or by phone:

- Register online at www.teracomtraining.com.
- Register by phone at 1-877-412-2700.

Once you register online or call us, we'll send your registration package by email, including a confirmation letter for you to sign and fax back to complete your registration. There is no obligation until you return the signed confirmation letter and you can cancel anytime up to two weeks before the course with no penalty.

We accept Visa, MasterCard and American Express, as well as checks and purchase orders.

FREE! Telecom 101 Textbook

Register for this course today, and you will receive a free electronic copy of Teracom's highly-acclaimed 400-page Telecom 101 textbook, 3rd edition, free!

Detailed Course Description

Part 1: Fill the Gaps and Build a Solid Foundation

The first three chapters of the course are devoted to understanding the essentials: VoIP buzzwords and jargon, components, standards, architecture choices, and call flow in the IP world.

1. VOIP SYSTEMS, COMPONENTS, STANDARDS, JARGON AND BUZZWORDS

In the first chapter, you'll understand VoIP jargon and buzzwords, basics of communicating voice in IP packets, what the components of VoIP systems are and what each does: soft switches, media servers, gateways and terminals, plus the main standards and protocols used in VoIP systems.

- A. The Big Picture
- B. VoIP System Components
 - 1. Terminals
 - 2. Voice in IP Packets
 - 3. Softswitches / SIP Servers / Call Managers
 - 4. Media Servers and Unified Messaging
 - 5. Gateways
 - 6. LANs and WANs
- C. Key VoIP Standards
- D. Where All of This is Headed: Broadband IP Dial Tone

2. VOIP ARCHITECTURES AND IMPLEMENTATION CHOICES

“Voice over IP” can happen in many different ways. One by one, we'll review the many flavors of VoIP, comparing and contrasting the various implementations and architecture choices. Progressing through Internet telephony, Managed IP Telephony, PBX replacement with distributed call manager systems and IP Centrex / Hosted PBX, you'll gain the knowledge to confidently differentiate VoIP architectures and discuss pros and cons of options.

- A. Internet Telephony
 - 1. Computer to Computer VoIP over the Internet; Skype and IM
 - 2. Computer to Phone (DS0 Interconnect to LEC)
 - 3. Phone to Phone over the Internet
- B. Managed-IP Telephone Service
 - 1. MIPT from Telephone Companies
 - 2. IXCs and IP-based backbones
- C. VoIP for Businesses and Organizations
 - 1. VoIP-Enabled PBX
 - Migration Options
 - 2. PBX Replacement
 - Softswitches and Application Processors
 - Distributed Call Managers
 - Survivability Options
 - 3. Hosted PBXs
 - Financial Options
 - 4. IP Centrex
 - Multisite Support
 - 5. Open-Source IP-PBX Software Solutions
- D. IP Phone Features and Uses

3. SIP AND CALL FLOW IN THE IP WORLD

SIP has emerged as the dominant method of establishing communications in the VoIP world. Here, you'll understand what SIP is, how it works, demystify jargon like proxy server and location server, understand how SIP fits in with softswitches and call managers, and trace the establishment of an IP phone call step by step. At the end of this, you'll understand call flow in IP telephone systems – maybe worth attending the course all by itself!

- A. What SIP is and What it Can Do
 - 1. SIP URIs: “Telephone Numbers”
 - 2. Registration and Location
 - 3. Proxy servers

- B. How calls are set up using SIP
- C. The SIP Trapezoid; SIP Message Example
- D. How SIP relates to softswitches and call managers
- E. ENUM: relating SIP to NPA-NXX-XXXX phone numbers

Part 2: Applications and Business Cases

In the next two chapters, we'll take a closer look at why VoIP is such a good idea, identifying more than 12 ways VoIP can increase productivity and 15 ways VoIP can save money, and highlight some of the truly "neat" applications emerging that use VoIP and SIP.

4. A WHOLE NEW WORLD OF COMMUNICATION SERVICES

Here, we'll identify concrete reasons why VoIP should be implemented, with examples and case studies showing how communications service and productivity can be radically improved. You'll understand convergence and the increasingly important concept of Presence, enabling sophisticated call handling. We'll also take a look at IP in the Call Center, enabling virtual contact centers, hosted contact centers and new ways of communicating with customers. This chapter finishes with an overview of IPTV: cable TV from the phone company.

- A. Convergence
 - 1. One network service, one infrastructure, one bill
 - 2. Multiple media communications during a conversation
 - 3. Device-agnostic communications
- B. Presence: beyond Instant Messaging
 - 1. Automatic registration for location independence and improved reachability
 - 2. Sophisticated call handling to improve productivity
- C. What Happens When We Have Convergence and Presence?
 - Geographic Independence
 - Media Independence
 - Network Independence
 - Device Independence
 - Address Independence
- D. Unified messaging
- E. Group Communications: Mixed Devices
- F. Group Communications: Personal Communicator
- G. Applications Running on IP Phones
- H. Virtual Contact Center
- I. Hosted Contact Center Services
- J. IP Call Center Application Example
- K. Video over IP and IPTV

5. HOW VOIP CAN SAVE MONEY

Aside from productivity-enhancing communication applications, there are plenty of other reasons why VoIP as a way of implementing converged communications is a very good idea. In this chapter, you'll learn 15 concrete ways that VoIP can save money, both in the short and long term.

- A. Benefits to Cable TV companies
- B. Benefits to telephone companies
- C. Large Organizations: Merging the Voice and Data Infrastructure
 - 1. Capital expense
 - 2. In-building wiring infrastructure
 - 3. WAN consolidation
 - 4. Maintenance: spare parts
- D. How VoIP Can Be Used More Effectively to Carry Voice and Data
 - 1. Dynamic bandwidth allocation - access
 - 2. Improved voice coding (compression)
 - 3. Integrated Access Device (IAD)
 - 4. Centralization of multisite systems and applications
- E. Merging the Support Systems

1. Help desk
 2. Installation and repair technicians
 3. Planning and provisioning
 4. Procurement
- F. Avoiding Switched Access Charges and Regulatory Fees
G. Avoiding Proprietary Hardware and Software
H. The End of Geography

Part 3: Understanding VoIP Technology and Networking

With a good understanding of “what”, “how” and “why”, the next two chapters drill into VoIP technology, enough to understand the fundamentals, fill in gaps in your knowledge and explain jargon and mainstream practices without bogging down on details.

6. UNDERSTANDING PACKETIZED VOICE

In this chapter, you’ll understand what exactly packetized voice is, how it happens and the standards and protocols used. You’ll learn about codecs and compression, and the factors affecting sound quality. We’ll listen to sound clips of impairments, and provide you with a practical checklist of tips and recommendations for ensuring success.

- A. Voice Packetization
- B. Measuring Voice Quality
- C. Factors Affecting Voice Quality
- D. Codecs, Compression and the G.729 codec
- E. Network Delay and Jitter
- F. RTP and UDP
- G. IP Networks: Layers 1-3
- H. The VoIP Protocol Stack
- I. In-Class Demo: Impairments and Effects on Sound Quality
- J. Tips for Maximizing Voice Quality

7. CARRIER VOIP NETWORKS, SERVICES AND INTERCONNECT

Completing our technology overview, we’ll examine carriers’ IP network technologies and services and connecting to networks. We’ll cover the important topic of MPLS as a way of implementing Quality of Service (QoS) and VPNs for security. You’ll learn about connecting to the VoIP carrier and the significant differences in cost between connecting at the DS0 level vs. the IP level. We’ll complete the topic identifying seven critical areas any potential service provider must be evaluated on.

- A. Carrier Services Offered
 1. MPLS and Quality of Service
 2. VPNs and secure call paths
 3. Session Border Controllers
 4. Megaco/H.248 services
 5. Types of managed services available
- B. Accessing the VoIP Carrier
 1. DS0-level connectivity: existing/legacy systems
 2. Gateway configurations and options
 3. IP-level connectivity: cost savings
 4. SIP trunking: on-net/off-net calling
 5. Fall-back to PSTN options
- C. Selecting a VoIP Carrier
 1. IP equipment and systems support
 2. Legacy Frame Relay and ATM migration support
 3. Service Level Agreements (SLAs) and Guarantees
 4. Global access and connectivity
 5. Carrier Service Level Interconnect Agreements
 6. Remote and mobile worker support
 7. Business continuity support

Part 4: Readiness, Deployment Cases, Vendors and Project Management

The last part of the course is the practical. First the Readiness Assessment to identify potential issues, then case studies to cement your understanding what architecture choice is appropriate for what kind of organization, a survey of the top vendors and finally detailed project management guidelines.

8. READINESS ASSESSMENT

With the nuts and bolts in place, we're ready to tackle the Readiness Assessment. Step-by-step, we'll walk through issues that must be considered, and finish with a practical Readiness Assessment Checklist you can put to immediate use. This will allow you to plan for change, rather than having hidden issues become a series of career-limiting surprises.

- A. Readiness Assessment: Issues That Must be Reviewed
- B. Implications for the Organizational Structure
- C. VoIP's Implications for the LAN
- D. LAN Cabling
- E. Phone Powering: AC, PoE, UPS
- F. Recommended LAN Configuration for VoIP
- G. VoIP's Implications for the WAN: Capacity / Scalability Assessment
- H. Comparing Transmission Choices: T1, Frame Relay, ATM, MPLS, Internet
- I. Redundancy and Disaster Recovery
- J. IPv6
- K. End-user Equipment
- L. Readiness Assessment Checklist

9. CASE STUDIES: VOIP IN-BUILDING

Continuing with the practical, to cement your knowledge, we'll present mainstream solutions for deploying VoIP in a series of interactive, class-participation case studies. In groups, the class will develop profiles for the kind of organization that would select each strategy – and why, then discuss each case. This is an ideal opportunity for you to compare and contrast different strategies, share practical implementation experience, and understand which approach may be best for your situation. The first case studies are VoIP inside the building:

- A. Case Study: Network-based VoIP Service (IP Centrex)
- B. Case Study: PBX-based VoIP
- C. Case Study: Softswitch-based VoIP

10. CASE STUDIES: VOIP LONG-DISTANCE

The second set of case studies are VoIP for long-distance communications. Again, this is an ideal opportunity for you to compare and contrast different strategies, share practical implementation experience, and understand which approach may be best for your situation.

- A. Case Study: Private Network
- B. Case Study: Over Legacy Data Networks (Frame/ATM)
- C. Case Study: VoIP over the Internet
- D. Case Study: Internet VPNs (CPE-based IPsec)
- E. Case Study: Carrier VoIP Service: VPN + QoS

11. VOIP VENDOR PROFILES

Touching base with the marketplace, we'll take a survey of vendors: "hardware" vendors, softswitch vendors and service providers, chosen to be representative of all of the vendors in their category. You'll learn about the different philosophies of major players, their key products, latest trends and developments.

- A. Hardware Vendors
 - 1. Avaya, Nortel and Cisco
- B. Soft-switch Vendors
 - 1. Broadsoft
 - 2. ShoreTel
- C. Service Providers
 - 1. AT&T, Verizon, Qwest
 - 2. McLeod USA
 - 3. Vonage et al.

12. VOIP PROJECT MANAGEMENT

We complete the practical with a comprehensive template for managing a VoIP project. You'll learn how to do it the "right" way, from analyzing requirements to running trials, evaluating and selecting a vendor, rollout, acceptance testing and more. This project management guide is packed with practical tips and checklists that can be put to immediate use. If you are about to embark on a VoIP deployment, this might well be worth the price of the course all on its own.

- A. The Need for a Process
 - 1. Requirements before design before product purchase
- B. Dealing with Vendors
 - 1. Who is in charge here?
 - 2. Sales techniques to beware of
- C. Step 1: Internal Requirements Specification
- D. Step 2: Identify Potential Vendors
 - 1. Generating a Request for Information (RFI)
 - 2. Checklist: Who is providing what?
- E. Step 3: Qualify Vendors
- F. Step 4: Evaluate Qualified Vendors
 - 1. Setting up a captive test environment
 - 2. Trial their system
 - 3. Procedure: How to run tests and evaluate the results
- G. Step 5: Vendor Selection
 - 1. Generating a Request for Quote (RFQ)
 - 2. Reconciling the RFQ and the responses
 - 3. Dealing with unwanted features
- H. Step 6: Close the Deal
 - 1. Checklist: Core contract clauses and items that must be specified
 - 2. Negotiating the price
- I. Step 7: Roll Out the System
 - 1. Structured roll-out
 - 2. Leaving room for a roll-back
- J. Step 8: Maintenance
 - 1. Template: Trouble categories and response standards

Our Goal

Our goal is to bust the buzzwords, demystify jargon, understand technologies and mainstream solutions and - most importantly - the ideas underlying all of this, and how it all works together... knowledge you can't get on the job, talking to vendors or reading trade magazines.

How You Will Benefit

You'll gain a long-lasting, solid base of unbiased career-enhancing knowledge you can build on, an investment sure to be repaid many times over, increasing your confidence and productivity and eliminating jargon- and buzzword-related frustration.

Plus, you will receive a high-quality 300-page workbook – a valuable reference packed with detailed notes, diagrams and practical explanations, with experience, tips and templates you can put to immediate use, as well as a certificate attesting to your IP telecom knowledge skills.

Don't Miss This Opportunity!

If you've read this far, you know by now that this is the training you've been looking for to fill the gaps and get on top of IP Telecom. Coverage of all major topics, high-quality course materials, certification and certificate suitable for framing, bonus free textbook and value pricing... don't miss this opportunity. Invest in yourself and your career and [register](#) for this course now.

Bring This Course To Your Location

In addition to scheduled "public" seminars, since 1992, we have provided high-quality on-site training at 3Com, Qualcomm, Intel, Cisco, Nortel, AT&T, Alcatel, Kyocera, T-Mobile, Ericsson/Hewlett-Packard, Verizon, MindSpring, APEX Telecom, Equifax, Transamerica Insurance, CNA Insurance, the US Air Force, Bell Canada, TELUS, Cap Gemini, ComSec Establishment, MicroCell, TDS Telecom, Western Wireless... to name a few.

Onsite training has special advantages:

- Your personnel will be up to a common speed with a solid knowledge base.
- We'll fill in the gaps and put in place productivity-enhancing structured understanding.
- The seminar will be a strong team-building exercise.
- Significant reductions in training costs are often achieved.
- Each student receives a detailed workbook / textbook that will be a valuable reference for years to come.

We have built a solid reputation for delivering high-quality team-training programs that are a resounding success. Please contact us at 1-877-412-2700 or visit our web site for information on "[onsite training](#)".

About the Author



Eric Coll is an international expert in telecommunications, data communications and networking and has been actively involved in the industry since 1983. He holds Bachelor's and Master of Engineering (Electrical) degrees, and is licensed as a Professional Engineer in his home jurisdiction.

Mr. Coll has taught telecommunications technology training seminars to wide acclaim across North America since 1992, and has broad experience working as an engineer in the telecommunications industry.

He has worked for Nortel's R&D labs as a design engineer on projects including digital voice and data communications research and digital network equipment design; on satellite radar systems; Wide Area Network design for HMO applications; and many other projects in capacities ranging from detailed design and implementation to systems engineering, project leader and consultant.



Course Instructors

Storm Connors, M.S. A graduate of Central Connecticut State College holding Bachelor's and Master's degrees, Storm started his career with Honeywell, and was key in Aetna Life and Casualty's Data Processing Education Program as instructor, developer, and manager, helping the program grow from nothing to over 50,000 student days/year.

For over twenty years, Storm has been a program developer and instructor, teaching numerous telecommunications technology seminars to rave reviews from thousands of students.



Richard Olsen, B.S.E.E., P.E. Richard Olsen holds a B.S. in Electrical Engineering and has over 36 years of professional engineering and teaching experience. Richard held senior management and engineering positions at Southwestern Bell for over 20 years. He has served as an instructor for numerous major companies as well as being an Adjunct Professor and Executive-in-Residence in the Master of Science in Telecommunications Management degree program, Oklahoma State University. Richard is a member of the MSTM Industry Advisory Board, Oklahoma State University, the National Society of Professional Engineers, the Oklahoma Society of Professional Engineers and the IEEE. Richard consistently receives

excellent ratings across the board on student evaluations, with many comments specifically praising his knowledge and thoroughness in making sure everyone understands the topics.



Jay McGuire, M.Eng. Jay D. McGuire holds advanced degrees in engineering and has been a professional trainer since 1982. Jay specializes in delivering instructor-led technical training covering the fields of telecommunications, data communications and networking, local area networks, and call center and customer care technologies. His publications and training manuals use a highly graphical approach to teaching technical concepts to non-technical audiences from a wide range of corporate environments. Jay has held past positions as a telecommunications manager for a Fortune 100 insurance company and as a digital design engineer. He is "one of the best" in the technical training business.