
BOOT CAMP: TELECOM 2017

NEW-GENERATION TELECOMMUNICATIONS FOR NON-ENGINEERING PROFESSIONALS

A comprehensive overview and update on the current generation IP-based telecommunications for non-engineers

BOOT CAMP: TELECOM 2017 is a comprehensive training course specifically designed for non-engineering professionals, to get you up to speed on today's telecommunications.

What used to be called the "next generation" of telecom has happened – and it's based on IP packets, Ethernet, fiber and wireless. The days of TDM channels and telephone switches are over. Everything is packetized and routed.

Those who have been in the telecom business for a while, as well as newcomers must be up to speed on IP and all of the related and supporting technologies like SIP Trunking.

Taking this course, you will get the solid core knowledge base needed for telecom going forward... plus detailed course books that will be an invaluable reference for years to come.

Without bogging down on technical details, we bust the buzzwords, explain the jargon, and more importantly, the ideas and concepts behind the jargon. You will gain the key concept-level knowledge that you can't get on the job, from blogs or vendors, building *structured knowledge* that lasts a lifetime.

Thousands of people from organizations including Cisco, Intel and Microsoft, CIA, NSA, IRS, FAA and FBI, the US Army, Navy, Air Force, Marines and Coast Guard, AT&T, Verizon, Sprint, Bell Canada, Comcast, Cox, Rogers, many equipment manufacturers, and many big telecom users including banks, insurance companies and all levels of government who needed to be more effective in understanding and dealing with telecom and networking technology have benefited from our training.

This training - and our superb instructors - consistently receive rave reviews on evaluations. Many attendees tell us they wish they'd had this course years ago!

Join us!

Register online at www.teracomtraining.com or call toll-free: 1-877-412-2700

Course Overview

Day 1: The New-Generation IP Telecom Network

We begin with a big-picture overview of modern IP-based telecom on the first day:

- New-Generation Telecom Network Overview
- Fundamentals of IP
- VoIP and SIP
- IP Services

Day 2: IP Network Fundamentals

Next is fundamentals: IP packets and addresses, Ethernet LANs, TCP/IP and routers:

- “Data” Fundamentals
- OSI Layers
- Ethernet, LANs and VLANs
- IP Addresses & TCP/IP
- Routing

Day 3: IP Over Wireless, Fiber and Copper

The third day is devoted to the physical connections that make up the network: wireless, both cellular and WiFi, fiber and last-mile DSL and cable modems:

- Mobile IP: Cellular
- Wi-Fi and Bluetooth
- Fiber Optics
- Last Mile Copper: DSL and Cable Modems

Day 4: MPLS, IP Security, Internet and Cloud Services

Day four is carrier services and security; Class of Service and Service Level Agreements, MPLS, IP security essentials, ISPs, Internet and Cloud services:

- Carriers and Class Of Service
- MPLS
- IP Security
- The Internet and ISPs
- Content Delivery and Cloud Services

Day 5: Voice Communications – The PSTN, Carriers, VoIP and SIP

The last day is voice communications, from installed-base PSTN technologies, LECs, IXCs and CLECs to VoIP, SIP and SIP Trunking:

- The PSTN
- Carriers, Competition and Interconnect
- Voice Over IP (VoIP)
- SIP
- VoIP For Businesses and Organizations

Taking this proven training, you will understand the jargon and buzzwords, the technologies and services, and most importantly, the underlying ideas, and how it all fits together.

Be more confident, more accurate and more productive. Put an end to buzzword and jargon frustration and get up to speed.

Sign up for this invaluable career training today!

Here's What Course Attendees Like You Are Saying

Hundreds of people like you have benefited from Teracom training. Many tell us this was their best course ever; filled gaps in their knowledge and tied everything together... knowledge they've been needing for years. Others on course their first week on the job remarked "what a wonderful way to get started in the business."

Here's a sampling of comments from Teracom alumni:

"Feedback from my team was TERRIFIC. It gave our entire technical Call Center a common foundation, and you seem to have crafted that perfect balance between technical depth, real-world applications, and lively delivery. I couldn't be happier with the results. The things my team learned from this training were applied in real-world situations almost immediately."

- Rusty Walther, Vice President, Client Services, AboveNet Communications

"Excellent! I learned a lot - everyday terms, definitions, and acronyms. Seminar notebook very helpful. The instructor was the best I ever had - lots of knowledge and experience and stories were GREAT."

- Serena Laursen, Microsoft

"The selection of material - the order of its presentation - the way it was presented... incredibly effective at presenting concepts and ideas - uses great analogies and stays on topic."

- Susan Lennon, Nortel

"The seminar delivered exactly what was advertised, at a very high quality.

Truth in advertising!" - Gary Lundberg, Copper Mountain Networks

Whether you work for an organization that produces telecom, datacom or networking products or services; or you buy these products and services - or just have to get up to speed on what all the rest of them are talking about when they say "SIP trunking", "Ethernet", "MAC frame", "4G, MPLS or VPN..."

"Best course we have ever had onsite at 3Com"

"Perfect content; well organized, well paced, building block approach, resulted in a very nice cathedral" - Jim George, Qualcomm

"Course was excellent! One of the best I have taken. Extremely well organized and presented.

Seminar workbook is outstanding - a very valuable reference" - Kieran Delaney, Maritime Life

"I liked most the use of analogies to explain complex concepts. It delivered exactly what the brochure promoted. Gave me a thorough understanding so I feel more confident."

- Judith Myers, Ameritech

"Excellent! Tied the individual pieces of knowledge together into a picture... was interactive and built up the knowledge layers properly." - Jim Geiss, Qwest

"Filled in a lot of gaps in my knowledge of networking... able to deliver the knowledge effectively and entertainingly. Excellent seminar" - Kirk Kroeker, IEEE Computer Society

"Great information that I will be able to use at work. Very easy to understand all the information especially the IP networking part. I wouldn't change a thing"

- Orlando Jasso, AboveNet Communications.

"Layman's terms with humor was very relaxing - helped me concentrate... understanding is now CLEAR ... the manual will be very helpful" - Linda Côté, Bell Canada

"Best instructor I have had on a course - excellent explainer in layman terms, not techie terms"

- Susan Coleman, Bell Sygma

"Best course materials ever; the full text descriptions are invaluable.

Course filled in so many gaps for me. Bravo!" - Ross Brooks, Vertek

"Outstanding! The best I've encountered, and I've attended many seminars."

- Bob Gibbons, WMX Technologies

Six Reasons to Take This Course

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

1. Learn more with instructor-led training, where you can interact and ask questions – the best kind of training you can get – and instructors consistently rated “excellent” on student evaluations.
2. Cut through the buzzwords, jargon and vendor hype to gain a structured understanding of telecommunications and networking, allowing you to make meaningful comparisons and informed decisions... knowledge skills you can put to use today and in the future.
3. Get up to speed on the latest developments and trends. This course is totally up to date with SIP trunking, VoIP, 4G LTE, WiFi, Optical Ethernet, MPLS, IoT and more.
4. Get a solid base of vendor-independent knowledge of technologies, service providers, standard practices and mainstream solutions that you can build on.
5. Understand how it all fits together.
6. Obtain course books with detailed text notes that will serve as a valuable reference for years.

Develop a structure for understanding technologies and solutions, allowing you to make informed choices and meaningful comparisons -- knowledge you can't get on the job, reading trade magazines or talking to vendors.

Course Schedule

We're constantly adding new dates. To see the latest schedule, please visit teracomtraining.com.

How to Register

Space in our seminars is limited, and may sell out, so please register as early as possible to reserve your place. Register online at teracomtraining.com, or call us at 1-877-412-2700. You will receive a registration package with full details and instructions plus a confirmation letter to sign and fax back to complete your registration.

Tuition Fees

This five-day intensive course is \$1995. We accept Visa, MasterCard and Amex, checks and purchase orders.

Free Bonus! Online Courses & TCO CTNS Certification

As a free bonus, you get the full set of Teracom's Online Courses. Not only are these an excellent way to take a second pass through various topics, the Online Courses include pictures of equipment and additional lessons beyond those in this course. If you choose to write the optional course exams, and pass, you will also earn the TCO CTNS certification, complete with certificate suitable for framing and letter of reference.

Free Bonus! Optional Final Exam & TCO CTA Certification

The full Certified Telecommunications Analyst (CTA) certification from the Telecommunications Certification Organization is also included. This is the optional “final exam” for this course. Upon successful completion, obtain your CTA certification with certificate suitable for framing and letter of reference. The Unlimited Plan allows you to repeat exams as needed until you pass... guaranteed to pass if you're willing to learn!

Your Course Materials: An Invaluable Reference

Every course comes complete with a high-quality course book that's been called the best on-the-job reference tool around. Written in plain English, this easy-to-use reference includes copies of all graphics PLUS extensive detailed text notes. Topics are organized in logical groups to give you easy reference after the seminar to the practical experience, theoretical background, and unbiased information on industry technologies, products and trends you'll need. With numerous chapters covering all major topics, you'll obtain an invaluable resource impossible to find anywhere else in one book.

Get a sneak preview of the course materials via the tutorials at www.teracomtraining.com.

Detailed Course Outline

DAY 1: TELECOM 111: THE NEW-GENERATION IP TELECOM NETWORK

The first day of BOOT CAMP: TELECOM 2017 is a comprehensive overview of the entire story from A-Z, specifically designed to get non-engineers up to speed on the new generation of telecommunications network technology and services.

In one information-packed day, we will bust the buzzwords and demystify the jargon, covering in plain English all of the main aspects of new-generation IP telecom, including what IP is, the business reasons for IP, the main network components, packets, addresses and routers, MPLS, Voice over IP, SIP, softswitches, and IP-based services.

This will provide an introduction to all of the aspects of new-generation IP telecommunications and the big-picture view.

On subsequent days, we will delve into these topics and more in much greater detail.

1. NEW-GENERATION TELECOM NETWORK OVERVIEW

- The IP Telecom Network business and technology goals & solutions
- Convergence: telephone, television and Internet together
- IP telecom network & components
- Ethernet LANs In-Building
- Fiber outside: Optical Ethernet, PONs
- Last mile on copper: DSL & cable modems
- Wireless: Cellular, WiFi, Satellite

2. FUNDAMENTALS OF IP

- The definition of a network
- IP addresses and IP packets
- Routers and packet forwarding
- Overbooking and Bandwidth on Demand
- MPLS for traffic management

3. VOIP AND SIP

- Voice digitization and packetization
- Packet voice communications end-to-end
- SIP and Softswitches
- Gateways

4. IP SERVICES

- Individual Phone Line
- Centrex Service
- Hosted PBX Service
- SIP Trunking
- VPN Service
- IPTV
- Internet Service and Internet Wholesale
- Cloud Services

DAY 2: IP NETWORK FUNDAMENTALS

The second day of BOOT CAMP: TELECOM 2017 is devoted to the network protocols for the new-generation telecom network: Ethernet and IP.

Specifically designed for non-engineers, we'll begin with the basic concepts of what used to be called "data communications": MAC frames and IP packets.

Next, to understand all of the functions that must be performed and how they are organized, we'll cover the OSI layers. Then we'll cover Layer 2: Ethernet LANs and VLANs, and Layer 3: IP packets, addresses and routing.

You will understand terms like "Layer 2", "Layer 3", MAC address, MAC frame, IP address, DHCP, static and dynamic addresses, NAT, ports and sockets and subnets... and how it all fits together.

1. "DATA" FUNDAMENTALS

- Multidrop Circuits, e.g. WiFi
- Access Control, Error Control
- Frames and MAC Addresses
- Packets and IP Addresses
- How packets and frames are related
- How MAC addresses and IP addresses relate

2. OSI LAYERS

- Protocols and Standards
- Framework to organize discussions
- The 7 Layers
- How protocol stacks work
- Protocol Headers & Deep Packet Inspection

3. ETHERNET, LANS AND VLANS

- Ethernet and 802.11
- Broadcast Domain
- Cables & Categories
- Optical Ethernet
- LAN Switches
- VLANs

4. IP ADDRESSES & TCP/IP

- IPv4 Address Classes, Dotted-Decimal Notation
- DHCP: Static and Dynamic Addresses
- Private Addresses
- NAT: Network Address Translation
- TCP, UDP, Ports and Sockets
- Multicast
- IPv6

5. IP ROUTING

- Subnets and CIDR
- Prefix and Subnet Mask
- Assigning Subnets to Broadcast Domains
- Routing Tables
- Routing Protocols: Autonomous Systems, OSPF and BGP

DAY 3: IP OVER WIRELESS, FIBER AND COPPER

The third day of BOOT CAMP: TELECOM 2017 is all about the physical connections that implement the network: how IP is communicated over wireless, fiber and copper.

We'll begin with wireless, first covering radio and cellular mobile fundamentals, how voice and data are communicated over cellular and a roundup of technologies and generations. Then, we'll cover non-mobile wireless: WiFi and Bluetooth.

Next is a chapter on fiber optics and how fiber is used in every part of the network, including DWDM in the core and Passive Optical Networks (PONs) for residences.

The last chapter is IP packets on copper for the "last mile": DSL on twisted pair and cable modems on hybrid fiber-coax networks.

1. MOBILE IP: CELLULAR

- Radio fundamentals
- Spectrum
- Cellular Concepts
- Digital Cellular: Voice
- Digital Cellular: Data = Internet Access
- Spectrum-Sharing Technologies: FDMA, TDMA, CDMA, OFDM
- 3G: 1X, UMTS, HSPA
- 4G: LTE

2. MORE WIRELESS IP: WI-FI AND BLUETOOTH

- WiFi standards & speeds
- Hotspots and SSIDs
- Voice over IP over WiFi
- WiFi security
- Smartphone WiFi hotspots
- Bluetooth

3. IP ON FIBER OPTICS

- Fundamentals of fiber & fiber cables
- Wavelengths, single-mode and multimode
- WDM: Wave-Division Multiplexing
- Fiber in the Core
- MAN: Metropolitan Area Network
- Fiber to the Premise
- PON: Passive Optical Network
- Fiber to the Apartment Building

4. IP LAST MILE ON COPPER

- Twisted-Pair Outside Plant
- CATV Hybrid Fiber-Coax Plant
- Fiber to the Neighborhood
- DSL & DSLAMs for twisted pair
- VDSL for TV over twisted pair
- Cable Modems

DAY 4: CARRIERS, MPLS, INTERNET, SECURITY, IOT AND CLOUD

The fourth day of BOOT CAMP: TELECOM 2017 is devoted to IP carrier services, the Internet as a business, Cloud services and IP security.

We'll begin with practical introduction to business IP services from carriers like AT&T, including the important concepts of Service Level Agreements and Class of Service. Without bogging down on details, we'll understand MPLS and how it is used by carriers internal to their networks for traffic management.

Next, we will survey of all of the different aspects of IP security, from basic network security design to encryption, VPNs and certificates and threats like viruses

This course finishes with the Internet, understanding what ISPs are, wholesale IP, Content Delivery Networks and Cloud services.

1. CARRIERS AND CLASS OF SERVICE

- Carrier Packet Network Basics
- Service Level Agreement
- Class of Service (CoS)
- Service Assurance

2. MPLS

- Virtual Circuits
- MPLS: Label-Switched Paths & Label-Switching Routers
- MPLS VPNs for Business Customers
- MPLS and Diff-Serv to Support Classes of Service
- MPLS for Service Integration
- MPLS for Traffic Aggregation

3. IP SECURITY

- Risks, Measures and Policy
- Network Segmentation and Perimeters
- Packet Filtering and Port Filtering
- Firewalls & Stateful Packet Inspection
- Public Key Encryption, Authentication
- IPsec and Internet VPNs
- Digital Certificates
- Malicious Software: Viruses, Trojans
- VoIP Security Risk Areas

4. THE INTERNET AND ISPS

- The Inter-Net
- Domain Name System
- Internet Service Providers (ISPs)
- IP Interconnect: IXs, transit and peering
- The Internet of Things (IoT)

5. CONTENT DELIVERY AND CLOUD SERVICES

- Content Delivery Networks
- IPTV and Video Servers
- Netflix Appliance
- Virtualization
- Cloud Storage
- Cloud Computing

DAY 5: THE PSTN, THE TELECOM BUSINESS, VOIP AND SIP

The last day of BOOT CAMP: TELECOM 2017 is dedicated to voice communications and telephone calls, from analog POTS to VoIP and SIP.

We begin with the Public Switched Telephone Network and basic telephony concepts of analog loops, trunks, circuit switching, digital voice and 64 kb/s DS0 channels.

Next, we'll understand telephone companies, the components of a telecom service and how carriers actually implement services with different types of equipment, and how carriers interconnect to provide competitive services.

The final chapters cover the nuts and bolts of Voice over IP (VoIP), SIP, softswitches and SIP trunking, and implementation choices for businesses and organizations.

1. THE PSTN

- The Public Switched Telephone Network (PSTN)
- Analog Circuits and The Voiceband
- Plain Ordinary Telephone Service (POTS)
- Network Architecture: Access, Switching, Transmission
- Digital Voice and the 64kb/s G.711 Standard
- Legacy Digital Hierarchy DS0-DS3
- Legacy Circuit Switches: PBX and Centrex

2. CARRIERS, COMPETITION AND INTERCONNECT

- The Telecom "Network Cloud"
- How Telecommunications Services Are Actually Implemented
- Network Equipment: How and Where Each is Used
- Domestic Telephone Companies
- Switching Center Hierarchy
- LD Competition: Switched Access, LECs, IXCs and POPs
- CLEC: Collocation plus ILEC Dark Fiber
- Carrier Network Model: Regional Rings, POPs and MANs

3. VOICE OVER IP (VOIP)

- Voice Packetization
- Impairments and Effects on Sound Quality
- Codecs and Compression
- Network Delay and Jitter
- RTP and UDP
- The VoIP Protocol Stack

4. SIP

- What SIP is and What it Can Do
- SIP URIs: "Telephone Numbers"
- SIP proxy servers and call setup
- Softswitches and Call Managers vs. SIP
- SIP Trunking

5. VOIP FOR BUSINESSES AND ORGANIZATIONS

- VoIP-Enabled PBX
- PBX Replacement with Softswitches
- Hosted PBX
- IP Centrex
- Open-Source IP-PBX Software Solutions
- IP Phone Features and Uses

Bring This Course To Your Location

Since 1992, we have provided high-quality on-site training in telecommunications for non-engineering professionals at AT&T, Verizon, Bell Canada, TELUS, Qualcomm, 3Com, Cisco, Intel, Alcatel, Nortel, Teleglobe, the NSA, Defense Information Systems Agency, US Coast Guard, US Air Force, Office of Naval Intelligence, MindSpring, APEX Telecom, Equifax, Transamerica Insurance, The Hartford, American Broadband, Cap Gemini, ComSec Establishment, MicroCell Telecom, TDS Telecom, Kyocera, Winstar, Western Wireless, US Cellular, Ericsson/Hewlett-Packard, Entergy, Intelsat, RangeTel, Alltel, Vertek, DSCI, Cox Cable, Florida Power and Light, Frontier Communications, Western Iowa Telephone, Genuity, LG Electronics, Panasonic, SouthEast Telephone, State of Nebraska, State of Montana, Tektronix, Bermuda Telecom, UTS and the Universal Service Administrative Company... to name a few.

Plus, we have a GSA contract with pre-approved government pricing.

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 of telecom and networking fundamentals, wireless, TCP/IP, MPLS, VoIP... to meet your requirements..
- 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.
- Pre- and post-training testing is available, including team results on a spreadsheet

We have built a solid reputation for delivering high-quality private team-training programs that are a resounding success.

We'd like to do the same for you!

Please contact us at 1-877-412-2700 for more information.

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 of Engineering and Master of Engineering (Electrical) degrees.

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 telecom network equipment design, and on satellite radar systems, consulting on Wide Area Network design, and many other projects in capacities ranging from detailed design and implementation to systems engineering, project leader and consultant.

In addition to being founder and Director of Teracom Training Institute, Mr. Coll provides consulting to the telecommunications industry, specializing in telecommunications technology R&D and as a Subject Matter Expert in tax matters.