

TELECOMMUNICATIONS 101

October 25-26, 2017
EUCI Office Building Conference Center
Denver, CO

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EUCI is authorized
by IACET to offer
1.0 CEUs for the
course

OVERVIEW

This 1.5 day course for non-engineering professionals will provide an overview of the telecommunications industry and rapidly changing technology. This is a basic course, so experience within in the telecommunications industry is not required. It is designed for anyone new to the world of telecommunications or for those who have traditionally supported the data side of the business, which now includes telephony. It is also very applicable to telecommunication professionals who have tenure, yet find their traditional roles changing with the collaboration and cross functional support that is needed for today's telephony environment.

Consumers are demanding new and faster ways of communicating and corporations are struggling to keep up. The focus on application integration and the impact of the "cloud" is changing the way we do business and the technology required to support it. Who's responsible for what? Why and how is "real-time communications" different from data communications? Join us to gain clarity on today's confusing landscape and prepare to set your sights on the Next Generation Technologies.

In addition to the knowledge gained in this course, attendees will depart with valuable resources and industry inks. These tools will provide the opportunity for ongoing research and increased knowledge.

This course is designed to encourage questions from the participants. It will be fun and interactive, however no individual will be called upon or singled out. Some PowerPoint slides will be used to illustrate important points; however, it will not be death by PowerPoint and full of dry bullets.

The course will cover the following:

- The history of the telephone industry and telephony regulation and why it still matters
- The historical breakup of the Bell System and its lasting impact
- Understanding the Public Switched Telephone Network (PSTN) and underlying technology
- The technology behind the migration of the old telephony network to today's IP-PSTN
- The technical details related to the transformation from analog, to digital, to Voice over IP (VoIP)
- The fundamental telephone service concepts needed to support real-time communications
- The physical networks needed for real-time communications
- The nature of LANs, MANs, and WANs and the role in connecting users and services
- Advanced technology such as Fiber to the Premise (FTTP) and Wave-Division Multiplexing
- Premises-based systems vs. cloud technology
- SIP trunks, Web-RTC and Software Defined Networks
- Unified communications and collaboration
- The key players in today's marketplace
- Next Generation Technologies; where do we go next?
- What does it all mean to the attendee

LEARNING OUTCOMES

- Discuss the history of Telecommunications and how it impacts today's world
- Explain the basics of the many elements of telecommunications
- Apply knowledge of the fundamentals to understand current technologies
- Define the meaning of the industry buzz words and acronyms
- Recognize what it takes to support the emerging technologies
- Identify and become aware of the "yah-buts" – when promises exceed reality
- Identify the current technology options and the industry leaders
- Discuss the future trends and developing technology
- Identify the next steps regarding career options and resources

COURSE TIMING

WEDNESDAY OCTOBER 25, 2017

The collaboration of technologies and cross functional support that is needed for today's environment is changing. This session begins with the history of Telecommunications and will walk through the systems, networks, and supporting technologies. We will close with the future and next generation of telephony.

8:00 – 8:30 am **Registration & Continental Breakfast**

8:30 am – 5:00 pm **Course Timing**

12:00 – 1:00 pm **Group Luncheon**

AGENDA

Introductions, Course Plan, and Expectations

Telephony Fundamentals

- Historical Viewpoint
 - Invention of the Telephone
 - Local Phone Companies
 - The Bell System and Long Distance
 - Regulation and Competition
 - IXC, ILECs, and CLECs
 - Resellers and Broadband Carriers
- Public Switched Telephone Network
 - Basic Model of the PSTN
 - Voice Bandwidth
 - Trunks and Circuit Switching
 - Digital Subscriber Line (DSL)
 - Synchronous Optical Networking (SONET)
 - Passive Optical Networking (PON)
 - Ethernet over Copper
- Analog
 - Analog Signals & Circuits
 - Attenuation and Amplifiers
 - EMI, RFI, and Crosstalk
- Key Telephone Service Concepts
 - Tip and Ring and Circuit Signaling
 - Supervision and Call Progress Tones
 - In-Band and Out of Band Signaling
 - North American Numbering Plan
 - Interconnection and Point of Presence
 - ANI and Caller ID
 - E911 Routing
- Digital
 - Encoding/Decoding
 - Time Division Multiplexing (TDM)
 - Compression and Codec Standards
 - Digital Carrier Standards (DS0, DS1, etc.)
 - Multiplexers and Channel Banks
 - Integrated Services Digital Network (ISDN)

AGENDA

WEDNESDAY OCTOBER 25, 2017 (CONTINUED)

- Voice Over IP (VoIP)
 - Packetized Voice
 - VoIP System Components
 - Channels versus Packets

Physical Networking

- LAN Cables and Categories
 - Unshielded Twisted Pair (UTP)
 - Shielding
 - TIA-568 Cable Categories
 - TIA-568A vs. TIA-568B
- Fiber Optic Basics
 - Lambda
 - Light Pulses
 - Attenuation and Dispersion
 - Multimode Fiber
 - Single-Mode Fiber
- Wave-Division Multiplexing: CWDM and DWDM
 - WDM
 - WDM Multiplexers
- Metropolitan Area Networks (MANs)
- Fiber to the Premise (FTTP)
- Broadband Carriers: FTTN & Broadband Coax to the Premise
- DSLAM & Cable Modems: Local Loop on Copper
- Wireless
 - Original Mobile Networks
 - Cellular Radio and 1G
 - Second Generation: Digital Cellular
 - Cellular: CDMA
 - 4G Mobile Cellular: LTE
 - Wireless LANs
 - Communications Satellites

Switching

- Telephone Network Architecture
 - Access Network
 - Central Offices
 - Transmission Network
- Telephony Systems: Key, PBX, and Centrex
 - Key Systems
 - PBX and PBX Trunks
 - Digital Telephony
 - Attendant & Automated Attendant
 - Direct Inward Dialing (DID)
 - Automated Call Distribution (ACD)
 - Interactive Voice Response (IVR)
 - Centrex
- VoIP Service, Hosted/Cloud Solutions
 - Session Initiation Protocol (SIP)
 - Multi-Tenant and IP-Centrex
 - Dedicated Instance and Hosted Systems

AGENDA

WEDNESDAY OCTOBER 25, 2017 (CONTINUED)

Key Network Concepts for Telephony

- ISO OSI Reference Model
 - o Physical Layer
 - o Data Link Layer
 - o Network Layer
 - o Transport Layer
 - o Session Layer
 - o Presentation Layer
 - o Application Layer
- Wide Area Networks (WANs)
- IP Networks
 - o Critical Requirements
 - o Critical Requirements
 - o Other Layer Options, including Encryption
- Asynchronous Transfer Mode (ATM)
- MPLS
 - o Service Level Agreements
 - o Traffic Profile
 - o Class of Service
 - o Assured & Expedited Forwarding
- Virtual Circuit Technologies
 - o Traffic Classes
 - o Virtual Private Network (VPN)
 - o Internet VPNs

The IP-PSTN

- The Network Cloud
- Private Clouds versus Internet / Public Clouds
- Internet Telephony
 - o Connectionless
 - o Reliability
 - o Quality of Service
 - o Internet VPNs
- SIP Trunks
 - o Architecture Options
 - o Key Components
 - o Impact on the Marketplace
- Web-RTC
- Software Defined Networks (SDN)

COURSE TIMING

THURSDAY, OCTOBER 26, 2017

8:00 – 8:30 am **Continental Breakfast**

8:30 am – 12:00 pm **Course Timing**

AGENDA

Recap of Day One and Questions from Attendees

Unified Communications

- The Fuzzy Definitions
- System Architecture and Convergence
- Solution Components beyond IP Telephony
 - o Messaging
 - o Conferencing
 - o Collaboration
 - o Mobility
 - o Video
 - o Presence
- Enhanced Systems
 - o Contact Centers
 - o IVRs
 - o Communications Enabled Business Processes
- Analytics and Reporting
- Recap of the Leading Players in the Industry

Next Generation Technologies

- Communications Platform as a Service (CPaaS)
- 5G and Wireless Technologies
- Expansion of the Internet Cloud
- Leveraging Artificial Intelligence
- The Future of Telecom

Telecom Employment Opportunities

Course Recap and General Questions

- High-Quality Industry Resources

INSTRUCTOR



J.R. Simmons

Principal Consultant, COMgroup, Inc.

J.R. Simmons has over 40 years of experience in the telecommunications systems industry, including over 30 years as a consultant providing strategic planning, design, analysis, and implementation management skills. He is considered a thought leader in unified communications and collaboration technologies. J.R. is the owner and Principal Consultant of COMgroup, Inc., which is located in Kirkland Washington. COMgroup is one of the most widely respected independent telecommunications consulting firms in the nation and a recognized leader for telecommunication systems design and communications infrastructure consulting projects.

As an industry expert J.R. has provided expert testimony in several legal cases. He contributes to two of the most respected industry web sites (No Jitter and BC Strategies) and frequently gives speeches on a wide variety of telecommunications management and technology subjects. He taught advanced telecommunications courses for a Community College Certificate program and continues to teach via independent seminars, and educational programs such as this one offered by EUCL.

J.R.'s experience includes work on complex telephone systems and call centers, cabling infrastructure and layer one electronics, and both local and wide area networks. His current projects tend to focus on strategic planning and business process analysis, but also include data networking design, systems analysis, unified communications, and contact centers.

COMgroup works with organizations of all sizes with increasingly complex technical environments. As a teacher at heart, J.R. has a passion of sharing his knowledge of trends and emerging technology in an effort to educate others and assist his customers in making the best decisions. J.R.'s team of Senior Consultants are experts in all facets of voice and data communications; they provide professional services that incorporate multiple technology disciplines including:

- Strategic planning
- Functional and technical requirements definition
- System design
- Infrastructure communication design and cabling coordination
- Contact Center design and operational improvements
- Carrier services including Telecom Expense Management
- Telecom facility/utility audit
- Project management services

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance for the entirety of the course to be eligible for continuing education credit.

INSTRUCTIONAL METHODS

Power Point presentations and open discussion will be used in the program.

PROCEEDINGS

The proceedings of the course will be published, and one copy will be distributed to each registrant at the course

IACET CREDITS



EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 1.0 CEUs for this course.

REGISTER 3, SEND THE 4TH FREE

Any organization wishing to send multiple attendees to this course may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.

EVENT LOCATION

EUCI Conference Center

4601 DTC Blvd., B-100
Denver, CO 80237

NEARBY HOTELS

Hyatt Regency Denver Tech Center

7800 E. Tufts Ave
Denver, CO 80237
Phone: 303-779-1234
0.3 miles away

Denver Marriott Tech Center

4900 S. Syracuse St
Denver, CO 80237
Phone: 303-779-1100
0.7 miles away

Hyatt Place Denver Tech Center

8300 E. Crescent Parkway
Greenwood Village, CO 80111
Phone: 303-804-0700
0.9 miles away

REGISTRATION
to register [CLICK HERE](#) or

Call: 201 871 0474
fax: 253 663 7224
email: register@pmaconference.com
web: <http://pmaconference.com/>
Mail: POB 2303 Falls Church Va 22042

Please make checks payable to: "PMA"

EVENT LOCATION

EUCI Conference Center

4601 DTC Blvd., B-100
 Denver, CO 80237

See nearby hotels on page 8

PLEASE REGISTER

- TELECOMMUNICATIONS 101 COURSE**
 OCTOBER 25-26, 2017: US \$1395,
 Early bird on or before October 6, 2017: US \$1195

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

Print Name Job Title

Company

What name do you prefer on your name badge?

Address

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Phone Email

List any dietary or accessibility needs here

CREDIT CARD INFORMATION

Name on Card Billing Address

Account Number Billing City Billing State

Exp. Date Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx) Billing Zip Code/Postal Code

OR Enclosed is a check for \$ _____ to cover _____ registrations.

Substitutions & Cancellations

Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before September 22, 2017 in order to be refunded and will be subject to a US \$195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of course cancellation, EUCI's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at (201) 871-0474.