


**Improving your Net-Tel IQ**  
**LIDO Telecommunications Essentials®**  
**eLearning Series**



[www.telecomwebcentral.com](http://www.telecomwebcentral.com)

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Something to Think About... 

**“In a time of drastic change, it is the learners who inherit the future. The learned find themselves equipped to live in a world that no longer exists. “**

*- Eric Hoffer, “Reflection on the Human Condition “(1973)*

## The LIDO Organization, Inc.

World-class  
Telecom  
Education and  
Advisory  
Services  
Provider

Established  
in 1984

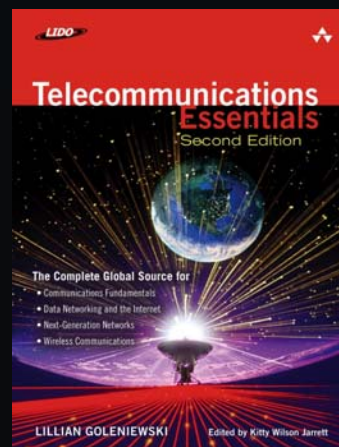
Headquartered  
in California,  
USA



LIDO Telecommunications Essentials: Next Generation Networks - [Aruba](#), [Caribbean](#)

## LIDO Products and Services

- **Seminars** : Conducted since 1984, worldwide, and attended by over 50,000 professionals to date
- **eLearning** : Pioneer in telecom eLearning programs since 1999
- **Books** : Telecommunications Essentials, 2nd Edition: The Complete Global Source
- **Consulting** : Strategic planning, customized training solutions, eLearning curriculum and content development



## LIDO – A Global Community LIDO



In-House seminar for MDs of NITEL - Nigeria

Trained over  
50,000  
professionals  
worldwide



LIDO Telecom Essentials - Hong Kong

Global  
perspective,  
Global practice,  
Global clientele

## About Lili Goleniewski LIDO

- **Unmatched telecom mentor**  
Lili has been conducting seminars and workshops , on a global basis, for 28 years, addressing professional, technical and academic audiences
- **Author, Telecommunications Essentials, 2nd Edition :**  
The Complete Global Source for Communications Fundamentals, Data Networking and the Internet, Next - Generation Networks and Wireless Communications (Addison-Wesley, ISBN-13:978-0321427618).
- **Industry Activities:**  
Lili has served as Advisory Board Member for numerous industry conferences, (including Comdex, Comnet, and EJ Krause Expocomm); served on many technical committees ,and acted as judge for ICT awards programs worldwide. She is currently serving as an Advisory Board member for the CompTIA Convergence+ certification program

**Lillian Goleniewski**  
President, The LIDO Organization, Inc.



## LIDO TELECOM Pvt. Ltd. Serving India



The LIDO Organization, Inc., is now serving India via LIDO Telecom Pvt. Ltd. Located in Bangalore, India, LIDO Telecom offers LIDO's globally acclaimed Telecommunications Essentials educational programs and knowledge solutions.

With a zeal to provide excellent customer service, LIDO Telecom is established to ensure technical support, comfort of reach and service to Indian enterprises, academic institutions, and students.

"LIDO Telecommunications Essentials® provides the region with the knowledge needed to enhance the skills of our workforce to be able to compete globally, and better serve global clients. The benefit of this venture to our community, indeed the world at large, is that now we can provide on-demand learning on all levels, with excellent up-to-the-minute information." – P. Ratnakar

## About Pavithra R. Shirodkar



- **Pavithra R. Shirodkar, Managing Director, LIDO Telecom**, is an entrepreneur with an engineering background. She envisioned that the region's tremendous growth in the telecommunications and networking field has created the requirement and market for innovative telecom training in Asia and the Middle East.

- Pavithra is also involved in business development and process improvement at 2 other companies she owns, Apex Test Technologies, an Embedded Test Solution provider and Pavithra Toolings, an automobile springs and wireforms manufacturer, both ISO certified companies. She holds Bachelor of Mechanical Engineering from Bangalore University and has specialized in Quality Assurance.

### Pavithra Ratnakar Shirodkar

Managing Director, LIDO Telecom



## Client List – Enterprise - Partial LIDO

## Academic Client List - Partial LIDO

- Collin County Community College
- SZABIST, Dubai International Academic City, UAE
- University of New Mexico, USA
- Ryerson University, Canada
- University of Arkansas at Little Rock, USA
- Illinois State University, USA
- MAHE - Manipal University, Dubai, UAE
- S. P. Jain Center of Management, Singapore
- University of Wollongong, Australia
- National Cheng Kung University, Taiwan
- King Mongkut's University of Technology North Bangkok (KMUTNB), Thailand

## The Telecom Infrastructure



- Telecommunications is the most critical infrastructure of the 21st century. Investment in telecom is more productive than investment in other kinds of infrastructure.
  - World Bank research\* shows a large productivity benefit to investment in telecom—larger than investments in roads, electricity or even education!
    - Canning, David. Infrastructure's Contribution to Aggregate Output, The World Bank Policy Research Working Papers Series # 2246, 30 Nov 1999. <http://ideas.repec.org/p/wbk/wbrwps/2246.html>
  - And of course, the impact is exceptionally noticeable in developing nations.
  - More recent research based on the spread of mobile phones finds telecommunication's impact on economic growth is twice as large in developing nations as in developed nations.
    - Waverman, Leonard; Meschi, Meloria and Fuss, Melvyn. The Impact of Telecoms on Economic Growth in Developing Countries, Vodafone Policy Paper Series, 2, March 2005, pp. 10-23.

## The Telecom Economy



- Historically, telecommunications revenues have increased after every crisis since the 1970s.
  - Even in the aftermath of the telecom bubble, the U.S. telecom market still managed 6.6% growth in 2001, 1.8% in 2002, and 3.2% in 2003 before bouncing back to close to 10%.
- Policymakers understand that the telecom sector has traditionally shown financial resilience and can help rejuvenate a region's entire economy.
- Up-to-date technologies enable many cost-savings solutions for providers and service enhancements for customers leading to better services for subscribers, more satisfied clients, and lower cost of service.
- This finally leads to economy rejuvenation and a thriving telecom industry. (Source: WorldIT Report, January 4, 2010)

## The Telecom Economy



- Worldwide telecom revenue totaled \$3.5 trillion in 2007, up 11.2 % from 2006 *(Telephony Online, May 5, 2008)*
  - Europe was the largest telecom market at \$1.2 trillion (8.6% growth)
  - The U.S. market represented \$1 trillion of that total (8.3% growth)
  - Asia/Pacific accounted for \$880 billion (17.1% growth)
- The telecoms market in Canada, Europe, Middle East/Africa, Latin America and Asia Pacific declined 3% in 2009 as the global recession cut into spending on equipment and support services. *(TIA 2010 ICT Market Review)*

## The Telecom Economy



- Economic conditions are stabilizing, and a recovery is expected to begin gaining momentum in 2011, with healthy economic growth extending through 2013.
- Revenue from the mobile sector is predicted to top US \$1 trillion by 2010 *(Thriving Telecom Industry, <http://www.powersourceonline.com/magazine/2009/02/thriving-telecom-industry>)*
- By 2011, global telecom revenue is estimated to reach close to US\$5 trillion. *(TIA ICT2020 initiative)*
- A thriving telecom industry requires a large and knowledgeable ICT workforce!

## The Telecom Sector

- Telecom is the fastest growing sector today
- It offers huge career opportunities to engineers, computer science, and business and management graduates



- Professionals are required in all telecom skills areas – including tech support, software design , R&D, maintenance, network design, product management, marketing and sales, project management, business development, strategic planning, financial analysts, legal and regulatory advisors, and executive management !



## The Urgent Need for Telecom Essentials Training

LIDO



While the Telecom sector is clocking unprecedented growth, it is troubled by severe lack of trained professionals

Innumerable professionals are required to fill the job openings

**Ironically, there is a huge skill gap between telecom industry requirements and the business professionals and engineers entering the industry**



## The Urgent Need for Telecom Essentials Training

LIDO

- There is a growing need for professionals to keep pace with emerging technologies
- There is an urgent need to train and deploy knowledgeable telecom professionals as quickly and effectively as possible



- With an increasing number of technical and professional candidates coming from various backgrounds, today it is essential to train them quickly and on their own schedule

## The eLearning Solution

LIDO

- LIDO is an industry pioneer in creating Telecom eLearning, providing products since 1999.



LIDO  
eLearning

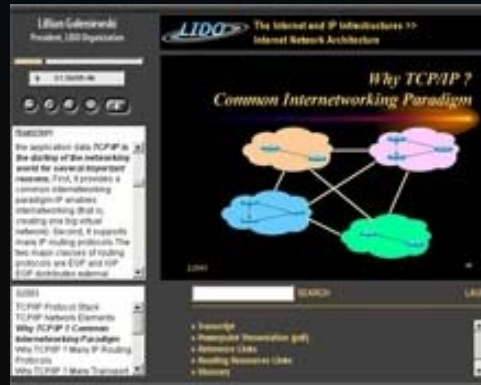
- This has been the direct outcome of understanding the Telecom Professional's need to keep pace with the mind boggling speed of new developments and technologies appearing daily, and the recognition of the convenience eLearning offers in acquiring the necessary knowledge to succeed in this industry!

## Why eLearning?



### Learning-on-Demand:

- Busy professionals are able to structure their study time around work schedule
- Customize and manage your learning experience
- **Ability to control when and what you choose to learn**
- Allows review
- Improves retention



## eLearning is Uniquely Effective



### Accommodates Variant Learning Styles:

Auditory – Visual – Kinesthetic learners are supported

- Streaming Audio
- Synchronized Word-by-Word Transcript
- Synchronized Slides
- Animated Network Diagrams
- Download and Print both the transcripts and powerpoint presentations
- Links to related educational resources and websites
- Navigational controls and search capabilities

### Each learner selects the media type and presentation

that assures your attention to learning. Listen, read, visualize, draw, highlight – work with the information in the manner that best enables you to assimilate and retain!

## LIDO Telecom Essentials® eLearning Objectives

*LIDO*

- ▶ De-mystifies telecom concepts and terminology
- ▶ Provides a solid foundation for building your knowledge of telecommunications technologies, infrastructures, networks, applications, systems, devices, and regulations.
- ▶ LIDO Telecommunications Essentials' concise and complete overview gives you the framework you need to think telecom
- ▶ Understand and become familiar with telecom Jargons and latest buzzwords
- ▶ Proof of completion and Certification




## The LIDO eLearning Advantage

*LIDO*

- LIDO has been a pioneer in offering Telecom education in eLearning format since 1999.
  - LIDO offers unmatched quality in telecom education – covering telecom A-Z, with a global perspective, and with the convenience of online, anytime, anywhere learning!
- LIDO offers consistency in knowledge delivery.
  - LIDO offers a self-paced, flexible, on-demand, and multi-dimensional learning experience!
- LIDO eLearning reduces training and travel costs, reduces the time spent away from the job, improves productivity, promotes active learning, and provides an economic incentive for enterprise-wide training of all employees!

## Who Will Benefit From the LIDO eLearning Series?



On Demand & Customized courseware modules available  
Customized testing and evaluation options available


Executives, Directors, and Managers

Business Development and Strategic Planning

Marketing and Sales

Finance, Legal and Regulatory Affairs

Product and Project Management



Consultants and System Integrators


Investment Bankers, VCs, Stock Analysts

Lawyers, Regulatory Officials

Public Relations and Advertising

Professors, Instructors, Undergraduate and Graduate ICT students

## LIDO Telecom Essentials® eLearning Features



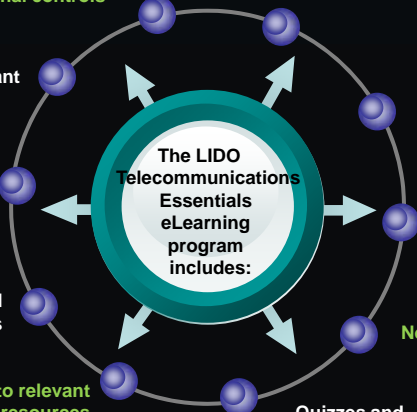
Search capabilities and navigational controls

LMS, SCORM 1.2 Compliant

Downloadable transcripts and ppts

Word-by-word synchronized transcripts

Links to relevant telecom resources



33.5 hours of rich-media content

Customizable content

Information-rich slides and animated diagrams

Notes & Searchable Glossary

Quizzes and Certification

## LIDO Telecommunications Essentials® eLearning Series

### Part 1

#### Communications Fundamentals

- Understanding the Broadband Evolution
- **Telecommunications Technology Basics**
- Traditional Transmission Media
- **Establishing Communications Channels**
- Public Switched Telephone Network

### Part 2

#### Data Networking and the Internet

- Understanding the Broadband Evolution
- **Data Communications Basics**
- Local Area Networking
- **Wide Area Networking**
- The Internet and IP Infrastructures

## LIDO Telecommunications Essentials® eLearning Series

### Part 3

#### Next Generation Networks

- Understanding the Broadband Evolution
- **IP Services**
- Next Generation Networks
- **Optical Networking**
- Broadband Access Alternatives

### Part 4

#### Wireless Communications

- Understanding the Broadband Evolution
- **Wireless Communications Basics**
- Wireless WANs
- **WMANs, WLANs and WPANs**
- Emerging Wireless Applications

## Part 1: Communications Fundamentals



- Provides the foundation for a solid, practical understanding of telecommunications technologies and infrastructures
- Delivers a working knowledge of key telecommunications concepts and principles
- LIDO Telecommunications Essentials will enable you to *understand*, *speak* and *think telecom* – allowing you to communicate effectively with clients and colleagues !

## Part 1: Communications Fundamentals – Module Descriptions



MODULE 01 Understanding the Broadband Evolution 98 Minutes	MODULE 02 Telecommunications Technology Fundamentals 91 Minutes	MODULE 03 Traditional Transmission Media 124 Minutes	MODULE 04 Establishing Communications Channels 58 Minutes	MODULE 05 Public Switched Telephone Network (PSTN) Infrastructure 107 Minutes
<ul style="list-style-type: none"> <li>• Measurements of the Digital Era</li> <li>• Adapting to New Traffic Patterns</li> <li>• Embedded Devices</li> <li>• Intelligent Wearables</li> <li>• Human-Machine Interactions</li> <li>• Grid Computing and Real-time Communications</li> <li>• The New Generation of Networks</li> </ul>	<ul style="list-style-type: none"> <li>• Transmission Fundamentals</li> <li>• Electromagnetic Spectrum</li> <li>• Analog &amp; Digital Transmission</li> <li>• Multiplexing</li> <li>• Political and Regulatory Forces in Telecom</li> </ul>	<ul style="list-style-type: none"> <li>• Media Characteristics</li> <li>• Twisted-Pair</li> <li>• Copper Cable</li> <li>• Coaxial Cable</li> <li>• Microwave</li> <li>• Satellite</li> <li>• Fiber Optics</li> </ul>	<ul style="list-style-type: none"> <li>• Establishing Communications Channels</li> <li>• Switching and Routing</li> <li>• Circuit Switching</li> <li>• Packet Switching</li> <li>• The PSTN and the Internet</li> </ul>	<ul style="list-style-type: none"> <li>• PSTN Infrastructure</li> <li>• PDH Infrastructure</li> <li>• SDH/SONET Infrastructure</li> <li>• Signaling Systems</li> <li>• Intelligent Networks</li> <li>• SS7 &amp; Next Generation Networks</li> </ul>

## Part 2: Data Networking and the Internet



- Data is one of the fastest growing traffic streams.
- The changing dynamics of bandwidth and processing power are shifting network economics and computer architectures.
- With these seismic changes in the ICT industry, no telecom or IT-related professional should be without a basic understanding of
  - Data Communications Basics
  - Local Area Networking
  - Wide Area Networking
  - The Internet and IP Infrastructures

## Part 2: Data Networking and the Internet – Module Descriptions



MODULE 6 Data Communications Basics 69 Minutes	MODULE 7 Local Area Networking 59 Minutes	MODULE 8 Wide Area Networking 107 Minutes	MODULE 9 The Internet and IP Infrastructures 169 Minutes
<ul style="list-style-type: none"> <li>• Data Communications Architectures</li> <li>• Data Communication Traffic</li> <li>• Data Transmission</li> <li>• OSI and TCP/IP Reference Models</li> </ul>	<ul style="list-style-type: none"> <li>• LAN Basics</li> <li>• LAN Transport Techniques and Standards</li> <li>• LAN Access Techniques and Topologies</li> <li>• LAN Switches, VLANs and Bridges</li> <li>• Routers and IP Switches</li> </ul>	<ul style="list-style-type: none"> <li>• Wide Area Networking</li> <li>• Circuit Switched and Leased Line Networks</li> <li>• ISDN Networks</li> <li>• Packet Switched Networks</li> <li>• X.25</li> <li>• Frame Relay</li> <li>• Asynchronous Transfer Mode (ATM)</li> </ul>	<ul style="list-style-type: none"> <li>• Internet Basics</li> <li>• Internet Protocols</li> <li>• Routing Protocols</li> <li>• Internet Network Architecture</li> <li>• Internet Addressing and Address Resolution</li> <li>• IPv6 Addressing</li> <li>• Domain Name System (DNS)</li> <li>• The Internet Infrastructure</li> <li>• Service Providers and Interconnection</li> <li>• IP Quality of Service</li> <li>• What's Next on the Internet</li> </ul>

## Part 3: Next Generation Networks



- Provides a complete guide to broadband technologies and next generation networks.
- Driven by the forces of innovation, the telecom industry is on the brink of huge leaps in broadband applications impacting
  - Architecture
  - Products
  - Business Models
  - Technical Standards
- What are the next generation technologies and which are likely to survive? LIDO Telecommunications Essentials Part 3 answers these questions with in-depth coverage of
  - IP Services
  - Next-generation Network Infrastructures
  - Broadband Applications
  - Optical Networking
  - Broadband Access Alternatives

## Part 3: Next Generation Networks – Module Descriptions



MODULE 10 IP Services 180 Minutes	MODULE 11 Next-Generation Networks 193 Minutes	MODULE 12 Optical Networking 92 Minutes	MODULE 13 Broadband Access Alternatives 184 Minutes
<ul style="list-style-type: none"> <li>• Evolution to IP Services</li> <li>• IP Telephony</li> <li>• IPT Network Architecture</li> <li>• Digital Voice Technologies</li> <li>• IPT Quality of Service</li> <li>• VoIP Call Signaling Protocols</li> <li>• ENUM</li> <li>• Virtual Private Networks</li> <li>• Applications of VPNs</li> <li>• IPsec and GRE VPNs</li> <li>• Layer 3 VPNs</li> <li>• Layer 2 VPNs</li> <li>• VPN Security</li> <li>• IPTV</li> </ul>	<ul style="list-style-type: none"> <li>• The Broadband Evolution</li> <li>• Multimedia Networking Requirements</li> <li>• Digital Television</li> <li>• The Broadband Infrastructure</li> <li>• Next-Generation Networks and Convergence</li> <li>• IP Multimedia Subsystem</li> <li>• Multi-service Intelligent Edge</li> <li>• Quality of Service</li> <li>• MPLS Architecture</li> </ul>	<ul style="list-style-type: none"> <li>• Optical Networking Drivers</li> <li>• Optical Networking Elements</li> <li>• Optical Switches</li> <li>• The Optical Edge</li> <li>• The Optical Core</li> <li>• The IP+Optical Control Plane</li> </ul>	<ul style="list-style-type: none"> <li>• Broadband Access Drivers</li> <li>• DSL Technology</li> <li>• Cable TV Networks</li> <li>• Fiber Solutions</li> <li>• Wireless Broadband</li> <li>• Powerline Telecommunications</li> <li>• Home Area Networks</li> </ul>



## Part 4: Wireless Communications



- Addresses how wireless technologies are making anytime/anywhere computing and communicating a reality.
- Offers a comprehensive survey of the wireless networking landscape
  - Establishes a blueprint for the understanding of radio transmission
  - Surveys the latest and greatest in mobile applications
  - Explores emerging technologies in broadband wireless
    - Fixed and Mobile wireless alternatives for voice, data, video and multimedia,
    - Wireless access to the Internet and the entertainment universe
    - WANs, MANs, LANs, PANs, and even FANs and BANs
- Covers how wireless communications is
  - Driving innovation in the industry
  - Changing the fabric of both commerce and lifestyle
  - Bringing benefits to industry and to consumers

## Part 4: Wireless Communications – Module Descriptions



MODULE 14 Wireless Communications Basics 83 Minutes	MODULE 15 Wireless Wide Area Networks (WWANs) 106 Minutes	MODULE 16 Wireless MANs, LANs and PANs 203 Minutes	MODULE 17 Emerging Wireless Applications 80 Minutes
<ul style="list-style-type: none"> <li>• A Brief History of Wireless</li> <li>• Wireless Communication Regulation Issues</li> <li>• Wireless Impairments</li> <li>• Antennas</li> <li>• Wireless Bandwidth</li> <li>• Wireless Signal Modulation</li> <li>• Spectrum Utilization</li> </ul>	<ul style="list-style-type: none"> <li>• Analog Transmission</li> <li>• 2G Digital Cellular Radio</li> <li>• 2.5G Enhanced Data Services</li> <li>• 3G: Moving Toward Broadband Wireless</li> <li>• Beyond 3G</li> <li>• 4G: Wireless Broadband</li> <li>• 5G: Intelligent Technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Broadband Fixed Wireless Access (BFWA)</li> <li>• WMANs – 802.16, WiBro, 802.20</li> <li>• WMANs – iBurst, Flash-OFDM, DMB, VF</li> <li>• WLANs and Wi-Fi</li> <li>• IEEE 802.11x standards</li> <li>• WLAN Security</li> <li>• Voice over WLAN</li> <li>• Integration of WLANs and Cellular Networks</li> <li>• Mesh Networks</li> <li>• IEEE 802.15 standards</li> <li>• Ultra-wide Band (UWB)</li> <li>• Radio Frequency Identification (RFID)</li> <li>• Near-Field Communications</li> </ul>	<ul style="list-style-type: none"> <li>• The Handset Revolution</li> <li>• Mobile IP</li> <li>• IP Multimedia Subsystem</li> <li>• Mobile Gaming</li> <li>• Mobile Video</li> <li>• Mobile TV</li> <li>• Mobile Content</li> </ul>


## Customizable Solutions



- Customer Branding
- Custom Module Selection and Sequencing
- Development of Need-Specific Modules
- Custom Content Development
- Inclusion of Customer-Provided Content
- Curriculum Development
- Design and Production of eLearning Courses

## LIDO Provides Knowledge of –



- 
 The entire telecommunications landscape  
 PSTN, Internet and IP, Cable TV, Wireless, Powerline  
 Infrastructures, Applications, Devices, Regulations
- 
 The complete range of telecom disciplines  
 Voice, data, image, video, multimedia, television
- 
 Global standards and deployments  
 ITU-T, IEEE, IETF, ANSI, ETSI, TTC, and more
- 
 Comprehensive coverage of all telecom sectors  
 Wireline, Wireless, Optical,  
 Broadband, NGN, Convergence, Mobility  
 2.0 Ecosystem (Telco 2.0, User 2.0, Enterprise 2.0)

## Why LIDO?

- ▶ Unique multi-dimensional format addresses all learning styles
- ▶ Word-by-word transcript facilitates understanding where English is not the first language
- ▶ LMS tracks learning progress of users, provides testing and scoring, and enables certification
- ▶ SCORM 1.2 compliant
- ▶ Consistency in format and delivery, with content based on 28 years of ongoing research

**Lillian Goleniewski**  
President, LIDO Organization

**LIDO** Telecommunications Technology Fundamentals >> **4**  
Introduction

**1** The Status Bar displays the status of the media (playing, paused, buffering, etc.) and the current time code of the media as well as the duration of the entire presentation. This feature saves time by providing an indication of how long the overall presentation is and how much has been viewed

**2** TRANSCRIPT  
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switched telephone network...  
(PSTN). *Four-wire circuits*  
*are also used with leased*  
*lines, where a customer may*  
*be connecting locations of its*  
*own that are separated by*  
*distance.* Also, all digital  
circuits are provisioned on a

**3** SLIDES  
Transmission Fundamentals  
Transmission Lines  
2-wire Circuits  
**4-wire Circuits**  
2 - wire and 4 - wire Circuits in  
the PSTN  
Transmission Lines

**4** **Carrier**

**5** **4 Wire**

- Two pairs of conductors
- Two sets of one-way transmission paths
- One path for each direction of transmission
  - allows one pair to be used for transmission in each direction
- Main applications include interexchange trunks, leased lines and digital circuits

**6** SEARCH

**7** LAUNCH QUIZ

**8**

> Transcript  
> PowerPoint Presentation (pdf)  
> Reference Links  
> Reference Reading Resources  
> Glossary

QUIT

Lillian Goleniewski  
President, LIDO Organization

**LIDO** Telecommunications Technology Fundamentals >> Introduction

08:46/22:41

**1** [Navigation icons]

**2** TRANSCRIPT  
amplified, periodically. So, for example, four-wire circuits connect the various switches that make up the public switched telephone network (PSTN). *Four-wire circuits are also used with leased lines, where a customer may be connecting locations of its own that are separated by distance.* Also, all digital circuits are provisioned on a

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**4** Introduction

**5** 4-wire Circuits

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QUIT

Transcript highlighting focuses on the current text tract being spoken. This feature provides you with a quick and easy point of reference in the text tract. By clicking on any portion of the text, you will automatically switch to the proper audio segment and slide as well

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President, LIDO Organization

**LIDO** Telecommunications Technology Fundamentals >> Introduction

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**4** Introduction

**5** 4-wire Circuits

Customer Carrier

Tip Ring

4 Wire

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**6**

**7** LAUNCH QUIZ

**8** > Reference Links  
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QUIT

The Slide Index follows along with the audio, enabling you to always know which section is being heard and viewed. This feature provides a quick point of reference in the presentation relative to the audio, thus eliminating "guess work". When navigating topics via the slide index, the audio files and transcript change accordingly

Lillian Goleniewski  
President, LIDO Organization

08:46/22:41

TRANSCRIPT

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Telecommunications Technology Fundamentals >>  
Introduction

4-wire

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**LIDO** Telecommunications Technology Fundamentals >> Introduction

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**3** SLIDES  
Transmission Fundamentals  
Transmission Lines  
2-wire Circuits  
**4-wire Circuits**  
2 - wire and 4 - wire Circuits in the PSTN  
Transmission Lines

**4** Introduction

**5** **4-wire Circuits**

The Search Function searches the transcript for key words or phrases. This feature searches both the transcript and the presentation slides

**6** SEARCH

**7** LAUNCH QUIZ

**8**

- > Transcript
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- > Reference Links
- > Reference Reading Resources
- > Glossary

QUIT

Lillian Goleniewski  
President, LIDO Organization

**LIDO** Telecommunications Technology Fundamentals >> Introduction

08:46/22:41

**1** [Navigation icons]

**2** TRANSCRIPT  
amplified, periodically. So, for example, four-wire circuits connect the various switches that make up the public switched telephone network (PSTN). *Four-wire circuits are also used with leased lines, where a customer may be connecting locations of its own that are separated by distance.* Also, all digital circuits are provisioned on a

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The Launch Quiz button opens a window that presents you with an interactive quiz for the segment. Answer the questions, submit your answers, and receive your total score, along with a response indicating correct answers, identifying wrong answers and providing the correct response

**6** SEARCH

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QUIT

## Testimonials....

### We Are Impressed !!!

**Peter Brierley**  
 Professor  
 Networking Technologies  
 Collin County Community College  
 Texas, USA

"At Collin College, we conducted an exhaustive search for the right content for the new Convergence Technology Center (CTC). LIDO Telecommunications Essentials eLearning is the most up-to-date, comprehensive resource I have ever seen for telecommunications and networking training."  
 "The quality of information is outstanding."

"The elearning series has passed my scrutiny with flying colors. I think one of the student comments really hit the nail on the head" ...  
 "...get rid of the text book and go with eLearning, it's the future! First I had Cisco and then LIDO I hope other courses soon begin to do the same thing"

**Testimonials....**  
**We Are Impressed !!!**

**LIDO**

“When Lill’s revised edition of Telecommunications Essentials was released, I was excited to have in my hands the single best resource on the subject in the industry.”

“Combining state-of-the-art web technologies with content from the book and elsewhere creates a most impressive 24x7 Multimedia Experience”.

“But, the new eLearning series, if possible, is even more powerful than the book.”

“I strongly recommend the eLearning experience for companies, large and small, whose staff or clients demand the very best.”



**Dr. Art St. George**  
 CTO, Cerelink, New Mexico, USA, and Como, Italy  
 Chairman - Internet 2 Bandwidth Mgmt Working Group  
 Member - Educause Evolving Technologies Committee

**Testimonials**

**LIDO**

“.....provided a wide range of elements in telecommunications, from the basic to the critical. I was able to follow the presentation even with limited technical background.”

- Jack Ong, Commercial Services Section Manager, Hewlett Packard

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“.....provided full elements on telecommunications, from the basic to the critical aspect. Very suitable for those who have limited technical background”

- Norrshamsul Azizi Mohd Nor, Senior Executive, Packet One Network

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“The information and presentation were excellent, brought down to a technical level enough to do justice to the information, but still tangible to the ‘non-engineers’”.

- Amy Chen, Consultant, Coopers & Lybrand Consultants



## Something to Think About...

LIDO

“ Knowledge is of two kinds. We know a subject or we know where we can find information upon it. ” - Samuel Johnson (1775)

To Know the subject of Telecom...  
LIDO Telecommunications Essentials eLearning

To Find information about Telecom...  
the LIDO Telecom WebCentral website  
[www.telecomwebcentral.com](http://www.telecomwebcentral.com)



## QUESTIONS?

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LIDO Telecommunications Essentials®  
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**Thank You !!!**

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