



## NEW GENERATION NETWORKS IN RURAL AMERICA

**N**etworking is changing in rural America. Technology is advancing quickly and vendors are offering new and better products. Customers are interested in broadband Internet, advanced TV, and new cellphone services in increasing numbers. Many believe that a modern communications network is a key to rural community prosperity. This course provides a comprehensive overview of the technical concepts behind the new generation networking technologies that will have major impact in the next two years. The course is designed for rural communications professionals that have a solid knowledge of today's network and wish an overview of future technology trends.

### **Audience:**

This course focus is on the big picture plans that should be of interest to both technical and non-technical, and business managers. Students should already have a basic understanding of Voice, Data and Cellular technology.

### **Objective:**

This course will give the student an understanding of all the new architectures in rural America that will have a significant impact in the next two years.

### **Expected Outcomes:**

By the end of this class the student will be able to:

- Understand and describe all the new copper based broadband access technologies
- Describe the new Fiber to the Customer Passive Optical Network architectures and the new data and video services they can offer
- List and discuss the fixed radio based broadband access architectures.
- Explain how Voice over IP works and the various configurations that use it
- Discuss the softswitch concept and how it differs from traditional local switch design
- Discuss the new trends in cellular service
- Explain how the New Generation Network Target Architecture fit together

Tuition is \$695 per student and includes all books and learning materials as well as lunches and breaks both days.

Please register before the class by contacting Jerry Griggs at 785-478-1024 or [griggsjerry@sbcglobal.net](mailto:griggsjerry@sbcglobal.net).

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### COURSE OUTLINE

#### Day 1

#### 1. What has changed in Networking?

- Traditional Networking
- Microelectronic, Fiber Optic, and Internet Technology Revolution
- New Generation Networking Target Architecture
- Course Outline

#### 2. Broadband Access Technologies—Copper to the Customer

- Modern Broadband Based “Triple Play” Services: Voice, Data, and Video
- Local Access Bandwidth Bottleneck
- Next Generation Digital Subscriber Line (DSL)
  - ADSL2
  - RE-ADSL2
  - ADSL2+
  - VDSL
  - VDSL2
- Next Generation Digital Loop Carrier (DLC)
- Next Generation Central Office DSLAM
- Fiber In The Loop (FITL), Fiber To The Curb (FTTC), and Fiber To The Neighborhood (FTTN) Architectures
- Broadband over Powerlines (BPL)

#### 3. Broadband Access Technologies—Fiber to the Customer

- Fiber to the Home (FTTH) and Fiber to the Premises (FTTP)
- “Home Run” Fiber Access
- Broadband Passive Optical Network (BPON, G.983 APON) Architecture
- BPON Network Elements
- Back-up Power Issues
- Gigabit PON (GPON) Architecture
- GPON Network Elements
- Ethernet PON (EPON) Architecture
- Ethernet PON Network Elements
- Example FTTH, FTTP Deployments

#### Day 2

#### 4. Broadband Access Technologies - Radio to the Customer

- Wi-Fi (802.11) Networking in Towns
- Wi-Fi (802.11)/Cellular Interworking
- WiMAX (802.16) Fixed Wireless Networking
- Satellite Based 2-Way Data Service

#### 5. Voice over Internet Protocol (VoIP)

- VoIP Concept
- VoIP Applications
- VoIP Gateways
- VoIP Interworking with Traditional Telephony

#### 6. Central Office Softswitch for Data and VoIP Service

- The Softswitch Concept
- Softswitch Compared to Traditional Voice and Data Switches
- Softswitch Benefits and Concerns
- VoIP and Softswitch Deployment

#### 7. What's New in Cellular Networks in Rural Areas?

- New High Speed Data on Cellphones
- New Cellphone Features
- Popular Text, Picture, Sound, and Video Messaging Cellphones
- Cellphone Technology
  - CDMA2000 1x and 1xEV-DO
  - GSM GPRS and EDGE
- Trends in Cellphone Network Deployment Requirements

#### 8. Summary of New Generation Networks in Rural America

- Applied Research Technologies to Watch in the Future