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Ethernet Backhaul Overview H0LY0AAE (IPC_122)

HPE course number	H0LY0AAE
Course length	3 hours
Delivery mode	WBT
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Emerging 3G and 4G networks reflect two key fundamental changes in wireless networks. The first change is the trend toward an "all IP" network and the second change is a more efficient radio interface resulting in a huge growth in the volume of traffic supported by the air interface. Traditional backhaul using T1/E1 leased lines is no longer economical so new backhaul solutions are being deployed. This course describes the key issues leading to the need for new backhaul solutions and provides an overview of the various backhaul solutions and related technologies. It introduces the backhaul network architecture and reviews technologies such as ATM, DSL, Bonded T1/E1, DOCSIS, Microwave Radio, PON, Carrier Ethernet, MPLS/MPLS-TP, and PBB-TE. A backhaul capacity planning and technology migration scenario is presented, and the course ends with an exercise to test the student's comprehension of the topics covered.

Audience

This course is suitable for those looking for a high-level conceptual overview of IP/Ethernet backhaul networks and an introduction to associated technologies.

Course objectives

After completing this course, the student will be able to:

- List the requirements for 3G/4G backhaul
- Describe the challenges for 3G/4G backhaul
- Differentiate between the access and aggregation networks
- Identify the networking options most likely deployed for Ethernet Backhaul (EBH)
- Discuss the role of various technologies in backhaul networks
- Explain benefits of Carrier Ethernet and list various services provided for backhaul
- List the key issues related to migrating to an Ethernet-based backhaul network
- Identify tools and techniques used to seamlessly migrate to EBH
- Compare different backhaul facilities and explain the pros and cons of the available solutions
- Explain where faults in the EBH network may occur, and how these faults are detected and isolated
- Identify the key challenges in sizing backhaul capacity links
- Sketch possible migration path from a T1/E1 based backhaul solution to tomorrow's IP/Carrier Ethernet

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* Realize Technology Value with Training, IDC Infographic 2037, Sponsored by HPE, January 2016

Detailed course outline

Module 1: The "Big Picture"	• What is "Backhaul"? • Motivation for EBH • Backhaul requirements • Backhaul challenges
Module 2: Backhaul options	• SONET transport • Microwave transport • Ethernet transport • Other transport
Module 3: Carrier Ethernet (CE)	• What is it? • CE service types • CE connection granularity • Negotiating a CE service • EBH backhaul design
Module 4: Key EBH issues	• Migration: Today's BH to tomorrow's BH • Joint backhaul of 2G, 3G, and 4G traffic • Emerging all-IP environment • Timing and synchronization • EBH operations and management
Module 5: EBH growing pains	• Market evolution • Bonding techniques • CE transport options • TDM-based to Ethernet-based backhaul
Module 6: Deploying and operating an EBH network	• Deployment testing (RFC2544; Y.1731, CFM) • Fault detection and recovery • Performance monitoring
Module 7: EBH capacity planning	• Capacity planning process • Nature of data traffic • Forecasting subscriber mixes • Sizing EBH links
Module 8: Summary	

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