Course ID
BHAUL-STND
Course Duration
2-3 days

Course Title
Mobile Backhaul Standards and Protocols

Related Courses

- Mobile Backhaul Business and Technology Briefing™ (BHAUL-BRIEF, 1 day)
- Mobile Backhaul Market Briefing (BHAUL-MKT, 1 day)
- Mobile Backhaul Application Case Studies (BHAUL-APP, 1+ days)
- Mobile Backhaul Architecture and Implementation (BHAUL-AI, 2-3 days)
- Mobile Backhaul Security (BHAUL-SEC, 1 day)
- Mobile Backhaul End-to-End (BHAUL-E2E, 1 day)

Aimed At

Persons responsible for the implementation and/or ongoing support and troubleshooting of mobile backhaul environments will benefit most from this course.

Group Size

5-25

Prerequisites

Knowledge of operations of packet based networks is a pre-requisite. Prior experience with the open source WireShark™ network traffic analyzer is also beneficial.

Course in a Nutshell

The underlying protocols, message formats and exchanges are what make the architectures work. This course will review the predominant protocols, their standards and operation. This course will, optionally, include protocol analysis labs using the WireShark protocol analyzer depending on the length of the class and the customization and emphasis options chosen.

Customize It!

This briefing can be scheduled as a two or three day standalone course or as a part of a larger curriculum along with other courses. The course can be optionally taught as a hands-on workshop at no added cost.

Learn How To

- Identify and differentiate all major mobile backhaul standards and protocols
- Choose the right standards and protocols for specific tasks and applications
- Implement Layer 2 standards
- Understand the impact of various configuration options on Quality of Service and Quality of Experience

Course Outline

Standards and Protocols Introduction

A high level overview of the topic and the briefing.

Standardization Landscape

- Metro Ethernet Forum
- IP / MPLS Forum

Metro Ethernet Forum MEF 22

- MEF 22: Standardization Process
- MEF 22: Overview
    - MEF Specifications for Mobile Backhaul
    - Generic Specification for Ethernet backhaul
    - Guidelines to Architecture, Equipment and RAN Operation
    - Standardized Toolset

MEF Terminology and Concepts

- Network Elements
- MEF Services
    - Ethernet Private Line Service
    - Ethernet Virtual Private Line Service
    - Ethernet Private LAN Service
    - Ethernet Virtual Private LAN service
    - Ethernet Private Tree Service
    - Ethernet Virtual Private Tree Service
    - Legacy RAN Mobile Backhaul Migration
    - Ethernet RAN Mobile Backhaul Migration

Challenges

- 2G Transport
- Service Definition
- Timing Delivery
- Service Monitoring

UNI for TDM-based Base Stations

- Generic Interworking Function (GIWF)
- Adaptation
- Interconnection

  - **Any** Combination of 2G/3G Legacy and Evolved-3G and 4G Voice and Data Traffic over a Single Carrier Ethernet RAN
  - Implementation Based on TDM Circuit Emulation Standards as Well as ATM/HDLC Pseudo-wire Standards
- Services
  - Emulated Circuits
  - 3G
  - CoS Configuration

Approach to Synchronization

- Packet Based Methods (in scope Phase 1)
- Synchronization Quality Requirements
- The IA Is Agnostic to Specific Methods /Implementations
- Synchronous Ethernet
- Non-Ethernet Sync
- Delivering Packet Synchronization

OAM in MBH Migration

- Ethernet OAM
  - Provides Ethernet management
  - Features
  - Connectivity Fault Management
  - Performance Management
  - Link Management

Current Focus Areas

- LTE
- LTE and Requirements for Ethernet Services
- Synchronization
- Frequency Synchronization Requirements
- Timing Methods
- Resiliency
- Performance Monitoring
- Established Reference Model
- Service Performance
- MEF 22 Scope Comparison

IP/MPLS Forum 20.0.0

- Reference Architectures
  - Centralized Mobile Networks
  - Flat Mobile Networks
- Transport Network Layer Scenarios
  - Centralized Mobile Networks
    - Transport Network Layer Encapsulation
  - Flat Mobile Networks
    - L2VPN MPLS
    - L3VPN MPLS
  - IP Transport Network Layer
- Generic Requirements for MPLS Backhaul Transport Network
  - Encapsulation Requirements
  - Network Signaling Requirements for PWs and LSPs
  - MPLS Network Signaling Requirements for VPLS and L3VPNs
  - Operations Administration and Maintenance (OAM)
  - Traffic Engineering and QoS Requirements
  - Protection
  - CSG and MASG Configuration
  - Multicast Requirements
  - Multi-Path Optimization
  - Security Requirements
  - Network Synchronization
  - Clock Distribution over MPLS Based Mobile Backhaul Networks

Standards and Protocols Review and Summary

A review of the briefing topics and summary of the program.

Revised *2Jl-f*