GogoTraining™
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USB 3.0 Architecture
Training Course Outline

Course Description:
In this USB 3.0 training course you will learn about the third generation of USB-SuperSpeed USB, the increased transfer rates to 5.0Gbps, improved flow control and power management, as well as the changes to the protocol layers will be thoroughly examined. USB 2.0 is briefly reviewed because USB 3.0 is required to be completely backwards compatible.

Course Prerequisites:
Some understanding of the USB 2.0 specification

Course Objectives:
As a result of taking this USB 3.0 training course, you will be able to:
- Explain the required backward compatibility with USB 2.0
- Discuss the details of the new bus architecture
- Define the new SuperSpeed data flow model
- Identify host and device requirements
- Analyze actual traffic on the bus, including the different transfer types
- Describe the new power management features
- Implement requirements at the physical, link, and protocol layers

Course Outline:

Module 00: Course Introduction

Module 01: USB 2.0 Review
- Device, Host, and Hubs
- USB 2.0 Topology
    - o Physical Layer
    - o Link Layer
    - o Protocol Layer
- USB Transfer Types

Module 02: USB 2.0 Communication
- Error Handling
- Communication Model
    - o Transactions
    - o Transfer s

Module 03: USB 2.0 Configuration
- Packets and Packet Types

- Descriptors
- Device Detection
    - Signaling

Module 04: USB 3.0 Architecture

- Support for USB 2.0
- USB 3.0 Architecture Overview
    - System Description

Module 05: Data Flow Model

- USB 3.0 Transferso Types
    - Data Bursting
- Transaction Protocol Improvements

Module 06: Physical Layer

- Transmitter/Receiver requirements
- Data Scrambling
- Encoding
- LFPS
- Mechanical Requirements

Module 07: Link Layer

- Packets
- Flow Control and Link Management
- LTSSM
- State Diagrams
- Resets

Module 08: Protocol Layer Part 1

- Packet Formats
    - Link Management Packets
    - Transaction Packets

Module 09: Protocol Layer Part 2

- Data Packets
- Isochronous Timestamp
- Route String
- Flow Control

Module 10: USB 3.0 Device Framework

- Device States
- Device Operation
- Standard Device Requests
- Stand Device Descriptors

Module 11: Hubs

- Hub Architecture
    - State Machine
    - Repeater/Forwarder
- Packet Routing
- Resume Signaling

Module 12: Power Management
- Link power management
- Device PM
- Hub PM
- Suspend/Resume
- Latency Tolerance Message

Module 13: Data Traffic Analysis
- Link Control
- IN and OUT Transactions
- Packets

Module 14: Course Summary and Evaluation