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Leader in IT & Management Training

7561 E. Gold Dust Ave
Scottsdale, AZ 85258
1-877-546-4446
www.gogotraining.com

USB 2.0 Architecture Part 1
Training Course Outline

Course Description:
Do you need a USB class that helps you learn USB 2.0 architecture? This USB training course focuses on system definition including the USB component. The USB communication model will be studied and transactions will be evaluated in detail. Bandwidth allocations, packet types, packet protocols, and packet sequencing are also covered. This USB training course also covers device framework including device descriptors and device requests.

Note: To receive training specific to USB 3.0, please see *USB 3.0 Architecture Update*.

Course Objectives:
As a result of taking this USB training course, you will be able to:
- Explain the architecture of USB and its components
- Understand the operation of USB low-, full-, and high-speed devices and protocols
- Describe the electrical and signaling requirements for 1.5, 12, and 480 Mbps operation
- Describe USB Hubs, power management, and split transactions
- Learn USB configuration requirements
- Explore USB transaction types and device classes.

Continue to learn USB 2.0 with *USB 2.0 Architecture Part 2*.

Course Prerequisites:
One should have a good understanding of PC hardware and software architecture. An understanding of serial communications techniques is also highly recommended.

Modular Outlines:
Module 00: Course Introduction

Module 01: History and Overview
- Problem Solved by USB
- USB Specification History
- USB Features
- Hot Plug, Isochronous Bandwidth, Error Handling/Fault Recovery

Module 02: System Description
- System Description and Configuration
- USB Components
- Topologies
- Attachment/Removal of USB Devices

Module 03: Architectural Overview

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- Bus Enumeration
- Physical Interface
- USB Protocol
- Transactions

Module 04: Communications Flow
- Host-client Relationship
- Device End Point
- Pipes
- Frames
- In and Out Transactions

Module 05: Bus Transfers
- Transfer types
- Transaction Examples for Each Type
- Bus Access for Transfers
- Bus Bandwidth Reclamation

Module 06: Packet Types and Formats
- Packet Field Formats
- Token Packets
- Data Packets

Module 07: Packets and Packet Sequencing
- Hand Shake Packets
- Special Token Packets
- NAK and Ping

Module 08: Packet Protocol
- Bulk, Control, Interrupt, and Isochronous
- Synchronization and Re-try
- Packet Errors
- Bus Errors

Module 09: Device Framework
- Device Class Definitions
- Standard Descriptors
- USB Device Operation
- Power Management

Module 10: USB Device Requirements
- Device Request Types
- Class Specific Requests
- Vendor Specific Requests

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Module 11: USB Host Requirements

- Host Controller Requirements
- Device Drivers
- Resource Management

Module 12: Course Summary