Industrial Network Fundamentals

This course covers essential networking topics such as VLANs, QoS, IP Addressing, Remote Access, SNMP, SYSLOG, and configuration best practices.

Empowering professionals with cutting-edge skills and real-world operational technology experience.

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Overview:

The Industrial Network Fundamentals Course provides a broad range of fundamental knowledge for OT careers. Through a combination of lecture and hands-on labs, you will acquire the skills necessary to install, operate, configure, and validate basic IPv4 and OT networks. The curriculum includes instruction on configuring network components like switches, WoCs, Wireless AP, and Veto, as well as managing network devices and recognizing fundamental security threats.

Target Audience:

Any IT Staff looking to start a career in Operational Technology or a Technician, Planner, Operational Team, and Cyber Security Specialist

Objectives:

After completing this course, you should:

- Have an understanding of high-level network topologies.
- Have an understanding of LANs and the role of switches within LANs.
- Have an understanding of Ethernet as the network access layer of TCP/IP and an Understanding of the operation of switches.
- Install a switch and perform the initial configuration.
- Have an understanding of the TCP/IP network model, IPv4, its addressing scheme, and subnetting.
- Be proficient at installing and configuring WoCs.
- Identify and resolve common switched network issues and common problems associated with IPv4 addressing.
- Have an understanding of, implementation of, and verification of VLANs and trunks.
- Have an understanding of the concepts of wireless networks, and what types of wireless networks can be built.
- Have an understanding of the basic QoS concepts
- Have an understanding of Effective PoE power budgeting to prevent overloading of PoE switches.
- Have an understanding of the best OT practices.
- Implement a basic security configuration of the device management plane.

Course Outline:

Day 1:

Module 1: High-Level Network Topologies
- Understanding high-level network topologies
- Overview of complex network structures and their applications

Module 2: LANs and Switches
- Understanding LANs and their characteristics
- Role of switches within LANs and their operation

Module 3: Ethernet and Switch Operation
- Overview of Ethernet as the network access layer of TCP/IP
- Understanding the operation of switches in network environments

Module 4: Switch Installation and Initial Configuration
- Steps to install a switch in a network setup
- Performing initial configuration of switches for network operation

Module 5: TCP/IP Network model and IPv4
- Understanding the TCP/IP Network model
- Overview of IPv4 addressing scheme and subnetting concepts

Module 6: WoC Configuration
- Basic configuration of a Wireless over Coax (WoC)
- Implementing and verifying configuration settings on a WoC

Module 7: Switched Network Issues and IPv4 Addressing Problems
- Identifying and resolving common switched network issues
- Troubleshooting common problems associated with IPv4 addressing

Course Outline:

Day 2:

Module 8: VLANs and Trunks
- Understanding VLANs and their benefits
- Implementing and verifying VLANs and trunks in network setups

Module 9: Wireless Networks
- Concepts of wireless networks and their types
- Building different types of wireless networks

Module 10: Quality of Service (QoS)
- Basic concepts of Quality of Service (QoS) in networking
- Implementing basic QoS configurations for network optimization

Module 11: PoE Power Budgeting and Best OT Practices
- Understanding Power over Ethernet (PoE) and its budgeting
- Best practices for Operational Technology (OT) in networking environments

Module 12: Device Management Plane Security
- Implementing basic security configurations for device management plane
- Protecting network devices from unauthorized access and attacks

Module 13: Configuration of an Element Management System (EMS)
- Install EMS and configure network element discovery (e.g., WoCs) to enable monitoring and management.

Assessment and Practical Sessions:

Quizzes and assessments at the end of each module to evaluate understanding.
Hands-on practical sessions for switch installation, configuration, and troubleshooting

Resources:

- Online resources covering advanced networking concepts.
- Hands-on labs with networking equipment for practical exercises
- Instructor-led demonstrations and presentations

This course dives into advanced networking concepts and configurations, providing participants with practical skills and knowledge to manage complex network environments effectively. Each module is structured to build upon the previous one, ensuring a comprehensive understanding of advanced networking topics over the course of two days.

Prerequisites:

Attendees should meet the following prerequisites:

- Basic computer literacy
- Basic PC operating system navigation skills
- Basic internet usage skills
- Basic IP address knowledge
- Must have knowledge of Mining Network Foundation course.

Price:

- $2,500 + GST = $2,750 total

Dates Available:

- October 22-23, 29-30; November 5-6, 12-13, 19-20, 26-27; December 3-4,10-11