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Switching and Routing in Industrial Networks with RUGGEDCOM

Industrial Networks Education

Description

Ethernet has found its way into the industrial and the industry-related environment. A high degree of reliability and throughput rates are demanded from industrial networks. At the same time, a reliable connec-tion of these networks to an existing network infrastructure as well as the seamless integration into a corporate network is highly required.

With the training course "Switching and Routing in Industrial Networks" of the Industrial Networks Education – Certification Program, you will acquire the knowledge required to plan, implement, operate and maintain such networks.

Objective

Switching
In the Switching part of the course participants will gain the theoretical and practical knowledge required for real world implementation of industrial networks and the methods applied to operate and maintain such networks.

Routing
After completion of this section of the course participants will have theoretical and practical knowledge of what IP communications, routing protocols, redundancy, LAN/WAN concepts that help facilitate communications between multiple network locations.

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General Information

Course Code: IEN-RCMSWROU
Length: 5 Days

Audience

This course is for users who are involved with developing or sustaining networks in rugged environments – such as Electric Power, Transportation, Rail, and Defense markets, where RUGGEDCOM equipment is required. This includes, but is not limited to the following:

- Application Engineers
- Automation Engineers
- Communication Engineers
- Control Engineers
- Operations or IT Network Engineers
- Project Engineers
- Substation Engineers
- System Engineers

Prerequisites

- Basic knowledge of the topic "Ethernet".
- Familiar with network topologies, Media Access Control (MAC), Internet Protocol, data transport and associated technical vocabulary.
- Familiar with the principles of switching operations, hubs and the OSI reference model.
- Recommended: Participants are encouraged to attend the Industrial Ethernet Fundamentals training course or pass a written examination.

Profile

This course is one of three certification courses offered under the Siemens Certified Professional for Industrial Networks (CPIN) program, which incorporate RUGGEDCOM products into the curriculum, ensuring students learn and test using products they use on a regular basis. The curriculum covers Network solutions and how they connect to real-time systems in theory and in practice.

Throughout the course, students will have ample time for practical exercises, diagnostics, and troubleshooting. The course uses a hands-on model for realistic demonstrations.

At the end of the course, students are equipped with the knowledge to plan, configure, operate and provide support for networks in their specific market.

Objectives

Upon completion of this course, the student will learn:
- Switching in Industrial Ethernet Networks
- Redundancy in a Switched Network (Spanning Tree Protocol)
- Network segmentation with Virtual Local Area Networks (VLAN)
- Increasing bandwidth availability (Link Aggregation)
- Integrating Serial Protocols
- Diagnostics and troubleshooting
- Practical exercises using the RUGGEDCOM ROS and RUGGEDCOM ROX product line

Topics

Switching
1. Industrial Ethernet Overview
2. Layer 2 – Data Link Layer
3. Commissioning (ROS Platform)
4. Switching in Industrial Ethernet Networks
5. Ethernet Port Configuration
6. Redundancy in Switched Networks
7. Segmenting Switched Networks
8. Increasing Bandwidth Availability
9. Integrating Serial Protocols
10. Monitoring (ROS Platform)
11. Maintenance / Troubleshooting (ROS Platform)

Routing
1. Layer 3 – Network Layer
2. Commissioning (ROXII Platform)
3. LAN and IP Interfaces
4. WAN Interfaces
5. Internet Protocol Services
6. First Hop Redundancy Protocol
7. Moving packets across IP Networks
8. Automatic Path Determination
9. Automatic Path Determination with standard-based protocols
10. Monitoring (ROX platform)
11. Maintenance/Troubleshooting (ROX platform)

Certification (Siemens CPIN-LEVEL)

This training prepares for the certification "Siemens Certified Professional for Industrial Networks – Switching and Routing". A voluntary certification examination which consists of two sections will take place at the end of the training.