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Switching and Routing in Industrial Networks with SCALANCE

Industrial Networks Education

Description

An industrial or industry-related environment without Ethernet is no longer conceivable. A high degree of reliability and sufficient capacities are demanded from hard-wired industrial networks, because otherwise downtimes would be a constant threat and costs would be incurred. At the same time, Ethernet networks in industrial and industry-related environments must be securely connected via interfaces to a wide variety of machines and the existing network structure. Connecting the industrial network to the corporate network should be a seamless process.

With Industrial Ethernet/PROFINET networks from Siemens, such solutions are not a problem if you are familiar with the basic of such networks.

General Information

Course Code: IEN-IKSWROU1A
Length: 5 Days

Audience

This course is for users who are involved with developing or sustaining automation networks in an industrial environment. This includes, but is not limited to the following:

- Plant Engineers
- Control Engineers
- System Engineers
- Commission Engineers
- Application Engineers
- Operations or IT Network Engineers
- Facility Managers
- Project Engineers

Prerequisites

- Basic knowledge of the topic "Ethernet".
- Familiar with network topologies, transfer processes, addressing, data transport, and understand the associated technical vocabulary.
- Familiar with the principles of router operations, switches and an OSI reference model.
- Recommended: Completion of the web-based Initial Training for Industrial Networks (ITIN) course.

Profile

This course is one of three certification courses offered under the Siemens Certified Professional for Industrial Networks (CPIN) program. The curriculum covers Network solutions and how they connect to real-time systems in theory and in practice. It also addresses the requirements and fundamental principles of industrial routing solutions.

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 industrial networks.

Objectives

Upon completion of this course, the student will learn:

- Differences between Ethernet and Industrial Ethernet topologies
- IPv4 and IPv6 basics (addressing, data exchange, important protocols)
- Redundancy Protocols (MRP, HRP, Standby Redundancy Protocol, RSTP, Passive Listening, HSR, and PRP)
- Network Segmentation with VLANs
- Static routing
- Router redundancy (VRRP)
- Dynamic routing (RIP, OSPF)
- Diagnostics and troubleshooting
- Practical exercises using the SCALANCE X product line

Topics

1. Switching

- a. Ethernet Basics
- b. On-site networking in automation
- c. Increased availability in automation
- d. Coupling automation segments
- e. Networking with IT standards
- f. Coupling automation and IT system
- g. Seamless redundancy in the ring
- h. Seamless redundancy
- i. Separating different communication types
- j. Useful Features

2. Routing

- a. Internet Protocol in Automation
- b. Connecting to the IT Network
- c. Redundant Connection to the IT Network
- d. Extending an Existing Network
- e. Dynamic Routing Protocols
- f. Best Practices - Routing

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.

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