NetLab

Networks and IT security in the context of Industry 4.0

FESTO

New data, new communications, new risks

Communication networks are the spinal cord of Industry 4.0 (I4.0). Under this new production paradigm, networking of plants, processes, systems, and components will accelerate, with data flowing not only within the company and across its locations, but also across partners of the value creation chain. The amount of data exchanged will increase at exponential rate.

Confidentiality, integrity, and availability of data become critical, raising requirements for industry, and subsequently, for training.

A didactic tool mitigating complexity

In the context of automation, new, complex topics related to cybersecurity and privacy are emerging, such as Ethernet, switching, routing, remote access, encryption, VPN, access control, virtual LAN, etc., but have not yet been well-integrated in training programs,
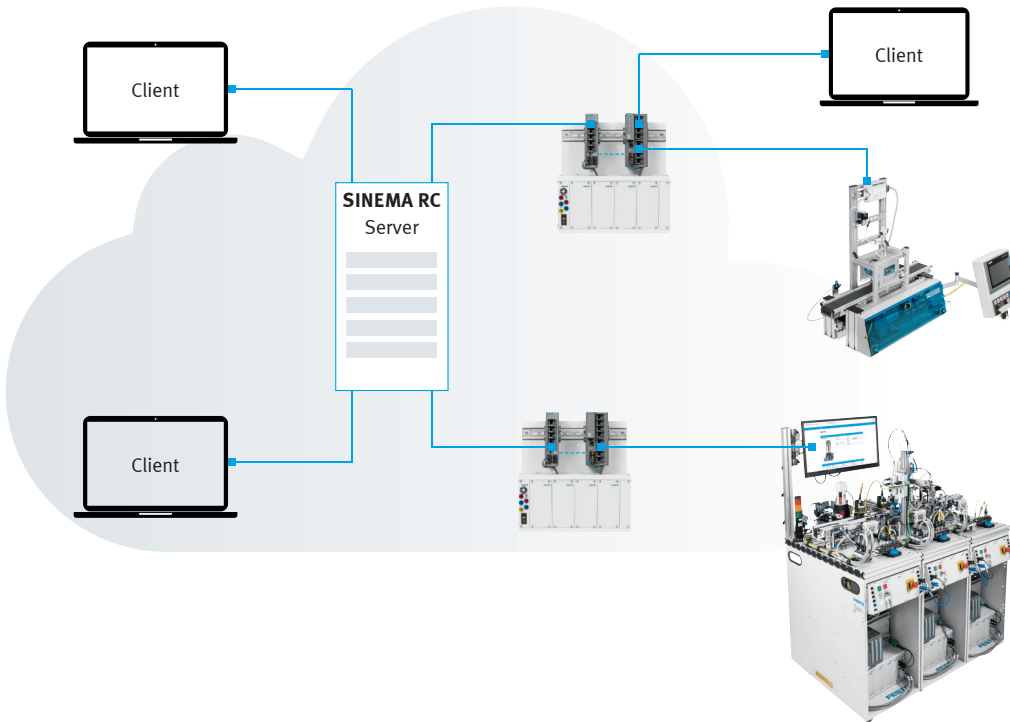
NetLab offers a complete and valuable didactic solution designed to make learning efficient, while mitigating the difficulty of teaching such intricate topics.

i4.0

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Client

Client

SINEMA RC
Server

Client

Topic coverage

- Networking Fundamentals: Ethernet Technology, Packet-Oriented Communication, IPv4-Addressing Schemes, Switching, Routing, Layered Communication Stack, DHCP, DCP
- High Availability: Loop Detection, Redundancy, (Rapid) Spanning Tree, Ring Structures, Media Redundancy Protocol (MRP), High Speed Redundancy Protocol (HRP), Priority Switching and Quality of Service (QoS)
- Separation of Networks: Routing Scenarios, Network Address Translation (NAT), VLAN-Separated Networks, Firewalls, Access Control, Introduction to Cryptography, Virtual Private Networks (VPN)
- Remote Access: Authentication Principles, Password Protection, Digital Certificates, Direct Dial-In, Server-Managed Access

A modular and universal concept

Secure communications are becoming an imperative in the qualification of competent mechatronic and industrial electronic technicians, IT specialists, and others who will work in I4.0.

NetLab combines hardware and software components with courseware to integrate the study of IT networks and security in the qualification programs for I4.0.

NetLab can be used in standard teaching situations, or as part of a project-oriented approach, for increased flexibility. Utilization scenarios enable use within learning environments of CP Lab, CP Factory, and MPS 203 I4.0.

Industrial components for realistic learning

The EduTrainer "Network and Security" is the fundamental component of NetLab packages. It is based on the EduTrainer Universal to fit in A4 and ER mounting frames, allowing use in combination with other PLC modules.

It also includes two industrial SCALANCE communications devices from Siemens: a VPN-capable firewall router, S615, and a managed industrial Ethernet switch, XC208. Additionally, the SINEMA Remote Connect Server can also be used in secured, remote access scenarios.

Practice-oriented courseware

Courseware developed for NetLab provides networking and security content for classroom scenarios. Theory is followed by detailed, practical exercises. Prepared setups and sample solutions optimize laboratory work and teaching. Didactic packages also include Siemens trainer packages.

Available packages:
- NetLab Twin Package, adapted to single/double seat, or team scenarios
- NetLab Remote Access Package, based on SINEMA Remote Connect Server virtual application installed on a PC server
- NetLab Add-on Package for CP Factory, specifically designed to cover IT security using this learning system.