Understanding Cisco Industrial IoT Networking Foundation (INFND) v1.0

What you’ll learn in this course
The Understanding Cisco Industrial IoT Networking Foundation (INFND) v1.0 course gives you an overview of the protocols, applications, and network infrastructure you need to support and manage Industrial Internet of Things (IIoT) solutions. You will learn about IIoT industry verticals and how different protocols are used within them. The course also covers configuring and verifying the protocols on Cisco® IIoT networking devices.

Course duration
- Instructor-led training: 5 days with hands-on lab practice
- Virtual instructor-led training: 5 days of web-based classes with hands-on lab practice
- E-learning: Equivalent of 5 days of instruction with hands-on lab practice

How you’ll benefit
This course will help you:
- Understand what IIoT is, IIoT market verticals, and the related standards
- Understand the protocols, applications, and network infrastructure needed to support IIoT solutions
- Identify Cisco IIoT networking devices and how they are different from other devices
- Configure and verify IIoT networking devices to support IIoT solutions

Who should enroll
- Operational Technology (OT) Engineers
- IT engineers
- Generalists, including managers, project leads, and solutions and business architects

How to enroll
- For instructor-led training, visit the Cisco Learning Locator.
- For private group training, visit Cisco Private Group Training.
- For self-paced e-learning, visit the Cisco Learning Network Store.
- For digital library access, visit Cisco Platinum Learning Library.
- For e-learning volume discounts, email ask_cpll@cisco.com.

Technology areas
- Internet of Things (IOT)
- IOT industrial
- Routing and switching
Course details

Objectives

- Define what IIoT is and identify IIoT architectures.
- Identify IIoT market verticals, and their motivations and requirements.
- Explore Cisco IIoT networking devices, how they are different from other devices, and use common administrative tools for managing them.
- Explore industrial communications protocols for control and automation, and how they have been adapted to run on top of a TCP/IP network infrastructure.
- Describe wireless protocols used in IIoT environments, including architectures and devices used.
- Understand the TCP/IP protocol stack and how it is used with other protocols in IIoT environments.
- Discuss network protocols for clock synchronization between network devices, and describe available tools for IIoT network administration.
- Discuss wireless technologies used in a core LAN, and their relevance to IIoT implementations.
- Explore field WAN technologies and how they are used in IIoT environments.
- Explore legacy protocols and explain the methods available to transport non-routable protocols over modern networks.
- Explain fundamental concepts of Quality of Service (QoS) related to IIoT network environments.
- Discuss Multiprotocol Label Switching (MPLS) operation, components, terminology, and features, and explore its use in IIoT environments.
- Explore Layer 2 and Layer 3 VPN technologies and describe the way they can be used on IIoT deployments.
- Describe Dense Wave Division Multiplexing (DWDM) technology and its use in IIoT environments.
- Explore Layer 1 and Layer 2 high availability technologies and redundancy mechanisms.
- Describe Layer 3 high availability and the need for Layer 3 redundancy in IIoT deployments.

Prerequisites

The knowledge and skills that students are expected to have before attending this course are:

- CCNA® Routing and Switching (R&S) (or equivalent knowledge).
- Either the Control Systems Fundamentals for Industrial Networking (ICINS) course, the Managing Industrial Networks for Manufacturing with Cisco Technologies (IMINS2) course, or equivalent knowledge.

Outline

- Course Introduction
- Defining Industrial Internet of Things
- Examining Common IIoT Verticals
- Examining Cisco IIoT Networking Devices
- Examining and Configuring Industrial Communication Protocols
- Describing Wireless IIoT Protocols
- Explaining and Configuring TCP/IP Protocols, Addressing, and Segmentation
- Examining Network Services and Administration
- Examining and Configuring Wireless Core LAN Technologies
Course overview

- Describing Field WAN Technologies
- Examining and Configuring Transportation of Legacy Protocols
- Describing, Configuring, and Verifying Quality of Service (QoS) for IIoT Protocols
- Examining and Verifying MPLS and IIoT
- Configuring and Explaining VPN Technology and IIoT
- Describing DWDM
- Configuring and Defining Layer 1 and Layer 2 High Availability Technologies
- Defining and Configuring Layer 3 High Availability Technologies

Lab outline

- Connect to the Cisco IIoT Devices
- Use Industrial Protocols with Cisco Industrial Ethernet Switches
- Configure an 802.11 Client
- Configure an IPv6 Address
- Configure Layer 2 Network Address Translation (NAT) and IP Addressing in an Example IoT Deployment
- Configure and Verify Mapping of Address and Port Using Translation (MAP-T)
- Implement VLANs
- Configure IP Addressing, Layer 2 NAT, and Virtual LANs (VLANs)
- Use Network Administration Applications
- Configure Access Point and Wireless Network Using Wireless LAN Controller (WLC)
- Configure Wireless Networking
- Configure a WAN Interface on IR829B
- Configure an Long-Term Evolution LTE Connection
- Configure Raw Socket TCP Tunnel
- Configure Distributed Network Protocol 3 (DNP3) to DNP3/IP Translation
- Configure and Verify QoS for IIoT Networks
- Configure and Verify MPLS for IIoT
- Configure and Verify Virtual Private LAN Service (VPLS) VPNs
- Configure and Verify Layer Two Tunneling Protocol v3 (L2TPv3) VPNs
- Configure and Explain VPN Technology and IIoT
- Configure Dynamic Multipoint VPNs (DMVPNs)
- Configure FlexVPN
- Verify Connectivity for IIoT Devices over MPLS VPN Backbone
- Configure Layer 2 Redundancy
- Configure Layer 3 Redundancy