

# 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

### E-learning

- To buy a single e-learning license, visit the [Cisco Learning Network Store](#).
- For more than one license, or a learning library subscription, contact us at [learning-bdm@cisco.com](mailto:learning-bdm@cisco.com).

### Instructor-led training

- Find a class at the [Cisco Learning Locator](#).
- Arrange training at your location through [Cisco Private Group Training](#).

## Technology areas

- Internet of Things (IOT).
- IOT industrial.
- Routing and switching.

## Course details

### Objectives

- Define what IloT is and identify IloT architectures.
- Identify IloT market verticals, and their motivations and requirements.
- Explore Cisco IloT 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 IloT environments, including architectures and devices used.
- Understand the TCP/IP protocol stack and how it is used with other protocols in IloT environments.
- Discuss network protocols for clock synchronization between network devices, and describe available tools for IloT network administration.
- Discuss wireless technologies used in a core LAN, and their relevance to IloT implementations.
- Explore field WAN technologies and how they are used in IloT 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 IloT network environments.
- Discuss Multiprotocol Label Switching (MPLS) operation, components, terminology, and features, and explore its use in IloT environments.
- Explore Layer 2 and Layer 3 VPN technologies and describe the way they can be used on IloT deployments.
- Describe Dense Wave Division Multiplexing (DWDM) technology and its use in IloT 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 IloT deployments.

### Prerequisites

The knowledge and skills you are expected to have before attending this course is:

- **Implementing and Administering Cisco Solutions (CCNA)**<sup>®</sup>

## 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.
- 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 IloT.
- 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 IloT.
- Configure Dynamic Multipoint VPNs (DMVPNs).
- Configure FlexVPN.
- Verify Connectivity for IloT Devices over MPLS VPN Backbone.
- Configure Layer 2 Redundancy.
- Configure Layer 3 Redundancy.



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