

# WMNGI (MANAGING CISCO WIRELESS LAN)

## Objetivo

O curso WMNGI 1.2 habilita o profissional na utilização dos produtos de gerência Cisco Prime Infrastructure e Cisco Mobility Services Engine (MSE) na gestão de redes sem fio Cisco. Estes produtos fazem parte do portfólio de produtos Cisco Unified Wireless Network (CUWN), com a finalidade de configurar, administrar, gerenciar, prestar suporte e otimização de uma rede sem fio Cisco. Depois de concluir este curso, os alunos serão capazes de:

- Explicar como a solução de gerenciamento para redes sem fio CUWN podem ajudar a resolver os desafios no gerenciamento de rede de hoje
- Descrever como configurar o Cisco Prime Infrastructure (PI) na utilização de gerenciamento nas redes sem fio;
- Configurar os componentes através da utilização da interface gráfica e modelos (templates) que compõem os produtos;
- Configurar o acesso de usuários convidados;
- Configurar o conjunto de recursos para controle de acesso através da Integração do Cisco Prime Infrastructure e o Mobility Service Engine, para fornecer serviços de localização e monitoramento dos clientes móveis da rede;
- Configurar e disponibilizar os serviços “Bonjour” e “Application Visibility and Control” (AVC) para aplicação e suporte aos dispositivos;
- Utilizar uma metodologia para resolução de problemas recomendado pela Cisco, e as várias ferramentas disponíveis para se reunir e avaliar os dados do sistema para isolar várias falhas que podem ocorrer da rede;
- Monitorar os dispositivos de rede com fio e sem fio, tais como controladoras, APs controladas, APs independentes;
- Utilização das ferramentas gráficas e relatórios.

## Público Alvo

A audiência preliminar é composta de indivíduos que têm a tarefa de executar ou supervisionar tarefas de gerenciamento da rede sem fio utilizando os produtos Cisco Prime Infrastructure e Mobility Service Engine (MSE). Público alvo: Cliente final, Channel Partner e funcionários Cisco, compostos por projetistas e planejadores de rede, gerentes de Rede, administradores de Rede e consultores.

## Pré-Requisitos

Para aproveitar ao máximo este curso, é recomendável que os alunos possuam as seguintes habilidades e conhecimentos:

- Conhecimentos básicos em rede cabeada e sem fio;
- Conhecimentos básicos na configuração de equipamentos cisco (roteadores, switches e controladora);
- Conhecimentos básicos em gerenciamento da rede e suas terminologias;
- Conhecimento do sistema operacional Microsoft Windows.

## Carga Horária

32 horas (4 dias).

## Conteúdo Programático

Course Introduction

- The Course Introduction provides learners with the course objectives and prerequisite learner skills and knowledge

## Cisco Unified Wireless Network Management Solutions

- Explain how Cisco Unified Wireless Network management components help resolve today's network management challenges.

## Introducing Lifecycle Management

This lesson provides an overview of lifecycle management and the network management products and applications created to provide lifecycle management functionality for the Cisco Unified Wireless Network.

- List and define the five phases of lifecycle management
- List the network management products and applications created to provide lifecycle management functionality for the Cisco Unified Wireless Network
- Lifecycle Management
- Cisco Network Management Products and Applications

## Introducing Cisco Prime Network Control System

This lesson provides an overview of Cisco PIPI.

- List the network management challenges that network managers exist today
- Explain the purpose of Cisco PI
- Identify the foundation for Cisco PI and the differences that exist between the WCS, NCS and PI
- Describe the delivery models available with Cisco PI
- Describe how Cisco PI supports the lifecycle management phases
- Describe the licensing required for Cisco PI

## Introducing Cisco Mobility Services Engine

This lesson provides an overview of Cisco MSE.

- Describe Cisco MSE and its purpose
- Describe the software suite provided by the MSE
- Describe the protocol used between the MSE and wireless LAN controllers
- Describe the models available with the MSE
- Describe the licensing associated with Cisco MSE
- Mobility Services Engine
- Mobility Services Software Suite which includes Connected Mobile Experiences (CMX)
- Network Mobility Services Protocol
- MSE Models
- MSE Licensing

## Introducing Cisco Identity Services Engine

This lesson provides an overview of Cisco ISE.

- Explain the purpose of Cisco Secure Access Control Server
- Describe the communication security challenges that face network managers today
- Describe the purpose of Cisco ISE
- Describe the benefits provided by Cisco ISE
- Describe the interaction between Cisco PI and ISE
- Cisco Secure Access Control Server
- Communication Security Challenges
- Cisco Identity Services Engine
- Cisco ISE Benefits
- Cisco PI and ISE Interaction

## Network Management System Configuration

- Describe how to configure Cisco PI.

## Configuring High Availability and Firewall Rules for Cisco PI

This lesson discusses the high availability feature and how to configure it for Cisco PI.

- Describes the deployment steps that are required to get a WLAN up and running
- Configure Cisco PI for high availability
- Configure firewall rules to support Cisco PI
- Network Deployment Steps
- Configuring High Availability
- Configuring Firewall Rules

## Managing Administrative Users

This lesson describes how administrative users are added and managed in Cisco PI so that they can access the information they need.

- Define the two features that determine the amount of NCS access given to a particular user
- Configure a user group and a virtual domain
- Add a user to Cisco PI
- View a log of PI login attempts
- Defining User Access
- Configuring, Viewing, and Editing User Access
- Adding User Accounts to Cisco PI
- Viewing an Audit Trail

## Navigating Cisco PI

This lesson provides instructions on navigating Cisco PI.

- Log on to Cisco PI
- Access and explain the purpose of the various tabs located on the Home page
- Customize the Home page by creating a dashboard
- Cisco PI Server Login
- PI Home Page Tabs
- Customizing the homepage

## Using the Map Editor

This lesson describes how to manage maps in Cisco PI.

- Describe the purpose of Cisco PI Map tool
- View installed maps (including building and floor views) in Cisco PI
- List the tools and controls that enable you to modify the information on a floor view map
- Explain the importance of the heatmaps feature
- Explain the benefit of importing site survey information into the Map tool
- Add a map and objects to a map
- Use Google Earth maps to import AP information into outdoor area maps
- Export/import maps from one PI instance to another PI instance
- NCS Map tool
- Viewing Existing Maps
- Floor View Tools
- Floor Heatmaps
- Importing Site Survey Information

- Adding a Map
- Using Google Earth Maps to Import AP Information to Outdoor Areas
- Moving Maps from One PI to Another PI

## Using the Planning Tool

This lesson provides an overview of Cisco PI Planning tool and how it can be used during the planning process.

- Describe the purpose of Cisco PI Planning tool
- Use the Planning tool to calculate the number and location of APs required
- Describe the two readiness inspection tools
- PI Planning Tool
- Calculating the Number and Location of APs
- Readiness Inspection Tools

## Component Configuration through Cisco PI

- Configure components through the Configure tab and templates

## Configuring Components through Cisco PI Configure Tab

Configure components through Cisco PI Configure tab.

- List the capabilities that are available through Cisco PI Configure tab
- Use Cisco PI Configure tab to add and configure a component in the Cisco PI environment
- Run an audit to compare controller and AP configurations with the running configuration that is saved in Cisco PI
- Describe the function of audits
- Describe how to add and configure switches through the Configure tab
- Describe how to add and configure the chokepoints through the Configure tab
- Describe how to add and configure spectrum receivers through the Configure tab
- Describe how to configure Wi-Fi TDOA receivers through the Configure tab
- Describe aWIPS profiles and how to configure them
- Describe the actions required to enable an ACS View Server or external TFTP server to be used with Cisco PI.
- PI Configure Tab
- Adding and Configuring Controllers Through the Configure Tab
- Adding and Configuring APs Through the Configure Tab
- Performing an Audit
- Adding and Configuring Switches Through the Configure Tab
- Adding and Configuring Chokepoints Through the Configure Tab
- Adding and Configuring Spectrum Receivers Through the Configure Tab
- Adding and Configuring Wi-Fi TDOA Receivers Through the Configure Tab
- Configuring aWIPS Profiles Through the Configure Tab
- Configuring ACS and TFTP Servers Through the Configure Tab

## Working with Controller Templates and Switch Location Templates

This lesson describes Cisco PI Configure Templates menu and the controller configuration templates and switch location configuration templates that are available through this menu.

- Explain the purpose of templates
- Describe the purpose of the Controller Template Launch Pad
- Describe how to create and add a controller template to Cisco PI
- Describe how to apply saved templates
- Describe the switch location template
- Provide an overview of the configuration groups

- Describe how to create a configuration group
- Controller Template Launch Pad
- Creating and Adding a Template
- Applying Saved Templates
- Using Switch Location Templates
- Configuration Groups
- Creating a Configuration Group

### Lesson 3: Working with AP Configuration and Migration Templates

This lesson discusses the templates used for configuring lightweight and autonomous access points (APs) and for migrating autonomous APs to lightweight APs.

- Describe how to access AP templates
- Describe how to create and apply a lightweight AP template
- Describe how to create and apply an autonomous AP template
- Describe how to create and apply an autonomous AP migration template
- Accessing AP Templates
- Creating a Lightweight AP Template
- Creating an Autonomous AP Template
- Creating an Autonomous AP Migration Template

### Setting up Auto-Provisioning and Scheduling Configuration Tasks

This lesson explains how to use the controller auto-provisioning and scheduling features.

- Explain the purpose of the controller auto-provisioning feature
- Set up controller auto-provisioning
- Describe the Scheduled Configuration Tasks feature and how to schedule configuration tasks
- Controller Auto-Provisioning
- Setting Up Auto-Provisioning
- Scheduling Configuration Tasks

### Guest Access

- Configure the guest access feature set.

### Defining Guest Access Methods

This lesson describes how secure guest access can be implemented with the use of a captive portal for both wired and wireless clients along with the similarities and differences between the two implementations.

- Define the technical requirements for a guest access solution
- Describe the traditional methods used by enterprise customers to provide guest access capabilities
- Describe how enterprise customers provide guest access capabilities using Cisco WLCs
- Describe the use of a web browser to authenticate users to a guest network and the various customization options available with guest access and on boarding
- Technical Requirements
- Guest Access Overview
- Guest Access with Cisco Wireless LAN Controllers
- Web Authentication Process
- Sleeping Client feature
- Push QoS profile feature
- 4 modes of guest authentication

## Configuring Guest Access Features Through Cisco PI

Create a Lobby Ambassador and configure guest access user accounts through Cisco PI.

- Describe how to create a Lobby Ambassador through Cisco PI
- Describe how to customize a Lobby Ambassador view on Cisco PI
- Describe how to create single and multiple guest access accounts through Cisco PI
- Describe how to modify or delete a guest account through Cisco PI
- Describe how to apply network bandwidth policy controls for guest user accounts
- Describe how to assign user roles to guest users through Cisco PI
- Lobby Ambassador
- Customizing a Lobby Ambassador View
- Creating Guest User Accounts
- Modify or Delete a Guest Account
- Network Bandwidth Policy Controls
- User Roles for Guest Users

## Mobility Services Engine

- Integrate the Cisco PI and the MSE to provide Location Services and track mobile clients.

## Configuring and Integrating the MSE

Configure and integrate MSE with Cisco PI.

- Describe the initial configuration of the MSE
- Describe how to manage MSE setup and security options
- Describe how to integrate Cisco MSE with Cisco PI
- Describe how to synchronize Cisco MSE with Cisco PI
- Describe how to configure MSE High Availability
- Describe how to configure and view system properties on Cisco MSE
- Mobility Services Engine Initial Configuration
- Managing MSE Setup and Security Options
- Mobility Services Engine Integration
- Mobility Services Engine Synchronization
- Configuring MSE High Availability
- Configuring and Viewing System Properties

## Configuring and Tuning Location Services

This lesson describes how to fine-tune Cisco MSE and configure its advanced parameters.

- Describe how to configure tracking with Cisco PI and Cisco MSE
- Describe how to tune polling intervals and configure history parameters, including the steps within the Cisco PI
- Describe methods to configure Connected Mobile Experiences (Including CMX engage and analytics) and procedures to perform location analytics using Cisco PI.
- Describe Cisco MSE and Cisco Wireless Location Appliance hard-disk storage considerations, including the relevant Linux commands and the maximum database-size calculation
- Describe the benefits of the Cisco MSE presence parameters
- Describe the benefits of the Map and AP position import and export feature
- Configuring General Tracking Parameters
- Tuning Location Polling and History Parameters
- Managing the Appliance Disk
- Configuring Presence Parameters

- Configuring the CMX solution
- Importing and Exporting AP Position Information

## Tracking Mobile Clients

This lesson describes the differences between the 802.11 messages expected from a laptop and the message received from a radio frequency identification (RFID) tag.

This lesson also shows the criteria used to locate each type of wireless device.

- Describe the client probing mechanism and explain how variations in client probing affect location accuracy
- Describe what RF fingerprinting is and how it is used to locate devices on the wireless network
- Describe how to track WLAN clients on Cisco PI
- Describe how to track 802.11 Wi-Fi active RFID tags on Cisco PI
- Describe what TDoA receivers are and how they are used to help locate RFID tags in the wireless network
- Describe how to locate rogue APs
- Describe how to locate rogue clients
- Describe how to locate workgroup bridges
- Client Probing
- RF Fingerprinting
- Tracking WLAN Clients
- Detecting Active RFID Tags
- Detecting RFID Tags with TDoA Receivers
- Detecting Rogue APs
- Detecting Rogue Clients
- Detecting Workgroup Bridges

## Lesson 4: Supporting Location Services

This lesson explains how RF models are used and how to calibrate a custom RF model.

- Describe the general practice guidelines for proper AP placement within a Location Services deployment
- Describe the importance of proper antenna placement and orientation, including why it is best to avoid third-party antennas
- Describe various considerations to keep in mind when using Cisco PI to conduct a site calibration
- Describe how to create RF calibration models for Cisco PI
- Proper AP Deployment
- Placing and Orienting Antennas
- Calibration Considerations
- Creating RF Calibration Models

## Troubleshooting Context-Aware Services

This lesson explains how to ensure the network is ready for Location Services and analyze why an expected location accuracy is not being provided.

- Describe how to troubleshoot common issues with Cisco MSE
- Describe how to troubleshoot MSE issues that are related to tag location
- Describe the Cisco PI used to verify client location accuracy
- Describe techniques for calibration troubleshooting
- Troubleshooting General Cisco MSE Issues
- Troubleshooting Tag Location Issues
- Troubleshooting Wireless Client Location Issues
- Troubleshooting Calibration



## Configuring Adaptive Wireless IPS

This lesson provides detailed instruction on configuring the Adaptive Wireless Intrusion Preventive Service running on the Cisco MSE.

- Describe the functions of the Cisco Adaptive Wireless IPS solution
- Describe deployment considerations of the Cisco Adaptive Wireless IPS solution
- Configure Cisco PI to communicate with Cisco Adaptive Wireless IPS
- Monitor Cisco Adaptive Wireless IPS Alarms
- Cisco Adaptive Wireless IPS Functions
- Deployment Considerations
- Integrating Cisco PI with Cisco Adaptive Wireless IPS
- Monitoring Cisco Adaptive Wireless IPS Alarms

## Connected Mobile Experiences

Provide information on the Connected Mobile Experiences (CMX) solution, its benefits, the underlying technologies and use cases that utilize this technology and the implementation process.

### Overview of CMX

This lesson provides detailed information about the CMX solution and its benefits. It further explains the underlying technologies and components that drive this solution.

Upon completing this lesson, the learner will be able to meet these objectives:

- Explain what we mean by CMX solution
- Discuss the benefits of using CMX
- Identify the underlying technologies and components behind CMX
- Describe use case scenarios for CMX across various verticals such as retail, hospitality, transportation and healthcare
- Cisco Connected Mobile Experiences
- Cisco Mobile Concierge
- Hotspot 2.0
- Mobility Services Advertisement Protocol

### Implementing CMX

This lesson explains the requirements and processes to implement CMX using Cisco PI. It explains features like Location Analytics and the CMX engage solution in more depth.

- Recognize how AP placement and RF planning affect location accuracy
- Discuss the ever-growing ecosystem of Cisco partners capable of creating customized customer CMX applications.
- Identify how location analytics are launched and supported on MSE
- Describe the CMX Browser Engage solution within CMX
- Generally describe the licensing changes and options available for CMX implementation.
- Location Analytics
- CMX Engage
- CMX Licensing Options

## Configuring Mobility Services Advertisement Protocol

This lesson provides detailed instructions on configuring the Mobility Services Advertisement Protocol (MSAP)



running on the Cisco Mobility Services Engine (MSE). This lesson covers the architecture, deployment considerations, and configuration process.

- Describe the functions of the Cisco Mobility Services Advertisement Protocol
- Configure Cisco PI and MSE for MSAP
- Monitor MSAP
- Cisco Mobility Services Advertisement Protocol Functions
- Cisco Mobility Services Advertisement Protocol Configuration
- Monitoring Cisco Mobility Services Advertisement Protocol

#### Application and Device Support

• Provide information on the various features available within Cisco for application and device support. Describe features such as multicast DNS services, referred to as Bonjour services as well as the Application Visibility and Control (AVC) features.

#### Overview of Bonjour Services

This lesson provides description and benefits of Bonjour services, typical business cases for implementing it and the requirements for this service.

- Explain what we mean by Bonjour services, the process of implementing Bonjour on a network and the enterprise features offered with this service.
- Describe a customer scenario, identifying the requirements to implement a Bonjour solution.
- Identify the high-level steps for implementing Bonjour services on the WLC
- Configure Bonjour services using CPI
- Multicast DNS
- Location Specific Services (LSS)
- mDNS AP
- Priority MAC Addresses
- Origin of Service for Wired and Wireless
- Bonjour SSO
- Bonjour Browser

#### Overview of Application Visibility and Control (AVC)

This lesson provides description of the Application Visibility and Control (AVC) solution and explain the process of implementing this feature on a network. It further explains the benefits of implementing AVC and the underlying technologies associated with this feature.

- Explain what we mean by implementing AVC within a network and the benefits it provides
- Generally describe how NBAR2 is implemented on the WLC and its benefits
- Explain Netflow and what it does as part of AVC.
- Describe the interactivity between NBAR2 and Netflow as they relate to AVC.
- Generally describe the configuration process for implementing AVC.
- Describe the method for implementing netflow on the network
- NBAR and NBAR2
- NetFlow
- QoS

#### NCS Maintenance and Troubleshooting Tasks

- Provide information on the methodology and tools for performing routine maintenance functions and troubleshooting operational issues on Cisco PI.

## Performing Maintenance Operations

This lesson provides detailed instruction on maintaining the Cisco Prime Network Control Server (NCS).

- Describe how to back up the Cisco PI database
- Describe how to restore the Cisco PI database
- Describe how to upgrade the Cisco PI software
- Describe how to recover a lost PI FTP or root user password
- Describe how to use Cisco PI to schedule software downloads for controllers and APs
- Backing Up Cisco PI
- Restore Cisco PI Database
- Upgrading Cisco PI
- Recovering Cisco PI Passwords
- Scheduling Network Upgrades

## Troubleshooting PI Operational Issues

This lesson examines issues that could potentially interfere with Cisco PI. This lesson discusses how to identify these issues and how to troubleshoot them.

- Describe a methodology for troubleshooting that can be applied to errors with Cisco PI
- Describe operational issues that could affect the Cisco PI
- Describe issues relating to adding or removing controllers from Cisco PI
- Troubleshooting Basics
- Common Cisco PI Operational Issues
- Adding and Removing Controllers with PI

## Network Monitoring and Troubleshooting

• Monitor wired devices; Cisco ISE; wireless controllers; APs; rogue APs; ad hoc events; and CleanAir heatmaps, charts, and reports.

## Monitoring and Troubleshooting the Network

In this lesson, the learner will use PI to monitor and troubleshoot the network environment.

- Describe how to monitor alarms in Cisco PI
- Describe the resources available for monitoring and troubleshooting wired devices from Cisco Prime Network Control Server
- Describe how and where valuable information for monitoring and troubleshooting controllers, APs and wireless devices can be located in Cisco Prime Network Control Server
- Describe how to monitor and troubleshoot security events
- Describe the benefits of Cisco CleanAir and how to monitor CleanAir through Cisco PI
- Monitoring Alarms
- Monitoring and Troubleshooting Wired Devices
- Monitoring and Troubleshooting Wireless Devices
- Monitoring and Troubleshooting Security Events
- Monitoring CleanAir Through Cisco PI

## Managing Network Performance

In this lesson, the learner will use Cisco PI reporting functionality.

- Describe an overview of Cisco PI reports
- Provide an overview of the report creation and customization process, and detail the steps necessary to successfully utilize Cisco PI reporting features
- Describe how to view the results of saved and scheduled reports on Cisco PI
- Describe how Cisco PI reporting capabilities can be leveraged in network troubleshooting and optimization
- List and Describe the Various Report Categories
- Create, Customize, and Launch a Report
- View Report Results
- Analyze Report Data for Troubleshooting and Optimization

## Roteiro de Laboratórios

### Lab 1: Adding Users

- Logging into PI
- Viewing User Group Tasks
- Adding and Deleting Tasks to and from a User Group
- Adding a User

### Lab 2: Customizing a Home Page

- Adding a Dashboard and Dashlet
- Changing the Layout of a Dashboard
- Changing Dashlet Settings
- Deleting Dashlets and Dashboards

### Lab 3: Using the Map Editor

- Adding Building and Floor Maps
- Placing APs on a Map

### Lab 4: Using the Planning Tool

- Using the Planning Mode to Estimate the Number of Recommended APs
- Using the Readiness Tool to Evaluate VoWLAN Readiness
- Using the Readiness Tool to Determine Location Readiness

### Lab 5: Adding and Configuring Controllers and APs Using Templates

- Add a Controller and Access Point to the PI
- Configuring Multiple Controllers
- Users and Templates

### Lab 6: Configuring Guest Access via PI

- Add a Lobby Ambassador Account to the PI
- Customize the Lobby Ambassador View
- Create an Individual Guest Account
- Schedule a Guest Account to be Active at a Future Date or Time

### Lab 7: Configuring Location Services

- Add an MSE to the PI
- Synchronize the MSE and the PI
- Configure Tracking Parameters
- Examining Advanced Location Parameters

### Lab 8: Using Location Services

- Configure Presence Information for a Floor
- Enable and Configure NMSP on a Switch
- Locate a Wireless Client

- TaskLocate a Rogue AP

#### Lab 9: Implementing Adaptive Wireless IPS

- Prepare the Network and Protect an External SSID on the network
- Create a WIPS profile
- Blacklist an unauthorized user

#### Lab 10: Troubleshooting PI Operational Issues

- Isolate an PI Failure
- Correct the Network Failure

#### Lab 11: Monitoring /Troubleshooting Wired devices, Controllers, APs, and Rogue APs

- Monitor Wired Devices
- Monitor Wireless Devices

#### Lab 12: Reports

- Create a Custom Report
- Using Cisco Prime PI to Create Trend Reports