



CCIE Professional Development

Integrated Security Technologies and Solutions

Volume II

Cisco Security Solutions for Network Access Control,
Segmentation, Context Sharing, Secure Connectivity
and Virtualization

Aaron Woland, CCIE® No. 20113

Vivek Santuka, CCIE® No. 17621

Jamie Sanbower, CCIE® No. 13637

Chad Mitchell, CCIE® No. 44090

Integrated Security Technologies and Solutions - Volume II

Cisco Security Solutions for Network Access Control, Segmentation, Context Sharing, Secure Connectivity, and Virtualization

Aaron Woland, CCIE® No. 20113

Vivek Santuka, CCIE® No. 17621

Jamie Sanbower, CCIE® No. 13637

Chad Mitchell, CCIE® No. 44090

Cisco Press

Integrated Security Technologies and Solutions - Volume II: Cisco Security Solutions for Network Access Control, Segmentation, Context Sharing, Secure Connectivity and Virtualization

Table of Contents

Cover

Title Page

Copyright Page

About the Authors

About the Technical Reviewer

Dedications

Acknowledgments

Contents at a Glance

Contents

Introduction

Part I: Knock, Knock! Whos There?

Chapter 1 Who and What: AAA Basics

Fundamentals of AAA

Understanding the Concept of Triple-A in the Real World

Compare and Select AAA Options

Device Administration

Network Access

TACACS+

Table of Contents

TACACS+ Authentication Messages

TACACS+ Authorization and Accounting Messages

RADIUS

AV Pairs

Change of Authorization (CoA)

Comparing RADIUS and TACACS+

Summary

Chapter 2 Basic Network Access Control

What Is Cisco ISE?

ISE Architecture for Network Access AAA

Personas

Network Access AAA Architecture and ISE Personas

Configuring ISE for Single/Standalone and Multinode Deployments

Standalone

Dual Node

Distributed Deployment

ISE Configuration for Network Access

Identity Sources

Identity Source Sequences

Network Resources

802.1X and Beyond

EAP Types

Not Everything Has a (Configured) Supplicant

Configuring Wired Network Access with ISE

Configuring Cisco Catalyst Switches

Global Configuration for All Catalyst Switches

Interface Configuration for Classic and Newer IOS Switches

Common Classification Policy Language Switches

Configuring ISE for Basic Wired Network Access Control

Configuring Wireless Network Access with ISE

Introduction to AireOS and Its Versions

Authentication Configuration on WLCs

Table of Contents

- Configure the AAA Servers
- Configure the Airespace ACLs
- Create the Dynamic Interfaces for the Client VLANs
- Create the Wireless LANs
- Configuring ISE for Wireless Network Access Control

Verifying Dot1X and MAB

- Endpoint Supplicant Verification
- Network Access Device Verification
- Cisco ISE Verification

Summary

Chapter 3 Beyond Basic Network Access Control

Profiling with ISE

- ISE Profiler Work Center
- Profiling Policies
- Profiling Feed Service
- Endpoint Profile Policies
- Context Visibility
- Logical Profiles

ISE Profiler and CoA

- Global CoA
- Global Profiler Settings

Profiles in Authorization Policies

- Endpoint Identity Groups

Passive Identities and EasyConnect

- Passive Authentication
- EasyConnect

Summary

Chapter 4 Extending Network Access with ISE

Get Ready, Get Set, Prerequisites

- URL Redirection
- AAA Configuration

BYOD Onboarding with ISE

Table of Contents

- Building Blocks of a BYOD Solution
- Single SSID and Dual SSID Provisioning
- Configuring ISE for BYOD Onboarding
- Network Device Configuration for BYOD Onboarding
- BYOD Onboarding Verification and End-User Experience

MDM Onboarding and Enforcement with ISE

Posture Assessment and Remediation with ISE

- Preparing to Configure Posture
- Configuring AnyConnect Provisioning
- Configuring Posture Policy
- Configure Policy Set for Posture

Guest Access with ISE

- Preparing to Configure Guest Access
- Sponsor Groups and Portal
- Hotspot Portal
- Sponsored and Self-Registered Guest Portals
- Configuring Policy Sets for Guest Access

TrustSec with ISE

- Introducing TrustSec
- Classification
- Propagation
- Enforcement

Summary

Chapter 5 Device Administration Control with ISE

The Case for Centralized AAA

RADIUS Versus TACACS+ for Device Administration

Using TACACS+ for Device Administration

- Configuring ISE for TACACS+
- TACACS+ with Cisco IOS Routers, Switches, and ISE
- TACACS+ with Cisco ASA and ISE
- TACACS+ with Cisco WLC and ISE

Using RADIUS for Device Administration

Table of Contents

RADIUS-Based Device Administration on Cisco FMC

RADIUS-Based Device Administration on Cisco WSA/ESA

Summary

Part II: Spread the Love!

Chapter 6 Sharing the Context

The Many Integration Types of the Ecosystem

MDM Integration

Rapid Threat Containment

Ciscos platform eXchange Grid (pxGrid)

pxGrid in Depth

pxGrid in Action

Context-In

Configuring ISE for pxGrid

Configuring pxGrid Participants

Summary

Chapter 7 APIs in Cisco Security

APIs 101

RESTful APIs

Working with APIs

Cisco DevNet

Firepower Management Center APIs

FMC REST API for Configuration

Firepower System Remediation API

FMC Host Input API

FMC Database Access API

FMC eStreamer API

Identity Services Engine APIs

ISE Monitoring REST API

ISE External RESTful Services API

Advanced Malware Protection APIs

Threat Grid APIs

Table of Contents

Umbrella APIs

Summary

References

Part III: c2889775343d1ed91b

Chapter 8 Security Connectivity

Hashing, Ciphers, Cryptography, and PKI

Hashing

Cipher Types

Encryption Schemes

The Keys to the Kingdom

Authentication Mechanisms

Security Protocols

The Bits and Pieces

Virtual Private Networks

IPsec

DMVPN

FlexVPN

GETVPN

SSL Remote Access VPN

Layer 2 Encryption: IEEE 802.1AE/MACsec

Summary

References

Chapter 9 Infrastructure VPN

IPsec with IKEv1

IPsec with IKEv2

EzVPN

DMVPN

DMVPN Phase 1

DMVPN Phase 2

DMVPN Phase 3

Dual-Hub DMVPN

Table of Contents

FlexVPN

GETVPN

Summary

References

Chapter 10 Remote Access VPN

Remote Access VPN Overview

Clientless versus Client-Based VPNs

Cisco AnyConnect Secure Mobility Client

AnyConnect Profile Editor

Deploying AnyConnect

Client-Based Remote Access VPN

RAVPN with ASA

Group Policies

Dynamic Access Policies

Posture Assessment

RAVPN with Firepower Threat Defense

RAVPN with Routers

IPsec Remote Access VPN on IOS Using IKEv2 with FlexVPN Example

Clientless Remote Access VPN

Summary

References

Part IV: The Red Pill

Chapter 11 Security Virtualization and Automation

Cisco Virtual Solutions and Server Virtualization

Virtualization and Automation Solutions

Cisco Virtual Security Gateway

Service Function Chaining with Network Service Header

Network Function Virtualization

Application Centric Infrastructure and Micro-Segmentation

Summary

References

Table of Contents

Index