

Implementing Cisco Catalyst 6500 Series Switches

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Zielgruppe

- Systems- und Fieldengineers
- Consulting System Engineers
- Technical Solution Architects
- Cisco Integratoren
- Cisco Partner, welche mit der Installation und der Implementierung von Cisco Catalyst 6500 Series Switches betraut werden

Voraussetzungen

Für die Kursteilnahme werden Cisco Certified Network Associate (CCNA) Kenntnisse empfohlen.

Kursziele

Der Kurs wurde entwickelt für Systems- and Fieldengineers, Consulting Systems Engineers, Technical Solutions Architects und Cisco Integratoren sowie Cisco Partner, welche mit der Installation und der Implementation der Cisco Catalyst 6500 Series Switches betraut sind. Der Kurs enthält praxismgerechte Labore und behandelt die Kernkomponenten und Prozeduren, die benötigt werden, um Catalyst 6500 Series Switches in einer Netzwerk-Umgebung zu installieren, zu konfigurieren und Fehlersuche zu betreiben unter Einsatz der neuesten Hardware (Supervisor Engine 2T). Nach Besuch dieses Kurses erreicht ein Teilnehmer die folgenden Ziele:

- Kenntnisse der Cisco Catalyst 6500 Series Switch Produkt Familie, speziell die Chassis und alle weiteren Komponenten.
- Gemäß einer Anforderung die Möglichkeit des Einsatzes eines Virtual Switch Systems zu evaluieren, zu planen und dessen Einrichtung.
- Bewertung der verfügbaren Security Möglichkeiten des Cisco Catalyst 6500 Series Switch, um aufgrund einer

- Anforderung die geeignetsten zu verwenden
- Bewertung von Hochverfügbarkeit auf Service- und Netzwerkelevel der Cisco Catalyst 6500 Series Switches sowie der Möglichkeit, ein IOS Software Upgrade im laufenden Betrieb zu vollziehen.
- Verständnis der Prozesse, Werkzeuge und Ressourcen für die Fehlersuche:
 - innerhalb der Netzwerk Infrastruktur
 - den Netzwerkverbindungen
 - im laufendem Produktionsbetrieb

Kursinhalt

- Cisco Catalyst 6500 Series Switch Architektur
 - Bewertung der Cisco Catalyst 6500 Series Switches
 - Funktionalitäten der Cisco Catalyst 6500 Series Switch Supervisor Engines
 - Auswahl von Cisco Catalyst 6500 Series Switch Line Cards
 - Ablauf der Paket Weiterleitung in einem Cisco Catalyst 6500 Series Switch
 - Aufzeigen des Paketflusses zwischen unterschiedlichen Line Cards
- Kern Technologien auf den Cisco Catalyst 6500 Series Switches
 - Anwendung des Virtual Switching System 1440/4T in einem Netzwerk
 - Multicast Einsatz auf den Cisco Catalyst 6500 Series Switches
 - Identity und Authentication Charakteristik
 - Einführung in die Netzwerk Virtualisierung
 - Darlegung einer Data Center Verbindung mittels Cisco Catalyst 6500 Series Switches
 - Planung und Implementierung von Hochverfügbarkeit mit Cisco Catalyst 6500 Series Switches
- Cisco Catalyst 6500 Überwachung und

Operation

- Password Recovery
- Konfiguration von SPAN, RSPAN und ERSPAN
- Konfiguration von NetFlow
- Erweitertes Management
- Komplexe Embedded Even Manager (EEM) Applets und TCL-Skripte
- Einsatz von Control Plane Policing
- Implementierung von ACL
- Priorisierung von Verkehr durch den Catalyst 6500 mittels QoS

Detallierter Kursinhalt

Module 1: Cisco Catalyst 6500 Series Switches Architecture

The participant will understand the Catalyst 6500 Series Switches hardware and architecture of chassis and line cards, especially the new Supervisor engine 2T and the line cards for this new supervisor engine as well as the forwarding of packets through a Catalyst 6500.

Lesson 1: Assessing the Cisco Catalyst 6500 Series Switches

This lesson defines how to describe the capabilities and performance considerations of the Catalyst 6500 Series switch chassis, power supplies and fan trays. Upon completing this lesson, the learner will be able to meet these objectives:

- Identify the characteristics of the Cisco Catalyst 6500 Series Switches, the system architecture, and features
- Describe the fan trays available for the Cisco Catalyst 6500 Series Switches and the different chassis types
- Describe the power supplies available for the Cisco Catalyst 6500 Series Switches and the different chassis types

The lesson includes these topics:

- Catalyst 6500 Chassis
- Fan Trays
- Power Supplies

Lesson 2: Listing Cisco Catalyst 6500 Series Switch Supervisor Engines

This lesson defines how to describe the capabilities and performance considerations of the Catalyst 6500 Series switch supervisor modules including Sup32, Sup720, Sup720-10G and Sup2T. Upon completing this lesson, the learner will be able to meet these objectives:

- Describe the Cisco Catalyst 6500 Series Switch supervisor module architecture
- Describe the Cisco Catalyst 6500 Series Supervisor Engine 32 modules
- Describe the Cisco Catalyst 6500 Series Supervisor Engine 720 and 720 10GE with PFC3A/B/BXL/C/CXL modules
- Describe the Cisco Catalyst 6500 Series Supervisor Engine 2T with PFC4/4XL modules
- Explain the functions of MSFC and PFC
- Describe the switch fabrics and shared bus

The lesson includes these topics:

- Supervisor Architecture
- Supervisor Engine 32
- Supervisor Engine 720
- Supervisor Engine 720 10GE
- Supervisor Engine 2T
- MSFC and PFC
- Crossbar Fabric and Shared Bus

Lesson 3: Choosing Cisco Catalyst 6500 Series Switch Line Cards

This lesson defines how to choose the right line cards for the Catalyst 6500 based on capabilities and performance including 10GBase-T Line Card. Upon completing this lesson, the learner will be able to meet these objectives:

- Describe the functionality of the CFC and DFCs for the Cisco Catalyst 6500 Series Switches
- List the types of LAN line cards that are offered for the Cisco Catalyst 6500 Series Switch and describe the architectures of the Catalyst 6500 Series Switch line cards
- Explain the available WAN line cards for the Catalyst 6500

- Describe the Service Modules used in a Cisco Catalyst 6500 Series Switch
- Describe the Service Modules used in a Cisco Catalyst 6500 Series Switch

The lesson includes these topics:

- CFC and DFCs
- Line Cards from classical to dCEF2T
- WAN Module
- Service Modules
- POE

Lesson 4: Characterizing Packet Forwarding in a Cisco Catalyst 6500 Series Switch

This lesson defines how to characterize the packet forwarding mechanisms for Layer 2 and Layer 3 operations including load balancing of the Catalyst 6500 Switch. Upon completing this lesson, the learner will be able to meet these objectives:

- Examine the architecture of Cisco Catalyst 6500 Series Switches
- Describe Layer 2 and Layer 3 Unicast forwarding
- Explain Equal Cost Multi Path and Ether Channel Load Balancing

The lesson includes these topics:

- Switch Architecture
- Unicast Forwarding
- Load Balancing

Lesson 5: Describing Unicast Packet Walks Between Different Line Cards

This lesson defines how to follow a unicast frame or datagram through a Catalyst 6500 switch and understand the participating entities within the switch. Upon completing this lesson, the learner will be able to meet these objectives:

- Explain Switching Modes in a Cisco Catalyst 6500 Series Switch
- Examine the packet walk between different interfaces within Catalyst 6500 Switch

The lesson includes these topics:

- Switch Modes
- Packet Walkthrough

Lab

The lesson includes this lab:

- Deploy and examine the VSS 1440/4T operation

Module 2: Core Technologies on the Cisco Catalyst 6500 Series Switches

Understand the Catalyst 6500 Series Switches core technologies that are specific to these switches, especially the Virtual Switching System 1440/4T and High Availability within the Switches as well as more general technologies like Multicasting, Cisco TrustSec, Network Virtualization and Data Center Interconnect and how these features are implemented within the Catalyst 6500 Series switches. Lesson 1: Applying the Virtual Switching System 1440/4T to a Network This lesson defines how to implement the VSS 1440/4T system virtualization technology, capabilities, performance, design considerations and troubleshooting methodology. Upon completing this lesson, the learner will be able to meet these objectives:

- Identify the VSS 1440/4T benefits
- Describe the VSS 1440/4T architecture and concepts
- Describe the VSS 1440/4T architecture and concepts
- Describe the VSS 1440/4T operation and protocols used to maintain the state
- Describe the VSS 1440/4T operation and protocols regarding redundancy
- Describe VSS 1440/4T service module integration
- Identify the VSS 1440/4T deployment considerations and best practices

The lesson includes these topics:

- Introduction to VSS 1440/4T
- VSS 1440/4T Architecture
- VSS 1440/4T Hard- and Software Requirements
- VSS 1440/4T Migration

- VSS 1440/4T Redundancy
- VSS 1440/4T Service Module Integration
- VSS 1440/4T Deployment

Lesson 2: Analyzing Multicast on the Cisco Catalyst 6500 Series Switches

This lesson defines how to describe the capabilities of the Catalyst 6500 Series Switches regarding Multicast operations. Upon completing this lesson, the learner will be able to meet these objectives:

- Have an overview about Multicasting Components
- Describe the capabilities of the Catalyst 6500 Series Switches regarding Multicast operations
- Follow an IPv4 Multicast packet on the Policy Feature Card (PFC)
- Layer 2 Multicast configuration

The lesson includes these topics:

- Multicasting Overview
- Multicasting Replication Modes
- Multicasting Packet Forwarding
- Multicasting Configuration

Lesson 3: Characterizing Identity and Authentication

This lesson defines how to characterize Cisco TrustSec – Identity based access control including IEEE 802.3X, IEEE 802.3ae and Role-Based Access Control (RBAC). Upon completing this lesson, the learner will be able to meet these objectives:

- Understand the concepts of IEEE 802.1X
- Characterize identity-based network services
- Describe the Cisco TrustSec Architecture
- Examine the Migration to Cisco TrustSec

The lesson includes these topics:

- Identity Based Network Services
- Identity Based Network Services – Deployment Considerations and Deployment Phase

- Cisco TrustSec
- Migrating to Cisco TrustSec

Lesson 4: Introducing Network Virtualization

This lesson defines how to introduce Network Virtualization mechanisms that are implemented in the Catalyst 6500 Series switches including VRF, VRF-lite, MPLS Transport, MPLS VPNs and QOS in an MPLS environment. Upon completing this lesson, the learner will be able to meet these objectives:

- Explain VRF and VRF Lite
- Introduction to MPLS and MPLS VPNs
- MPLS and IPv6

The lesson includes these topics:

- Explain VRF and VRF Lite
- Describe MPLS Transport and MPLS VPNs
- Explain MPLS and IPv6

Lesson 5: Describing Data Center Interconnect Using Cisco Catalyst 6500 Series Switches

This lesson defines how to describe Data Center Interconnect (DCI) methods available on the Catalyst 6500 Switch Series to extend the Data Center including Dark Fiber Solutions, IP Solutions, VPLS and A-VPLS. Upon completing this lesson, the learner will be able to meet these objectives:

- Describe Data Center Interconnect
- Explain DCI with Dark Fiber
- Describe DCI using MPLS
- Describe DCI using IP
- Explain Redundancy in DCI with MPLS or IP
- Understand Innovations in VPLS

The lesson includes these topics:

- DCI Overview
- DCI with Dark Fiber
- DCI MPLS Solution
- DCI IP Solutions
- DCI Redundancy
- DCI – Innovations in VPLS

Lesson 6: Planning and Implementing High

Availability on Cisco Catalyst 6500 Series Switches

This lesson defines how to planning and Implementing High Availability. Upon completing this lesson, the learner will be able to meet these objectives:

- Available supervisor redundancy options for the Cisco Catalyst 6500 Series switches
- How SSO affects the network availability
- Explain Enhanced Fast Software Upgrade (EFSU)
- High Availability Options with a VSS
- Quad Active Supervisor Engine within a VSS
- Software upgrade on a VSS using EFSU

The lesson includes these topics:

- Redundant Supervisor Technologies
- Stateful Switchover
- Non Stop Forwarding
- EFSU
- VSS High Availability
- VSS Quad Supervisor Uplink Forwarding
- VSS Software Upgrade

Module 3: Cisco Catalyst 6500 Monitoring and Operations

This module emphasizes on the management functionalities special to the Catalyst 6500 Series Switches as well as its special hardware implementation of security and quality of service. It finishes with a Lesson that gives the students a review of all the special functions on a Catalyst 6500 Series Switch and its new features. Lesson 1: Configuring SPAN, RSPAN and ERSPAN This lesson defines how to configure Switch Port Analyzer (SPAN), remote SPAN and ERSPAN sessions; explain when to use them on the Catalyst 6500 Series Switches. Upon completing this lesson, the learner will be able to meet these objectives:

- Describe how to use SPAN sessions within the network
- Describe how to use SPAN sessions
- Describe how to use RSPAN sessions within the network

- Describe how to configure an RSPAN session
- Describe how to use ERSPAN sessions within the network
- Describe how to configure ERSPAN sessions

The lesson includes these topics:

- SPAN Overview
- SPAN Configuration
- RSPAN Overview
- RSPAN Configuration
- ESPAN Overview
- ERSPAN Configuration

Lesson 2: Configuring NetFlow

This lesson defines how to how to configure the capabilities of the Catalyst 6500 Switch regarding the Netflow feature including Netflow Data Collection, Netflow Data Export and Flexible Netflow. Upon completing this lesson, the learner will be able to meet these objectives:

- Describe the use of NetFlow and NDE on the Cisco Catalyst 6500 Series Switch
- Understand the Differences between PFC3 and PFC4
- Explain the process of configuring NetFlow and NDE

The lesson includes these topics:

- Netflow and NDE Overview
- Netflow on the PFC4
- Configuring Netflow and NDE

Lab The lesson includes this lab:

- NetFlow Configuration

Lesson 3: Introducing Enhanced Manageability

This lesson defines how to introduce the Embedded Event Manager (EEM), Generic Online Diagnostics (GOLD) and Smart Call Home (SCH) features. Upon completing this lesson, the learner will be able to meet these objectives:

- Describe the EEM functionality and usage
- Configure EEM policies and applets
- Explain automated diagnostics using GOLD and EEM
- Identify the enhanced troubleshooting and debug information available on the Catalyst 6500 Series Switch

The lesson includes these topics:

- EEM Overview
- Configuring EEM
- Automated Diagnostics Overview
- Using Diagnostics for Troubleshooting

Lab

The lesson includes this lab:

Configure EEM, GOLD and SCH

Lesson 4: Deploying Control Plane Policing

This lesson defines how to deploy the Control Plane Policing (CoPP) and Hardware Rate Limiter (HWRL) features on the Catalyst 6500 Switch Series. Upon completing this lesson, the learner will be able to meet these objectives:

- Describe the reasons for CoPP
- Explain Hardware Rate Limiters
- Figure out the reasons for control plane monitoring
- Configure CoPP
- Improvements for CoPP on the Supervisor Engine 2T

The lesson includes these topics:

- Control Plane Policing Overview
- Hardware Rate Limiters
- Control Plane Monitoring
- Configure CoPP
- Sup2T CoPP

Lab

The lesson includes this lab:

- CoPP Configuration

Lesson 5: Implementing ACL Features

This lesson defines how to implement Access Control List (ACL) capabilities including Router ACLs (RACLs), Port ACLs (PACLs), VLAN ACLs (VACLs) and Supervisor 2T ACL Enhancements. Upon completing this lesson, the learner will be able to meet these objectives:

- Explain the general structure and use of ACLs
- Know the different types of ACLs in a Cisco Catalyst 6500 Series Switches
- Enhancements on a Sup2T, the PFC4 and the DFC4 regarding ACLs

The lesson includes these topics:

- Access Control List Overview
- VLAN ACLs
- Enhancements of Sup2T and PFC4 regarding ACLs

Lab

The lesson includes this lab:

Access Control List Configuration

Lesson 6: Prioritizing Traffic through the Catalyst 6500 using QoS This lesson defines how to describe how packets are prioritized in the Catalyst 6500 Series switch hardware using quality of service (QoS) features; explain how QoS functions are performed on packets in hardware and software. Upon completing this lesson, the learner will be able to meet these objectives:

- Describe QoS
- Explain QoS features on the Cisco Catalyst 6500 Series Switches
- Emphasize QoS on a Catalyst 6500 ingress interface
- Describe Policing on the Catalyst 6500 Policy Feature Card
- Emphasize QoS on a Catalyst 6500 egress interface
- Describe Policing on a Catalyst 6500 egress interface

- Explain Port vs. VLAN based QoS
- Describe QoS new functions on the PFC4
- Explain how MQC works
- Describe the QoS on the Cisco Catalyst 6500 VSS 1440/4T

The lesson includes these topics:

- QoS Overview
- Catalyst 6500 QoS Overview
- Ingress QoS Processing
- QoS Policing
- Egress QoS Queuing
- Egress QoS Policing
- Port vs. VLAN-Based QoS
- QoS on the PFC4
- Modular QoS CLI
- VSS 1440/4T and QoS