Common Configurations for Layer 3 Core Switches



Overview

All Ethernet ports are switched interfaces by default. You can change this default behavior with the CLI setup script or through the system default switchport command.

Key Takeaways

A Layer 3 core switch is configured with routed interfaces, VLAN interfaces, IP addressing, static or dynamic routing, and uplinks to access switches and routers to enable inter-VLAN and external network communication.

Core Interface Configuration

A Layer 3 switch combines high-speed Layer 2 switching with Layer 3 routing capabilities. Physical ports can be configured as routed interfaces to forward IP traffic, or as Layer 2 ports for VLAN switching. Routed interfaces do not participate in Layer 2 protocols like STP and can be assigned IP addresses and routing protocol parameters.

Subinterfaces can be created on a parent routed interface to provide unique IP addresses for multiple VLANs, enabling inter-VLAN routing.

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N and Inter-VLAN RoutingEach VLAN is associated with a VLAN interface (SVI) on the switch, which acts as the default gateway for devices in that VLAN. For example, VLAN 10 may have an interface Vlan10 with IP 192.168.10.1/24. Inter-VLAN routing is enabled by assigning IP addresses to these VLAN interfaces and ensuring the switch has routing enabled.

Access ports on the switch are assigned to VLANs, while uplink ports to other switches or routers are typically configured as trunk ports to carry multiple VLANs.

Routing Configuration

Layer 3 switches support both static and dynamic routing. A default route is often configured to point to an upstream router for Internet access, e.g., ip route 0.0.0.0 0.0.0.0 192.168.100.1. Dynamic routing protocols such as OSPF or EIGRP can be enabled on routed interfaces or VLAN interfaces to propagate routes across the network.

This allows the core switch to efficiently route traffic between VLANs and to external networks.

DHCP and Gateway Services

The core switch can act as a DHCP server for VLANs, assigning IP addresses to clients using the VLAN interface as the pool source.

DN

S servers can also be configured for client resolution. The switch serves as the gateway for all VLANs, ensuring that traffic between subnets and to external networks is properly routed.

Uplink and Redundancy

Uplink ports to distribution or access switches are configured as trunks to carry multiple VLANs. Redundant uplinks can be aggregated using port channels for higher bandwidth and failover. The core switch may also connect to firewalls or routers, which require static routes back to the VLAN subnets to ensure proper traffic flow.

Best Practices

Enable I

P routing globally on the switch. Assign unique IP subnets to each VLAN interface. Use trunk ports for uplinks to carry multiple VLANs.

Configure routing protocols for scalability and redundancy. Implement port channels for high availability and load balancing. Keep management interfaces separate from data VLANs for security.

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By following these steps, a Layer 3 core switch can efficiently handle inter-VLAN routing, provide gateway services, and integrate seamlessly with upstream routers and firewalls, forming the backbone of a scalable enterprise network.

Article Content

Configuring Layer 3 Interfaces

All Ethernet ports are switched interfaces by default. You can change this default behavior with the CLI setup script or through the system default switchport command. You can assign an IP address to the

What Is a Layer 3 Switch? Features, Benefits, and Use Cases

Learn what a Layer 3 switch is, how it works, and why it''s a common solution for enterprise networks needing speed, scalability, and efficient routing.

Chapter: Configuring Layer 3 Interfaces

The Catalyst 4500 series switch supports Layer 3 interfaces with the Cisco IOS IP and IP routing protocols. Layer 3, the network layer, is primarily responsible for the routing of data in packets

Mastering the Core: A Practical Guide to Layer 3 Switch ...

In this post, we''ll explore how to configure a Layer 3 switch to handle Inter-VLAN routing, turning your flat network into a high-performance routed architecture.

Layer 3 Switches Explained: Architecture, Routing Logic, Use Cases,

In enterprise networks, Layer 3 switches are commonly deployed at the core layer or aggregation layer. They connect different departments, service networks, server areas, wireless

Layer 3 Switches in Cisco

In simple words, a Layer 3 Switch is a networking device that can perform switching (functions of layer 2) as well as routing (functions of Layer 3).

Layer 3 Switch Example

This article outlines a basic example of how layer 3 routing functionality on MS series switches could be implemented. Before proceeding, please refer to the Layer 3 Switch Overview for general information

Example for Configuring a Layer 3 Switch to Work with a Router for ...

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Layer 3 switches can work at Layer 2 and Layer 3 and be deployed at the access layer or aggregation layer as user gateways. This example uses router configurations of AR3600

Example for Configuring a Layer 3 Switch to Work with a Router for ...

Switch configurations used in this example apply to all versions of S12700 and S12700E switches. This example uses router configurations of AR3600 V200R007C00SPCc00. For other

What Is a Core Switch? Network Backbone Architecture Guide

What makes a core switch a “Layer 3” switch? Core switches are considered Layer 3 switches because they utilize Application Specific Integrated Circuits (ASICs) to perform hardware

Cisco Switch Selector

Cisco Meraki MS225 series switches provide layer 2 access switching and are ideal for deploying to branch locations. With stacking capabilities and 10G SFP+ uplinks on every model, performance is

Cisco Layer 3 Switch InterVLAN Routing Configuration

A simple approach in understanding how to configure Cisco Layer 3 switch interVLAN routing to enable routing capabilities among them.

MS Layer 3 Switching and Routing

Layer 3 routing capabilities are available on most Cisco Meraki switches. This allows the switches to route traffic between VLANs in a campus network without the need for an additional layer

Understanding Layer 3 Switches: Routing and Ethernet Insights

Discover the role of layer 3 switches in routing and Ethernet networks. Learn how they differ from layer 2 switches and find out if they fit your network needs.

Understanding Layer 3 Switches: Key Differences and Uses in

Explore the key differences between layer 2 and layer 3 switches, and discover their ideal use cases to optimize your networking strategy. Learn more now!

Layer 2 or 3? Choose the right switch for optimal

Learn how to choose the right network switches for your enterprise. Explore Layer 2 and Layer 3 capabilities to optimize segmentation and enhance

How To Use A Layer 3 Switch In A Small Network

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This is where a Layer 3 switch comes in handy. A Layer 3 switch can perform IP routing tasks as well as Layer 2 tasks such as VLANs. Moreover, a Layer 3 switch can typically route faster than a router,

Introduction to Core Switch Configuration

A switch that functions as part of a router and operates at the third layer of the OSI network standard model, the network layer. The most important purpose of the layer 3 switch is to speed up the data

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