

Static IP Binding for Core Switches



Overview

Creates a static binding that associates an IP address in the current pool with a specific MAC address.

Key Takeaways

Static IP binding ensures that specific devices or ports on a core switch consistently receive the same IP address, either via MAC address or port-based DHCP mapping. MAC-Based Static IP Binding

For most core switches, static IP binding is commonly done using the device's MAC address. This method ensures that whenever a device connects to the network, the DHCP server assigns it the same IP address:

- Cisco IOS: You can configure a DHCP pool and assign a static IP to a host using its MAC address (client identifier). Enable DHCP debugging to capture the client identifier if needed, then create a static binding in the DHCP pool. For example, on a Cisco router or switch acting as a DHCP server, you can define a pool and bind the IP to the client identifier:

```
ip dhcp pool STATIC-DEVICE host 192.168.1.100 255.255.255.0 client-identifier 0063.6973.636f.2d63.3230.382e.3135.6430.2e30.3030.302d.4661.302f.30
```

After configuration, renew the DHCP lease on the client to receive the assigned IP .

- Juniper (Junos OS): You can statically configure MAC-IP bindings on logical interfaces or VLANs. The PE device probes the MAC-IP entry and propagates it via EVPN Type 2 MAC advertisement routes, ensuring consistent IP assignment across the network .

Port-Based Static IP Assignment

In some specialized setups, such as pre-configured embedded devices, you may want the IP to correspond to a specific switch port rather than the MAC address:

- Each port can be assigned a unique VLAN and a DHCP scope with a single IP. When a device is plugged into that port, it receives the pre-defined IP regardless of its MAC address .

- This approach is useful for user-replaceable devices where firmware expects a specific IP per port, allowing plug-and-play operation without manual configuration.

Considerations for Core Switches

- Layer 2 vs Layer 3: Port-based static IP assignment typically requires a Layer 3 switch capable of DHCP relay or DHCP server functionality. Layer 2 switches can support MAC-based static bindings but cannot assign IPs per port without VLAN segmentation.

- DHCP Server Integration: Ensure the DHCP server supports static mappings and that the IP pool does not conflict with dynamic assignments.

- Network Management: Use static bindings to simplify troubleshooting, improve predictability, and maintain consistent communication between devices with pre-defined IPs.

Best Practices

- Document all static bindings to avoid IP conflicts.
- Use DHCP reservations for MAC-based bindings to centralize management.
- Segment ports with VLANs if implementing port-based IP assignment.
- Test configuration with a single device before deploying across all ports. By combining MAC-based static bindings and port-based DHCP scopes, core switches can reliably assign IP addresses to critical devices while supporting plug-and-play replacement in pre-configured systems .

Article Content

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Security

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The ip host entries on the core are useful for hostname-to-IP mappings within the switch itself but do not help clients

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