

RIVO MULTITRADE OPTICAL SYSTEMS

Core Switch Two-to-One Virtualization Technology



Overview

VSS technology allows for the grouping of two Cisco Catalyst 6500 switches into a single virtual switch.

Key Takeaways

Two-to-one switch virtualization allows two physical core switches to operate as a single logical switch, simplifying management, enhancing redundancy, and improving network resiliency.

Two-to-one virtualization technology enables two independent physical switches to function as a single logical switch, sharing the same configuration, management IP, and forwarding state. This approach is widely used in core and distribution layers to provide high availability, seamless failover, and simplified network topology. By virtualizing two switches, the network treats them as a single device, reducing the complexity of spanning-tree domains and enabling loop-free topologies.

Key Technologies Cisco StackWise Virtual (SV)

- **Functionality:** Connects two Cisco Catalyst 9000 switches using a StackWise Virtual Link (SVL) over 10G, 40G, or 100G interfaces, forming a single logical switch.
- **Control Plane:** One switch acts as the Active unit, the other as Standby, but both forward traffic simultaneously.
- **Redundancy Features:** Includes Stateful Switch Over (SSO), Non-Stop Forwarding (NSF), and Dual Active Detection (DAD) to prevent split-brain scenarios.

- Multi-Chassis EtherChannel (MEC): Allows uplinks to distribution switches to be combined into a single EtherChannel, eliminating blocked links in spanning-tree and increasing bandwidth .
- Deployment Example: Two Catalyst 9500 core switches connected via 40G SVL links appear as a single core switch to the distribution layer, ensuring high availability and operational simplicity .

Aruba VSX (Virtual Switching Extension)

- Functionality: Two ArubaOS-CX switches operate as a distributed, redundant architecture, each maintaining independent control while synchronizing state via a unique database .
 - High Availability: Designed for always-on access, VSX supports upgrades without downtime and provides redundancy similar to Multi-Chassis Link Aggregation (MC-LAG) and Virtual Switching Framework (VSF).
 - Topology Simplification: VSX allows two chassis to appear as a single logical switch, enabling cross-chassis link aggregation and reducing spanning-tree complexity .
- #### Benefits
- High Availability: Continuous operation even if one switch fails, with seamless failover.
 - Simplified Management: Single management IP and unified configuration for both switches.
 - Enhanced Bandwidth: Multi-chassis EtherChannel allows aggregation of multiple links across switches.
 - Topology Optimization: Reduces blocked links in spanning-tree, creating loop-free and efficient network designs.

- Scalability: Extends stacking beyond physical chassis, supporting cross-rack or cross-floor deployments .

Practical Considerations

- Link Requirements: SVL or VSX interconnects typically require high-speed links (10G, 40G, or 100G) for synchronization and traffic forwarding.
- Redundancy Planning: Ensure proper configuration of DAD or equivalent mechanisms to prevent split-brain scenarios.
- Compatibility: Only supported on specific switch models (e.g., Cisco Catalyst 9000 series for StackWise Virtual, Aruba 8400/8320 for VSX).
- EtherChannel Configuration: Multi-chassis EtherChannel must be configured to fully leverage the logical switch benefits. Two-to-one virtualization is a strategic approach for modern campus and data center networks, providing operational simplicity, high availability, and optimized traffic flow while reducing the complexity of traditional multi-switch topologies .

Article Content

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MDC virtualizes one S7500X switch into multiple logical switches, enabling multiple services to share one core switch. The 1:N

To replace your two core switches with a Virtual Switching System (VSS

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Cisco Switch Virtualization

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