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Packet loss occurs across multiple VLANs on the core switch



Overview

When attempting to ping from host to host there''s a lot of latency and packet loss, this occurs within the switch. e.g.

Key Takeaways

Packet loss between VLANs on the same switch is often caused by misconfigurations in inter-VLAN routing, duplex mismatches, trunking issues, or hardware/software forwarding limitations.Common Causes



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1. Duplex and Speed Mismatches If a port on the switch or connected device is set to half-duplex while the other side is full-duplex, packet loss can occur, especially under higher traffic loads. This typically affects inter-VLAN traffic more noticeably than intra-VLAN traffic because inter-VLAN packets traverse the Layer 3 routing path, which is more sensitive to collisions and retransmissions . 2. Inter-VLAN Routing Issues When a Layer 3 switch performs inter-VLAN routing, misconfigurations can force packets to be routed via the CPU (slow path) instead of hardware-based Multilayer Switching (MLS). This can drastically reduce forwarding rates and cause packet drops between VLANs, while traffic within the same VLAN remains unaffected . 3. Trunk and VLAN Tagging Problems Incorrect trunk configuration or mismatched VLAN IDs can result in dropped packets. For example, if a trunk port does not allow a specific VLAN or if the native VLAN is inconsistent across switches, inter-VLAN traffic may be dropped. Similarly, in virtualized environments, mismatches between ESXi portgroups and physical switch VLAN tagging can lead to packet loss . 4. Overloaded or Oversubscribed Links High traffic on uplinks or inter-VLAN routing interfaces can cause congestion, leading to packet drops. This is more pronounced when multiple VLANs share the same physical interface or when the switch CPU is handling routing in software . 5. Physical Layer Issues Faulty cables, NICs, or connectors can cause unidirectional traffic or intermittent packet loss. Even if intra-VLAN traffic appears normal, inter-VLAN traffic may be affected if it traverses a problematic link .

Troubleshooting Steps
• Check Port Duplex and Speed Settings – Ensure all ports, including uplinks and server connections, are set to the same duplex and speed, preferably auto-negotiation or explicitly full-duplex .

• Verify VLAN and Trunk Configuration – Confirm that all VLANs are allowed on trunk ports, native VLANs match, and encapsulation types (802.1Q or ISL) are consistent .

• Monitor Switch Counters – Look for errors, collisions, or drops on interfaces involved in inter-VLAN traffic .

• Test Inter-VLAN Routing Path – Use ping and traceroute between VLANs to identify where packet loss occurs. If the CPU is handling routing, consider enabling hardware-based MLS or optimizing routing paths .

• Inspect Physical Layer – Check cables, NICs, and switch ports for faults or intermittent connectivity issues .

• Virtual Environment Checks – Ensure virtual portgroups and physical switch ports are configured compatibly for VLAN tagging, especially in ESXi or NSX environments .
Summary

Packet loss between VLANs on the same core switch is usually due to duplex mismatches, trunk misconfigurations, inter-VLAN routing via software, or physical layer issues. By systematically checking port settings, VLAN/trunk configurations, switch counters, and routing paths, you can isolate and resolve the problem while ensuring smooth inter-VLAN communication.

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Article Content

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I manage a Wide Area Network with 50 + subnets all connected through Intern Vlan Routing via Layer 3 switched

Troubleshooting VLAN Connectivity Issues

Pinging between VLANs or capturing traffic between VLANs shows packet loss, even though the physical NICs

Troubleshoot LAN Switching Environments

Trunking is a mechanism that is most often used to allow multiple VLANs to function independently across multiple switches. Routers

Troubleshooting VLAN Communication Issues in Cisco Switches

Discover how to troubleshoot VLAN communication issues on Cisco switches and resolve common network

routing

If the problem only happens between VLANs, you need to look at the router which is used to route between the VLANs.

Common Problems with Inter-VLAN Routing and How to Fix Them

Inter-VLAN routing allows devices in different VLANs to talk to each other. This is very useful for managing traffic and keeping

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There can be a few different causes for VLAN connectivity issues: Incorrect configurations of the virtual portgroups and

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Understanding VLANs and Inter-VLAN Routing

Understanding VLAN tagging is essential for implementing more advanced networking concepts like inter-VLAN

Routing Between VLANs Overview

The switch that receives the frame from the source station inserts the VLAN ID and the packet is switched onto the shared backbone

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WOL across multiple VLANS and across mulitple switches

WOL is layer 2 so it''s not going to traverse VLANs natively. With the right hardware, there are ways allegedly: Cisco

VLAN Configurations: Setting and Troubleshooting | NSC

Trunk settings on network switches allow multiple VLANs to traverse a single network link between switches or other

Common Causes of Native VLAN Mismatch Errors and How to Fix Them

Learn the common causes of Native VLAN mismatch errors in enterprise networks, troubleshooting steps, best practices, and multi

Routing Between VLANs & Layer 3 Switches

Routing Between VLANs & Layer 3 Switches Routing Between VLANs & Layer 3 Switches We wrote an article which covers Virtual

Best Practices for Inter-VLAN Routing in CISCO

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Consider Private VLANs for additional isolation between devices. Choosing the right Inter-VLAN routing method depends on your

Inter VLAN Routing by Layer 3 Switch

Disadvantages: Complexity: Inter-VLAN routing by Layer 3 switch can be complex to configure and manage,

VLANs disappear and connectivity is lost due to the addition of a new ...

This behavior can lead to the deletion of numerous VLANs, a loss of connectivity across the network, and the ports

CCNA 2 v7 Modules 1

In the out-of-the-box factory configuration of a Cisco switch, the default VLAN (VLAN 1) serves multiple foundational

packet loss between networks / VLANs

Hi all, what is an acceptable amount of packet loss between networks / VLANs. for example what would you expect in

InterVLAN routing using Layer 3 switch | NetworkAcademy.IO

They are commonly used in enterprise LANs, especially in distribution and core layers. Layer 3 switches made the three-tier network

The same MAC in different VLANs

Core Switch were sending packets with incorrect destination MAC address towards Access switch - it was due to some

Troubleshoot Switch Port and Interface Problems

The input packet counters increment in the output of show interface for a VLAN interface when that packet is Layer 3

Intermittent Packet Loss on Switch Only on Secondary VLAN ...

We are seeing intermittent ping drops on VMs on VLAN 999 (the secondary VLAN) as well as to VLAN 999 devices connected to the

Inter-VLAN Routing Configuration

Inter-VLAN routing is a network configuration technique that allows communication between devices on different

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Fix VLAN Misconfiguration: Step-by-Step Guide

If all tests pass, your VLAN misconfiguration is resolved! Get Expert IT Support for VLAN & Network Issues Still facing VLAN

Cisco VLAN Troubleshooting Commands And VLAN Issues

This may occur if the router IP address -to-MAC address cache of the VLAN is different from the switch''s MAC

How to Troubleshoot Common VLAN Interface Issues | NSC

Misconfigured trunk links often lead to connectivity issues across switches. Validate Routing Information: For VLANs

Building a Multi-Switch VLAN Network: A Successful Implementation

Recently, I built a multi-switch VLAN network in Cisco Packet Tracer, connecting different departments while ensuring

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