Analysis of Access Switch Performance Parameters



Overview

Learn how to analyze network switch performance with 7 key metrics. Compare throughput, latency, packet loss & more to choose the right switch for your needs.

Key Takeaways

Access switch performance is primarily evaluated using metrics such as throughput, latency, packet loss, PoE compliance, VLAN activity, and switch load, often benchmarked using standardized tests like RFC 2544.

Key Performance Metrics

Throughput: This measures the maximum data rate a switch can handle without dropping packets, typically expressed in packets per second (PPS) or bits per second (Gbps/Tbps). It reflects the switch's ability to forward traffic efficiently, especially under high loads or with small packets, such as in VoIP or gaming applications. Theoretical throughput is calculated using minimum Ethernet frame sizes, while actual throughput is measured using tools like Iperf or Wireshark, which account for real-world conditions.

Latency: Latency indicates the time it takes for a packet to traverse the switch. Low latency is critical for time-sensitive applications. It is measured during controlled tests or live traffic monitoring and can vary depending on packet size, switch load, and enabled features like QoS or ACLs.

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Packet Loss: Packet loss occurs when the switch cannot forward all incoming packets due to congestion or resource limitations. It is a key indicator of network reliability and is often measured alongside throughput and latency during benchmarking.

Po

E Compliance: For switches providing Power over Ethernet, PoE compliance measures whether connected devices receive the required power.

Over-allocated Po

E can degrade performance and cause device failures.

VLA

N and Configuration Compliance: Monitoring VLAN activity ensures that all necessary VLANs are active and properly configured. Version compliance ensures all switches run compatible firmware, which affects stability and performance.

Switch Load and A

P Affinity: Metrics like Switch-AP Affinity track the number of access points connected to a switch relative to thresholds, helping identify overloaded switches and balance network load. Testing and Benchmarking MethodsRFC 2544 Benchmarking: This standardized protocol evaluates switches under controlled conditions, measuring throughput, latency, frame loss, and back-to-back frames. It allows consistent comparison between devices and simulates real-world traffic stress.

Simulation and Modeling: For wireless networks, switching-based multiple access control models (e.g., polling, token passing, reservation) can be used to analyze throughput, delay, and packet loss. Studies show that such models can achieve high throughput (≈98. 3%), low delay (≈40 ms), and minimal packet loss (≈0.

024%) in wireless ATM networks. Monitoring Tools: Platforms like Mist or Juniper provide dashboards to track switch metrics in real time, enabling proactive management of performance issues, PoE allocation, VLAN activity, and firmware compliance.

Practical Considerations

Feature Impact: Advanced features like QoS, ACLs, and NAT can affect throughput and latency, so performance testing should consider the switch's operational configuration. Traffic Patterns: Small packet traffic or bursty loads can stress switches differently than large, continuous flows. Network Design: Proper distribution of APs, VLAN segmentation, and PoE planning ensures optimal switch performance and avoids bottlenecks.

By systematically monitoring these parameters and using standardized testing methods, network administrators can ensure access switches operate efficiently, reliably, and in alignment with network performance objectives.

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Article Content

How To Analyze Network Switch Performance: 7 Key Metrics

Learn how to analyze network switch performance with 7 key metrics. Compare throughput, latency, packet loss & more to choose the right switch for your needs.

Analysis of performance parameters for wireless network using

This work overcomes these concerns by developing a switching-based multiple access control model to improve the data transmission performance of wireless ATM.

Analysis of Performance Parameters for Wireless Network Using

Using OPNET 10.5, the results show that the presented switching-based multiple access control model can achieve a throughput value of 98.3 %, data transmission delay of about 40.2 ms, and 0.024 % of

Evaluating Switch Performance Using Ixia Test Tools and RFC 2544

Discover how Ixia''s advanced testing tools and RFC 2544 benchmarks ensure robust network switch performance for reliable data transmission.

Managed Switches: A Guide to Optimizing Network Performance

This technical overview will explore key strategies to optimize network performance using managed switches, helping you build a reliable, high-speed network infrastructure.

Modeling Components for Cut-Through Performance Analysis of

The modeling methods proposed in this paper are intended as a ready-made toolkit for performance analysis whose results should help the NOC optimize the use of switching equipment, given that

Performance analysis of switch access systems

We compare simulation and analytical approaches for estimating the blocking of switch access systems. We include the effects of both concentration and limited availability.

Benchmarking Methodology for LAN Switching Devices RFC 2889

This RFC primarily deals with devices which switch frames at the Medium Access Control (MAC) layer. It provides a methodology for benchmarking switching devices, forwarding

Evaluating Switch Performance Using Ixia Test Tools

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4. Data Analysis: After the tests are completed, the data collected by the Ixia test tool is analyzed to evaluate the performance of the switch under test.

Essential CLI Commands for Optimizing Network Switch Performance

As network complexity grows by 68% annually and 73% of enterprises report troubleshooting delays due to insufficient switch visibility (IDC 2024), mastering critical CLI commands has become essential for

What is an access switch and how to select access switches?

What is an access switch? Learn the features and applications, and know how to select the right access switch for your network needs. Ruijie Networks'' access switches here for you.

A study on network performance metrics and their composition

These users and the network engineers operating the networks would like to get access to network performance metrics to optimise their use of the network and to troubleshoot performance ...

Access vs. Distribution vs. Core Switch Comparison Guide

Distribution Layer Switches: Positioned between the access and core layers, distribution switches aggregate traffic from multiple access switches. They are typically Layer 3 devices responsible for

ANALYZING NETWORK PERFORMANCE PARAMETERS USING

For troubleshooting a network, an in-depth understanding of network protocols is required. The main objective of this research is to analyze the performance and various other parameters related to the

Network and Switch Monitoring

Configuring Performance Manager for Use with Cisco Traffic Analyzer Performance Monitoring Cisco Fabric Manager and Device Manager provide multiple tools for monitoring the performance of the

Analytical Performance Evaluation of Different Switch Solutions

PC-based switches are becoming an alternative to off-the-shelf switches, since they are cheaper. For this reason, it is important to evaluate the performance of PC-based switches. In this

Analytical Performance Evaluation of Different Switch Solutions

In this paper, we present a performance evaluation of two PC-based switches, using Open vSwitch and LiSA, and compare their performance with an off-the-shelf Cisco switch.

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Switch Buffer vs. Latency: Why Specs Matter in 2026

By the Network-Switch Content Team, in collaboration with our CCIE/HCIE Technical Engineering Team. Executive Summary (TL;DR) The Myth: A 100G switch is a 100G

Related Video Reference

This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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