

Network Security Equipment Information Flow



Article Overview

Network security equipment captures, monitors, and analyzes data flows using flow telemetry, packet capture, and log analysis to detect threats and optimize network performance.

Overview of Information Flow in Network Security

Network security equipment manages information flow by continuously capturing, summarizing, and analyzing traffic across the network. This process ensures visibility into network operations, application usage, and potential security threats. The flow of information typically follows these stages:

- **Data Collection:** Traffic is captured using three primary methods:
- **Packet Capture:** Intercepts individual packets for high-fidelity analysis, including application-layer content, but requires significant storage and processing resources.
- **Flow Monitoring:** Uses protocols like NetFlow, sFlow, IPFIX, and J-Flow to export metadata summaries of traffic flows, including source/destination IPs, ports, protocols, byte counts, and timestamps. Flow monitoring scales efficiently to high-volume networks but does not include packet payloads.
- **Log Analysis:** Routers, firewalls, switches, and servers generate logs recording connection events, rule matches, and errors, providing context for traffic patterns and policy compliance .
- **Data Transmission to Collectors:** Flow records or logs are exported to centralized collectors or security analytics platforms. For example, NetFlow exports flow record...

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Information flow (information theory)

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