

JUNOS[™]

JUNOS Software Version 8.5ES with Enhanced Services for the Juniper Networks J-series Services Routers

JUNOS[™] Enhanced Services (JUNOS ES) brings high-performance security together with application acceleration to branch locations in the distributed enterprise. JUNOS ES tightly integrates security services by re-architecting the router to be a true security device. This inseparable routing and security improves performance and latency compared with classic routers. The addition of application acceleration and WAN optimization through the WXC Integrated Service Module 200 (WXC ISM 200) enables enterprises to deploy new classes of applications with improved end user productivity to remote locations in the network. JUNOS ES is available on the Juniper Networks J-series Services Routers.

Product Description

Enterprises are faced with a number of challenges and opportunities to improve customer relations, interactions with suppliers and employee productivity. JUNOS Enhanced Services provides the high-performance infrastructure that helps enterprises implement key initiatives that:

- Enable the rollout of new applications across the entire network. The high-performance network infrastructure of JUNOS ES on the J-series together with the application acceleration of the WXC ISM 200 allows enterprises to overcome the limitations of low bandwidth and high latency WAN links. This combination enables users in the branch to access applications that were previously unusable in remote locations, as well as to improve the performance of existing applications.
- Secure critical information and protect the network from attack. Enterprises need to protect confidential information from external and internal attacks as they connect with their customers and suppliers. The inseparable routing and firewall offered by JUNOS Enhanced Services secures every location in the network and allows departmental segmentation out to remote locations of the network. Implementing IPSec virtual private networks (VPNs) with firewalls at remote sites allows for flexible network connectivity with security for split tunneling configurations.
- Minimize the cost of installing and operating the network. JUNOS software minimizes the cost of operating the network in several key areas. Because of the modular, protected mode design of JUNOS software and the rigorous JUNOS software development and testing process, there are fewer system failures. Superior configuration management reduces human errors that could lead to network down time. The single code source of JUNOS software makes the qualification of new releases across the network much simpler.
- Simplify the operation of the branch network. JUNOS ES integrates best-in-class routing with best-in-class stateful inspection firewall. Together with the integration of Ethernet switching, application acceleration and WAN optimization offered by the WXC ISM 200, the J-series delivers “branch in a box” simplicity. This integrated package is easier to install, configure and operate compared with discrete devices in the network.

Architecture and Key Components

Session-Based Forwarding

In order to optimize the throughput and latency of the combined router and firewall, JUNOS ES changes the fundamental architecture of the router. JUNOS ES implements session-based forwarding, an innovation that combines the session state information of a traditional firewall and the next-hop forwarding of a classic router into a single operation. With JUNOS ES, a session that is permitted by the forwarding policy is added to the forwarding table along with a pointer to the next-hop route. Established sessions have a single table lookup to verify that the session has been permitted and to find the next hop. This efficient algorithm improves throughput and lowers latency for session traffic when compared with a classic router that performs multiple table lookups to verify session information and then to find a next-hop route.

Figure 1 shows the session-based forwarding algorithm. When a new session is established, JUNOS ES verifies that the session is allowed by the forwarding policies. If the session is allowed, JUNOS ES will look up the next-hop route in the routing table. JUNOS ES inserts the session and the next-hop route into the session and forwarding table and forwards the packet. Subsequent packets for the established session require a single table lookup in the session and forwarding table and are forwarded to the egress zone.

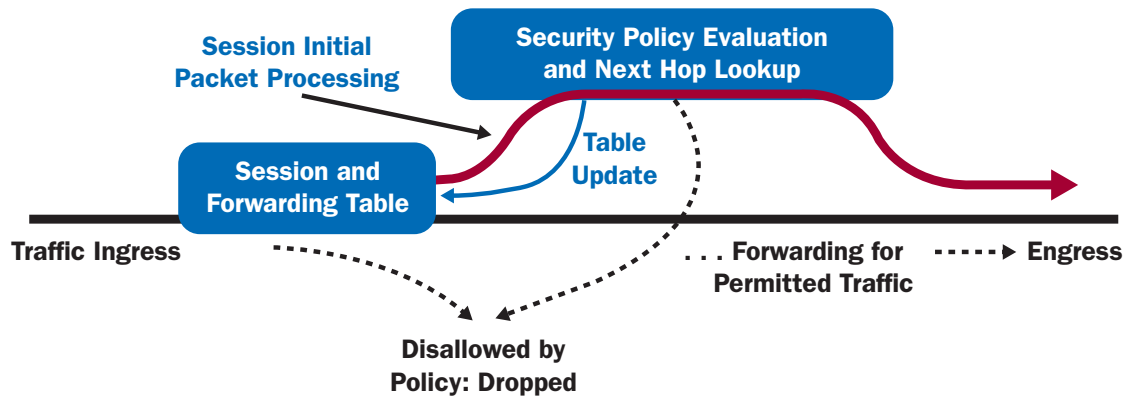


Figure 1: Session-based Forwarding Algorithm

Firewall Concepts Derived from ScreenOS

JUNOS ES uses firewall concepts derived from ScreenOS to simplify the configuration and administration of the stateful inspection firewall. As in ScreenOS, physical interfaces are assigned to security zones. Security policies are defined to permit or deny traffic between zones. As a security device, JUNOS ES by default denies all traffic in all directions. Through the creation of policies, you can control the traffic flow from zone to zone by defining the kinds of traffic permitted to pass from specified sources to specified destinations at scheduled times.

Features and Benefits

JUNOS ES combines best-in-class JUNOS routing features with best-in-class security features derived from ScreenOS. Table 1 shows the features and benefits of JUNOS ES.

Feature	Feature Description	Benefit
Best-in-class routing features of JUNOS	The rich set of JUNOS routing features are available in JUNOS ES, including multicast, advanced quality of service (QoS) and sophisticated routing protocol support.	JUNOS ES allows the network designer maximum flexibility to design high-performance networks using the J-series at remote locations and the M-series at the aggregation point and the core of the network.
Integrated routing and security	Routing and security tightly integrated into a single operating system.	Ease of operation with routing and services in the same system and managed with the same user interfaces (command-line interface and Web).
Inseparable routing and firewall	Best-in-class stateful inspection firewall combined with best-in-class routing fundamentally re-architected for tight integration.	Protects the network from the start as a true security device. High-performance and low latency optimize the network for application traffic.
Network Address Translation	Conservation of IP address space by translating public IP addresses to private IP addresses and mapping multiple internal IP addresses to a single public IP address.	Conserves IPv4 address space.
IPSec VPN	Provides encrypted IPSec VPN transport across public networks or the Internet.	Secure connectivity over a variety of public networks allows flexibility in network design and the ability to optimize for cost or performance.
Integrated application acceleration and WAN optimization	The WXC ISM 200 offers features to improve application performance and monitoring that include bandwidth optimization, protocol acceleration, traffic management, and WAN visibility and reporting.	Enables the rollout of new applications over bandwidth and latency constrained WAN links. Improves end user response times for existing applications.

Table 1: Features and Benefits of JUNOS ES

Product Options

JUNOS ES Options

JUNOS ES is available with licenses for Advanced BGP (with route reflector) and J-Flow statistics. There are no licenses required to enable ports or security features.

Option	Option Description	Applicable Products
Advanced BGP	Enables advanced BGP features such as BGP route reflector.	JX-BGP-ADV-LTU
J-Flow Accounting	Monitors traffic flows in real time, collecting and exporting per-flow statistics in standards-based records. This flow data can be used to provide granular accounting for billing, to analyze traffic patterns for network planning and to perform security analysis.	JX-JFlow-LTU

Table 2: JUNOS ES Licenses Agency Approvals

WXC ISM 200 Options

Please see the datasheet for the WXC ISM 200 for specifications and options.

Specifications

Protocols

- IPv4, IPv6, ISO Connectionless Network Service (CLNS)

Routing and Multicast

- OSPF
- BGP
- BGP Router Reflector*
- RIPv2
- Static routes
- IS-IS
- Multicast (IGMPv3, PIM, SDP, DVMRP, source-specific)
- IPv6 Multicast Listener Discovery (MLD)

IP Address Management

- Static
- Dynamic Host Configuration Protocol (DHCP) (client and server)
- DHCP relay

Encapsulations

- Ethernet (MAC and tagged)
- PPP (synchronous)
- Frame Relay
- High-Level Datalink Control (HDLC)
- Serial (RS-232, RS-449, X.21, V.35, EIA-530)
- 802.1q support
- Multilink Point-to-Point Protocol (MLPPP)
- Multilink Frame Relay (MLFR) (FRF.15, FRF.16)
- Point-to-Point Protocol over Ethernet (PPPoE)

Traffic Management

- Marking, policing, and shaping
- Class-based queuing with prioritization
- Weighted random early detection (WRED)
- Queuing based on VLAN, data-link connection identifier (DLCI), interface, bundles or filters

Security

- Stateful firewall with security zones and policies
- Screens for denial of service protection
- Tunnels (GRE, IP-in-IP, IPSec)
- Data Encryption Standard (DES) (56-bit), 3DES (168-bit), AES (256-bit) encryption
- MD5 and SHA-1 authentication
- Prevent replay attack

Voice Transport

- FRF.12
- Link fragmentation and interleaving (LFI)
- Compressed Real-Time Transport Protocol (CRTP)

High Availability

- Virtual Router Redundancy Protocol (VRRP)
- Dial backup

IPv6

- OSPFv3
- RIPvng
- Multicast Listener Discovery (MLD)
- BGP
- QoS
- IPv4 tunneling
- 6PE

System Management

- Juniper Networks J-Web browser interface
- Juniper Networks JUNOScript™ XML API
- Juniper Networks JUNOS command-line interface (console, telnet, SSH)
- SNMPv2 and SNMPv3

Service-Level Agreement (SLA) and Measurement

- Real-time performance monitoring
- Top talkers (sessions, packets, bandwidth usage)
- J-Flow flow monitoring and accounting services

Logging and Monitoring

- Syslog
- Traceroute

Administration

- External administrator database (RADIUS, LDAP, SecureID)
- Role-based administration
- Auto configuration
- Configuration rollback
- Rescue configuration with button
- Commit confirm for changes
- Auto record for diagnostics
- Software upgrades

Supported Platforms

JUNOS ES is supported on the following J-series models:

- J6350
- J4350
- J2350
- J2320

Ordering information

JUNOS ES is available for download to customers with J-series routers under a maintenance agreement.

About Juniper Networks

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at www.juniper.net.



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