



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

JUNOS™ software with enhanced services brings high-performance routing together with best-in-class integrated security to branch locations in the distributed enterprise. JUNOS software tightly integrates security services by bringing the power of sessions to deliver a true security device. This inseparable joining of routing and security improves performance and latency compared with classic routers. JUNOS software with enhanced services 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 software with enhanced services provides the high-performance infrastructure that helps enterprises implement key initiatives that:

- Secure critical information and protect the network from vulnerabilities and attacks. 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 software with 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. 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 downtime. 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 software with enhanced services integrates best-in-class routing with best-in-class stateful inspection firewall. In addition, chassis clustering provides stateful high availability and systems level resiliency for complex networks. 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 software with enhanced services 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 software, 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, the session-based architecture within JUNOS software verifies that the session is allowed by the forwarding policies. If the session is allowed, JUNOS software will look up the next-hop route in the routing table. It 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 interface.

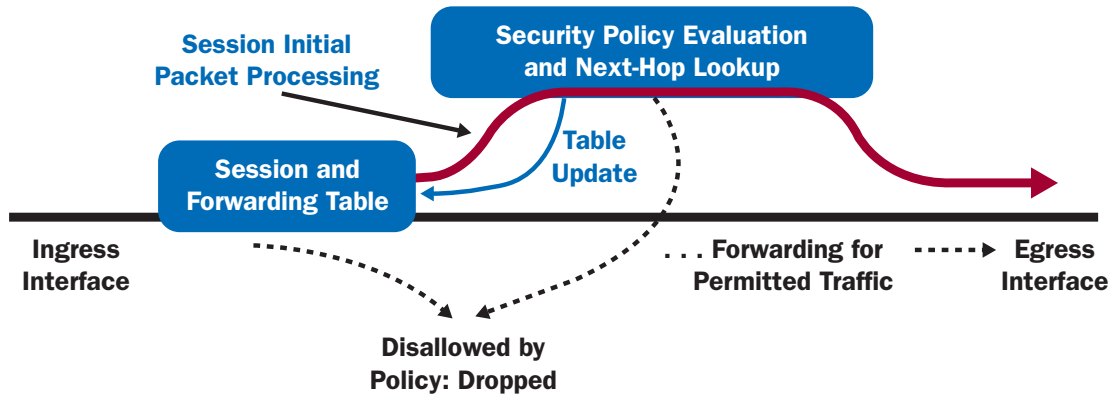


Figure 1: Session-Based Forwarding Algorithm

Firewall Concepts Derived from ScreenOS

JUNOS software with enhanced services 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 secure router device, JUNOS software 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

Combining best-in-class JUNOS routing features with best-in-class security features derived from ScreenOS, JUNOS software with enhanced services offers the benefits and features shown in table 1.

Feature	Feature Description	Benefit
Best-in-class routing features	The rich set of routing features are available in JUNOS software, including multicast, advanced quality of service (QoS), and sophisticated routing protocol support.	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 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.	Provides immediate protection against vulnerabilities and attacks, since by default the device is secure in configuration settings. 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.
Chassis clustering	Provides stateful failover, with an active/backup control plane and active/active data plane, all within a single system view.	Maintains connection persistence and improves system resiliency for services, while load sharing across systems in optimized secure routing environments.

Table 1: Features and benefits of JUNOS software with enhanced services

Product Options

J-series with JUNOS Software with Enhanced Services Options

JUNOS software with enhanced services is available with licensing for advanced BGP (with route reflector) and J-Flow statistics. No licenses are 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 software with enhanced services licensed features

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, SHA-128, SHA-256, authentication
- Prevent replay attack
- User Web authentication
- Expanded Application Layer Gateway (ALG) support

Voice Transport

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

High Availability

- Virtual Router Redundancy Protocol (VRRP)
- Dial backup
- Chassis clustering (active/active, active/passive)

IPv6

- OSPFv3
- RIPng
- 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

* Licensed feature

Specifications (cont'd.)

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 software with enhanced services is supported on the following J-series models:

- J6350
- J4350
- J2350
- J2320

Ordering information

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

Performance-Enabling Services and Support

Juniper is the leader in Performance-Enabling Services and Support, which are designed around a time-to-value experience that accelerates, extends, and optimizes the value of high-performance networking. These services bring revenue-generating capabilities online faster for bigger productivity gains, faster rollouts of new business models and ventures, greater market reach, and higher levels of customer satisfaction. At the same time, Juniper helps build operational excellence—to maintain required levels of performance, reliability, and availability, scale and adapt to new business requirements, reduce operational costs, and cut exposure to IT risks.

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.



CORPORATE HEADQUARTERS
AND SALES HEADQUARTERS FOR
NORTH AND SOUTH AMERICA
Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, CA 94089 USA
Phone: 888.JUNIPER (888.586.4737)
or 408.745.2000
Fax: 408.745.2100
www.juniper.net

EUROPE, MIDDLE EAST, AFRICA
REGIONAL SALES HEADQUARTERS
Juniper Networks (UK) Limited
Building 1
Aviator Park
Station Road
Addlestone
Surrey, KT15 2PG, U.K.
Phone: 44.(0).1372.385500
Fax: 44.(0).1372.385501

EAST COAST OFFICE
Juniper Networks, Inc.
10 Technology Park Drive
Westford, MA 01886-3146 USA
Phone: 978.589.5800
Fax: 978.589.0800

ASIA PACIFIC REGIONAL SALES HEADQUARTERS
Juniper Networks (Hong Kong) Ltd.
26/F, Cityplaza One
1111 King's Road
Taikoo Shing, Hong Kong
Phone: 852.2332.3636
Fax: 852.2574.7803

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