

## Chapter 31

# Security Services Overview

The JUNOS software supports Internet Protocol Security (IPSec). This chapter discusses the following topics, which provide background information related to configuring IPSec:

IPSec Overview on page 619

Security Associations on page 620

IKE on page 620

For a list of IPSec- and IKE-supported standards, see “IPSec and IKE” on page 25.

### IPSec Overview

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IPSec architecture provides a security suite for the IP version 4 (IPv4) and IP version 6 (IPv6) network layers. The suite provides such functionality as authentication of origin, data integrity, confidentiality, replay protection, and nonrepudiation of source. In addition to IPSec, the JUNOS software also supports the Internet Key Exchange (IKE), which defines mechanisms for key generation and exchange, and manages security associations (SAs).

IPSec also defines a security association and key management framework that can be used with any network layer protocol. The SA specifies what protection policy to apply to traffic between two IP-layer entities. IPSec provides secure tunnels between two peers.

## Security Associations

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To use IPSec security services, you create SAs between hosts. An SA is a simplex connection that allows two hosts to communicate with each other securely by means of IPSec. There are two types of SAs: manual and dynamic.

Manual SAs require no negotiation; all values, including the keys, are static and specified in the configuration. Manual SAs statically define the Security Parameter Index (SPI) values, algorithms, and keys to be used, and require matching configurations on both ends of the tunnel. Each peer must have the same configured options for communication to take place.

Dynamic SAs require additional configuration. With dynamic SAs, you configure IKE first and then the SA. IKE creates dynamic security associations; it negotiates SAs for IPSec. The IKE configuration defines the algorithms and keys used to establish the secure IKE connection with the peer security gateway. This connection is then used to dynamically agree upon keys and other data used by the dynamic IPSec SA. The IKE SA is negotiated first and then used to protect the negotiations that determine the dynamic IPSec SAs.

The JUNOS software implementation of IPSec supports two modes of security (transport and tunnel). For more information about transport and tunnel mode, see “Configuring IPSec Mode” on page 626.

## IKE

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IKE is a key management protocol that creates dynamic SAs; it negotiates SAs for IPSec. An IKE configuration defines the algorithms and keys used to establish a secure connection with a peer security gateway.

IKE does the following:

- Negotiates and manages IKE and IPSec parameters

- Authenticates secure key exchange

- Provides mutual peer authentication by means of shared secrets (not passwords) and public keys

- Provides identity protection (in main mode)

IKE occurs over two phases. In the first phase, it negotiates security attributes and establishes shared secrets to form the bidirectional IKE SA. In the second phase, inbound and outbound IPSec SAs are established. The IKE SA secures the exchanges in the second phase. IKE also generates keying material, provides Perfect Forward Secrecy, and exchanges identities.