9 Managing Tunnel Service and IPSec Service Interfaces

Use the information in this chapter when you are working with Tunnel Service line modules (TSMs) and IPSec Service line modules (ISMs).

Overview

TSMs and ISMs support different types of tunnels, as described in the following sections, *TSMs* and *ISMs*. Depending on the type of tunnels you require the system to support, you must install at least one TSM or ISM. For information about installing line modules, see the *ERX Installation and User Guide*.

Unlike other line modules, TSMs and ISMs do not pair with corresponding I/O modules that provide ingress and egress ports. A TSM or ISM receives data from and transmits data to other line modules with ingress and egress ports.

TSMs

A TSM supports two types of interfaces:

- Dynamic TSM interfaces associated with L2TP LNS sessions and L2F sessions.

  The system establishes dynamic TSM interfaces when required and removes the interfaces when they are not required. For more information on applications that use dynamic TSM interfaces, see *ERX Broadband Access Configuration Guide, Chapter 4, Configuring L2TP* and *ERX Broadband Access Configuration Guide, Chapter 5, Configuring L2F*.

- Static IP TSM interfaces that you configure and delete

  Static IP TSM interfaces include DVMRP and GRE tunnels. You must assign interfaces on other line modules to act as source endpoints for these tunnels. For information on configuring these tunnels, see *ERX Routing Protocols Configuration Guide, Vol. 1, Chapter 4, Configuring IP Tunnels.*

ISMs

ISMs support interfaces associated with secure IP tunnels. You configure and delete these interfaces statically; however, the system assigns tunnels to the interfaces dynamically. This mechanism means that you must manage the interfaces for tunnels manually; however, the system will add and remove tunnels when required. For information on configuring secure IP tunnels, see *ERX Routing Protocols Configuration Guide, Vol. 1, Chapter 10, Configuring IPSec*.

Redundancy and Interface Distribution

Redundancy and interface distribution differs for TSMs and ISMs.

TSMs

You can install multiple TSMs to provide redundancy. If you install multiple TSMs at the same time, the system automatically distributes TSM interfaces evenly over the modules.

Even distribution of TSM interfaces is not critical to the system performance. It is, however, important that the number of TSMs you install be able to support the extra tunnels if one of the modules becomes unavailable.

When the system creates a dynamic TSM interface, it assigns that interface to a particular TSM. If that TSM becomes unavailable, the system removes the interface. If the initiator of the dynamic interface requests its reestablishment, the system recreates the interface and assigns it to an available TSM.

Going forward, the system removes unwanted dynamic TSM interfaces and creates new ones for applications on other TSMs. Gradually, the distribution of dynamic TSM interfaces on the TSMs becomes even.

When you configure a static TSM interface, the system automatically assigns that interface to a particular TSM. If that TSM becomes unavailable, the system attempts to reassign the interface to an available TSM. If no TSM is available, the system keeps track of the interface and assigns it to a TSM when one become available. Consequently, the distribution of static TSM interfaces over the modules may become uneven. Because users create and remove static tunnels, the distribution may remain uneven indefinitely.

ISMs

You can install multiple ISMs to provide redundancy. If you install multiple ISMs at the same time, the system automatically distributes ISM interfaces evenly over the modules.

Even distribution of ISM interfaces is not critical to the system performance. It is, however, important that the number of ISMs you install be able to support the extra tunnels if one of the modules becomes unavailable.

When you configure a static ISM interface, the system automatically assigns that interface to a particular ISM. If that ISM becomes unavailable, the interface becomes unavailable (operational state “down”). The then system manages the interface as follows:

- If the initiator of the interface is at the local end, the system immediately attempts to reassign the interface to an available ISM and to refresh the source address of the interface.
- If the initiator of the interface is at the remote end, the system immediately attempts to assign the interface to an available ISM and starts a timer to for refreshing the source address.

  The initiator can refresh the source address during the timeout period. However, if the initiator does not do so, the system will initiate a source address refresh operation when the timer expires.

In any case, the interface will become available (operational state “up”) when the source address is refreshed. If a source address refresh operation fails, the system

If there is no available ISM to accommodate reassigned interfaces, the system keeps track of the interface, and reassigns it when an ISM becomes available. Consequently, the distribution of static ISM interfaces over the modules may become uneven. Because users create and remove static interfaces, the distribution may remain uneven indefinitely.

ERX Models

Both the ERX-700 series and the ERX-1400 series support TSMs and ISMs.

Features

Each TSM supports up to 8000 tunnels and each ISM supports 5000 tunnels.

Monitoring TSMs and ISMs

You can monitor TSM and ISM interfaces using the **show tunnel server** command.

show tunnel-server

- Use to display information about the TSM interfaces that a specific TSM or all TSMs support.
- Field descriptions
  - Port:Appl – identifier in slot/port format for the TSM, ISM, or tunneling application
    - slot – number of the slot in the chassis where TSM or ISM resides
    - port – number of the virtual port on the TSM or ISM; always 0
  - Type – type of port: static or dynamic
  - Admin State – configured state of the port or application: enabled or disabled
  - Oper State – physical state of the port or application
    - up – port or application is available
    - down – port or application is unavailable
    - present – TSM or ISM associated with this port is installed
    - not present – TSM or ISM associated with this port has been removed
    - pending – system has not yet detected all previously configured TSMs or ISM during a reboot or initial installation of a TSM or ISM
  - Active Interfaces – number of TSM or ISM interfaces on this port

- Max Interfaces – total number of TSM or ISM interfaces available on this module
- Weight/Interface
  - For ports – indication of the relative processing power available for the port. A lower value indicates that more processing power is available.
  - For applications – indication of the processing power that TSM or ISM interfaces for this application require. A lower value indicates that less processing power is required.
- Total Weight – total weight of the TSM or ISM interfaces for the port or application
- Appl Total – statistics for each application

- Example (TSMs)

```
host1#show tunnel-server
                    Admin   Oper     Active      Max      Weight/  Total
 Port:Appl   Type   State   State  Interfaces Interfaces Interface Weight
----------- ------ ------- ------- ---------- ---------- --------- ------
   Port 2/0 static enabled present          5       8000        16    800
  gre/dvmrp        enabled      up          0                    9      0
        l2f        enabled    down          0                    0      0
       l2tp        enabled      up          5                   10    800
   Port 4/0 static enabled present          4       8000        16    640
  gre/dvmrp        enabled      up          0                    9      0
        l2f        enabled    down          0                    0      0
       l2tp        enabled      up          4                   10    640
Appl Totals
  gre/dvmrp                                 0                          0
        l2f                                 0                          0
       l2tp                                 9                       1440
```

- Example (ISMs)

```
host1:vr14#show tunnel-server
                    Admin   Oper     Active      Max      Weight/  Total
 Port:Appl   Type   State   State  Interfaces Interfaces Interface Weight
----------- ------ ------- ------- ---------- ---------- --------- ------
   Port 2/0 static enabled present        500       5000        16  72000
      ipsec        enabled      up        500                    9  72000
  gre/dvmrp        enabled    down          0                    9      0
       l2tp        enabled    down          0                   10      0
        l2f        enabled    down          0                   10      0
Appl Totals
      ipsec                                 500                       72000
  gre/dvmrp                                   0                           0
       l2tp                                   0                           0
        l2f                                   0                           0
```