



Secure Shell Commands

This module describes the Cisco IOS XR software commands used to configure Secure Shell (SSH).

For detailed information about SSH concepts, configuration tasks, and examples, see the *Implementing Secure Shell on the Cisco IOS XR Software module in the Cisco IOS XR System Security Configuration Guide for the Cisco XR 12000 Series Router*.

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clear ssh

To terminate an incoming or outgoing Secure Shell (SSH) connection, use the **clear ssh** command.

clear ssh {*session-id*| **outgoing** *session-id*}

Syntax Description

<i>session-id</i>	Session ID number of an incoming connection as displayed in the show ssh command output. Range is from 0 to 1024.
outgoing <i>session-id</i>	Specifies the session ID number of an outgoing connection as displayed in the show ssh command output. Range is from 1 to 10.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

Use the **clear ssh** command to disconnect incoming or outgoing SSH connections. Incoming connections are managed by the SSH server running on the local networking device. Outgoing connections are initiated from the local networking device.

To display the session ID for a connection, use the **show ssh** command.

Task ID

Task ID	Operations
crypto	execute

Examples

In the following example, the **show ssh** command is used to display all incoming and outgoing connections to the router. The **clear ssh** command is then used to terminate the incoming session with the ID number 0.

```
RP/0/0/CPU0:router# show ssh

SSH version: Cisco-2.0
session      pty  location  state      userid    host      ver
-----
Incoming sessions
0           vty0 0/33/1  SESSION_OPEN  cisco    172.19.72.182  v2
```

```

1          vty1 0/33/1  SESSION_OPEN  cisco  172.18.0.5    v2
2          vty2 0/33/1  SESSION_OPEN  cisco  172.20.10.3   v1
3          vty3 0/33/1  SESSION_OPEN  cisco  3333::50     v2

```

Outgoing sessions

```

1          0/33/1  SESSION_OPEN  cisco  172.19.72.182 v2
2          0/33/1  SESSION_OPEN  cisco  3333::50     v2

```

```
RP/0/0/CPU0:router# clear ssh 0
```

Related Commands

Command	Description
show ssh, on page 11	Displays the incoming and outgoing connections to the router.

sftp

To start the secure FTP (SFTP) client, use the **sftp** command.

sftp [*username @ host : remote-filenam e*] *source-filename dest-filename* [**source-interface** *type interface-path-id*] [**vrf** *vrf-name*]

Syntax Description

<i>username</i>	(Optional) Name of the user performing the file transfer. The at symbol (@) following the username is required.
<i>hostname:remote-filename</i>	(Optional) Name of the Secure Shell File Transfer Protocol (SFTP) server. The colon (:) following the hostname is required.
<i>source-filename</i>	SFTP source, including the path.
<i>dest-filename</i>	SFTP destination, including the path.
source-interface	(Optional) Specifies the source IP address of a selected interface for all outgoing SSH connections.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
vrf <i>vrf-name</i>	Specifies the name of the VRF associated with the source interface.

Command Default

If no *username* argument is provided, the login name on the router is used. If no *hostname* argument is provided, the file is considered local.

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.8.0	The srcfile keyword was removed and was replaced by an argument for this same purpose. Support was added for the vrf and the source-interface keywords.

Usage Guidelines

SFTP provides for the secure (and authenticated) copying of files between a router and a remote host. Like the **copy** command, the **sftp** command can be invoked only in EXEC mode.

If a username is not provided, the login name on the router is used as the default. If a host name is not provided, the file is considered local.

If the source interface is specified in the **sftp** command, the **sftp** interface takes precedence over the interface specified in the **ssh client source-interface** command.

When the file destination is a local path, all of the source files should be on remote hosts, and vice versa.

When multiple source files exist, the destination should be a preexisting directory. Otherwise, the destination can be either a directory name or destination filename. The file source cannot be a directory name.

If you download files from different remote hosts, that is, the source points to different remote hosts, the SFTP client spawns SSH instances for each host, which may result in multiple prompts for user authentication.

Task ID

Task ID	Operations
crypto	execute
basic-services	execute

Examples

In the following example, user *abc* is downloading the file *ssh.diff* from the SFTP server *ena-view1* to *disk0*:

```
RP/0/0/CPU0:router#sftp abc@ena-view1:ssh.diff disk0
```

In the following example, user *abc* is uploading multiple files from *disk 0:/sam_** to */users/abc/* on a remote SFTP server called *ena-view1*:

```
RP/0/0/CPU0:router# sftp disk0:/sam_* abc@ena-view1:/users/abc/
```

In the following example, user *admin* is downloading the file *run* from *disk0a:* to *disk0:/v6copy* on a local SFTP server using an IPv6 address:

```
RP/0/0/CPU0:router#sftp admin@[2:2:2::2]:disk0a:/run disk0:/V6copy
Connecting to 2:2:2::2...
Password:
```

```
disk0a:/run
  Transferred 308413 Bytes
  308413 bytes copied in 0 sec (338172)bytes/sec
```

```
RP/0/0/CPU0:router#dir disk0:/V6copy
```

```
Directory of disk0:
```

```
70144      -rwx  308413      Sun Oct 16 23:06:52 2011  V6copy
```

```
2102657024 bytes total (1537638400 bytes free)
```

In the following example, user *admin* is uploading the file *v6copy* from *disk0:* to *disk0a:/v6back* on a local SFTP server using an IPv6 address:

```
RP/0/0/CPU0:router#sftp disk0:/V6copy admin@[2:2:2::2]:disk0a:/v6back
Connecting to 2:2:2::2...
Password:

/disk0:/V6copy
  Transferred 308413 Bytes
  308413 bytes copied in 0 sec (421329)bytes/sec

RP/0/0/CPU0:router#dir disk0a:/v6back

Directory of disk0a:

66016      -rwx  308413      Sun Oct 16 23:07:28 2011  v6back

2102788096 bytes total (2098987008 bytes free)
```

In the following example, user *admin* is downloading the file *sampfile* from *disk0:* to *disk0a:/sampfile_v4* on a local SFTP server using an IPv4 address:

```
RP/0/0/CPU0:router#sftp admin@2.2.2.2:disk0:/sampfile disk0a:/sampfile_v4
Connecting to 2.2.2.2...
Password:

disk0:/sampfile
  Transferred 986 Bytes
  986 bytes copied in 0 sec (493000)bytes/sec

RP/0/0/CPU0:router#dir disk0a:/sampfile_v4

Directory of disk0a:

131520     -rwx   986        Tue Oct 18 05:37:00 2011  sampfile_v4

502710272 bytes total (502001664 bytes free)
```

In the following example, user *admin* is uploading the file *sampfile_v4* from *disk0a:* to *disk0:/sampfile_back* on a local SFTP server using an IPv4 address:

```
RP/0/0/CPU0:router#sftp disk0a:/sampfile_v4 admin@2.2.2.2:disk0:/sampfile_back
Connecting to 2.2.2.2...
Password:

disk0a:/sampfile_v4
  Transferred 986 Bytes
  986 bytes copied in 0 sec (564000)bytes/sec

RP/0/0/CPU0:router#dir disk0:/sampfile_back

Directory of disk0:

121765     -rwx   986        Tue Oct 18 05:39:00 2011  sampfile_back

524501272 bytes total (512507614 bytes free)
```

Related Commands

Command	Description
ssh client source-interface , on page 20	Specifies the source IP address of a selected interface for all outgoing SSH connections.
ssh client vrf , on page 22	Configures a new VRF for use by the SSH client.

sftp (Interactive Mode)

To enable users to start the secure FTP (SFTP) client, use the **sftp** command.

sftp [*username @ host : remote-filenam e*] [**source-interface** *type interface-path-id*] [**vrf** *vrf-name*]

Syntax Description

<i>username</i>	(Optional) Name of the user performing the file transfer. The at symbol (@) following the username is required.
<i>hostname:remote-filename</i>	(Optional) Name of the Secure Shell File Transfer Protocol (SFTP) server. The colon (:) following the hostname is required.
source-interface	(Optional) Specifies the source IP address of a selected interface for all outgoing SSH connections.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
vrf <i>vrf-name</i>	Specifies the name of the VRF associated with the source interface.

Command Default

If no *username* argument is provided, the login name on the router is used. If no *hostname* argument is provided, the file is considered local.

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

The SFTP client, in the interactive mode, creates a secure SSH channel where the user can enter any supported command. When a user starts the SFTP client in an interactive mode, the SFTP client process creates a secure SSH channel and opens an editor where user can enter any supported command.

More than one request can be sent to the SFTP server to execute the commands. While there is no limit on the number of 'non-acknowledged' or outstanding requests to the server, the server might buffer or queue these requests for convenience. Therefore, there might be a logical sequence to the order of requests.

The following unix based commands are supported in the interactive mode:

- `bye`
- `cd <path>`
- `chmod <mode> <path>`
- `exit`
- `get <remote-path> [local-path]`
- `help`
- `ls [-alt] [path]`
- `mkdir <path>`
- `put <local-path> [remote-path]`
- `pwd`
- `quit`
- `rename <old-path> <new-path>`
- `rmdir <path>`
- `rm <path>`

The following commands are not supported:

- `lcd, lls, lpwd, lumask, lmkdir`
- `ln, symlink`
- `chgrp, chown`
- `!, !command`
- `?`
- `mget, mput`

Task ID

Task ID	Operations
crypto	execute
basic-services	execute

Examples

In the following example, user *admin* is downloading and uploading a file from/to an external SFTP server using an IPv6 address:

```
RP/0/0/CPU0:router#sftp admin@[2:2:2::2]
Connecting to 2:2:2::2...
Password:
sftp> pwd
```

```

Remote working directory: /
sftp> cd /auto/tftp-server1-users5/admin
sftp> get frmRouter /disk0:/frmRouterdownload

/auto/tftp-server1-users5/admin/frmRouter
  Transferred 1578 Bytes
  1578 bytes copied in 0 sec (27684)bytes/sec
sftp> put /disk0:/frmRouterdownload againtoServer

/disk0:/frmRouterdownload
  Transferred 1578 Bytes
  1578 bytes copied in 0 sec (14747)bytes/sec
sftp>

```

In the following example, user *abc* is downloading and uploading a file from/to an external SFTP server using an IPv4 address:

```

RP/0/0/CPU0:router#sftp abc@2.2.2.2
Connecting to 2.2.2.2...
Password:
sftp> pwd
Remote working directory: /
sftp> cd /auto/tftp-server1-users5/abc
sftp> get frmRouter /disk0:/frmRouterdownload

/auto/tftp-server1-users5/abc/frmRouter
  Transferred 1578 Bytes
  1578 bytes copied in 0 sec (27684)bytes/sec
sftp> put /disk0:/frmRouterdownload againtoServer

/disk0:/frmRouterdownload
  Transferred 1578 Bytes
  1578 bytes copied in 0 sec (14747)bytes/sec
sftp>

```

Related Commands

Command	Description
ssh client source-interface , on page 20	Specifies the source IP address of a selected interface for all outgoing SSH connections.
ssh client vrf , on page 22	Configures a new VRF for use by the SSH client.

show ssh

To display all incoming and outgoing connections to the router, use the **show ssh** command.

show ssh

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced.

Usage Guidelines Use the **show ssh** command to display all incoming and outgoing Secure Shell (SSH) Version 1 (SSHv1) and SSH Version 2 (SSHv2) connections.

Task ID	Task ID	Operations
	crypto	read

Examples This is sample output from the **show ssh** command when SSH is enabled:

```
RP/0/0/CPU0:router# show ssh
SSH version : Cisco-2.0
id  pty  location  state      userid  host      ver      authentication
-----
Incoming sessions
Outgoing sessions
1   0/3/CPU0  SESSION_OPEN  lab  12.22.57.  v2      password
2   0/3/CPU0  SESSION_OPEN  lab  12.22.57.75  v2      keyboard-interactive
```

This table describes significant fields shown in the display.

Table 1: show ssh Field Descriptions

Field	Description
session	Session identifier for the incoming and outgoing SSH connections.
pty	pty-id allocated for the incoming session. Null for outgoing SSH connection.
location	Specifies the location of the SSH server for an incoming connection. For an outgoing connection, location specifies from which route processor the SSH session is initiated.
state	The SSH state that the connection is currently in.
userid	Authentication, authorization and accounting (AAA) username used to connect to or from the router.
host	IP address of the remote peer.
ver	Specifies if the connection type is SSHv1 or SSHv2.
authentication	Specifies the type of authentication method chosen by the user.

Related Commands

Command	Description
show sessions	Displays information about open Telnet or rlogin connections. For more information, see the <i>Cisco IOS XR System Management Command Reference for the Cisco XR 12000 Series Router</i>
show ssh session details, on page 13	Displays the details for all the incoming and outgoing SSHv2 connections, to the router.

show ssh session details

To display the details for all incoming and outgoing Secure Shell Version 2 (SSHv2) connections, use the **show ssh session details** command.

show ssh session details

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced.

Usage Guidelines Use the **show ssh session details** command to display a detailed report of the SSHv2 connections to or from the router, including the cipher chosen for the specific session.

Task ID	Task ID	Operations
	crypto	read

Examples The following is sample output from the **show ssh session details** command to display the details for all the incoming and outgoing SSHv2 connections:

```
RP/0/0/CPU0:router# show ssh session details
SSH version: Cisco-2.0
session      key-exchange  pubkey  incipher  outcipher  inmac  outmac
-----
Incoming Session
0           diffie-hellman ssh-dss  3des-cbc  3des-cbc  hmac-md5  hmac-md5
Outgoing connection
1           diffie-hellman ssh-dss  3des-cbc  3des-cbc  hmac-md5  hmac-md5
```

This table describes the significant fields shown in the display.

Table 2: show ssh session details Field Descriptions

Field	Description
session	Session identifier for the incoming and outgoing SSH connections.
key-exchange	Key exchange algorithm chosen by both peers to authenticate each other.
pubkey	Public key algorithm chosen for key exchange.
incipher	Encryption cipher chosen for the Rx traffic.
outcipher	Encryption cipher chosen for the Tx traffic.
inmac	Authentication (message digest) algorithm chosen for the Rx traffic.
outmac	Authentication (message digest) algorithm chosen for the Tx traffic.

Related Commands

Command	Description
show sessions	Displays information about open Telnet or rlogin connections.
show ssh, on page 11	Displays all the incoming and outgoing connections to the router.

ssh

To start the Secure Shell (SSH) client connection and enable an outbound connection to an SSH server, use the **ssh** command.

```
ssh [vrf vrf-name] {ipv4-address| ipv6-address| hostname} [username user-id] [cipher aes {128-cbc| 192-cbc| 256-cbc}][source-interface type interface-path-id][command command-name]
```

Syntax Description

vrf <i>vrf-name</i>	Specifies the name of the VRF associated with this connection.
<i>ipv4-address</i>	IPv4 address in A:B:C:D format.
<i>ipv6-address</i>	IPv6 address in X:X::X format.
<i>hostname</i>	Hostname of the remote node. If the hostname has both IPv4 and IPv6 addresses, the IPv6 address is used.
username <i>user-id</i>	(Optional) Specifies the username to use when logging in on the remote networking device running the SSH server. If no user ID is specified, the default is the current user ID.
cipher <i>aes</i>	(Optional) Specifies Advanced Encryption Standard (AES) as the cipher for the SSH client connection. Note If there is no specification of a particular cipher by the administrator, the client proposes 3DES as the default to ensure compatibility.
128-CBC	128-bit keys in CBC mode.
192-CBC	192-bit keys in CBC mode.
256-CBC	256-bit keys in CBC mode.
source interface	(Optional) Specifies the source IP address of a selected interface for all outgoing SSH connections.
<i>type</i>	Interface type. For more information, use the question mark (?)online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark(?)online help function.
command	(Optional) Specifies a remote command. Adding this keyword prompts the SSHv2 server to parse and execute the ssh command in non-interactive mode instead of initiating the interactive session.

Command Default 3DES cipher
None

Command Modes EXEC

Release	Modification
Release 3.2	This command was introduced.
Release 3.8.0	Support was added for the following: <ul style="list-style-type: none"> • Association of a specific VRF for the client connection was added. • Advanced Encryption Standard (AES) cipher with three bit lengths.
Release 4.3.1	The authentication keyword was added.

Usage Guidelines

Use the **ssh** command to make an outbound client connection. The SSH client tries to make an SSHv2 connection to the remote peer. If the remote peer supports only the SSHv1 server, it internally spawns an SSHv1 connection to the remote server. The process of the remote peer version detection and spawning the appropriate client connection is transparent to the user.

If a VRF is specified in the **ssh** command, the **ssh** interface takes precedence over the interface specified in the **ssh client source-interface ssh client source-interface**, [on page 20](#) command.

When you configure the **cipher aes** keyword, an SSH client makes a proposal, including one or more of the key sizes you specified, as part of its request to the SSH server. The SSH server chooses the best possible cipher, based both on which ciphers that server supports and on the client proposal.



Note

AES encryption algorithm is not supported on the SSHv1 server and client. Any requests for an AES cipher sent by an SSHv2 client to an SSHv1 server are ignored, with the server using 3DES instead.

A VRF is required to run SSH, although this may be either the default VRF or a VRF specified by the user. If no VRF is specified while configuring the **ssh client source-interface**, [on page 20](#) or **ssh client knownhost**, [on page 18](#) commands, the default VRF is assumed.

Use the **command** keyword to enable the SSHv2 server to parse and execute the **ssh** command in non-interactive mode instead of initiating an interactive session.

Task ID

Task ID	Operations
crypto	execute
basic-services	execute

Examples

The following sample output is from the **ssh** command to enable an outbound SSH client connection:

```
RP/0/0/CPU0:router# ssh vrf green username userabc
Password:
Remote-host>
```

Related Commands

Command	Description
show ssh, on page 11	Displays all the incoming and outgoing connections to the router.

ssh client knownhost

To authenticate a server public key (pubkey), use the **ssh client knownhost** command. To disable authentication of a server pubkey, use the **no** form of this command.

ssh client knownhost device:/filename

no ssh client knownhost device:/filename

Syntax Description

<i>device:/filename</i>	Complete path of the filename (for example, slot0:/server_pubkey). The colon (:) and slash (/) are required.
-------------------------	--

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

The *server pubkey* is a cryptographic system that uses two keys at the client end—a public key known to everyone and a private, or secret, key known only to the owner of the keys. In the absence of certificates, the server pubkey is transported to the client through an out-of-band secure channel. The client stores this pubkey in its local database and compares this key against the key supplied by the server during the early stage of key negotiation for a session-building handshake. If the key is not matched or no key is found in the local database of the client, users are prompted to either accept or reject the session.

The operative assumption is that the first time the server pubkey is retrieved through an out-of-band secure channel, it is stored in the local database. This process is identical to the current model adapted by Secure Shell (SSH) implementations in the UNIX environment.

Task ID

Task ID	Operations
crypto	read, write

Examples

The following sample output is from the **ssh client knownhost** command:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# ssh client knownhost disk0:/ssh.knownhost
RP/0/0/CPU0:router(config)# commit
```

```
RP/0/0/CPU0:router# ssh host1 username user1234
Host key not found from the list of known hosts.
Are you sure you want to continue connecting (yes/no)? yes
Password:
RP/0/0/CPU0:host1# exit
RP/0/0/CPU0:router# ssh host1 username user1234
```

ssh client source-interface

To specify the source IP address of a selected interface for all outgoing Secure Shell (SSH) connections, use the **ssh client source-interface** command. To disable use of the specified interface IP address, use the **no** form of this command.

ssh client source-interface *type interface-path-id*

no ssh client source-interface *type interface-path-id*

Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

No source interface is used.

Command Modes

Global configuration mode

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

Use the **ssh client source-interface** command to set the IP address of the specified interface for all outgoing SSH connections. If this command is not configured, TCP chooses the source IP address when the socket is connected, based on the outgoing interface used—which in turn is based on the route required to reach the server. This command applies to outbound shell over SSH as well as Secure Shell File Transfer Protocol (SFTP) sessions, which use the ssh client as a transport.

The source-interface configuration affects connections only to the remote host in the same address family. The system database (Sysdb) verifies that the interface specified in the command has a corresponding IP address (in the same family) configured.

Task ID

Task ID	Operations
crypto	read, write

Examples

The following example shows how to set the IP address of the Management Ethernet interface for all outgoing SSH connections:

```
RP/0/0/CPU0:router# configure  
RP/0/0/CPU0:router(config)# ssh client source-interface MgmtEth 0/0/CPU0/0
```

ssh client vrf

To configure a new VRF for use by the SSH client, use the **ssh client vrf** command. To remove the specified VRF, use the **no** form of this command.

ssh client vrf *vrf-name*

no ssh client vrf *vrf-name*

Syntax Description

<i>vrf-name</i>	Specifies the name of the VRF to be used by the SSH client.
-----------------	---

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

An SSH client can have only one VRF.

If a specific VRF is not configured for the SSH client, the default VRF is assumed when applying other SSH client-related commands, such as [ssh client knownhost](#), on page 18 or [ssh client source-interface](#), on page 20.

Task ID

Task ID	Operations
crypto	read, write

Examples

The following example shows the SSH client being configured to start with the specified VRF:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# ssh client vrf green
```

Related Commands

Command	Description
ssh client dscp <value from 0 - 63>	SSH Client supports setting DSCP value in the outgoing packets. If not configured, the default DSCP value set in packets is 16 (for both client and server).

ssh server

To bring up the Secure Shell (SSH) server and to configure one or more VRFs for its use, use the **ssh server** command. To stop the SSH server from receiving any further connections for the specified VRF, use the **no** form of this command.

ssh server [**vrf** *vrf-name*] **v2**

no ssh server [**vrf** *vrf-name*] **v2**

Syntax Description

vrf <i>vrf-name</i>	Specifies the name of the VRF to be used by the SSH server. The maximum VRF length is 32 characters. Note If no VRF is specified, the default VRF is assumed.
v2	Forces the SSH server version to be only 2.

Command Default

The default SSH server version is 2 (SSHv2), which falls back to 1 (SSHv1) if the incoming SSH client connection is set to SSHv1.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.8.0	The vrf keyword was supported.

Usage Guidelines

An SSH server must be configured at minimum for one VRF. If you delete all configured VRFs, including the default, the SSH server process stops. If you do not configure a specific VRF for the SSH client when applying other commands, such as **ssh client knownhost** or **ssh client source-interface**, the default VRF is assumed.

The SSH server listens for an incoming client connection on port 22. This server handles both Secure Shell Version 1 (SSHv1) and SSHv2 incoming client connections for both IPv4 and IPv6 address families. To accept only Secure Shell Version 2 connections, use the [ssh server v2](#), on page 32 command.

To verify that the SSH server is up and running, use the **show process sshd** command.

Task ID

Task ID	Operations
crypto	read, write

Examples

In the following example, the SSH server is brought up to receive connections for VRF “green”:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# ssh server vrf green
```

Related Commands

Command	Description
show processes	Displays information about the SSH server. For more information, see the <i>Cisco IOS XR System Management Command Reference for the Cisco XR 12000 Series Router</i> .
ssh server v2, on page 32	Forces the SSH server version to be only 2 (SSHv2).
ssh server dscp <value from 0 - 63>	SSH server supports setting DSCP value in the outgoing packets. If not configured, the default DSCP value set in packets is 16 (for both client and server).

ssh server logging

To enable SSH server logging, use the **ssh server logging** command. To discontinue SSH server logging, use the **no** form of this command.

ssh server logging

no ssh server logging

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes Global configuration

Command History	Release	Modification
	Release 3.8.0	This command was introduced.

Usage Guidelines Once you configure the logging, the following messages are displayed:

- Warning: The requested term-type is not supported
- SSH v2 connection from %s succeeded (*user:%s, cipher:%s, mac:%s, pty:%s*)

The warning message appears if you try to connect using an unsupported terminal type. Routers running the Cisco IOS XR software support only the vt100 terminal type.

The second message confirms a successful login.

Task ID	Task ID	Operations
	crypto	read, write

Examples The following example shows the initiation of an SSH server logging:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# ssh server logging
```

Related Commands

Command	Description
ssh server , on page 24	Initiates the SSH server.

ssh server rate-limit

To limit the number of incoming Secure Shell (SSH) connection requests allowed per minute, use the **ssh server rate-limit** command. To return to the default value, use the **no** form of this command.

ssh server rate-limit *rate-limit*

no ssh server rate-limit

Syntax Description

<i>rate-limit</i>	Number of incoming SSH connection requests allowed per minute. Range is from 1 to 120. When setting it to 60 attempts per minute, it basically means that we can only allow 1 per second. If you set up 2 sessions at the same time from 2 different consoles, one of them will get rate limited. This is connection attempts to the ssh server, not bound per interface/username or anything like that. So value of 30 means 1 session per 2 seconds and so forth.
-------------------	---

Command Default

rate-limit: 60 connection requests per minute

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 3.2	This command was introduced.

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines

Use the **ssh server rate-limit** command to limit the incoming SSH connection requests to the configured rate. Any connection request beyond the rate limit is rejected by the SSH server. Changing the rate limit does not affect established SSH sessions.

If, for example, the *rate-limit* argument is set to 30, then 30 requests are allowed per minute, or more precisely, a two-second interval between connections is enforced.

Task ID

Task ID	Operations
crypto	read, write

Examples

The following example shows how to set the limit of incoming SSH connection requests to 20 per minute:

```
RP/0/0/CPU0:router# configure  
RP/0/0/CPU0:router(config)# ssh server rate-limit 20
```

ssh server session-limit

To configure the number of allowable concurrent incoming Secure Shell (SSH) sessions, use the **ssh server session-limit** command. To return to the default value, use the **no** form of this command.

ssh server session-limit *sessions*

no ssh server session-limit

Syntax Description

<i>sessions</i>	Number of incoming SSH sessions allowed across the router. The range is from 1 to 1024.
-----------------	---

Command Default

sessions: 64 per router

Command Modes

Global configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

Use the **ssh server session-limit** command to configure the limit of allowable concurrent incoming SSH connections. Outgoing connections are not part of the limit.

Task ID

Task ID	Operations
crypto	read, write

Examples

The following example shows how to set the limit of incoming SSH connections to 50:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# ssh server session-limit 50
```

Related Commands

Command	Description
show processes	Displays information about the SSH server. For more information, see <i>Cisco IOS XR System Management Command Reference for the Cisco XR 12000 Series Router</i> .

ssh server v2

To force the SSH server version to be only 2 (SSHv2), use the **ssh server v2** command. To bring down an SSH server for SSHv2, use the **no** form of this command.

ssh server v2

no ssh server v2

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes Global configuration

Command History	Release	Modification
	Release 3.3.0	This command was introduced.

Usage Guidelines Only SSHv2 client connections are allowed.

Task ID	Task ID	Operations
	crypto	read, write

Examples The following example shows how to initiate the SSH server version to be only SSHv2:

```
RP/0/0/CPU0:router#configure
RP/0/0/CPU0:router(config)# ssh server v2
```

Related Commands

Command	Description
ssh server , on page 24	Initiates the SSH server.

ssh timeout

To configure the timeout value for authentication, authorization, and accounting (AAA) user authentication, use the **ssh timeout** command. To set the timeout value to the default time, use the **no** form of this command.

ssh timeout *seconds*

no ssh timeout *seconds*

Syntax Description	<i>seconds</i>	Time period (in seconds) for user authentication. The range is from 5 to 120.
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Command Default	<i>seconds: 30</i>
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Command Modes	Global configuration
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Command History	Release	Modification
	Release 3.2	This command was introduced.

Usage Guidelines Use the **ssh timeout** command to configure the timeout value for user authentication to AAA. If the user fails to authenticate itself within the configured time to AAA, the connection is aborted. If no value is configured, the default value of 30 seconds is used.

Task ID	Task ID	Operations
	crypto	read, write

Examples In the following example, the timeout value for AAA user authentication is set to 60 seconds:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router (config)# ssh timeout 60
```

