



# Reverse SSH Enhancements

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The Reverse SSH Enhancements feature provides an alternative method of configuring reverse Secure Shell (SSH). Using this feature, you can configure reverse SSH without having to list separate lines for every terminal or auxiliary line on which SSH has to be enabled. This feature also eliminates the rotary-group limitation. This feature is supported for SSH Version 1 and SSH Version 2.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## Prerequisites for Reverse SSH Enhancements

- SSH must be enabled.
- The SSH client and server must be running the same version of SSH.



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**Americas Headquarters:**  
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

## Restrictions for Reverse SSH Enhancements

- The `-I` keyword and `userid :{number} {ip-address}` delimiter and arguments are mandatory when configuring the alternative method of Reverse SSH for console access.

## Information About Reverse SSH Enhancements

- [Reverse Telnet, page 2](#)
- [Reverse SSH, page 2](#)

## Reverse Telnet

Cisco IOS XE software has for quite some time included a feature called Reverse Telnet, whereby you can telnet to a certain port range and connect to terminal or auxiliary lines. Reverse telnetting has often been used to connect a router that has many terminal lines to the consoles of other routers or to other devices. Telnetting makes it easy to reach the router console from anywhere simply by telnetting to the terminal server on a specific line. This telnetting approach can be used to configure a router even if all network connectivity to that router is disconnected. Reverse telnetting also allows modems that are attached to routers to be used for dial-out (usually with a rotary device).

## Reverse SSH

Reverse telnetting can be accomplished using SSH. Unlike reverse telnetting, SSH provides for secure connections. The Reverse SSH Enhancements feature provides you with a simplified method of configuring SSH. Using this feature, you no longer have to configure a separate line for every terminal or auxiliary line on which you want to enable SSH. The previous method of configuring reverse SSH limited the number of ports that can be accessed to 100. The Reverse SSH Enhancements feature removes the port number limitation. For information on the alternative method of configuring reverse SSH, see the section “[How to Configure Reverse SSH Enhancements, page 2.](#)”

## How to Configure Reverse SSH Enhancements

- [Configuring Reverse SSH for Console Access, page 3](#)
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## Configuring Reverse SSH for Console Access

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **line** *line-number ending-line-number*
4. **no exec**
5. **login authentication** *listname*
6. **transport input ssh**
7. **exit**
8. **exit**
9. **ssh -l** *userid* : {*number*} {*ip-address*}

### DETAILED STEPS

Command or Action	Purpose
<p><b>Step 1</b> <b>enable</b></p> <p><b>Example:</b></p> <pre>Router&gt; enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<p><b>Step 2</b> <b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Router# configure terminal</pre>	<p>Enters global configuration mode.</p>
<p><b>Step 3</b> <b>line</b> <i>line-number ending-line-number</i></p> <p><b>Example:</b></p> <pre>Router# line 1 3</pre>	<p>Identifies a line for configuration and enters line configuration mode.</p>
<p><b>Step 4</b> <b>no exec</b></p> <p><b>Example:</b></p> <pre>Router (config-line)# no exec</pre>	<p>Disables EXEC processing on a line.</p>

Command or Action	Purpose
<p><b>Step 5</b> login authentication <i>listname</i></p> <p><b>Example:</b></p> <pre>Router (config-line)# login authentication default</pre>	<p>Defines a login authentication mechanism for the lines.</p> <p><b>Note</b> The authentication method must use a username and password.</p>
<p><b>Step 6</b> transport input ssh</p> <p><b>Example:</b></p> <pre>Router (config-line)# transport input ssh</pre>	<p>Defines which protocols to use to connect to a specific line of the router.</p> <ul style="list-style-type: none"> <li>The <b>ssh</b> keyword must be used for the Reverse SSH Enhancements feature.</li> </ul>
<p><b>Step 7</b> exit</p> <p><b>Example:</b></p> <pre>Router (config-line)# exit</pre>	<p>Exits line configuration mode.</p>
<p><b>Step 8</b> exit</p> <p><b>Example:</b></p> <pre>Router (config)# exit</pre>	<p>Exits global configuration mode.</p>
<p><b>Step 9</b> ssh -l <i>userid</i> : {<i>number</i>} {<i>ip-address</i>}</p> <p><b>Example:</b></p> <pre>Router# ssh -l lab:1 router.example.com</pre>	<p>Specifies the user ID to use when logging in on the remote networking device that is running the SSH server.</p> <ul style="list-style-type: none"> <li><i>userid</i> --User ID.</li> <li>: --Signifies that a port number and terminal IP address will follow the <i>userid</i> argument.</li> <li><i>number</i> --Terminal or auxiliary line number.</li> <li><i>ip-address</i> --Terminal server IP address.</li> </ul> <p><b>Note</b> The <i>userid</i> argument and <b>:rotary</b>{<i>number</i>}{<i>ip-address</i>} delimiter and arguments are mandatory when configuring the alternative method of Reverse SSH for modem access.</p>

## Configuring Reverse SSH for Modem Access

Reverse SSH is configured on a modem used for dial-out lines. To get any of the dial-out modems, you can use any SSH client and start a SSH session as shown (in Step 10) to get to the next available modem from the rotary device.

**SUMMARY STEPS**

1. **enable**
2. **configure terminal**
3. **line** *line-number ending-line-number*
4. **no exec**
5. **login authentication** *listname*
6. **rotary** *group*
7. **transport input ssh**
8. **exit**
9. **exit**
10. **ssh -l** *userid* **:rotary** {*number*} {*ip-address*}

**DETAILED STEPS**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>line</b> <i>line-number ending-line-number</i>  <b>Example:</b> Router# line 1 200	Identifies a line for configuration and enters line configuration mode.
<b>Step 4</b>	<b>no exec</b>  <b>Example:</b> Router (config-line)# no exec	Disables EXEC processing on a line.
<b>Step 5</b>	<b>login authentication</b> <i>listname</i>  <b>Example:</b> Router (config-line)# login authentication default	Defines a login authentication mechanism for the lines.  <b>Note</b> The authentication method must use a username and password.

Command or Action	Purpose
<p><b>Step 6</b> <code>rotary group</code></p> <p><b>Example:</b></p> <pre>Router (config-line)# rotary 1</pre>	<p>Defines a group of lines consisting of one or more virtual terminal lines or one auxiliary port line.</p>
<p><b>Step 7</b> <code>transport input ssh</code></p> <p><b>Example:</b></p> <pre>Router (config-line)# transport input ssh</pre>	<p>Defines which protocols to use to connect to a specific line of the router.</p> <ul style="list-style-type: none"> <li>The <code>ssh</code> keyword must be used for the Reverse SSH Enhancements feature.</li> </ul>
<p><b>Step 8</b> <code>exit</code></p> <p><b>Example:</b></p> <pre>Router (config-line)# exit</pre>	<p>Exits line configuration mode.</p>
<p><b>Step 9</b> <code>exit</code></p> <p><b>Example:</b></p> <pre>Router (config)# exit</pre>	<p>Exits global configuration mode.</p>
<p><b>Step 10</b> <code>ssh -l userid :rotary {number} {ip-address}</code></p> <p><b>Example:</b></p> <pre>Router# ssh -l lab:rotary1 router.example.com</pre>	<p>Specifies the user ID to use when logging in on the remote networking device that is running the SSH server.</p> <ul style="list-style-type: none"> <li><code>userid</code> --User ID.</li> <li><code>:</code> --Signifies that a port number and terminal IP address will follow the <code>userid</code> argument.</li> <li><code>number</code> --Terminal or auxiliary line number.</li> <li><code>ip-address</code> --Terminal server IP address.</li> </ul> <p><b>Note</b> The <code>userid</code> argument and <code>:rotary{number}{ip-address}</code> delimiter and arguments are mandatory when configuring the alternative method of Reverse SSH for modem access.</p>

## Troubleshooting Reverse SSH on the Client

To troubleshoot the reverse SSH configuration on the client (remote device), perform the following steps.

### SUMMARY STEPS

1. `enable`
2. `debug ip ssh client`

**DETAILED STEPS**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	<p><b>enable</b></p> <p><b>Example:</b></p> <pre>Router&gt; enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<p><b>debug ip ssh client</b></p> <p><b>Example:</b></p> <pre>Router# debug ip ssh client</pre>	<p>Displays debugging messages for the SSH client.</p>

## Troubleshooting Reverse SSH on the Server

To troubleshoot the reverse SSH configuration on the terminal server, perform the following steps. The steps may be configured in any order or independent of one another.

**SUMMARY STEPS**

1. **enable**
2. **debug ip ssh**
3. **show ssh**
4. **show line**

**DETAILED STEPS**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	<p><b>enable</b></p> <p><b>Example:</b></p> <pre>Router&gt; enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<p><b>debug ip ssh</b></p> <p><b>Example:</b></p> <pre>Router# debug ip ssh</pre>	<p>Displays debugging messages for the SSH server.</p>

	Command or Action	Purpose
Step 3	<b>show ssh</b>  <b>Example:</b> Router# show ssh	Displays the status of the SSH server connections.
Step 4	<b>show line</b>  <b>Example:</b> Router# show line	Displays parameters of a terminal line.

## Configuration Examples for Reverse SSH Enhancements

- [Example Reverse SSH Console Access, page 8](#)
- [Example Reverse SSH Modem Access, page 8](#)

### Example Reverse SSH Console Access

The following configuration example shows that reverse SSH has been configured for console access for terminal lines 1 through 3:

#### Terminal Server Configuration

```
line 1 3
  no exec
  login authentication default
  transport input ssh
```

#### Client Configuration

The following commands configured on the SSH client will form the reverse SSH session with lines 1, 2, and 3, respectively:

```
ssh -l lab:1 router.example.com
ssh -l lab:2 router.example.com
ssh -l lab:3 router.example.com
```

### Example Reverse SSH Modem Access

The following configuration example shows that dial-out lines 1 through 200 have been grouped under rotary group 1 for modem access:

```
line 1 200
  no exec
  login authentication default
  rotary 1
```



```
transport input ssh
exit
```

The following command shows that reverse SSH will connect to the first free line in the rotary group:

```
ssh -l lab:rotary1 router.example.com
```

## Additional References

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Commands List, All Releases</a>
Security commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	Cisco IOS Security Command Reference
Configuring Secure Shell	Configuring Secure Shell and Secure Shell Version 2 Support feature modules.

### Standards

Standards	Title
None.	--

### MIBs

MIBs	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

### RFCs

RFCs	Title
None	--

### Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for Reverse SSH Enhancements

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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**Table 1** *Feature Information for Reverse SSH Enhancements*

Feature Name	Releases	Feature Configuration Information
Reverse SSH Enhancements	Cisco IOS XE Release 2.1	<p>The Reverse SSH Enhancements feature provides an alternative method of configuring reverse Secure Shell (SSH). Using this feature, you can configure reverse SSH without having to list separate lines for every terminal or auxiliary line on which SSH has to be enabled. This feature also eliminates the rotary-group limitation. This feature is supported for SSH Version 1 and SSH Version 2.</p> <p>In Cisco IOS XE Release 2.1, this feature was introduced on Cisco ASR 1000 Series Aggregation Services Routers.</p> <p>The following command was introduced or modified: <b>ssh</b>.</p>

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