



Physical and Virtual Terminals

You can access and manage the configuration and settings of a router using Physical and Virtual Terminals.

Physical terminals on routers are the physical ports or interfaces that provide connectivity for devices. Ethernet Ports, Serial Ports, Console Ports and USB ports are few examples of physical terminal. The physical terminal lines for the console port is identified by its location, expressed in the format of *rack/slot/module*, on the active or standby route processor (RP) where the respective console port resides.

Virtual terminals or **vty** lines are virtual lines that allow connecting to the device using telnet or Secure Shell (SSH). These virtual terminals can be accessed remotely over a network. The Cisco IOS XR software assigns a **vty** identifier to **vtys** according to the order in which the **vty** connection has been established.

- [Physical Terminals, on page 1](#)
- [Virtual Terminals, on page 1](#)
- [Line Templates, on page 2](#)
- [Configure Physical and Virtual Terminals, on page 3](#)

Physical Terminals

The physical terminal lines for the console port is identified by its location, expressed in the format of *rack/slot/module*, on the active or standby route processor (RP) where the respective console port resides.

Virtual Terminals

Virtual terminal lines are used to allow remote access to the router. The virtual terminal or **vty** lines are virtual lines that allow connecting to the device using telnet or Secure Shell (SSH).

Physical location is not applicable for virtual terminals. The Cisco IOS XR software assigns a **vty** identifier to **vtys** according to the order in which the **vty** connection has been established.

vty Pools

Each virtual line is a member of a pool of connections using a common line template configuration. Multiple vty pools may exist, each containing a defined number of vtys as configured in the vty pool.

vty Pools Supported by Default

The Cisco IOS XR software supports the following vty pools by default:

Default vty Pools

The default vty pool consists of five vtys (vtys 0 through 4) that each reference the default line template.

Default Fault Manager Pool

The default fault manager pool consists of six vtys (vtys 100 through 105) that each reference the default line template.

User-defined vty Pool

In addition to the default vty pool and default fault manager pool, you can also configure a user-defined vty pool that can reference the default template or a user-defined template.

Guidelines for vty Pools

- The vty range for the default vty pool must start at vty 0 and must contain a minimum of five vtys.
- The vty range from 0 through 99 can reference the default vty pool.
- You can resize the default vty pool by increasing the range of vtys that compose the default vty pool.
- The vty range from 5 through 99 can reference a user-defined vty pool.
- If the range of vtys for the default vty pool has been resized, use the first range value free from the default line template. For example, if the range of vtys for the default vty pool has been configured to include 10 vtys (vty 0 through 9), the range value for the user-defined vty pool must start with vty 10.
- The vty range from 100 is reserved for the fault manager vty pool.
- The vty range for fault manager vty pools must start at vty 100 and must contain a minimum of six vtys.
- A vty can be a member of only one vty pool. A vty pool configuration will fail if the vty pool includes a vty that is already in another pool.
- If you attempt to remove an active vty from the active vty pool when configuring a vty pool, the configuration for that vty pool will fail

Line Templates

Configuration templates allow you to create a name that represents a group of configuration commands. Likewise, line templates represent a set of attributes that can be applied to multiple terminal lines. It greatly reduces the time and simplifies the process of configuring multiple terminal lines.

Line templates define standard attribute settings for incoming and outgoing transport over physical and virtual terminal lines (vtys). Vty pools are used to apply template settings to ranges of vtys.

Line Templates Types

The following line templates are available in the Cisco IOS XR software.

Default Line Template

The default line template that applies to a physical and virtual terminal lines.

Console Line Template

The line template that applies to the console line.

User-defined Line Template

User-defined line templates that can be applied to a range of virtual terminal lines.

Line Template Guidelines

- Modify the templates for the physical terminal lines on the router (the console port) from line template configuration mode. Use the **line console** command from Global Configuration mode to enter line template configuration mode for the console template.
- Modify the template for virtual lines by configuring a user-defined template with the **line template-name** command, configuring the terminal attributes for the user-defined template from line template configuration, and applying the template to a range of virtual terminal lines using the **vtty pool** command.
- The default EXEC timeout for the default line template is 10 minutes.
- The default width for the default line template is 80 characters.
- The default length for the default line template is 24 lines.
- Attributes not defined in the console template, or any virtual template, are taken from the default template.
- The default session-limit for line template is applicable to Telnet sessions only. It is not applicable for SSH sessions.

Configure Physical and Virtual Terminals

To modify the terminal attributes for the console and default line templates, follow these steps in Global configuration mode

You can use the console or default options while configuring the line templates

Modify Console Line Template

This configuration example shows how to modify the terminal attribute settings for the console line template:

Procedure

Step 1 Example:

```
Router# configure
Router(config)# line console
Router(config-line)# exec-timeout 0 0
Router(config-line)# escape-character 0x5a
Router(config-line)# session-limit 10
Router(config-line)# disconnect-character 0x59
Router(config-line)# session-timeout 100
Router(config-line)# transport input telnet
Router(config-line)# transport output telnet
Router(config-line)# commit
```

Step 2 To verify that the terminal attributes for the console line template have been applied to the console, use the **show line** command:

Example:

```
Router# show line console location 0/0/CPU0
```

Modify Default Template

This configuration example shows how to override the terminal settings for the default line template:

Procedure

Example:

```
Router# configure
Router(config)# line default
Router(config-line)# exec-timeout 0 0
Router(config-line)# width 512
Router(config-line)# length 512
Router(config-line)# commit
```

Create or Modify vty Pools

The two primary steps in working with templates are creating templates and applying templates.

Before you begin

Before creating or modifying the vty pools, enable the telnet server using the **telnet server** command in Global Configuration mode. See *IP Addresses and Services Configuration Guide for Cisco ASR 9000 Series Routers* and *IP Addresses and Services Command Reference for Cisco ASR 9000 Series Routers* for more information.

Procedure

Step 1 Configure number of allowable telnet servers, upto a maximum of 100 telnet servers.

Example:

```
Router# configure
Router#(config) telnet ipv4 server max-servers 10
Router#(config) line template 1
Router#(config-line) exit
Router#(config) vty-pool default 0 5 line-template default
Router#(config) commit
```

Step 2 **Example:**

Monitor Terminals and Terminal Sessions

The optional tasks in this module describes how to monitor terminals and terminal sessions on your router.

Procedure

Step 1 Display the terminal parameters of terminal lines.

Example:

```
Router# show line
```

Step 2 Display the terminal attribute settings for the current terminal line

Example:

```
Router# show terminal
```

Step 3 Displays information about the active lines on the router.

Example:

```
Router# show users
```

