

Configuring the Switch with the CLI Setup Program

- Entering the Initial Configuration Information, on page 1
- System Security Configuration, on page 2

Entering the Initial Configuration Information

This chapter provides a command-line interface (CLI)-based setup procedure for a switch.

To set up the switch, you need to complete the setup program, which runs automatically after the switch is powered on. You must assign an IP address and other configuration information necessary for the switch to communicate with the local routers and the Internet. This information is also required if you plan to use WebUI to configure and manage the switch.

In Cisco IOS XE 17.17.1 and later, you can set a password encryption level so that user passwords are not stored in plain text. See .

Before connecting the switch to a power source, review the safety warnings in Warnings.

To connect a PC to the console port of the switch, see Connecting a PC or Terminal to the Console Port.

IP and Password Settings

You need this information from your network administrator before you complete the setup program:

- Encryption level and Master key (Cisco IOS XE 17.17.1 and later)
- · Switch IP address
- Subnet mask (IP netmask)
- Default gateway (router)
- Enable secret password
- Enable password
- · SSH password

System Security Configuration

For enchanced security, sensitive information such as passwords needs to be encrypted. The configuration dialog includes a System Security Configuration Dialog that allows you to set the password encryption level. Encryption levels include type-6 and type-7 encryption. It is recommended that you enable both types.

- Type-6 uses Advanced Encryption Standard (AES) for encrypting the passwords. Type-6 password encryption and decryption is coupled with a master-key that you enter. You must remember the master key because it cannot be recovered.
- The master key is the password/key used to encrypt all other keys in the switch configuration with the use of an AES symmetric cipher. The master key is not stored in the switch configuration and cannot be seen or obtained in any way while connected to the switch. Once configured, the master key is used to encrypt any existing or new keys in the switch configuration. Keys are not encrypted until you issue the password encryption aes command.
- Type-7 passwords are an obfuscation of the original plain text password. It is based on Vigenere Cipher and prevents someone seeing the real passwords in a configuration.

You can use the setup program to set the password encryption level on both a new switch and a switch that is already configured. For a new switch, see Initial Configuration - Type-6 Encryption, on page 2 or Initial Configuration - Type-7 Encryption, on page 5. To configure system security settings without running the initial setup, see Setting the Password Encryption Level, on page 8.

Initial Configuration - Type-6 Encryption

To create an initial configuration for the switch with the setup program with type-6 encryption, complete the following steps:

Procedure

Step 1 Enter **Yes** at the following prompt:

```
--- System Configuration Dialog ---
```

Would you like to enter the initial configuration dialog? [yes/no]: yes

Step 2 At the prompt, enter the password encryption level that you want to apply:

```
----System Security Configuration Dialog----
```

Cisco recommends that for enchanced security users should encrypt sensitive info The configuration dialog will allow you to set encryption level It is recommended that both type-6 & type-7 encryption should be enabled by user For type-6 user will need to create and remember Master key as it cannot be recovered

- [0] for both type-6 & type-7 encryption to be applied on the box
- [1] for only type-7 encryption to be applied on the box
- [2] for no encryption to be applied on the box

Enter your encryption selection [2]: $\mathbf{0}$

Note

In Cisco IOS XE 17.17.1, if you select both type 6 & type 7 encryption [0], only the username is automatically converted to type 6, and the enable password and the line vty password are automatically converted to type 7 instead of type 6.

Step 3 Enter the master key to be used to encrypt all other keys in the switch:

```
Enter the Master key min 8 chars \& max 127 chars, Master key should not begin with '!, \#, ': *************
```

Step 4 Enter the master key again to confirm it:

```
Confirm the master key: *********

The following configuration command script was created:

key config-key password-encrypt

Testkey12345
!

password encryption aes
service password-encryption
!
!
end
```

Note

You should save the Master Key, because you will need it if this device is replaced.

Step 5 Enter **2** at the prompt to save the System Security Configuration:

```
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]: 2
Building configuration...
[OK]
Use the enabled mode 'configure' command to modify this configuration.
```

Step 6 Enter **yes** at the prompt to configure basic management settings:

```
At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.

Basic management setup configures only enough connectivity for management of the system, extended setup will ask you to configure each interface on the system

Would you like to enter basic management setup? [yes/no]: yes Configuring global parameters:
```

Step 7 Enter a hostname for the switch:

```
Enter host name [Switch]: Switch123
```

Step 8 Enter an enable secret password:

```
The enable secret is a password used to protect access to privileged EXEC and configuration modes. This password, after entered, becomes encrypted in the configuration.
```

Step 9 Enter the enable secret password again to confirm it:

```
Confirm enable secret: *******
```

Step 10 Enter an enable password:

```
The enable password is used when you do not specify an enable secret password, with some older software versions, and some boot images.

Enter enable password: ********
```

Step 11 Enter a virtual terminal password.

The password can be from 1 to 25 alphanumeric characters, is case sensitive, allows spaces, but ignores leading spaces.

```
The virtual terminal password is used to protect access to the router over a network interface. Enter virtual terminal password: ********
```

Step 12 Enter the interface name (physical interface or VLAN name) of the interface that connects to the management network. For this release, always use **vlan1** as that interface.

Note

The switch will transmit a DHCP discover message on the **vlan1** interface. If the switch is connected to the network before the CLI initial setup process is started, the interface may have been assigned a dynamic IP address. It is all right if you do not see an IP address on the **vlan1** interface. This process allows you set a static IP address for management, which will over write the dynamically assigned IP address.

Current interface summary

```
OK? Method Status
Interface
                      IP-Address
                                                                       Protocol
                     10.16.1.120
                                      YES DHCP up
Vlan1
                                                                       up
GigabitEthernet1/1
                                      YES unset up
                      unassigned
                                                                       up
GigabitEthernet1/2 unassigned YES unset up WigabitEthernet1/2 unassigned YES unset down
                                                                       down
GigabitEthernet1/3 unassigned YES unset up
                                                                       uρ
GigabitEthernet1/4 unassigned
                                     YES unset down
                                                                       down
GigabitEthernet1/5 unassigned
                                     YES unset down
                                                                       down
GigabitEthernet1/6 unassigned GigabitEthernet1/7 unassigned
                                      YES unset down
                                                                       down
                                    YES unset up
                                                                       up
GigabitEthernet1/8 unassigned
                                    YES unset up
                                                                       uρ
GigabitEthernet1/9 unassigned
                                     YES unset down
                                                                       down
GigabitEthernet1/10 unassigned
                                     YES unset down
                                                                       down
AppGigabitEthernet1/1 unassigned
                                      YES unset up
                                                                       up
Enter interface name used to connect to the
management network from the above interface summary: vlan1
Configuring interface Vlan1:
    IP address for this interface [10.16.1.120]:
    Subnet mask for this interface [255.0.0.0] :
    Class A network is 10.0.0.0, 8 subnet bits; mask is /8
The following configuration command script was created:
hostname Switch123
```

```
enable secret 9 $9$4kYFyV4Hh9JVOk$Cwi3/tNTc7uHy7CBsBfOWo6ulq/Sg07in3NJ5e7Yy0U
enable password 0 password
service password-encryption
line vty 0 15
password 0 password
no snmp-server
!
!
interface Vlan1
no shutdown
ip address 10.16.1.120 255.0.0.0
!
interface GigabitEthernet1/1
!
interface GigabitEthernet1/2
!
interface GigabitEthernet1/3
!
interface GigabitEthernet1/4
```

Step 13 Enter **2** to save the configuration:

```
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]: 2
Building configuration...
[OK]
Use the enabled mode 'configure' command to modify this configuration.

Press RETURN to get started!
```

What to do next

After you complete the setup program, the switch can run the default configuration that you created. If you want to change this configuration or want to perform other management tasks, use one of these tools:

- Command-line interface (CLI)
- Web User Interface (WebUI)

To use the CLI, enter commands at the *Switch* > prompt through the console port by using a terminal emulation program or through the network by using Telnet. For configuration information, see the

To use WebUI, see the online help for WebUI.

Initial Configuration - Type-7 Encryption

To create an initial configuration for the switch with the setup program with only type-7 encryption, complete the following steps:

Before you begin

Access the CLI as described in Connecting a PC or Terminal to the Console Port.

Procedure

Step 1 Enter **Yes** at the following prompt:

```
--- System Configuration Dialog ---
```

Would you like to enter the initial configuration dialog? [yes/no]: yes

Step 2 At the prompt, enter **1** to apply only type-7 password encryption:

```
----System Security Configuration Dialog----
```

Cisco recommends that for enchanced security users should encrypt sensitive info The configuration dialog will allow you to set encryption level It is recommended that both type-6 & type-7 encryption should be enabled by user For type-6 user will need to create and remember Master key as it cannot be recovered

- [0] for both type-6 & type-7 encryption to be applied on the box
- [1] for only type-7 encryption to be applied on the box
- [2] for no encryption to be applied on the box

Enter your encryption selection [2]: 1

Step 3 Enter **2** at the prompt to save the System Security Configuration:

- [0] Go to the IOS command prompt without saving this config.
- [1] Return back to the setup without saving this config.
- [2] Save this configuration to nvram and exit.

```
Enter your selection [2]: 2
Building configuration...
[OK]
```

Use the enabled mode 'configure' command to modify this configuration.

Step 4 Enter **yes** at the prompt to configure basic management settings:

At any point you may enter a question mark '?' for help. Use ctrl-c to abort configuration dialog at any prompt. Default settings are in square brackets '[]'.

Basic management setup configures only enough connectivity for management of the system, extended setup will ask you to configure each interface on the system

Would you like to enter basic management setup? [yes/no]: **yes** Configuring global parameters:

Step 5 Enter a hostname for the switch:

Enter host name [Switch]: Switch123

Step 6 Enter an enable secret password:

```
The enable secret is a password used to protect access to privileged EXEC and configuration modes. This password, after entered, becomes encrypted in the configuration.
```

secret should be of minimum 10 characters and maximum 32 characters with at least 1 upper case, 1 lower case, 1 digit and should not contain [cisco]

Step 7 Enter the enable secret password again to confirm it:

```
Confirm enable secret: ********
```

Step 8 Enter an enable password:

```
The enable password is used when you do not specify an enable secret password, with some older software versions, and some boot images.

Enter enable password: *******
```

Step 9 Enter a virtual terminal password.

The password can be from 1 to 25 alphanumeric characters, is case sensitive, allows spaces, but ignores leading spaces.

```
The virtual terminal password is used to protect access to the router over a network interface. Enter virtual terminal password: ********
```

Step 10 Enter the interface name (physical interface or VLAN name) of the interface that connects to the management network. For this release, always use **vlan1** as that interface.

Note

The switch will transmit a DHCP discover message on the **vlan1** interface. If the switch is connected to the network before the CLI initial setup process is started, the interface may have been assigned a dynamic IP address. It is all right if you do not see an IP address on the **vlan1** interface. This process allows you set a static IP address for management, which will over write the dynamically assigned IP address.

Current interface summary

```
Interface
                     IP-Address
                                   OK? Method Status
                                                                    Protocol
                    10.16.1.120 YES DHCP up
Vlan1
                                                                   up
                   unassigned YES unset up
GigabitEthernet1/1
                                                                    up
GigabitEthernet1/2 unassigned
                                   YES unset down
                                                                    down
                                   YES unset up
GigabitEthernet1/3 unassigned
                                                                    up
                                    YES unset down
                                                                    down
GigabitEthernet1/4
                     unassigned
                                   YES unset down
GigabitEthernet1/5
                     unassigned
                                                                    down
GigabitEthernet1/6 unassigned
                                   YES unset down
                                                                   down
GigabitEthernet1/7
                   unassigned
                                   YES unset up
                                                                    up
GigabitEthernet1/8 unassigned
                                   YES unset up
                                                                    up
GigabitEthernet1/9
                     unassigned
                                    YES unset down
                                                                    down
                                   YES unset down
GigabitEthernet1/10 unassigned unassigned
                                                                    down
AppGigabitEthernet1/1 unassigned
                                   YES unset up
                                                                    uρ
Enter interface name used to connect to the
management network from the above interface summary: vlan1
Configuring interface Vlan1:
   IP address for this interface [10.16.1.120]:
   Subnet mask for this interface [255.0.0.0] :
   Class A network is 10.0.0.0, 8 subnet bits; mask is /8
The following configuration command script was created:
hostname Switch123
enable secret 9 $9$4kYFyV4Hh9JVOk$Cwi3/tNTc7uHy7CBsBf0Wo6u1q/Sg07in3NJ5e7Yy0U
enable password 0 password
service password-encryption
```

```
line vty 0 15
password 0 password
no snmp-server
!
!
interface Vlan1
no shutdown
ip address 10.16.1.120 255.0.0.0
!
interface GigabitEthernet1/1
!
interface GigabitEthernet1/2
!
interface GigabitEthernet1/3
!
interface GigabitEthernet1/4
```

Step 11 Enter **2** to save the configuration:

```
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]: 2

Building configuration...
[OK]
Use the enabled mode 'configure' command to modify this configuration.
```

What to do next

After you complete the setup program, the switch can run the default configuration that you created. If you want to change this configuration or want to perform other management tasks, use one of these tools:

• Command-line interface (CLI)

Press RETURN to get started!

• Web User Interface (WebUI)

To use the CLI, enter commands at the *Switch* > prompt through the console port by using a terminal emulation program or through the network by using Telnet. For configuration information, see the .

To use WebUI, see the online help for WebUI.

Setting the Password Encryption Level

Follow this procedure to configure system security settings (type-6 and type-7 encryption) without running the initial setup.

Procedure

Step 1 Enter **No** at the following prompt:

Step 2

Step 3

Step 4

Step 5

Step 6

Confirm the master key: *********

The following configuration command script was created:

```
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]:
Autoinstall trying DHCPv6 on Vlan1
Would you like to enter the initial configuration dialog? [yes/no]: no
Enter the enable secret at the prompt:
  The enable secret is a password used to protect
  access to privileged EXEC and configuration modes.
  This password, after entered, becomes encrypted in
  the configuration.
  secret should be of minimum 10 characters and maximum 32 characters with
  at least 1 upper case, 1 lower case, 1 digit and
  should not contain [cisco]
  _____
  Enter enable secret: *******
  Confirm enable secret: ********
The following configuration command script was created:
enable secret 9 $9$YMkVvPLbxKn4bE$OAOX/akBBsukkRV1L.Tk7p2KaM0BXLQI.HbyGbXB8/g
end
Enter 2 to save the configuration and go to the System Security Configuration:
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.
Enter your selection [2]: 2
Building configuration...
[OK]
Use the enabled mode 'configure' command to modify this configuration.
At the prompt, enter the password encryption level that you want to apply:
  ----System Security Configuration Dialog----
 Cisco recommends that for enchanced security users should encrypt sensitive info
 The configuration dialog will allow you to set encryption level
 It is recommended that both type-6 & type-7 encryption should be enabled by user
 For type-6 user will need to create and remember Master key as it cannot be recovered
 [0] for both type-6 & type-7 encryption to be applied on the box
 [1] for only type-7 encryption to be applied on the box
 [2] for no encryption to be applied on the box
Enter your encryption selection [2]: 0
Enter the master key to be used to encrypt all other keys in the switch:
Enter the Master key min 8 chars & max 127 chars, Master key should not begin with '!, #,
; ' : ********
Enter the master key again to confirm it:
```

```
key config-key password-encrypt
Testkey12345
!
password encryption aes
service password-encryption
!
!
end
```

Note

You should save the Master Key, because you will need it if this device is replaced.

Step 7 Enter **2** at the prompt to save the System Security Configuration:

```
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]: 2
Building configuration...
[OK]
Use the enabled mode 'configure' command to modify this configuration.

Press RETURN to get started!

Switch>
```

CLI Setup Examples

Initial Configuration Example

```
key config-key password-encrypt
Testkey12345
password encryption aes
service password-encryption
!
end
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.
Enter your selection [2]: 2
Building configuration...
[OK]
Use the enabled mode 'configure' command to modify this configuration.
At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.
Basic management setup configures only enough connectivity
for management of the system, extended setup will ask you
to configure each interface on the system
Would you like to enter basic management setup? [yes/no]: yes
Configuring global parameters:
  Enter host name [Switch]: Switch123
 The enable secret is a password used to protect
  access to privileged EXEC and configuration modes.
  This password, after entered, becomes encrypted in
  the configuration.
  secret should be of minimum 10 characters and maximum 32 characters with
  at least 1 upper case, 1 lower case, 1 digit and
  should not contain [cisco]
  Enter enable secret: ********
  Confirm enable secret: *******
 The enable password is used when you do not specify an
  enable secret password, with some older software versions, and
  some boot images.
  Enter enable password: *******
  The virtual terminal password is used to protect
  access to the router over a network interface.
  Enter virtual terminal password: ******
Current interface summary
Interface
                      IP-Address
                                     OK? Method Status
                                                                       Protocol
                                   YES DHCP up
Vlan1
                      12.16.1.120
                                                                       up
GigabitEthernet1/1
                      unassigned
                                      YES unset up
                                                                       up
                                     YES unset down
GigabitEthernet1/2
                      unassigned
                                                                       down
GigabitEthernet1/3 unassigned
                                    YES unset up
                                                                       up
GigabitEthernet1/4
                    unassigned
                                     YES unset down
                                                                       down
```

```
unassigned
unassigned
GigabitEthernet1/5
                                      YES unset down
                                                                       down
                                  YES unset down
GigabitEthernet1/6
                                                                       down
GigabitEthernet1/7 unassigned
                                    YES unset up
                                                                       up
GigabitEthernet1/8 unassigned
                                     YES unset up
                                                                       up
                    unassigned
GigabitEthernet1/9
                                      YES unset down
                                                                       down
GigabitEthernet1/10
                                      YES unset down
                                                                       down
                      unassigned
AppGigabitEthernet1/1 unassigned
                                      YES unset up
                                                                       up
Enter interface name used to connect to the
management network from the above interface summary: vlan1
Configuring interface Vlan1:
    IP address for this interface [12.16.1.120]:
    Subnet mask for this interface [255.0.0.0] :
   Class A network is 12.0.0.0, 8 subnet bits; mask is /8
The following configuration command script was created:
hostname Switch123
enable secret 9 $9$4kYFyV4Hh9JVOk$Cwi3/tNTc7uHy7CBsBf0Wo6u1q/Sg07in3NJ5e7Yy0U
enable password 0 password
service password-encryption
line vty 0 15
password 0 password
no snmp-server
interface Vlan1
no shutdown
ip address 12.16.1.120 255.0.0.0
interface GigabitEthernet1/1
interface GigabitEthernet1/2
interface GigabitEthernet1/3
interface GigabitEthernet1/4
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.
Enter your selection [2]: 2
Building configuration...
[OK]
Use the enabled mode 'configure' command to modify this configuration.
Press RETURN to get started!
```

System Security Configuration Example

```
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]:
Autoinstall trying DHCPv6 on Vlan1 yes
```

```
----System Security Configuration Dialog----
 Cisco recommends that for enchanced security users should encrypt sensitive info
 The configuration dialog will allow you to set encryption level
 It is recommended that both type-6 & type-7 encryption should be enabled by user
 For type-6 user will need to create and remember Master key as it cannot be recovered
 [0] for both type-6 & type-7 encryption to be applied on the box
 [1] for only type-7 encryption to be applied on the box
 [2] for no encryption to be applied on the box
Enter your encryption selection [2]: 0
Enter the Master key min 8 chars & max 127 chars, Master key should not begin with '!,
#, ; : ********
 Confirm the master key: ********
The following configuration command script was created:
key config-key password-encrypt
Testkey12345
password encryption aes
service password-encryption
1
end
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.
Enter your selection [2]: 2
Building configuration...
[OK]
Use the enabled mode 'configure' command to modify this configuration.
At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.
Basic management setup configures only enough connectivity
for management of the system, extended setup will ask you
to configure each interface on the system
Would you like to enter basic management setup? [yes/no]: yes
Configuring global parameters:
  Enter host name [Switch]: Switch123
  The enable secret is a password used to protect
  access to privileged EXEC and configuration modes.
  This password, after entered, becomes encrypted in
  the configuration.
  secret should be of minimum 10 characters and maximum 32 characters with
  at least 1 upper case, 1 lower case, 1 digit and
  should not contain [cisco]
```

```
Enter enable secret: *******
 Confirm enable secret: *******
 The enable password is used when you do not specify an
 enable secret password, with some older software versions, and
  some boot images.
 Enter enable password: *******
 The virtual terminal password is used to protect
 access to the router over a network interface.
 Enter virtual terminal password: ******
Current interface summary
Interface
                     IP-Address
                                   OK? Method Status
                                                                    Protocol
                     12.16.1.120 YES DHCP up
Vlan1
                                                                     up
GigabitEthernet1/1
                     unassigned
                                     YES unset up
                                                                     up
                                 YES unset down
GigabitEthernet1/2
                     unassigned
                                                                     down
GigabitEthernet1/3
                   unassigned
                                 YES unset up
                                                                     บท
GigabitEthernet1/4 unassigned
                                   YES unset down
                                                                     down
GigabitEthernet1/5
                   unassigned
                                   YES unset down
                                                                     down
                  unassigned
GigabitEthernet1/6
                                    YES unset down
                                                                     down
                                   YES unset up
GigabitEthernet1/7
                     unassigned
                                                                     up
GigabitEthernet1/8 unassigned
                                 YES unset up
                                                                    up
GigabitEthernet1/9 unassigned YES unset down
                                                                     down
GigabitEthernet1/10 unassigned
                                   YES unset down
                                                                     down
                                   YES unset up
AppGigabitEthernet1/1 unassigned
                                                                     up
Enter interface name used to connect to the
management network from the above interface summary: vlan1
Configuring interface Vlan1:
    IP address for this interface [12.16.1.120]:
    Subnet mask for this interface [255.0.0.0] :
   Class A network is 12.0.0.0, 8 subnet bits; mask is /8
The following configuration command script was created:
hostname Switch123
enable secret 9 $9$4kYFyV4Hh9JVOk$Cwi3/tNTc7uHy7CBsBf0Wo6u1q/Sg07in3NJ5e7Yy0U
enable password 0 password
service password-encryption
line vty 0 15
password 0 password
no snmp-server
interface Vlan1
no shutdown
ip address 12.16.1.120 255.0.0.0
interface GigabitEthernet1/1
interface GigabitEthernet1/2
interface GigabitEthernet1/3
interface GigabitEthernet1/4
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.
```

```
Enter your selection [2]: 2
Building configuration...
[OK]
Use the enabled mode 'configure' command to modify this configuration.

Press RETURN to get started!
```

CLI Setup Examples