



Continuing the Cisco BCS Verified Designs Configuration Using CLI

This chapter describes the procedures using the command line interface (CLI) to continue Cisco Business Communications Solution Verified Designs configuration. Perform the procedures in this chapter using a terminal emulation utility such as Hyperterminal through the console port of your router.

Each procedure provides a list of summary and detailed steps that you can follow. Follow the detailed steps if you need examples and explanations of each CLI entry.

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Configuring Subinterfaces for VLANs

This task creates subinterfaces for a Cisco LAN switch that will carry voice and data on the network.

Summary steps (see [Figure 110](#)) list the steps necessary to configure the subinterfaces. For detailed steps including examples, see [Table 6](#).

Figure 110 CLI for Configuring Subinterfaces for VLANs

```

Cisco.r2w - WRO Reflection for UNIX and Digital
File Edit Connection Setup Macro Window Help
service-module ip address 10.1.20.2 255.255.255.0
service-module ip default-gateway 10.1.20.1
!
interface GigabitEthernet0/1
no ip address
shutdown
duplex auto
speed auto
media-type rj45
!
ip classless
ip route 10.1.20.2 255.255.255.255 Service-Engine0/1
!
!
ip http server
ip http authentication local
no ip http secure-server
ip http path flash:
!

Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitethernet 0/0
Router(config-if)#no ip address
Router(config-if)#interface gigabitethernet 0/0.10
Router(config-subif)#encapsulation dot1q 10
Router(config-subif)#ip address 10.1.10.1 255.255.255.0
Router(config-subif)#interface gigabitethernet 0/0.20
Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip address 10.1.20.1 255.255.255.0
Router(config-subif)#exit
Router(config)#interface service-engine 0/1
Router(config-if)#ip unnumbered gigabitethernet 0/0.20
Router(config-if)#exit
Router(config)#exit
Router#
Jun 29 10:51:58.211: %SYS-5-CONFIG_I: Configured from console by consolear
Building configuration...
[OK]
Router#

```

Summary Steps

1. **enable**
2. **configure terminal**
3. **interface gigabitethernet *slot/port***
4. **no ip address**
5. **interface gigabitethernet *slot/port.subinterface***
6. **encapsulation dot1q *vlan-id***
7. **ip address subnet mask**
8. **interface gigabitethernet *slot/port.subinterface***
9. **encapsulation dot1q *vlan-id***
10. **ip address subnet mask**
11. **exit**

12. **interface service-engine** *slot/port*
13. **ip unnumbered gigabitethernet** *slot/port.subinterface*
14. **exit**
15. **exit**
16. **wr**

**Note**

It is recommended to save a copy of the router configuration for backup purposes.

Detailed Steps

Table 6 *Detailed Steps for Configuring Subinterfaces for VLANs*

	Command or Action	Purpose
Step 1	enable Example: Router>	Enters privileged EXEC mode.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	interface gigabitethernet <i>slot/port</i> Example: Router(config)# interface gigabitethernet 0/0	Configures the interface and enters interface configuration mode.
Step 4	no ip address Example: Router(config-if)# no ip address	Disables IP processing for the specified interface.
Step 5	interface gigabitethernet <i>slot/port.subinterface</i> Example: Router(config)# interface gigabitethernet 0/0.10	Configures the subinterface and enters subinterface configuration mode. It is recommended to set the subinterface to the same value as the <i>vlan-id</i> .
Step 6	encapsulation dot1q <i>vlan-id</i> Example: Router(config-subif)# encapsulation dot1q 10	Sets 802.1q encapsulation for the subinterface.
Step 7	ip address <i>ip-address subnet mask</i> Example: Router(config-subif)# ip address 10.1.10.1 255.255.255.0	Sets the IP address for the subinterface.

■ Configuring Subinterfaces for VLANs

	Command or Action	Purpose
Step 8	interface gigabitethernet <i>slot/port.subinterface</i> Example: Router(config-subif)# interface gigabitethernet 0/0.20	Configures the subinterface. It is recommended to set the subinterface to the same value as the <i>vlan-id</i> .
Step 9	encapsulation dot1q <i>vlan-id</i> Example: Router(config-subif)# encapsulation dot1q 20	Sets 802.1q encapsulation for the subinterface.
Step 10	ip address <i>ip-address subnet mask</i> Example: Router(config-subif)# ip address 10.1.20.1 255.255.255.0	Sets the IP address for the subinterface.
Step 11	exit Example: Router(config)# exit	Exits subinterface configuration mode.
Step 12	interface service-engine <i>slot/port</i> Example: Router(config)# interface service-engine 0/1	Enters interface configuration mode for a network module (NM) or an advanced integration module (AIM) in slot 0, port 1.
Step 13	ip unnumbered gigabitethernet <i>slot/port.subinterface</i> Example: Router(config-if)# ip unnumbered gigabitethernet 0/0.20	Enables IP processing on the gigabitethernet subinterface without assigning an explicit IP address to the subinterface. This subinterface represents the IP address of the Cisco CME router.
Step 14	exit Example: Router(config-if)# exit	Exits interface configuration mode.
Step 15	exit Example: Router(config)# exit	Exits global configuration mode.
Step 16	wr Example: Router# wr	Writes the changes to the configuration file.

Testing the Installation

At this point, IP phones should no longer be connected to Cisco CME. No dial tone should be present if the speaker button is pressed.

**Note**

If the IP phones seem as if they still have a configuration, the phones have not timed out yet.

What to Do Next

Once you configure subinterfaces for a Cisco LAN switch using Summary or Detailed Steps, proceed to configure your DHCP IP address pool for the data network (see the [“Configuring a DHCP IP Address Pool for the Data Network”](#) section on page 62).

Configuring a DHCP IP Address Pool for the Data Network

This section describes the configuration of a DHCP IP address pool for your data network. If you do not already have a DHCP pool setup for your data, use this section to set up the data IP subnet.

This procedure creates a large shared pool of IP addresses, in which all DHCP clients receive the same information.

Summary steps (see [Figure 111](#)) list the steps necessary to set up a DHCP IP address pool for the data network. For detailed steps with examples, see [Table 7](#).

Figure 111 Configuring DHCP IP Address Pool for Data

```

Cisco.r2w - WRQ Reflection for UNIX and Digital
File Edit Connection Setup Macro Window Help

Router con0 is now available

Press RETURN to get started.

Router>en
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip dhcp excluded-address 10.1.10.1 10.1.10.10
Router(config)#ip dhcp pool data
Router(dhcp-config)#network 10.1.10.0 255.255.255.0
Router(dhcp-config)#default-router 10.1.10.1
Router(dhcp-config)#exit
Router(config)#exit
Router#wr
Jun 29 11:23:22.223: %SYS-5-CONFIG_I: Configured from console by console
Building configuration...
[OK]
Router#
1317, 8 VT400-7 -- COM1 at 9600 baud 00:40:19 135911

```

Summary Steps

1. **enable**
2. **configure terminal**
3. **ip dhcp excluded-address** *low-ip-address* [*high-ip-address*]
4. **ip dhcp pool** *pool-name*
5. **network** *ip-address* [*mask* \| *prefix-length*]
6. **default-router** *ip-address*
7. **exit**
8. **exit**

9. wr



Note It is recommended to save a copy of the router configuration for backup purposes.

Detailed Steps

Table 7 Detailed Steps for Configuring a DHCP IP Address Pool

	Command or Action	Purpose
Step 1	enable Example: Router>enable	Enters privileged EXEC mode.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	ip dhcp excluded-address <i>low-ip-address</i> [<i>high-ip address</i>] Example: Router(config)# dhcp excluded-address 10.1.10.1 10.1.10.10	Specifies IP addresses that should not be assigned to clients.
Step 4	ip dhcp pool <i>pool-name</i> Example: Router(config)# ip dhcp pool data	Creates a name for the DHCP server address pool and enters DHCP pool configuration mode.
Step 5	network <i>ip-address</i> [<i>mask</i> <i>/prefix-length</i>] Example: Router(dhcp-config)# network 10.1.10.1 255.255.255.0	Specifies the IP address of the DHCP address pool and the optional mask or number of bits in the address prefix, preceded by a forward slash.
Step 6	default-router <i>ip-address</i> Example: Router(dhcp-config)# default-router 10.1.10.1	Specifies the router to which the IP phones are connected. This router is either a Cisco CME router or any Cisco router attached to the Cisco CME router. Note As long as the Cisco IP phones have connection to the Cisco CME router, the Cisco IP phones can get the required network details.
Step 7	exit Example: Router(dhcp-config)# exit	Exits DHCP pool configuration mode.

	Command or Action	Purpose
Step 8	<code>exit</code> Example: <code>Router(config)# exit</code>	Exits global configuration mode.
Step 9	<code>wr</code> Example: <code>Router# wr</code>	Writes the changes to the configuration file.

Testing the Installation

The DHCP server is now set up for the data side of the network. Perform the following steps to ensure that DHCP is properly set up.

-
- Step 1** Enter the **show ip dhcp server stat** command to ensure that the DHCP server is running and to display any queries made to it.
 - Step 2** Enter the **show ip dhcp pool** command to display configured DHCP pools.
-

What to Do Next

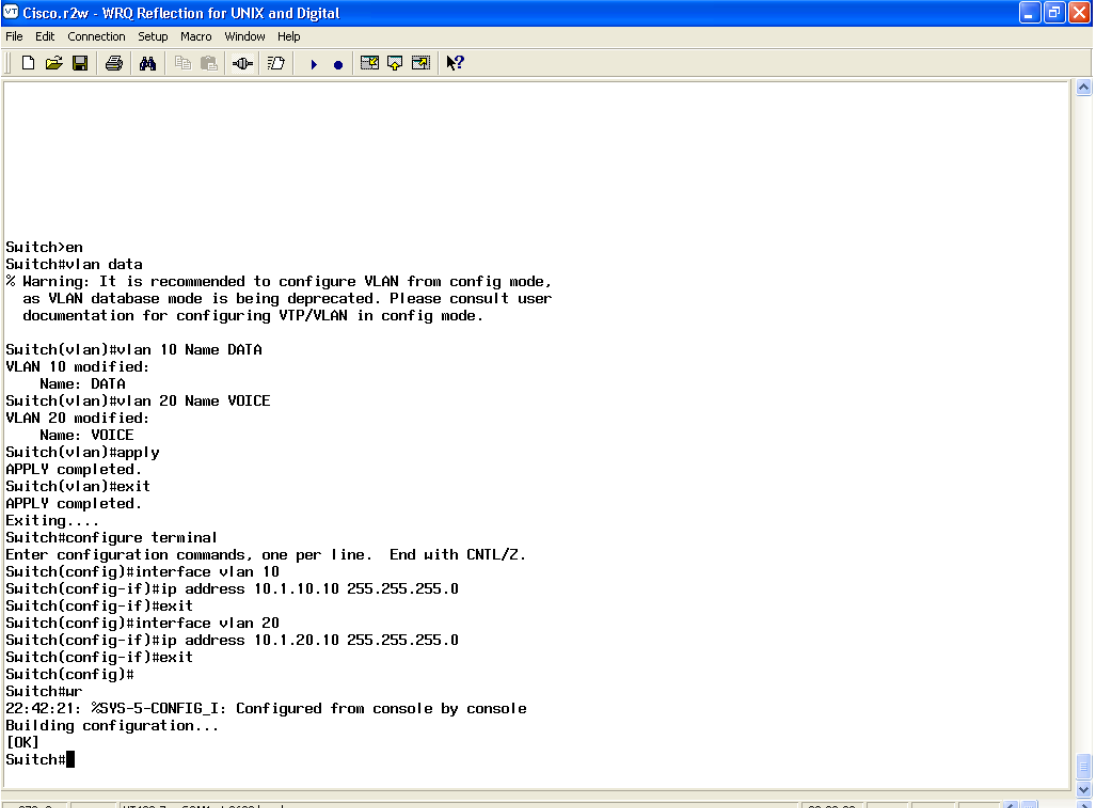
Once you configure a DHCP IP pool for the data network using the Summary or Detailed Steps, proceed to configure separate voice and data VLANs for the data network (see the [“Configuring Separate Data and Voice VLANs”](#) section on page 65).

Configuring Separate Data and Voice VLANs

It is recommended that you create separate VLANs for voice and data on your switch.

Summary steps (see [Figure 112](#)) list the steps necessary to set up separate VLANs for your voice and data networks. For detailed steps with examples, see [Table 8](#).

Figure 112 Configuring Separate Data and Voice VLANs



```
Cisco.r2w - WRO Reflection for UNIX and Digital
File Edit Connection Setup Macro Window Help
Switch>en
Switch#vlan data
% Warning: It is recommended to configure VLAN from config mode,
as VLAN database mode is being deprecated. Please consult user
documentation for configuring VTP/VLAN in config mode.

Switch(vlan)#vlan 10 Name DATA
VLAN 10 modified:
  Name: DATA
Switch(vlan)#vlan 20 Name VOICE
VLAN 20 modified:
  Name: VOICE
Switch(vlan)#apply
APPLY completed.
Switch(vlan)#exit
APPLY completed.
Exiting...
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface vlan 10
Switch(config-if)#ip address 10.1.10.10 255.255.255.0
Switch(config-if)#exit
Switch(config)#interface vlan 20
Switch(config-if)#ip address 10.1.20.10 255.255.255.0
Switch(config-if)#exit
Switch(config)#
Switch#
22:42:21: %SYS-5-CONFIG_I: Configured from console by console
Building configuration...
[OK]
Switch#
```

978, 8 VT400-7 -- COM1 at 9600 baud 00:22:39 135987

Summary Steps

1. **enable**
2. **vlan data**
3. **vlan** *vlan-number* **name** *vlan-name* (for data)
4. **vlan** *vlan-number* **name** *vlan-name* (for voice)
5. **apply**
6. **exit**
7. **configure terminal**
8. **interface** **vlan** *vlan-number*
9. **ip address** *ip-address* *subnet mask*
10. **exit**
11. **interface** **vlan** *vlan-number*
12. **ip address** *ip-address* *subnet mask*
13. **exit**
14. **exit**
15. **wr**


Note

It is recommended to save a copy of the switch configuration for backup purposes.

Detailed Steps

Table 8 Detailed Steps for Configuring Separate Data and Voice VLANs

	Command or Action	Purpose
Step 1	enable Example: Switch>enable	Enters privileged EXEC mode.
Step 2	vlan data Example: Switch# vlan data	Enters VLAN configuration mode and defines a string used to name the VLAN.
Step 3	vlan <i>vlan-number</i> name <i>vlan-name</i> Example: Switch(vlan)# vlan 10 name DATA VLAN 10 modified Name: DATA	Configures the specified VLAN and defines a text string used as the name of the VLAN.

	Command or Action	Purpose
Step 4	<p>vlan <i>vlan-number</i> name <i>vlan-name</i></p> <p>Example: Switch(vlan)# vlan 20 name VOICE VLAN 20 modified Name: VOICE</p>	Configures the specified VLAN and defines a text string used as the name of the VLAN.
Step 5	<p>apply</p> <p>Example: Switch(vlan)# apply APPLY completed.</p>	Saves changed configuration parameters.
Step 6	<p>exit</p> <p>Example: Switch(vlan)# exit APPLY completed Exiting....</p>	Exits VLAN configuration mode.
Step 7	<p>configure terminal</p> <p>Example: Switch# configure terminal</p>	Enters global configuration mode.
Step 8	<p>interface <i>vlan-number</i></p> <p>Example: Switch(config)# interface vlan 10</p>	Configures the specified interface type and enters interface configuration mode.
Step 9	<p>ip address <i>ip-address subnet mask</i></p> <p>Example: Switch(config-if)# ip address 10.1.10.10 255.255.255.0</p>	Assigns an IP address to the VLAN.
Step 10	<p>exit</p> <p>Example: Switch(config-if)# exit</p>	Exits interface configuration mode.
Step 11	<p>interface <i>vlan-number</i></p> <p>Example: Switch(config)# interface vlan 20</p>	Configures the specified interface type and enters interface configuration mode.
Step 12	<p>ip address <i>ip-address subnet mask</i></p> <p>Example: Switch(config-if)# ip address 10.1.20.10 255.255.255.0</p>	Assigns an IP address to the VLAN.

	Command or Action	Purpose
Step 13	<code>exit</code> Example: Switch(config-if)# <code>exit</code>	Exits interface configuration mode.
Step 14	<code>exit</code> Example: Switch(config)# <code>exit</code>	Exits global configuration mode.
Step 15	<code>wr</code> Example: Switch# <code>wr</code>	Writes the changes to the configuration file.

Figure 113 summarizes the LAN switch interface configuration.

Figure 113 LAN Switch Interface Configuration

```

Cisco.r2w - WRQ Reflection for UNIX and Digital
File Edit Connection Setup Macro Window Help
vlan internal allocation policy ascending
!
interface FastEthernet0/1
description CallManager Express Router Connection
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface FastEthernet0/2
description Data Vlan 10 - Voice Vlan 20
switchport access vlan 10
switchport trunk encapsulation dot1q
switchport mode access
switchport voice vlan 20
spanning-tree portfast
!
interface FastEthernet0/3
description Data Vlan 10 - Voice Vlan 20
switchport access vlan 10
switchport trunk encapsulation dot1q
switchport mode access
switchport voice vlan 20
spanning-tree portfast
!
interface FastEthernet0/4
description Data Vlan 10 - Voice Vlan 20
switchport access vlan 10
switchport trunk encapsulation dot1q
switchport mode access
switchport voice vlan 20
spanning-tree portfast
!
interface FastEthernet0/5
description Data Vlan 10 - Voice Vlan 20
switchport access vlan 10
switchport trunk encapsulation dot1q
switchport mode access
switchport voice vlan 20
spanning-tree portfast
!
--More--
637, 11 VT400-7 -- COM1 at 9600 baud 00:15:03 135689

```

This completes the voice network configuration.

Testing the Installation

VLANs are now configured on the switch. Use the **show interface** command to verify that the VLANs are configured. IP addressing will not appear in any routing table until the interfaces are running.

Once the switch is configured, IP phones and stations should connect using different IP addressing.

-
- Step 1** Enter the **ipconfig** command to see the IP configuration.
 - Step 2** Press **settings** on the IP phone and look for IP addressing under Network Configuration.
 - Step 3** Plug in multiple IP phones and initiate a call.
-

What to Do Next

To configure security on the voice network, see the [“Configuring Security on the Voice Network” section on page 71](#).

