



# Configuring Voice over HDLC



**Caution**

Beginning with Cisco IOS Releases 12.0(7)XK and 12.1(2)T, this feature is no longer supported.

This chapter describes how to configure a Cisco MC3810 multiservice access concentrator for Voice over High-Level Data Link Control (VoHDLC), a protocol that provides Cisco serial encapsulation.

VoHDLC enables a Cisco MC3810 to carry live voice traffic (for example, telephone calls and faxes) back-to-back to a second Cisco MC3810. VoHDLC on the Cisco MC3810 is supported on serial ports 0 or 1, or on 0:x (the T1/E1 trunk, where *x* represents the channel group number).

This chapter is organized as follows:

- [Configuring HDLC Voice Encapsulation, page 8-1](#)
- [Configuring Dial Peers, page 8-2](#)
- [VoHDLC Configuration Example, page 8-6](#)

Configuring VoHDLC is simpler than configuring VoFR or VoATM. Because the target voice-network peer is another Cisco MC3810 configured back-to-back with the first Cisco MC3810, you do not have to configure the network backbone to support VoHDLC.

## Configuring HDLC Voice Encapsulation

Before you can configure HDLC dial peers, you need to configure the HDLC voice encapsulation.

To configure HDLC voice encapsulation, complete the following steps in global configuration mode:

Step	Command	Purpose
1	<code>router(config)# controller {t1   e1} number</code>	<p>If you will configure VoHDLC over the T1/E1 trunk, enter controller configuration mode.</p> <p>If you will configure VoHDLC over serial port 0 or 1, proceed to step 4.</p> <p>The <i>number</i> should be 1 if the controller is for the interface to the local phone device or PBX (through the DVM). The <i>number</i> should be 0 for the interface to the WAN (through the MFT).</p>
2	<code>router(config-controller)# tdm-group tdm-group-no timeslot timeslot-list</code>	Configure a time-division multiplexing (TDM) channel group for the controller.
3	<code>router(config)# interface serial 0:x point-to-point</code>	<p>If configuring VoHDLC over the T1/E1 trunk, enter interface configuration mode by specifying <b>serial 0:x</b>, where <i>x</i> is the channel group number.</p> <p><b>Note</b> In Cisco IOS Release 11.3(1) MA, serial port 2 was a valid port number. Beginning with Release 12.0, <b>serial 2</b> is not a valid designation on the Cisco MC3810.</p> <p>Proceed to step 5.</p>
4	<code>router(config)# interface serial number point-to-point</code>	If configuring VoHDLC over a serial port, enter interface configuration mode and configure serial interface 0 or 1.
5	<code>router(config-if)# voice-encap size</code>	Configure the voice segmentation size. The valid range for the <i>size</i> value is from 80–1600. There is no default.

Proceed to the next section, “[Configuring Dial Peers](#).”

## Configuring Dial Peers

Dial peers describe the entities to and/or from which a call is established. Dial-peer configuration tasks define the address or set of addresses serviced by that dial peer and the call parameters required to establish a call to and/or from that dial peer.

There are two different kinds of dial peers:

- Plain old telephone service (POTS)—Dial peer connected via a traditional telephony network. POTS dial peers point to a particular voice-port on a voice network device.
- High-Level Data Link Control (HDLC) dial peer—Dial peer connected back-to-back with the Cisco MC3810. HDLC peers point to specific voice-network devices, normally a second Cisco MC3810.



### Note

The configuration for HDLC dial peers is very similar to the dial-peer configuration for Frame Relay or ATM. The term *HDLC dial peer* is used here because in most cases, the peer is back-to-back and normally on the same network.

POTS dial peers associate a telephone number with a particular voice port so that incoming calls for that telephone number can be received and outgoing calls can be placed. HDLC peers point to specific voice-network devices so that incoming calls can be received and outgoing calls can be placed. Both POTS and HDLC dial peers are needed to establish VoHDLC connections if you want to both send and receive calls. Establishing two-way communication using VoHDLC requires establishing a specific voice connection between two defined endpoints.

The following sections describe how to configure POTS and VoHDLC dial peers.

## Configuring POTS Dial Peers

To configure a POTS dial peer, you need to uniquely identify the peer (by assigning it a unique tag number), define its telephone number, and associate it with a voice port through which calls will be established. Under most circumstances, the default values for the remaining dial-peer configuration commands will be sufficient to establish connections.

Depending on your dial plan configuration, you may need to consider how to configure voice networks with variable-length dial plans, number expansion, excess digit ployout, forward digits and default voice routes, or use hunt groups with dial-peer preferences. For more information on these topics, see [Chapter 9, “Voice Dial Plan Considerations.”](#)

To configure POTS dial peers, complete the following steps from global configuration mode:

Step	Command	Purpose
1	<code>router(config)# dial-peer voice tag pots</code>	Define a POTS dial peer and enter dial-peer configuration mode. All subsequent commands that you enter in dial-peer voice mode before you exit will apply to this dial peer.  The <i>tag</i> value identifies the dial peer and must be unique on the Cisco MC3810. Do not duplicate a specific <i>tag</i> number.

Step	Command	Purpose
2	<code>router(config-dialpeer)# destination-pattern string</code>	<p>Configure the dial peer's destination pattern.</p> <p>The <i>string</i> is a series of digits that specify the E.164 or private dialing plan telephone number. Valid entries are the digits 0–9 and the letters A–D. The following special characters can be entered in the string:</p> <ul style="list-style-type: none"> <li>• The star character (*) and the pound sign (#) that appear on standard touch-tone dial pads can be used in any dial string. However, these characters cannot be used as leading characters in a string (for example, *650).</li> <li>• The period (.) can be entered any time, and is used as a wildcard character. For more information see the “<a href="#">Destination Pattern Wildcards</a>” section on page 9-1.</li> <li>• The comma (,) can be used only in prefixes, and is used to insert a one-second pause or a delay.</li> <li>• The timer (T) character can be used to configure variable-length dial plans. For more information, see the “<a href="#">Variable-Length Dial Plans</a>” section on page 9-3.</li> </ul> <p>The plus symbol (+) is not a valid character in the string.</p>
3	<code>router(config-dialpeer)# port slot/port</code>	Associate this POTS dial peer with a specific logical dial interface. Enter the <i>slot/port</i> number of the voice port connected to the POTS dial peer.
4	<code>router(config-dialpeer)# forward-digits {num-digit   all   implicit}</code>	<p>(Optional) If using the forward-digits feature, configure the digit-forwarding method that will be used on the dial peer. The valid range for the number of digits forwarded (<i>num-digit</i>) is from 0–32.</p> <p>The default value is <b>implicit</b>, in which the exactly matched digits are not forwarded. Only digits matched by the wildcard pattern are forwarded.</p> <p>For more information about the forward-digits functionality, see the “<a href="#">Forward Digits and Voice Default Routes</a>” section on page 9-4.</p>
5	<code>router(config-dialpeer)# prefix string</code>	(Optional) If the forward-digits feature was not configured in the last step, assign the dialed digits prefix for the dial peer.

To configure the next POTS dial peer, exit dial-peer configuration mode by entering **exit**, and repeat the previous steps. To configure the HDLC dial peer, see the next section.

## Configuring VoHDLC Dial Peers

To configure a VoHDLC dial peer, you need to uniquely identify the peer (by assigning it a unique tag number), define the outgoing serial port number and the virtual circuit number.

Depending on your dial plan configuration, you may need to consider how to configure voice networks with variable-length dial plans, number expansion, excess digit ployout, forward digits and default voice routes, or use hunt groups with dial-peer preferences. For more information on these topics, see [Chapter 9, “Voice Dial Plan Considerations.”](#)

To configure VoHDLC dial peers, complete the following steps from global configuration mode:

Step	Command	Purpose
1	<code>router(config)# dial-peer voice tag <b>vohdlc</b></code>	Define a dial peer for VoHDLC and enter dial-peer configuration mode. All subsequent commands that you enter in dial-peer voice mode before you exit will apply to this dial peer.  The <i>tag</i> value identifies the dial peer and must be unique on the Cisco MC3810. Do not duplicate a specific <i>tag</i> number.
2	<code>router(config-dialpeer)# <b>destination-pattern</b> string</code>	Configure the dial peer's destination pattern. The same restrictions for the string listed in the POTS dial peer configuration also apply to the VoHDLC destination-pattern.
3	<code>router(config-dialpeer)# <b>session</b> <b>target</b> interface serial-port-number</code>	Configure the HDLC session target for the dial peer. For the <i>serial-port-number</i> value, enter either 0 and 1.
4	<code>router(config-dialpeer)# <b>preference</b> value</code>	(Optional) Configure a preference for the VoHDLC dial peer. The value is a number from 0–10 where the lower the number, the higher the preference.
5	<code>router(config-dialpeer)# <b>alt-dial</b> string</code>	(Optional) Configure the alternate dial-out string when configuring on-net-to-off-net alternative dialing.

To configure the next HDLC dial peer, exit dial-peer configuration mode by entering **exit**, and repeat the previous steps.

### Verify Your VoHDLC Dial-Peer Configuration

If you have relatively few dial peers configured, you can use the **show dial-peer voice** command to verify the validity of your dial-peer configuration.

### Troubleshooting Tips

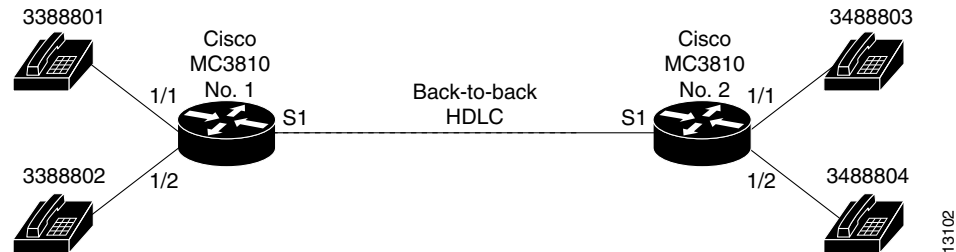
If you are having trouble connecting a call, you can try to resolve the problem by performing the following tasks:

- If you suspect the problem is associated with the dial-peer configuration, use the **show dial-peer voice** command on the local and remote concentrators to verify that the data is configured correctly on both.
- Toggle the voice port and/or serial port by entering **shutdown**, and then **no shutdown**.

## VoHDLC Configuration Example

Figure 8-1 shows an example of a simple back-to-back VoHDLC configuration.

**Figure 8-1 VoHDLC Configuration Example**



The following examples show the configuration for both Cisco MC3810 concentrators to configure back-to-back VoHDLC.

### Cisco MC3810 No. 1

```
interface Serial1 point-to-point
 ip address 5.5.5.1 255.0.0.0
 no keepalive
 ipx network 2222
 ipx accounting
 voice-encap 512
 clockrate 64000

ip classless

line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 login

voice-port 1/1

dial-peer voice 1 pots
 destination-pattern 3388801
 port 1/1

dial-peer voice 2 pots
 destination-pattern 3388802
 port 1/2

dial-peer voice 44 vohdlc
 destination-pattern 348....
 session target Serial1

end
```

**Cisco MC3810 No. 2**

```
interface Serial1 point-to-point
 ip address 5.5.5.2 255.0.0.0
 no keepalive
 ipx network 2222
 ipx accounting
 voice-encap 512
 clockrate 64000

ip classless

line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 login

voice-port 1/1

 dial-peer voice 1 pots
 destination-pattern 3488803
 port 1/1

 dial-peer voice 2 pots
 destination-pattern 3488804
 port 1/2

 dial-peer voice 40 vohdlc
 destination-pattern 338....
 session target Serial1

end
```

