



## Appendix A - Dial Peer Configuration Examples

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This appendix contains a series of configuration examples featuring the minimum required components and critical Cisco IOS command lines extracted from voice gateway configuration files necessary to complete an endpoint-to-endpoint call. Each example is designed to focus on a specific combination of components or configuration concept essential to voice over IP (VoIP) communication. This appendix covers the following topics:

- [Two Analog Phones, page 1](#)
- [Two Fax Machines, page 4](#)
- [An Analog Phone and an IP Phone Connected over an IP Network, page 5](#)
- [Two IP Phones Connected via a Voice over Frame Relay Network, page 6](#)
- [Two IP Phones Connected via a Voice over Frame Relay Network, page 6](#)
- [Using Digit Manipulation to Overcome the Obstacle of an IP Network Failure, page 7](#)

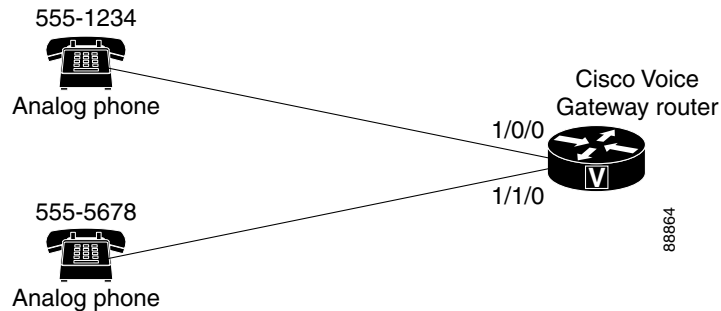
### Two Analog Phones

The simplest and most ubiquitous implementation of dial peer configuration involves connecting two standard analog telephones over an IP network. The following two examples illustrate the minimum required configurations necessary to connect two analog phones, where they are attached to the same voice gateway router and where each phone is attached to its own voice gateway router via FXS ports installed in the voice gateway routers in question.



## Both Connected to the Same Voice Gateway Router

**Figure 17** Two analog phones connected to the same voice gateway router

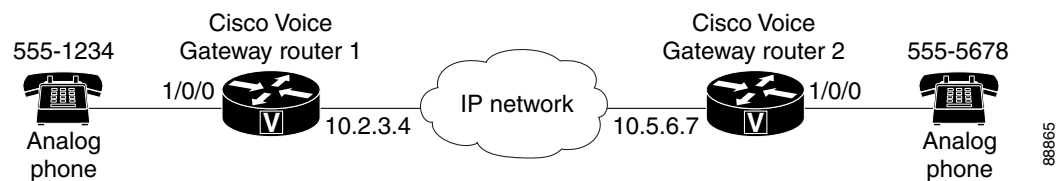


### Voice Gateway Router Configuration File

```
voice-port 1/0/0
!
voice-port 1/0/1
!
!
dial-peer voice 1 pots
 destination-pattern 5551234
 port 1/0/0
!
dial-peer voice 2 pots
 destination-pattern 5555678
 port 1/0/1
```

## Each Connected to Their Own Voice Gateway Router Using the G.711 Codec

**Figure 18** Two analog phones each connected to their own voice gateway router



### Voice Gateway Router 1 Configuration File

```
voice-port 1/0/0
!
dial-peer voice 1 pots
 destination-pattern 5551234
 port 1/0/0
!
dial-peer voice 10 voip
 destination-pattern 5555678
 session target ipv4:10.5.6.7
 codec g711ulaw
```

**Voice Gateway Router 2 Configuration File**

```
voice-port 1/0/0
!
dial-peer voice 2 pots
 destination-pattern 5555678
 port 1/0/0
!
dial-peer voice 20 voip
 destination-pattern 5551234
 session target ipv4:10.2.3.4
 codec g711ulaw
```

**Each Connected to Their Own Voice Gateway Routers Using the G.729r8 Codec****Voice Gateway Router 1 Configuration File**

```
voice class codec 1
 codec preference 1 g729r8
 codec preference 2 g711ulaw
!
voice-port 1/0/0
!
voice-port 1/0/1
!
!
dial-peer voice 1 pots
 destination-pattern 5551234
 port 1/0/0
!
dial-peer voice 2 voip
 destination-pattern 5555678
 voice-class codec 1
 session target ipv4:10.5.6.7
```

**Voice Gateway Router 2 Configuration File**

```
voice class codec 1
 codec preference 1 g729r8
 codec preference 2 g711ulaw
!
voice-port 1/0/0
!
voice-port 1/0/1
!
!
dial-peer voice 1 pots
 destination-pattern 5555678
 port 1/0/0
!
dial-peer voice 2 voip
 destination-pattern 5551234
 voice-class codec 1
 session target ipv4:10.2.3.4
```

# Two Fax Machines

Once the connection between two analog phones over the IP network can be set up, you can then alter the configuration slightly to enable fax communication over the IP network. [Figure 19](#) illustrates the configuration files necessary to establish T.38 Fax Relay functionality over the IP network.

**Figure 19** Two fax machines connected via T.38 Fax Relay



### Voice Gateway Router 1 Configuration File

```
interface FastEthernet0/0
 ip address 10.21.9.4 255.255.255.0
 !
voice-port 1/0/0
 !
voice-port 1/0/1
 !
dial-peer voice 1 pots
 destination-pattern 5551234
 port 1/0/0
 !
dial-peer voice 2 voip
 destination-pattern 5555678
 session target ipv4:10.5.6.7
 codec g711ulaw
 fax protocol t38 ls-redundancy 0 hs-redundancy 0 fallback cisco
 fax rate voice
```

### Voice Gateway Router 2 Configuration File

```
interface FastEthernet0/0
 ip address 10.21.7.61 255.255.255.0
 !
voice-port 1/0/0
 !
voice-port 1/0/1
 !
dial-peer voice 1 pots
 destination-pattern 5555678
 port 1/0/0
 !
dial-peer voice 2 voip
 destination-pattern 5551234
 voice-class codec 1
 session target ipv4:10.2.3.4
 codec g711ulaw
 fax protocol t38 ls-redundancy 0 hs-redundancy 0
 fax rate voice
```

# An Analog Phone and an IP Phone Connected over an IP Network

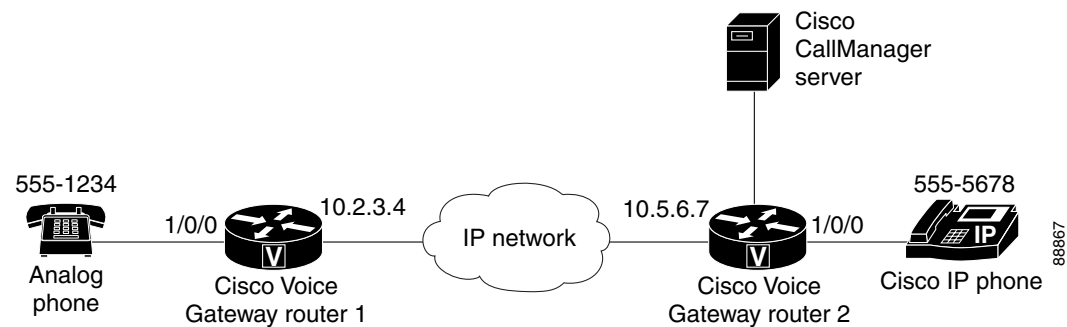
Once you are able to establish the connection of two analog phones over an IP network, you can then expand the scope of configuration coverage to include an analog phone and an IP phone connected over the IP network. The configuration for each of the voice gateway routers is essentially the same as if you were connecting two analog phones; you will need to ensure that you have allowed for a Cisco CallManager server connection to the appropriate Cisco voice gateway router to accommodate the introduction of the IP phone.



## Note

A CallManager server has been used in this configuration to manage the Cisco IP phone. However, this document does not address Cisco CallManager configuration. For more information on Cisco CallManager setup and configuration, refer to the Cisco CallManager documentation available on Cisco.com.

**Figure 20** An analog phone and an IP phone each connected to their own voice gateway router



### Voice Gateway Router 1 Configuration File

```
voice-port 1/0/0
!
dial-peer voice 1 pots
 destination-pattern 5551234
 port 1/0/0
!
dial-peer voice 2 voip
 destination-pattern 5555678
 session target ipv4:10.5.6.7
```

### Voice Gateway Router 2 Configuration File

```
voice-port 1/0/0
!
dial-peer voice 1 pots
 destination-pattern 5555678
 port 1/0/0
!
dial-peer voice 2 voip
 destination-pattern 5551234
 session target ipv4:10.2.3.4
```

# Two IP Phones Connected via a Voice over Frame Relay Network

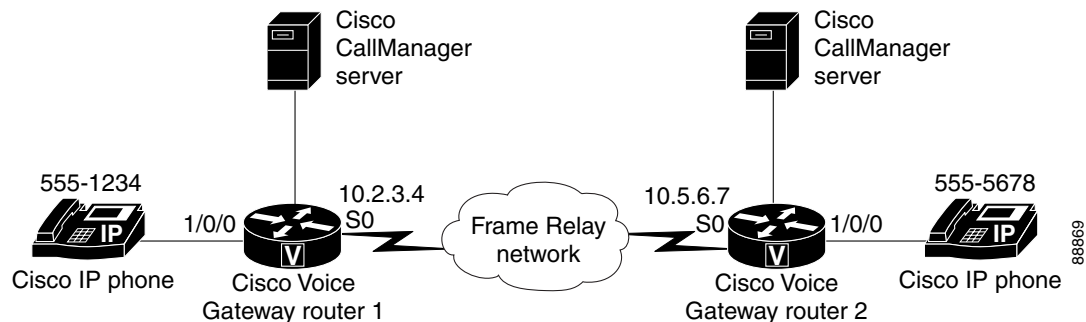
The examples thus far in this appendix have described connecting endpoints over an IP network based primarily on Ethernet connections. However, you may find that you must configure a Frame Relay WAN to effectively serve the voice communications demands for your system. Figure 21 and the subsequent Cisco voice gateway router configuration examples illustrate the dial peer configuration and Frame Relay Cisco IOS commands necessary to enable Frame Relay communication across your IP network.



## Note

Although it is an essential portion of the configuration of this system, and the following configuration files contain the Cisco IOS commands necessary to establish Frame Relay connectivity, Frame Relay configuration is not addressed in this document. For more information on Frame Relay configuration, refer to the appropriate documentation available on Cisco.com.

**Figure 21** Two IP phones connected over a Frame Relay network



## Voice Gateway Router 1 Configuration File

The configuration for this voice gateway features a Cisco 3620 running Cisco IOS Release 12.2(11)T6.

```
interface Serial0/0
 ip address 10.2.1.1 255.0.0.0
 encapsulation frame-relay
 !
 voice-port 1/0/0
 !
 voice-port 1/0/1
 !
 voice-port 1/1/0
 !
 voice-port 1/1/1
 !
 dial-peer cor custom
 !
 dial-peer voice 1 pots
 destination-pattern 5551234
 port 1/0/0
 !
 dial-peer voice 1000 voip
 preference 1
 destination-pattern 5555678
 session target ipv4:10.5.6.7
```

### Voice Gateway Router 2 Configuration File

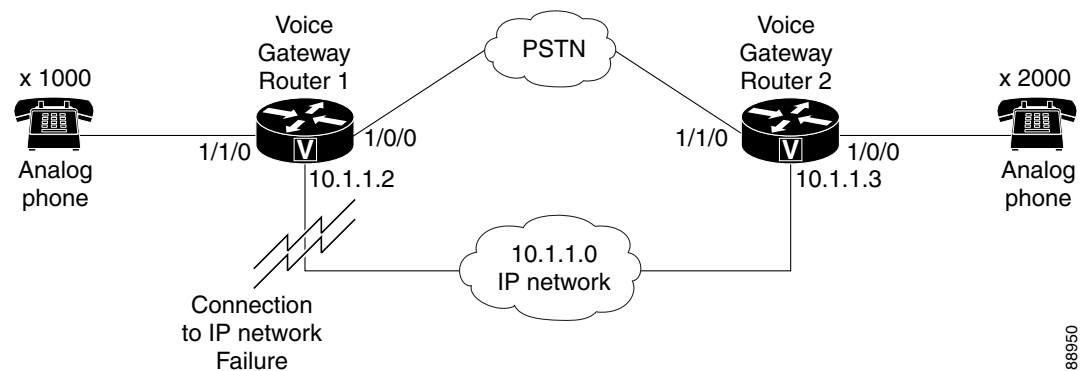
The configuration for this voice gateway features a Cisco 3620 running Cisco IOS Release 12.2(15)T.

```
interface Serial0/0
 ip address 10.2.3.4 255.0.0.0
 encapsulation frame-relay
 clockrate 2000000
 no fair-queue
 !
 voice-port 1/0/0
 !
 voice-port 1/0/1
 !
 voice-port 1/1/0
 !
 voice-port 1/1/1
 !
 dial-peer cor custom
 !
 dial-peer voice 1 pots
 destination-pattern 5555678
 port 1/0/0
 !
 dial-peer voice 2000 voip
 preference 1
 destination-pattern 5551234
 session target ipv4:10.2.3.4
```

## Using Digit Manipulation to Overcome the Obstacle of an IP Network Failure

Figure 22 and the subsequent Cisco voice gateway router configuration examples illustrate the dial peer configuration necessary to automatically route an outgoing voice call over the PSTN in the event of a temporary IP network outage. An advantage to this method of setting up and connecting the call over the PSTN (while still originating the transmission from a voice gateway router) is more commonly known as “toll bypass.”

**Figure 22** Using the PSTN in the event of an IP network failure



### Voice Gateway Router 1 Configuration File

The configuration for this voice gateway features a Cisco 3620 running Cisco IOS Release 12.2(15)T.

```

translation-rule 21
  Rule 1 ^2 5552
!
translation-rule 11
  Rule 1 ^5551 1
!
interface FastEthernet0/0
  ip address 10.1.1.2 255.255.255.0
  duplex auto
  speed auto
!
voice-port 1/0/0
  translate called 11
!
voice-port 1/0/1
!
voice-port 1/1/0
!
voice-port 1/1/1
!
dial-peer cor custom
!
dial-peer voice 1 pots
  destination-pattern 1000
  port 1/1/0
!
dial-peer voice 2000 voip
  preference 1
  destination-pattern 2000
  session target ipv4:10.1.1.3
!
dial-peer voice 20 pots
  preference 2
  destination-pattern 2000
  translate-outgoing called 21
  port 1/0/0
  forward-digits all

```

### Voice Gateway Router 2 Configuration File

The configuration for this voice gateway features a Cisco 3620 running Cisco IOS Release 12.2(11)T6.

```

translation-rule 11
  Rule 1 ^1 5551
!
translation-rule 21
  Rule 1 ^5552 2
!
interface Ethernet0/0
  ip address 10.1.1.3 255.255.255.0
  full-duplex
!
voice-port 1/0/0
!
voice-port 1/0/1
!
voice-port 1/1/0
  translate called 21
!
voice-port 1/1/1
!
dial-peer cor custom
!
dial-peer voice 1 pots

```

```
destination-pattern 2000
port 1/0/0
!
dial-peer voice 1000 voip
preference 1
destination-pattern 1000
session target ipv4:10.1.1.2
!
dial-peer voice 10 pots
preference 2
destination-pattern 1000
translate-outgoing called 11
port 1/1/0
forward-digits all
```

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