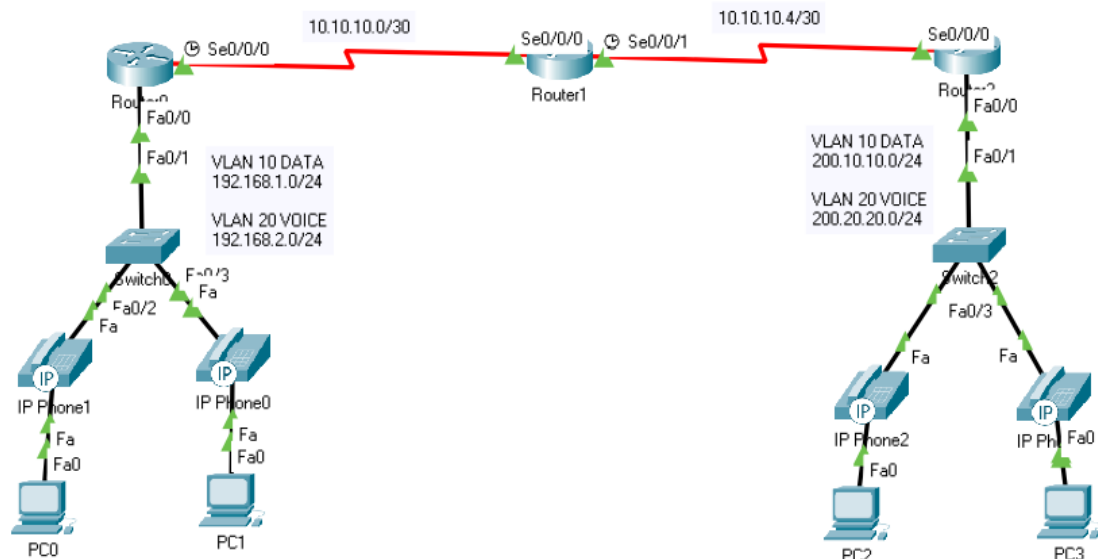


## VoIP Configuration

"VoIP" (voice over IP) lets you make phone calls over an IP (Internet protocol) data network. Unified communications from Cisco takes VoIP for small business a step further. It helps you combine all of your communications-including voice, data, and video-into a secure, inexpensive, easy-to-manage solution with lots of great features.



### 1st Telephony Network

```
Switch(config)# vlan 10
```

```
Switch(config-vlan)# name DATA
```

```
Switch(config-vlan)# vlan 20
```

```
Switch(config-vlan)# name VOICE
```

```
Switch(config)# interface range fastEthernet 0/2-3
```

```
Switch(config-if-range)# switchport mode access
```

```
Switch(config-if-range)# switchport access vlan 10
```

```
Switch(config-if-range)# switchport voice vlan 20
```

```
Switch(config)# interface fastEthernet 0/1
```

```
Switch(config-if)# switchport mode trunk
```

```
Router(config)# interface fastEthernet 0/0
Router(config-if)# no shutdown
Router(config-if)# interface fastEthernet 0/0.10
Router(config-subif)# encapsulation dot1Q 10
Router(config-subif)# ip address 192.168.1.1 255.255.255.0
Router(config)# interface fastEthernet 0/0.20
Router(config-subif)# encapsulation dot1Q 20
Router(config-subif)# ip address 192.168.2.1 255.255.255.0

Router(config)# ip dhcp excluded-address 192.168.1.1 192.168.1.5
Router(config)# ip dhcp excluded-address 192.168.2.1 192.168.2.5

Router(config)# ip dhcp pool DATA
Router(dhcp-config)# network 192.168.1.0 255.255.255.0
Router(dhcp-config)# default-router 192.168.1.1
Router(dhcp-config)# dns-server 8.8.8.8

Router(config)# ip dhcp pool VOICE
Router(dhcp-config)# network 192.168.2.0 255.255.255.0
Router(dhcp-config)# default-router 192.168.2.1
Router(dhcp-config)# option 150 ip 192.168.2.1
```

IP phone needs to download necessary boot files as well as configuration files which we can provide it with the help of TFTP server. Here, 'option 150' points out to the IP address of TFTP server where all files are available to server IP phones and '192.168.1.1' is an IP address of TFTP server; in our case, it is Router itself.

```
Router(config)# telephony-service                # Enabling the router for telephony services #
Router(config-telephony)# max-ephones 2          # Define the maximum number of phones #
Router(config-telephony)# max-dn 3               # Define the maximum number of directory numbers #
Router(config-telephony)# ip source-address 192.168.2.1 port 2000 # Source IP & Port #
Router(config-telephony)# create cnf-files
```

CNF is a data directory which contains examples of files stored using the DIMACS CNF file format.

An ephone-dn can be described in its simplest form as a directory number which can be assigned to one or more buttons on one or more Cisco IP phones. We can configure each ephone-dns either as single or dual mode ephone-dn. We will learn about the difference between the two in the subsequent sections.

**Single line ephone-dn** – Only one call can occur from this type of e-phone-dn. It is able to make or receive only one call at a time. If a call arrives on an ephone-dn where a call is already active, the caller will get a busy signal. It does not support call waiting and is mostly used for paging, intercom, call parking, and MOH feeds. It is also used to create a virtual voice port.

**Dual-line ephone-dn** – This ephone type supports two call connections at the same time, as it can handle two calls simultaneously. Since it has two channels, it could have one number or two (– Dual-number ephone-dn – primary and secondary), this type of ephone has features such as call waiting, call transfer and conferencing. Dual-line should not be used for call waiting, call transfer or conferencing.

```
Router(config)# ephone-dn 1
```

```
Router(config-ephone-dn)# number 1001
```

```
Router(config-ephone-dn)# ephone-dn 2
```

```
Router(config-ephone-dn)# number 1002
```

```
Router(config)# ephone 1
```

```
Router(config-ephone)# type 7960
```

```
Router(config-ephone)# button 1:1
```

```
Router(config)# ephone 2
```

```
Router(config-ephone)# type 7960
```

```
Router(config-ephone)# button 1:2
```

```
Router0(config)# dial-peer voice 200 voip
```

```
Router0(config-dial-peer)# session target ipv4:10.10.10.6
```

```
Router0(config-dial-peer)# destination-pattern 2001
```

```
Router0(config-dial-peer)# destination-pattern 2002
```

## 2<sup>nd</sup> Telephony Network

```
Switch(config)# vlan 10
```

```
Switch(config-vlan)# name DATA
```

```
Switch(config-vlan)# vlan 20
```

```
Switch(config-vlan)# name VOICE
```

```
Switch(config)# interface range fastEthernet 0/2-3
```

```
Switch(config-if-range)# switchport mode access
```

```
Switch(config-if-range)# switchport access vlan 10
```

```
Switch(config-if-range)# switchport voice vlan 20
```

```
Switch(config)# interface fastEthernet 0/1
```

```
Switch(config-if)# switchport mode trunk
```

```
Router(config)# interface fastEthernet 0/0
```

```
Router(config-if)# no shutdown
```

```
Router(config-if)# interface fastEthernet 0/0.10
```

```
Router(config-subif)# encapsulation dot1Q 10
```

```
Router(config-subif)# ip address 200.10.10.1 255.255.255.0
```

```
Router(config)# interface fastEthernet 0/0.20
```

```
Router(config-subif)# encapsulation dot1Q 20
```

```
Router(config-subif)# ip address 200.20.20.1 255.255.255.0
```

```
Router(config)# ip dhcp excluded-address 200.10.10.1 200.10.10.5
```

```
Router(config)# ip dhcp excluded-address 200.20.20.1 200.20.20.5
```

```
Router(config)# ip dhcp pool DATA
```

```
Router(dhcp-config)# network 200.10.10.0 255.255.255.0
```

```
Router(dhcp-config)# default-router 200.10.10.1
```

```
Router(dhcp-config)# dns-server 8.8.8.8
```

```
Router(config)# ip dhcp pool VOICE
Router(dhcp-config)# network 200.20.20.0 255.255.255.0
Router(dhcp-config)# default-router 200.20.20.1
Router(dhcp-config)# option 150 ip 200.20.20.1
```

```
Router(config)# telephony-service
Router(config-telephony)# max-ephones 2
Router(config-telephony)# max-dn 3
Router(config-telephony)# ip source-address 200.20.20.1 port 2001
Router(config-telephony)# create cnf-files
```

```
Router(config)# ephone-dn 1
Router(config-ephone-dn)# number 2001
```

```
Router(config-ephone-dn)# ephone-dn 2
Router(config-ephone-dn)# number 2002
```

```
Router(config)# ephone 1
Router(config-ephone)# type 7960
Router(config-ephone)# button 1:1
```

```
Router(config)# ephone 2
Router(config-ephone)# type 7960
Router(config-ephone)# button 1:2
```

```
Router2(config)# dial-peer voice 200 voip
Router2(config-dial-peer)# session target ipv4:10.10.10.1
Router2(config-dial-peer)# destination-pattern 1001
Router2(config-dial-peer)# destination-pattern 1002
```