Lab Topic:Voip Phone System

There main objectifof this lab is to simulate and configurate an efficience telephony system using the simulation software cisco packet tracer.

For the well been of this lab we will used some the following devices on cisco packet tracer

1. We will need to add 3 Routers(e.g 2811 with Cisco IOS Uncerfitied Commuincation image)But any other swicth is good.

2. 3 swicthes (2960 model) thats we gonna have 3 telephone networks

3. Now to eah of our networks we gonna add 4 IP Phones which will make a total of 12 IP phones on our topology in which in each network will have.

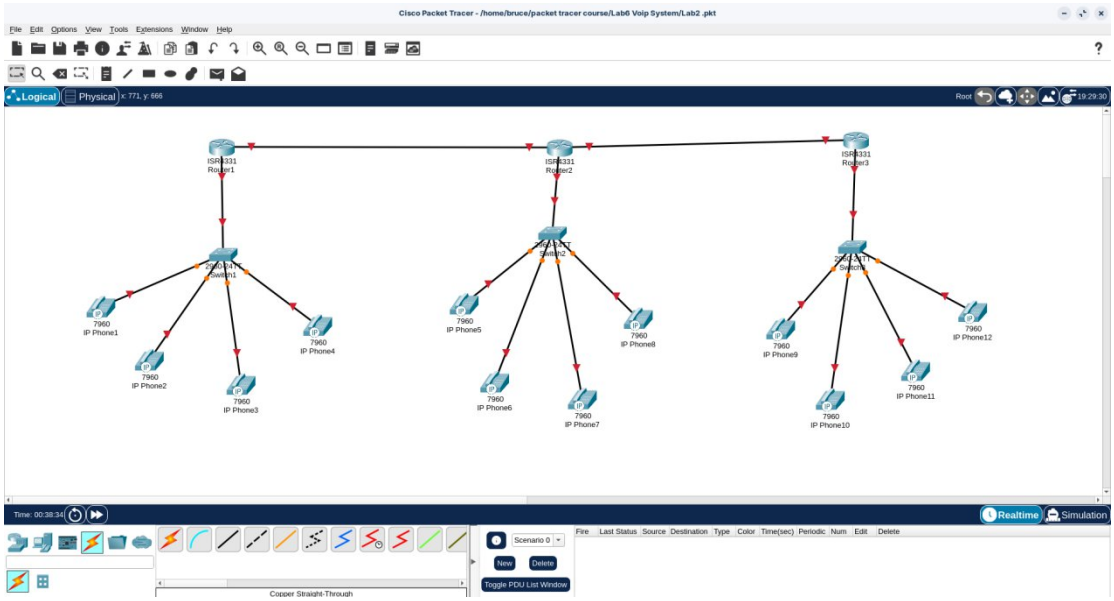
4. After the topology set up configurate the connection between the Routers and the IP phones in each network.

5. Assgn a number to each IP phone in each network if necessary add the user name to each phone user for easy identification.

6. With each network okay now you will now configurate the connection between each routers and permit each phones from each network to communicate with one another.

Note:For the interconnection between the routers add to router 2 the NIM-ES2-4 provides four switching ports.

Lab Structure



As seen from the above images our lab screenshot shows it inactive and so it needs to configurated so let start rerl business

Step 1: Assign IP Addresses

A. Assign IPs to Routers and Switches

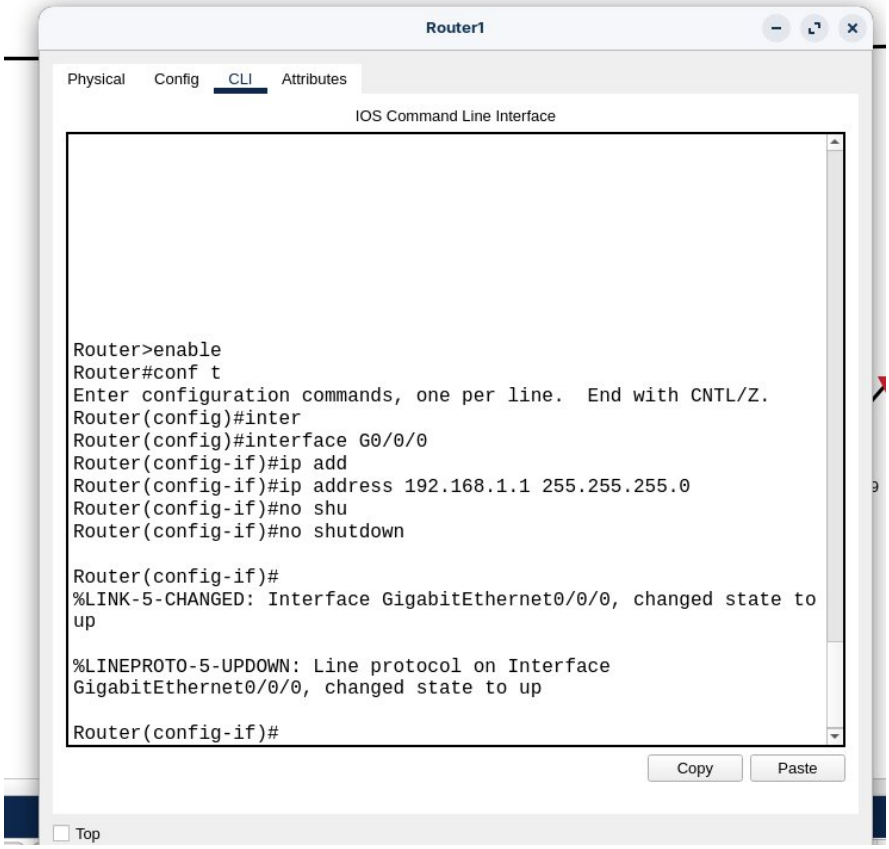
- **Routers**: Assign IP addresses to each router interface (the ones connecting to switches and other routers).
- **Switches**: Switches are Layer 2, so they don't need an IP unless you want to manage them (optional).

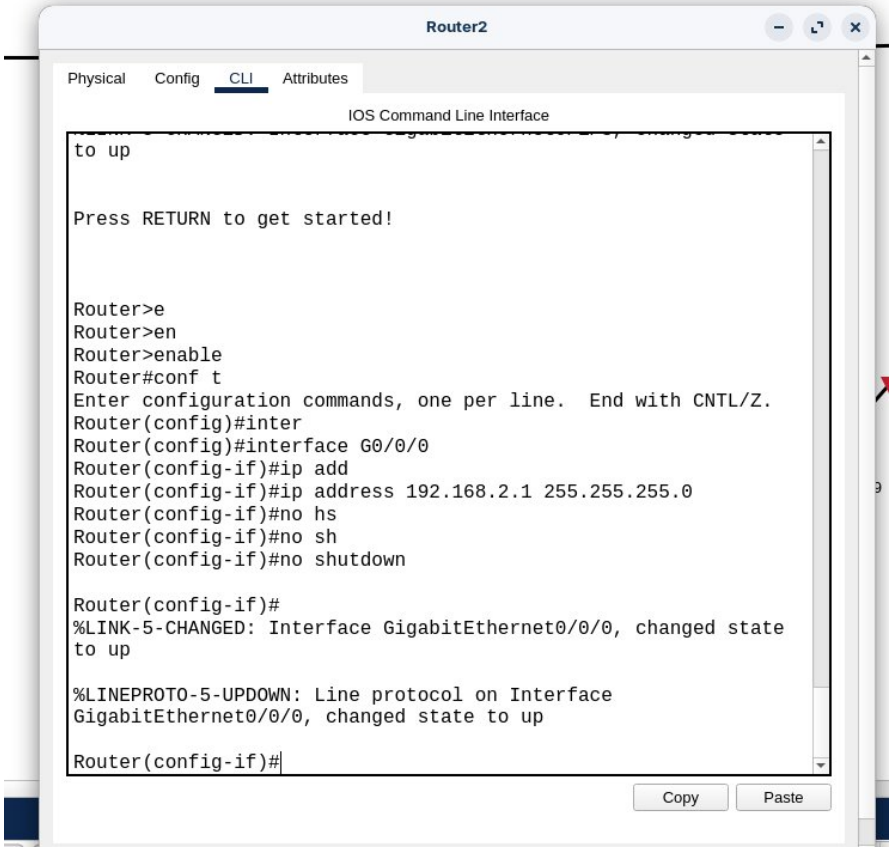
Example IP Plan

You can use the following (adjust as needed):

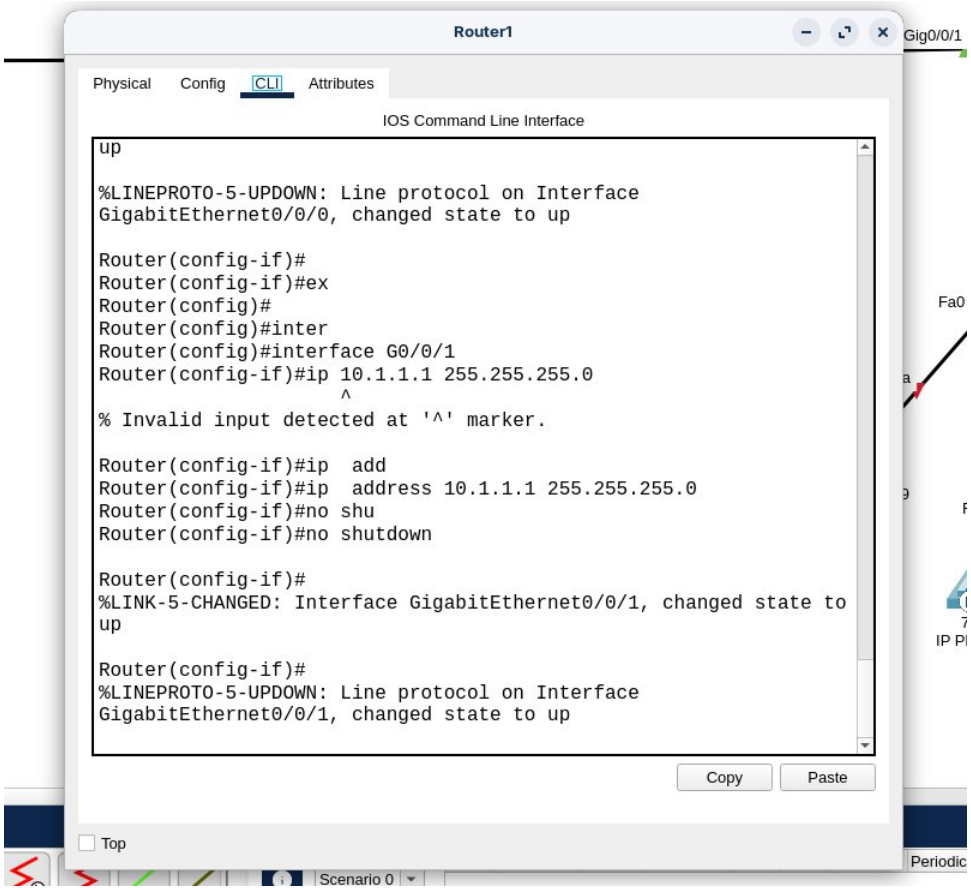
Device	Interface	IP Address	Subnet Mask
Router1	G0/0	192.168.1.1	255.255.255.0
Router2	G0/0	192.168.2.1	255.255.255.0
Router3	G0/0	192.168.3.1	255.255.255.0
Router1	G0/1	10.1.1.1	255.255.255.0
Router2	G0/1	10.1.1.2	255.255.255.0
Router3	G0/1	10.1.1.3	255.255.255.0

- **Connect G0/0 to the switch for each group of phones.**


Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#inter
Router(config)#interface G0/0/0
Router(config-if)#ip add
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shu
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
Router(config-if)#
Copy
Paste
Top


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
to up
Press RETURN to get started!
Router>e
Router>en
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#inter
Router(config)#interface G0/0/0
Router(config-if)#ip add
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no hs
Router(config-if)#no sh
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
Router(config-if)#
Copy
Paste

Just do the same for Router3



For this also repeat that for the router2 and router3 for the G0/1 interfaces in each.

Step2 :Assign IPs to Iphones

- Each phone should be in the same subnet as it router LAN’s interface.
- Exemple for Router1 phones w gonna have.

1. **Phone 1:192.168.1.10**
2. **Phone 2:192.168.1.11**
3. **Phone 3: 192.168.1.12**
4. **Phone 4:192.168.1.13**

Then repeat i will repeat this operation for Router2 and Router3

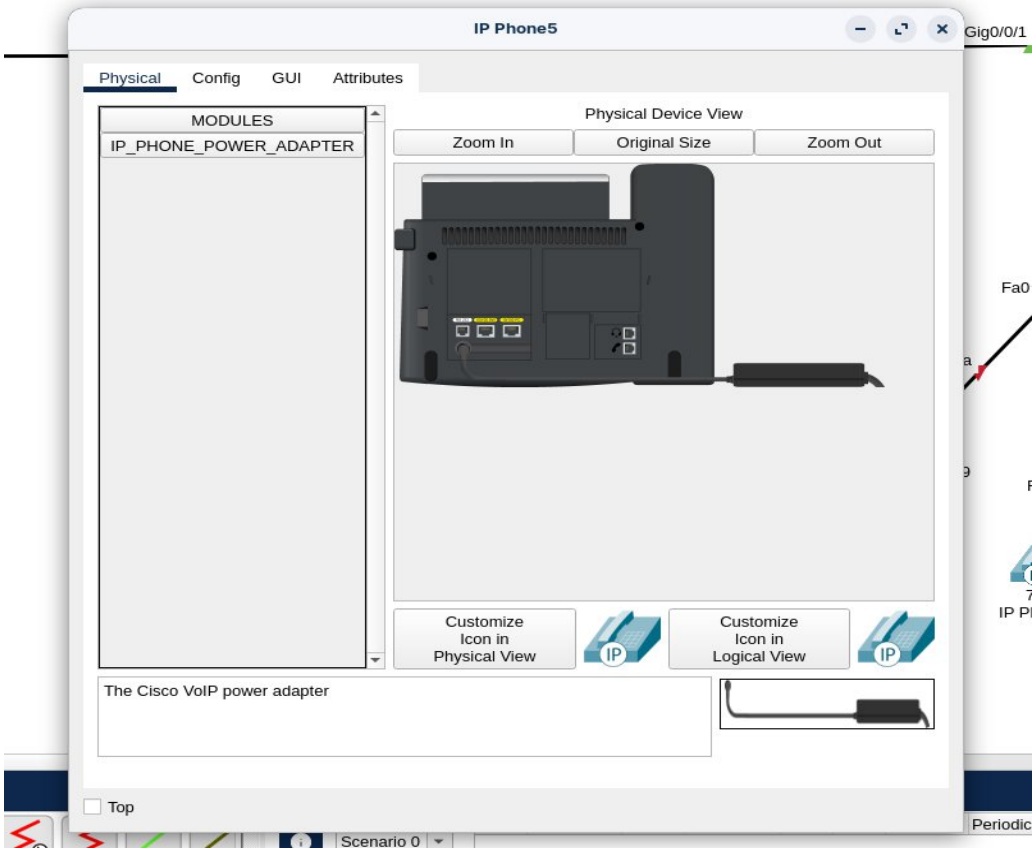
Then for Router 2 we have

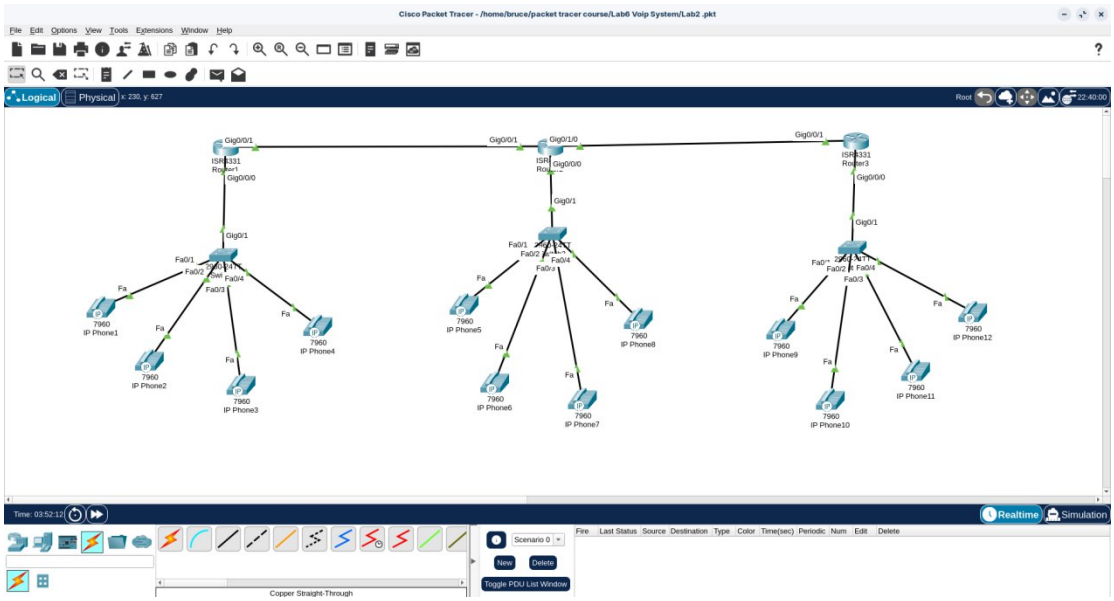
5. **Phone 1:192.168.2.10**
6. **Phone 2:192.168.2.11**
7. **Phone 3: 192.168.2.12**
8. **Phone 4:192.168.2.13**

How to this

1. Put on the IP phones by adding to each the power module.
2. Click on our IP Phones
3. Go to the **config** Tab
4. Assign the IP address, subnet mask, and default gateway (the router's LAN IP).

All this will be seen on the image below



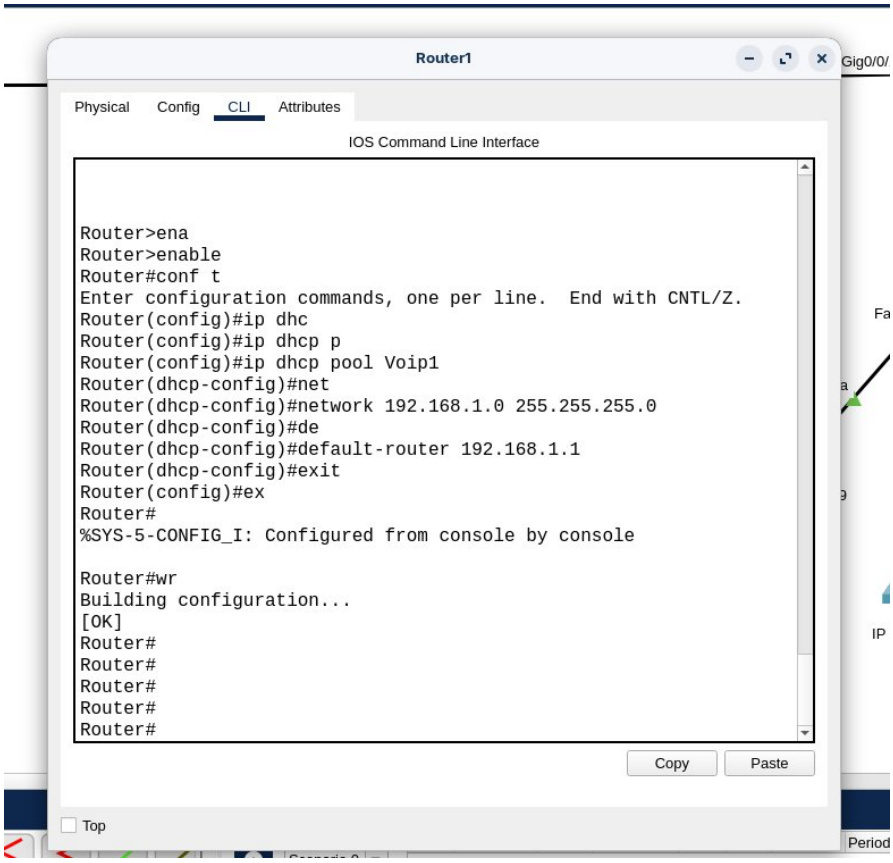


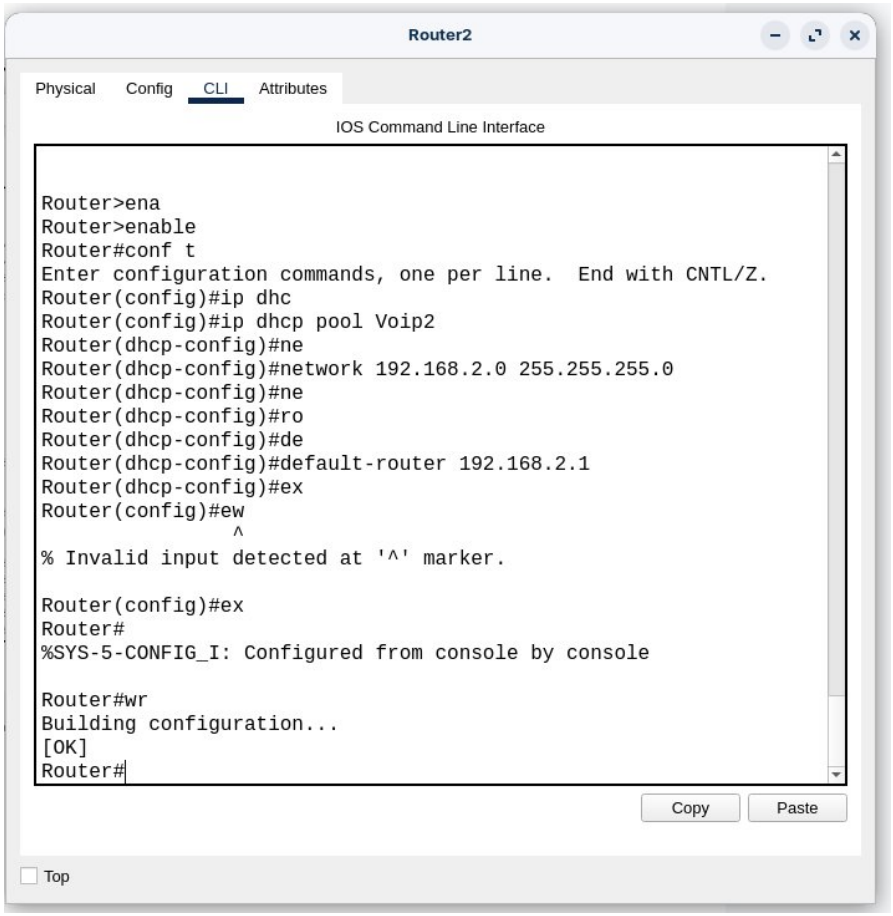
After putting on all the IP Phones we gonna the image about.

Step 3:Configure DHCP (optional)

But i prefer using Dhcp for this lab intern of using static phone address.
For setting DHCP configuartion we gonna type the following commands and repeat that for each routers let start with Router 1.

1. Go to Router CLI
2. type the following


Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>ena
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip dhc
Router(config)#ip dhcp p
Router(config)#ip dhcp pool Voip1
Router(dhcp-config)#net
Router(dhcp-config)#network 192.168.1.0 255.255.255.0
Router(dhcp-config)#de
Router(dhcp-config)#default-router 192.168.1.1
Router(dhcp-config)#exit
Router(config)#ex
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#wr
Building configuration...
[OK]
Router#
Router#
Router#
Router#
Router#
Copy
Paste
Top
Gig0/0/
Fa
IP
Period

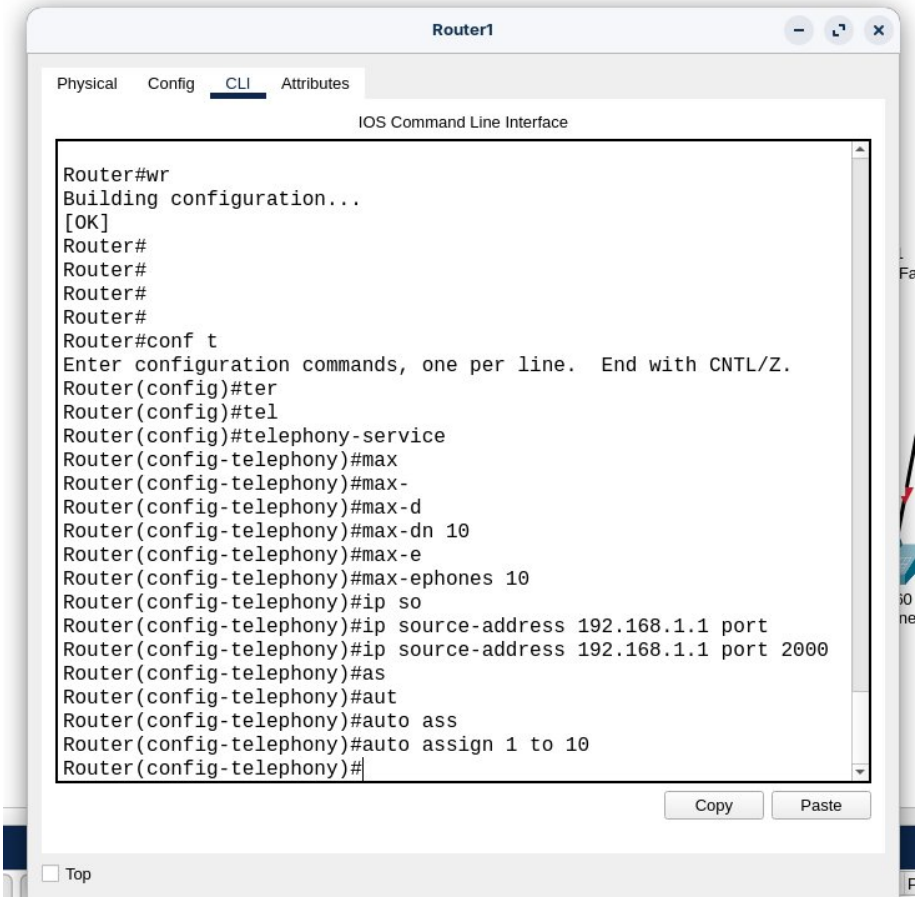

Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>ena
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip dhc
Router(config)#ip dhcp pool Voip2
Router(dhcp-config)#ne
Router(dhcp-config)#network 192.168.2.0 255.255.255.0
Router(dhcp-config)#ne
Router(dhcp-config)#ro
Router(dhcp-config)#de
Router(dhcp-config)#default-router 192.168.2.1
Router(dhcp-config)#ex
Router(config)#ew
^
% Invalid input detected at '^' marker.
Router(config)#ex
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#wr
Building configuration...
[OK]
Router#
Copy
Paste
Top

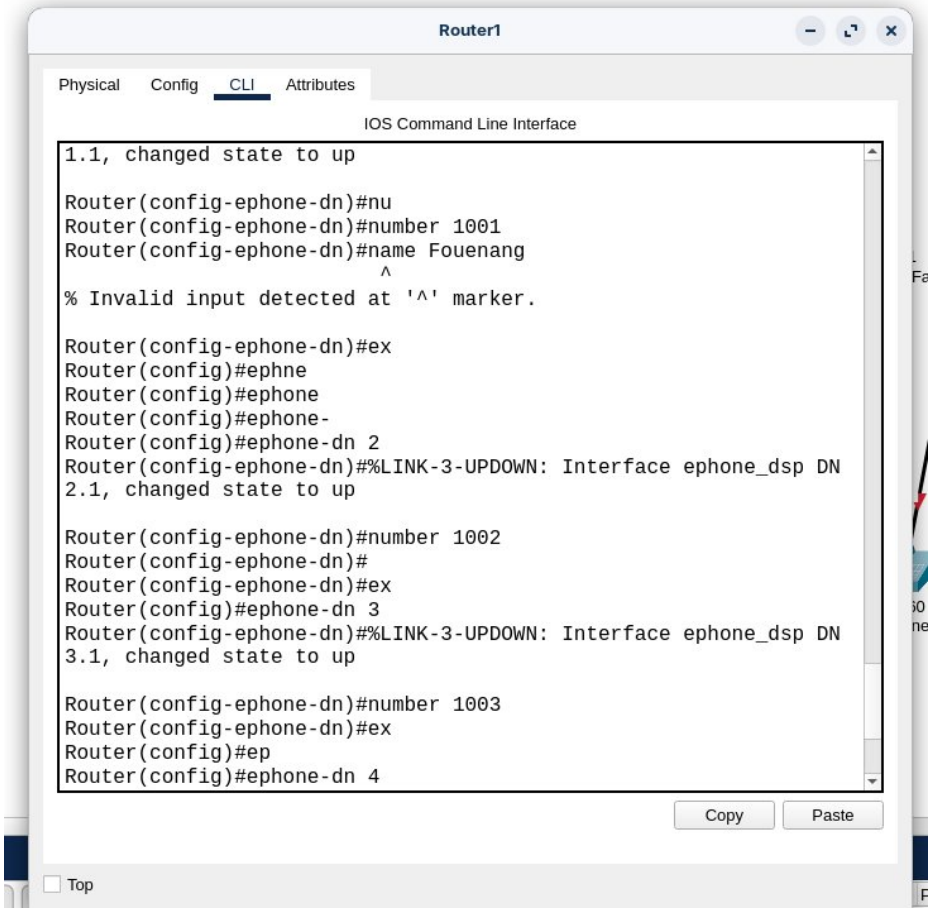
Do the same for Router 3.

Step 4:Add a Call manager (CUCM Express) on Routers

1. On each router,go to the config tab and type telephony
2. Enable the telephony services on each Router

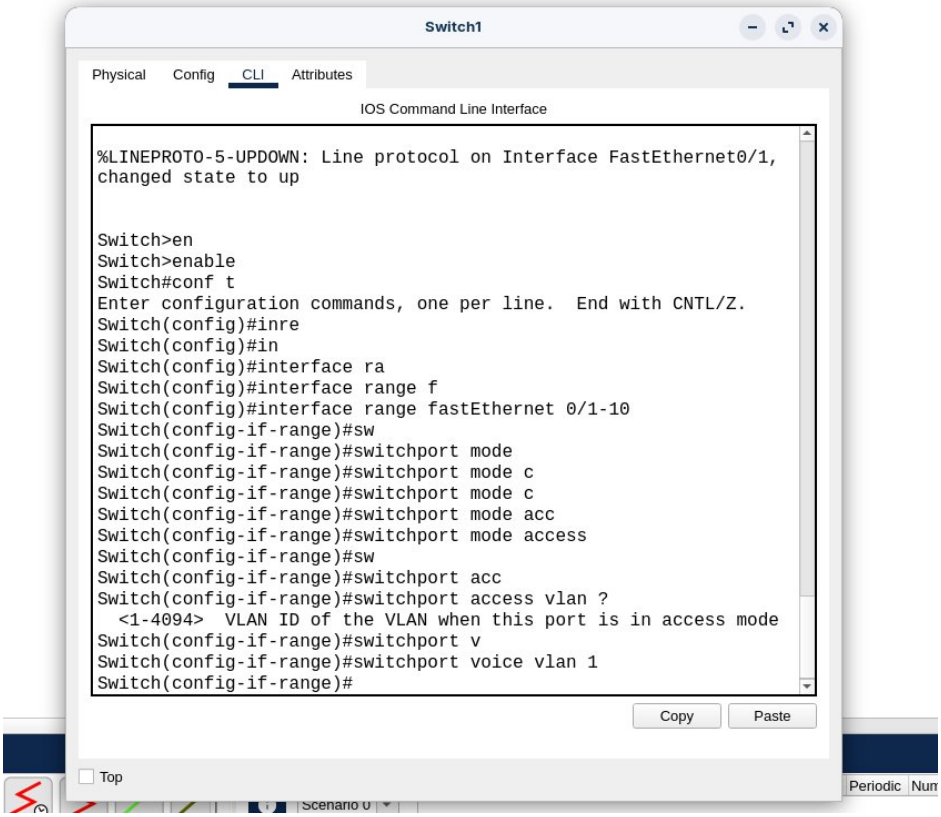
So the following will happened.



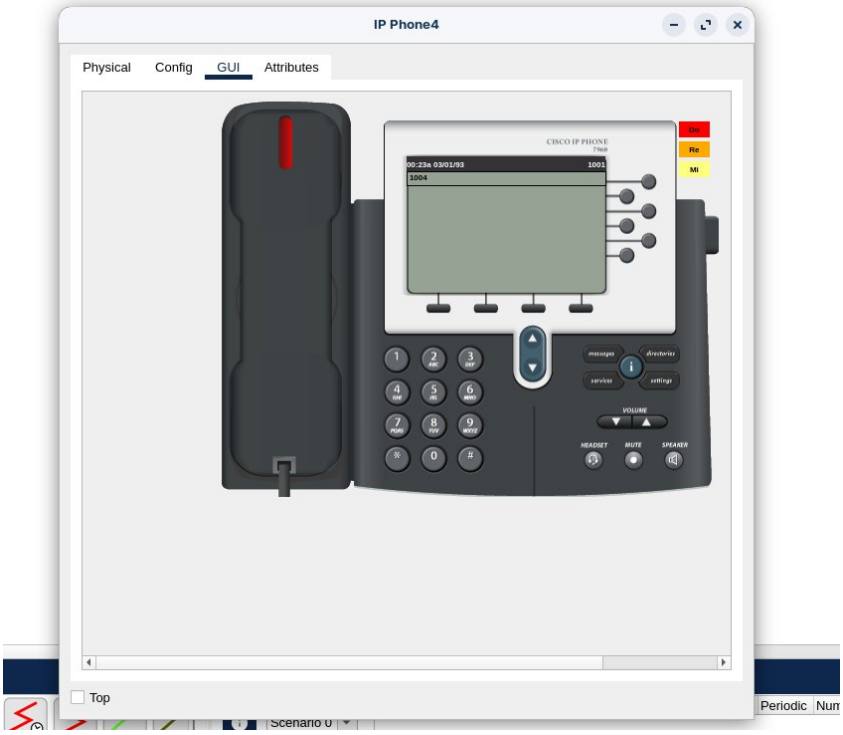


Step5:Configure switchport Voice

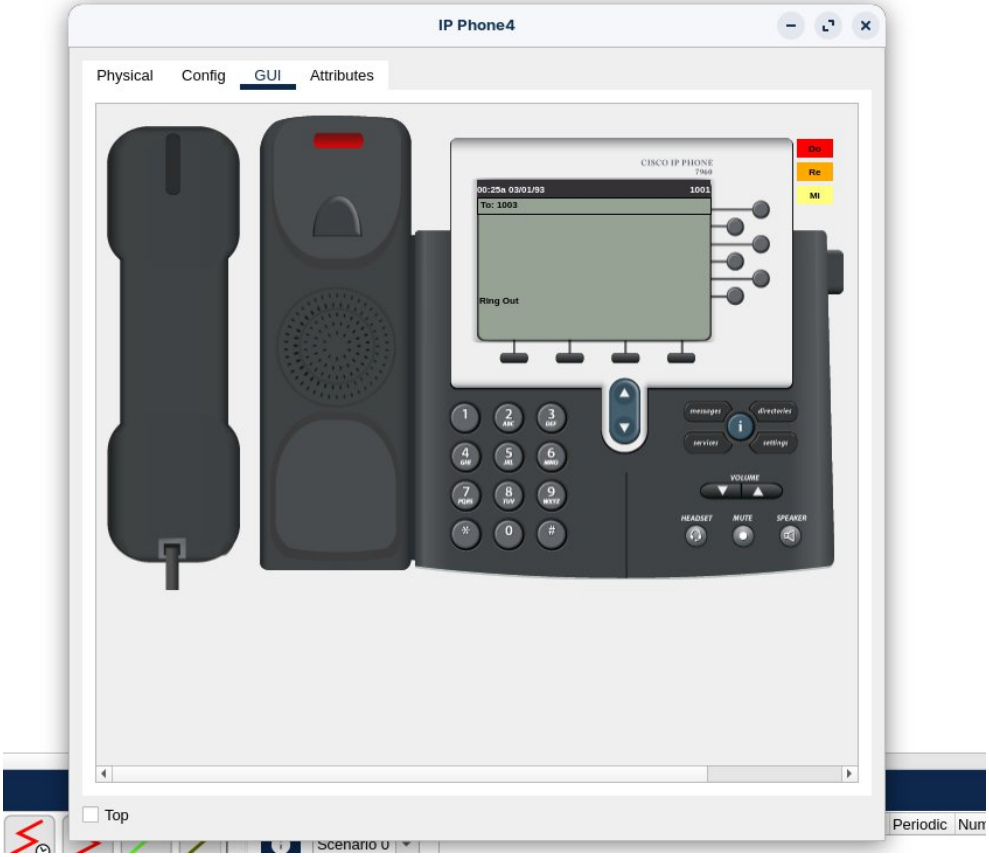
For all this to work we need to configure Vlan access for our phones on our swicthes



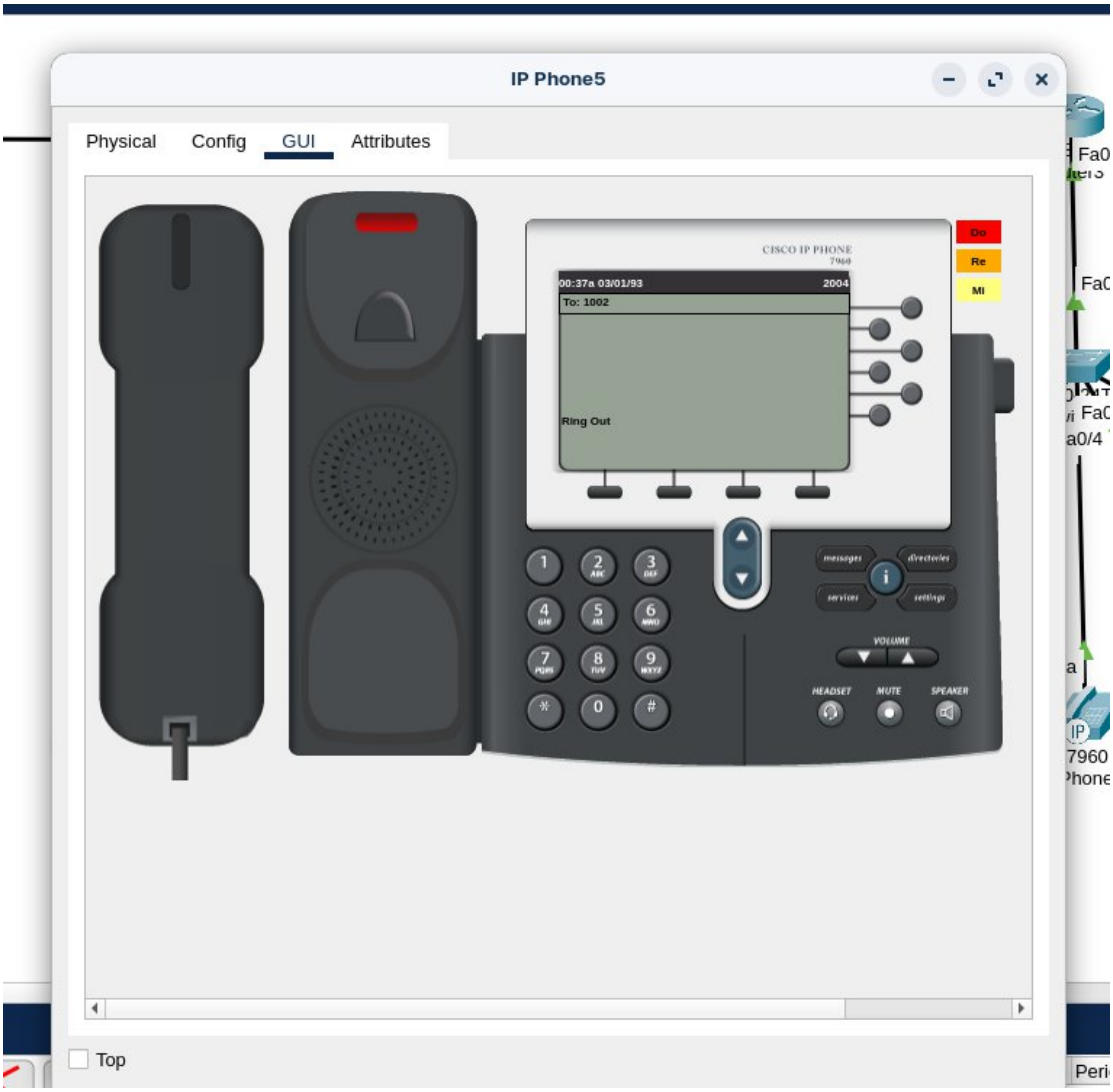
Repeat the operation for other swithes and we will be able to call each othet on our telephones networks.

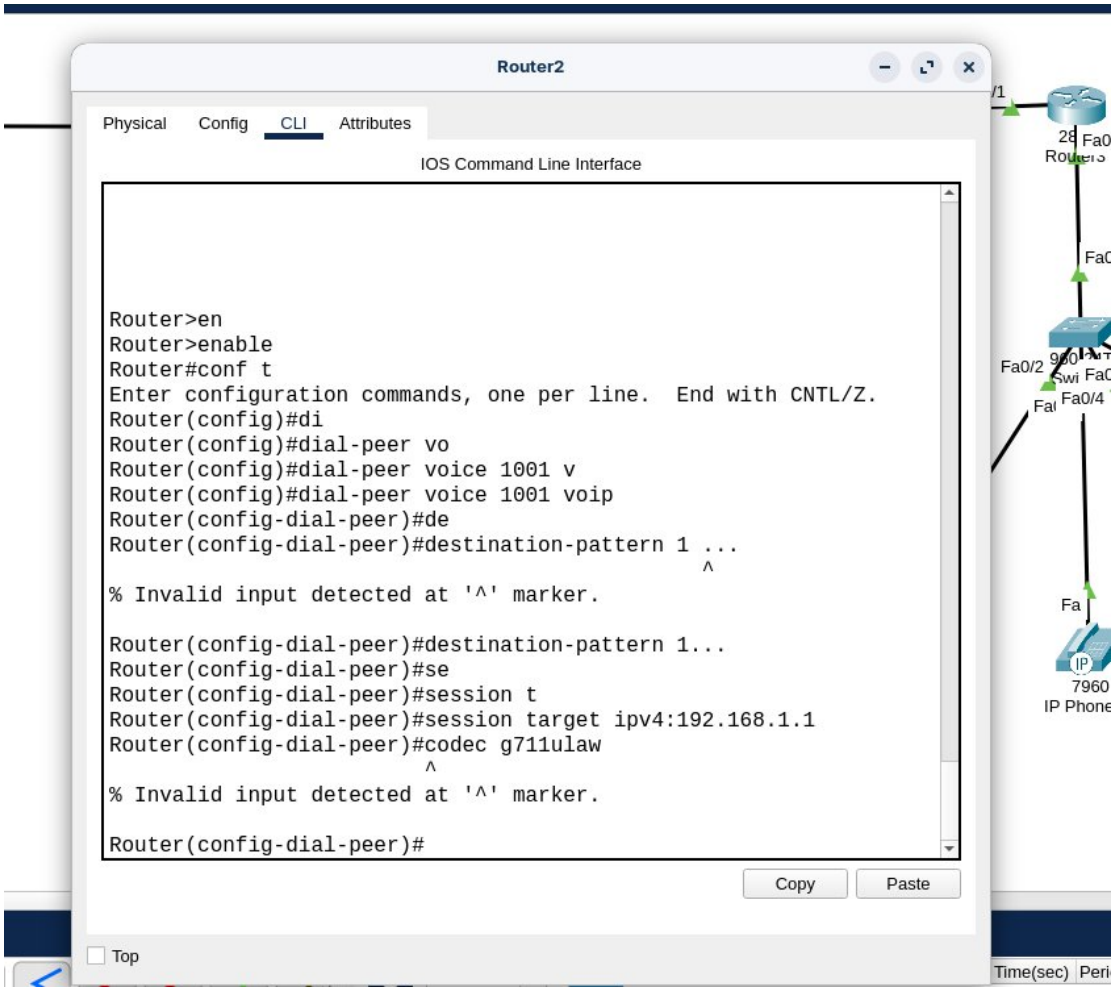


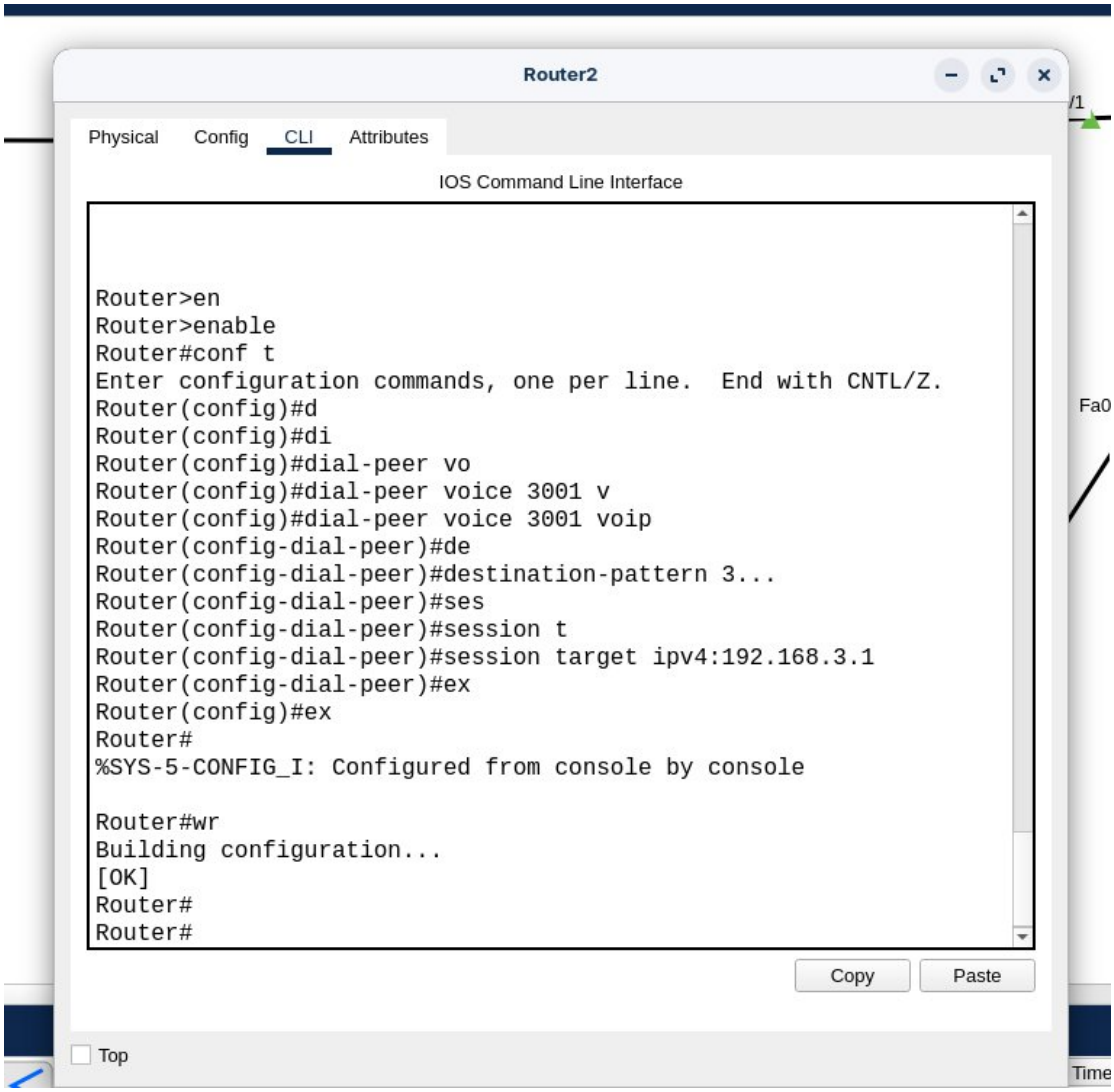
When the Number is been compose.



Chrome Ringing and also phone connection will pass like that


IP Phone5
Physical
Config
GUI
Attributes
CISCO IP PHONE
7960
00:37a 03/01/93
2004
To: 1002
Ring Out
Do
Re
Mi
messages
directories
services
settings
VOLUME
HEADSET
MUTE
SPEAKER
Top


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>en
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#di
Router(config)#dial-peer vo
Router(config)#dial-peer voice 1001 v
Router(config)#dial-peer voice 1001 voip
Router(config-dial-peer)#de
Router(config-dial-peer)#destination-pattern 1 ...
^
% Invalid input detected at '^' marker.
Router(config-dial-peer)#destination-pattern 1...
Router(config-dial-peer)#se
Router(config-dial-peer)#session t
Router(config-dial-peer)#session target ipv4:192.168.1.1
Router(config-dial-peer)#codec g711ulaw
^
% Invalid input detected at '^' marker.
Router(config-dial-peer)#
Copy
Paste
Top
Fa0/2
Fa0/4
7960
IP Phone
Time(sec)



Repeat the operation of all the destinations and all the Routers.