औद्योगिक प्रशिक्षण के लिए राष्ट्रीय संस्थान

National Institute for Industrial Training

One Premier Organization with Non Profit Status | Registered Under Govt. of WB
Empanelled Under Planning Commission Govt. of India
Inspired By: National Task Force on IT & SD Government of India

राष्ट्रीय आईटी और साइबर सुरक्षा रिसर्च एसोसिएशन

National IT and Cyber Security Research Association

One Premier Organization with Non Profit Status | Registered Under Govt. of West Bengal
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Inspired By: National Task Force on IT & SD Government of India

साइबर सुरक्षा ज्ञान बांटने और अनुसंधान परिषद

Cyber Security Knowledge Sharing and Research Council

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FOR THE PURPOSE OF

CERTIFICATION

NAME:RAKTIM MUKHOPADHYAY

COLLEGE:GOVT. COLLEGE OF ENGG. AND CERAMIC TECHNOLOGY

DEPT: COMPUTER SCIENCE AND ENGG.

DATE OF EXAM:22TH JULY 2016

QUESTION I

CONFIGURE SEVEN 18XX ROUTERS IN SERIES USING OSPF.

ROUTER CONNECTIVITY WITH OSPF COMMANDS:

OSPF stands for Open Shortest Path First. OSPF is a link state open standard based routing protocol.

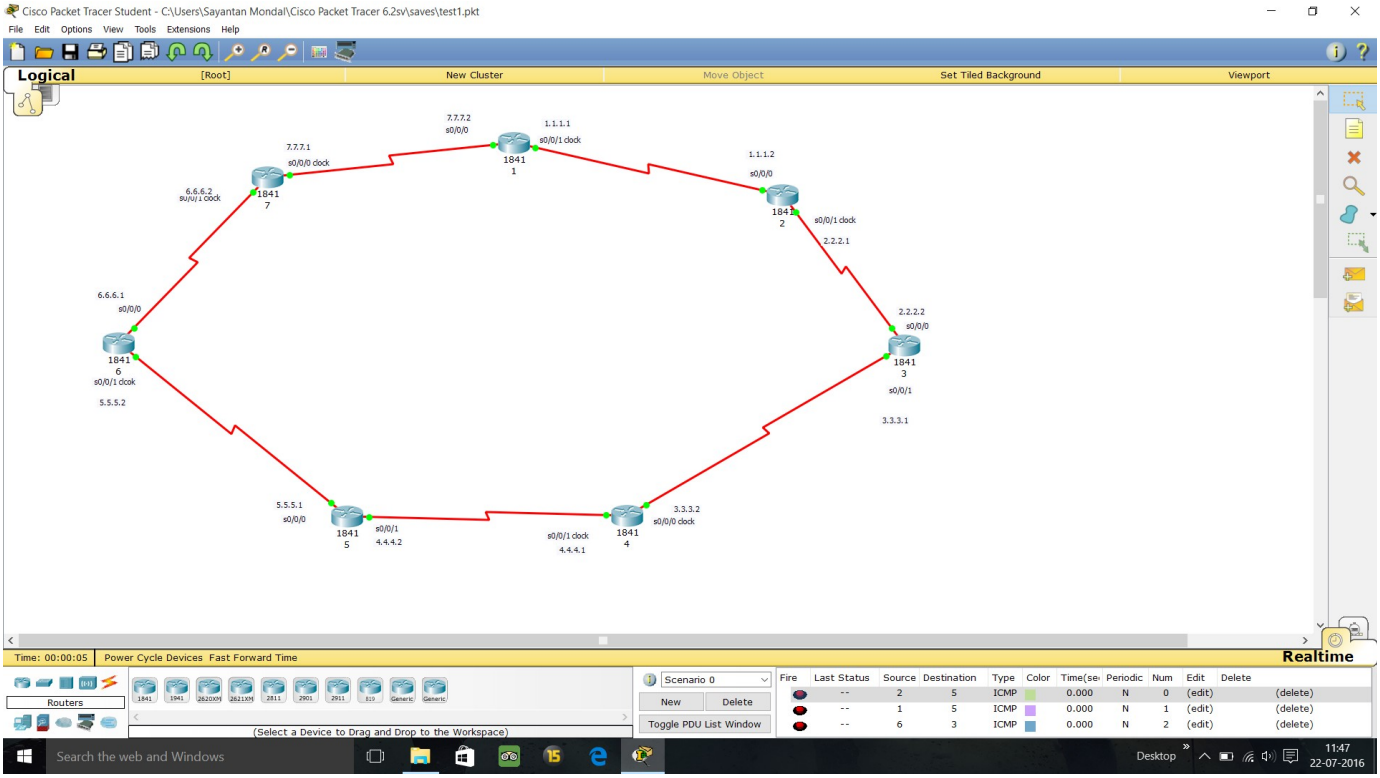
A topology as demonstrated in the picture is created using Cisco Packet Tracer Student v6.2.

Eight CISCO 1841 Routers are connected together across its serial interfaces via Serial DCE and DTE cables.

Configuring each Router:

1.Double click on each Router

2.Under the Physical tab, we find the back side of the router where we need to power off the router and add a Wan Interface Card (WIC) and then turn the router back on. In this case, we use WIC-2T for the purpose.



TAKING 7 ROUTERS CONNECTING THEM BY FIRST CONFIGURING THE IP IN RESPECTIVE PORTS, THEN USING OSPF COMMAND INTERCONNECTING THEM.

SOURCE CODES CONFIGURING CISCO ROUTER 1811

FOR CONFIGURING ROUTER CONNECTIONS

Router 1:

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int s0/0/1
Router(config-if)#ip address 1.1.1.1 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Router(config-if)#int s0/0/0
Router(config-if)#ip address 7.7.7.2 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,
changed state to up
```

Router 2

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int s0/0/0
Router(config-if)#ip address 1.1.1.2 255.0.0.0
```

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

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Router(config-if)#int
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
Router(config-if)#int s0/0/1
Router(config-if)#ip address 2.2.2.1 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
```

Router 3

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int s0/0/0
Router(config-if)#ip address 2.2.2.2 255.0.0.0
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
Router(config-if)#int s0/0/1
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up

Router(config-if)#ip address 3.3.3.1 255.0.0.0
```

```
Router(config-if)#clock rate 64000
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
```

Router 4

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int s0/0/0
Router(config-if)#ip address 3.3.3.2 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up

Router(config-if)#int s0/0/1
Router(config-if)#ip address 4.4.4.1 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
```

Router 5

```
Router>en
Router#config t
```

```
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int s0/0/0
Router(config-if)#ip address 4.4.4.2 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Router(config-if)#int
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
Router(config-if)#int s0/0/0
Router(config-if)#ip address 5.5.5.1 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
```

Router 6

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int s0/0/1
Router(config-if)#ip address 5.5.5.2 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up
Router(config-if)#int s0/0/0
Router(config-if)#ip address 6.6.6.1 255.0.0.0
Router(config-if)#no shut
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
```

Router 7

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int s0/0/1
Router(config-if)#ip address 6.6.6.2 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

Router(config-if)#int s0/0/0
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up

Router(config-if)#ip address 7.7.7.1 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
```

Configure OSPF routing protocol:

Enabling OSPF is a two-step process: -

1. Enable OSPF routing protocol from global configuration mode.
2. Tell OSPF which interfaces we want to include.

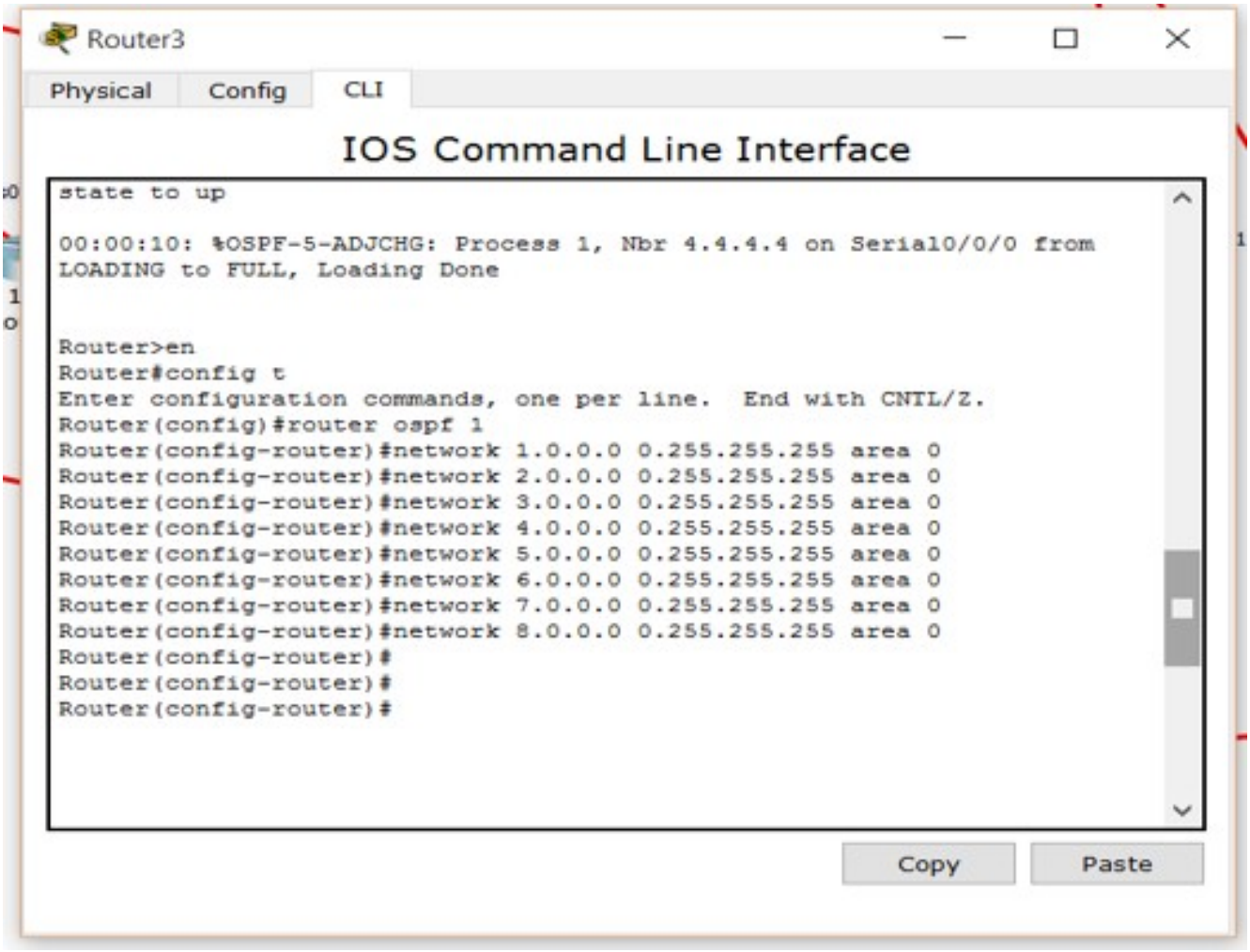
For these steps following commands are used respectively.

```
Router(config)# router ospf processID
Router(config-router)# network IPnetwork_[wild card mask] Area
Number area number
```

This code is same for all the routers. For Router 1 code is shown:

ROUTER 1

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 1.0.0.0 0.255.255.255 area 0
Router(config-router)#network 2.0.0.0 0.255.255.255 area 0
Router(config-router)#network 3.0.0.0 0.255.255.255 area 0
Router(config-router)#network 4.0.0.0 0.255.255.255 area 0
Router(config-router)#network 5.0.0.0 0.255.255.255 area 0
Router(config-router)#network 6.0.0.0 0.255.255.255 area 0
Router(config-router)#network 7.0.0.0 0.255.255.255 area 0
```



CLI SCREEN SHOWING OSPF COMMANDS

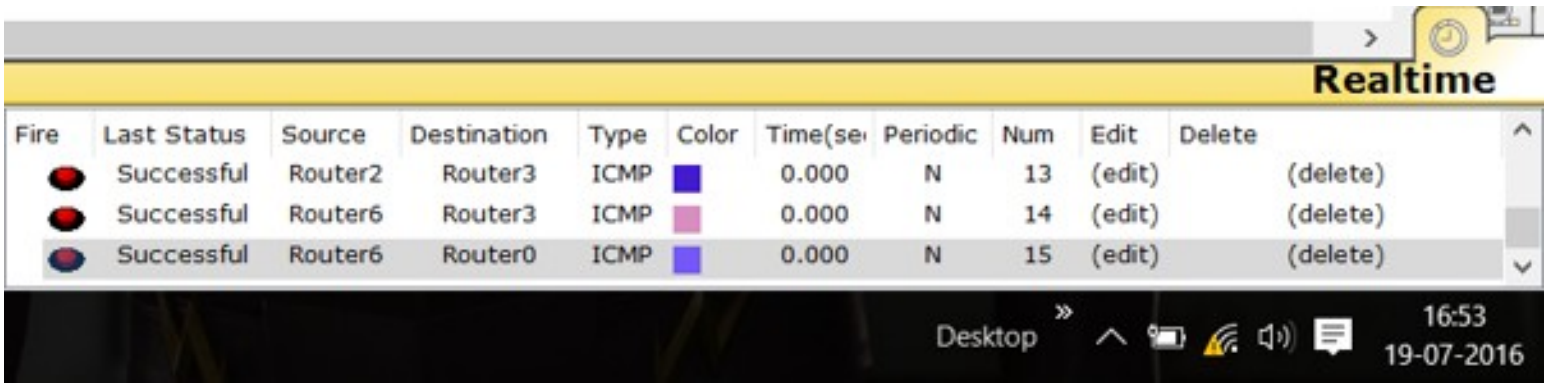


Image showing success in dispatching packet data.

QUESTION II

CONFIGURE TELEPHONY SERVICE USING 2811 ROUTER

STEP 1:

Configure interface FastEthernet 0/0 and DHCP server on Router (2811 router)

STEP 2:

Configure the Call Manager Express telephony service on Router

STEP 3:

Configure a voice VLAN on Switch

STEP 4:

Configure the phone directory for IP Phones

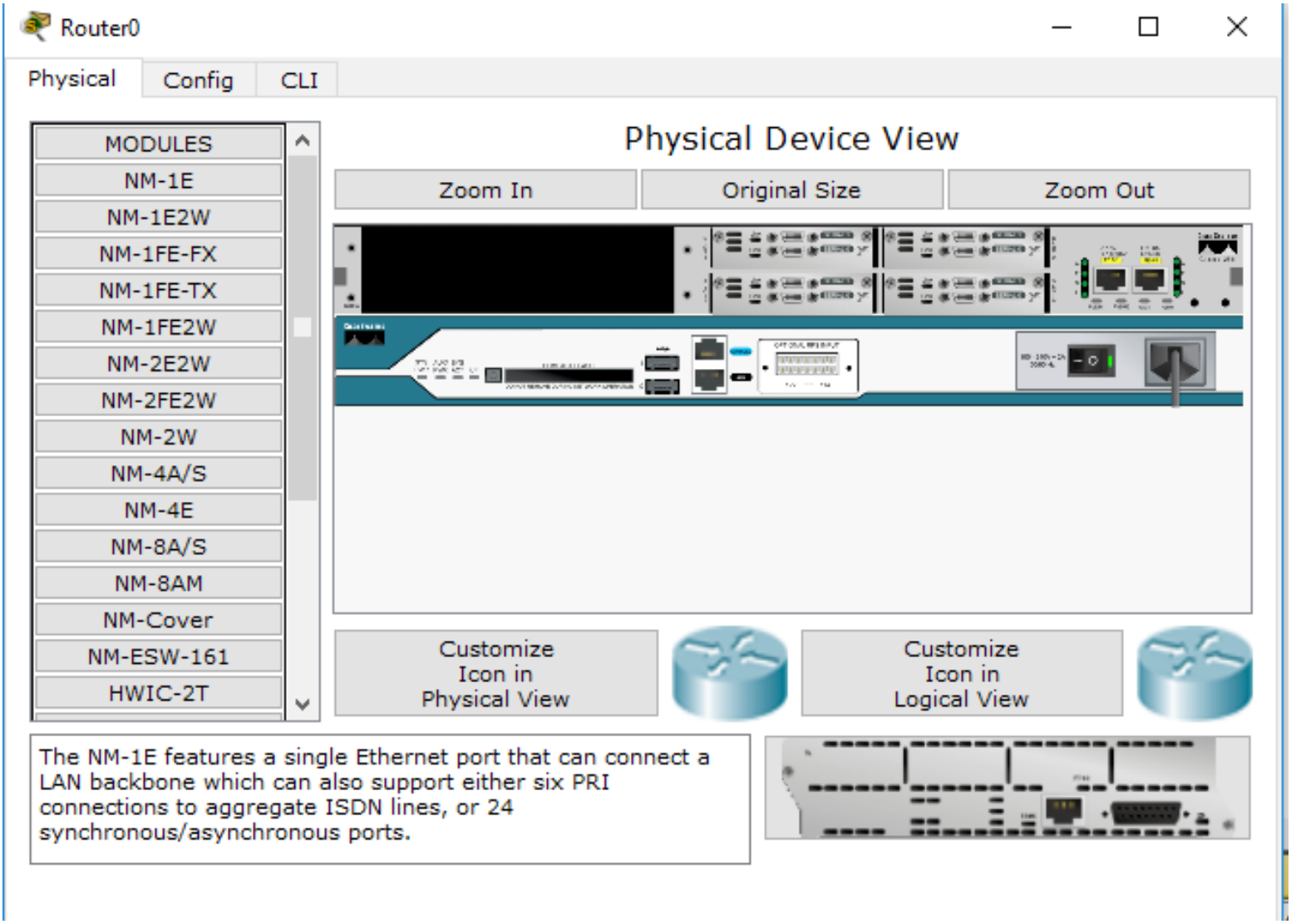
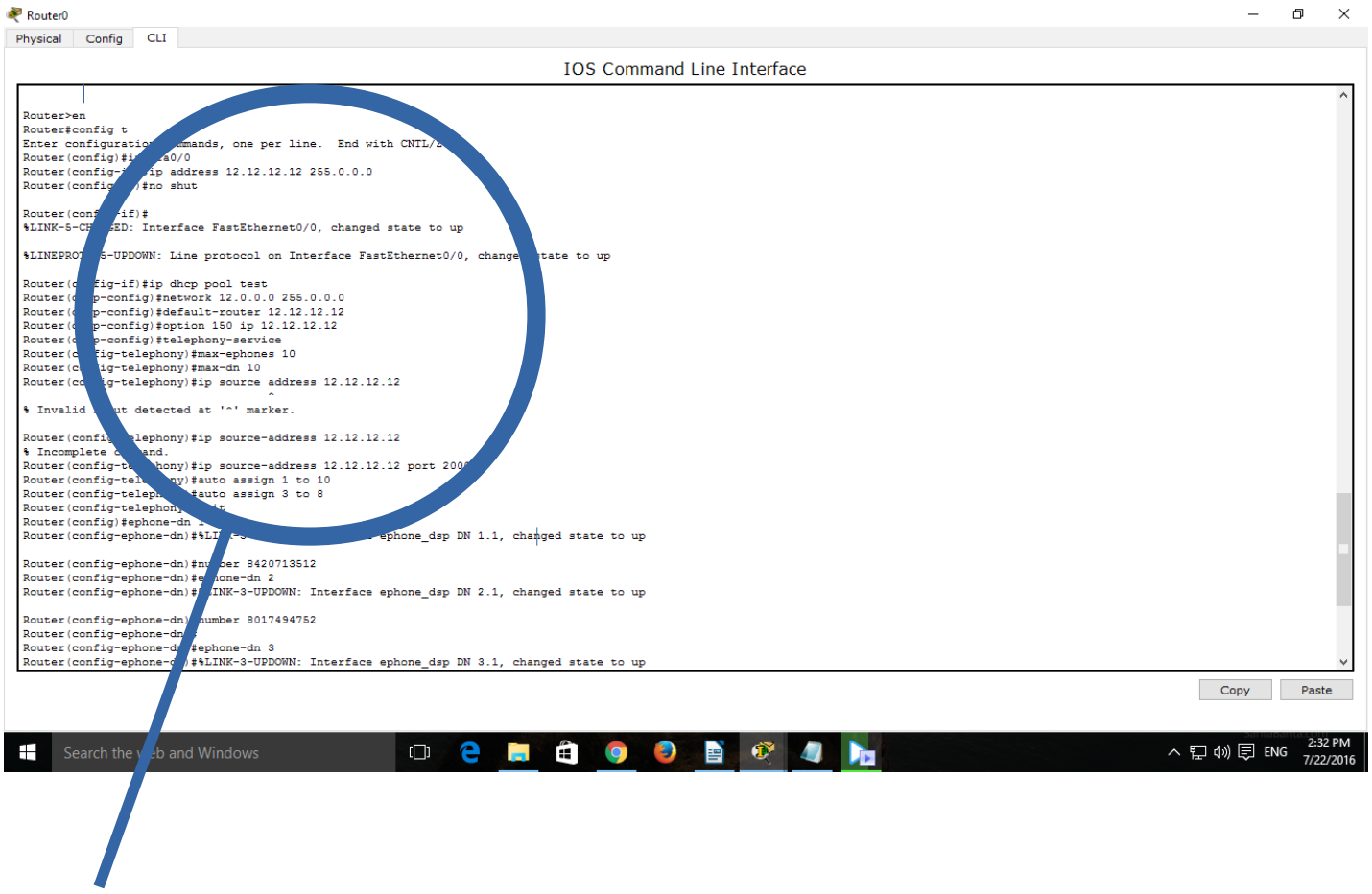


Image represents attaching of WIC-2T card to CISCO ROUTER 2811

SOURCE CODE FOR CONFIGURING CISCO ROUTER 2811




```
Router>en
Router#config t
Enter configuration commands, one per line.  End
with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip address 12.12.12.12 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed
state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/0, changed state to up


Router(config-if)#ip dhcp pool test
Router(dhcp-config)#network 12.0.0.0 255.0.0.0
Router(dhcp-config)#default-router 12.12.12.12
Router(dhcp-config)#option 150 ip 12.12.12.12
Router(dhcp-config)#telephony-service
Router(config-telephony)#max-ephones 10
Router(config-telephony)#max-dn 10
Router(config-telephony)#ip source-address
12.12.12.12 port 2000
Router(config-telephony)#auto assign 1 to 10
Router(config-telephony)#auto assign 3 to 8
Router(config-telephony)#exit
Router(config)#ephone-dn 1
Router(config-ephone-dn)#%LINK-3-UPDOWN: Interface
ephone_dsp DN 1.1, changed state to up


Router(config-ephone-dn)#number 8420713512
Router(config-ephone-dn)#ephone-dn 2
Router(config-ephone-dn)#%LINK-3-UPDOWN: Interface
ephone_dsp DN 2.1, changed state to up


Router(config-ephone-dn)#number 8017494752
Router(config-ephone-dn)#
Router(config-ephone-dn)#ephone-dn 3
```

```
Router(config-ephone-dn)#%LINK-3-UPDOWN: Interface
ephone_dsp DN 3.1, changed state to up

Router(config-ephone-dn)#number 8697547445
Router(config-ephone-dn)#ephone-dn 4
Router(config-ephone-dn)#%LINK-3-UPDOWN: Interface
ephone_dsp DN 4.1, changed state to up

Router(config-ephone-dn)#number 8420649435
Router(config-ephone-dn)#
Router(config-ephone-dn)#ephone-dn 5
```

SOURCE CODE FOR CONFIGURING CISCO SWITCH 2960

```
Switch>en
Switch#config t
Switch(config)#int range fa0/1-24
Switch(config-if range)#switchport mode access
Switch(config-if range)#switchport voice vlan 1
Switch(config-if range)#
```

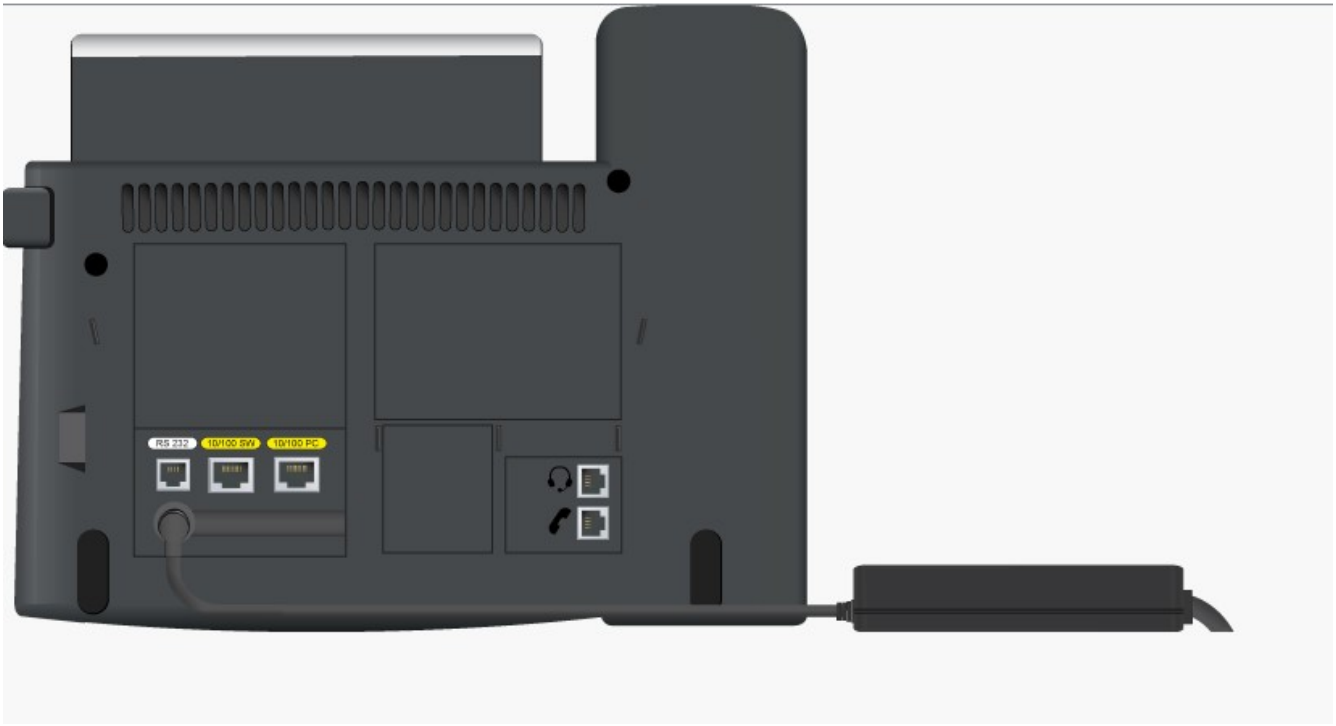


Image represents attaching of IP Phone Power Adapter card to CISCO ROUTER 2811

Image represents GUI of CISCO IP PHONE

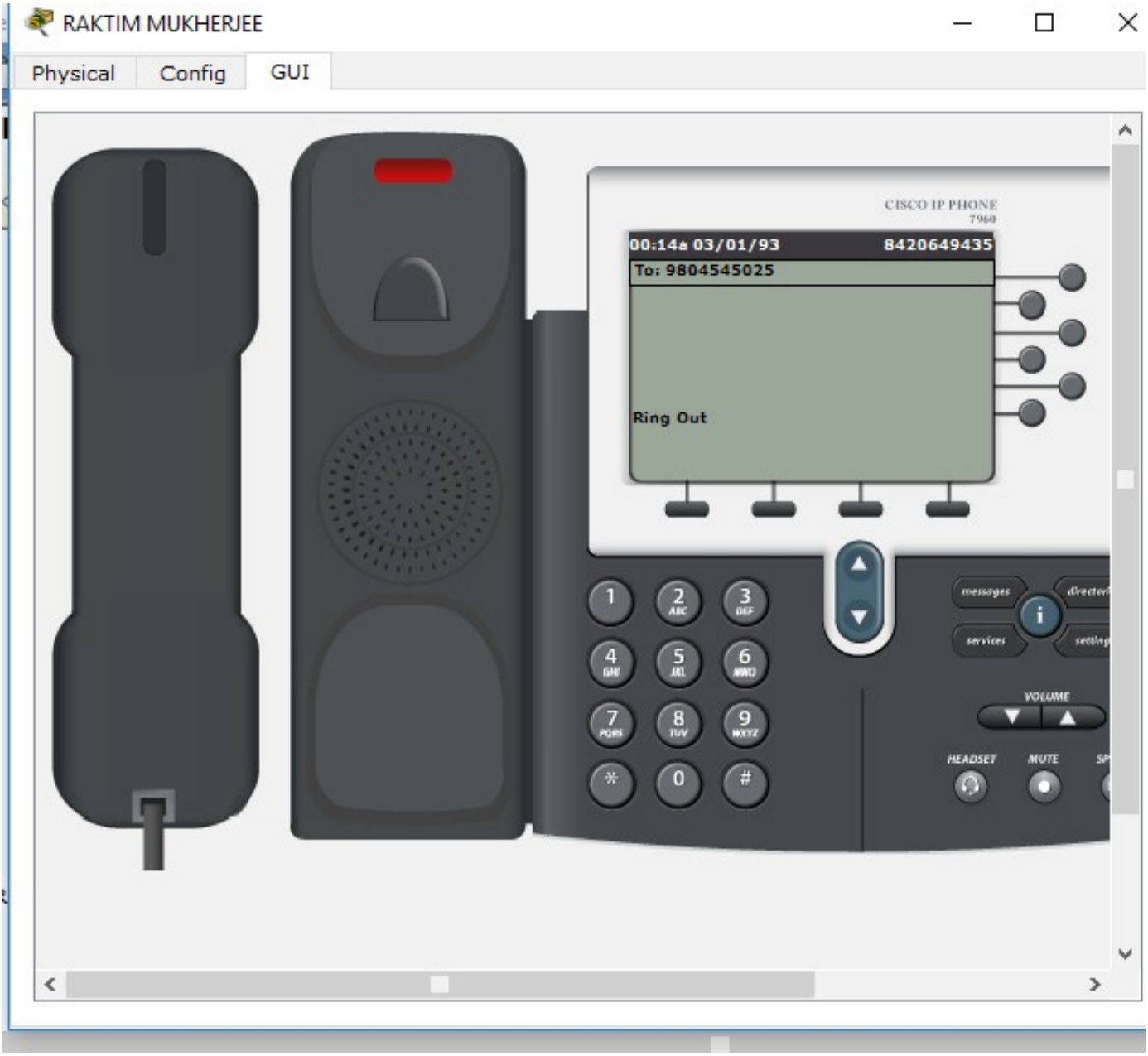


Image represents RING OUT

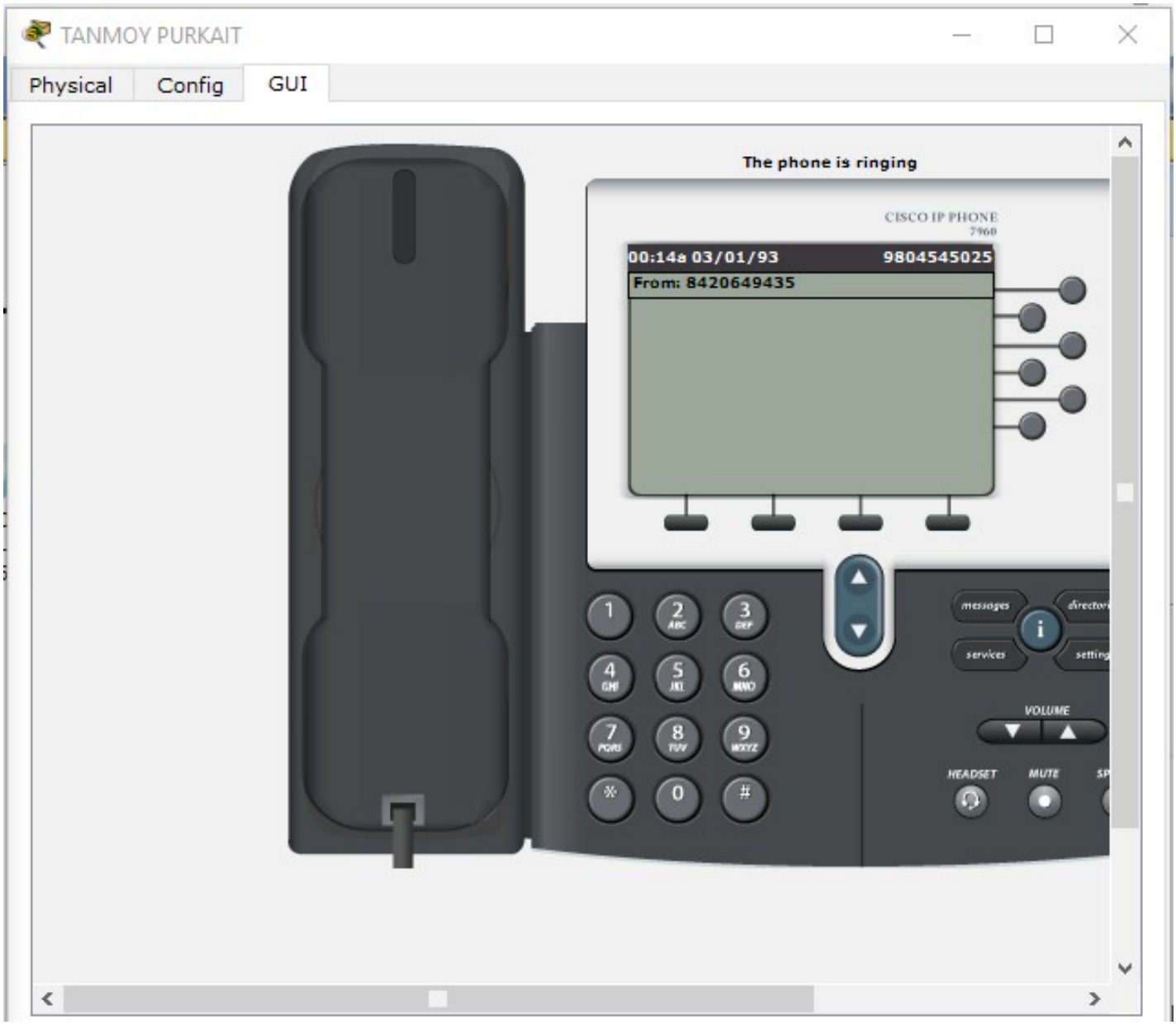


Image represents RING IN

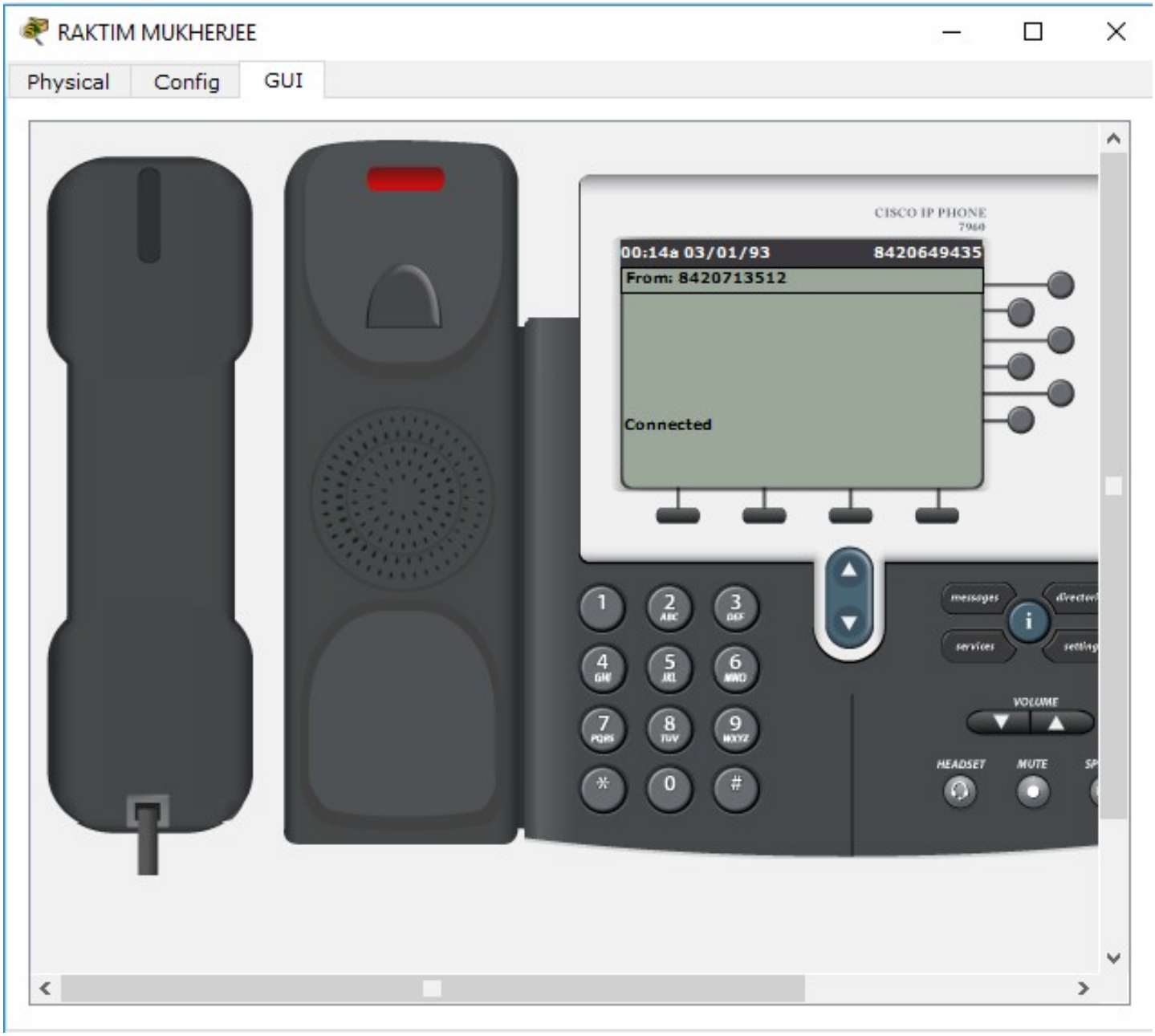


Image represents CONNECTED

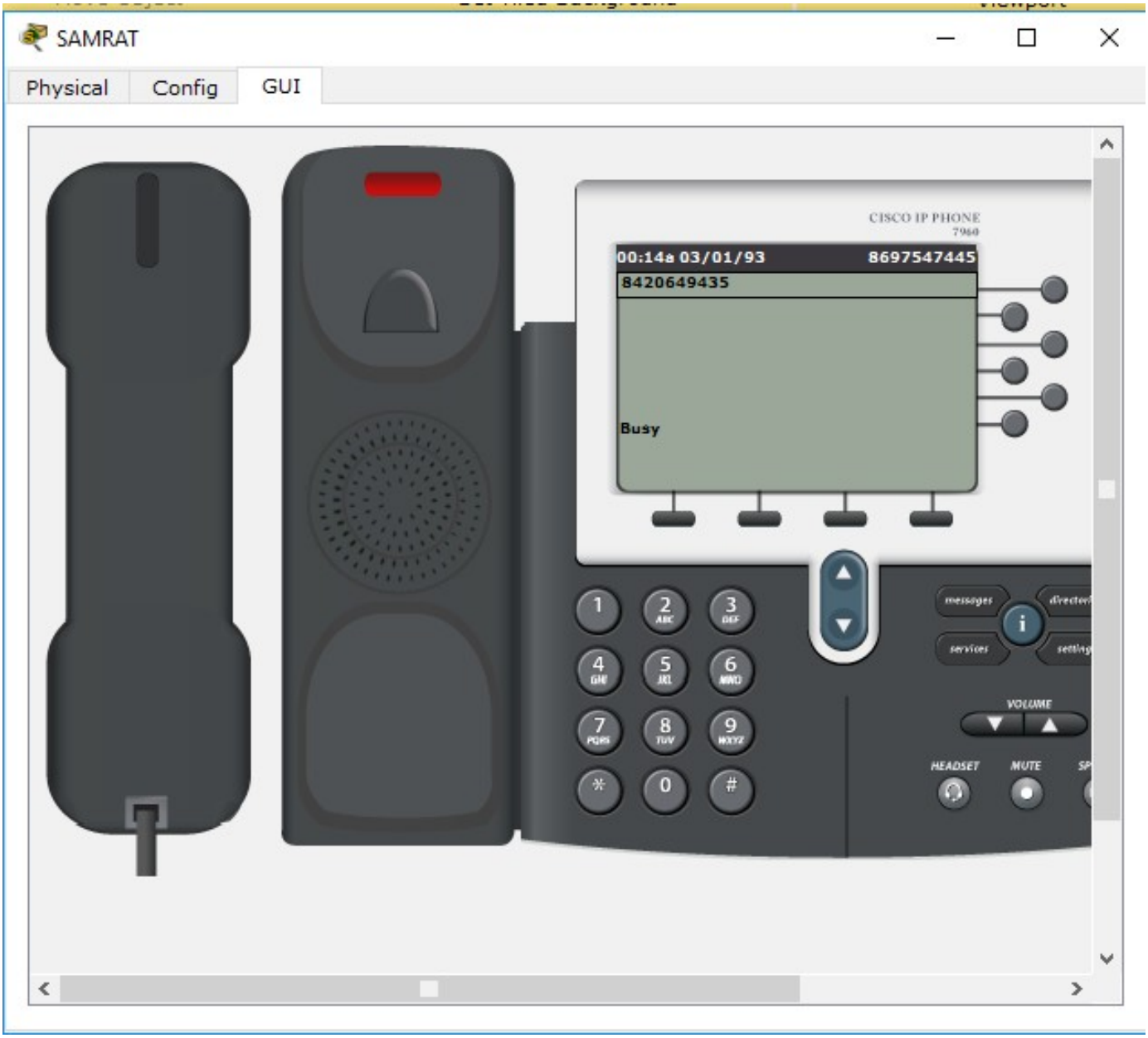


Image represents CONNECTED

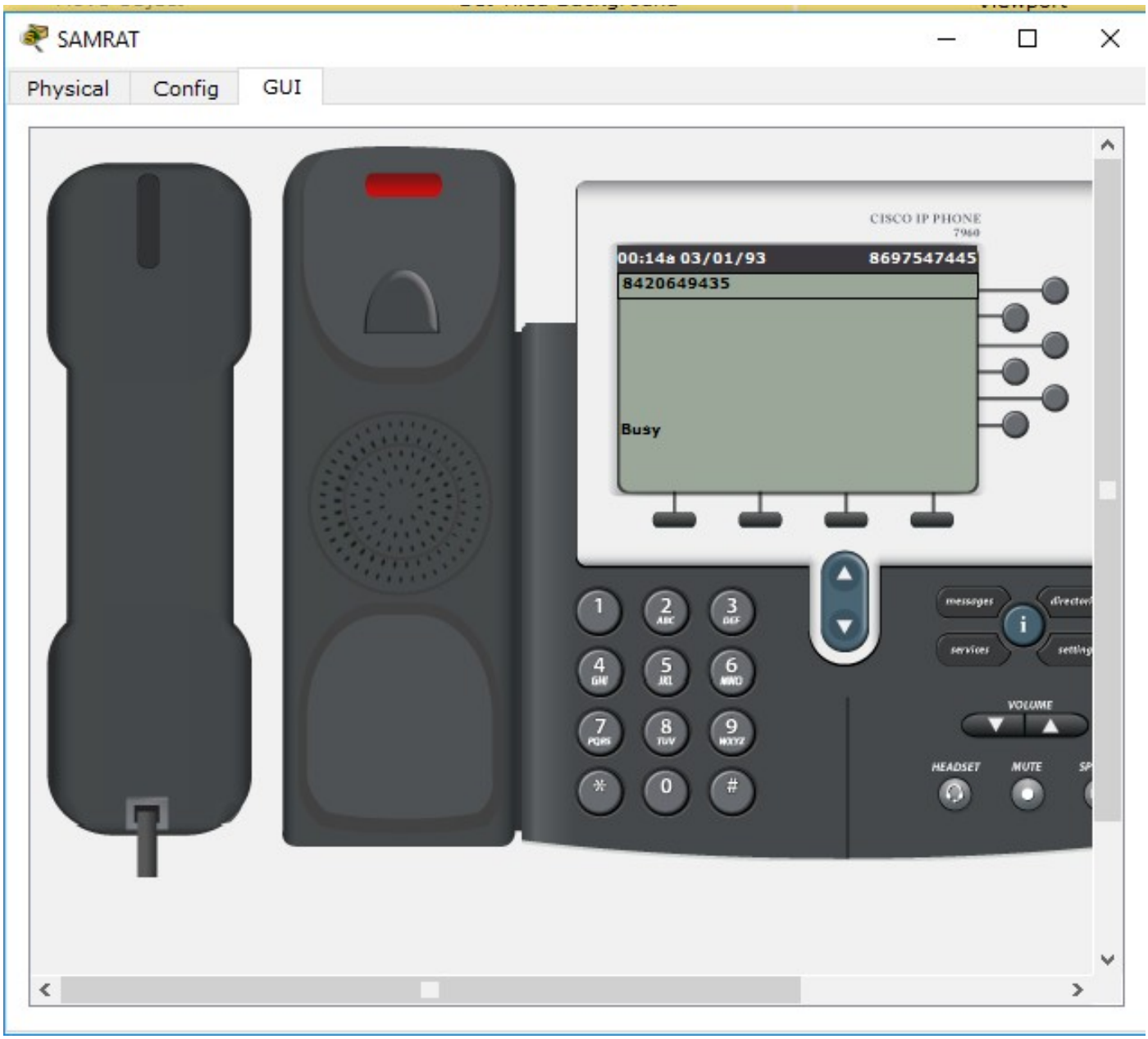


Image represents BUSY