Pre-Lab Activities:
None

Purpose of the experiment:
To explore the Cisco IP Telephony System, its configuration options, and its use.

Smoking and any food or drinks are not permitted in the Applications Lab!

Equipment:
The heart of a Cisco telephony system is a server running an application called “Cisco Call Manager”. This server is located on the bottom left of the rack in your work area. (The other server houses the Cisco messaging server, called “Unity”). In accordance with Cisco’s recommendations, the Call Manager server is only used for call handling, the keyboard, mouse, and screen you are using are attached to a client PC.

You will use several Cisco phones, Trillian, Marvin, Zaphod, and a phone you will configure during the lab. You will also use an extension on the Siemens – your instructor will suggest one.

You’ll use the client computer for two purposes:
1. To monitor the network traffic generated by calls in and out of the extension called Zaphod, this display is on the large overhead monitor.
2. On the regular display you use a web browser to configure the system.

Taking Data
At the end of these instructions, you will find a sheet with several labeled sections. Use this sheet to record data as you take measurements. The lab instructor must initial the data sheet before you leave the lab. You must include the initialed data sheet with your lab report to receive full credit.

Steps to be Performed:
Using Cisco Phone
In this part you will make several phone calls. You should actually talk some on each call. Listen for delay, noise, echo, or any other audio problems. Note the steps needed to invoke various call handling steps.

- Make an internal call between two Cisco phones.
- Call the outside phone from a Cisco phone – dial 8, then the number to do this.
- Place calls from an outside phone to 5103 and answer at Marvin’s station, then transfer that call to another station.
- Have Marvin answer an inbound call, then place the call on hold, call Trillian, then return to the original call.
- Have Marvin again answer an inbound call, this time have him add Zaphod to the call (a conference call).
- Make a call between any two Cisco phones. Once you’re actually talking, unplug the Call Manager computer from the switch. This is very top right jack of the Cisco Catalyst 3560. Verify that the Call Manager is disconnected by looking at the Call Manager Console.
- Note what happens to the call. Try using a third phone to make a call. Hang up the call in progress. What happens? Reconnect the Call Manager. What happens? About how long does it take for the system to settle down and allow calls again?
On Trillian’s phone, press the settings button. Look around this menu. Change her ring tone. Record the phone’s IP and MAC addresses. Exit settings.

On Trillian’s phone, press the directories button. Look at the list of missed calls. Note the time and originator of the most recent unanswered call prior to the beginning of the lab period.

Call Manager

On the PC screen bring up the window for Call Manager Administration. (It is already running and logged in).

Note the black tool bar on the page. Choose Device | Phone and search for phones; use the search criterion “Device Name is not empty”. Record the Device Names for Trillian’s and Zaphod’s phones. What are their Directory Numbers (these are called their DNs)? You’ll need to explore a bit.

Redo the search and click on Zaphod’s phone’s Device Name (not called the DN – don’t blame me). Look at what you can change. Let’s disable Zaphod’s speakerphone. Note that you have to click successively on Update and Reset Phone. Be patient. Call Zaphod and check that his speakerphone doesn’t work. Leave it that way.

Adding a phone.

Plug in the 7940 phone, connecting the black cable with the white and yellow zip ties to the phone port labeled “10/100 SW”.

Wait for the phone to settle and try using it to send and receive calls. Don’t Panic! (Startup for a new phone take a considerable amount of time).

Do another device search in the CM Administrator and record the description and DN of the new phone.

On the Directory Number Configuration page for the new phone, change its DN to 2222 While you’re there, change the partition to “None.” You should change the Line Text Label and Internal Caller ID to the name of another Hitchhiker’s Guide character or other sci-fi personage.

Update & reset. Try again to send and receive calls from ext 2222.

On the Configure Phone page, change the Description to the same name. Update & reset.

Find the entry for Phone Button Template and change it to “2-Line 7940”. Update.

On this same page, click on Line 2 – Add DN

Add 2010 (Zaphod’s extension) as line 2 and update.

Experiment with a call from Marvin to Zaphod. Assume that the Line 2 appearance on the new phone is there to help answer Zaphod’s phone when he is not available. Pick a reasonable set of ring options and test the one you pick.

Speed Dial

In the Call Manager Administrator, click on Device | Phone and select Marvin’s phone. Click on the “Add / Update Speed Dials” link at the upper right. Add your newly installed phone as the fifth speed dial on Marvin’s phone. Be sure to get the name right or they may insist on reading their poetry. Where on the phone does the speed dial appear?

Codecs

In the Call Manager Administrator, click on System | Region and Find. Choose the “Earth” region. What codec is used inside the Earth region? What codec is used from Earth to Magrathea?

Make a call from Zaphod to Marvin (Both Marvin and Zaphod are on Earth). Watch the display on the monitor as the call is answered. Record the approximate “Bytes per Second” and “Packets per Second” load reported. Hang up.

Call from Zaphod to Trillian (Trillian is on Magrathea, connected over a WAN link). Do you notice a sound quality difference? Again record the “Bytes per Second” and “Packets per Second” load information from the monitor.

Hunt Group

In Call Manager, go to Route Plan | Route / Hunt | Line Group.


Go to Route Plan | Route / Hunt | Hunt List.
• Add a new Hunt List; call it ITS220List. Set the Call Manager Group to Default. When you click Insert, the screen expands to allow you to add the group ITS220Lines to the Hunt List.
• Go to Route Plan | Route/Hunt | Hunt Pilot. Add a new Hunt Pilot. Make the Pilot 2900 (this is the extension you will call to access the Hunt Group). Select ITS220List as the Hunt List, and Insert.
• Go back to your Hunt List and “Reset”.
• Call 2900 from Marvin and observe where the call goes. Answer the call and hang up. Repeat a few more times to see how this works.
• Go back to Route Plan | Route/Hunt | Line Group and find your Line Group. Change the Distribution Algorithm to Broadcast. Update and test the setup again.

Leave the system as is.
Requirements for your lab report

General Rules

Your report must be typed, except that drawings may be made by hand. While your raw data sheet must be attached, all relevant data must be copied into your typed report. Do not put things like “see data sheet” into your typed report.

Things to put into your lab report

A header section with your name, your teammates’ names, group number, and date/time of the lab.

The initialed raw data sheet (always attach this at the end of the report)

Each of the subsections below requires a brief description of what you measured, your results, and – when requested – a reference to and a quote from a reference source that you can compare your measurement to (for example, one of our readings or an internet source).

- Comment / discuss how this was different from configuring the Norstar and the Siemens.
- Comment on the overall voice quality of the system.
- How do you transfer a call in this system?
- How do you make a conference call in this system?
- What happens to a call if the Call Manager is disconnected?
- What functions fail while the Call Manager is disconnected, and how long does it take for the system to recover?
- Trillian’s IP and MAC Address
- Time and origin of a previous missed call
- Trillian’s and Zaphod’s device names and directory numbers
  - [I will verify that Zaphod’s speaker phone is off]
  - [I will verify that the new phone is correctly configured]
- Ring options for Line 2 on the new phone
- Location of the new speed dial entry on Marvin’s phone
- Network load for the G.711 codec
- Network load for the G.729 codec
  - [I will verify that the Hunt Group is correctly set up]
- Call sequence in the Hunt Group with the Circular distribution
- Call sequence in the Hunt Group with the Broadcast distribution
Comment / discuss how this was different from configuring the Norstar and the Siemens.

Comment on the overall voice quality of the system.

How do you transfer a call in this system?

How do you make a conference call in this system?
What happens to a call if the Call Manager is disconnected?

What functions fail while the Call Manager is disconnected, and how long does it take for the system to recover?

Trillian’s IP and MAC Address

Time and origin of a previous missed call

Trillian’s and Zaphod’s device names and directory numbers

Ring options for Line 2 on the new phone
Location of the new speed dial entry on Marvin’s phone

Network load for the G.711 codec

Network load for the G.729 codec

Call sequence in the Hunt Group with the Circular distribution

Call sequence in the Hunt Group with the Broadcast distribution