Lab Book:
Select and Use Internet Services

Contents

Select and Use Internet Services

Lab Objectives

- Investigate the purpose of Local Area Networks (LANs) and Wide Area Networks (WANs).
- Demonstrate the use of Internet services.
- Examine the flow of data packets in a network environment.

Lab Resources

- Packet Tracer (PT) 6.01 or higher.
- Computer with Windows OS, XP or higher.
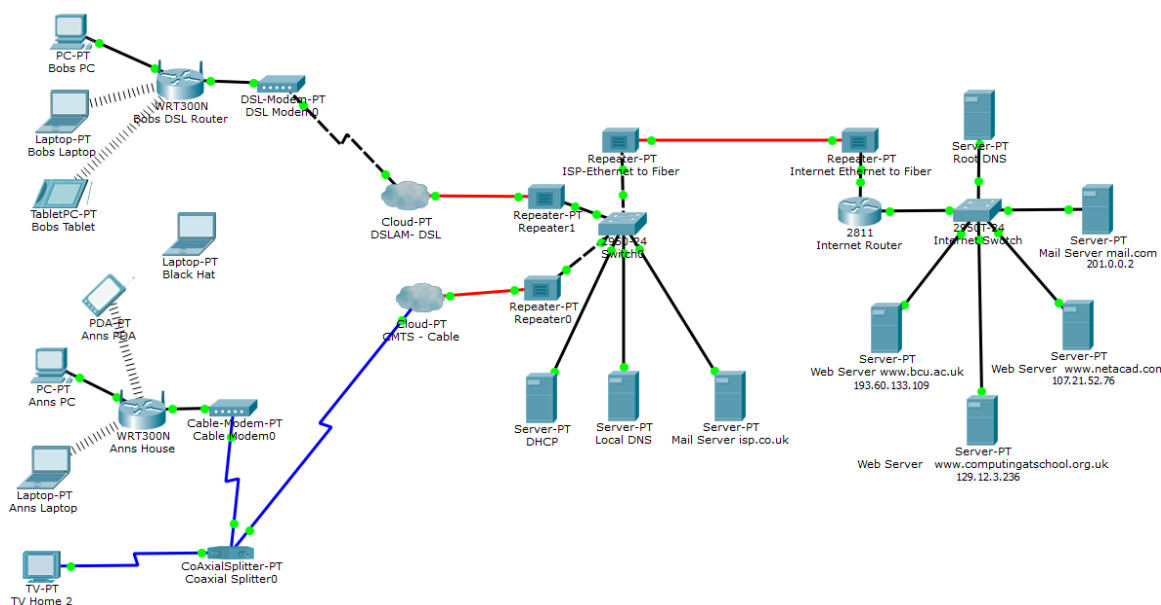
Lab Topology

Figure 1 – PT Base Internet Topology

Task 1 – Investigate LANs and WANs

1. A computer network or data network is a telecommunications network which allows computers to exchange data. In computer networks, networked computing devices pass data to each other along network links (data connections), with the best-known computer network being the Internet. The connections between devices are established using either cable media or wireless media.

2. Computer networks can be divided into two basic categories, Local Area Networks (LANs) and Wide Area Networks (WANs):

   a. LAN: A collection of interconnected device within a limited geographical area (i.e. local), that provide high-speed data transfer and low error rates. Devices normally owned by the household or company using the LAN. A home network is an example of a LAN.

   b. WAN: a collection of interconnected LANs, spread over a wide geographical area, that provides reliable data transfer, although often at data rates lower than LANs. WAN

devices are typically owned by service providers, and LAN users typically rent WAN access as required. The Internet is an example of a WAN.

3. Internet Service providers (ISPs) own the WAN devices that allow LAN users to connect and access Internet services.

4. Which ISP does your family use to connect to the Internet?

5. Examine the topology diagram and identify the devices that belong to the household LANs and the ISP.

Task 2 – Demonstrate the use of Internet Services

6. Electronic mail, most commonly referred to as email or e-mail is a method of exchanging digital messages from a sender to one or more recipients. Modern email operates across the Internet or private computer networks. Early email systems often required that the sender and the recipient both be online at the same time in order to exchange messages, in common with today's instant messaging systems. Email systems are now based on a store-and-forward model, where Email servers accept, forward, deliver, and store messages, thus email users only need to connect briefly, typically to a mail server, for as long as it takes to send or receive messages.

7. Open up the PT *CASBIT.pkz file.* Bob (bob@isp.co.uk) and Ann (ann@isp.co.uk) both have email services configured on their laptops. Open Bob's laptop and select the Desktop tab and then email. Write an email to send to Ann:
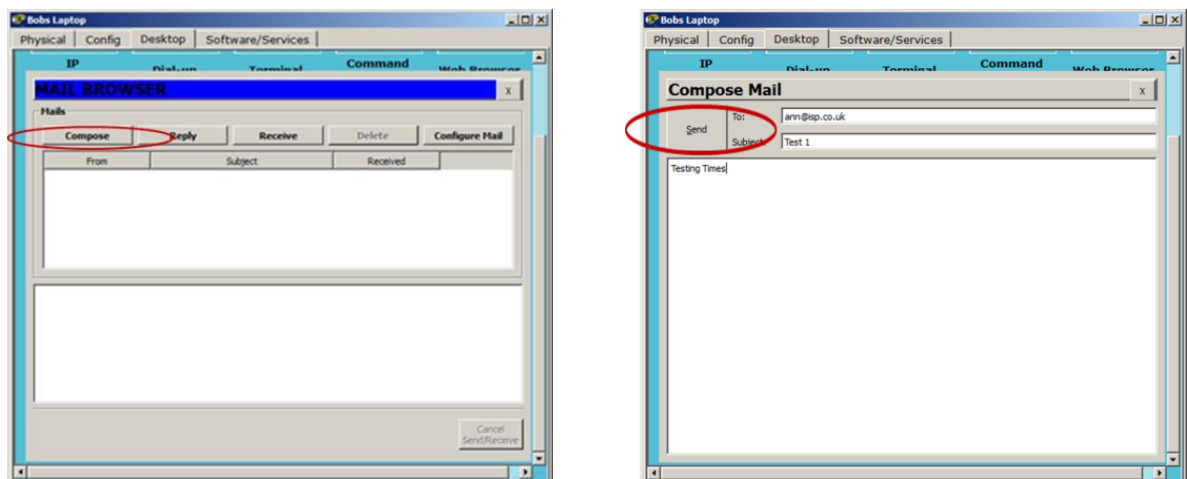

Figure 2 – PT Email Application

8. Once you have sent the email, examine the status information at the bottom of the mail browser:
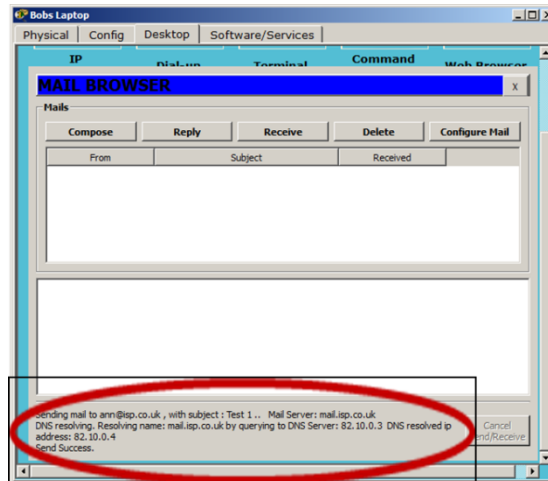
Figure 3 – PT Email Status Information

9. Use the status information to locate the mail server that has received the sent email. Who does the mail server belong to?

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10. The Email process seems to have used a protocol called DNS when the email was sent. Do an Internet search to discover the full name of this protocol and its purpose.

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11. The World Wide Web (WWW or web) is a system of interlinked *hypertext* documents that are accessed via the Internet. It operates in a client/server mode, with client software (browser) on users PCs accessing web pages stored on web servers located within the Internet. With a web browser, you can view web pages that may contain text, images, videos, and other multimedia and navigate between them via *hyperlinks*. List three different web browsers that you could use to browse the WWW:

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12. Open Ann's PC, select the *Desktop* tab and the Web Browser. Type the address of the Cisco Networking Academy (www.netacad.com) website into the address bar and select *Go* (or just use the 'enter' key):
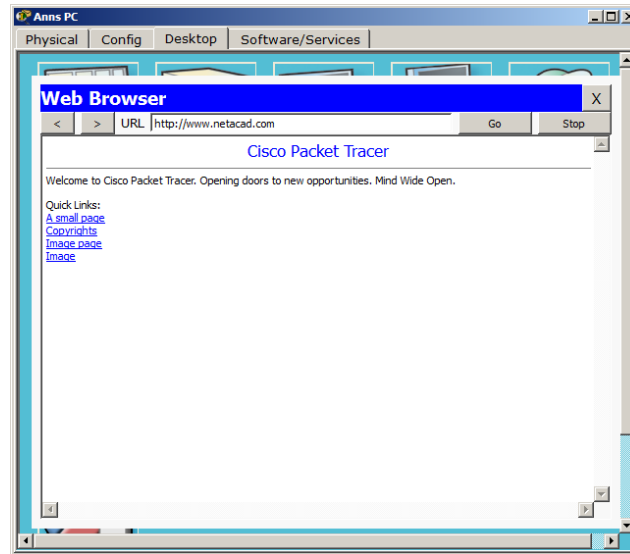
Figure 4 – PT Web Browser Application

13. Locate and open the web server that the web page is stored on. Select the *Services* tab, then *HTTP* and then the *edit* next to *index.html*:
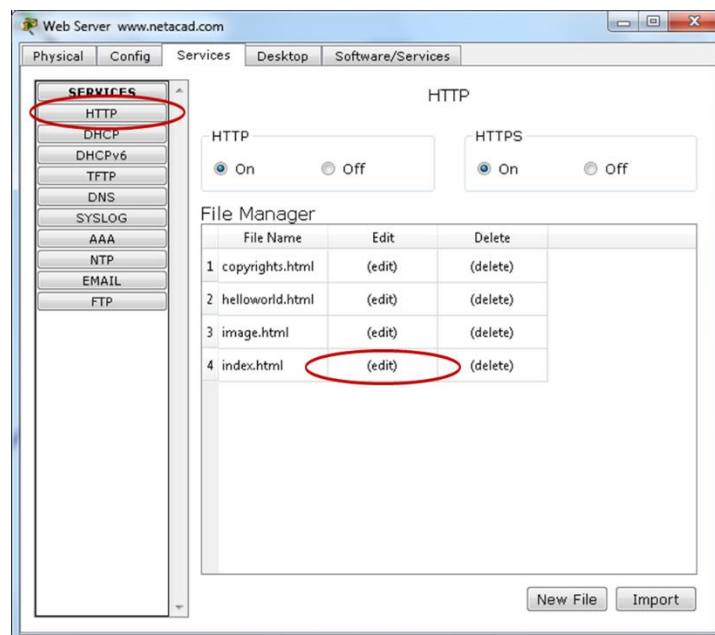

Figure 5 – PT Web Server

14. The web server should display the web page that you have just viewed using Ann's web browser. Why does the web page stored on the web server look nothing like the web page viewed using the browser?

15. Try changing the HTML code on the web server, and observing its effect from Ann's web browser. Carefully edit the *'Welcome to Cisco Packet Tracer'* to read *'Welcome to Cisco*

Networking Academy'. Return to Ann's PC and access the web page again – has the page changed?

16. Who do you think would be in charge of maintaining the Cisco website, and who would own the server that it is stored on?

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17. Now that you have explored a (small) representation of the Internet using Packet Tracer, explain the difference between the Internet and the World Wide Web:

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Task 3 - Examine the flow of data packets in a network environment.

21. Data is transferred across the internet in blocks called **packets**. It is possible to examine the flow of packets in a network using the PT simulation mode, which is accessed by selecting the *Simulation* tab hiding behind the *Realtime* tab at the bottom right of the workspace.

22. Select the *Event List* on the left of the simulation tab, and then *Show All/None* to clear the protocols that will be captured when a simulation again. Note, every time *Show All/None* is selected, the event list will toggle between capturing *all* protocols and *no* protocols.

23. Select Edit Filters, and make sure that all the protocol tick-boxes are clear. Under the **Misc** tab, select the HTTP protocol, which is used to transfer web pages across the Internet.
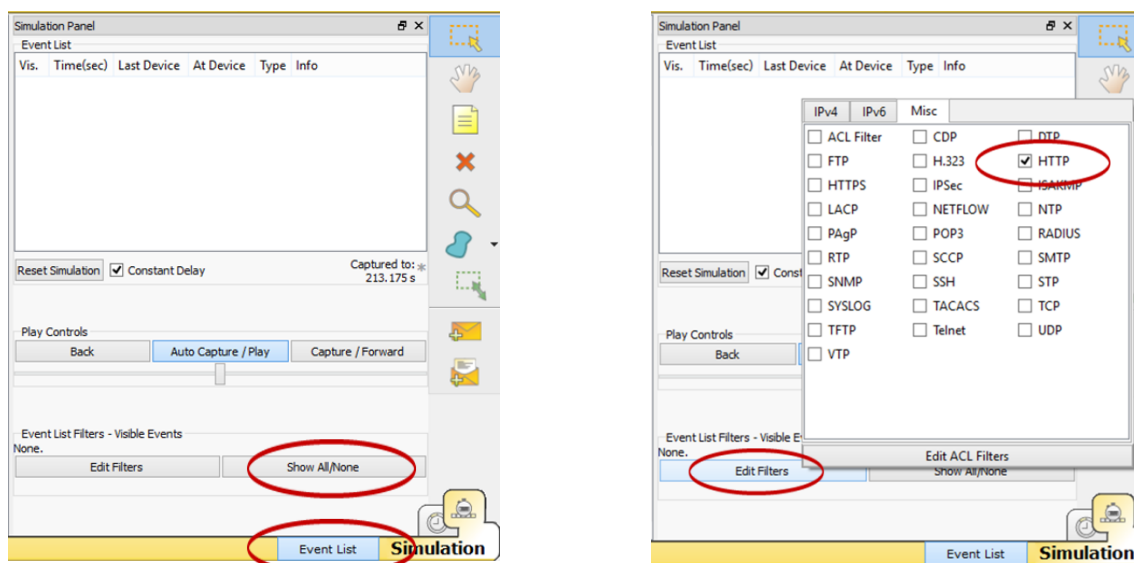

Figure 6 – Simulation Mode Configuration

24. Staying in simulation mode, access Bob's PC and select the Desktop tab and then open up the web browser and enter www.netacad.com into the address. Because you are in *Simulation* mode, nothing will happen, as the simulation must be run using the *Auto Capture/Play* link in the centre of the *Simulation* tool bar:
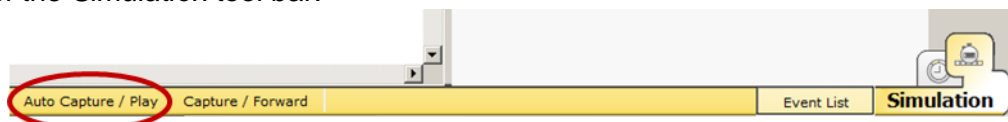

Figure 7 – Simulation Auto Capture/Play

25. You should now see HTTP packets travelling between Bob's PC and the www.netacad.com web server within the ISP. As packets are created, they will appear as captures in the *Simulation Panel*, which is at the top of the Event List.

26. Use the *Delete* button under the *Capture/Forward* on the *Simulation* tool bar to clear all the captured packets.
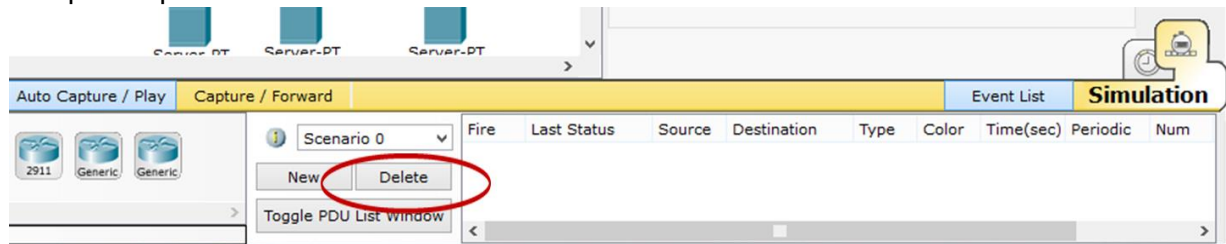

Figure 8 – Deleting Captured Packets

27. Repeat simulated packet capture for an email exchange between Ann and Bob. You will need to return to *Edit Filters*, deselecting HTTP and selecting SMTP and POP3 instead. Stay in simulation mode while you write an email on Ann's PC addressed to Bob, and select Send.

28. Which protocol is used to carry Ann's email? To which device in the network are Ann's email sent to?

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29. Staying in simulation mode, go to Bob's PC, open up the email client and select *Receive*.

30. Which protocol is used to receive Bob's email from Ann, and where is the email retrieved from?

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