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CSIS 1800: Introduction to Computer Science and Information Systems

Chapter number: 15-Networks & 16-The World Wide Web

Assignment number: 12

1. Describe the Token Ring technology?

A Token Ring network is a local area network (LAN) in which all computers are connected in a ring or star topology and a [bit](http://searchcio-midmarket.techtarget.com/definition/bit)- or token-passing scheme is used in order to prevent the collision of data between two computers that want to send messages at the same time. The Token Ring protocol is the second most widely-used protocol on local area networks after [Ethernet](http://searchnetworking.techtarget.com/definition/Ethernet).

* Empty information frames are continuously circulated on the ring.
* When a computer has a message to send, it inserts a token in an empty frame (this may consist of simply changing a 0 to a 1 in the token bit part of the frame) and inserts a message and a destination identifier in the frame.
* The frame is then examined by each successive workstation. If the workstation sees that it is the destination for the message, it copies the message from the frame and changes the token back to 0.
* When the frame gets back to the originator, it sees that the token has been changed to 0 and that the message has been copied and received. It removes the message from the frame.
* The frame continues to circulate as an "empty" frame, ready to be taken by a workstation when it has a message to send.

1. What is a gateway and what is its purpose?

A Gateway is a node that handles communication between its LAN and other networks. I is used in a wide-area network (WAN) to permit communication among smaller networks.

1. Describe the term *packet switching and w*hat problems arise due to packet switching

Packet Switching is the approach to network communication in which packets are individually routed to their destination, then reassembled

* The packets of a message may take different routes on their way to the final destination.
* Therefore, they may arrive in a different order than the way they were sent.
* The packets must be put into the proper order once again, and then combined to form the original message.

1. Describe functions of *routers* and *repeaters*

Routers are network devices that direct a packet between networks toward its final destination

* Intermediate routers don’t plan out the packet’s entire course
* Each router merely knows the best next step to get it closer to its destination.
* Eventually a message reaches a router that knows where the destination machine is.
* If a path is blocked due to a down machine, or if a path currently has a lot of network traffic, a router might send a packet along an alternative route.

Repeater are network devices that strengthens and propagates a signal along a long communication line.

* A digital signal loses information only if it is allowed to degrade too much. A repeater keeps that from happening.

1. Define *TCP/IP in terms of layers and functions of each layer*

TCP stands for Transmission Control Protocol and IP stands for Internet Protocol.

* The name TCP/IP refers to a suite of protocols and utility programs that support low-level network communication.
* The name TCP/IP is written to reflect the nature of the protocols’ relationship: TCP rests on top of the IP foundation.
* IP software deals with the routing of packets through the maze of interconnected networks to their final destination.
* TCP software breaks messages into packets, hands them off to the IP software for delivery, and then orders and reassembles the packets at their destination. It also deals with any errors that occur, such as if a packet never arrives at the destination.

1. Compare TCP and UDP.

UDP stands for User Datagram Protocol and it is an alternative to TCP.

* UDP software plays the same role as TCP software.
* UDP is part of the TCP/IP suite of protocols. Because of the heavy reliance on TCP, and for historical reasons, the entire suite is referred to as TCP/IP.

The main difference:

* TCP is highly reliable, at the cost of decreased performance, whereas UDP is less reliable, but generally faster.

1. What is an *IP address* and how is it composed?

IP address is an address made up of four numeric values separated by dots that uniquely identifies a computer on the Internet

* Usually represented as a series of four decimal numbers separated by dots, for example:

198.122.40.5

200.26.144.13

* Stored in 32 bits with each number in an IP address corresponding to one byte.
* One byte (8 bits) can represent 256 things, thus each number in an IP address is in the range 0 to 255.

1. Design and implement an HTML document describing one or more of your personal hobbies.

<!DOCTYPE html>

<html>

<head>

<title> My Personal Hobbies </title>

</head>

<body>

<h1> Hobbies </h1>

<h3> Coding </h3>

<p> I enjoy learning to code in various languages.

Currently I am fascinated with the concept and

complexity of C++ </p>

<br>

<br>

<h3> Video Games </h3>

<p> I really just play one game. A 3D weapon based

fighting genre game Developed by Project Soul (NAMCO BANDAI) </p>

<ul>

<li> Soul Calibur 5 </li>

</ul>

</body>

</html>

1. What is a Java applet? Where does a Java applet get executed? What kinds of restrictions are put on Java applets and why?

* A Java applet is a Java program that is designed to be embedded into an HTML document, transferred over the Web to someone who wants to run the program
* An applet is executed in a browser used to view the Web page.
* The Java language has a carefully constructed security model which ensures that an applet cannot access any local files or change any system settings.
* Because Java applets model puts the burden on the client’s machine by running and executing directly on the user’s computer

1. How does JSP processing differ from applet processing?

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| **JSP Processing** | **Applet Processing** |
| A Java Server Page (JSP) is a dynamic web page which contains JSP scriptlets | A Java applet is a small program usually coded in Java language and produces the bytecode. It is embedded into HTML document. |
| It is executed on the web server, where the web page exists. A web server with a servlet container is needed to execute the java server page. | It is executed inside the user’s web browser. The web browser uses JVM (Java Virtual Machine) to execute. |
| JSP processing is done in the server side. | Applet processing is done in the client side. |

Reference:

1. Computer Science Illuminated, Nell Dale and John Lewis, Fourth Edition, Chapter 15-16.
2. http://searchnetworking.techtarget.com/definition/Token-Ring