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Assignment 6

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6.2

All peers might act like both the server and the client at the same time. After obtaining some list of seeders, a client might try and make connections with all/some of those addresses. When a connection is established, the client could request different parts of the file it needs to download. While all of this is happening, the client will also be acting like a server by listening for connections. This time, other peers connect to it and request parts of the file, and are uploaded when found.

6.19

Assuming the book means the process ID given to an program by the OS, that would be a pretty bad way of identifying services. It would completely defeat the purpose of "well-known" ports as process IDs not only differ from host to host, but also change when a program is restarted. To get around this, all connections would need to first be filtered through some auxilary service like inetd that can forward a request along to the correct service.

7.3

DNS servers map domain and subdomain names to actual IP addresses. Losing that ability would cripple the net for most individuals, seeing as not many people know the exact IP address for any of the web sites or email addresses they use. It would render most of the world internet-less until the DNS servers were put back online (assuming their data is all backed up and locked away).

7.6

If a DNS server in charge of returning the IP address for such a machine, it may be updating dynamically based on server load. Another way this could be achieved is if multiple IPs point to a machine but the domain name is just associated with one of them.

7.11

Every 24 bits are split in to four groups of 6 bits. Each individual group is then encoded in to an ASCII character. 4 ASCII characters is 32 bits, so we gain 8 bits for every 24. 4560 bytes is 36480 bits, or 1520 24-bit groups. Each 24-bit group is transformed in to a 32-bit group and thus the file size grows to 48640 bits, or 6080 bytes. Adding a CR+LF (2 bytes) after 110 consecutive bytes means an extra 110 bytes for a grand total of 6190 bytes.

7.13

The MP3 file being sent could be split in to four pieces of 1MB each (the limit his friend's ISP set). He could then send each of these four parts in order, using the content-id of the email header to specify the order. Once his friend has recieved the four parts, he could rig them back together and have his file.

7.15

White space generally means the "space" character, but whether that's just one or multiple isn't necessarily defined. The space character isn't the only thing that statisfies "blank space." In html the string *nbsp*; is rendered as white space. New line's are rendered as space. Sometimes non-printables can be rendered as spaces.

7.18

Of course not. The IMAP interface must be the same across all implementations so that a single client can make the same request to any and recieve the same response. An actual implementation should be free to design the actual mailbox structure however they want, granted they know how to respond to client IMAP requests.

7.23

With just the information given in the question, I don't really know why a domain name shouldn't end with a digit. Any browser or program that uses URLs should be able to determine whether or not it's working with an IP or a DNS name. Subdomains can end in digits, I'm not sure if the question is asking specifically about the last character of the TLD or something else.

7.44

Assuming equal distribution across the month, one tenth of their customers will watch a movie at some time on any given day (3 movies per 30 days, $\frac{3}{30} = \frac{1}{10}$). One tenth of their customers is 5,000, and two thirds of those will be watched at 9pm. Rounding up, that's

556 movies each requiring 6Mbps for a total of 3333Mbps served. OC-12 lines have up to 622Mbps capability. The video server will need is 5-6 such connections.

7.47

8.1

8.3

8.30

8.41

private key crypto systems (10)

explain public key crypto systems (10)