

Course: INFO2601

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Assignment 2

- 1) Instantaneous throughput is the rate at any given time in bits per second that the receiver is receiving files from the sender at. Average throughput is the average time it takes for the receiver to receive one bit of data or the (total amount of bits sent/total time taken to send the bits).
- 2) When a user visits a site for the first time the server creates a unique ID and creates an entry in the backend database using the ID as a primary key, the server then sends an HTTP response to the users edge system which contain a SET-COOKIE header which contains the unique ID. The browser then adds that ID to a cookie file and when that specific site is visited again, the browser extracts the respective ID and sends it as an identifier to the server which can then log the users activities on the site without specifically knowing the name of the user and allows the user to keep the same state across all pages of a given site.
- 3) The owner, Relay1.bar.foo.com, sends some data of type A or an IPv4 address with the value, 145.37.93.126, and a time to live of 86400 seconds. The owner, foo.com sends some data of type CNAME which stands for canonical name with a value, relay1.bar.foo.com, and a time to live of 86400 seconds.
- 4) The client server architecture consists of one or more clients connecting to a server which would handle requests however there is a limit to how many clients that can connect to a server before the server is flooded by request and calls and can no longer carry out its intended purpose. The P2P architecture however has no dedicated server, it solely consists of computers sharing parts or all their resources with each other and acting as both servers and clients based on their needs. Although the client server architecture is scalable to an extent the P2P architecture is has no limit to its scalability since there is no limit to how many computers can interact with each other.
- 5) With TCP datagrams are accepted at the receiving end and the transport header is removed, each sub packet is sent to its respective socket which in turn sends it to their respective transport layers using the receiver IP and port which is called a socket where the TCP header are removed as it is sent to its intended application. The UDP process is quite similar however it is sent to the application based solely on it's port number.
- 6) .
- 7) A.) $01011100 + 01100101 = 11000001$
Flip bits-00111110
- B.) $11011010 + 01100101 = 00111111$ //1 is truncated.
Flip bits- 11000000
- C.) $01011101 + 01100100 = 11000001$
Flip bits- 00111110

- 8) When sending the a UDP package there is no guarantee that the data is 100% intact since the validation method used, the check sum which would be obtained by taking a specific value which is agreed upon by both parties and divide the sum of all bytes in the data by it and the remainder would be your checksum, however variations in the data which would give the same sum would slip by this system since it is not comparing the data byte by byte but creating a system that would give a quick check to see if the data may be intact.

For example, we send the numbers 12,34,21,5 and both sender and receiver agree to use a number 16 as a constant for the checksum, the sum of the numbers would be 72, this number is divided by the base which is 16 and the result is a remainder of 8 this number would be 8, however is the numbers that are being sent are changed in such a way that the sum is still 72 it will pass the checksum.

- 9) C: Dele 2
C: Quit
S: +OK POP3 server signing off

- 10) C: Quit
S: +OK POP3 server signing off

- 11) C: list
S: 1 498
S: 2 912
S: .
C: retr 1
S: blah
S:blah
S: .
C: retr 2
S: blah blah ...
S:blah
S: .C: quit
S: +OK POP3 server log off

12) W= window size

RTT= 30 millisecond

$L/R = 2700 \text{ bytes} / 1 \text{ gigabit/s} = 1.72 \times 10^{-4}$

$.75(W * L/R) / (RTT + L/R) = 0.9$

$(W * L/R) / (RTT + L/R) = 0.9 / 0.75$

$1.72 \times 10^{-4} W = 0.674 \times 0.0302$

$W = 0.0202 / 1.72 \times 10^{-4}$

$W = 118.5$

$W = 119$