

CS3530: Assignment - 2

Report - star - 5E

a)

Pcap traces at H1, H2, H3 can be found in folder named "i" in "temp" folder which is in "star" folder as "h1.pcap", "h2.pcap", "h3.pcap" which includes the GET request for the case in which the cache does not have key-value pair which we want. And folder named "ii" has the pcap trace files for the case where cache has the required key-value pair

To get h1.pcap file first we set up the Mininet environment by executing commands

```
$ make clean
```

```
$ make run
```

Then in Mininet environment we executed "xterm h1", we got terminal access to the host h1(Client) with IP address 10.0.1.1, similar for host h2(cache) with IP address 10.0.1.2, similar for host h3(server) with IP address 10.0.1.3

Then we open Wireshark to trace the packets for host H1, host H2, host H3 by executing the below,

```
$ h1 wireshark &
```

```
$ h2 wireshark &
```

```
$ h3 wireshark &
```

respectively

Which opens "h1-eth0", "h2-eth0", h3-eth0" interface for H1, H2, H3 respectively, in which can see the requests and their responses.

Then we followed the same procedure for case-2 in which cache has the required key-value pair.

b)

Time is calculated in milliseconds(ms)

We have calculated end-to-end time from the Wireshark timestamps.

Key	Req1	Req2	Req3
Key1	6.886	1.834	1.658
Key2	5.127	1.608	1.582
Key3	6.201	1.859	1.708
Key4	5.064	1.685	1.787
Key5	4.575	1.987	1.648
Key6	5.820	1.559	1.591
Avg. Time	5.612	1.755	1.662

Q6) Observations:

By comparing the average time taken for requests, the following are the observations and their reasons.

1. The average time taken for Req1 is greater than Req2 and Req3. The one and only main reason is that,

Cache Hits Vs. Cache Misses: When a key is already present in the cache (cache hit), it can be served much faster than when the cache needs to fetch the data from the main server (cache miss). Cache hits will generally result in faster response times.

2. Okay that says about why Req1 takes more time, but why time taken by Req2 and Req3 not equal. The reasons can be, (generally)

Network Latency: The time it takes for data to travel over the network can vary based on factors such as physical distance, network congestion, and the quality of the network connection.

Cache size and Cache Efficiency: The size of the cache can influence how quickly it can serve requests. A larger cache may

result in more cache hits. The efficiency and effectiveness of the cache can significantly impact response times.

Network Conditions: Network congestion or instability can lead to variable response times. A stable and uncongested network typically results in more consistent response times.

Content Complexity: The complexity of the content being requested can affect response times. Larger or more complex data may take longer to process and transmit.

PLAGIARISM STATEMENT:

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