COMP 431 Internet Protocols & Services

Fall 2018  
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Worksheet 9, October 17

1) Redo problem 2 from the midterm (the problem of downloading homepage for *www.banana.com*. And embedded object). In each case make sure you give 1 coherent expression and *pay attention to your units!*

*a*) How long would it take to download the *banana*.*com* homepage and all the embedded objects if the browser uses only non-persistent connections? Hint: Your expression should evaluate to 480.8 *ms*.

*b*) Repeat your analysis for (*a*) now assuming the browser uses only persistent connections. Hint: Your expression should evaluate to 370.8 *ms*.

*c*) Repeat your analysis for (*a*) now assuming the browser uses only pipelined connections. Hint: Your expression should evaluate to 310.8 *ms*.

*d*) Repeat your analysis for (*a*) now assuming the browser can use up to four parallel connections. Hint: There are several possible answers here but two obvious values your expression might evaluate to are 300.34 *ms* or 200.35 *ms*.

2) Redo problem 3 from the midterm (the News and Observer website using the *cdn-name* CDN for delivering video content).

*a*) The URL the user clicks on:

|  |  |
| --- | --- |
| *http://hs7vtga89ql.sktn3.z23.cdn-name.net/* |  |

consists of just a hostname and does not contain a file path to any object. Explain in detail how is it that the user is directed to a CDN server that has a copy of the cat burglar video when they click on this link? Make sure you answer what the question is asking. That is, if you explain how the user is directed to a certain server, you need to also explain how it is that that server will have a copy of the cat burglar video.

Points you should pay attention to:

* This URL was created and embedded in the News and Observer home page by the N&O server and this server had *no knowledge* of where content is stored in the *cdn-name* CDN network.
* This question is *not* asking about whether or not the server the user is directed to is close to the user.
* When the server *hs7vtga89ql.sktn3.z23.cdn-name.net* receives the user’s HTTP GET request, the request line of the request will simply be GET / HTTP/1.1. This means that no content/object name or path appears in this request line. This further means that at least on its face, this is a request for a home page (and specifically is not a request for the cat burglar video).

*b*) An alternate way the N&O web server could have changed its URLs for video assets to be served by the third-party CDN would have been to change URL (1) above to something like

|  |  |
| --- | --- |
| *http://www.cdn-name.net/<some path name>/cat-burglar.mp4* |  |

What’s wrong with this approach?

3) Redo problem 5 from the midterm (the awful Furby download problem).

*a*) What would you suspect is the most likely cause of the 10:1 performance difference in downloading the content necessary to display the Furby web page at Dook and State? Hint: Read the problem carefully. The writeup is designed to eliminate many possible performance problems.

*b*) Describe an experiment or set of experiments you could perform (at either Dook, State, or UNC) to confirm your hypothesis. Make sure you describe how data gathered from your experiment would prove or disprove your hypothesis.