WRITEUP
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CSE 130 Fall19

ASGN3 WRITEUP

Using your new httpserver with caching, perform an experiment to demonstrate how caching can improve performance (latency and/or throughput). Do a test with caching turned on and compare it with the same test but with caching turned off.

Testing Strategy:
After fully Implementation of caching I wrote a short code for testing purposes.

```
//To enable testing enable or disable globally
#define TEST 1

//I searched on the internet and found Chrono is best library for measuring time elapsed time in c++ therefore I used it for testing purposes. When server received any request it save time to start variable.

while (1)
{
	if ((client_socket = accept(server_fd, (struct sockaddr *)&address, (socklen_t *)&addrlen)) < 0)
	{
		perror("In accept");
		exit(EXIT_FAILURE);
	}
#ifdef TEST
	std::chrono::time_point<std::chrono::system_clock> start, end;
	start = std::chrono::system_clock::now();
#endif
---
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---
}


// After processing and sending response to client request , server again save time in end variable then simply calculate elapsed time using end – start and print result on screen.

#ifdef TEST
	end = std::chrono::system_clock::now();
	std::chrono::duration<double> elapsed_seconds = end - start;
```

```
        std::time_t end_time = std::chrono::system_clock::to_time_t(end);
        std::cout << "elapsed time: "
                  << elapsed_seconds.count() << "s\n";
#endif
}
else if( strncmp(http_method, "PUT", 3) == 0 )
```

Output:

```
$ ./httpserver -c
Server is started on port 8080
GET Request, Sending page /wrk/fl/httpserverchache/image.jpg
GET /wrk/fl/httpserverchache/image.jpg length 157889 [was not in cache]
elapsed time: 0.00916158s

GET Request, Sending page /wrk/fl/httpserverchache/image.jpg
GET /wrk/fl/httpserverchache/image.jpg length 157889 [was in cache]
elapsed time: 0.000397446s

GET Request, Sending page /wrk/fl/httpserverchache/image.jpg
GET /wrk/fl/httpserverchache/image.jpg length 157889 [was in cache]
elapsed time: 0.00120232s
```

First time when I downloaded image.jpg it took 0.00916158 second this is the first time when file was not cached. Second and third time it sent the same file from caching and you can clearly see that response time has decreased drastically.