Performance Tactics

1. Logging for performance – A log was added that logs values important for measuring the performance of the system, including time between request received and processing, and process time. This helps in calculating latency, throughput, jitter, and other key system measures.
2. Scheduling – A queue was added to process requests in the order they are received. This could be changed to be based off size fairly easily. This helps improve the performance of the system to be more reliable and get requests done in proper order.
3. Limit event response – A 413 Entity Too Large response was added for when a file over ½ Gigabyte is requested. These are automatically denied due to their excessive size, and helps reduced the load on the server.
4. Bound queue sizes – In regards to the scheduling, any request that causes the queue size to overflow beyond 10 will be denied. We reason that with the size limit, performance, and purpose of this simple server, any requests that are causing the server to take so long to respond that events are being queued above 10 are probably malicious and should be denied due to excessive large file requesting.

Performance Measurements

The measurements are from before changes and after changes in tactics on the server. These were obtained from the log information from a series of tests involving various size files from 5kb – 1gb over periods of 5 minutes. As you can see below, while the latency increased slightly (most likely due to logging functionality before beginning processing), the jitter and throughput of the server improved slightly after our changes involving scheduling and bounding some unnecessary instances of response.

1. Before changes
   1. Latency – 3.01 ms
   2. Jitter – 9.2 ms
   3. Throughput – 1.48/second (1323/90000 converted to seconds)
2. After changes
   1. Latency – 3.166 ms
   2. Jitter – 6.4 ms
   3. Throughput – 1.6/second (1444/90000 converted to seconds)