EECS 428 Episode 4

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March 12, 2012

1 Exponential Flows

Trace file analysis has yielded an average on time of $\mu = 80.2846$ seconds, and an average off time of $w = 147.7159$ seconds. The total duration of the simulation $S = 2000$ seconds, and the number of browser flows was $n = 60$. The total number of bytes transmitted by the exponential flows was measured to be $T = 222283500$ bytes, or approximately 212 MB.

Theoretically, the total number of bytes transmitted is given by the equation $T = \dfrac{Sn\mu r}{\mu + w}$, where r is the average on-time rate in bytes per second.

Solving for r, we get $r = 5260.53$ B/s, or about 0.04 Mbps.

2 Pareto Flows

For the Pareto flows, trace file analysis yields an average on time $\mu = 0.411519$ seconds, and an average off time of $w = 24.7697$ seconds. The total number of pareto bytes was $T = 16812900$ bytes, or approximately 16 MB.

Solving the same equation for r, this time we get $r = 8573.3$ B/s, or about 0.07 Mbps.

3 Elephant Prediction

Given the bandwidth taken up by the Pareto and Exponential flows, the Elephants are left with $10 - r_{exp} - r_{pareto} = 9.8945$ Mbps of bandwidth through the central link. Given that each Elephant must transmit a 400MB file, the Elephant is expected to finish at about 970s on average, given one-third of the remaining bandwidth.

The measured Elephant finish times were 704s, 885s, and 1441s. This is in keeping with the expected average finish time.