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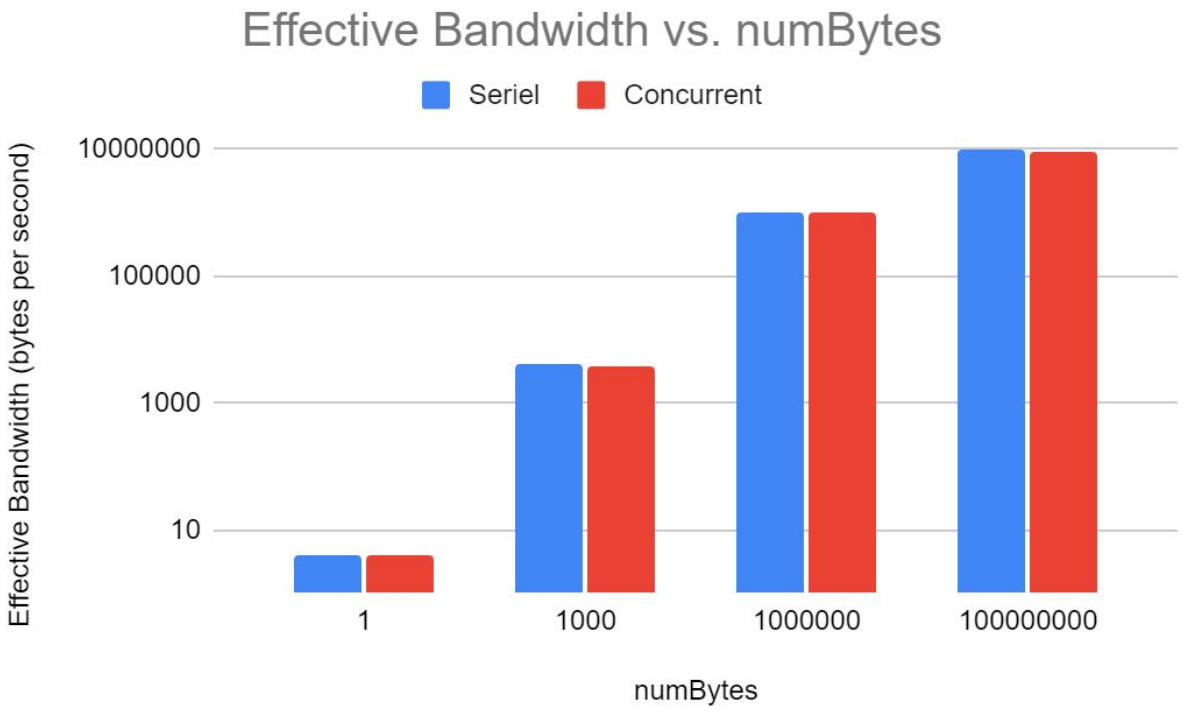
Regions: Oregon (Server), Ireland (Client)



Q1. For the data from the serial experiment, how was the effective bandwidth affected by the size of numBytes?

As more data is requested, our effective bandwidth is higher.

Q2. Using the data from only the Serial experiment, estimate the bandwidth between your client and your server. Now incorporate the data from your Latency experiment to increase the accuracy of your bandwidth estimate. Describe how data from the Latency experiment improves accuracy

Our 1 byte of data effective bandwidth was very low, but that at that point we would mostly be measuring latency. As we increased the bytes sent, our bandwidth consistently grew higher, so our most accurate bandwidth would be with the most bytes sent, 100 million, to account for the propagation delay. Our bandwidth for that was about **10,155,721 bytes per second**, or **10.16 MBps** based on the Serial experiment.Our round-trip latency when running `ping` on the linux AWS servers was consistent at 118 ms for long periods of time, which is our propagation + transmit + queue times. We can then more accurately estimate our bandwidth by subtracting our

latency value from the total elapsed time in the case where numBytes = 100 million and then calculating bandwidth again. Doing so gives us 10 million bytes / (elapsed time - 118ms) which is equal to **10,278,900 bytes per second** or **10.28 MBps**.

Q3. How did the data from the Serial experiment compare from the Concurrent experiment? Similar? Dissimilar? Explain these results as best you can.

The data from the Serial and Concurrent experiment were pretty similar with the Concurrent experiment having slightly smaller effective bandwidth values. This is probably due to the fact that the concurrent experiment was running four different requests per fetchall at once which might have created more overhead for processing those requests compared to the serial experiment running just one request per fetchall. Besides that both experiment's effective bandwidth values increased as numBytes increased.

Q4. After carrying out these experiments, what is something that you learned about performance and networked applications?

We learned a lot about http routes and how to pass parameters to them. We learned about bandwidth and how it is affected by different amounts of data, especially at a large scale.

Q5. After carrying out these experiments, what is one (or more) unanswered question(s) you still have about network performance?

Is there a lot of latency or overhead for converting a DNS to an IP address?
What is more often preferred in real world scenarios, serial or concurrent?