

Network Next.

BACKEND PROGRAMMER TEST

Scenario

You are working on a client/server application that needs to scale up to millions of users. The application is written in Golang and runs in Google Cloud.

The client in this application communicates with the server over UDP. Each client sends 100 requests per-second. Each request is 100 bytes long. The server processes each request and forwards it over HTTP to the backend. The backend processes the request, and returns a response. The server returns the response it receives from the backend down to the client over UDP.

The current implementation doesn't scale past a few hundred users before it breaks.

Your task is to scale the application to millions of users.

Step One

Implement a client, server and backend in Golang.

To simulate request/response, take the request data on the backend and return the FNV 1a 64 bit hash of that data as the response.

Run the client, server and backend on Google Cloud as n1-standard-16 instances running Ubuntu 20.04 LTS. IMPORTANT: Make sure you communicate using internal IP addresses to avoid egress bandwidth charges.

Sustain at least 400k responses per-second with zero packet loss.

Step Two

Setup managed instance groups in Google cloud for the client, server and backend with n1-standard-16 instances running Ubuntu 20.04 LTS.

Setup internal load balancers in front of the server and backend components.

Demonstrate that you can scale the application past one million clients.