

Efficient Load Balancing of Dockerized Adaptive Algorithms using Nginx

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Abstract

One of the most crucial aspects to be taken care of in modern web frameworks is the efficient sharing of incoming requests which, in turn, leads to fast performance and high reliability. The main intention is to display by means of a browser, based simulation the effectiveness of load balancing with present and custom algorithms, all of them running in a containerized environment with Docker and Nginx. The centerpiece is basically to test the behaviour of different load balancing algorithms including a newly developed custom one when they receive multiple concurrent requests and need to distribute the load among servers in an efficient manner. To isolate, scale, and keep the system modular, each algorithm is set up in a separate Docker container. Depending on the chosen strategy, Nginx acting as a reverse proxy sends requests to these algorithm containers. It provides a convenient and interactive tool which lets one see the flow of requests, keep track of server loads in real, time, and compare the performance of different algorithms. The logic is very flexible to changes and is capable of dynamically handling requests as well as returning accurate data, such as response times and server loads, for that load balancing method that is most effective. By generating heavy traffic scenarios, the system shows how load balancing can be used to better resource management and getting rid of server overloads in real web infrastructures.

Keywords

Concurrent requests, Docker, Load Balancing, Nginx, Performance.

