Analysis of the use of SDN for load balancing

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1 Contextualization

Load balancing in computer networks is a very important technique that ensures the optimization of the existing resources for a better distribution of the data packets, avoiding the overload and minimizing the response time. For this technique to be possible, several mechanisms can be used, one of the most common are specific hardware, such as routers and ADCs (application delivery controller, devices capable of distributing the packets to improve the performance of internet-provided applications), which perform balancing algorithms for ensure that data travels to the computers that are in the best condition[1]. However, the use of these large routers can be very costly, reaching U$ 2000.[2]

However, with the widespread dissemination of software-defined networks (SDN), establishing behavior and data traffic within the network does not have to rely solely on hardware. This ensures greater customization and customization that varies according to network conditions (e.g. servers available, package metadata, etc.) differently than the fixed model allowed by the hardware. The use of this recent technique takes place in several aspects, ranging from the academic scope, for the development and testing of new network protocols, as well as in the commercial scope, for cost reduction and greater control over the network.

With this in mind, it's possible to take the SDN technique to create a load balancer, thus reducing the high costs generated by the use of own devices and allowing the administrator greater control of the network, since this technique allows the generation of a more flexible balancer with more than one balancing algorithm.

[1] It is understood here that a computer in the best condition depends on the balancing algorithm that is running.

[2] It was chosen the Barracuda Load Balancer ADC 240. Available at http://www.zones.com/site/product/index.html?id=100713342. Accessed in 04/22/2018.

2 Objectives

The purpose of this work, therefore, will be to analyze and compare the cost and benefit of using SDN with the hardware for load balancing.

To perform this analysis, we intend to develop a SDN that contains three algorithms for the balancing and allows the network administrator to choose the algorithm to be executed, as well as its due parameters. This will ensure greater control of the entire process to the user, something that is not allowed with the routers.

3 Schedule

We divide the project into seven tasks, they are:

1. Create the repository/base code using OpenFlow protocol and Mininet;
2. Define the algorithms to be used;
3. Add the algorithms to the network;
4. Allow the user to select the algorithm and its parameters for load balancing;
5. Create network quality tests using the developed SDN and specific hardware;
6. Write the monograph;
7. Make the poster.

With this, our schedule of activities is as follows.

	abr	mai	jun	jul	ago	set	out	nov
1	X	X						
2	X	X						
3		X	X					
4			X	X				
5					X			
6						X	X	
7							X	X