

SDN Based Load-Balancing in Cloud Computing with Security Enhancement

Author: Arshad Haris (2016051) | Supervisor: Ms. Dilushinie Fernando

BSc(Hons) Computer Networking



Introduction

In industry technologies and internet usage rapidly increased. As a result, there is congestion, which arise packet loss and decrease system efficiency and performance. So single server cannot handle the huge traffic. So, industry need load-balancing approach in cloud computing with secure manner. Moreover, there are so many approaches provide by researchers to balance the load such as Roud-Robin, weighted Roud-Robin and least bandwidth algorithms. In this project introduce least packet load-balancing idea to the IT industry.

Technologies Used



Oracle Virtual Box



Wireshark



XTerm



Ubunthu OS

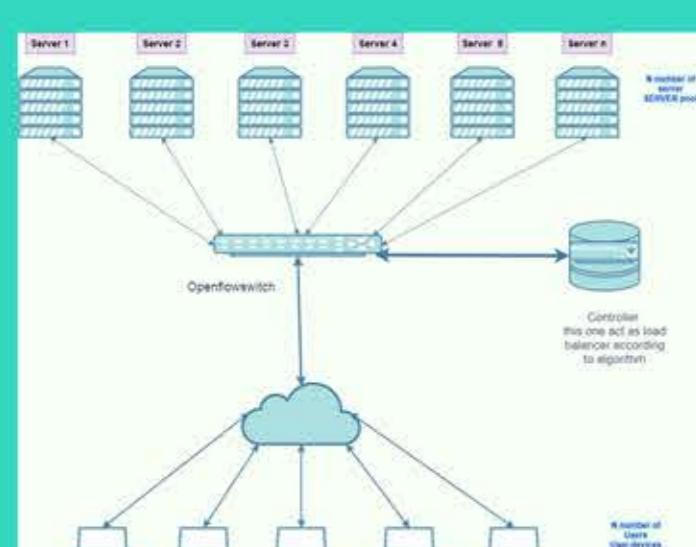


POX Controller

Results

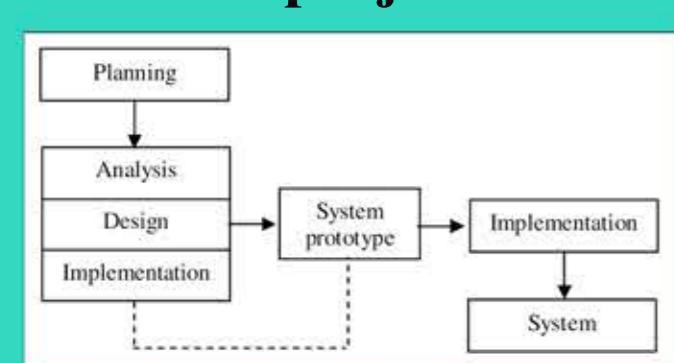


Topology



Methodology

Project used prototyping methodology because it is built, tested and reworked as necessary until an acceptable outcome achieved from which complete system. the prototype is iterative and takes trial-and-error process between user and company. So missing functionality and errors one detected easily and prototype can be reused in future for projects.



Benefits

- Increase network and system performance.
- High availability, integrity, agility and scalability.
- Programmable. So, hardware independent.
- Good security concept like port security
- No congestion or packet losses happen. Also, it was dynamic.

Research Problem

The traditional network's load-balancers are expensive, close vendor and non-programmable. Also hardware depended. So, if we want multiple servers, it's so expensive and some times its not support to the network. Security must in this generation.

Research Aim

To implement a load-balancing technique to SDN controller to get efficient and secure network infrastructure.

Solution

SDN based loadbalancing is solution given by researcher. The use of a load-balancer to distribute network traffic among multiple servers could decrease the load on a single server give availability and scalability and efficiency in network. So, project concept that utilized load-balancer is programmable.

Research Objectives

- To identify and evaluate existing load balancing techniques implemented in SDN field network infrastructure.
- To gather information about SDN based load-balancing to create new technologies.

- To identify the load-balancing approach which suitable for SDN and design simulation system for new techniques.
- To implement and analyse network get packet flow, response time, and check how the load is balancing with time and speed.

- After the implement compares with other load balancing approach and compare security performance with existing approaches and produce ideas to mitigate the threat.

Features

- * Analysis of the outcome results from network traffic and comparison with small, medium, and large loads.
- * Monitor and Analysis security check the network.
- * If threat will detect give physical or logical solution.

References

- t Dhumal, S., 2020. Load Balancing in Cloud Computing, scholarworks: s.n.
- F. Bannour, S. Souihi, and A. Mellouk, 2017. Distributed SDN ControlSurvey, Taxonomy and Challenges," IEEE Communication. Survey. Tutorials, vol.20, issue 1, s.l.: s.n.
- G. Tiwari, V. Chakaravarthy, and A. Rai, 2019. Dynamic load balancing in software defined networking. Int. J. Eng. Adv. Technol., 8(5), p. pp. 2706–2712.