Big Data Analysis-Based Secure Cluster Management for Optimized Control Plane in Software-Defined Networks

Abstract—In software-defined networks (SDNs), the abstracted control plane is its symbolic characteristic, whose core component is the software-based controller. The control plane is logically centralized, but the controllers can be physically distributed and composed of multiple nodes. To meet the service management requirements of large-scale network scenarios, the control plane is usually implemented in the form of distributed controller clusters. Cluster management technology monitors all types of events and must maintain a consistent global network status, which usually leads to big data in SDNs. Simultaneously, the cluster security is an open issue because of the programmable and dynamic features of SDNs. To address the above challenges, this paper proposes a big data analysis-based secure cluster management architecture for the optimized control plane. A security authentication scheme is proposed for cluster management. Moreover, we propose an ant colony optimization approach that enables big data analysis scheme and the implementation system that optimizes the control plane. Simulations and comparisons show the feasibility and efficiency of the proposed scheme. The proposed scheme is significant in improving the security and efficiency SDN control plane.

CONCLUSION

In large-scale SDN, multiple controllers in the control plane must be able to collaborate to manage the entire network. Control plane extensibility is an important issue. Clustering is a feasible and proven approach to achieve efficient SDN management, in which the cluster monitors all types of events and maintain a consistent global network status. This usually involves big data in SDN. At the same time, the legality of the data sources should be ensured, thus the big data for cluster must be trustworthy. To address the above challenges, this paper proposed a big data analysis-based secure cluster management architecture for optimized control plane. A secure authentication scheme was proposed to ensure the legality
of the data sources. Next, ant colony optimization was used to enable a big data analysis scheme and an implementation system was proposed to optimize the control plane. This work is significant in improving the performance and efficiency of applications running in SDN. In future work, a distributed security data storage scheme for the SDN controller cluster will be proposed.

SYSTEM REQUIREMENTS:

HARDWARE REQUIREMENTS:

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Floppy Drive : 1.44 Mb.
- Monitor : 15 VGA Colour.
- Mouse : Logitech.
- Ram : 512 Mb

SOFTWARE REQUIREMENTS:

- Operating system : Windows 7/UBUNTU.
- Coding Language : Java 1.7 ,Hadoop 0.8.1
- IDE : Eclipse
- Database : MYSQL

REFERENCES
