

Accepted Manuscript

An early detection of low rate DDoS attack to SDN based data center networks using information distance metrics

Kshira Sagar Sahoo, Deepak Puthal, Mayank Tiwary, Joel J.P.C. Rodrigues, Bibhudatta Sahoo, Ratnakar Dash



PII: S0167-739X(18)30954-3
DOI: <https://doi.org/10.1016/j.future.2018.07.017>
Reference: FUTURE 4335

To appear in: *Future Generation Computer Systems*

Received date: 21 April 2018
Revised date: 25 June 2018
Accepted date: 10 July 2018

Please cite this article as: K.S. Sahoo, D. Puthal, M. Tiwary, J.J.P.C. Rodrigues, B. Sahoo, R. Dash, An early detection of low rate DDoS attack to SDN based data center networks using information distance metrics, *Future Generation Computer Systems* (2018), <https://doi.org/10.1016/j.future.2018.07.017>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

An Early Detection of Low Rate DDoS Attack to SDN Based Data Center Networks using Information Distance Metrics

Kshira Sagar Sahoo^a, Deepak Puthal^{b,*}, Mayank Tiwary^c, Joel J. P. C. Rodrigues^d, Bibhudatta Sahoo^a, Ratnakar Dash^a

^a*Department of CSE, National Institute of Technology, Rourkela, India*

^b*Faculty of Engineering and IT, University of Technology Sydney, NSW, Australia*

^c*SAP Labs, Bangalore, India*

^d*National Institute of Telecommunications (Inatel), Brazil*

Instituto de Telecomunicaes, Portugal

ITMO University, St. Petersburg, Russia

University of Fortaleza (UNIFOR), Brazil

Abstract

The primary innovations behind Software Defined Networks (SDN) are the decoupling of the control plane from the data plane and centralizing the network management through a specialized application running on the controller. In spite of many advantages, SDN based data centers' security issues is still a matter of concern among the research communities. Although SDN becomes a valuable tool to defeat attackers, at the same time SDN itself becomes a victim of Distributed Denial-of-Service (DDoS) attacks due to the potential vulnerabilities exist across various SDN layer. The logically centralized controller is always an attractive target for DDoS attack. Hence, it is important to have a fast as well as accurate detection model to detect the control layer attack traffic at an early stage. We have employed information distance (ID) as a metric to detect the attack traffic at the controller. The ID metric can quantify the deviations of network traffic with different probability distributions. In this paper, taking the advantages of flow based nature

*Corresponding author

Email addresses: kshirasagar12@gmail.com (Kshira Sagar Sahoo), deepak.puthal@gmail.com (Deepak Puthal), mayank.tiwary@sap.com (Mayank Tiwary), joeljr@ieee.org (Joel J. P. C. Rodrigues), bdsahu@nitrkl.ac.in (Bibhudatta Sahoo), ratnakar.dash@gmail.com (Ratnakar Dash)

Download English Version:

<https://daneshyari.com/en/article/6872862>

Download Persian Version:

<https://daneshyari.com/article/6872862>

[Daneshyari.com](https://daneshyari.com)