

Network Monitoring on Cloud Environment using SDN



G. Kavitha, R. Kavitha, Allin Geo A.V

Abstract: Network Monitoring is going to be play a vital role in today's software defined networking as the completed network/topology information is now available at a centralized controller which is having the complete picture about the underlying network with respect to the connectivity, fault management, a centralized configuration and performance along with enhanced security. Network Monitoring System (NMS) Application which has been developed as part of this project is a north bound application sitting on top of SDN (ODL) controller and sending periodic requested in the form of http request. This application will send various unique requests towards the ODL using different Rest URL and processed the response for each request which will be in the form of JSON format. Each response will then be fed to individual module and the data will be extracted, processed and will be updated accordingly in individual display pages meant for specific purpose.

Keywords : Network Monitoring, Display Pages, Fault Management

I. INTRODUCTION

Programming characterized Networking (SDN) is another way to deal with structuring, building and overseeing systems[1],[3],[5]. The essential idea is that SDN isolates the system's control (minds) and sending (muscle) planes to make it simpler to enhance the system. SDN condition uses open, application automatic interfaces (APIs) to help every one of the administrations and applications running over the system. These APIs encourage advancement and empower productive administration coordination and robotization[2],[4],[6].

System Monitoring System (NMS) Application which has been created as a feature of this task is a north bound application sitting over SDN (ODL) controller and sending occasional mentioned as http demand. This application will send different one of a kind solicitations towards the ODL utilizing diverse Rest URL and prepared the reaction for each solicitation which will be as JSON position.

Each response will then be fed to individual module and the data will be extracted, processed and will be updated accordingly in individual display pages meant for specific purpose[7],[9],[11]. This application is proactive in nature in

the sense that it will identify the change in network say, w.r.to link failure and the same will be displayed in the GUI page and the failure information will be sent via e-mail without human intervention. This can give a visual alerts and SNMP Trap notifications during the identification of failure[8],[10],[12]. Apart from the fault monitoring functionality, this NMS application can also get the information pertaining to the port statistics of individual OVS switches in the network and can also be used to track the number of hosts that are connected to various OVS switched in the network. The completed application including the GUI part has been developed using python[13],[15],[17].

II. SOFTWARE DEFINED WORKS

A. About SDN

- Software defined Networking (SDN) is a new approach to designing, building and managing networks
- The basic concept is that SDN separates the network's control (brains) and forwarding(muscle) planes to make it easier to optimize the network
- SDN environment uses open, application programmatic interfaces (APIs) to support all the services and applications running over the network[14],[16],[18].
- These APIs facilitate innovation and enable efficient service orchestration and automation

B. Objectives

The main objective is to develop a network monitoring and reporting application network availability, capacity utilization and other network monitoring parameters which helps in building and understand SDN concepts and ODL application development. As part of this project, a new application will be built that can be used on top of SDN controller to read the underlying network for any fault occurrence because of links failure or switch failure, link availability and bandwidth utilization[19],[21],[23]. Currently the GUI available with the ODL controller is reactive1 in the sense that the user needs to select the individual options to check various networking attributes and not meeting the real time production quality meant for a monitoring application possible. Finally deploy the same in cloud environment [20],[22],[24].

C. Architectural Design Specification

This application is mainly designed for networks which are controller by a centralized controller viz., SD Ncontroller. The main functionality of this controller is to have the complete view of the underlying network and can control or configure the network devices programmatically.

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* Correspondence Author (s)

G.Kavitha, Department of Computer science and Engineering, Bharath Institute of Higher Education and Research, Chennai, Tamilnadu, India. Email: kavithag90@gmail.com

R.Kavitha, Department of Computer science and Engineering, Bharath Institute of Higher Education and Research, Chennai, Tamilnadu, India. Email: kavis_happy@yahoo.co.in

Allin Geo A.V., Department of Computer science and Engineering, Bharath Institute of Higher Education and Research, Chennai, Tamilnadu, India. Email: seemeallin@gmail.com

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This NMS application has been developed keeping in mind that an operator can have a proactive monitoring application which can read failures of the underlying network in terms of link or node fail and can autonomously report to the operator whomsoever managing the network [25],[27],[29]. This will avoid periodic human intervention to check for any failures in the network.

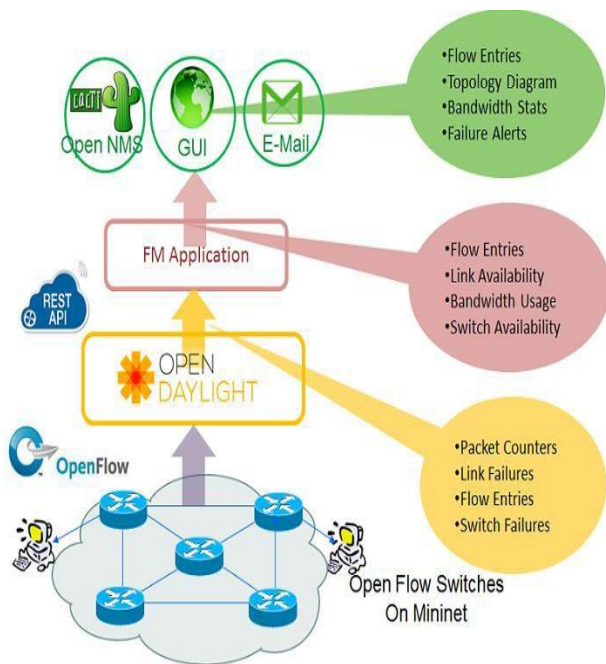


Figure 1 – Architecture

D. Control Flow

Python based NMS application running on top of ODL controller will send a Rest API request to the underlying ODL controller. We have unique Rest URL per service to extract the required information and process accordingly [26],[28],[30]. Once individual module of ODL receives these incoming request will respond with the data which in turn will be fed to the awaiting NMS application. This response will be in the form of JSON (name, value format).

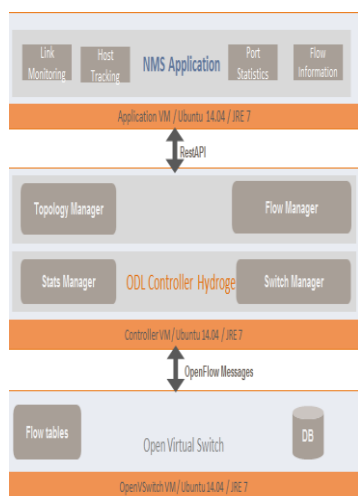


Figure 2 : Control Flow Diagram

III. CONCLUSION

Network Monitoring System Application is a key corner stone in developing different applications on top of ODL which can have a better overview of the completed network and can reduce human intervention. This thesis work gives wonderful opportunity to get hands on with the latest coming architectures and technologies in telecom industry. This research work show the payment to carry forward similar research oriented projects with a good exposure towards using new languages and tools. Trying to extend this work in cloud computing environment.

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R.Kavitha Associate Professor, Department of Computer science and Engineering, Bharath Institute of Higher Education and Research, Chennai, India



Allin Geo A.V Assistant Professor, Department of Computer science and Engineering, Bharath Institute of Higher Education and Research, Chennai, India

AUTHORS PROFILE



G.Kavitha Assistant Professor, Department of Computer science and Engineering, Bharath Institute of Higher Education and Research, Chennai, India