

Aweb Application ('Live Switch') for Current Configuration Details Of Switches in a Network

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Abstract- It became a common practice for many organizations to use their own intra networks to share the information within the organization to provide more security. Any network will be constructed using different types of switches which connects different devices to the network. All these Switches are of type Layer 2, Layer 3, and containing various releases of Cisco IOS. Day to day activity of Network maintenance engineers has to configure & maintain secure features as per Lab's information security policy. To ensure this, Network management periodically checks & audits all these switches. It takes lot of time to complete this operation. Hence, to ease this activity, it is required to develop a web based software tool to configure, monitor and report the configuration details. The main issue of auditor is logging into all the switches with IP addresses & entering logging credentials using TELNET software and verifying secure features configurations and recording manually consumes a lot of Auditor time. The Secure features that need to verify are IP address, port numbers, VLANs, MAC addresses, Port connectivity status & speed, port modes (access, trunk) and disable of unwanted services like telnet, http, etc. These parameters are to be recorded in a database daily. Using this database, changes report is to be generated and reasons for the changes to be recorded.

Keywords – Intra network, mac-address, telnet, logging, reporting, configuration of switches.

I. INTRODUCTION

The day to day activity of Network maintenance engineers has to configure & maintain secure features as per Lab's information security policy. To ensure this, Network management periodically checks & audits all these switches. It takes lot of time to complete this operation. Hence, to ease this activity, it is required to develop a web based application to configure, monitor and report configuration details of switches.

The main issue of auditor is logging into all switches with IP addresses & entering logging credentials using telnet command and verifying secure features configurations. The Secure features that need to verify are IP address, port numbers, VLANs, MAC addresses, Port connectivity status & speed, port modes (access, trunk), Host Name, System Serial Number, Model Number, Switch image, version etc.. These parameters are to be recorded in the database daily. But recording all these details manually consumes lot of auditor's time. PING is an application layer protocol based on the Internet control and Management Protocols (ICMP), echo sub protocol used for knowing the status of a node. TELNET is an application layer protocol used to access a remote node. The modules developed in this project have to interact with the remote nodes using PING and TELNET application layer protocols. The required parameters has to be recorded to the database for each node. For developing Graphical user interface (GUI), JSP and HTML were used and for storing configuration details Oracle database is used. The next stage in the project is to generate various kinds of web reports based on the requirement of the network engineer or auditor. SQL is used to fetch required data from the database to display on the jsp reports.

A. Need of the application

The main need of this web application is to save time of network engineers by the reports that will be generated by this application in order to avoid multiple logins to each switch when needed. By logging into the switch the network engineers will check the details of which ports are connected and which are free, they also check the Vlan number of the particular switch, Mac address of particular switch.

By using this application the network engineers can view the last date information that was recorded in the database and they can also view the past information about the switches.

B. Usage of TELNET command

The abbreviation for TELNET is Terminal Network which was developed in 1969. Telnet is a client-server protocol and it is based on a reliable connection-oriented transport. Mainly this protocol is used to establish connection to transmission control protocol (TCP) which is having port number 23. This telnet command can be used in command prompt as well as in putty also. This command can be used as telnet and the ip address of the switch. Telnet should be used only through the sockets when writing in programming code. Because it does not support any encryption standards.

TELNET command plays an important role in this application. Because using this command only the network engineers are able to login into the switches. The syntax of the command to login to any switch starts with the telnet command followed by the IP address of the switch.

C. Functional model of 'Live Switch'

The Architecture of 'Live Switch' can be divided into four major levels, which are

1. User interface to run and get the configuration details
2. Connecting to remote nodes using TELNET command
3. User interfaces to view reports
4. A Relational database to store the data

Pictorially, the levels are represented as follows

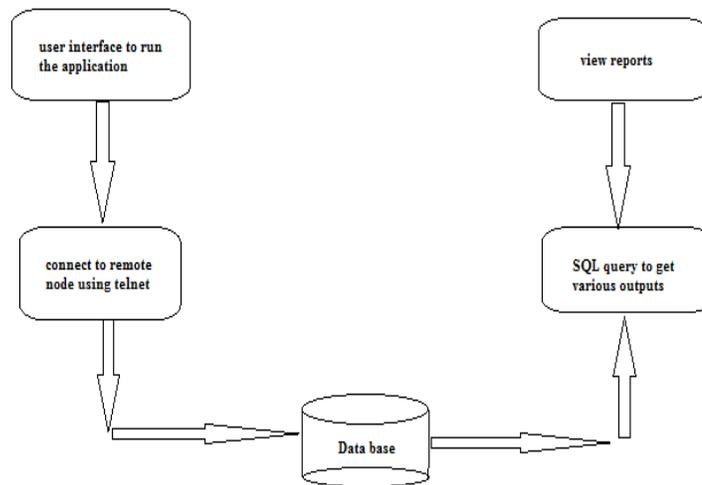


Figure 1. Functional model of Live Switch

II. IMPLEMENTATION DETAILS

A. User Interface to run

The Starting page in this application is a simple page containing one run button and a link which is very user friendly and a naïve user can also understands how to run the application. The total concept of getting configuration details of all switches will be done by clicking the run button only. After the button was clicked it will call a servlet which will do all the required task to get all the configuration details of switches which are active in the network.

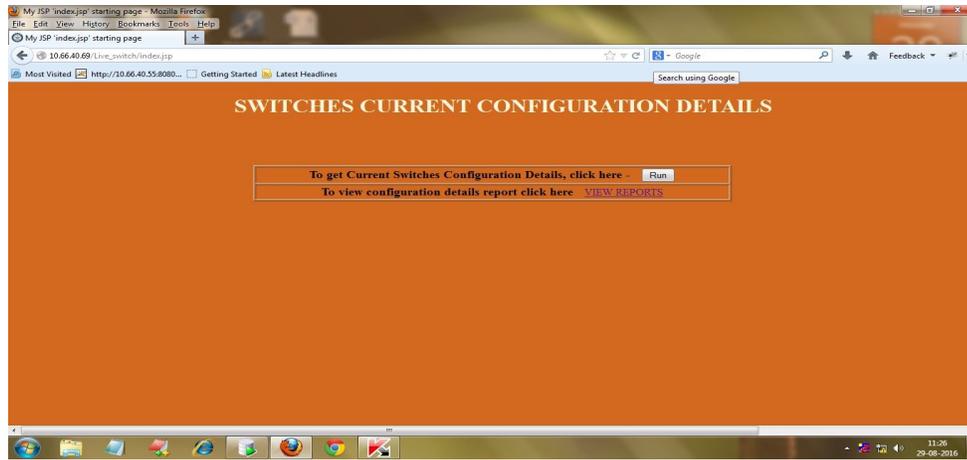


Figure 2. User interface to run Live Switch and to view reports

This is the first page which will be displayed when the user (most probably the network engineer) click the link provided in the DRDL apps link. This page simply contains a single button to run this application and a link which navigates the user to view the details. The main thing here is even a naïve user can also use this application without knowing any detailed information about this application and by just clicking the run button he will get all the details into the database.

```

p04 597 ff C
*****
+           WEL-COME           +
+           +                   +
+   THANK YOU FOR YOUR VALID CRIDENTIAL'S   +
+           +                   +
*****
C
+ PLEASE LOGIN WITH VALID CRIDENTIAL'S
+ UN-AUTHORIZED ACCESS IS DENIED !! YOU WILL BE PUNISHED...!!!
+ ALL NETWORK IS MONITORED AND RECORDED
+
+
User Access Verification
Username:
SW_MB_FF_237@ah run
Building configuration...

Current configuration : 8472 bytes
:
: Last configuration change at 11:10:31 ist Wed Nov 4 2015 by ITSecurity
: VTYAM config last updated at 10:42:16 ist Wed Nov 4 2015 by ITSecurity
:
:
version 12.2
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
:
hostname SW_MB_FF_237
:
boot-start-marker
boot-end-marker

enable secret 5 $1$KcvSLJW7A6.gw2mXX09n1Xx0
enable password 7 0322520931D2E6CA003A
:
interface FastEthernet0/3
switchport access vlan 40
switchport mode access
:
interface FastEthernet0/4
switchport access vlan 40
switchport mode access
switchport port-security maximum 1
:
interface FastEthernet0/5
switchport access vlan 40
switchport mode access
:
interface FastEthernet0/6
switchport access vlan 40
switchport mode access
:
interface FastEthernet0/7
description MANJULATHA
switchport access vlan 40
switchport mode access
:
interface FastEthernet0/8
description NAGIOS PORT
switchport access vlan 40
switchport mode access
:
interface FastEthernet0/9
switchport access vlan 40
switchport mode access
:
interface FastEthernet0/10

```

Figure 2. All the switch current configuration details will be stored in a text document for further extraction of useful data.

B. Connecting to remote nodes

The main goal of this application to login into various switches connected in the network and get all the configuration details. To do this telnet command was used in the pseudo code which will be prefixed with the ip address while it tries to connect to the each switch. This will be done using for loop. The application will get all the ip addresses and their secure credentials from a text file named ip.txt. After logging into each switch the application has to give to commands which are show run and show version to get the required details. These commands will be written in commands.txt file. After the commands was given the output generated from the each switch will be written to output.txt file. From the output.txt file only required details will be extracted.

C. Storing in a database

Storing of configuration details of all switches on daily base will makes the auditor to feel comfortable in checking the changes in the configuration details from last day to today. And also it is very much helpful and easiest way to visualize the data in a tabular format.

D. Generating Reports

Generating various reports is a flexible way to view the data in different directions based on the requirement. The reports can be generated in tabular forms and graphs and pie charts etc.

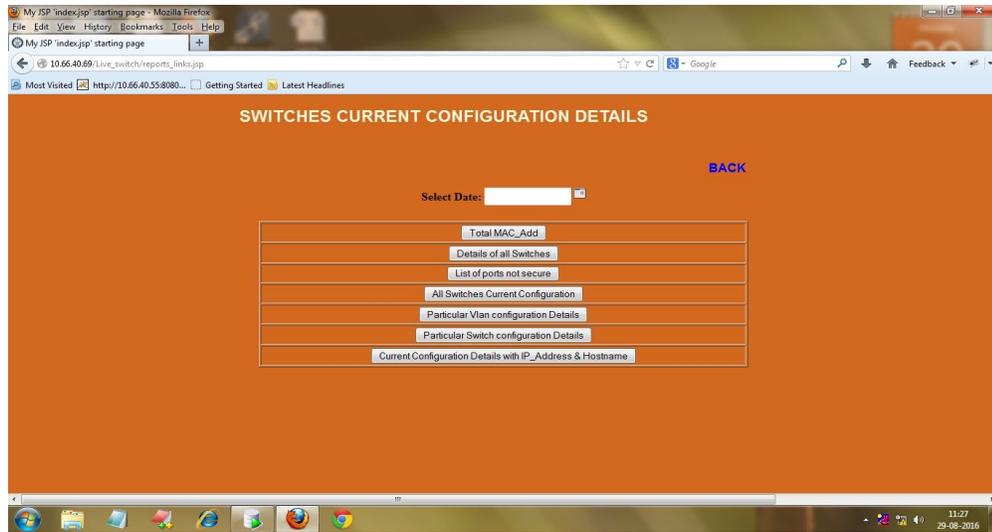


Figure 4 various reports to get configuration details of all switches in different views

IV.CONCLUSION

Live Switch is a powerful and nicely highly application for network management for a highly complicated network as that of DRDL. Its primary goal being very user friendly and economy in space have been carefully met with the help of open source software like java. Live Switch in its present version provides some of the links all in one window.

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