Report

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I. Introduction

Multi Router Traffic Grapher (MRTG) is a network traffic monitoring tool. MRTG [1] uses the SNMP [2](Simple Network Management Protocol) compatibility of the network to monitor the in and out traffic bit rate of a network device. This tool generates daily, weekly, monthly and yearly graphs of the requested network device.

Keywords– MRTG, SNMP, Bit rate.

II. Background

A network monitoring tool is nothing but a software which keeps an eye on the network links/connections and records data like bitrate—number of bits processed per unit of time, packet loss, and etc. There are many different types of network monitoring tool's working based on different methods, this tool uses SNMP [2] protocol as its primary tool to monitor network devices.

SNMP—Simple Network Management Protocol [2] is a protocol used for managing devices in IP network. Devices like routers, switches, workstations, etc., have SNMP [2] compatibility within them.

III. Installation

The installation of MRTG [1] is done in ubuntu-14.04. To install it properly and make it run flawlessly there are some pre-requisites for it.

A. Pre-requisites and Installation

1) snmp — sudo apt-get install snmp
2) snmpd — sudo apt-get install snmp
3) Apache web server — sudo apt-get install apache2

B. Installation and Configuration of mrtg

1) First, updating the package list of ubuntu 14.04 operating system through terminal [3].
   - sudo apt-get update
2) Now, MRTG tool is installed by executing the following command [3].
   - sudo apt-get install mrtg

   (A screen appears during the installation procedure prompting for 'Yes' or 'No'. Choose 'Yes' to give MRTG configuration file permissions to 640 making it only readable to local system)
3) For listing the things installed by MRTG and its location, a locate command is executed [3]:
   - sudo updatedb && locate mrtg
4) Now, we will set a desired folder for mrtg by creating it in /etc directory and moving mrtg.conf file into it [3].
   - sudo mkdir /etc/mrtg && sudo mv /etc/mrtg.cfg /etc/mrtg
5) After all the installation, MRTG is now configured to make it to monitor the desired devices in the network. Starting with the following command [3]:
   - sudo cfgmaker --output=/etc/mrtg/mrtg.cfg <community>@<IP address>

     (Replace <community>with community name and <IP address>with Ip address of device) (To get info on more than one device, type the communtiy and IP address pair in the same command seperating both with space) [3]

     (If you want to give even the port number, then mention it at the section of IP address with : ie., for Eg: 192.168.184.25:1161)
6) Open mrtg.conf file present in /etc/mrtg/ directory and edit the file as follows:
   - Add the following lines under the Global Defaults section [3]:

     RunAsDaemon: Yes

     Interval: 5
   - Uncomment/modify the following lines as shown ie., remove # (if they are commented) Options[ ]: growright

     WorkDir: /var/www/mrtg
7) After making the required changes in mrtg.conf, execute the following commands in terminal to generate graphs [3].
   - sudo mkdir /var/www/mrtg
   - sudo indexmaker --output=/var/www/mrtg/index.html /etc/mrtg/mrtg.cfg

8) Open apache2.conf file present in /etc/apache2/ directory and add the following lines and restart the apache2 server [3]:

- In apache2.conf file Alias /mrtg ”/var/www/mrtg/” <Directory ”/var/www/mrtg/”> Options None AllowOverride None Require all granted </Directory>
- Open terminal and execute the following command: sudo service apache2 restart

9) Now change the environmental variable of MRTG ’LANG’ to ’C’ by executing the following command in terminal [3]:

- sudo env LANG=C /usr/bin/mrtg /etc/mrtg/mrtg.cfg --logging /var/log/mrtg.log

  (For the first time, many warnings may arrise indicating missing of log file. No problem, Neglect it).

10) Now open browser and type localhost/mrtg/ in the url bar [3].

(If you see any errors displaying on the page, then give 0777 permissions to mrtg folder by executing the following command: sudo chmod -R 0777 /var/www/mrtg/)

11) Click on the graph to see the four types of graphs (daily, weekly, monthly, yearly) of that device.

IV. Comparision of MRTG and Tool

This section deals with the comparison of MRTG and the tool that impersonates MRTG. The main difference between MRTG and the Tool is that MRTG uses SNMP protocol that has blocking properties i.e; the code flow is blocked until the response to the request has been obtained, While the tool uses SNMP protocol that has non-blocking properties i.e; the tool sends all the requests without waiting for the response to the request. Graphs generated by MRTG and the tool on daily basis or shown below.

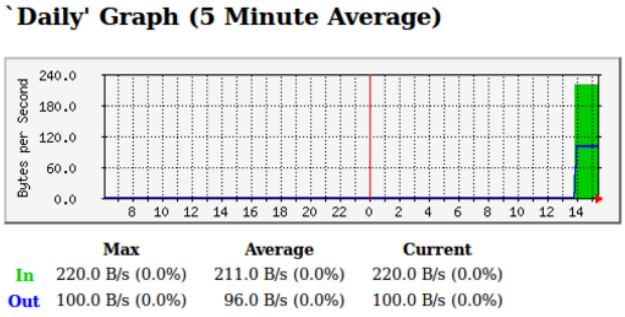

Fig.1. MRTG daily graph

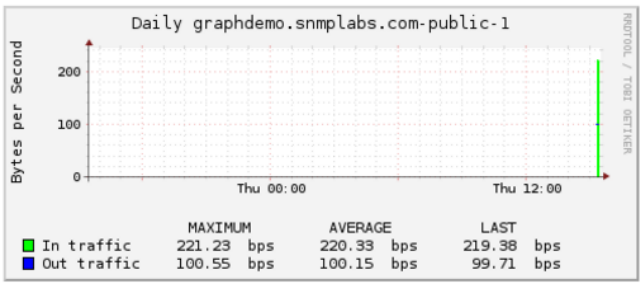

Fig.2. Daily graph created by tool

From above graphs we can observe that Max, Average and current bitrate of inOctet obtained from MRTG are 220 B/s,211.0 B/s, 220.0 B/s and that obtained from Tool is 221.3 B/s, 220.33 B/s, 219.38 B/s (both are represented in bytes per second). The slight difference between MRTG and the tool might be because of the time dependency i.e; MRTG starts collecting the values as soon as it is configured while Tool starts when the Tool script is executed . Thus the slight time delay between configuring MRTG and running the script for the Tool might be the reason for the slight change in values.

References

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[3] Iceflatline, How to Install and Configure MRTG on Ubuntu, 23Mar2016. [Online]. Available: http://www.iceflatline.com/2009/08/how-toinstall-and-configuremrtg-on-ubuntu-server/