

Upgrade the router using Tomato firmware

Monitor bandwidth and quality of service (QoS) on the router line using Tomato firmware, combined with two tools, Mark Vejvoda's IPTables Bandwidth Monitor and Script 's Robert Generator' Mytkowski.

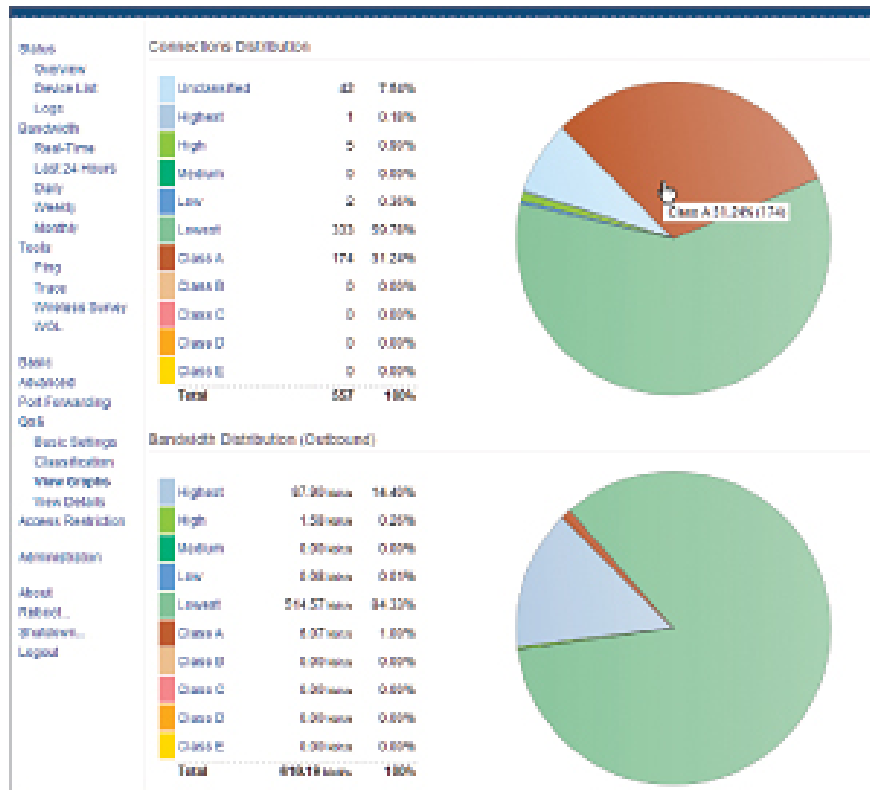
Monitor bandwidth and quality of service (QoS) on the router line using Tomato firmware, combined with two tools, Mark Vejvoda's IPTables Bandwidth Monitor and Script Generator by Robert "Robson" Mytkowski.



Unless you buy an expensive router that costs about ten million, otherwise, with several million routers running Linux it is hard to expect bandwidth management features to be available. However, you can do that with customized Linux versions.

In this article, the user of **Linksys WRT54GL version 1.1** is priced at VND 1.2 million. To buy the right device running **Tomato** (Linux kernel), you should know about the types of routers using Broadcom chipset that have enough flash memory (usually from 4MB or more) and RAM (from 16MB or more). You can find Tomato-compatible routers mentioned on Tomato's website (<http://www.polarcloud.com/tomato>).

About Tomato



Tomato's interface has **Bandwidth** section for bandwidth monitoring, **QoS** for service quality management, **Access Restriction** allows creating rules to manage access . according to each **TCP / UDP port** and **P2P download** restrictions (peer to peer) or hourly usage. The *Administration* section of **Tomato** has a number of options different from the available firmware of common routers like **Debugging** (quite familiar to you who have worked with Cisco IOS). Or the **CIFS Client** and **JFFS2 section** to access shared folders on the local network or use flash memory as a file folder. In addition, **Scripts** and **Scheduler section** is the place for you to add features that Tomato does not have, if you know how to exploit. As for monitoring normal bandwidth, Tomato is available in real time or every day, every week, every month. But if you want to monitor bandwidth by IP address or limit / customize the download of users, you will have to combine 2 **scripts** and **scheduler** with 2 tools that will be introduced later.

Track bandwidth by IP address

Why do you need to monitor bandwidth usage by IP address?

To use **Mark Vejvoda** 's **IPTables Bandwidth Monitor** with Tomato, you must use Static Lease of the DHCP service to fix the user's IP address. This makes it very easy for Tomato, just go to the **Device List** section , select each user's IP address and click the [**static**] text directly below, the interface of **Static DHCP** will appear, you can type the username or name the **computer** in the **Hostname field** , click **Add** and that's it for a user. Just repeat this until the list of your users is gone.

The screenshot shows the Tomato Firmware Manager interface. At the top, there's a navigation menu with 'File', 'Edit', 'View', 'History', 'Bookmarks', 'Tools', and 'Help'. Below that is a browser address bar showing 'http://192.168.0.1:8080'. The main content area has a red header with 'Tomato Version 1.2.3'. Below the header, there's a table titled 'Per Client Bandwidth Usage defaults'. The table has columns for 'Service', 'Bandwidth Usage of 1 From 20090401 to 20090401', 'Local Upload', 'Local Download', and 'Total'. The 'Total' column is highlighted in red. The table lists various services like Standard, Device, Logs, Bandwidth, Per Client Usage, RealTime, Local DNS, Daily, Weekly, Monthly, Misc, Ping, Trace, Wireless Survey, WPA, Scan, Advanced, Port Forwarding, DNS, Business Notifications, Administrative, and About.

Service	Bandwidth Usage of 1 From 20090401 to 20090401	Local Upload	Local Download	Total
Standard	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Device	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Logs	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Bandwidth	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Per Client Usage	0.00 MB	0.00 MB	0.00 MB	0.00 MB
RealTime	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Local DNS	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Daily	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Weekly	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Monthly	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Misc	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Ping	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Trace	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Wireless Survey	0.00 MB	0.00 MB	0.00 MB	0.00 MB
WPA	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Scan	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Advanced	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Port Forwarding	0.00 MB	0.00 MB	0.00 MB	0.00 MB
DNS	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Business Notifications	0.00 MB	0.00 MB	0.00 MB	0.00 MB
Administrative	0.00 MB	0.00 MB	0.00 MB	0.00 MB
About	0.00 MB	0.00 MB	0.00 MB	0.00 MB

You need to set up a shared folder to store the log and the necessary files for the **IPTables Bandwidth Monitor** package. You can use **flash** memory, but for simplicity, you can start with **CIFS Client** first. You create a shared folder on a computer in the local network, granting write access to a username on the computer. Then use the username and password to declare in the **CIFS Client** section . The **UNC** path should use the hostname according to the IP address, in the form: **xxx.xxx.xxx.xxxsharedfolder** . If you do it right, after clicking **Save** and waiting for Tomato to restart the necessary services, **Total / Free Size** will show the maximum and available space of the above shared folder.

Next, download the **IPTables Bandwidth Monitor** package from here and extract the **ipt-parse.7z** file to get the folder called **tomato_files** . Copy the contents of this folder into the above shared folder.

On Mark Vejvoda's **wiki** page, there are two ways to guide: using **logfile** or using **SQLITE database** . This article only mentions the second way. Go to **Scripts** under the **Administration** section, select the **Firewall** tab and type the following command into the empty box: **/ cifs1 / ipt-parse 6** .

Click **Save** and let Tomato restart the necessary service. Then go to **Scheduler** , select **Custom 1** , click Enable. Choose Time as '**Every 15 minutes**' and make sure you choose Everyday in the **Days** section. In the Command box, type the following command lines:

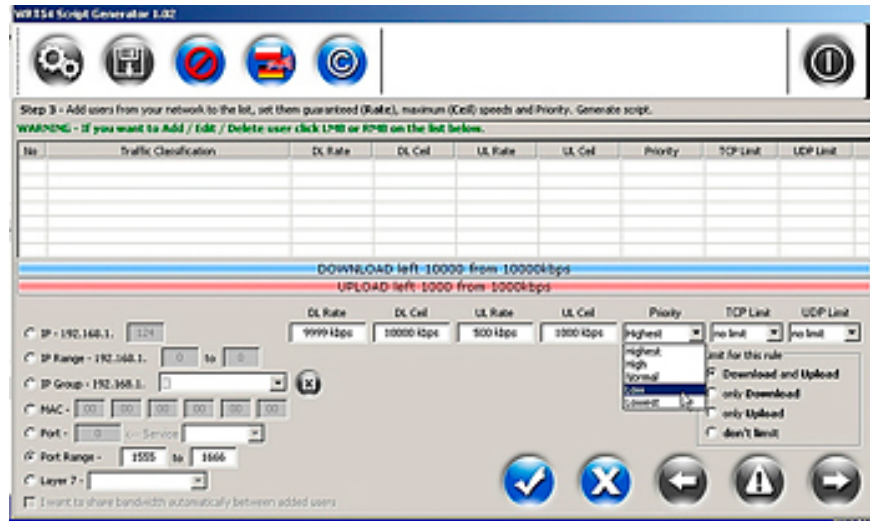
```
cd / cifs1
./ipt-parse 2 BANDWIDTH "iptables -L traffic_all -vnx" "iptables -Z traffic_all"
./ipt-parse 4 today today BANDWIDTH flags = morehostinfo> dailybandwidthlive.html
./ipt-parse 4 today-7 today BANDWIDTH flags = morehostinfo> weeklybandwidthlive.html
```

(You can go to Mark Vejvoda's wiki page to copy and paste the command line)

Click Save and wait for Tomato to restart the service. If you get it right, and the username to access in CIFS Client is sufficient, after 15 minutes in the shared folder, there will be 2 files with the **.html** extension with information on the bandwidth usage of each IP address. You have declared in **Static Lease** of DHCP.

If successful and still want to explore more, the wiki has instructions on how to put the above 2 report pages on the router. At that time, you will access those two pages according to the address of the router as follows: <http://xxx.xxx.xxx.xxx/ext/dailybandwidthlive.asp> with the letter x is the IP address of the router. Or you can directly insert the contents of the tomato_files folder into flash memory, no need to use shared folders.

QoS



Tomato provides the following interfaces for you to manage the translation quality of bandwidth traffic on the network. As mentioned above, **View Details** section is very useful for you to know who-what-is-doing on your network. From there you can adjust, or even restrict, **rules** in the **Access Restriction** section.

However, **Robson's Script Generator** gives you more power than Tomato's available features. (See picture)

You can specify to each IP address, or range of IP addresses, or ports, or even a range of ports with own bandwidth, how many connections. Even prioritize a certain type of traffic.

Script Generator simply writes the Linux command on your behalf, after you've set up rules that serve your needs, follow its instructions. It will then export to the command line. You just copy and paste them into Scripts section, in the Firewall tab. Save and if possible, restart the router.

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