MRTG / RRDTool

Network Management Workshop
intERlab at AIT
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MRTG…

• The Multi Router Traffic Grapher (MRTG) is a tool to monitor the traffic load on network-links. MRTG generates HTML pages containing PNG images which provide an almost live visual representation of this traffic. Check http://oss.oetiker.ch/mrtg/ to see what it does.

• MRTG has been the most common network traffic measurement tool for all Service Providers

• MRTG uses simple SNMP queries on a regular interval to generate graphs
MRTG…

• External readers for MRTG graphs can create other interpretation of data.

• MRTG software can be used not only to measure network traffic on interfaces, but also build graphs of anything that has an equivalent SNMP MIB - like CPU load, Disk availability, Temperature, etc...

• Data sources can be anything that provides a counter or gauge value – not necessarily SNMP.
  – For example, graphing round trip times

• MRTG can be extended to work with RRDTool
MRTG - Issues

• MRTG generates each graph (what if you have hundreds of graphs!) every 5 minutes, creating a lot of overhead.

• It also has very few customizable graphing options.

• Disk space is always an issue.

• MRTG management itself can be tedious work.
Running MRTG

- Get the required packages
- Compile and install the packages
- Make cfg files for router interfaces with cfgmaker
- Create html pages from the cfg files with indexmaker
- Trigger MRTG periodically from Cron or run it in daemon mode
RRDtool

- Round Robin Database for time series data storage
- Command line based
- From the author of MRTG
- Made to be faster and more flexible
- Includes CGI and Graphing tools, plus APIs
- Solves the Historical Trends and Simple Interface problems
Define Data Sources (Inputs)

- **DS:speed:COUNTER:600:U:U**
- **DS:fuel:GAUGE:600:U:U**
  - **DS = Data Source**
  - **speed, fuel = “variable” names**
  - **COUNTER, GAUGE = variable type**
  - **600 = heart beat – UNKNOWN returned for interval if nothing received after this amount of time**
  - **U:U = limits on minimum and maximum variable values (U means unknown and any value is permitted)**
Define Archives (Outputs)

• **RRA:AVERAGE:0.5:1:24**
  - **RRA** = Round Robin Archive
  - **AVERAGE** = consolidation function
  - **0.5** = up to 50% of consolidated points may be UNKNOWN
  - **1:24** = this RRA keeps each sample (average over one 5 minute primary sample), 24 times (which is 2 hours worth)

• **RRA:AVERAGE:0.5:6:10**
  - **1:24** = this RRA keeps each sample (average over one 5 minute primary sample), 24 times (which is 2 hours worth)
  - **6:10** = one RRA keeps an average over every six 5 minute primary samples (30 minutes), 10 times (which is 5 hours worth)

• **Clear as mud!**
  - all depends on original step size which defaults to 5 minutes
RRDtool Database Format

Recent data stored once every 5 minutes for the past 2 hours (1:24)

Medium length data averaged to one entry per half hour for the last 5 hours (6:10)

Old data averaged to one entry per day for the last 365 days (288:365)

--step 300 (5 minute input step size)

RRD File

RRD
1:24

RRA
6:10

RRA
288:365

Medium length data averaged to one entry per half hour for the last 5 hours (6:10)
Isn't it simple ?!


- rrdtool create /var/nagios/rrd/apricot-INTL_Ping.rrd -s 300 DS:ping:GAUGE:600:0:U RRA:AVERAGE:0.5:1:50400 RRA:AVERAGE:0.5:60:43800

Ping Latency Graph Created by APAN from RRD Database
Labs
MRTG

- In Ubuntu / Debian
  - apt-get install mrtg
  - Configuration
    - /etc/mrtg/<device.mrtg>
    - Global directory : /var/www/mrtg/
    - Run MRTG against the configuration file from cron.
cfgmaker

- Uses snmpwalk and creates a mrtg configuration file
- /usr/bin/cfgmaker
  --output=/etc/mrtg/router.mrtg
  --global 'workdir: /var/www/mrtg'
  --global 'options[\[\]: growright,bits'
apric0t08@169.223.2.1
sample

#Title[leased]: a 128K leased line
#PageTop[leased]: <H1>Our 128K link to the outside world</H1>
#Target[leased]: 1:public@router.localnet
#MaxBytes[leased]: 16000
Creating HTML with indexmaker

• /usr/bin/indexmaker
  --output=/var/www/mrtg/device.html
  /etc/mrtg/device.mrtg

If your mrtg configuration file is well commented, the html is nice and detailed.
Lab instructions

• Separate paper
RRDTool

- `# apt-get install rrdtool`
- `# apt-get install librrdp-perl`
- `# apt-get install librrds-perl`

- Add in your MRTG Configuration file
  - `/etc/mrtg/router.mrtg`
- `LogFormat: rrdtool`
- Run mrtg
- Go see in `/var/www/mrtg`