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Counter

Grading with RRDtool Tutorial

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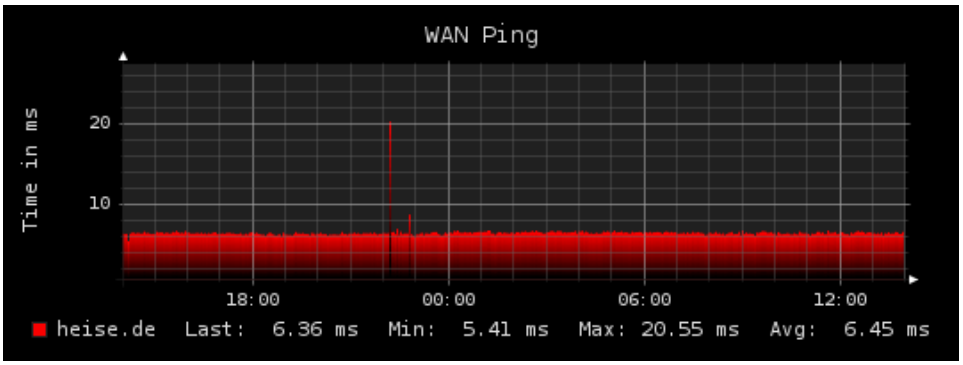
Introduction

This HOWTO describes how to quickly generate a nice graph, showing you the average ping time off a specific host. This picture is the result we should get.



This setup consists of 4 steps

- Configfile
- RRDcreate
- RRDupdate
- RRDgraph

Configfile

The config file defines some global variables that will be used inside the other scripts.

rrd.conf:

```
#!/bin/bash

RRDTOOL='/data/rrd/bin/rrdtool'
FILE='/data/rrd/db/ping.rrd'
HOST='heise.de'
OUTPUT='/data/rrd/png/ping.png'
```

RRDTOOL	Path to RRDtool binary
FILE	Path to the .rrd database file
HOST	Host to ping
OUTPUT	Path to the Image

RRDcreate

We need a Round Robin Database to collect the data. Following script will create a RRD file that will accept values every 60 seconds and that can hold one day's worth of samples. For further explanation about creating Round Robin Databases please refer to the **RRDcreate manpage**.

create.sh:

```
#!/bin/bash

. /data/rrd/etc/rrd.conf

$RRDTOOL create $FILE -s 60 \
DS:ping:GAUGE:120:0:65535 \
RRA:AVERAGE:0.5:1:2880
```

RRDupdate

The next step is a script which updates the Round Robin Database. This script must run every 60 seconds, for exemple via crontab or a loop (`while true; do update.sh; sleep 60; done`). For further explanation about updating Round Robin Databases please refer to the **RRDupdate manpage**.

update.sh:

```
#!/bin/bash

. /data/rrd/etc/rrd.conf

UPDATECMD=$(ping -c 3 -w 6 $HOST | grep rtt | awk -F "/" '{ print $5 }' )

$RRDTOOL update $FILE N:$UPDATECMD
```

In the first step the script reads in the variables from the configfile.

```
. /data/rrd/etc/rrd.conf
```

The second step is the command which pings the host. `ping -c 3 -w 6` makes 3 pings and stop after 6 seconds if no ping returns. After that it builds the average of the 3 pings

```
UPDATECMD=$(ping -c 3 -w 6 $HOST | grep rtt | awk -F "/" '{ print $5 }' )
```

The last step updates the Round Robin Database with the current timestamp (N) and the result ping gives.

```
$RRDTOOL update $FILE N:$UPDATECMD
```

RRDgraph

The last script creates the graph itself. For further explanation about graphing Round Robin Databases please refer to the **RRDgraph manpage**.

graph.sh:

```
#!/bin/bash

. /data/rrd/etc/rrd.conf

$RRDTOOL graph $OUTPUT \
        -t "WAN Ping" -v "Time in ms" \
        --start="now-1d" \
        --end="now" \
        --height="120" \
        --width="440" \
        -c "BACK#000000" \
        -c "SHADEA#000000" \
        -c "SHADEB#000000" \
        -c "FONT#DDDDDD" \
        -c "CANVAS#202020" \
        -c "GRID#666666" \
        -c "MGRID#AAAAAA" \
        -c "FRAME#202020" \
        -c "ARROW#FFFFFF" \
        "DEF:ping_time=$FILE:ping:AVERAGE" \
        "CDEF:shading2=ping_time,0.98,*" "AREA:shading2#F90000:$HOST" \
        "GPRINT:ping_time:LAST:Last\: %5.2lf ms" \
        "GPRINT:ping_time:MIN:Min\: %5.2lf ms" \
        "GPRINT:ping_time:MAX:Max\: %5.2lf ms" \
        "GPRINT:ping_time:AVERAGE:Avg\: %5.2lf ms" \
        "CDEF:shading10=ping_time,0.90,*" "AREA:shading10#E10000" \
        "CDEF:shading15=ping_time,0.85,*" "AREA:shading15#D20000" \
        "CDEF:shading20=ping_time,0.80,*" "AREA:shading20#C30000" \
        "CDEF:shading25=ping_time,0.75,*" "AREA:shading25#B40000" \
```

```
        "CDEF:shading30=ping_time,0.70,*" "AREA:shading30#A50000" \
        "CDEF:shading35=ping_time,0.65,*" "AREA:shading35#960000" \
        "CDEF:shading40=ping_time,0.60,*" "AREA:shading40#870000" \
        "CDEF:shading45=ping_time,0.55,*" "AREA:shading45#780000" \
        "CDEF:shading50=ping_time,0.50,*" "AREA:shading50#690000" \
        "CDEF:shading55=ping_time,0.45,*" "AREA:shading55#5A0000" \
        "CDEF:shading60=ping_time,0.40,*" "AREA:shading60#4B0000" \
        "CDEF:shading65=ping_time,0.35,*" "AREA:shading65#3C0000" \
        "CDEF:shading70=ping_time,0.30,*" "AREA:shading70#2D0000" \
        "CDEF:shading75=ping_time,0.25,*" "AREA:shading75#180000" \
        "CDEF:shading80=ping_time,0.20,*" "AREA:shading80#0F0000" \
        "CDEF:shading85=ping_time,0.15,*" "AREA:shading85#000000" >/dev/null
```

The first sections are settings about the graph's labels, size and colours.

```
$RRDTOOL graph $OUTPUT \
        -t "WAN Ping" -v "Time in ms" \
        --start="now-1d" \
        --end="now" \
        --height="120" \
        --width="440" \
        -c "BACK#000000" \
        -c "SHADEA#000000" \
        -c "SHADEB#000000" \
        -c "FONT#DDDDDD" \
        -c "CANVAS#202020" \
        -c "GRID#666666" \
        -c "MGRID#AAAAAA" \
        -c "FRAME#202020" \
        -c "ARROW#FFFFFF" \
```

The variable 'ping_time' gets defined as ping in the Round Robin Database.

```
  "DEF:ping_time=$FILE:ping:AVERAGE" \
```

The first CDEF is the last line and that one which has the description under it.

```
  "CDEF:shading2=ping_time,0.98,*" "AREA:shading2#F90000:$HOST" \
```

This sections puts out the legend under the graph.

```
  "GPRINT:ping:_timeLAST:Last\: %5.2lf ms" \
  "GPRINT:ping_time:MIN:Min\: %5.2lf ms" \
  "GPRINT:ping_time:MAX:Max\: %5.2lf ms" \
  "GPRINT:ping_time:AVERAGE:Avg\: %5.2lf ms" \
```

This last part does the actual grading. By calculating percentages out of the original value we can draw layers of areas with different colors. This makes the nice effect of a color gradient

```
  "CDEF:shading10=ping_time,0.90,*" "AREA:shading10#E10000" \
  "CDEF:shading15=ping_time,0.85,*" "AREA:shading15#D20000" \
  "CDEF:shading20=ping_time,0.80,*" "AREA:shading20#C30000" \
  "CDEF:shading25=ping_time,0.75,*" "AREA:shading25#B40000" \
  "CDEF:shading30=ping_time,0.70,*" "AREA:shading30#A50000" \
  "CDEF:shading35=ping_time,0.65,*" "AREA:shading35#960000" \
  "CDEF:shading40=ping_time,0.60,*" "AREA:shading40#870000" \
  "CDEF:shading45=ping_time,0.55,*" "AREA:shading45#780000" \
  "CDEF:shading50=ping_time,0.50,*" "AREA:shading50#690000" \
  "CDEF:shading55=ping_time,0.45,*" "AREA:shading55#5A0000" \
  "CDEF:shading60=ping_time,0.40,*" "AREA:shading60#4B0000" \
  "CDEF:shading65=ping_time,0.35,*" "AREA:shading65#3C0000" \
  "CDEF:shading70=ping_time,0.30,*" "AREA:shading70#2D0000" \
  "CDEF:shading75=ping_time,0.25,*" "AREA:shading75#180000" \
  "CDEF:shading80=ping_time,0.20,*" "AREA:shading80#0F0000" \
  "CDEF:shading85=ping_time,0.15,*" "AREA:shading85#000000" >/dev/null
```

If you have any questions or suggestions feel free to write me an email (**alex@krogloth.de**) or join the rrdtool channel (#rrdtool) on the IRCnet.