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PHP RRDTool tutorial

By CARSON | *Published:* JULY 18, 2006

On a number of occasions I've used RRDTool to graph network traffic and the like. A few years ago when I started using cacti I started wondering how to make the graphs myself. Creating the graphs on the command line isn't that hard once you know how to set things up and it turns out doing the same in PHP is just as easy.

For this tutorial I'm going to assume you understand how to get RRDTool installed and working from the command line. If not you should take a look at this tutorial (if you are in a hurry look at the "A Real World Example" section) or any of the tutorials on this page.

Setup and introduction

You need to have PHP compiled with RRDTool support to run the following PHP examples. If you compile PHP by hand then see: how to build the php rrdtool extension by hand. If you are using a distribution's pre-compiled PHP binary you should be able to install a second package with RRDTool support. You can verify that your PHP install is ready to go by running this:

```php
<?php
phpinfo(INFO_MODULES);
?>
```

Then search for "rrdtool" in the output and make sure that "rrdtool support" is enabled.

While going through each of the following steps you will notice that each call takes a couple of parameters and then one parameter that is just a string of options. The string of options is exactly how it is for generating/updating/graphing RRDs from the command line. This makes for a consistent interface for the different languages that have RRDTool support.

Creating a RRD

We first need to create a database for our data. For these examples I will be creating a database that could be used for generating network graphs. This database is created for updates every 5 minutes (300 seconds), has input and output counters that store data for the average and max counts and stores enough samples for hourly, daily, monthly and yearly graphs of both average and max.

```php
<?php

  $fname = "net.rrd";

  $opts = array( "-step", "300", "-start", 0,
          "DS:input:COUNTER:600:U:U",
          "DS:output:COUNTER:600:U:U",
          "RRA:AVERAGE:0.5:1:600",
          "RRA:AVERAGE:0.5:6:700",
          "RRA:AVERAGE:0.5:24:775",
          "RRA:AVERAGE:0.5:288:797",
          "RRA:MAX:0.5:1:600",
          "RRA:MAX:0.5:6:700",
          "RRA:MAX:0.5:24:775",
          "RRA:MAX:0.5:288:797"
        );

  $ret = rrd_create($fname, $opts, count($opts));

  if( $ret == 0 )
  {
    $err = rrd_error();
    echo "Create error: $err\n";
```

```php
    }
?>
```

After running you will have a file called net.rrd in the current directory. This is your RRD and will contain all the samples for your graphs.

For more information on the options to rrd_create see: rrdcreate

Updating a RRD

The next step is to update your RRD on the frequency you set when you created it. In the case above the frequency was set to 5 minutes (300 seconds). The following script generates random input and output values as input to the update function, sleeps for 300 seconds and then loops.

```php
<?php

  $fname = "net.rrd";

  $total_input_traffic = 0;
  $total_output_traffic = 0;

  while(true)
  {
    $total_input_traffic += rand(10000, 15000);
    $total_output_traffic += rand(10000, 30000);

    echo time() . ": " . $total_input_traffic . " and
" . $total_output_traffic . "\n";

    $ret = rrd_update($fname,
"N:$total_input_traffic:$total_output_traffic");

    if( $ret == 0 )
    {
      $err = rrd_error();
      echo "ERROR occurred: $err\n";
    }
```

```
    sleep(300);
  }
?>
```

Your input and output values could be pulled from anywhere here, I just wanted to have a source that would work for anyone who wanted to try the script.

After letting this script run for a few hours you can run the following shell script to see what type of data you have collected so far:

For more information on the options to rrd_update here: rrdupdate

```
#!/bin/sh
END=`date +%s`
START=`echo $END-3600|bc` # over the hour
rrdtool fetch net.rrd AVERAGE -start $START -end $END
```

That should display the average sample values for the last hour.

Displaying RRD data as a graph

Now that you have data in your RRD you will want to graph it. The following code will graph the average input and output for 1 day as well as the max for that day.

```php
<?php

  $opts = array( "-start", "-1d", "-vertical-label=B/s",
                 "DEF:inoctets=net.rrd:input:AVERAGE",
                 "DEF:outoctets=net.rrd:output:AVERAGE",
                 "AREA:inoctets#00FF00:In traffic",
                 "LINE1:outoctets#0000FF:Out
traffic\\r",
                 "CDEF:inbits=inoctets,8,*",
                 "CDEF:outbits=outoctets,8,*",
                 "COMMENT:\\n",
                 "GPRINT:inbits:AVERAGE:Avg In traffic\:
%6.2lf %Sbps",
                 "COMMENT:   ",
                 "GPRINT:inbits:MAX:Max In traffic\: %
6.2lf %Sbps\\r",
```

```
                    "GPRINT:outbits:AVERAGE:Avg Out
traffic\: %6.2lf %Sbps",
                    "COMMENT: ",
                    "GPRINT:outbits:MAX:Max Out traffic\: %
6.2lf %Sbps\\r"
                );

  $ret = rrd_graph("net_1d.gif", $opts, count($opts));

  if( !is_array($ret) )
  {
    $err = rrd_error();
    echo "rrd_graph() ERROR: $err\n";
  }
?>
```
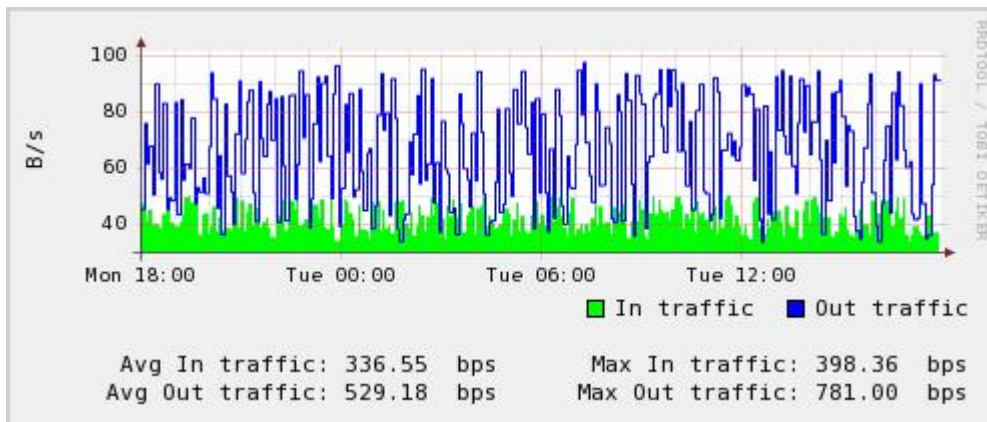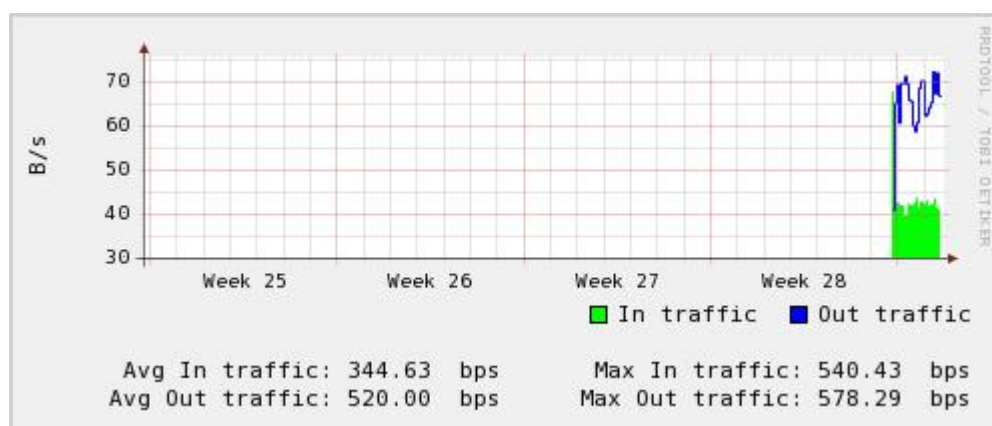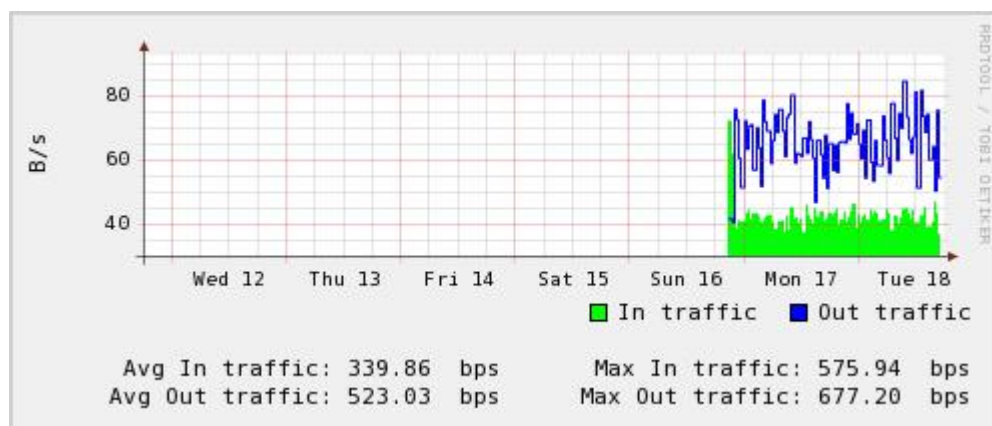
You should end up with a file named net_1d.gif in your working directory that looks something like:

You can also do weekly and monthly graphs by changing the start parameter to -1w or -1m:

For the impatient you can download my net.rrd file and try the graphs for yourself.

See the other tutorials for more information on the options you have for graphing.

For more information on the options to rrd_graph see: rrdgraph

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15 Comments

passerby
Posted December 9, 2006 at 4:50 pm | *Permalink*

Seems nice, makes the graph and all but doesnt update any info? Graph available for download also didnt not show any info, with script to check provided.

— copy as . due to some funky stuff on this site.

passerby
Posted December 9, 2006 at 5:06 pm | *Permalink*

Just to update before the prev post gets approved it seems to work, it was just reading a weird cache copy, changed a few names and all is good.

Please make a note on the — (double dashes) copying over as . (periods), was a little weird.

Mathews
Posted January 30, 2007 at 1:02 am | *Permalink*

I did every configuration as mensioned in http://www.ioncannon.net/system-administration/25/how-to-build-the-php-rrdtool-extension-by-hand/.

But I dont get 'rrdtool' in
phpinfo(INFO_MODULES);

I get the Configure Command as './configure' '—with-apxs2=/usr/local/apache/apache2/bin/apxs' '—with-mysql' '—with-rrdtool' when try phpinfo() alone.

Could you help me?

Sébastien Cramatte
Posted March 14, 2007 at 11:50 am | *Permalink*

nyone know how can I made a raw output directly in PHP without generate the image file on the disk ?

I've tried to put '-' as filename and effectively no file is generated ... but I don't know how can I get the output ...

this code doesn't work because rrd_graph return an array but no raw datas ...

header('Content-type: image/png');
...
echo rrd_graph("-", $opts, count($opts);

Sam
Posted June 8, 2007 at 12:12 pm | *Permalink*

There's an rrd_fetch function included with the library as well, but I cannot for the life of me get it to work. This should work:

rrd_fetch("basic.rrd",array("MAX"),1);

But it just spits back null. If I add any arguments (like a start time), I get a seg fault. e.g.

rrd_fetch("basic.rrd",array("MAX","-s","now-1hr"),3);

Anyone got any insights in to this?

---

kulaba james
Posted July 3, 2007 at 3:07 am | *Permalink*

thanks for that work. but how do I use RRDtool to monitor the hard disk usage.\

thanks

Fritz
Posted April 30, 2008 at 5:23 pm | *Permalink*

The rrdtool extension works great with the apache php module through a web browser. But if I try to use any of the rrd functions from the php-cli command line php, I get a segmentation fault.

Any ideas/advice?

Novae
Posted June 1, 2008 at 7:34 am | *Permalink*

Is there any way to force it to make png's instead of gifs. I'd like to use some custom fonts but ttf support is only available in png's.

cheers, Novae.

Fritz

Posted December 10, 2008 at 6:48 pm | *Permalink*

I have noticed another problem with rrd_graph. When operating on the same datafile, with the same exact parameters, I refresh the page 4 times and get 4 slightly different graphs.

If I refresh 12 times, I get the same 4 graphs in the same sequence over and over 3 times.

If I keep refreshing the browser, It continues to cycle through the same 4 graphs... same parameters... same rrd file.

Any idea what's going on? I've been trying to figure it out all day.

Florian

Posted March 4, 2009 at 12:29 pm | *Permalink*

Excellent tutorial ! If you are providing random values to your rrd database using scripts or whatever, also make sure that when you call rrd_graph you pass the –start and –end arguments correctly. I spent some hours understanding why nothing was graphed while the RRD was correct. Hope that helps.

Marcin

Posted June 16, 2009 at 3:19 am | *Permalink*

Well it is very good indeed but could you also add how to put on the Graph total sum up of incoming/outgoing traffic? It would be very helpful as many people ask about this. Thank you.

carson

Posted June 22, 2009 at 9:18 am | *Permalink*

@Marcin

You would want to use the rrd_fetch call to do that. Something like this:

$opts = array("AVERAGE", "–start", "-1d");
$ret = rrd_fetch("net.rrd", $opts, count($opts));

Then iterate over the returned values and sum them up in code. After that you can just print the value along with all the other values in the rrd_graph call.

Peter
Posted August 13, 2009 at 7:01 pm | *Permalink*

Hi,

thx for excellent tutorial.

I have question:

Is it possible to make network graph (based on netacct-mysql) with 5min average?

Thx

Luigi Rosa
Posted February 7, 2010 at 2:07 am | *Permalink*

Under CentOS/64 the rrd_create() function returned "can't parse argument '\x96step'" error.

I solved it calling the function in this way:

> $opts = array(chr(45).chr(45)."step", "900", chr(45).chr(45)."start", 0,

and so on.

Joe Linux
Posted February 19, 2010 at 3:36 am | *Permalink*

Hi,

The extension build fine, but when i tried this example i got the following error :

> Create error: can't parse argument 'net.rrd'

If anyone has an idea... seems there's something weird in the API... Something related to my versions ? RRDtool 1.3.1 and PHP 5.2.5, and i'm on a 64-bits (AMD) plateform.

Thanks for any help,
regards,

2 Trackbacks

1. By [Akismet spam graphs with PHP RRD @ IONCANNON](#) on January 1, 2007 at 12:37 pm
2. By [Installing RRDTool for PHP on Ubuntu Server](#) on November 11, 2009 at 2:34 am

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