Network and Server Statistics using Cacti

PacNOG5

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Introduction

- A tool to monitor, store and present network and system/server statistics
- Designed around RRDTool with a special emphasis on the graphical interface
- Almost all of Cacti's functionality can be configured via the Web.

Introduction Cont.

Cacti: Uses RRDtool, PHP and stores data in MySQL. It supports the use of SNMP and graphics with MRTG.

"Cacti is a complete frontend to RRDTool, it stores all of the necessary information to create graphs and populate them with data in a MySQL database. The frontend is completely PHP driven. Along with being able to maintain Graphs, Data Sources, and Round Robin Archives in a database, cacti handles the data gathering. There is also SNMP support for those used to creating traffic graphs with MRTG."

Advantages

Graphics

- Allows the use of all the functions of rrdgraph to define graphics and to automate some of them
- Allows you to organize information in hierarchical trees.

Date sources

 Allows you to use all the rrdcreate and rrdupdate functions, including defining multiple data sources for RRD files

Data collection

- Data sources can be updated via SNMP or by defining scripts
- SNMP support included using php-snmp or net-snmp
- An optional component, cactid, implements SNMP routines in C with multi-threading for increased efficiency. This can be critical if you have lots of devices.

Templates

You can create templates to reuse graphics definitions, data sources and devices.

User management

 You can manage authentication (locally or via LDAP) having distinct levels of authorization for users (if you so wish).

Installation: Ubuntu Server 8.1

- Available in RPMs and packages for Gentoo,
 Debian, etc.
- It's necessary to install cactid separately if you wish to use it for faster SNMP calls.

apt-get install cacti

Configuring mysql-server-5.0 While not mandatory, it is highly recommended that you set a password for the MySQL administrative "root" user.		
If that field is left blank, the password will not be changed.		
New password for the MySQL "root" user:		

<0k>		

Use our class password

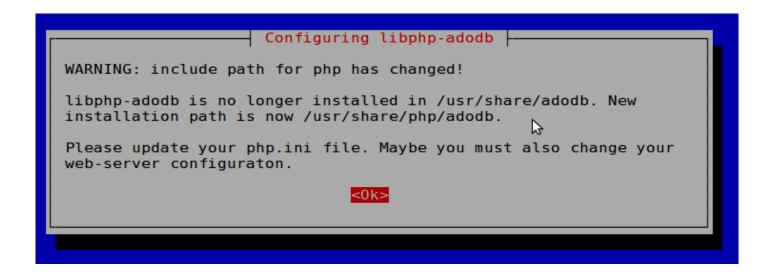
```
Configuring mysql-server-5.0

Repeat password for the MySQL "root" user:

*******

<0k>
```

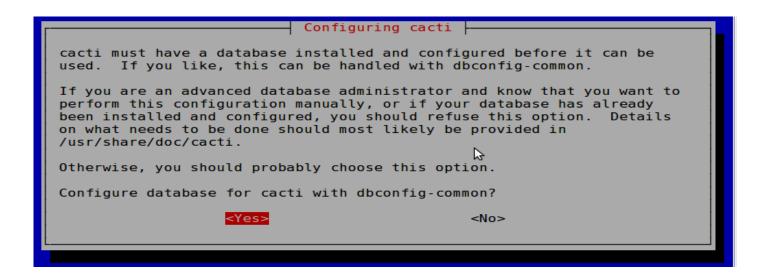
Use our class password, again



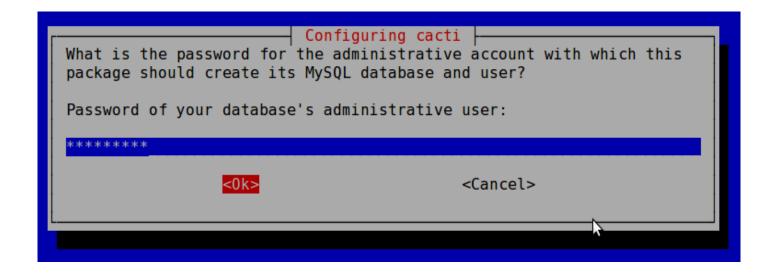
For your information. Generally not a problem.



We are using Apache2, be sure to choose this.



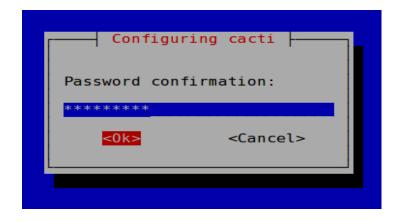
Choose "Yes". If you choose "No", then you will need to do database configuration by hand at a later time.



Use our class password. Same as earlier.



Enter the class password, again.



Enter the class password, one final time.

Now, use your web browser and open:

http://localhost/cacti

You'll see the following...

Cacti Installation Guide

Thanks for taking the time to download and install cacti, the complete graphing solution for your network. Before you can start making cool graphs, there are a few pieces of data that cacti needs to know.

Make sure you have read and followed the required steps needed to install cacti before continuing. Install information can be found for Unix and Win32-based operating systems.

Also, if this is an upgrade, be sure to reading the Upgrade information file.

Cacti is licensed under the GNU General Public License, you must agree to its provisions before continuing:

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

Next >>

Press "Next >>"



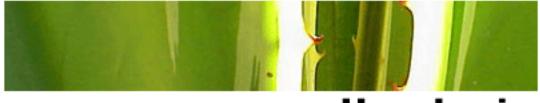
Choose "New Install" and press "Next >>" again.

Cacti Installation Guide Make sure all of these values are correct before continuing. [FOUND] RRDTool Binary Path: The path to the rrdtool binary. /usr/bin/rrdtool [FOUND] PHP Binary Path: The path to your PHP binary file (may require a php recompile to get this file). /usr/bin/php [FOUND] snmpwalk Binary Path: The path to your snmpwalk binary. /usr/bin/snmpwalk [FOUND] snmpget Binary Path: The path to your snmpget binary. /usr/bin/snmpget [FOUND] snmpbulkwalk Binary Path: The path to your snmpbulkwalk binary. /usr/bin/snmpbulkwalk [FOUND] snmpgetnext Binary Path: The path to your snmpgetnext binary. /usr/bin/snmpgetnext [FOUND] Cacti Log File Path: The path to your Cacti log file. /usr/share/cacti/site/log/cacti.log SNMP Utility Version: The type of SNMP you have installed. Required if you are using SNMP v2c or don't have embedded SNMP support in PHP. NET-SNMP 5.x ▼ RRDTool Utility Version: The version of RRDTool that you have installed. RRDTool 1.2.x ▼ NOTE: Once you click "Finish", all of your settings will be saved and your database will be upgraded if this is an upgrade. You can change any of the settings on this screen at a later time by going to "Cacti Settings" from within Cacti. Finish

Should screen should look like this. If not, ask for help from your instructor.

Press "Finish"

cacti: First Login



User Login

Please enter your Cacti user name and password below:

User Name:	
Password:	

Login

Log in the first time using:

User Name: admin Password: admin

cacti: Password Change



*** Forced Password Change ***

Please enter a new password for cacti:

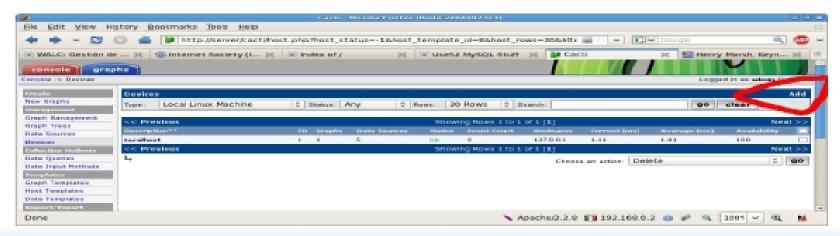
Password:	************
Confirm:	********

Save

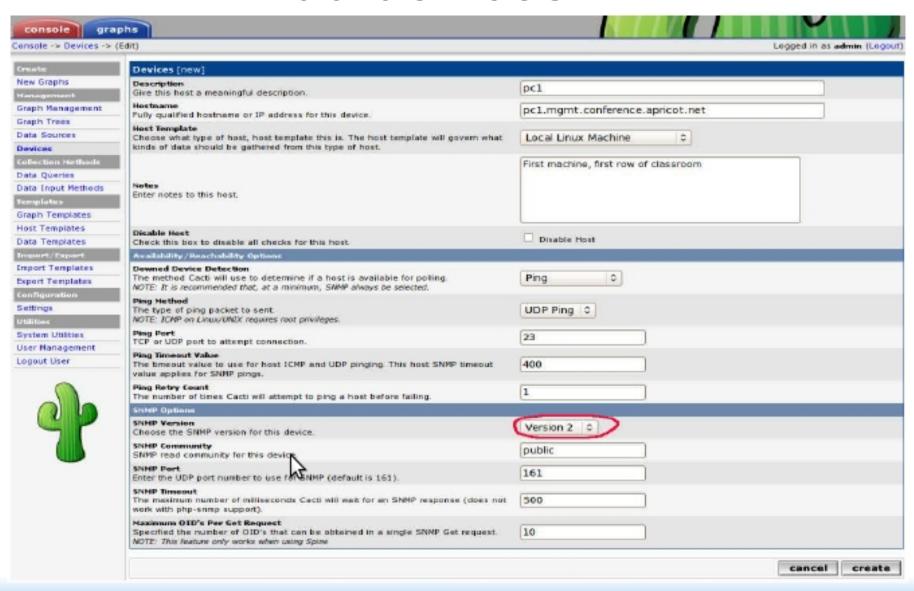
Now you must change the admin password. Please *use the workshop password* when you do this.

Add Devices

- Management -> Devices -> Add
- Specify device attributes
 - Select a device template and this will automatically provide you with several device templates as well as ask for information about the device.
 - You can add additional templates when/if you wish.



Add devices: 2



Add Devices

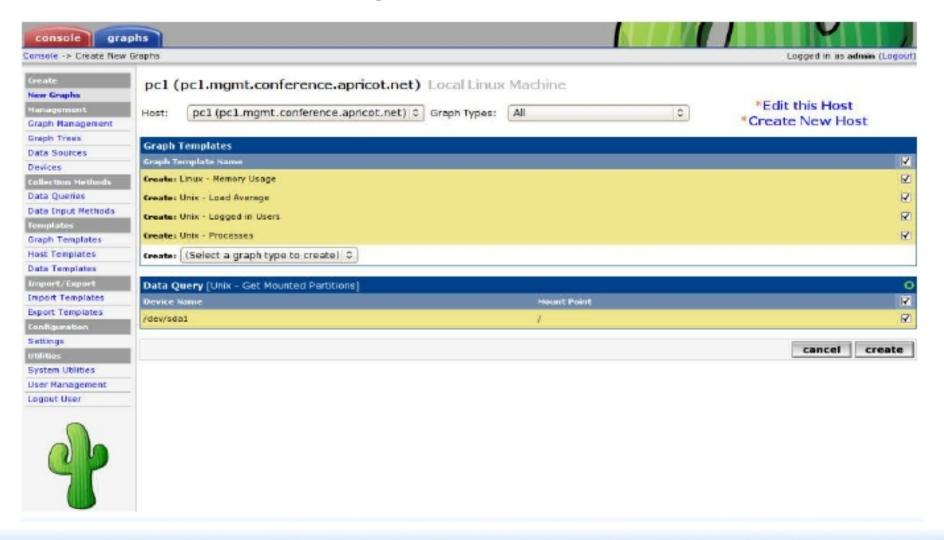
Be sure you choose SNMP Version 2 for class.

You can, of course, use SNMP Version 3 in your own environment.

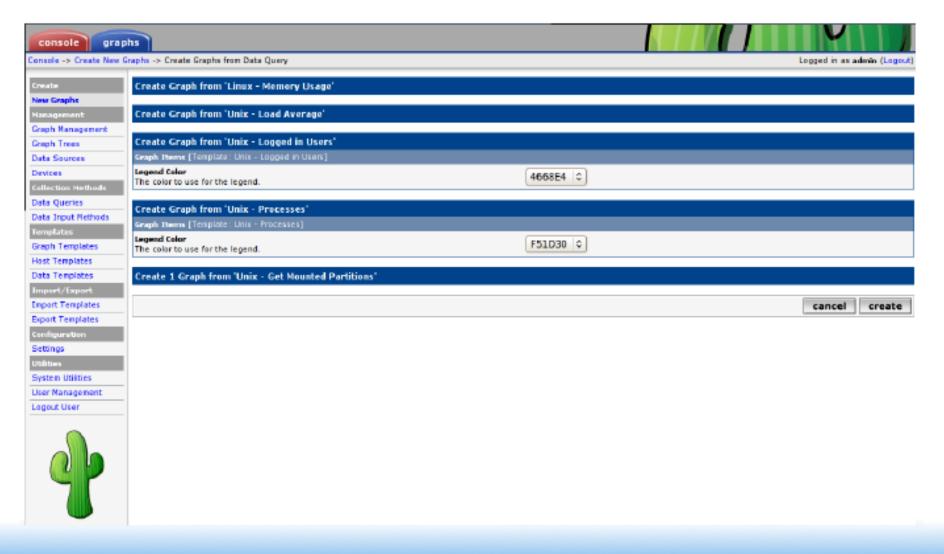
Create graphics

- Go to the "Create graphs for this host" choice.
- Choose the graph templates and date queries you want, then press "Create".
- You can change the default color schemes for the graphs if you wish, but the predefined ones seem pretty reasonable.

Create graphics: Step 1



Create graphics: Step 2



See the Graphics

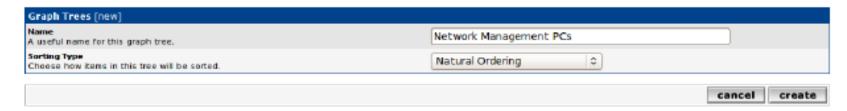
- Place the new device on the tree hierarchy that corresponds to where it belongs.
- This is up to you, but, perhaps, draw this out on a sheet of paper first.
 - In Management -> Graph Trees select the default graph tree (or create your own)

Graph Trees

First, press "Add" if you want a new graphing tree:

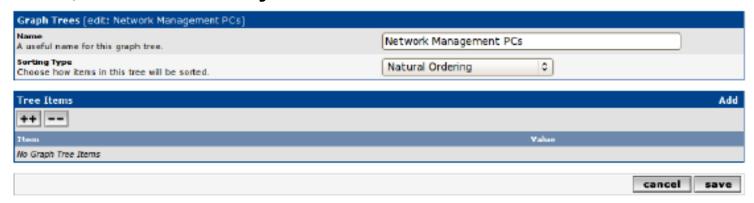


Second, name your tree, choose the sorting order (author likes Natural Sorting and press "create":

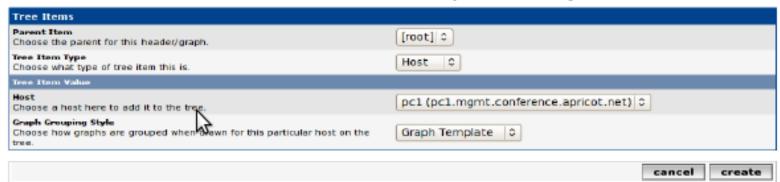


Graph Trees

Third, add devices to your new tree:

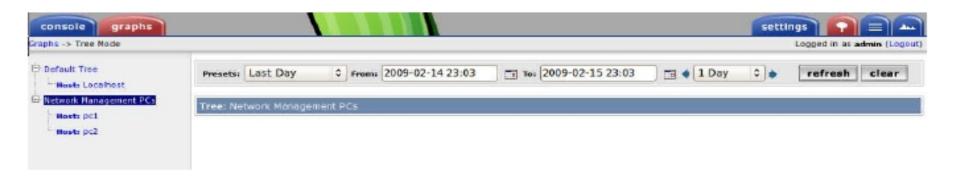


Once you click "Add" you can add "Headers" (separators), graphs or hosts. Now we'll add Hosts to our newly created graph tree:



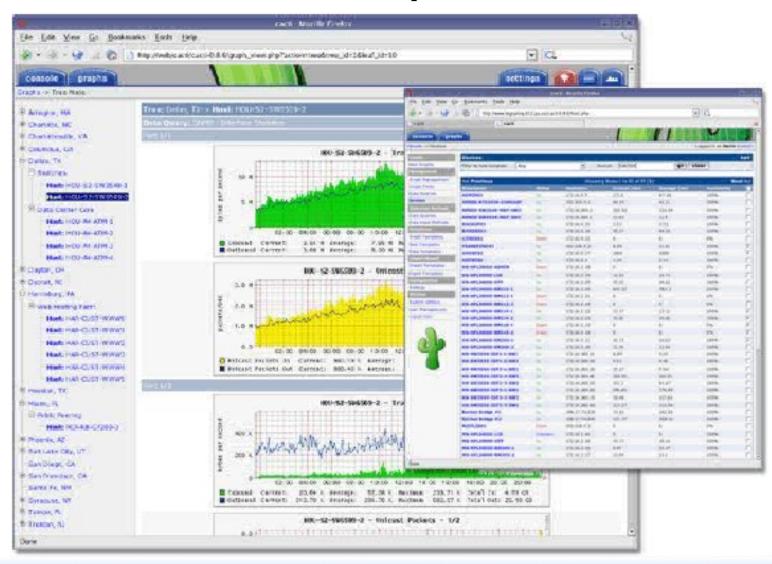
Graph Tree with 2 Devices

Our graph tree after our first two devices have been added. No graphs are displayed yet. This can take up to 5 minutes (remember the Cacti cron job?):



Next a much larger example with graphs being displayed ==>

An Example...



Conclusions

- Cacti is very flexible due to the idea of templates.
- Once you understand the concepts behind RRDTool, then using Cacti should be intuitive.
- The hierarchical visualization of devices helps to organize and find devices very quickly.
- There are no (or very little) available statistics about the performance of cactid (anyone want to collect some?)
- It's not easy to do rediscovery of devices.
- To add lots of devices requires lots of time and effort.
 Tools like Netdot and Netdisco can help or, homegrown MySQL scripts.

References

- Cacti web site: http://www.cacti.net/
- Forums. http://forums.cacti.net/

Configuration

 Cacti uses MySQL to store configurations. In older Ubuntu versions it was necessary to manually create the cacti MySQL database and set the permissions:

```
# mysqladmin --user=root create cacti
# mysql cacti < cacti.sql
# mysql --user=root mysql

mysql> GRANT ALL ON cacti.* TO cactiuser@localhost IDENTIFIED BY 'cacti_pass';
mysql> flush privileges;
```

• It was, also, sometimes necessary to manually specify the cacti connection parameters in /etc/cacti/db.php:

```
$database_type = "mysql";
$database_default = "cacti";
$database_hostname = "localhost";
$database_username = "cactiuser";
$database_password = "cacti_pass";
$database_port = "3306";
```

Configuration

- Make sure that there is a cron job that has been configured as well – Likely in /etc/cron.d/cacti.
- This will be something like:

```
*/5 * * * * www-data php /usr/share/cacti/site/poller.php >/dev/null \ 2>/var/log/cacti/poller-error.log
```

 This is not necessary with the Debian package in Ubuntu 8.10.

cactid

```
# tar xvzf cacti-cactid-0.8.6.tar.gz
# cd cactid-0.8.6
# ./configure
# make
# make install
```

```
# vi /usr/local/cactid/bin/cactid.conf

DB_Host    localhost

DB_Database    cacti

DB_User     cactiuser

DB_Pass     cacti_pass

DB_Port     3306
```

In the web interface:

- Go to Configuration -> Settings -> Paths -> Cactid Poller File Path and specify the location of cactid
- Go to Poller and in Poller Type, select cactid