Network and Server Statistics using Cacti

PacNOG5
17 June 2009

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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

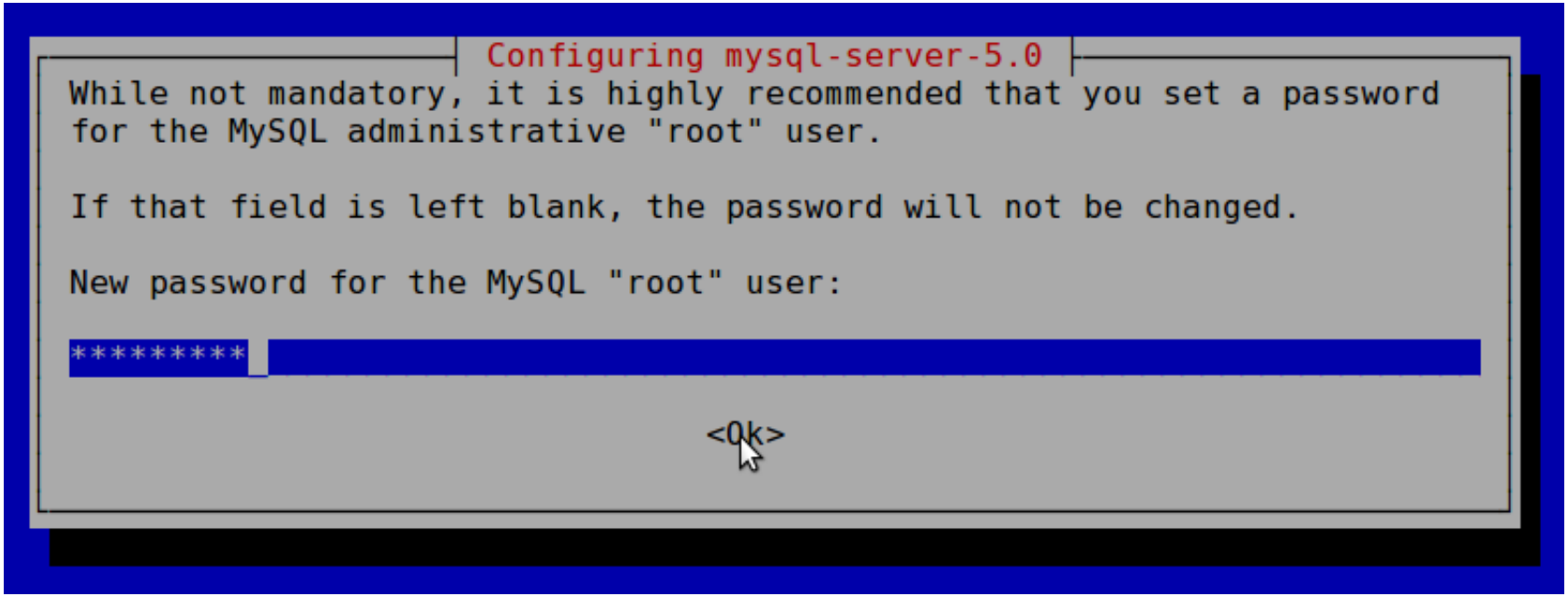
- Graphics
  - Allows the use of all the functions of rrdgraph to define graphics and to automate some of them
  - Allows you to organize information in hierarchical trees.
- Date sources
  - Allows you to use all the rrdcreate and rrdupdate functions, including defining multiple data sources for RRD 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.

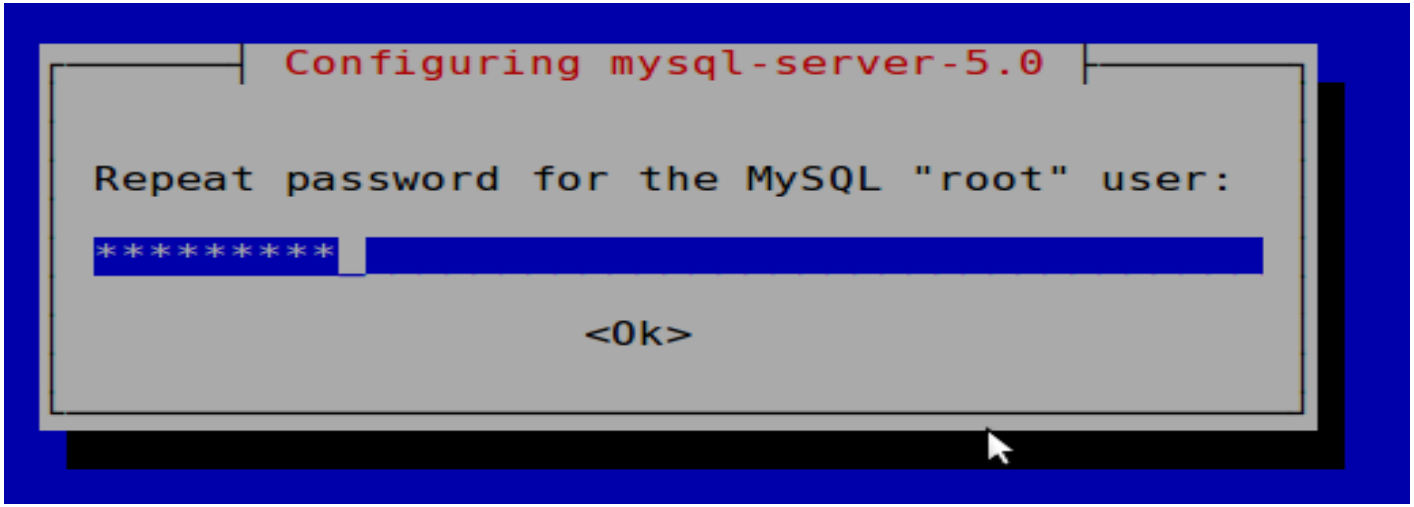
```
# apt-get install cacti
```

Installation:2



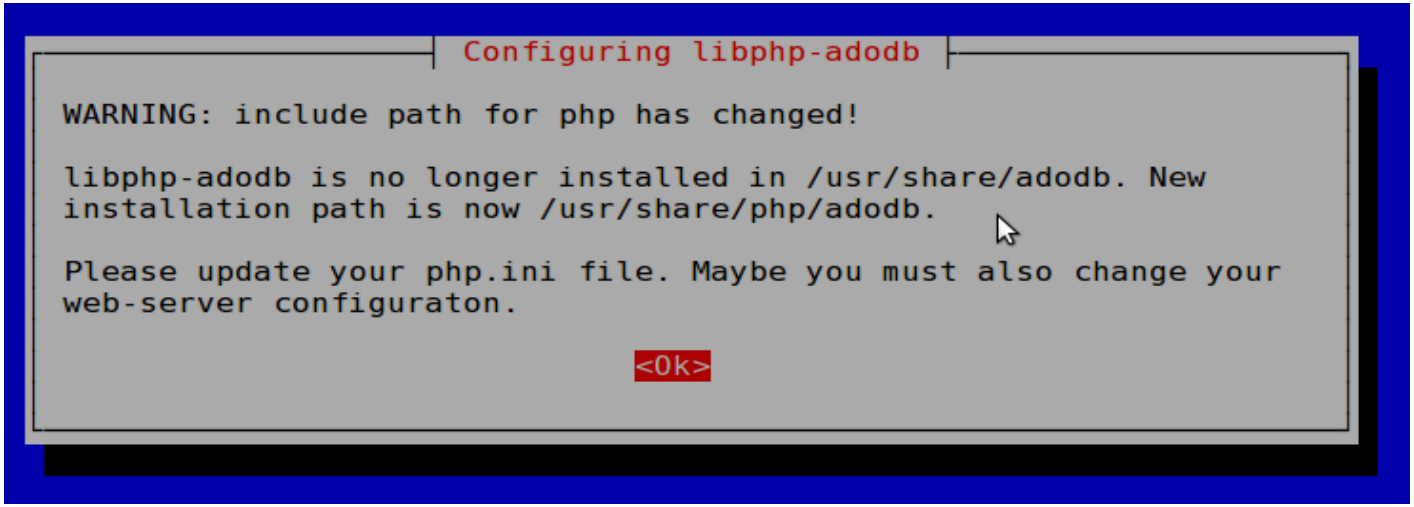
Use our class password

Installation:3



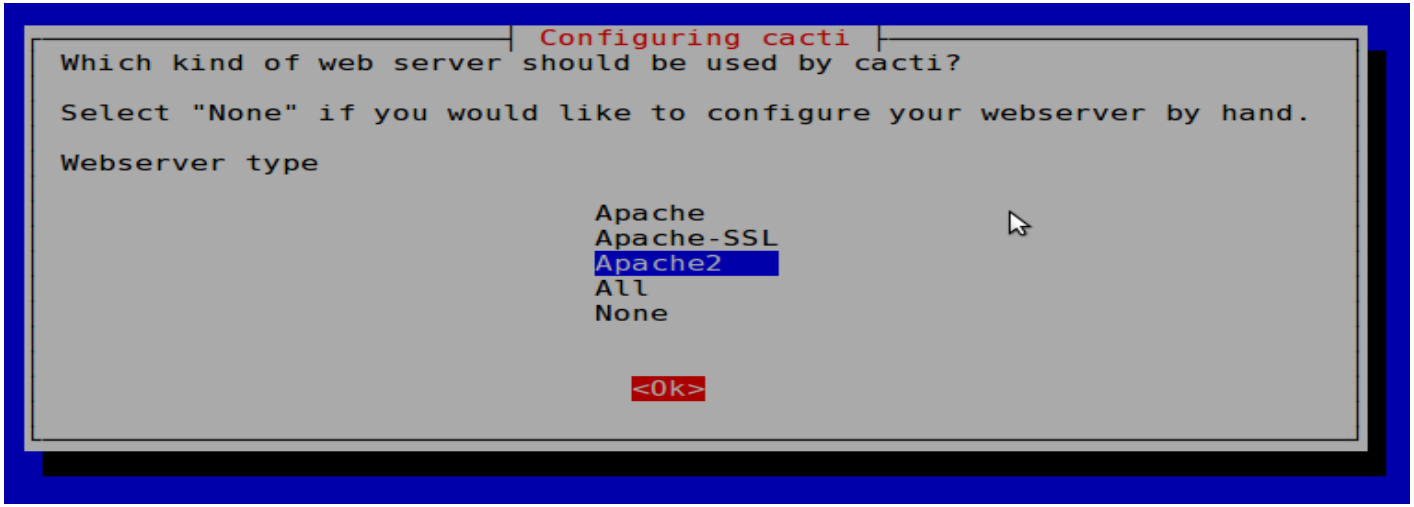
Use our class password, again

Installation:4



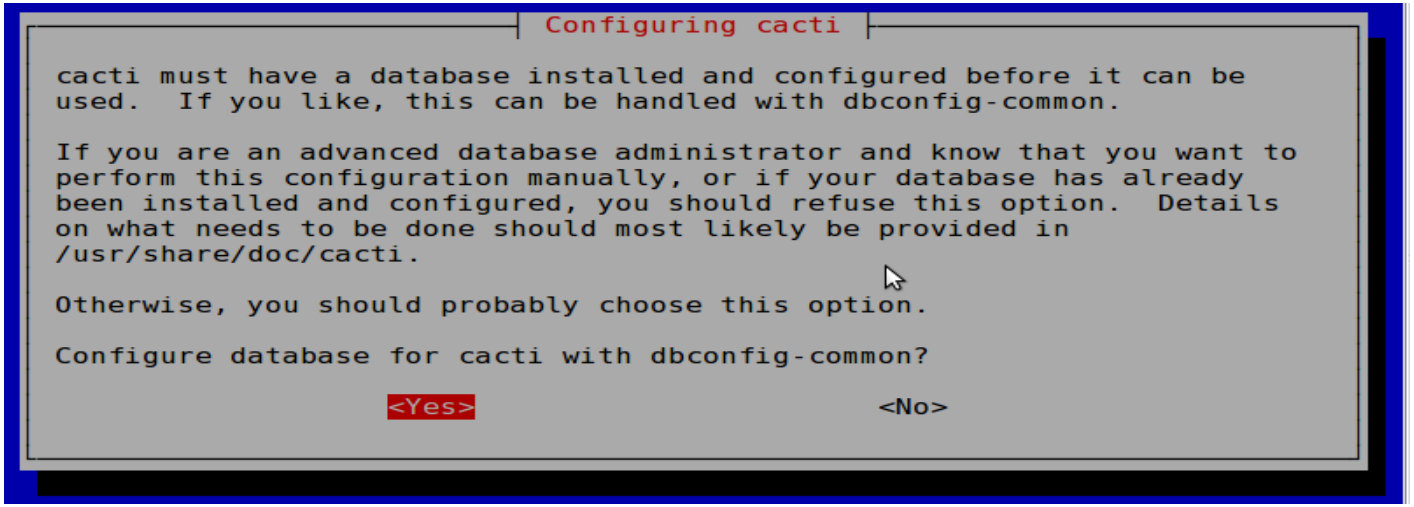
For your information. Generally not a problem.

Installation:5



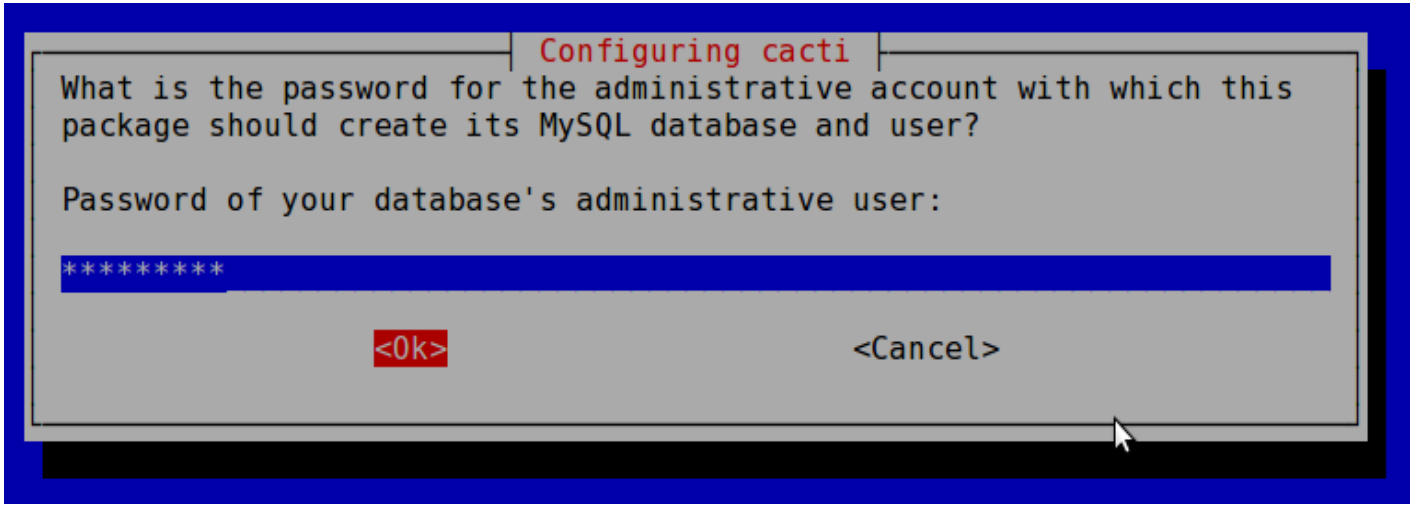
We are using Apache2, be sure to choose this.

Installation:6



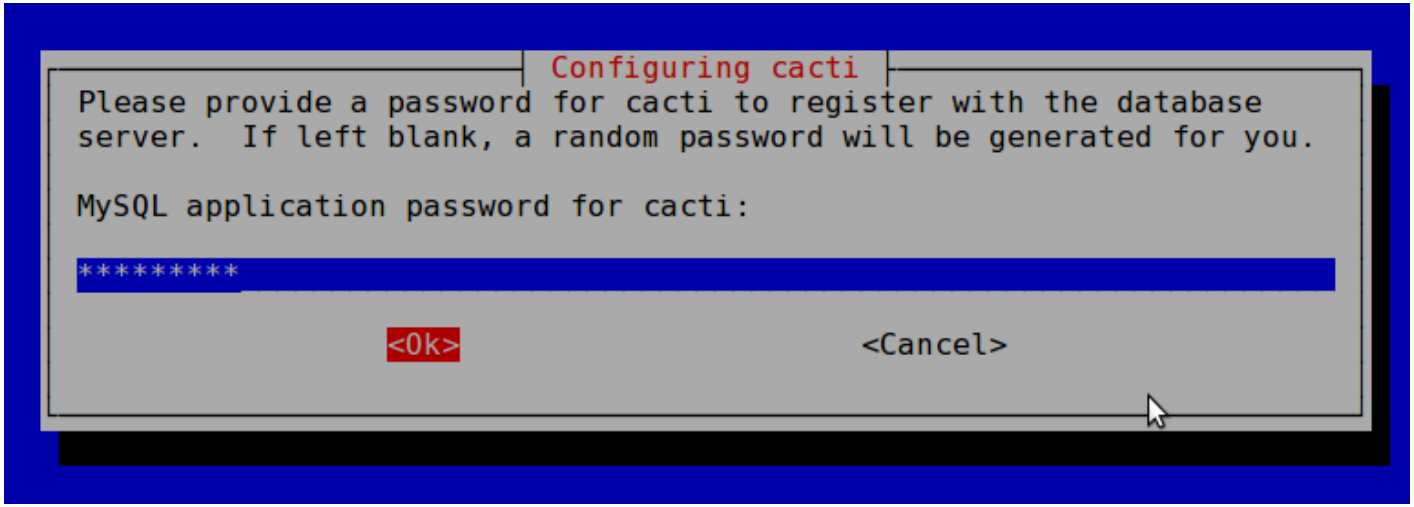
Choose “Yes”. If you choose “No”, then you will need to do database configuration by hand at a later time.

Installation:7



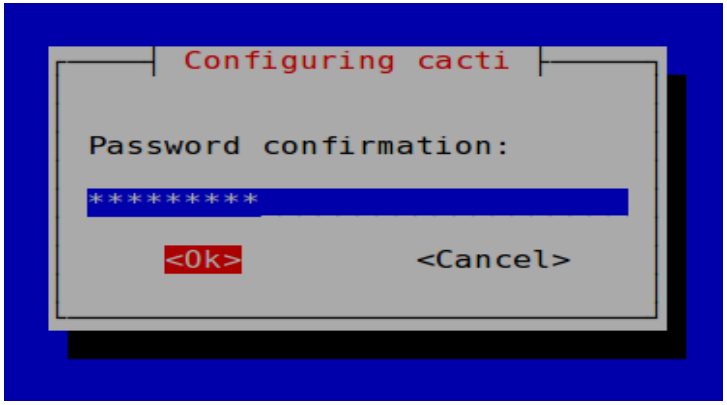
Use our class password. Same as earlier.

Installation:8



Enter the class password, again.

Installation:9



Enter the class password, one final time.

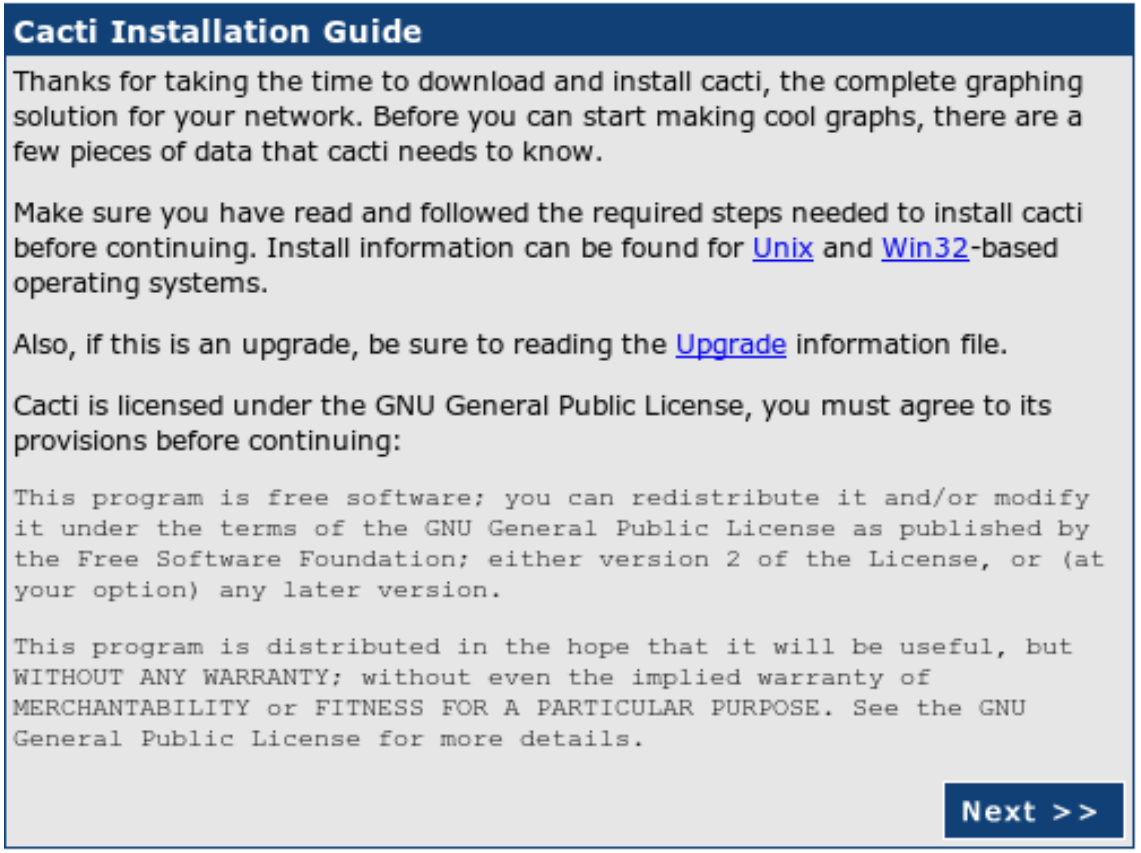
cacti: Installation

Now, use your web browser and open:

```
http://localhost/cacti
```

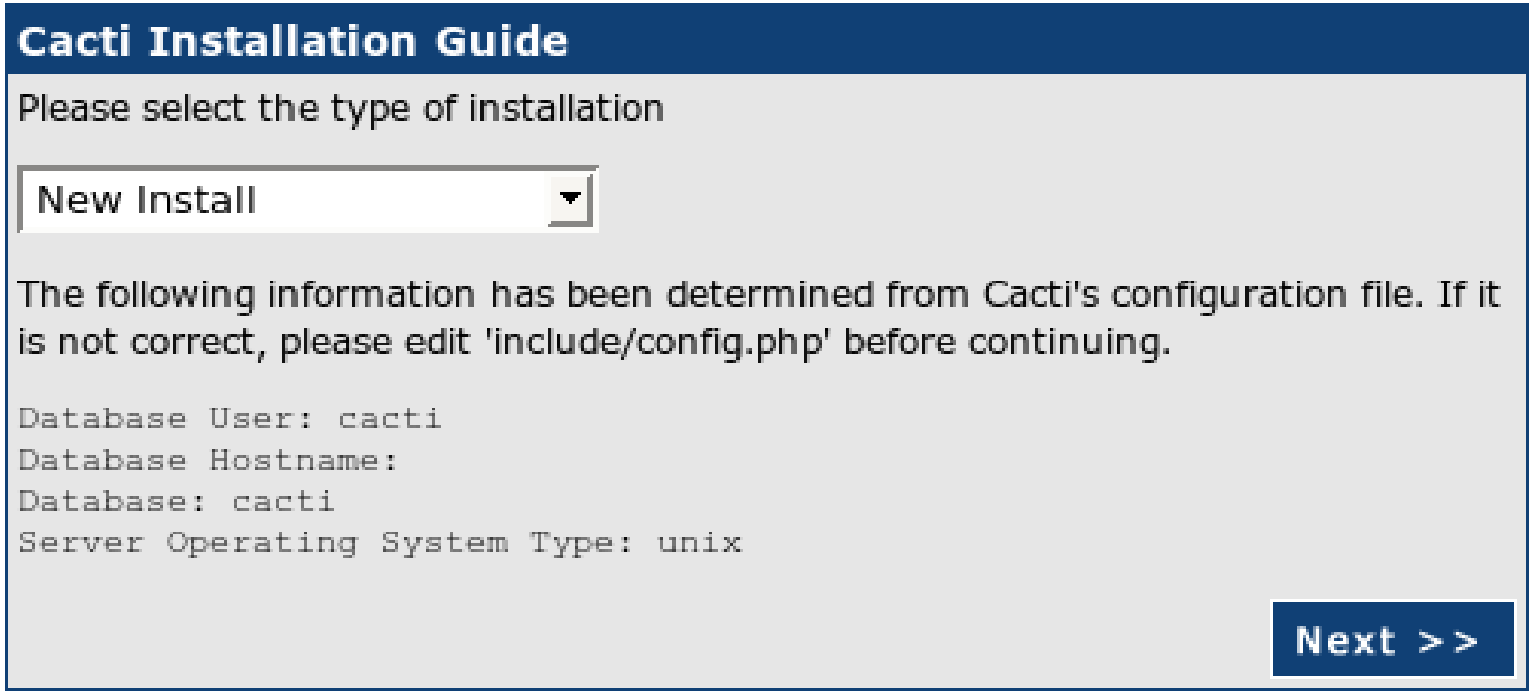
You'll see the following...

cacti: Installation



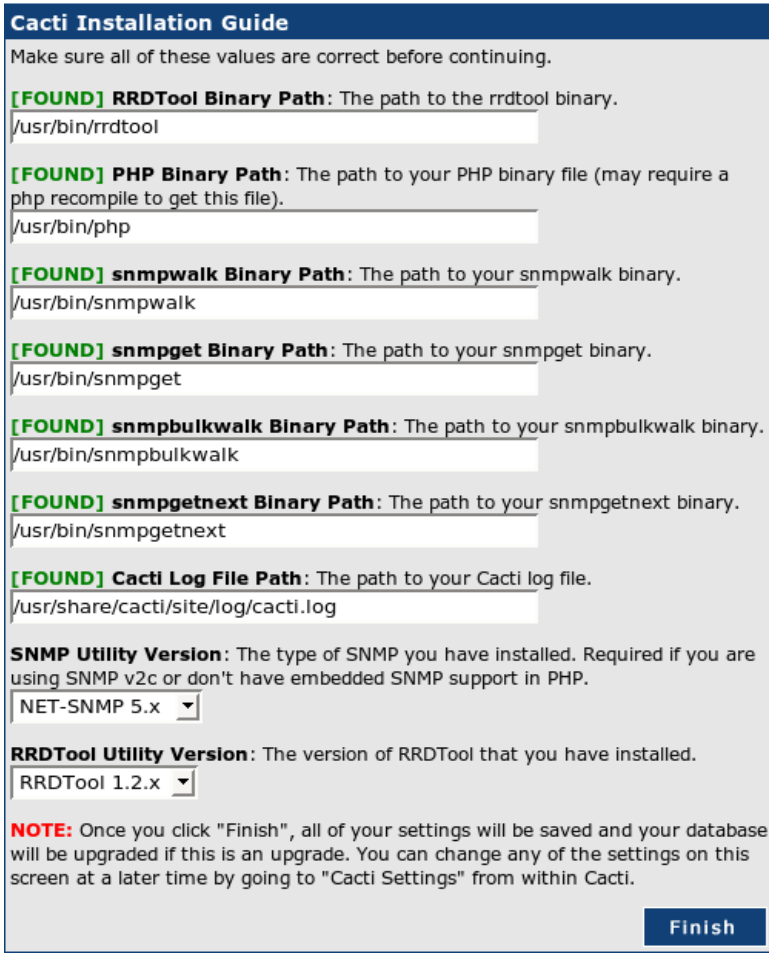
Press “Next >>”

cacti: Installation



Choose “New Install” and press “Next >>” again.

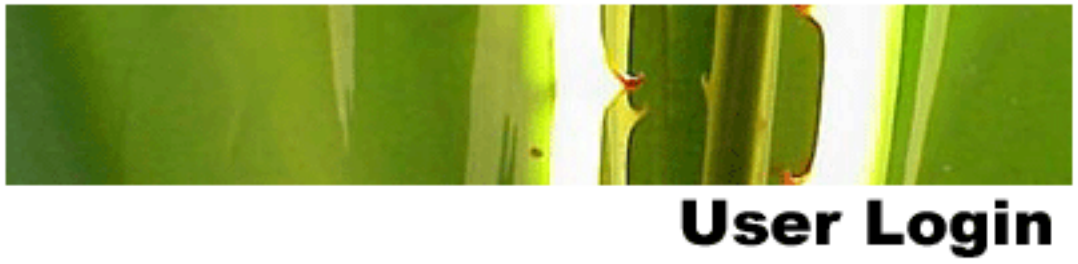
cacti: Installation



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

Press “Finish”

cacti: First Login

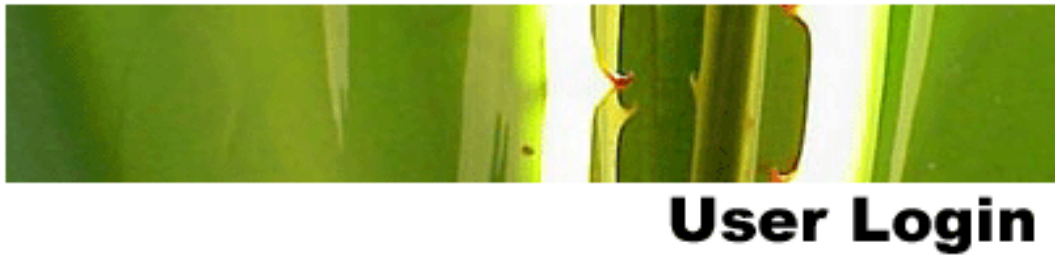


Log in the first time using:

User Name: *admin*

Password: *admin*

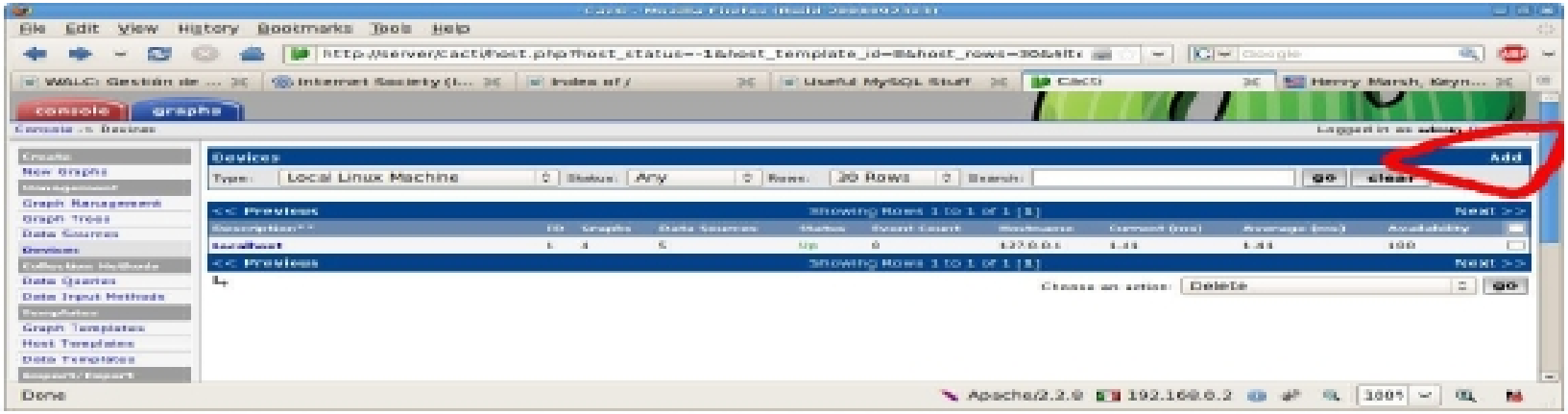
cacti: Password Change



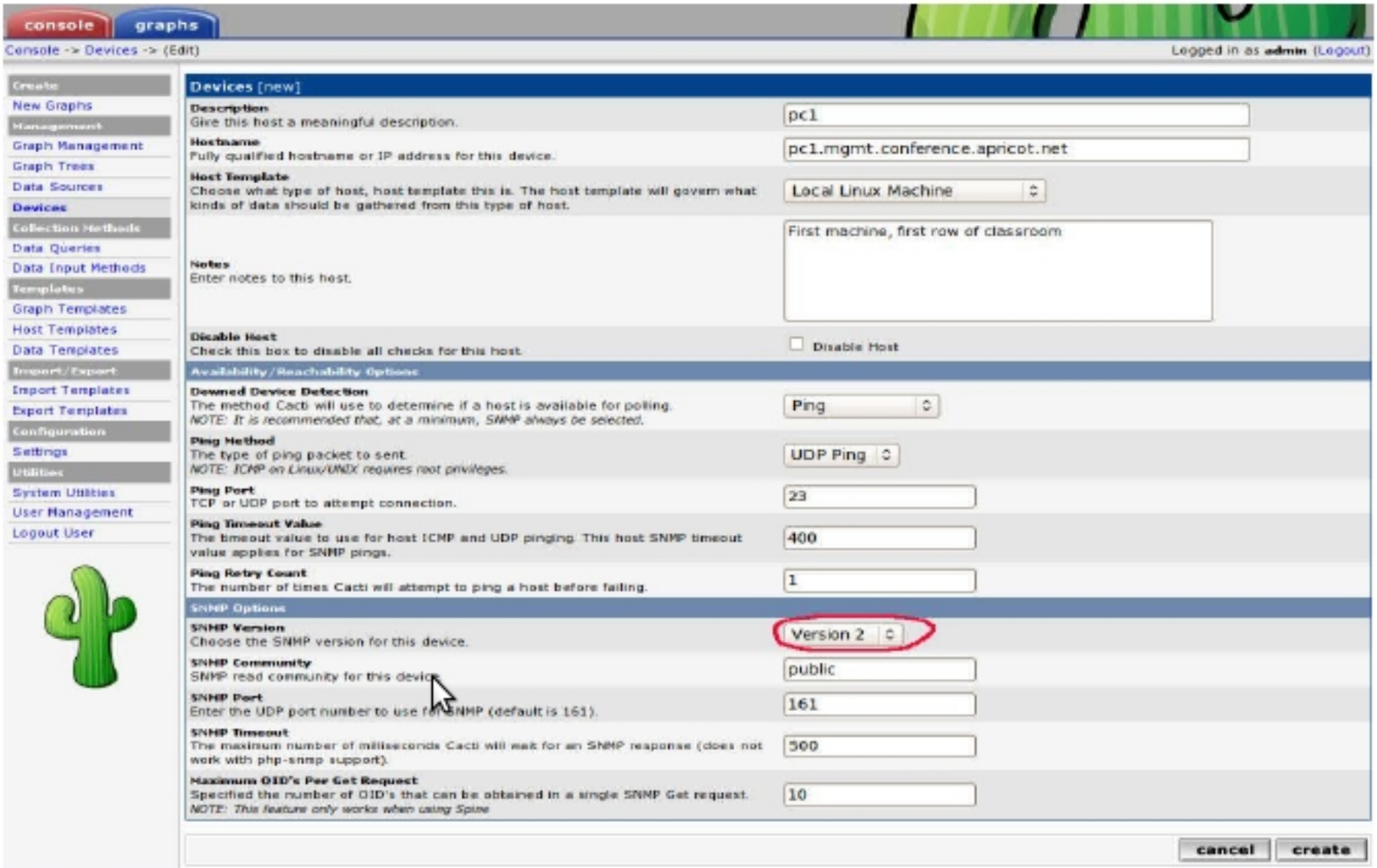
Now you must change the admin password. Please *use the workshop password* when you do this.

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

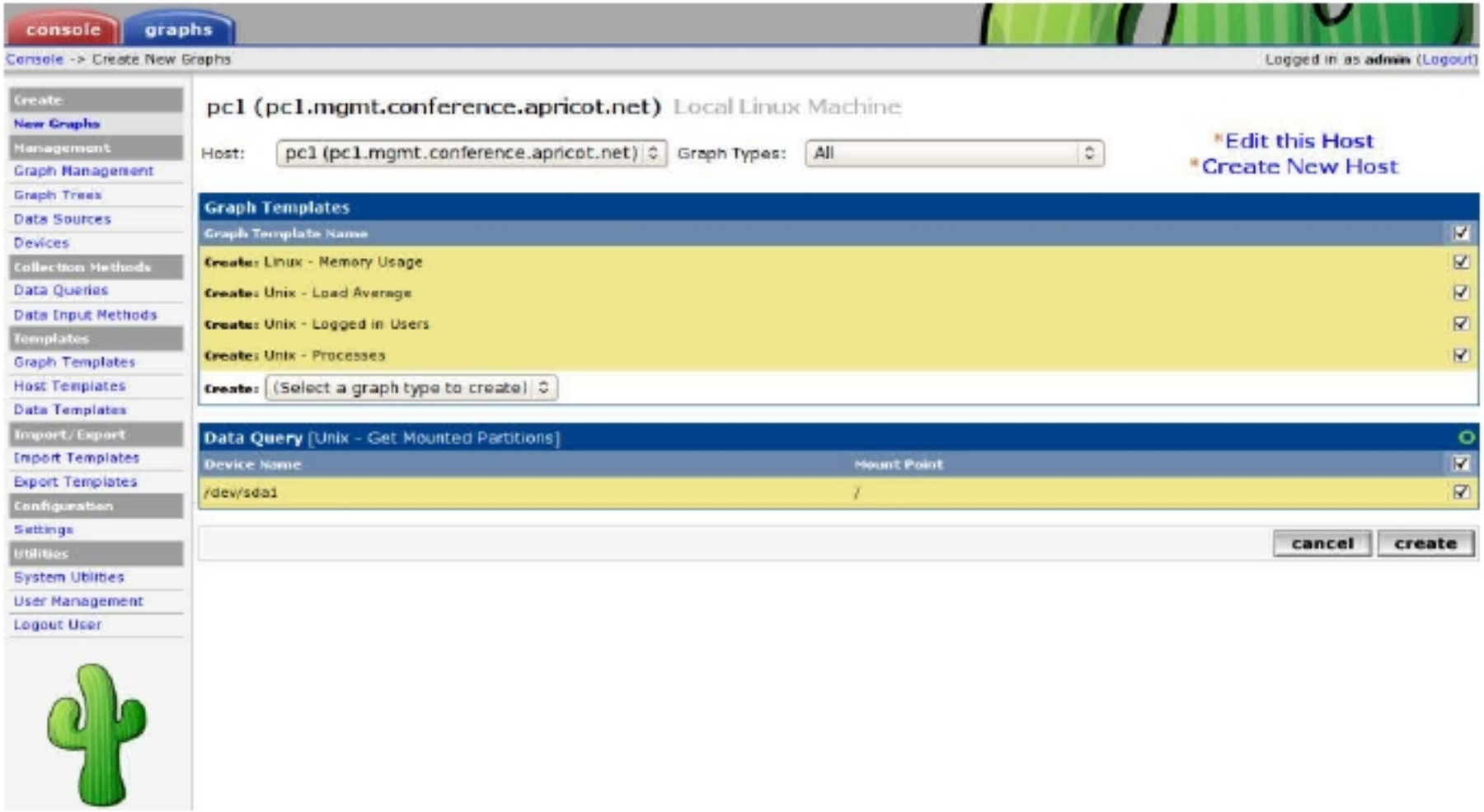
Be sure you choose SNMP Version 2 for class.

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

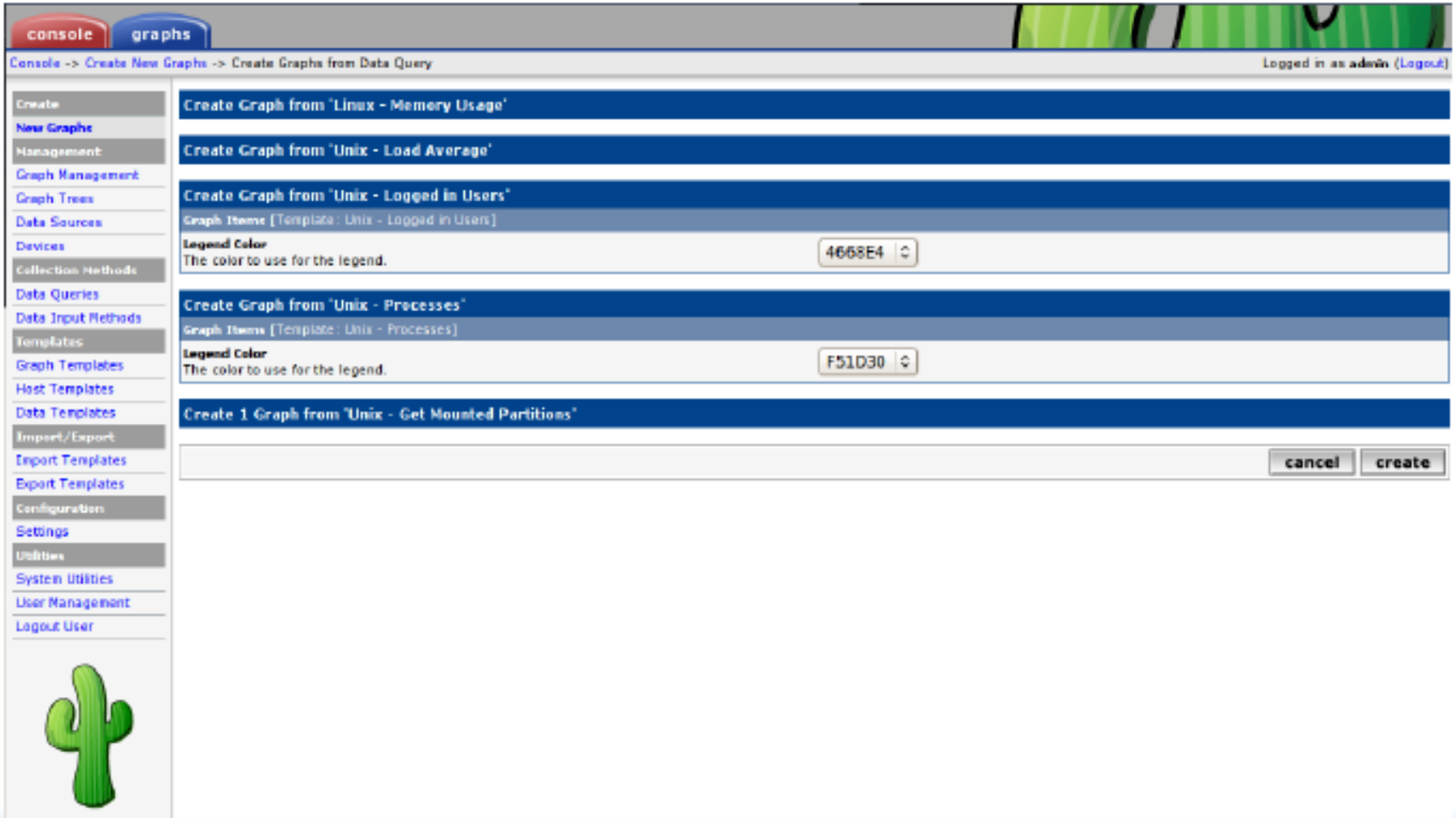
Create graphics

- 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

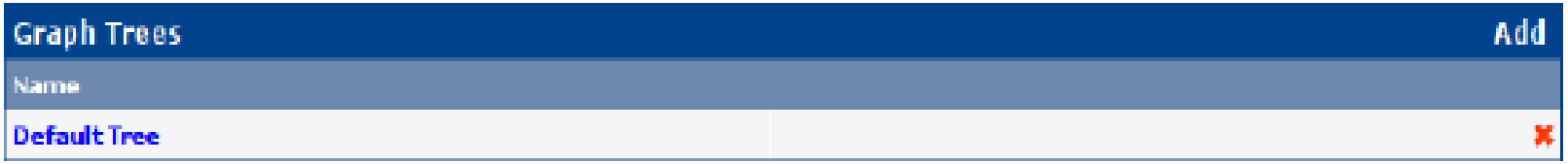


See the Graphics

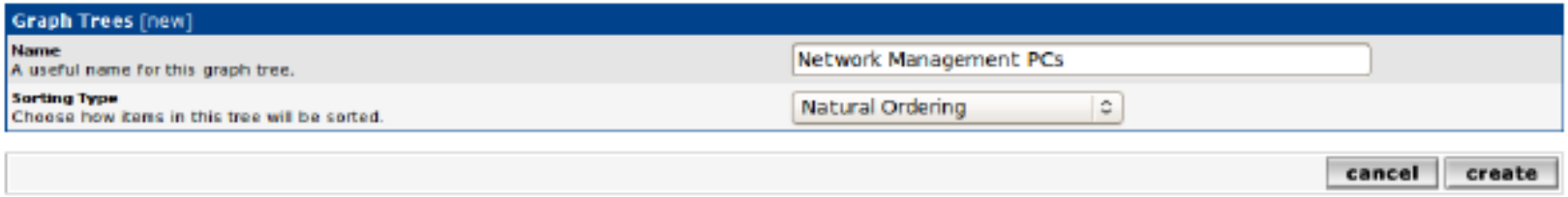
- Place the new device on the tree hierarchy that corresponds to where it belongs.
- This is up to you, but, perhaps, draw this out on a sheet of paper first.
  - In Management -> Graph Trees select the default graph tree (or create your own)

Graph Trees

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

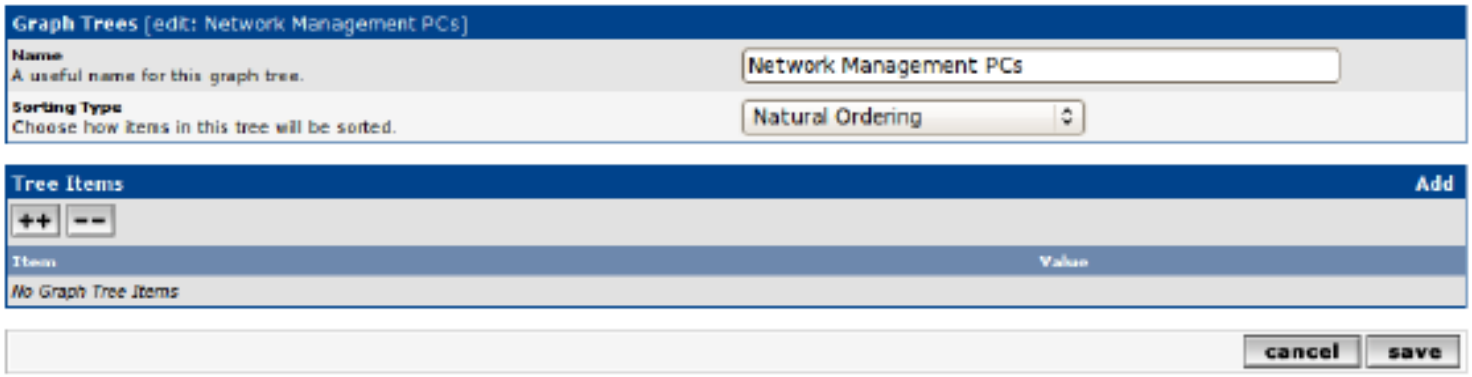


Second, name your tree, choose the sorting order (author likes Natural Sorting and press “create”:

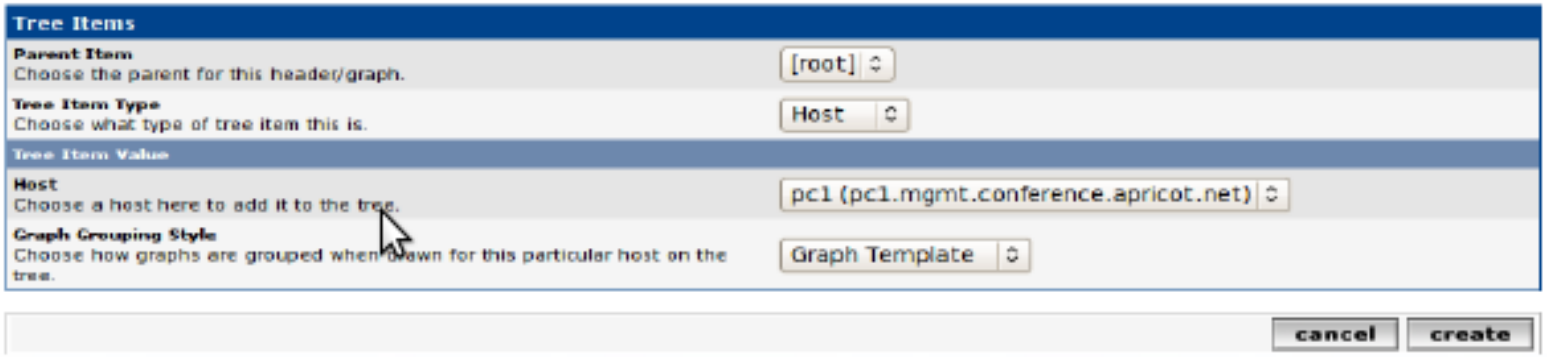


Graph Trees

Third, add devices to your new tree:

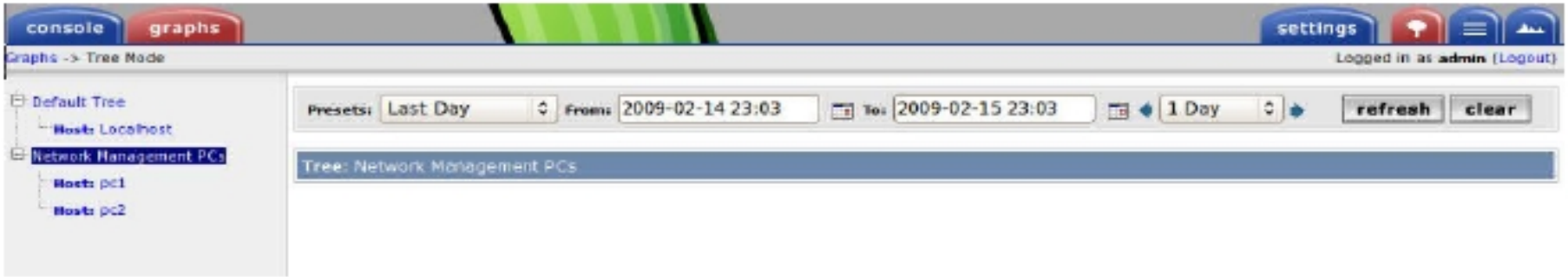


Once you click "Add" you can add "Headers" (separators), graphs or hosts. Now we'll add Hosts to our newly created graph tree:



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, home-grown 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**