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Purpose

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Purpose

1. Monitor Performance:

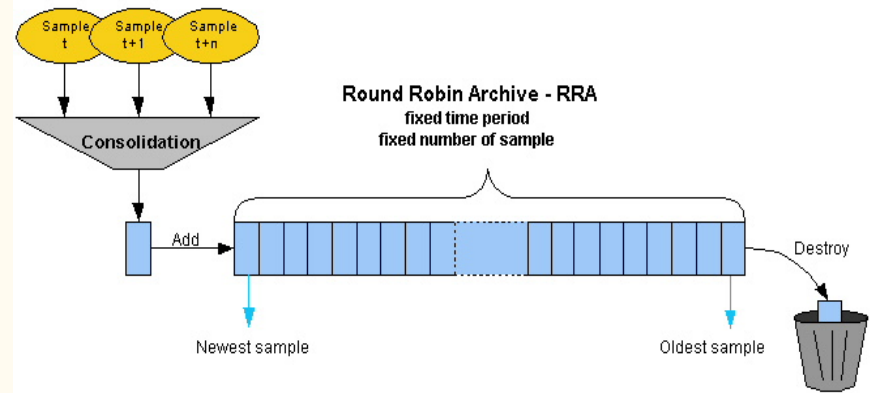
- Keep track of how well our network and systems are working over time.

1. Visualize Data

- Cacti takes the data it collects and turns it into easy-to-understand graphs.

1. Manage Faults

- Cacti helps you identify problems and faults in your network by setting up alerts and using plugins.



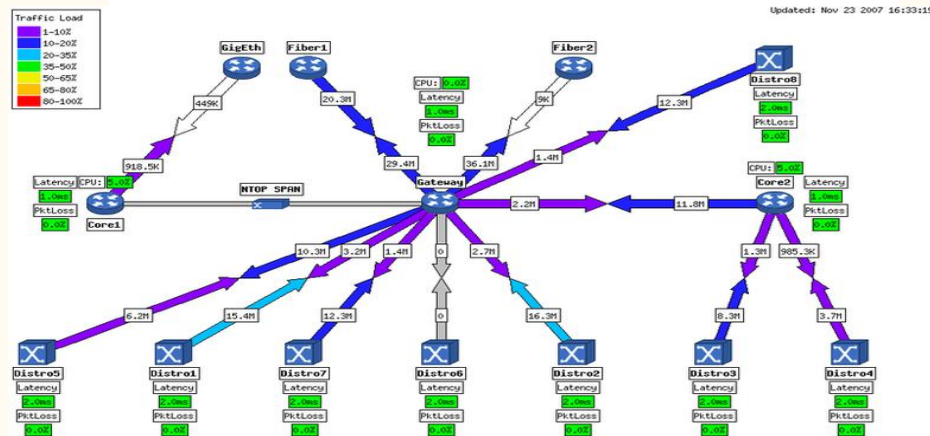
Purpose

1. Automate Configuration

- Simplifies setting up monitoring for your devices using templates and automated discovery. This means you don't have to manually configure each device.

1. Scale Efficiently

- Handles large networks with thousands of devices.
- Cacti uses multiple "collectors" to gather data across our network and report back to a central server.



Download Path

Cacti is available in multiple formats

- **Source Code** : Cacti GitHub Repository
- **Debian/Ubuntu** : apt-get install cacti
- **RedHat/CentOS/Fedora yum** : install cacti or dnf install cacti
SUSE Windows Available via Yast or SUSE media
Dedicated installer from the official Cacti website



Target Platform

Platform	Support Level	Notes
Linux/Unix	Full	RHEL, CentOS, Ubuntu, Debian, etc.
Windows	Full	Native installer available
MacOS	Partial	Requires LAMP stack configuration
BSD	Full	FreeBSD, OpenBSD, NetBSD



Installation Procedure : System Pre-requirements

PHP	Version depends on Cacti release (e.g., PHP 8.1+ for Cacti 1.3.x)
Database	MySQL or MariaDB with InnoDB and UTF8MB4
RRDtool	Check specific version requirements in documentation
Net-SNMP	Required for SNMP-based data collection
Web Server	Apache, Nginx, or IIS with PHP support



Installation: Ubuntu 24.04 LTS

Available in RPM form and packages for Gentoo, Red Hat, Fedora, SuSE, FreeBSD, etc.

It is necessary to install cacti separately if you wish to use this for larger installations. Again, this code has not been formally measured for improved performance. In Ubuntu/Debian...

```
sudo apt-get install cacti
```

```
alok@2022csb091:~$ sudo apt-get install cacti
[sudo] password for alok:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libllvm17t64 liblua5.2-0 libwireshark17t64 libwiretap14t64 libwsutil15t64
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
```



Installation 2

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:

<Ok>

Use the workshop password



Installation 3

Configuring mysql-server-5.0

Repeat password for the MySQL "root" user:

<Ok>

Again, use the workshop password



Installation 4

Configuring cacti

Please select the web server for which Cacti should be automatically configured.

Select "None" if you would like to configure the web server manually.

Web server:

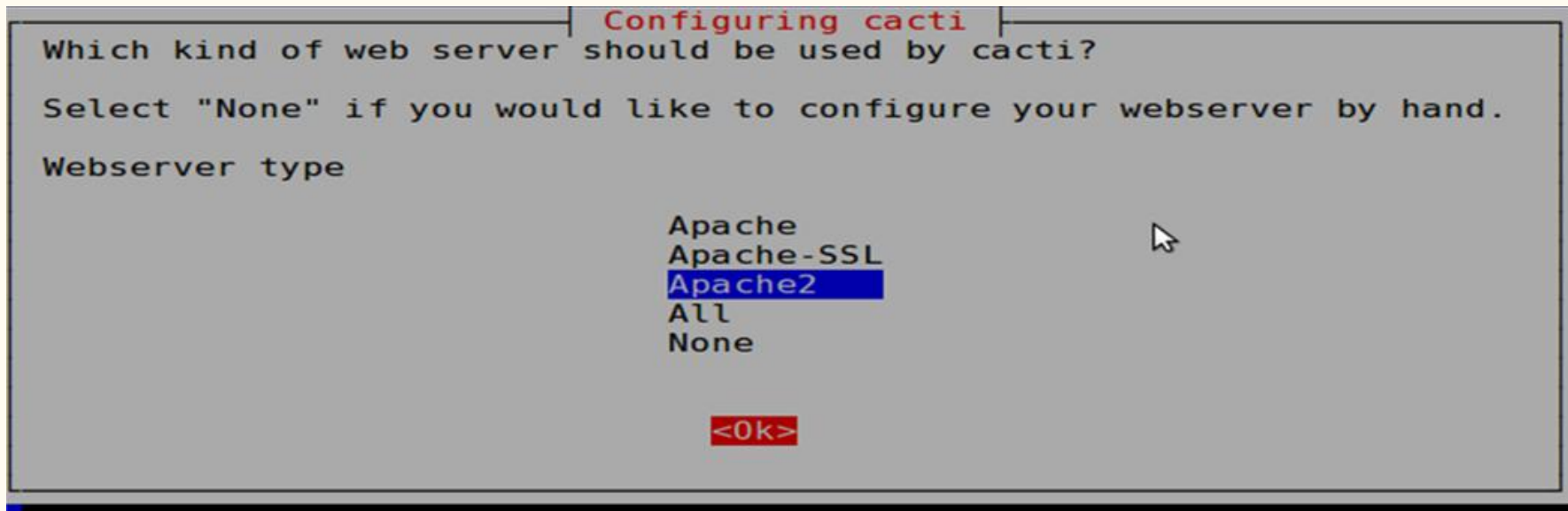
apache2
lighttpd
None

<Ok>

Informational message. Is not normally an issue.



Installation 5



We are using Apache2. Be sure this is chosen, then highlight <Ok> and press <ENTER> to continue.



Installation 6

Configuring cacti

cacti must have a database installed and configured before it can be used. If you like, this can be handled with dbconfig-common.

If you are an advanced database administrator and know that you want to perform this configuration manually, or if your database has already been installed and configured, you should refuse this option. Details on what needs to be done should most likely be provided in /usr/share/doc/cacti.

Otherwise, you should probably choose this option.

Configure database for cacti with dbconfig-common?

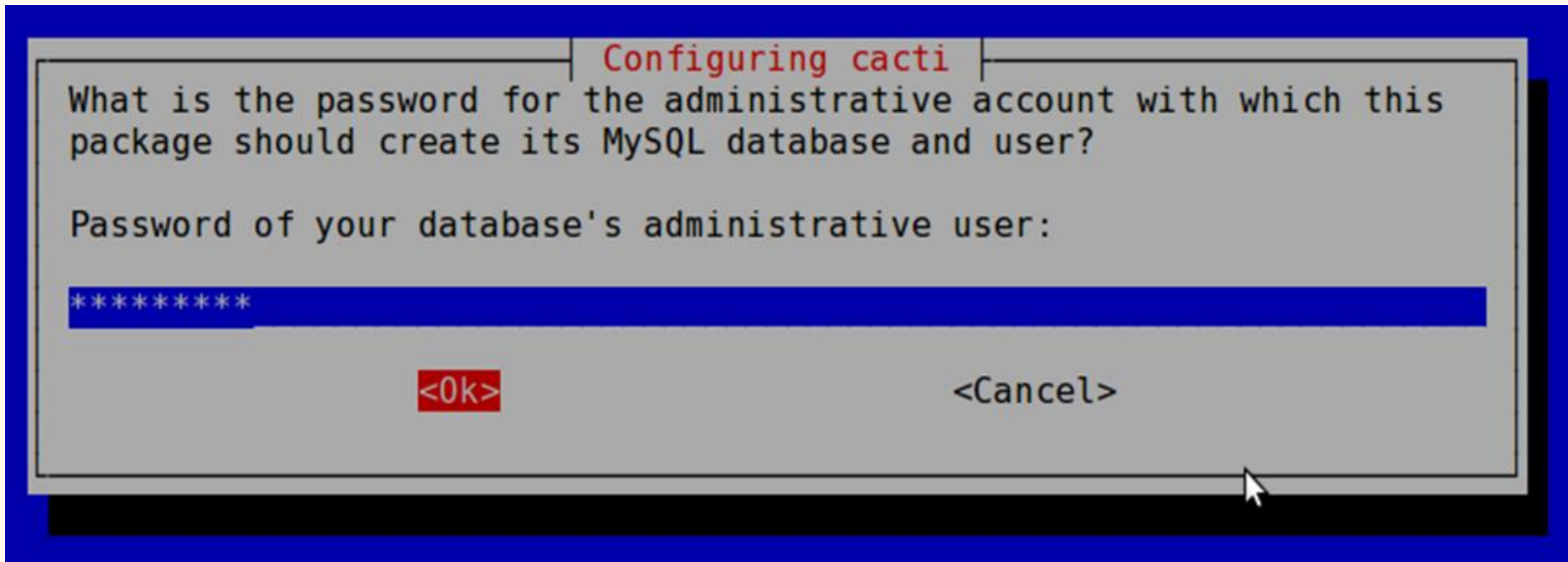
<Yes>

<No>

Choose <Yes>. If you choose <No> you will have to manually configure your database at a later time.



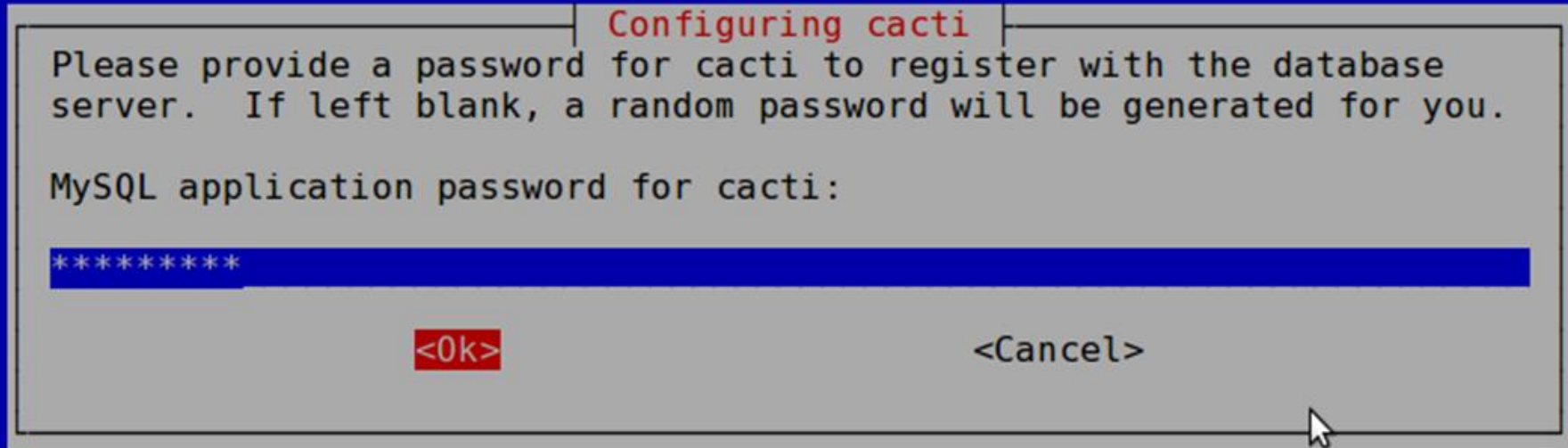
Installation 7



Use our workshop password.



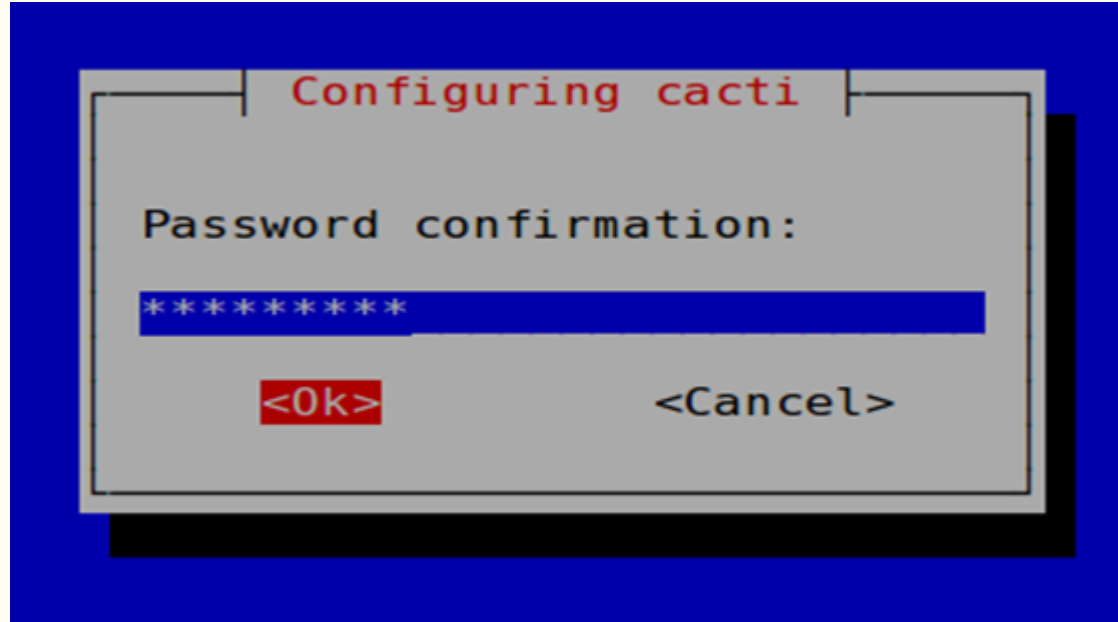
Installation 8



Again, use the workshop password.



Installation 9



Finally, one last time, use the workshop password.



cacti: Installation

Now use a web browser and open the following address:

`http://localhost/cacti`

You will see the following...



cacti: First Login

A screenshot of the Cacti web application's login page. The page has a dark green background with a white login form in the center. A green cactus icon is positioned in the top right corner of the form. The form contains the following elements: the title 'User Login', a prompt 'Enter your Username and Password below', a 'Username' field with 'admin' entered, a 'Password' field with six asterisks, a checked checkbox for 'Keep me signed in', and a 'Login' button. At the bottom of the form, it says 'Version 1.2.26 | (c) 2004-2025 - The Cacti Group'.

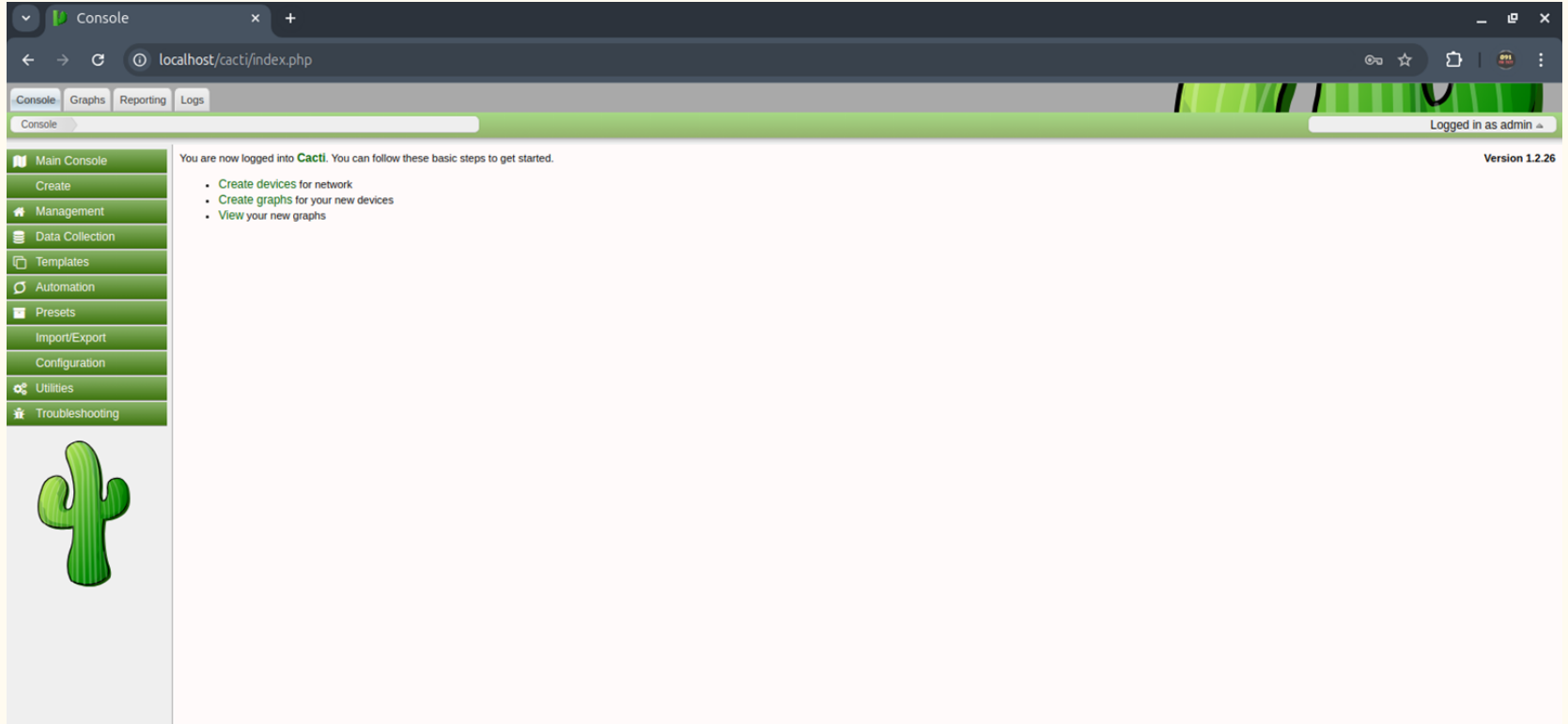
First time login use:

User Name: *admin*

Password : *previously entered password*



cacti: final page after login



Configuration and Running the Tool

1. Database Upgrade and Initialization

After installation or when updating, run the database upgrade script

Command : **php-q upgrade_database.php--forcever=1.2.22**

2. Running the Poller

The poller is the engine that collects data from monitored devices. To run it:

Command : **php poller.php**



Configuration and Running the Tool

3. Enhanced Data Collection with Spine

For large-scale deployments, the Spine data collector—written in C—offers significant performance improvements over the default PHP poller by handling thousands of devices concurrently.

Key advantages include:

- Multi-threaded design
- Lower CPU and memory utilization
- Faster data collection cycles
- Better handling of large networks



Configuration and Running the Tool

4. Verify SNMP service

```
sudo systemctl status snmpd
```

5. Check Apache and MySQL status

```
sudo systemctl status apache2
```

```
sudo systemctl status mysql
```

6. Restart Cacti services

```
sudo systemctl restart apache2 mysql snmp
```

7. Manually update Cacti poller

```
php /var/www/html/cacti/poller.php
```



Generating Graphs using cacti

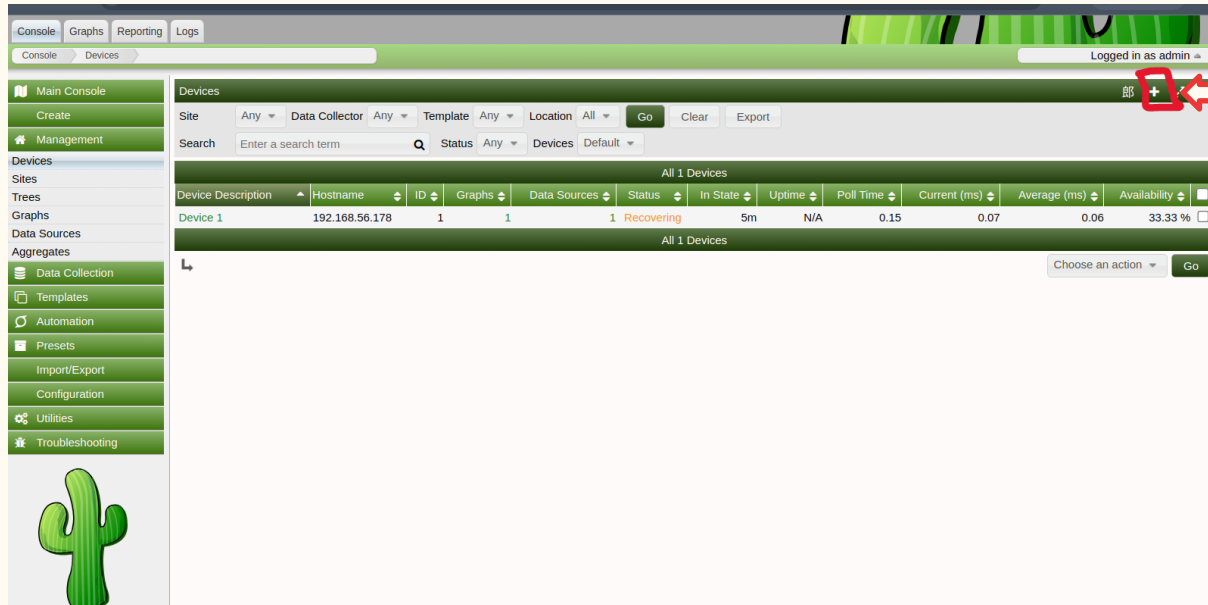
Steps :

1. Add Devices
2. Create Graphics
3. View the Graphics



1. Add Devices : 1

- **Management -> Devices -> Add**
- Specify device attributes
 - Choose a device template and this will ask you for additional information about the device.
 - You can add additional templates when, or if, you want.



Add a Device



1. Add Devices : 2

Console Graphs Reporting Logs

Console Devices (Edit) Logged in as admin

Main Console
Create
Management
Devices
Sites
Trees
Graphs
Data Sources
Aggregates
Data Collection
Templates
Automation
Presets
Import/Export
Configuration
Utilities
Troubleshooting

General Device Options

Description ? Device 1

Hostname ? 192.168.56.178

Location ? Local Linux Mac

Poller Association ? Main Poller

Device Site Association ? Edge

Device Template ? Local Linux Machine

Number of Collection Threads ? 1 Thread

Disable Device ? ☐

SNMP Options

SNMP Version ? Version 2

SNMP Community String ? public

SNMP Port ? 161

SNMP Timeout ? 500

Maximum OID's Per Get Request ? 10 OID's

Bulk Walk Maximum Repetitions ? Auto Detect/Set on first Re-Index

Availability/Reachability Options

Additional Options

Associated Graph Templates

Graph Template Name	Status
---------------------	--------

1. Add Devices : 3

Choose SNMP version 2 for this workshop.

At your own location you can use SNMP version 3 if your devices support this.

SNMP access is a security issue:

- Version 2 is not encrypted
- Watch out for globally readable “public” communities
- Be careful about who can access r/w communities.



1. Add Devices : 4

Note the “Associated Data Queries” menu:

- By default, Cacti does not use SNMP to query a device. You must be sure to add this.

Availability/Reachability Options

Downed Device Detection ?

Ping

Ping Method ?

UDP Ping

Ping Port ?

23

Ping Timeout Value ?

400

Ping Retry Count ?

1

Additional Options

Associated Graph Templates

Graph Template Name	Status
1) ACME CPU Usage (min.)	Is Being Graphed (Edit) ✖
2) Linux - Memory Usage	Is Being Graphed (Edit) ✖
3) Unix - Load Average	Is Being Graphed (Edit) ✖
4) Unix - Logged in Users	Is Being Graphed (Edit) ✖
5) Unix - Processes	Is Being Graphed (Edit) ✖

Add Graph Template

ACME CPU Usage (5 min.)

Add

Associated Data Queries

Data Query Name	Re-Index Method	Status	Actions
1) Unix - Get Mounted Partitions	None Uptime Index Count Verify All	Success [2 Items, 1 Rows]	↺ ↻ ✖

Add Data Query

Acme SD Combined Session Stats

Re-Index Method

Uptime

Add

Return

Save



2. Create Graphics : Step 1

- Chose the “Create graphs for this host”
- Under Graph Templates generally check the top box that chooses *all* the available graphs to be displayed.
- Press Create.
- You can change the default colors, but the predefined definitions generally work well.

The screenshot displays the Nagios XI web interface. The top navigation bar includes 'Console', 'Graphs', 'Reporting', and 'Logs'. Below this, a breadcrumb trail shows 'Console > Devices > (Edit)'. The user is logged in as 'admin'. On the left sidebar, the 'Graphs' menu item is highlighted with a red box. The main content area shows 'Device 1 (192.168.56.178)' with 'Ping Results' and 'UDP Ping Success (0.05 ms)'. A green bar indicates 'Device [edit: Device 1]' and 'General Device Options'. Below this, a form contains fields for 'Description' (Device 1), 'Hostname' (192.168.56.178), 'Location' (Local Linux Mac), 'Poller Association' (Main Poller), and 'Device Site Association' (Edge). On the right, a list of actions is shown, with 'Create Graphs for this Device' highlighted by a red box. Other actions include 'Create New Device', 'Re-Index Device', 'Enable Device Debug', 'Repopulate Poller Cache', 'View Poller Cache', and 'Data Source List'.



2. Create Graphics : Step 2

Console Graphs Reporting Logs

Console Create New Graphs Logged in as admin

Main Console

Create

New Graphs

New Device

Management

Data Collection

Templates

Automation

Presets

Import/Export

Configuration

Utilities

Troubleshooting

New Graphs for [Device 1] (192.168.56.178 Local Linux Machine)

Device Device 1 Graph Types All Go Clear Save Filter Settings Saved

Search Enter a search term Rows 10

New Graph Template

(Select a graph type to create) Create

Graph Templates


Graph Template Name	
ACME CPU Usage (min.)	<input type="checkbox"/>
Linux - Memory Usage	<input type="checkbox"/>
Unix - Load Average	<input type="checkbox"/>
Unix - Logged in Users	<input type="checkbox"/>
Unix - Processes	<input type="checkbox"/>

Data Query [Unix - Get Mounted Partitions]

All 1 Items


Device Name	Mount Point
/dev/sda2	/

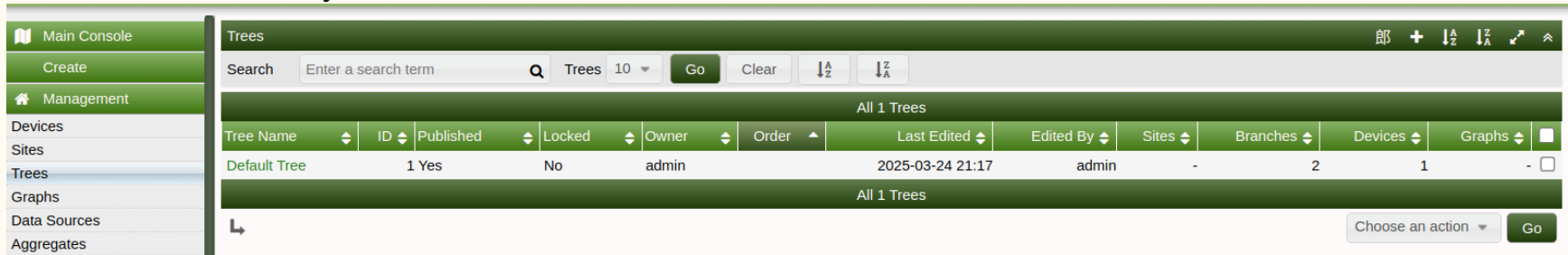
Cancel Create



3. View Graphics

- Place the new device in its proper location in your tree hierarchy.
- Building your display hierarchy is your decision. It might make sense to try drawing this out on paper first.
 - Under Management → Graph Trees
select the Default Tree hierarchy (or, create one of your own).

Default Tree hierarchy 







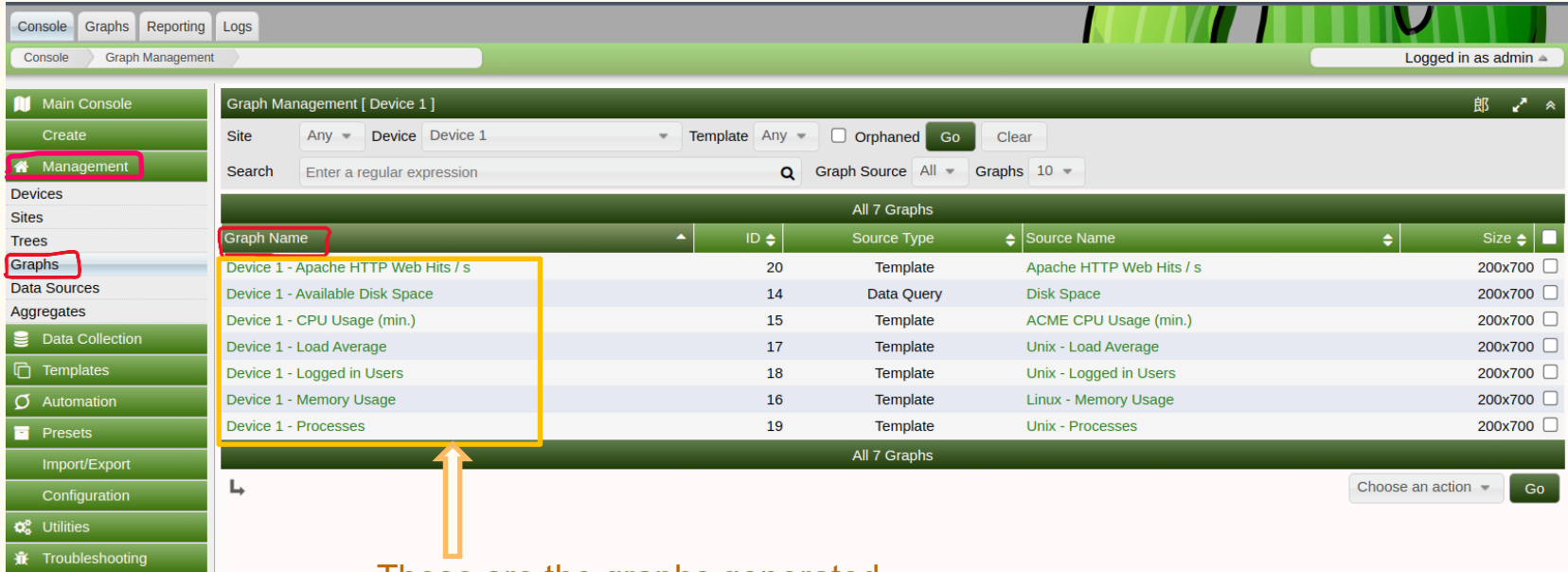
Tree Name	ID	Published	Locked	Owner	Order	Last Edited	Edited By	Sites	Branches	Devices	Graphs
Default Tree	1	Yes	No	admin		2025-03-24 21:17	admin	-	2	1	-



3. View Graphics

To View Graphs :

 Management  Graphs  Graph Name  Double Tap to see graph



Graph Management [Device 1]

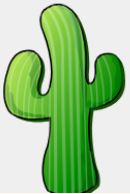
Site: Any Device Device 1 Template: Any ☐ Orphaned Go Clear

Search: Enter a regular expression Graph Source: All Graphs: 10

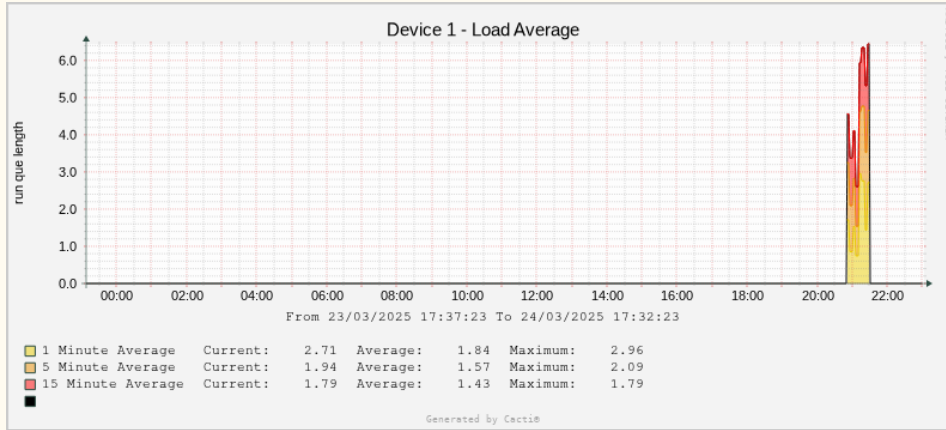
Graph Name	ID	Source Type	Source Name	Size	
Device 1 - Apache HTTP Web Hits / s	20	Template	Apache HTTP Web Hits / s	200x700	<input type="checkbox"/>
Device 1 - Available Disk Space	14	Data Query	Disk Space	200x700	<input type="checkbox"/>
Device 1 - CPU Usage (min.)	15	Template	ACME CPU Usage (min.)	200x700	<input type="checkbox"/>
Device 1 - Load Average	17	Template	Unix - Load Average	200x700	<input type="checkbox"/>
Device 1 - Logged in Users	18	Template	Unix - Logged in Users	200x700	<input type="checkbox"/>
Device 1 - Memory Usage	16	Template	Linux - Memory Usage	200x700	<input type="checkbox"/>
Device 1 - Processes	19	Template	Unix - Processes	200x700	<input type="checkbox"/>

Choose an action Go

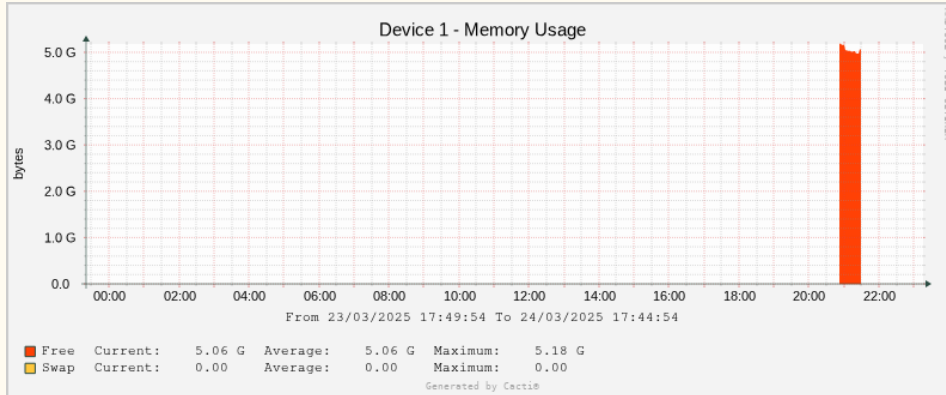
These are the graphs generated



3. View Graphics - Expamples



← Load Average Graph



← Memory Usage Graph



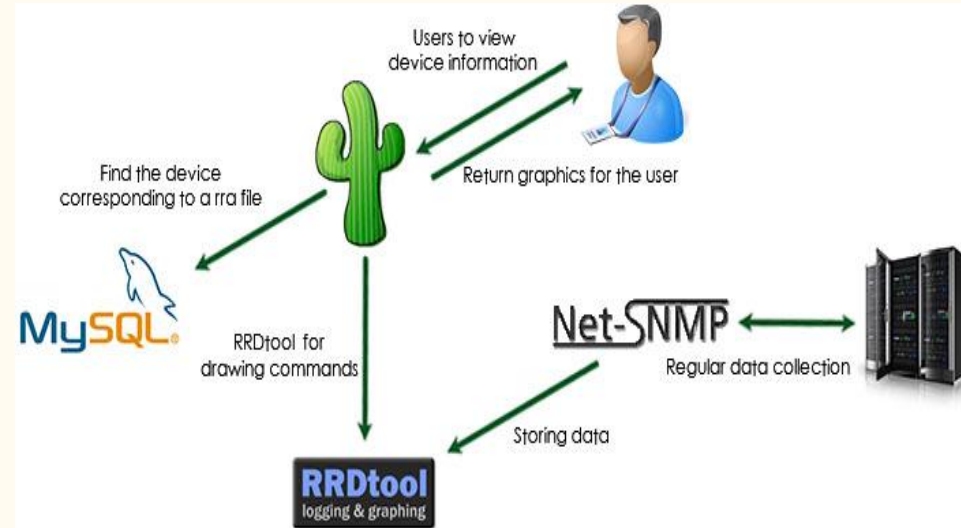
Case studies



Wireless Network Optimization

A university used Cacti to monitor connected users on wireless access points throughout campus.

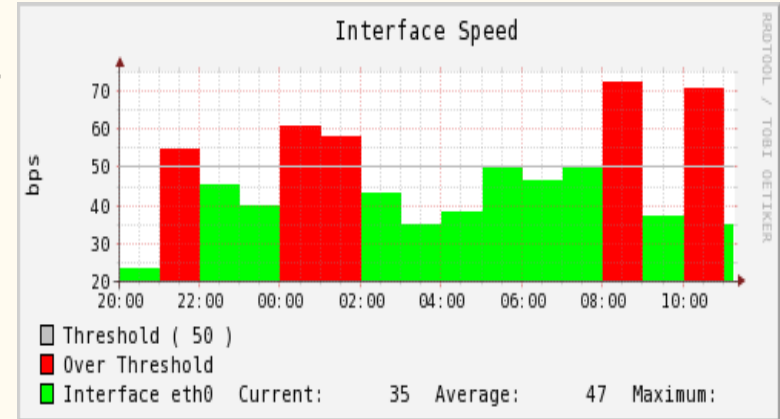
- **How Cacti Monitors Wireless Networks**
- Cacti can track wireless access point (AP) usage by monitoring the number of connected clients.
- This is accomplished through SNMP queries that collect data about client associations.
- The data is stored in RRD databases and presented as graphs showing trends over time.



Wireless Network Optimization

Cacti to monitor connected users on wireless access points throughout campus, which enabled them to:

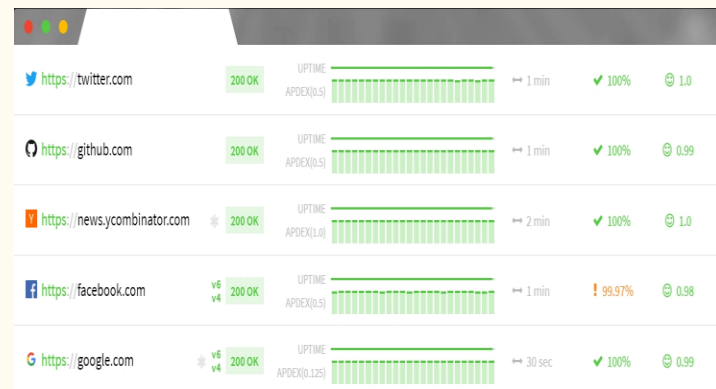
- Track User Counts Throughout Day and Year
- Identify Peak Load Times and Locations
- Plan Strategic Infrastructure Upgrades
- Improve Overall Wireless Performance



E-commerce Performance Scaling

A growing e-commerce company used Cacti to monitor their server infrastructure. Through analysis of performance metrics such as CPU utilization, memory usage, and network bandwidth, they:

- Identified peak usage periods and resource bottlenecks
- Accurately forecasted future resource requirements
- Proactively upgraded their infrastructure to accommodate increased traffic during seasonal sales
- Ensured uninterrupted service and handled increased customer demand



Calculate expectations for the coming peak season

by applying last year's calculated percentage growth against your site's running daily and weekly averages for traffic.



Use the year-over-year growth rate to validate the prediction

from the step above by applying this percentage to last year's peak season numbers.



Drawbacks

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6. Drawbacks of the Tool

While CACTE is a powerful and effective tool, it does have some drawbacks:

- **Limited Support for Non-Linux Platforms:** Although CACTE can be used on Windows or macOS, the full range of features is optimized for Linux systems. Users on other platforms may face limitations or need additional configuration to fully utilize the tool.
- **Complex Setup for Beginners:** The installation and configuration processes may be challenging for users who are not familiar with network monitoring tools or command-line interfaces. Detailed documentation and user guides are essential for ensuring successful deployment and usage.
- **Dependency on Network Conditions:** CACTE's performance is tied to the network conditions. In highly congested or unstable networks, the tool might experience delayed updates or less accurate reporting.



LIMITED SUPPORT FOR NON LINUX SYSTEM :

1. Dependency on linux Specific tools and Libraries
 - Linux based network utilities
 - Package Management
1. Performance and Efficiency Differences
2. Graphical User Interface (GUI) Limitations
3. Limited Community Support and Documentation for Non-Linux Platforms



Reference

- [Cacti Github](#)
- [Cacti Web Site](#)
- [Cacti Discussion Group](#)
- https://www.perplexity.ai/search/cacte-network-monitoring-tool-kl_4XCOjSwanahY.TvnWjw
- <https://last9.io/blog/essentials-of-snmp-monitoring/>

