Cacti

Alok Ranjan	2022CSB091
Ranveer Kumar	2022CSB092
Karan Kumar	2022CSB093
Rajesh Kumar	2022CSB094

Purpose

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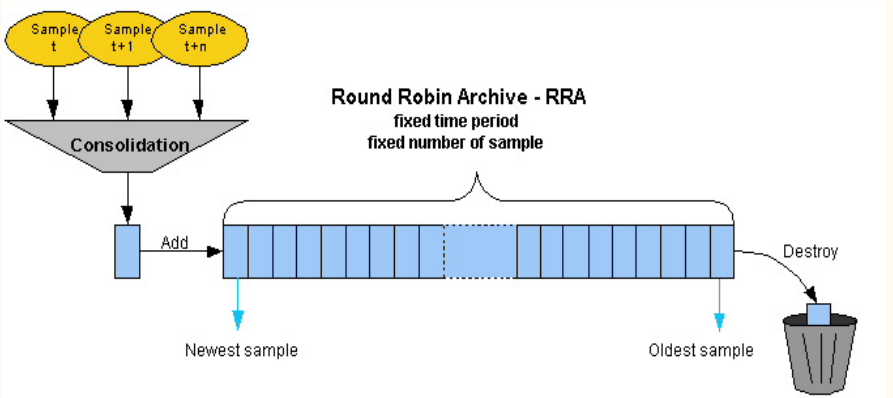
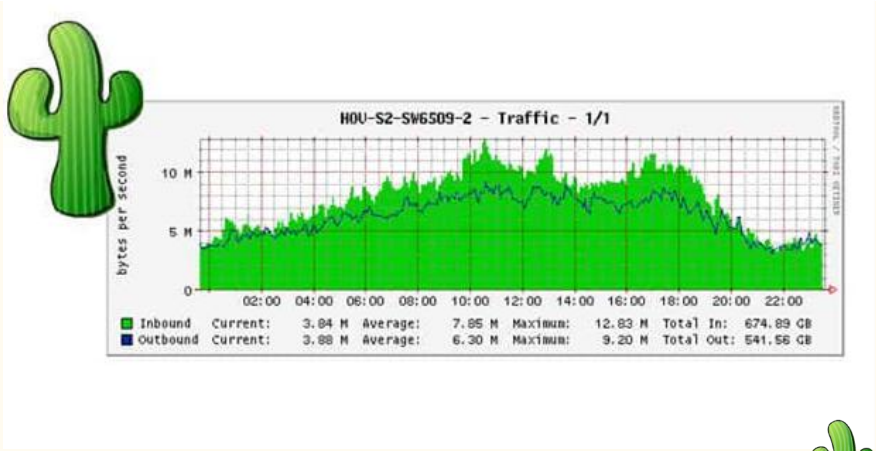
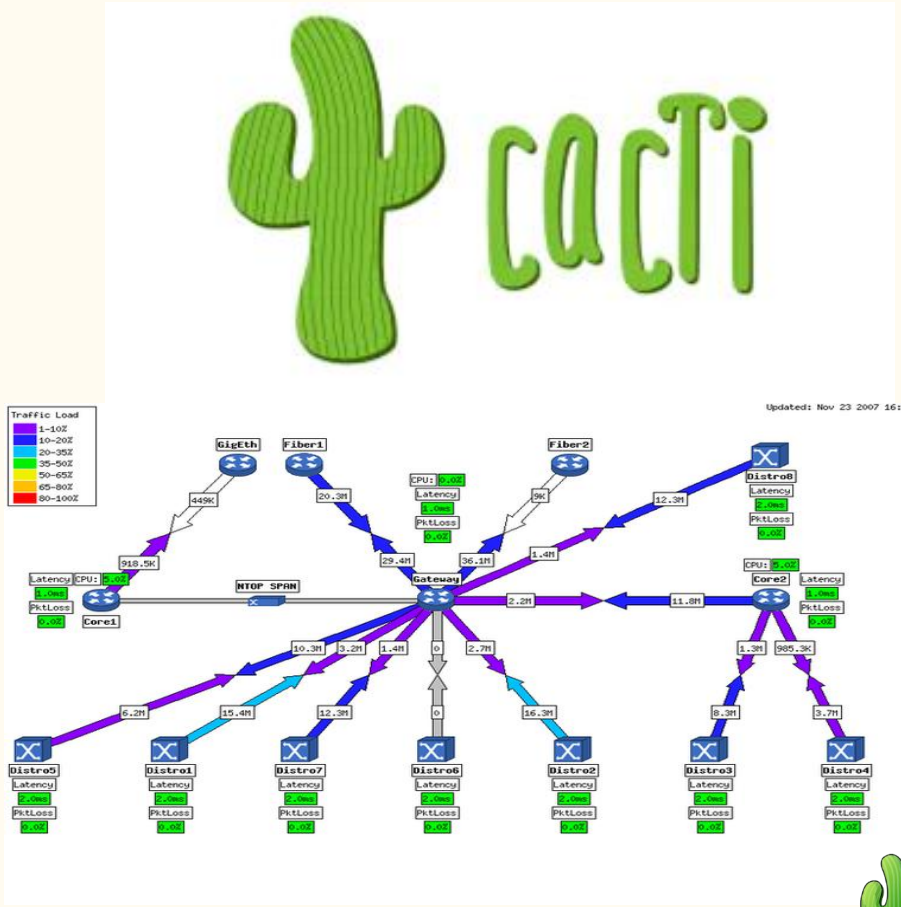
1. **Monitor Performance:**
   - Keep track of how well our network and systems are working over time.
1. **Visualize Data**
   - Cacti takes the data it collects and turns it into easy-to-understand graphs.
1. **Manage Faults**
   - Cacti helps you identify problems and faults in your network by setting 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

cactigreen!20 **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

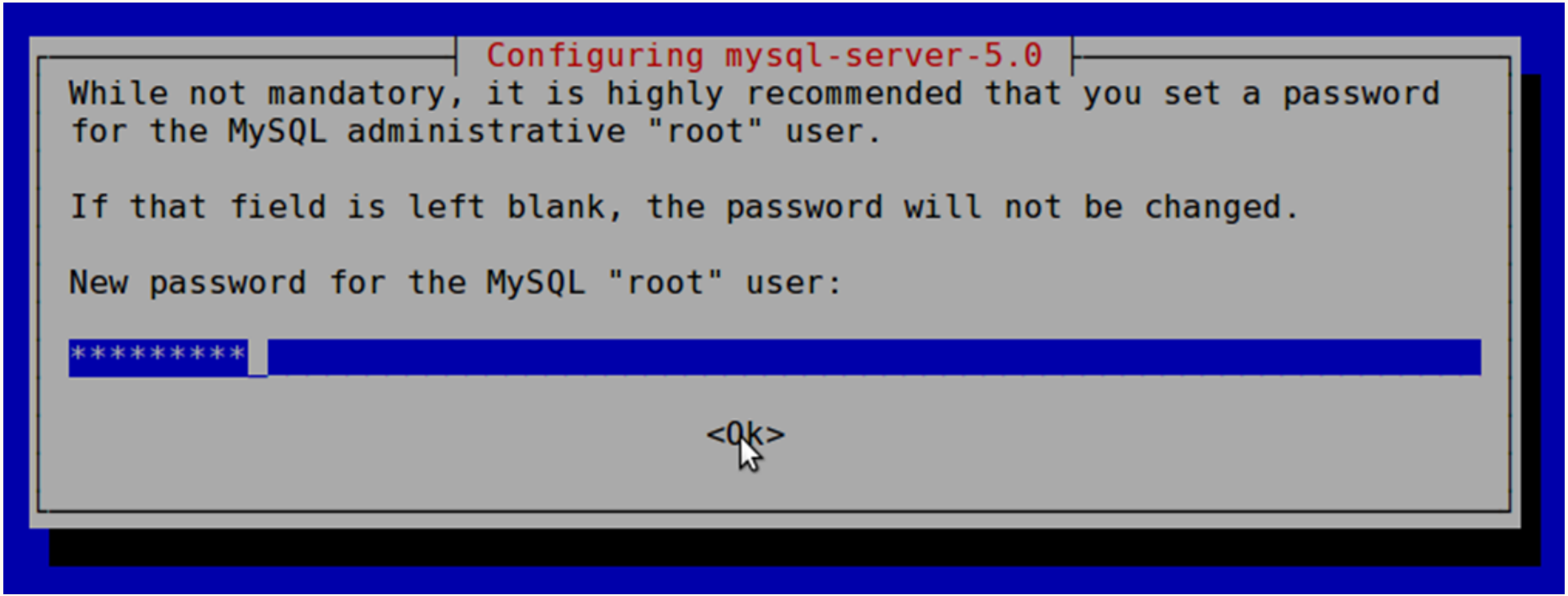
Installation: Ubuntu 24.04 LTS

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

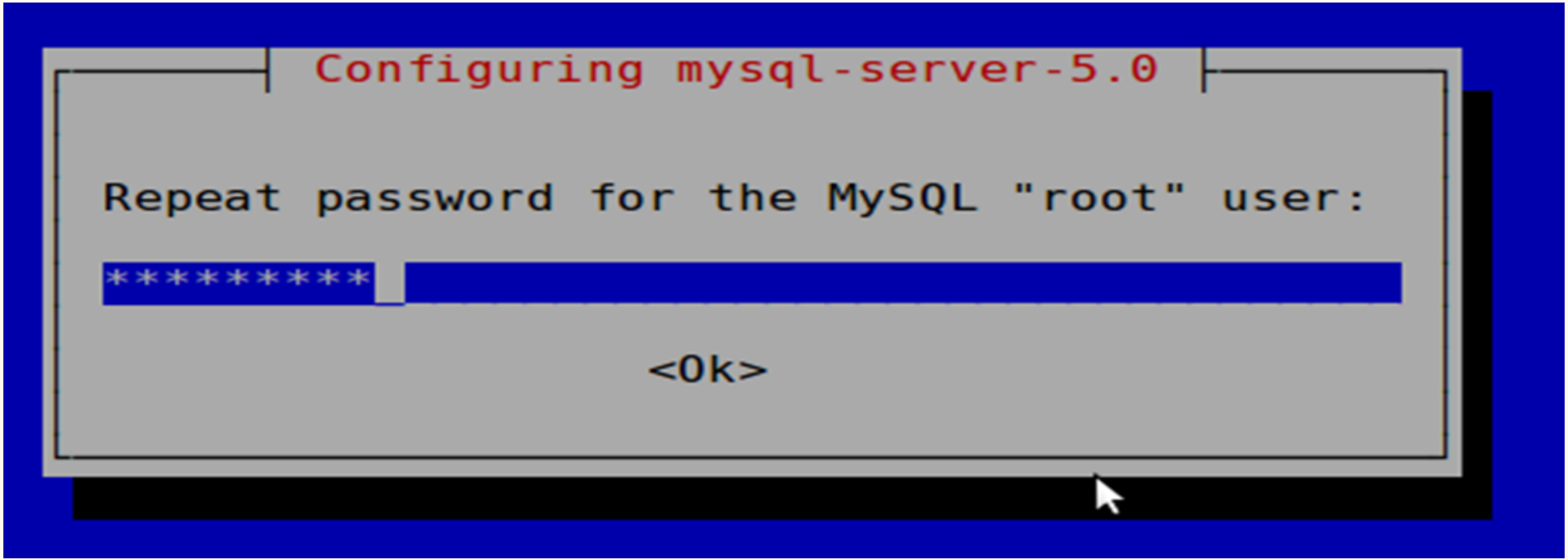
```
alok@2022csb091:~$ sudo apt-get install cacti
[sudo] password for alok:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libllvm17t64 liblua5.2-0 libwireshark17t64 libwiretap14t64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

Installation 2



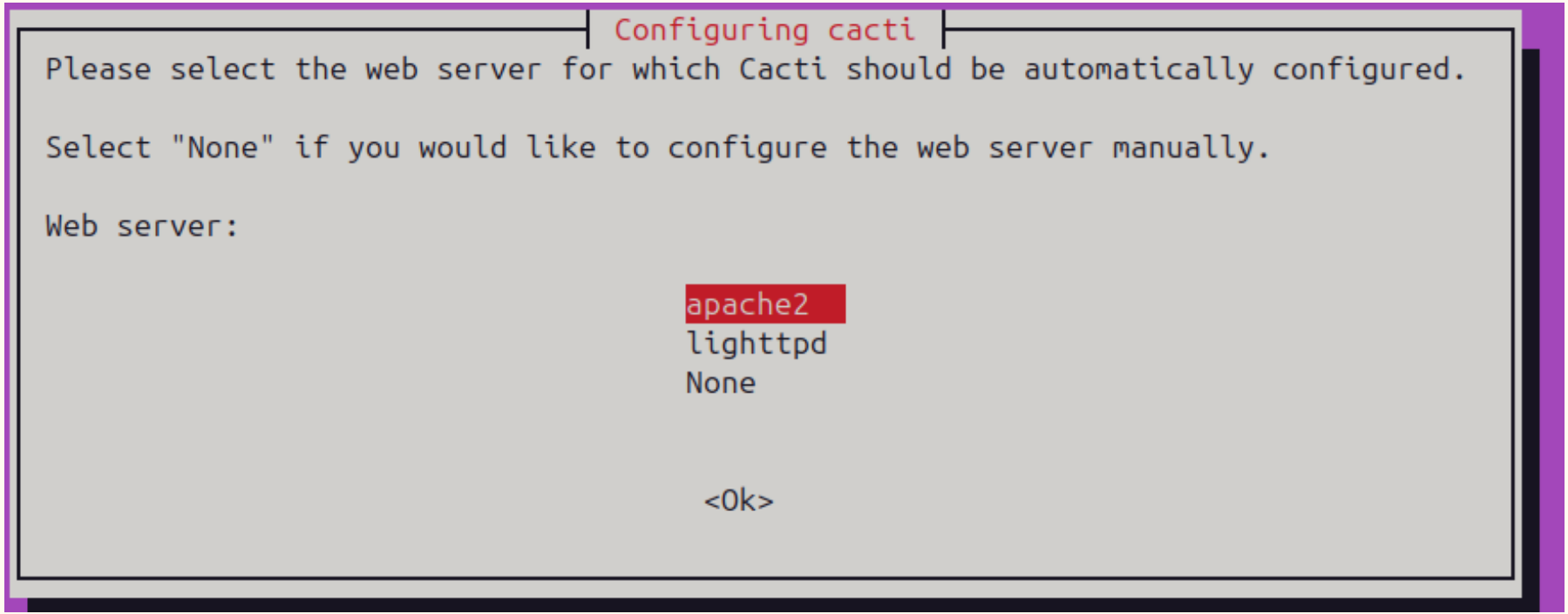
Use the workshop password

Installation 3



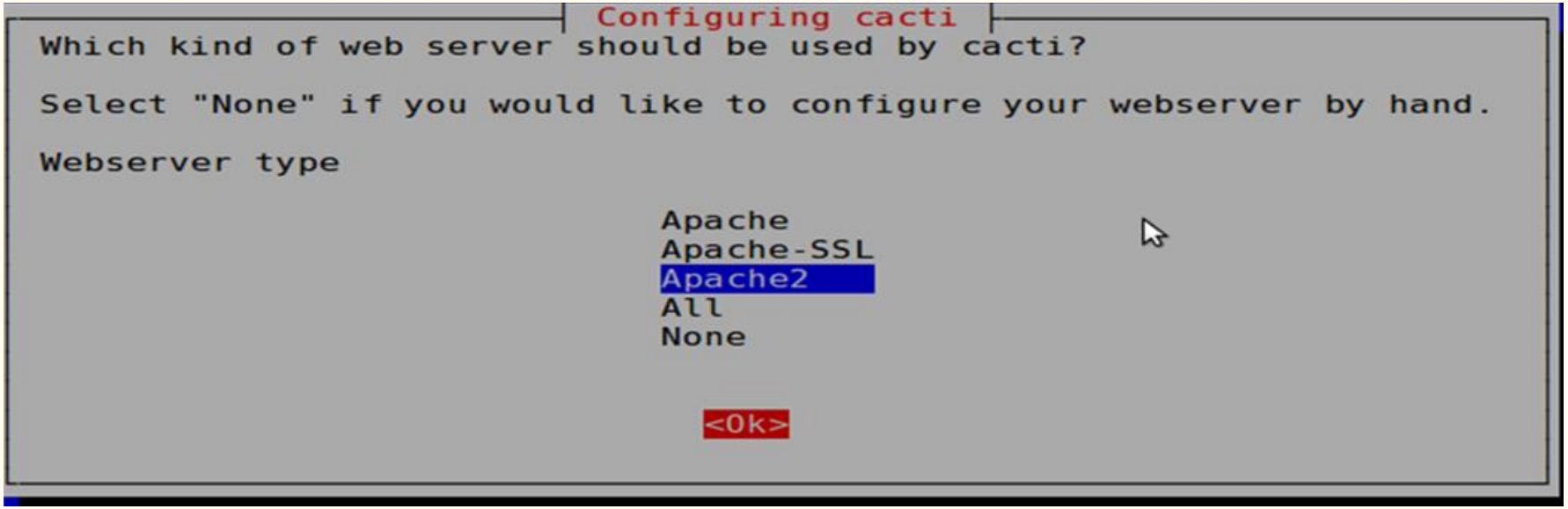
Again, use the workshop password

Installation 4



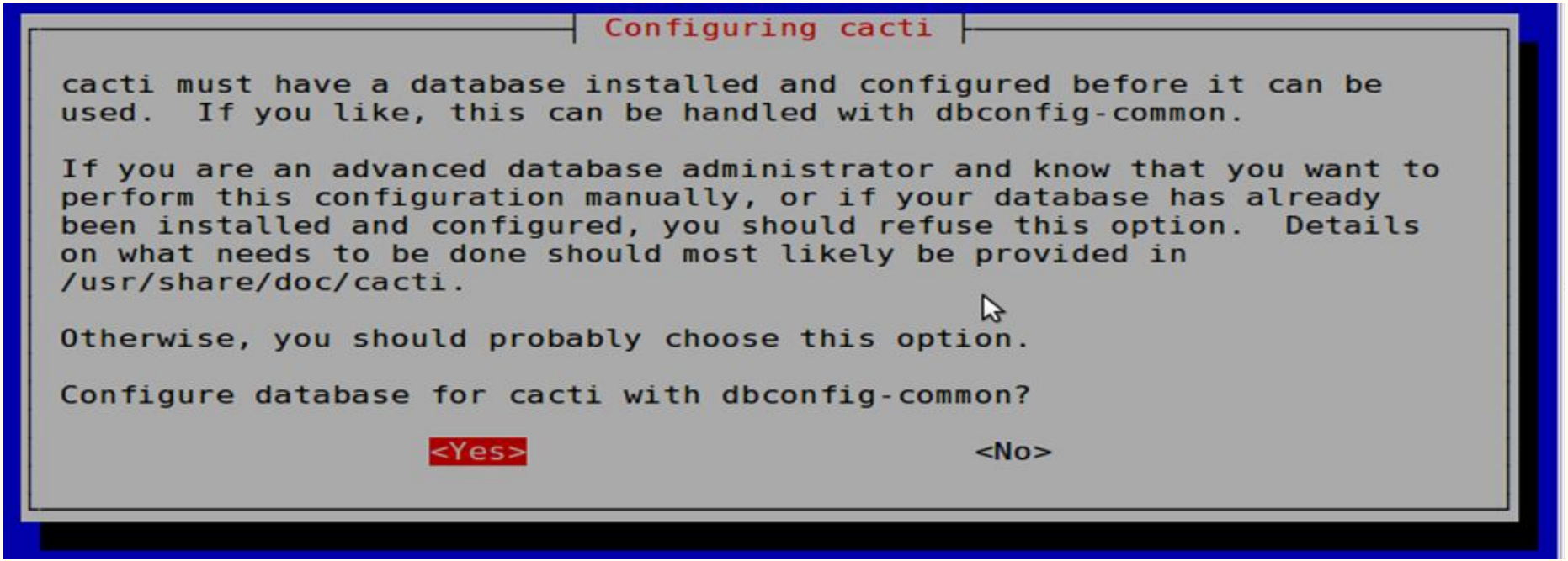
Informational message. Is not normally an issue.

Installation 5



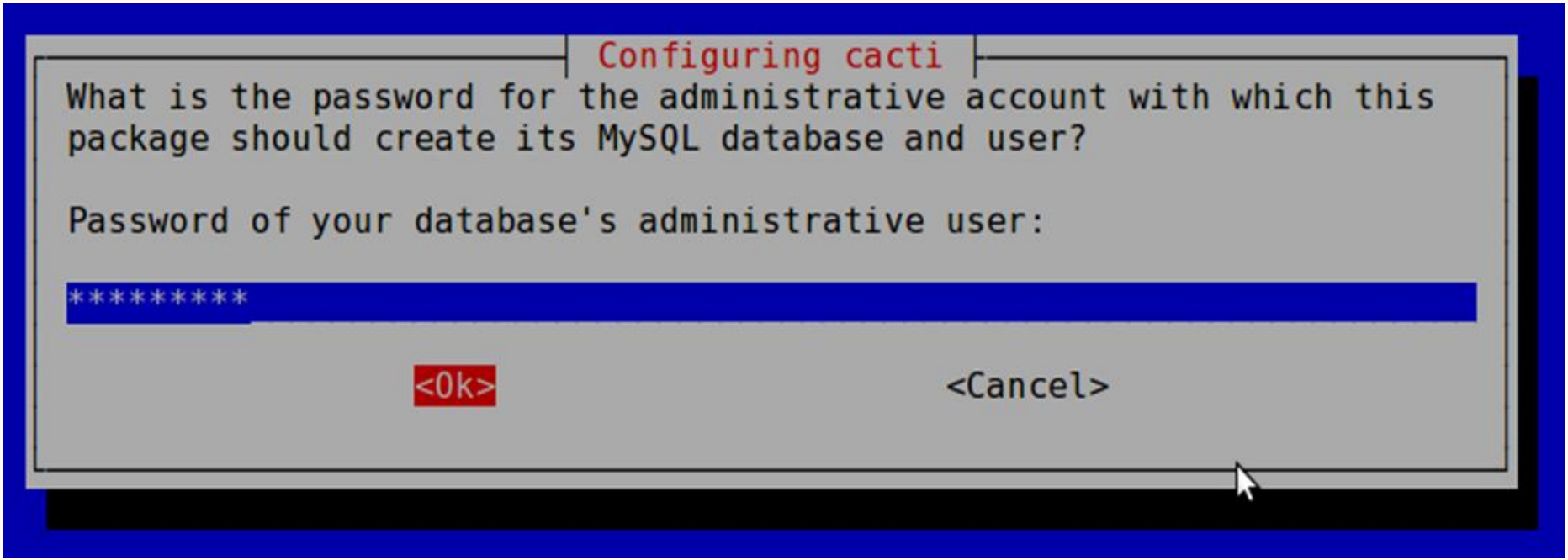
We are using Apache2. Be sure this is chosen, then highlight <Ok> and press <ENTER> to continue.

Installation 6



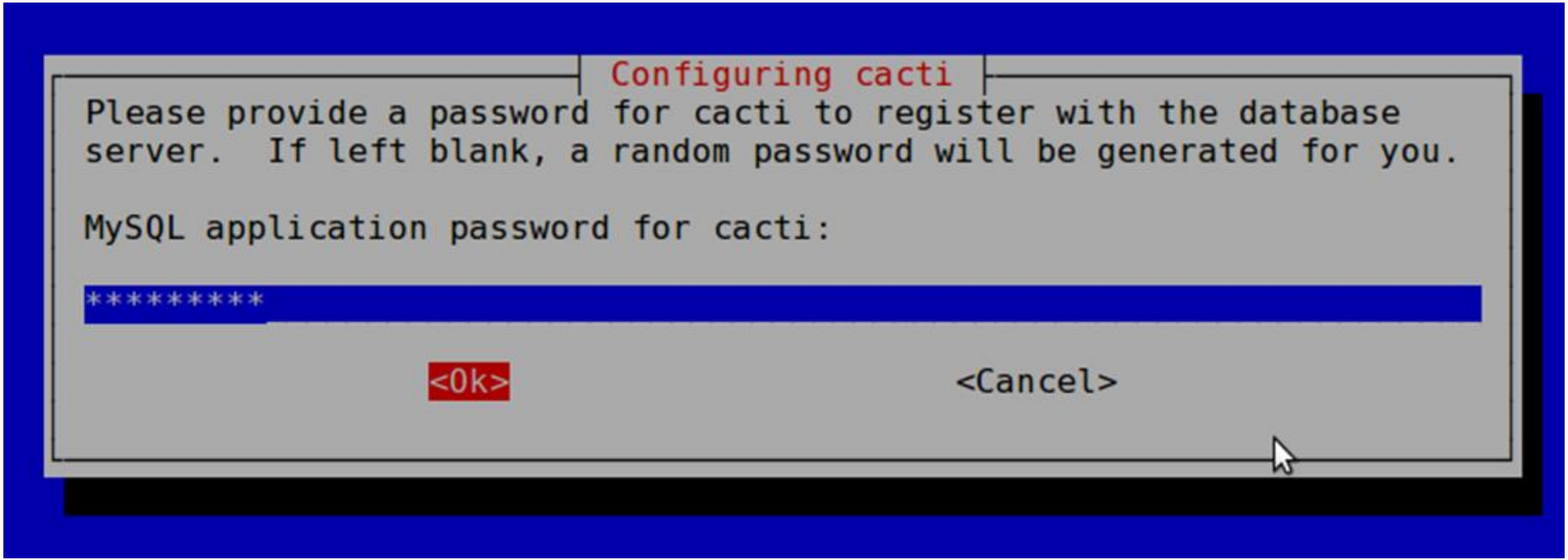
Choose <Yes>. If you choose <No> you will have to manually configure your database at a later time.

Installation 7



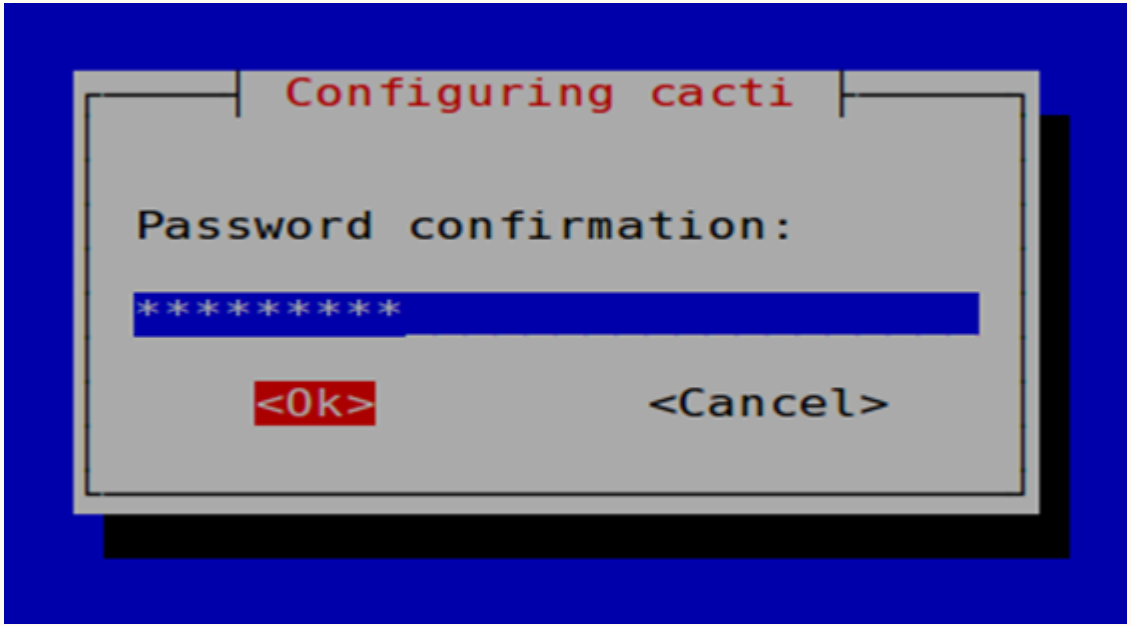
Use our workshop password.

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...

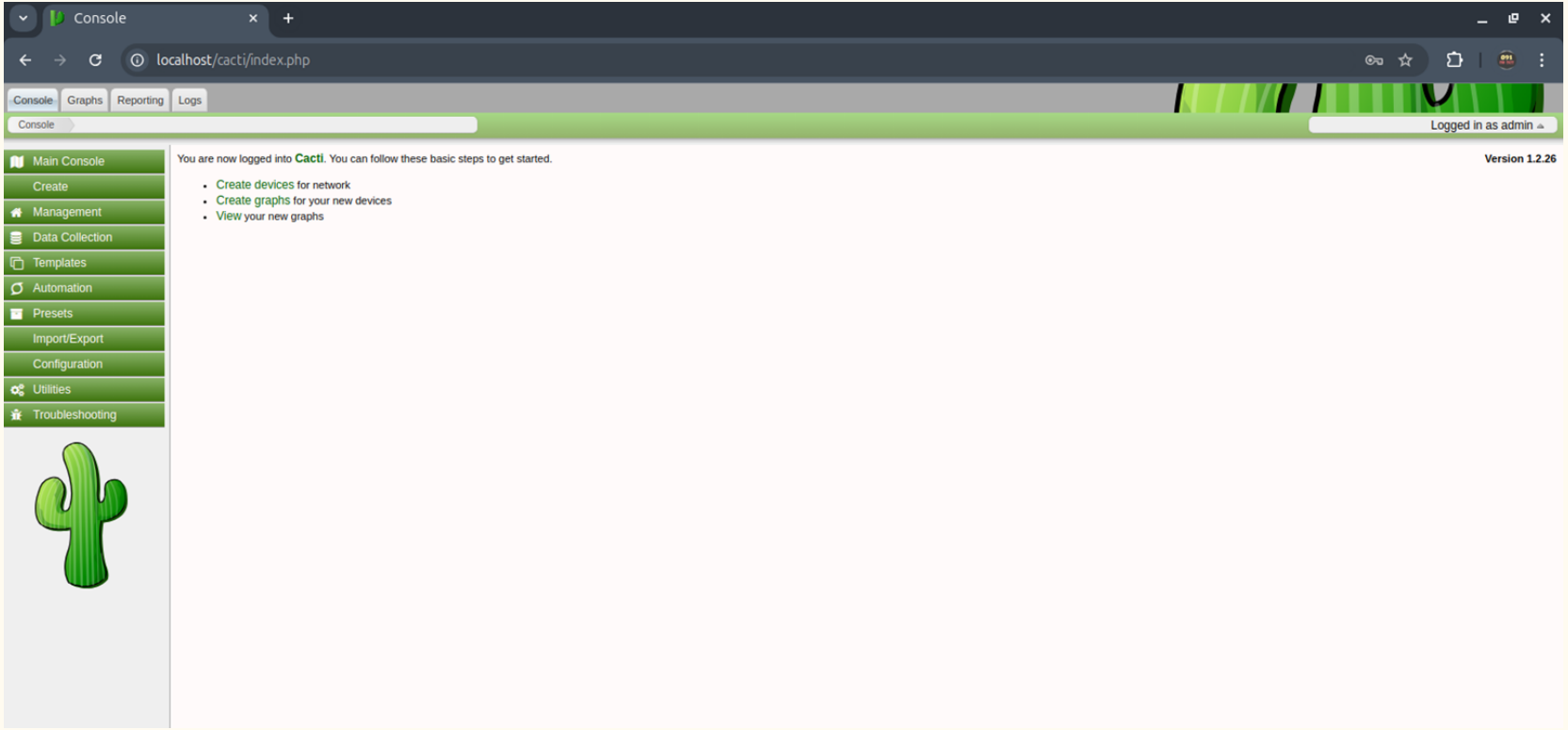
cacti: First Login

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

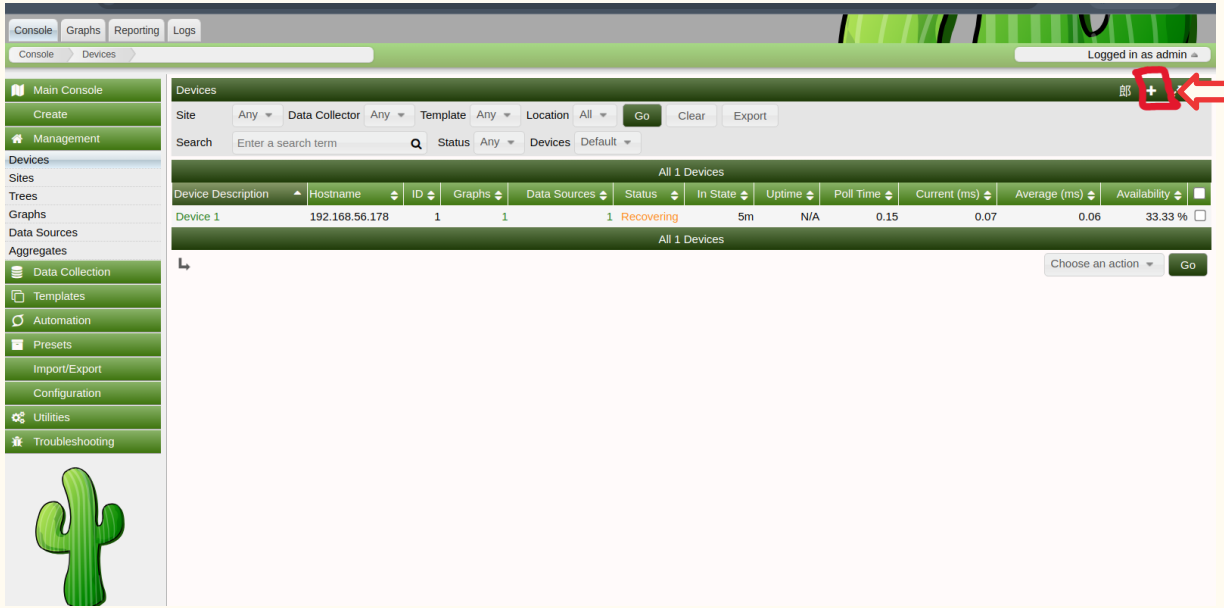
Generating Graphs using cacti

Steps :

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

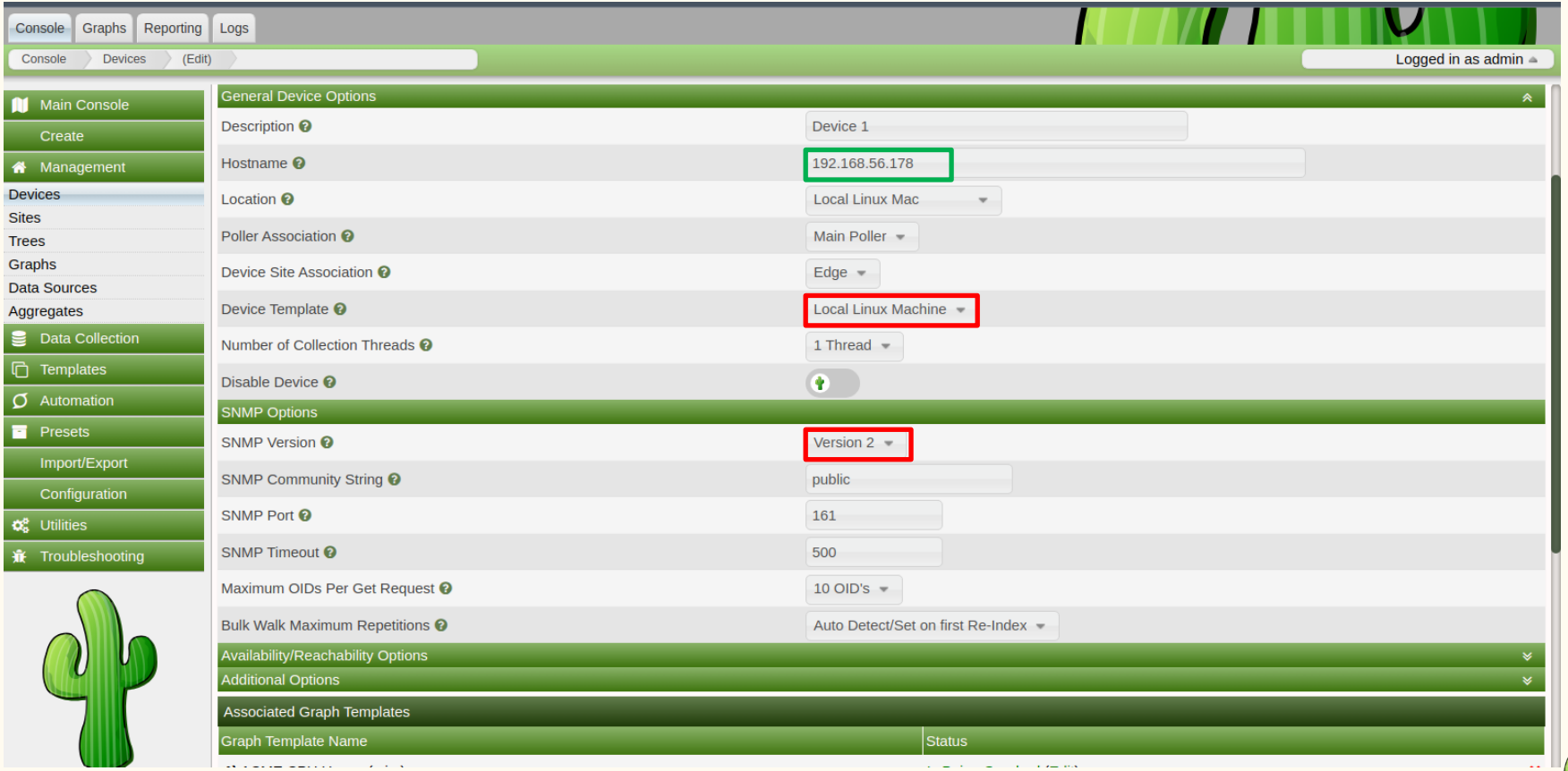
1. Add Devices : 1

- **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



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

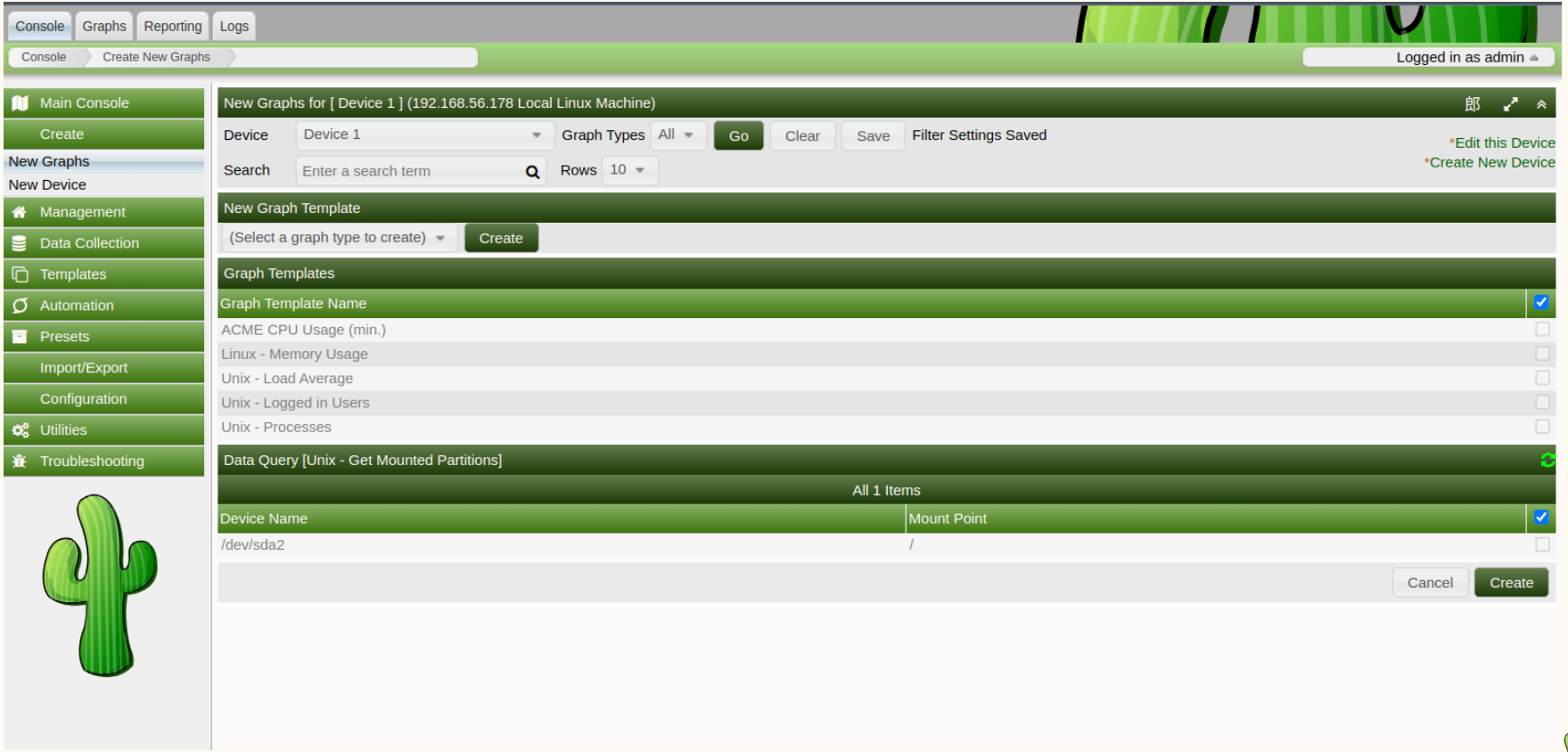
Note the “Associated Data Queries” menu:

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

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.

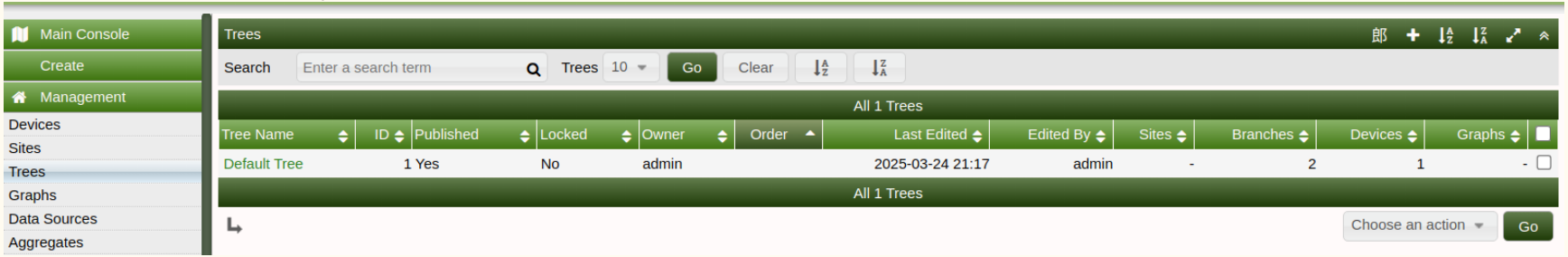
2. Create Graphics : Step 2



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).

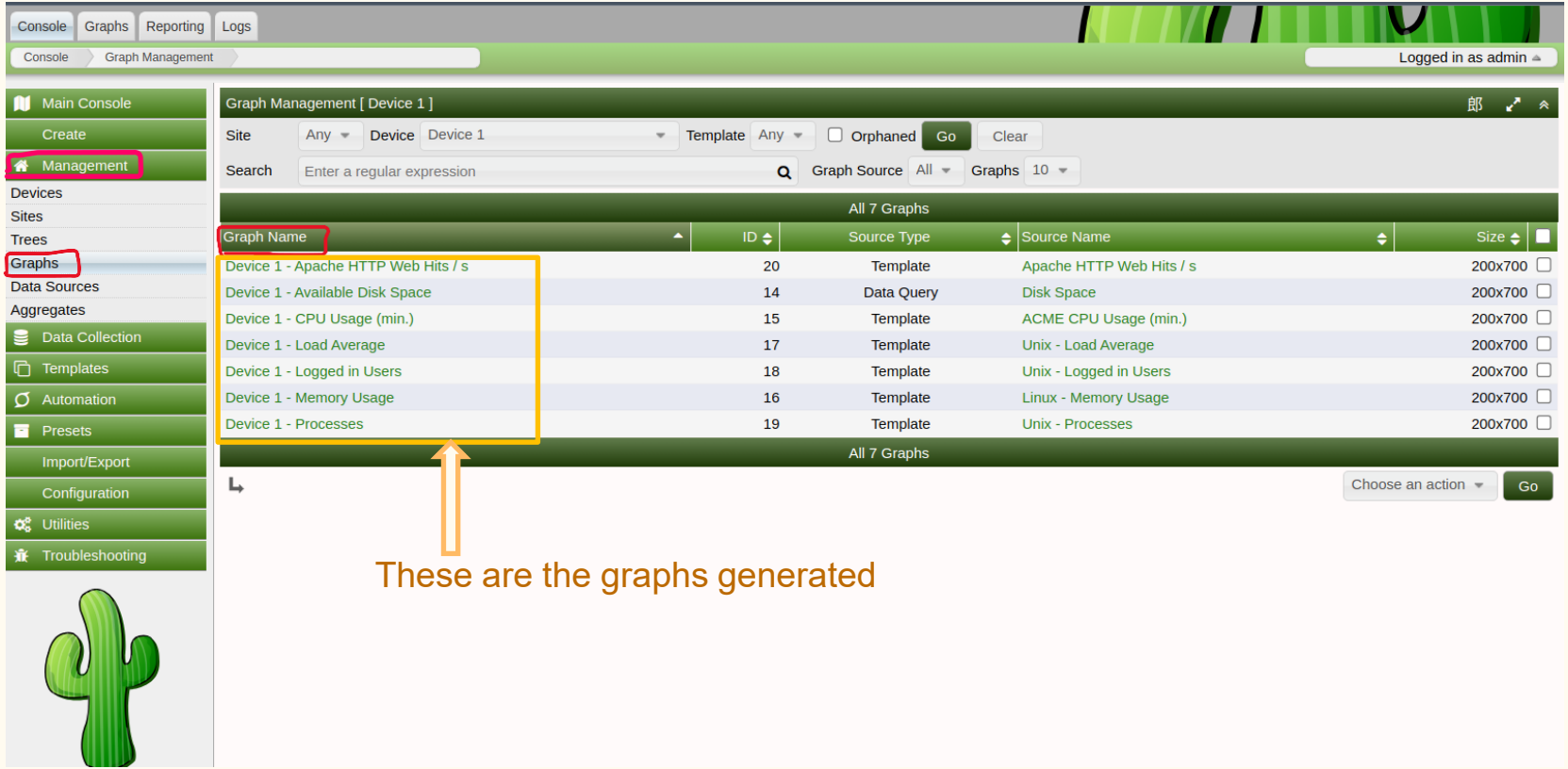
Default Tree hierarchy



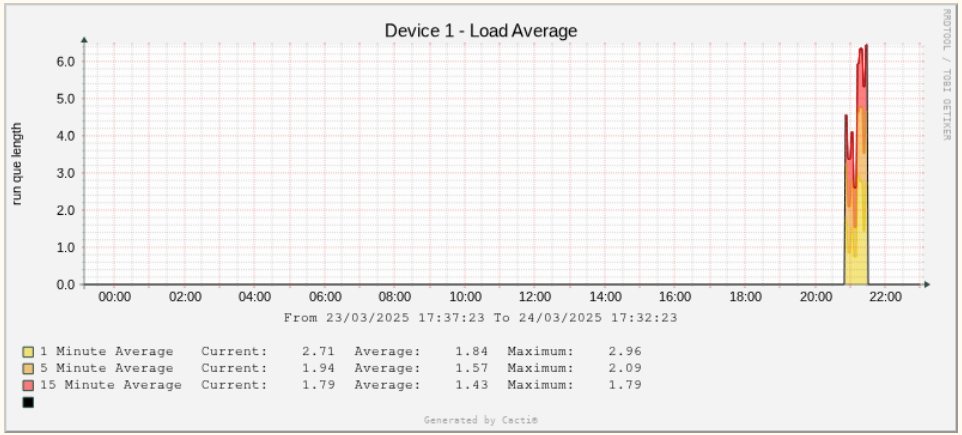
3. View Graphics

To View Graphs :

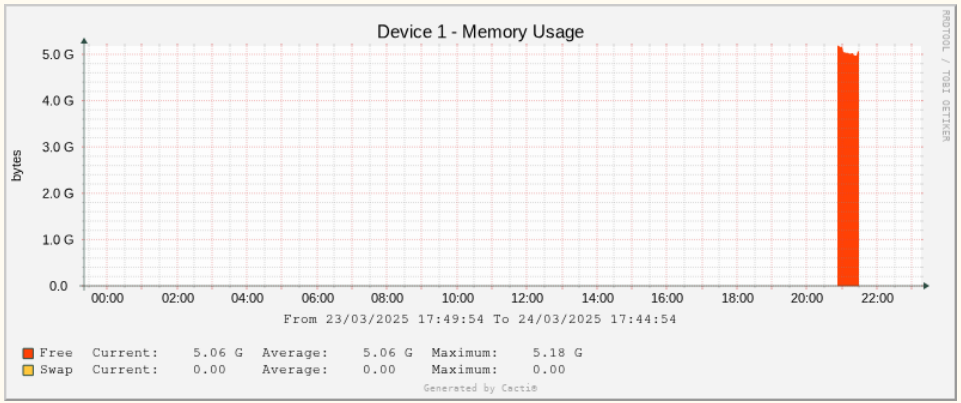
🏠Management ➡️ Graphs ➡️ Graph Name ➡️ Double Tap to see graph



3. View Graphics - Expamples



Load Average Graph



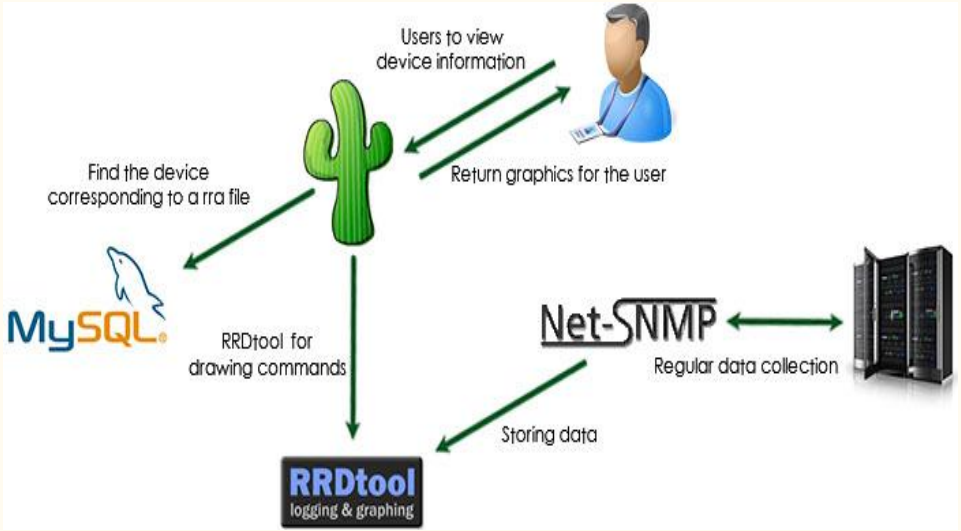
Memory Usage Graph

Case studies

Wireless Network Optimization

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

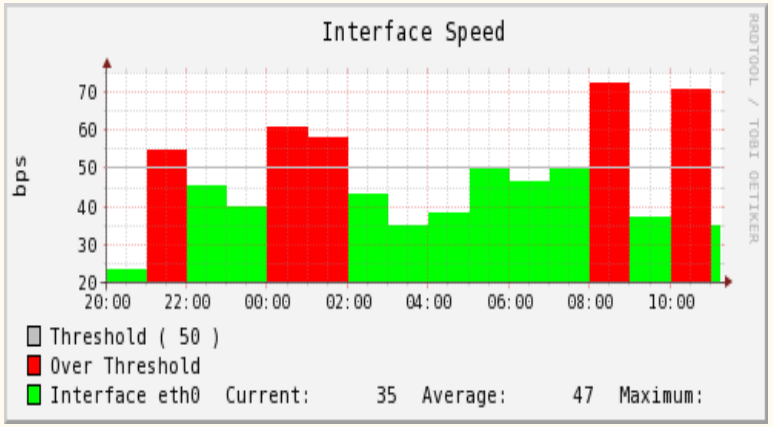
- How Cacti Monitors Wireless Networks
  - Cacti can track wireless access point (AP) usage by monitoring the number of connected clients.
  - This is accomplished through SNMP queries that collect data about client associations.
  - The data is stored in RRD databases and presented as graphs showing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



Wireless Network Optimization

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

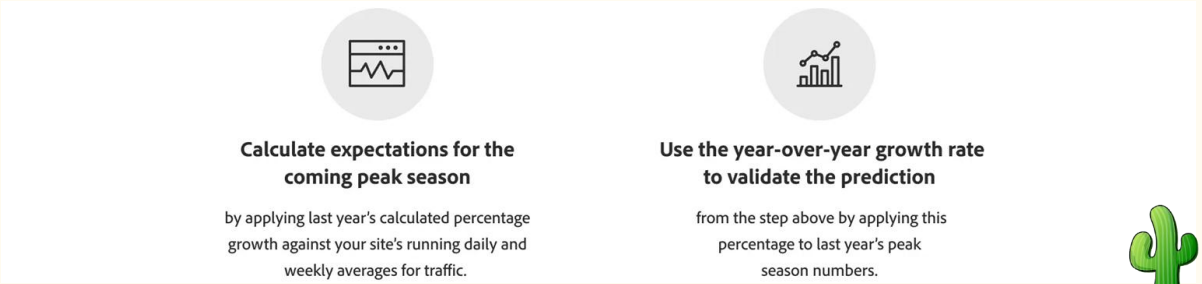
- Track User Counts Throughout Day and Year
- Identify Peak Load Times and Locations
- Plan Strategic Infrastructure Upgrades
- Improve Overall Wireless Performance



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



Drawbacks

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/