Install Cacti 1.x (Network Monitoring) on RHEL/CentOS 8.x

Cacti tool is an open source web-based network monitoring and system monitoring graphing solution for IT business. **Cacti** enables a user to poll services at regular intervals to create graphs on resulting data using RRDtool.

Generally, it is used to graph time-series data of metrics such as network bandwidth utilization, CPU load, running processes, disk space etc.

Cacti Required Packages:

The **Cacti** required following packages to be installed on your Linux operating systems like RHEL / CentOS

- **Apache:** A Web server to display network graphs created by PHP and RRDTool.
- **MySQL:** A Database server to store cacti information.
- **PHP:** A script module to create graphs using RRDTool.
- **PHP-SNMP:** A PHP extension for SNMP to access data.
- **NET-SNMP:** A SNMP (Simple Network Management Protocol) is used to manage network.
- **RRDTool:** A database tool to manage and retrieve time series data like CPU load, Network Bandwidth etc.

Set Selinux Disable/permissive mode:

```
# vi /etc/selinux/config
```

```
# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#     enforcing - SELinux security policy is enforced.
#     permissive - SELinux prints warnings instead of enforcing.
#     disabled - No SELinux policy is loaded.
SELINUX=disabled
:x

# reboot
```

Installing Cacti Required Packages on RHEL/CentOS

First, we need to install following dependency packages one-by-one using YUM package manager tool. Here, you need to install and enable EPEL Repository.

```
# yum install epel-release
```

Install require software:

```
yum install vim wget git tar
```

Install httpd server:

```
# yum -y install httpd httpd-devel
```

Start and enable httpd server

```
# systemctl enable httpd
# systemctl start httpd
```

Check status of httpd server to make sure it's running

```
# systemctl status httpd

● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled;
 vendor preset: disabled)
   Active: active (running) since Sun 2017-08-20 02:33:03 EDT; 7s ago
     Docs: man:httpd(8)
           man:apachectl(8)
 Main PID: 7147 (httpd)
   Status: "Processing requests..."
```

Install and Configure MariaDB

MariaDB is a community-developed fork of the MySQL database project, and provides a replacement for MySQL. Previously the official supported database was MySQl under RHEL/CentOS 6.x/5.x and Fedora.

Recently, RedHat makes a new transaction from MySQl to MariaDB, as MariaDB is the default implementation of MySQL in RHEL/CentOS 7.x and Fedora 19 onwards..

```
# yum install -y mariadb-server mariadb
```

Start and enable MariaDB to run on boot

```
# systemctl start mariadb
# systemctl enable mariadb
```

Check if running and if enabled

```
# systemctl status mariadb
● mariadb.service - MariaDB database server
   Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; vendor
 preset: disabled)
   Active: active (running) since Sun 2017-08-20 02:35:18 EDT; 12s ago
  Process: 7724 ExecStartPost=/usr/libexec/mariadb-wait-ready $MAINPID
 (code=exited, status=0/SUCCESS)
  Process: 7695 ExecStartPre=/usr/libexec/mariadb-prepare-db-dir %n
 (code=exited, status=0/SUCCESS)
 Main PID: 7723 (mysqld_safe)
   CGroup: /system.slice/mariadb.service
           ├─7723 /bin/sh /usr/bin/mysqld_safe --basedir=/usr
           └─7882 /usr/libexec/mysqld --basedir=/usr --datadir=/var/lib/mysql -
 -plugin-dir=/usr/lib64/my...

Aug 20 02:35:16 ns1.mahedi.net systemd[1]: Starting MariaDB database server...
```

```
Aug 20 02:35:16 ns1.mahedi.net mysqld_safe[7723]: 170820 02:35:16 mysqld_safe
 Logging to '/var/log/ma...g'.
```

Installing php

```
# yum install -y php php-xml php-session php-sockets php-ldap php-gd php-json php-
 mysqlnd php-gmp php-mbstring php-posix php-intl
```

Install PHP-SNMP

```
# yum install php-snmp -y
```

Install NET-SNMP

```
# yum install net-snmp net-snmp-utils net-snmp-libs -y
```

Configure snmpd:

```
# vim /etc/snmp/snmpd.conf
```

```
#Add this into the VIEW
view    systemview      included   .1
```

Enable and start snmpd Service:

```
# systemctl enable snmpd
# systemctl restart snmpd
```

Check Interface Status:

```
# snmpwalk -v 1 -c public localhost ifSpeed
IF-MIB::ifSpeed.1 = Gauge32: 10000000
IF-MIB::ifSpeed.2 = Gauge32: 1000000000
IF-MIB::ifSpeed.3 = Gauge32: 1000000000
```

Install RRDTool

```
# yum install rrdtool -y
```

Install and enable NTP

```
# yum install chrony -y
```

Set Timezone

```
# timedatectl set-timezone Asia/Dhaka
```

Verify System Time

```
# timedatectl
```

```
               Local time: Fri 2020-11-27 16:24:04 +06
           Universal time: Fri 2020-11-27 10:24:04 UTC
                 RTC time: Fri 2020-11-27 10:24:03
                Time zone: Asia/Dhaka (+06, +0600)
System clock synchronized: yes
              NTP service: active
          RTC in local TZ: no
```

Install Cacti on RHEL / CentOS-8

Configure time zone in php

```
vim /etc/php.ini
```

```
[Date]
; Defines the default timezone used by the date functions
; http://php.net/date.timezone
date.timezone = 'Asia/Dhaka'
```

Change PHP memory limit to 512M

```
memory_limit = 512M
```

Change PHP `max_execution_time` **to 300**

```
max_execution_time = 300
```

Restart php-fpm and httpd service.

```
# systemctl restart php-fpm
# systemctl restart httpd
```

Tuning MySQL for Cacti: Cacti recommend changing MySQL variables settings for better performances. Edit configuration file depends on the operating system.

```
vi /etc/my.cnf.d/mariadb-server.cnf
```

Add variables in the `[mysqld]` section.

```
collation-server=utf8mb4_unicode_ci
character-set-server=utf8mb4
max_heap_table_size=128M
tmp_table_size=128M
join_buffer_size=256M
# 25% Of Total System Memory
innodb_buffer_pool_size=2GB
# pool_size/128 for less than 1GB of memory
innodb_buffer_pool_instances=24
innodb_flush_log_at_timeout=3
```

```
innodb_read_io_threads=32
innodb_write_io_threads=16
innodb_io_capacity=5000
innodb_io_capacity_max=10000
innodb_large_prefix=1
innodb_file_format=Barracuda
```

Restart the service.

```
systemctl restart mariadb
```

Configure Database for cacti

```
# mysql -u root -p
Password:
MariaDB [(none)]>
MariaDB [(none)]> CREATE DATABASE cacti;
MariaDB [(none)]> GRANT ALL ON cacti.* TO cactiuser@localhost IDENTIFIED
 BY "cactipassword";
MariaDB [(none)]> grant select on mysql.time_zone_name to
 cactiuser@localhost;
MariaDB [(none)]> FLUSH PRIVILEGES;
MariaDB [(none)]> quit
Bye
```

Setup mysql timezone for cacti database user:

```
[root@ns1 cacti]# mysql_tzinfo_to_sql /usr/share/zoneinfo | mysql -u root -p mysql
```

Download and Install cacti: Download the latest release of Cacti tarball to your system.

```
# cd /opt
# wget https://www.cacti.net/downloads/cacti-latest.tar.gz
# tar -zxvf cacti-latest.tar.gz
```

See the version extracted and move to /var/www/html directory:

```
# ls -la
drwxrwxr-x. 17 jamie projects     4096 Nov  2 09:26 cacti-1.2.16
-rw-r--r--.  1 root  root     29148789 Nov  3 00:56 cacti-latest.tar.gz

# mv cacti-1.2.16 /var/www/html/cacti
# cd /var/www/html/cacti
```

Import Database Schema:

```
[root@localhost cacti]# mysql -u root -p cacti < /var/www/html/cacti/cacti.sql
Enter password:
```

Configure Cacti:

Edit the file `/var/www/html/cacti/include/config.php` and set database connection parameters.

```
# vi /var/www/html/cacti/include/config.php
```

```
$database_type     = 'mysql';
$database_default  = 'cacti';
$database_hostname = 'localhost';
$database_username = 'cactiuser';
$database_password = 'cactipassword';
$database_port     = '3306';
```

Replace **cactipassword** with your cacti user database password. When done. save file and exit.

Create Cacti system log file.

```
touch /var/www/html/cacti/log/cacti.log
```

Set directory permissions

```
chown -R apache:apache  /var/www/html/cacti
```

Setup Cacti cron job.

```
crontab -u apache -e
```

Add below.

```
*/5 * * * * php /var/www/html/cacti/poller.php > /dev/null 2>&1
```

Apache Configure:

```
[root@ns1 cacti]# vim /etc/httpd/conf.d/cacti.conf
```

```
Alias /cacti    /var/www/html/cacti

<Directory /var/www/html/cacti>
        <IfModule mod_authz_core.c>
                # httpd 2.4
                Require all granted
                # host localhost
        </IfModule>
        <IfModule !mod_authz_core.c>
                # httpd 2.2
                Order deny,allow
                # Deny from all
                Allow from All
        </IfModule>
```

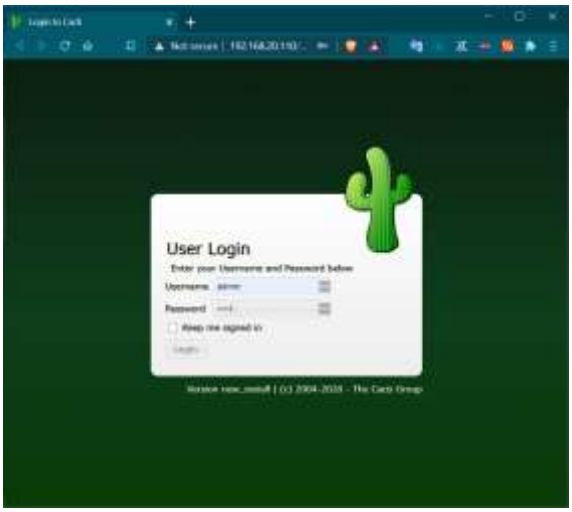
```
</Directory>
```

Restart Apache:

```
[root@ns1 ~]# systemctl restart httpd
```

Up to this point, we've covered complete configuration of cacti now to complete installation open the link using your IP address:

http://Server-IP/cacti



The default Logins are:

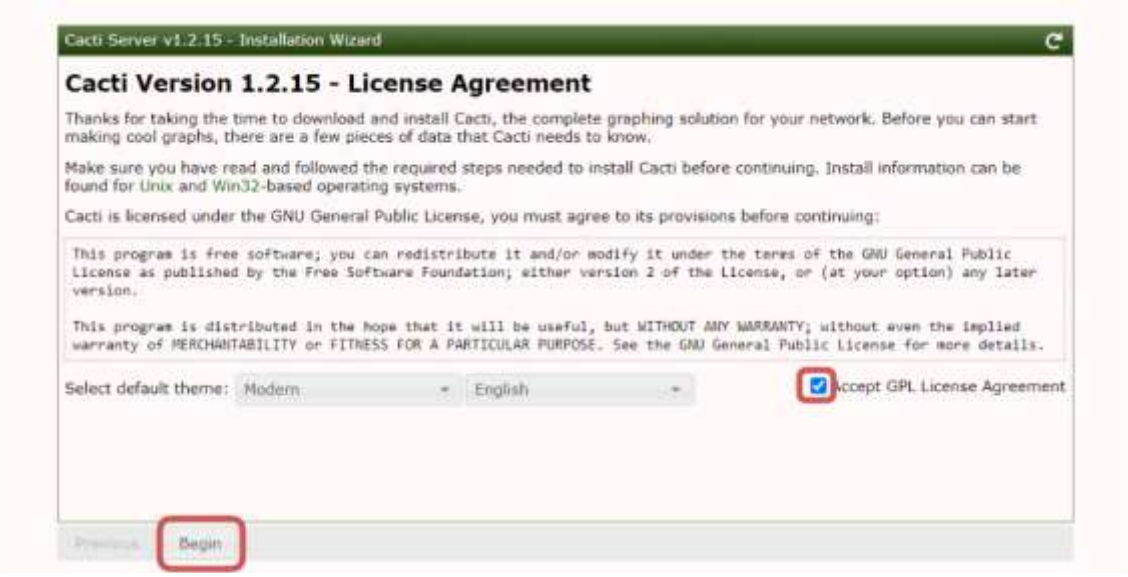
```
Username: admin
Password: admin
```

Change default password:

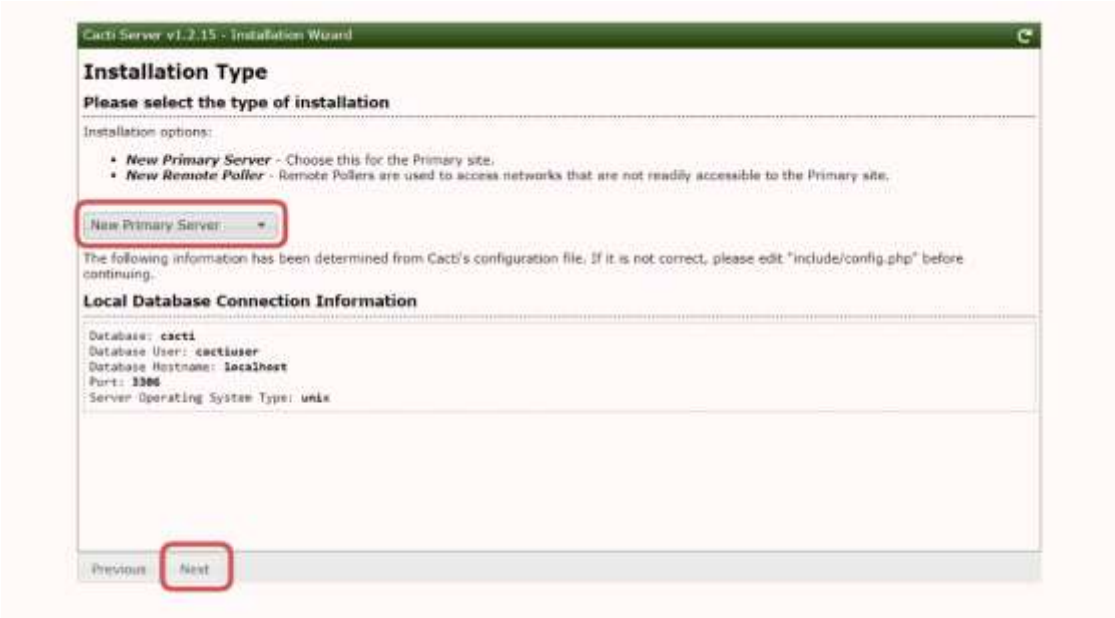
The new password should:

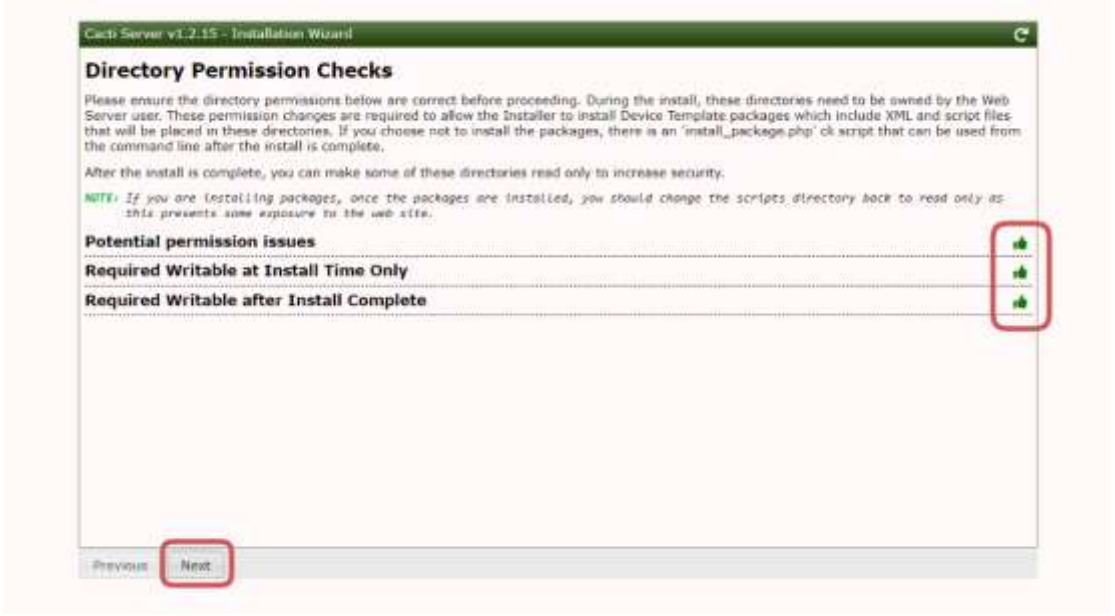
- Contain at least 1 numerical character!
- Contain at least 1 special character!


Change Password
Please enter your new Cacti password.
Current password
New password
Confirm new password
Save


Cacti Server v1.2.15 - Installation Wizard
Cacti Version 1.2.15 - License Agreement
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.
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.
Select default theme:
Modern
English
Accept GPL License Agreement
Previous
Begin

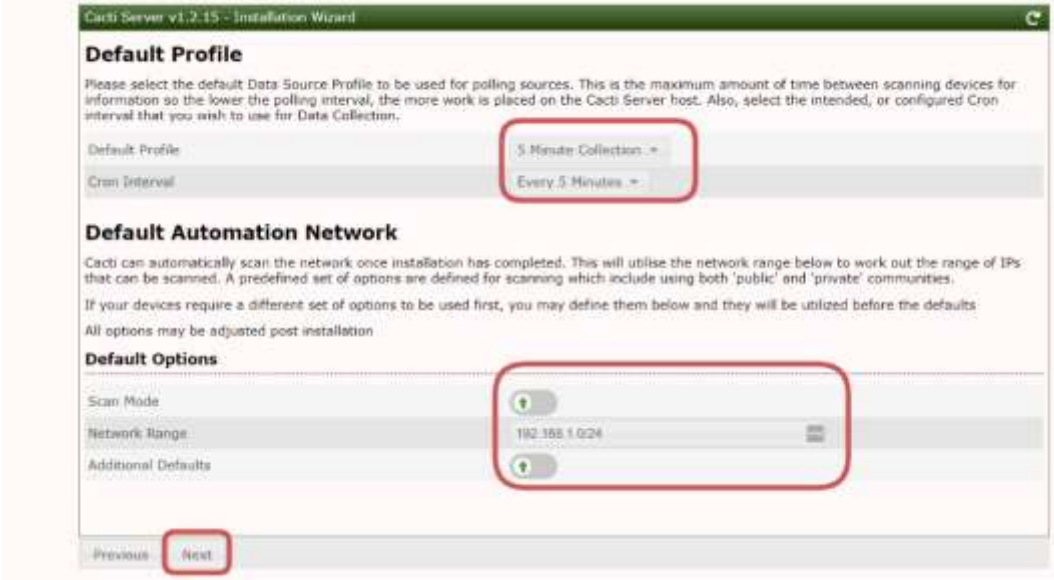

Cacti Server v1.2.15 - Installation Wizard
Pre-installation Checks
Location checks
PHP - Recommendations (web)
PHP - Recommendations (cli)
PHP - Module Support (Required)
PHP - Module Support (Optional)
MySQL - TimeZone Support
MySQL - Settings
These MySQL performance tuning settings will help your Cacti system perform better without issues for a longer time.
Recommended MySQL System Variable Settings
Variable
Current Value
Recommended Value
Comments
version
10.3.17-MariaDB
>= 5.6
MySQL 5.6+ and MariaDB 10.0+ are great releases, and are very good versions to choose. Make sure you run the very latest release though which fixes a long standing low level networking issue that was causing spine many issues with reliability.
collation_server
utf8mb4_unicode_ci
=
utf8mb4_unicode_ci
When using Cacti with languages other than English, it is important to use the utf8mb4_unicode_ci collation type as some
Previous
Next

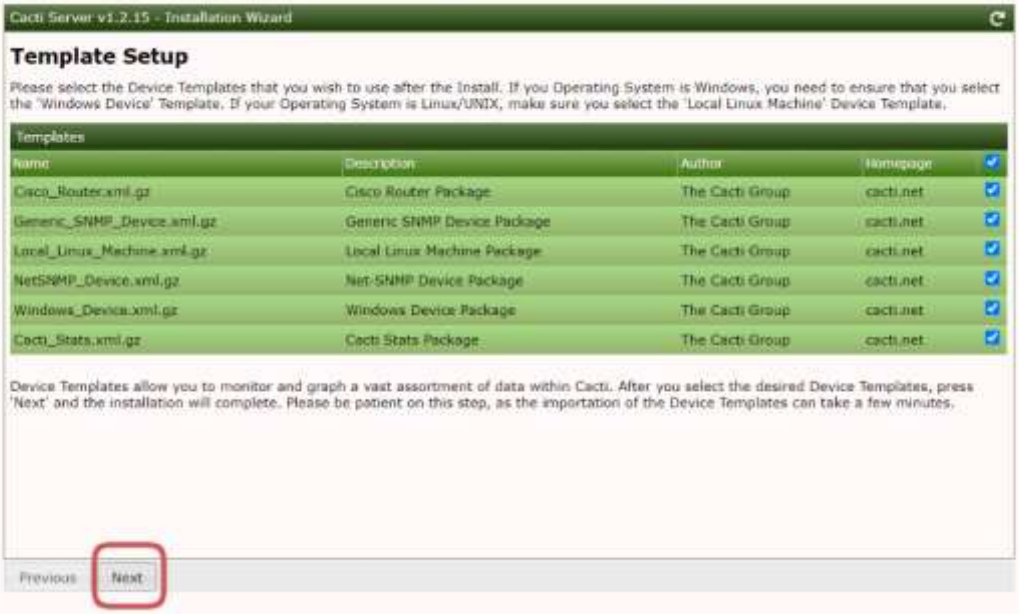

Cacti Server v1.2.15 - Installation Wizard
Installation Type
Please select the type of installation
Installation options:
New Primary Server - Choose this for the Primary site.
New Remote Poller - Remote Pollers are used to access networks that are not readily accessible to the Primary site.
New Primary Server
The following information has been determined from Cacti's configuration file. If it is not correct, please edit "include/config.php" before continuing.
Local Database Connection Information
Database: cacti
Database User: cactiuser
Database Hostname: localhost
Port: 3306
Server Operating System Type: unix
Previous
Next

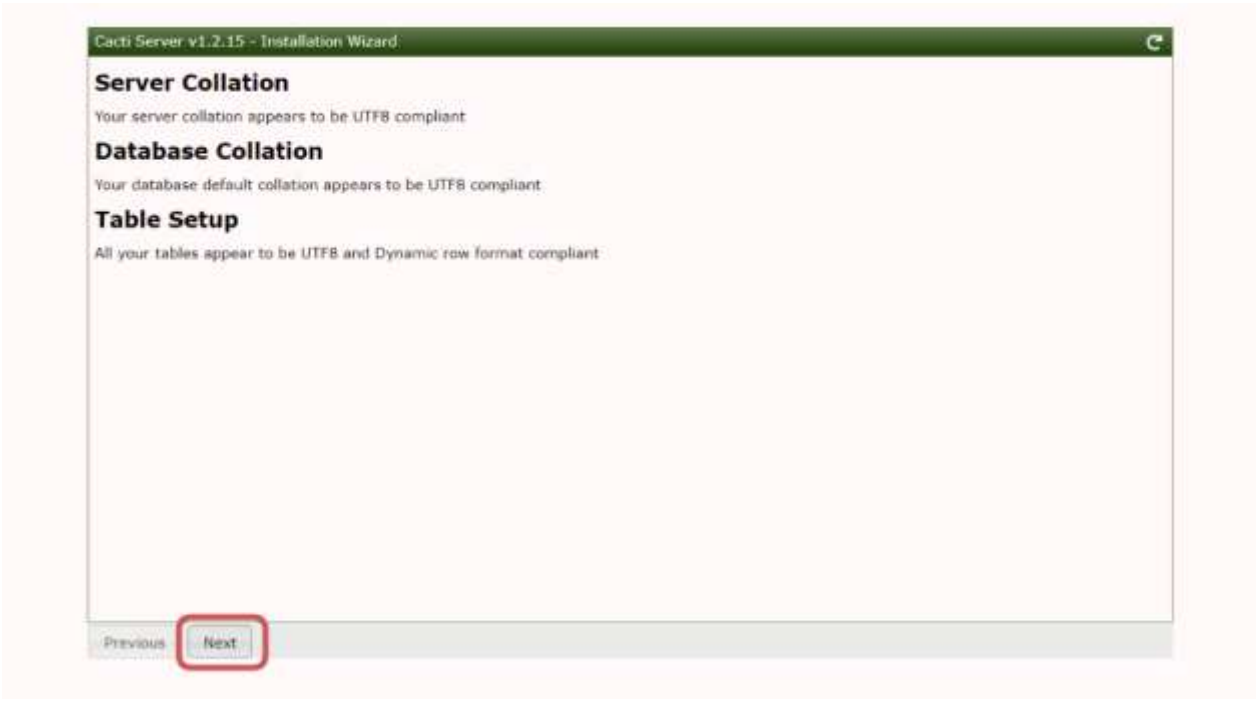

Cacti Server v1.2.15 - Installation Wizard
Directory Permission Checks
Please ensure the directory permissions below are correct before proceeding. During the install, these directories need to be owned by the Web Server user. These permission changes are required to allow the Installer to install Device Template packages which include XML and script files that will be placed in these directories. If you choose not to install the packages, there is an 'install_package.php' cli script that can be used from the command line after the install is complete.
After the install is complete, you can make some of these directories read only to increase security.
NOTE: If you are installing packages, once the packages are installed, you should change the scripts directory back to read only as this presents some exposure to the web site.
Potential permission issues
Required Writable at Install Time Only
Required Writable after Install Complete
Previous
Next

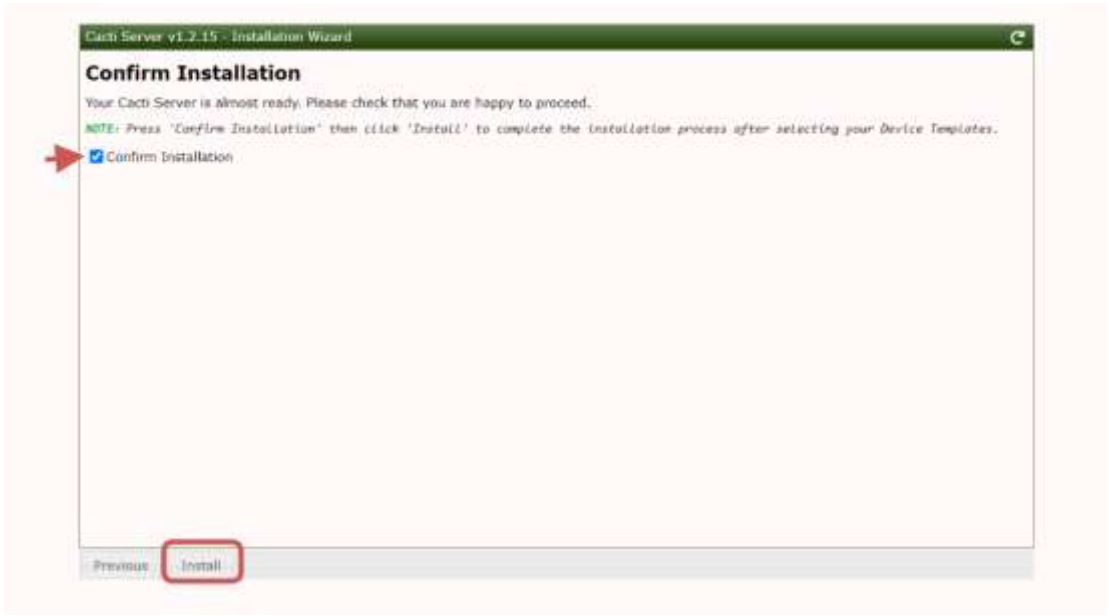

Cacti Server v1.2.15 - Installation Wizard
Critical Binary Locations and Versions
Make sure all of these values are correct before continuing.
PHP Binary Path
RRDtool Binary Path
snmpwalk Binary Path
snmpget Binary Path
snmpbulkwalk Binary Path
snmpgetnext Binary Path
snmptrap Binary Path
Sendmail Path
Spine Binary File Location
Spine Config File Path
Cacti Log Path
Poller Standard Error Log Path
RRDtool Version
RRDtool 1.7+
Previous
Next

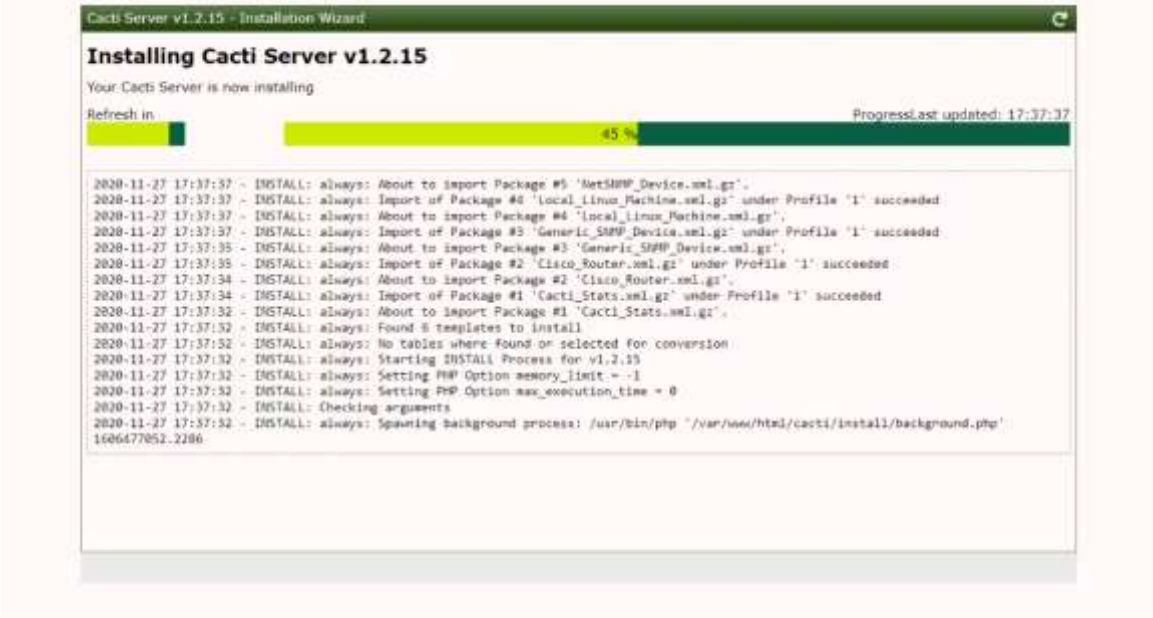

Cacti Server v1.2.15 - Installation Wizard
Input Validation Whitelist Protection
Cacti Data Input methods that call a script can be exploited in ways that a non-administrator can perform damage to either files owned by the poller account, and in cases where someone runs the Cacti poller as root, can compromise the operating system allowing attackers to exploit your infrastructure.
Therefore, several versions ago, Cacti was enhanced to provide Whitelist capabilities on the these types of Data Input Methods. Though this does secure Cacti more thouroughly, it does increase the amount of work required by the Cacti administrator to import and manage Templates and Packages.
The way that the Whitelisting works is that when you first import a Data Input Method, or you re-import a Data Input Method, and the script and or aguments change in any way, the Data Input Method, and all the corresponding Data Sources will be immediatly disabled until the administrator validates that the Data Input Method is valid.
To make identifying Data Input Methods in this state, we have provided a validation script in Cacti's CLI directory that can be run with the following options:
php -q input_whitelist.php --audit - This script option will search for any Data Input Methods that are currently banned and provide details as to why.
php -q input_whitelist.php --update - This script option un-ban the Data Input Methods that are currently banned.
php -q input_whitelist.php --push - This script option will re-enable any disabled Data Sources.
It is strongly suggested that you update your config.php to enable this feature by uncommenting the $input_whitelist variable and then running the three CLI script options above after the web based install has completed.
Check the Checkbox below to acknowledge that you have read and understand this security concern
I have read this statement
Previous
Next

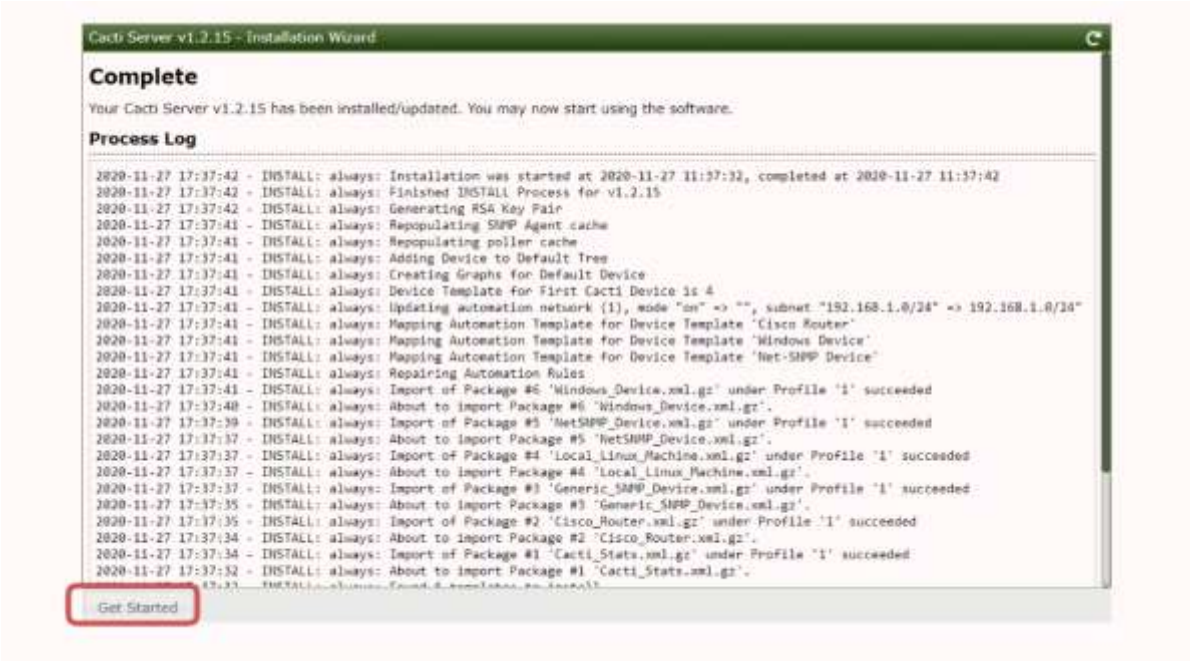

Cacti Server v1.2.15 - Installation Wizard
Default Profile
Please select the default Data Source Profile to be used for polling sources. This is the maximum amount of time between scanning devices for information so the lower the polling interval, the more work is placed on the Cacti Server host. Also, select the intended, or configured Cron interval that you wish to use for Data Collection.
Default Profile
5 Minute Collection
Cron Interval
Every 5 Minutes
Default Automation Network
Cacti can automatically scan the network once installation has completed. This will utilise the network range below to work out the range of IPs that can be scanned. A predefined set of options are defined for scanning which include using both 'public' and 'private' communities.
If your devices require a different set of options to be used first, you may define them below and they will be utilized before the defaults
All options may be adjusted post installation
Default Options
Scan Mode
Network Range
192.168.1.0/24
Additional Defaults
Previous
Next

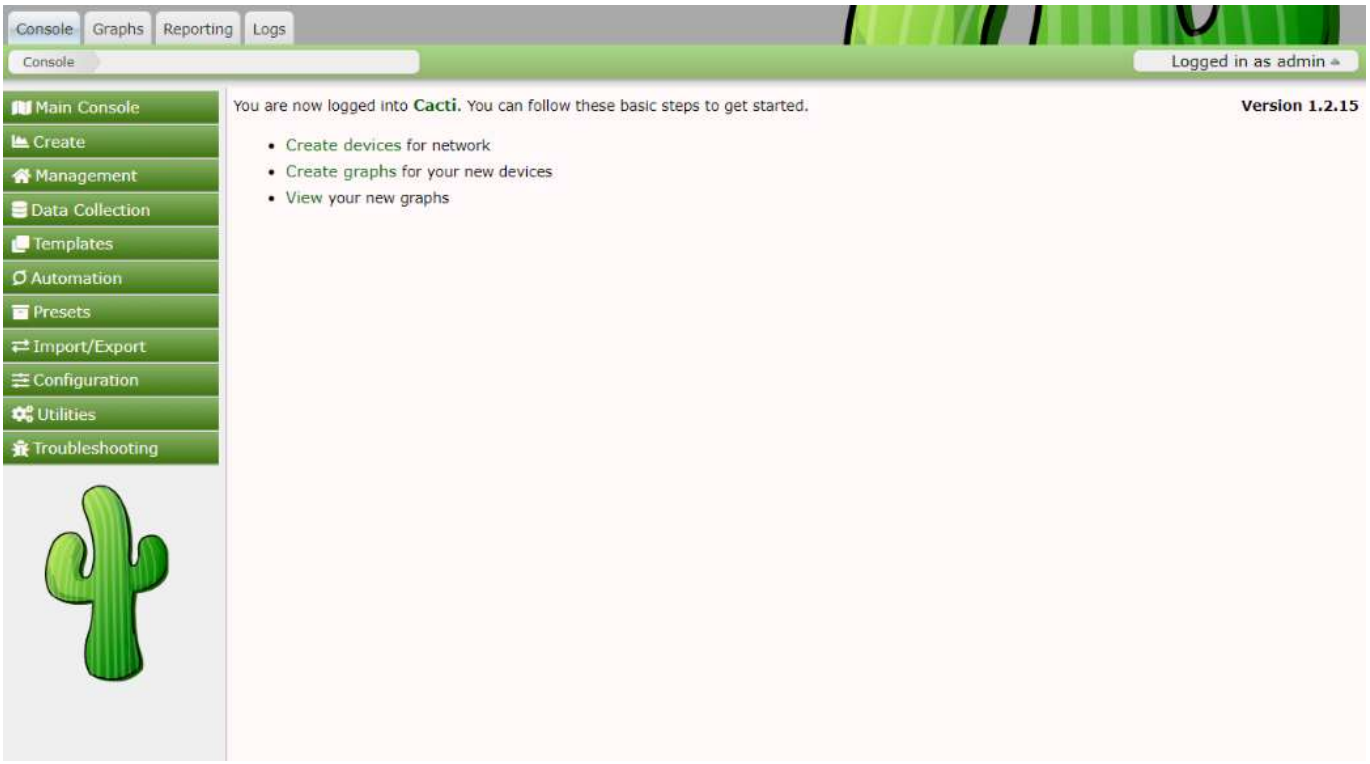

Cacti Server v1.2.15 - Installation Wizard
Template Setup
Please select the Device Templates that you wish to use after the Install. If you Operating System is Windows, you need to ensure that you select the 'Windows Device' Template. If your Operating System is Linux/UNIX, make sure you select the 'Local Linux Machine' Device Template.
Templates
Name
Description
Author
Homepage
Cisco_Router.xml.gz
Cisco Router Package
The Cacti Group
cacti.net
Generic_SNMP_Device.xml.gz
Generic SNMP Device Package
The Cacti Group
cacti.net
Local_Linux_Machine.xml.gz
Local Linux Machine Package
The Cacti Group
cacti.net
NetSNMP_Device.xml.gz
Net-SNMP Device Package
The Cacti Group
cacti.net
Windows_Device.xml.gz
Windows Device Package
The Cacti Group
cacti.net
Cacti_Stats.xml.gz
Cacti Stats Package
The Cacti Group
cacti.net
Device Templates allow you to monitor and graph a vast assortment of data within Cacti. After you select the desired Device Templates, press 'Next' and the installation will complete. Please be patient on this step, as the importation of the Device Templates can take a few minutes.
Previous
Next


Cacti Server v1.2.15 - Installation Wizard
Server Collation
Your server collation appears to be UTF8 compliant
Database Collation
Your database default collation appears to be UTF8 compliant
Table Setup
All your tables appear to be UTF8 and Dynamic row format compliant
Previous
Next

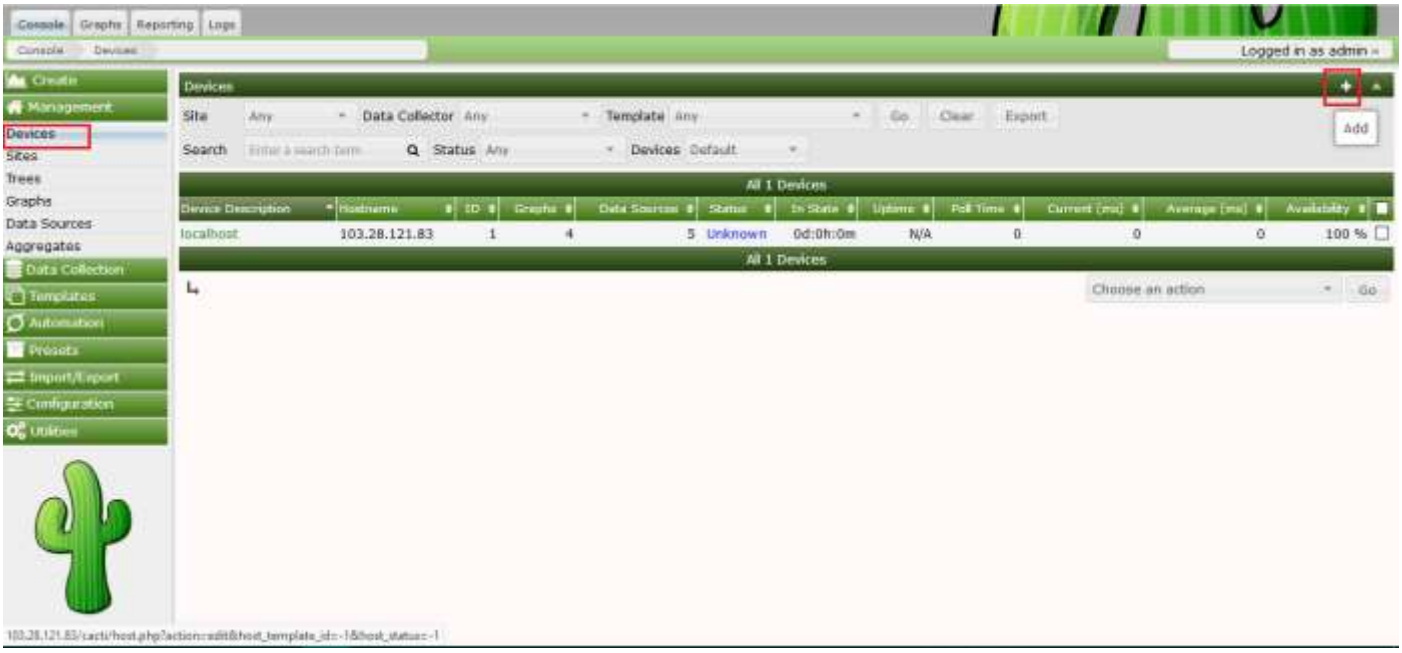

Cacti Server v1.2.15 - Installation Wizard
Confirm Installation
Your Cacti Server is almost ready. Please check that you are happy to proceed.
NOTE: Press 'Confirm Installation' then click 'Install' to complete the installation process after selecting your Device Templates.
Confirm Installation
Previous
Install


Cacti Server v1.2.15 - Installation Wizard
Installing Cacti Server v1.2.15
Your Cacti Server is now installing
Refresh in
Progress
Last updated: 17:37:37
45 %
2020-11-27 17:37:37 - INSTALL: always: About to import Package #5 'NetSNMP_Device.xml.gz'.
2020-11-27 17:37:37 - INSTALL: always: Import of Package #4 'Local_Linux_Machine.xml.gz' under Profile '1' succeeded
2020-11-27 17:37:37 - INSTALL: always: About to import Package #4 'Local_Linux_Machine.xml.gz'.
2020-11-27 17:37:37 - INSTALL: always: Import of Package #3 'Generic_SNMP_Device.xml.gz' under Profile '1' succeeded
2020-11-27 17:37:35 - INSTALL: always: About to import Package #3 'Generic_SNMP_Device.xml.gz'.
2020-11-27 17:37:35 - INSTALL: always: Import of Package #2 'Cisco_Router.xml.gz' under Profile '1' succeeded
2020-11-27 17:37:34 - INSTALL: always: About to import Package #2 'Cisco_Router.xml.gz'.
2020-11-27 17:37:34 - INSTALL: always: Import of Package #1 'Cacti_Stats.xml.gz' under Profile '1' succeeded
2020-11-27 17:37:32 - INSTALL: always: About to import Package #1 'Cacti_Stats.xml.gz'.
2020-11-27 17:37:32 - INSTALL: always: Found 6 templates to install
2020-11-27 17:37:32 - INSTALL: always: No tables where found or selected for conversion
2020-11-27 17:37:32 - INSTALL: always: Starting INSTALL Process for v1.2.15
2020-11-27 17:37:32 - INSTALL: always: Setting PHP Option memory_limit = -1
2020-11-27 17:37:32 - INSTALL: always: Setting PHP Option max_execution_time = 0
2020-11-27 17:37:32 - INSTALL: Checking arguments
2020-11-27 17:37:32 - INSTALL: always: Spawning background process: /usr/bin/php "/var/www/html/cacti/install/background.php"
1606477052.2286



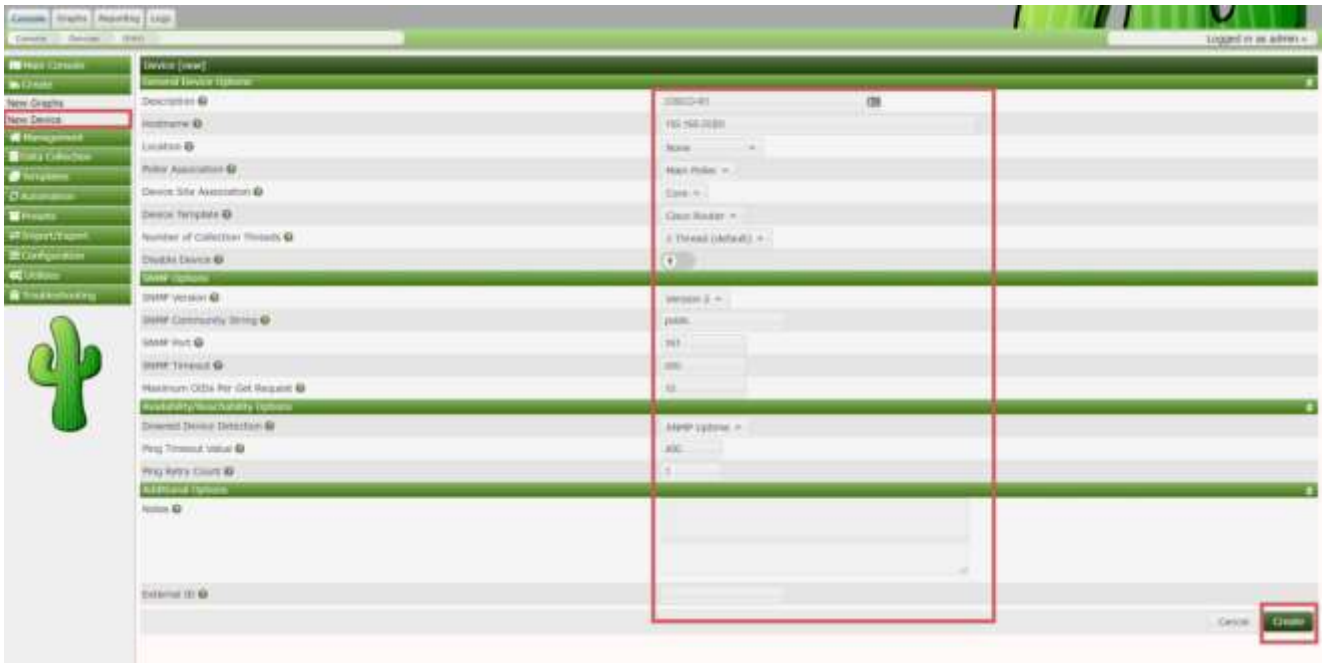


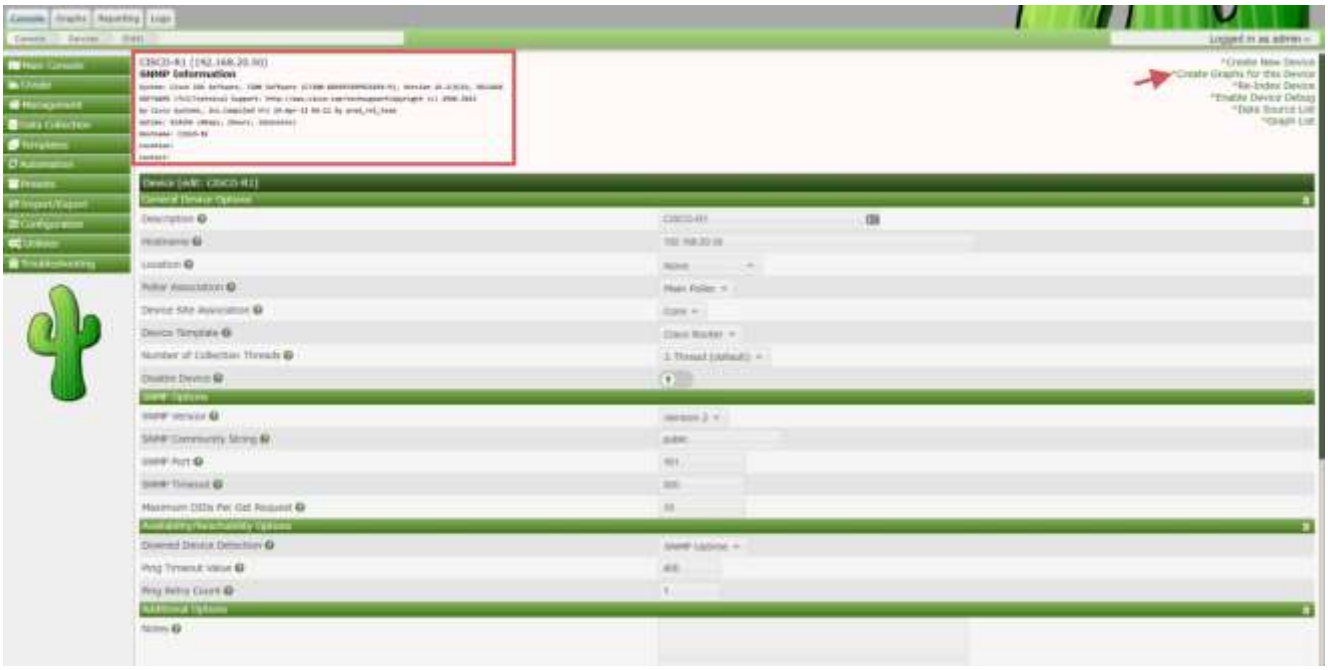
Now you have to add devices to create graph.

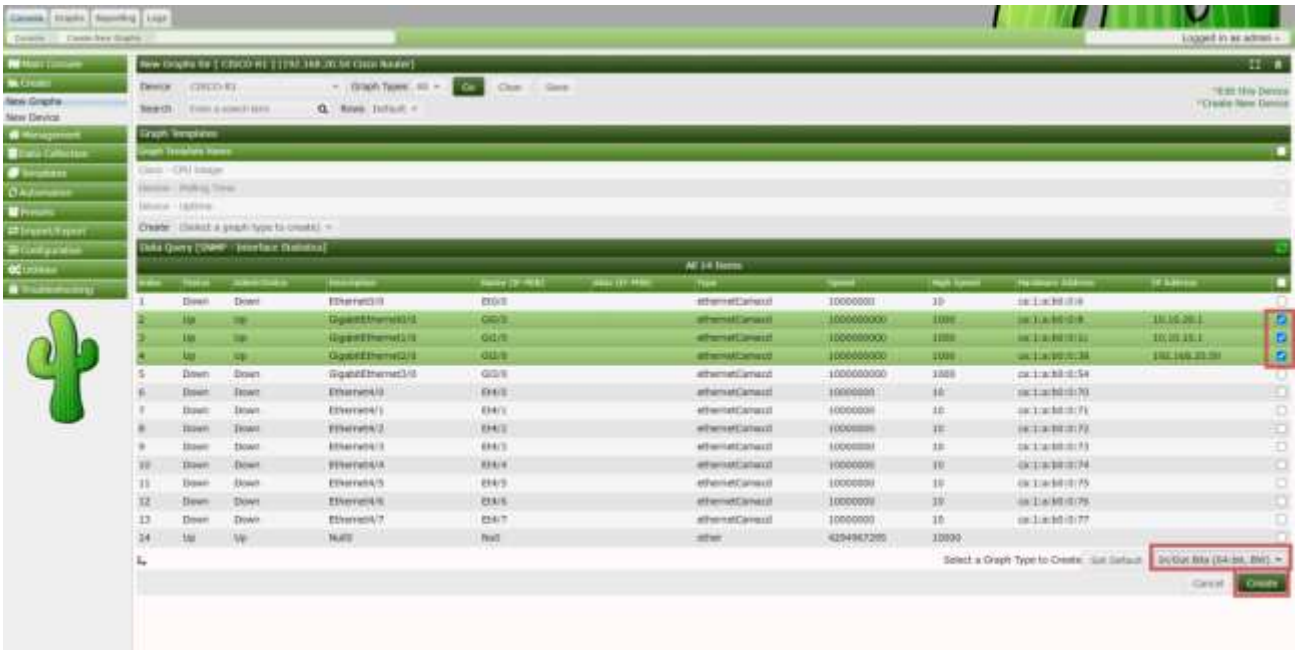


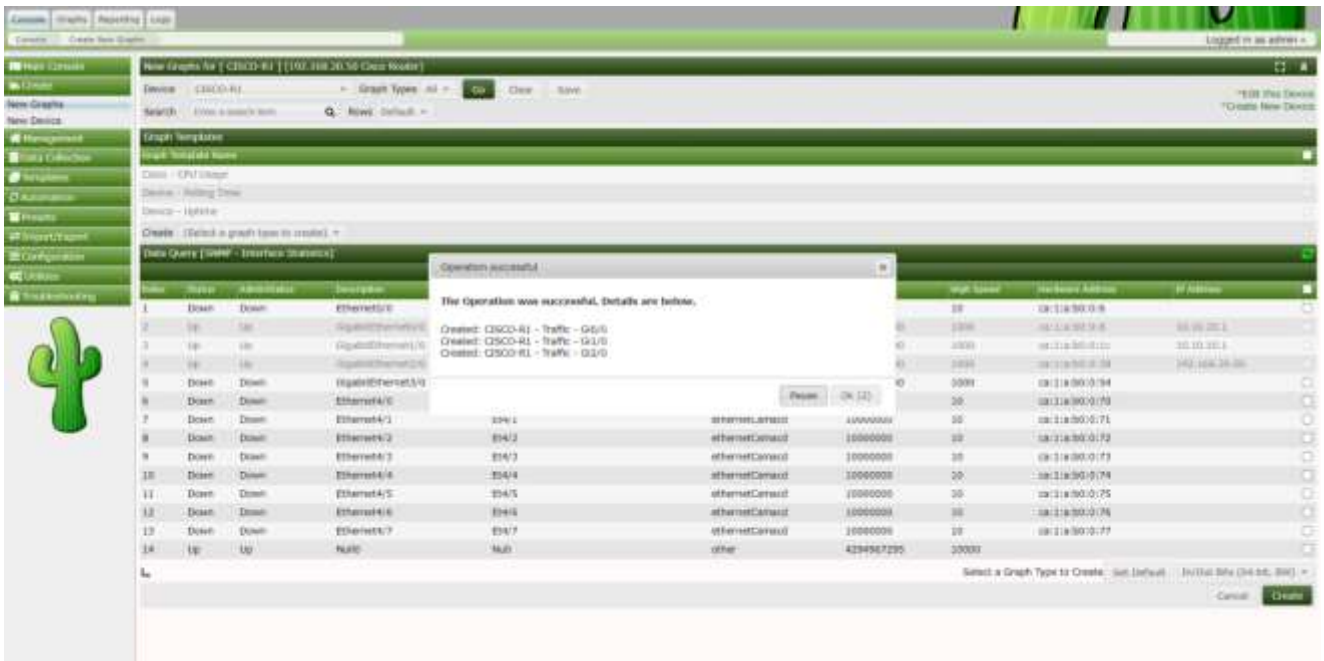
Before going start add devices check the snmp status of the devices:

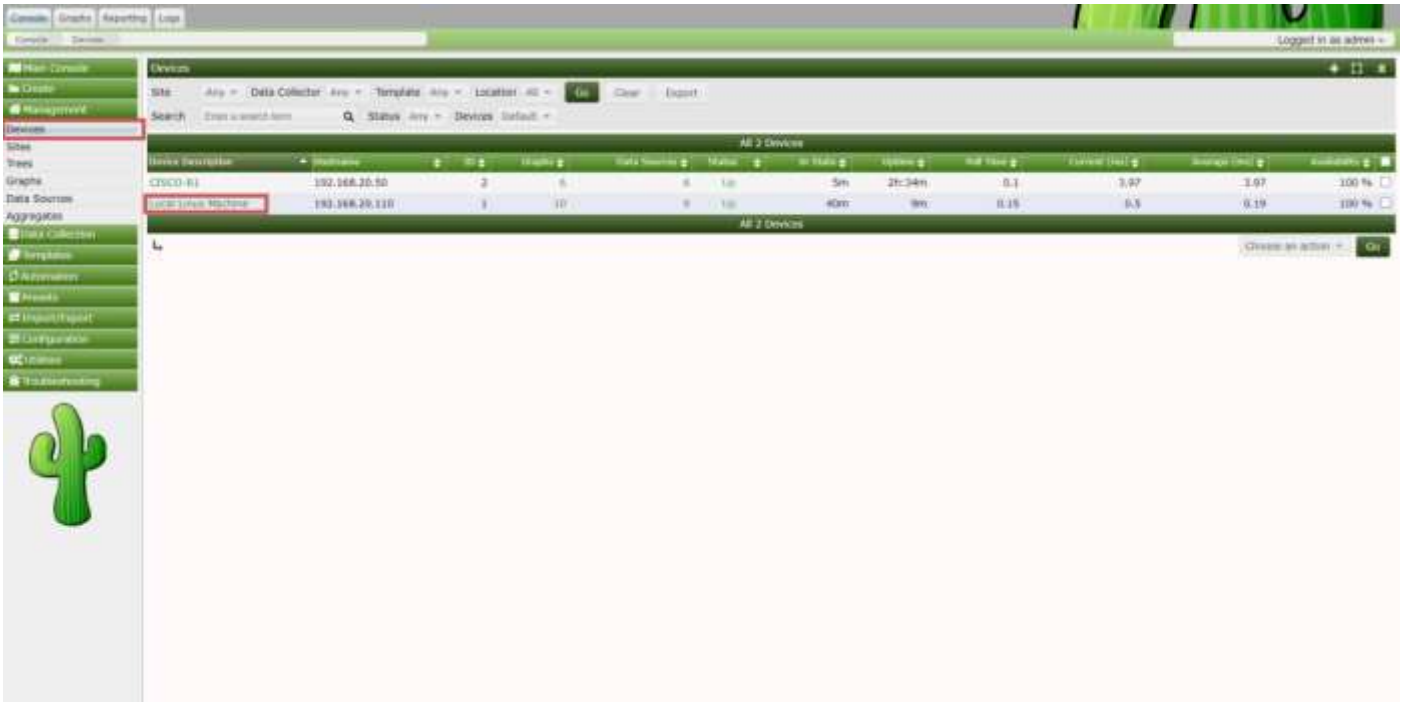
```
snmpwalk -v 2c -c public -O e 127.0.0.1
snmpwalk -v 2c -c public -O e <IP-OF-THE-HOST>
```

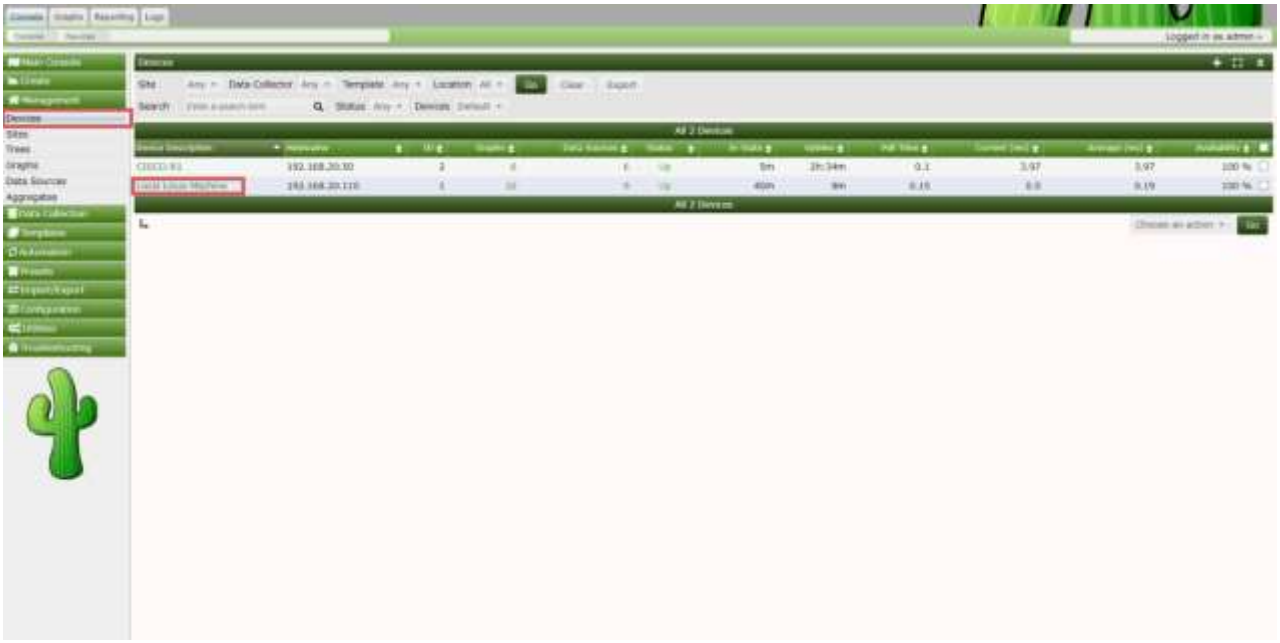


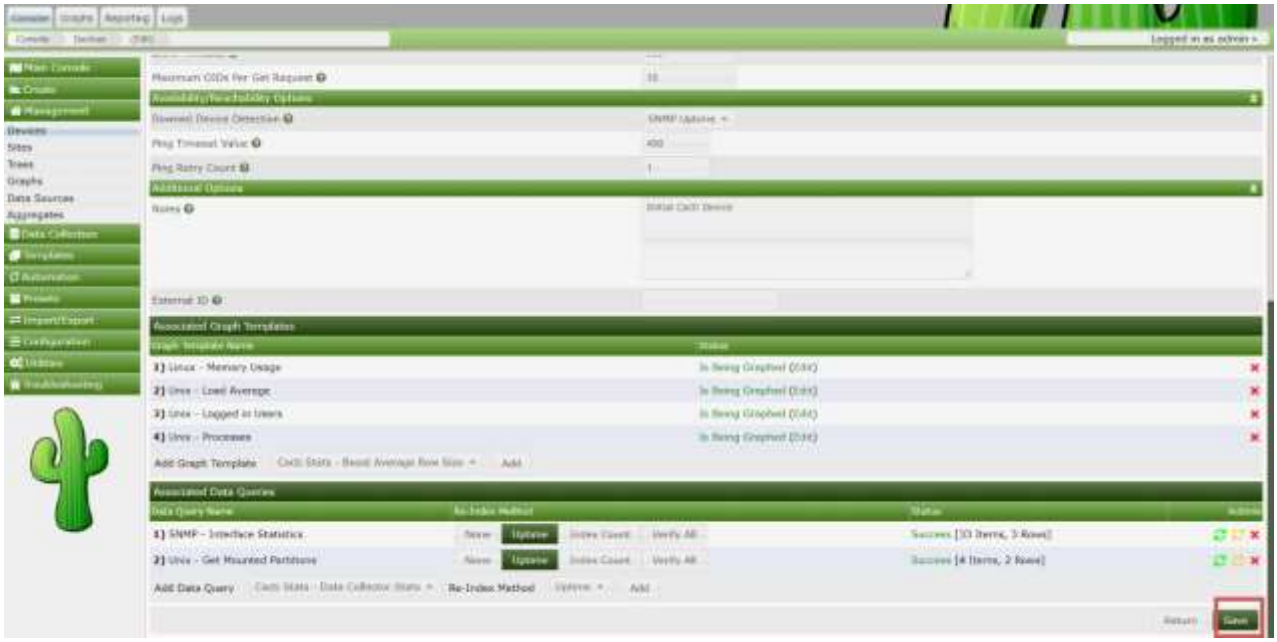


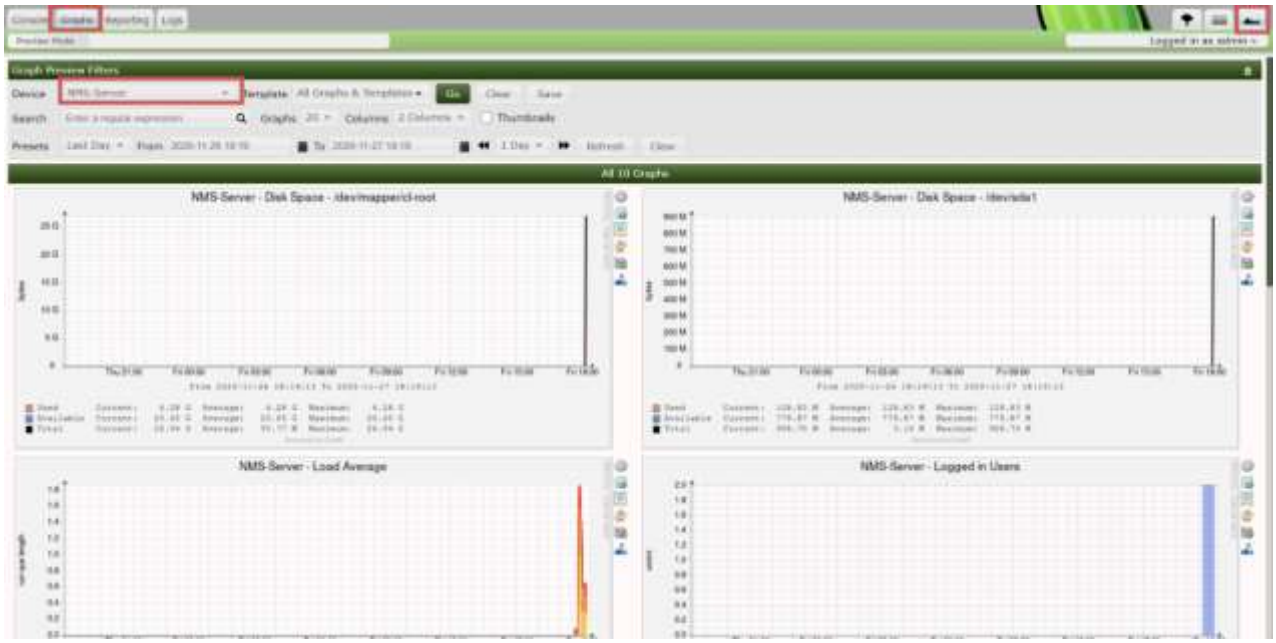












Install Plugins ins cacti:

Link: https://github.com/Cacti

Install Monitor Plugin: to install monitor plugin require to install thold plugin first.

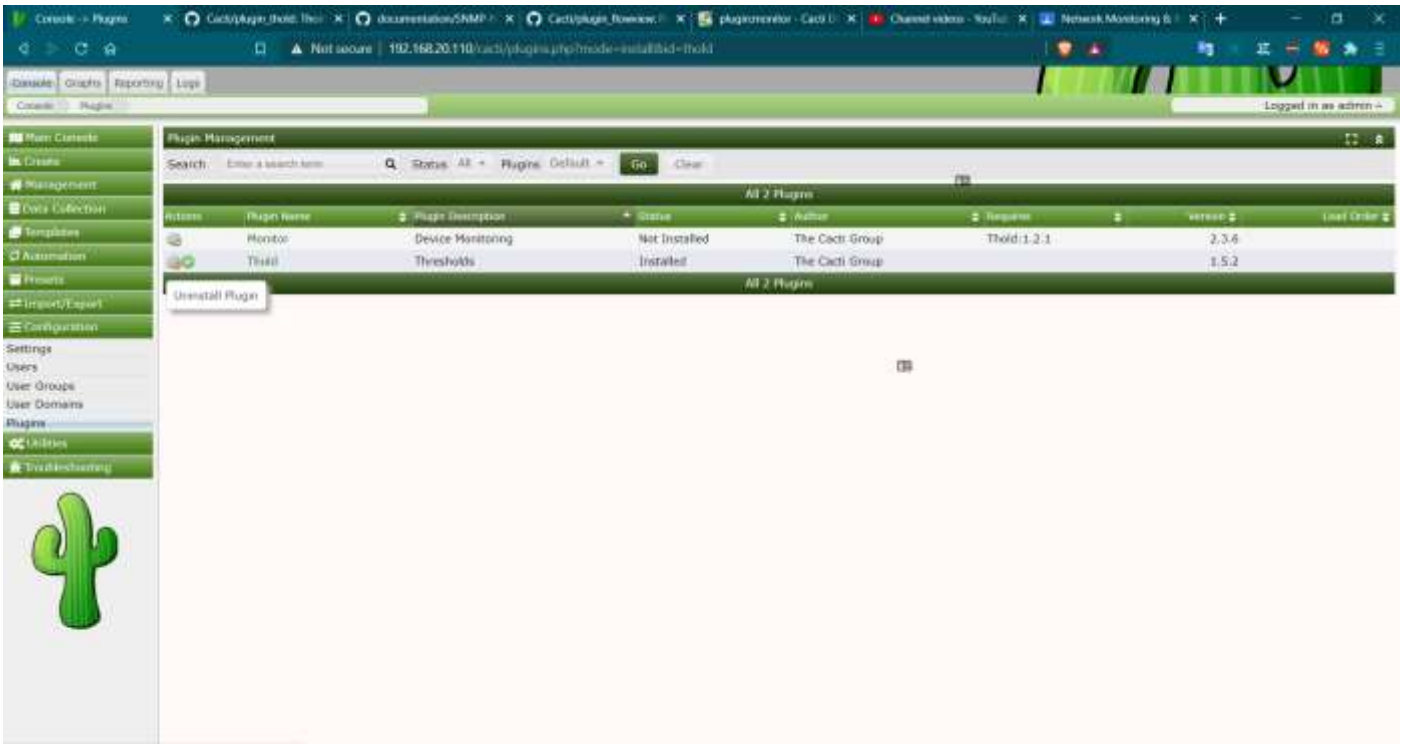
```
# cd /var/www/html/cacti/plugins
# git clone https://github.com/Cacti/plugin_thold.git

Cloning into 'plugin_thold'...
remote: Enumerating objects: 90, done.
remote: Counting objects: 100% (90/90), done.
remote: Compressing objects: 100% (65/65), done.
remote: Total 5368 (delta 48), reused 57 (delta 25), pack-reused 5278
Receiving objects: 100% (5368/5368), 4.91 MiB | 116.00 KiB/s, done.
Resolving deltas: 100% (4058/4058), done.
```

```
[root@localhost plugins]# ls
index.php  monitor  plugin_thold

[root@localhost plugins]# mv plugin_thold thold

[root@localhost plugins]# chown -R  apache.apache thold/
```




```
#cd /var/www/html/cacti/plugins
# git clone https://github.com/Cacti/plugin_monitor.git
# mv plugin_monitor monitor
# chown -R  apache.apache monitor/
```


Console
Graphs
Reporting
Logs
Trend
Monitor
Logged in as admin
Monitor Filter [Last Refresh: 7:10:41 pm] [Refresh Again in 295 Seconds]
Layout
Status
All Monitored
View
Default
Grouping
Default
Refresh
Save
New
Acknowledge
Search
Criticality
Deadliest
Size
Medium
Trim
Full
Refresh
5 Minutes
Monitored Devices
CISCO-R1
3h 29m
Mikrotik
6m
NMS-Server
1h 4m
All Monitored Devices, and All Criticalities