



## Rapport TP CACTI & GNS<sub>3</sub>

Réalisé par :

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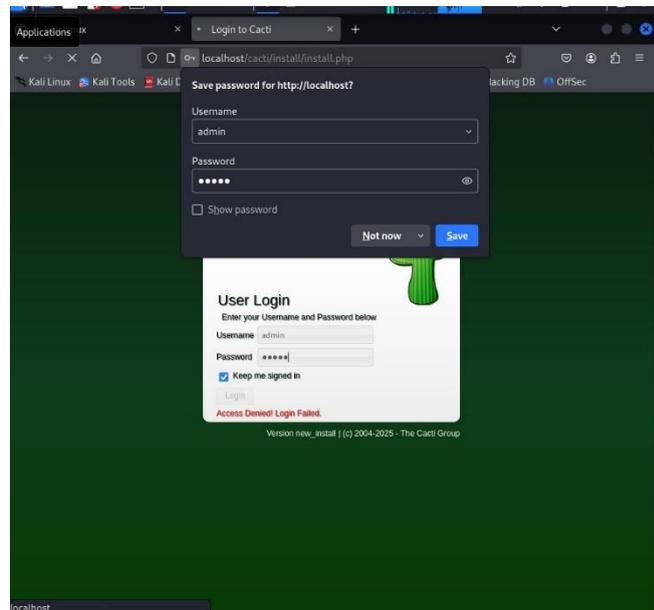
Encadré par:

Pr. J. JEBRANE

## 1. Configuration de CACTI :

Après avoir suivi les étapes d'installation de Cacti, nous sommes arrivés aux étapes suivantes :

- Login :



- Vérifions l'installation de tous les composants : mysql , PHP .... :

Cacti Server v1.2.29 - 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.

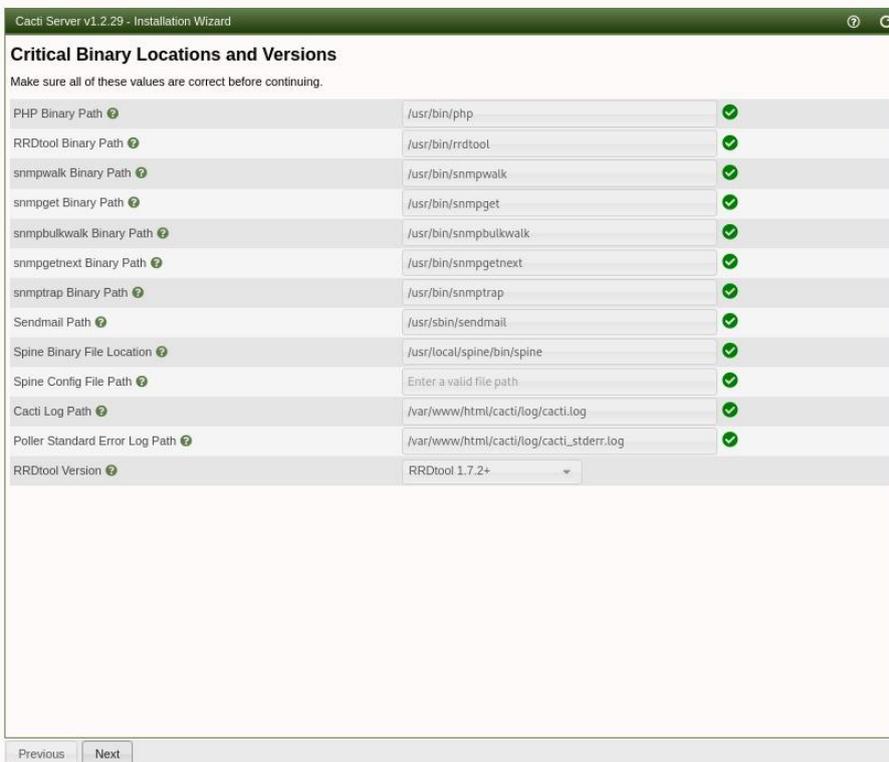
#### Recommended MySQL System Variable Settings

MariaDB Tuning (/etc/my.cnf) - [ Documentation ] Note: Many changes below require a database restart

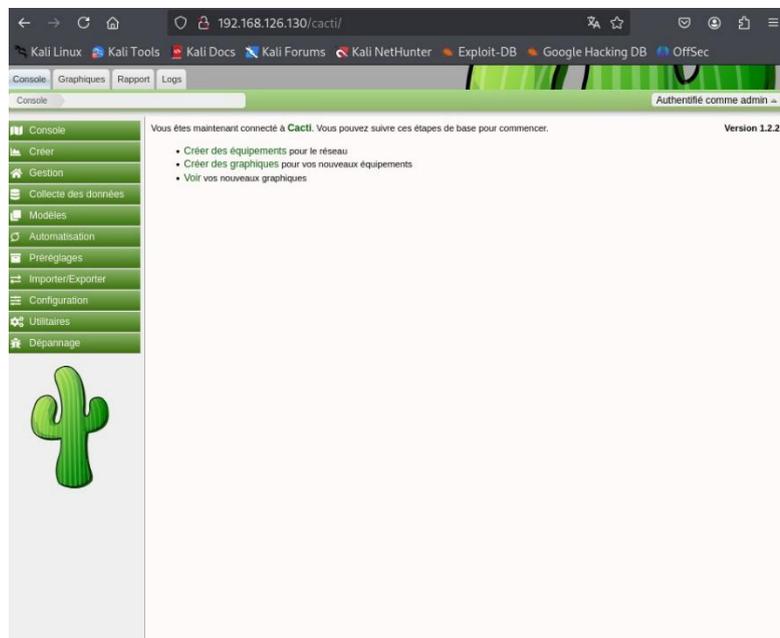
Variable	Current Value	Recommended Value	Comments
version	11.4.4-MariaDB-3 >= 5.6		MySQL 5.6+ and MariaDB 10.0+ are great releases, and are very good versions to choose. Make sure you run the very latest release though which fixes a long standing low level networking issue that was causing spine many 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 characters take more than a single byte.
character_set_server	utf8mb4 = utf8mb4		When using Cacti with languages other than English, it is important to use the utf8mb4 character set as some characters take more than a single byte.
character_set_client	utf8mb4 = utf8mb4		When using Cacti with languages other than English, it is important to use the utf8mb4 character set as some characters take more than a single byte.
max_connections	151 >= 100		Depending on the number of logins and use of spine data collector, MariaDB will need many connections. The calculation for spine is: total_connections = total_processes * (total_threads + script_servers + 1), then you must leave headroom for user connections, which will change depending on the number of concurrent login accounts.
max_allowed_packet	16777216 >= 16777216		With Remote polling capabilities, large amounts of data will be synced from the main server to the remote pollers. Therefore, keep this value at or above 16M.
max_heap_table_size	128 M >= 30.84 M		If using the Cacti Performance Booster and choosing a memory storage engine, you have to be careful to flush your Performance Booster buffer before the system runs out of memory table space. This is done two ways, first reducing the size of your output column to just the right size. This column is in the tables poller_output, and poller_output_boost. The second thing you can do is allocate more memory to memory tables. We have arbitrarily chosen a recommended value of 10% of system memory, but if you are using SSD disk drives, or have a smaller system, you may ignore this recommendation or choose a different storage engine. You may see the expected consumption of the Performance Booster tables under Console -> System Utilities -> View Boost Status.

Previous Next

- Vérifions binary locations :



- Enfin, Cacti est prêt :



## 2. Configuration de GNS3 :

- Après avoir suivi les étapes citées dans la documentation GNS3, nous avons pu l'installer correctement :

docs.gns3.com/docs/getting-started/installation/linux/

Google Drive OneDrive YouTube Gmail ChatGPT DeepSeek LinkedIn Outlook ENSA Khouribga IG Browser-Sandbox SecDojo All labs | Web S

GNS3 Documentation Appliances

Getting Started

- What is GNS3?
- Installation
  - Windows
  - Mac
  - Linux**
  - ESXi
  - Remote Server
  - Download the GNS3 VM
  - Download for Windows 32-bit

Getting Started Installation **Linux**

# GNS3 Linux Install

## Ubuntu-based distributions (64-bit only)

These instructions are for Ubuntu and all distributions based on it (like Linux Mint).

```
sudo add-apt-repository ppa:gns3/ppa
sudo apt update
sudo apt install gns3-gui gns3-server
```

(when prompted whether non-root users should be allowed to use wireshark and ubridge, select 'Yes' both times)

- Téléchargent Routeur C3725:

sysnettechsolutions.com/en/cisco-ios-download-for-gns3/

Google Drive OneDrive YouTube Gmail ChatGPT DeepSeek LinkedIn Outlook ENSA Khouribga IG Browser-San

c3660	12.4.19	c3660-a3jk9s-mz.124-19.bin	192 MB	Download
c3725	12.4.25d	c3725-adventerprisek9-mz.124-25d.bin	128 MB	Download
c3725	12.4.15T14	c3725-adventerprisek9-mz.124-15.T14.bin	256 MB	Download
c3745	12.4.25d	c3745-adventerprisek9-mz.124-25d.bin	256 MB	Download
c3745	12.4.15T14	c3745-adventerprisek9-mz.124-15.T14 bin	256 MB	Download

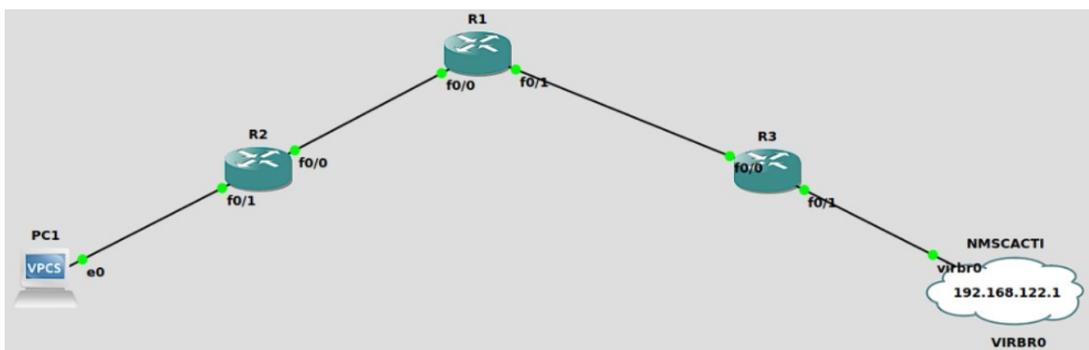
**Table of Contents**

- GNS3 Supported Cisco Router IOS Images Download
- Using Cisco IOS Network Devices with More Performance

**Filter**

 c3725

- Mettons la topologie :



- Configurons les routeurs:

R3:

```

R3#show ip interface brief
Interface              IP-Address      OK? Method Status      Prot
ocol
FastEthernet0/0        192.168.122.2   YES NVRAM   up          up
Serial0/0              unassigned      YES NVRAM   administratively down down
FastEthernet0/1        192.168.1.1    YES NVRAM   up          up
FastEthernet1/0        unassigned      YES NVRAM   administratively down down
R3#ping 192.168.122.1

```

ip route 192.168.3.0 255.255.255.0 192.168.1.2

```

Gateway of last resort is not set

C   192.168.122.0/24 is directly connected, FastEthernet0/1
C   192.168.1.0/24 is directly connected, FastEthernet0/0
S   192.168.2.0/24 [1/0] via 192.168.1.2
S   192.168.3.0/24 [1/0] via 192.168.1.2
R3#

```

R2:

```

R2#
R2#show ip interface brief
Interface              IP-Address      OK? Method Status      Prot
ocol
FastEthernet0/0        192.168.2.2    YES NVRAM   up          up
Serial0/0              unassigned      YES NVRAM   administratively down down
FastEthernet0/1        192.168.3.1    YES NVRAM   up          up
FastEthernet1/0        unassigned      YES NVRAM   administratively down down
R2#

```

ip route 192.168.122.0 255.255.255.0 192.168.2.1

```

Gateway of last resort is not set

S   192.168.122.0/24 [1/0] via 192.168.2.1
S   192.168.1.0/24 [1/0] via 192.168.2.1
C   192.168.2.0/24 is directly connected, FastEthernet0/0
C   192.168.3.0/24 is directly connected, FastEthernet0/1
R2#

```

R1:

```

*Mar 1 00:00:08.787: %LINK-5-CHANGED: Interface FastEthernet1/0, changed state
to administratively down
R1#
R1#show ip interface brief
Interface              IP-Address      OK? Method Status      Prot
ocol
FastEthernet0/0        192.168.2.1    YES NVRAM   up          up
Serial0/0              unassigned      YES NVRAM   administratively down down
FastEthernet0/1        192.168.1.2    YES NVRAM   up          up
FastEthernet1/0        unassigned      YES NVRAM   administratively down down
R1#

```

ip route 192.168.3.0 255.255.255.0 192.168.2.2

ip route 192.168.122.0 255.255.255.0 192.168.1.1



- Configurons PC1:

Testons connectivité du pc1 vers Cloud :

```
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.

PC1>
PC1>
PC1> ip 192.168.3.2 255.255.255.0 192.168.3.1
Checking for duplicate address...
PC1 : 192.168.3.2 255.255.255.0 gateway 192.168.3.1

PC1> ping 192.168.122.1

84 bytes from 192.168.122.1 icmp_seq=1 ttl=61 time=40.699 ms
84 bytes from 192.168.122.1 icmp_seq=2 ttl=61 time=41.800 ms
84 bytes from 192.168.122.1 icmp_seq=3 ttl=61 time=54.642 ms
84 bytes from 192.168.122.1 icmp_seq=4 ttl=61 time=47.782 ms
^C
```

### 3. Configuration de SNMPv3 :

- Sur le routeur R2 exécutant ces commandes :

```
snmp-server group MonGroupe v3 priv
snmp-server user MonUtilisateur MonGroupe v3 auth sha MonMotDePasse priv aes 128 MaCleDeChiffrement
```

```
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#snmp-server group MonGroupe v3 priv
R2(config)#v3 auth sha MonMotDePasse priv aes 128 MaCleDeChiffrement
R2(config)#
*Mar 1 00:03:05.823: Configuring snmpv3 USM user, persisting snmpEngineBoots. Please Wait...
R2(config)#}t
```

- Testons la Configuration SNMPv3 au niveau de cacti :

```
David@david-virtual-machine:~$ snmpwalk -v3 -u MonUtilisateur -l authPriv -a SHA -A MonMotDePasse -x AES -X MaCleDeChiffrement 192.168.2.2
iso.3.6.1.2.1.1.1.0 = STRING: "Cisco IOS Software, 3700 Software (C3725-ADVENTERPRISEK9-M), Version 12.4(15)T14, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Tue 17-Aug-10 12:08 by prod_rel_team"
iso.3.6.1.2.1.1.2.0 = OID: iso.3.6.1.4.1.9.1.122
iso.3.6.1.2.1.1.3.0 = Timeticks: (315580) 0:52:35.80
iso.3.6.1.2.1.1.4.0 = ""
iso.3.6.1.2.1.1.5.0 = STRING: "R2"
iso.3.6.1.2.1.1.6.0 = ""
iso.3.6.1.2.1.1.7.0 = INTEGER: 78
iso.3.6.1.2.1.1.8.0 = Timeticks: (0) 0:00:00.00
iso.3.6.1.2.1.1.9.1.2.1 = OID: iso.3.6.1.4.1.9.7.129
iso.3.6.1.2.1.1.9.1.2.2 = OID: iso.3.6.1.4.1.9.7.115
iso.3.6.1.2.1.1.9.1.2.3 = OID: iso.3.6.1.4.1.9.7.265
iso.3.6.1.2.1.1.9.1.2.4 = OID: iso.3.6.1.4.1.9.7.112
iso.3.6.1.2.1.1.9.1.2.5 = OID: iso.3.6.1.4.1.9.7.106
iso.3.6.1.2.1.1.9.1.2.6 = OID: iso.3.6.1.4.1.9.7.47
iso.3.6.1.2.1.1.9.1.2.7 = OID: iso.3.6.1.4.1.9.7.122
```

### 4. Configuration de cacti :

- Ajout d'un Hôte dans Cacti :

Description: R22  
 Nom d'hôte: 192.168.2.2  
 Emplacement: Aucun  
 Association du collecteur: Main Poller  
 Site de l'équipement: Edge  
 Modèle d'équipement: Generic SNMP Device  
 Nombre de Threads pour la collecte: %d Thread(s)  
 Désactiver l'équipement:

**Options SNMP**  
 Version de SNMP: Version 3  
 Communauté SNMP: public  
 Niveau de sécurité SNMP: authPriv  
 Protocole SNMP Auth (v3): SHA  
 Nom d'utilisateur SNMP (v3): MonUtilisateur  
 Mot de passe SNMP (v3): .....  
 Protocole de chiffrement SNMP (v3): AES-128  
 Mot de passe SNMP (v3): .....  
 Contexte SNMP (v3):

Site: Any | Data Collector: Any | Template: Any | Location: All | **Go** | Clear | Export  
 Search: Enter a search term | Status: Any | Devices: Default

All 2 Devices												
Device Description	Hostname	ID	Graphs	Data Sources	Status	In State	Uptime	Poll Time	Current (ms)	Average (ms)	Availability	
Local Linux Machine	localhost	1	4	5	Up	N/A	N/A	0.11	0	0	100 %	<input type="checkbox"/>
snmpv3	SNMPV3	2	0	0	Up	3m	N/A	0	0	0	100 %	<input type="checkbox"/>

Choose an action | **Go**

- Création de Graphiques dans Cacti:

**Associated Graph Templates**

Graph Template Name	Status
1) Cisco - CPU Usage	Is Being Graphed (Edit) <input type="checkbox"/>
2) Device - Polling Time	Is Being Graphed (Edit) <input type="checkbox"/>
3) Device - Uptime	Is Being Graphed (Edit) <input type="checkbox"/>
4) SNMP - Generic OID Template	Not Being Graphed <input type="checkbox"/>
5) Unix - Ping Latency	Is Being Graphed (Edit) <input type="checkbox"/>

Add Graph Template: ACME CPU Usage (5 min.) | Add

**Associated Data Queries**

Data Query Name	Re-Index Method	Status	Actions
1) SNMP - Interface Statistics	None   Uptime   Index Count   <b>Verify All</b>	Success [32 Items, 3 Rows]	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Add Data Query: Acme SD Combined Session Stats | Re-Index Method: Uptime | Add

Return | **Save**

Console | Graph Management | Logged in as admin

Graph Management [All Devices]

Site: Any | Device: Any | Template: Any |  Orphaned | **Go** | Clear

Search: Enter a regular expression | Graph Source: All | Graphs: Default

All 11 Graphs				
Graph Name	ID	Source Type	Source Name	Size
Local Linux Machine - Load Average	2	Template	Unix - Load Average	200x700 <input type="checkbox"/>
Local Linux Machine - Logged in Users	3	Template	Unix - Logged in Users	200x700 <input type="checkbox"/>
Local Linux Machine - Memory Usage	4	Template	Linux - Memory Usage	200x700 <input type="checkbox"/>
Local Linux Machine - Processes	1	Template	Unix - Processes	200x700 <input type="checkbox"/>
Router#2 - CPU Usage	5	Template	Cisco - CPU Usage	200x700 <input type="checkbox"/>
Router#2 - Ping Latency	8	Template	Unix - Ping Latency	200x700 <input type="checkbox"/>
Router#2 - Polling Time	6	Template	Device - Polling Time	200x700 <input type="checkbox"/>
Router#2 - Status - Fa0/0	11	Data Query	Status (Up/Down)	200x700 <input type="checkbox"/>
Router#2 - Traffic - Fa0/0	9	Data Query	In/Out Bytes (64-bit)	200x700 <input type="checkbox"/>
Router#2 - Traffic - Fa0/1	10	Data Query	In/Out Bytes (64-bit)	200x700 <input type="checkbox"/>
Router#2 - Uptime	7	Template	Device - Uptime	200x700 <input type="checkbox"/>

Choose an action | **Go**



- Création de 'TREE':

Console | Graphs | Reporting | Logs

Console | Graph Trees | (Edit)

Logged in as admin

Main Console

Create

Management

Devices

Sites

Trees

Graphs

Data Sources

Aggregates

Trees [new]

Name: Tp1\_SNMP

Sorting Type: Manual Ordering (No Sorting)

Cancel Create

Console | Graphs | Reporting | Logs

Console | Graph Trees

Logged in as admin

Trees

Search: Enter a search term

Trees Default

Go Clear

All 2 Trees

Tree Name	ID	Published	Locked	Owner	Order	Last Edited	Edited By	Sites	Branches	Devices	Graphs
Default Tree	1	Yes	No	admin		0000-00-00 00:00	admin	-	2	2	-
Tp1_SNMP	2	Yes	No	admin		2025-03-10 14:36	admin	-	-	1	-

All 2 Trees

Choose an action Go

Console | Graphs | Reporting | Logs

Console | Graph Trees | (Edit)

Logged in as admin

Trees [edit: Tp1\_SNMP]

Name: Tp1\_SNMP

Sorting Type: Manual Ordering (No Sorting)

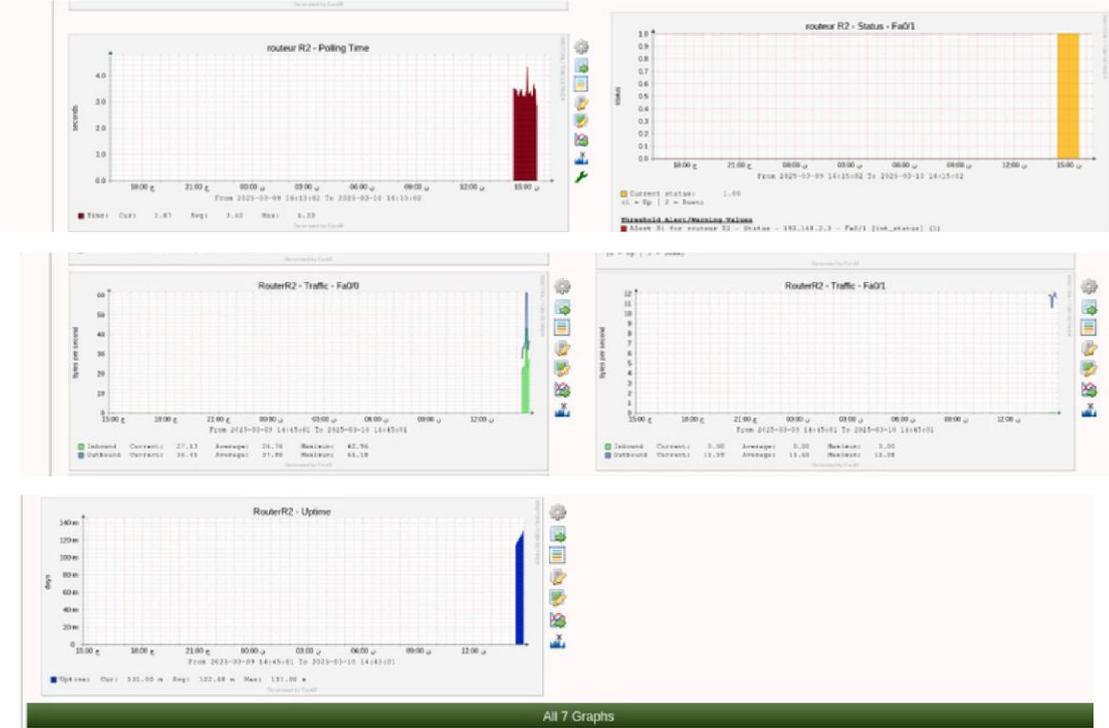
Publish:

Edit Tree: To edit this tree, you must first lock it by pressing the Edit Tree button.

Display: All

Tree Items	Available Sites	Available Devices	Available Graphs
Router2	<p>Search</p> <p>Site Name</p> <ul style="list-style-type: none"> <li>Edge</li> <li>Core</li> </ul>	<p>Search</p> <p>Device Description</p> <ul style="list-style-type: none"> <li>Local Linux Machine (localhost)</li> <li>RouterR2 (192.168.2.2)</li> </ul>	<p>Search</p> <p>Graph Name</p> <ul style="list-style-type: none"> <li>Local Linux Machine - Load Average</li> <li>Local Linux Machine - Logged in Users</li> <li>Local Linux Machine - Memory Usage</li> <li>Local Linux Machine - Processes</li> <li>RouterR2 - CPU Usage</li> <li>RouterR2 - Ping Latency</li> <li>RouterR2 - Polling Time</li> </ul>

Résultats :



## Partie 4 : Simulation d'une Panne et Réception d'Alerte sur

*L'installation et la configuration de plugin thold :*

```

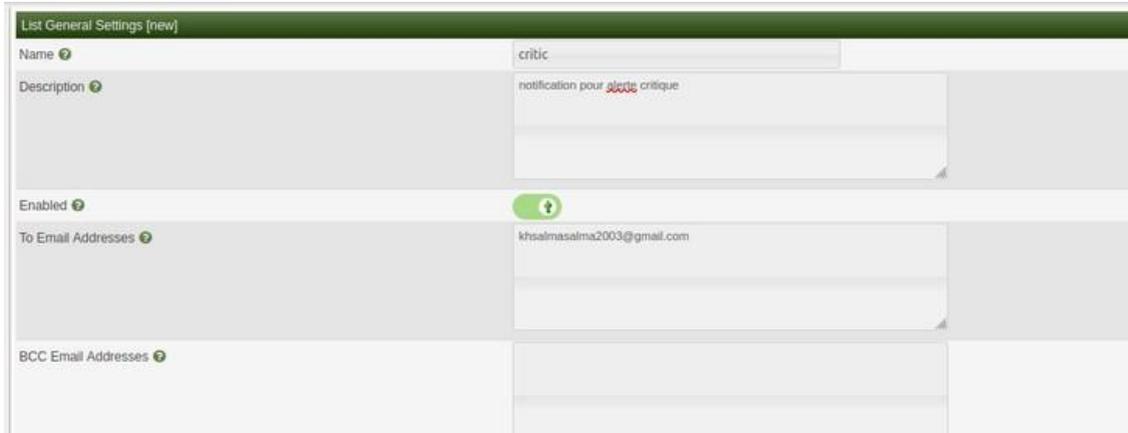
david@david-virtual-machine:/var/www/html/cacti/plugins$ sudo git clone https://github.com/Cacti/plugin_thold.git thold
Cloning into 'thold'...
remote: Enumerating objects: 8112, done.
remote: Counting objects: 100% (121/121), done.
remote: Compressing objects: 100% (69/69), done.
remote: Total 8112 (delta 84), reused 71 (delta 52), pack-reused 7991 (from 4)
Receiving objects: 100% (8112/8112), 9.45 MiB | 319.00 KiB/s, done.
Resolving deltas: 100% (6230/6230), done.

```

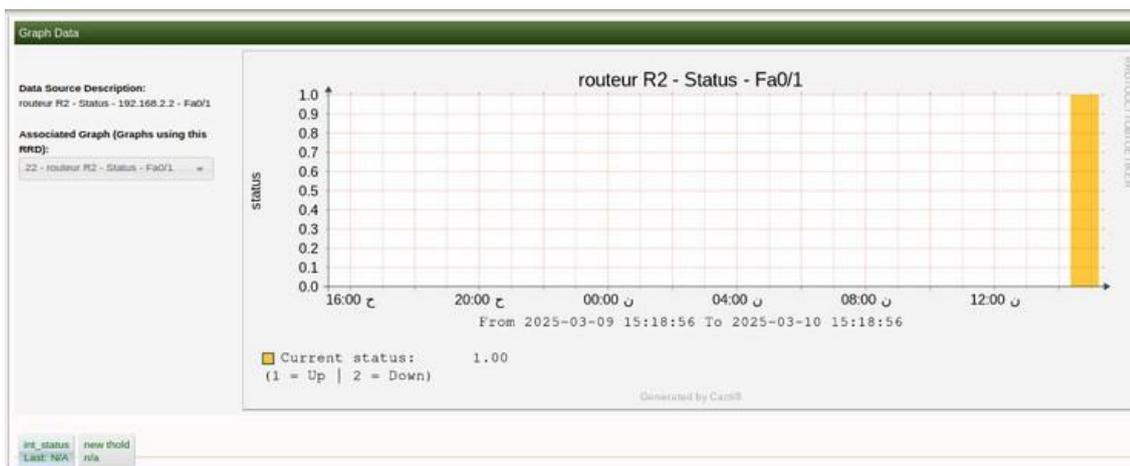
• *L'activation de plugin depuis l'interface web de Cacti :*



• *La configuration de notification lists :*



• *La configuration de Thresholds l'interface Fa0/0-status-:*



int_status	new thold
Last: N/A	n/a

Data Source Item [ int\_status ] - Current value: [ - ]

### Template/Enabled Information

Template Propagation Enabled

Template Name

Enabled at Threshold Level

### General Settings

Name (Displayed)

Name (Format)

Warning HRULE Color

Alert HRULE Color

Graph Timespan

Skip Scaling on HRULEs

Weekend Exemption

Disable Restoration Email

Acknowledgment Options  None Required  
 Suspending Notification

Weekend Exemption

Disable Restoration Email

Acknowledgment Options  None Required  
 Suspending Notification  
 Persistent Acknowledgment

Threshold Type

Re-Alert Cycle

### Warning - High / Low Settings

High Threshold

Low Threshold

Breach Duration

### Alert - High / Low Settings

High Threshold

Low Threshold

Breach Duration

### Data Manipulation

Data Type

Show Units

Force Units Suffix

Decimal Digits to Display

### Notification Settings

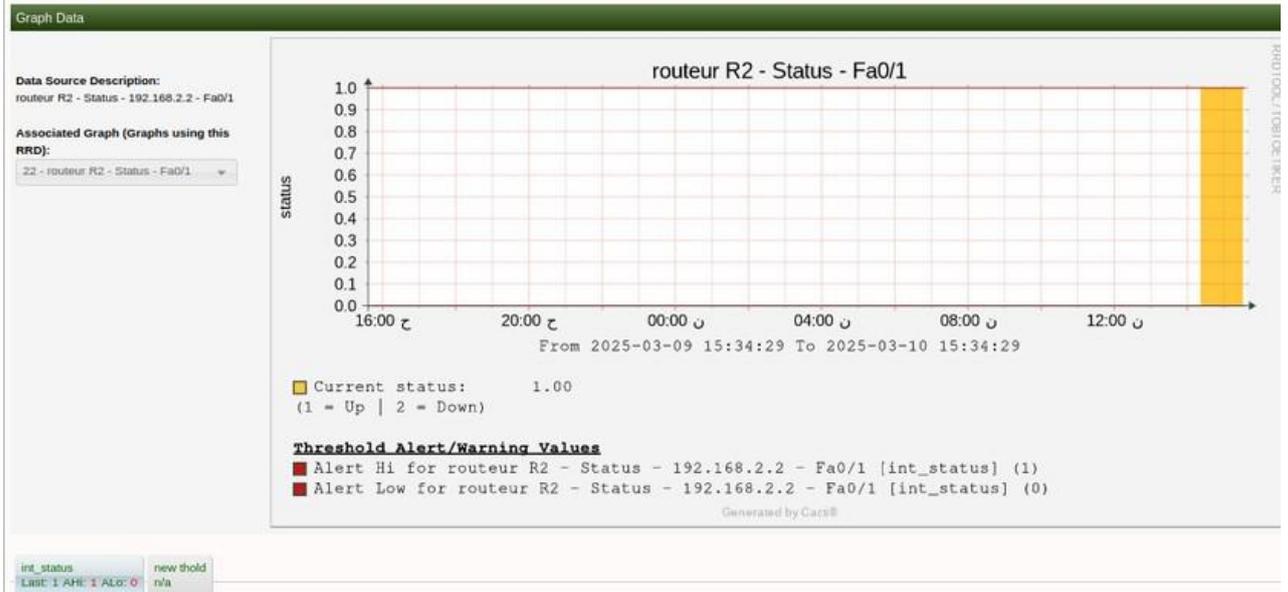
Warning Notification List

Alert Notification List

Style/Format File

Alert Emails

Warning Emails



Console | Graphs | Reporting | Logs | Thold

Console | Thresholds

Logged in as admin

Main Console

Create

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Aggregates

Notification Lists

Notification Queue

Thresholds

Data Collection

Templates

Automation

Presets

Import/Export

Configuration

Utilities

Troubleshooting

Threshold Management

Search: Enter a regular expression [Q] Site: All Device: Any [Go] [Clear]

Template: All Data Template: Any Status: All Thresholds: Default

All 2 Thresholds

Name	External ID	Enabled	ID	Type	DNSName	Current	High	Low	Trigger	Duration	Repeat	Triggered	In State	Templated	Ack Required
RouterR2 - Traffic - 192.168.2.2 - Fa0/0 [traffic_in]		Yes	1	Time Based	traffic_in	18 966555	- / 10 K	- / 500	1 Triggers	5 Minutes	Never	Yes	4m	No	No
RouterR2 - Status - 192.168.2.2 - Fa0/0 [int_status]		Yes	2	High / Low	int_status	1	- / 1	- / 0	5 Minutes	N/A	Never	No	Since Created	No	No

All 2 Thresholds

Alert | Baseline Alert | Warning | Notice | Ok | Acknowledgment | Disabled

Choose an action [Go]