

Definisi Cacti

Salah satu software yang digunakan untuk keperluan monitoring yang banyak digunakan saat ini adalah Cacti. Cacti merupakan sebuah software MRTG (Multi Router Traffic Grapher) *web-based* yang menjadi solusi lengkap untuk *network graphing* yang memanfaatkan penyimpanan data RRDTool dan fungsi grafik. Cacti menyimpan semua informasi yang diperlukan untuk membuat grafik dan mengumpulkannya dengan database MySQL. Cacti menyediakan kemampuan data yang cepat, pola grafik *advanced*, metode perolehan *multiple* data dan fitur pengelolaan user. Semuanya dikemas secara inklusif dengan sebuah interface yang mudah digunakan dan mudah dipahami untuk Local Area Network yang kompleks dengan ratusan device.

Kebutuhan Pre-Instalasi

Sebelum memulai instalasi Cacti, ada baiknya untuk mempersiapkan terlebih dahulu kebutuhan yang diperlukan baik berupa *software* dan *hardware*. Jika PC/laptop yang digunakan menggunakan OS Windows, maka kita membutuhkan beberapa *software* tambahan seperti XAMPP, RRDTool, dll. Hal ini bukan berarti kita tidak dapat menggunakan Cacti pada OS Windows, hanya saja kebutuhan tambahan pre-instalasi yang banyak dapat menyebabkan instalasi Cacti rawan untuk gagal karena masalah versi, *dependencies*, konfigurasi, dll. Oleh karena itu disarankan untuk menggunakan OS Linux karena Linux sudah *support* beberapa kebutuhan monitoring. Dalam laporan ini juga akan dipaparkan proses instalasi Cacti menggunakan Linux.

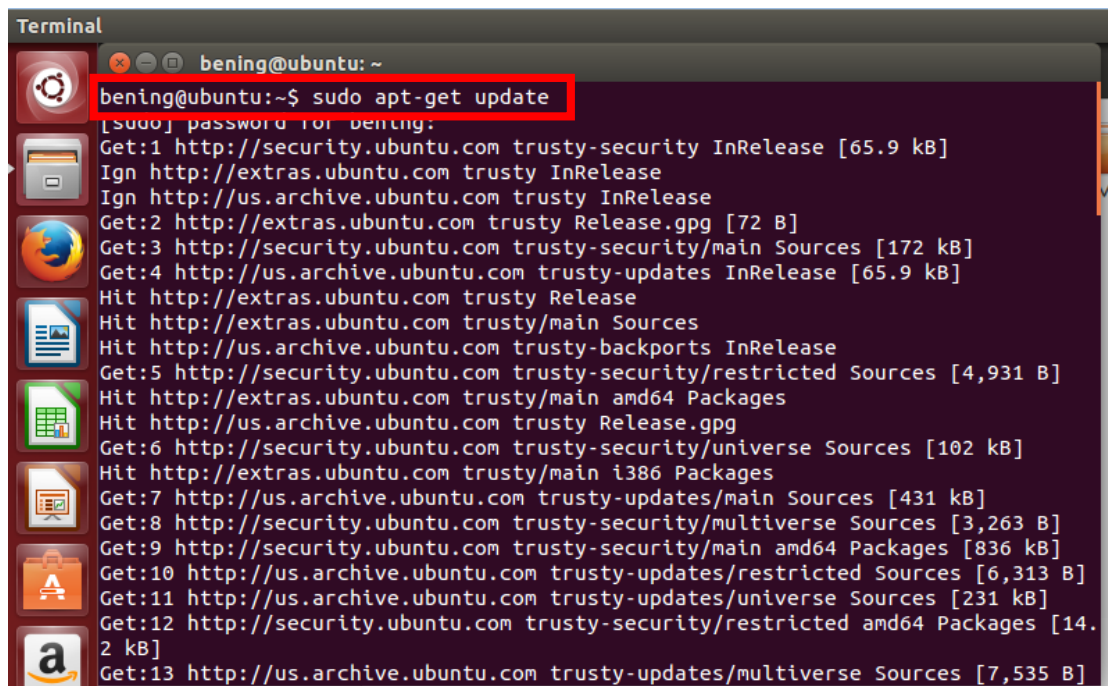
Jika tidak memiliki OS Linux, kita tidak perlu khawatir karena kita bisa install terlebih dahulu VMware yang merupakan *software* untuk membuat *virtual machine* sehingga kita dapat menggunakan berbagai OS dalam *software* tersebut. VMware dapat diunduh di https://my.vmware.com/en/web/vmware/free#desktop_end_user_computing/vmware_workstation_player/15_0/PLAYER-1510/product_downloads dan jangan lupa juga untuk mengunduh ISO Linuxnya di <https://ubuntu.com/download/desktop> agar bisa digunakan di dalam VMware.

Software yang paling penting dalam instalasi Cacti tentu saja adalah Cacti sendiri. Unduh Cacti di https://www.cacti.net/download_cacti.php dan pilih sesuai OS yang akan digunakan. Pada laporan ini kami menggunakan Cacti untuk Linux.

Proses Instalasi Cacti

1. Perbarui sistem dan perbarui semua *package*. Selalu mulailah *upgrade package* server untuk menghindari masalah *dependencies*. Buka terminal dan ketikkan

```
sudo apt-get update  
sudo apt-get upgrade
```



```
Terminal  
bening@ubuntu: ~  
bening@ubuntu:~$ sudo apt-get update  
[sudo] password for bening:  
Get:1 http://security.ubuntu.com trusty-security InRelease [65.9 kB]  
Ign http://extras.ubuntu.com trusty InRelease  
Ign http://us.archive.ubuntu.com trusty InRelease  
Get:2 http://extras.ubuntu.com trusty Release.gpg [72 B]  
Get:3 http://security.ubuntu.com trusty-security/main Sources [172 kB]  
Get:4 http://us.archive.ubuntu.com trusty-updates InRelease [65.9 kB]  
Hit http://extras.ubuntu.com trusty Release  
Hit http://extras.ubuntu.com trusty/main Sources  
Hit http://us.archive.ubuntu.com trusty-backports InRelease  
Get:5 http://security.ubuntu.com trusty-security/restricted Sources [4,931 B]  
Hit http://extras.ubuntu.com trusty/main amd64 Packages  
Hit http://us.archive.ubuntu.com trusty Release.gpg  
Get:6 http://security.ubuntu.com trusty-security/universe Sources [102 kB]  
Hit http://extras.ubuntu.com trusty/main i386 Packages  
Get:7 http://us.archive.ubuntu.com trusty-updates/main Sources [431 kB]  
Get:8 http://security.ubuntu.com trusty-security/multiverse Sources [3,263 B]  
Get:9 http://security.ubuntu.com trusty-security/main amd64 Packages [836 kB]  
Get:10 http://us.archive.ubuntu.com trusty-updates/restricted Sources [6,313 B]  
Get:11 http://us.archive.ubuntu.com trusty-updates/universe Sources [231 kB]  
Get:12 http://security.ubuntu.com trusty-security/restricted amd64 Packages [14.  
2 kB]  
Get:13 http://us.archive.ubuntu.com trusty-updates/multiverse Sources [7,535 B]
```

2. Install PHP, Apache, MariaDB. Jika sudah terinstall, maka langkah ini bisa dilewati dan langsung ke langkah ke-3.

- a. PHP

Ketikkan ini di terminal untuk menginstall PHP:

```
sudo apt-get -y install php php-mysql php-curl php-net-socket \  
php-gd php-intl php-pear php-imap php-memcache libapache2-mod-php \  
php-pspell php-recode php-tidy php-xmlrpc php-snmp \  
php-mbstring php-gettext php-gmp php-json php-xml php-common
```

Module yang paling penting adalah php-snmp dan php-mysql sehingga pastikan keduanya terinstall. Cek apakah sudah terinstall dengan melihat versinya.

```
php -v
```

Pastikan timezonenya sesuai dengan lokasi kita yaitu 'Asia/Jakarta'.

```
grep date.timezone /etc/php/7.2/apache2/php.ini
```

b. Apache

Webserver default dari Cacti menggunakan Apache. Ketikkan ini di terminal untuk menginstall Apache:

```
sudo apt-get -y install apache2
```

Setelah itu konfigurasi *basic security*nya dengan mengetikkan ini:

```
sudo vim /etc/apache2/conf-enabled/security.conf
```

Nantinya akan muncul mirip dengan notepad untuk mengedit file conf tersebut.

Ubah line 25 menjadi `ServerTokens Prod`

Line ini mengonfigurasi apa yang akan dikembalikan sebagai respons HTTP Server. Opsi yang bisa digunakan terdiri dari: Full | OS | Minimal | Minor | Major | Prod.

Atur ServerName dan ServerAdmin.

```
grep ServerName /etc/apache2/apache2.conf
```

```
grep ServerAdmin /etc/apache2/apache2.conf
```

Jika ufw sedang aktif, buka port http dan https dalam firewall.

```
ufw allow http
```

```
ufw allow https
```

Restart Apache setelah melakukan perubahan-perubahan tersebut.

```
sudo systemctl restart apache2
```

c. MariaDB

Install MariaDB dengan mengetikkan ini di terminal:

```
sudo yum -y install MariaDB-server MariaDB-client
```

Jalankan MariaDB

```
sudo systemctl start mariadb
```

```
sudo systemctl enable mariadb
```

Atur *security* pada MariaDB.

```
mysql_secure_installation
```

Login MariaDB untuk memastikan telah terinstall dengan baik.

```
mysql -u root -p
```

Atau bisa juga dengan cek versi MariaDB yang telah terinstall.

```
mysql -V
```

Tambahkan line-line berikut ini di bawah [mysqld] pada file /etc/mysql/mariadb.cnf.

```
max_heap_table_size=128M
tmp_table_size=128M
join_buffer_size=64M
innodb_buffer_pool_size=512M
innodb_doublewrite=OFF
innodb_flush_log_at_timeout=3
innodb_read_io_threads=32
innodb_write_io_threads=16
```

Reset MariaDB setelah melakukan perubahan di atas.

```
sudo systemctl restart mysql
```

Untuk mengecek apakah MariaDB sudah berjalan baik atau tidak dapat dilakukan dengan cara mengetik kalimat berikut di terminal:

```
select @@tmp_table_size; atau show variables like 'join_buffer_size';
```

3. Buat database Cacti

```
mysql -u root -p
create database cacti
show databases
```

4. Install Cacti

```
sudo apt-get install snmp snmpd snmp-mibs-downloader rrdtool cacti cacti-spine
```

```
Terminal
bening@ubuntu: ~
Hit http://us.archive.ubuntu.com trusty/restricted Sources
Hit http://us.archive.ubuntu.com trusty/universe Sources
Hit http://us.archive.ubuntu.com trusty/multiverse Sources
Hit http://us.archive.ubuntu.com trusty/main amd64 Packages
Hit http://us.archive.ubuntu.com trusty/restricted amd64 Packages
Hit http://us.archive.ubuntu.com trusty/universe amd64 Packages
Hit http://us.archive.ubuntu.com trusty/multiverse amd64 Packages
Hit http://us.archive.ubuntu.com trusty/main i386 Packages
Hit http://us.archive.ubuntu.com trusty/restricted i386 Packages
Hit http://us.archive.ubuntu.com trusty/universe i386 Packages
Hit http://us.archive.ubuntu.com trusty/multiverse i386 Packages
Hit http://us.archive.ubuntu.com trusty/main Translation-en
Hit http://us.archive.ubuntu.com trusty/multiverse Translation-en
Hit http://us.archive.ubuntu.com trusty/restricted Translation-en
Hit http://us.archive.ubuntu.com trusty/universe Translation-en
Ign http://us.archive.ubuntu.com trusty/main Translation-en_US
Ign http://us.archive.ubuntu.com trusty/multiverse Translation-en_US
Ign http://us.archive.ubuntu.com trusty/restricted Translation-en_US
Ign http://us.archive.ubuntu.com trusty/universe Translation-en_US
Fetched 8,132 kB in 1min 50s (73.7 kB/s)
Reading package lists... Done
bening@ubuntu:~$
bening@ubuntu:~$
bening@ubuntu:~$ sudo apt-get install cacti cacti-spine
```

Default password: root.

5. Ikuti langkah-langkah selanjutnya

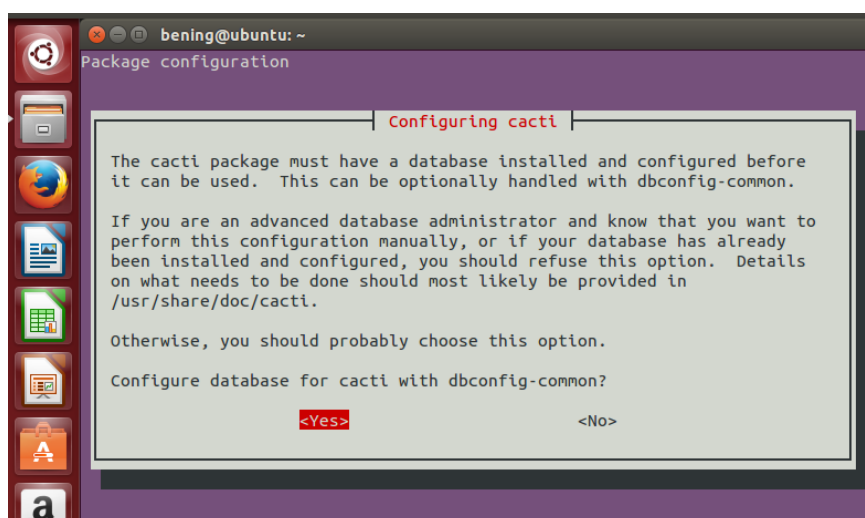
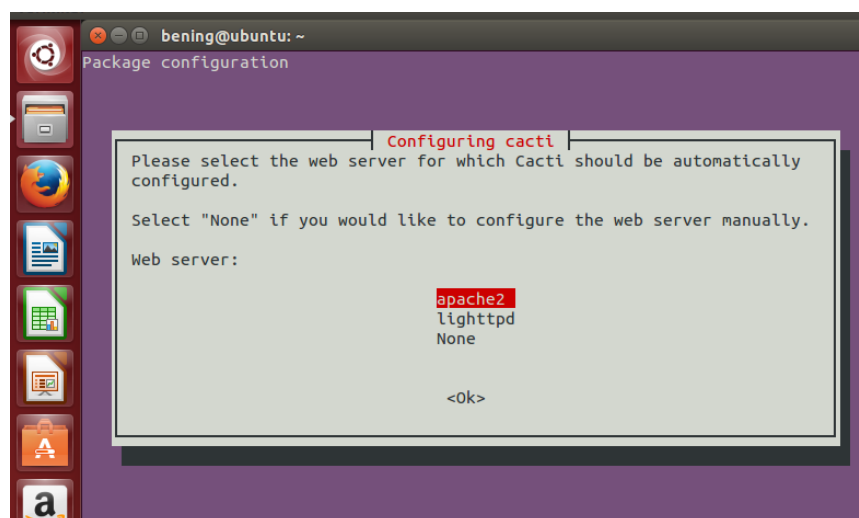
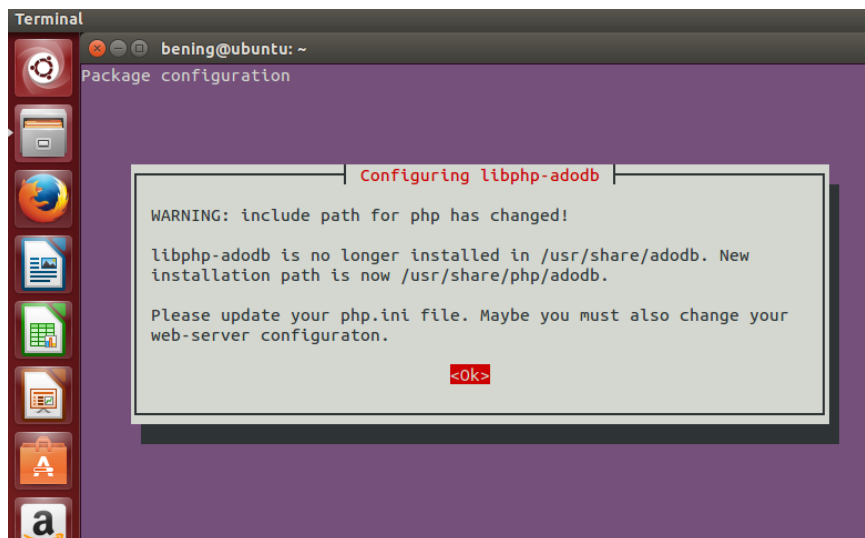
```
Terminal
bening@ubuntu: ~
Package configuration

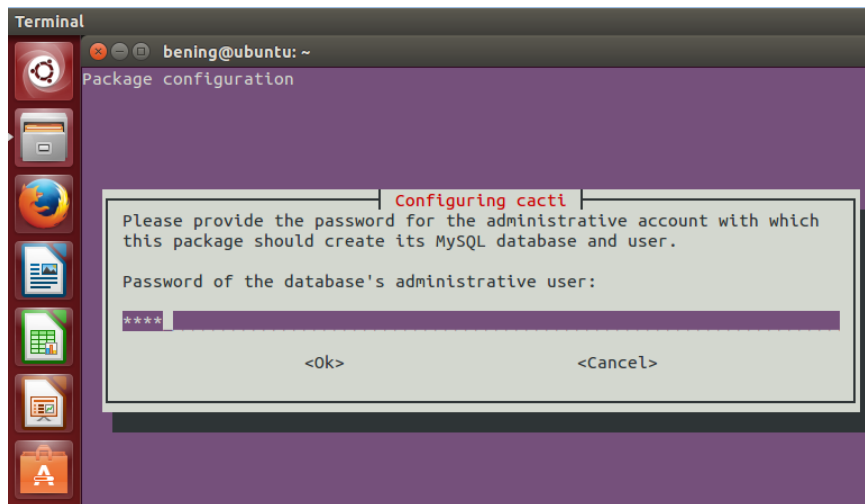
Configuring mysql-server-5.5
While not mandatory, it is highly recommended that you set a password
for the MySQL administrative "root" user.

If this field is left blank, the password will not be changed.

New password for the MySQL "root" user:
_____

<Ok>
```



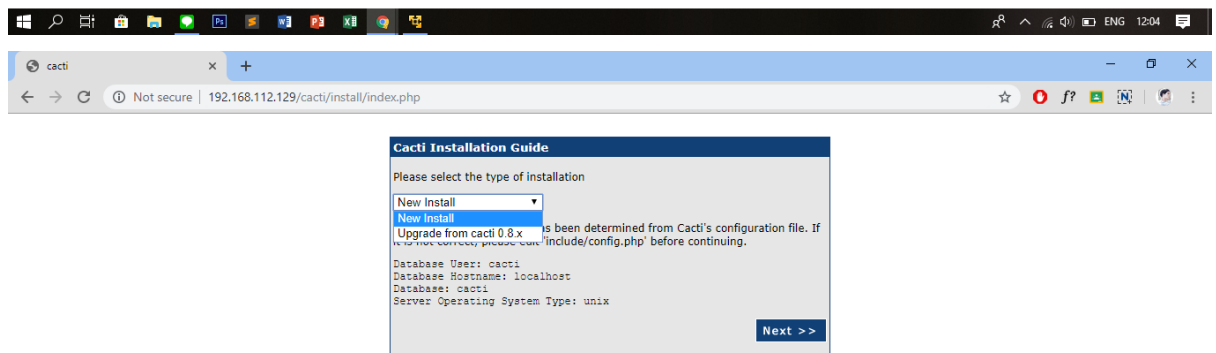
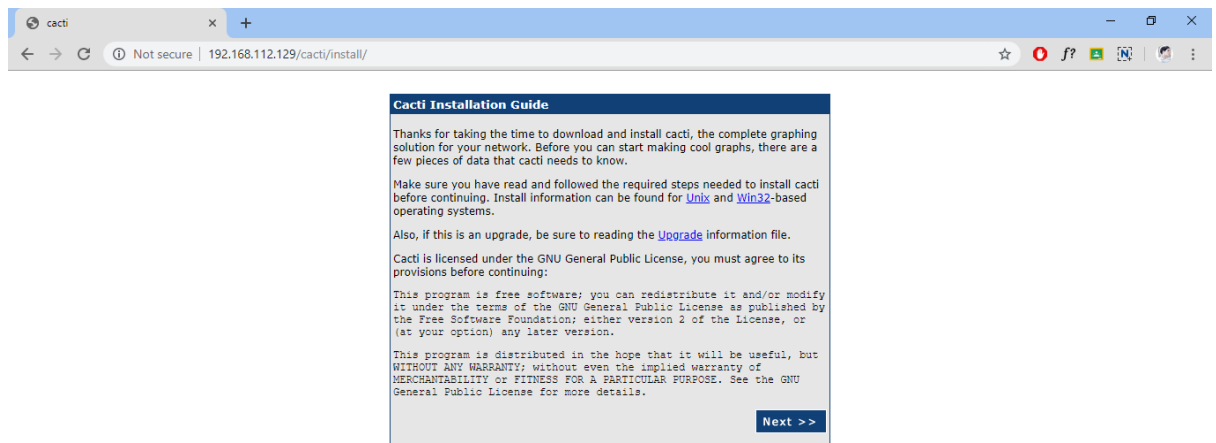


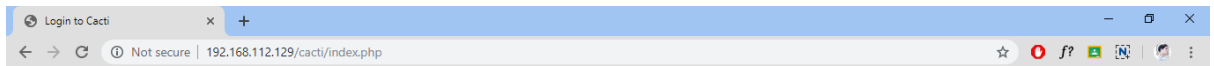
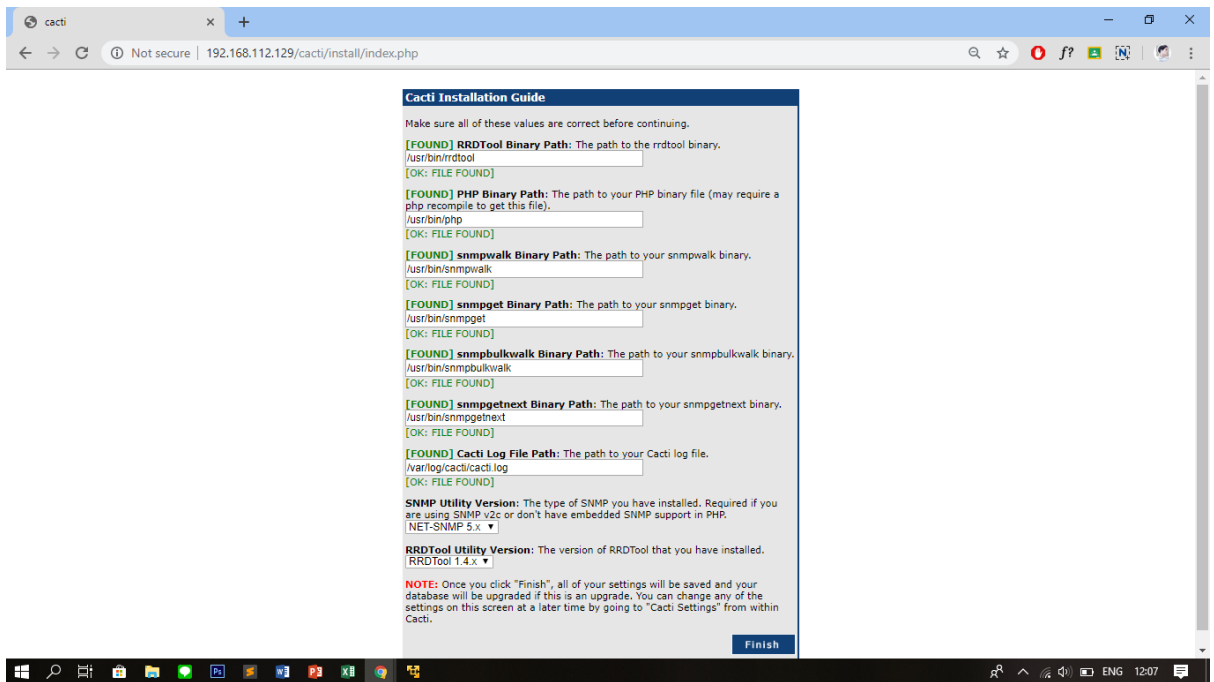
6. Install dan konfigurasi SNMP

```
bening@ubuntu: ~  
Creating config file /etc/dbconfig-common/cacti.conf with new version  
Creating config file /etc/cacti/debian.php with new version  
granting access to database cacti for cacti@localhost: success.  
verifying access for cacti@localhost: success.  
creating database cacti: success.  
verifying database cacti exists: success.  
populating database via sql... done.  
dbconfig-common: flushing administrative password  
  
Creating config file /etc/apache2/conf-available/cacti.conf with new version  
Creating config file /etc/lighttpd/conf-available/20-cacti.conf with new version  
apache2_invoke: Enable configuration cacti  
* Reloading web server apache2  
*  
* Reloading web server apache2  
*  
Setting up cacti-spine (0.8.8b-1) ...  
Creating config file /etc/cacti/spine.conf with new version  
Processing triggers for libc-bin (2.19-0ubuntu6) ...  
bening@ubuntu:~$
```

```
bening@ubuntu: ~  
Setting up cacti-spine (0.8.8b-1) ...  
Creating config file /etc/cacti/spine.conf with new version  
Processing triggers for libc-bin (2.19-0ubuntu6) ...  
bening@ubuntu:~$ ifconfig  
eth0      Link encap:Ethernet  HWaddr 00:0c:29:6c:da:ab  
          inet addr:192.168.112.129 Bcast:192.168.112.255 Mask:255.255.255.0  
          inet6 addr: fe80::20c:29ff:fe6c:daab/64 Scope:Link  
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1  
          RX packets:28070 errors:0 dropped:0 overruns:0 frame:0  
          TX packets:10064 errors:0 dropped:0 overruns:0 carrier:0  
          collisions:0 txqueuelen:1000  
          RX bytes:37190394 (37.1 MB)  TX bytes:644171 (644.1 KB)  
  
lo        Link encap:Local Loopback  
          inet addr:127.0.0.1 Mask:255.0.0.0  
          inet6 addr: ::1/128 Scope:Host  
          UP LOOPBACK RUNNING  MTU:65536  Metric:1  
          RX packets:388 errors:0 dropped:0 overruns:0 frame:0  
          TX packets:388 errors:0 dropped:0 overruns:0 carrier:0  
          collisions:0 txqueuelen:0  
          RX bytes:34979 (34.9 KB)  TX bytes:34979 (34.9 KB)  
bening@ubuntu:~$
```

7. Ikuti langkah selanjutnya





User Login

Please enter your Cacti user name and password below:

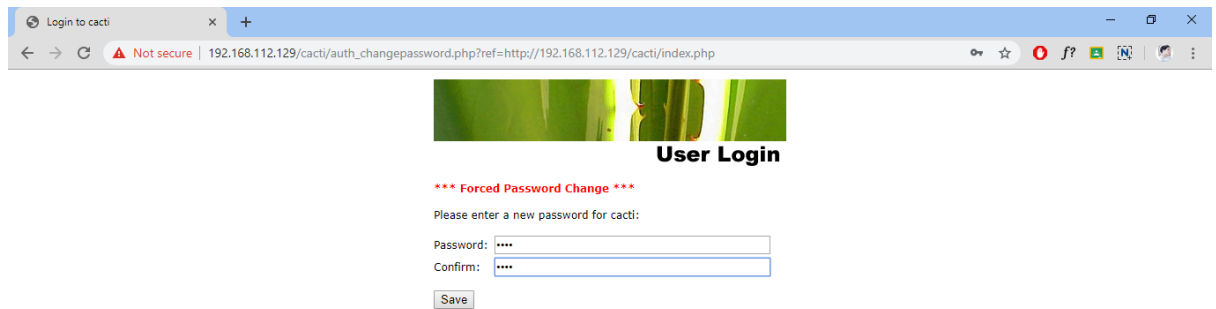
User Name:

Password:



Username: admin

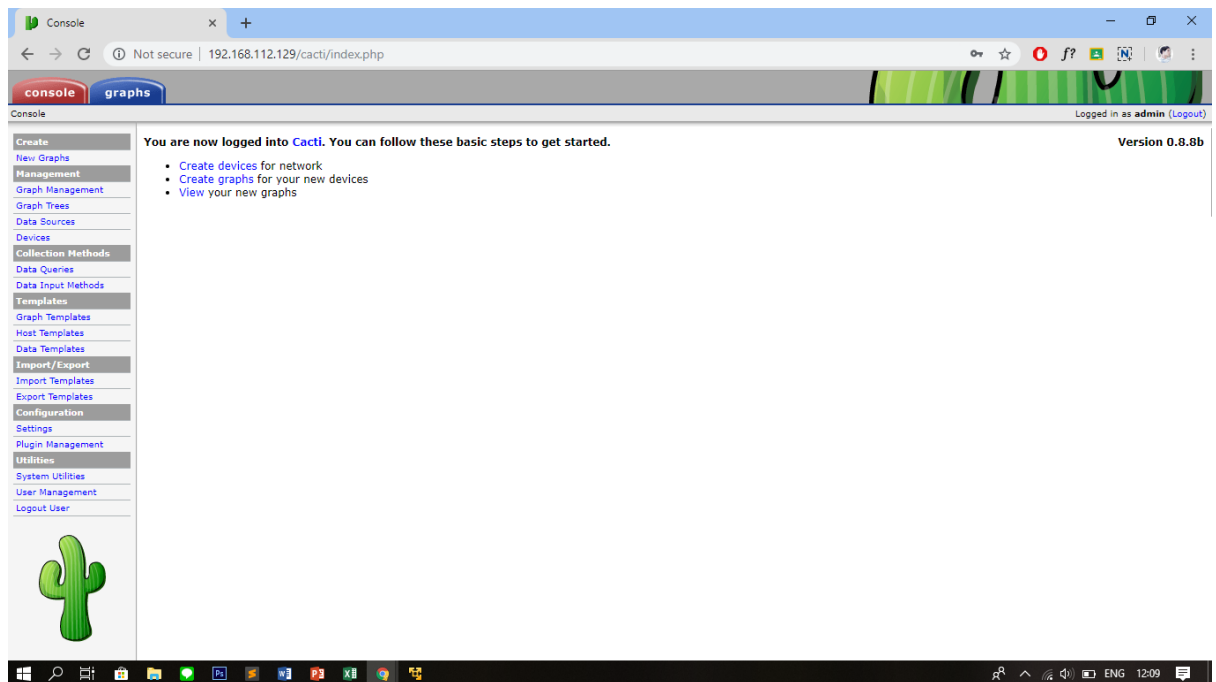
Password: root



Password: root

Confirm: root

8. Cacti berhasil diinstall.



Penggunaan Cacti

Berikut ini adalah hal-hal yang bisa dilakukan pada Cacti.

Console -> Devices


Not secure | 192.168.112.129/cacti/host.php

console graphs

Logged in as admin (Logout)

Create

- New Graphs
- Management
- Graph Management
- Graph Trees
- Data Sources
- Devices
- Collection Methods
- Data Queries
- Data Input Methods
- Templates
- Graph Templates
- Host Templates
- Data Templates
- Import/Export
- Import Templates
- Export Templates
- Configuration
- Settings
- Plugin Management
- Utilities
- System Utilities
- User Management
- Logout User



Devices

Type: Any Status: Any Search: Rows per Page: 30 Go Clear

<< Previous Showing Rows 1 to 1 of 1 [1] Next >>

Description**	ID	Graphs	Data Sources	Status	In State	Hostname	Current (ms)	Average (ms)	Availability
Localhost	1	4	5	Up	-	127.0.0.1	0.84	0.84	100

<< Previous Showing Rows 1 to 1 of 1 [1] Next >>

Choose an action: Delete Go

Tutorial SNMP Mic Console -> Device Console -> Device UAS (Cacti) - Goo UAS MANJAR - G How to Install and How to Monitor


Not secure | 192.168.112.129/cacti/host.php?action=edit&id=1

console graphs

Console -> Devices -> (Edit) Logged in as admin (Logout)

Create

- New Graphs
- Management
- Graph Management
- Graph Trees
- Data Sources
- Devices
- Collection Methods
- Data Queries
- Data Input Methods
- Templates
- Graph Templates
- Host Templates
- Data Templates
- Import/Export
- Import Templates
- Export Templates
- Configuration
- Settings
- Plugin Management
- Utilities
- System Utilities
- User Management
- Logout User



Localhost (127.0.0.1)

SNMP Information

System: Linux ubuntu 3.13.0-24-generic #46-Ubuntu SMP Thu Apr 18 19:11:08 UTC 2014 x86_64
Uptime: 20844 (0 days, 0 hours, 3 minutes)
Hostname: ubuntu
Location: Sitting on the Dock of the Bay
Contact: He hehe@example.org

Devices [edit: Localhost]

General Host Options

Description: Give this host a meaningful description. Localhost

Hostname: Fully qualified hostname or IP address for this device. 127.0.0.1

Host Template: Choose the Host Template to use to define the default Graph Templates and Data Queries associated with this Host. Local Linux Machine

Number of Collection Threads: The number of concurrent threads to use for polling this device. This applies to the Spine poller only. 1 Thread (default)

Disable Host: Check this box to disable all checks for this host. ☐ Disable Host

Availability/Reachability Options

Downed Device Detection: The method Cacti will use to determine if a host is available for polling. NOTE: It is recommended that, at a minimum, SNMP always be selected. SNMP Uptime

Ping Timeout Value: The timeout value to use for host ICMP and UDP ping. This host SNMP timeout value applies for SNMP pings. 400

Ping Retry Count: After an initial failure, the number of ping retries Cacti will attempt before failing. 1

SNMP Options

SNMP Version: Choose the SNMP version for this device. Version 1

SNMP Community: SNMP read community for this device. public

SNMP Port: Enter the UDP port number to use for SNMP (default is 161). 161

SNMP Timeout: The maximum number of milliseconds Cacti will wait for an SNMP response (does not work with php-snmp support). 500

Maximum OID's Per Get Request: Specified the number of OID's that can be obtained in a single SNMP Get request. 10

*Create Graphs for this Host
*Data Source List
*Graph List

(1) Cacti Network x Console -> Graph x UAS MANJAR - Go x How to Monitor R x apache - 403 Forb x How to Install and x UAS (Cacti) - Go x + -

Not secure | 192.168.112.129/cacti/graph_templates.php

console graphs

Console -> Graph Templates Logged in as admin (Logout)

Create
New Graphs
Management
Graph Management
Graph Trees
Data Sources
Devices
Collection Methods
Data Queries
Data Input Methods
Templates
Graph Templates
Host Templates
Data Templates
Import/Export
Import Templates
Export Templates
Configuration
Settings
Plugin Management
Utilities
System Utilities
User Management
Logout User

Graph Templates

Search: Go Clear

<< Previous Showing Rows 1 to 30 of 33 [1,2] Next >>

Template Title**	
Cisco - CPU Usage	<input type="checkbox"/>
Host MIB - Available Disk Space	<input type="checkbox"/>
Host MIB - CPU Utilization	<input type="checkbox"/>
Host MIB - Logged in Users	<input type="checkbox"/>
Host MIB - Processes	<input type="checkbox"/>
Interface - Errors/Discards	<input type="checkbox"/>
Interface - Non-Unicast Packets	<input type="checkbox"/>
Interface - Traffic (bits/sec)	<input type="checkbox"/>
Interface - Traffic (bits/sec, 95th Percentile)	<input type="checkbox"/>
Interface - Traffic (bits/sec, Total Bandwidth)	<input type="checkbox"/>
Interface - Traffic (bytes/sec)	<input type="checkbox"/>
Interface - Traffic (bytes/sec, Total Bandwidth)	<input type="checkbox"/>
Interface - Unicast Packets	<input type="checkbox"/>
Karlnet - Wireless Levels	<input type="checkbox"/>
Karlnet - Wireless Transmissions	<input type="checkbox"/>
Linux - Memory Usage	<input type="checkbox"/>
Network - CPU Utilization	<input type="checkbox"/>
Network - Directory Information	<input type="checkbox"/>
Network - File System Activity	<input type="checkbox"/>
Network - File System Cache	<input type="checkbox"/>
Network - Logged In Users	<input type="checkbox"/>
Network - Open Files	<input type="checkbox"/>
Network - Volume Information	<input type="checkbox"/>

SNMP - Generic OID Template

(1) Cacti Network x Console -> Graph x UAS MANJAR - Go x How to Monitor R x apache - 403 Forb x How to Install and x UAS (Cacti) - Go x + -

Not secure | 192.168.112.129/cacti/graph_templates.php

console graphs

Console -> Graph Templates Logged in as admin (Logout)

Create
New Graphs
Management
Graph Management
Graph Trees
Data Sources
Devices
Collection Methods
Data Queries
Data Input Methods
Templates
Graph Templates
Host Templates
Data Templates
Import/Export
Import Templates
Export Templates
Configuration
Settings
Plugin Management
Utilities
System Utilities
User Management
Logout User

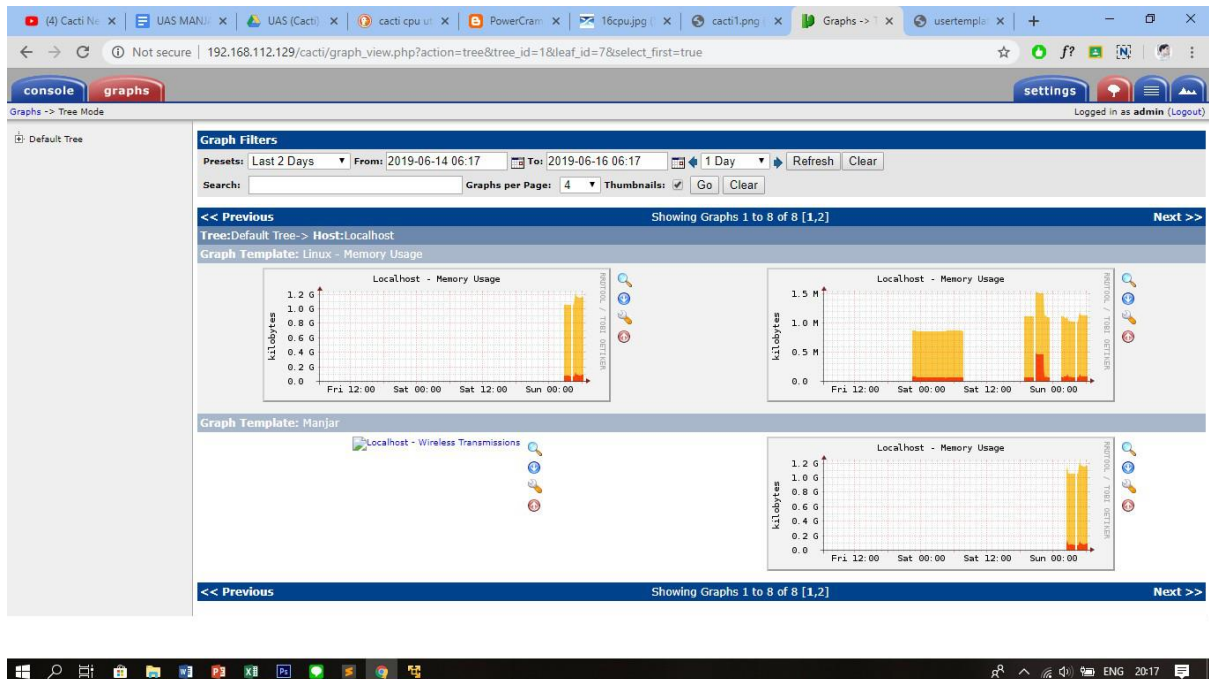
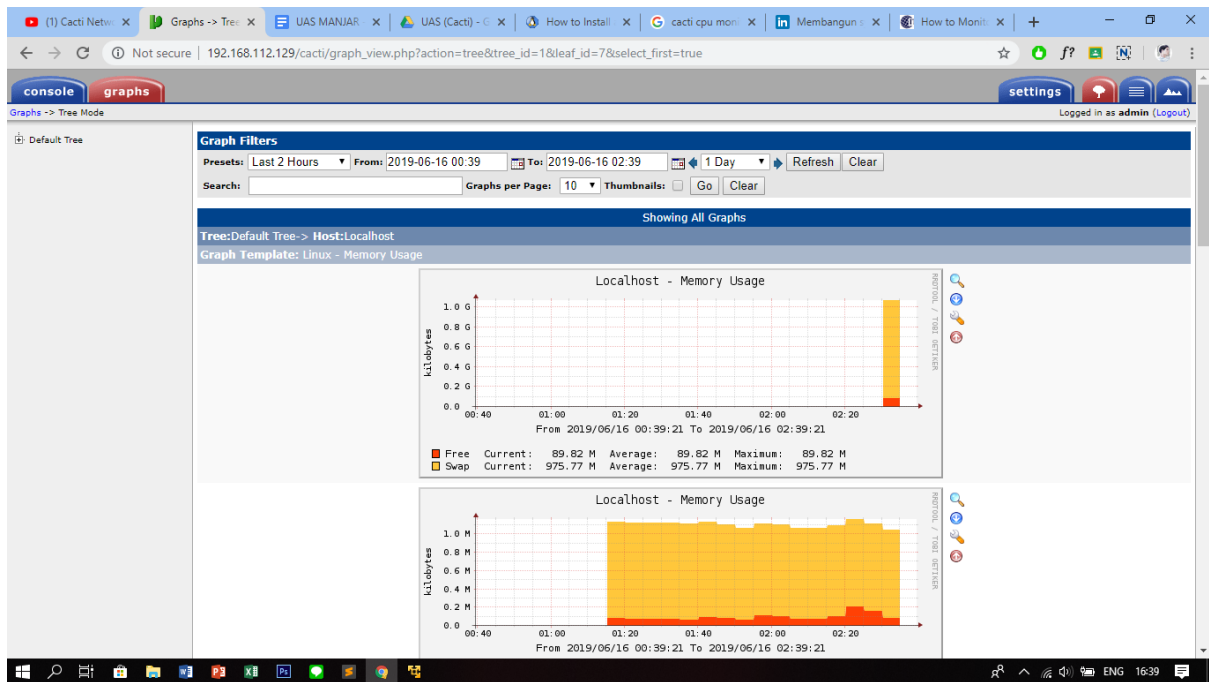
Graph Templates

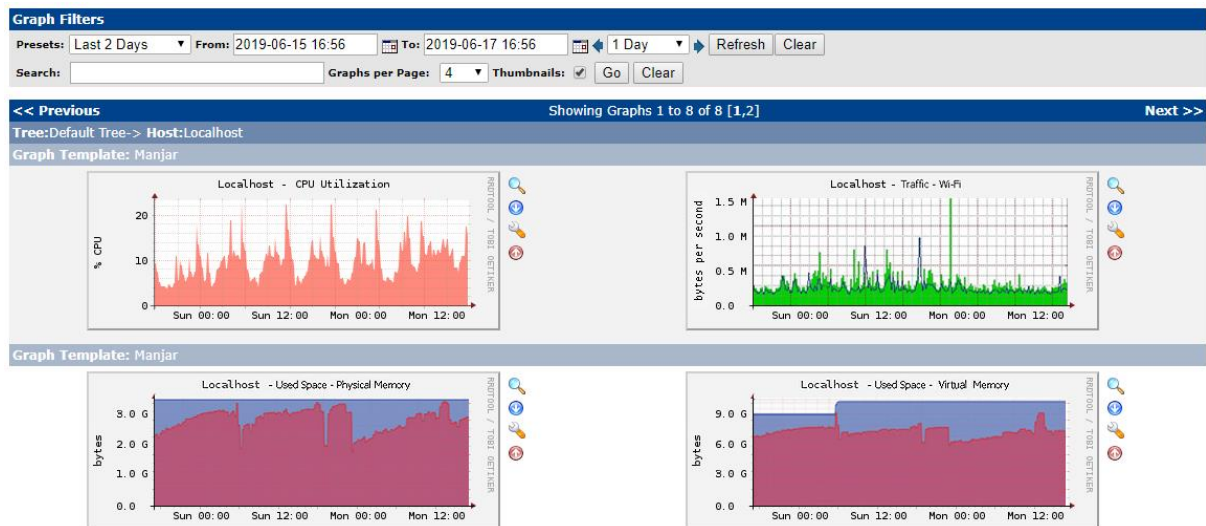
Search: Go Clear

<< Previous Showing Rows 1 to 30 of 33 [1,2] Next >>

Template Title**	
Cisco - CPU Usage	<input type="checkbox"/>
Host MIB - Available Disk Space	<input checked="" type="checkbox"/>
Host MIB - CPU Utilization	<input checked="" type="checkbox"/>
Host MIB - Logged in Users	<input checked="" type="checkbox"/>
Host MIB - Processes	<input checked="" type="checkbox"/>
Interface - Errors/Discards	<input type="checkbox"/>
Interface - Non-Unicast Packets	<input type="checkbox"/>
Interface - Traffic (bits/sec)	<input type="checkbox"/>
Interface - Traffic (bits/sec, 95th Percentile)	<input type="checkbox"/>
Interface - Traffic (bits/sec, Total Bandwidth)	<input type="checkbox"/>
Interface - Traffic (bytes/sec)	<input type="checkbox"/>
Interface - Traffic (bytes/sec, Total Bandwidth)	<input type="checkbox"/>
Interface - Unicast Packets	<input type="checkbox"/>
Karlnet - Wireless Levels	<input checked="" type="checkbox"/>
Karlnet - Wireless Transmissions	<input checked="" type="checkbox"/>
Linux - Memory Usage	<input checked="" type="checkbox"/>
Network - CPU Utilization	<input type="checkbox"/>
Network - Directory Information	<input type="checkbox"/>
Network - File System Activity	<input type="checkbox"/>
Network - File System Cache	<input type="checkbox"/>
Network - Logged In Users	<input type="checkbox"/>
Network - Open Files	<input type="checkbox"/>
Network - Volume Information	<input type="checkbox"/>

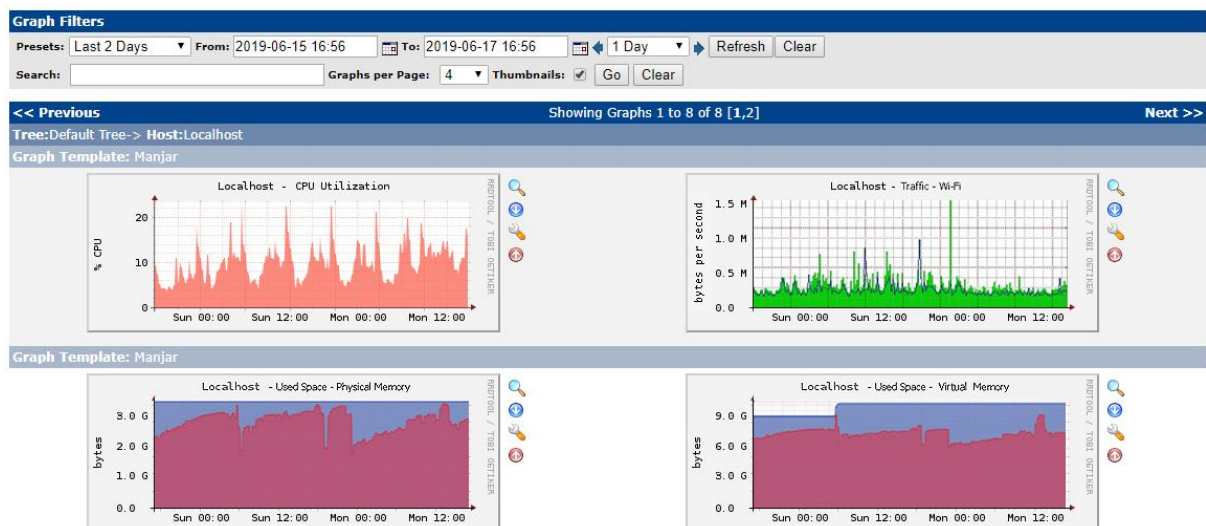
SNMP - Generic OID Template





Hasil Monitoring

Berikut ini adalah hasil monitoring CPU, *physical memory*, LAN/WiFi, dan *virtual memory* selama 2 hari yaitu tanggal 15 Juni hingga 17 Juni 2019.



Daftar Pustaka

- <https://computingforgeeks.com/how-to-install-and-configure-cacti-on-ubuntu-18-04/>
- <https://www.itzgeek.com/amp/how-tos/linux/how-to-monitor-remote-linux-servers-with-cacti.html>
- <https://www.techrepublic.com/article/how-to-install-cacti-snmp-monitor-on-ubuntu/>
- <https://www.youtube.com/watch?v=zQmE4IwNVvo>