

Computer System Design and Administration

Topic 13. Global monitoring tools: Ganglia and Nagios 3



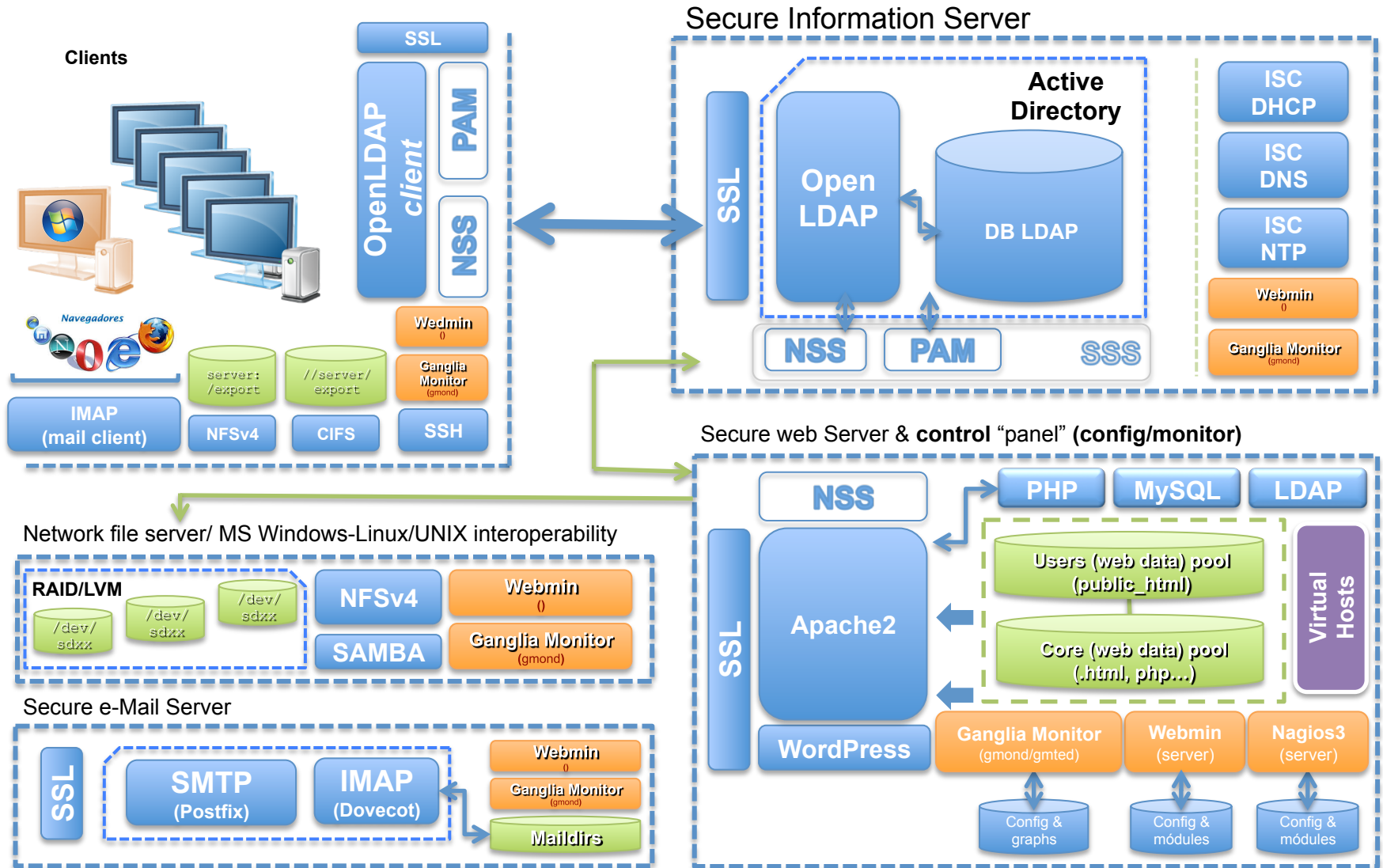
José Ángel Herrero Velasco

Department of Computer and
Electrical Engineering

This work is published under a License:

[Creative Commons BY-NC-SA 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/)

Puzzle



Target: Control panel (configuration)

• Deployment of a **unified control system** to configure and monitor a whole *computing environment*, based on:

– Global configuration:

- Webmin.

– Global monitoring:

- Ganglia-monitor.
- Nagios 3.

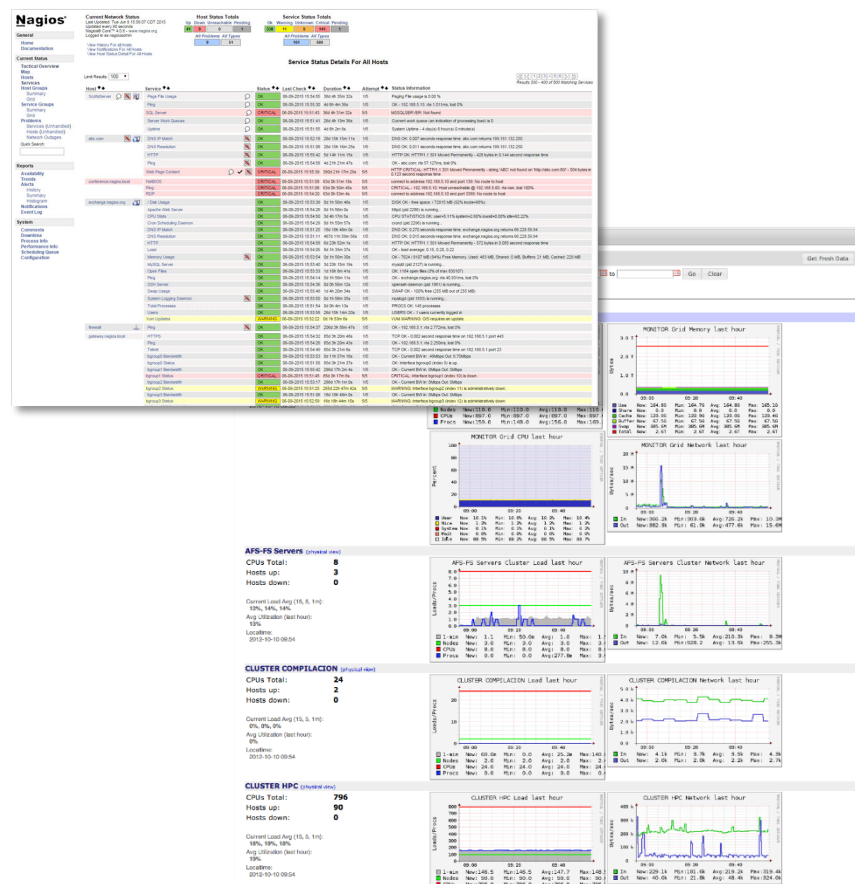
– Others:

- Log File Viewers:

- Webalizer Logfile Analysis (Webmin module).
- Ksystemlog.
- Logwatch.

- Linux tools:

- System:
 - » `sysstat`, `lsof`
- Accounting:
 - » `acct` (`lastcomm`, `sa`)
- Networking:
 - » `iptraf`, `netstat`, `nmap`



Ganglia-Monitor: Main features



• Ganglia-Monitor:

- It's a **scalable distributed monitoring system** for high-performance computing systems such as clusters and Grids:
 - Data Center environments too.
 - **Client-Server** schema.
 - Data access through simple *web browser*.
- **It's able to:**
 - **Monitor** remotely:
 - System load parameters.
 - **Network activity and traffic load.**
 - System resources use:
 - » Memory (RAM/Swap), disks, networking, cpu...
 - Create and manage *on-line* and *historical* **statistics...**
 - Plotting data with **on-line graphs.**

– Hypercritical and distributed design:

- 100% scalable...

– Leverages standard technologies:

- PHP, XML, XDR, RRDTOol.

– Open Source:

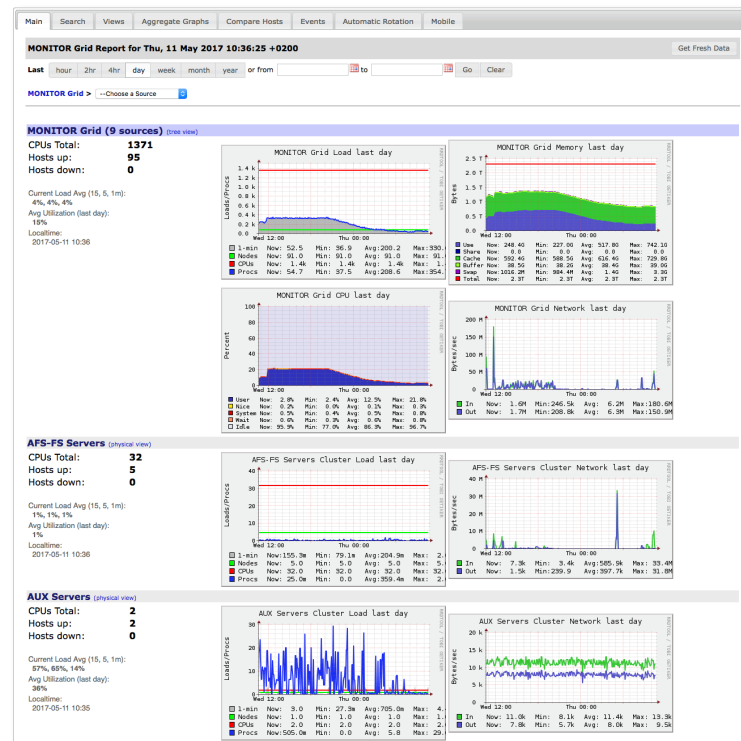
- BSD licensed.

– Portable:

- An extensive set of operating systems and processor architectures.

– More details:

- <http://ganglia.info>.

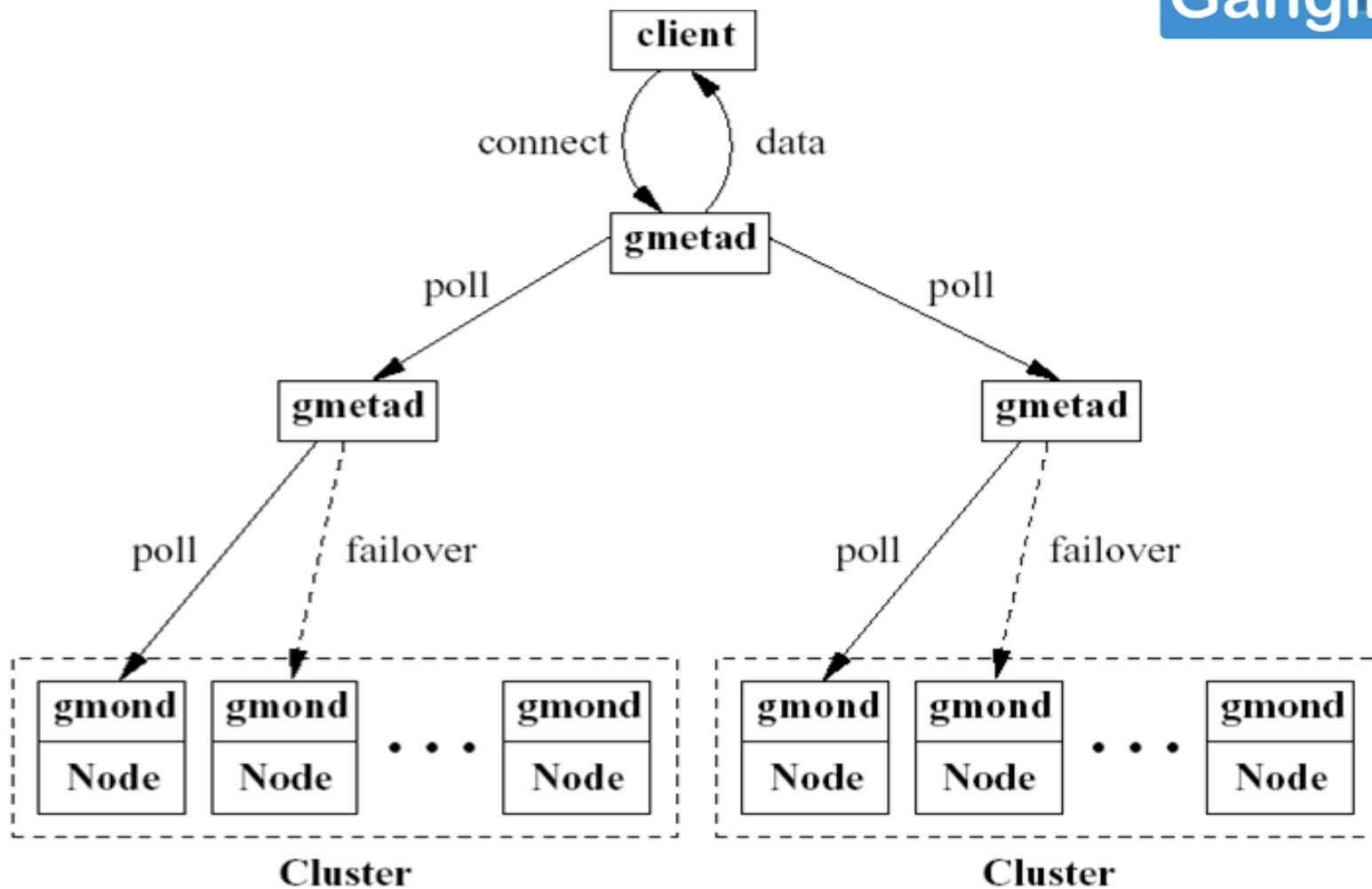


Ganglia-Monitor: Software components



- **Gmond (Ganglia Monitoring Daemon):**
 - *Multi-threads* daemon that **collects, processes and shows** the status of each *host* (node).
 - It must run on EVERY node that you want to monitor.
- **Gmetad (Ganglia Meta Daemon):**
 - It is a “*parser*”:
 - Gets the *gmond* data and **processes** (analyzes) them.
 - Only run on the main node or *front-end* node.
- **Web front-end (Ganglia PHP Web Front-end):**
 - Web interface based on PHP that makes the whole computing environment user-friendly:
 - Using RDD graphs.
 - **WEB server (apache)** is necessary.
 - It is usually installed on the *gmetad* node.

Ganglia-Monitor: Software components



Ganglia-Monitor: Installation (debian)



- Install **gmetad** (**frontend**) from debian 7:
(wheezy) repositories:

```
$ apt-get update
```

```
$ apt-get install gmetad ganglia-webfrontend
```

- Gmetad **configuration**:

```
$ vi /etc/ganglia/gmetad.conf
```

Ganglia-Monitor: Installation (debian)



- Install **gmond** (**backend**) from debian 7 (wheezy) repositories:

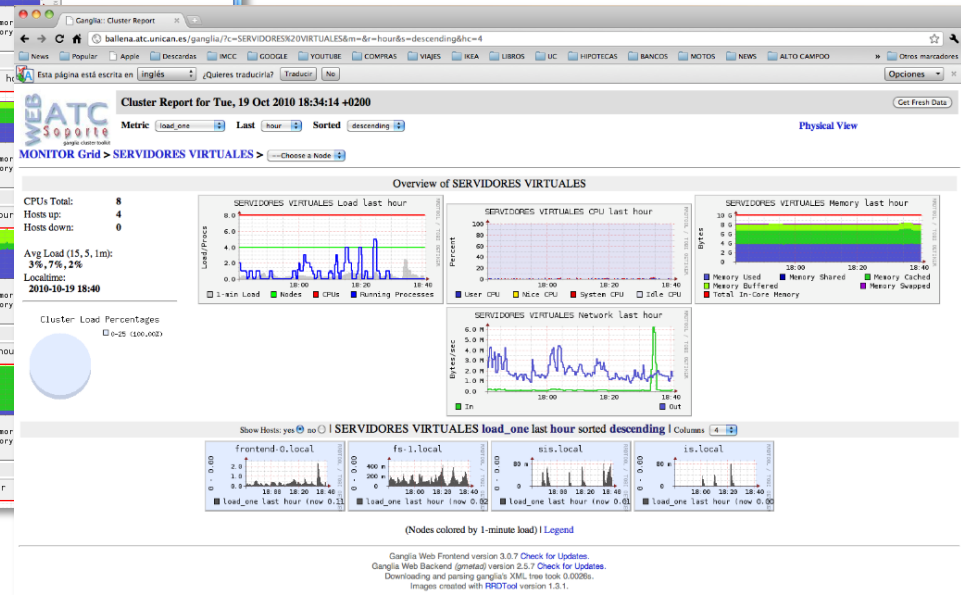
```
$ apt-get update
```

```
$ apt-get install ganglia-monitor
```
- Gmond **configuration**:

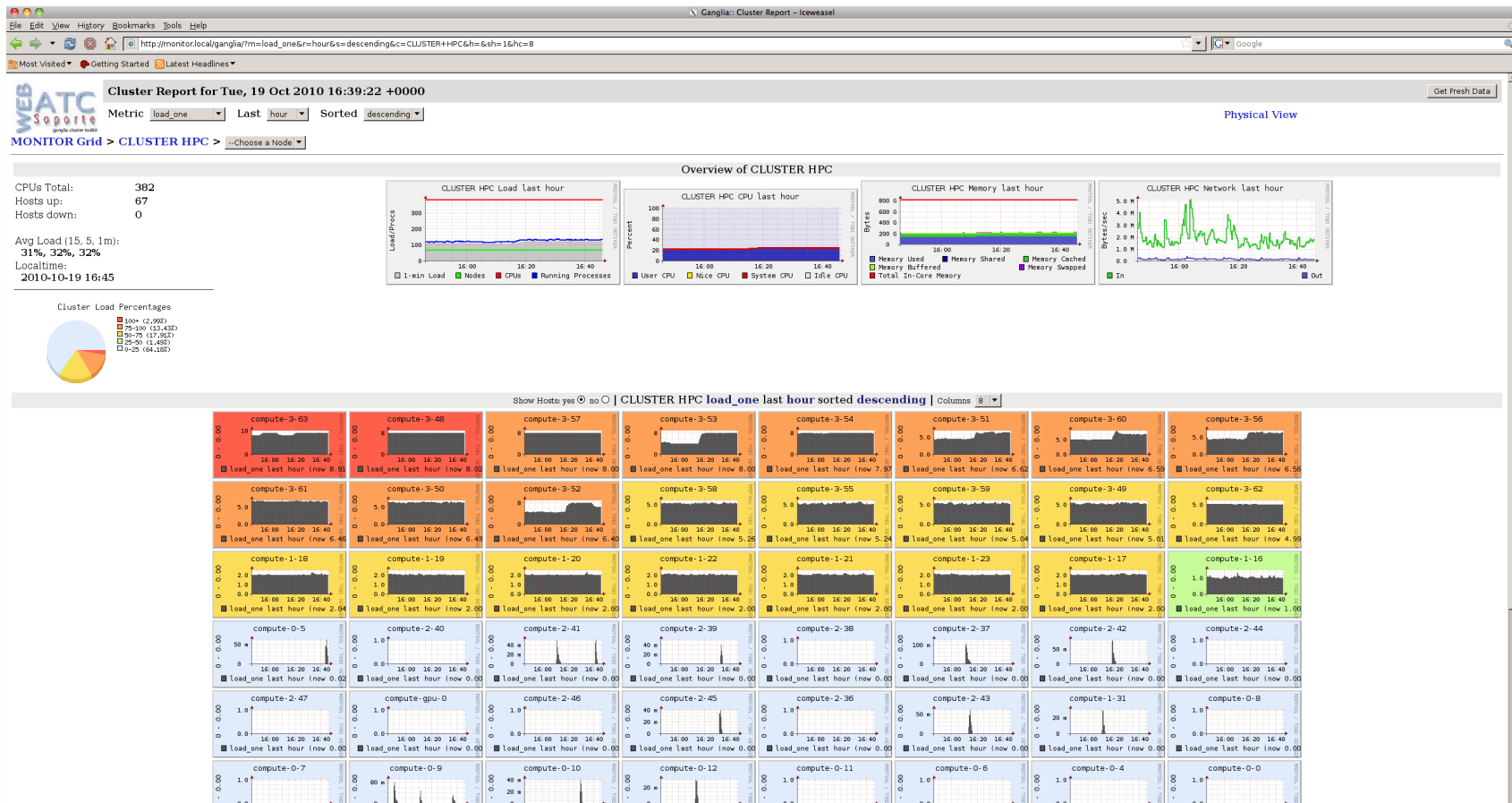
```
$ vi /etc/ganglia/gmond.conf
```


Ganglia-Monitor: What can it do?

<http://localhost/ganglia>



Ganglia-Monitor: What can it do?



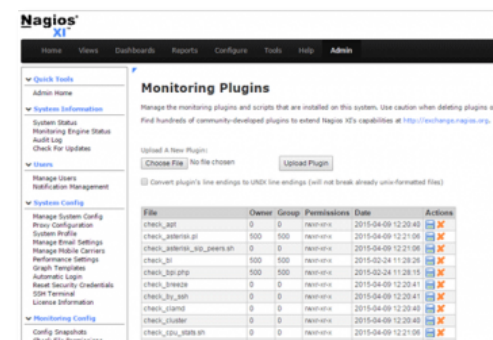
Nagios: Nagios Ain't Gonna Insist On Sainthood

• Nagios Core:

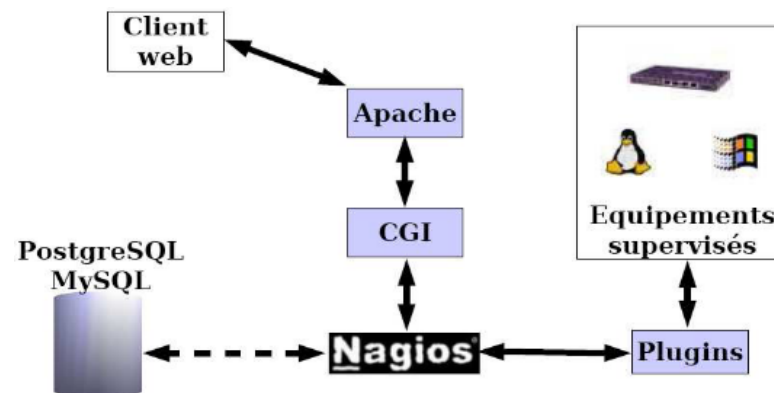
- **Computer-software application** that monitors system, network and infrastructure status from a “front-end” web.
- **Monitoring system:**
 - Devices:
 - **Hosts, switches, routers...**
 - Services:
 - **SMTP, POP3, HTTP, NNTP, ICMP, SNMP, FTP, SSH...**
 - Resources:
 - **Processor load, disk usage, system logs...**
 - Hardware:
 - **temperature, alarms.**
- **Alerting system:**
 - It alerts users when things go wrong.
- **Networking maps:**
 - Available data graphing plugins.
- An **web-interface** for viewing current network status, notifications, problem history, log files, etc.
- **Origins:**
 - *NetSaint:*
 - **Ethan Galstad and a group of developers.**
 - Predecessor: *Bigbrother...*
- **Nagios XI:**
 - Enterprise Server.
 - Extended interface, config manager, and toolkit using Nagios Core as the back-end.
 - www.nagios.org.



Based on a huge plugins suite



Source: <http://www.nagios.org>.



Source: <http://www.memoireonline.com>.

Nagios: Description



- Nagios core:

- Scalable:

- Based on **c-cgi** and “**common plug-ins**” developed using C/perl/**python**.
 - Parallelized service checks.

- Modular design:

- Its functionality is built through the **plug-ins**.

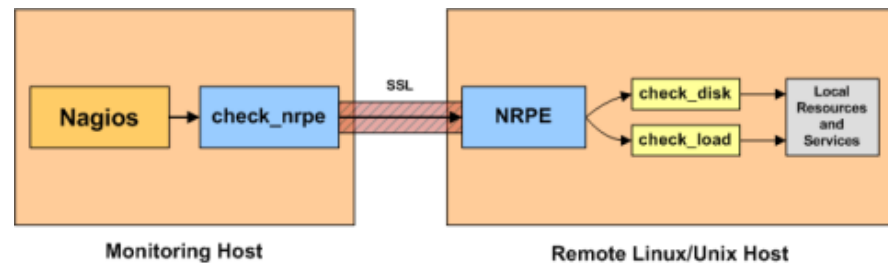
- “Easy” configuration:

- Plain text files.
 - “*Templates*”.

- Multiplatform.

- 2 development lines:

- Open sources:
 - **Nagios core.**
 - Enterprise.
 - **Nagios XI and more:**
 - » *Tools, web front-end, plugins...*



Source: <https://www.nagios.org/projects/>.

Nagios: Software agents



- **NRPE.** Nagios Remote Plugin Executor:
 - It is a Nagios agent that allows remote system monitoring *using scripts* that are hosted on the remote systems.
- **NRDP.** Nagios Remote Data Processor (NRDP):
 - It is a Nagios agent with a flexible **data transport mechanism** and processor.
- **NSClient++:**
 - This program is mainly used to monitor **Windows** machines.
- **NCPA.** The Nagios Cross Platform Agent:
 - It is an open source project and scale-able API that allows flexibility and simplicity in monitoring hosts.
 - Allows multiple checks such as memory usage, CPU usage, disk usage, processes, services, and network usage.

Nagios: Installation (debian)



- Install **nagios** (**core**) from debian 7 (wheezy) repositories:

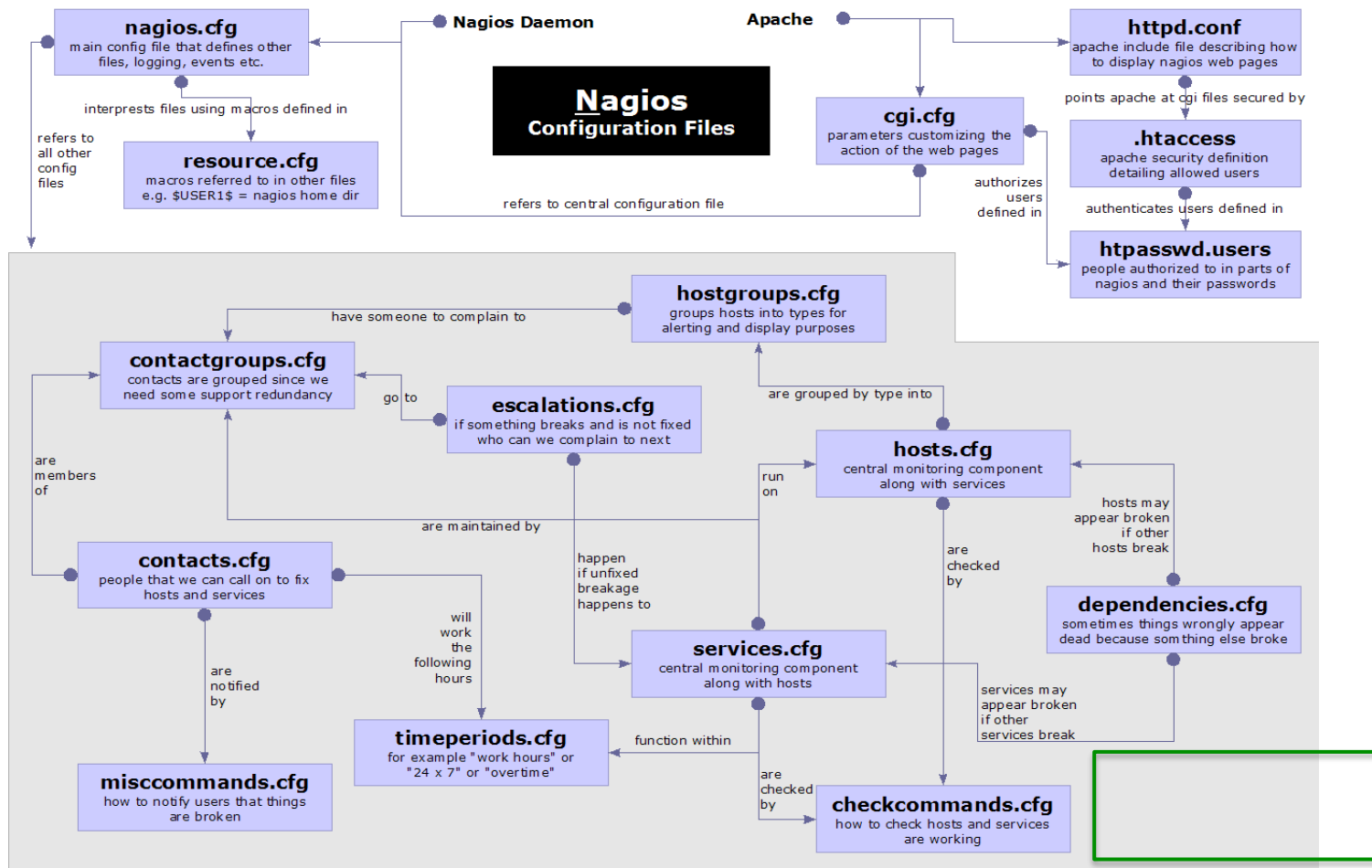
```
$ apt-get update
$ apt-get install nagios3
$ cd /etc/nagios3
$ htpasswd -c htpasswd.users nagiosadmin
** password -->> dgsi
$ cd /etc/nagios3/conf.d/
$ touch hosts.cfg (This will have to be configured later ...)
$ ...
$ /etc/init.d/nagios3 restart
```

<http://localhost/nagios3/>

- I leave Nagios configuration to you...

Nagios: Configuration schema

Nagios



Nagios: What can it do?



Nagios® Core™
Version 3.4.1
May 11, 2012

Get Started

- Start monitoring your infrastructure
- Change the look and feel of Nagios
- Extend Nagios with hundreds of addons
- Get support
- Get training
- Get certified

Don't Miss...

- Interested in speaking at Nagios World Conference 2014? Learn more and apply today at [go.nagios.com/conference](#).
- Improve your Nagios skillset with self-paced and instructor led training services.
- Don't miss the Nagios World Conference October 13th-16th, 2014. 3 days of presentations, industry experts, networking opportunities, and more. Register today before the conference fills up!

Quick Links

- Nagios Library (tutorials and docs)
- Nagios Labs (development blog)
- Nagios Exchange (plugins and addons)
- Nagios Support (tech support)
- Nagios.com (company)
- Nagios.org (project)

Latest News

- Nagios Core 4.0.6 Released
- Nagios Plugins 2.9.1 Released
- Nagios Core 4.0.5 Released
- More news...

Current Network Status
Last Updated: Mon Apr 28 17:52:30 CEST 2014
Updated every 90 seconds
Nagios® Core™ 3.4.1. www.nagios.org
Logged in as nagiosadmin

Host Status Totals
Up: 2, Down: 3, Unreachable: 0, Pending: 0

Service Status Totals
Ok: 8, Warning: 0, Unknown: 0, Critical: 6, Pending: 0

Service Status Details For All Hosts

Host	Service	Status	Last Check	Duration	Attempt	Status Information
cliente	Check Ping	CRITICAL	2014-04-28 17:48:54	0d 0h 18m 36s	4/4	CRITICAL - Host Unreachable (192.168.0.20)
	SSH	CRITICAL	2014-04-28 17:50:03	0d 0h 42m 4s	4/4	No existe ninguna ruta hasta el 'host'
monitor	Current Load	OK	2014-04-28 17:51:12	0d 0h 36m 48s	1/4	OK - load average: 0.01, 0.06, 0.05
	Current Users	OK	2014-04-28 17:52:21	0d 0h 36m 53s	1/4	USERS OK - 2 users currently logged in
	Disk Space	OK	2014-04-28 17:48:51	0d 0h 34m 54s	1/4	DISK OK
	HTTP	OK	2014-04-28 17:49:17	0d 0h 33m 57s	1/4	HTTP OK: HTTP/1.1 200 OK - 316 bytes in 0.002 second response time
	SSH	OK	2014-04-28 17:47:55	0d 0h 33m 0s	1/4	SSH OK - OpenSSH_6.0p1 Debian-4+deb7u1 (protocol 2.0)
	Total	OK	2014-04-28 17:51:35	0d 0h 36m 26s	1/4	PROCS OK: 85 processes
server-01	Check Ping	OK	2014-04-28 17:52:12	0d 0h 10m 18s	1/4	PING OK - Packet loss = 0%, RTA = 0.43 ms
	SSH	OK	2014-04-28 17:50:49	0d 0h 38m 48s	1/4	SSH OK - OpenSSH_6.0p1 Debian-4 (protocol 2.0)
server-02	Check Ping	CRITICAL	2014-04-28 17:48:59	0d 0h 8m 31s	1/4	CRITICAL - Host Unreachable (192.168.0.12)
	SSH	CRITICAL	2014-04-28 17:50:46	0d 0h 6m 44s	1/4	No existe ninguna ruta hasta el 'host'
server-03	Check Ping	CRITICAL	2014-04-28 17:47:33	0d 0h 9m 57s	1/4	CRITICAL - Host Unreachable (192.168.0.13)
	SSH	CRITICAL	2014-04-28 17:49:20	0d 0h 8m 10s	1/4	No existe ninguna ruta hasta el 'host'

Host Status Details For All Host Groups

Host	Status	Last Check	Duration	Status Information
cliente	DOWN	2014-04-30 09:55:55	1d 16h 46m 23s	CRITICAL - Host Unreachable
monitor	UP	2014-04-30 09:52:25	1d 16h 40m 48s	PING OK - Packet loss = 0%
server-01	UP	2014-04-30 09:54:05	1d 16h 45m 37s	PING OK - Packet loss = 0%
server-02	DOWN	2014-04-30 09:53:25	1d 16h 5m 25s	CRITICAL - Host Unreachable
server-03	DOWN	2014-04-30 09:54:25	1d 16h 4m 25s	CRITICAL - Host Unreachable (192.168.0.13)

