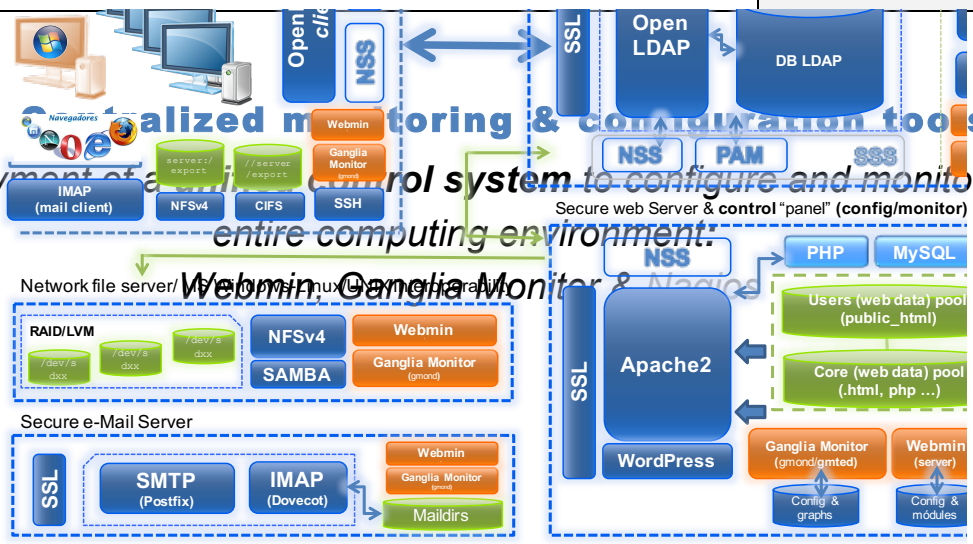

Specialized monitoring & configuration tools:

Deployment of a unified control system to configure and monitor an entire computing environment:

Webmin, Ganglia Monitor & Nagios

server-01

server-03

server-04

Server-05

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Main goals

- To learn about processes for adapting basic servers to certain needs. In this case:

- Installation and configuration of some of the most relevant tools for remote **configuration and monitoring** in Linux (Open Source).
- Adapting the web service under specific **organizational** and **security** premises**:**
    - Webmin
    - Ganglia Monitor
    - Nagios 3
    - Linux tools (auxiliary)

Getting started: Creating the snapshots for lab6

1. Create a new snapshot on the following **VMs**:
    a. *Clone_P1* → **snapshot_P6**.
    b. *Clone_P3* → **snapshot_P6**.
    c. *Clone_P4* → **snapshot_P6**.
    d. *Clone_P5* → **snapshot_P6**.
    e. Remember to keep the VM off.

Assignment 1: The Setting

Updating and initial configuration for **monitor** (`server-04`)

We will re-use *clone_P4* (`server-04`) to deploy a monitoring and configuration center that allows us to keep control of our entire service in our virtual infrastructure. Make sure that snapshot_P6 on *clone_P4* is available.

1. You will have to adapt your clone_P4 to turn it into a **monitoring and configuration center** for all our deployed services. So, carry out the tasks required as follows:
    a. First, update the system from debian repositories.
    b. Then, make an "alias" for `server-04` in the DNS service deployed in Lab1 (`server-01`). Also, be sure that `/etc/hosts` is properly updated on both servers.
        1. Alias: `monitor` → `server-04`

2. **Configure the VirtualBox environment** to access the *web* services on `server-01`, `server-03`, `server-04` and `server-05` from your host (PC or Laptop), using its web browser:
    a. Add the following new rules in the custom NAT network "network_1":
        i. IP host (127.0.0.1), port 8014 → IP `server-04` (192.168.0.14), port 80.
        ii. IP host (127.0.0.1), port 10011 → IP `server-01` (192.168.0.11), port 10000.
        iii. IP host (127.0.0.1), port 10013 → IP `server-03` (192.168.0.13), port 10000.
        iv. IP host (127.0.0.1), port 10015 → IP `server-05` (192.168.0.15), port 10000.
        v. IP host (127.0.0.1), port 10014 → IP `server-04` (192.168.0.14), port 10000.

Assignment 2: The Core I

Installation and configuration of remote *configuration* tools: **WEBMIN**

Once that's done, we will begin with the configuration service Webmin that allows us to configure every feature of both operating systems and services running on our servers. Webmin uses a centralized web interface, restricted access and form-based, to enable administrators to configure everything.

1. *Installation* of the **Webmin** app[1]. Keep the default configuration during the installation process.
    a. Install it on all our virtual servers:
        1. `server-01`
        2. `server-03`
        3. `server-04`
        4. `server-05`
    b. Add (link) the webmin apps on `server-01`, `server-03` and `server-05` to `monitor (server-04)` as webmin clients.
        1. Clue: `Webmin Server` **`Index`**
2. *Initial configuration*:
    a. Restrict IP access to webmin to only computers in the 192.168.0.0 subnet.
    b. Modify the *default* language to the Spanish language (Spanish ES.UTF-8).

3. *Advanced configuration*:
    a. **Administrator profiles**: Enable a new administrator profile (*operator*). This will have a sub-set of root (*administrator*) rights. The administrator will have all available rights. However, the operator will have only have the rights required to manage the service. For `server-04`, those are WEB, MySQL and SSH services. Design these profiles (roles) yourself.
    b. Enable the necessary webmin modules to manage configuration of the following services:
        1. `server-01`:
            1. LDAP Server/Client/Users and Groups
            2. BIND DNS
            3. NTP
            4. DHCP
        2. `server-03`:
            1. NFS
            2. Samba File Sharing
            3. Linux RAID

[1] Use the official debian software repositories

3. `server-04/monitor`:
    1. Web (Apache)
    2. Webalizer logfile analysis
4. `server-05`:
    1. Postfix Mail Server
    2. Dovecot IMAP/POP3 Server

c. Perform the following monitor setup tasks using Webmin:
    1. Modify the default "runlevel" for `server-05` to "*single user*"
    2. Create a new LDAP group and user:
        1. Username: **`user_monitor`**
        2. UID: 2010
        3. GID: 2000 (grp1)
        4. Default shell: `/bin/bash`
        5. User must change password at first login.
        6. Account expires on January 1st, 2020
        7. Force user to change password every 3 months
        8. Add GECON data: Phone number, e-mail address …

d. From `server-04`, using Webmin, configure the follow services:
    1. NFS service on `server-02`:
        1. Disable `/scratch` as directory exported by NFS.
    2. WEB service on `server-04`:
        1. Disable the **secure_csda** *virtualhost* in apache2.
    3. MAIL services on `server-05`:
        1. Send every mail log of postfix/imap services to `/var/log/correo-corporativo.log` on `server-04`

Assignment 3: The Core II

Installation and configuration of remote *monitoring* tools: **GANGLIA**

1. *Installation* of the **Ganglia Monitor** app[2]. Install and configure as a global monitoring tool. Remember that you will have to install the following items on `monitor`:

    a. `Gmetad (server)`
    b. `Gmond (client)`
    c. `Web-frontend (server)`

2. *Initial configuration*:

    We will begin by configuring the virtual host `monitor` as a ganglia **server/client**. In other words, it will act as a monitoring server and monitored client. To do this, follow the instructions below:

    a. *Server side*:
        1. Define a new "cluster" called "**CSDA**". Server-04 (`monitor`) will be the first host to monitor.
        2. Use the **8655** TCP port to link clients to server.
    b. *Client side*:
        1. Link clients to "CSDA" cluster.
        2. Use "multicast" communications.
            1. Multicast address: 239.2.11.71
        3. Remember to use the **8655** TCP port between clients and server.

3. *Adding new hosts to monitor*:
    a. Install **Ganglia Monitor (client)** on `server-01`, `server-03` and `server-05`.
    b. Configure the Ganglia client side on `server-01`, `server-03` and `server-05`, according to the following data:
        1. Link clients to "CSDA" cluster.
        2. Use "multicast" communications.
            1. Multicast address: 239.2.11.71
        3. Remember to use the **8655** TCP port between clients and server.

4. *Improving security*. Add a new security mechanism to HTTP apache2 on `server-04`:
    a. Configure apache2 so that it restricts access to Ganglia. Access from clients (browsers) will be protected by an administrator password.
        1. To do this, use **htaccess** Apache mechanism.
    b. Also, restrict IP access to Ganglia to 192.168.0.0.

[2] Use the official debian software repositories

[OPTIONAL] Assignment 4: More interesting tools I:

Installation and configuration of remote *monitoring* tools: NAGIOS 3

1. *Installation* of the **Nagios 3** app[3]. Install and configure as a global monitoring and *warning* tool. Remember that you will have to install the following items on monitor:

    a. `Nagios3`

2. *Configuration*:
    a. Define the Nagios network with these clients:
        1. `server-01`
        2. `server-03`
        3. `server-04 (monitor)`
        4. `server-05`
    b. Add 4 new profiles of host. Each one will mean a different *computing* feature and include as members all the hosts previously defined:
        1. Groups (profiles):
            1. **ALL**
                a. Members: `everyone`
            2. **HTTP servers**
                a. Members: `server-04` (`monitor`)
            3. **SSH servers**
                a. Members: `everyone`
            4. **Affordable Hosts**
                a. Members: `everyone`
    c. Associated service configuration for each host:
        1. `server-01`
            1. `ping`
            2. `SSH`
        2. `server-03`
            1. `ping`
            2. `SSH`
        3. `server-04/monitor`
            1. `ping`
            2. `SSH`
            3. `http`
            4. `defaults:`
                a. `Local disks checking (free space)`
                b. `System load (activity) checking`

[3] Use the official debian software repositories

c. System processes (number of) checking

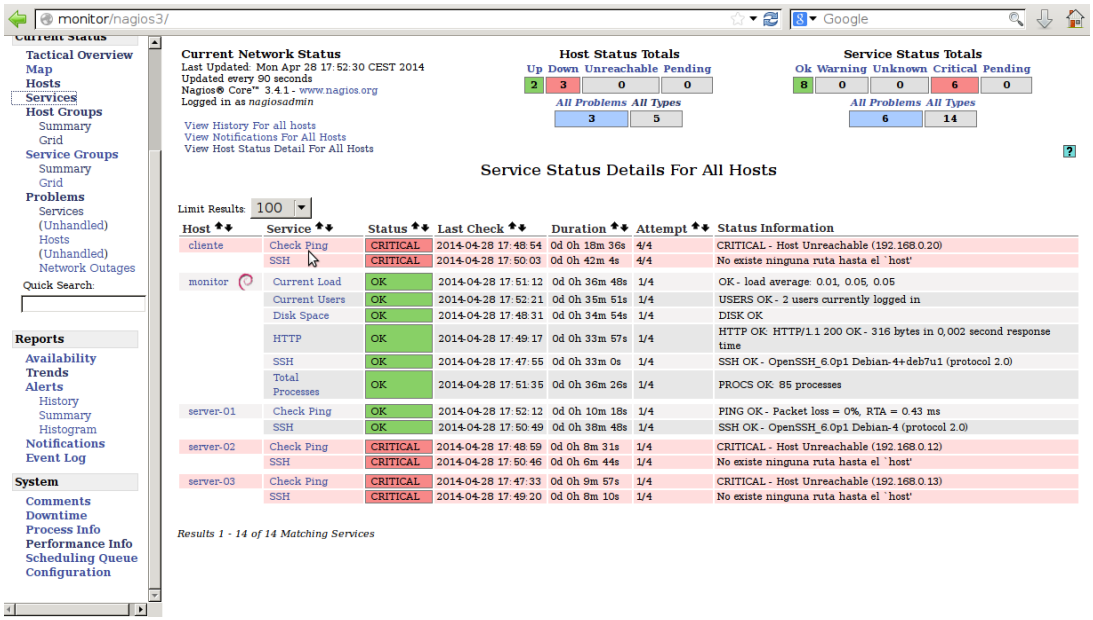
d. System users (number of) checking

4. client

1. ping

2. SSH

The final objective is for the Nagios monitoring service to look as follows:



(Section “Services”)

3. *Improving security*. As with Ganglia, add a new security mechanism to HTTP apache2 on `server-04`:

a. Configure apache2 so that it restricts access to Nagios. Access from clients (browsers) will be protected by an administrator password.

- To do this, use **htaccess** Apache mechanism.

b. Also, restrict IP access to Nagios to 192.168.0.0.

[OPTIONAL] Assignment 5: More interesting tools II:

Installation and use of basic administration tools: LINUX tools …

1. Enable *process accounting* on `monitor`: **`acct`**
   a. Check and evaluate its proper operation. What do you think this tool might be useful for?

2. Configure **rsyslog** on `server-01`, `server-03` and `server-05` in order to dump the main log information about *auth* and *syslog* on our monitor server `server-04`.

3. Install and configure the following tools about log analysis, early detection of potential attacks and system failures, bug detections … Briefly describe their operation modes and how they can be useful. → (Maybe, you can use some Webmin modules)
   a. `Webalizer Logfile Analysis` ("unused")
   b. `Ksystemlog`
   c. `Logwatch`

4. Install and check the proper operation of these *tool packages*:
   a. `iostat`
   b. `pidstat`
   c. `mpstat`
   d. `sar`
   e. `nfsstat`
   f. `lsof`

   For each command, you have to show its main functionality as a monitoring tool and its operation mode.

5. Install and check the proper operation of these *tool packages*:
   a. `iptraf` (no configuration, only install)
   b. `nmap` (no configuration, only install)
   c. `tcpdump`

   Once again, for each command, you have to show its main functionality as a monitoring tool and its operation mode.

Document all the installation and configuration processes carried out for the use of these tools, as well as the **relevant checks** of their operation.

References and resources

1. man
2. Google
3. **Slides:**
   → https://gitlab.com/herreroja/G679

4. And more:
   Webmin
   [1] http://www.webmin.com/

   Ganglia
   [2] http://ganglia.sourceforge.net/

   Nagios
   [3] http://www.nagios.org/