



DL NGL-CLOUD

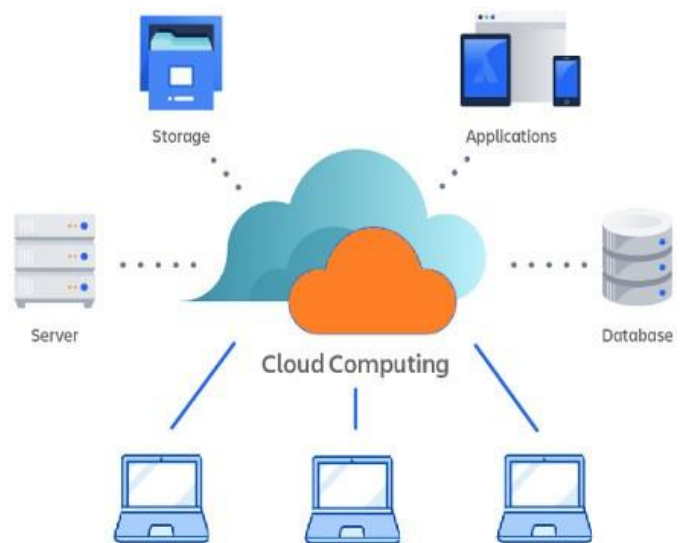
Module for the study of cloud computing

The 'Cloud Computing' module contains devices and tools for analysing and experimenting at an educational level with this latest generation information technology that allows managing processing resources on remote devices, connected to the Internet, which allow for global use of the contents.

The Cloud Computing paradigm is gaining more and more ground in corporate IT innovation, as it allows renting processing resources "on demand", without the need to manage the necessary machines (servers) on site, reducing maintenance costs (breakage of hardware components, addition of processing resources such as CPU, RAM or mass memory) and allowing a use of resources suited to the application they must support.

Further advantages are the possibility of increasing resources the instant they are needed (e.g., due to a sudden increase in the workload generated by a traffic burst) and being able to reduce them the instant they are no longer needed, ensuring cost savings.

This "abstraction" of cloud computing also makes it possible not to have to keep the physical machines directly on site, reducing the times in which the application is offline due to failures of the infrastructure or of the machines themselves.



The Module allows configuring and using a private Cloud Computing system within the Laboratory.

It consists of a Server equipped with all the necessary software components:

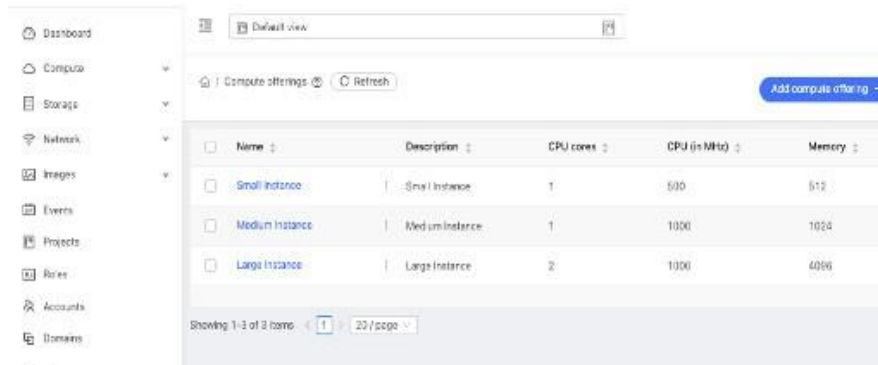
- Preconfigured physical server
- Physical hardware
- Ubuntu Operating System
- Apache CloudStack cloud computing platform and its software requirements
- Open Office, MySQL Database

The resources of this server can be accessed autonomously from the laboratory workstations, using a browser (e.g., Google Chrome) to connect to the Apache CloudStack web interface.

There is also a command prompt with SSH connection capability: Putty for Windows environment.

This solution of implementing a physical Server inside the Laboratory, instead of using Servers available online on the Internet with their Cloud Computing services, certainly has positive aspects both in terms of performance and, in the medium and long term, in terms of costs avoiding the burden of periodic payment for the service.

CloudStack allows configuring Virtual Machines, which reside on the Server, but which are used by Remote Users. For each machine you can set resources such as: number of cores, memory, disk space, etc.

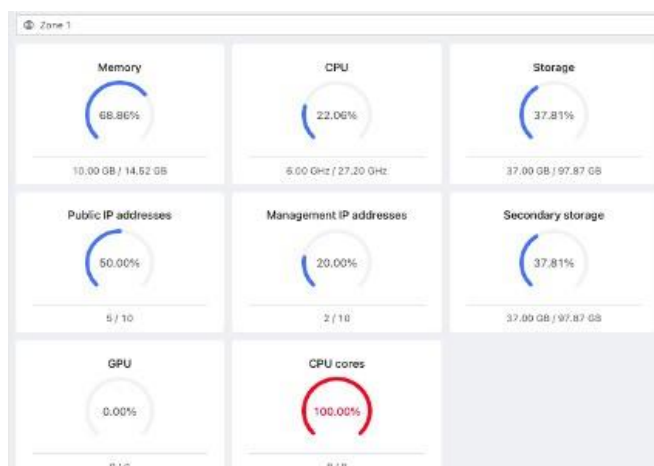
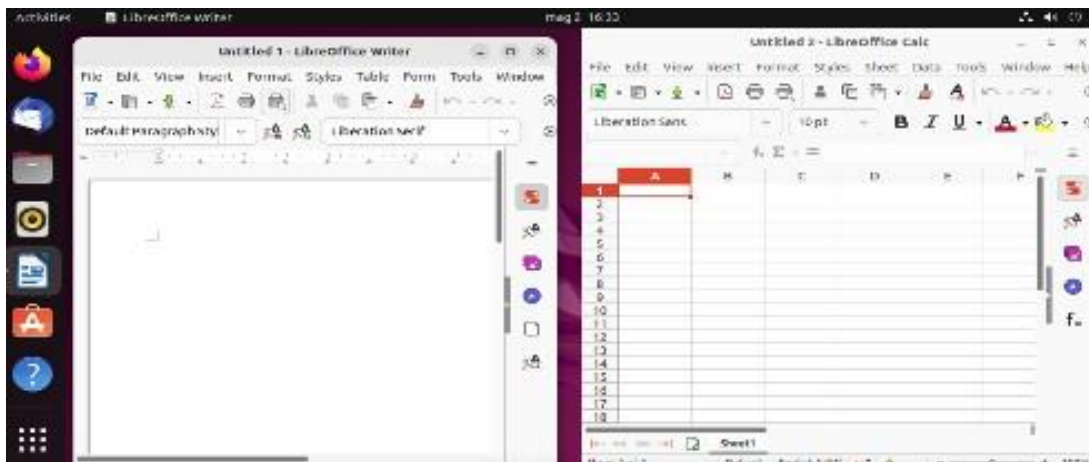


Name	Description	CPU cores	CPU (in MHz)	Memory
Small Instance	Small Instance	1	500	512
Medium Instance	Medium Instance	1	1000	1024
Large Instance	Large Instance	2	1000	4096

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The activity of all Virtual Machines is controlled on the server, in real time, using the appropriate CloudStack tools.

Once users of the system have connected to one of the Virtual Machines, they can work on them as if they were computers on their workstation. It works with the Ubuntu Operating System and with all its individual productivity tools: Editor, Spreadsheet, database, etc.



Educational experience

- Introduction to Cloud Computing
- Types: IaaS, PaaS, SaaS, XaaS
- Cloud Services
- Storage, security, analysis services
- Setting up virtual machines
- Using virtual machines
- Examples and applications

NEXT GENERATION LABS

The DL NGL-CLOUD module can be integrated in the NEXT GENERATION LAB - DL NGL laboratory through the minimum purchase of the following modules:

- **Teacher Station - DL NGL-BASE**
Necessary for the proper functioning of the laboratory. Quantity: 1.
- **Student Station - DL NGL-STUDENT**
To be multiplied by the number of "student stations" to be created.

