Too many grids?

How to share resources between different grid infrastructures

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- **INTRODUCTION**

- **SHARING THE INFRASTRUCTURE**

- **ACCOUNTING INFRASTRUCTURE**

- **MONITORING TOOLS**

- **TOWARDS CLOUD COMPUTING**

- **CONCLUSIONS**

- **Why sharing resources?**
  - Grid projects are in continuous development and expanding.
  - Hardware resources are limited.
  - Manpower overhead.

- **How CESGA has solved these issues?**
  - Implementing a totally virtualized grid infrastructure.
  - Middleware is based on gLite.
  - Developing a new accounting procedure.
  - Installing new monitoring tools and resource databases.
 - Cloud computing.

- **Current projects supported at CESGA:**
  - EGEE III
  - int.eu.grid
  - EELA II
  - Spanish NGI (gLite/Globus 4)
  - Ibergrid
  - FORMIGA
  - G-Fluxo
  - e-IMRT
  - ...

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- **All grid services are running under a totally virtualized infrastructure**
  - Servers are automated installed using kickstart and PXE.
  - **All** new grid services are configured and installed executing XEN VMs.

SHARING THE INFRASTRUCTURE
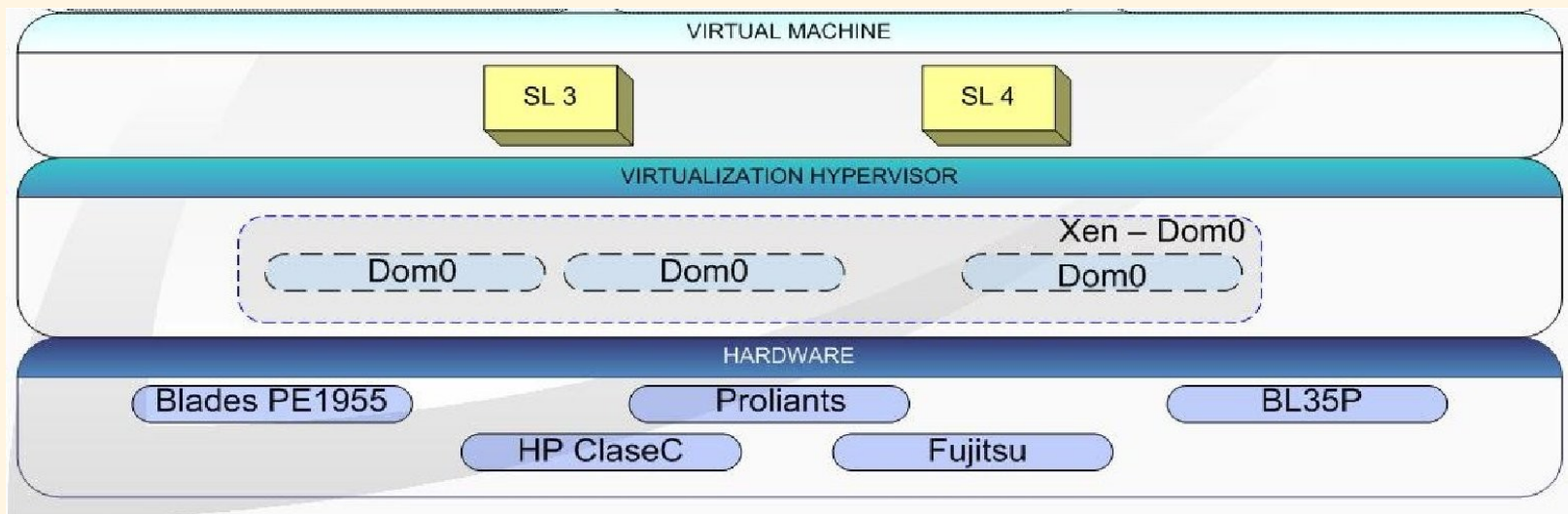
- ## Batch system
  - SGE batch system (supported into gLite by LIP, IC and CESGA).
  - Shared Worker Nodes.
  - Configuration is done by Yaim utility.
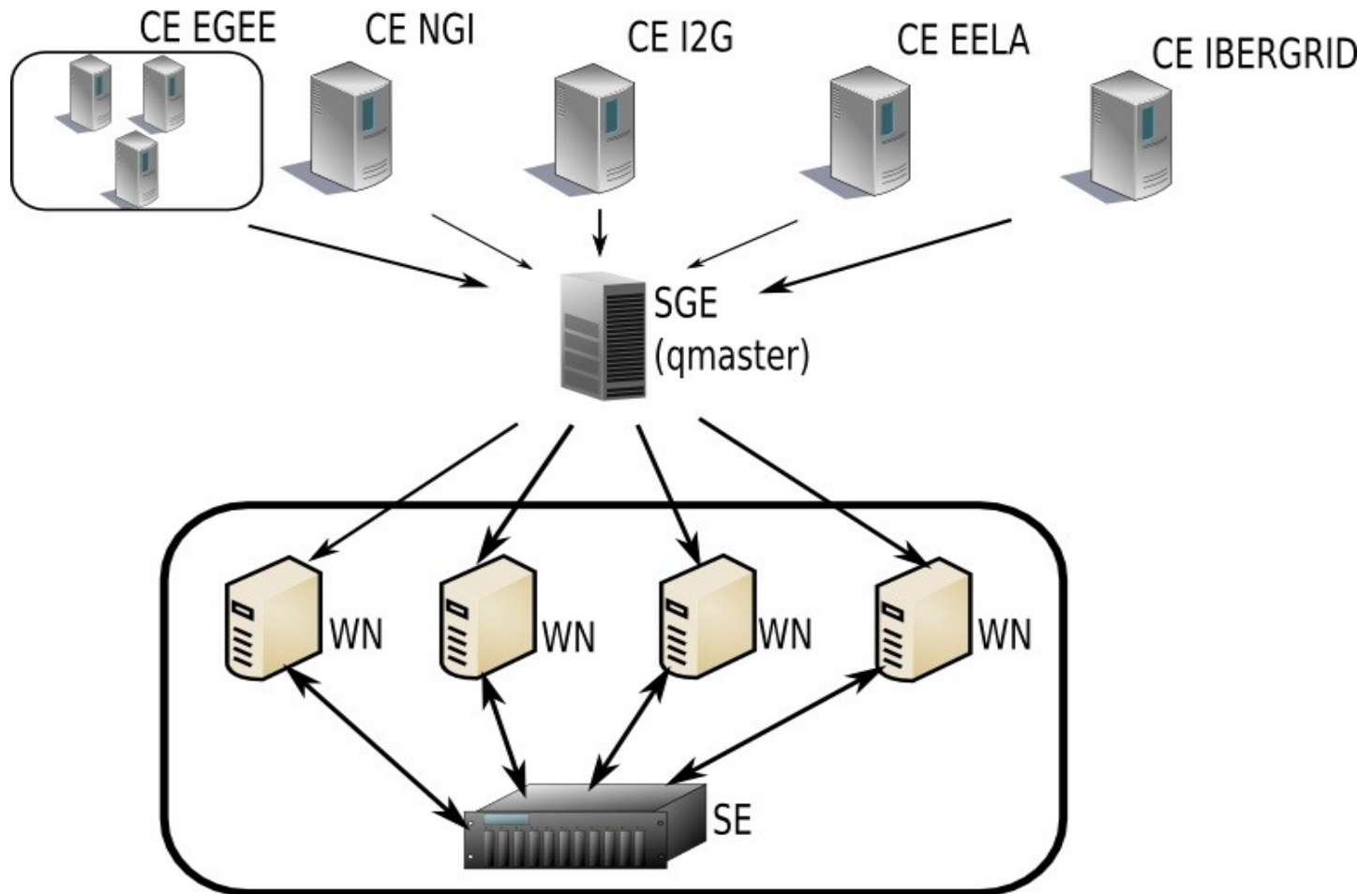 - SGE JobManager loads the correct environment for each project (lcgsge.conf)

    $GRID_ENV   = '/opt/cesga/lcg-wn/etc/profile.d/grid_env.sh';

- ## Storage
  - A single DPM is shared between all VOs and projects

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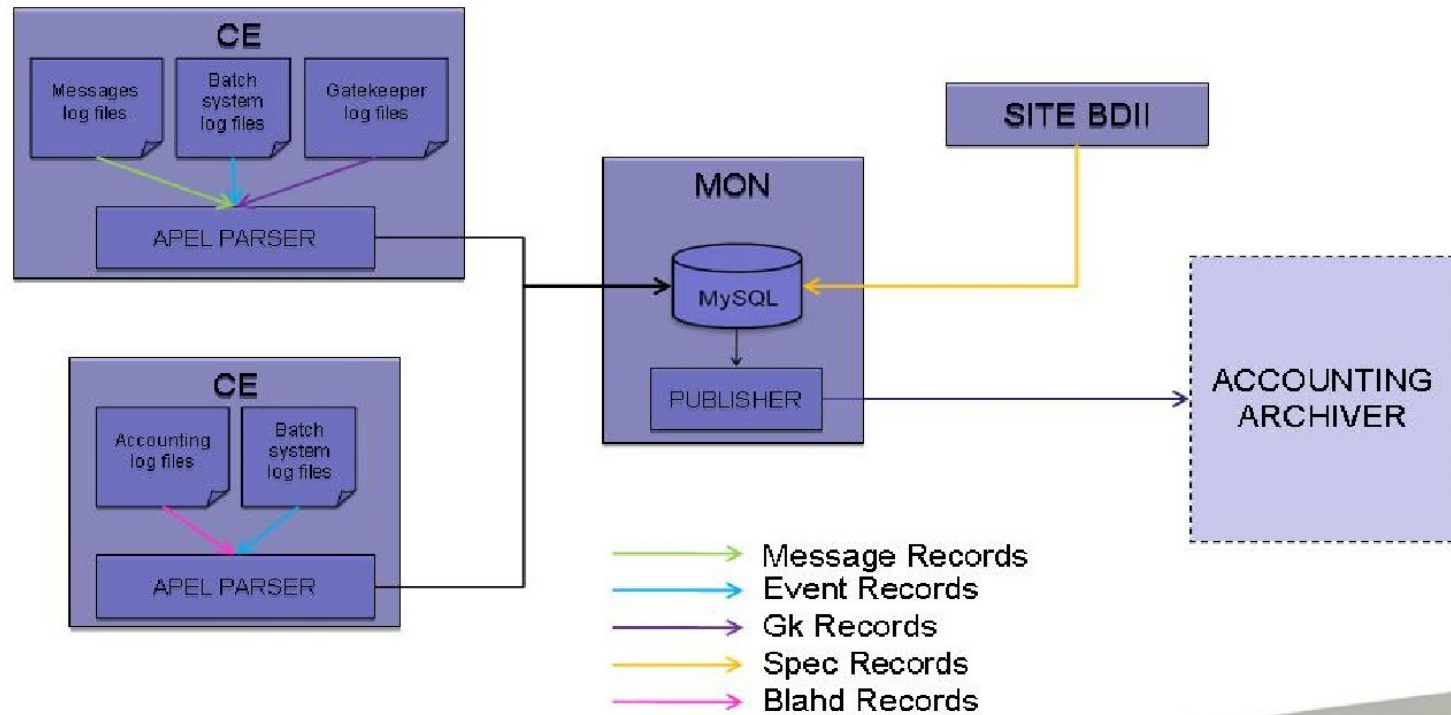FONDO EUROPEO DE
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ACCOUNTING INFRASTRUCTURE

- **Batch system accounting**
  - Each project has different queues.
  - Accounting data is shared into master host (qmaster).
  - We need a cron script to split accounting to a specific project (CE).

- **APEL**
  - Apel processes accounting data stored in each CE.
  - Processed entries by apel are stored on different MON boxes.

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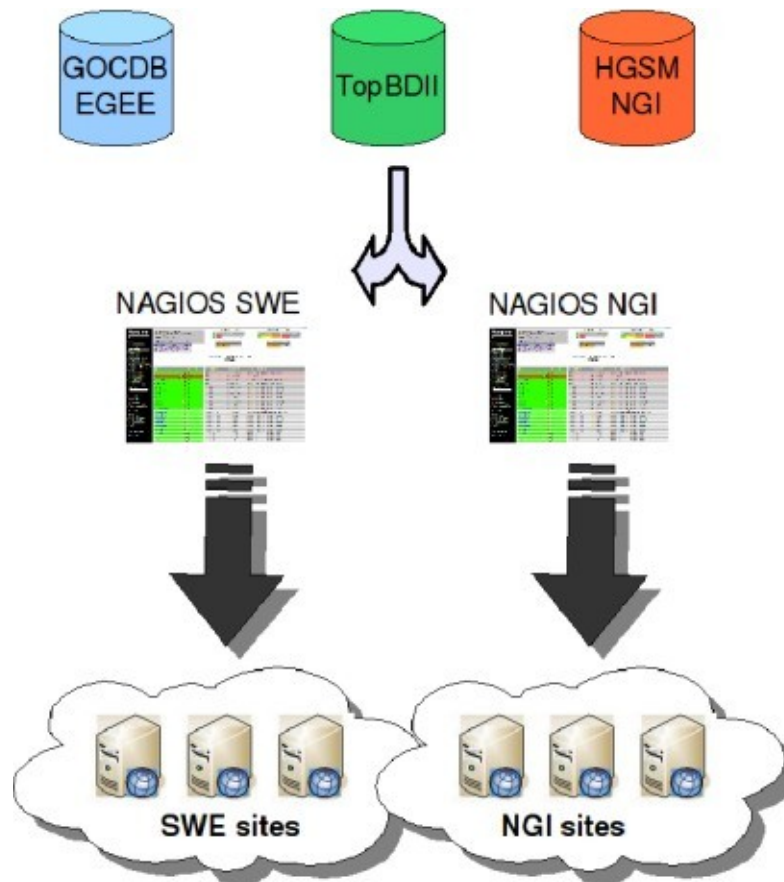FONDO EUROPEO DE
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- ## NCG Nagios
  - Gets hosts information from local or global ldap services (BDII).
  - Uses different probes types like local, native (native Nagios checks) and remote (from external agents like SAM).
  - Gather information from HGSM/GOCDB databases.
  - Multisite configuration.
  - E-mail notifications for grid site administrators.

- ## HGSM
  - Hierarchical Grid Site Management is a PHP web front-end developed into SEE-GRID.
  - CESGA HGSM is used for storing Ibergrid and NGI resources.

VALENCIA, SPAIN,

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- **Why Cloud?**
  - Most of the CESGA grid infrastructure is based on VMs.
  - VMs "golden copies" are stored in a central repository.
  - New grid services could be started in a short time.
  - XEN resources (Number of CPUs, allocated memory) could be managed from a central cloud controller.

- **Eucalyptus**
  - Compatible with Amazon's EC2 interface.
  - Only uses open source solutions:
    - Java Developer Kit (SDK) version 1.6 or above.
    - Apache ant 1.6.5 or above.
    - Curl development package.
    - OpenSSL development package.
    - XEN (version >= 3.0.x).
  - Takes care of available resources.
  - Uses different scheduling algorithms:
    - **Greedy** (first node that is found that can run the VM will be chosen).
    - **Roundrobin** (nodes are selected one after another until one is found that can run the VM).

TOWARDS CLOUD COMPUTING
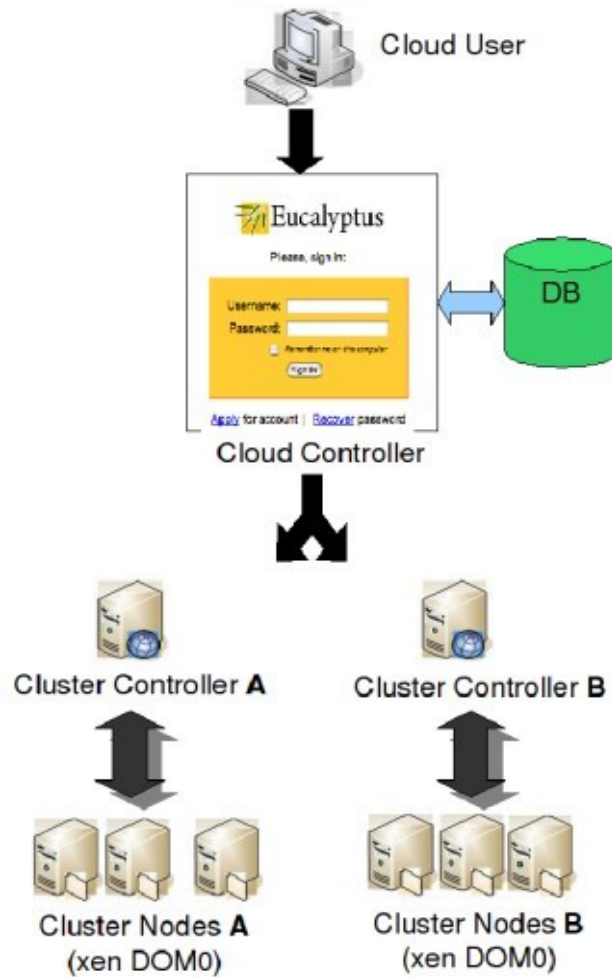
- **Totally virtualized infrastructure**
  - Reduce administration overhead.
  - Reduce hardware costs.
  - New services are installed in a short time.

- **Interoperability**
  - Accounting can be treated separately.
  - We can share computational and storage resources.
  - Scalable.

- **Cloud**
  - We can check available resources at a glance.
  - Automated start/stop services on demand.
  - We can make better use of available Dom0's.

THANK YOU

FOR YOUR ATTENTION

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