2 Architecture

Our solution is a two-server architecture: back-end server to host repository and java applications and front-end server for public access to objects. The servers are virtual machines guested on a hypervisor.

The storage for repository and virtualized infrastructure is a HA two-node active/passive cluster deployed with open source software.

2.1 Infrastructure

The whole project is realized at CNR Piedmont Network Infrastructure administered by Ceris-CNR IT Office. The infrastructure includes networking equipments, servers and offers core network services to CNR structures in Piedmont.

Some keywords to describe our experience: VLANs, IPv6, SAML2 SSO, Virtualization, Clustering, Mail server, File server, Wireless.

- **Virtualization**

There are many reasons to choice virtualized deployment: high availability provided by redundant hypervisors, simple maintenance operations, automatic backup, direct portability.

The hypervisors are connected to VLANs so virtual machines can have one or more interfaces, each of them connected to a different subnet.

The HA cluster is the backup storage for hypervisor virtual machines, in case of failure they could be run from cluster to reduce down time.

- **Storage**

The HA storage is our deployment of a open-source cluster. It provides storage for users and network services by iSCSI connected partitions.

Virtual machine system partitions are on local storage of hypervisor and daily scheduled backup on cluster. Data partition of repository server is on the cluster directly attached to server by iSCSI protocol.

The cluster is deployed on Linux OS (Ubuntu 10.04 LTS) using Corosync, Pacemaker and DRBD as main components for cluster orchestration, resources administration and data mirroring.

More details on cluster and maintenance in Ceris-CNR technical report No. 37 “Storage in HA: cluster attivo/passivo open source” and No. 41 “Storage in HA: manutenzione ordinaria e straordinaria”.