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Virtualization for high availability

A high availability service is one of the main problems for a data center. Till now high availability was achieved by host per host redundancy, a highly expensive method in terms of hardware and human costs. A new approach to the problem can be offered by virtualization.

Using virtualization, it is possible to achieve a redundancy system for all the services running on a data center. This new approach to high availability allows to share the running virtual machines over the servers up and running, by exploiting the features of the virtualization layer: start, stop and move virtual machines between physical hosts.

The system (3RC) is based on a finite state machine with hysteresis, providing the possibility to restart each virtual machine over any physical host, or reinstall it from scratch. A complete infrastructure has been developed to install operating system and middleware in a few minutes. To virtualize the main servers of a data center, a new procedure has been developed to migrate physical to virtual hosts.

The whole Grid data center SNS-PISA is running at the moment in virtual environment under the high availability system. As extension of the 3RC architecture, several storage solutions have been tested to store and centralize all the virtual disks, from NAS to SAN, to grant data safety and access from everywhere.

Exploiting virtualization and ability to automatically reinstall a host, we provide a sort of host on-demand, where the action on a virtual machine is performed only when a disaster occurs.

Primary author: Dr CALZOLARI, Federico (Scuola Normale Superiore - INFN Pisa)

Co-authors: Dr CIAMPA, Alberto (INFN Pisa); Dr MAZZONI, Enrico (INFN Pisa); Dr AREZZINI, Silvia (INFN Pisa)

Presenter: Dr CALZOLARI, Federico (Scuola Normale Superiore - INFN Pisa)

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