

INTERCONNECTING GRID, DESKTOP GRID AND NETWORK

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We are researching and evaluating systems that can provide a bridge to non-dedicated resources for the grid. We focused on the Condor system because it is a technology that has been around for many years. Furthermore, computing elements (CE) that use the LCG or gLite middleware can be configured to interact with Condor pools and forward jobs to be executed. Our aim was to test the functionality of this bridge and also to research issues like security, reliability and network functionality. Our testbed for this research was a Condor pool we set up and the gLite Pre-Production site we administer as part of the EGEE project. Additionally we researched, to some extent, other systems that provide a non-dedicated resources computing model like B.O.I.N.C and the LiveWN project. Our end goal is to provide some case studies that document the possible solutions for expanding the grid with non-dedicated resources and also to investigate the restrictions and boundaries imposed by these solutions.

3. Impact

Computing power that can be collected from idle computing resources can be a great benefit for the grid. It will provide an inexpensive way of expanding the present infrastructure and also gives countries a way to exploit their current computing resources that are located in places such as university or school labs and remain idle for the most part of the day. This can affect other areas as well: by increasing the computing power of an institution (e.g a university) one can provide the means to advance scientific research and knowledge. Furthermore, by using public computing resources, grid technologies are brought closer to the public and also to the scientific community. Finally, there can be a significant reduction to public expenditure, since it will be possible to have better utilisation of the large numbers of workstations being purchased every year in large public organisations, such as universities, research institutes, schools etc.

4. Conclusions / Future plans

The results so far are promising: the Condor system interacts well with our grid site and Condor's features of checkpointing and rescheduling in case of systems failing for some reason provide a very flexible and reliable service. Condor also provides many reliable security features. Future plans include extended scalability and reliability tests and also development of methods and tools that will ease the deployment of such an infrastructure.

Provide a set of generic keywords that define your contribution (e.g. Data Management, Workflows, High Energy Physics)

Grid, Middleware, Bridge, Idle Resources, Condor, B.O.I.N.C, Network Computing, LiveWN, Case Study

1. Short overview

Grid infrastructures today are expanding slowly because adding computing resources is sometimes a difficult, costly and bureaucratic procedure. Some high standards must be met so that a new cluster or high performance system can be added to the grid. We are investigating the interconnection of the main grid infrastructure to other grid-like systems (like Condor) or network computing systems (like B.O.I.N.C.) that provide inexpensive computing power by exploiting idle computing resources.

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