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GridUNESP: The Emergence of a Virtual Organization.

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Abstract – GRID computing has been emerged as a new important field by focusing on large-scale resource sharing, innovative applications, and high performance orientation, defined as a secure, flexible, and coordinated sharing of resources among individuals forming a Virtual Organization (VO). In these work we present, in details, the emergence, constitution, and possible applications that can be obtained through the sharing of the computational resources by scientists at UNESP.

The term GRID computing denote a computing infrastructure that underlies the coordinated resource sharing and problem solving involving a multi-institutional Virtual Organization (VO). VOs vary in their purpose, duration, size, objectives, and composition of the community, enabling different groups of institutions or organizations to share, dynamically, in a highly controlled fashion the resources available collaborating to achieve a shared initial objective.

In the definition of the GridUNESP architecture we started from the perspective the any effective VO requires that we could be able to establish many sharing relationship among the potential participants. The methodology, initially, used to define the VO at UNESP was through the realization of group seminars, and workshops. The first workshop was held in the city of Bauru/SP at May, 24, 2004. This workshop was designed to map the possible groups and scientist that could be members of the VO. T October, 6, 2006, we have the second workshop at São Paulo city, SP, and the main objective was to present the ProINFRA project and the possible interrelationship of computational resources previously existent at UNESP. In the third Workshop, December, 14, 2007, at São Paulo/SP, the main purpose was to present the status of the GRID, at that moment, and the next steps that would be done to implement the VO at UNESP. In 2008 we had approved the ProINFRA project (FINEP) enabling thus the physical implementation of the initial GRID project at Araraquara, Bauru, Botucatu, Ilha Solteira, Rio Claro, São José do Rio Preto and São Paulo cities.

The established GridUNESP architecture is composed of a central cluster with the following configuration: 2048 CPUs, 256 nodes (2x quad-core Intel Xeon) 16 GB mem, 132 TB (4x Sun Fire X4500, 24 TB StorageTek 6140, 36 TB) Sun technology, and seven clusters with 128 CPUs, 16 nodes (2x quad-core Intel Xeon E5440 2.83 GHz), 16 GB mem, Sun technology. The cities of São Paulo, Campinas, Rio Claro, and Araraquara will be linked, initially, by 10 Gbps, and Bauru, Botucatu, São José do Rio Preto and Ilha Solteira by a 1Gbps link. In the Figures 1, 2 bellow we present the GridUNESP architecture and the actual links.

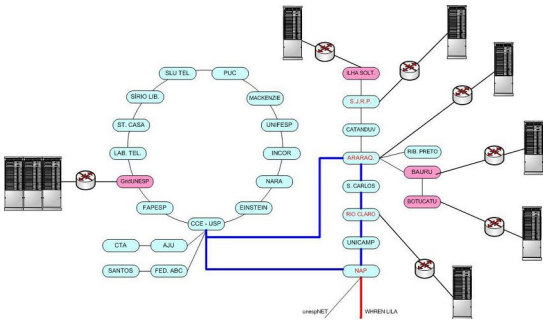

Figure 1. GridUNESP architecture.

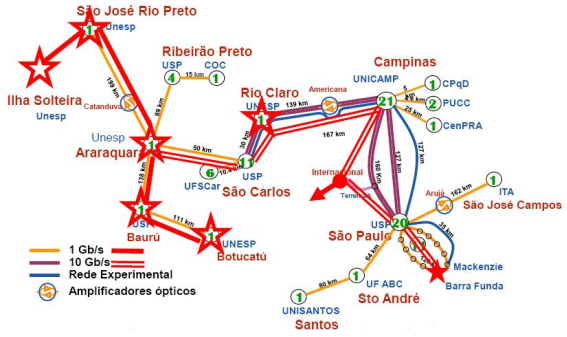

Figure 2. GridUNESP links.

References

[1] http://unesp.br/gridunesp/index_portal.php.
[2] 7 things you should know about Grid Computing, Educause Learning Initiative, January (2006).