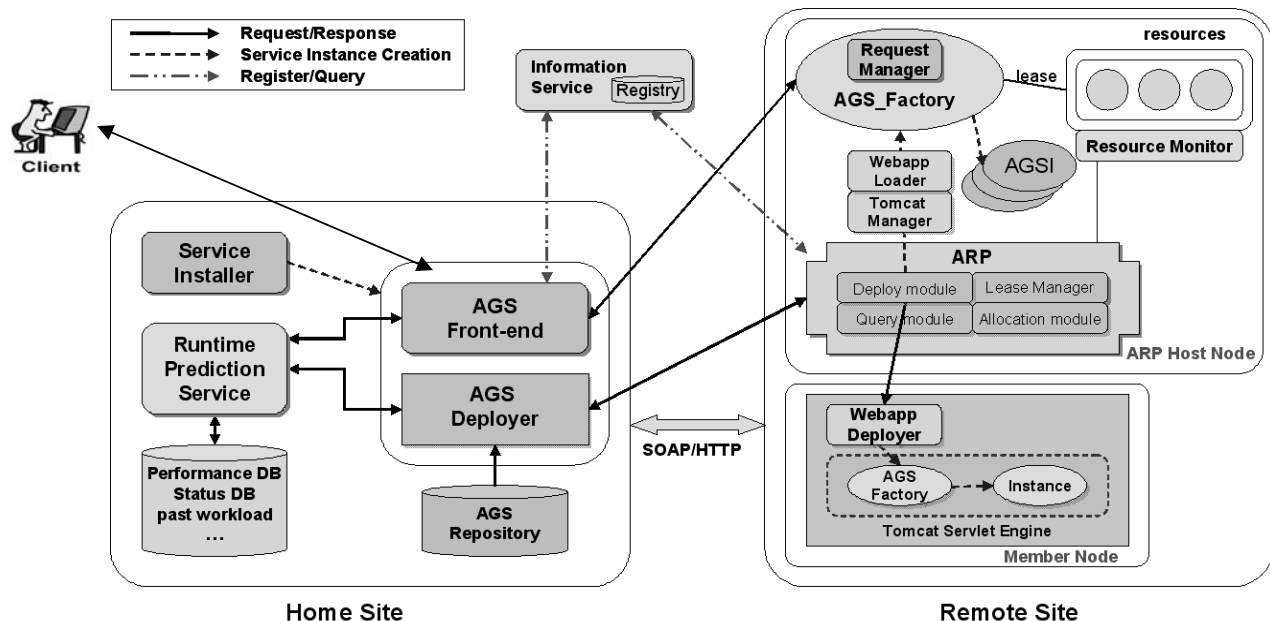


Quarterly Report, Community Services

The Community Services Team, May, 2004
community-services.cs.umn.edu

Highlights

This quarter we have focused on testbed construction of our dynamic Grid service architecture (see below). We have extended GT3 to support dynamic service hosting replacing the standard Grid service container. We have also developed modules that support the complete Grid service lifecycle: packing, installation, deployment, access, and tear down, that work on our local Linux/Solaris testbed that includes University of Minnesota and University of Virginia resources. We have measured and quantified the cost of dynamic service installation and deployment across the network and the basic costs of service access. The cost of dynamic installation and deployment depend linearly on the size of the service implementation package and this cost is on the order of seconds. We have also investigated several optimizations including service caching and incremental service deployment which can substantially reduce the overheads and are applicable in certain instances. These results are described in the SC 2004 paper. We have also made progress on the problem of deciding how many resources to lease to a service given client demand: this has been formulated mathematically and a dynamic programming algorithm was developed. Finally, we have begun to experiment with live services as a step towards deploying DOE-relevant services for next year. This included a genome BLAST service and an eigenvalue solver service for test purposes. We continue to work on adaptive scheduling of MPI jobs, data-intensive jobs, and adaptive load sharing. We expect that this more fundamental research will be implemented in our service architecture in the near future.



Workshops Organized:

Second Intelligent Storage Workshop, Digital Technology Center, U of Minnesota, May 2004

Invited Presentations:

Digital Technology Center, U of Minnesota: "Community Services Project", April 2004

Scheduling for Large scale Distributed Platforms Workshop (NSF-INRIA), Title TBD, Modane France, August 2004

Reviews related to DOE:

SBIR review

PPDG renewal review

Publications:

1. MPI-based Adaptive Parallel Services, to be submitted to the International Workshop on Grid Computing 2004.
2. Cost and Benefits of Load Sharing on the Computational Grid, to appear in the Workshop on Job Scheduling Strategies for Parallel Processing 2004.
3. A GA-based Approach for Scheduling Decomposable Data Grid Applications, to appear in ICPP 2004.
4. A Dynamic Grid Service Architecture, submitted to SC 2004.
5. A Model for Grid Resource Leasing, to be submitted to the International Workshop on Grid Computing 2004.

Program Committees (same as last quarter):

ICPP'04 2004 International Conference on Parallel Processing -- publicity chair

ICAC'04 International Conference on Autonomic Computing

HCW'04 11th Heterogeneous Computing Workshop

AMS'04 Fourth Annual International Workshop on Active Middleware Services

GRID'04 5th International Workshop on Grid Computing

HPDC'04 12th IEEE International Symposium on High Performance Distributed Computing