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NASA's Information Power Grid[18] (IPG) is a high-performance computational and data grid. Grid users can access widely distributed heterogeneous resources from any location, with IPG middleware adding security, uniformity, and control.

Some of the major projects undertaken by IPG are:

Resource Broker

A grid user has to make a resource selection from a large number and variety of resources that they could use for an application. For each potential resource, the resource selection system considers the following factors:

- Computer system characteristics, such as amount of memory, amount of disk space, CPU speed, number of CPUs, type of operating system, available software, and so on
- The time required for the execution of the job
- The cost to use that resource or computer system

Performance Prediction

There are several types of predictions that are useful when deciding where to run applications. These include job/application execution time on different computer systems, wait time in scheduling queues before the job begins executing, and the time to transfer files between computer systems.

Job Manager

Job Manager is used to reliably execute jobs and maintain information about jobs. These jobs consist of file operations (i.e., copy a file between machines, create a directory, delete a file or directory, and so on) and execution operations (i.e., execute an application on a specific computer system).

Portability Manager (PM)

Portability is a key issue with the grid environment and PM is responsible for the establishment of a suitable environment for the execution of the user application by automatically identifying the dependencies of each user program.

Framework for Control and Observation in Distributed Environments (CODE)

The CODE project provides a secure, scalable, and extensible framework for making observations on remote computer systems. It then transmits this observational data to where it is needed, performing actions on remote computer systems and analyzing observational data to determine what actions should be taken. Observational data is transmitted using a distributed event service.

Test and Monitoring Service

The IPG Test and Monitoring Service will provide a framework for examining the health of the grid, so that problems with, or degradation of, grid resources are promptly detected; the appropriate organization, system administrator, or user is notified; and solutions are dispatched in a timely manner.

Dynamic Accounting System (DAS)

DAS provides the following enhanced categories of accounting functionality to the IPG community:

- Allows a grid user to request access to a local resource via the presentation of grid credentials
- Determines and grants the appropriate authorizations for a user to access a local resource without requiring a preexisting account on the resource to govern local authorizations
- Exchanges allocation data between sites to manage allocations in a grid-wide manner instead of a site-specific manner
- Provides resource pricing information on the grid
- Collects and reports the necessary data to ensure accountability of grid users for the use of resources and to enable resource providers to better manage their grid resources

CORBA-IPG Infrastructure

The CORBA-IPG infrastructure gives CORBA-enabled applications, such as object-oriented propulsion systems being developed at NASA Glenn Research Center, the ability to utilize the widely distributed resources made available by the NASA IPG.