Goals

ResourceBroker is a resource management system for monitoring computing resources in a distributed platform and for dynamically assigning them to concurrently executing computations. It is, at present, partially designed and implemented. Although applicable to a wide variety of computations, including sequential ones, it especially benefits adaptive parallel computations.
A computation is *adaptive* if it exhibits at least one of these two properties: (1) it can statically (at start time) and/or dynamically (during the execution) ask for resources satisfying certain characteristics and incorporate such resources when they are given to it; (2) it can continue executing if some resources are taken away from it.

**Functionality**

ResourceBroker can dynamically select and assign resources to computations even if those computations were not developed to work with external resource managers. It simultaneously supports computations written for several unmodified parallel programming systems, including PVM, MPI, and Calypso. ResourceBroker can be viewed as supporting arbitration among concurrently running virtual machines, allocating, deallocating, and reallocating resources among the machines, and growing and shrinking the virtual machines as needed.

ResourceBroker is a service, optionally usable at each invocation of each computation. It runs with user-level privilege, never compromising the security of the platform.

The system consists of two weakly coupled layers. The *resource broker layer* is platform-wide. When fully developed, it will be able to bind resources to virtual machines based on the QoS requirements of the individual computations, with the resource needs specifiable in a language based on that used in Globus.

The *agent layer* consists of sets of agent pro-

---

**Bibliography** (available from MILAN web sites at NYU and/or ASU)


**MILAN is a joint project of**

**New York University**

**Arizona State University**

**Zvi M. Kedem**
New York University
+1 212 998 3101 (phone)
+1 212 477 3265 (fax)
kedem@cs.nyu.edu
http://www.cs.nyu.edu/milan

**Partha Dasgupta**
Arizona State University
+1 602 965 5583 (phone)
+1 602 965 2751 (fax)
partha@asu.edu
http://milan.eas.asu.edu

---

**Calypso Machine**

**MPI Machine**