

Software platform

- Multi computer-sending message:
 - PVM “parallel virtual Machine”, “MPI Message passing system”
 - Open MOSIX, single system image.
- Multiprocessor- sharing memory:
 - OpenMP, Open specification for multiprocessing.
 - Unix process and thread, library PThread.
- Distributed share memory:
 - ”patch” for OpenMOSIX.
- Grid computing:
 - Globus Toolkit.

Note: some technique use in software is very important for us:
Check point and restart.

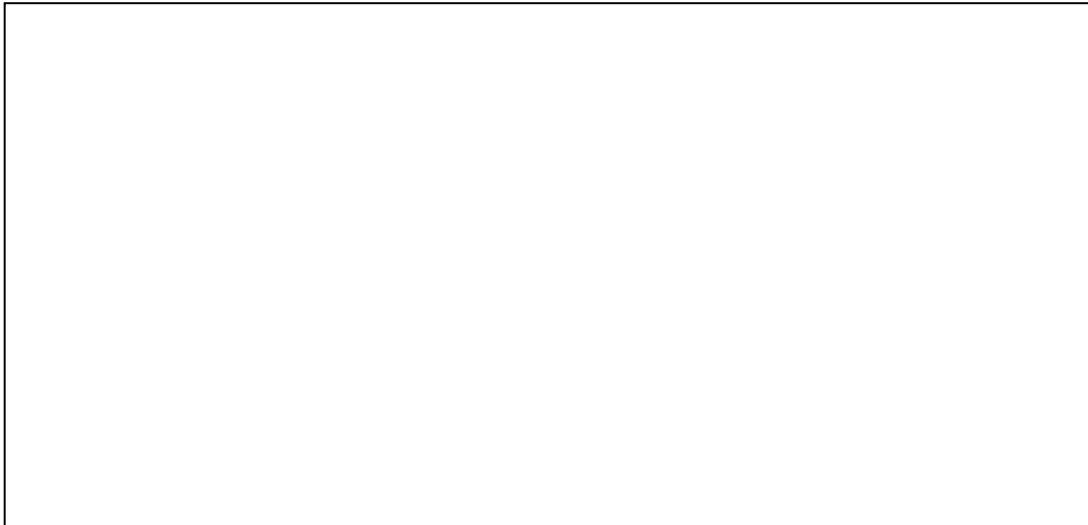
Grid computing

- Infrastructures enable to integrating and mutual (collaborate) use resources such as “executing computer, network, data base, tools, services, etc...”, also organize sharing and space filed.
- Go about new variety in distributed computing by dynamically sharing alternating resources.
- Integration big homogenous systems.

Grid-Architecture components

- Grid is distributed system consist of :
 1. Computers:
 - a- Server: support service.
 - b- application: mutual cooperation.
 2. Network:
 - a- WAN.
 - b- transport service: fast transfer data between application.
 - c- Switching, Routing, Protocols, Security.
 3. Storage data:
 - a- Disk connect to network, big quantity data.

Grid-Architecture components



Grid- Architecture

- Fabric:
 1. Need it to access to local network resources.
 2. Include: execute computer, data disk, code, space field.

- Connectivity- provides secure communication and authentication service, depend on TCP/IP.

- Resources – Safety share resources.
 1. Information protocols, data about structure and state.
 2. Manage protocols- decide sharing.

- Collective- allocate, planning, diagnostic.

Grid-Usage

1. Connection sharing performance computer.
2. Using is restriction: “grid” is specifying to concert area doesn’t extend for all general computing.
3. Not only for heavy computing force (use for most area of distributed computed).

Classification “Grid”

- Standard:
 1. Generate on base (public domain).
 2. Sharing program and data.
- Interactive:
 1. Provide high availability, limiting local user resources.
 2. Visual, virtual reality.
- High power computing(HPC):
 1. Distributed numeric compute.
 2. Demanding compute over large volume of data.
 3. Demanding for big network capacity and synchronization.

GRID COMPUTING

While clusters are collections of computers tied together as a single system, grids consist of multiple systems that work together while maintaining their distinct identities.

In their article “The grid grows up”, Fred Dougliis and Ian Foster (2003) defined the term Grid to denote middleware infrastructure, tools, and applications concerned with integrating geographically distributed computational resources. Owing to the decentralized and heterogeneous nature of the grid, the middleware that glues the different components is more complicated compared with that of clusters.

Resembling an electric power grid, the computing grid is expected to become a pervasive computing infrastructure that supports large-scale and resource-intensive applications. Grid resources, which span the entire globe, include hardware, software, data, and instruments. The significant increase in application complexity

and the need for collaboration have made grids an attractive computing infrastructure.

Applications will continue to be complex, multidisciplinary, and multidimensional, and collaboration will become the default mode of operation. Thus, the need for the distributed grid infrastructure will continue to be an important resource.

An important concept in grids is the virtual organization, which offers a unified view of resources. Although the resources in a grid might be in separate administrative domains, they are made available as virtual local resources to any node on the grid. A user signing on at one location would view computers at other remote locations as if they were part of the local system. Grid computing works by polling the resources available, and then allocating them to individual tasks as the need arise. Resources are returned to the pool upon completion of the task. Grid gives an illusion of a big virtual computer capable of carrying out enormous tasks. The challenge is to allow meaningful sharing of resources without compromising local autonomy. Support of grids requires innovative solutions to a number of challenging issues including: resource management, resource monitoring, interoperability, security, billing and accounting, communication, and performance.

There are several examples of grid platforms and tools such as Globus and Tera-Grid.

Standard grid implementing

- OGSA- Open Grid Services Architecture.
- OGSI- Open Grid Services Infrastructure:
 1. Basic element for grid is: OGSA.
 2. Require specification to generate, control and exchange information between grid servers.
 3. Grid services are web services, full same request and duties to communicate between client and grid.
 4. Grid service support safety and toward fault.

Globus Toolkit

- ***Globus resources Allocation manager***; Perform request for resources, by local instruction (generate process, control and serve it).
- ***Grid security Infrastructure***; authenticate right access, constricting pass global to local user.
- ***Monitoring and discovery***; information service, consist of LDAP(Light-weight Discovery Access Protocol), serve to indicate stat net, servers and data base.
- ***Gobus access to Second Storage***; enable access sharing application to local data.
- Nexus,globus_io; communication in heterogeneous space.

The Globus Toolkit is an enabling technology for the grid. It allows users to share computing power, databases, and other tools securely on line across corporate, institutional, and geographic boundaries, without sacrificing local autonomy. The toolkit includes software services and libraries for resource monitoring, discovery, and management, plus security and file management. It also includes software for communication, fault detection, and portability. The Globus Toolkit has grown through an open-source strategy. Version 1.0 was introduced in 1998 followed by the 2.0 release in 2002. The latest 3.0 version is based on new open-standard Grid services.