OVERVIEW OF BOINC

BOINC is a software platform for distributed computing using volunteer computer resources. The BOINC's features fall into several areas:

Resource sharing among independent projects

Many different projects can use BOINC. Projects are independent; each one operates its own servers and databases. However, projects can share resources in the following sense: Participants install a **core client** program which in turn downloads and executes project-specific application programs. Participants control which projects they participate in, and how their resources are divided among these projects. When a project is down or has no work, the resources of its participants are divided among the other projects in which the participants are registered.

Project features

BOINC provides features that simplify the creation and operation of distributed computing projects.

- **Flexible application framework**
  Existing applications in common languages (C, C++, Fortran) can run as BOINC applications with little or no modification. An application can consist of several files (e.g. multiple programs and a coordinating script). New versions of applications can be deployed with no participant involvement.
- **Security**
  BOINC protects against several types of attacks. For example, it uses digital signatures based on public-key encryption to protect against the distribution of viruses.
- **Multiple servers and fault-tolerance**
  Projects can have separate scheduling and data servers, with multiple servers of each type. Clients automatically try alternate servers; if all servers are down, clients do exponential backoff to avoid flooding the servers when they come back up.
- **System monitoring tools**
  BOINC includes a web-based system for displaying time-varying measurements (CPU load, network traffic, database table sizes). This simplifies the task of diagnosing performance problems.
- **Source code availability**
  BOINC is distributed under a public license that allows it to be used freely for public or private distributed computing projects, with the restriction that it cannot be used as the basis for commercial products. BOINC applications need not be open source. Each project must provide and maintain its own server systems; these systems can be set up easily using open-source components (MySQL, PHP, Apache).
- **Support for large data**

BOINC supports applications that produce or consume large amounts of data, or that use large amounts of memory. Data distribution and collection can be spread across many servers, and participant hosts transfer large data unobtrusively. Users can specify limits on disk usage and network bandwidth. Work is dispatched only to hosts able to handle it.

Participant features

BOINC provides the following features to participants:

- **Multiple participant platforms**
  The BOINC core client is available for most common platforms (Mac OS X, Windows, Linux and other Unix systems). The client can use multiple CPUs.
- **Web-based participant interfaces**
  BOINC provides web-based interfaces for account creation, preference editing, and participant status display. A participant's preferences are automatically propagated to all their hosts, making it easy to manage large numbers of hosts.
- **Configurable host work caching**
  The core client downloads enough work to keep its host busy for a user-specifiable amount of time. This can be used to decrease the frequency of connections or to allow the host to keep working during project downtime.

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