



The Israeli Association of Grid Technologies (IGT)

Comparing Grid and Cloud Computing

The following table provides a summary of the differences in the usage of the terms *Grid Computing* and *Cloud-Computing*. This is a common interpretation as of 6/2008 – and may of course change over time. Comments/Suggestions will be appreciated: info@grid.org.il

Topic	Classic Grid Computing	Cloud computing
The Problem	Computation over large data sets, or of parallelizable compute-intensive applications. Problem areas are often in pure research or in compute-intensive commercial R&D (e.g. in chip development)	On-demand scalability for all applications, including research, development and business applications.
Main Target Market	First - Academia Second – certain industries	Industry and academia:
Business Model – Where the money comes from?	Sponsor-based (Mainly government money) to enable the research community to achieve its research goals in reasonable time. Large corporations may implement it internally for cost saving. Users pay by contributing resources to the shared pool. Otherwise the usage is free (to those allowed to use the grid).	Hosted by commercial companies, paid-for by users. Based on the economies of scale and expertise. Only pay for what you need, when you need it: (On- Demand + Pay per Use).
The Customer	A member of a defined grid community, or a function within a large company.	Open to anyone with a credit card - anyone who can pay.
User motivation	Low cost for large computations and processing of large amounts of data	- On demand scalability - Lower IT costs (infrastructure operations, energy, personnel)
The capability offered	Access to computers	Access to VMs, services or applications
Unit of work	Grid computing application: A batch job, or a group of parallel batch jobs with a storage service	Either - A dedicated VM instance assigned to the user, on which anything can be run. - A Storage Service - usage of an online application
Current capacity allocation limits per customer request	10,000s of machines	10s of machines
Interface	- Proprietary middleware interface (Not simple) - gLite, Globus - Condor, Unicore	- Simple - Web Services (Industry standard) - Proprietary API
Resource ownership	In Multi-organization grids: Pool of distributed resources are shared between multiple organizations. In a single-company grid – resources are owned either centrally or by different departments.	Single owner: Commercial Service provider
Storage Services	Mainly to enable the sharing of the grid applications data	- General purpose storage services: including backups, media/software distribution, data sharing, on-line storage, applications storage
Continuous Availability -24x7	Nice to have	Must
Security	X509, single sign on, Grid Security Infrastructure (GSI)	x509, single sign on
Communication infrastructure	Internet based	Internet based, Pay per Use for network bandwidth
Administration	Distributed, Virtual organizations	Centralized
Examples of implementations	EGEE, Intel NetBatch, Condor, LSF, MICRON (CONDOR), UNICORE, GLOBUS	Amazon EC2, Google Apps, Joyent, Flexiscale, GoGrid, IBM BlueCloud, SUN network.com, Microsoft (coming soon)
Key Challenges	Interoperability, SLA, Security, Standards, complexity, competition with commercial clouds	(The list is longer due to broader applicability): The usual IT challenges: Security, Automation, SLA, Cost/Performance, Clouds Interoperability, universal application access, Data Protection & Recovery, Management Tools, Integration with enterprise Internal Infrastructure, Availability of compact economical applications, Cost/Performance prediction and measurement, maintaining transparency and Simplicity