Grid VIP Summit, June 11-13, 2005, Chicago

Alan J Weissberger
aweissberger@sbcglobal.net

1. Background

At this 4th Grid VIP Summit, speakers, senior executives, and grid industry luminaries (e.g. Ian Foster, Charlie Catlett, etc) discussed areas of common concern regarding Grid project justification, use, future developments and market trends.   The focus was clearly on industrial applications and challenges.   Market Research Analysts attempted to clarify the definition of grid and how the grid was being used to share resources, but it seems they created more questions then they answered. They also stimulated several debates (see 2. What's a Grid? below). Vendors sought to cover the grid technology evolution, but not necessarily their specific product(s).   Users shared the logistics of getting a grid up and running, but did not delve into their applications in any detail (for competitive reasons). Attendees were encouraged to engage the speakers in interactive dialog/ discussions and this was especially true during the Monday, July 11 and Tuesday, July 12 social hours. The shared perceptions and experiences made for a very lively event.

Market dynamics: The impact of Grid computing has already been seen throughout the world, providing increases in productivity of 13% to 36% and savings of 12% to 15%. Starting in educational research and government funded projects, grids have now spread to automotive, medical, aerospace, pharmaceutical, financial services, computing and semiconductor design industries. In fact, 37% of all enterprises are initiating or have implemented some form of grid computing.   But this number was later questioned by a "devils advocate" presentation (see 3. below). One statistic cited is very impressive: a projected 93% CAG rate for the grid market between 2005 and 2010. That certainly would mark this year as an inflection point with accelerating growth to follow.   Several market analysts cited more grid statistics, but at the same type cautioned the audience to be skeptical of their validity.

Link to some of the presentations:
http://www.gridtoday.com/vip/chi/speakers.html

2. What's a Grid? Seeking Clarity in the Grid Computer Market where apparently none exists

From the beginning to the end of the first day (July 12th) of the GRID VIP Summit, it was readily apparent that Grid computing -- both the technology and the market -- is desperately in need of a standard definition and some type of reference model illustrating what a grid might include. The relationship between grids and clusters was also left in doubt.

In a Tuesday, July 12 morning panel session led by HPC (High Performance Computing) market analyst Mike Bernhardt, a quartet of industry analysts were asked a battery of questions designed to shed light on a market mired in confusion.   For example, when asked if the various definitions of Grid computing act as a barrier to accelerated market acceptance, all four panelists -- Dan Kusnetzky and Addison Snell of IDC as well as Martin McCarthy and Steve Wallage of The 451 Group -- seemed to agree that while the definitions might not be a barrier, they definitely muddy the waters for everyone involved.

Kusnetzky stated he was tracking **14 different buzzwords that people he speaks to equate with Grid computing**, including technologies such as blade computing, cluster computing, and network-attached storage (NAS). There needs to be clarity or at least common definitions, he said.

IDC's Snell pointed out, however, that in the HPC market, there is little confusion among end-users as to what constitutes a Grid. However, vendors still suffer as a result of mismatch between grid user requirements and what they offer. Vendors often propose Grid packages, which define exactly what their customers can expect from the Grid infrastructure they are providing (often with one or more hardware partner companies). However, this seldom meets the needs of the users, which causes frustration for both parties.

According to The 451 Group's Wallage, the term Grid can be a dirty word for start-up vendors to utter. He remarked that start-ups that use the term "Grid" in their business plan to define what they do are often "dead in the water."   Many will use other terms, such as "next-generation computing," as they don't want to be directly associated with Grid, he said.
→*This implies that VCs are NOT willing to invest in grid software/ middleware vendors, as they don't believe the market is big enough to support them or that it is not a market ready to ramp.*

Even amongst Grid's biggest proponents, there is an obvious disconnect. The 451 Group's McCarthy cited as an example the Oracle Grid, which he said is not even a Grid at all. In fact, when moderator Bernhardt posed the question of how Grid will affect the cluster market, McCarthy quipped, "I think the Oracle Grid will definitely drive the market for clusters."
→*Does this mean that the Oracle Grid is actually a cluster and all the talk from Oracle about enterprise grids is off base?*

Although the panelists agreed that clusters and Grids are not competitive, there still is considerable confusion. Perhaps it is because some perceive a main draw of Grid computing to be its ability to harness the power of all the connected processors -- something for which clusters are specifically designed. In addition, **clusters often act as nodes on larger Grids** -- a relationship that can be hard to grasp for potential users not well versed in those technologies. *In other words, clusters can be interconnected and/or combined with servers to form a grid.*

This topic of clusters came up again in a presentation by **GGF chair Mark Linesch** of HP. Mark acknowledged the distinction between clusters and Grids can be quite fuzzy at times. "How many clusters could a "clusterer" cluster if a cluster could cluster clusters?" he joked. "And when is that cluster of clusters a Grid?"

What about **geographical differences in Grid** viewpoints?   Snell pointed out that there is a big difference between Europe and the United States when it comes to Grid computing. European users initially had much more sophisticated views of Grid, he said. The European Grid community was more focused on maximizing available HPC resources (e.g., existing clusters, mainframes, etc.) than on CPU harvesting, for example.

"There was not a lot of concern about cycle scavenging spare CPU cycles off of the receptionist's laptop in the middle of the night," Snell said. That is, **PC grids** were not of interest in Europe. Snell went on to mention that while projects like SETI@home, which dominated the North American Grid landscape in years past, do not reflect what could be done practically for a large majority of applications at this time. On the other hand, he said, "Large European companies, like Airbus, had extremely robust HPC Grids working in 1999-2000." Although, he added, that disparity looks to be evening out.

Wallage also chimed in on the issue, commenting that the European Union (actually the European Commission funded grid initiatives) is trying to use Grid to give SMEs (Small, Medium Enterprises) a competitive edge in the market by providing them with computing power. This type of commercial grid project has not received much federal government attention in the US.

So, what can the Grid community take away from this important discussion about what constitutes a grid and what it can be effectively used for? The answer is in how vendors present the technology to end-users. Whether one standard definition of Grid computing will ever emerge remains to be seen -- although events like the GRID VIP Summits could go along way to making this happen. The real challenge remains making users understand all that Grid has to offer and how it can help *them* achieve *their* goals. But first, the users need to clearly articulate what their grid goals are.

3. Are Grid Vendors Serving Users?

If all the discussion about the difficulty in defining Grid computing, and the ill effects it can have on the market, weren't enough, two presentations from grid software vendors introduced a healthy degree of skepticism regarding the current state of the grid computing market. Each presentation suggested an approach vendors need to take to succeed in grids.

These thought provoking presentations challenged grid evangelists who later claimed that the grid market was at an inflection point and ready for a sharp ramp upward.

A] John Powers, President of Digipede Technologies (described as a "distributed computing software start-up") made the following points in his presentation titled, **"Give the People What They Want":**

-Customers think grid is expensive, complex, poor fit

-84% of large computing users are not even exploring a grid project this year

-55% of CIOs are not even tracking grid developments this year

-The right vendor response to customers is to give them what they want: embrace the dominant OS (not necessarily multiple OS's), support the organizations own security model, embrace silos (don't call customers stupid), simplify, simplify, simplify! Support free trials and pilots; conduct experiments.

-Address the right audience: departments with urgent needs, SMB (small medium business)

-Make solutions radically easier to: buy, install, learn, use

B] Kelly Vizzini, DataSynapse's Chief Marketing Officer laid out **five reasons why more companies are <u>NOT adopting Grid computing</u>** in her presentation titled **"Who's Afraid of Grid Computing?"**   Here are the reasons:

[Data Synapse is a grid software vendor selling primarily to the financial industry.]

- A general lack of understanding among potential users. Kelly suggested that vendors shouldn't waste time defining Grid, but they instead should focus on answering users' questions about how Grid can help them solve their computing problems.

- A resistance to change (human nature?).

- The cultural impacts within an organization. Grids require learning to share and trust, among other things, and many companies are not used to departments sharing resources, for example.

- The technology impact has three aspects: applications, standards, and security.

1] Which applications are appropriate for Grids? Kelly said that "grid has legs beyond HPC" and that vendors needed to "map the ease of a grid application to business values."

2] Standards

3] Security

- Software licensing issues. Is the license per user? Per processor? Per machine? These questions need to be addressed by ISVs, as Grid computing presents a whole new world for software licensing.

Ms Vizzini then suggested that instead of wasting time on definitions**, grid vendors should spend their energy answering questions about what Grids can do for a company.**

Her suggestion is in stark contrast to recommendations made by Bernhardt during the market analyst panel earlier in the day. His advice: vendors should go to great lengths to clearly define what a Grid means to them.   Upon closer inspection, though, the two ideas might not

be that different, after all.   If vendors can present prospective users with a concrete definition of Grid -- what it is, what it isn't, what it can do and what it can't do -- those users should be able to decide whether Grid is truly the solution for their problems.

What about vendors collecting use cases and defining their products around user requirements? Robert Fogel of Intel, representing the EGA, stated that it was the vendors who were sharing the use cases of their customers with the EGA working groups. This is probably because few, if any users, participate in EGA.

4. Is the Grid Market a Real Business?

Toward the end of the Market Analyst panel session, a somewhat heated discussion took place as a result of a question from Bernhardt: **Is anyone making money in the Grid market today?**   The answer, it seems, isn't as easy as "yes" or "no."   [Our guess is that a few of the niche software vendors, such as Platform Computing and United Devices are making money, as is IBM on its huge packaged grid initiative]

The 451 Group's McCarthy pointed out that many companies that deal in Grid to some degree, such as IBM and Platform Computing, are claiming rather large profits, but they are not solely Grid companies. The problem, which the panelists seemed to agree upon, is in differentiating which lines of business (e.g., hardware, services, software) can be attributed directly to Grid sales.

A member of the audience raised an interesting point in this discussion when he said that the **only thing unique to Grid computing is the middleware market**. Vendors like IBM, Sun and HP will always be selling boxes, he said. He also mentioned that vertical-specific ISVs must be included when addressing the Grid market, as they should see more sales as they move to Grid-enable their various applications.

However, the discussion changed directions when DataSynapse's Kelly Vizzini turned the tables by commenting that "**a better question might be to ask what end-users are making money from Grid implementations.**" Although, she made sure to point out that it might be difficult to get too much information from users since most feel their Grid is giving them a real competitive advantage in their market.

McCarthy addressed this question not in terms of making money, but rather in terms of saving money. "As a general rule, we find that the early adopters have been wanting to be sold on saving money, and looking to get some benefit as a bonus on top of that," he said. "And the number that most people feel comfortable with is around 20 percent, in terms of overall savings." *He implied that the 20% savings number needs to be computed up front, in order to justify a grid project.*

 Labro Dimitriou of Platform Computing, agreed with this sentiment. Of course the vendors are making money, he said from the audience. Yet IT departments don't make money, they

only spend money. So, the question is whether Grid justifies that expenditure via savings in time and overall cost.

Moderator Bernhardt stepped in to put the original question into perspective. He said that as he spoke with acquaintances from the New York Times, the Wall Street Journal and the Associated Press -- the mainstream media, if you will -- the issue of whether anyone is making money in grids was among their "burning questions." The point, Bernhardt said, is that even though everyone present at the Grid VIP Summit knows about and has a vested interest in the Grid computing business, there needs to be a collective effort from the Grid community to work to educate the media (and users) on the dynamics of the Grid market.

"When you have mainstream reporters ... and their very first question is, "Well, is anybody making money in this market?" that tells you they're not believers in grid and are very skeptical it is a real business."

Intel's Tom Gibbs had a definite opinion this topic -- and posed yet another question: "Those same reporters were asking years ago, "Is anybody going to make money in e-commerce?"' he said. The better question is: "In five years, if you're a vendor selling infrastructure and tools, do you think you'll be able to make money if you don't support the basic concepts of **virtualization** that are inherent in Grids?" *Of course, he didn't bother to define virtualization or the other ubiquitous buzzword, "services oriented architecture."*

5. Grid Computing – What is Real Today!

Another standout presentation, chocked full of check lists, was from Wolfgang Gentzsch, who announced at the VIP Summit that he has left MCNC and will now be working with the Renaissance Computing Institute (RENCI) and the German D-Grid Initiative. During lunch, after his presentation, Wolfgang told me that he acquired his first grid experience from the start-up company he founded, which was later acquired by SUN Micro. Then he moved on to MCNC which developed a grid linking North Carolina Universities and funded various start-up companies that were later sold.

One of Wolfgang's best lists itemized "10 Good Reasons why Industry should Consider Grids Today." Here it is:

- There are benefits to be reaped from departmental, enterprise or global Grids.
- There is a strong standardization community represented by GGF.
- OGSA is real- it enables the integration of services and resources across distributed, heterogeneous, and dynamic virtual organizations
- There is a lot of Grid software available, like the Globus Toolkit 4
- There is a global Grid community, including many Grid projects worldwide.

- The EGA is really doing a lot to promote enterprise Grids. 1st deliverable is the EGA RM on May 11, 2005

- Globus Consortium will advance the Globus Toolkit which brings an open standards building block for enterprise grids

- There are already thousands of operational Grids in enterprises.

- Grid services providers are evolving- BT is focusing on a managed grid solution.

- Worldwide IT spending will increase at a CAGR of 5.9% from 2005 to 2010. Worldwide Grid spending is expected to increase at a CAGR of 93% during the same time period. Source: The Insight Research Corporation.

However, Gentzsch did acknowledge that despite the huge potential of Grids, there are still obstacles the market must overcome. Among those, he said, are **cultural, legal and regulatory obstacles issues**, as well as a Grid's ability to keep users content once it is deployed and operational.   Gentzsch said, "The easier the access to the resources, the more the customers want to use them. Users get very hungry for computing power."

Wolfgang further stated that:

A] There is no one grid business case or model, no use case that fits all, and that you can't buy a grid, you have to build it.

B] The grid business depends on the organization and the type of player: Virtual Organizations; Global/ Enterprise/ Department Grids; Grid Service Provider; Application Service Provider; Grid vendors (products and/or services)

He then provided another checklist for **Business Challenges and Potential Grid Inhibitors**, **Building a Business Case for Grids** and a **Classification of Business Cases and Models**. His presentation can be downloaded from the presentation link given above.

6. Sharing over the Enterprise- Boeing's Grid Perspective

John S. Hurley of The Boeing Company, in a very energetic presentation, discussed some of the issues he faces as the director of Grid Development and Implementation for Boeing- a leading company in the defense and aerospace business. [I've had several conversations with John, who is respected for his knowledge, sincerity and honesty. He is active on the GGF Board of Directors and presented at the Sept 2004 GGF12 in Brussels]. There are now 13 people in John's grid department, but he tells me it will be expanding to 20 people within the next 12 months.

Boeing's perspective on grids: use to improve performance, cost savings and shareholder value through resource sharing. However, Boeing "must hit its financial target," in order to justify any grid deployment. The grid solution must evolve with new technologies, according to John.   Boeing is not just an end user of grids, but also a developer (for internal grid use). *However, they are thinking about selling part of their grid capacity to other users*

as a grid service provider!

Assumption is that most **resources within the grid will be shared**. These resources include: hardware, software, middleware, network, data and information. **The art of sharing has very strong parallels with security, in that authorization must be in place to govern access to the shared resources.** Access control and authorization should be viewed in terms of a multi-level, hierarchical context: local, regional, national, and global. How to negotiate the boundaries and who has access to what? This needs to be clearly stated and accepted throughout the company using grid.

In the future, customers and collaborators will have access to a single organization's grid. As the grid boundaries expand, there is an urgent need to move data in a secure, timely, and cost effective way. John referred to the solution as a "knowledge and data grid," which requires a flexible and adaptable grid computing environment.

Increasingly, issues of **security and trust** are becoming paramount in John's day-to-day life. John preached that "trust in a contractual context" is becoming much more attractive to companies like Boeing, where mistakes can cost millions of dollars in lawsuits. Obviously, issues of trust will always be present in Grid situations where there is the opportunity for information sharing. Hence, Hurley said he uses "big stick" approach and lets people know that consequences will follow should they overstep their bounds. Hurley then spoke about the issues that arise when companies do business on a global scale. Large companies can have Grids that span not only countries, but continents, as well. However, John warned, "Once you move out of the scope of the United States, the rules become very, very different."

Speaking about "**Roles, Rights, and Rationale**," John said that corporate needs are more comprehensive today then ever before. To serve those needs, Hurley opined that an **enterprise grid should have the following characteristics**:

-layered infrastructure for computation and processing (proper responses should be defined)

-data and information should be exchanged in a secure environment (implying access control and encryption, where needed)

-seamless interoperability and application integration are vital

-trust is contractual

John then described three **grid scenarios** being considered at Boeing:

1] A war game exercise

2] Collaborative engineering in a virtual enterprise

3] International and Emerging Markets mergers and acquisitions

The issues common to all scenarios were: resource sharing policy, access control, application level policies, logical consistency, completeness, scalability, and maintainability.

John urged caution and deliberation when moving from an R & D to a Production Grid. Boeing established a **dedicated "transition team"** to be able to provide deployment ready

technology in "hand – off" mode to the production grid team. John said that the production team has no interest in learning new technologies. Instead, it's all about "solving the problem and meeting the need."   Training is a consideration, but "can't be left holding the bag." Meaning other methods should be considered when moving to production grids.

In summary, John made the following points:

- Make sure grids fit within the compliance of an organization's policies and requirements
- In commercial environments, trust may likely be contractual
- Inevitable parallels between security and sharing should be understood and embraced
- Transition from R&D to Production requires a fully engaged transition team to move grid technology to deployment

7. Other Presenters:

A few of the other well-respected presenters included: Ian Foster (Argonne National Laboratory and the Globus Alliance); Charlie Catlett (TeraGrid); Steve Campbell (Sun Microsystems); Tom Gibbs (Intel); Albert Bunshaft (IBM); Mark Linesch (GGF); Robert Fogel (EGA from Intel); Robert Marcus (SRI); Gerry Robert (Mass Mutual Life Insurance); Mike Oltman (Bank of America); and Steve Yatko (Credit Suisse First Boston).

8. Final Thoughts and Closing Comments

This stimulating, informative, and thought provoking conference convinced me that the grid vendors need to do more to match their technology to the needs of their potential customers-the grid users. There was a dichotomy between the grid evangelists (who were "preaching to the choir") vs the pragmatists (who suggested that the vendors were not listening to their customers). Perhaps the answer is to form User Groups within the GGF and EGA, or as a separate organization. Whatever approach is taken, there needs to be a better fit between user requirements and grid vendor offerings. The issues of grid security, manageability, scalability, performance, and networking all need to be discussed in a reasonably open environment for progress to be achieved.

This author is still troubled by the lack of attention given to networking grid sites. There was no discussion of this at all at the Grid VIP Summit, no follow-up from last October's OIF-GGF grid networking workshop, and rampant confusion at the GGF14 Telco Community Group meeting (see report at webtorials.com). So we wonder that when grids move from regional to national to global, how they will be interconnected? When a single organization grid is opened up to collaborators, partner companies, and customers (as John Hurley suggested) how will network access be achieved? Who will be the grid network provider?

Where will the grid networking specifications and recommendations be done?