Grid**Connections**

September 2007
News and Information for the Open Grid Forum Community

In this Issue:

Grid Landscape and Technical Strategy and Roadmap Documents Published

OGF recently published 2 important documents Grid – Distributed Computing at Scale and Technical Strategy and Roadmap for the Open Grid Forum 2007-2010. These 'companion' documents explain OGF's current view of the role of grid in the broader distributed computing landscape and OGF's technical strategy and roadmap for the next 3 years. We spoke with the primary editors of each document, Mark Linesch and Chris Smith respectively, to get a better understanding of why the documents where created and the importance of each.

GridConnections - These documents are described as 'companions', can you explain what is meant by that?"

Mark Linesch - Although these documents can each stand alone, they can also be viewed as documents that compliment each other. Grid - Distributed Computing at Scale sets the overall context and provides a high level overview of Grid, associated technologies and the role of OGF in accelerating adoption.

Chris Smith – The Technical Strategy and Roadmap for the Open Grid Forum 2007-2010 (TS&R, for short) document then outlines our strategy for how the OGF community is pursuing the standardization of grid technologies and describes the current state of maturity of the specifications under development. Together, they provide a high-level "snapshot" on the current state of grid, OGF and the work of our community within the context of the broader trends shaping the industry.

GridConnections - Why were each of these documents created?

Mark Linesch – The IT landscape is undergoing dramatic change as organizations of all sizes journey to a new world of distributed computing. This "new world" is about breaking down technology, process and people silos that inhibit the flow of information, innovation and commerce globally. Grid and related technologies such as virtualization, service

orientation and automation are all "fellow travelers" on this journey. Grid – Distributed Computing at Scale provides OGF's current position on where Grid and the Open Grid Forum fit within this overall IT landscape.

Chris Smith – The TS&R was created as a means of measuring the progress of OGF, and as a means of focusing our efforts on the highest priority problems and issues. By listing high priority requirements (in the form of capabilities or functions) and by listing the maturity level of various specifications produced by the working groups, it becomes straightforward to map the requirements to the specifications and to see whether the specifications being written address those requirements. The alignment process described in the document then kicks in by identifying where gaps exist in order to steer the standards function to focus on filling in those gaps.

GridConnections - How do you think each document should be used and what role does the OGF membership and the Grid community have?

Chris Smith – I would like the members of OGF to take part in the alignment process described in the document. If you are engaged in the Enterprise or eScience areas of OGF, I encourage you to help document your use cases and requirements and to input those into the alignment process. If you are engaged in the Standards function, I encourage you to make sure draft specifications are addressing these published requirements. Essentially, the alignment process enables interaction between users of Grid standards and those who define them.

Mark Linesch - I would like the community to read, discuss, comment, and extend the ideas associated with both documents. I also would like members of our community to share these documents with friends, colleagues, and partners interested in distributed systems and OGF. I hope this document and all OGF documents spark interest and encourage discourse. I also hope that documents such as these can foster a shared view as we continue our journey together.

GridConnections - What is the next step for each document?

Chris Smith – The TS&R document is clearly the first step and needs to widen its scope over time. Given the input from the Enterprise and eScience areas, the list of requirements will increase, and the priority of the items in the existing list might change. New versions of the document will occasionally be published containing the updated requirements list, as well as updates to the standards roadmap, allowing us to chart our progress in developing standards. Between versions of the document, the gaps analysis will be performed and the direction of working groups steered in the directions identified by the requirements.

Mark Linesch - To me, the landscape is continually shifting and thus, this "living document" needs to continue to improve as our understanding evolves and matures. I think there will be ongoing revisions and also a continual need to solicit ongoing feedback from the community on areas of agreement/disagreement, suggestions, and opportunities for deepening and/or extending some of the concepts. For instance, their may be a need to "dive a little deeper" into a particular type of grid usage such as data center or collaborative grids.

GridConnections – Thanks Mark and Chris. We encourage our readers to view and download these important documents by going to the OGF website home page at www.ogf.org. Feedback can be addressed directly to Mark or Chris.

OGF21…Continuing the Momentum

The [preliminary program schedule](#) for OGF21 (Seattle, Washington October 15-19) is now available. OGF21 will continue the momentum established through OGF's two previous 2007 events by providing high-quality content and a productive work environment to advance grid adoption in research and enterprise. OGF21 will feature an exceptional technical working group program, enterprise track focused on Grid use in IT data centers, and workshops on software solutions and scientific applications.

Technical Working Group Program

Over 80 sessions dedicated to advancing the work of OGF's research, community and working groups including OGSA, Reference Model, Virtualization, GLUE, SAGA, GRAAP, and many more! Also, learn about the SC07 demonstration plans of the HPC Profile and Grid Interoperation Now groups.

Enterprise Track

This full day track is dedicated to the emerging application of Grids in enterprises. Sessions will focus on thought leadership and case studies of Grid deployments in the IT data center, grids and server virtualization and data caching applications. Presentations by Boeing, SAS, Platform Computing, Gemstone, Gigaspaces, Intel and others are anticipated.

Software and Solutions Track

The software and solution track features over a dozen sessions dedicated to open-source and commercial software providers discussing their offerings and interacting with grid users and managers on desired features. The software providers will also participate in a round-table discussion on critical requirements to the interoperation of production grids around the world, as identified by OGF's GIN Working Group.

Workshops

Web 2.0 - This full day workshop features presentations on research and commercial applications of Web 2.0 technology including HPC, Cyberinfrastructure, Semantic Research, Social Networking and more.

Geospatial - This half day workshop is a collaboration with the Open Geospatial Consortium (OGC) . Engage on topics such as grid-enabling the OGC's Web Processing Service and a NSF proposal on Community-based Data Interoperability Networks.

GridNet2 - this workshop will highlight the work of the UK eScience at the OGF and in related standards bodies and encourage work across different working groups.

GridToday Article – Mark Linesch Discusses Emerging Trends and Technologies

On 8/26, GridToday published a Q&A article by Mark Linesch. In this article, Mark discusses some emerging technologies and trends and how they might impact OGF. In case you missed it the first time around, we've partially reprinted this important article below:

GridToday - How does the OGF define the "next-generation datacenter," and how do you see grid computing fitting into this arena?

Mark Linesch - I am not sure there is any type of formal definition of a next generation data center. My impression is that the term refers to a collection of the latest technologies and their impact on the data center as it evolves to better serve the needs of business in our increasingly global economy. The term covers a lot of territory – from data center consolidation and the increasing rise of server virtualization; to more intelligent power and cooling; to shared and service-oriented infrastructures and beyond.

Regarding how grid fits into this arena, in the broadest sense, Grids can be thought of as a platform for all types of network-distributed applications or services. This broad interpretation of Grid as application-agnostic, distributed system infrastructure is most evident in Internet-based businesses such as eBay, Amazon and Google but has relevance within the context of architecting any data center environment. Thinking of a data center in grid terms implies (1) breaking the static links between applications and data in relationship to the underlying network, server and storage infrastructure; (2) moving from the typical 3-tier data center architecture with fixed application and resource allocation to pooled, shared and aggregated resources; (3) dynamically managing provisioning and access to these resources based on workload, automated processes, and business policies; and (4) leveraging these capabilities to support multiple lines-of-business in a shared services model with or without chargeback. This enables an IT organization to optimize the ROI of their centrally controlled infrastructure – improving utilization rates and service levels while driving down costs and enabling a more flexible, agile relationship between IT and the businesses they support. Organizations that are deploying these concepts today sometimes refer to delivering" "IT as a service" and to themselves as "IT Service Providers". Ultimately, this can lead to additional flexibility as these more utility-oriented infrastructures can be managed by either the IT organization (in-source), 3rd party organizations (out-source) or some combination based on financial capital and/or other business strategies.

GridToday - Many people think of grid computing as being exclusively relevant to HPC applications, but there is a big push to apply grid-type technologies to transactional and business-critical applications. How is the OGF addressing this burgeoning usage model?

Mark Linesch - We are seeing interest in applying grid-related technologies to transactional and business-critical applications. Key enterprise application vendors such as SAP, Oracle and SAS are tuning their products to shared and service oriented infrastructures and leading industries such as Financial Services have been particularly aggressive adopters of grids and distributed systems technologies.

OGF's Enterprise function led by Robert Fogel of Intel focuses on the needs and requirements of enterprise organizations and associated workloads. Activities in this area include documentation of industry requirements, best practices for enterprise deployment, and evangelism of relevant OGF standards. We are also continuing to work toward a common reference model (the sets of components (both services and resources) that comprise a grid, their relationships and their life-cycles) for grids in the data center. This work is being championed by our Reference Model Working Group RM-WG based on data center-centric use cases focused on areas such as configuration management, provisioning (both transactional and batch), service level management, and dynamic resource control. OGF is also working with the DMTF to align grid requirements with their popular Common Information Model (CIM) which is used heavily in enterprise data center environments. Finally we have recently established a Grid and Virtualization Working Group. This working group is focused on identifying the synergies between Grid and server virtualization, documenting the virtualization specific use cases and virtualization integration profiles for grid infrastructure.

GridToday - Where do next-generation architecture technologies like virtualization, SOA, application fabrics, etc., factor into what the OGF is doing?

Mark Linesch - Grid is a core concept in modern distributed computing architectures and is aligned with other important distributed computing technologies such as virtualization, service-orientation and data center automation. In a sense, Grids are enabled by

virtualization, automation and service-orientation technologies and also integrate these technologies into a unifying solution – particularly across functional and organizational boundaries.

Server virtualization is increasingly popular in data centers around the world as organizations consolidate and then re-architect their IT infrastructure to improve utilization and overall flexibility. Grid compliments and extends server virtualization by pooling virtual and physical (non-virtualized) server resources across a wide range of operating systems and platforms that are controlled and managed as a common resource. Resources can be pooled, shared and aggregated, whether they are in the same building or across the world. Grid also takes virtualization beyond the systems/component level in dealing with applications and data resources. Application virtualization enables applications to be matched to appropriate resources from the pool of suitable and available resources – enforcing pre-defined policies and insuring successful job completion and/or graceful failover. Similarly, data virtualization provides access to data in an "abstracted" way enabling data in any format, at any location, to be accessed with appropriate security, performance, consistency, and coherency while masking complexity.

Service oriented architecture is a natural style both for use in implementing grid middleware and as a pattern for applications intended to be hosted in grids. Grids provide an ideal unifying infrastructure on which to run such loosely-coupled, composed, service-oriented applications given their capability of managing heterogeneous IT resources scaled across organizational and geographic boundaries. Grid middleware software components also exploit service-oriented concepts in their design and operation. Based on broadly adopted Internet and web services standards, these "Grid Services" enable the discovery of appropriate resources upon which to run applications, help to describe, execute and manage jobs, access and move data, and in general enable a robust and secure environment for the execution of a variety of scientific, engineering, and business applications.

Grids can also provide a unifying framework for policy-based automation. Automation is critical to managing the complexity of distributed systems - insuring required service levels are maintained based on pre-defined policies in a cost-efficient manner. For instance, Grid Services provide a control structure for the scheduling and provisioning of resources, the graceful failover of resources and the dynamic scaling of resources to meet workload demand based on policies set by the organization and/or IT professional. This ability to dynamically discover, assemble, operate and release the resources needed to accomplish a given application task securely is an important characteristic of grid technologies and a requirement for the cost-effective operation and management of distributed systems at scale.

GridToday - Where does the onset of multi-core processors rank among OGF's priorities? Will the work of OGF's various working groups be affected by this hardware revolution?

Mark Linesch - This is an area of great speculation and investigation right now within the industry; however this is an area that OGF has just begun to discuss. My sense is that over the next 5 years we are likely to see rapid growth in the number of cores per chip (2, 4, 8 … 128). Several key issues are being discussed with regards to this new "multi-core" to "many-core" evolution. First is how you effectively program these systems so that you get proper scalability and programmers are abstracted from as much complexity as possible? Second is how you scale beyond these systems using grid and distributed system technologies? Clearly Grids and multi-core/many-core technologies will need to converge from a programming perspective at some level – possibly through service-oriented architecture concepts; however, I think this is still very much of a research topic. Geoffrey

Fox, OGF's V.P. of eScience did a recent keynote at the CCGrid 2007 Conference in Brazil that your readers may want to access regarding how Grids relate to concepts such as Web 2.0 and multi-core processors.
http://ccgrid07.lncc.br/docs/keynotes/Web2_Multicore_Sandwich.pdf

GridToday - To be truly relevant in the datacenter, does the OGF need to realign its priorities somewhat to take on the standards-related challenges around these technologies? Virtualization, especially, seems to be for real and, at times, analogous to grid.

Mark Linesch - Grids and grid related technologies such as virtualization are clearly an important part of the next generation data center landscape. OGF continually tries to align/realign priorities as these technologies move mainstream but virtualization is a broad term and we need to focus on where we can provide value while partnering with other industry players where appropriate. Clearly the grid community has much to contribute to the application virtualization discussion and OGF has quite a bit of interesting API work underway in groups such as our SAGA workgroup (Simple API for Grid Applications). We also understand the importance of data virtualization within a distributed environment and are interested in working aggressively with vendors and industry experts whenever possible. On the storage front, we partner with the Storage Networking Industry Association and are having a workshop right after the NGDC conference to plan our continued collaboration efforts. With regards to server virtualization, as mentioned earlier in this article, we have established a Grid and Virtualization working group recently to explore use cases and alignment opportunities between grids and server virtualization. DMTF also has a well-established server virtualization working group exploring the management implications in this area and we hope to be able to align and not overlap with their efforts. We are also involved in a recently funded project in Europe called "Reservoir: Resources and Services Virtualization without Barriers".

GridToday - Overall, what do you see for the future of grid technologies in terms of enterprise grid adoption and new takes/applications/uses for grid and/or distributed computing technologies? What role will the OGF play in grid's continuing evolution?

Mark Linesch - I believe that grid technologies have quite a bit to offer enterprise line-of-business and data center environments. By leveraging the network to integrate, aggregate, manage, and scale IT, your ability to solve problems is limited only by the resources you and your collaborators can connect together and manage effectively as a system. In this sense, Grids enable an organization to operate and manage distributed resources as a secure, robust, and flexible infrastructure – particularly as this infrastructure grows, shrinks and changes in response to your needs. Grid and related technologies such as virtualization, automation and service orientation are critical to scaling IT – building at scale, operating at scale, managing at scale, and changing at scale to better enable IT to meet today's dynamic scientific, engineering, and business requirements.

Regarding the role that OGF will play in grid's continuing evolution, we will continue to solicit active feedback and participation from enterprise grid and distributed systems users, experts, and solution providers to knock down barriers and accelerate adoption. We accomplish this mission by: (1) bringing communities together to share, innovate, workshop and outreach; (2) leveraging the expertise & experience of the community to enable successful building and operating of grids; (3) aligning with/influencing other Standards Development Organizations (SDOs) and/or developing specifications that lead to interoperable software standards.

Valuable OGF Presentations From Next Generation Data Center Event
The NGDC show was held August 6-9, 2007 in San Francisco. Mark Linesch presented "Grid – Distributed Computing at Scale" and "Utilizing Grid in the Next Generation Data Center". Please take a look at the presentations as they provide some very valuable insight on their respective topics.

OGF21 Sponsorship Opportunities
At OGF21, over 300 grid leaders, technologists and existing users will come together to develop Grid standards and workshop best practices that will help them build a superior grid capability. This is a great opportunity for organizations to showcase their products and services and to communicate their brand across a wide spectrum of stakeholders, leaders and decision makers in the grid community. Gain exposure for your organization and achieve good will by showing your support for OGF! A wide variety of sponsorship opportunities are available to meet just about any budget, or we will be happy to tailor a package to suit your needs. For complete details, see the Sponsorship Prospectus.

Documents Update – 6 New Documents Including 3 New Recommendations
Recently Published Recommendations
Below is the full listing of the 6 new documents published in August, including 3 new recommendations. Congratulations to all the authors and working group members involved in getting this important work accomplished!

DOCUMENT	TITLE	TYPE	AUTHORS	AREA
GFD.116	Nomination Committee (NOMCOM) Process Charter	Community Practice	Yahyapour, Martin, de Laat	GFSG
GFD.115	JSDL SPMD Application Extension, Version 1.0	Recommendation	Savva	Compute
GFD.114	HPC Basic Profile, Version 1.0	Recommendation	Dillaway, Humphrey, Smith, Theimer, Wasson	Compute
GFD.113	Technical Strategy for the Open Grid Forum 2007-2010	Informational	Snelling, Kantarjiev	GFSG
GFD.112	Grid – Distributed Computing at Scale, An overview of Grid and the Open Grid Forum	Informational	Linesch	GFSG
GFD.111	JSDL HPC Profile Application Extension, Version 1.0	Recommendation	Humphrey, Smith, Theimer, Wasson	Compute

New Documents in Public Comment
Prior to formally publishing a document, OGF solicits "public comments" from the greater grid community, which is an important step in the OGF document process. The following document is now available for public comment. Please take a moment to provide your feedback.
Distributed Resource Management Application API Specification 1.0
2nd International Workshop on Campus and Community Grids
Execution Environment and Basic Execution Service Model in OGSA™ Grids
Guidelines for Information Modeling for OGSA™ Entities
PBS/Torque DRMAA 1.0 Implementation – Experience Report
Grid Certificate Profile
Grid Network Services Use Cases from the eScience Community

OGF 2008 Event Schedule

The OGF event schedule for 2008 is now available. Please reserved these important dates. Additional details for OGF22 and the later events will be published as soon as they are finalized.

OGF22 Boston, Massachusetts February 25-29, 2008
OGF23 Barcelona, Spain June 2-6, 2008
OGF24 Singapore September 15-19, 2008

Upcoming Events

SC07 Reno, Nevada November, 10-16 2007

SC07 is the international conference for high performance computing, networking, storage and analysis.

SYSTOR 2007 Haifa, Israel October 29-30, 2007

This conference, organized by IBM and the Technion of Haifa, includes two complementary events: A Virtualization Workshop and a Storage Practitioners' Seminar.

Additional Events

Our calendar page provides a full listing of grid and related technology events for 2007.

Join OGF Today

OGF membership provides resources, opportunities and insight focused on helping you and your organization stay engaged and ahead in grid technology.   OGF membership is a resource from which you can draw the most essential and relevant information about grid standards, issues and best practices. Participation in OGF offers the opportunity to contribute to, and benefit from, a collective point of view at an industry level. As an OGF member, organizations enjoy a wide variety of benefits including:

- **Recognition** through increased corporate exposure and signal to end-users, partners, grid industry experts, media and analysts that you are an industry leader driving specifications and standards
- **Influence** industry change by participating in OGF committees and working groups which provides a tremendous resource to understanding emerging strategies, standards and operational models
- **Insight** into the collective thinking of peers from a variety of industries and institutions who are involved in similar projects and initiatives; accessing fresh ideas from others who are addressing the real needs of technology users

Please consider joining OGF today. The vast majority of our funding comes from membership fees and we simply would not exist without your funding support.

Closing

The success of OGF depends upon member participation. All of the significant events, activities and accomplishments of the forum are member driven. Please contact any OGF staff member if you want to get involved. We welcome your input!