# GlobalGridForum

Leading the pervasive adoption of grid computing
for research and industry

# Enterprise Grids Requirements Research Group

Toshiyuki Nakata、Ravi Subramaniam、Satoshi Itoh

Session Name, EGR-RG
14th Feb, 2006 (GGF16 in Athens)

# GGF Intellectual Property Policy

All statements related to the activities of the GGF and addressed to the GGF are subject to all provisions of Appendix B of GFD-C.1, which grants to the GGF and its participants certain licenses and rights in such statements. Such statements include verbal statements in GGF meetings, as well as written and electronic communications made at any time or place, which are addressed to any GGF working group or portion thereof,

Where the GFSG knows of rights, or claimed rights, the GGF secretariat shall attempt to obtain from the claimant of such rights, a written assurance that upon approval by the GFSG of the relevant GGF document(s), any party will be able to obtain the right to implement, use and distribute the technology or works when implementing, using or distributing technology based upon the specific specification(s) under openly specified, reasonable, non-discriminatory terms. The working group or research group proposing the use of the technology with respect to which the proprietary rights are claimed may assist the GGF secretariat in this effort. The results of this procedure shall not affect advancement of document, except that the GFSG may defer approval where a delay may facilitate the obtaining of such assurances. The results will, however, be recorded by the GGF Secretariat, and made available. The GFSG may also direct that a summary of the results be included in any GFD published containing the specification.

# Session Agenda

- Summary of GGF15 and what we've done so far.
- Attempts at finding white papers on the web
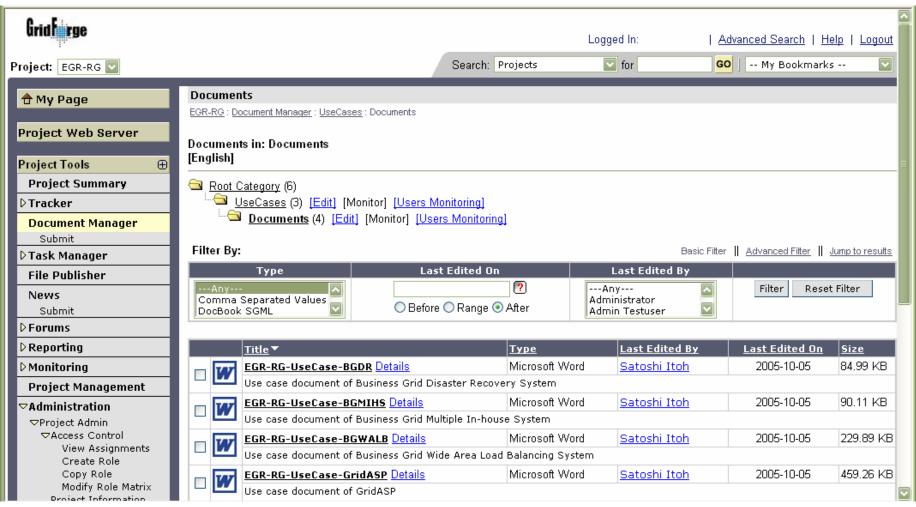  - Toshiyuki Nakata
  - Satoshi Itoh
- Future Plans

# Summary of GGF15

- Explanation of use case repository
- Discussion how to get the Use-Cases.
  - Copyright turned out to be one issue.
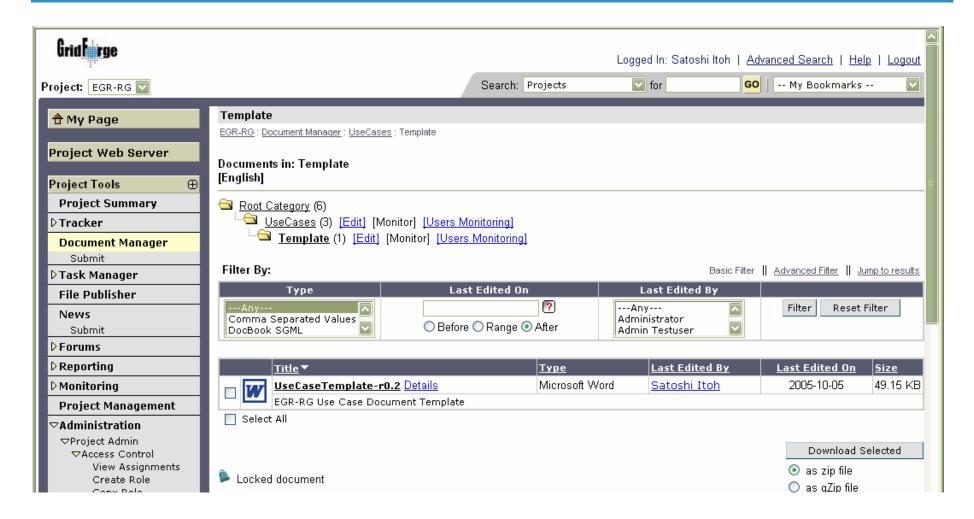  - Tried to see if existing usecases or white papers might work.

# Usecase on GridForge

# Usecase Template



Template -> https://forge.gridforum.org/projects/egr-rg/document/UseCaseTemplate-r0.2/en/1

# GGF Use Case Repository (Prototype)

| # | Title | Type | Area | Group | Keywords |
|---|---|---|---|---|---|
| 1 | Circuit Simulation | uc | Applications | GridRPC-WG | GridRPC, API, SCILAB, Matrix |
| 2 | DIRAC: Distibuted infrastructure with remote agent Control | uc | Applications | GridRPC-WG | GridRPC, API, Remote Agents, Particle Physics |
| 3 | GRID-TLSE | uc | Applications | GridRPC-WG | GridRPC, API, sparse matrix |
| 4 | GriPPS - Grid Protein Pattern Scanning | uc | Applications | GridRPC-WG | GridRPC, API, Genomics, protein scanning |
| 5 | HSEP | uc | Applications | GridRPC-WG | GridRPC, API, Chemistry, PES |
| 6 | KMC - Kinetic Monte Carlo Model | uc | Applications | GridRPC-WG | GridRPC, API, Monte Carlo, Solid State |
| 7 | LAMMPS | uc | Applications | GridRPC-WG | GridRPC, API, Molecular Dynamics |
| 8 | MNT - Digital Terrain Model | uc | Applications | GridRPC-WG | GridRPC, API, stereo vision, visualization, security |
| 9 | RobGrid | uc | Applications | GridRPC-WG | GridRPC, API, robot control |

| 10 | Application Migration | uc | Applications | SAGA-RG | API, SAGA, application migration |
|----|----------------------|-----|--------------|---------|--------------------------------|
| 11 | Bulk job submission | uc | Applications | SAGA-RG | SAGA, API, DRMAA, bulk job submission |
| 12 | Collaborative Visualization of Atmospherical Data | uc | Applications | SAGA-RG | SAGA, API, Collaborative Visualization |
| 13 | Computational steering of a ground water pollution simulation | uc | Applications | SAGA-RG | SAGA, API, Steering |
| 14 | CoreGRID integrated toolkit | uc | Applications | SAGA-RG | SAGA, API, CoreGrid, Framework |
| 15 | Cyber Infrastructure for Coastal Modeling | uc | Applications | SAGA-RG | SAGA, API, visualization, sensors, climate, environment |
| 16 | DiVA: Distributed Visualization Architecture | uc | Applications | SAGA-RG | SAGA, API, scientific visualization, visualization, large data |
| 17 | GRID superscalar | uc | Applications | SAGA-RG | SAGA, API, Task, Parallel, Remote |
| 18 | Hybrid Monte Carlo/Molecular Dynamics | uc | Applications | SAGA-RG | SAGA, API, Simulation, data processing, data base access |

| | | | | |
|---|---|---|---|---|
| 19 | Interactive Visualization Services | uc | Applications | SAGA-RG | SAGA, API, interactive visualization |
| 20 | Iterative Image Reconstruction | uc | Applications | SAGA-RG | SAGA, API, Image Reconstruction |
| 21 | RealityGrid: Real Scientific Computing on the Grid | uc | Applications | SAGA-RG | SAGA, API, Steering |
| 22 | SAGA Use Case Template | tmpl | Applications | SAGA-RG | SAGA, API |
| 23 | UCoMS Project | uc | Applications | SAGA-RG | SAGA, API, Visualization, Tasks, Sensors |
| 24 | Visualization Service for the Grid | uc | Applications | SAGA-RG | SAGA, API, Visualization |
| 25 | test use case | uc | Applications | SAGA-WG | security, application migration |
| 26 | OGSA Use Case Collection | uc | Architecture | OGSA-WG | OGSA |

| 27 | Disaster Recovery System | uc | Industry Applications | EGR-RG | Disaster Recovery, Business Grid Middleware |
|----|--------------------------|------|-----------------------|--------|---------------------------------------------|
| 28 | Multiple In-house System | uc | Industry Applications | EGR-RG | Data Center, Server Consolidation, Total Cost of Ownership (TCO), Business Grid Middleware, In-house System |
| 29 | Enterprise Grid Requirements – Research Group Use Case | tmpl | Industry Applications | EGR-RG | Enterprise Grid Requirements Usecase Scenario |
| 30 | Wide Area Load Balancing System | uc | Industry Applications | EGR-RG | Data Centers' Cooperation, Globally Distributed Application System |

# And then….

- Asked for Usecases on the web.
- Got two
  - IBM's usecase
  - Datasynapse's usecase…..

# Decided to find out on our own.

- Whose home page to look for?
  - Enterprises in the following. Due to time constraints, only Platinum and Gold Organization Members

**Platinum Organization Members**

- National Institute of Advanced Industrial Science and Technology, Japan (AIST)
- Hewlett-Packard
- IBM
- Intel
- Microsoft Research
- Silicon Graphics, Inc.
- Sun Microsystems

http://www.gridforum.org/Members/ggf_members_members.php

**Gold Organization Members**

- Computer Associates
- DataSynapse
- EMC
- Fujitsu
- Grid Consortium Japan
- Hitachi Data Systems
- KISTI
- US National Archives and Records Administration (NARA)
- National Computational Science Alliance (NCSA)
- Nortel Networks
- Oracle
- Platform Computing
- Shell Exploration
- Sybase

# Criteria for the white papers

- Did not include news releases.
- English white papers / Usecases only.
- Included journal papers.
- Algorithm.
  - Go to the top web page.
  - If a white page section exists => goto that page.
  - If not. > Search the company's webpages for the key word Grid.
- Apologies in advance: There probably are lots of papers that I've not been able to locate. Please tell me.

# Problems.

- Copyrights: How can one make a summary without fringing on each company's copyright?
  - For the time being, just include the URL and let the people find out. Probably some  more info. Eg. No. of pages can be added..
- Some companies ask you to register before you can get to the URLs.
  - I registered, but obviously, I cannot include URLs of those white papers.
    - Discussing with one of the company's egr-rg member.
- Most of the papers are either introductory material, or just describe the results and not the technologies which created the results.

# Abstract Candidates

- Source: http:
- Date: March 200X
- Adopter: AAA Corporation (Healthcare)
- System: YY System, ZZZ servers
- Users: Employee
- Application: data analysis
- Benefit: drastically lowered the total cost of ownership and dramatically increased productivity
- *Model：eg HPC*
- *Updated information： （Name of the  Contact Person)*
- *No. of Applications, No. of sites: Size of the Grid*
- *Webpod (Semantics?)*
- *Simple Questionnair.*
- *What are the semantic annotations*

15

- Create Top 500.=>Metrics to find out trends
- Company X Good Usecase for showcases. Success Story Usecases (Best Practices).
- A)How do we get the real inf.?
- How to give an incentive to the vendors?
  - GGF Contest? Publicity,
  - Derive segments etc.
- How to get the initial list.
- Any way to auto
- Checklist
- Got volunteers

# Case Studies on Sun Website

- http://www.sun.com/software/grid/case_studies.xml

| Company | Industry |
|---|---|
| »Aachen University of Technology | Education |
| »Axyz Animation, Inc. | Digital Special Effects |
| »Caprion Pharmaceuticals | Life Sciences - Drug Discovery |
| »CASPUR, Universita' La Sapienza | Academic |
| »Cognigen Corporation | Healthcare |
| »De Novo Pharmaceuticals Limited | Manufacturing |
| »Ford Motor Company | Automotive |
| »GlobeXplorer, Inc. | Aerial and satellite imagery |
| »HPCVL | Education |
| »Inpharmatica, Ltd. | Life sciences |
| » Mentor Graphics Corporation | Electronics/Electric |
| »Motorola | Microelectronics |
| »Ohio Supercomputer Center | Education |
| »Oxford GlycoSciences | Life Sciences |
| »Plexxikon | Life Sciences |
| »RiboTargets | Drug discovery |
| »Synopsys | Electronic Design Automation |
| »University of Durham | Education |
| »University of Houston | Education |
| »University of ULM | Education |

| Company | Industry | Products | Abstract |
|---|---|---|---|
| »Aachen University of Technology | Education | 8 Sun Fire 6800 servers, expanding to a 32-node cluster, 2 Sun Enterprise 450 servers, 4 Sun StorEdge T3 disk arrays, Sun HPC ClusterTools software, Solaris 8 Operating Environment | One of Europe's Premier Technical Universities Opts for Open Systems Supercomputer to Replace Vector Computer |
| »Axyz Animation, Inc. | Digital Special Effects | Sun Grid Engine software | Sun Helps Animation Company Find Available Compute Resources, Easily and Cost-Effectively |
| »Caprion Pharmaceuticals | Life Sciences - Drug Discovery | Sun Fire 6800, 4800, and 3800 servers, Sun Fire 280R servers, Sun Blade 100 workstations with smart card readers, Sun Ray digital appliances with smart card readers, Sun StorEdge T3 disk arrays (5 TB), Sun StorEdge L700 tape library, Solaris 8 Operating Environment, Sun Grid Engine software, Sun Forte development tools, Sun Management Center, iPlanet ECXpert software, Oracle 8i database and workflow software, Veritas backup, file system, and volume manager software, Micromass mass spectrometers and support software, CGI systems integration services | Caprion Pharmaceuticals has built one of the world's largest protein analysis compute farms using technology from Sun Microsystems, Inc. and its best-of-breed allies |
| »CASPUR, Universita' La Sapienza | Academic | Sun Enterprise 4500 server, Sun Enterprise 3500 server, Miscellaneous vendor servers, Sun Grid Engine software | Sun Helps Improve Italian Consortium's Supercomputing Services |
| »Cognigen Corporation | Healthcare | Sun Netra X1 servers, Sun Enterprise 450 servers, Solaris Operating Environment, Sun Grid Engine software | Cognigen turned to the Sun Grid Engine software from Sun Microsystems Inc. to provide dependable, consistent and inexpensive access to computerized capabilities |
| »De Novo Pharmaceuticals Limited | Manufacturing | 80 node Sun Netra based compute farm, Sun Throughput Engine Software Stack (TESS), Solaris 8 Operating System | Sun compute farm provides scalable, reliable, robust platform for De Novo's drug designs |
| »Ford Motor Company | Automotive | Sun Blade 1000 workstations, Sun Enterprise 3000 server, Sun Grid Engine software | Shifting Productivity Into High Gear |
| »GlobeXplorer, Inc. | Aerial and satellite imagery | Sun Grid Engine software | GlobeXplorer and Sun Act as a Gateway to World's Largest Archive of Aerial and Satellite Images |

18

| Company | Industry | Products | Abstract |
|---------|----------|----------|----------|
| »HPCVL | Education | 4 Sun Fire 6800 servers (24 CPUs each), soon to be expanded to 8, 1 Sun Blade 1000 workstation, 3 Sun Blade 100 workstations, 1 Sun Enterprise 220R server, Sun StorEdge T3 disk arrays (3.9 TB, soon to be expanded to 6.5 TB), Solaris 8 Operating Environment, Sun HPC ClusterTools 3.1 software, Forte Developer 6, Update 1, Sun Grid Engine 5.2.2 software, Solaris Resource Manager v1.2 software, Sun Management Center 3.0, Solstice DiskSuite software, Veritas Volume Manager | HPCVL, a consortium serving the high performance computing (HPC) needs of four Canadian universities, has deployed a massive HPC environment based on technology from Sun Microsystems, Inc. |
| »Inpharmatica, Ltd. | Life sciences | 1 Sun Fire 4800 server, 3 Sun Enterprise 4500 servers, 5 Sun Enterprise 450 servers, 6 Netra T1 servers, 500 Netra X1 servers, 1 Sun StorEdge 8600 filer, 25-TB Sun StorEdge T3 disk array, Solaris 8 Operating Environment, Sun Grid Engine software | Inpharmatica Chooses Sun to Quicken the Pace of Drug Discovery On the Web |
| » Mentor Graphics Corporation | Electronics/Electric | Sun Fire V440, N1 Grid Engine 6, Solaris Operating System, Sun Blade 2000 Workstation, Sun Fire V20z Server, Sun Fire V240 Server, Sun Fire V65x Server, Sun Fire V880 Server | Grid Solution Helps Mentor Graphics Improve Utilization, Efficiency, and Time-to-Market |
| »Motorola | Microelectronics | Sun Grid Engine software | Finding a Better Process for Processor Design |
| »Ohio Supercomputer Center | Education | Sun Grid Engine software, 4 Sun Fire 6800 midframe servers with a total of 72 UltraSPARC III processors, 2 Sun Fire 6800, Technical Compute Farm, iPlanet Portal Server, Sun Management Center, HPC Cluster Tools, Forte Workshop tools | The Ohio Supercomputer Center Leads in HPC, Distributed Computing and Scientific Portals |
| »Oxford GlycoSciences | Life Sciences | Sun Enterprise and Sun Fire servers, Sun servers running on Sun Linux platform, Sun Ultra and Sun Blade workstations, Solaris Operating System, Sun ONE Grid Engine Enterprise Edition | Oxford GlycoSciences used Sun ONE Grid Engine to meet its throughput challenge by increasing utilization and speeding turnaround time on compute intensive projects. |

| Company | Industry | Products | Abstract |
|---|---|---|---|
| »Plexxikon | Life Sciences | 2 Sun Fire 3800 servers, 2 Sun Fire 280R servers, Sun Enterprise 450 server, Sun Blade 2000 and 1000 workstations, UltraSPARC III and II technology, Solaris 8 Operating Environment, Sun Cluster 3.0 software, Sun StorEdge T3 disk arrays, Sun StorEdge L180 tape library, Sun Grid Engine, Enterprise Edition software, Oracle8i database, VERITAS software | Sun Drives Innovative Drug Discovery |
| »RiboTargets | Drug discovery | Sun Enterprise 420R server, Sun StorEdge A5200 Fibre Channel storage array, Cisco networking equipment, Solaris 8 Operating Environment, Solaris Management Console, Solstice DiskSuite software, Sun Management Center software, Sun Grid Engine software | Unique Pharmaceutical Research Project Relies on Sun Compute Farm |
| »Synopsys | Electronic Design Automation (EDA) | Sun Grid Engine software | Sun Grid Engine software helps Synopsis in producing enhanced software products |
| »University of Durham | Education | Sun Fire 6800 server (24-CPU), 64 Sun Blade 1000 workstations (2-CPU each), Sun StorEdge T3 disk arrays (5 TB total), Sun StorEdge L1000 tape library, Solaris 8 Operating Environment, Sun HPC ClusterTools software, Sun Grid Engine software, Myrinet switching technology | Under a close collaboration agreement with Durham, Sun Microsystems, Inc. provided its Sun Fire 6800 server and a cluster of 64 Sun Blade 1000 workstations, all of which are based on Sun's latest and most powerful foundations -- the UltraSPARC III microprocessor and the Solaris 8 Operating Environment |
| »University of Houston | Education | Sun Fire 6800, Sun Fire V880, Sun StorEdge T3 arrays , Solaris Operating Environment, Sun ONE Grid Engine, Sun HPC ClusterTools 4.0 | Building a High-performance Computing Infrastructure with Sun Fire Servers and Storage |
| »University of ULM | Education | Sun ONE Grid Engine, Solaris 9 Operating System, Solaris 9 Resource Manager, Sun Ray software, Sun ONE Studio 4, StarOffice 6.0 Office Suite, HPC ClusterTools software, Sun Fire 6800 servers, UltraSPARC III processors, Sun Ray appliances, Sun Enterprise 420R server | Sun hardware and software team up to create a powerful university research computing network. |