Enterprise: Taking Grid Beyond High Performance Computing (HPC)

Cheryl Doninger
R&D Director, SAS
OGF Area Director
Enterprise Challenges

- Increased data growth
- Many users on single resource
- Results needed in a timely fashion
- SMP obsolete or at capacity
- Production jobs w/ complex schedules or dependencies
- Unable to run larger more complex analysis
- Need reduced complexity increased manageability
- Need strategy to meet peak demand
- Many users on single resource
- Results needed in a timely fashion
- SMP obsolete or at capacity
- Production jobs w/ complex schedules or dependencies
- Unable to run larger more complex analysis
- Need reduced complexity increased manageability
- Need strategy to meet peak demand
Key Grid Capabilities

<table>
<thead>
<tr>
<th>SAS Grid Manager</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parallelized Workload Balancing</strong></td>
<td><strong>Distributed Enterprise Scheduling</strong></td>
</tr>
<tr>
<td>Distribute parallelized workloads to a shared pool of resources.</td>
<td>Distribute jobs within workflows to a shared pool of resources.</td>
</tr>
</tbody>
</table>

Optimize the Efficiency and Utilization of Computing Resources
Enterprise Trends

- Industry segments
  - Financial Services, Pharma, Academia, Telco, Energy, Airlines

- Size of environments
  - 8-16 cores for PoC
  - 50, 100, 100+ production

- Operating System
  - Linux, Windows, other flavors of Unix

- Shared file-system is critical
  - Data, data, data

- Primary Goals
  - Replace obsolete hardware
  - Create virtual computing environment with policies to manage multiple applications
  - License flexibility
Grid Aligns With IT

- Provides Enterprise infrastructure
- Consolidation and standardization of hardware
- Enables performance and manageability
- Enforce policies to meet SLA’s of entire organization
- Bridge the gap between IT and business users
- Flexibility with management and growth
- Allows ISV’s with grid capabilities to align with IT
Popular Grid Usage Patterns Are Emerging …

<table>
<thead>
<tr>
<th>Cluster Grids</th>
<th>Early Deployments</th>
<th>Momentum Building (Proven Solutions)</th>
<th>Broad Adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPC-oriented application-driven solutions</td>
<td></td>
<td>Finance, Pharma, Energy … Research, Engineering …</td>
<td></td>
</tr>
</tbody>
</table>

| Data Center Grids | | “Cloud” and emerging Utility Providers … |
| Shared & service-oriented infrastructures that span the data center (s) | Enterprise Data Centers … |

| Collaborative Grids | | Physics, Weather Forecasting … |
| Multi-organizational collaborations; and regional grid infrastructures | Automotive, Aerospace design … |

This slide courtesy Mark Linesch
Grid Enabling Applications Can Be Expensive

- Existing Programs
  - Add Grid Computing Program Header
  - Create Workflow and Schedule It
  - Automated Tools

- ISV Program with parallel sub-tasks
  - Add Grid Computing Program Header
  - Create Sub-Tasks Using 4GL Syntax
  - Automated Tools

- ISV Products and Solutions
  - Automatic Parallel/Grid Code Generation
Business Analytics on Grid

Parallel Processing Reduces Time to Results
Why Consider Grid Computing?

(Courtesy: Bolder Technology)
How To Increase Enterprise Adoption?
Make It Easier!!!

- More grid enabled solutions
  - Standards

- More information
  - Reference architectures
  - Case studies/success stories
  - Best practices

- Pricing/licensing
"When we first started in 1976, we let our customers know that our goal was to make SAS useful for them. Over thirty years, that's still the number one goal: make sure that we develop software that our customers need, and want, and are happy with. And if you have a happy customer, that’s one of the great keys to success in business."

Dr. Jim Goodnight
Founder and CEO, SAS