

Implement Optimized Workflow Solution on HPC Platform

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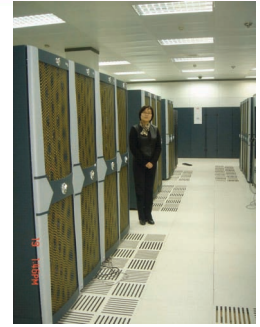


Implement Optimized Workflow Solution on HPC Platform

Ling Ling Zhang, Marketing/Channel Director of SGI Greater China Region

SGI in China

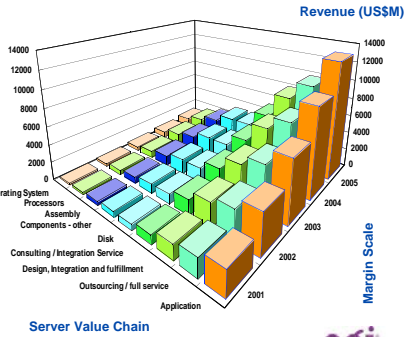
- **Set up China Rep Office in 1989**
- **Have Branch office in**
 - Beijing
 - Shanghai
 - Guangzhou
 - Chengdu
 - Taiwan
 - Hong Kong
- **Our Customers in**
 - Scientific Researching Institute
 - Universities
 - Manufactures
 - Oil and Gas
 - Media and Entertainment



Migration of HPC Value

Value in HPC ecosystem is being shifted out of assembling boxes

- Value shifting away from components and servers to highly integrated solutions
- Applications and services continue to drive revenue growth and higher profitability across all industry segments
- Increased application and architectural complexity coupled with broader, less skilled access exposes need for new application models around integration, interoperability and ease of use

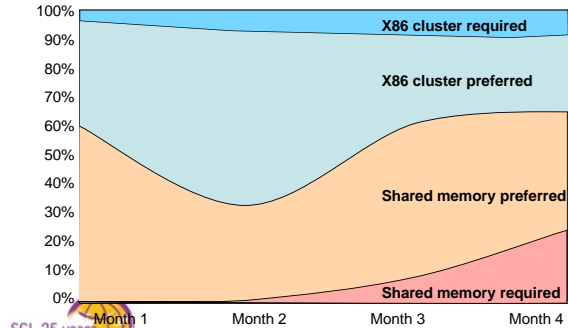


Challenges in Multi-Purpose Computing Centers

- **Maximizing differentiated research – within a fixed budget**
 - Breadth of disciplines using HPC is increasing
 - Differentiation means different things to different disciplines
 - Time-to-solution, interdisciplinary, problem size, scalability, etc.
 - Operational costs are increasingly important
- **Delivering the latest computing platforms**
 - 3-5 year purchase cycles versus 1-2 year technology cycles
 - Computing needs change throughout a project cycle
- **Effectively supporting data-intensive environments**
 - Higher resolution observations (e.g. TB/Day in Genomics, Earth Observation)
 - Longer-term projects (Metagenomics, Climate Simulation)

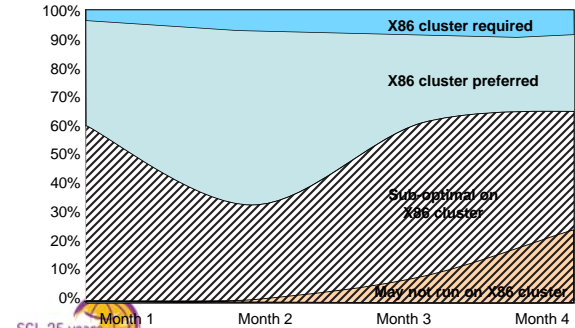
Multi-Purpose Computing Centers Heterogeneous Computing Environment

Aggregate Workload

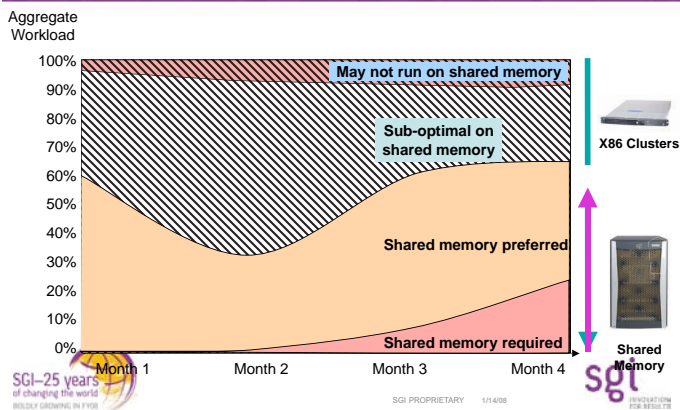


Multi-Purpose Computing Centers Heterogeneous Computing Environment

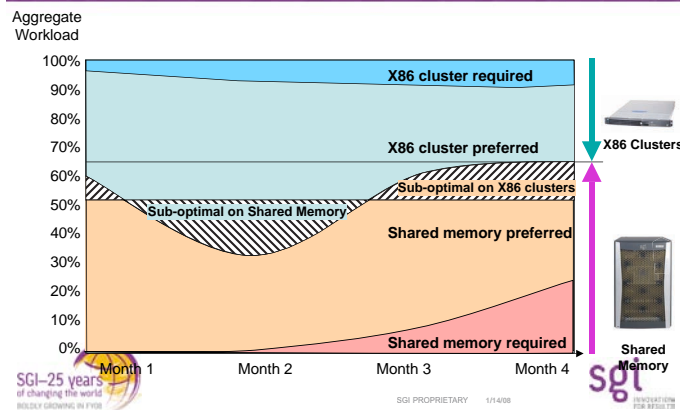
Aggregate Workload



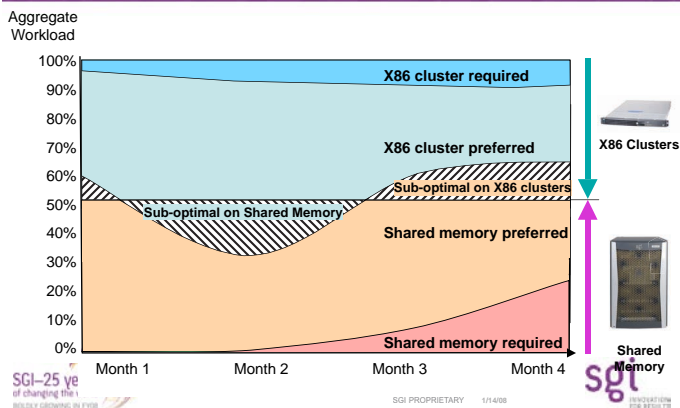
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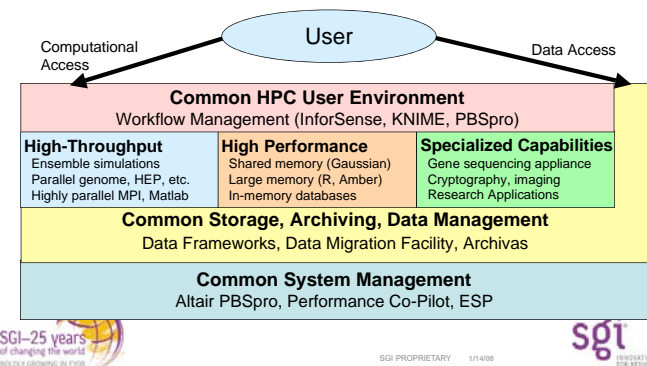
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Multi-Purpose Computing Centers Heterogeneous Computing Environment



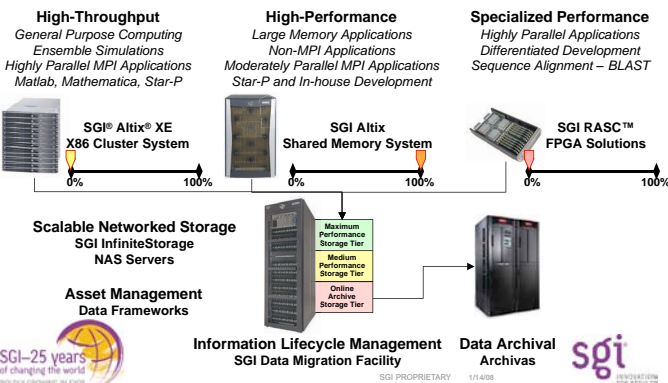
Multi-Purpose Computing Center Architecture



Benefits for Multi-Purpose Computing Centers

- Orders of magnitude research differentiation**
 - Higher performance with up to 10x on shared memory applications
 - Higher performance with 10x to 1000x with specialized processing
 - Larger problems with 10x to 100x memory
- Maximum flexibility**
 - Applications run on multiple systems, increasing utilization
 - Upgrade and replace each platform independently
 - HLL environments make HPC more approachable, shorten time to solution
- Improve storage utilization by 20% to 50% or more**
 - Global sharing eliminates "islands of data", increasing utilization
 - On-line accessible storage costs fall by 60% or more
- Minimize islands of computing**
 - Fewer, higher-performance systems gives 3x to 5k peak for single users
 - Centralization improves support and lowers personnel expenses by up to 50%
 - Up to 10x faster turnaround than national centers

Maximizing Performance and Flexibility



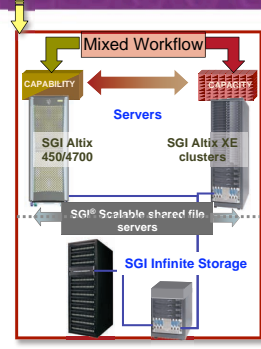
SGI Delivers the BEST Performance

Solution Performance:

Mixed Chemistry Workload Example	Altix 450 48 cores, 96GB IS220	Altix XE 1300 48 + 4 core, 102 GB NEXIS 2000	Hybrid with Altix 450 24 core, Altix XE 24 core, NEXIS 2000
Gaussian 2x Test 397	368 Seconds	638 Seconds	753 Seconds
Amber/Sander 90x gb_cox2	674 Seconds	390 Seconds	756 Seconds
Total Run Time	1042 Seconds 83 Runs/Day	1028 Seconds 84 Runs/Day	756 Seconds 114 Runs/Day

36% Faster

Infrastructure Solution Example: "Hybrid" Solution



Throughput benchmark results illustration

	Altix 450 Only	Altix XE 240 Only
MD NASTRAN	15,200 secs	28,400 secs
ABAQUS	8,900 secs	4,500 secs
Wall Clock Time	25,100 secs	32,900 secs
SGI Hybrid Solution	19,700 secs	19,700 secs

Delivers Performance and Reduces Complexity
Customers: Chrysler, Skoda, BMW, GE



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Multi-Purpose Computing Centers SGI Storage and Computing Benefits

- Comprehensive, High-Performance Storage Solution:**
 - SGI NAS Servers offer 2.6x better price/performance than NetApp.
 - SGI requires fewer NAS Servers, lowering costs by 40% or more.
 - SGI ILM solutions save up to 65% on capital expenses and power.
- Flexible High-Throughput and High-Performance Solution:**
 - SGI Altix XE 1300 clusters offer up to 50% more performance, 2x density.
 - SGI Altix high-performance servers cost 75% less than IBM, HP and Sun.
 - SGI RASC delivers up to 10x better performance for large BLASTN queries
 - An optimal mix of systems reduces the number of systems by 10% or more.
- Pay-As-You-Grow Options:**
 - SGI NAS solutions start at 8TB and scale to over 168TB in total capacity.
 - SGI Altix XE systems start at \$5K US street price and scale virtually any size.
 - Maximize performance and minimize cost by adding more specialized SGI Altix shared-memory systems and SGI RASC capability as needed.



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SGI Solutions for Multi-Purpose Computing Centers

Minimize Time-To-Solution and TCO with SGI

- Economic and Efficient Management of Mountains of Data**
 - SGI ILM and NAS solutions make lower storage costs by 60%
- Enable scientists to do more science**
 - Workflow driven computing and optimized platforms allow scientists to analyze up to 100x more data in the same amount of time
- SGI delivers leadership performance and value**
 - High throughput, high-performance and specialized computing solutions that deliver up to 1.6x to 10x performance and reduce expenses by up to 50%.
- Integrated solutions for next generation genome centers**
 - SGI Services provides end-to-end integration of asset management, archiving, scalable, hybrid cluster environments with lights-out operations, and on-site support.

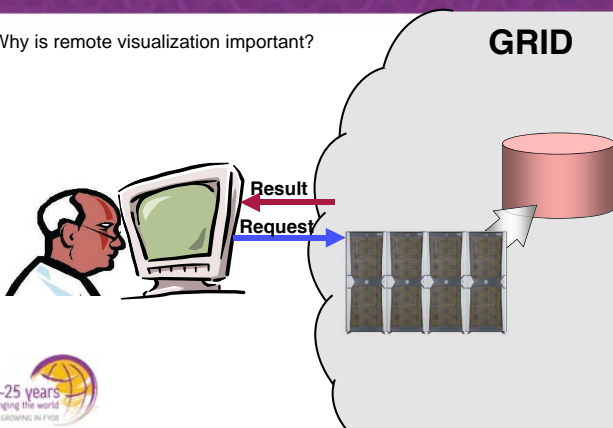


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Visual Supercomputing in Sciences – Remote Visualization of Simulation Results

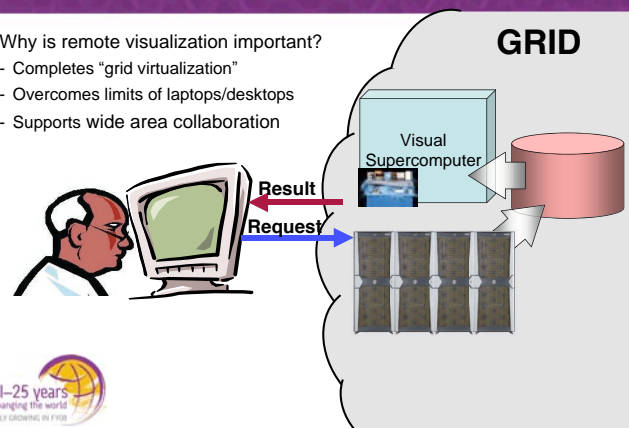
Why is remote visualization important?



Visual Supercomputing in Sciences – Remote Visualization of Simulation Results

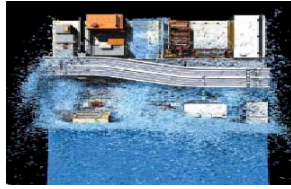
Why is remote visualization important?

- Completes "grid virtualization"
- Overcomes limits of laptops/desktops
- Supports wide area collaboration

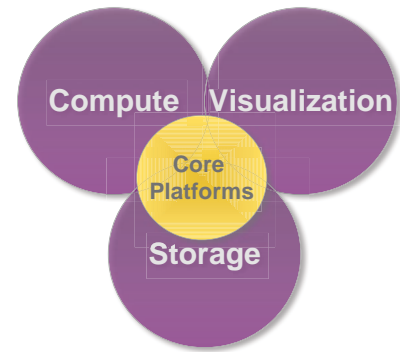


Visual Supercomputing in Sciences – Remote Visualization of Simulation Results

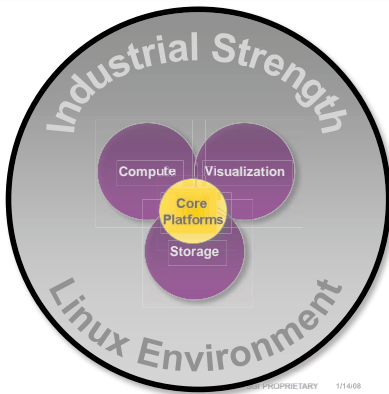
- Customer: HPC oriented data centers
 - Universities
 - Research Institutes
 - Government Labs
- Who: Senior managers and heavy users
 - VP/Director of Research
 - Computer Center Manager
 - Visualization Group or Services Manager
 - Department Chairperson (if Departmental HPC Center)
 - Local member of distributed consortia / grid projects
- Problem: Compute only solutions don't solve the entire problem because people, data, compute and visualization are not co-located
- What: x86 based Visual Supercomputer as add-on to HPC sales
 - Remote, application transparent remote viz using CPU OpenGL rendering with GraphOn
 - "As-is" Open-Source, application transparent remote viz (VNC, VirtualGL, etc.)
 - Integrated remote viz via ISV applications running exclusively on x86 (CEI Ensign Gold)
- Future Directions: Tested solutions with commercial, application transparent remote visualization using GPUs and integration with Altix HPC systems.



SGI – Platforms and Products



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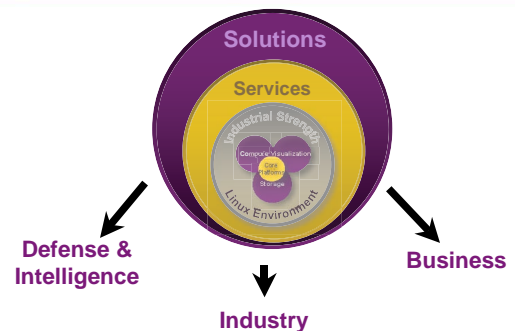
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SGI Value Proposition

- SGI as a best-of-breed solution provider with
 - A. Complementary Server & Storage products for numerically distinct workloads from multiple disciplines;
 - B. Efficient Data Management and seamless integration of all components across the entire product lifecycle;
 - C. Proven domain knowledge & Application expertise;
 - D. Strong ISV relationships & eco-system;
 - E. Customizable & scalable solution stacks tailor-made to handle customers' complex problems.

SGI is NOT a "Point Solution" Provider! SGI is a single stop shop for compute & storage solutions in Product Lifecycle Management



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