SILICON GRAPHICS | The Source of Innovation and Discovery™

The Flexible Enterprise:
Open, Scalable, Powerful

sgi®

Industry mega-trend:

LINUX® wave is transforming the enterprise

sgi

Criteria for the 21st Century Enterprise Platform

- Minimizes risk

- Improves utilization

- Maximizes ROI

- No proprietary shackles

- Enables efficient consolidation
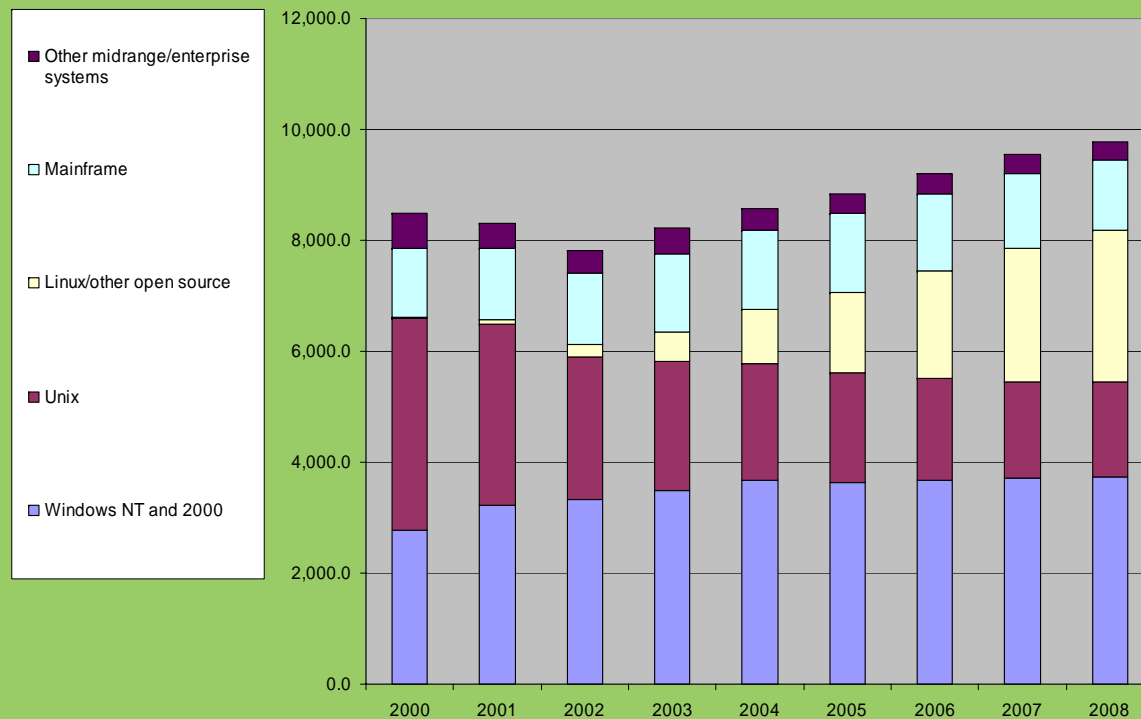
sgi

Market analysis – Market size facts

Data from analysts:

IDC 05	Technical server market	$7.25B	+6% growth to 2009
IDC	Enterprise server market	$53B	+5% on 2003
IDC	Enterprise Storage market	$20B	
Gartner 05	All servers 2004	$49.5B	+7,2% on 2003
Gartner 05	Unix® servers 2004	$16.2B	-2,8% on 2003
IDC 05	Unix® servers 2004	$14.4B	+5.1% on 2003
IDC 05	Linux® servers Q4-04	$1.3B	+35.6% on Q4-03
IDC 05	Windows® servers Q4-04	$4.6B	+15.5% on Q4-03

sgi

Market analysis - Market trends

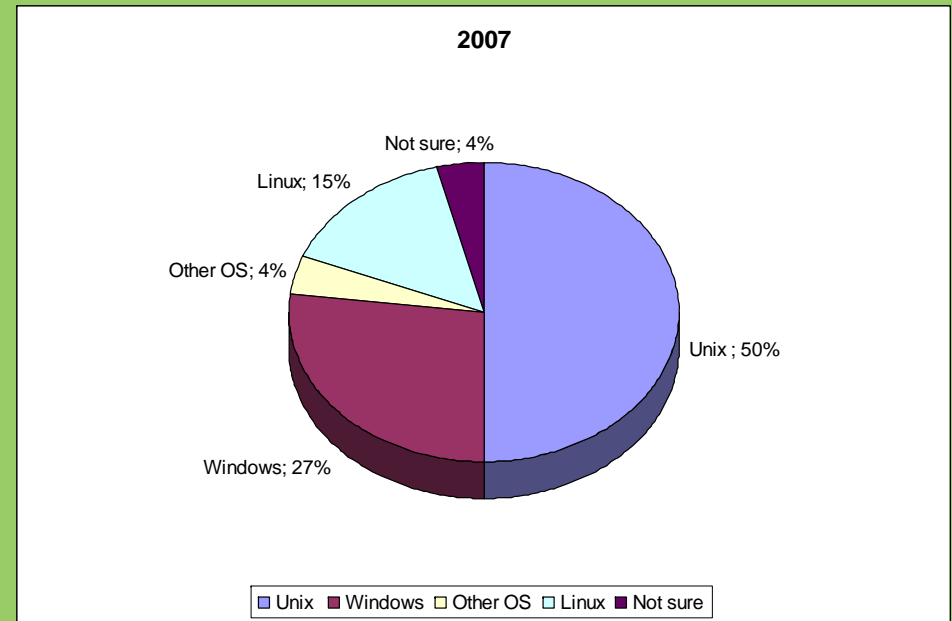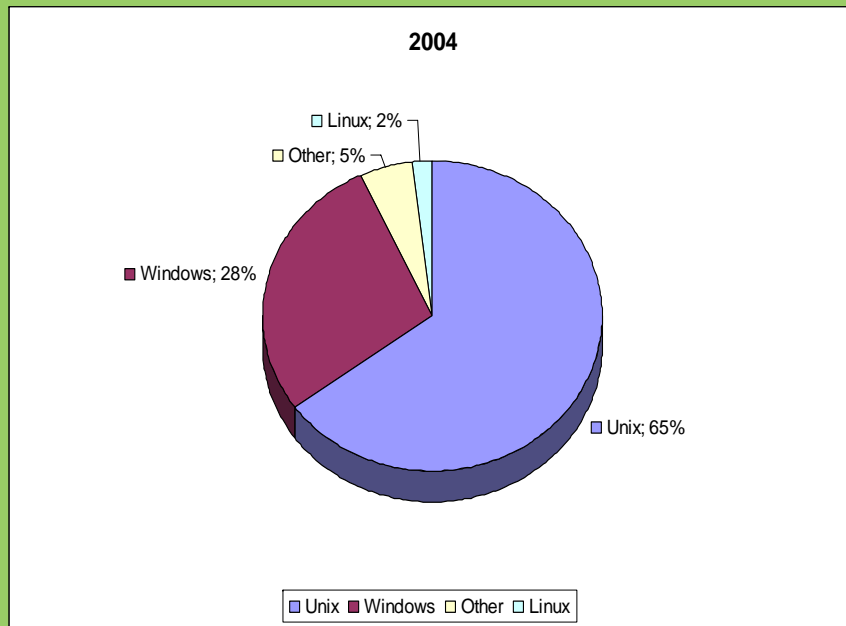Linux® is major growth platform for DBMS, growing from 6% market share in 2003 to 28% in 2008 (IDC)

Worldwide RDBMS Software License Revenue by Platform, 2000-2008

Legend:
- Other midrange/enterprise systems
- Mainframe
- Linux/other open source
- Unix
- Windows NT and 2000

sgi

Migration trend of BIG3 ERP
based on ERP & Linux Peerstone research Nov 2004

Question: What platform is used today and three years from now?
Asked SAP, Oracle and PeopleSoft users (represents about 700,000 installed servers)

2004

Linux; 2%
Other; 5%
Windows; 28%
Unix; 65%

Unix ■ Windows □ Other □ Linux

2007

Not sure; 4%
Linux; 15%
Other OS; 4%
Unix ; 50%
Windows; 27%

Unix ■ Windows □ Other OS □ Linux ■ Not sure

sgi

Gartner Server Consolidation Research

		1998	2001	2002	2003
1	No plans to consolidate servers	25%	6%	8%	6%
2	Want to consolidate servers and are looking into doing a consolidation	45%	25%	25%	28%
3	Have a consolidation project under way	30%	69%	67%	61%
4	Have already done a server consolidation and have no plans for any more (Only asked in 2003)	-	-	-	5%
	Total respondents	100+	116	475	518

sgi

Analyst opinion - Gartner

Gartner predicts that 60% of enterprises with 500 or more employees will have migrated 80% of their Unix® OS-based applications to Linux by 2008.

sgi

Linux® is <u>the</u> infrastructure platform for the Flexible Enterprise

Linux® is a cost effective solution

- Lower OS cost

- Forced upgrades of application software minimized

- Lower dependency on single vendor decreases risk

sgi

Linux® is the OPEN Unix® of the future

- Linux is an enterprise class operating system with a wide range of available applications

- Linux delivers what Unix was originally supposed to do: compatibility, portability and freedom from dependence on any proprietary platform

- Linux is the ideal platform for enterprise consolidation

- Linux is secure – CAPP/EAL3+ certified (September 2005)

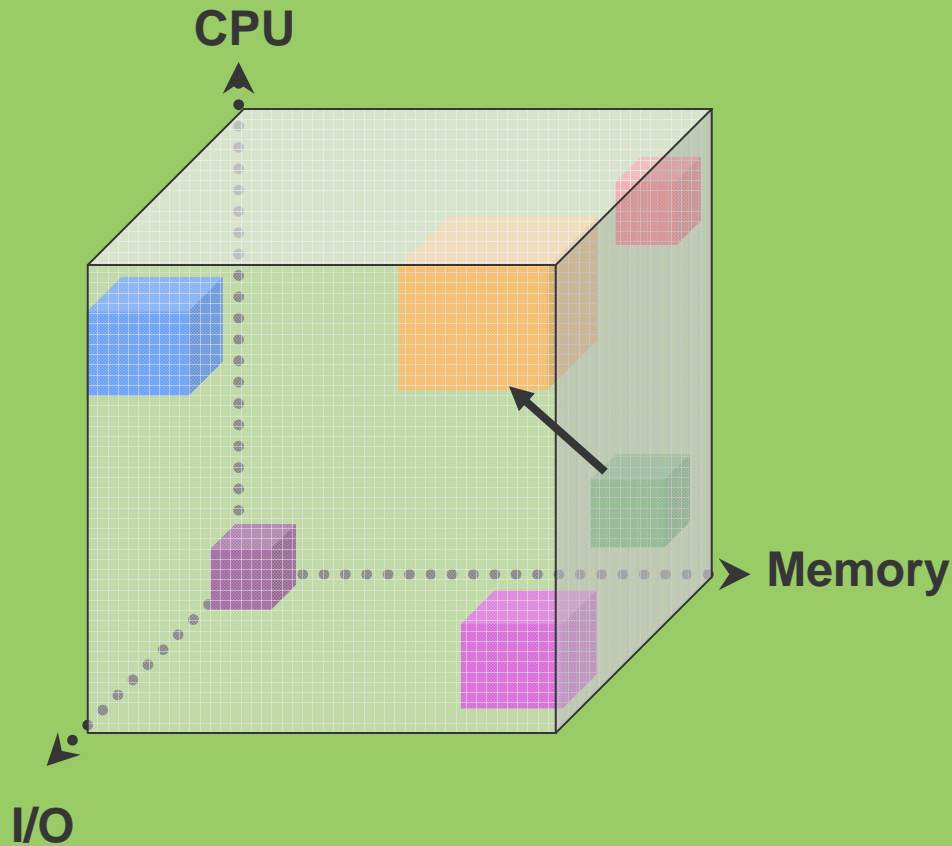## It isn't "Linux or Unix": Linux is Unix

sgi

Linux Delivers Business Benefits

- Efficiency and Control
  - Better utilization of available IT resources
  - Reduced IT server expense

- Greater Organizational Flexibility
  - Efficiently adapt infrastructure to incorporate new technologies and respond to new
    business requirements
  - Allows infrastructure to adapt to organizational changes

- Reduced Risk
  - Industry standards means maximum flexibility
  - Linux is here to stay

- Lower Total Cost of Ownership
  - Simpler, easier to maintain systems and infrastructure
  - Increased yields from IT expenditures
  - Expanded lifecycle of IT infrastructure

sgi

SGI delivers ideal building blocks for Flexible Enterprise infrastructure

sgi

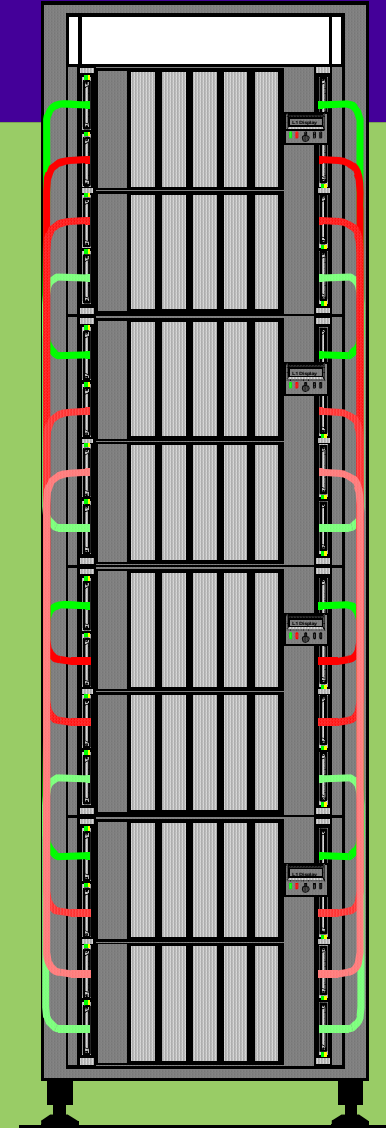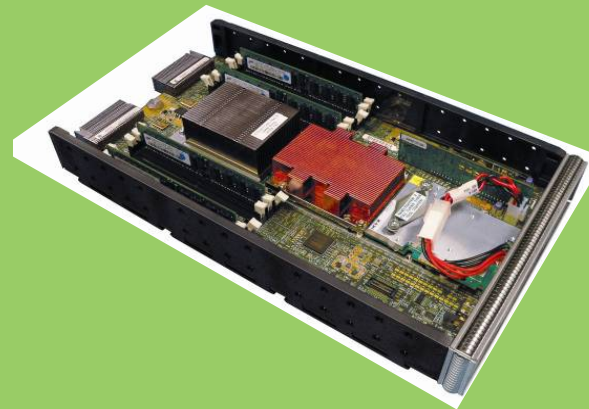# Tailored Solutions with Modular SGI® NUMAflex™ Architecture

CPU

Memory

I/O

Web serving:
Small, integrated system

Genomics:
Compute cycles

Signal processing:
Networking and compute

Database/ERP:
Compute, networking, storage

Media streaming:
Access storage and networking

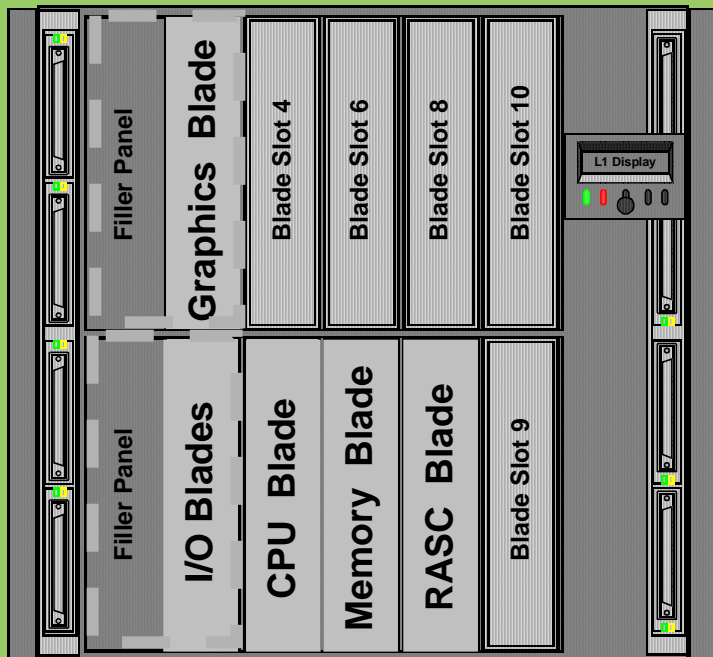**Traditional supercomputer:**
Compute, networking, storage

sgi

SGI® Altix® 4000 Platform
Extending Performance Leadership

- **Superior Performance Density:** nearly 3x the density of Altix® 3700 Bx2

- **'Plug and solve' Versatility:** 8 standardized blade choices and high-speed SGI® NUMAlink™ backbone supports top performance for any demanding application

- **Best Performance on Cluster Applications:** NUMAlink™ interconnect beats the competition with sub-microsecond latency

sgi

SGI® Altix® 4700 Platform: Building Blocks

Novell® SUSE®

& Red Hat Enterprise LINUX

- **Processor Blades**
  - One to four Intel® Itanium® 2 processor sockets per blade
  - Ideal for data-intensive applications requiring high-bandwidth per FLOP and computationally-intensive apps requiring high-density and maximum FLOPS
- **Memory Blades**:
  - Independent memory expansion enables best-in-class global memory addressing
  - Scales to 60TB per system
- **I/O blades**
  - Full spectrum of interconnects and capabilities: hot-swap, PCI-X and PCI-express
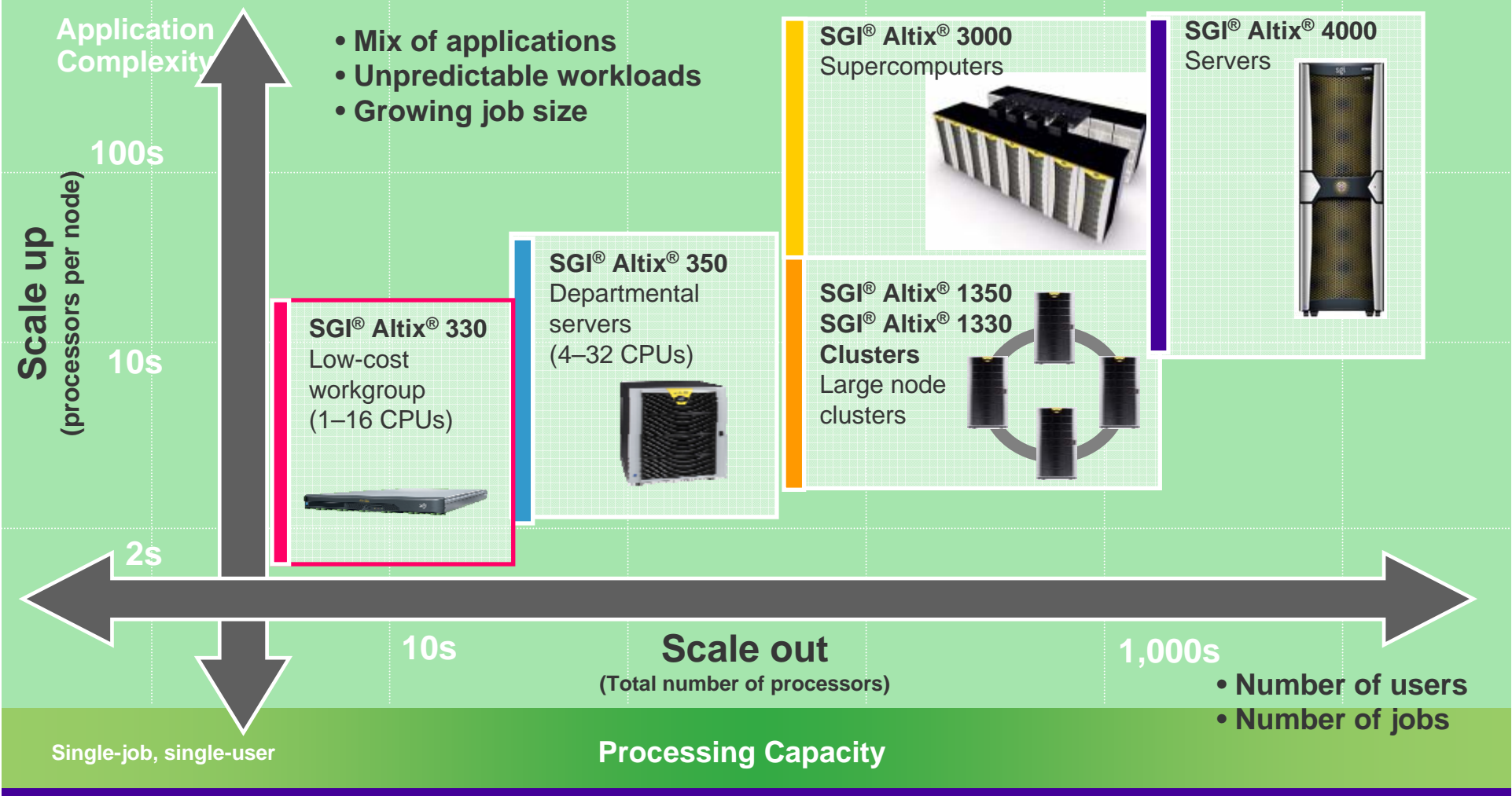 - SGI's InfiniteStorage products
- **Graphics processing blades**
  - SGI's legendary visualization products
  - Emerging high-performance processing applications
- **FPGA-based RASC™ processing blades**
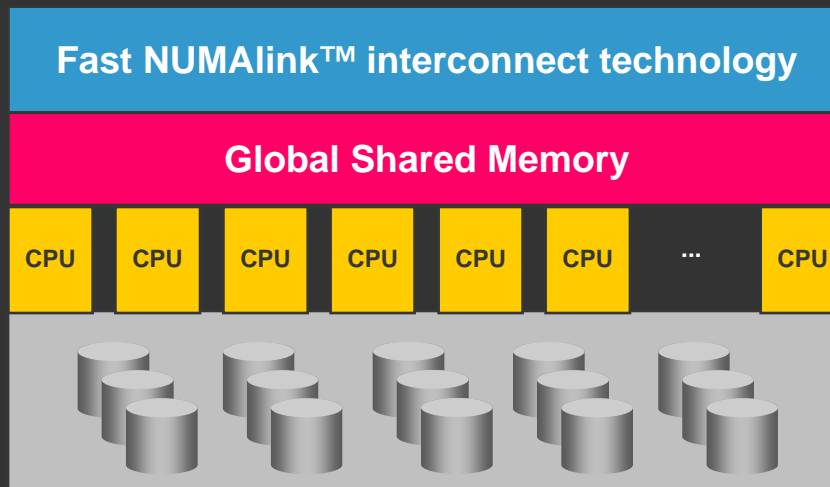 - Core algorithm acceleration and custom processing

High-Performance SGI® Altix® Servers and Supercomputers

Application Complexity

• Mix of applications
• Unpredictable workloads
• Growing job size

Scale up (processors per node)

100s

10s

2s

SGI® Altix® 330
Low-cost workgroup
(1–16 CPUs)

SGI® Altix® 350
Departmental servers
(4–32 CPUs)

SGI® Altix® 1350
SGI® Altix® 1330
Clusters
Large node clusters

SGI® Altix® 3000
Supercomputers

SGI® Altix® 4000
Servers

10s

Scale out
(Total number of processors)

1,000s

• Number of users
• Number of jobs

Single-job, single-user

Processing Capacity

16

SGI® Altix® Server High-Performance Architecture

- NUMAflex™ global shared memory and ultra-high bandwidth interconnect
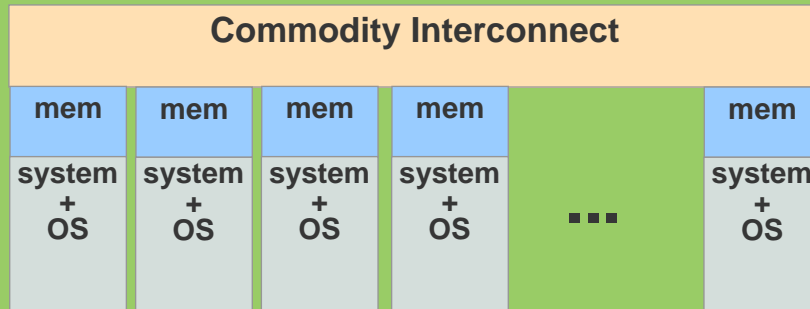- Modular, expandable architecture–processors, I/O, memory

SGI® Altix® Family

Fast NUMAlink™ interconnect technology

Global Shared Memory

| CPU | CPU | CPU | CPU | CPU | CPU | ... | CPU |

- **All processors operate on one large shared-memory space**
- **Industry's highest bandwidth interconnect at 6.4GB/second**
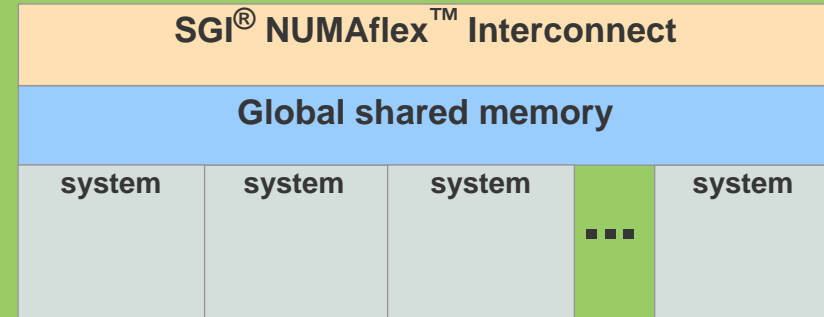- **High performance, low cost, easy to deploy**

sgi

Innovative Shared Memory Architecture

Traditional Clusters

Commodity Interconnect					
mem	mem	mem	mem		mem
system + OS	system + OS	system + OS	system + OS	...	system + OS

- Each system has own memory and OS
- Nodes communicate over commodity interconnect
- Inefficient cross-node communication creates bottlenecks
- Coding required for parallel code execution

SGI® Altix® Family

SGI® NUMAflex™ Interconnect				
Global shared memory				
system	system	system	...	system

- All nodes operate on one large shared memory space
- Eliminates data passing between nodes
- Big data sets fit entirely in memory
- Less memory per node required
- Simpler to program
- High Performance, Low Cost, Easy to Deploy

sgi

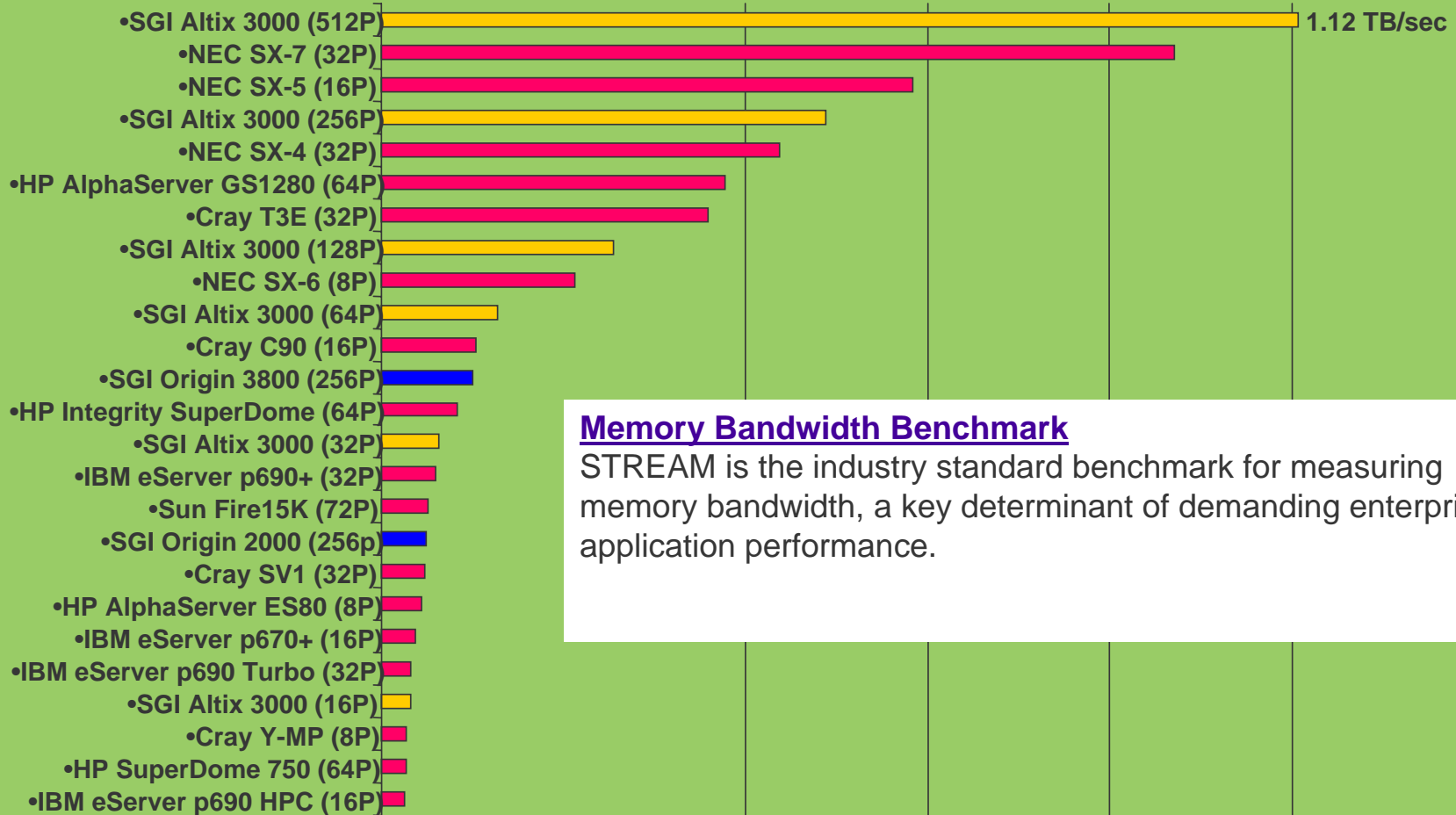# Memory architecture advantages

Large single image memory allows all data to be memory resident, which increases data access significantly
- – Transactional applications
- – Data Warehousing/BI applications
- – Scientific models

Middleware providers (SGI partners) are targeting "big memory database" trend
- – NexQL
- – Exegy
- – Oracle has acquired TimesTen

sgi

STREAM Benchmark Top 20 Results

- •SGI Altix 3000 (512P) — 1.12 TB/sec
- •NEC SX-7 (32P)
- •NEC SX-5 (16P)
- •SGI Altix 3000 (256P)
- •NEC SX-4 (32P)
- •HP AlphaServer GS1280 (64P)
- •Cray T3E (32P)
- •SGI Altix 3000 (128P)
- •NEC SX-6 (8P)
- •SGI Altix 3000 (64P)
- •Cray C90 (16P)
- •SGI Origin 3800 (256P)
- •HP Integrity SuperDome (64P)
- •SGI Altix 3000 (32P)
- •IBM eServer p690+ (32P)
- •Sun Fire15K (72P)
- •SGI Origin 2000 (256p)
- •Cray SV1 (32P)
- •HP AlphaServer ES80 (8P)
- •IBM eServer p670+ (16P)
- •IBM eServer p690 Turbo (32P)
- •SGI Altix 3000 (16P)
- •Cray Y-MP (8P)
- •HP SuperDome 750 (64P)
- •IBM eServer p690 HPC (16P)

Memory Bandwidth Benchmark
STREAM is the industry standard benchmark for measuring memory bandwidth, a key determinant of demanding enterprise application performance.

Source: SGI Altix 3000 Series Performance Report 1.6 (9/10/03), Customer provided data, & STREAM website (11/13/03)

sgi

In the enterprise market,
SGI is scaling down where
others are trying to scale up!

Legal Notice

This presentation contains forward-looking statements regarding SGI technologies and third-party technologies that are subject to risks and uncertainties. These risks and uncertainties could cause actual results to differ materially from those described in such statements. The viewer is cautioned not to rely unduly on these forward-looking statements, which are not a guarantee of future or current performance. Such risks and uncertainties include long-term program commitments, the performance of third parties, the sustained performance of current and future products, financing risks, the ability to integrate and support a complex technology solution involving multiple providers and users, and other risks detailed from time to time in the company's most recent SEC reports, including its reports on From 10-K and Form 10-Q.

sgi