



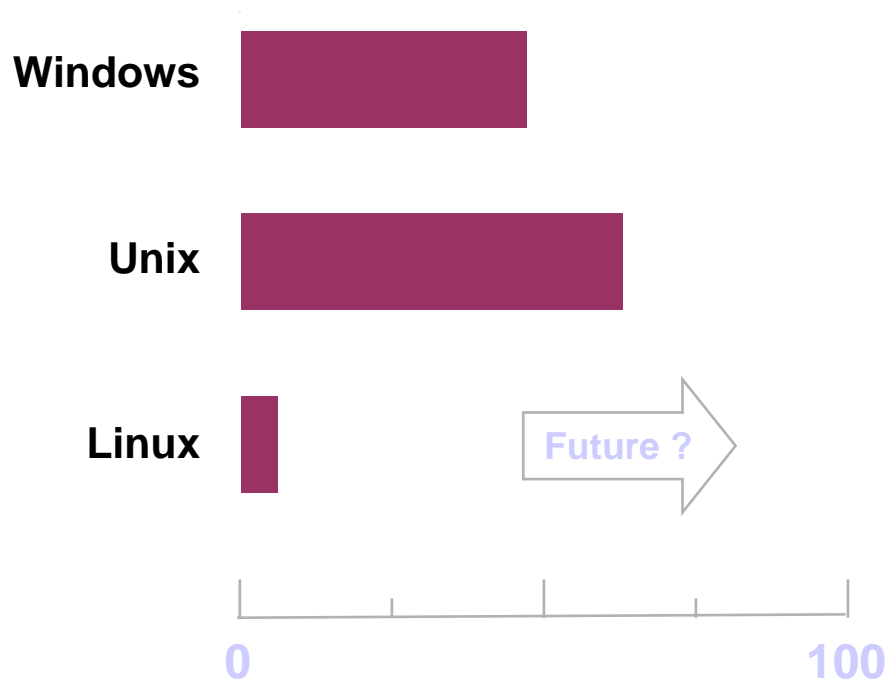
# SGI

## Accelerating Oracle on Open Architecture

Michal Klimes, Managing Director CEE

# The Linux Wave

What OS is used today, and what OS will be used three years from now?

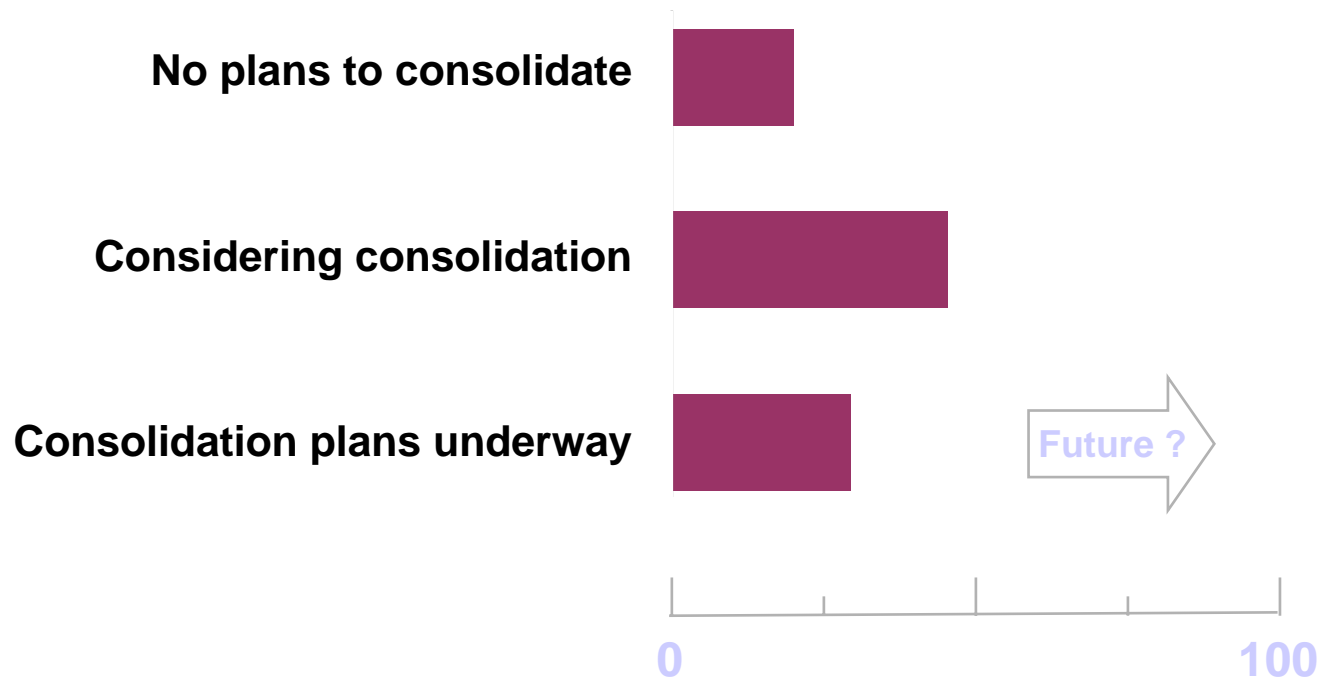


Source: Peerstone Research, Nov 2004

Who was asked this question?: SAP, Oracle, PeopleSoft  
users representing about 700,000 installed servers

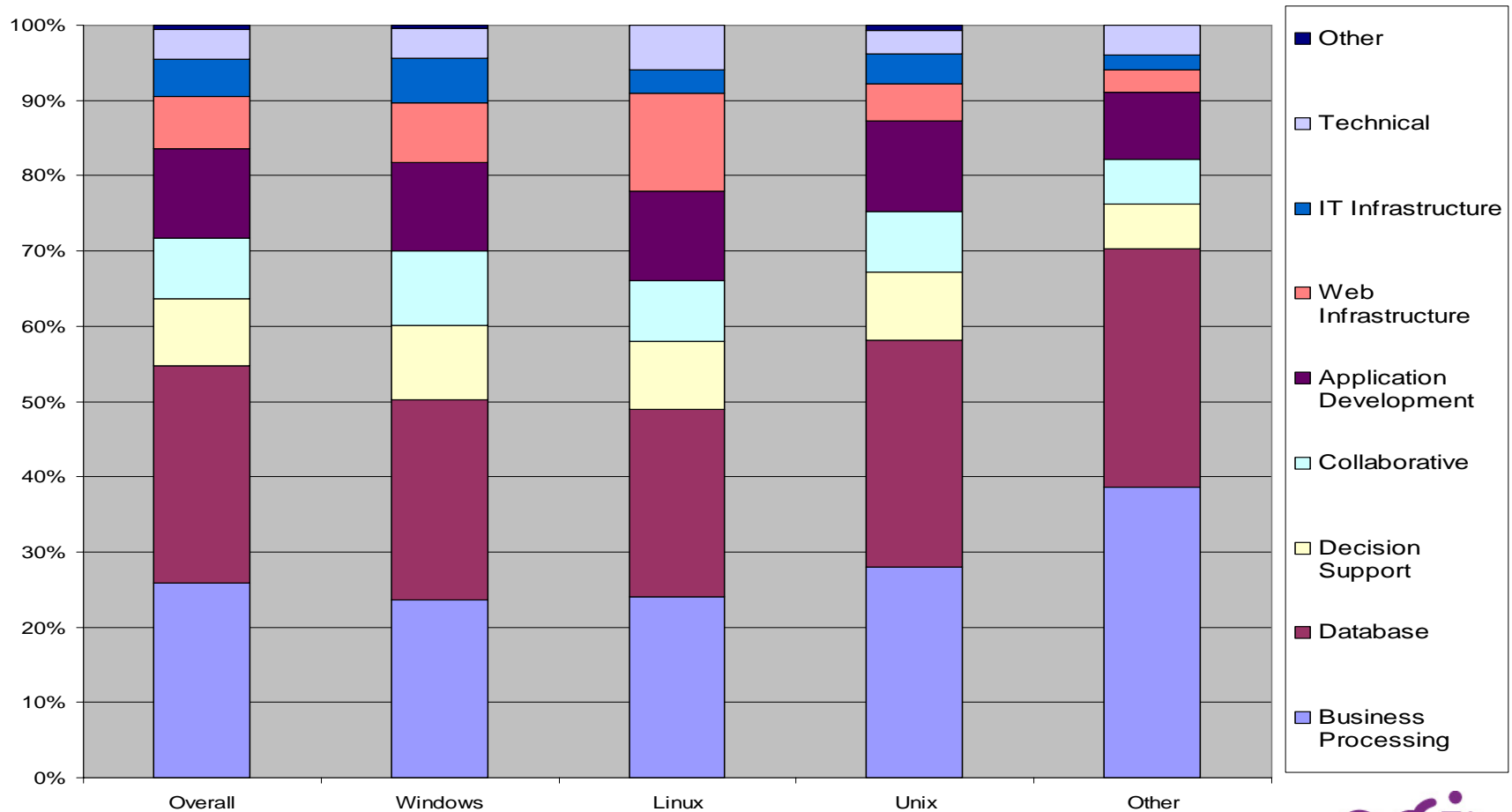
# The Consolidation Wave

Are companies looking to consolidate their database servers in the next three years?



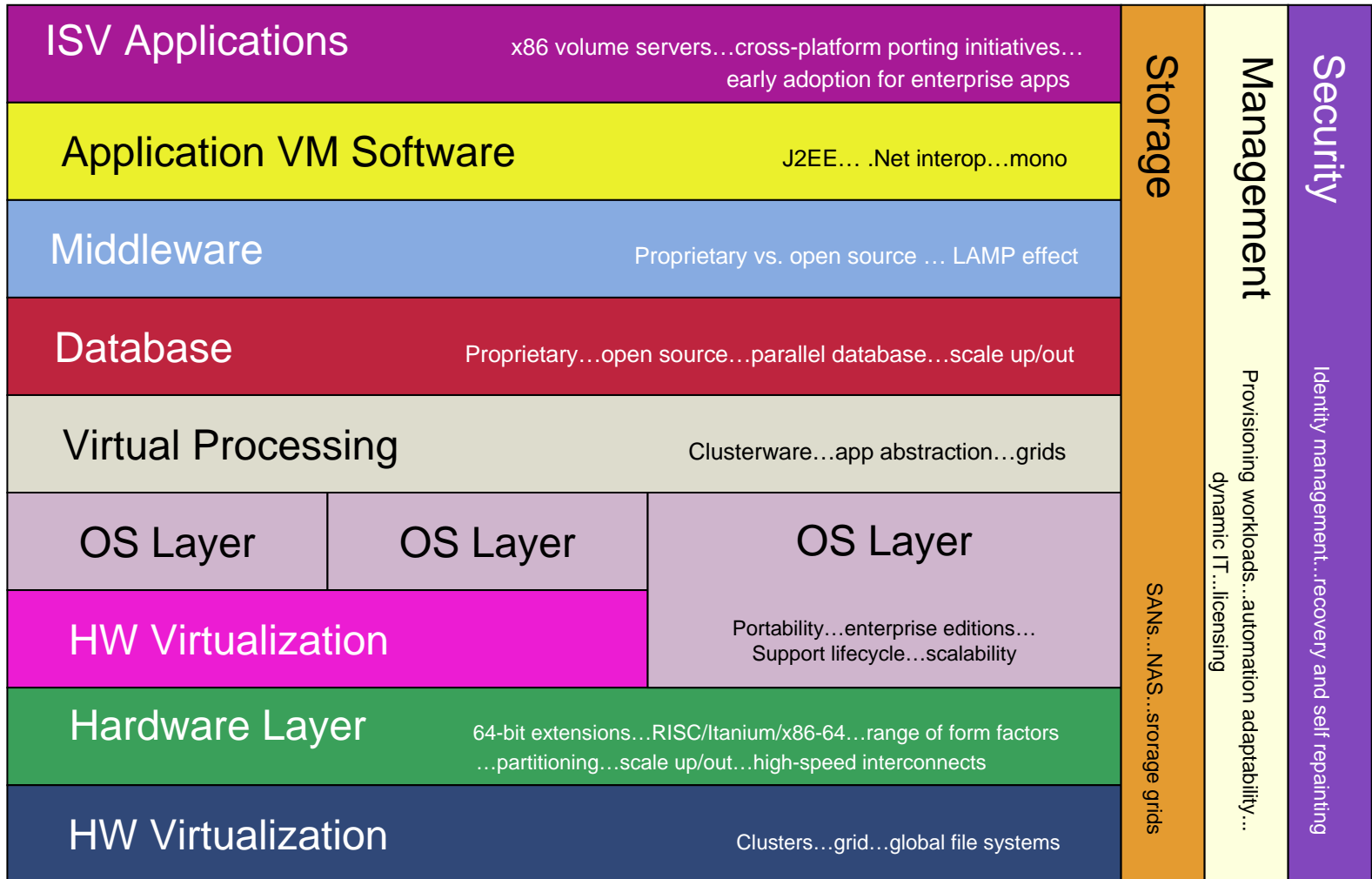
Source: Gartner, 2004

# Virtualization is Data Center Technology

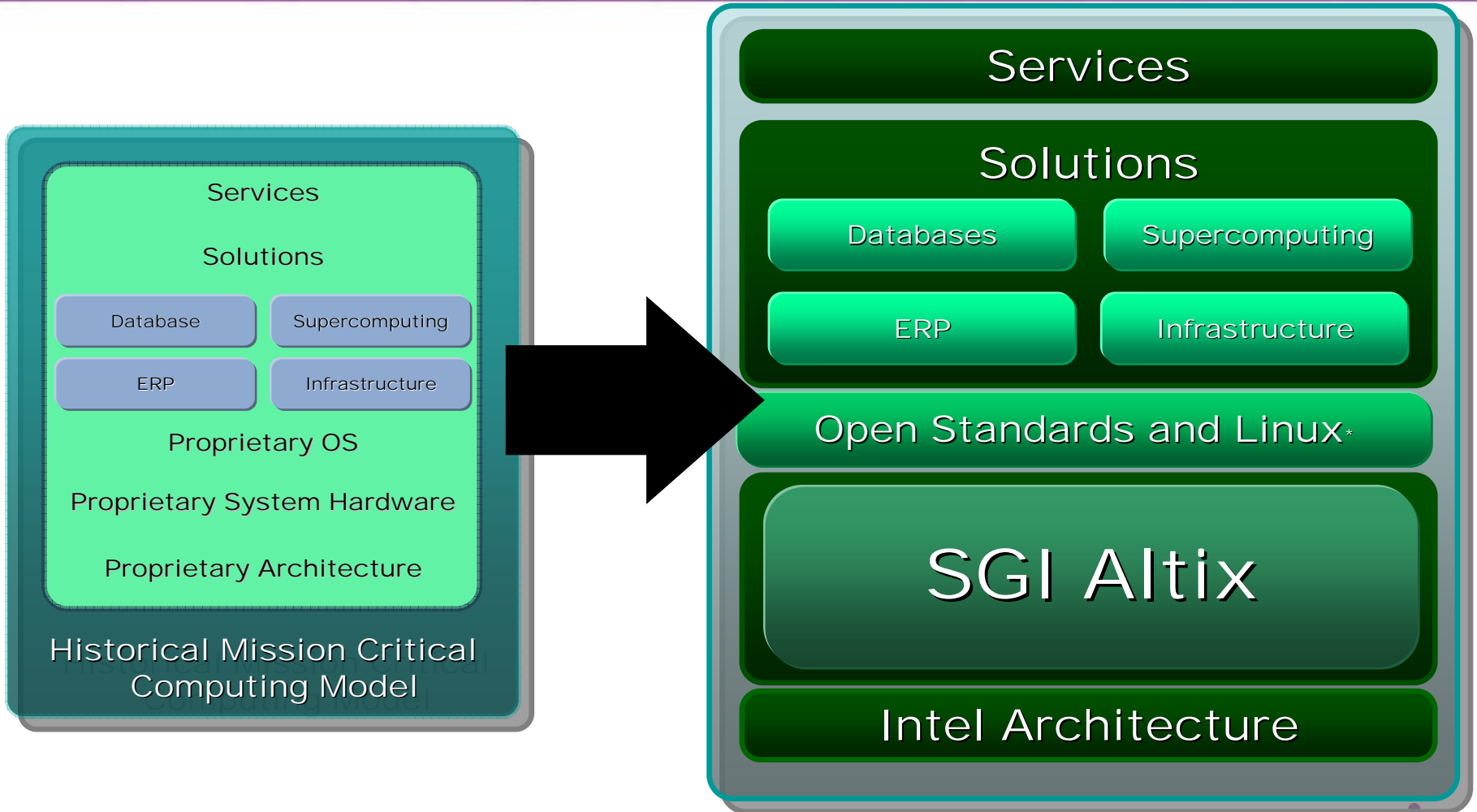


**Question: Thinking of all your virtualized XXOS servers, allocate the server resources across the following types of applications (source IDC 2007)**

# Building an Ecosystem to Support Linux Enterprise Servers

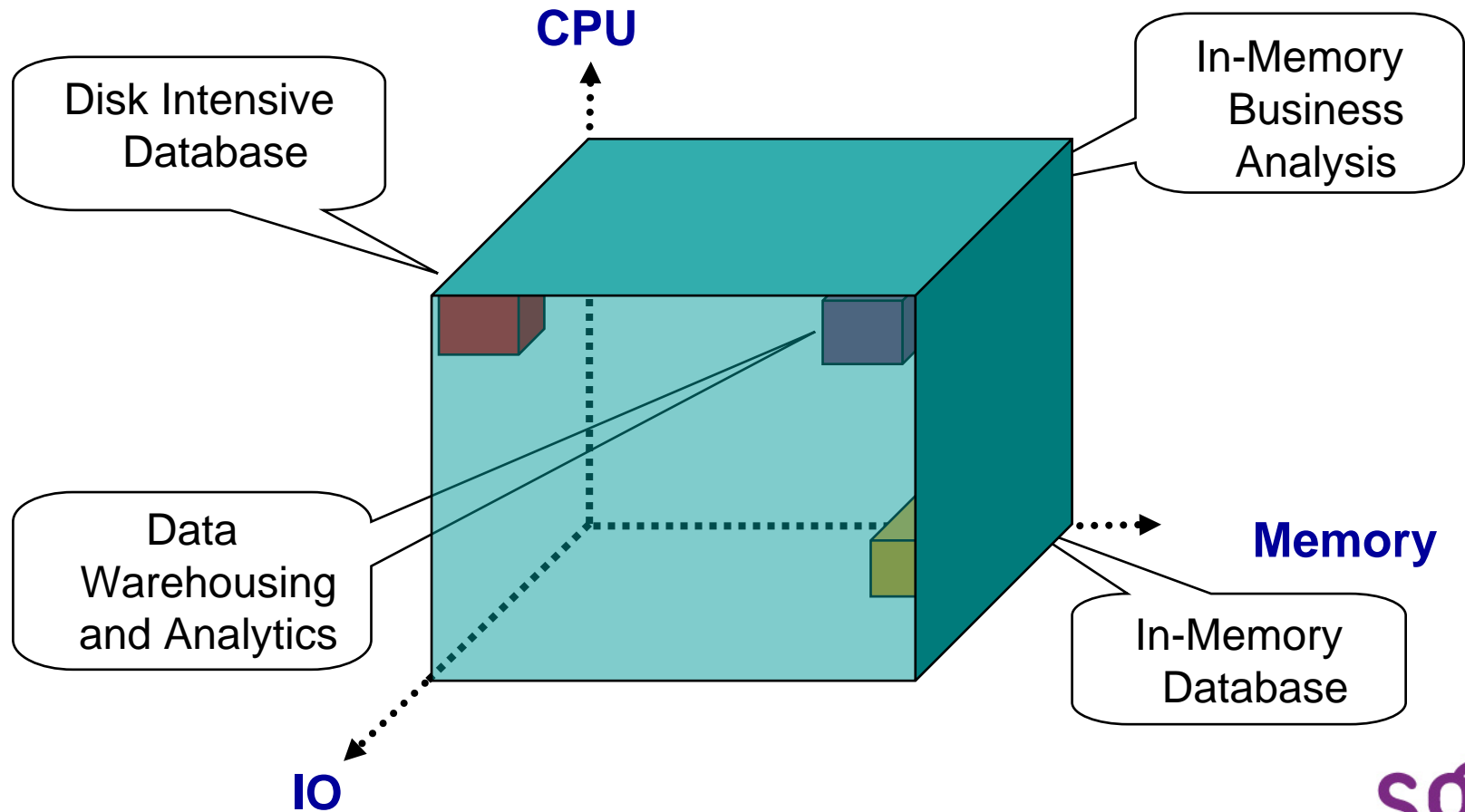


# The SGI Vision: A New Era in Enterprise Computing

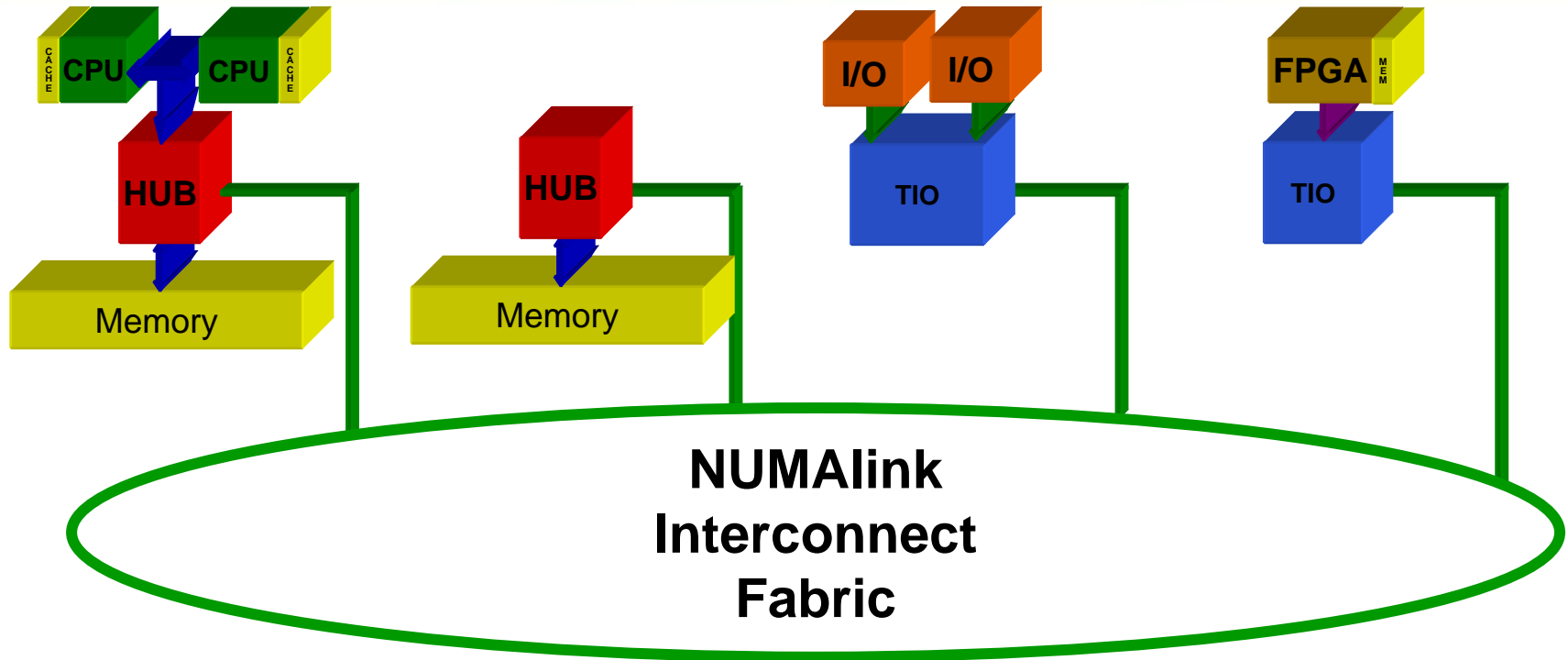


# Atlix Scalability Matches RDBMS Characteristics

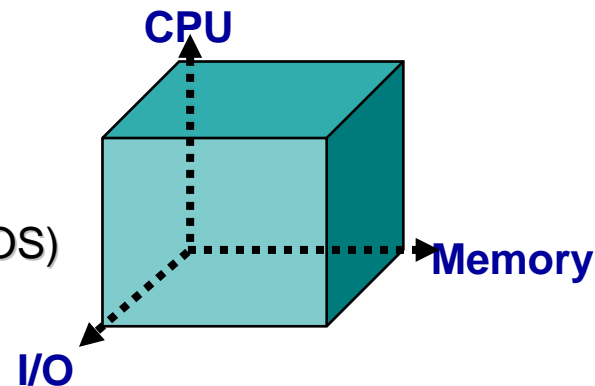
**Altix Building-Block Architecture Provides Custom-tailored Database Machine**



# SGI NUMAFLEX Architecture



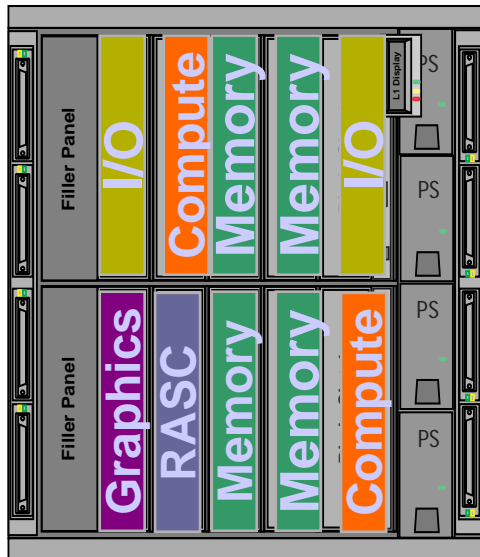
- Independent Scalability of CPU, RAM & I/O
- Global Shared Memoria
- “Commodity” Components (CPUs, Memory, I/O, OS)
- NUMALink Interconnect = 6.4GB/s ~ 51.2Gb/s





# SGI ALTIX 450/4700 SERVERS

## Independent Scalability



Individual Rack Unit (IRU)

### True Scalability:

System Bandwidth increases as blades are added

### Memory-Only Blades :

Add memory without having to add processors

### No Limits on Shared Memory:

From 2 Gigabytes to 128 *Terabytes*

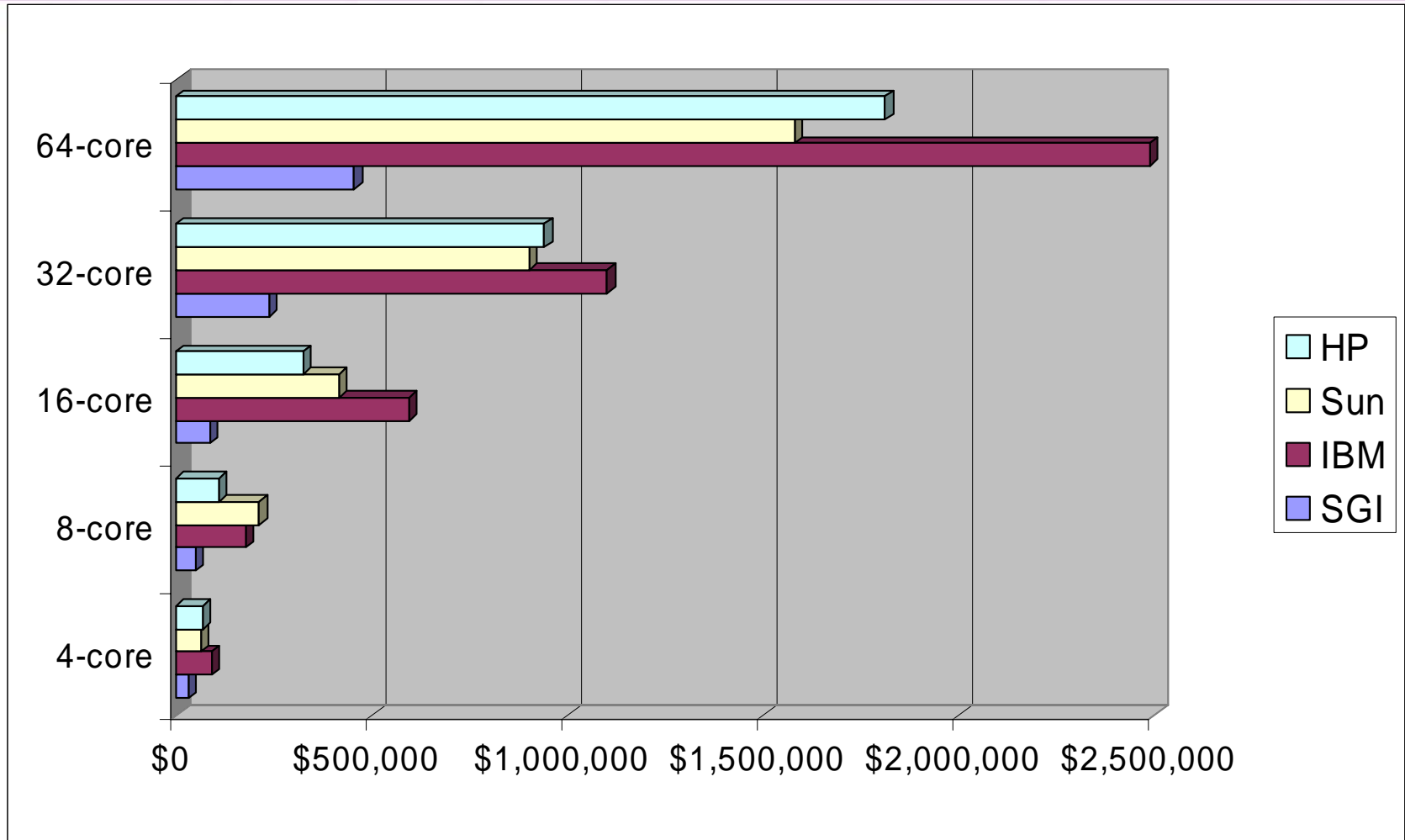
# SGI Altix Servers Support More Memory

- SGI Altix support more Memory
- Less cores are required to a large amount of Memory
- Better TCO:
  - Use less number of CPUs
  - Reduce CPU License cost

	Maximum Memory	Memory/Core
<b>SGI Altix 4700</b>	<b>128 TB</b>	<b>128 GB/core</b>
<b>IBM p595</b>	<b>2 TB</b>	<b>32 GB/core</b>
<b>HP Superdome</b>	<b>2 TB</b>	<b>16 GB/core</b>
<b>Sun Enterprise 25K</b>	<b>1 TB</b>	<b>8 GB/core</b>

Source: Ideas International, Inc.

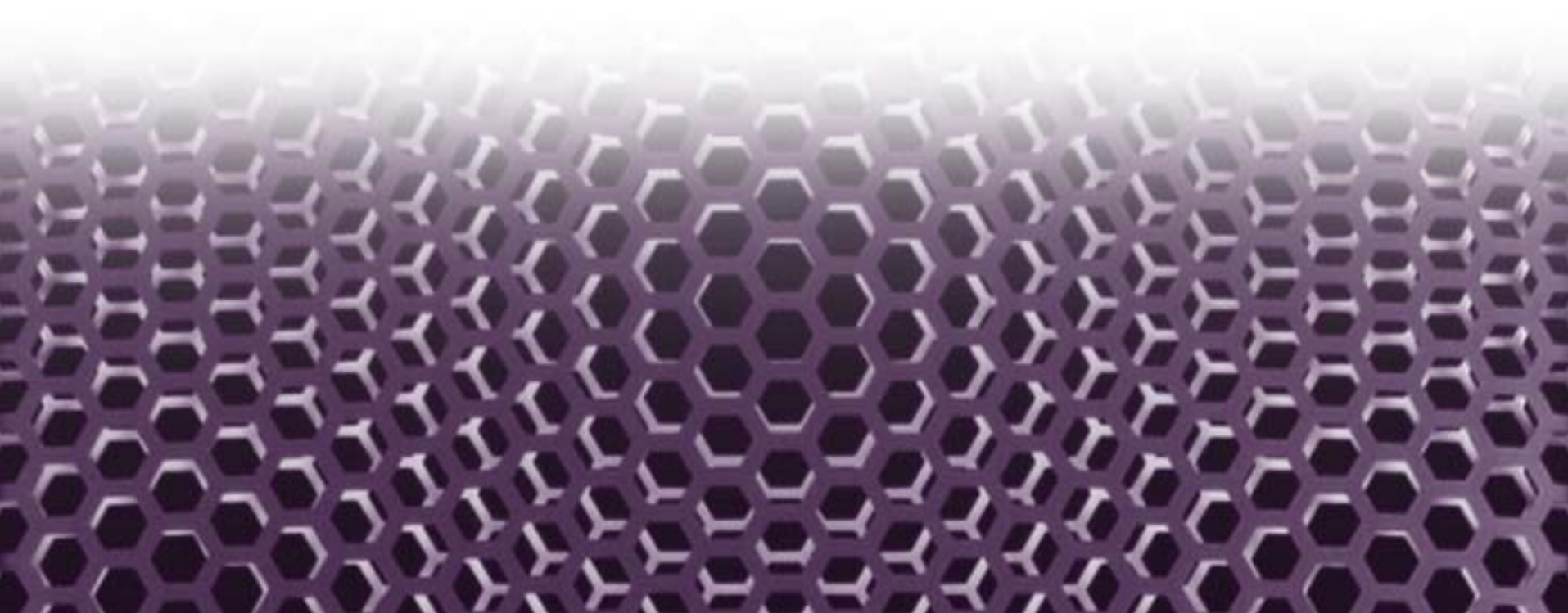
# SGI's Altix Costs Less



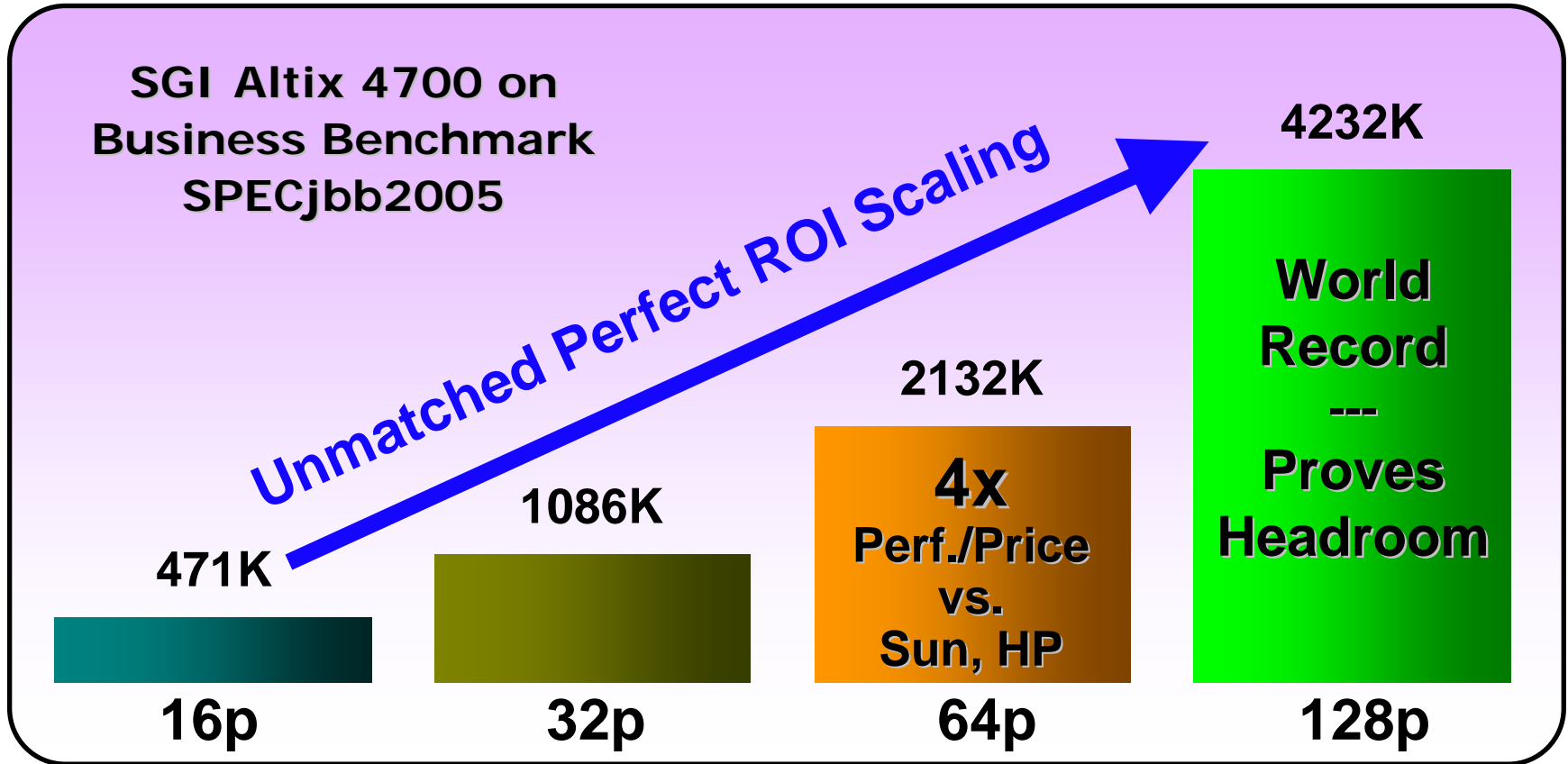
US List Price System Comparison



# SGI Altix – The Oracle Application Standard Benchmark



# SPECjbb2005 benchmark



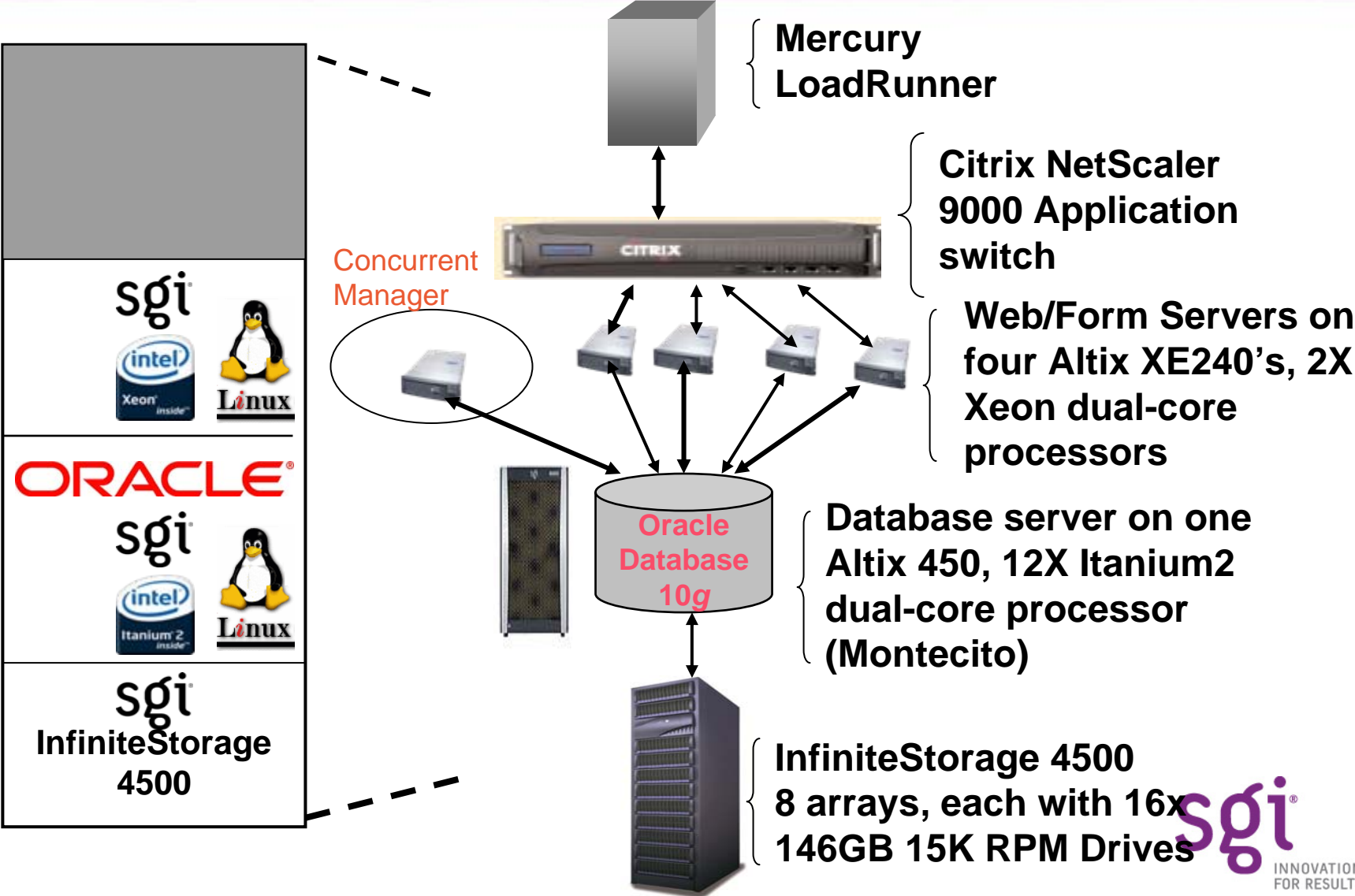
SPECjbb2005 competitive results, ranked here by order of total throughput metric, were accessed from <http://www.spec.org> on Jan. 19, 2007. Main configuration details shown above, but complete data are given at <http://www.spec.org/jbb2005/>. SPEC and SPECjbb are registered trademarks of Standard Performance Evaluation Corporation. Pricing Source: Ideas International Product Database

# OASB Benchmark - What does the benchmark measure?

- **Scalability** of the hardware for complex web operations
  - Max number of online users with a minimum response time
- **Throughput** of concurrent batch operations
- **Sizing** – tests whether a Three-Tier configuration (often Split Configuration) is well-sized to sustain complex web applications

- Tests power of CPUs in all three tiers to handle concurrency and user scalability
- Tests Network Bandwidth
- Tests System Sustainability during steady state when stressed with process concurrency

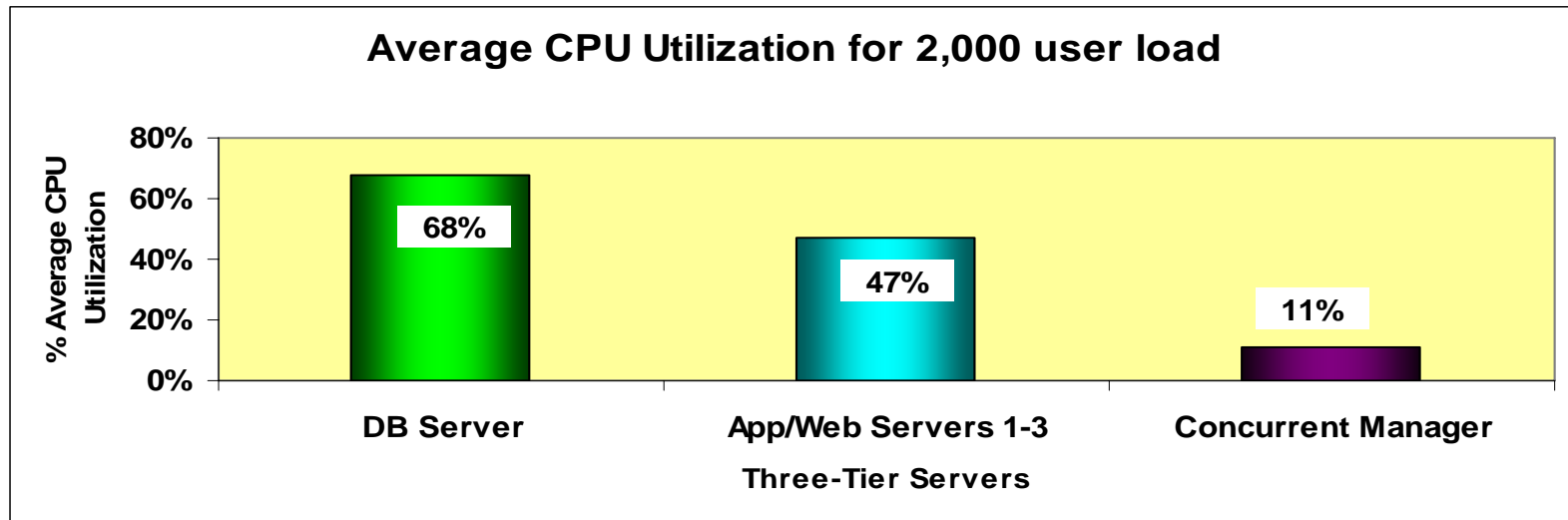
# OASB System Diagram



# Average CPU utilization on the DB and Apps servers: Altix 450 with 2,000 user load

↑ Room to grow

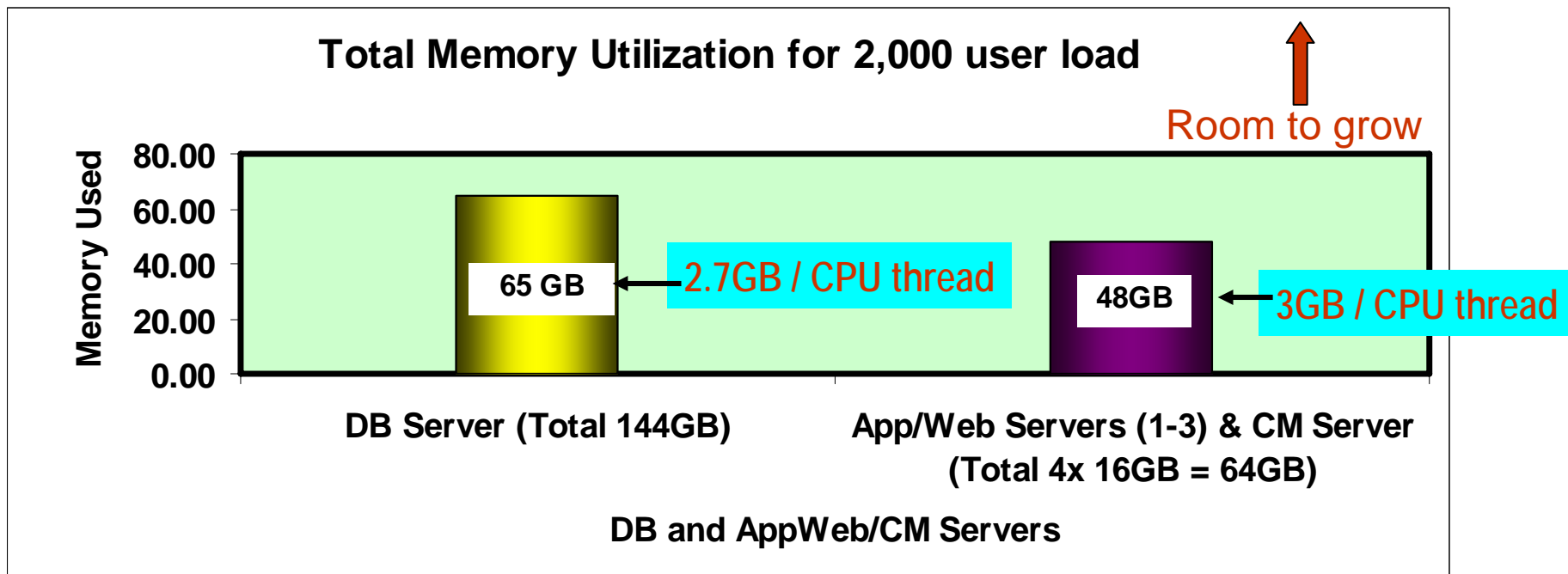
CPU usage < 75% on DB => better system stability



CPU utilization of 68% on DB Tier proves no system instability with high concurrency. Typically for this workload, the CPU usage is heavier on the DB side than on the Apps servers. Altix servers scaled smoothly as users were added, keeping the batch load constant over the steady state period.



# Total Memory usage on the DB and Middle-Tier servers: Altix 450 and Altix XE 240 with 2,000 user load



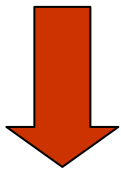
Altix 450 uses 2.7GB memory per CPU thread; Altix XE 240 uses 3GB memory per CPU thread

# E-Business Suite 11.5.10 BM: Average Response Times

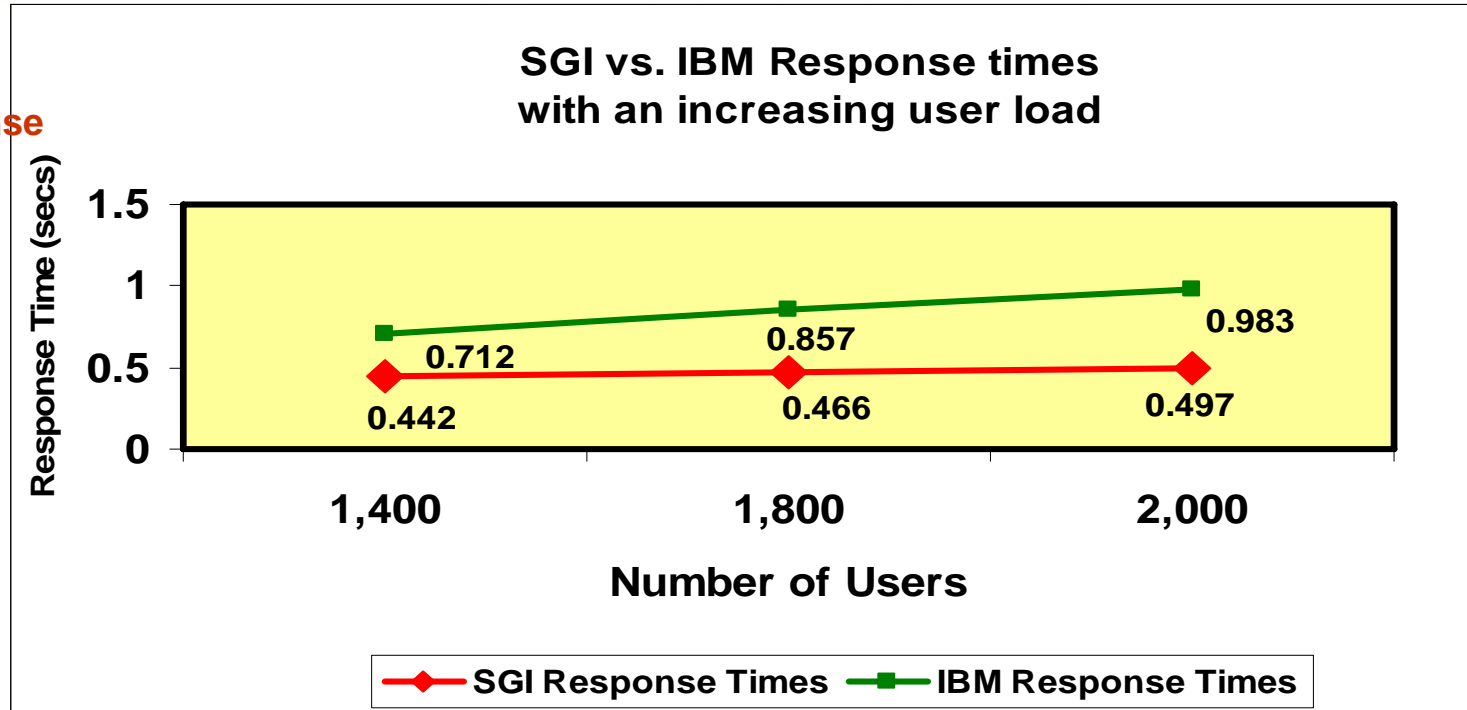
for 1,400, 1,800 and 2,000 users -

**SGI Altix 450 24-cores/24-Threads Itanium2 vs. IBM p5-570 8-cores/16-Threads**

**SGI has 2x  
faster response  
time**



**Lower  
the  
better**



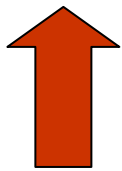
**With an increasing user load, Altix 450 maintains a constantly low response time and has 2x faster response time than IBM p5-570 even with 2,000 users**

# E-Business Suite 11.5.10 BM: Payroll Batch Throughput for

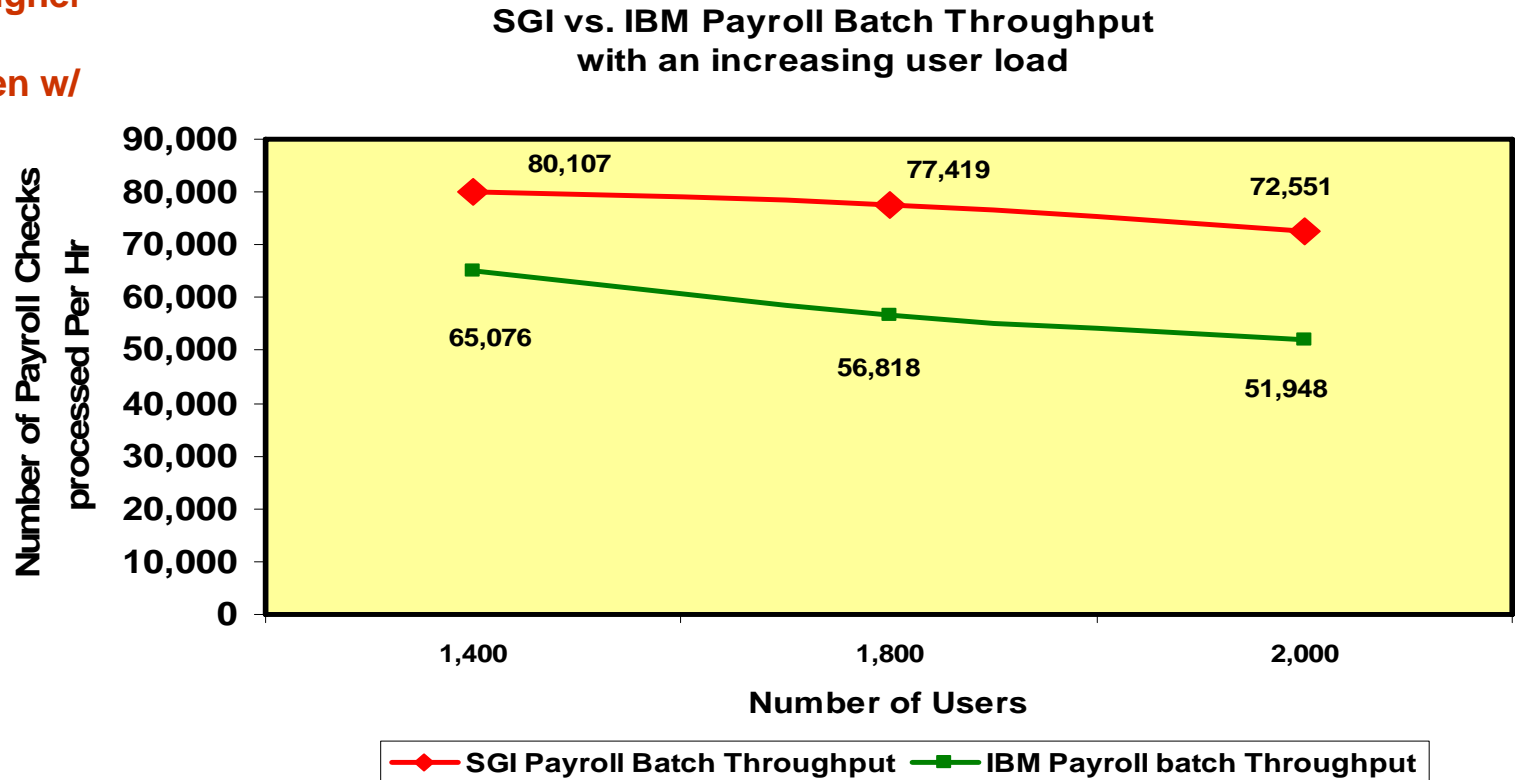
1,400, 1,800 and 2,000 users -

**SGI Altix 450 24-cores/24-Threads Itanium2 vs. IBM p5-570 8-cores/16-Threads**

SGI has 40% higher payroll batch throughput even w/ 2,000 users



Higher the better

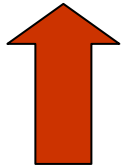


Altix 450 maintains a constantly high payroll batch throughput with increased user load. It can process 23%, 36% and 40% higher number of employee checks in a payroll system than IBM p5-570 respectively with 1,400; 1,800 and 2,000 users

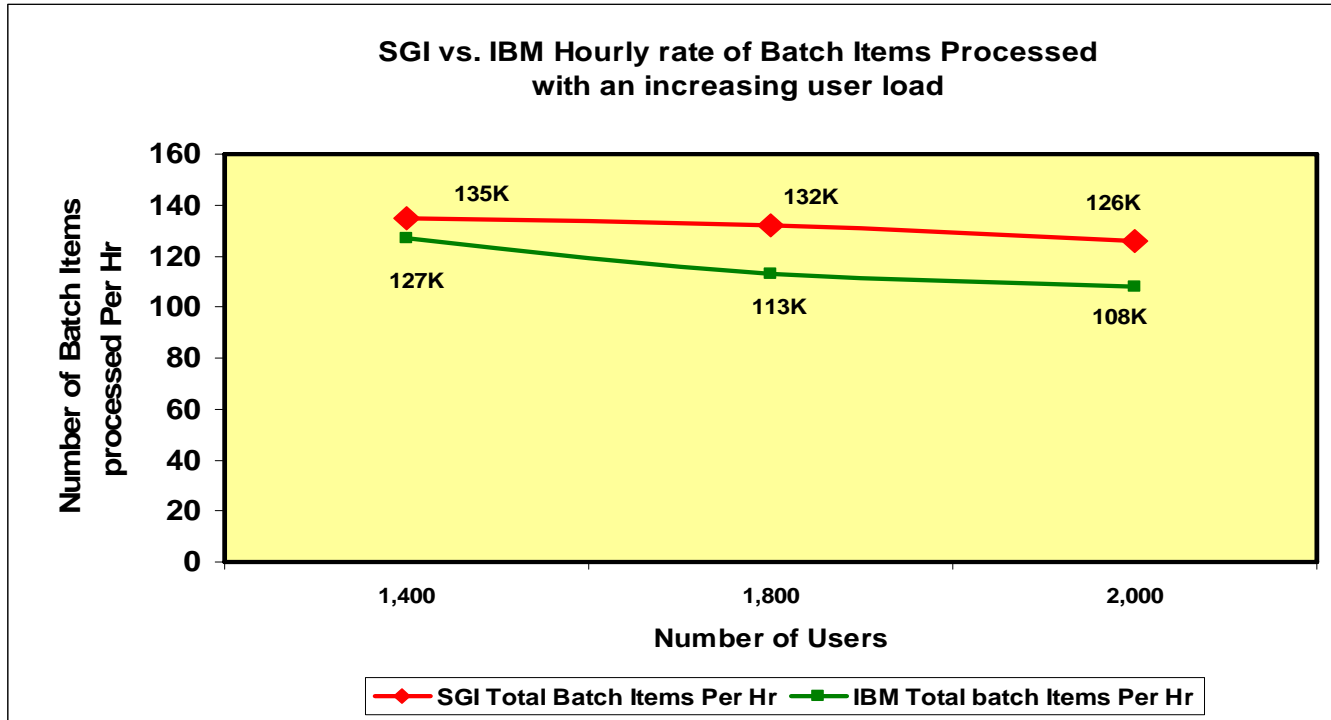
# E-Business Suite 11.5.10 BM: Cumulative Batch Throughput for 1,400, 1,800 and 2,000 users -

## SGI Altix 450 24-cores/24-Threads Itanium2 vs. IBM p5-570 8-cores/16-Threads

SGI can process a larger number of batch items / Hr



Higher the better



Altix 450 maintains a constantly high cumulative batch throughput. It can process a larger number of batch items/hr than IBM p5-570 - 135K, 132K and 126K batch items /hr with 1,400; 1,800 and 2,000 users

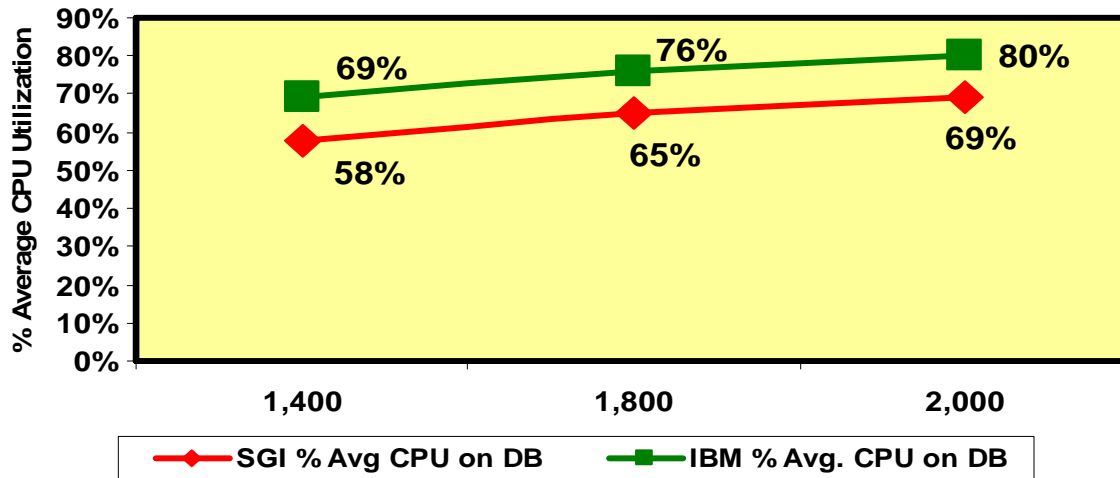
# E-Business Suite 11.5.10 BM : % Avg. CPU utilization for 1,400, 1,800 and 2,000 users with Oracle 10gR2 DB SGI Altix 450 24-cores/24-Threads Itanium2 vs. IBM p5-570 8-cores/16-Threads

SGI has headroom  
to grow for an  
adaptive enterprise



Lower  
the  
better

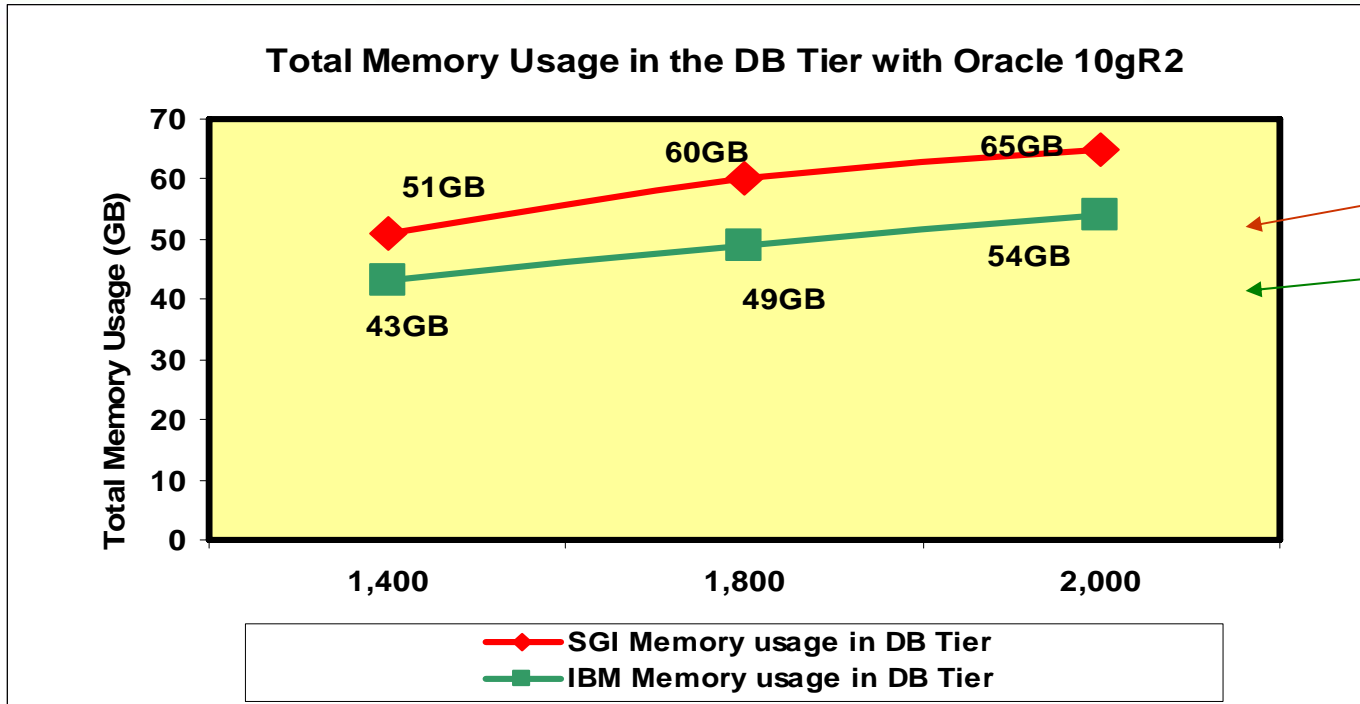
**% Avg. CPU usage for Oracle 10gR2 Database:  
1x SGI Altix 450 versus 1x IBM p5-570**



Altix 450 scales linearly with respect to CPU utilization for 1,400; 1,800 and 2,000 users. It provides enough CPU headroom than IBM p5-570 to accommodate more than 2,000 users, in an adaptive enterprise.

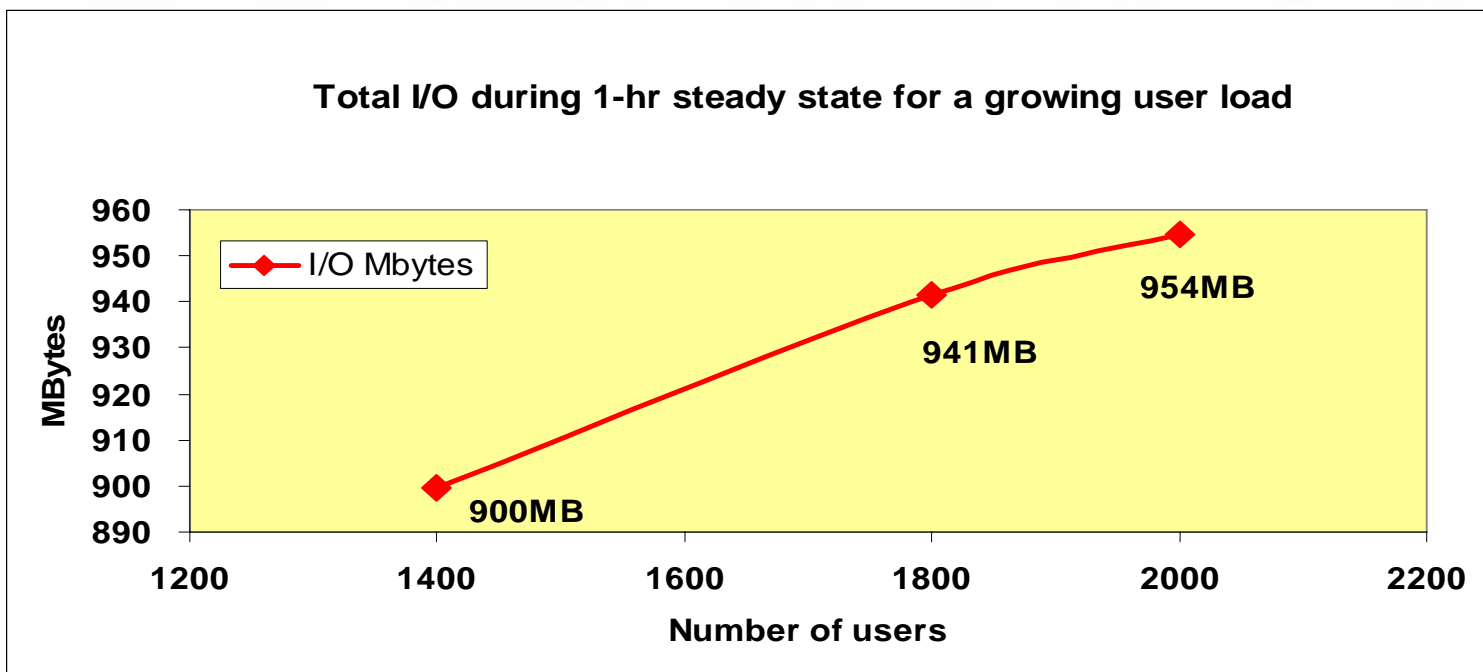
# E-Business Suite 11.5.10 BM: Total Memory usage for 1,400, 1,800 and 2,000 users with Oracle 10gR2 DB

SGI Altix 450 24-cores/24-Threads Itanium2 vs. IBM p5-570 8-cores/16-Threads



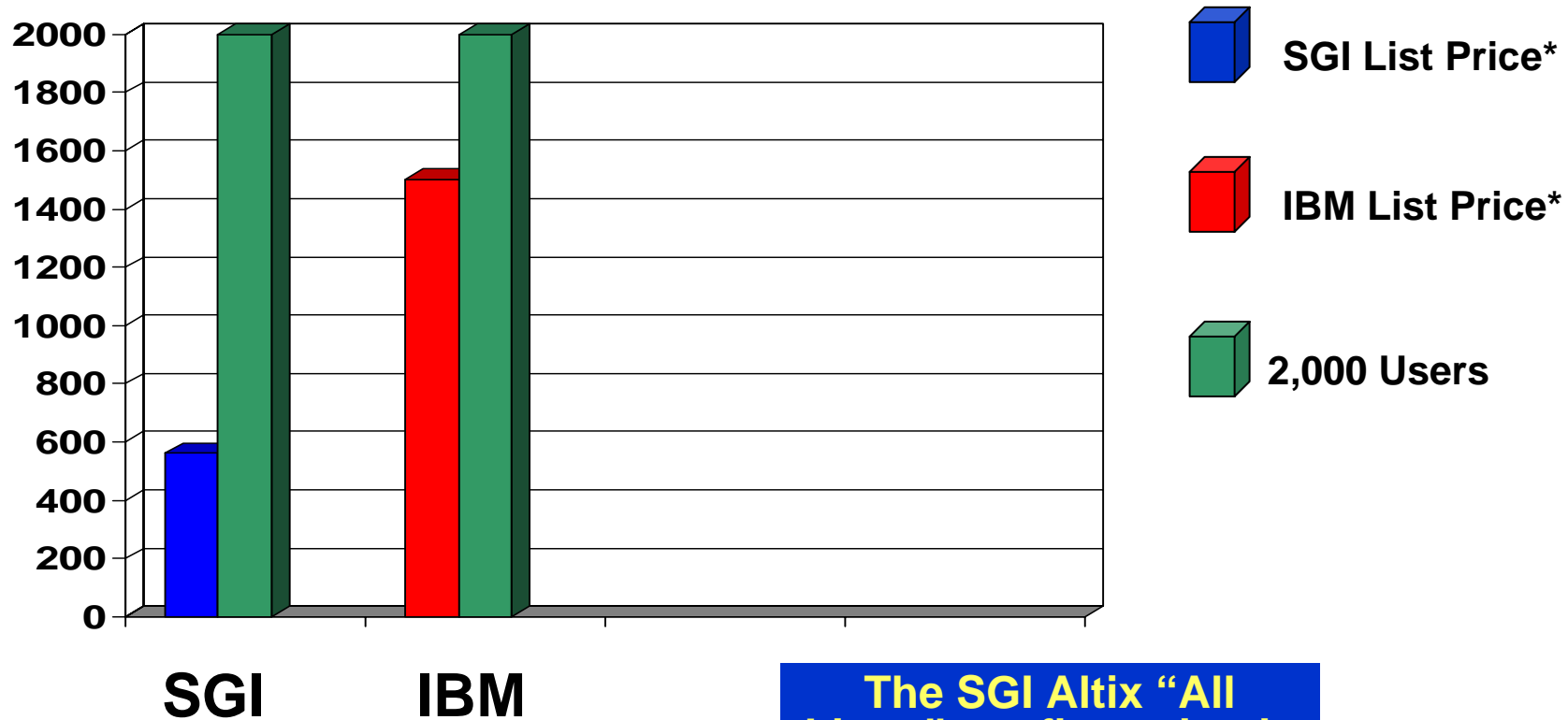
**Altix 450 uses less memory per thread: 2.7GB/thread compared to 3.4GB/thread for on IBM p5-570 .**

# E-Business Suite 11.5.10 BM: Total I/O executed during the 1-hr steady state for 1,400, 1,800 and 2,000 users with Oracle 10gR2 DB - SGI Altix 450 24-cores/24-Threads Itanium2



**Altix 450 maintains a linear I/O scalability to the Storage with an increasing number of users**

# E-Business Suite 11.5.10 BM – 2,000 users: Price/Performance Comparison SGI Altix 450 with IBM p5-570 server



\*Based on U.S. List Pricing from Web-site pricing

The SGI Altix "All Linux" configuration is considerably lower in cost compared to an AIX-based IBM p5-570 server



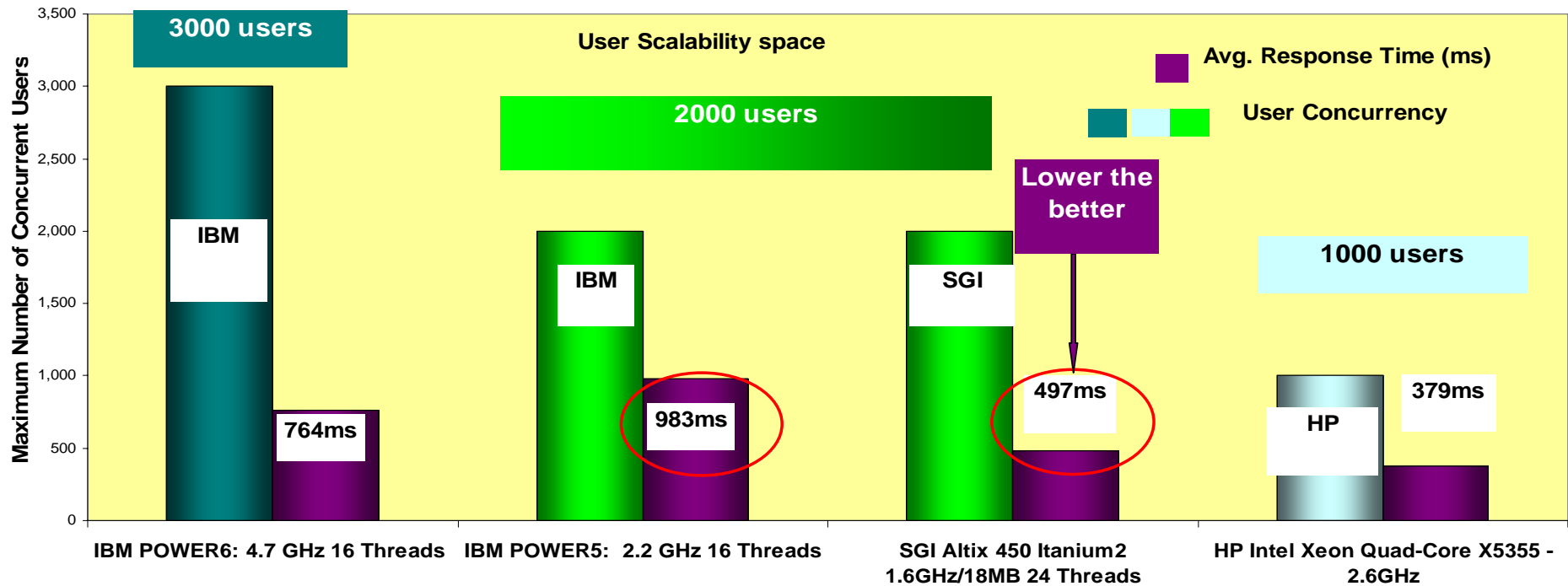
# Summary

- SGI Altix Servers Demonstrate Superior Price/performance
- SGI Altix Servers allow a high user scalability and excellent performance for executing heavily multi-threaded complex Oracle Applications on an Oracle10g Database
- The E-Business Suite benchmark results provide system sizing information to support concurrent business processes and on-line transactions with minimal response time and maximal performance throughput
- The “All-Linux” stack gives the SGI Altix better scalability and value coupled with the flexibility needed to maximize technology investments with Oracle products

The price/performance of the Altix system is significantly better. It uses the Linux open source operating system and Intel processors to keep the initial costs low; and the longer term costs significantly lower with incremental system flexibility. This is achieved through the award-winning SGI NUMAFlex architecture.

# SGI in the E-Business Suite 11.5.10 BM space: 2,000 users scalability compared to HP and IBM

OASB (E-Biz 11.5.10 Benchmark): User Scalability and Avg. Response Time

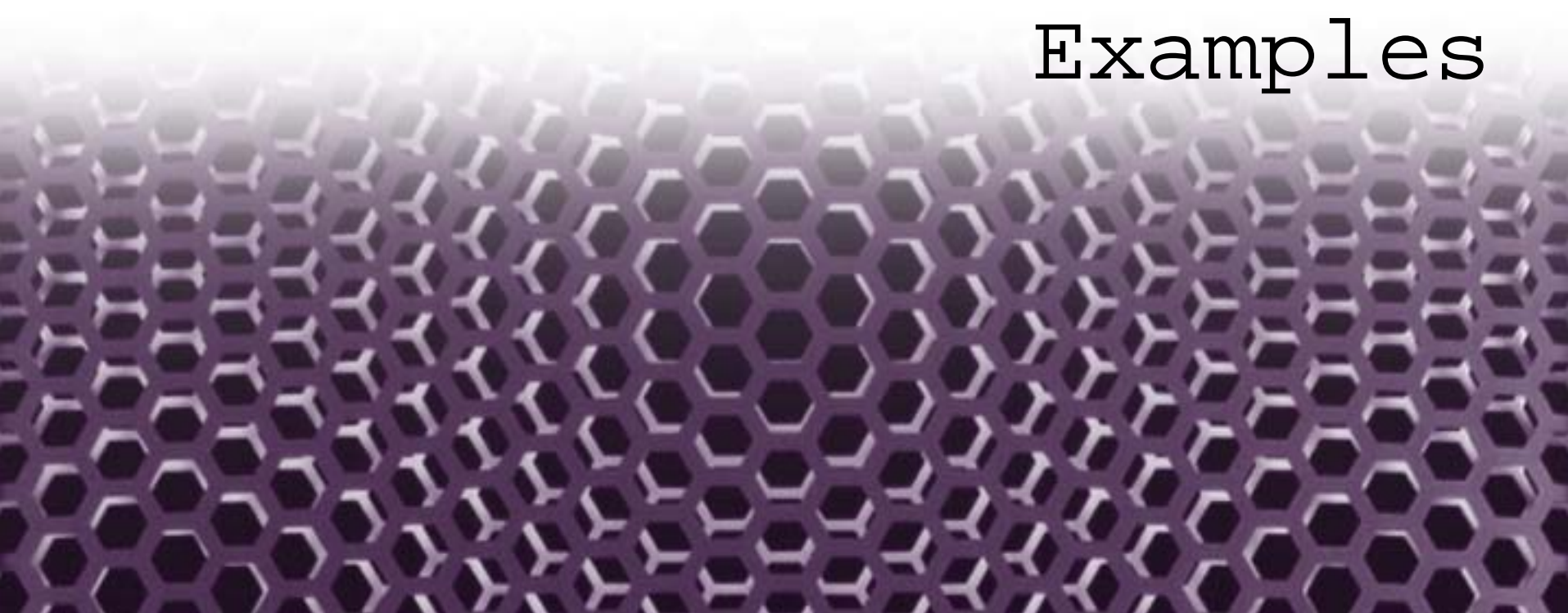


**SGI is in the 2,000 user scalability space with IBM: With a 2,000 user scalability, Altix 450 has 2x faster response time than IBM p5-570.**

**Immediate Goal: Set a milestone in the 3,000 user space next to IBM p6 number**



# SGI and Customer Examples



# Real Time Data Access

## MTU Aeroengines AG



### The Challenge

- Increase ROI, decrease TCO
- Consolidation of technical and enterprise computing resources
- Adoption of new open-standards-based platform

### The Solution

- 3+2 Altix® 350s (16p, 62GB)
- HDS 2x20TB

### The Benefits

- Fastest Oracle 10g performance
- Solid base for SAP
- Improved ROI 15-30%

*“SGI Altix gives us the fast performing consolidated platform for technical and transaction computing.”*

Norbert Diehl, CIO of MTU Aeroengines

# Real Time Data Access

**Masaryk University** Masaryk University Information System (IS MU)



*“SGI Altix was definitely faster than any other system for running Oracle... And Altix was cheaper than the proprietary systems.”*

Michael Brandejs, Director of Computer Systems Unit at University's Faculty of Informatics

## The Challenge

- Provide real-time access to TBs of Oracle data for 37K students, faculty, staff
- Process complex transactions (1M+/day)
- 24x7 availability of critical services that touch all organizations
- Tight budget!

## The Solution

- Two Altix® 350s (16p, 32GB)
- IS TP9300 (Fiber Channel, RAID)
- New 72 core A450 added in June 07

## The Benefits

- Fastest Oracle 10g performance
- Lowest Total Cost of Ownership

# Real-time Casino Management

## Konami Gaming, Inc.



*“Our competitors need multiple servers to do this. We can do it all with the bandwidth of a single Altix 350 server.”*

Tom Soukup,  
Senior Director of R&D, Konami

## The Challenge

- Optimize the gaming experience: instant results and feedback
- Track all carded and uncarded game play 24x7 (millions of small transactions and random I/O per day)
- Support reports, analysis, and data mining of real-time gaming data

## The Results

- High-performance solution for satisfied gamers and management
- High availability (zero downtime) and excellent SGI service/support

## The SGI with Oracle Solution

- 17 casino mgmt system across the U.S.
- Scalable Altix 350 systems
- IS TP9300 and TP9500 (Fiber Channel) handle the random I/O at top speeds

# *SGI's Value*

High Performance from  
Innovative Architectures

Flexibility through  
Open Standards

High Density Packaging,  
Low Power Design

Complete Solutions by  
working with Partners

Lower Cost than  
Proprietary Architectures



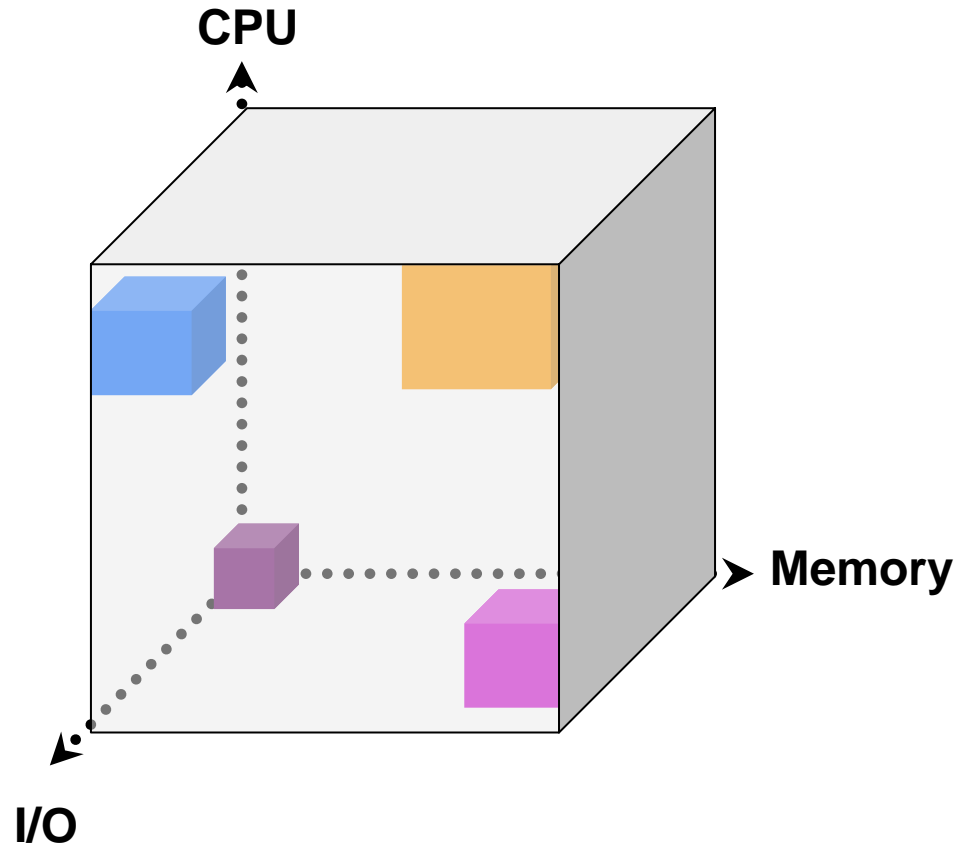
# Minimizing Risk of being locked

- Linux is here to deliver what Unix was originally supposed to do: compatibility, portability and independence on single vendor proprietary platform – ideal platform for enterprise consolidation
- Linux is supported by all SW vendors from top
- Linux allows efficient platform consolidation
- Linux allows system reuse
- Linux is supported by all major HW vendors from bottom



# Minimizing Risk of making wrong decision

- NUMAflex architecture scales in all dimensions independently
- NUMAflex allows to adopt to changing IT environment
- SGI implementation of NUMA allows to take advantage from different technology life cycles of system components



# Minimizing Risk of outgrowing capacity

Application Complexity

- Mix of applications
- Unpredictable workloads
- Growing job size

- Capacity grows on demand
- 2-38 sockets (4-76 cores) still same product

SGI® Altix® 450 servers  
(2-32 sockets)



Scale up  
(processors per node)

Scale out

(Total number of processors)

- Number of users
- Number of jobs

Processing Capacity

# **SGI's REAL-TIME ENTERPRISE**

**SGI's unique technology increases customer productivity and competitiveness by enabling...**

**...an open, flexible, real-time enterprise**

*Q*  
QUESTIONS  
&  
ANSWERS  
*A*