

Oracle 9iRAC Why Linux ?

Yann Allandit
H-P Pre-sales consultant
Oracle Competence Center EMEA

August 13, 2003



Why choose Linux with hp for Oracle 9iRAC ?

- Because Linux is in the heart of the Oracle strategy
- Because hp and Oracle are strong partners
- Because of the market evolution
- Because of the performance and the price
- Because of the technology improvements
- Because of the future.. The present
- Because of the hp commitment on Linux
- Because hp helps you to implement Oracle on Linux
- Because of already satisfied customers



Why choose Linux with hp for Oracle 9iRAC ?

- Because Linux is in the heart of the Oracle strategy
- Because hp and Oracle are strong partners
- Because of the market evolution
- Because of the performance and the price
- Because of the technology improvements
- Because of the future/the present
- Because of the hp commitment on Linux
- Because hp helps you to implement Oracle on Linux
- Because of the already satisfied customers



Larry Ellison – Oracle Strategy



Oracle Open world 2002

Why choose Linux with hp for Oracle 9iRAC ?



- Because Linux is in the heart of the Oracle strategy
- Because hp and Oracle are strong partners
- Because of the market evolution
- Because of the performance and the price
- Because of the technology improvements
- Because of the future/the present
- Because of the hp commitment on Linux
- Because hp helps you to implement Oracle on Linux
- Because of the already satisfied customers

HP/Oracle alliance

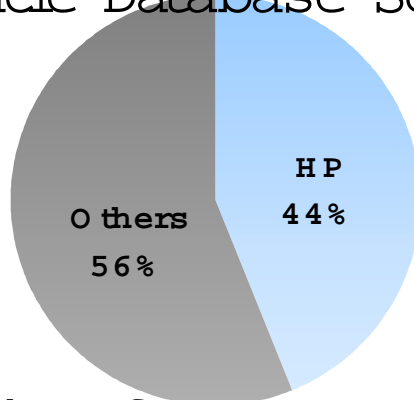
- executive alignment
- 20 years of collaborative partnership
- 80,000+ combined customers \$6 billion business
- parity for all Oracle products
- a market leading 40% of Oracle customers use HP systems
- 400 people dedicated to Oracle 13 worldwide technology & competency centers



HP Maintains a Leading Position Across Oracle Products

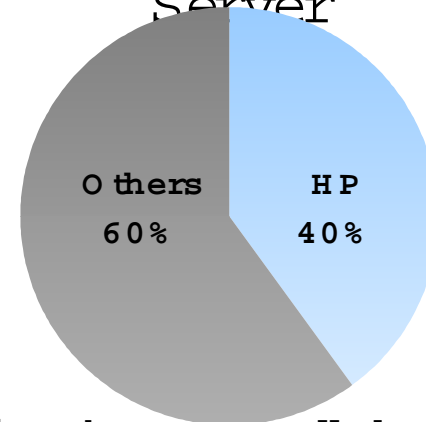


Oracle Database Servers



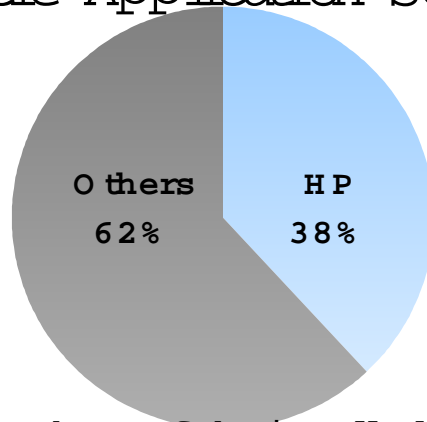
Leading share of recent server purchases

Oracle E-Business Application Server



Leading share of installed servers

Oracle Application Server



Leading share of the installed servers

- Over 50 % of Oracle sites use HP storage
- Over 50 % of the sites running Oracle 9iRAC use HP servers

Source: HP commissioned IDC Primary Research , completed 02/2003. Share % based on number of servers recently purchased or installed as indicated.

Why choose Linux with hp for Oracle 9iRAC ?

- Because Linux is in the heart of the Oracle strategy
- Because hp and Oracle are strong partners
- Because of the market evolution
- Because of the performance and the price
- Because of the technology improvements
- Because of the future/the present
- Because of the hp commitment on Linux
- Because hp helps you to implement Oracle on Linux
- Because of the already satisfied customers



- Linux is the fastest growing platform, projected to grow 174% to US\$5.9 billion to 2002 (IDC, April, 2002).
- 3,500 Independent software vendors are using Oracle Database on Linux.
- Oracle Database is the leading database on Linux (IDC, 2001).
- Over 650,000 downloads of Oracle on Linux (Oracle).

- Linux Market Trends
 - Linux fastest growing > 30% CAGR – annual growth rate - (IDC)
 - 33% of all web servers run Linux
 - growing support from ISVs
- Linux is strategic to hp
- expanding hp customer base and adds incremental revenue, ex. Reuters
 - Long history with Linux
 - 13,3% of ProLiant servers ww run Linux, numbers increasing
 - Best competitive offering to hit SUN and IBM Risc
 - ISS Volume for 2003 EMEA: 555.000 servers \$2.5Bn (Units + SS&I) Linux: \$33.250.000
- Early Itanium server shipments >80% on Linux

Worldwide ProLiant server sales



	2001	1Q02	2Q02	3Q02
■ NetWare®	13.9%	12.5%	12.6%	12.0%
■ Windows®	67.3%	68.1%	68.6%	69.1%
■ UNIX®	6.2%	5.3%	4.6%	4.5%
■ Linux®	11.1%	12.8%	12.9%	13.3%
■ Other	1.4%	1.3%	1.3%	1.1%

source: IDC server market tracker, 3Q02 units, released 11/26/02





Why choose Linux with hp for Oracle 9iRAC ?

- Because Linux is in the heart of the Oracle strategy
- Because hp and Oracle are strong partners
- Because of the market evolution
- Because of the performance and the price
- Because of the technology improvements
- Because of the future/the present
- Because of the hp commitment on Linux
- Because hp helps you to implement Oracle on Linux
- Because of the already satisfied customers



Oracle Applications Standard Benchmark 1

8 CPU RESULTS BY USER COUNT (11.5.6) – June 2003

	Company	System	User Count	Average Response Time (s)	Benchmark Version	Date Submitted	Disclosure Report
2*4 cpu		HP Proliant DL580 G2 Suse with 2 nodes cluster	7504	1.19	11.5.6	06-23-03	Detailed Report
8 cpu		PRIMEPOWER 850	6272	1.073	11.5.6	11-07-02	Detailed Report
8 cpu		E server xSeries x440	5656	0.49	11.5.6	06-02-03	Detailed Report
8 cpu		Sun Fire V880	5208	1.16	11.5.6	12-13-02	Detailed Report

http://www.oracle.com/apps_benchmark/html/index.html?results.htm

Oracle Applications Standard Benchmark







Application Tier	Database Tier	Storage
<p>11 x Proliant ML530G2 each with: CPUs: 2 x Xeon DP at 2.8GHz, 512 KB L2 cache Memory: 16GB OS: RedHat AS 2.1.1 Disks: 2 x 72.8GB (Ultra 3)</p> <p>4 x Proliant ML530G2 each with: CPUs: 2 x Xeon DP at 2.4GHz, 512 KB L2 cache Memory: 16GB OS: RedHat AS 2.1.1 Disks: 2 x 72.8GB (Ultra 3)</p> <p>2 x Proliant ML530G2 each with: CPUs: 2 x Xeon DP at 2.8GHz, 512 KB L2 cache Memory: 8GB OS: RedHat AS 2.1.1 Disks: 2 x 72.8GB (Ultra 3)</p>	<p>2 x HP ProLiant DL580G2 with: CPUs: 4 x Intel Xeon MP 2.8GHz Processor caches: 12 KB L1; 512 KB L2; 2MB L3 Memory: 32GB Operating System: SuSE SLES8 Disks: 2 x 72.8GB (Ultra 3)</p>	<p>2 x HP StorageWorks MSA1000 each with: 14 x 36.4GB (Ultra3 15k)</p>

Oracle Applications Standard Benchmark 2

ITANIUM RESULTS BY USER COUNT (11.5.6) – August 2003

UPDATED

	Company	System	User Count	Average Response Time (s)	Benchmark Version	Date Submitted	Disclosure Report
2*4 cpu		HP Proliant DL580 G2 Suse with 2 nodes cluster	7504	1.19	11.5.6	06-23-03	Detailed Report
4 cpu		HP server rx5670	5992	0.6	11.5.6	07-30-03	Detailed Report
8 cpu		E server xSeries x440	5656	0.49	11.5.6	06-02-03	Detailed Report
8 cpu		Sun Fire V880	5208	1.16	11.5.6	12-13-02	Detailed Report

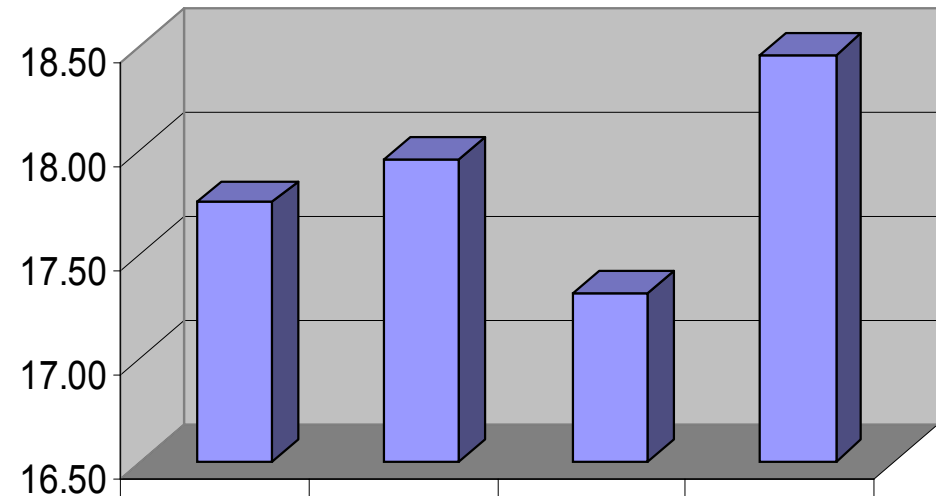
http://www.oracle.com/apps_benchmark/html/index.html?results.htm

Cost Information

Price/tpmC
comparison

Based on tpc-c
benchmarks running
Oracle 9.2

tpc-c results for Oracle 9i R2



	IBM eServer	Bull Escala PL3200R/	HP RedHat Proliant	HP W2k Proliant
\$/transaction	17.75	17.96	17.32	18.46

Only HP performed tpc-c benchmarks with RAC

source: www.tpc.org - 2003

Why choose Linux with hp for Oracle 9iRAC ?



- Because Linux is in the heart of the Oracle strategy
- Because hp and Oracle are strong partners
- Because of the market evolution
- Because of the performance and the price
- Because of the technology improvements
- Because of the future/the present
- Because of the hp commitment on Linux
- Because hp helps you to implement Oracle on Linux
- Because of the already satisfied customers

Storage solutions for Linux and Oracle

1.1 – Which hardware



HP is the number 1 in the storage market :

Over 2000PB shipped in 2001*

- #1 in disk storage systems
- #1 in external storage systems
- #1 in tape drives and automation
- #1 in storage area networks
- #1 in virtualization technology

Over 50 % of Oracle sites use
HP storage

* Source: UC Berkeley Report – "How Much Information"
1PB = 1000 TB

Wide range of Storage solutions

- MSA1000
 - Low cost fibre channel storage
 - Excellent performance – benchmarks
 - Supports redundancy (Secure Path)
- Enterprise Virtual Arrays (EVA)
 - Full featured (virtualized) storage
 - Easy to manage
 - Priced lower than EMC Symmetrix
- VA (IA64)
 - Full featured (virtualized) storage
 - Easy to manage

1.2 – Device management

■ Raw devices ?



Performance



Management

■ Logical volume manager ?



Familiar to HP
customers



Not usable with RedHat

■ Cluster File System ?



Manageability



Third party software
Performance ?

Storage solutions for Linux and Oracle

1.3 – Oracle Cluster File System

■ features and benefits:

- developed and supported by Oracle
- simplifies storage and Oracle management
 - file level backup
 - no limitation on number of devices
- minimal performance impact
- available for Windows and Linux
- Supported by Oracle



■ limitations:

- Currently, only recommended for database files, not for Oracle Binaries
- OCFS requires Red Hat Errata 12 or higher
- Currently OCFS doesn't support Asynch_IO, will be supported in 1.0-9

Storage solutions for Linux and Oracle

1.4 - Sistina Global File System

■ features and benefits:

- Support 9iRAC datafiles
- Journaled cluster file system
- Supports dynamic multi-path I/O
- Primarily in high-performance computing
- Can change the on-disk size of a file system without taking it offline
- Support direct I/O to storage
- 64-bit file system
- Support for shared root disk
- Capability for “context-dependent path names”

■ limitations:

- No server management or monitoring tool
- Not available on Itanium Processor Family
- Third part software vendor



Storage solutions for Linux and Oracle

1.5 - Polyserve SAN File System

■ features and benefits:

- Based on Oracle Disk Manager
- Support Direct I/O
- Single shared Oracle Home across all nodes in the cluster
- Centralized management of storage resources
- Provides monitoring and application fail over functionality

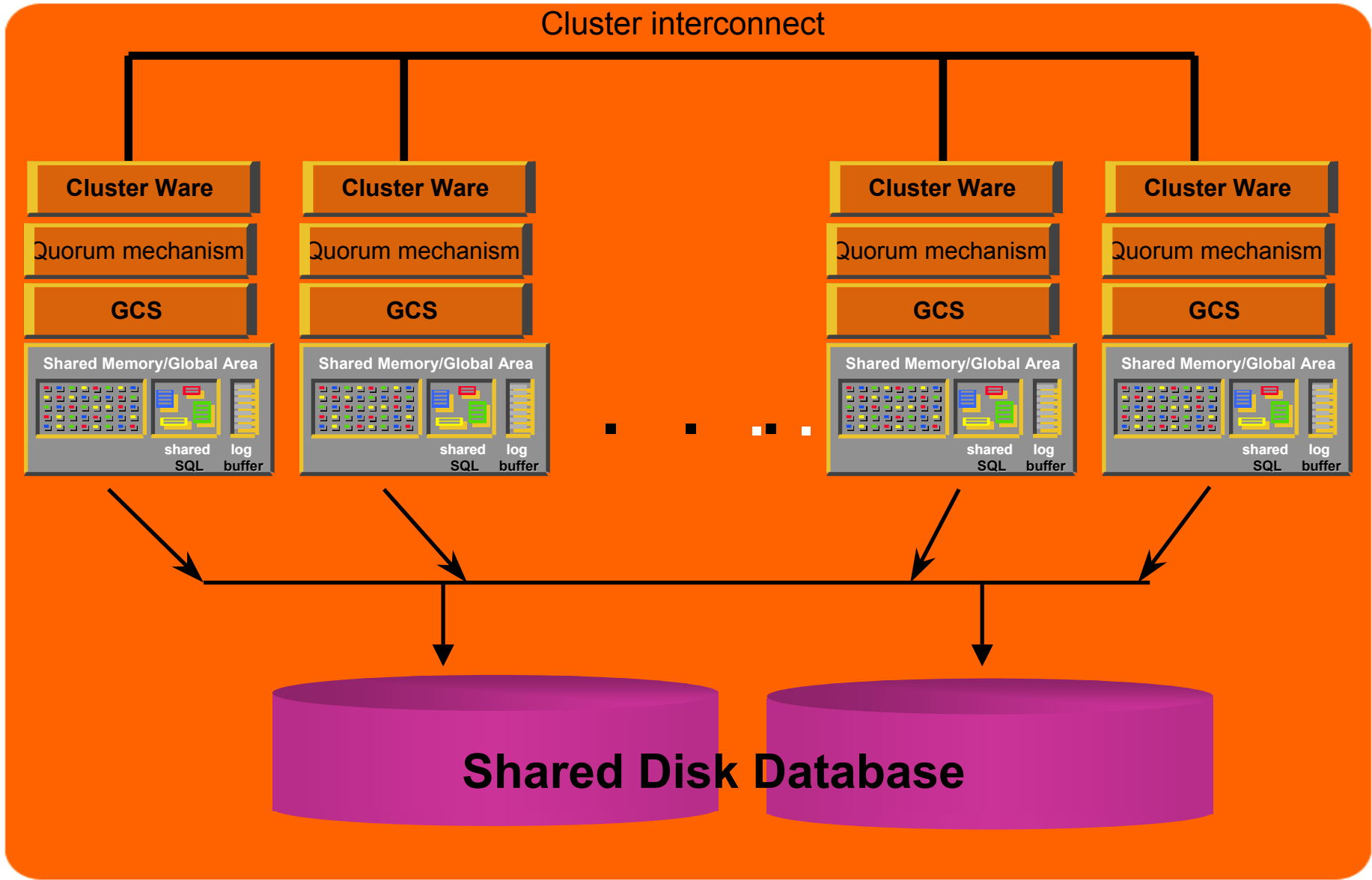


■ limitations:

- Third part software vendor
- Not available on Itanium



2.1 - Cluster Layer Architecture



2.2 - Cluster Layer Architecture

Comparison of Common Interconnects technologies

Name	Latency (in Microsec)	Throughput (in Gb/S)
Memory Channel	3	1
Hyper-Fabric	22	4
Fast Ethernet	3000	0.1 *
Gigabit Ethernet	3000	1 *
InfiniBand	<500	>2.5 **
Myrinet	7	2 *

* Available with Linux

** Not yet available

Advanced server features

3.1 – Summary



- Advanced Server contains various optimisations for making sure that large memory configurations (>1GB) are handled as efficiently as possible.
- For database performance, more memory is almost always better. Memory is one of the best “bang for the buck” upgrades possible.
- Most of the large memory optimisations made in Advanced Server were designed to work around the 32-bit limitations of IA-32 platforms and are therefore IA-32 specific.

base address

pfs

processor's TLB (Translation Lookaside Buffer) cache is important.

The processor to do virtual-to-physical mappings
entries in the TLB cache is limited

Advanced server features

3.2 - IA-32: memory map base address



- Oracle running on Linux will, by default, be limited to a shared memory area of 1.7GB.
- Oracle running on Red Hat Advanced Server can allocate a shared memory area of 2.7GB by lowering Oracle's memory map base address.
 - Relink Oracle with a modified base address
 - [oracle]\$ cd \$oracle_home/rdbms/lib
 - [oracle]\$ genksms -s 0x15000000 > ksms.s
 - [oracle]\$ make -f ins_rdbms.mk ksms.o
 - [oracle]\$ make -f ins_rdbms.mk ioracle
 - Modify the base mmap address for the Oracle user before starting the Oracle processes
 - [root]# echo 268435456 > /proc/\$pid/mapped_base

Advanced server features

3.3.1 - IA-32: Oracle VLM using tmpfs

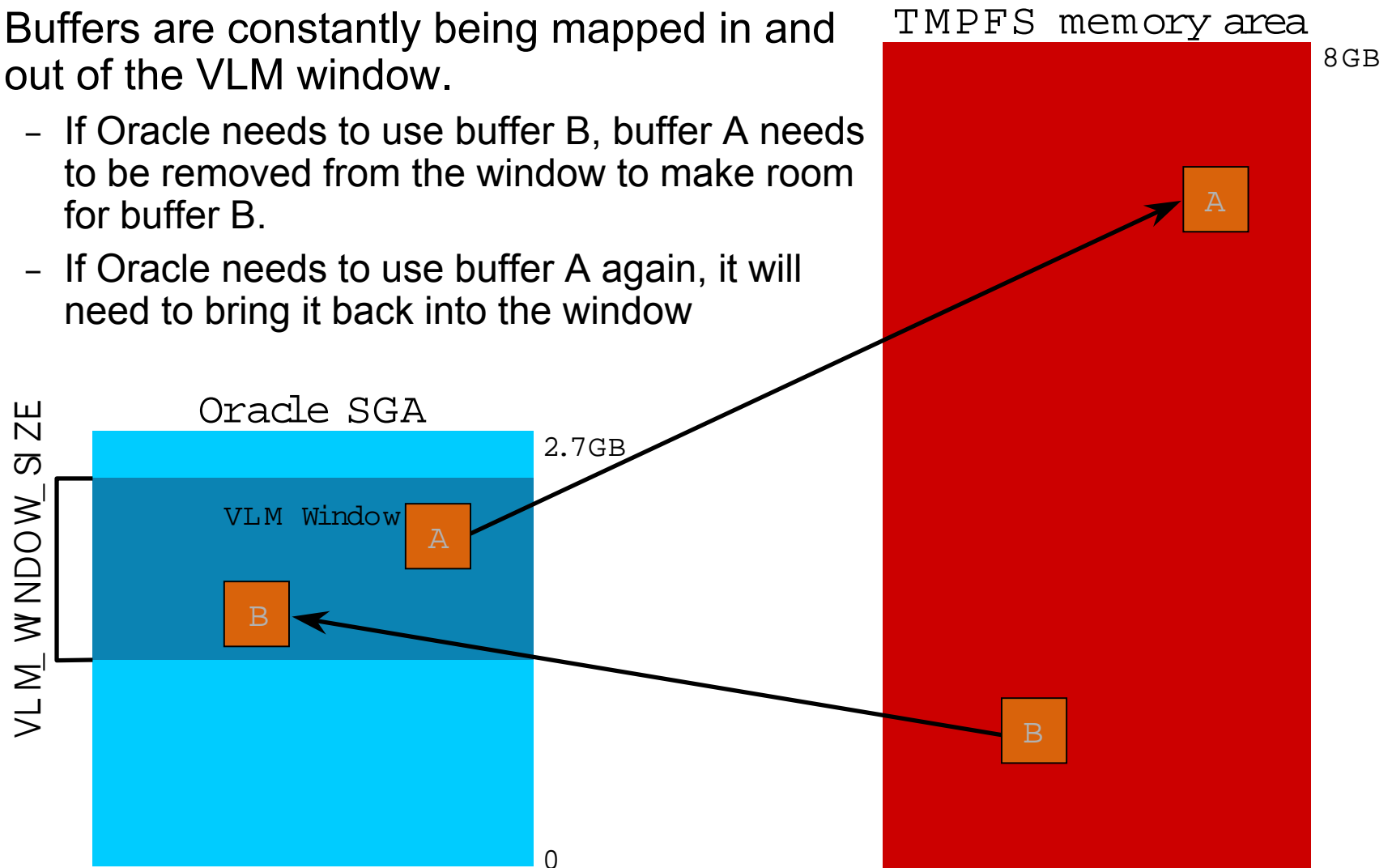


- For SGA sizes >2.7 GB, Oracle needs to allocate parts of the SGA through a memory mapped file system called tmpfs.
 - Oracle designed their Linux VLM implementation using existing kernel capabilities. This approach avoids having to load additional drivers into the kernel.
 - The init.ora parameter “use_indirect_data_buffers” determines whether Oracle will allocate memory through tmpfs. Set to true to enable the use of tmpfs.
 - use_indirect_data_buffers=true
- Only database buffers may reside in the tmpfs memory area. All other parts of the Oracle SGA must still reside in regular Oracle shared memory.

Advanced server features

3.3.2 - IA-32: Oracle VLM using tmpfs

- Buffers are constantly being mapped in and out of the VLM window.
 - If Oracle needs to use buffer B, buffer A needs to be removed from the window to make room for buffer B.
 - If Oracle needs to use buffer A again, it will need to bring it back into the window



Advanced server features

3.4 - IA-32: large memory pages (bigpages)

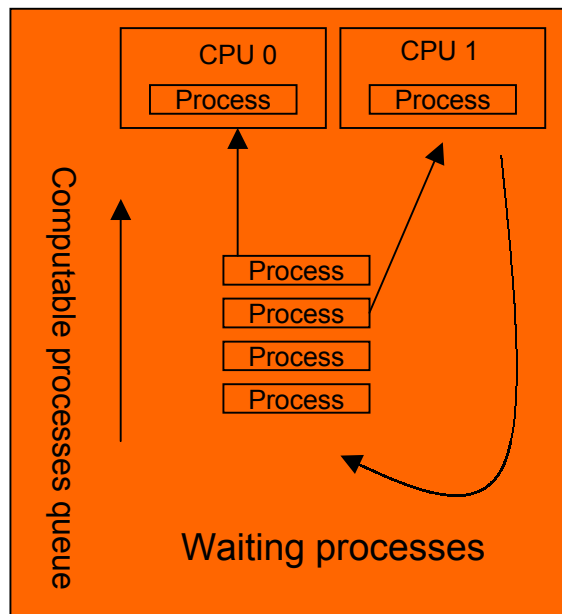


- A separate memory area is allocated using 2MB or 4MB memory pages rather than the normal 4k.
- More efficient use of the processors limited memory map resources (TLB cache)
- Increased hit rates in the TLB cache cause less processor stalling and make the processors run more efficiently, especially in large memory configurations.
- This separate bigpage memory area is locked in memory and not swapped out.

Advanced server features

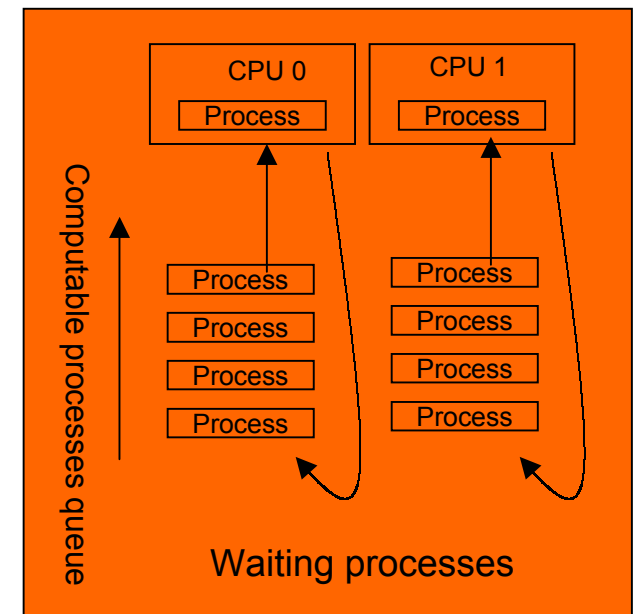
3.5 - Scheduler Enhancement

Replace the single scheduler compute queue with a per-CPU scheduling queue.



Before

After



- Asynchronous I/O
 - Permits apps to continue processing after issuing I/Os
 - Prevents apps stalls
 - Enables much higher I/O throughput.
- Memory Improvements
 - Bounce buffer elimination
 - Up to 64 Gb RAM
- SCSI Adapter Spinlocks
 - Lock on SCSI HBA only activate when I/O request is processing
 - Enables multi-threaded I/O operations in SMP systems.
 - Support initially provided for Adaptec and Qlogic HBAs.



About Linux Support

Remember...

... Oracle now provides direct P1 (critical nature) support of the Linux operating system (RedHat AS and United Linux) included as part of the customer's Oracle support contract. No additional fee.



Why choose Linux with hp for Oracle 9iRAC ?

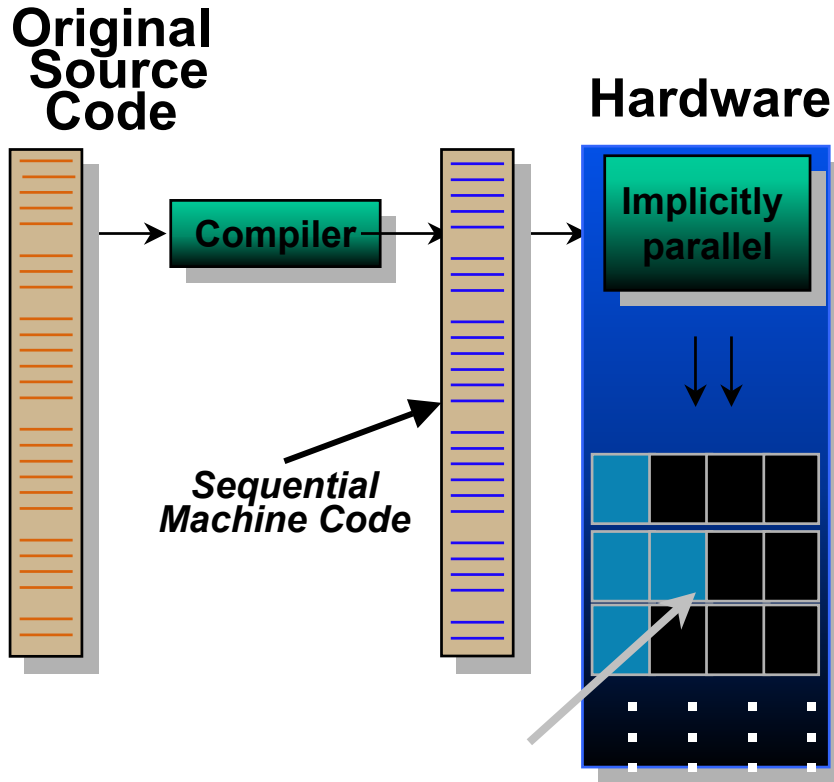
- Because Linux is in the heart of the Oracle strategy
- Because hp and Oracle are strong partners
- Because of the market evolution
- Because of the performance and the price
- Because of the technology improvements
- Because of the future/the present
- Because of the hp commitment on Linux
- Because hp helps you to implement Oracle on Linux
- Because of the already satisfied customers



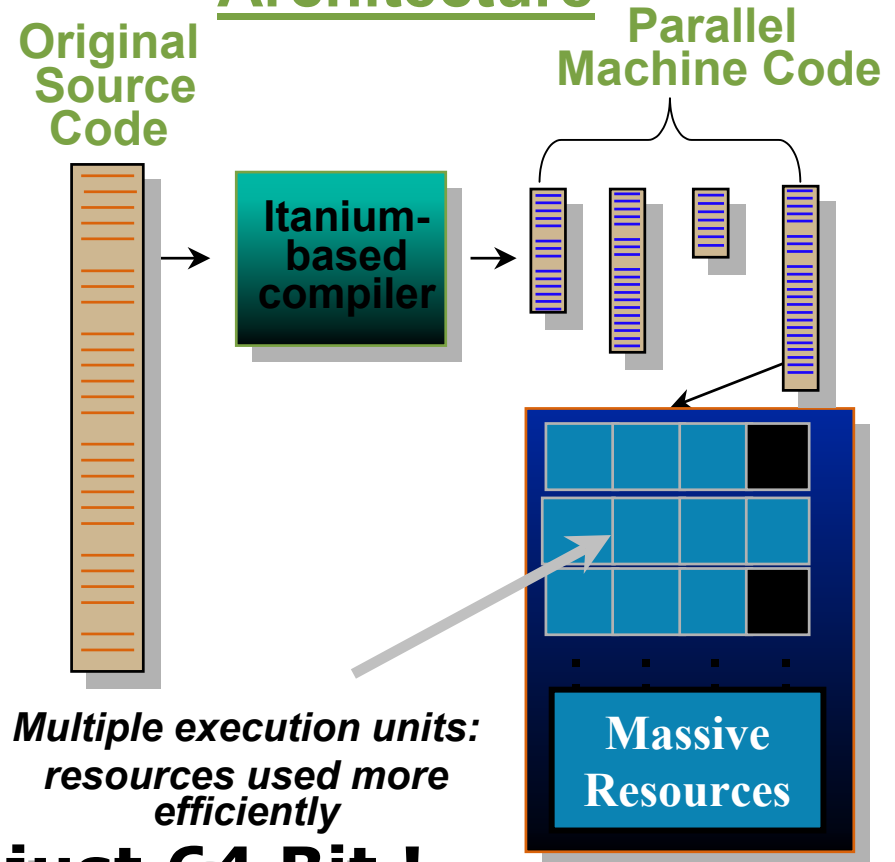
Intel® Itanium®2 Processor Architecture

Performance through (Explicit) Parallelism

Traditional



Itanium™ System Architecture



Much more than just 64 Bit !

Intel Itanium 2-based systems address the growing customer application demand to run applications

faster than IA-32 and more cost effectively than RISC through more than just 64-bits and fast floating point

	typical IA-32 system	typical RISC system	Itanium 2-based hp system	benefits:
system bandwidth	1–3 GB/s	2–4 GB/s	6.4 GB/s	→ faster OLTP
I/O bandwidth	1 GB/s	2–GB/s	4 GB/s	→ quicker Web serving
on-chip resources	8 general registers	32 general registers	128 general registers	→ faster secure transactions
parallel execution	1 instruction per cycle	2–4 instructions per cycle	6 instructions per cycle	→ better Java object code performance

rationale behind the Intel® Itanium® architecture



- Leader in RISC and UNIX systems
- Advanced PA-RISC designs and compilers



- Creator of the world's most pervasive computing technology
- Leadership in high volume semi-conductor process

- Breakthrough performance
 - Next generation beyond RISC
 - Advanced compiler technology
- Tens of thousands of applications
 - Fully binary compatible with Intel x86 and PA-RISC
 - Supports applications for the next century
- Enterprise Systems
 - Handhelds to supercomputers
 - Extensive middleware

Integrity Server the benefits for Oracle users

HP-UX 11i



Linux



OpenVMS™

- open/non-proprietary
 - no vendor lock-in
- multi-operating support in 1 box
 - easier to support
 - easier to re-deploy
- higher performance
 - lower cost of ownership
- available now
 - better return on investment
 - OpenVMS will come on Itanium

Oracle DB on Itanium2 – status

■ HP-UX

- Developer release Oracle8i R2 available since Feb 2001
- Developer release Oracle9i R1 available since Feb 2002
- Oracle 9i R2 production released for HP-UX
February 2003

■ Linux - RedHat Advanced Server 2.1

- Second developer release available since mid Jan 2003
- Oracle 9i R2 production released for Linux
March 2003

■ Windows 2003 (64bit)

- Oracle 9i R2 developer release available since Oct 2002
- Oracle 9i R2 production April 28th 2003

Migration to Oracle 9i on Itanium®2 Processor



- Migration from HP PA-RISC (check the release notes)
 - no export and import required
- Migrating from a 32-Bit System Linux
 - no export and import required
- Migrating from a 32-Bit System Windows
 - no export and import required
- Migrating from a Proprietary RISC Based System
 - export – import

How to migrate Oracle DB from Linux IA-32 to Itanium®2 on Linux



- Only migrations from Oracle 9.2.0.2 on Linux IA-32 will be supported. Pre Oracle 9i versions have to be migrated before to Oracle 9i.
- Simple migration steps:
 - Shutdown database
 - Install new binaries on Itanium server
 - Copy your existing configuration files to the new ORACLE_HOME
 - Copy database files from IA-32 server to the Itanium2 server or plug your external storage on the new Itanium server
 - Re-create control file (a single SQL statement)
SQL> ALTER DATABASE BACKUP CONTROLFILE TO TRACE;
 - Startup database on the Itanium2 server
 - Re-compile existing PL/SQL and change the word size
SQL> @utlirp.sql;
 - Re-compile Java (a single SQL script)
SQL > create or replace java system;
 - Done!

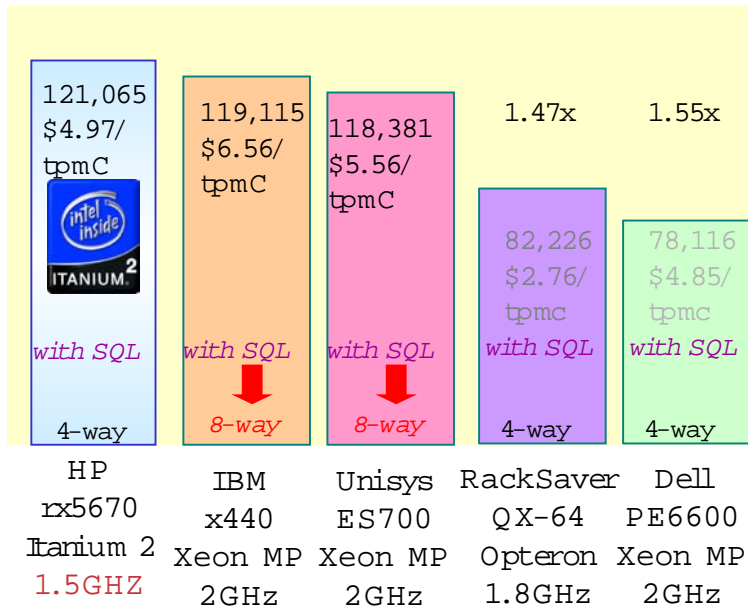
HP 4-way Itanium OLTP top performance with Linux and Windows



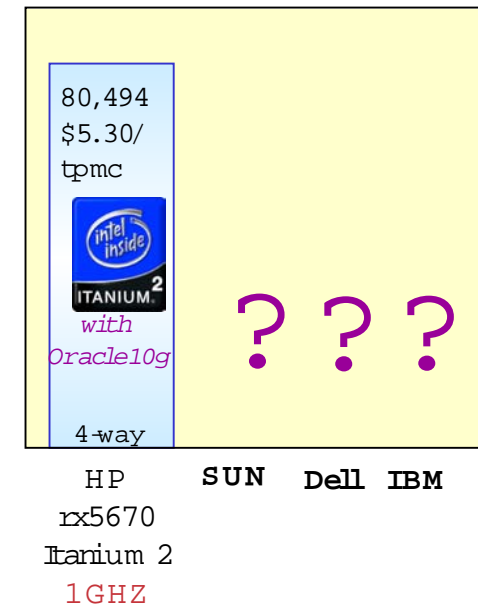
#1 4-way performance!

HP Server rx5670 with next generation Itanium 2 processors and 64-bit Windows tops all other 4-way and 8-way servers!

OLTP tpmC
with Windows



OLTP tpmC
with Linux



IBM withdrew their x440 4-way results

Tpm-C and \$/tpm-C results from April 2003
Intel and Itanium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

More cpu power and less Oracle license costs

- Oracle standard server edition 15.000 \$ per cpu
- Oracle enterprise edition 40.000 \$ per cpu

- Example : 4 cpu Itanium to 8 cpu competition
 - 4 cpu and Oracle enterprise edition 160.000 \$
 - 8 cpu and Oracle enterprise edition 320.000 \$
 - Makes **160.000 \$** advantage in pricing for Itanium2 !

 - Oracle license fee at <http://store.oracle.com>

Roadmap for Oracle on Itanium2

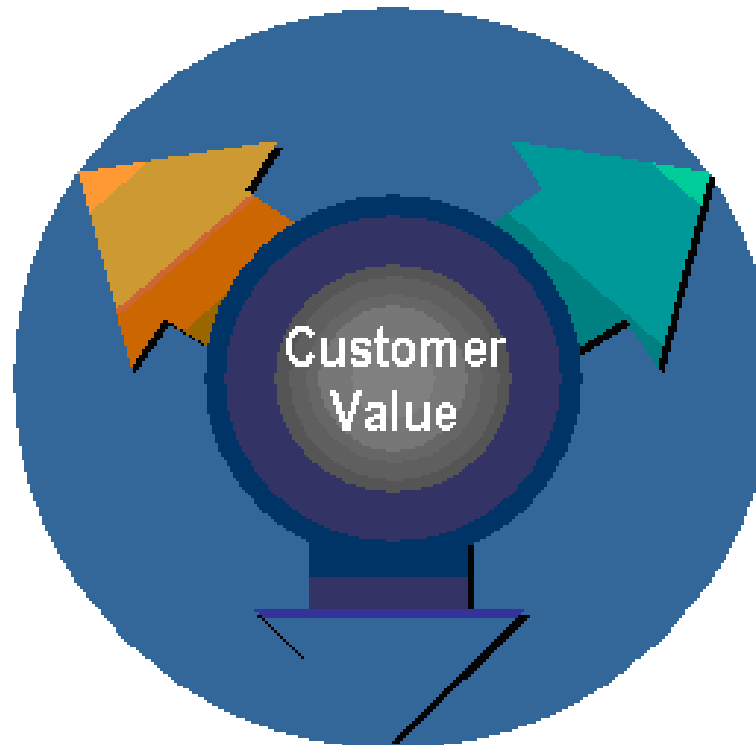


■ other previous Oracle releases	nothing planned
■ Oracle 9i R2	available
■ Oracle 10g	end 2003
■ Oracle iAS J2EE	available
■ Oracle iAS	tbd
■ Oracle E-Business Suite	
– As split configuration	available
– Pure Itanium2	tbd
■ Oracle Collaboration Suite	tbd
■ Oracle Developer Suite	tbd
■ Clustered file system	
– Linux	in 2003
– Windows	in 2003
■ Oracle 9i/9i RAC and HP DataProtector certification	Q2/2003
■ HMP support on Hyperfabric as interconnect for HP-UX RAC	later 2003 as patch

Business Impact of Database Consolidation

Operational Costs/Savings

- Hardware, software, and network
- Staff utilization
- Server utilization
- Storage utilization
- Asset management



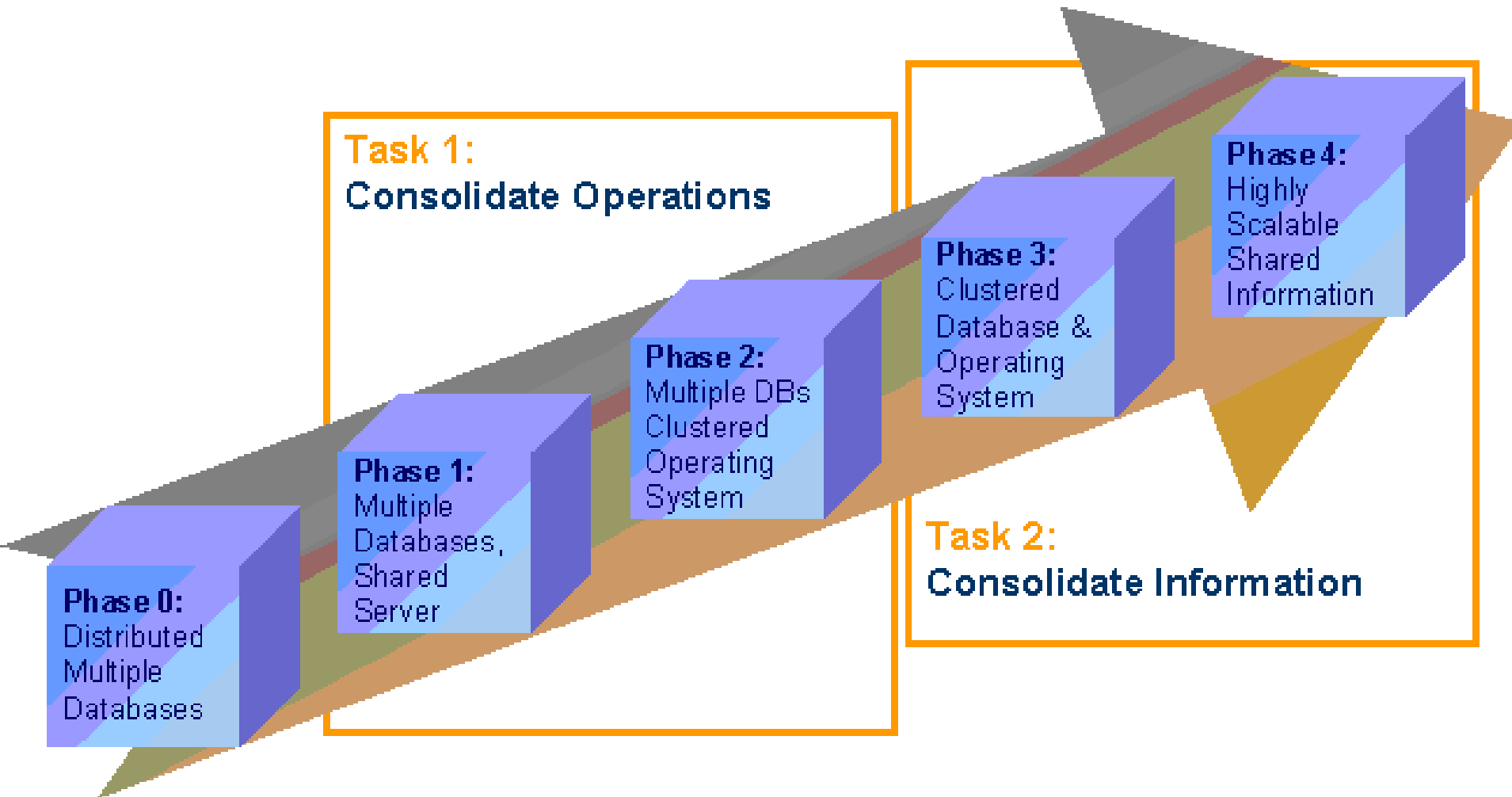
Levels of Service

- Availability
- Number of customers
- Number of users
- Application value
- Impact of downtime
- Performance

Business Flexibility Time-to-Market

- | | |
|------------------------------|-------------------|
| • Application deployment | • Cycle time |
| • Rate of application change | • Revenue impacts |
| • Application value | • Responsiveness |
| • Speed of data access | |

The Database Consolidation Journey



Why choose Linux with hp for Oracle 9iRAC ?

- Because Linux is in the heart of the Oracle strategy
- Because hp and Oracle are strong partners
- Because of the market evolution
- Because of the performance and the price
- Because of the technology improvements
- Because of the future/the present
- Because of the hp commitment on Linux
- Because hp helps you to implement Oracle on Linux
- Because of the already satisfied customers



Consulting skill

- HP trains its consulting team, Oracle people and partners to 9iRAC and Linux
- Training covering :
 - Hardware setup
 - Linux Installation and setting
 - Oracle 9.2 RAC installation
 - Database creation
 - OEM installation
 - Linux tuning
- 200 trained people in 1 year in the EMEA .



OpenSSI project

- Single System Image for Linux
- Based on the NonStop cluster technology
- Gift from HP to the Linux Community
- Strongly supported and sponsored by HP
- Best Open Source Project 2002 by “LinuxWorld”
- The OpenSSI code is released under the GNU General Public Licence
- Release 0.9.9 available for RedHat 8.0 or kernel 2.4.18



OpenSSI project : Current Status



- **Most components functional in a 2.4.18 system (release 0.9.9):**
 - shared root using GFS or CFS; single init with failover; clusterwide processes with failure handling; remote exec, rfork and process migration with file reopen; clusterwide device access; clusterwide ptys, pipes, fifos and sockets; clusterwide /proc; membership and inter-node communication; clusterwide message queues; nodedown handling and failover; application monitoring and restart; integration with DLM, LVS; Mosix load level algorithm adapted; works with UML; works with Lustre; works on Alpha processor; works on blades; works on IA-64 and Itanium 2; clusterwide device naming and access; shared memory and semaphores; HA-CFS; CFS file record locking
 - release available via opensource.hp.com with all those components (2.4.18 based source and RH8.0 based binary)
- **Ongoing:**
 - NFS client; NFS server; Lustre as a root filesystem

Open source projects

- Oracle is publishing in open source libraries and toolkits.
 - The code is published in OTN's Community Code under the GNU General Public License (GPL).
 - Cluster support features include fireware patches, NIC failover, watchdog driver patches and I/O fence.
 - Developer features include libaio, userfs with GnomeVFS ...
- HP is hosting a number of Open Source software projects that run on various HP systems. These projects are hosted using SourceForge, the online Open Source repository.

<http://www.opensource.hp.com/>



Why choose Linux with hp for Oracle 9iRAC ?

- Because Linux is in the heart of the Oracle strategy
- Because hp and Oracle are strong partners
- Because of the market evolution
- Because of the performance and the price
- Because of the technology improvements
- Because of the future/the present
- Because of the hp commitment on Linux
- Because hp helps you to implement Oracle on Linux
- Because of the already satisfied customers



What are the ProLiant Parallel Database Clusters for Oracle® 9i?

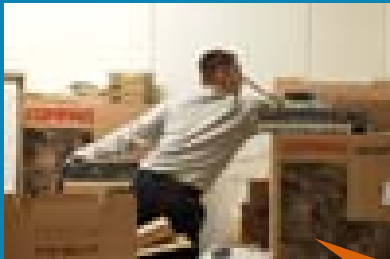


- RAC optimized HP hardware and software platforms
- Stress tested and 'real-world' proven
- Deployment options from 'do-it-yourself' to completely 'pre-installed' and ready to run
- Detailed documentation and installation tools
- Single contact support by dedicated RAC specialists
- Continuous improvement roadmap
- Available today on Windows 2000® and Linux for Intel servers up to 8 CPUs per node

PDC implementation options

Parallel Database Clusters

'do-it-yourself' PDC cluster kit options



- range of supported server configurations: 2, 4, and 8 way
- 2 to 6 nodes supported
- MSA1000 or EVA storage in full SAN configurations
- available on Windows and Linux
- available direct from HP or through HP resellers

New

'pre-installed' PDC ready to run solutions



- MSA1000 based solutions
- HP installation options
 - hw rack and cable only
 - OS & Oracle RAC loaded
 - at factory or on-site
- Windows or Linux



custom solutions from HP global service



- for other RAC options and solutions contact HP service
- ProLiant with EMC RAC
 - PDC with PolyServe
 - etc.



'do-it-yourself' PDC Cluster Kits for Windows or Linux

New

- The PDC Administrator Guide includes:
 - detailed installation instructions,
 - cluster expansion, nodes and storage
 - PDC customization for end user database

New

- The PDC Installation Test Tool automates verification of:

- inter-cluster communication
- storage view consistency
- hardware and software version comparison
- Oracle services and environment variable validation

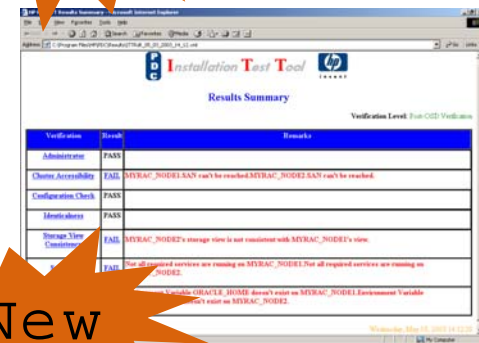
New

- The PDC scripted install software (for Linux only) automates:

- OS installation and configuration
- Hardware configuration
- Oracle installation through sample database install

- 2 x Secure Path licenses

- Phone support from PDC Support Specialists



■ Linux Kit:

- Installation scripts eliminate human errors
 - Installs OS
 - Sets up shared memory parameters
 - Sets up NICs and HBAs
 - Sets up high availability features
 - Sets up shared storage
 - Sets up OCFS or raw devices
 - Verifies cluster connectivity
 - Installs Oracle 9i RAC
 - Installs Oracle patches
 - Database creation
 - Validation of functional cluster
- Kit owners entitled to PDC Support escalation

■ Windows Kit:

- Detailed Administrator Guide includes add-a-node and add-storage processes
- Includes two Secure Path licenses
- Includes PDC Installation Test Tool that validates:
 - key hardware and software versions and compatibility
 - OS configuration for networking etc
 - Oracle cluster configuration
 - consistent inter-cluster communication
 - common storage view across all nodes of the cluster
 - final cluster validation scripts ensure proper RAC functionality
- Kit owners entitled to PDC Support escalation

'pre-installed' PDC for Linux or Windows

- MSA1000 based solutions on Windows or Linux (not available in all areas)
- choose the level of integration right for you
 - factory direct hardware bundles
 - simplified configuration and ordering
 - all options installed, hardware racked and cabled
 - fully installed solutions thru HP integration partner
 - complete hardware installation and burn in
 - OS and Oracle RAC loaded and ready to run
 - on-site custom integration by HP Consulting and integration
 - customized hw sw and integration services plus:
 - optional custom database configuration and tuning
 - optional RAC training
- backed by PDC Support specialists



- optional RAC solutions for customers with specific requirements beyond the PDC offerings
 - HP components backed by HP Support
 - Cooperative Support Agreement with Oracle
 - implemented by HP Consulting and Integration Services

- ProLiant with EMC
- PDC with PolyServe cluster file system
- ProLiant with United Linux
- etc.

- For more information see HP.com or e-mail RAC_Contact@HP.com

why Oracle® 9i RAC on ProLiant Parallel Database Clusters...



- only partner to certify every Oracle version since '97 reflects HP commitment to the technology
- advancing RAC with benchmarks and ISV testing
- consistently broadest server and storage options
- extensive documentation and custom installation tools
- solutions packaging for ease of purchase & deployment
- experienced field personnel and specialized services
- all-HP solutions mean tight integration and simplified support
- one call cluster support by dedicated PDC specialists
- continuous improvement roadmap ensures investment protection

Why choose Linux with hp for Oracle 9iRAC ?



- Because Linux is in the heart of the Oracle strategy
- Because hp and Oracle are strong partners
- Because of the market evolution
- Because of the performance and the price
- Because of the technology improvements
- Because of the future/the present
- Because of the hp commitment on Linux
- Because hp helps you to implement Oracle on Linux
- Because of the already satisfied customers

Success Stories

These customers chose
HP ProLiant Server Solutions
for Oracle
9i Database and Real Application Clusters



Useful URLs and contacts



HP HA homepage

<http://h18000.www1.hp.com/solutions/enterprise/highavailability/oracle/index.html>

Oracle certifications

See MetaLink – “certify”

<http://otn.oracle.com/support/metalink/content.html>

Oracle Apps Std Benchmark on Linux

http://www.oracle.com/apps_benchmark/html/index.html?results.html

HP Briefing Room – Storage

http://www.hpbriefingroom.com/north_america/storage/

Americas Oracle CC

CSPS_Americas@HP.com

HP/Oracle Competence Center

<http://www.hporaclecc.com/cug/index.html>

Contact : oraclecc@hp.com

Tech pubs at Oracle

<http://technet.oracle.com/doc/products.htm>

Oracle RH support

http://www.oracle.com/partnerships/how/redhat/index.html?redhat_support.html

Oracle on Linux FAQs

http://www.oracle.com/partnerships/how/redhat/linux_techsupp_faq.html



Questions & Answers



Interex, Encompass and HP bring you a powerful new HP World.

