Lower Your IT Costs: What is New in Oracle Database 11g

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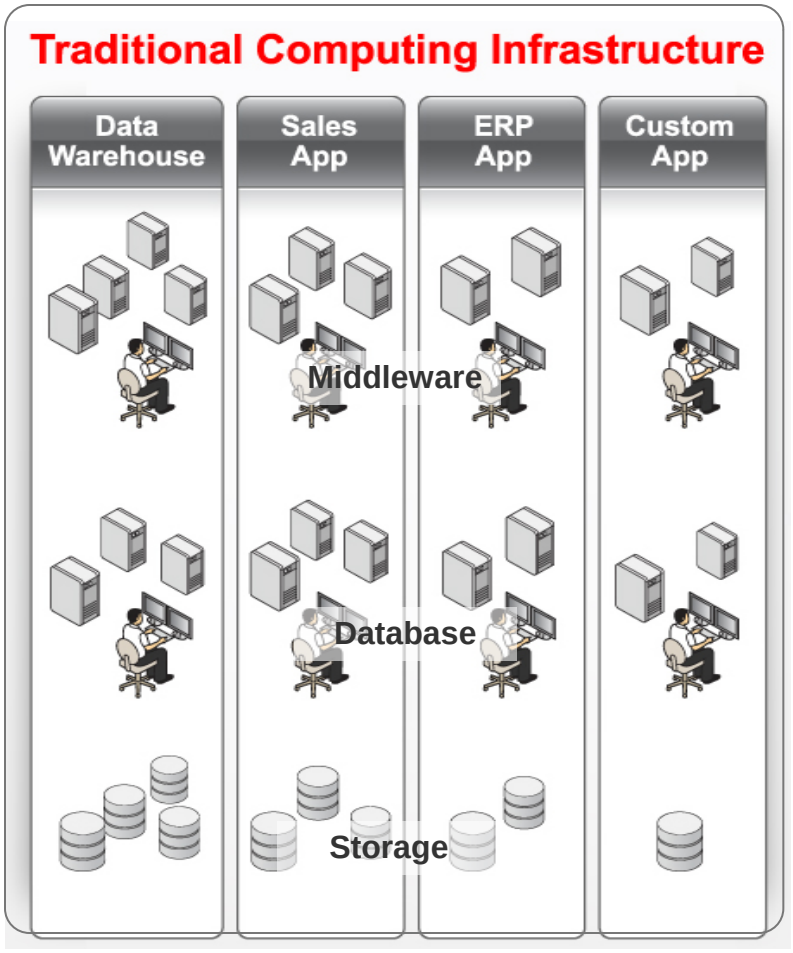
ORACLE

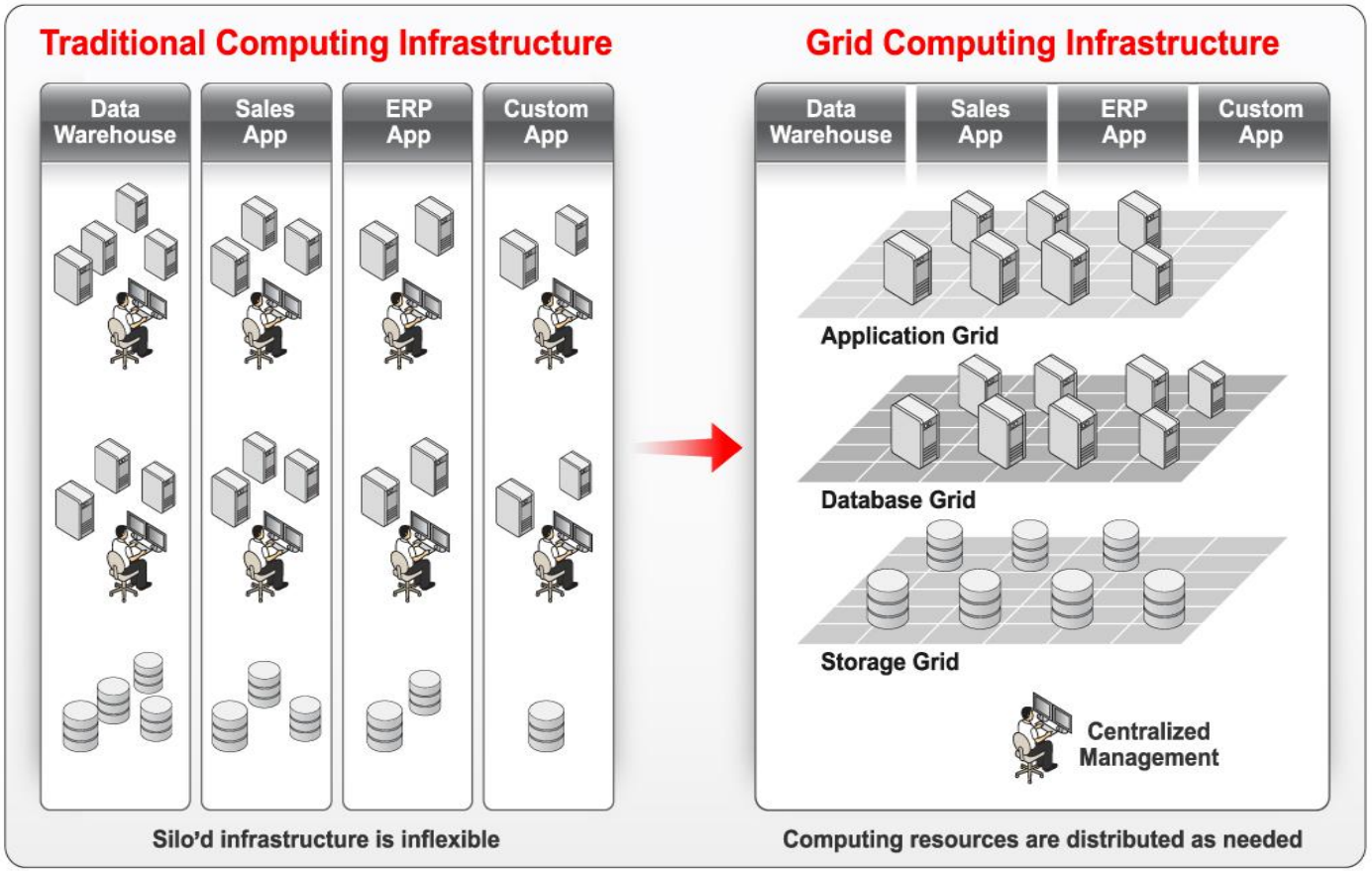
CURRENT COMPLEXITY



- DIFFICULT AND EXPENSIVE TO SCALE
- POOR UTILIZATION
- EXPENSIVE TO MANAGE
- RISKY TO CHANGE

THE SHARED INFRASTRUCTURE

Virtualizes and Pools IT Resources

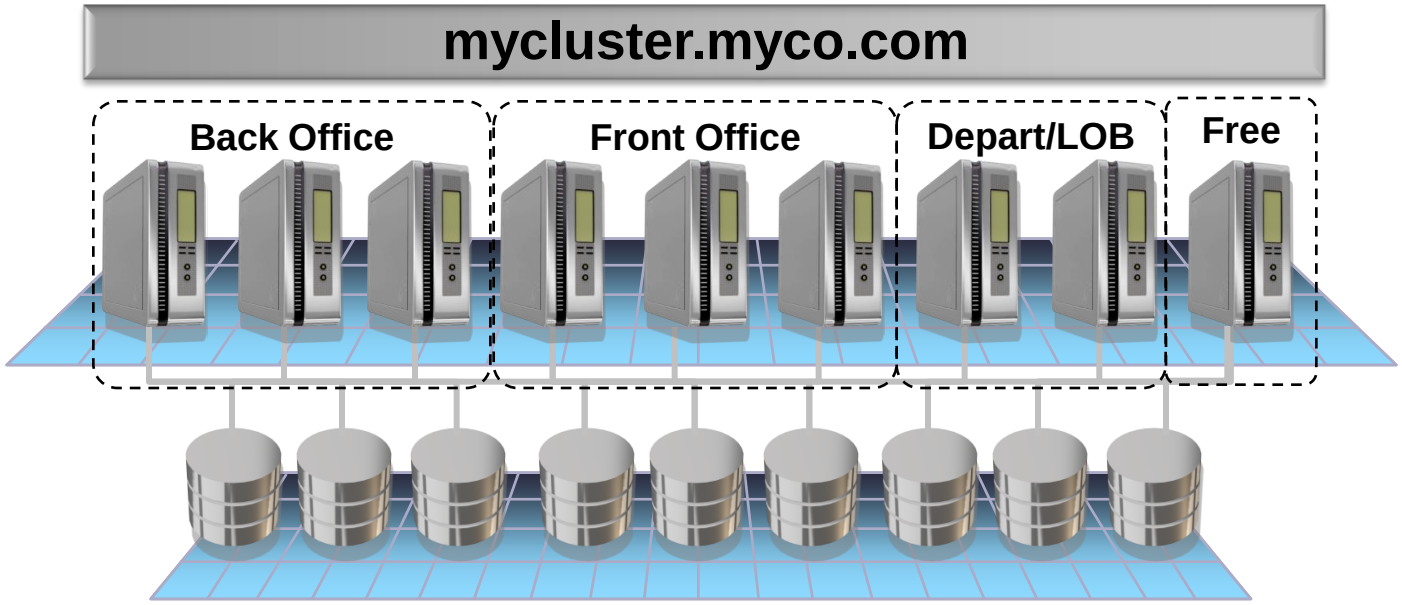


- Sized for peak load
- Difficult to Scale
- Expensive to Manage

- Pools of shared resources
- Re-distribute resources as needed
- Cost efficient

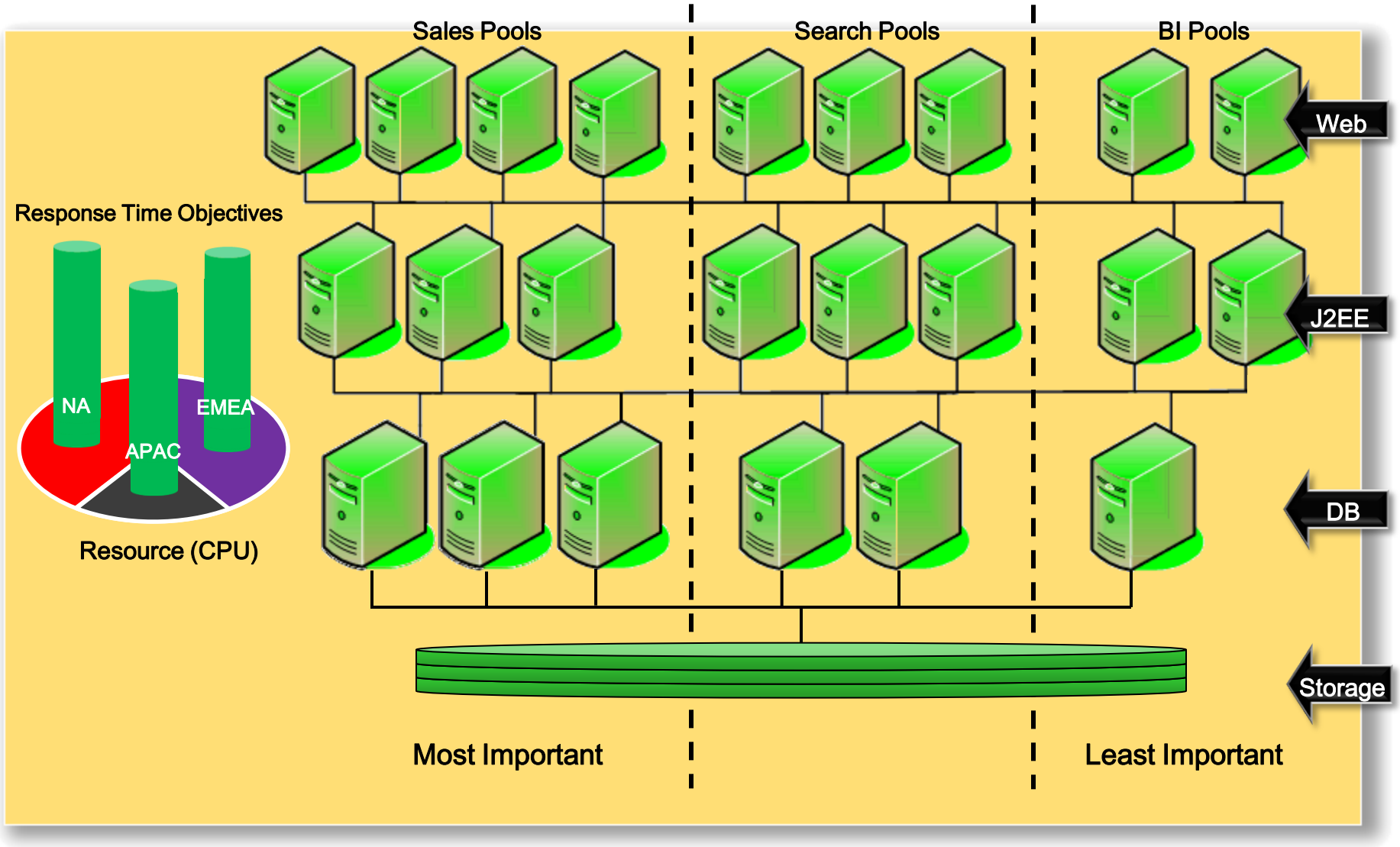
Oracle Database 11g Release 2

Simplified Grid Provisioning

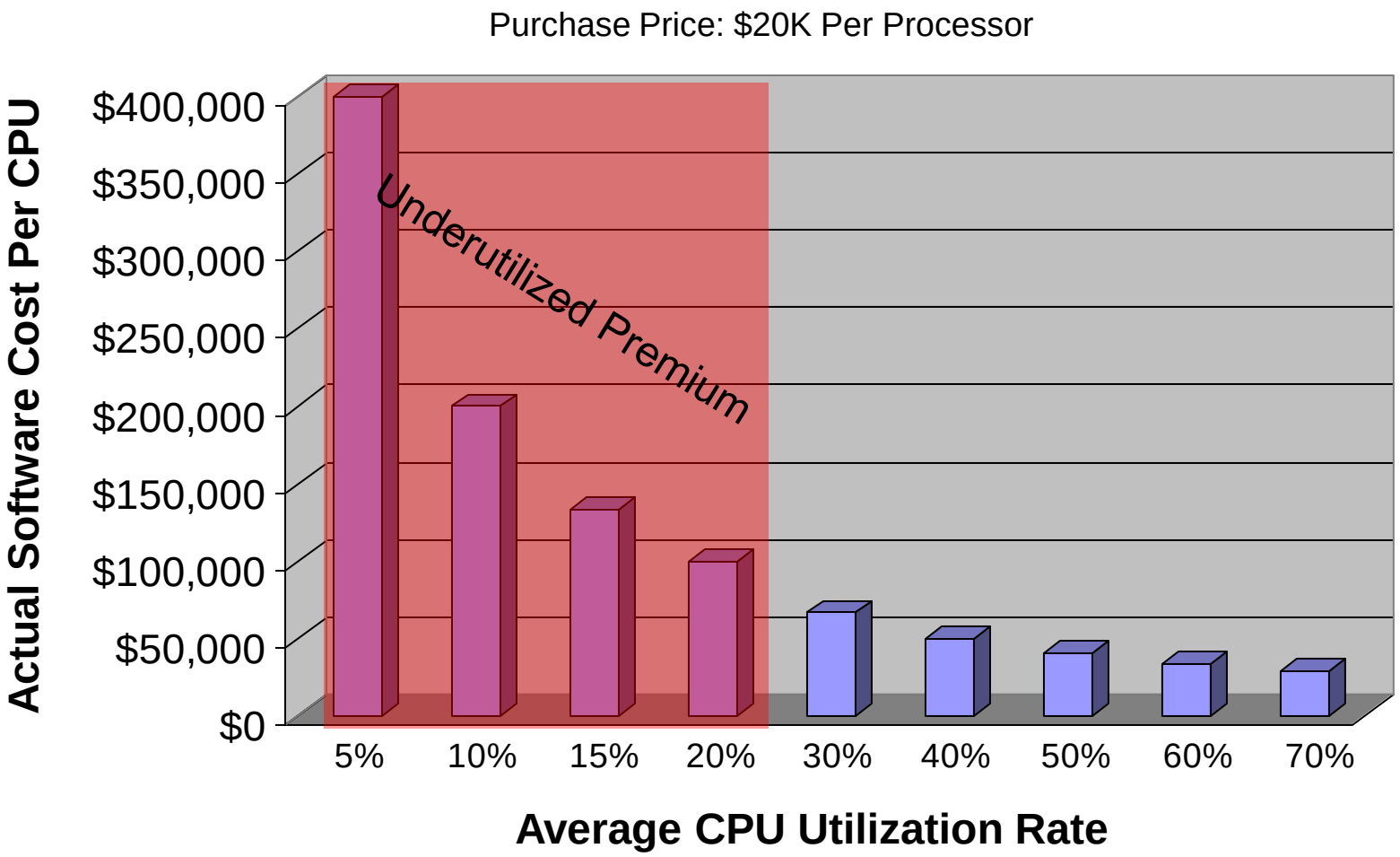


- New intelligent installer - 40% fewer steps to install RAC
- SCAN - Single cluster-wide alias for database connections
- Nodes can be easily repurposed

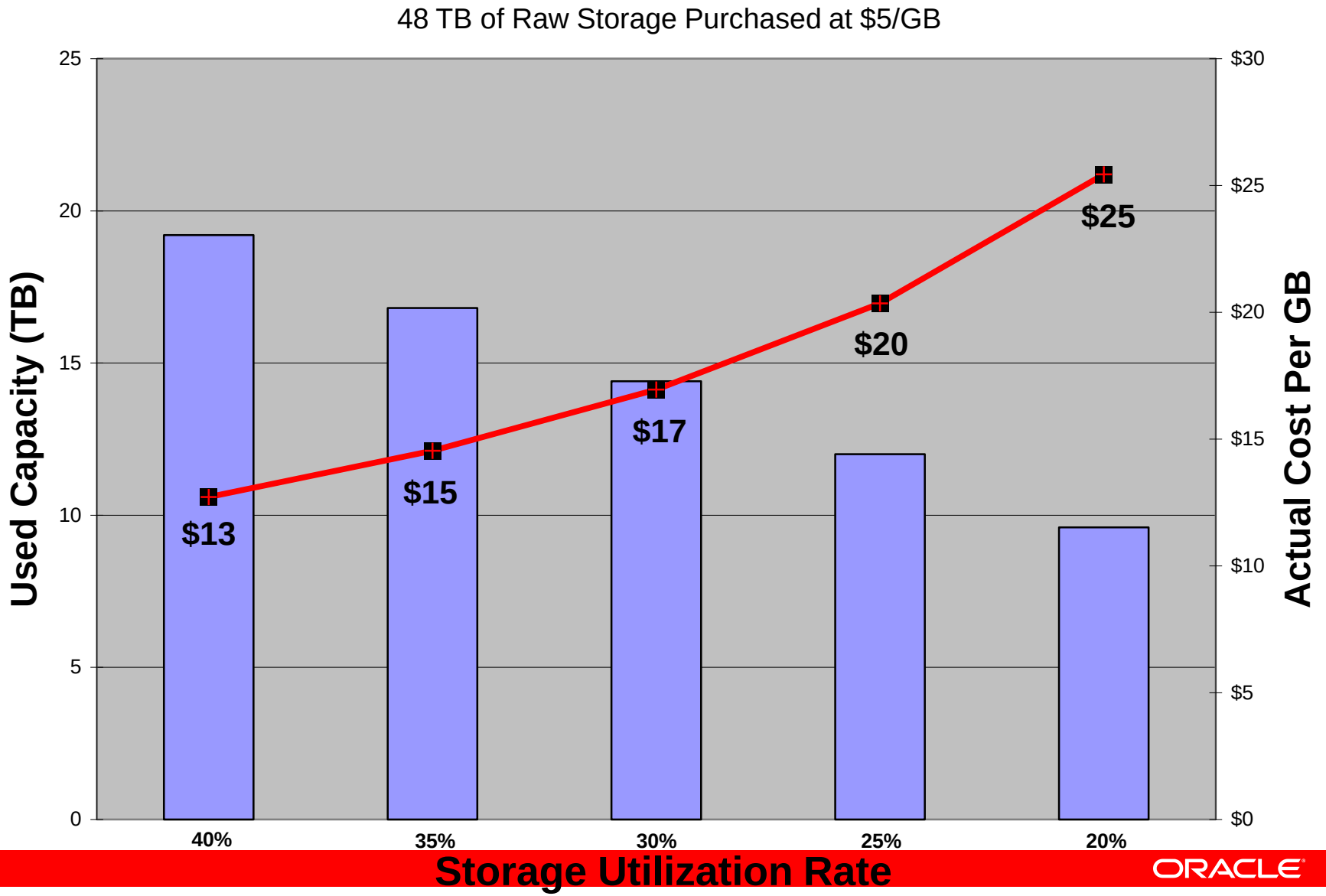
Grid Automated Quality of Service



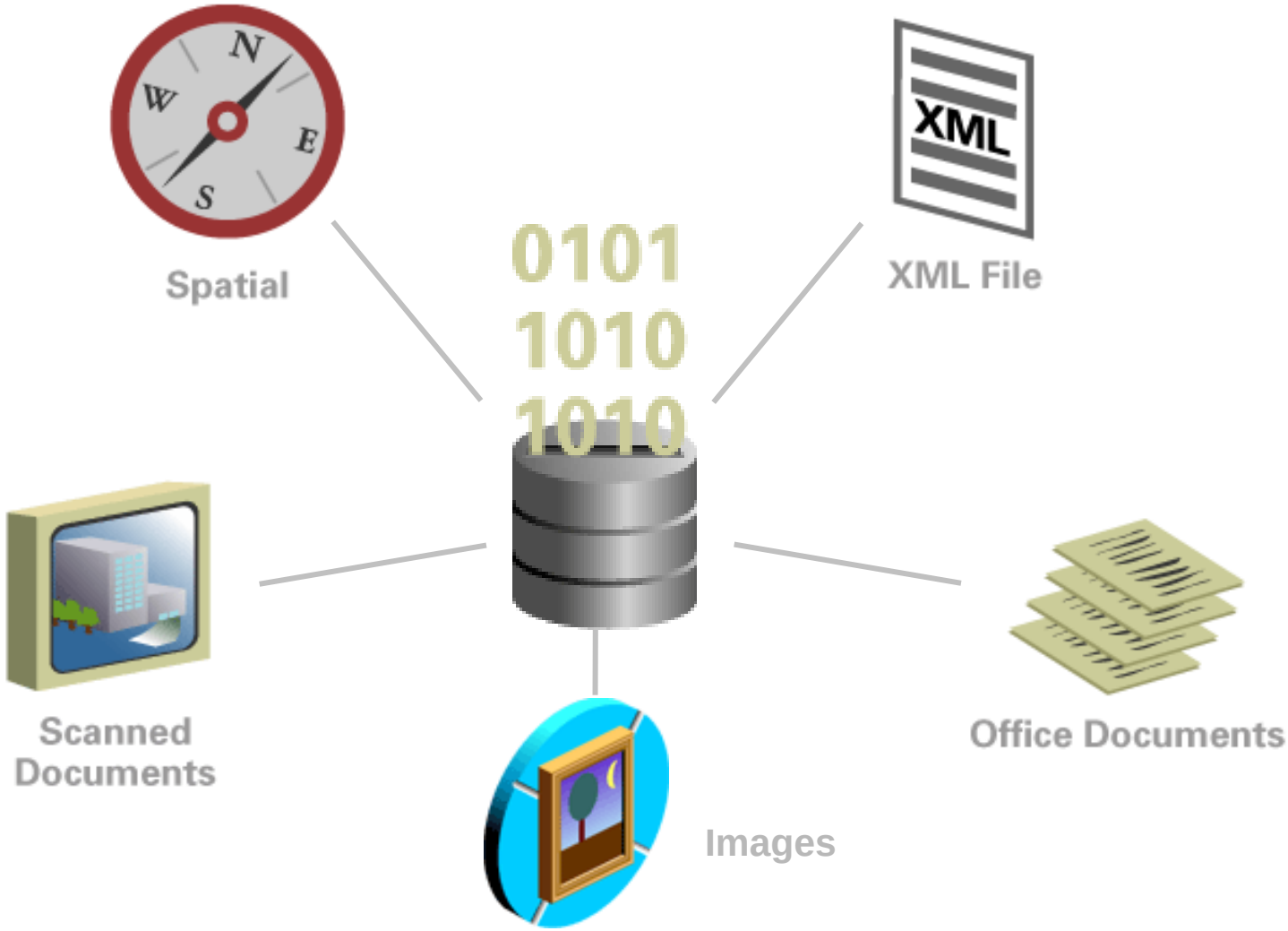
The Price of Underutilized Servers



The Price of Underutilized Storage



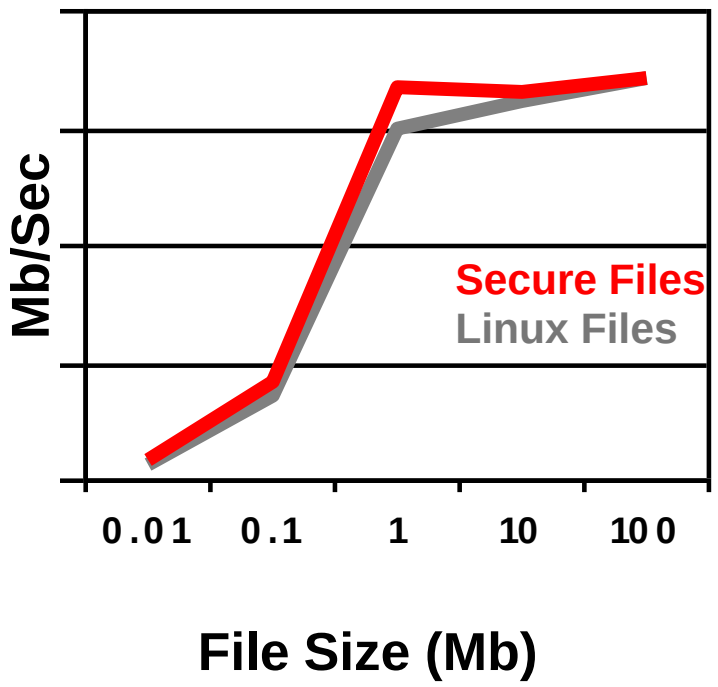
Consolidating All Your Data



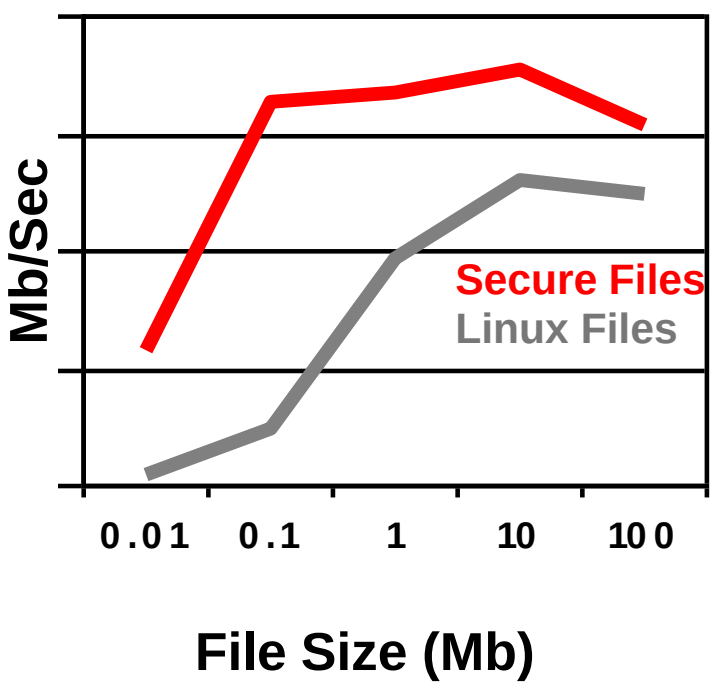
Oracle Secure Files

Consolidate Unstructured Data On the Grid

Read Performance

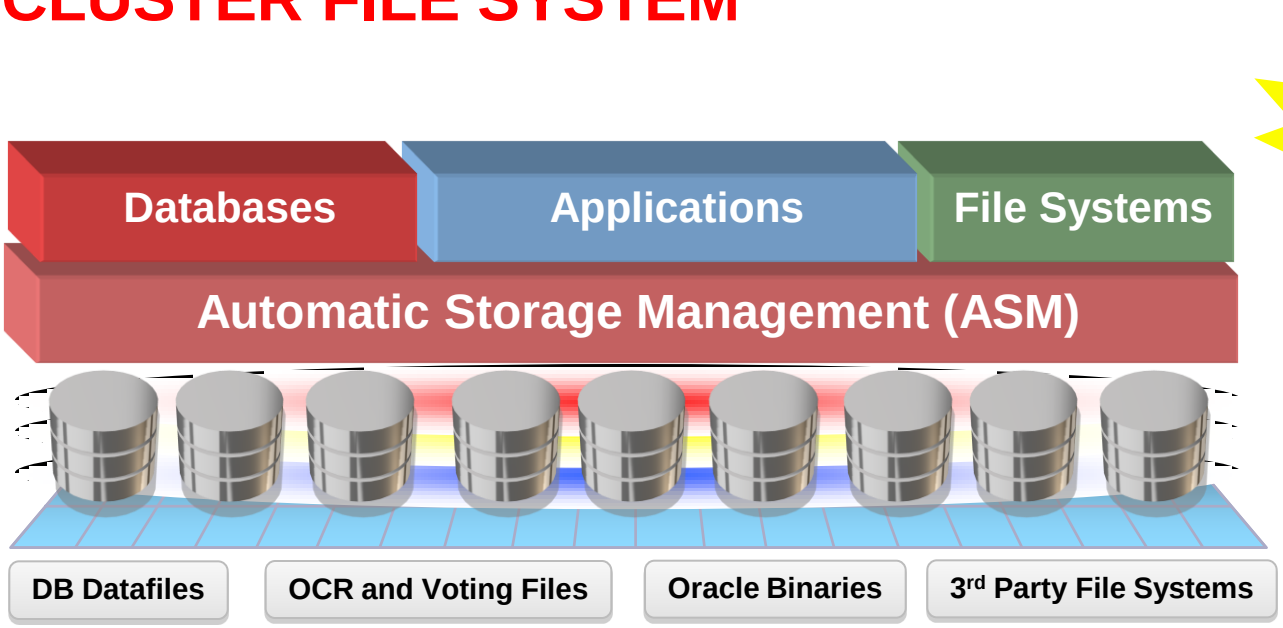


Write Performance



STORAGE CONSOLIDATION

ASM CLUSTER FILE SYSTEM



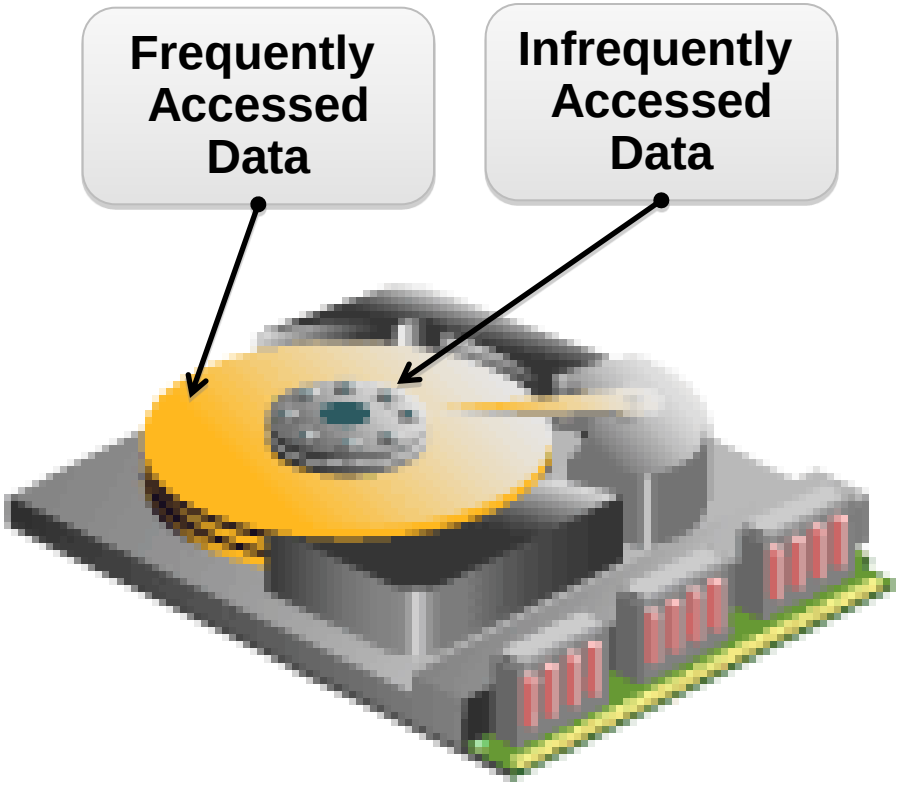
- ASM supports ALL data
  - Database files
  - File systems: ACFS, 3rd-party file systems
  - Shared Clusterware files: OCR and Voting disk now stored in ASM

STORAGE UTILIZATION

OPTIMAL DISK PLACEMENT

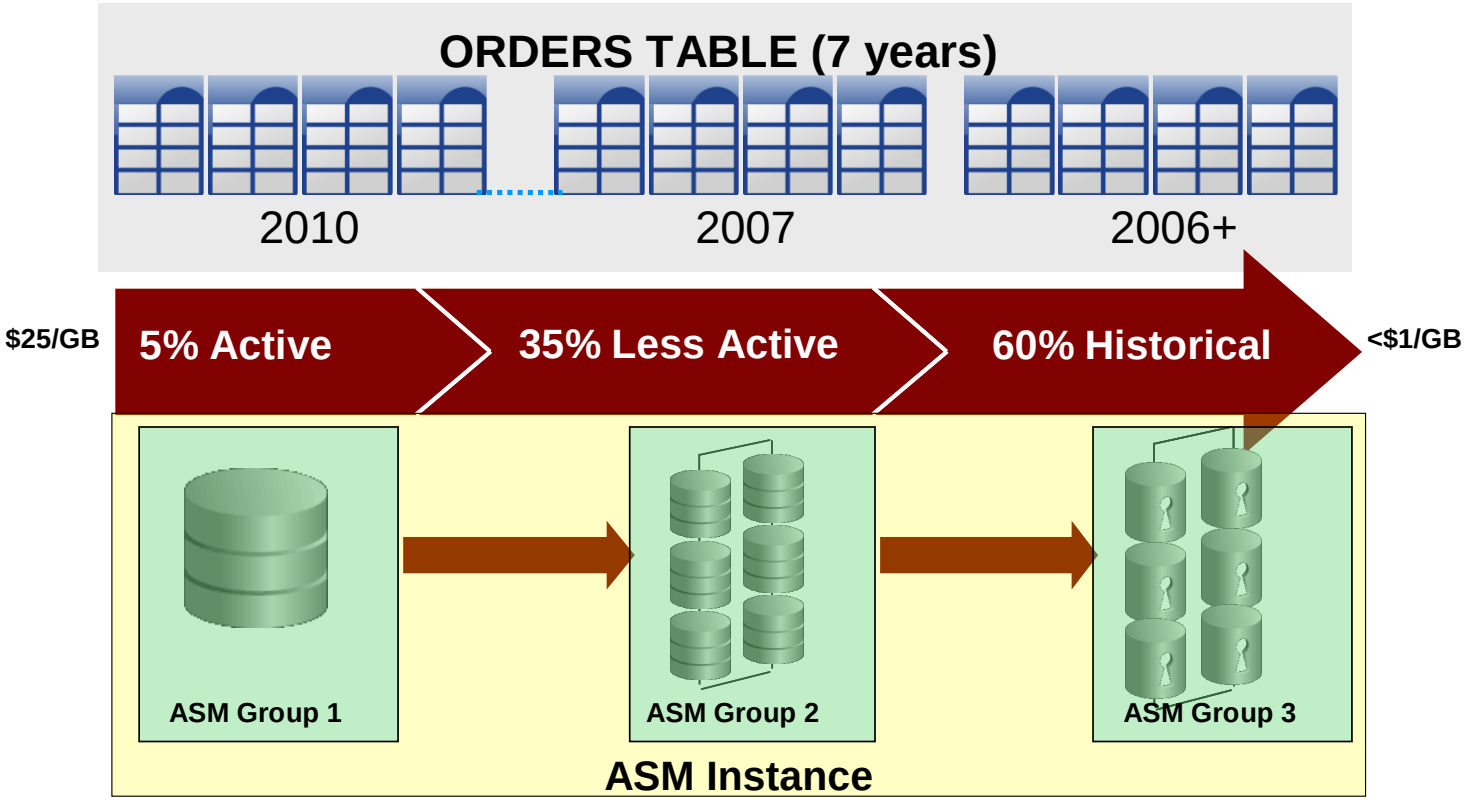
New with 11.2

- AUTOMATIC STORAGE MANAGEMENT
  - DESIGNATE DATA AS HOT or COLD



STORAGE UTILIZATION

ASM GROUPS: TIERED STORAGE



STORAGE UTILIZATION

ASM GROUPS: TIERED STORAGE

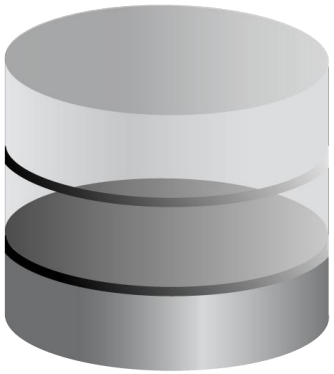
NON-TIERED STORAGE				TIERED STORAGE			
STORAGE TYPE	TOTAL CAPACITY GB	PRICE PER GB	TOTAL	STORAGE TYPE	TOTAL CAPACITY GB	PRICE PER GB	TOTAL
High-End	50,000	$25	1,250,000	High-End	2,500	$25	$62,500
				Mid-Tier	17,500	$7	$122,500
				JBOD	30,000	$1	30,000
Totals	**50,000**	**$25**	**1,250,000**		**50,000**	**$4.30**	**$215,000**

Tiered Approach is 83% Cheaper

Optimize I/O Performance

Advanced OLTP Compression

- Compress large application tables
  - Transaction processing, data warehousing
- Compress all data types
  - Structured and unstructured data types
- Improve query performance
  - Cascade storage savings throughout data center

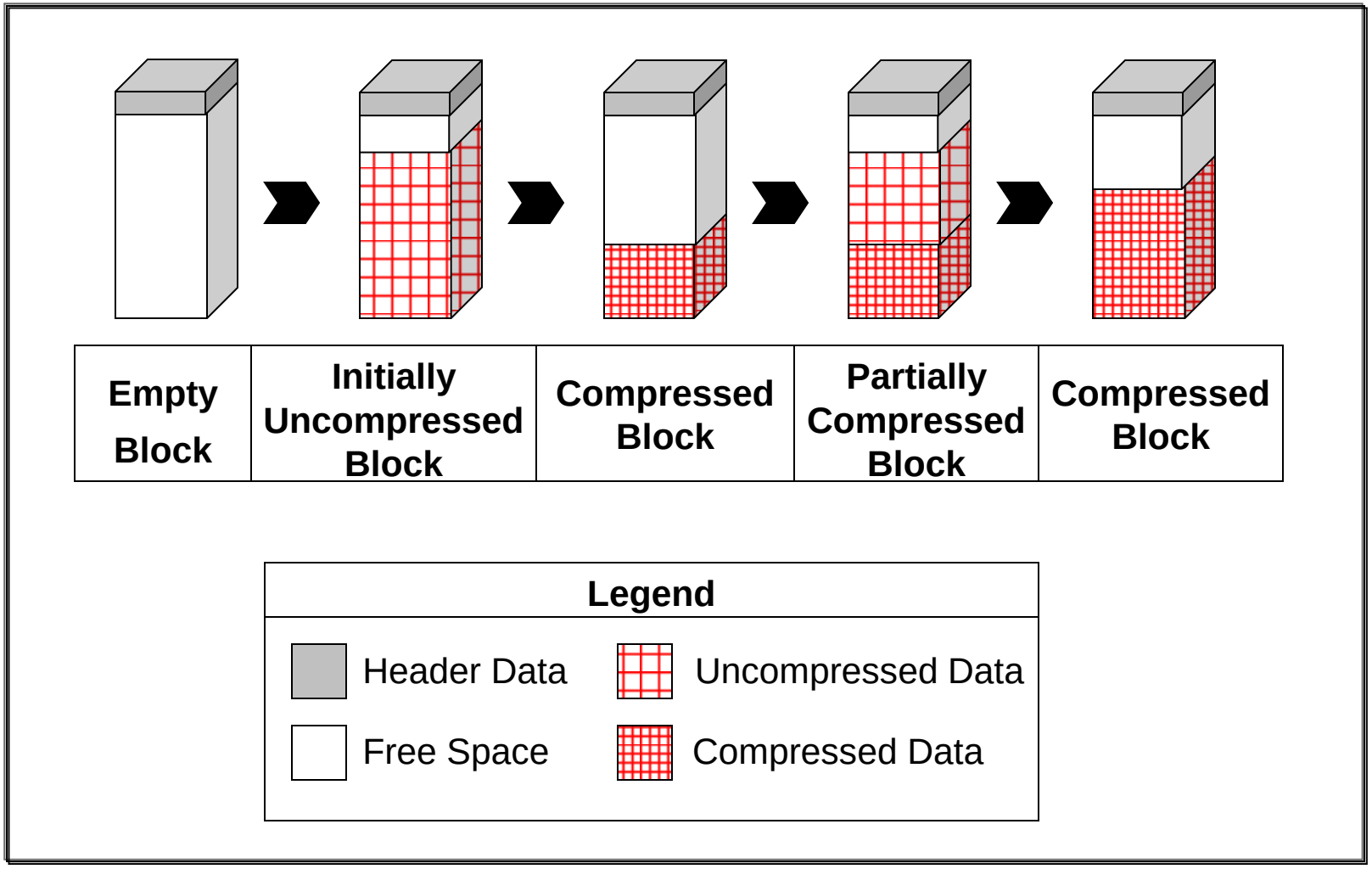


Up To

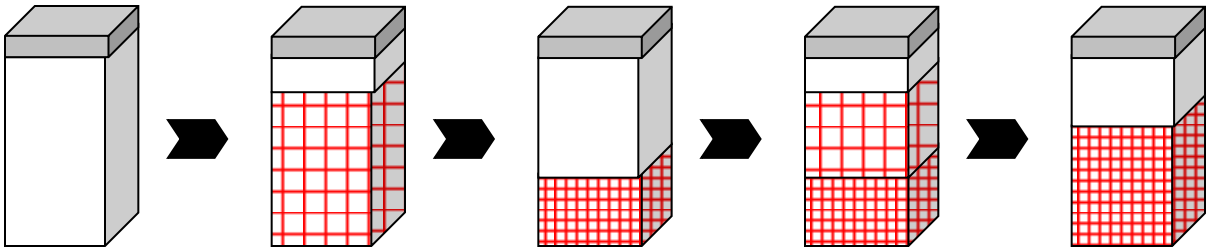
4X

Compression

OLTP Table Compression Process



Block-Level *Batch* Compression



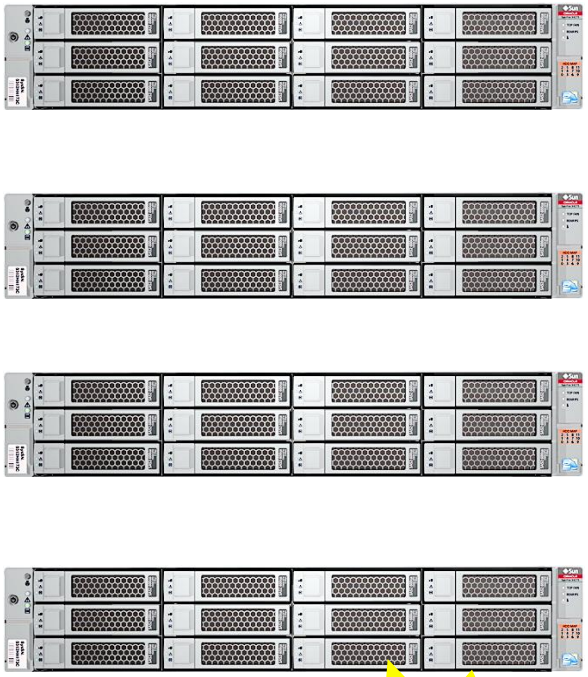
- Patent pending algorithm minimizes performance overhead and maximizes compression
- Individual INSERT and UPDATEs do not cause recompression
- Compression cost is amortized over several DML operations
- Block-level (Local) compression keeps up with frequent data changes in OLTP environments
  - Others use static, fixed size dictionary table thereby compromising compression benefits
- Extends industry standard compression algorithm to databases
  - Compression utilities such as GZIP and BZ2 use similar adaptive, block level compression

Exadata Smart Storage

Breaks Data Bandwidth and Random I/O Bottleneck

- Oracle addresses data bandwidth bottleneck 4 ways
  - Massively parallel storage grid of high performance Exadata storage servers (cells).
    - Data bandwidth scales with data volume
  - Data intensive processing runs in Exadata storage.
    - Queries run in storage as data streams from disk, offloading database server CPUs
  - Exadata Smart Flash Cache Increase random I/Os by factor of 20X
  - Columnar compression reduces data volume up to 10x
    - Exadata Hybrid Columnar Compression provides 10x lower cost, 10x higher performance

Exadata Storage Cells



New in 11.2

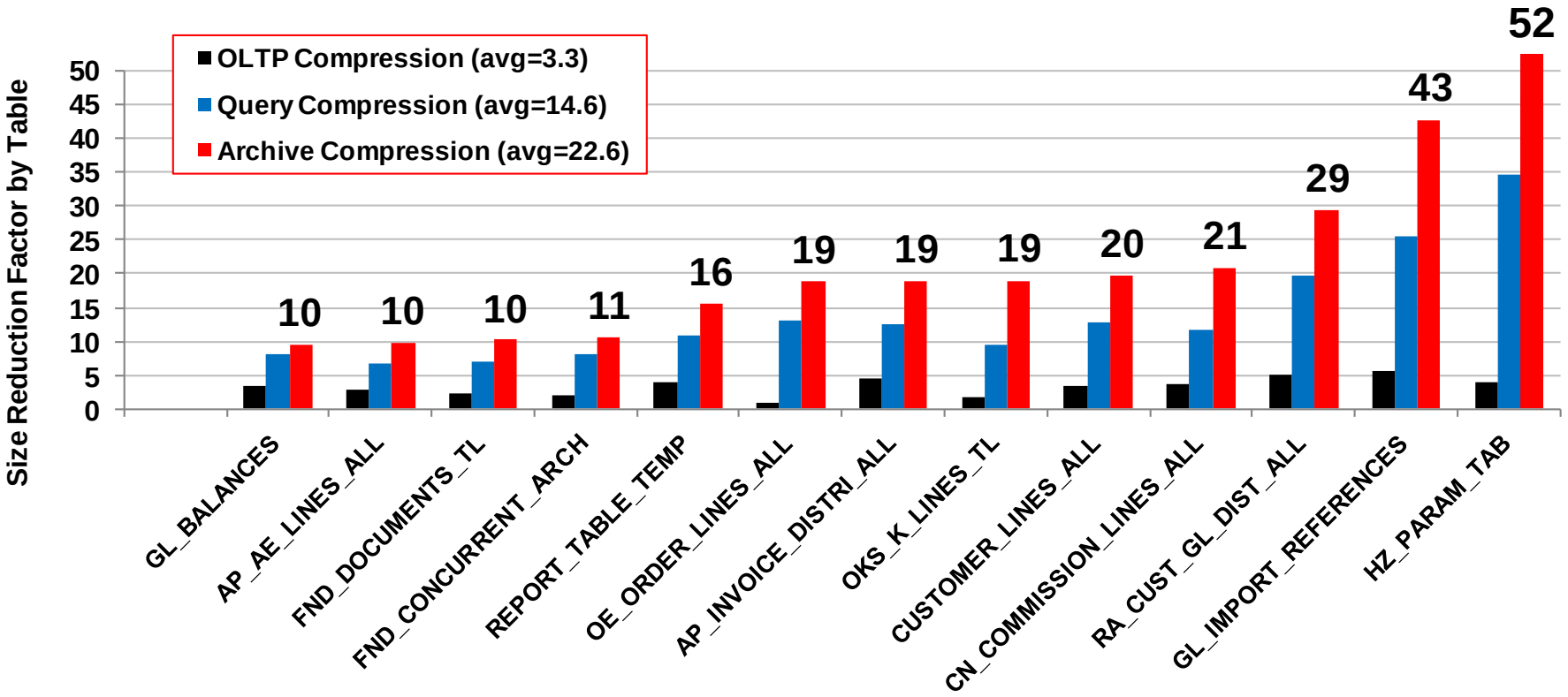
Oracle Exadata Storage Server

Hybrid Columnar Compression

- Data stored by column and then compressed
- Useful for data that is bulk loaded or moved
- **Query mode** for data warehousing
  - Typical 10X compression ratios
  - Scans improve accordingly
- **Archival mode** for old data
  - Typical 15X up to 50X compression ratios

Real-World Compression Ratios

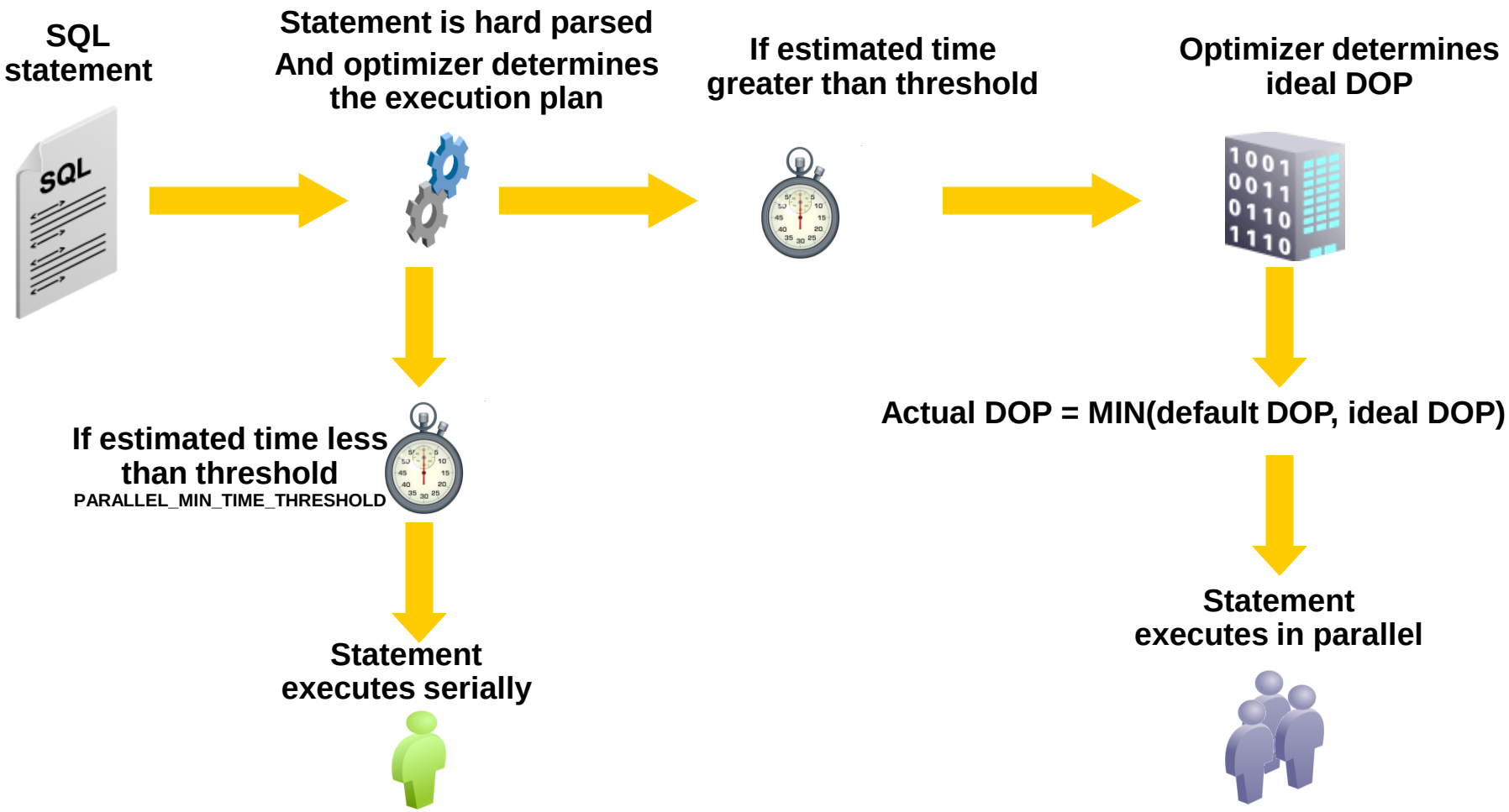
Oracle Production E-Business Suite Tables



- Columnar compression ratios
  - Query = 14.6X
  - Archive = 22.6X
  - Vary by application and table

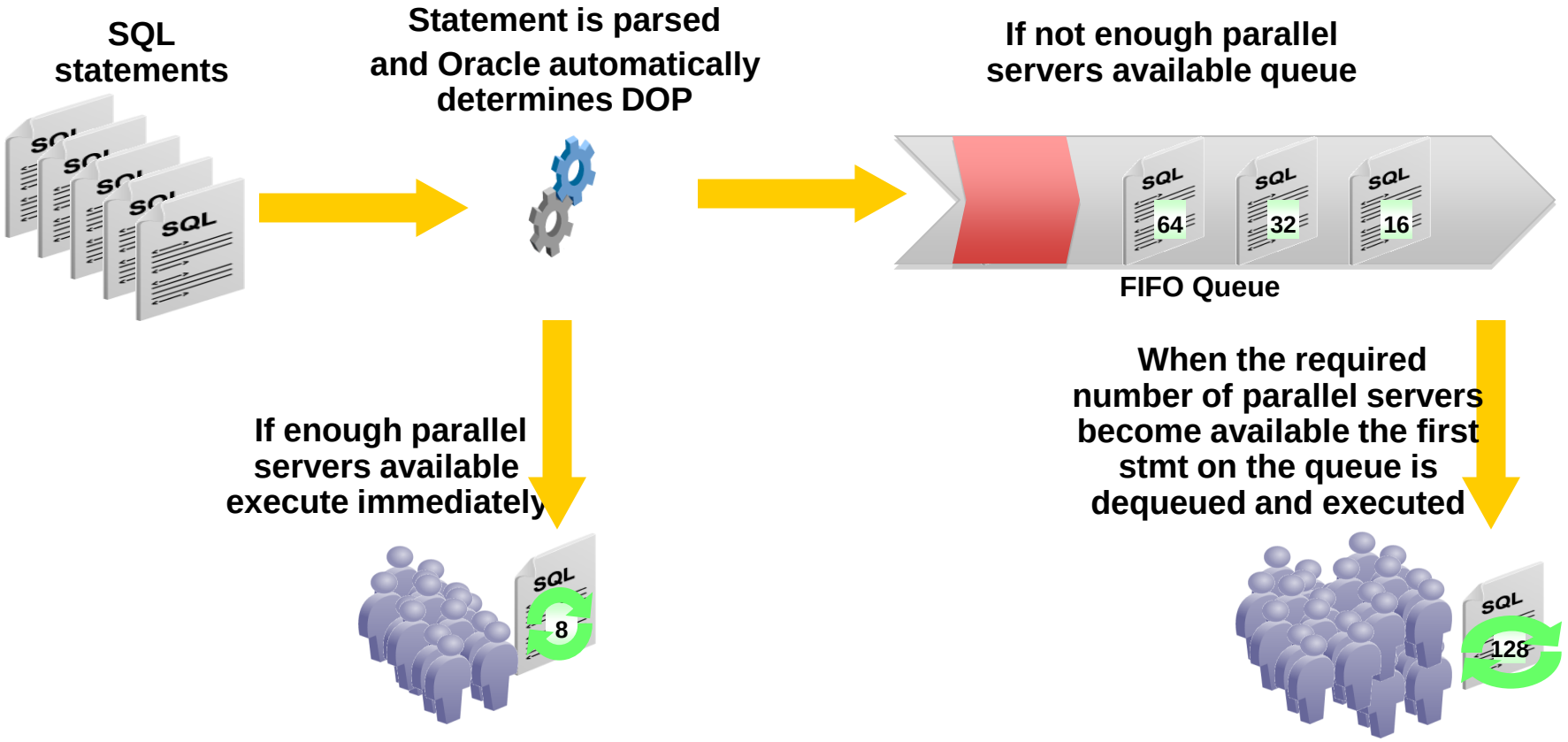
Automated Degree of Parallelism

How it works



Parallel Statement Queuing

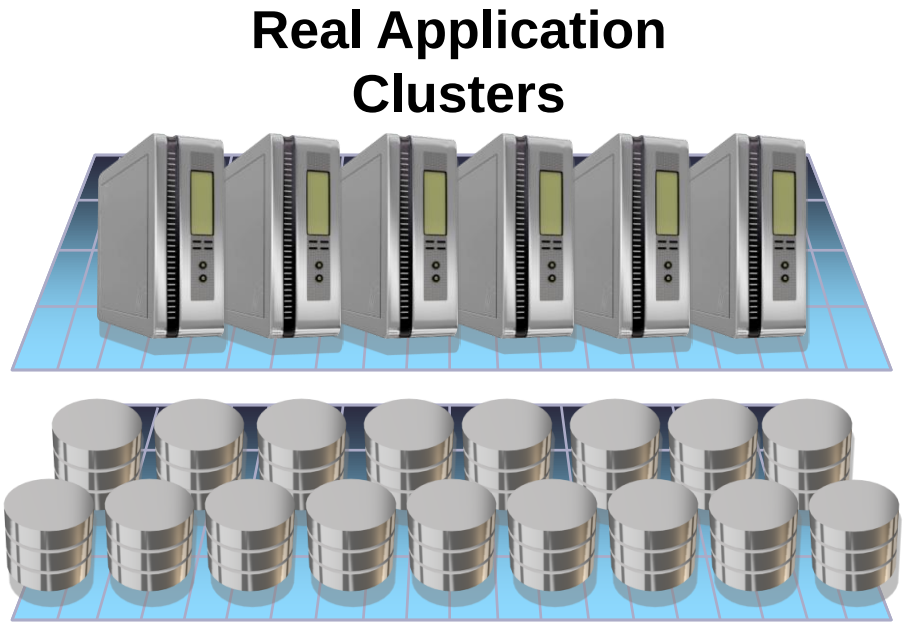
How it works



Oracle Database 11g Release 2

In-Memory Parallel Execution

- New commodity servers have have large amounts of memory
- Data Compression also means more data in memory
- Intelligent algorithm places fragments of a table in memory on different nodes
- In Memory Parallel Queries are then executed on the corresponding nodes
- Removes need to perform disk I/O for queries on large tables



Controlling Auto DOP, Queuing and In-Memory Execution

- PARALLEL_DEGREE_POLICY
  - MANUAL – disables Auto DOP, statement queuing and in-memory execution and defaults to behavior prior to 11gR2
  - LIMITED – Enables Auto DOP for some statements
    - Those with hints or that access tables and indexes created with PARALLEL clause
    - Disables queuing and in-memory execution
  - AUTO – enables all

Managing Complexity

Automated Self-management

Automated:

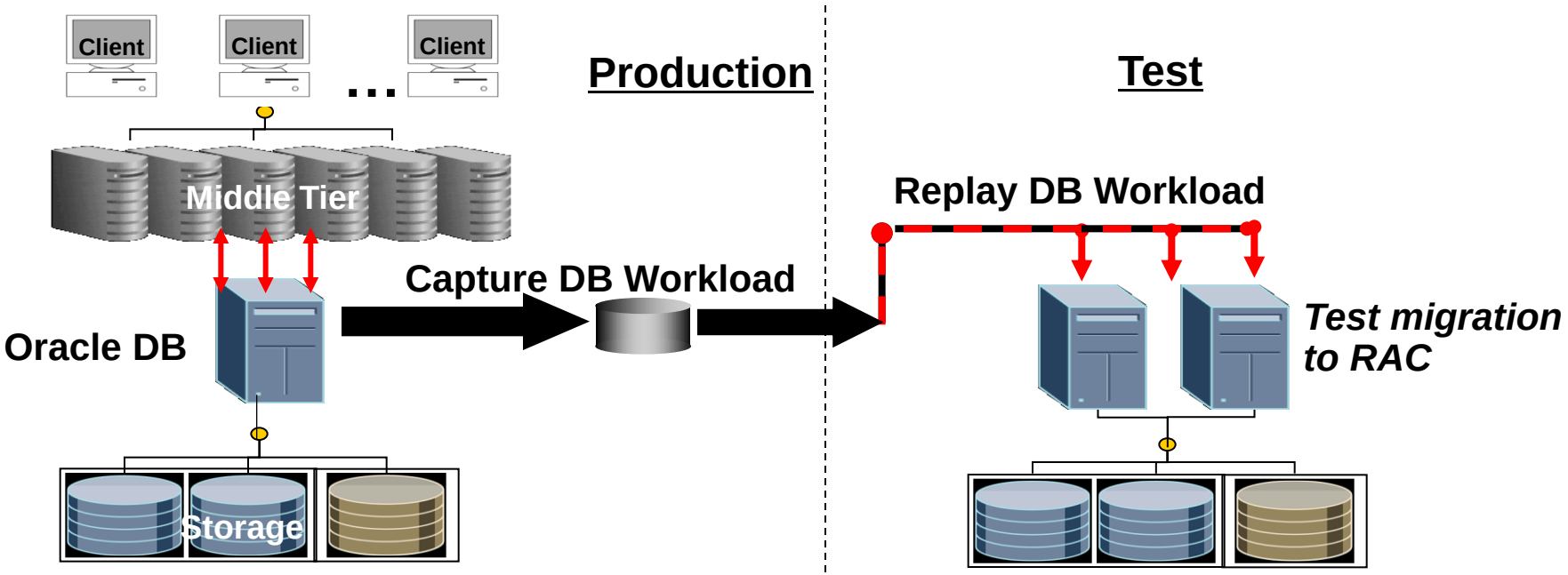
- Storage
- Memory
- Statistics
- SQL tuning
- Backup and Recovery

Advisory:

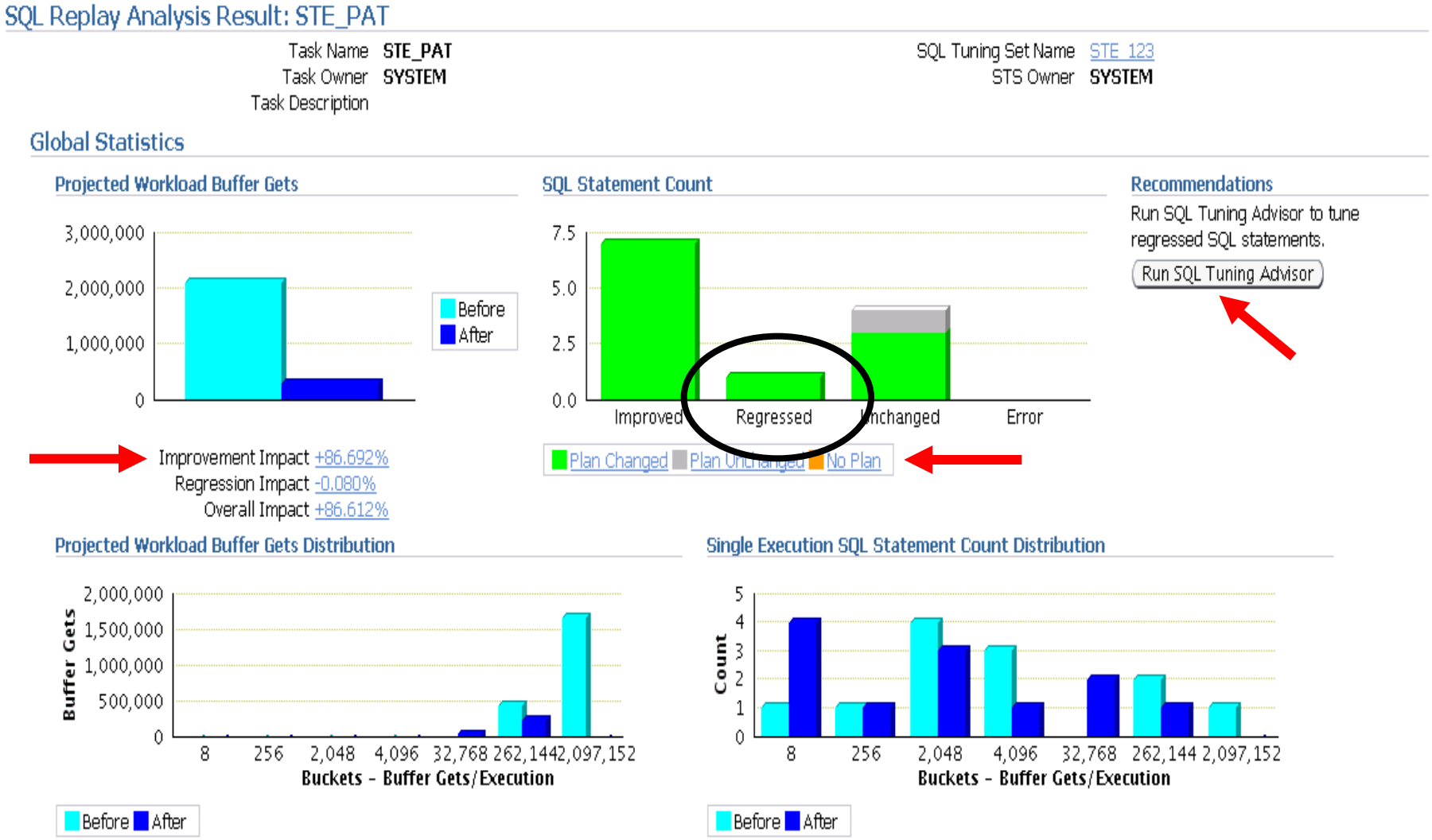
- Indexing
- Partitioning
- Compression
- Availability
- Data Recovery

Make Change Safe -
Realistic Testing with Database Replay

- Recreate actual production database workload in test environment
- No test development required
- Replay workload in test with production timing
- Analyze & fix issues before production

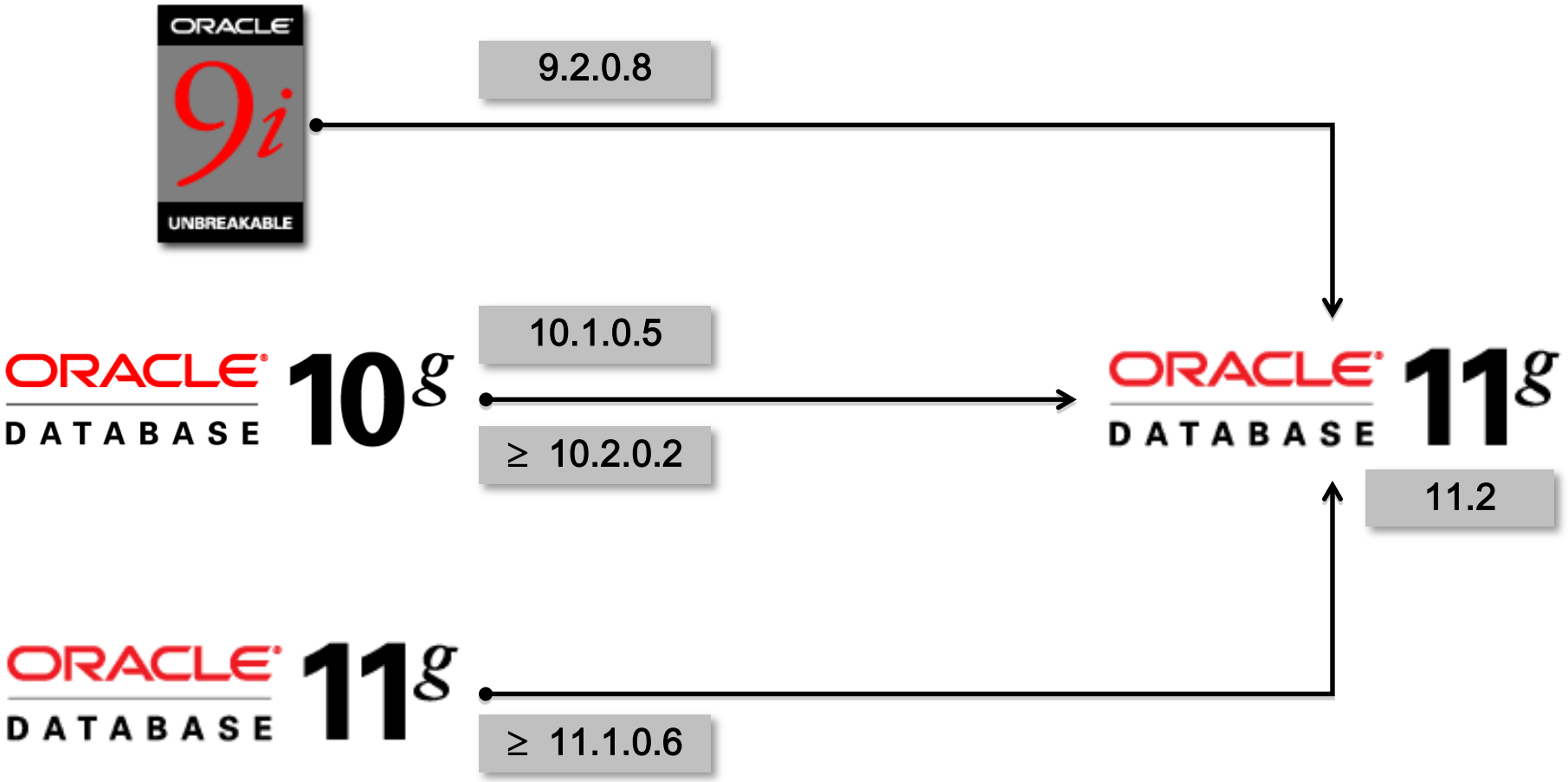


Make Change Safe –
Find Regressed SQL with SQL Performance Analyzer



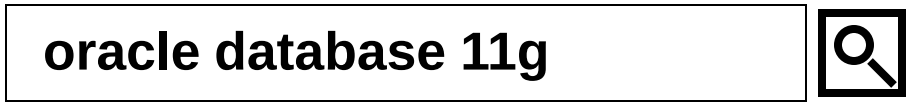
Oracle Database 11g Release 2

What are my upgrade paths?



For More Information

http://search.oracle.com



or

www.oracle.com/database