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## **Oracle on OpenVMS, A Platform Update**

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# An Update for Oracle Database on OpenVMS

- A Primer on Oracle “Porting” Process
- The Next Generation of Oracle Database (11g)
- Currently Supported Products
- Products in Development Cycle
- 11g Features Planning



# The Porting Issue

- Building Unix source code onto the OpenVMS Data Base Platform
- Unix development environment
  - “makefile”
  - Shell commands
  - Scripting (ksh, csh, sh, & bash)
  - Corporate Source Control System (ADE)
    - A full scale package written in Perl based on Unix system calls
- VMS Issues
  - file naming issues
    - Long file names
    - Special characters in file name ( multi “.” and “:” or “;” )
  - Soft link support (aka lack of)



# The VPE Solution (VMS Porting Environment)

- Use a Unix host to drive the VMS build
  - Currently hosted by Tru64 moving to Linux
- Use makefiles to drive builds.
- Rich set of Unix tools automatically available.
  - Unix things happen on Unix
    - “sed, awk, sh, csh...”
  - VMS binary actions occur on VMS
    - CC, CXX, LIB, LINK...
- A Unix Client allows access to Corporate Source Control – ADE <aka Oracle Repository>





# Why is this an issue?


- Well, it's a scaling thing!
  - 9.2.0.8 -> 487,186 \*\*
  - 10.1.0.5 -> 621,080
  - 10.2.0.4 -> 737,277
  - 11.2.0.1 -> 1,094,113

\*\* Files/Directories/Symlinks



# How We Came to Our Solution

- Not Posix Shell (for you old time vms'ers)
- Not GNV
- Port gmake to VMS?
  - Look back to base development methods/tools
- And Not our Corporate Source Control
  - Not practical to port Unix Perl to VMS, due to “fork” and other embedded Unix dependencies



# 11gR2 (11.2.0.1)

- What it will be for OpenVMS
  - IA64VMS only planned
  - Development environment will be the first release making use of symbolic soft links on OpenVMS
    - Source Control Access
    - Build Environment
    - QA Environment
    - Development
      - We have been working toward this change for years



# Currently Supported Releases

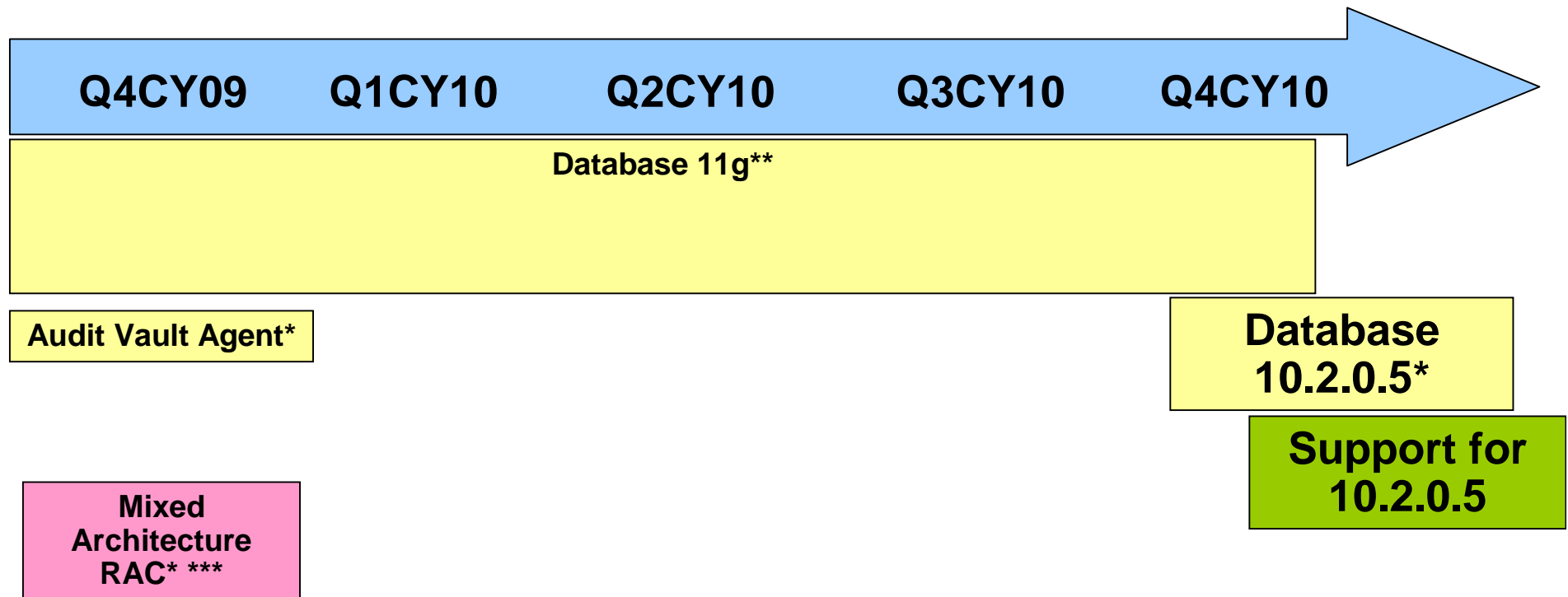
- Oracle 9iR2 Database 9.2.0.8 Alpha OpenVMS (22-May-2007)  
<In Extended Support>
- Oracle 10gR1 Database 10.1.0.5 Alpha OpenVMS (15-Feb-2008)
- Oracle 10gR2 Database 10.2.0.4 Alpha OpenVMS (12-Dec-2008)
- Oracle 10gR2 Database 10.2.0.4 [Integrity](#) (12-Dec-2008)
- Oracle EM Agent 10.2.0.2 for hp OpenVMS Alpha and Integrity (September 2008) (Patch #5 available)
- Oracle 10gR2 Data Vault 10.2.0.4 Alpha OpenVMS (6-Mar-2009)
- Oracle 10gR2 Data Vault 10.2.0.4 Integrity (6-Mar-2009)



# Projects in Development

- MAR (Mixed Architecture RAC) Research Project
  - Will exist only for the 10.2 Alpha/Integrity
  - Pending final reviews
- Audit Vault Agent (10.2.0.4)
- Grid Control Agent (10.2.0.5) terminal patch set for GC 10.2 code line

# Oracle on OpenVMS Development Pipe Line \*\*\*\*



**The Next GC product**

**\*\*\*\*Note: this is not intended to announce schedules**

**\*Both Alpha and Itanium**

**\*\*Itanium Planned Only**

**\*\*\* Planned**

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# 11gR2 Features in Planning

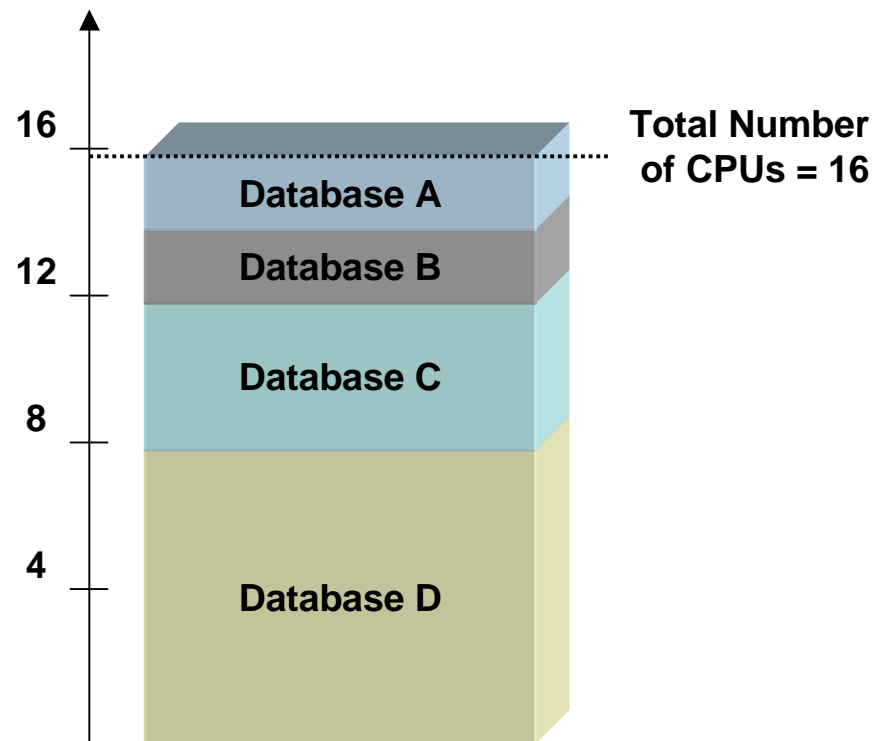
- Additional Real Application Cluster Support
  - Intra-Node Instance Caging
  - Simplified Grid Provisioning
  - RAC ONE Node
  - Oracle's Grid Computing Architecture
  - Oracle In memory Cache
- Active Data Guard
- Data Vault and Audit Vault support enhancements
- Warehousing Optimizations
- Real Applications Testing
  - (RAT)
- Feed back?

# Oracle Database 11g Release 2

## Intra-Node Instance Caging

- Flexible alternative to server partitioning
- Wider platform support than operating system resource managers
- Lower administration overhead than virtualization
- Set CPU\_COUNT per instance and enable resource manager

Sum of cpu\_counts

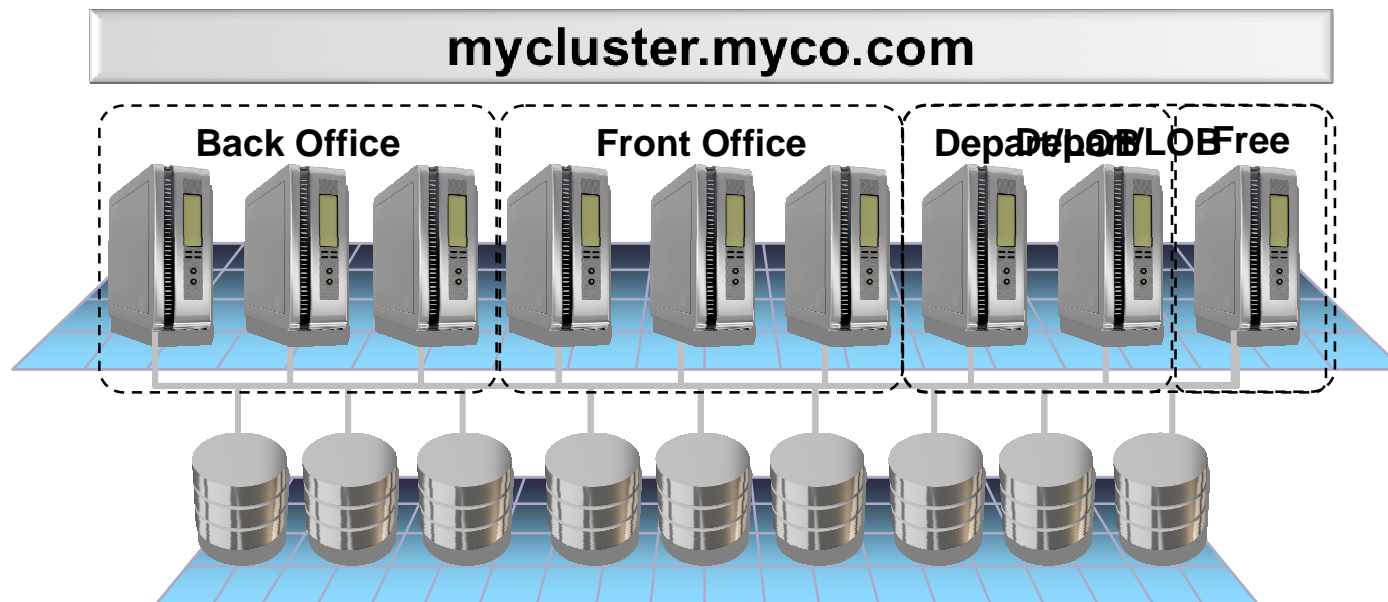


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# Oracle Database 11g Release 2

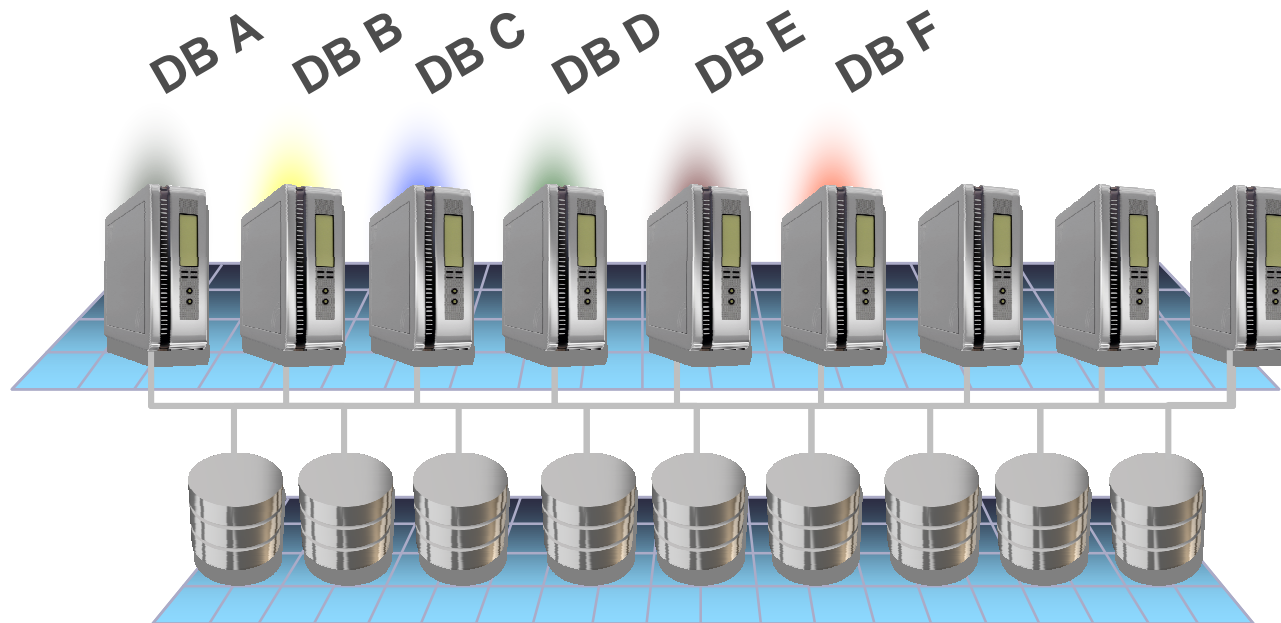
## Simplified Grid Provisioning



- SCAN - Single cluster-wide alias for database connections
- Nodes can be easily repurposed

# Oracle Database 11g Release 2

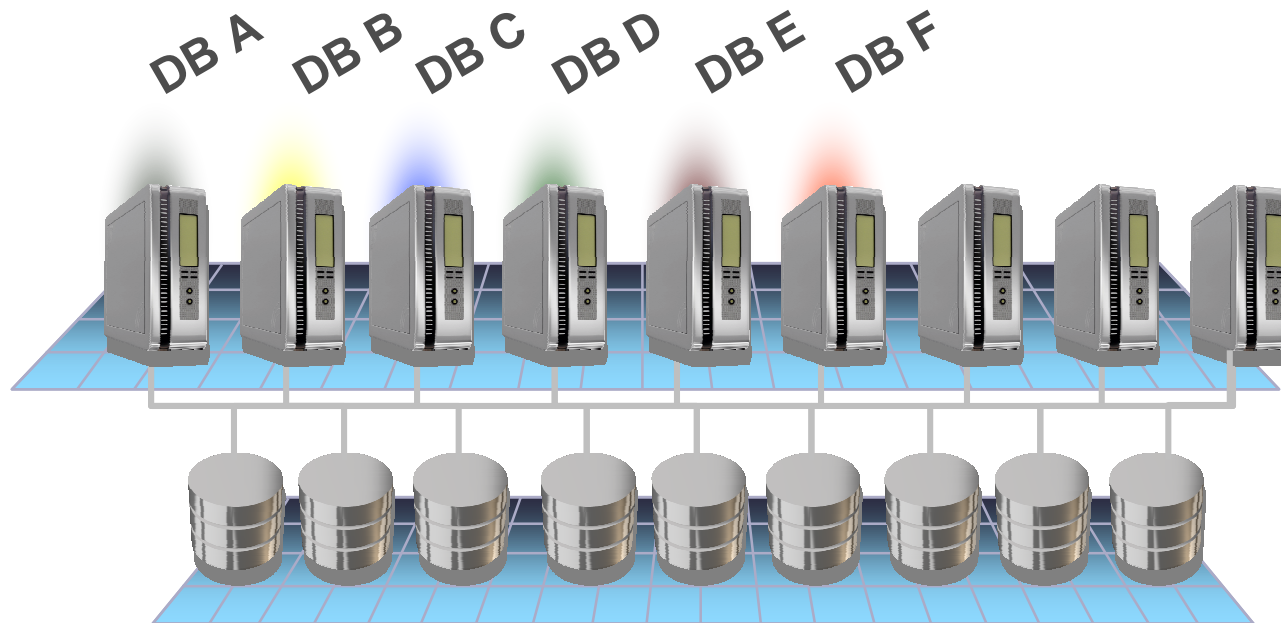
## RAC ONE Node – RAC for mass consolidation



- RAC One Node extends many benefits of RAC to single-node databases

# Oracle Database 11g Release 2

## RAC ONE Node – RAC for mass consolidation

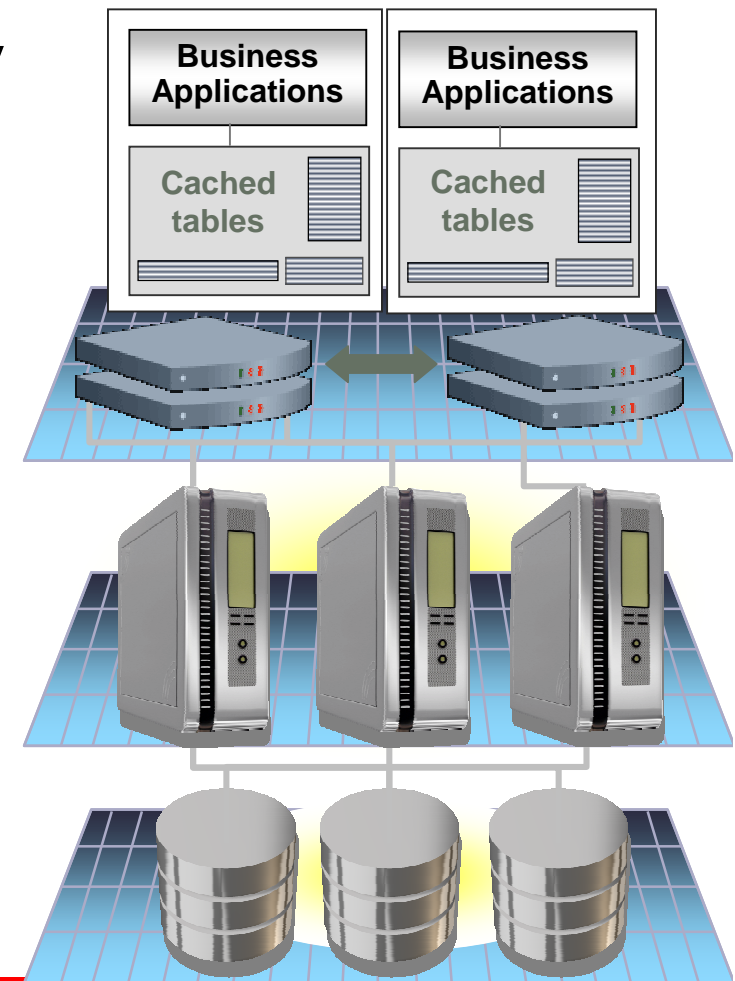


- Automated Failover within Grid

# Oracle In Memory Database Cache

**Offload Data processing to Middle Tier resources**

- Data cached in application memory
  - Synchronized with Oracle Database
- Fast, consistent response times
  - High transaction throughput
  - Scale out with In Memory Database Cache Grid
- Standard Oracle Interfaces
  - SQL, PL/SQL, OCI



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# Data Warehousing Optimizations

Work smarter not harder ...

Key Features	Oracle Database 11g
Partitioning	✓
Parallel Operations	✓
Optimized Indexing	✓
Materialized Views	✓
Data Mining	✓
Query Results Cache	✓
ETL & Data Quality	✓

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# Oracle Database 11g Release 2

## Automated Degree of Parallelism

- Currently tuning parallelism is a manual process
  - one degree of parallelism does not fit all queries
  - too much parallelism can flood system
- Automated Degree of Parallelism automatically decides
  - If a statement will execute in parallel or not (serial execution would take longer than a set threshold – 30 secs)
  - What degree of parallelism the statement will use
- Optimizer derives the DoP from the statement based on resource requirements
  - Uses the cost of all scan operations
  - Balanced against a max limit of parallelism



# Oracle Database 11g Release 2

## Parallel Statement Queuing

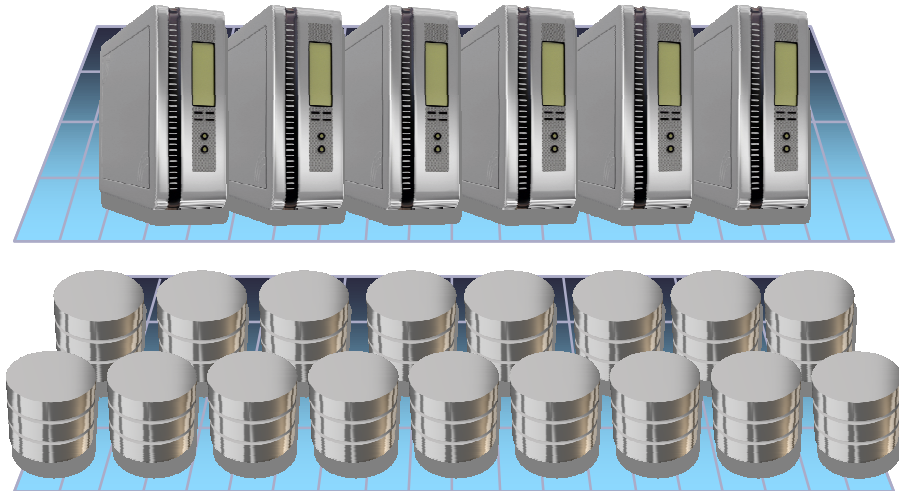
- Automatic Degree of Parallelism means
  - More statements will run in parallel
  - Potential system thrashing due to too many processes
- Parallel Statement Queuing automatically decides if a statement can execute immediately or not
- When a parallel statement starts it checks if enough parallel servers (aka Parallel Query Slaves) are available
  - If not, queue the statement
  - Once enough parallel servers become available, statement is de-queued and executed

# Oracle Database 11g Release 2

## In-Memory Parallel Execution

- New commodity servers 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 disk I/O for large tables

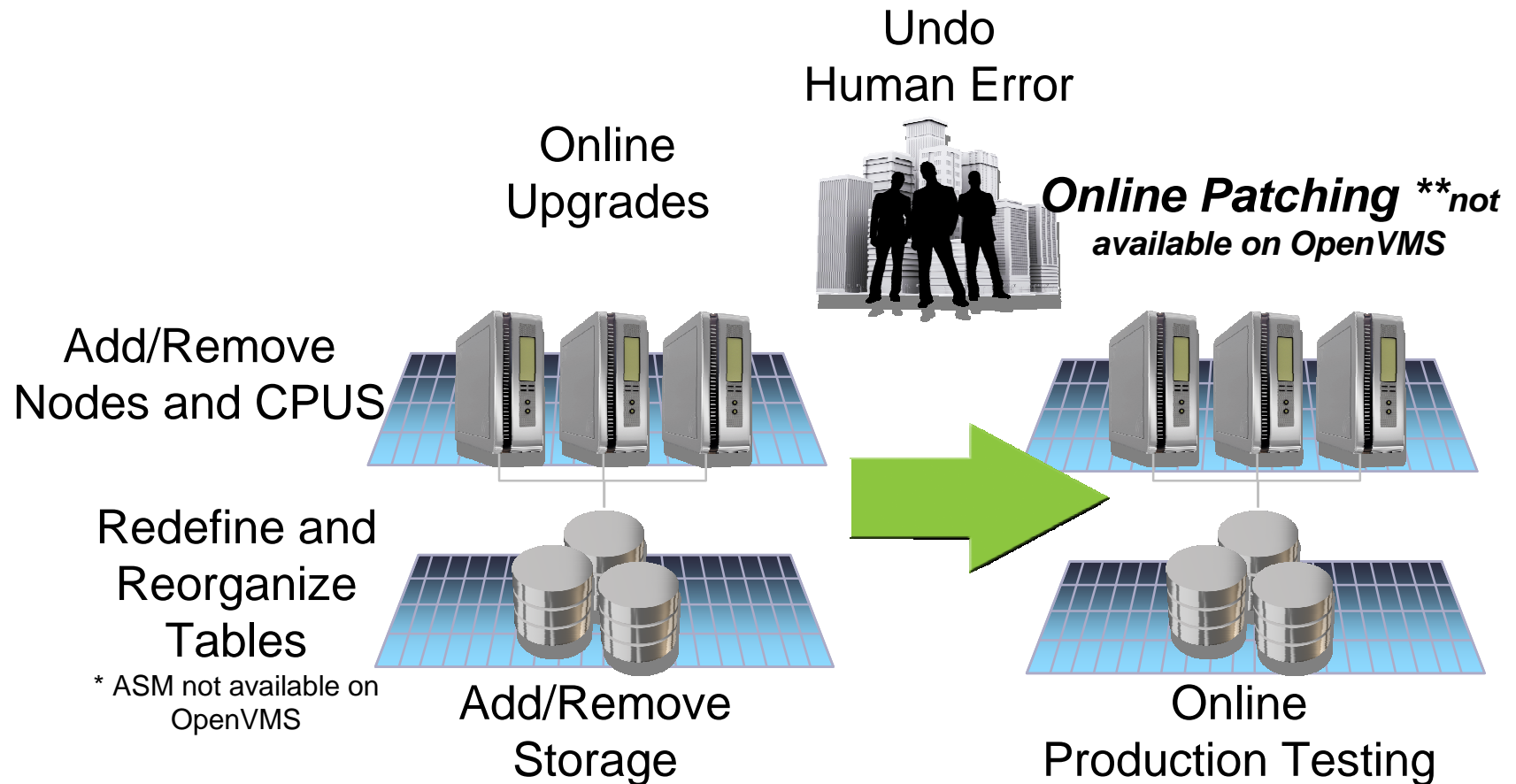
**Real Application  
Clusters**





# Oracle Maximum Availability Architecture

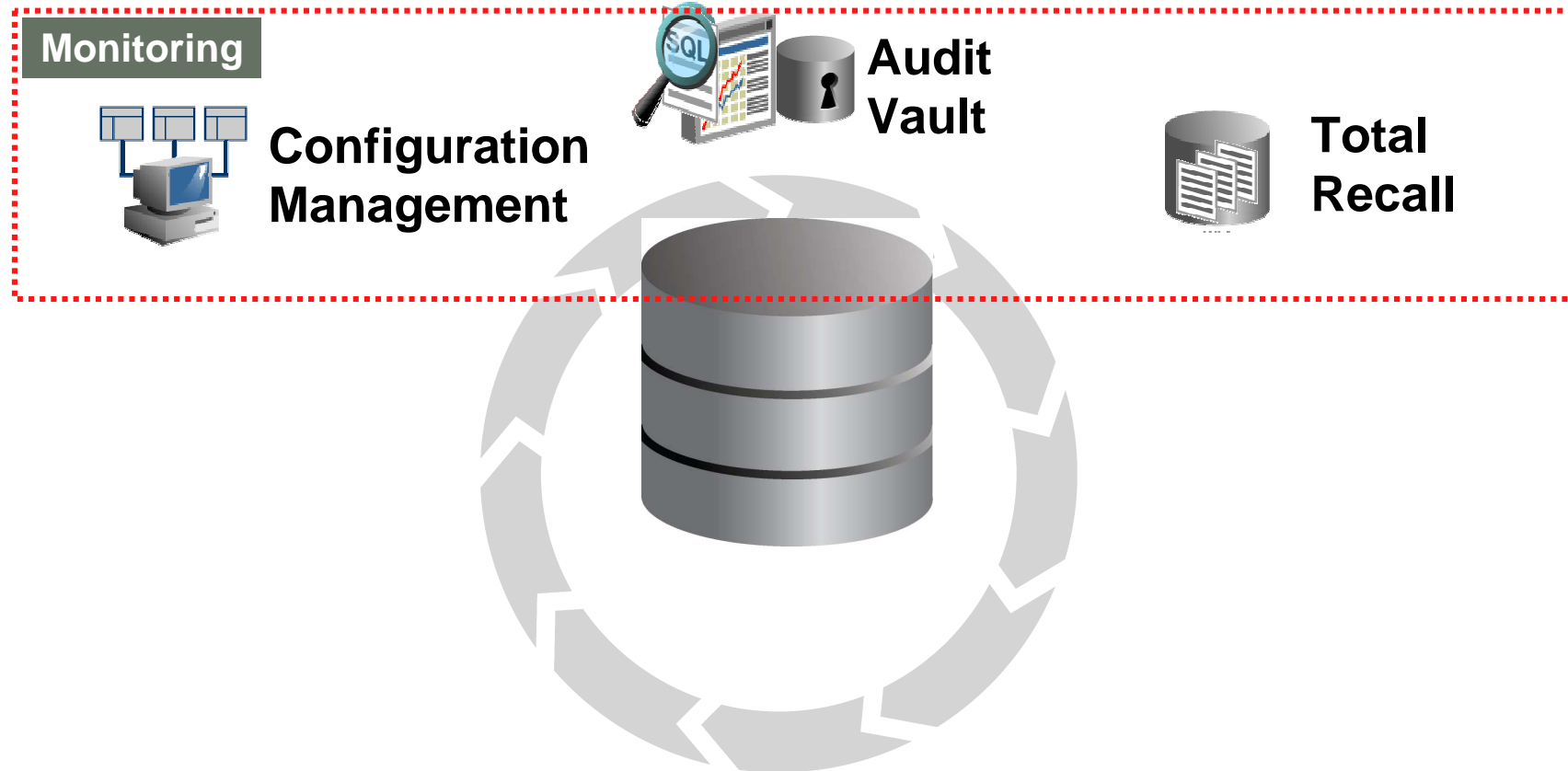
**Eliminate the cost of planned downtime**



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# Oracle Database Security Audit Vault...

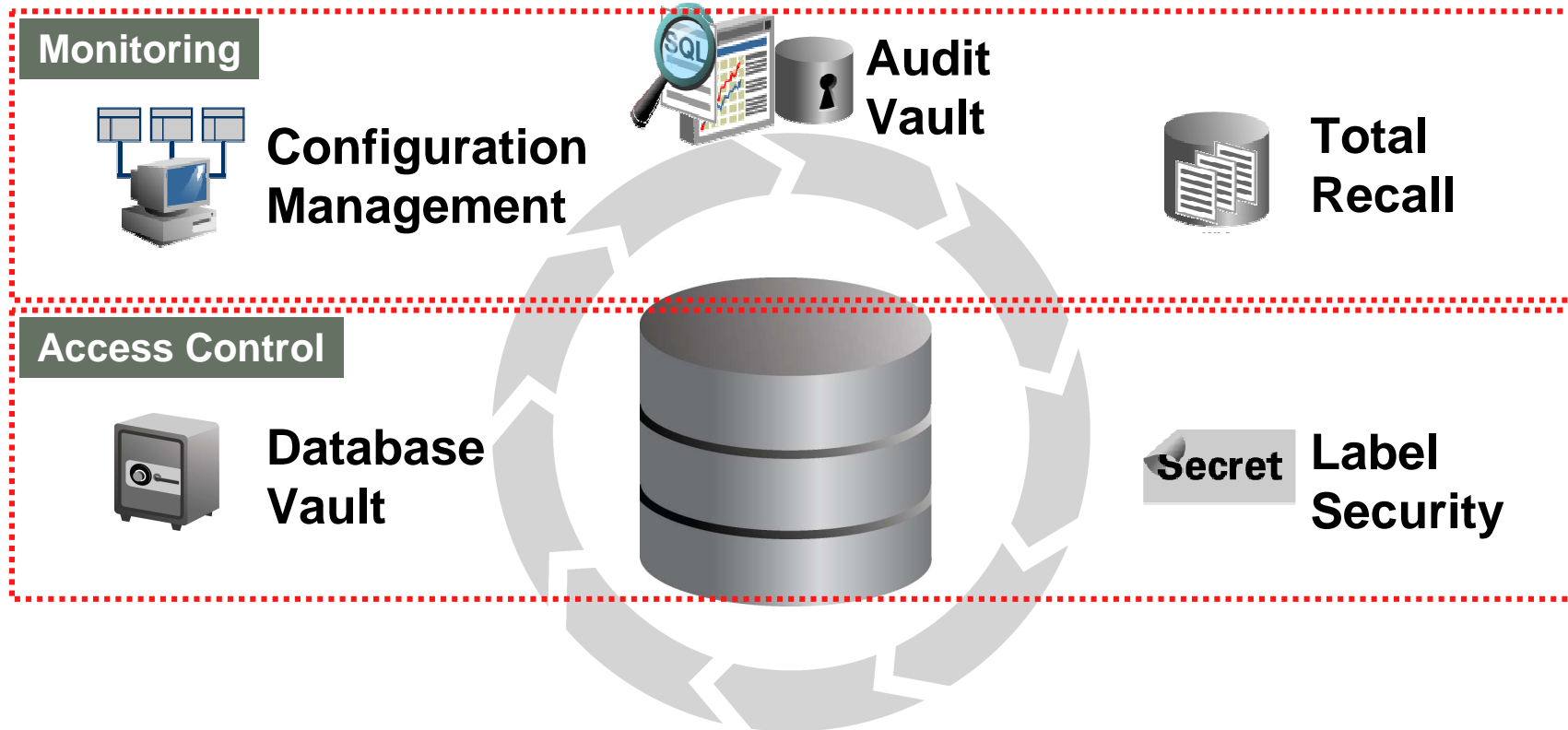
## Auditing and Configuration Scanning



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# Oracle Database Security

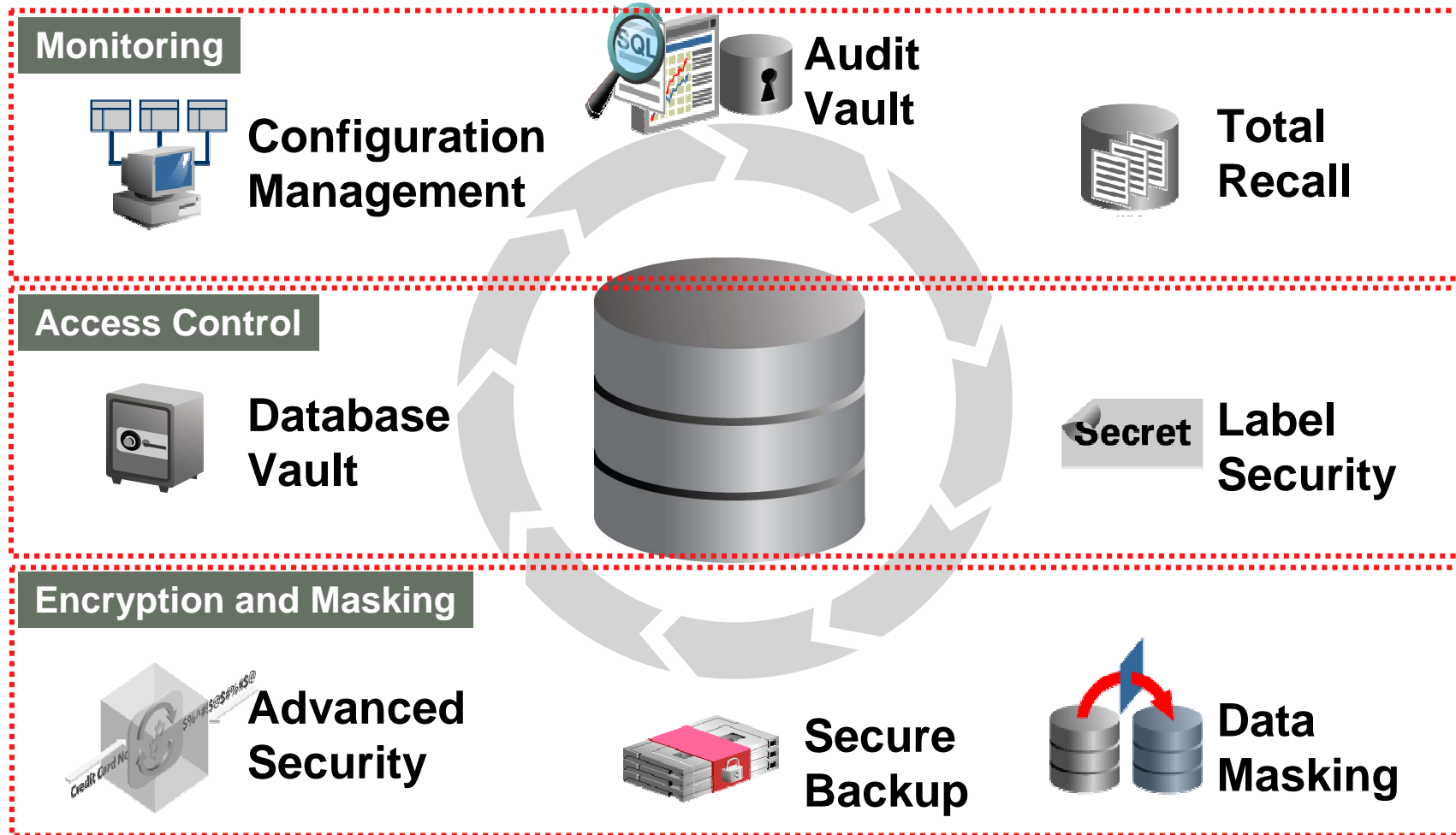
## Fine Grain Access Control



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# Oracle Database Security

## Data encryption and masking



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# Oracle Database 11g Release 2

## Data Masking Pack

**Format Library**

The Format Library contains a collection of ready-to-use masking formats which can be used when creating a masking definition.

Search

Select	Format	Data Type	Sample	Description
<input checked="" type="radio"/>	<a href="#">American Express Credit Card Number</a>	Character	3737652673504728	~10 billion unique American Express credit card numbers
<input type="radio"/>	<a href="#">Discover Card Credit Card Number</a>	Character	6011119415762055	~10 billion unique Discover Card credit card numbers
<input type="radio"/>	<a href="#">MasterCard Credit Card Number</a>	Character	5450028508701930	~10 billion unique MasterCard credit card numbers
<input type="radio"/>	<a href="#">Visa Credit Card Number</a>	Character	4485866837369032	~10 billion unique Visa credit card numbers
<input type="radio"/>	<a href="#">Generic Credit Card Number</a>	Character	6011924613720064	~10 billion unique generic credit card numbers

- Out of box mask formats for commonly masked data
- Condition-based Masking
- Compound Masks
- Integrated Clone + Mask workflow
- Deterministic masking support
- Supported in Enterprise Manager Database Control

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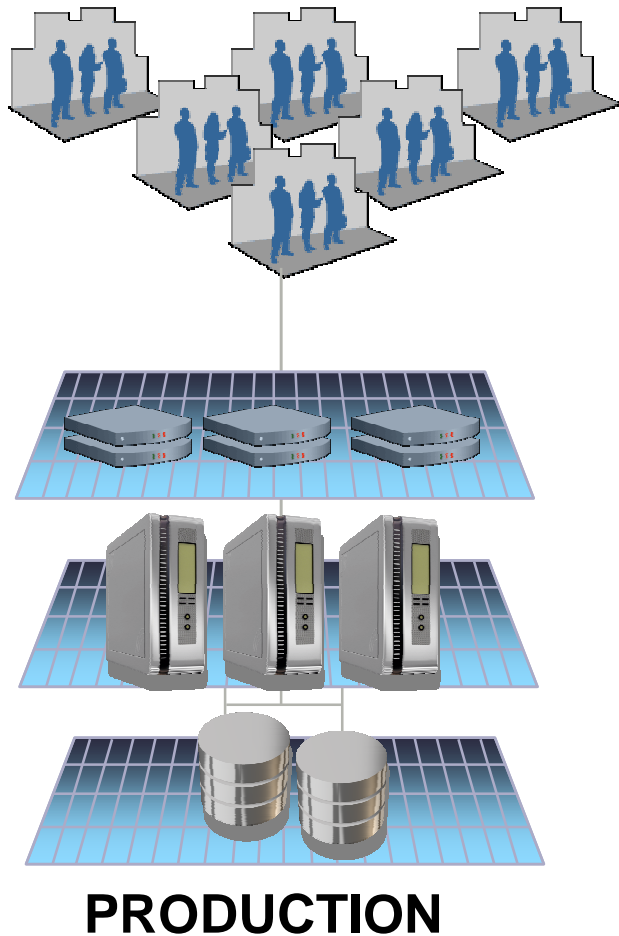


# Oracle 11gR2 – Real Application Testing

- Real Application Testing (RAT)

# Traditional Testing Approach

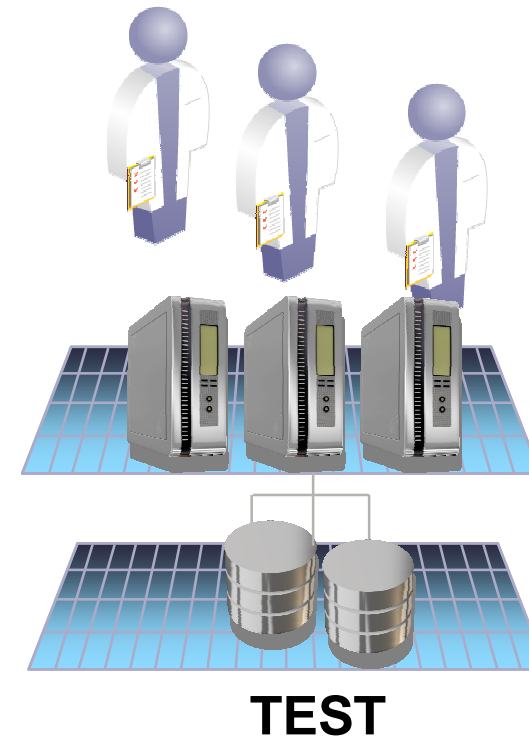
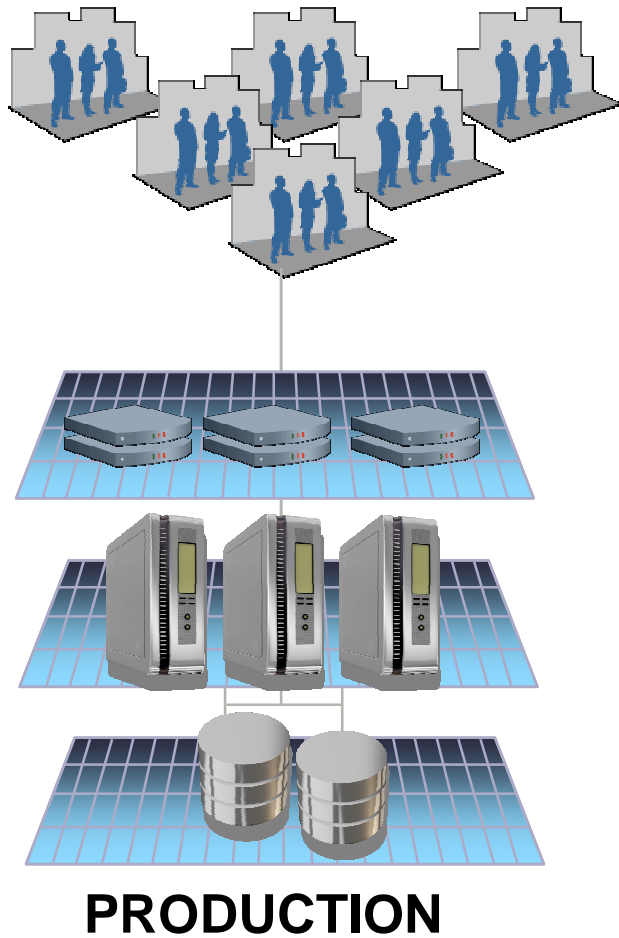
Production – 1,000s of Real Online Users



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# Limited Testing Capabilities

Few users trying to be 1,000s of users

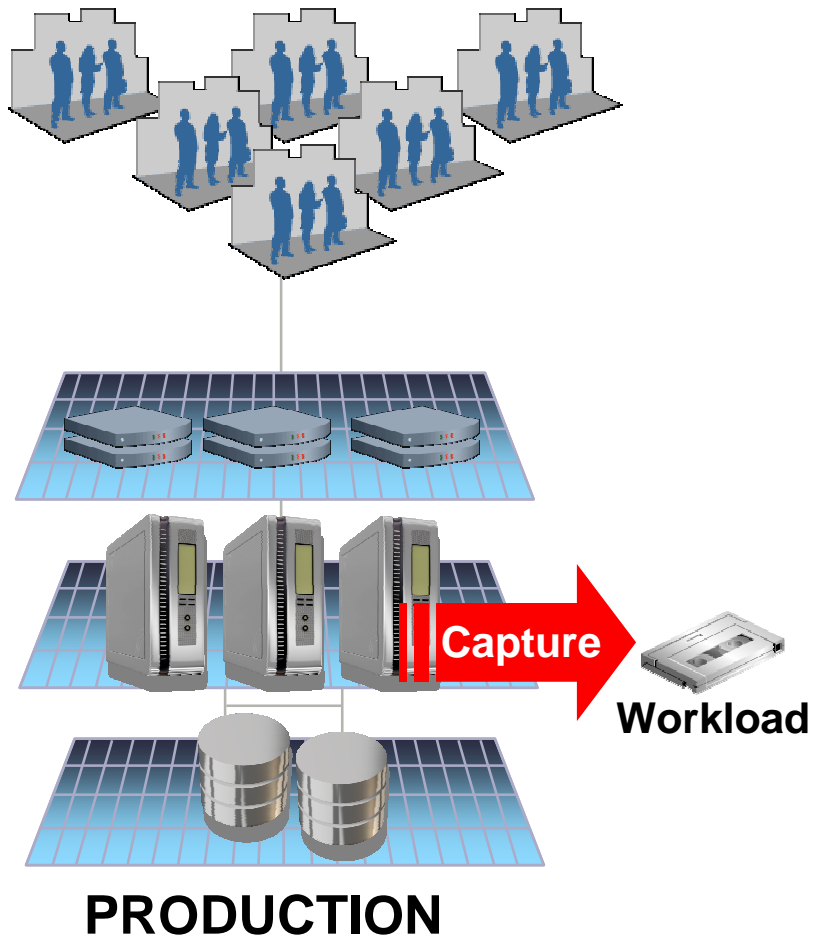


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# Real Application Testing

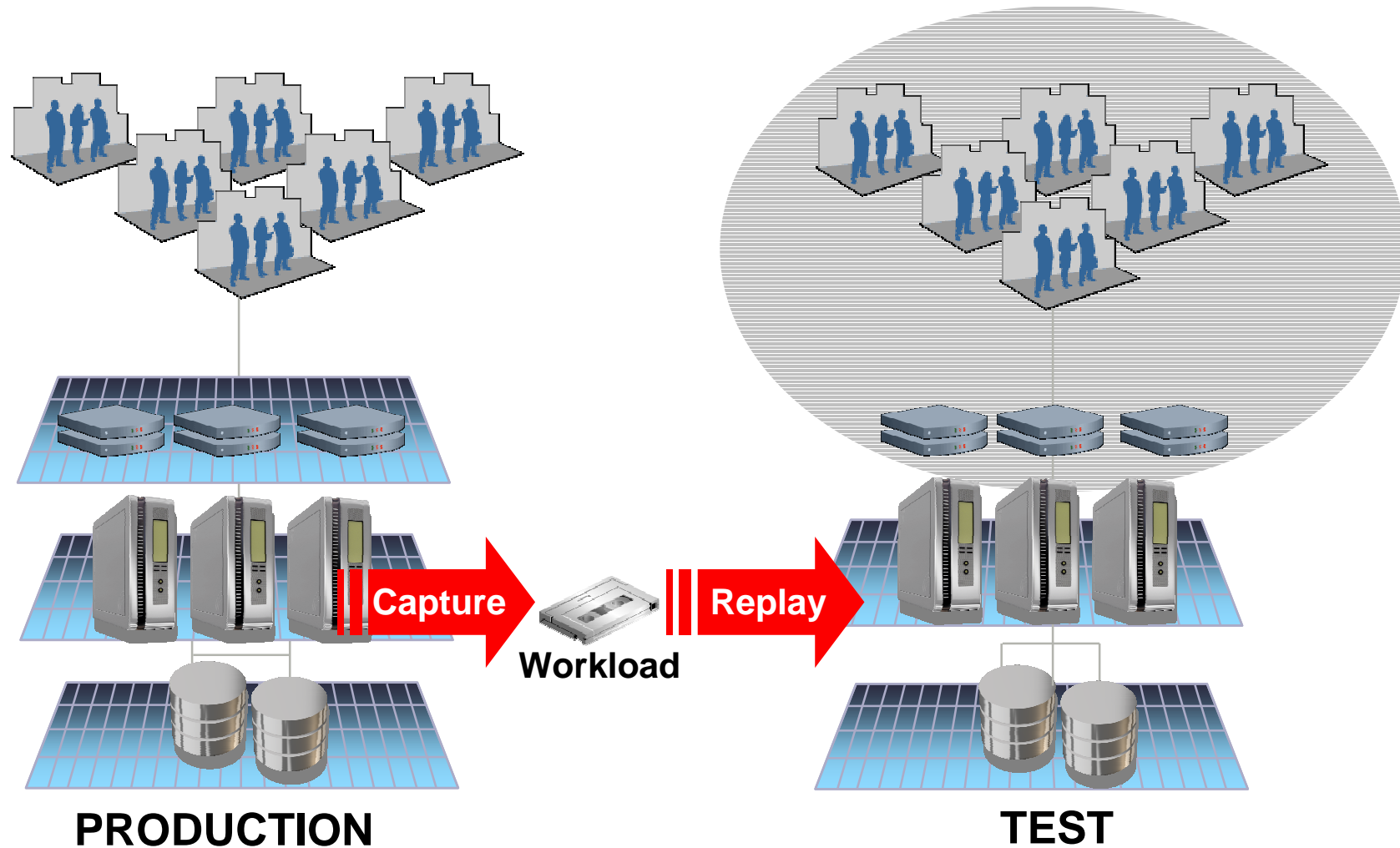
Workload for 1,000s of Online Users Captured



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# Real Application Testing

Workload for 1,000s of Online Users Replayed



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## For More Information

<http://search.oracle.com>

oracle database 11g



or

[www.oracle.com/database](http://www.oracle.com/database)

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# Oracle 11gR2 Database on OpenVMS



# *Questions?*