
ORACLE®

# Private Cloud Database Consolidation

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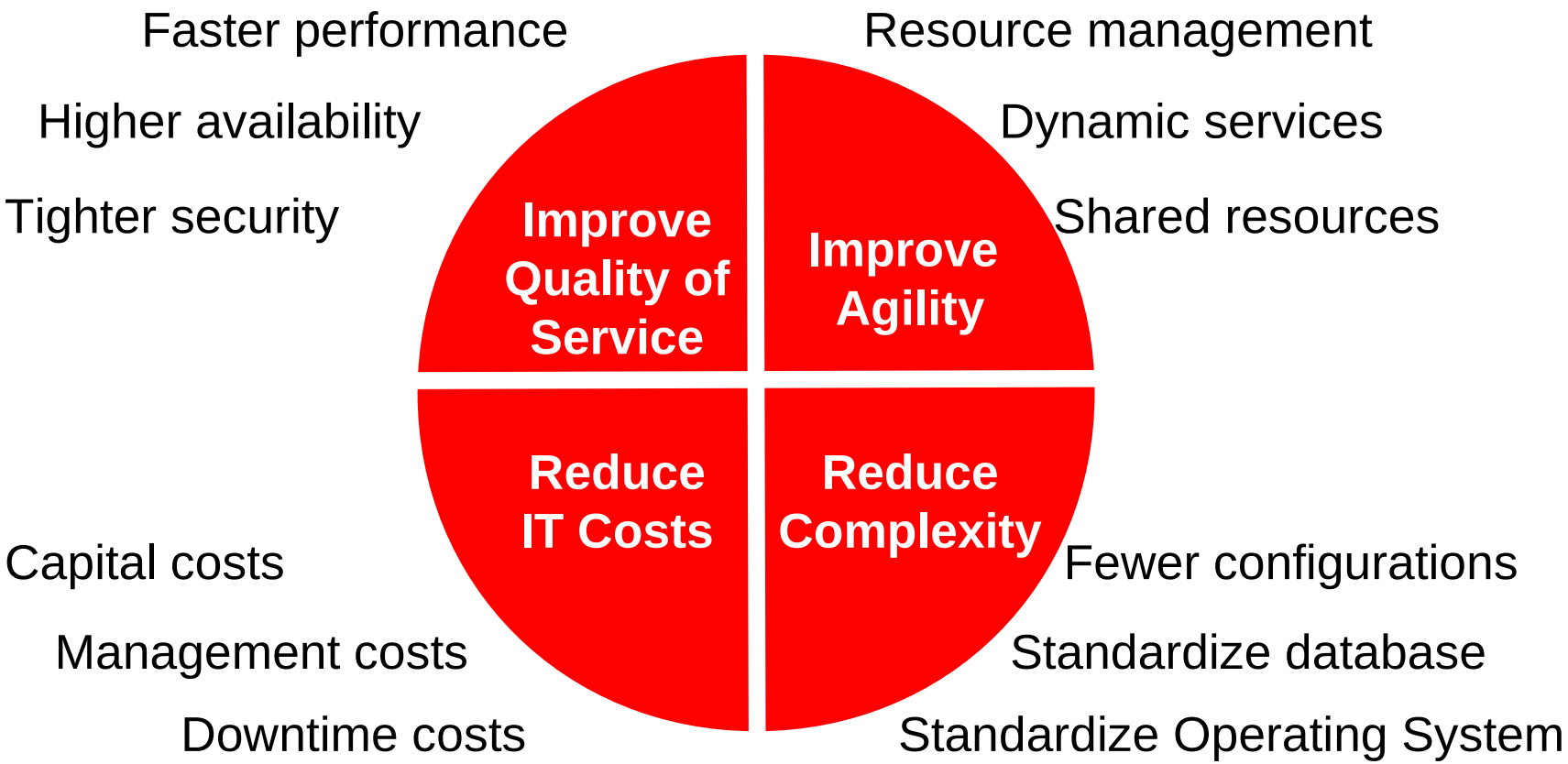
# Private Database Cloud
## Business Drivers



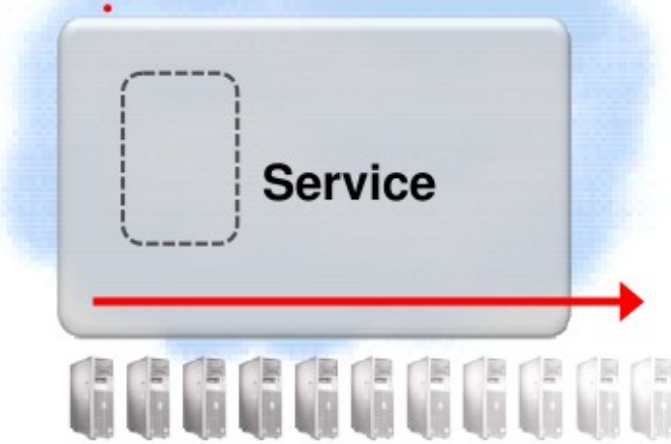
# Database as a Service

**Traditional Database Deployment (Admin driven)**


- Specify and procure hardware
- Configure hardware
- Deploy hardware
- Configure and deploy supporting software
- Configure and deploy Database
- Add hardware and reconfigure stack as demand grows


**As-a-Service Deployment (End-user driven)**

- Set up software through Web interface
- Capacity adjusts as demand changes
- Retire software when not needed

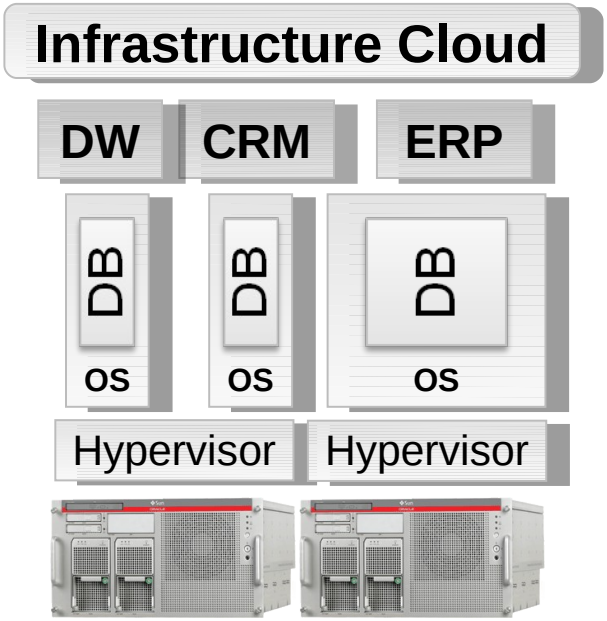



**Self-Service Provisioning**

**Charge Back**

# Database Cloud Architectures

## Common building blocks are shared server and storage pools




**Server**

Deploy in dedicated VMs
Server virtualization

# Database Cloud Architectures

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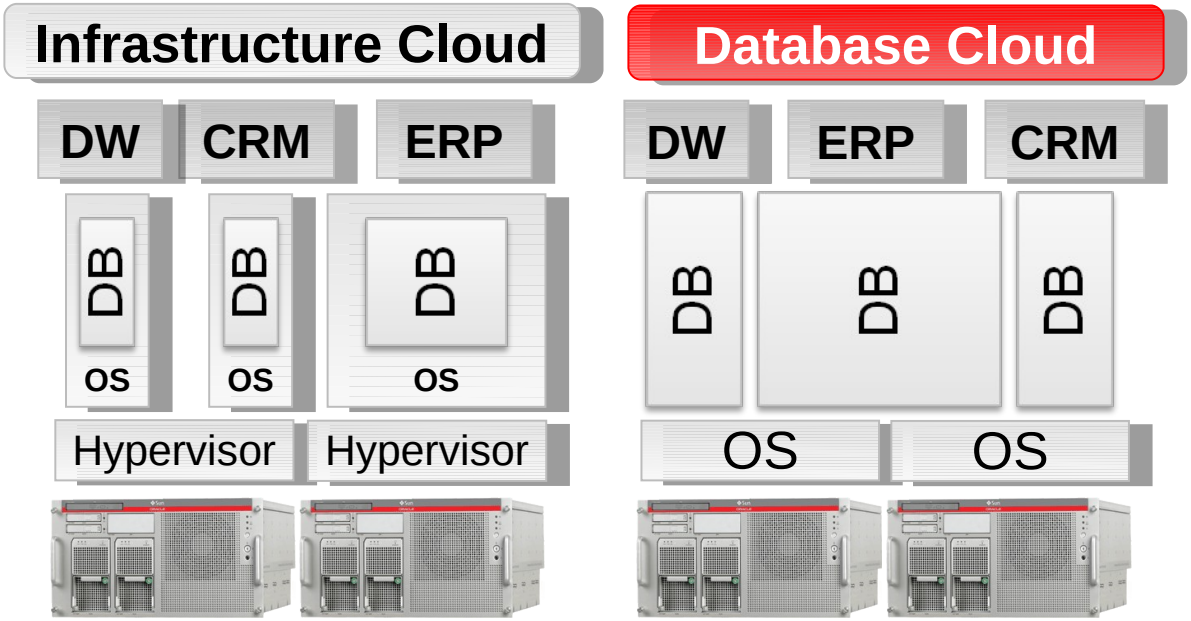


**Server**

Deploy in dedicated VMs
Server virtualization

**Database**

Share server pool
Real Application Clusters

# Database Cloud Architectures

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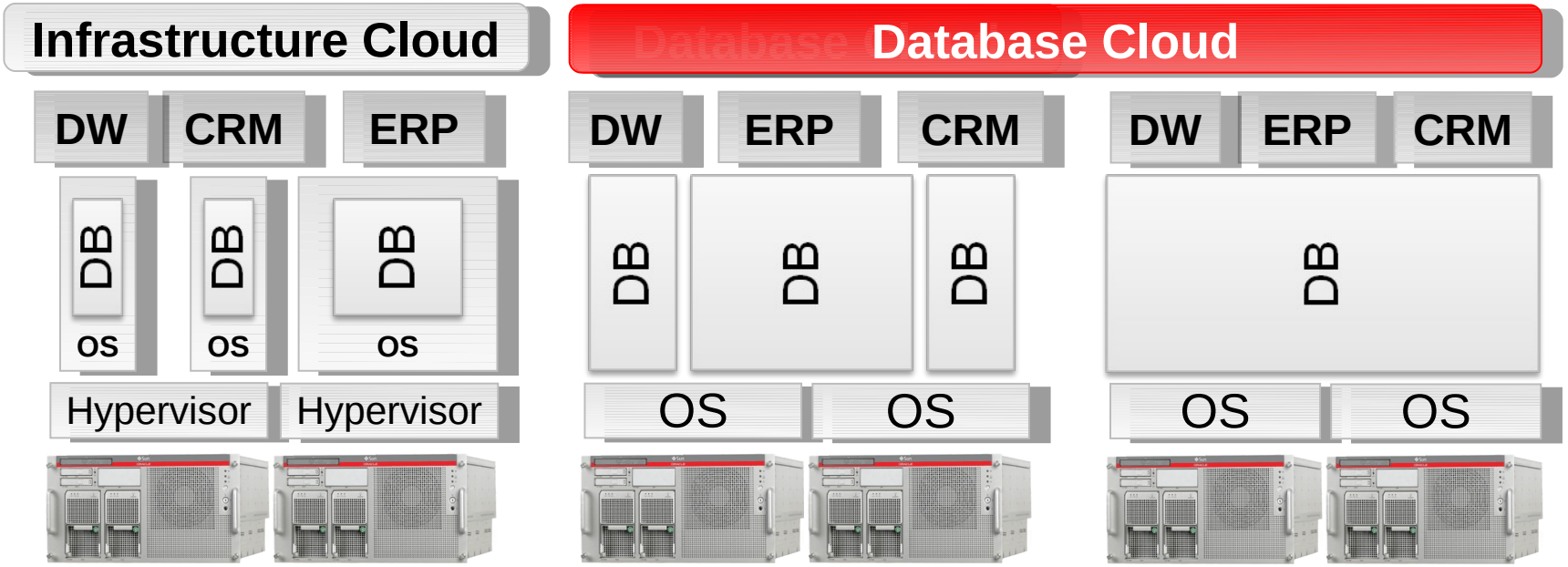



**Server**
Deploy in dedicated VMs
Server virtualization

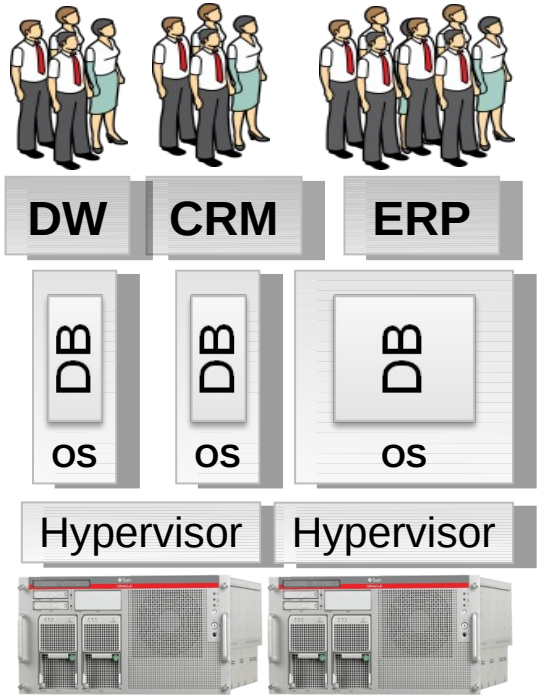
**Database**
Share server pool
Real Application Clusters

**Schema**
Share database instances
Real Application Clusters

# Infrastructure Cloud

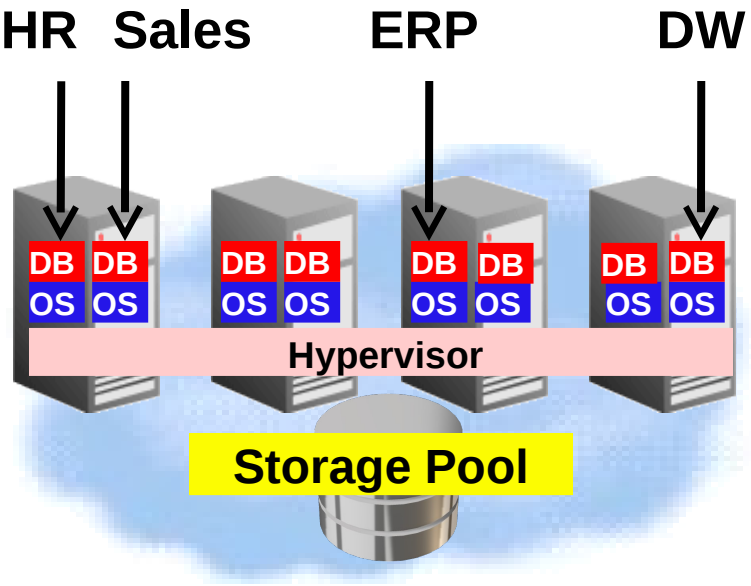
## Provision a Database in a VM

- Requires Hypervisor
  - Works with single & clustered servers
- Supports heterogeneous OS
  - Excellent isolation
- Low consolidation density
  - Server and storage only
- Performance issues
  - Hypervisor overhead
- Low ROI
  - But, simple to implement



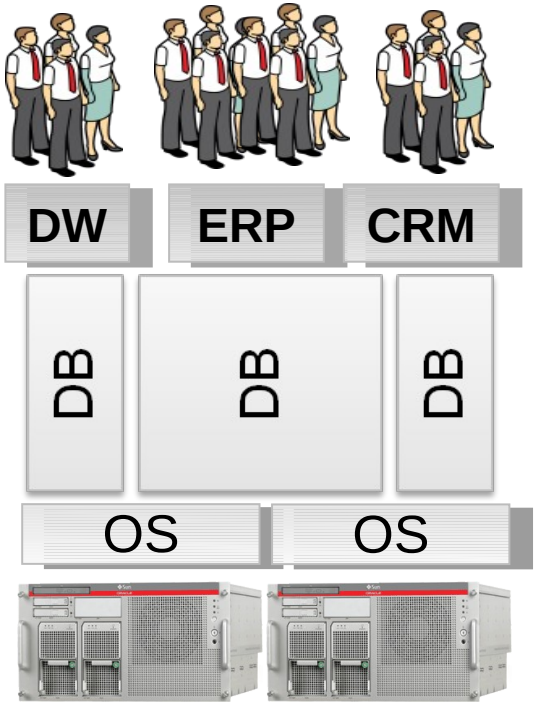
# Infrastructure Cloud
## Provision a Database in a VM

- **Pros**
  - Simple to implement
  - Easy migration
  - Excellent isolation
- **Cons**
  - Lower consolidation density
  - Lower ROI
  - Performance



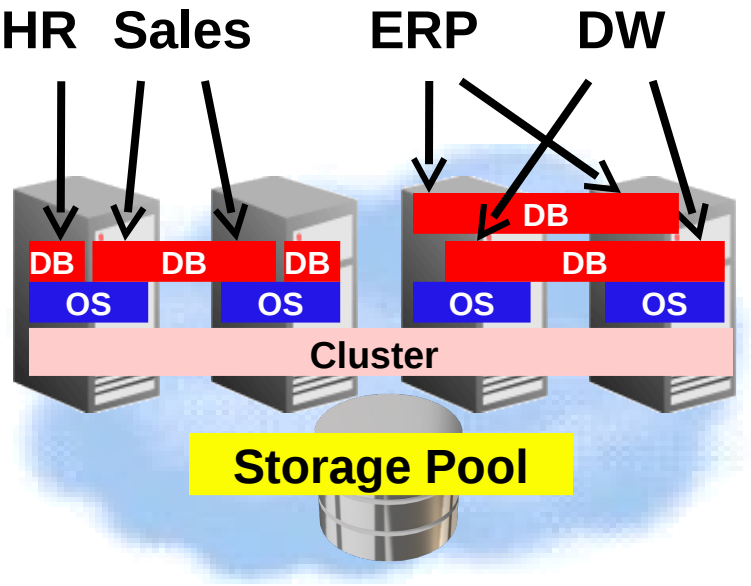
# Private Database Cloud
## Provision Databases Natively

- Single Instance/ Real Application Clusters
- Requires common OS
  - Linux, Unix, Windows
- High consolidation density
  - Servers, storage and OS
- Excellent performance
  - No hypervisor overhead
- High ROI
  - Especially using commodity hardware



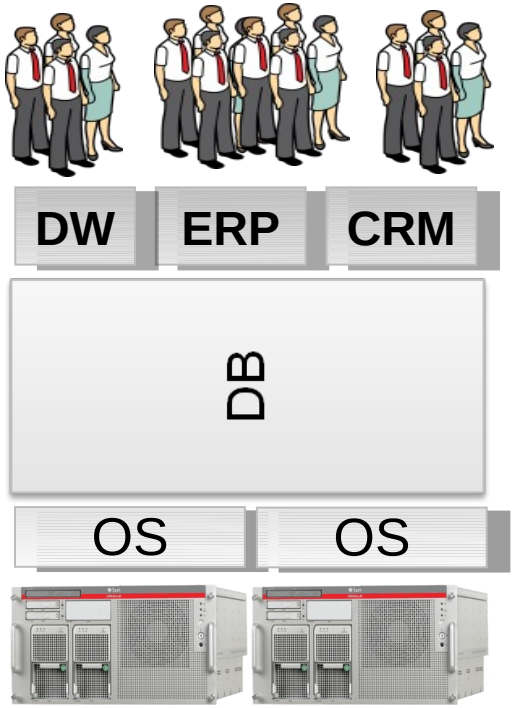
# Database Cloud
## Provision a Database

- **Pros**
  - Consolidation density
  - ROI
  - Performance
  - Supports any app
  - Good Isolation
- **Cons**
  - Requires OS standardization



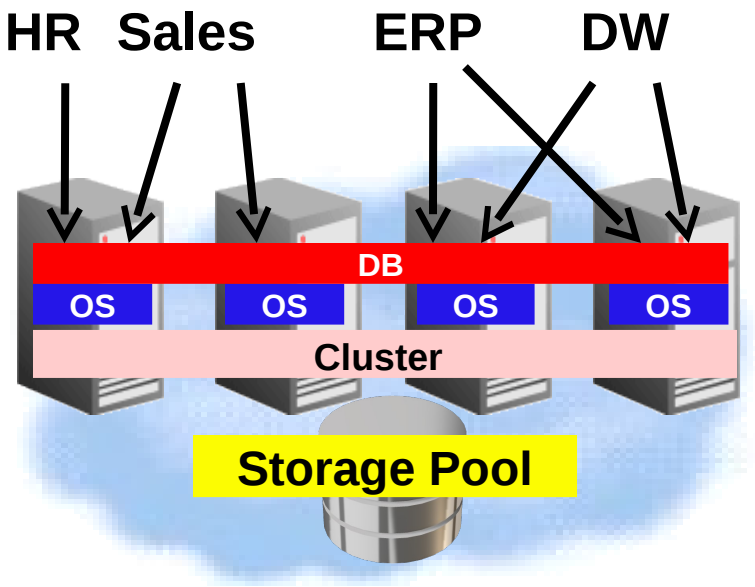
# Private Database Cloud
## Provision a Schema to a Shared Database

- Single Instance /Real Application Clusters
  - Extremely fast provisioning
- Requires common OS
  - Least isolation
- Highest consolidation density
  - Servers, storage, OS, database
- Excellent performance
  - Fewest database instances
- Highest ROI
  - But, requires application validation



# Database Cloud
## Provision a Schema

- **Pros**
  - Most efficient
  - Extremely fast provisioning
  - Best ROI
  - Performance
  - Efficient memory use
- **Cons**
  - App qualification required
  - Requires OS and DB standardization
  - Least Isolation



# Architectural Assessment

## Pick the Cloud architecture that best suits your needs

**Infrastructure Cloud** | **Platform as Service**

### Server

- Lowest ROI
- Easiest to Implement
- Can consolidate existing environment as-is
- Best Isolation
- Consolidate mixed workloads
- Coarse-grained resource management (VM level)
- High Availability

### Database

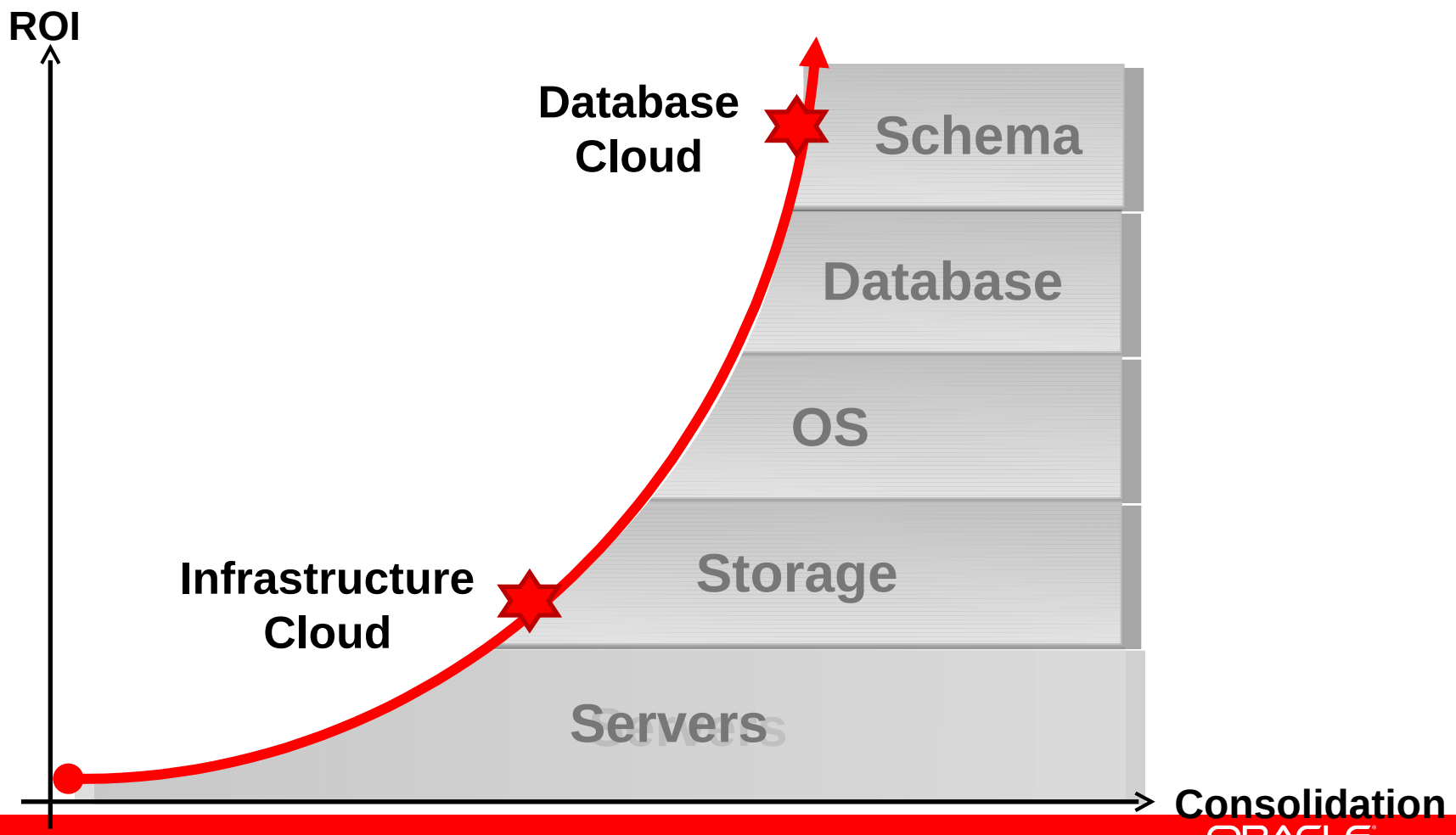
- Good ROI
- Easy to Implement
- Requires some standardization (OS)
- Managed by DBA
- Good Isolation
- Consolidate DB workloads only
- Fine-grained resource management (DB Service)
- Maximum Availability

### Schema

- Highest ROI
- Requires most standardization (OS and DB)
- Managed by DBA
- Least Isolation
- Consolidate DB workloads only
- Fine-grained resource management (DB Service)
- Maximum Availability

# Private Database Cloud

## Greatest consolidation, maximum ROI

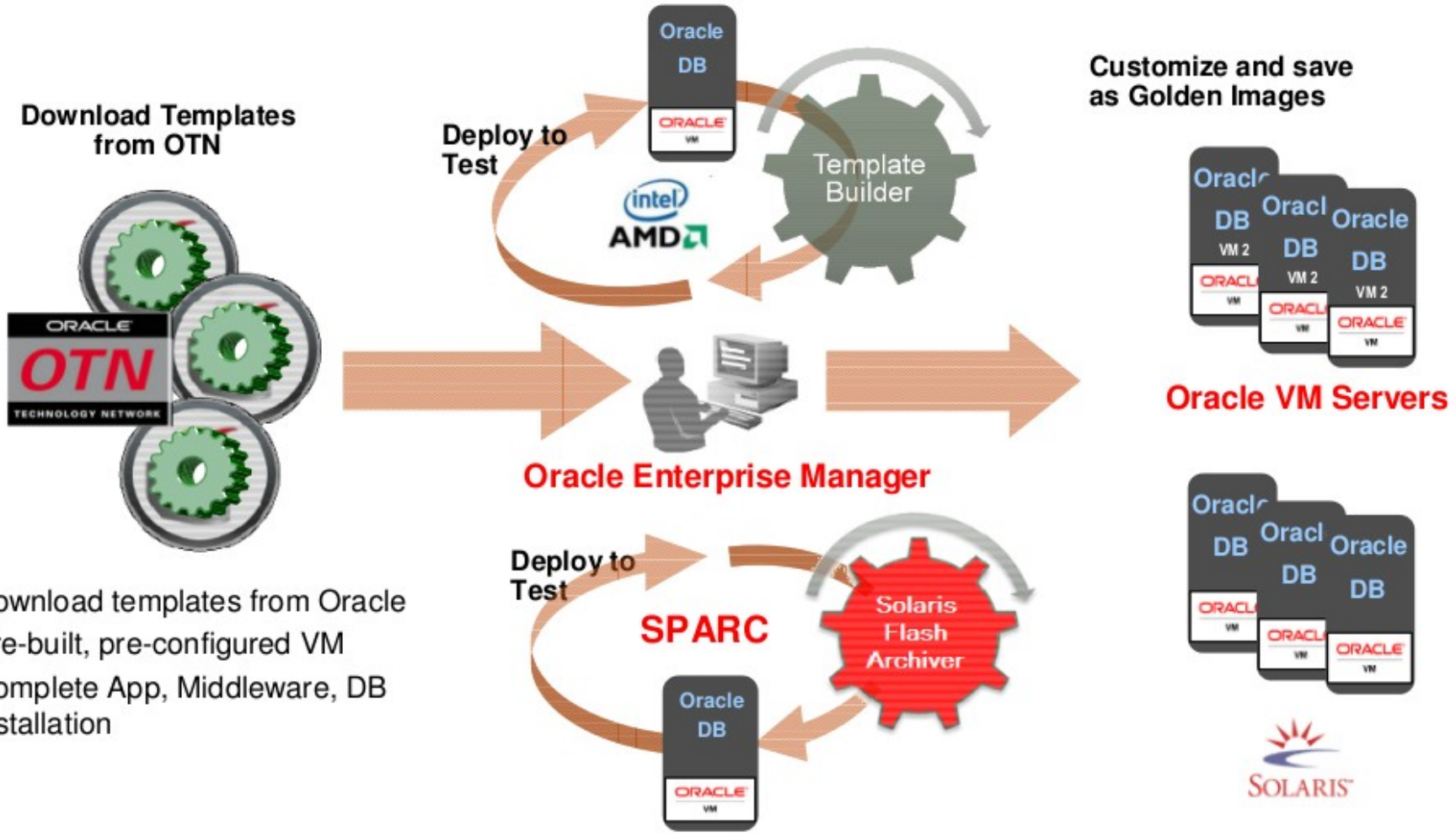


# PRIVATE DATABASE CLOUD ENABLING TECHNOLOGIES

# Server Virtualization Provisioning

| Technology | Benefits |
| --- | --- |
| **Oracle VM for x86** | ▪ Virtualize Commodity Servers<br>▪ Consolidate<br>▪ Migrate Workloads<br>▪ OS-level Isolation<br>▪ Archive Application Environments |
| **Oracle VM for SPARC (LDOMs)** | ▪ Highly Scalable Technology<br>▪ Consolidate<br>▪ Complete Hardware-Level Application Isolation<br>▪ Resize Domains without Rebooting |
| **Solaris Containers** | ▪ Single OS to Manage and Patch<br>▪ Largest UNIX/Linux OS Install Base |

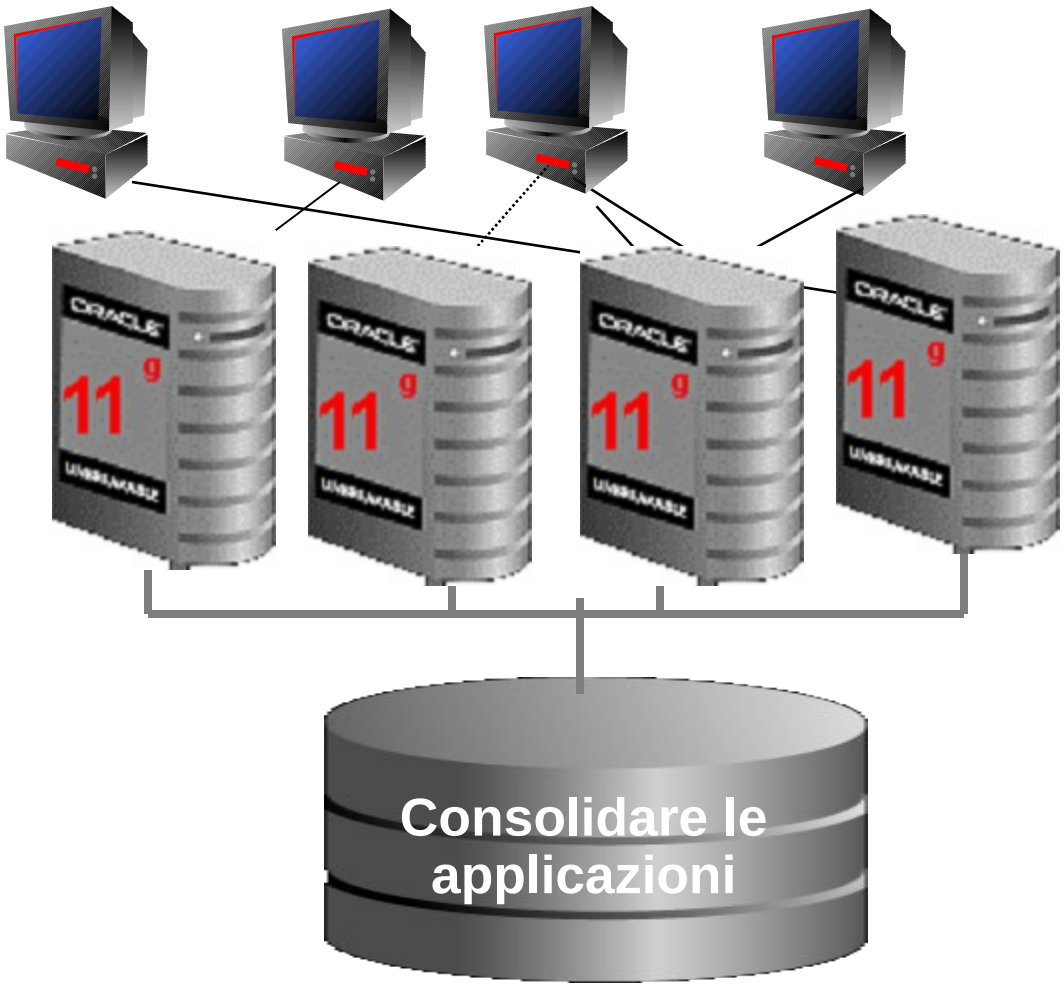
# Server Virtualization Provisioning



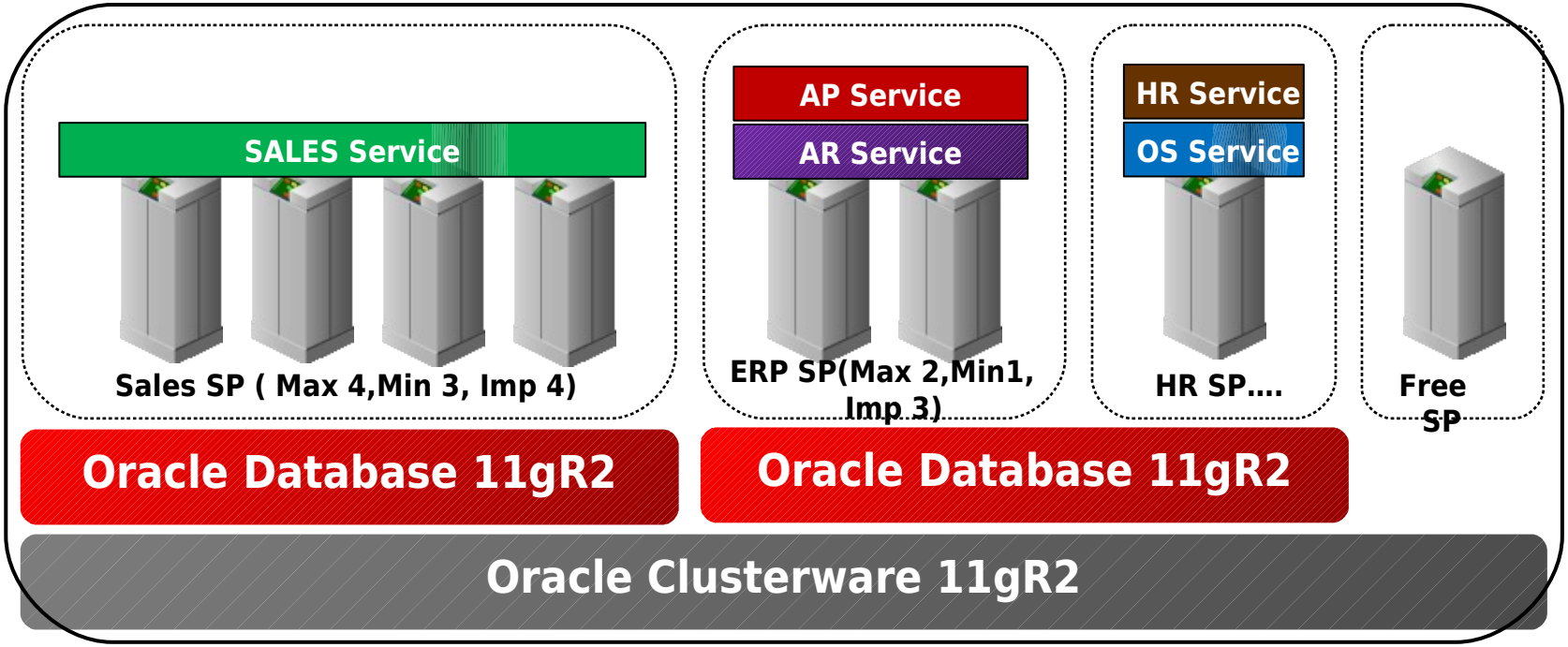

- Download templates from Oracle
- Pre-built, pre-configured VM
- Complete App, Middleware, DB installation

# Real Application Cluster

- Scalability
- High Availability
- Performance



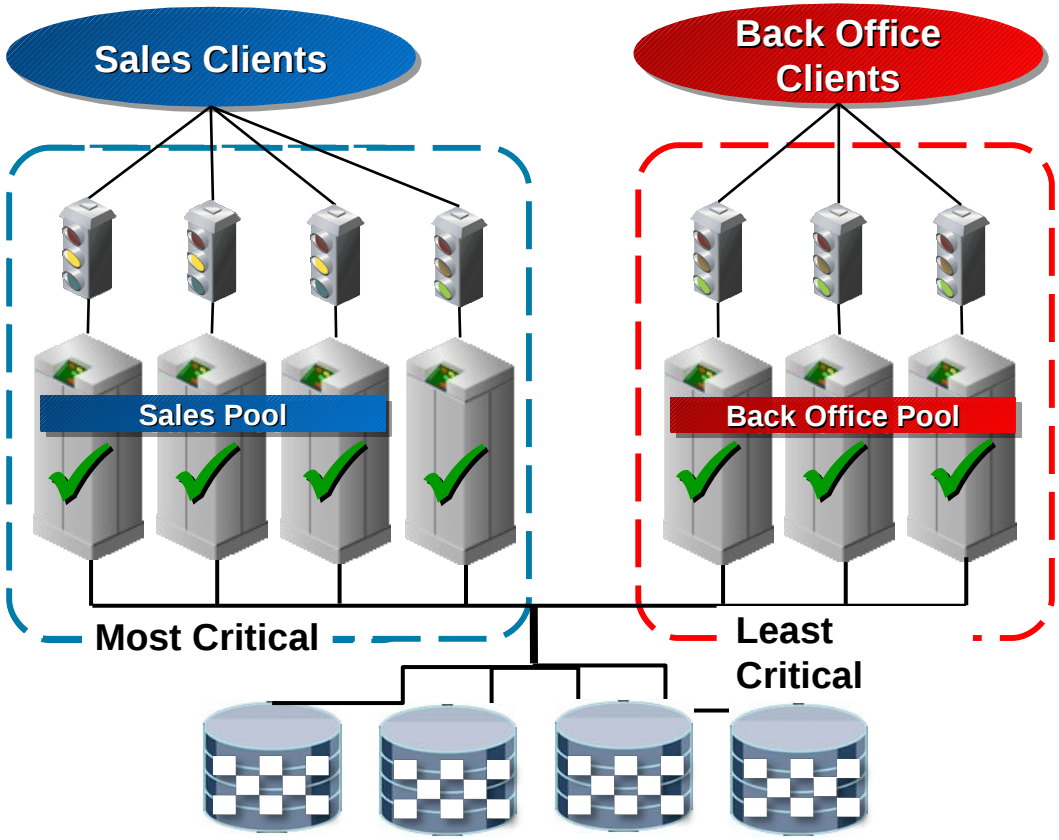
# Oracle Clusterware 11g R2
## - Database Server Pools




- Dynamically manage DB resources for services by Policy
- Control availability with Min, Max, & Importance attributes
- Easily Manage large clusters hosting multiple databases

# Oracle Quality of Service Management

## - The Oracle Approach in Action




**Recommendation: All Performance Objects being met.**
**Action: No action required.**

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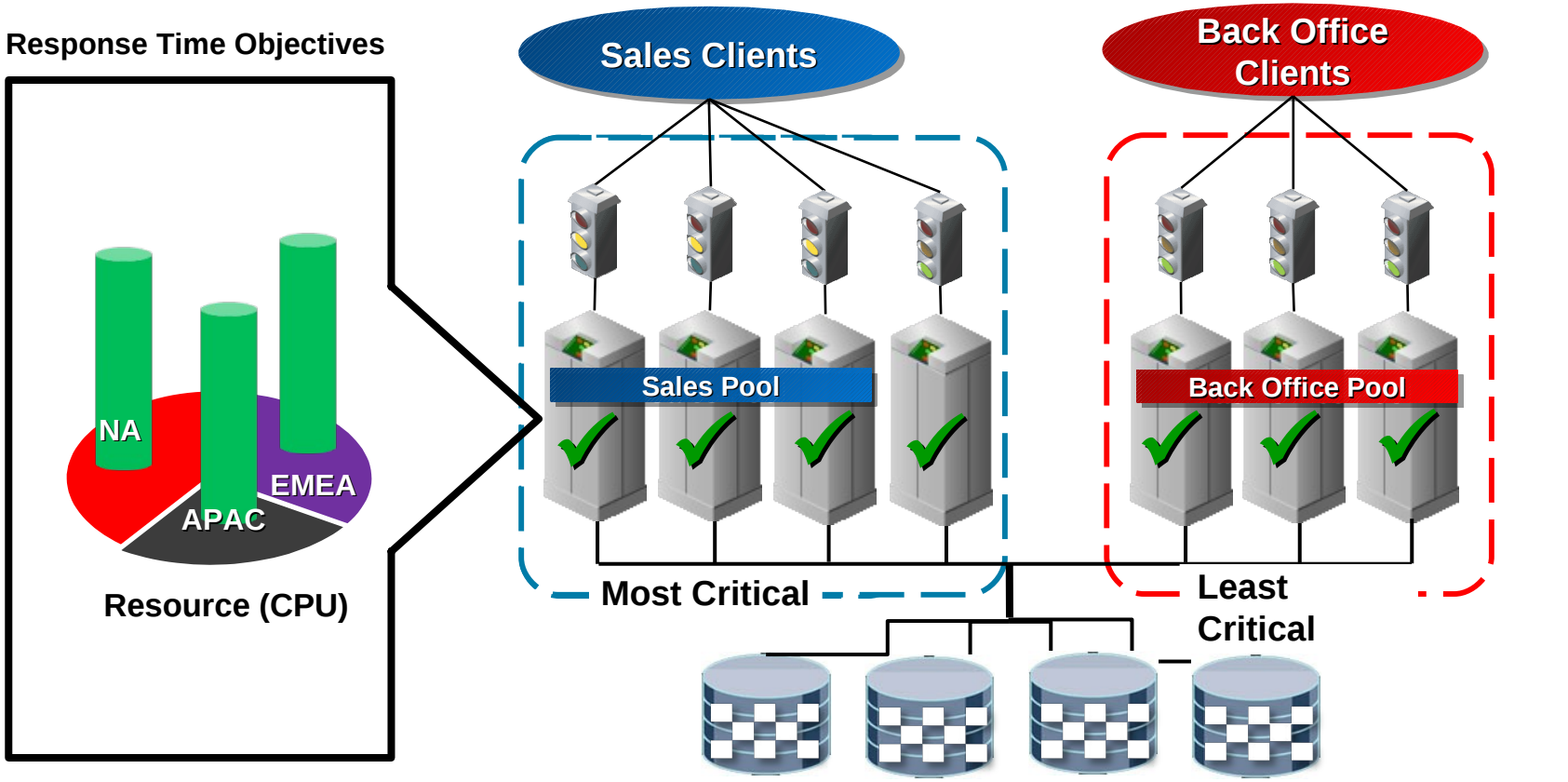


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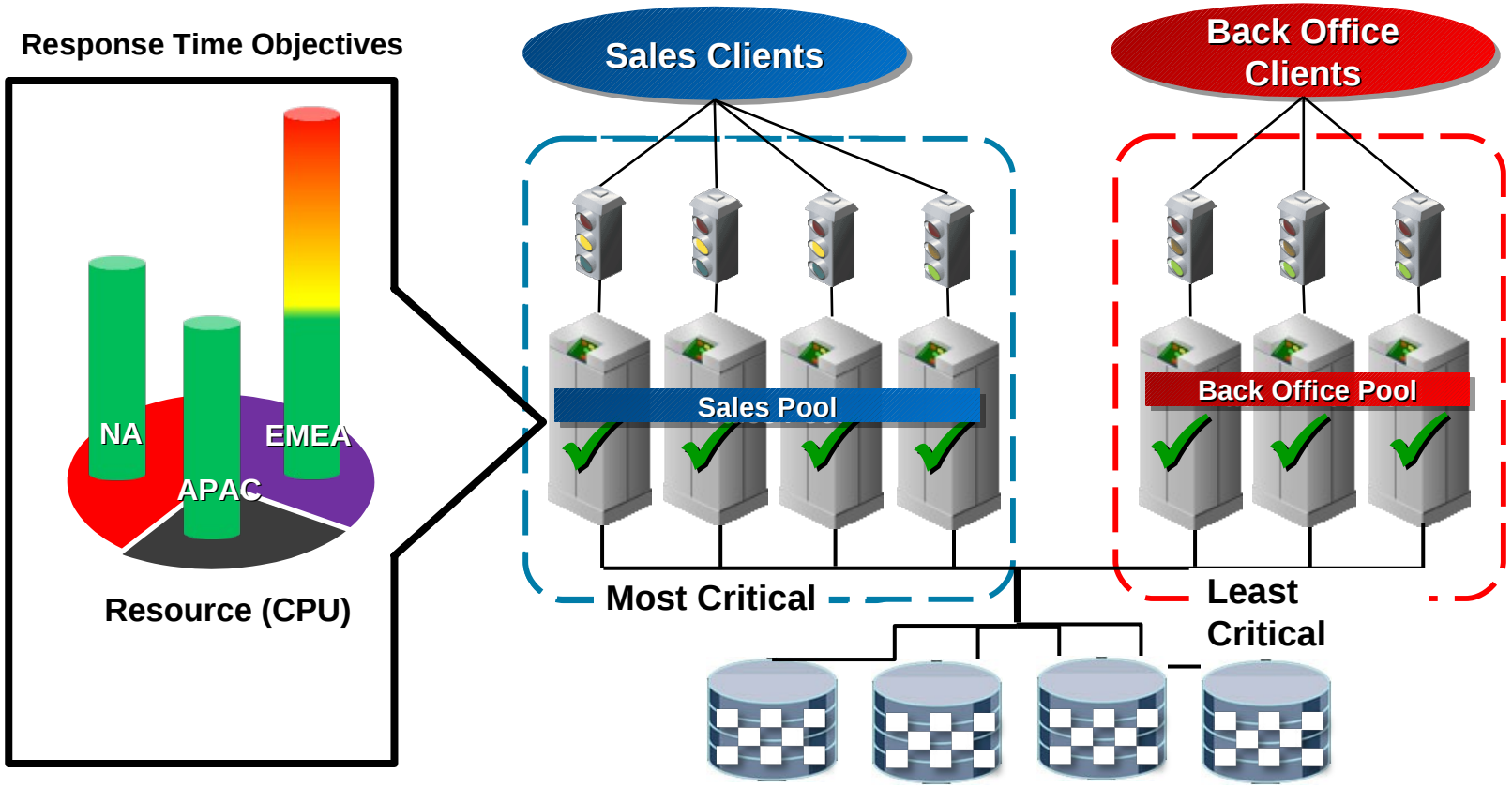


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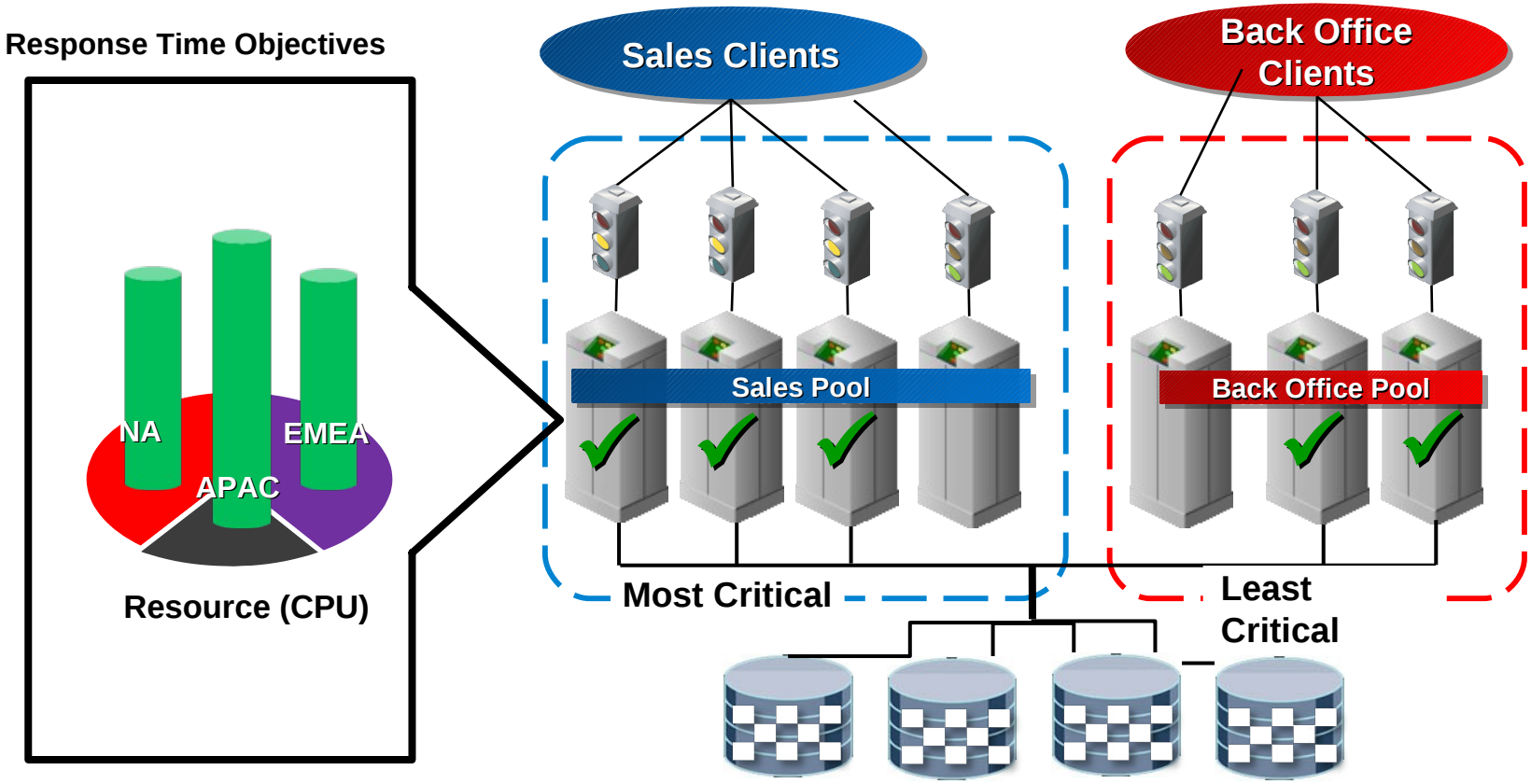


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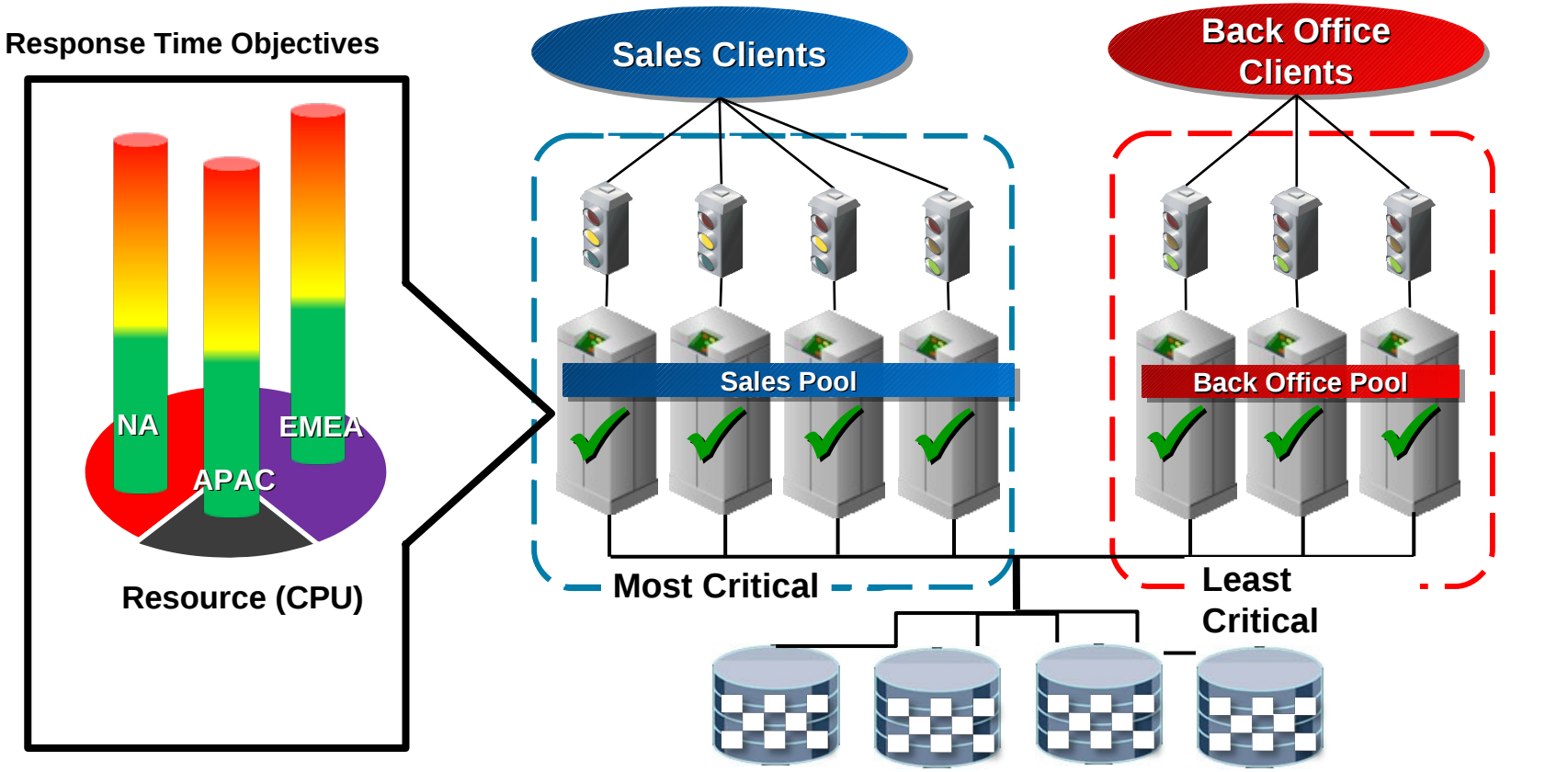


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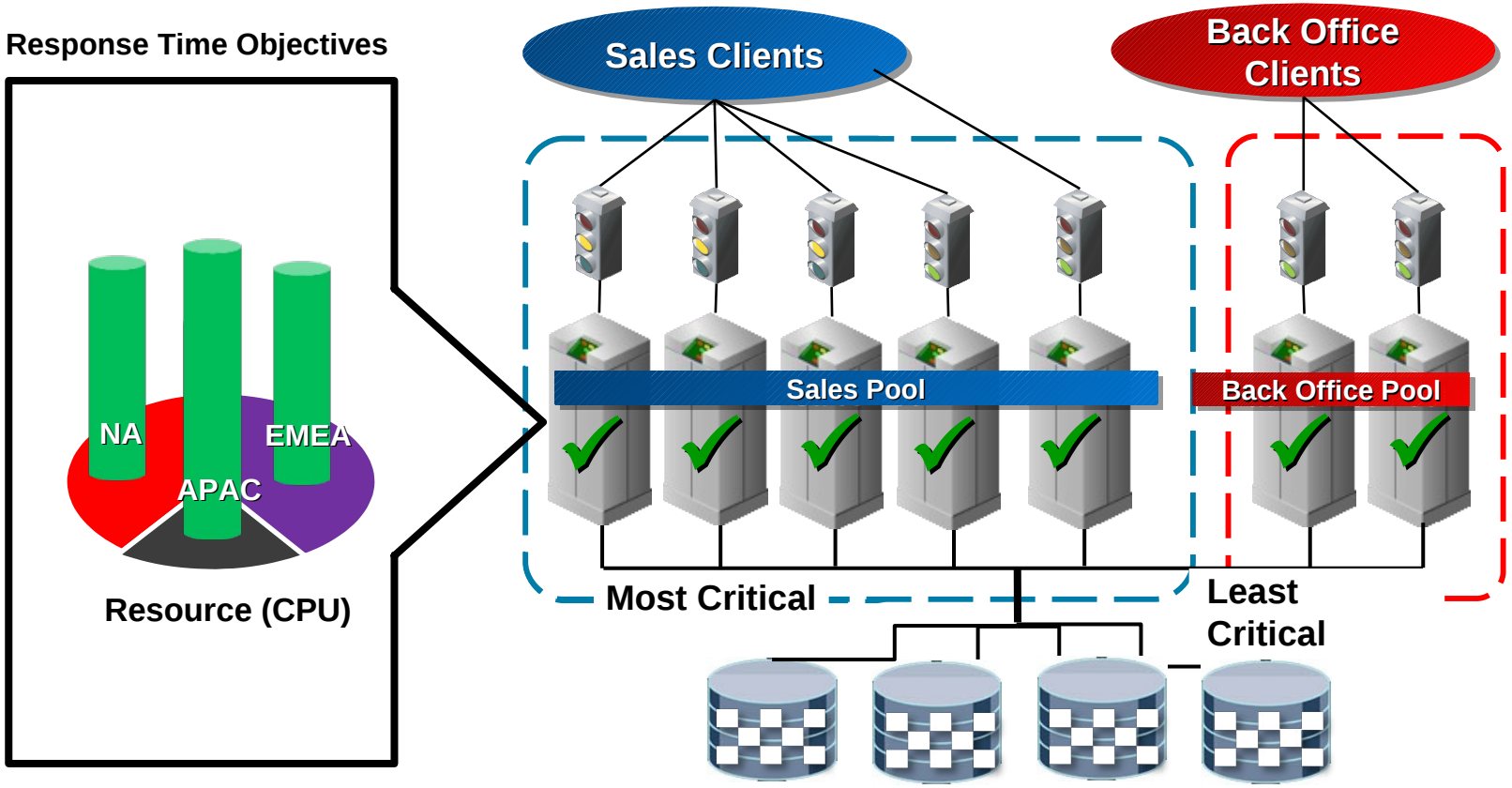


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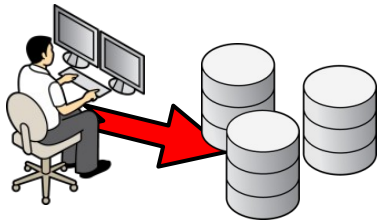
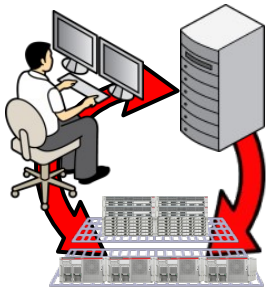
# Provisioning Software to the Cloud

## Lower complexity via Reference Configurations

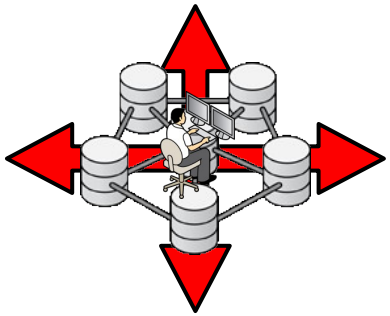


Create Reference Configuration

Stage As Gold Image



Provision Database On Cloud



Manage Centrally

- Gold image reference configurations
- Standardized deployments via profiles
- Rapidly provision databases to the Cloud
- Monitor change centrally to ensure compliance

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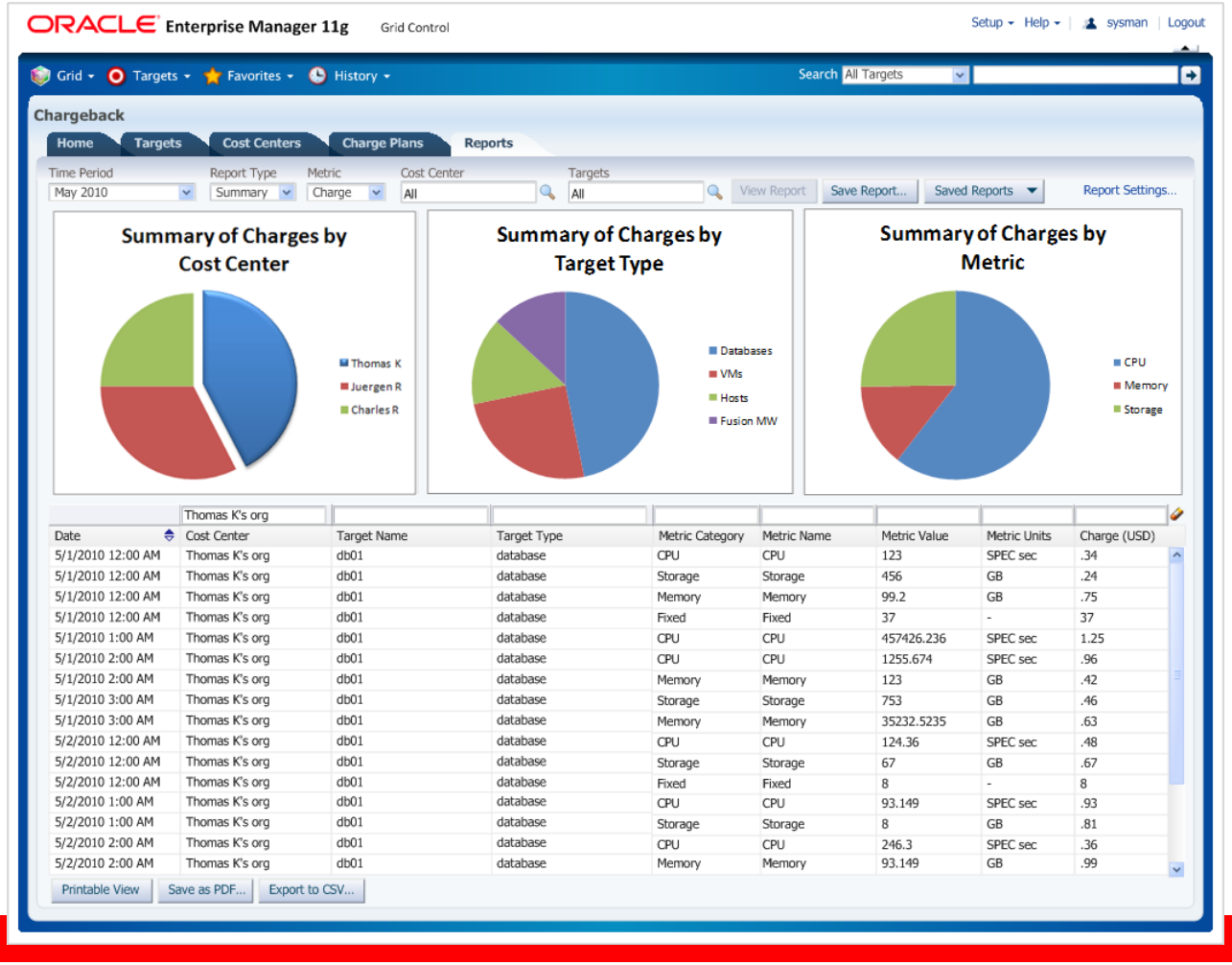
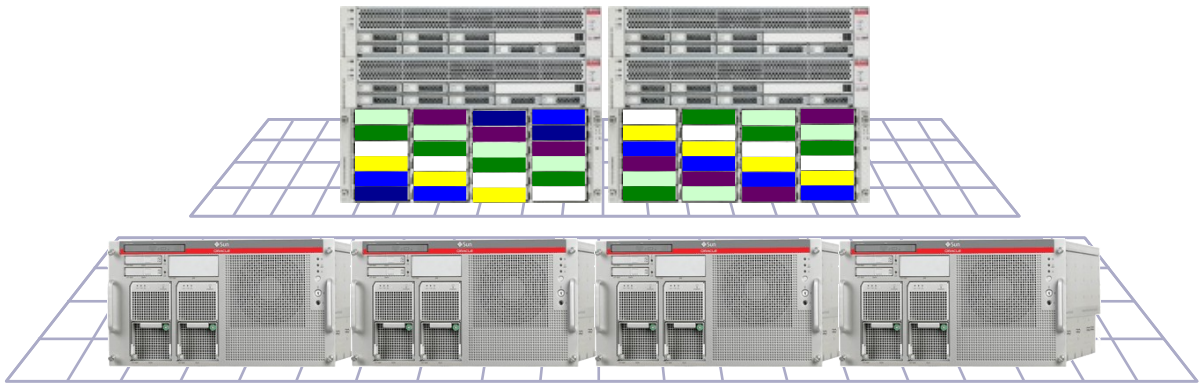
# Monitoring, Metering and Chargeback

## Share costs across user groups



# Automatic Storage Management

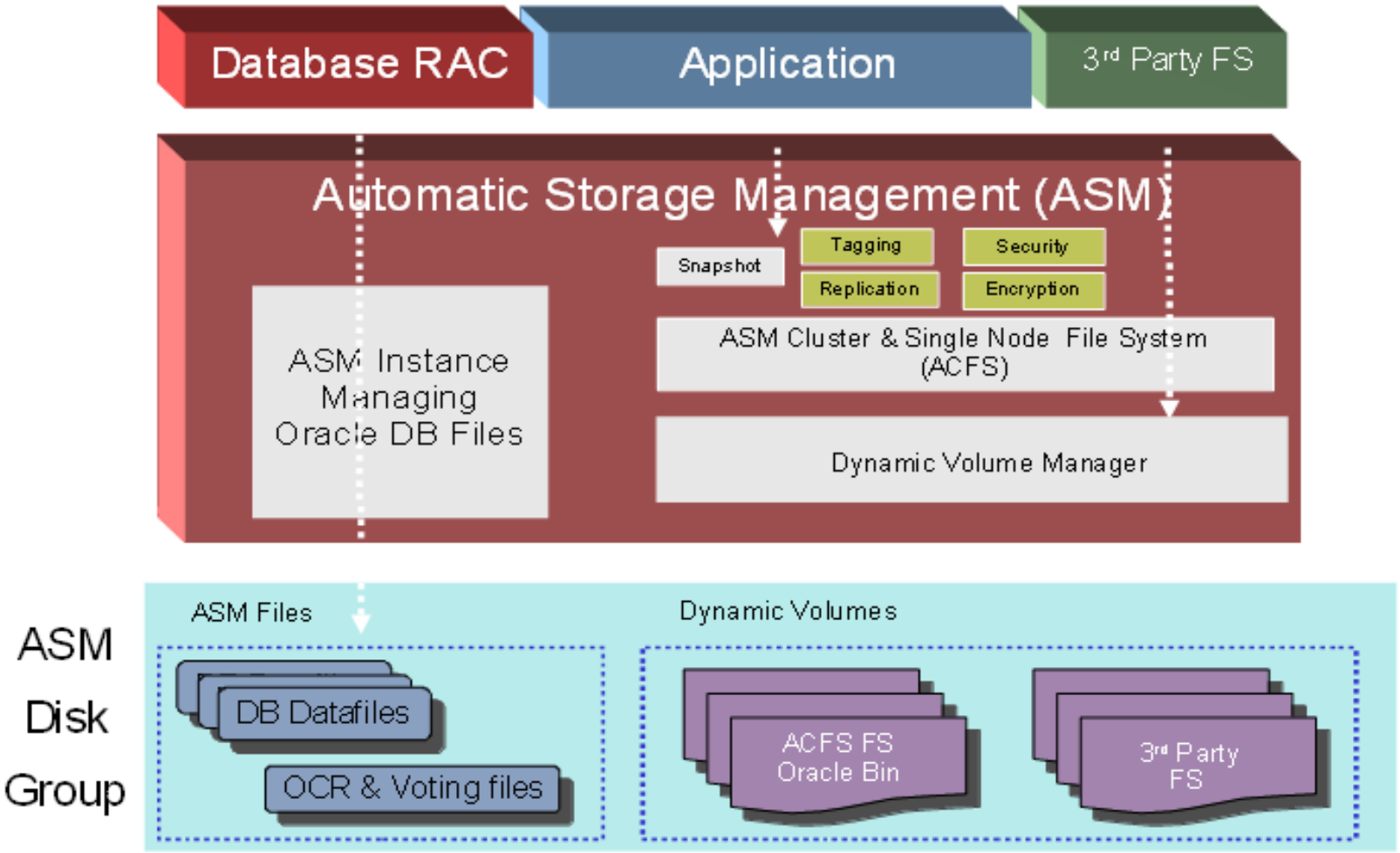
## Virtualize and share storage resources



- Automates storage management
- Advanced data striping for maximum I/O performance
- Capacity on demand
- Optional mirroring protects from disk failure

# ASM / ACFS Enhancements

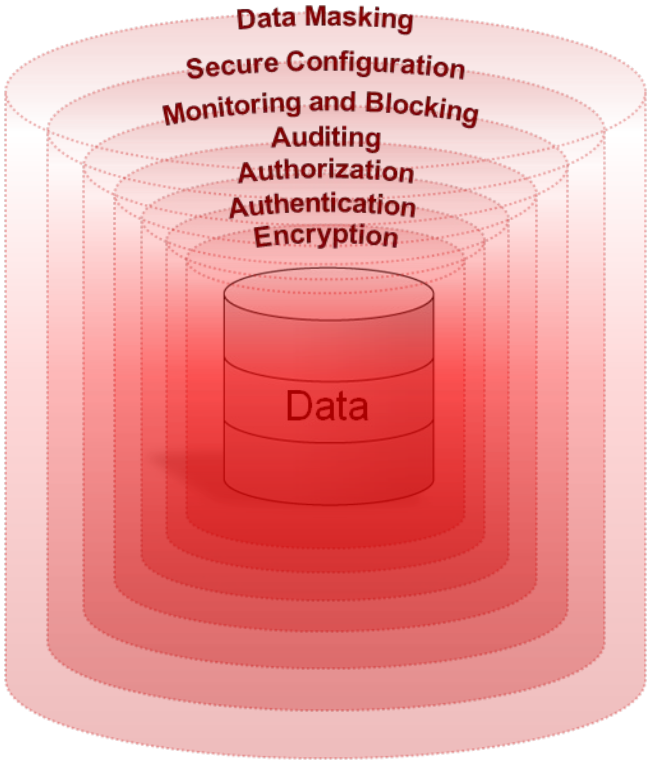
## Extending ASM to manage ALL data



# Physical Standby with Real-Time Query


- Read-only queries on physical standby concurrent with redo apply
  - Supports RAC on primary and/or standby
  - Queries see transactionally consistent results
  - Handles all data types, but not as flexible as logical standby

# Oracle Database 11g
## Complete Data Security




- Oracle Advanced Security
- Oracle Identity Management
- Oracle Database Vault & Label Security
- Oracle Audit Vault & Total Recall
- Oracle Database Firewall
- Oracle Configuration Management
- Oracle Data Masking

# Database Consolidation

## Exadata

- Server rationalization
  - OLTP + OLTP …
  - Data mart + data mart…
  - System life-cycle
    - Production + test + development
- Mixed workload
  - Operational BI
  - Real-time data warehousing
  - Embedded reports, analytics
- Schema integration