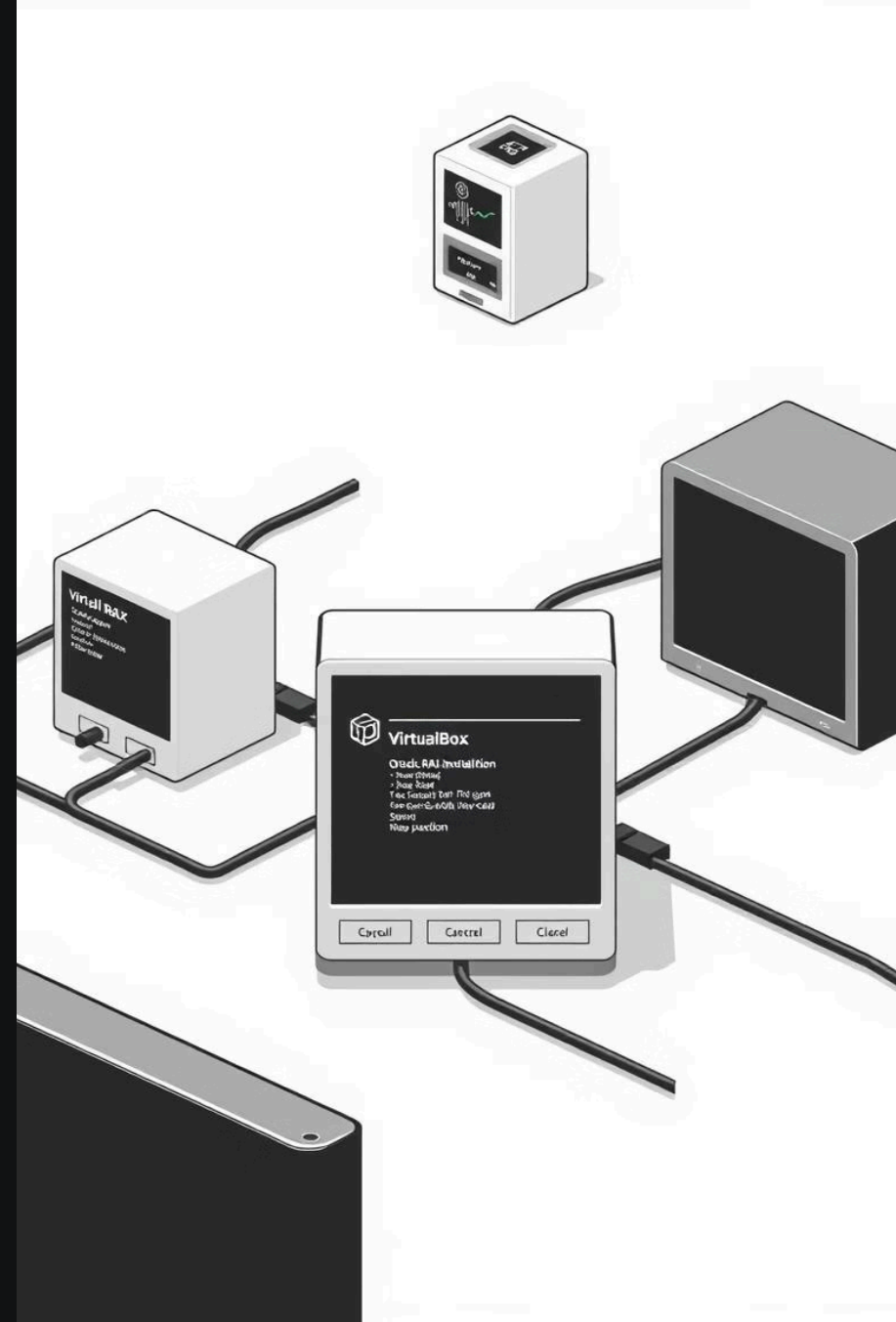


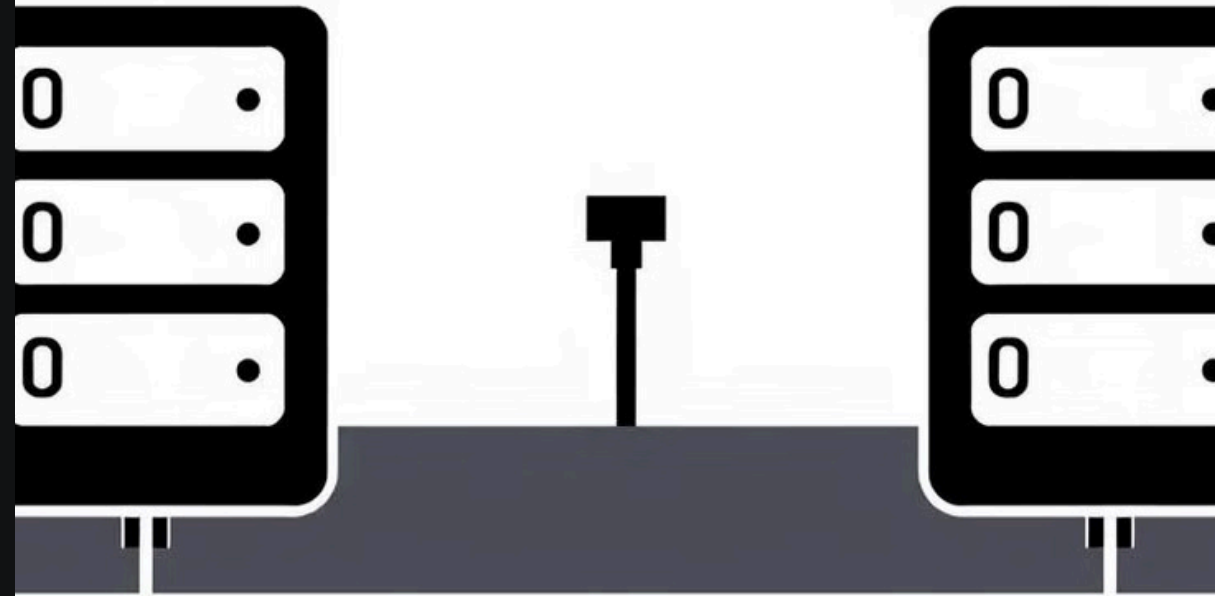
Oracle RAC Installation on VirtualBox

This presentation outlines the steps involved in installing an Oracle Real Application Clusters (RAC) environment on VirtualBox.



Summary

- Introduction
- Overview of Oracle RAC
- Results and Analysis
- Conclusion



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Introduction

Oracle Real Application Clusters (RAC) is an Oracle clustering solution that allows multiple servers to operate as a single database using shared storage. It ensures workload distribution, high availability, and fault tolerance through features like automatic failover and load balancing. RAC enhances performance and guarantees business continuity, making it an ideal solution for enterprises with mission-critical database operations.

Objectives

High Availability | Enhanced Performance | Fault Tolerance | Scalability

OVERVIEW OF ORACLE RAC: Operating Principles

1. Distributed Architecture:

- Oracle RAC operates across multiple nodes, each running a database instance.
- These nodes share a single physical database, allowing for distributed query processing and improved performance.

2. Shared Storage:

- All cluster nodes access a shared storage area, typically managed by Oracle ASM.
- This ensures data accessibility even if a node fails.

3. Node Interconnection:

- Nodes communicate via a high-speed, redundant network interconnect.
- This enables data access coordination and transaction synchronization across instances.

OVERVIEW OF ORACLE RAC: Operating Principles

4. Fault tolerance:

- If a node fails, other nodes automatically take over.
- Oracle Clusterware manages this process seamlessly for end users.

5. Load Balancing:

- Oracle RAC distributes queries evenly across nodes.
- This optimizes resource utilization and prevents bottlenecks.

6. Scalability and Flexibility:

- New nodes can be added to an existing cluster without downtime.
- This allows for horizontal scaling to meet growing business needs.

Essential components

1-Automatic Storage Management (ASM)

ASM (Automatic Storage Management) is a storage management system developed by Oracle, designed for managing shared storage in a RAC (Real Application Clusters) environment.

Key Features:

- **Storage Abstraction:** Simplifies storage management by eliminating the need for manual file handling.
- **Automatic Allocation:** Automatically manages the allocation and distribution of database files across physical disks.
- **Disk Failure Protection:** Provides redundancy mechanisms to safeguard against disk failures.

ASM Disk Groups:

Physical disks are organized into logical units called "disk groups," enabling centralized and optimized management of shared storage.

Essential components

2-Oracle Clusterware

Key Features:

- **High Availability:** Provides resource and high-availability management.
- **Node Management:** Handles the addition and removal of cluster nodes.
- **Failover Coordination:** Manages failover and recovery mechanisms in case of failures.

OCR (Oracle Cluster Registry):

Clusterware uses a centralized registry to store cluster configuration details, including active resources, database instances, and network information.

Essential components

3-Network Interconnect

A fast and reliable communication network is crucial for RAC clusters.

Key Features:

- **Node Communication:** Facilitates communication between cluster nodes.
- **Cache Synchronization:** Ensures cache synchronization between instances using Cache Fusion.
- **Redundancy:** Must be redundant to eliminate single points of failure.

Installing Oracle Database 19c

1

Installation

Install the Oracle 19c database software on each node.

2

Configuration

Configure the database to work with the Grid Infrastructure and the RAC environment.

3

Verification

Verify the installation and configuration of the Oracle 19c database and RAC environment.

CONCLUSION

In conclusion, the Oracle RAC cluster report highlights key aspects of its implementation, including high availability, scalability, and load balancing for critical databases. Oracle RAC enhances performance, reduces downtime, and improves resilience against failures, ensuring optimal operational continuity. These benefits lead to increased efficiency and significant ROI for strategic information systems.

