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VM

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# Virtual Machine High Availability

Presenter's Name
Presenter's Title

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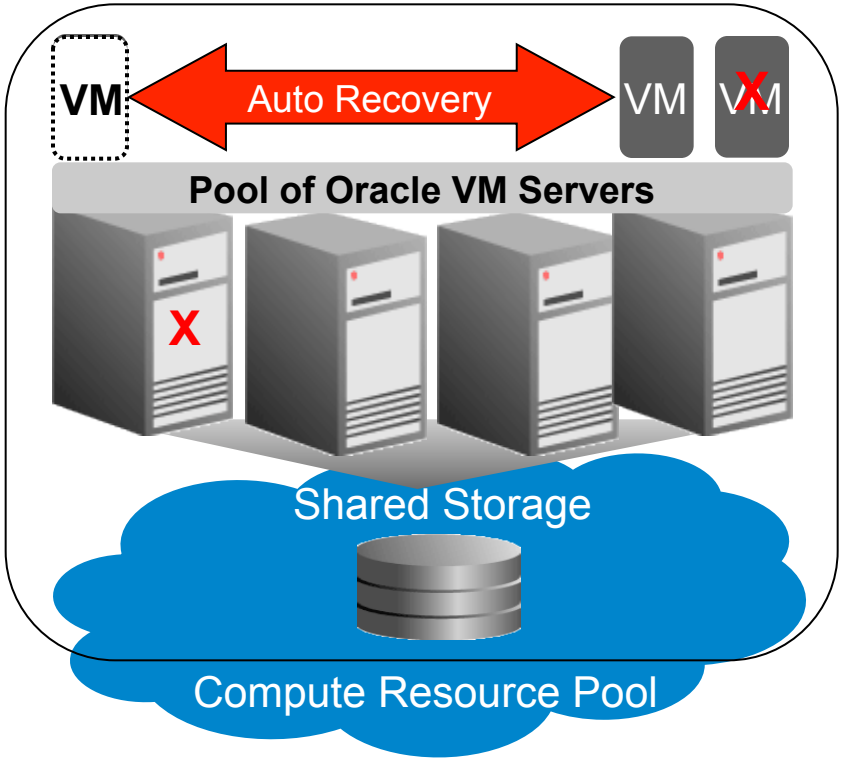
PARTNERNETWORK

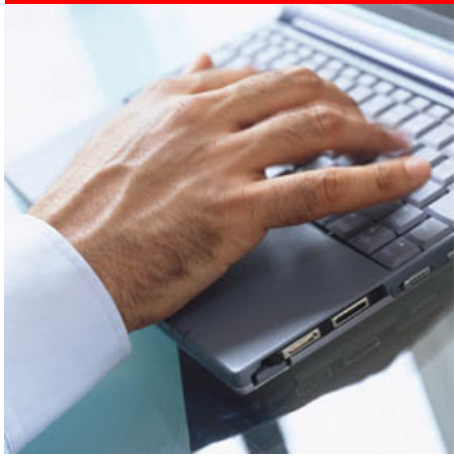
Specialized. Recognized by Oracle.
Preferred by Customers.

# Built-In High Availability

## Auto Failure Recovery

- Increased Protection
  - General VM-level protection for non-cluster-aware workloads
  - No manual intervention
- Fast Recovery from Unplanned Events:
  - Physical compute node failure
  - VM/OS level failures





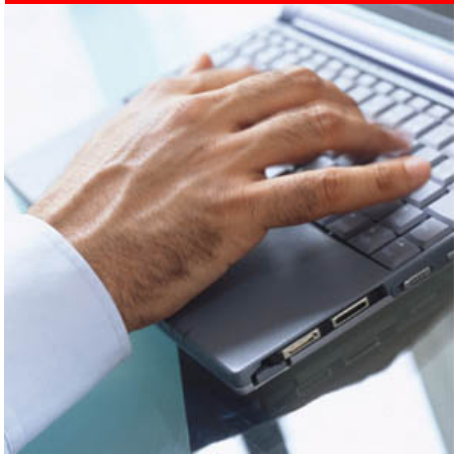
# Oracle VM Server Clusterware

# Why Clusterware?

- Virtual machine disk images and configuration files must be protected
- Administrator can start a virtual machine using Oracle VM Manager, xm create (command line) or XenAPI

- What if?
  - Virtual machine dies
  - After timeout, server pool master adds virtual machine to restart list
  - Admin logs in and issues the command: “xm create ...”
  - Server pool master starts guest
  - This is what Clusterware protects against



# Virtual Machine High Availability

# Virtual Machine High Availability

- **Automatic restart of failed virtual machines across the pool**
  - Server failure (all virtual machines restarted)
  - Individual VM failure
- **Reliable restart based on proven Oracle Clusterware technology**
  - Sophisticated heartbeat and lock management
  - Reliable failure detection and corruption prevention
- **Maximize up-time without complexity of traditional HA clustering**
  - Cost-effective solution
  - No virtual machine agents or modifications required

# Virtual Machine / HA Considerations

## (1 of 4)

- Excellent, easy way to make anything HA literally by checking a box
  - Do have to do one-time clusterware set-up for the pool, but that's all
- Failure detection more reliable/deterministic than VMware's HA
  - VMware: Uses network pings and disk reserve/release locking
    - Notorious "node isolation" problems, i.e., problems handling servers that it cannot contact but that still might be running
    - Often results in virtual machines shutting down, but not restarting
  - Oracle VM: Uses network and storage pings and disk locking
    - More accurate/deterministic detection of node failure to prevent "false positives/negatives" and maximize uptime

# Virtual Machine / HA Considerations

## Failure Detection (2 of 4)

Two techniques:

- 1) Individual guest failure detection:
  - Detected by the agent-collected status
    - Are all “Running” status virtual machines running?  If not, restart
- 2) Complete server failure detection
  - OCFS2 clusterware driven detection
    - Effectively makes pool into HA cluster
    - Network- and storage (quorum disk) pings

# Virtual Machine / HA Considerations

## Failure Detection (3 of 4)

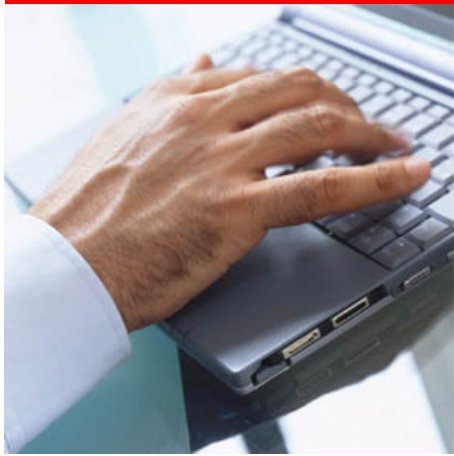
- Failure detection timing:  generally up to 2 minutes to trigger restart…based on time-outs and retries
  - Clusterware timing is configurable but making it too aggressive risks "false positives"

# Virtual Machine / HA Considerations

## HA Restart (4 of 4)

- It is a restart of the virtual machine based on what is on-disk:  it is what you would have if you hit the power switch
  - In-flight, uncommitted data may be lost
  - This is NOT a replacement for RAC: no “continuous availability”
- Virtual machine restart uses the same algorithms as a normal virtual machine start:
  - Preferred server policies will be respected
  - The VMs will be load balanced across the pool
- Virtual machine restart order after server failure(s) is based on order that virtual machines failed



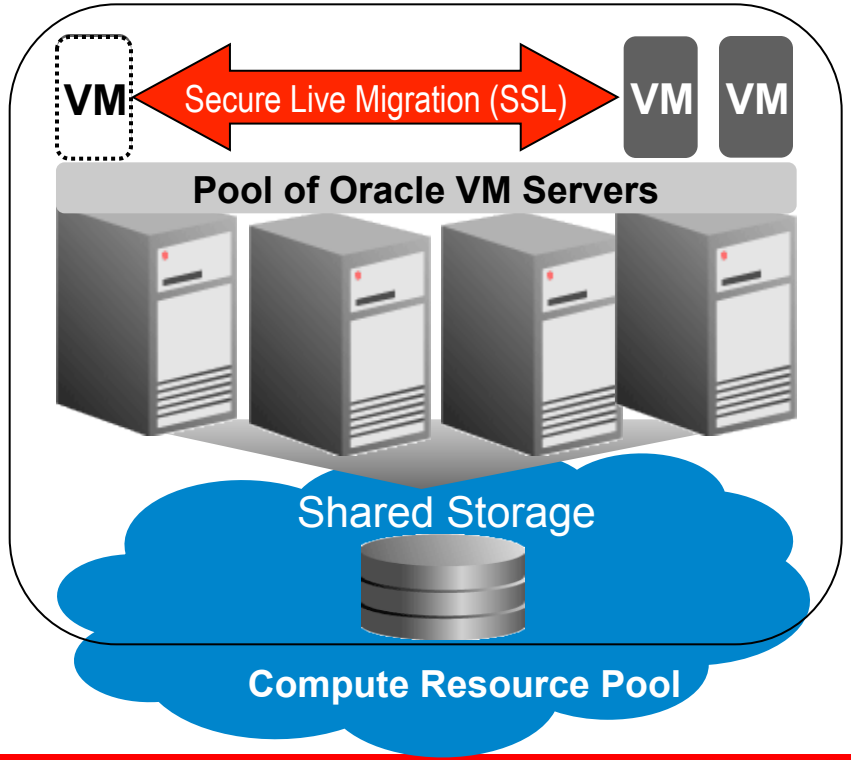
# Secure Live Migration

# Secure Live Migration

## Uninterrupted Business Services

- Encrypted Live Migration
  - no additional hardware required
  - eliminates requirement for a dedicated network
- Avoids migrating a VM over the wire “in the clear”
  - no risk of exposing sensitive data, e.g., passwords, account numbers
- Zero interruptions from planned events:
  - Maintenance or upgrades
  - Rebalancing workloads

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# Hardware and Software

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# Engineered to Work Together

 


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