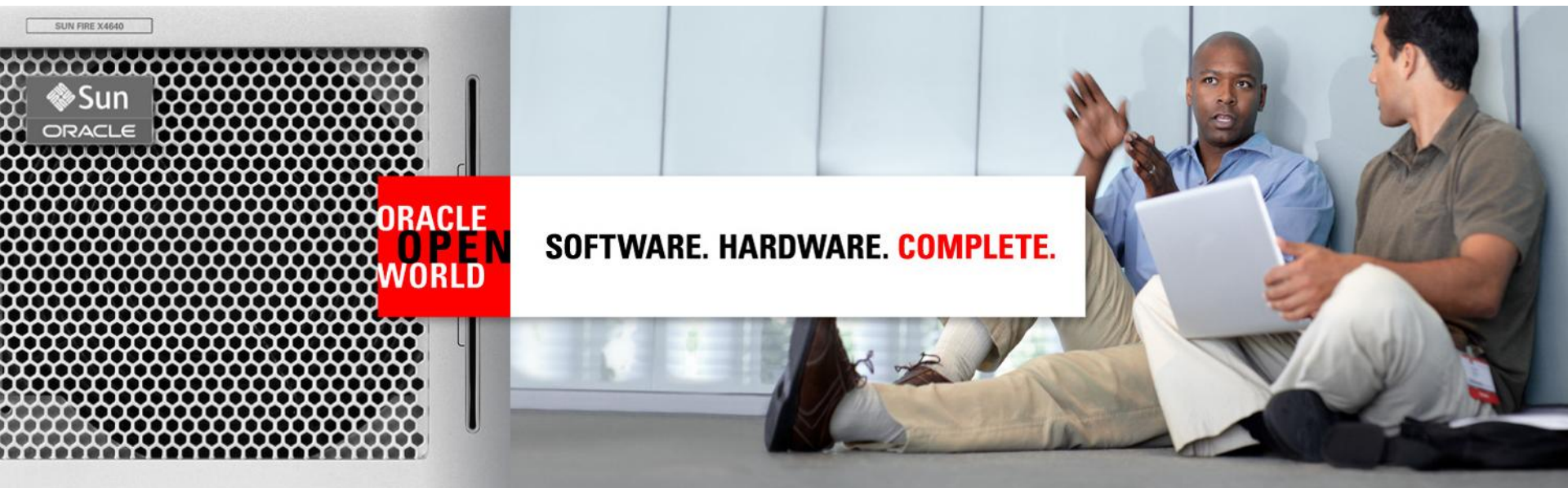


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Best Practices for Oracle Database and Client Deployment on Windows

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Program **Agenda**

- General Deployment
- Patching
- Client Deployment
- Server Deployment
- New 11.2 Install and Deployment Features
- RAC Deployment



A man in a dark suit, light blue shirt, and striped tie is sitting in an office chair, gesturing with his right hand. He is positioned in front of a large server rack. The server rack has a perforated metal front and various control buttons and indicators on the right side. The background is a blurred office setting with large windows.

General Deployment

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General Deployment Options

- Oracle Universal Installer (OUI)
 - GUI-driven install
 - Great for individual database and client deployments
 - Can be interactive with a pre-defined response file
- Silent install
 - Automate the installation and configuration fully or partially
 - Can be pushed with Microsoft SMS or other install products
 - For large scale database and client deployments
- Enterprise Manager Grid Control
 - Highly recommended for database deployments
 - Great for large scale deployments

OUI Interactive Mode

- Normal interactive install
- Interactive install with input fields defaulted to pre-defined values
 - Admin defines defaults in the response file
 - Setup.exe <response file>

Response Files

- Generating response files
 - Run OUI interactively and record a response file
 - Setup.exe -record -destinationFile <response_file>
 - Generates .RSP file
 - Customize existing response file via text editor
 - .RSP file is a text file
- Don't use response files generated by older Oracle installers
 - Generally best to use the response file from version planned to deploy

Silent Install

- Unattended installs
 - Great for ISV packaging and large-scale deployments
- Silent mode
 - No screen prompts
 - Setup.exe -silent <response file>

Microsoft Systems Management Server

- Change and configuration management for the Microsoft platform
- Provide relevant software and updates to users quickly and cost-effectively
- Used to deploy patches and application upgrades for multiple installs

Multiple Oracle Deployment with SMS

- SMS steps to build an installable software image
 - Take a snapshot of a build machine without the software installed
 - Install Oracle and bundled patches
 - Take another snapshot with new software installed
- Use SMS to push installation image to target computers
 - Ensure targets start from a consistent base image
- Works with Oracle database clients, servers, and RAC

A man in a dark suit, light blue shirt, and striped tie is sitting in an office chair, gesturing with his right hand. He is positioned in front of a large server rack. The server rack has a perforated metal front and various control buttons and indicators on the right side. A red banner is overlaid on the image, containing the word "Patching" and a small white box with the text "SOFTWARE. HARDWARE. COMPLETE.".

Patching

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Oracle Patching

- Patchset (e.g. 10.2.0.x)
 - Accumulation of bundled patches since last patchset plus some additional fixes
 - No architecture changes and new functionality is rare
 - 12 month release cycle
 - Very well-tested
- Bundled patch (e.g. 10.2.0.5.x)
 - Each patch is cumulative
 - Accumulation of bundled patches, PSUs, and bug fixes since last patchset
 - Around every 2 weeks release cycle
 - Well-tested

Oracle Patching

- One-off patch
 - Provided for P1s on top of last PSU within the last six months
 - Not intended to be a long term fix
 - Limited testing
- Fixes included in one of the next two patch releases
- If patch backport needed, request it and provide justification
- Unix patching different from Windows
 - Unix has more one-offs because DBAs compile fixes into existing Oracle deployment
 - This is atypical for Windows admins, which is why Oracle has bundled patches on Windows

Oracle Security CPUs

- Published once a quarter
- Security fixes only
- If applying only one set of patches, these are the most highly recommended
- Recommended Procedure
 - 1. Install latest Oracle patch
 - 2. Apply security CPU on top
- CPU built on top of the latest Oracle patch
 - Oracle patches contain cumulative security CPU fixes

Patching Best Practices

- Make plans to test and apply future patchsets
- At minimum, apply CPU patches released quarterly
- If encountering possible bug, apply latest patchset and fifth-digit patch available
 - Eliminates known issues first

OPatch

- OPatch is an Oracle-supplied utility
 - Assists with applying interim patches
 - Roll back interim patches if necessary
 - For database clients, servers, and RAC
 - Make sure to use the latest OPatch version
- Easy to use
- Uses Oracle inventory
- For OUI-based Oracle Homes

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Client Deployment

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Instant Client (IC)

- Package of binaries
 - Zip file
 - Install done manually or through a third-party installer easily
 - Lots of control of the installation process
- Provides additional deployment options for ISVs and for large scale deployments
 - Includes features that make these deployments easier
- No functionality difference between IC and standard client components

Instant Client Benefits

- Greater control over install process
 - Xcopy
 - Fine grain control over installation process
 - Great for large scale deployments or ISV packaging
 - OUI
 - Great individual deployments
- Xcopy – smallest install size
- Xcopy – fast client deployment

Instant Client XCopy Deployment – Install process

- Step 1: Unzip and copy IC files to disk
- Step 2: Run install.bat
 - Provide parameters specifying product(s) to install, Oracle Home name, and target location
- Step 3: Add installation directories to Windows PATH
- Step 4: Modify NLS_LANG to desired locale

Instant Client XCopy Components

- JDBC-OCI
- ODP.NET
- ODBC
- Oracle Provider for OLE DB
- Oracle Services for MTS
- SQL*Plus
- Oracle Providers for ASP.NET
- OCI
- OCCI
- OO4O

Managing Database Connect Identifiers

- Centralize identifiers for all machines
 - Central file server – one TNS Names file to be referenced
 - Directory server – single centralized repository
 - Oracle Virtual Directory, Internet Directory, or Active Directory
- One identifier file per machine
 - Maintain tnsnames.ora file on each machine
 - TNS_ADMIN parameter sets file's directory location
- Maintain identifier within application
 - Easy Connect naming method
 - No TNS file needs to be maintained
 - Specify server host, port, and service name in conn. string
 - Best for testing and development, not for deployment

Working with Multiple Oracle Homes

- Multiple Oracle Homes (MOH) that are defined on the same computer are:
 - Necessary to support multiple Oracle applications on the same machine
 - E.g. packaged software
 - Helpful in testing, upgrading, and migrating production databases and clients
- Installed in different directories, for example:
 - Oracle 10.2.0: d:\oracle10\ora102
 - Oracle 11.0.0: d:\oracle11\ora110

Managing Multiple Oracle Homes with Standard Oracle Client Software

- Oracle client DLLs are loaded using Windows Path setting
- Use separate processes for different Oracle clients
- Web (IIS) solution
 - IIS supports separate worker processes in same instance
 - In IIS 6 for Windows Server 2003 and higher
 - SetDllDirectory for each process
- Client/Server solution
 - As each application starts up, set the PATH to point to the application's Oracle Home

Managing Multiple Oracle Homes in .NET

- Solution for ODP.NET 10.2.0.4 and higher
 - ODP.NET reads .NET config files for unmanaged client DLL location
 - Each app can use different Oracle unmanaged client DLLs even when same ODP.NET managed version is used
- DLL search order
 - 1. Current application directory
 - 2. Application config or web.config
 - 3. Machine.config
 - 4. Windows Registry
 - HKLM\Software\Oracle\ODP.NET\<version>\DllPath
 - 5. Windows System Path setting

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Server Deployment

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Database Cloning

- Exact copy of an existing database
- Great for creating a duplicate database for dev, test, and production
- Cloning databases saves time and effort and reduces errors
 - Clones include patches and configuration already applied
 - Clone Oracle homes or instances
 - Can be used by system admins, ISVs, SI solutions, etc.

Database Cloning Options

- Clone using Enterprise Manager
 - Ideal for cloning within a large organization and hosted DBs
 - Hot cloning with no downtime of source DB
 - Works well for large DBs
 - Can be used with features like "Convert to RAC" to do RAC to RAC cloning *OR* moving to RAC.
 - Advantage: easy to use
- Clone using Database Configuration Assistant (DBCA)
 - Ideal for ISVs or distributing standardized DBs across enterprise
 - Advantage: more flexibility and control

Database Cloning Options

- Manually cloning
 - Not recommended
 - Provides even more complete control
 - Now simpler with "RMAN Duplicate"

Enterprise Manager Database Cloning

- Web based wizard
- Select existing Oracle Home and point where GC should clone the database
 - One to one server
- Clone from live database or existing backups
- Can be scheduled to run at a future time
- Once cloned, alerts, metrics, patches, etc. will be setup automatically
 - Admins can add their own custom jobs or application changes

DBCA Database Cloning

- DBCA creates DB templates, which can have:
 - Seed – includes datafiles and structure
 - Nonseed – no datafiles, just structure
 - Modify existing templates
- Create RAC or single instance DB with same template
 - DBCA records DB creation and saves templates
 - XML file “scripts” with database creation information
- Package and transfer templates to target system manually
- Greater control over DB clone
 - Modify settings via DBCA
 - Change initialization parameters, storage parameters, apply custom scripts, security settings, automated maintenance tasks, backup and recovery settings, etc.

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New Install Features

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Full Install for Patchsets

New in
11.2

- Fast and easier install of Patchsets
 - No need to install base release first and then upgrade to a patchset
- Out-of-place Server Upgrade
 - Improved customer experience
 - Improved testing
 - Less downtime and safer
 - Direct database upgrade from previous releases
 - DB upgrade can be done one instance at a time
 - In-place Server upgrade not recommended
- Client upgrade
 - Flexibility for both in-place and out-of-place upgrade

Software Updates and Deinstall

New in
11.2

- Software Updates Option
 - Dynamically download and apply software updates as part of DB installation
 - Download updates separately and later apply during install
- Deinstall
 - Clean deinstall
 - Script also available from OTN
 - Can be used to clean up after partial install or deinstall

Online Patching



New in
11.2

- Patch installation and removal without downtime
 - Do not need to bring DB instance down.
- Specially packaged shared library
 - Contains replacements for some of the product functions.
- OPatch used to install online patches in customer's environment
- Supported on both Windows 32-bit and x64.

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RAC Deployment

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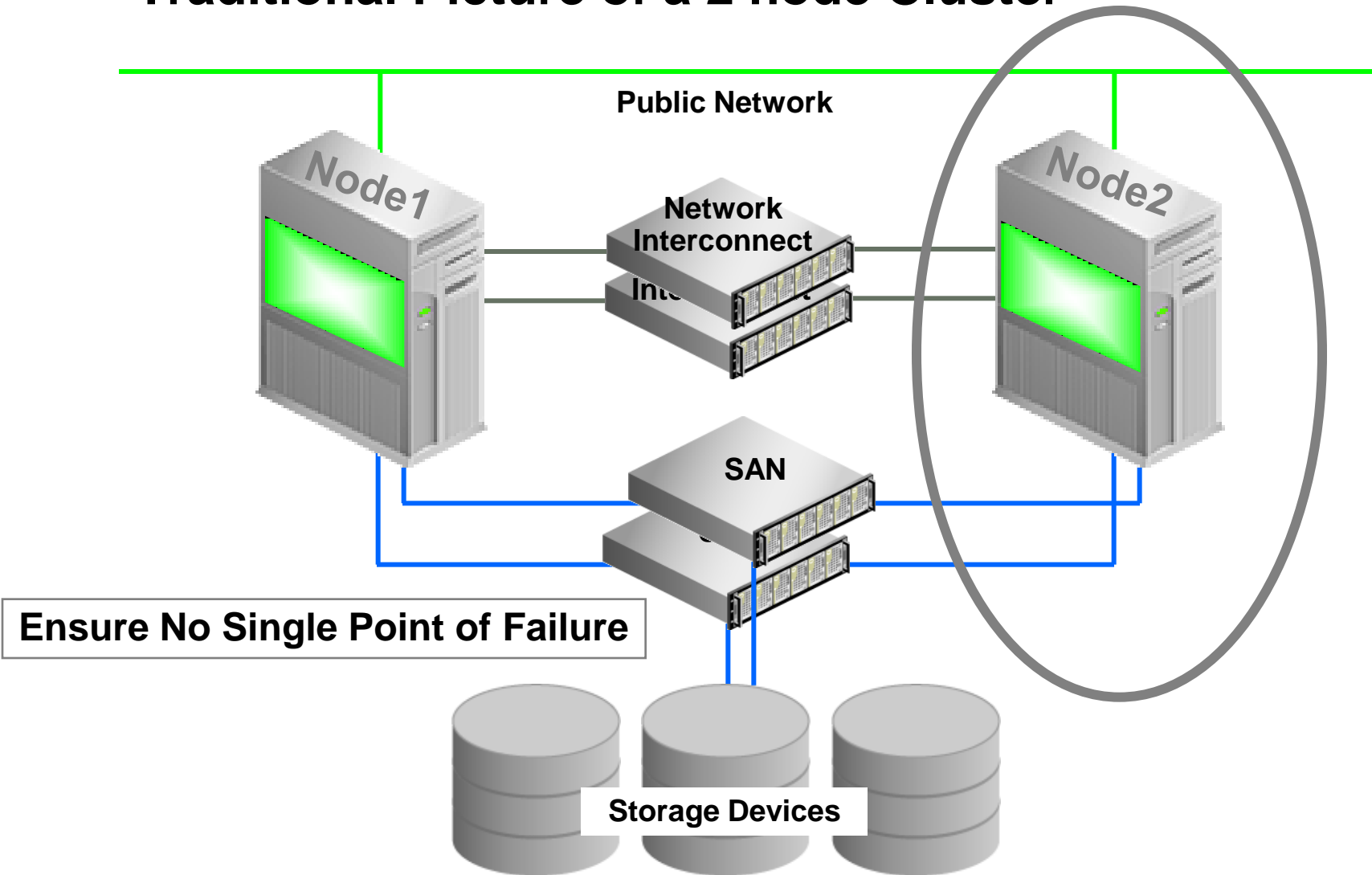
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Real Applications Clusters

- Use RAC for scalability and High Availability
 - Add instances against same database files providing more Oracle processes and increasing number of users
 - Provides unique scalability on Windows that no other vendor offers
 - Node & Database instance no longer represent single point of failure
- Clustered databases supported on Windows platforms since version 7.3.4
- Oracle provides platform independent Oracle Clusterware as part of Oracle Grid Infrastructure to handle failover of services to surviving nodes.

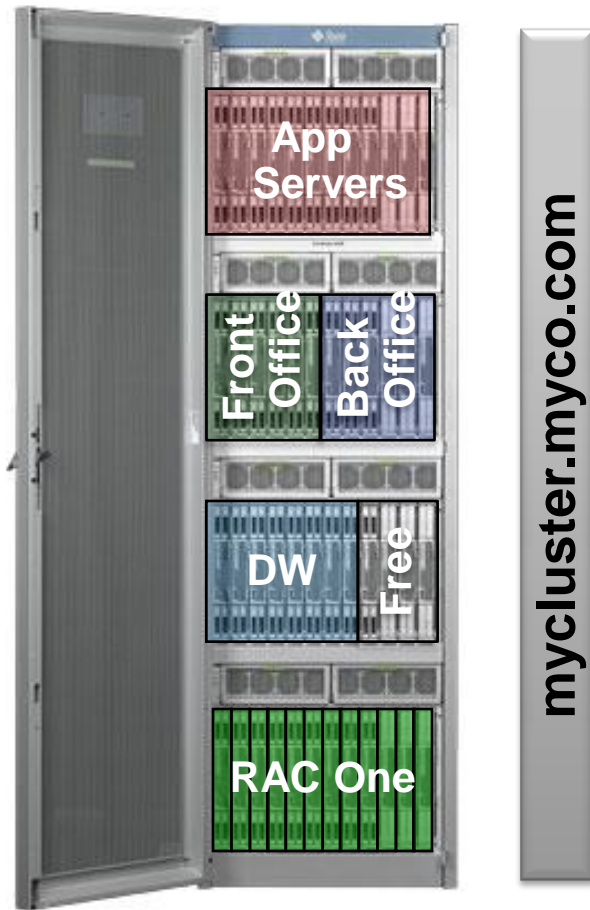
Hardware

Traditional Picture of a 2 node Cluster



Oracle Database 11g Release 2

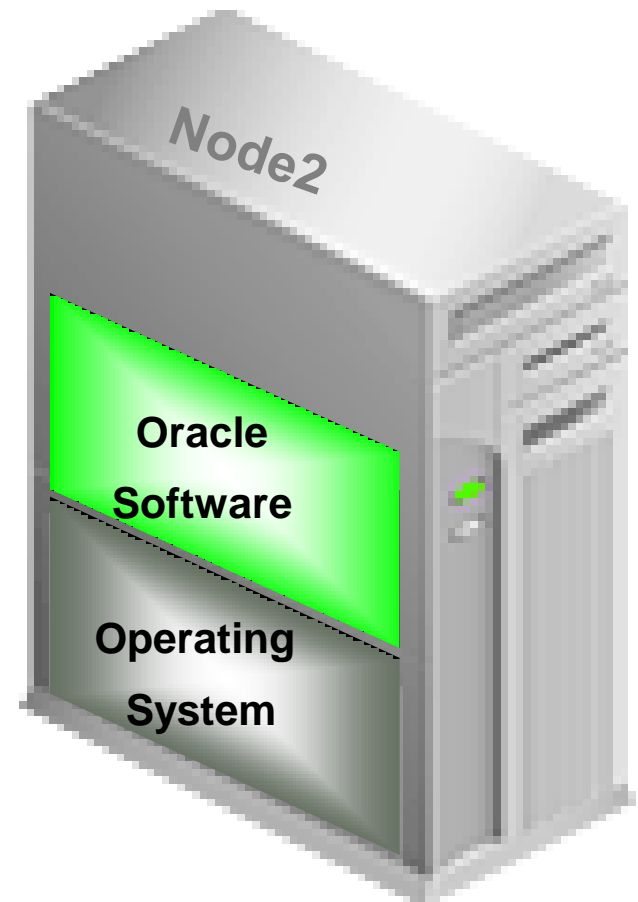
Simplified Provisioning



- New intelligent installer
 - 40% fewer steps to install RAC
- Nodes can be easily repurposed
- SCAN--Single cluster-wide alias for database connections simplifies connections
 - Clients need not be aware of cluster configuration changes
- RAC Assurance Starter Kit: Note#811271.1
 - Step-by-Step install cookbook
 - System Test Plan Outline
 - Basic Artificial Load Test

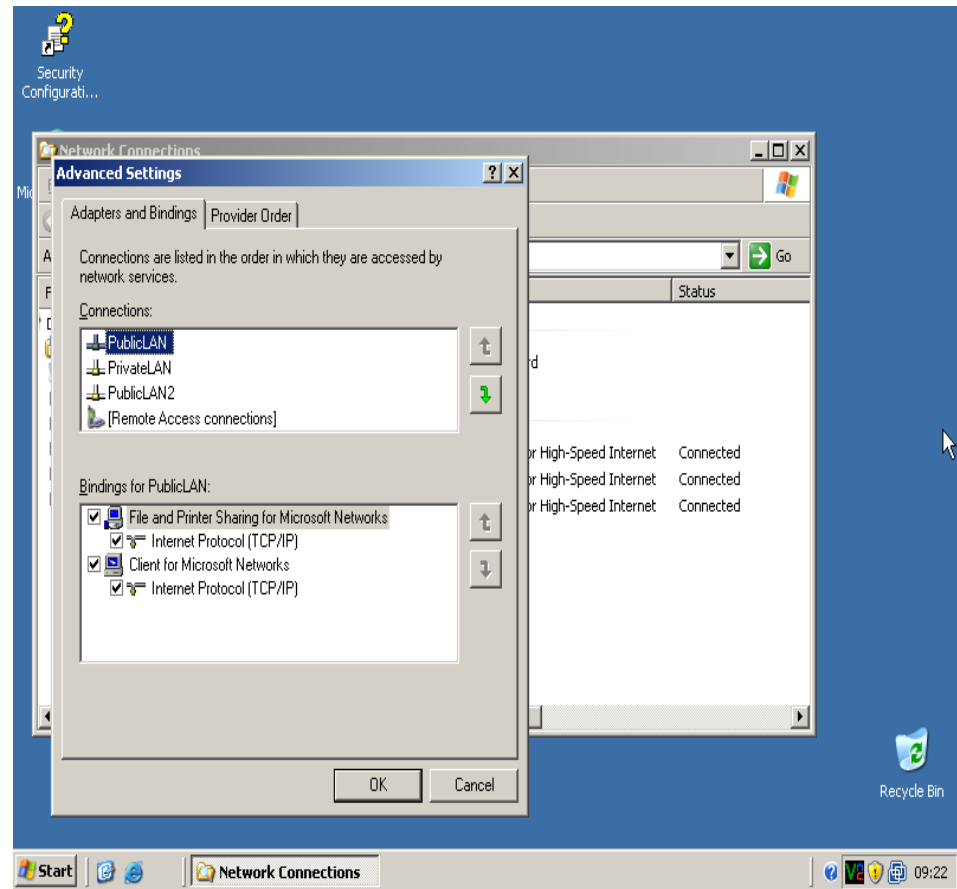
Operating System Considerations

- Same operating System on all nodes
 - Do not mix versions except during rolling upgrades (for short periods)
- Recommend Windows 2008
 - 11gR1 Supports Windows 2008 R1
 - 11gR2 Supports Windows 2008 R2
- If using Windows 2003
 - Both 11gR1 and R2 support Windows 2003
 - Use at least SP2 (see MoS Note 464683.1)
 - Also use caution with Large Pages
 - Large Pages provide faster memory access
 - Can result in longer DB startup times
 - (See Note #862690.1)



Network Considerations

- Adapters should have the same name on each node
- Each node should have
 - * Public IP
 - * Interconnect IP (Private IP)
 - ** Virtual IP
 - ** Scan VIP (11gR2) is Clusterwide
- Binding order the same on all nodes
- * Public & Interconnect should be live at start of install
- ** VIP and SCAN VIP must not be live at install
- Interconnect
 - Oracle uses TCP/IP between nodes (not UDP)
 - Enable Jumbo Frames for best performance
 - Disable TCP Offload Engine and Receive Side Scaling – Note#988008.1
 - Infiniband is supported – 10gigE cert underway
 - Team the interconnect adapters



Oracle Database 11g Release 2

Automatic Storage Management (ASM)



- The foundation for Grid Storage
- Easier to manage than file systems
- Reduces storage costs
- Provides best performance
- Stores all data

New in
11.2

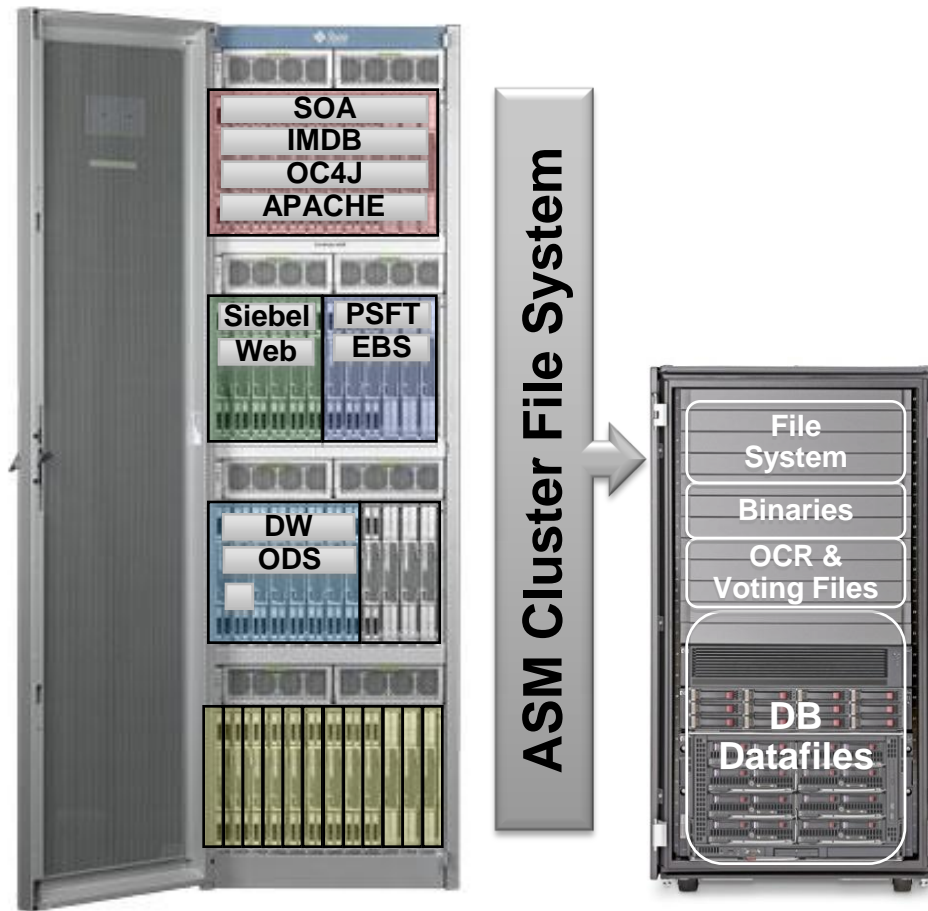
Storage

- Oracle Clusterware and RAC requires Shared everything access to storage
- Windows 'Basic' disks
 - Dynamic disks are not supported
- AUTOMOUNT must be enabled on all nodes
 - **DISKPART> AUTOMOUNT ENABLE**
- Windows 2008 – Create Partitions via Diskpart
- Rescan disks on remote nodes after partition creation
- Remove drive letters from remote nodes
- Recommend ASM for Clusterware Files (OCR and Votedsk)
- Use ACFS for files that cannot be stored in ASM

Stores All Data

ASM Cluster File System (ACFS)

New in
11.2



- General purpose scalable file system
- Accessible through NAS protocols (NFS, CIFS)
- Multi OS platform (Linux and Windows at initial release)
- Still recommend private drives for ORACLE_HOME
- Consider ACFS for ADR location for RDBMS
- Other logfiles or 3rd party logfiles, batch jobs, etc

Oracle Software Tidbits

- Latest Oracle Clusterware
 - 11.2.0.1
 - No need for MS Cluster Services
 - Grid Infrastructure (GI) in 11gR2 combines ASM and Oracle Clusterware into a single home.
- Relevant RAC Database Version:
 - As per your Application requirements
 - Note#337737.1 Oracle Clusterware - ASM - Database Version Compatibility
- Patching/Upgrading – Patch/Upgrade GI Stack first
 - Example - 11.2.0.2

Additional Best Practices

- Monitoring and Troubleshooting Best Practices
 - Install CHM (Cluster Health Monitor – formerly called IPD/OS)
 - <Note 811151.1> How to install Oracle Instantaneous Problem Detector for Clusters (IPD/OS) on Windows
 - <Note 810915.1> How to monitor, detect and analyze OS and RAC resource related degradation and failures on Windows
 - Monitor Desktop Heap (Desktop Heap Monitor) if running multiple databases/instances on single cluster
 - Install Sysinternals Utilities such as Process Explorer for better monitoring and diagnosis (<http://www.sysinternals.com>)
 - Install Debugging Tools for Windows –
 - Bookmark **Note#811271.1 - RAC Assurance Support Team: RAC Starter Kit and Best Practices (Windows)** - Monitor for regular updates

Appendix



More Information

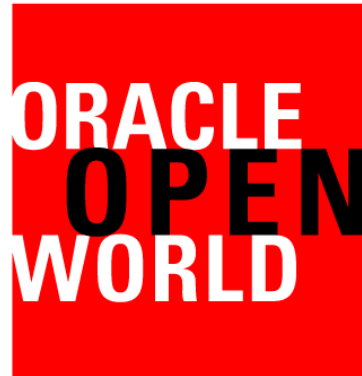
- OTN – Windows Server System Center
 - <http://www.oracle.com/technetwork/database/windows/>
- OTN – Oracle Database
 - <http://www.oracle.com/technetwork/database/enterprise-edition/>
- For more questions
 - alex.keh@oracle.com



Oracle OpenWorld

Latin America 2010

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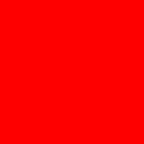
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