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# SCANning the Oracle Grid Infrastructure

Presented by:

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**Senior DBA Consultant**

**SmartDog Services**

“The Oracle Customer’s Best Friend”



[www.smartdogservices.com](http://www.smartdogservices.com)

# Agenda

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- Your Oracle Solution was a great decision
- Oracle Grid Infrastructure 11gR2
- Automatic Storage Management (ASM)
- Oracle Networking
- Oracle High Availability Services (OHAS)



# Eric Siglin

## Senior DBA Consultant

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- 26 years of IT experience
  - Oracle DBA (versions 6 through 11gR2)
    - Oracle on Unix, Linux and MS Windows
    - Real Application Clusters
    - Data Guard
    - Streams
  - Oracle GoldenGate
  - Oracle Exadata Database Machine
  - Application Design and Development
  - System Administration on Unix and Linux
- Over 10 years of Oracle Teaching Experience
  - Oracle University
  - SmartDog Services/DCC Services (an OAEC Partner)



## SmartDog At a Glance

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- 18 Years as an Oracle Technical Services Firm
- 1st Authorized Oracle Education Center 1995
- Began Remote Managed Services model in 1999
- Austin, Texas based
- SAS 70 Security Compliance
- 250% Organic Growth in past 3 years
- 2008 Oracle North America Titan Award
- Certified Advantage Partner - less than 1% achieve this level because annual recertification required
- Small and Medium Business (SMB) TOLA Oracle Partner of the Year in 2006 and 2007

**100%**

**Oracle Tech Stack and  
EBusiness Suite**

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# Why you chose an Oracle Solution

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- Oracle Technology and Applications best met your Business Requirements during evaluation
- Excellent technology, #1 Relational Database
- Analysts highly rank Oracle EBS
- Oracle continues to make smart acquisitions
- Confidence in market dominance
- What's not there now will be developed or acquired by Oracle making it the most complete offering
- Strongest strategic road map
- Most open, most innovative, and fastest growing application platform



# Oracle Grid Infrastructure 11g Overview

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- Installed first on the server
- Provides services shared to all DB instances
  - Storage
  - Networking
  - High Availability Services
- Software in separate Oracle Home
- Security supports separation of duties

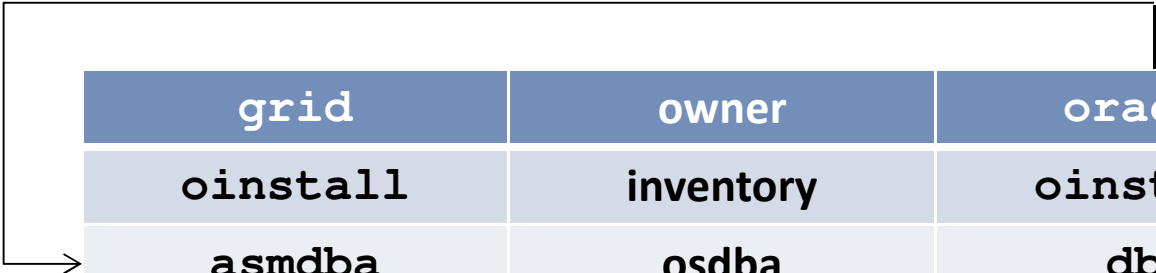


# Oracle Grid Infrastructure 11g Security

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## Separation of Duties

If your IT security requires separation of duties between System Administrators and Database Administrators, you can accomplish this with different software owners.



grid	owner	oracle
oinstall	inventory	oinstall
asmdba	osdba	dba
asmoper	osoper	oper
asmadmin	osasm	

# Oracle Grid Infrastructure Networking

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- Implements a long-time recommendation of Oracle networking in a separate Oracle Home.
- Simplifies client networking configuration through use of Single Client Access Name (SCAN).
- Streamlines server-side connect-time load balancing with SCAN listeners.
- Reduces the number of static IP addresses needed within a cluster.
- Name resolution for dynamic IP assigned servers through Grid Naming Service (GNS).





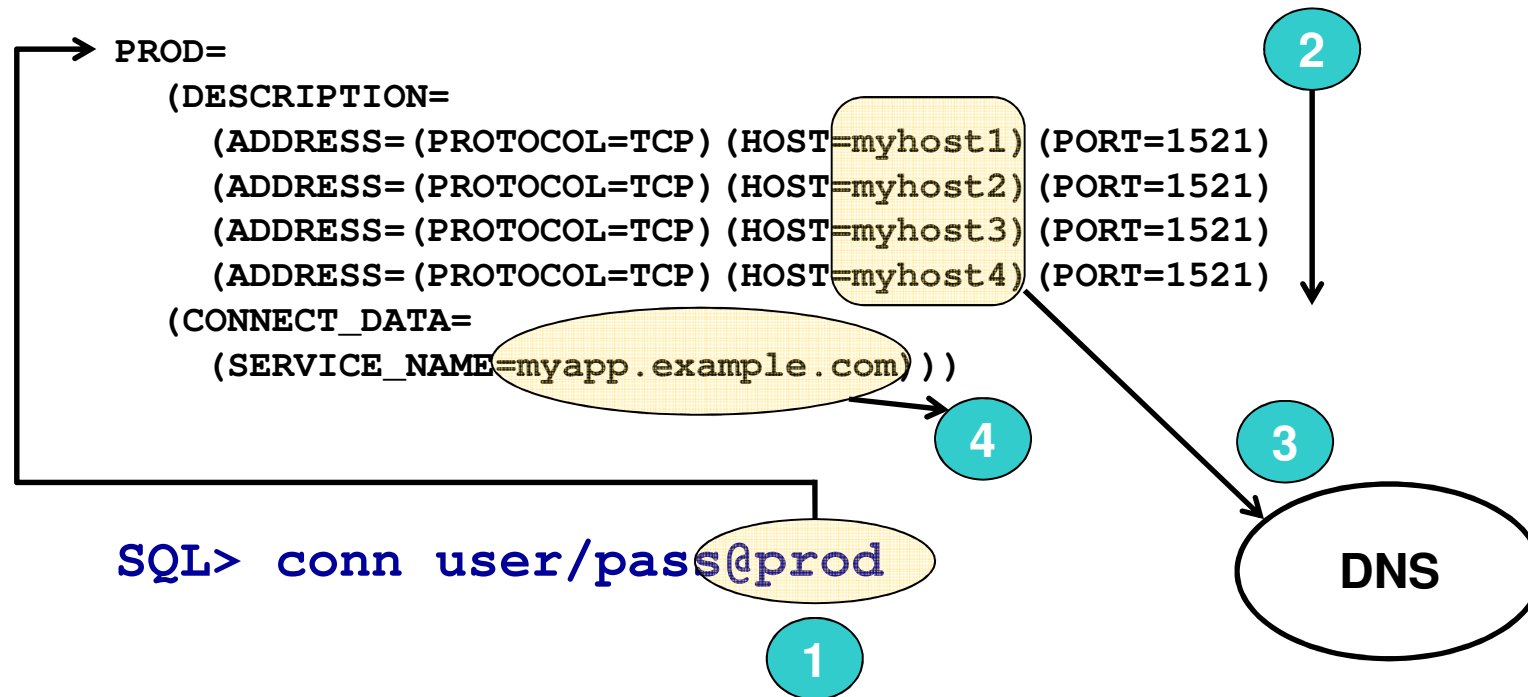
## Single Client Access Name (SCAN)

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- Single Client Access Name (SCAN) simplifies client networking configuration.
- One host name linked to three SCAN listeners for high availability and scalability.
- Starting with 11gR2, `REMOTE_LISTENER` defaults to the SCAN address and port 1521.  
`myscan.mycluster.example.com:1521`
- Client-side connect-time failover is handled by the round-robin rotation of the IP addresses by DNS.
- SCAN listeners and their VIP is a service maintained by Oracle Clusterware for High Availability.
- Server-side load balancing is handled by the SCAN listener with a redirect to the best node.

# Basic Oracle Networking

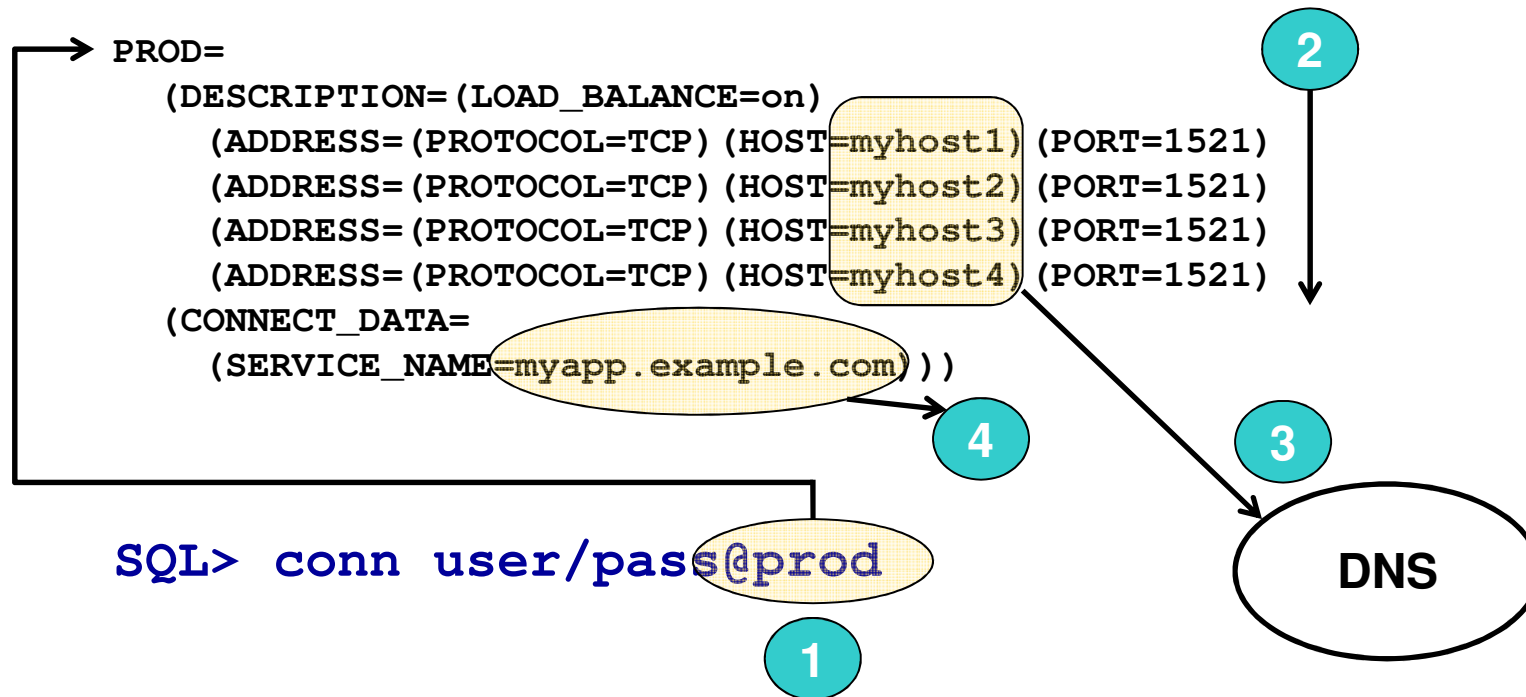
## Client-Side Connect-Time Failover



1. SQL\*Plus resolves network service name (alias).
2. Client needs to traverse address list.
3. Client needs to resolve host name to get IP address.
4. Client communicates to listener looking for SERVICE\_NAME in descriptor.

# Basic Oracle Networking

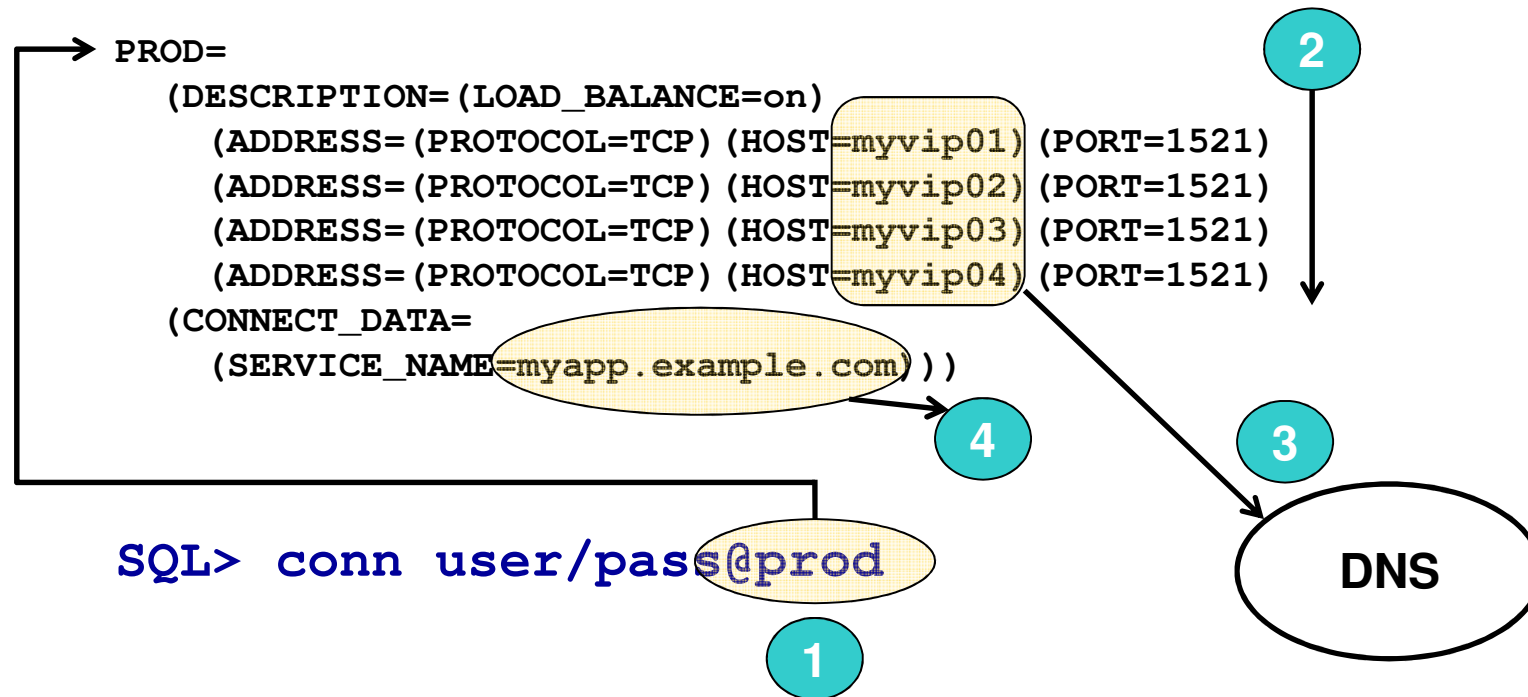
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# Oracle Cluster Networking

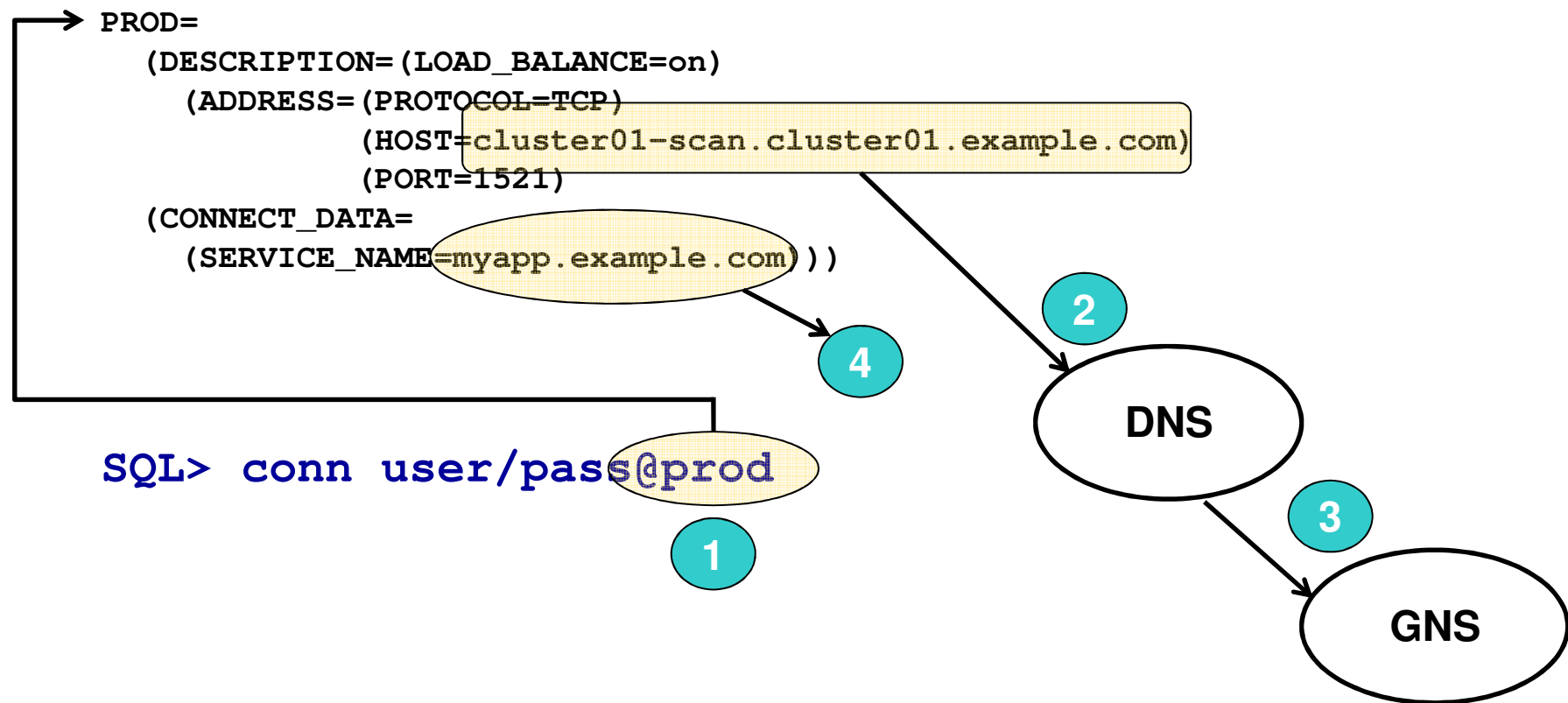
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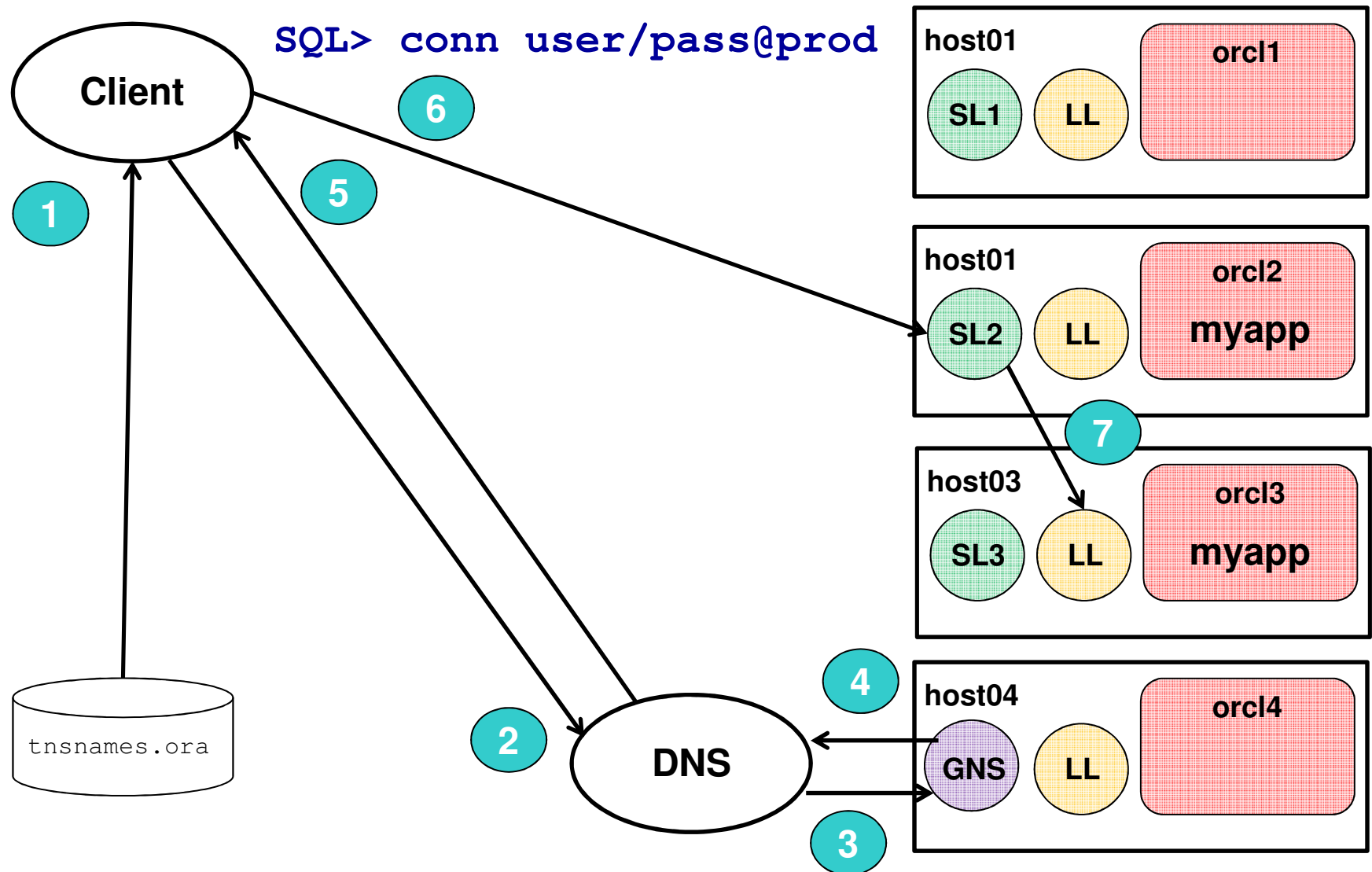
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# Oracle Cluster Networking

## Client-Side Connect-Time Failover



# Oracle Cluster Networking Client Connection Process



# Oracle High Availability Services

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- Simplifies implementing high availability.
- Stand alone servers: Oracle Restart
  - Based on Oracle Clusterware technology
  - Eliminates the need for startup scripts
  - Centralized management and monitoring of resources
- Clustered servers: Oracle Clusterware
  - Administrator Managed Servers (new term for old method)
  - Policy Managed Servers (organized with server pools)
  - Tighter integration with RAC through Grid Plug-n-Play
- Improved dependency management between different types of cluster resources.

# Oracle High Availability Services

## Oracle Restart

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- Improves Oracle database availability.
- Restarts various Oracle components after hardware or software failure on after server reboot.
  - Database Instance
  - Oracle Net Listener
  - Database Services
  - ASM Instance
  - ASM Disk Groups
  - Oracle Notification Services (ONS)
- If a check for the health of a component fails, it is stopped and restarted.
- Components are stopped and started in the correct order.



# Oracle High Availability Services

## Oracle Clusterware Enhancements

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- Enhancements made to improve manageability.
- Restarts various Oracle components after hardware or software failure on after server reboot.
- Resources can be ranked by importance so lower priority applications don't take resources from important applications.
- Role-Separated Management allows a cluster administrator to set permissions on server pools or resources and access control lists (ACLs) to provide access.

# Oracle Grid Infrastructure 11g: Automatic Storage Management

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- Improved ASM manageability.
- Storage support for non-database applications.
- High availability support on single node implementations with Oracle Restart.

# Oracle ASM

## Manageability enhancements

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- ASMCMD has been enhanced to permit any ASM operation that can be performed within SQL.
- ASM Configuration Assistant (ASMCA) provides a GUI to manage ASM storage.
- EM has been enhanced with improved ASM support including Support Workbench for ASM.
- Disk provisioning simplified with Intelligent Data Placement allowing ASM to place file extents in hot or cold regions of the disk.
- ASM allows for the use of 4K sector disks without a performance penalty by specifying the `SECTOR_SIZE` when creating a disk group.

# Oracle ASM

## Storage for Non-Database Applications

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- Oracle ASM Dynamic Volume Manager provides a standard disk device driver interface for file systems.
- Oracle ASM Cluster File System (ACFS) supports storage needs in single host and cluster configurations.
- ACFS Snapshots are an online read-only or read-write point-in-time copy of an ASM cluster file system.
- ACFS Security gives a finer-grained access control on top of OS access control.
- ACFS Encryption protects data stored on disk.
- ACFS Replication enables replication across the network to a remote site for disaster recovery.

# Oracle ASM

## Enhancements for Oracle-Related Storage

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- Oracle Cluster Registry (OCR) files, voting files and ASM SPFILEs can now be stored in ASM disk groups.
- ASM Cluster File System (without snapshots) supports Oracle backup and recovery related files beginning with ASM version 11.2.0.3.
  - RMAN backups
  - Archived log files
  - Data Pump dumpsets
- Compatibility Disk Group attributes allow for heterogeneous versions of Oracle software.
  - `COMPATIBLE.ASM` – minimum version of ASM
  - `COMPATIBLE.RDBMS` – minimum version of RDBMS

## Oracle Grid Infrastructure Enhanced Patchset Installation

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- Oracle Grid Infrastructure patch sets are full installations of the Oracle Grid Infrastructure software beginning with version 11.2.0.2.
- Direct upgrades from previous releases (11.x, 10.x) to the most recent patch set are supported.
- Out-of-place patch set upgrades only are supported.
- New installations consist of installing the most recent patch set
- Also see My Oracle Support note 1189783.1, "Important Changes to Oracle Database Patch Sets Starting With 11.2.0.2"

## Conclusion

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- Your Oracle investment was a sound decision.
- There is a wealth of resources included with the product you purchased.
- The Oracle Grid Infrastructure gives you services you need for your Oracle environment.
  - Automatic Storage Management (ASM)
  - Oracle Networking
  - Oracle High Availability Services (OHAS)
- With some planning, you could have an Oracle environment that's easier to manage.



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# Questions

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