Oracle 11gR2 New Features for RAC

What's New in Clusterware!!!

OTN Tour

(Costa Rica, Ecuador, Columbia, Peru)

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About me…

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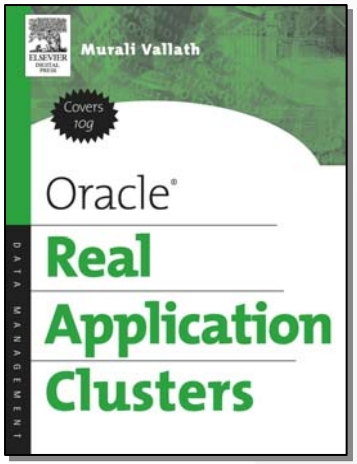

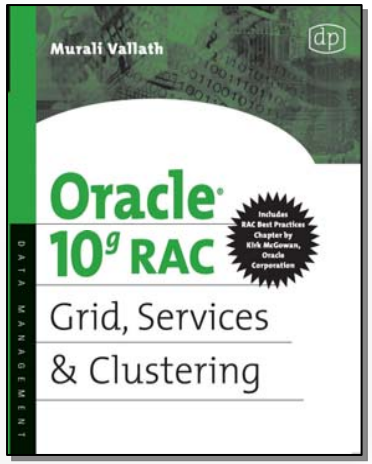

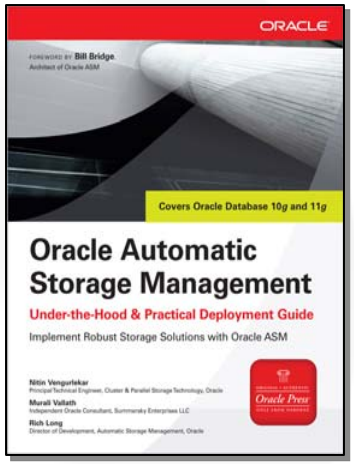

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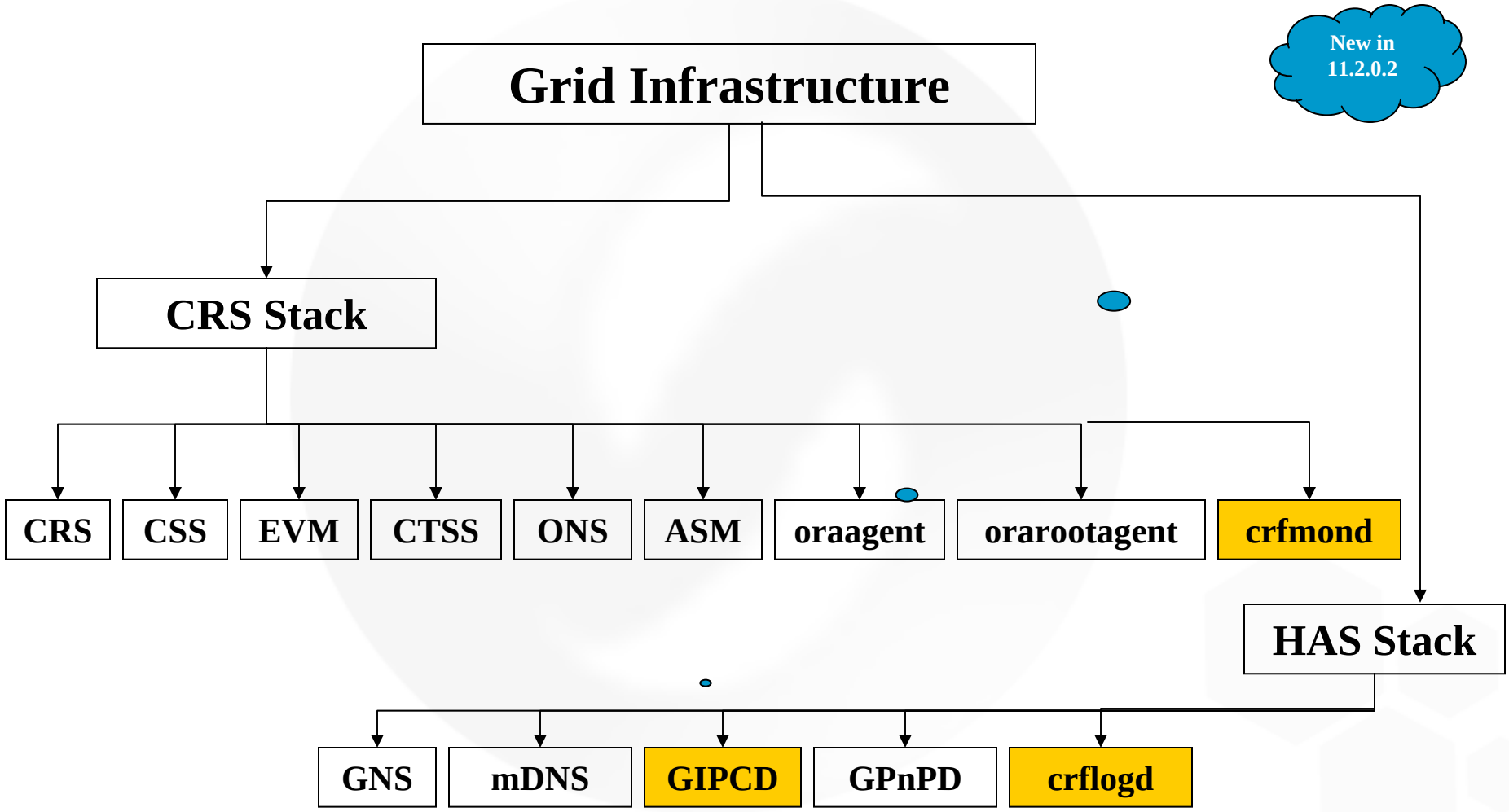
THE POWER TO CONNECT & CONQUER

ORACLE ACE Director

Oracle Clusterware Components

- HAS stack
- CRS stack
- SCAN
- Virtual (IP)

Oracle Clusterware Components

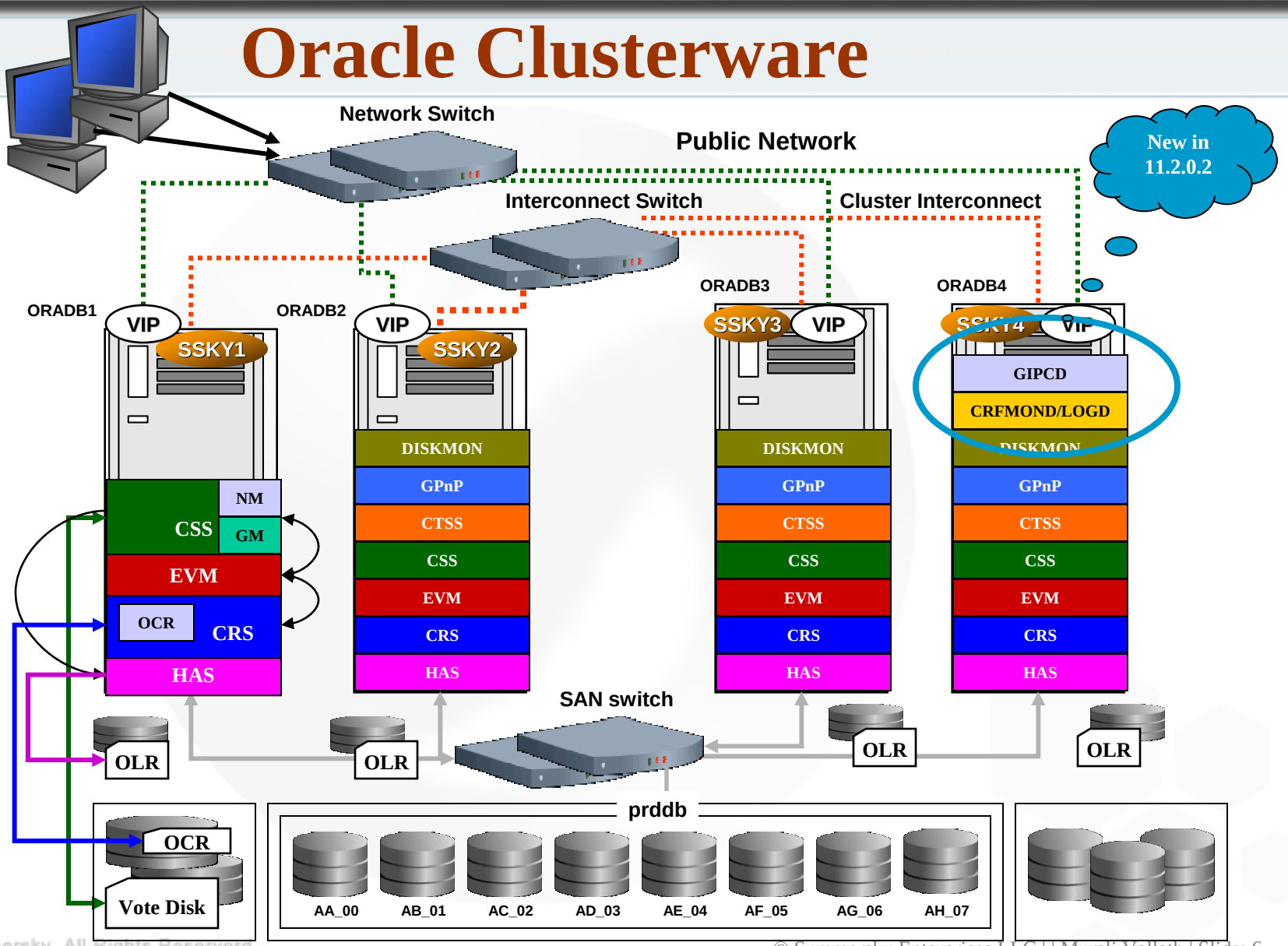


ClusterWare Files

- Oracle Cluster Registry (OCR)
- Oracle Local Registry (OLR)
- Voting Disk
- GPnP Profile

New in 11.2.0.2

Oracle Clusterware



GPnPD

New in 11.2.0.2

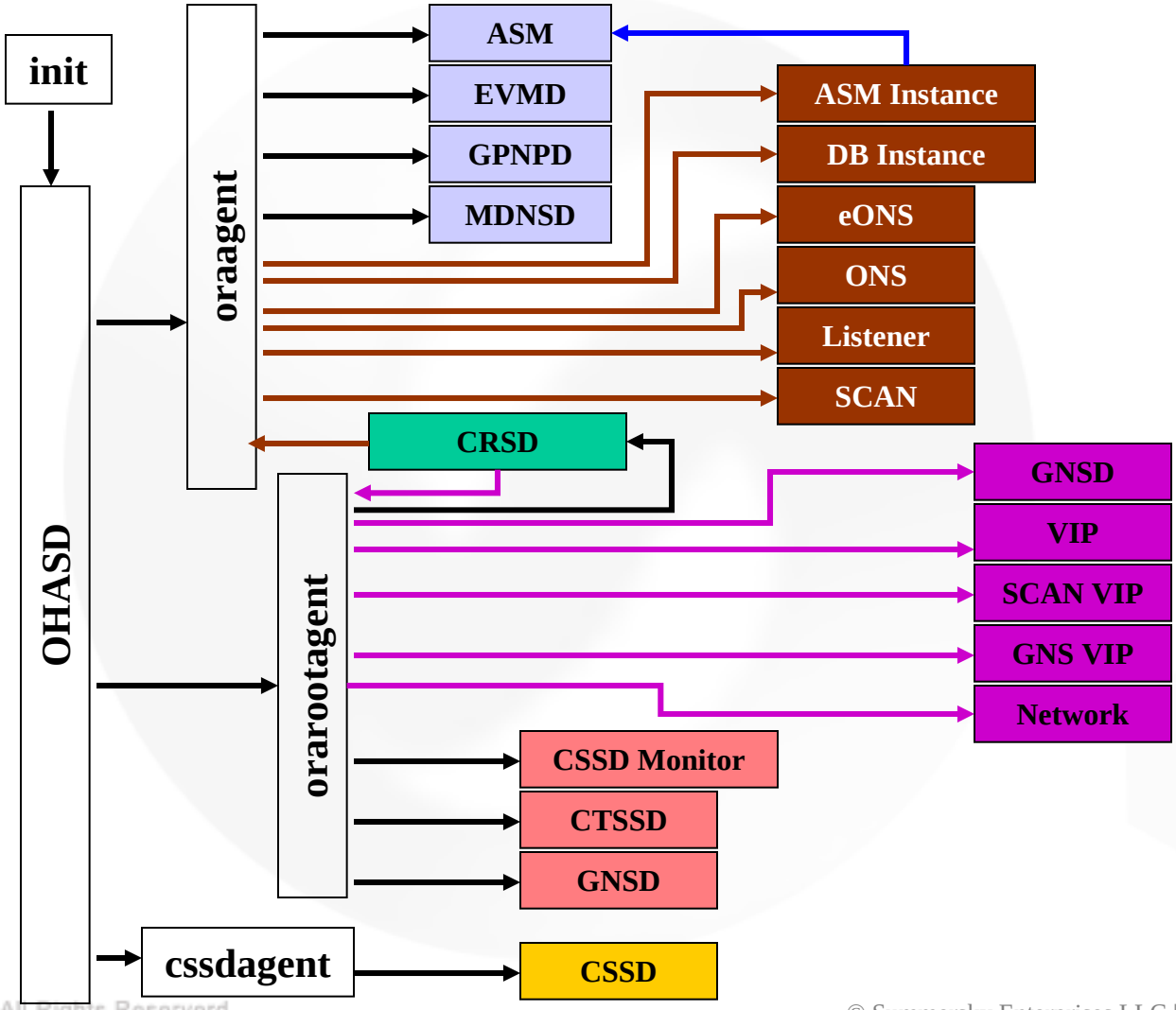
- Grid Plug and Play Daemon
- Started before CSS
- Allows easy addition and deletion of nodes
- Dynamic management of VIPs
- Maintains essential cluster information in an XML profile:
  - Cluster name and unique cluster identifier
  - Public and private network interface mappings
  - Location for the OCR and voting disks
  - Location for the ASM parameter file
- Manages and distributes the profile using the GPnP daemon
- Defines cluster name, networks and storage

GPnP Profile

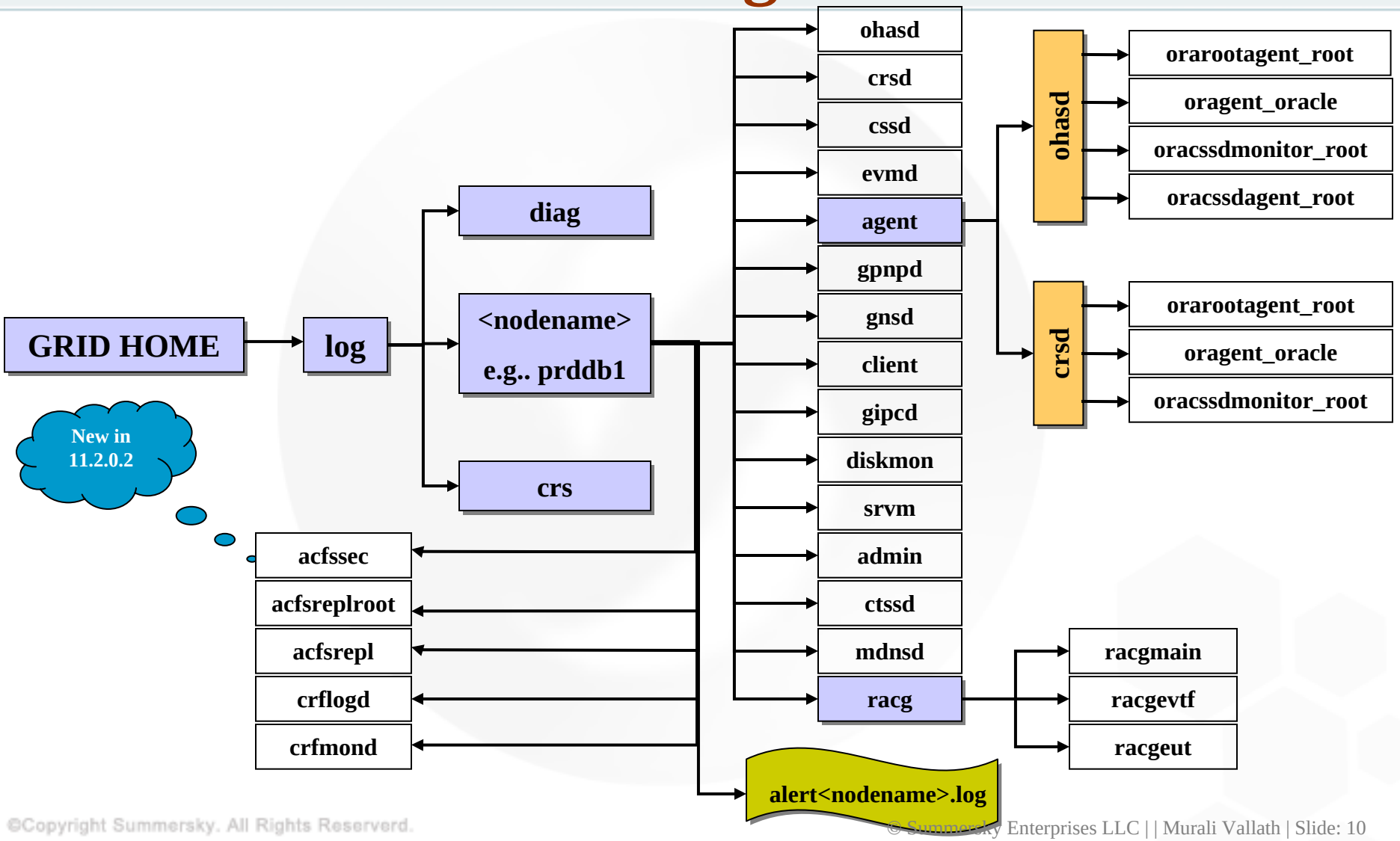
New in 11.2.0.2

```
<?xml version="1.0" encoding="UTF-8" ?>
- <gpnp:GPnP-Profile Version="1.0" xmlns="http://www.grid-pnp.org/2005/11/gpnp-profile" xmlns:gpnp="http://www.grid-
  pnp.org/2005/11/gpnp-profile" xmlns:orcl="http://www.oracle.com/gpnp/2005/11/gpnp-profile"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.grid-pnp.org/2005/11/gpnp-profile gpnp-
  profile.xsd" ProfileSequence="6" ClusterUId="1a90c7ca58d54f87bfeef9b839865478" ClusterName="EGCDEVCW" PALocation="">
  - <gpnp:Network-Profile>
    - <gpnp:HostNetwork id="gen" HostName="*">
        <gpnp:Network id="net1" IP="192.30.0.0" Adapter="eth22" Use="cluster_interconnect" />
        <gpnp:Network id="net2" IP="192.30.0.0" Adapter="eth23" Use="cluster_interconnect" />
        <gpnp:Network id="net3" IP="192.30.0.0" Adapter="eth21" Use="cluster_interconnect" />
        <gpnp:Network id="net4" IP="10.32.7.0" Adapter="bond0" Use="public" />
      </gpnp:HostNetwork>
    </gpnp:Network-Profile>
    <orcl:CSS-Profile id="css" DiscoveryString="+asm" LeaseDuration="400" />
    <orcl:ASM-Profile id="asm" DiscoveryString="" SPFile="+EGCDEV_GRID1/egcdevcw/asmparameterfile/registry.253.740352251" />
  + <ds:Signature xmlns:ds="http://www.w3.org/2000/09/xmldsig#">
  </gpnp:GPnP-Profile>
```

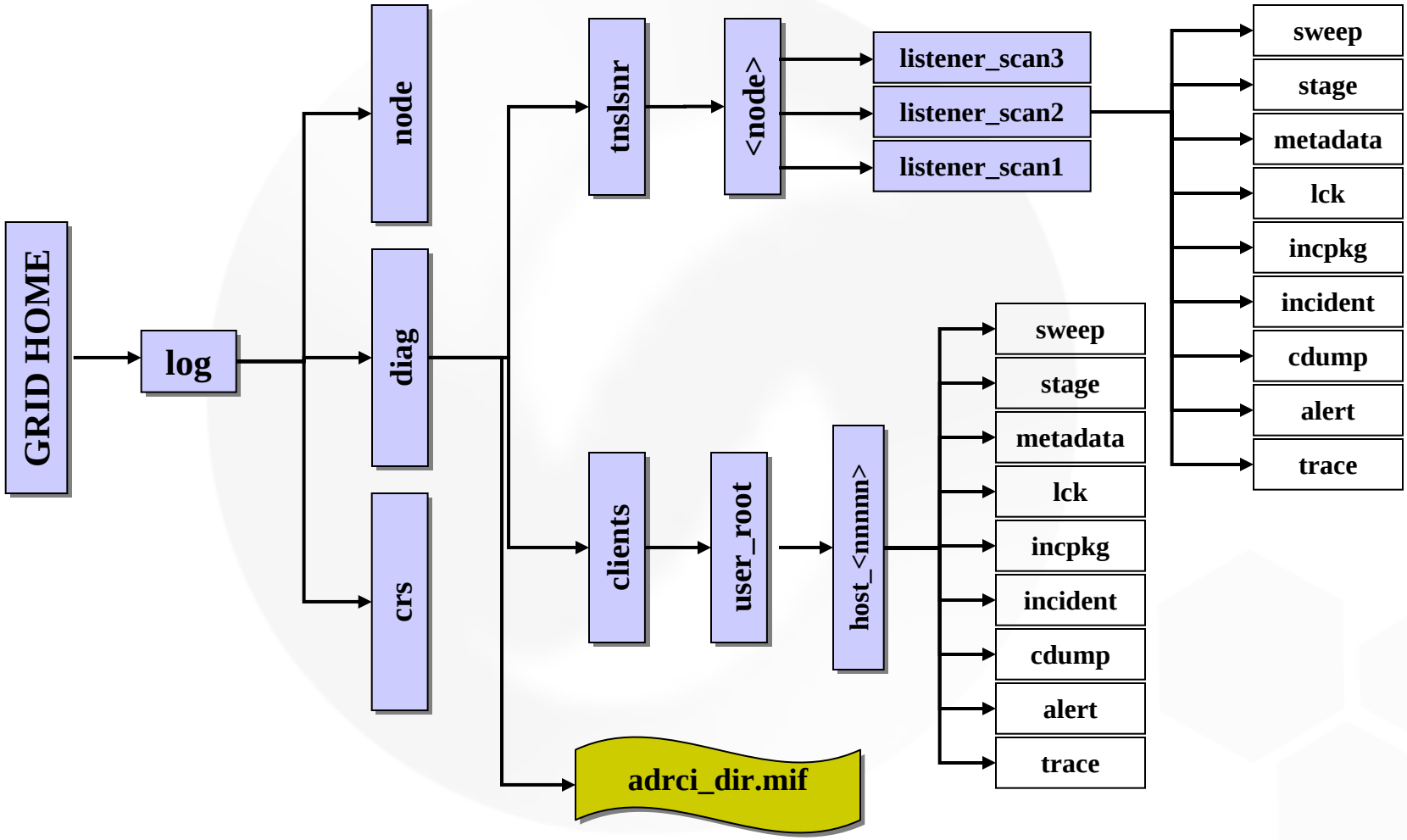
Cluster Stack Invocation



Clusterware Log Directories



Clusterware Log Directories



VIP's

- Database VIP (also called RAC VIP)
- Application VIP
- HAIP (IC VIP)

New in 11.2.0.2

Cluster Interconnect

New in 11.2.0.2

- Oracle uses the interconnect for cache synchronization
- Interconnect is also used for
  - Data blocks
  - Locks
  - SCN numbers
  - Messages

Redundant Interconnects

New in 11.2.0.2

- `CLUSTER_INTERCONNECT`
- NIC Bonding
- HAIP

Verify Deamons

```
$GRID_HOME/bin/crsctl stat res -t -init
```

```
--------------------------------------------------------------------------------
NAME                           TARGET  STATE        SERVER                   STATE_DETAILS
--------------------------------------------------------------------------------
ora.asm                        1   ONLINE  ONLINE devsrv1                   Started
ora.cluster_interconnect.haip  1   ONLINE  ONLINE devsrv1
ora.crf                        1   ONLINE  ONLINE devsrv1
ora.crsd                       1   ONLINE  ONLINE devsrv1
ora.cssd                       1   ONLINE  ONLINE devsrv1
ora.cssdmonitor                1   ONLINE  ONLINE devsrv1
ora.ctssd                      1   ONLINE  ONLINE devsrv1                   OBSERVER
```

RAC Background Process

- **ACMS – Atomic Controlfile to Memory Service**
- **GTX0-j – Global Transaction Process**
- **RMSn – Oracle RAC Management Processes (RMSn)**
- **RMSN – Remote Slave Monitor**
- **LMS – Global Cache Service Processes**
- **LMON – Global Enqueue Service Monitor**
- **LMD – Global Enqueue Service Daemon**
- **LCK – Lock Process**
- **DBRM – Database Resource Manager**
- **PING – Response time agent**

SCAN

- SCAN –Single Client Access Number
- Similar to a cluster alias available on Tru64 and VMS clusters
- Helps load balance across the database cluster
- Clients do not require VIP information
- Removes the requirement to change the client connection if cluster changes
- Must resolve to atleast one address on the public network
- Best practice .. resolve to 3 addresses for the entire cluster

SCAN

- Allows clients to use EZConnect or simple JDBC connections
- Each cluster will have 3 SCAN listeners, each having a SCAN VIP defined as cluster resources on network 1
- A SCAN VIP/LISTENER will failover to another node in the cluster
- Instance registers with local listener on its node
- Database "`REMOTE_LISTENER`" registers instances with all SCAN listeners

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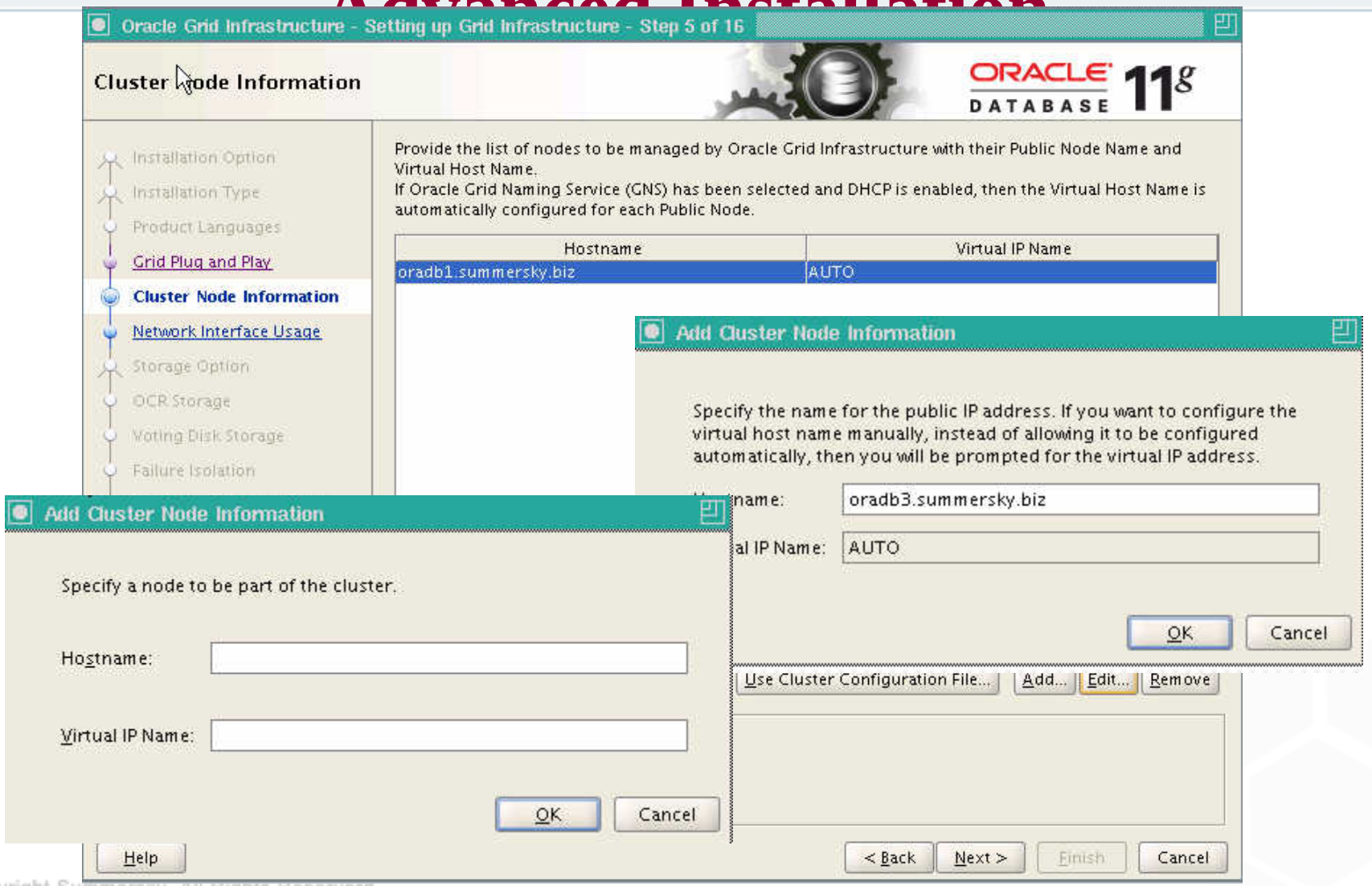
Advanced Installation



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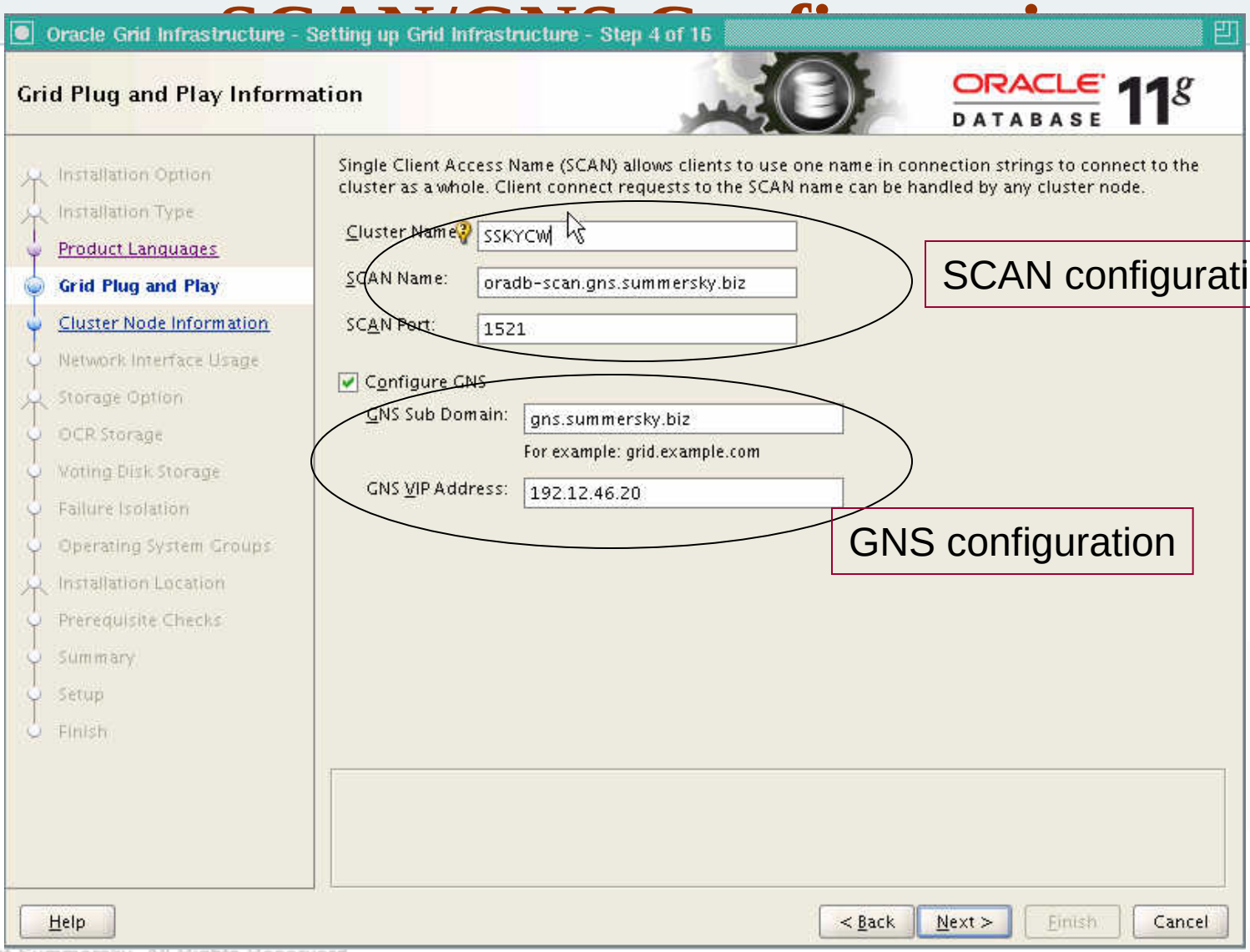
SCAN/GNS Configuration



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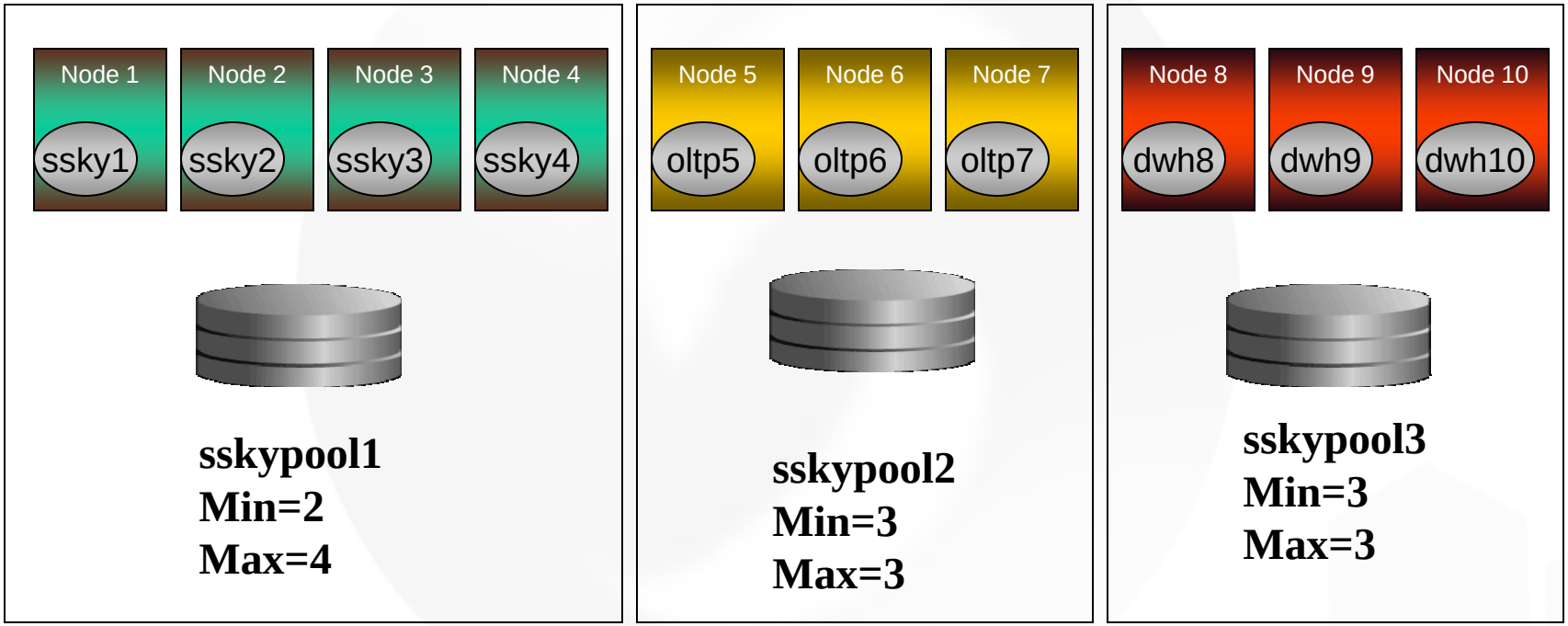
ORACLE 11g DATABASE

Server Pools



Server Pools

- Logical division of the cluster into pools of servers
- Applications (e.g. databases) can be configured to run in one or more server pools
- Managed by `crsctl` (applications), `srvctl` (Oracle)
- Defined by 3 attributes:
  - `MIN` - minimum number of servers (default 0)
  - `MAX` – maximum number of servers (default 0 or -1)
  - `IMPORTANCE` – 0 (least important) to 1000

Server Pools

- One-to-one mapping between a database service and server pool
- A database service can only be defined to operate in one pool
  - `UNIFORM` – all servers in the pool
  - `SINGLETON` – one server in the pool
- Resources are contained in logical groups of server pools

Types of Server Pools

- System defined
  - Free
  - Generic
- User defined

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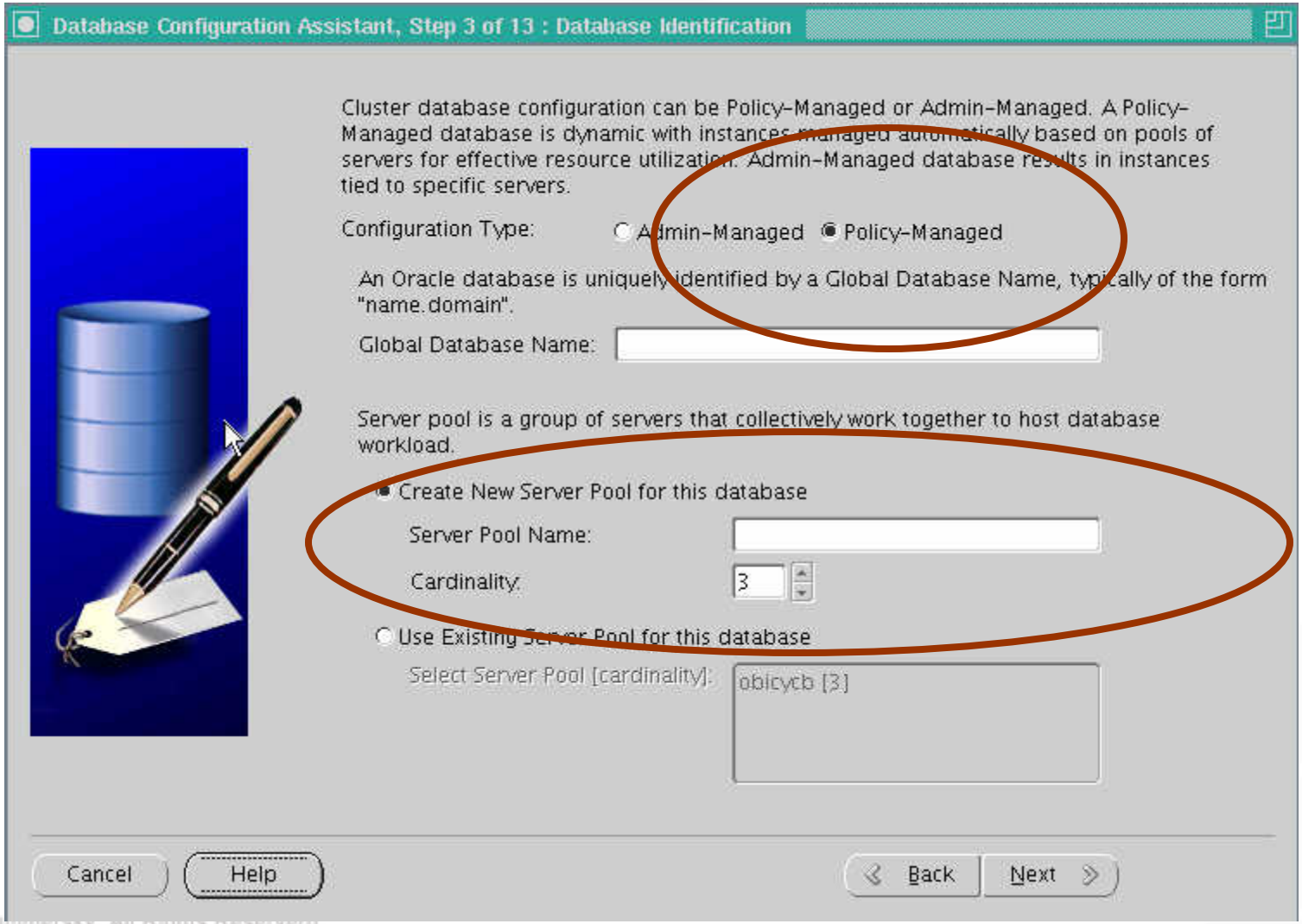
Server Pools



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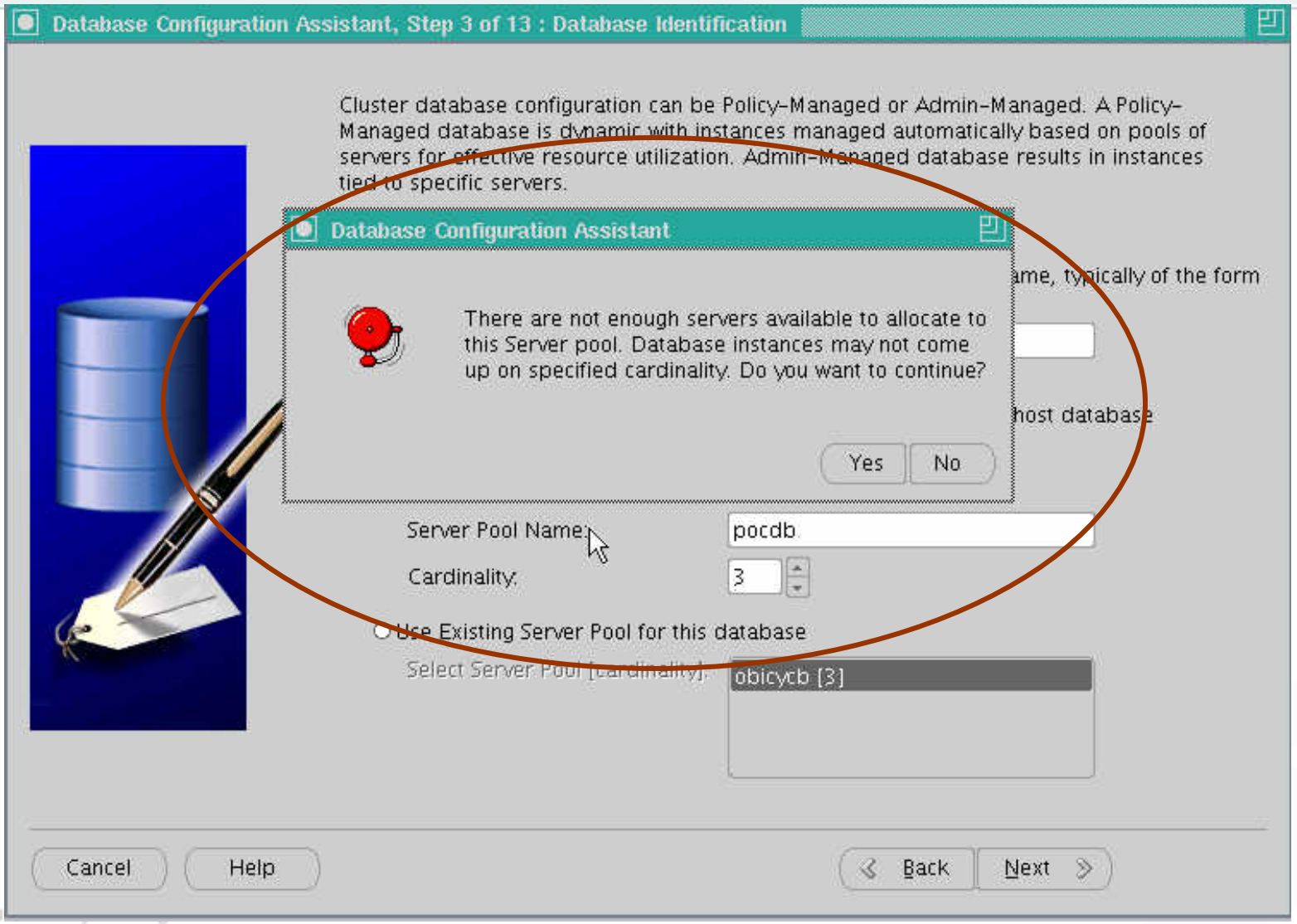
Server Pools



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ORACLE 11g DATABASE

Server Pools

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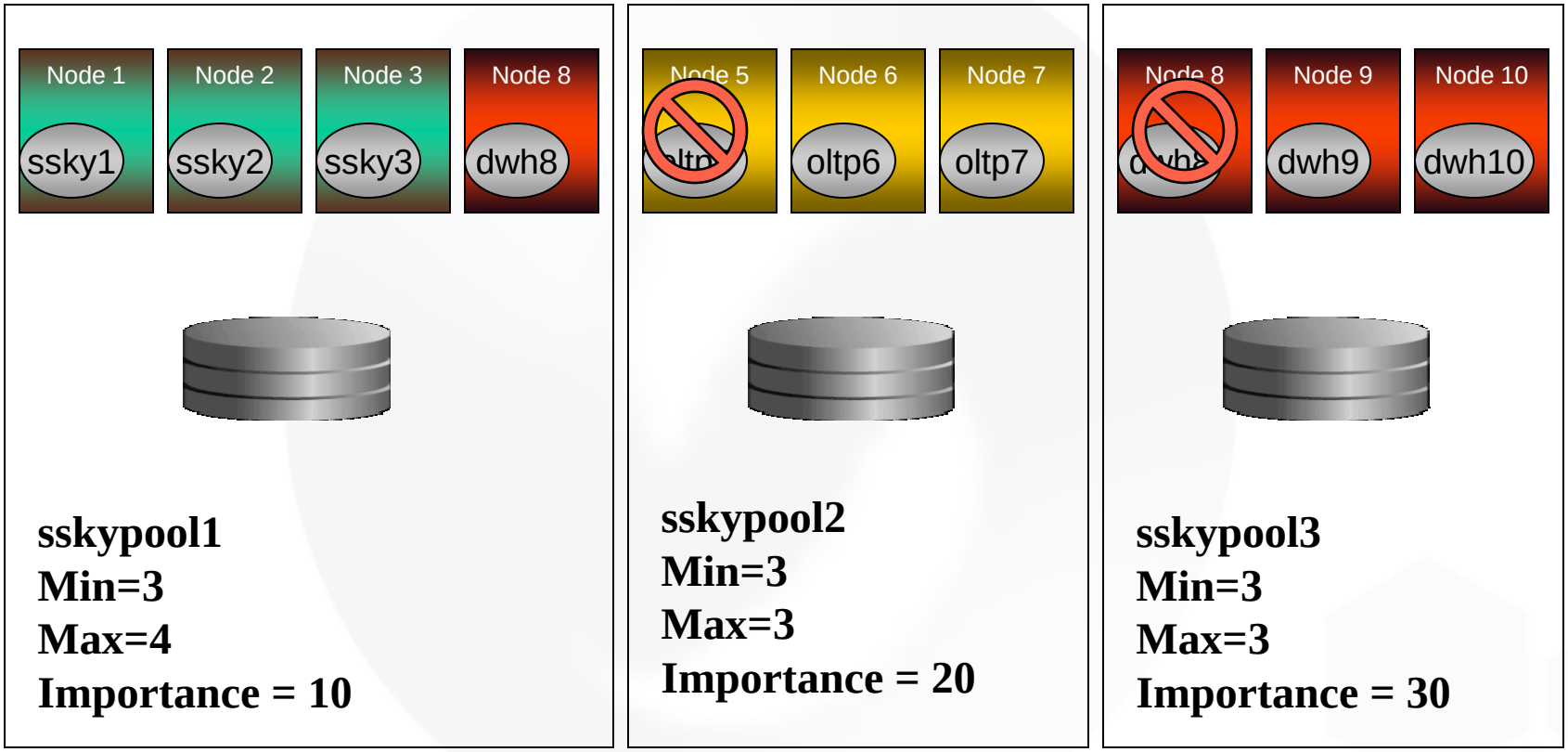
Server Pools



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Thanks for Listening

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