Scalable Oracle 10g for the Physics Database Services

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Outline

- Oracle 10g RAC main architectural components
- Installation overview
- ASM examples
- Utilities and Benchmark Tools
- Q/A

Scalable Oracle Architecture

Goal: A database infrastructure that provides the required system resources to the end-users and applications.

How: A modular architecture that can scale up to a large number of components
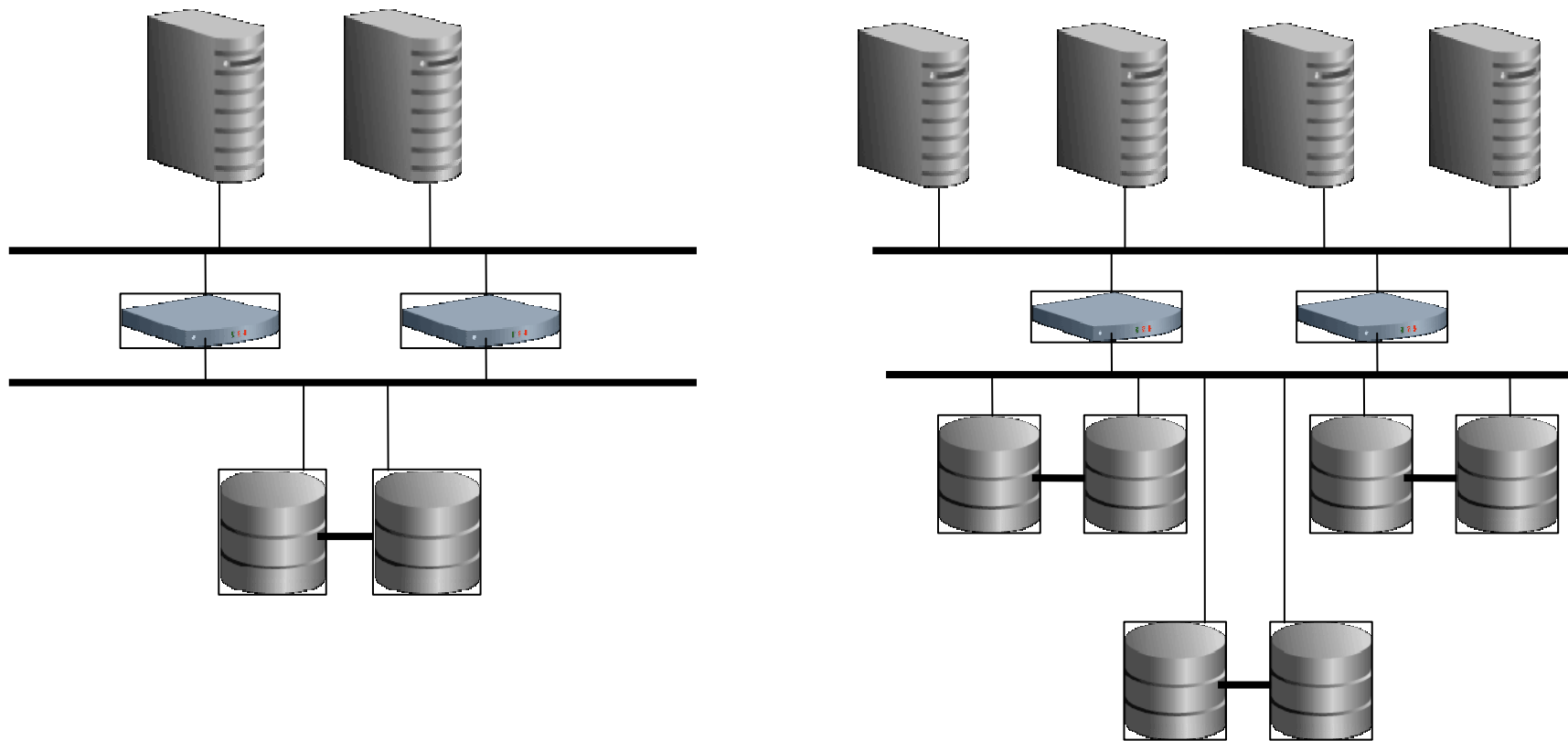
Architectural Elements

- **Oracle RAC for HA and Performance**
  - Multiple nodes
  - Services to balance and segment workload
  - Clients configured with TAF
- **Low cost scalable storage**
  - SAN infrastructure
  - Oracle's ASM (volume manager and RAID)
- **Network infrastructure**
  - Cluster interconnects
  - Public network

Deployment Elements

- **Linux**
  - Oracle certified Linux distribution RHEL 3 or 4
  - Processor architecture
    - At CERN so far 32 bit and Intel Xeon
    - Planned: 64 bit architectures
- **Monitoring and Manageability**
  - EM for monitoring
  - Additional custom scripting/alerts
  - Backups with RMAN
    - to tape
    - to disk (flash backups)

Pre-Installation

- **SAN configuration**
  - Attach storage arrays to the Linux servers (SAN network)
  - Configure the HBA drivers (possibly using multipathing)
- **Configure TCP/IP networks**
  - Cluster interconnects
  - Public networks (possibly using teaming)
- **Setup ssh equivalence (logon without pass) for the cluster nodes**
- **Create the necessary disk partitions**
- **Setup raw devices**
  - For RHEL 3 use devlabel to map rawdevices to obtain persistency
- **Setup asmlib to map disk partitions for ASM**
- **Check OS prerequisites on Oracle's installation guide (kernel parameters, etc)**

Installation

- **Install CRS**
- **Install RDBMS**
- **Install latest Patchset**
- **Install 'CPU' (latest security update)**
- **Install EM agents**
- **Setup ASM (dbca can do it, but double check the results)**
  - ASM instances
  - ASM diskgroups
- **Create DB**

Useful Tools

- **Performance tools:**
  - IO tests: ORION from otn.oracle.com
  - Hammerora (hammerora.sourceforge.net)
  - Bytemark (nbench port by U. Mayer)
- **Oracle RAC on VMWARE from OTN.oracle.com**
- **Utilities and time savers**
  - pconsole: allows to send keyboard input to multiple cluster nodes shell.
  - rlwrap: command history to sqlplus for Linux
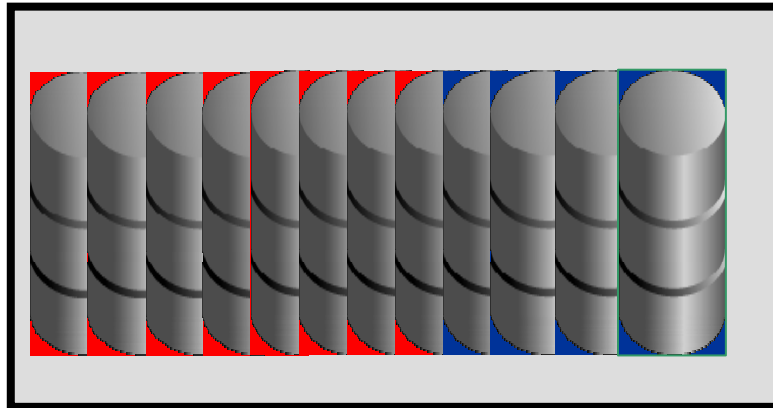 - Oracle's CVU (cluster verification utility)
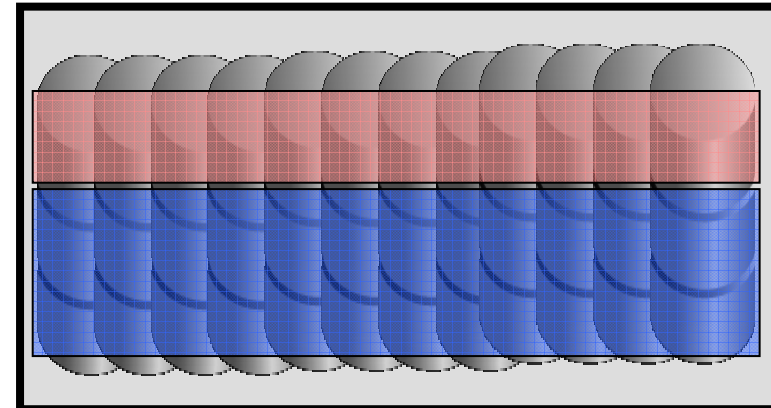
ASM's Configuration – Examples 1

- ASM is a volume manager, its output are disk groups (DG) that Oracle databases can mount to allocate their files

| DATA-DG | RECOVERY-DG |

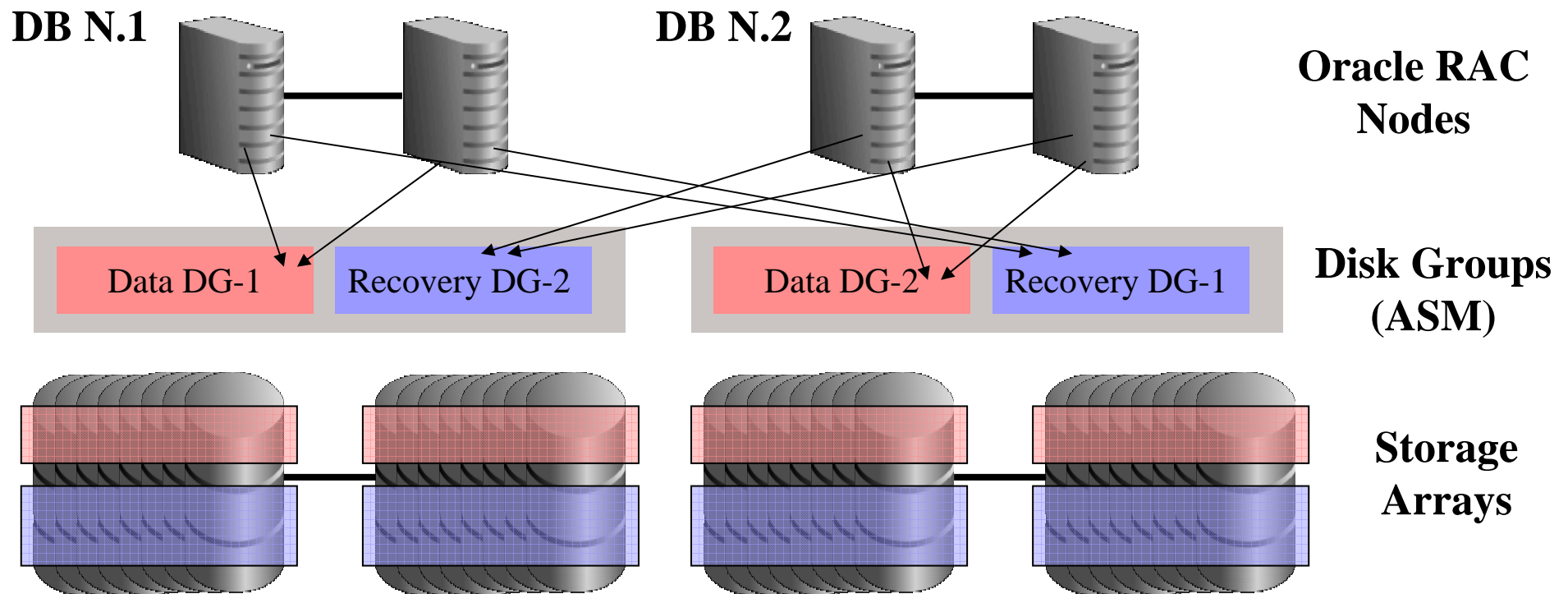**Config 1**: Disk groups created with dedicated disks

Config 2: Disk groups created by 'horizontal' slicing

ASM Configuration –Examples 2

- 'Coupled-RACs' storage configuration:
  - High availability
  - High performance
  - DBs have dedicated resources

  - Allows backups to disk
  - Allows clusterware mirroring (10.2)

DB N.1

DB N.2

Oracle RAC Nodes

Data DG-1	Recovery DG-2

Data DG-2	Recovery DG-1

Disk Groups (ASM)

Storage Arrays

Conclusions

- **See also our wiki page**
  - https://uimon.cern.ch/twiki/bin/view/PSSGroup/DbaArea
    - Installation procedures
    - Post install actions

- Q/A