

Database Services on the National Grid Service

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Overview

- Database Services
- NGS Set-up
- Monitoring, Back-ups
- Hardware & Structure
- Other Services
- Future

Database Services Structure

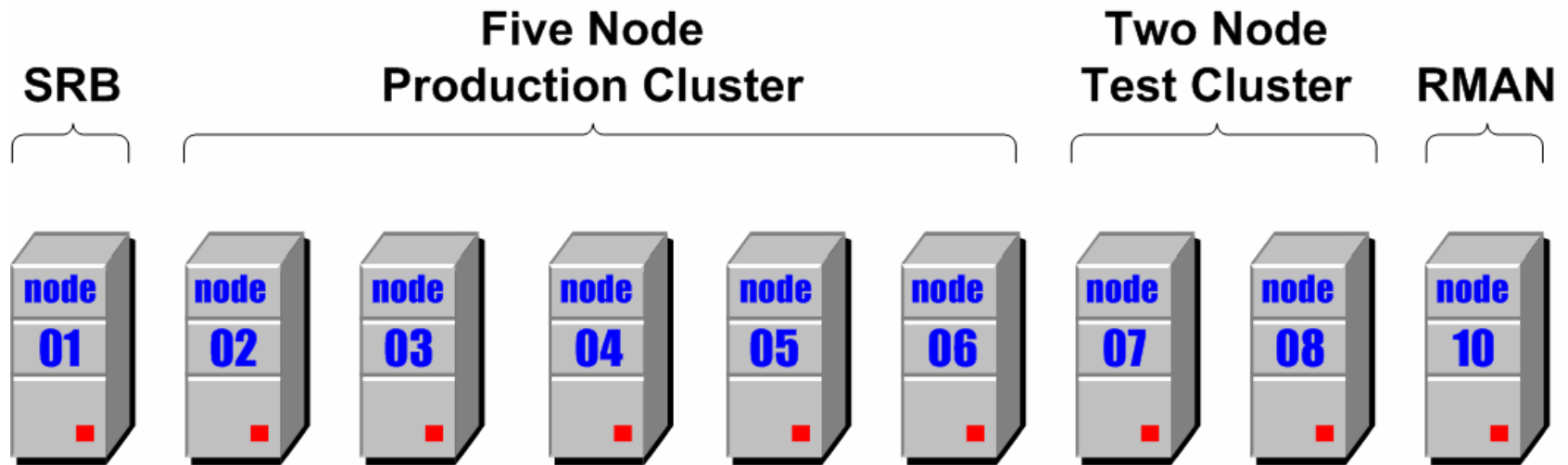
- Part of the Data Management Group in the e-Science Centre
- Structure
 - Database Services Manager
 - 4 DBA Staff Resource
 - 1 System Administration Staff Resources
 - More resources with other groups (including HPCSG)

Database Services Set-up

- Running Oracle 9i Enterprise Server with Real Application Clusters (migrating to 10g in May 2006)
- Using RedHat Linux (RHEL 3.0) with Oracle Cluster File System (OCFS)
- Oracle Data Guard
- Recovery Manager (RMAN)
- Grid Control (Oracle Enterprise Manager)

National Grid Service

- Configuration



Setup

- All slave nodes boot from an image
- Images stored on head node:
/slave-images/oracle686-image/

/var

/opt

/usr

/etc

CCLRC

- Nodes are created using rsync
- Certain files excluded
e.g. listener.log, alert.log
- Node specific files are added:

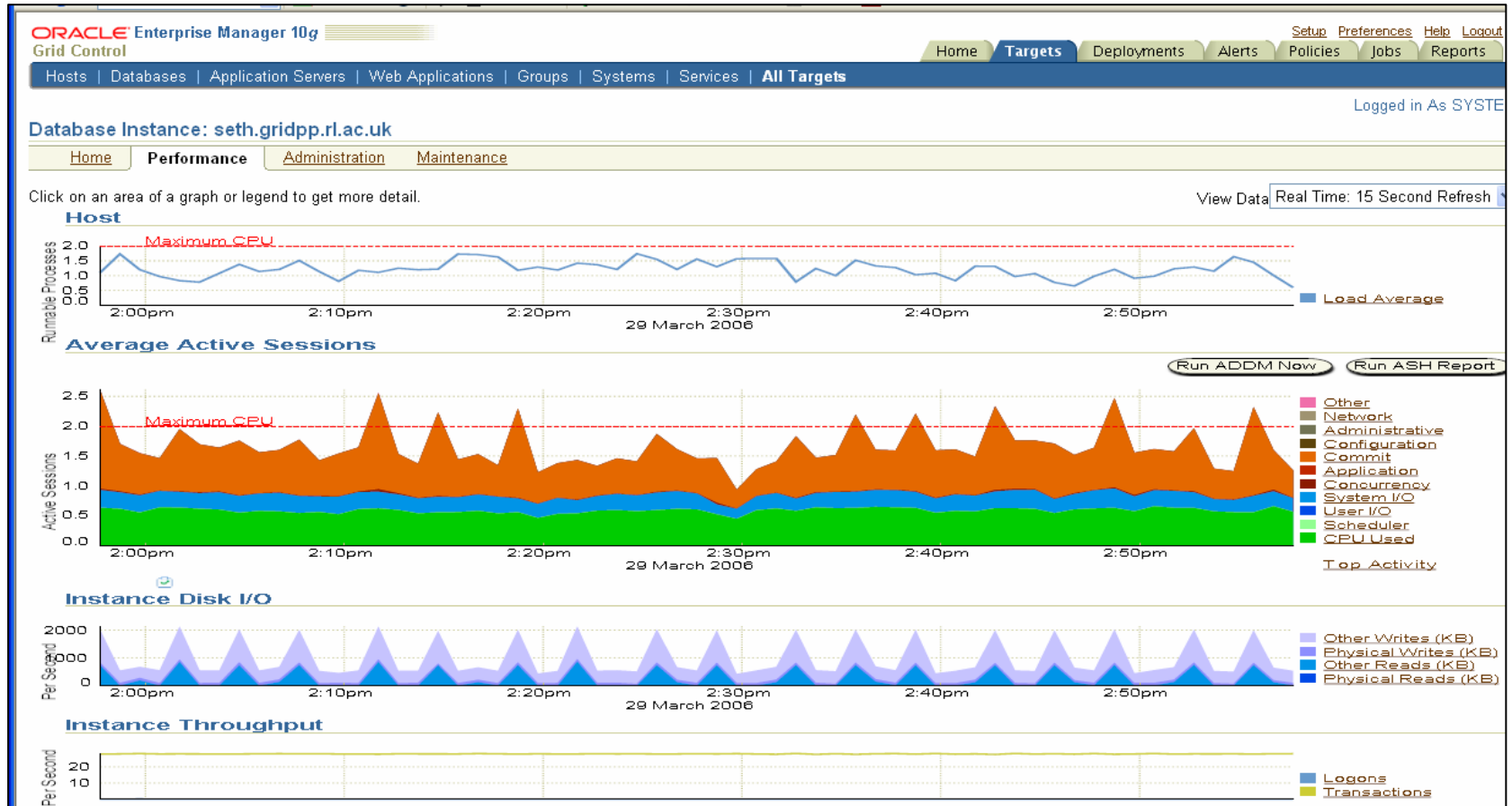
```
/opt/oracle/ora01/app/oracle/product/9.2.0/dbs/initnrsr11.ora  
/opt/oracle/ora01/app/oracle/product/9.2.0/network/admin/listener.ora  
/opt/oracle/ora01/app/oracle/product/9.2.0/network/admin/tnsnames.ora  
/opt/oracle/ora01/app/oracle/product/9.2.0/network/admin/sqlnet.ora  
/opt/oracle/ora01/app/oracle/product/9.2.0/oracm/admin/cmcfg.ora
```

Patching

- Had problems with some patches going to all nodes
- Wanted to minimise downtime
- Patched image and rebooted nodes back into cluster

Monitoring

- Started with 9i Agent
- Recently installed 10g Grid Control Agent
- Agents report to central Oracle Management System (OMS)
- Ganglia used to check machines, space and CPU



Backups

- Oracle Recovery Manager (RMAN)
 - To Atlas Datastore
- Using Recovery Catalogue
- Catalogues to single-instance “Admin” database
- Level 0 in Sunday, incremental for the next six days

User Management

- Separate tablespaces for each user (data and index)
- Naming schema: NGSDB<user ID>
- Allocation of space
- Oracle Resource Manager if necessary

NGS Oracle Users

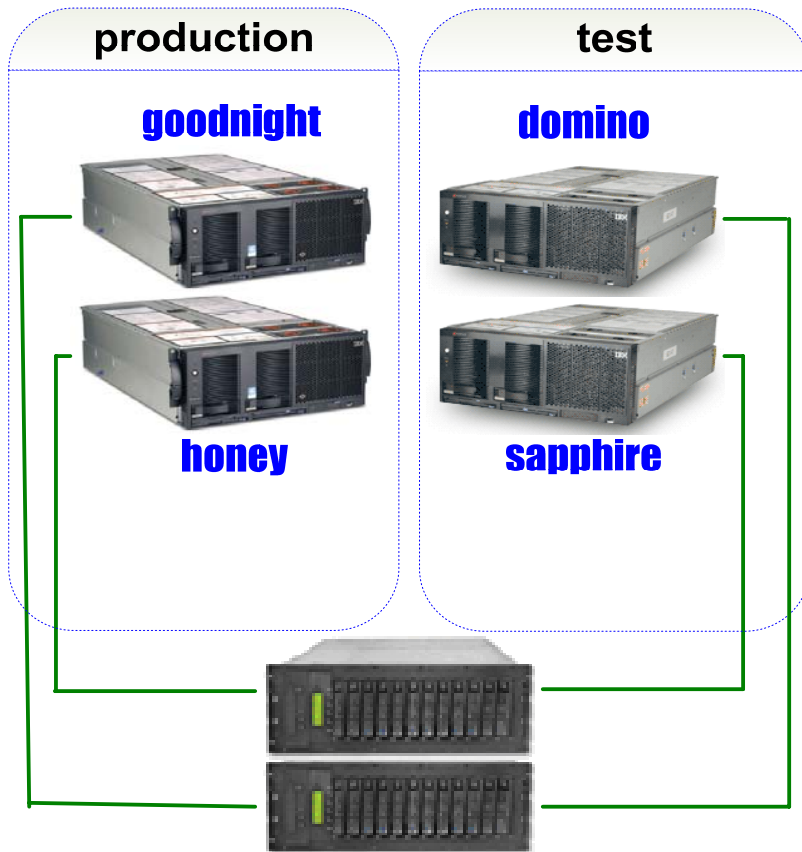
- Storage Resource Broker
- Geodise Project, Southampton University
- Ematerials Crystals and Metadata, University College London
- Mircobase, Newcastle University
- National Grid Service Portal
- Integrative Biology Metadata
- SAKAI Portal
- Structure Health Monitoring project, Southampton University

Other Projects

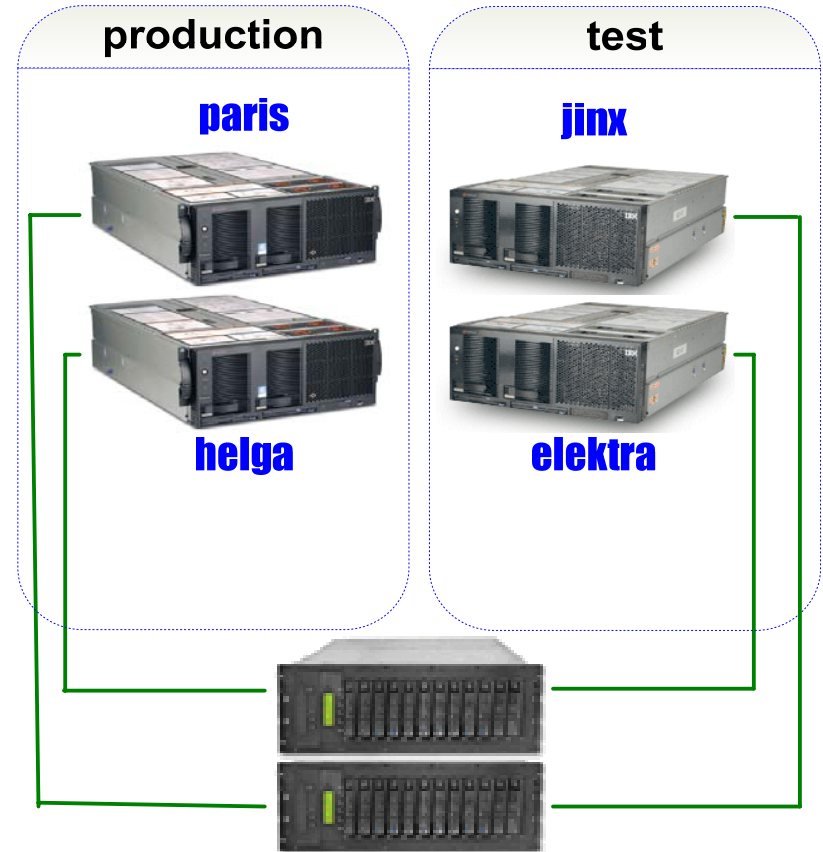
- **Storage Resource Broker**
 - A distributed file system (Data Grid), based on a client-server architecture
- **CASTOR**
 - Cern Advanced STORage
- **Distributed Database for Deployment (3D)**
 - LCG Project for distributing database data from Tier-0 to Tier-1/2

Database Services Hardware Structure

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Future Developments on the NGS

- Oracle Features
 - Spatial
 - XML
 - Single Sign On
 - Streams (replication)
- Reporting infrastructure
- HTML DB

Future Developments on the NGS

- Upgrade to 10g Real Application Clusters
- Oracle Automatic Storage Management (ASM)
- Resource Manager Configuration
- Improved Statistics and Reporting
- Continued Production Service

Questions & (hopefully) Answers

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