# Outcome of the Database Workshop

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# Workshop Goals

- ## Review Upcoming Milestones
  - Tier 0 and Tier 1 status
- ## Review Security and Backup Policy proposals
- ## Database Production and integration with Grid Tools & Procedures
  - Use of GGUS, SAM test(s), GOCDB, CIC portal
- ## Update on Experiment Requirements
  - Scope next 6 months
  - Sasha's summary talk

- ## March
  - ATLAS Conditions Data Challenge
    - All phase 1 sites expected to join
    - ATLAS grid jobs accessing Tier 1 replicas
- ## End of March
  - All phase 2 site setups complete
    - TRIUMF, SARA, NDGF, PIC available for experiment tests
    - All 3D sites participating at this stage
- ## April
  - LHCb Conditions Deployment
    - All LHCb database sites participating
    - LHCb grid jobs accessing Tier 1 replicas
  - Sequence and schedule of LFC tier 1 replicas being defined with LHCb

# Tier 0 and Tier 1 status

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# Tier 0 Service Architecture

**PSS**
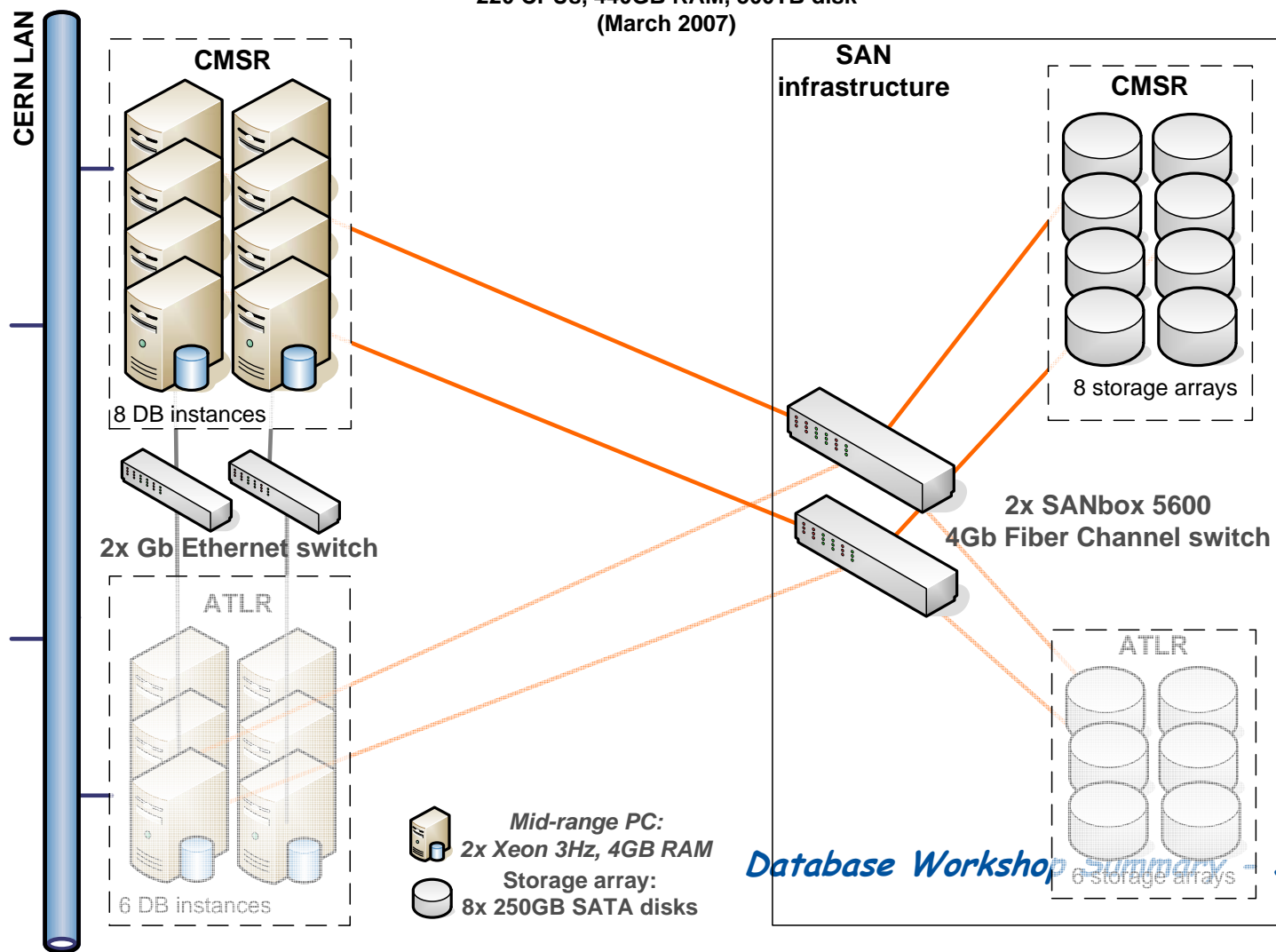
HA DB requires redundant h/w : db server, storage array, ethernet networks, fiber Channel networks (SAN), redundant power supplies and UPS

**Oracle RAC on Linux,** CERN-IT-PSS
**220 CPUs, 440GB RAM, 300TB disk**
**(March 2007)**

**CERN LAN**

**CMSR**

8 DB instances

2x Gb Ethernet switch

ATLR

6 DB instances

**SAN infrastructure**

**CMSR**

8 storage arrays

**2x SANbox 5600**
**4Gb Fiber Channel switch**

ATLR

8 storage arrays

*Mid-range PC:*
*2x Xeon 3Hz, 4GB RAM*
*Storage array:*
*8x 250GB SATA disks*

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# Tier 0 Database Expansion

| Experiment/ activity | Q1 2006 | | | Q1 2007 | | |
|---|---|---|---|---|---|---|
| | Production | Integration/ Pilot/Test | On-line test | Production | Integration/ Pilot/Test | On-line test |
| ALICE | On PDB | - | - | On PDB | - | 1 x 2 nodes (PVSS tests) |
| ATLAS | 1 x 4 nodes | 1 x 2 nodes | 1 x 2 nodes | 1 x 6 nodes | 1 x 2 nodes | 1 x 6 nodes |
| CMS | 1 x 4 nodes | 1 x 2 nodes | - | 1 x 8 nodes | 1 x 2 nodes | 1 x 6 nodes (PVSS tests) |
| LHCB | 1 x 4 nodes | 1 x 2 nodes | - | 1 x 6 nodes | 1 x 2 nodes | 1 x 6 nodes (PVSS tests) |
| WLCG | 1 x 4 nodes | 1 x 2 nodes | - | 1 x 8 nodes | 2 x 2 nodes | - |
| PDB (alice, harp, totem) | 1 x 2 nodes | - | - | 1 x 4 nodes | - | - |
| COMPASS | 1 x 4 nodes | - | - | 1 x 4 nodes | - | - |
| 3D | - | 1 x 2 nodes | - | 3 nodes (downstream capture) | 1 x 2 nodes | - |

# Tier1 Status

- 10 Tier-1 Sites
  - FermiLab - CMS only
  - 4 out of 9 Tier-1 sites took part in first Atlas tests (TAGS and Conditions data)
  - 6 Phase 1 sites available
  - 4 Phase 2 sites
    - 2 being tested (TRIUMF and SARA)
    - 2 should be ready by end of march (NDGF and PIC)

- Backups, monitoring and patching updates/advice on wiki and known to 3D

- 6 sites on monitoring infrastructure (Oracle Enterprise Manager)

# What could be done better?

- Monitoring
    - Sharing more information and learn what is best for each site
    - More documentation on Oracle Enterprise Manager

- Email
    - List not used enough
    - Reliance on CERN

- Backups/Recovery
    - More documentation needed

- Physics
    - Relation of 3D tests to physics could be of interest

- Requirements
    - Information on concurrent database connections
    - Scheduled disk usage of experiments

# Backup and Security Proposals

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# Backup and Recovery Proposal

- Backup based on ORACLE RMAN 10g
  - Risky changes should be tried on the validation set-up first
  - Backup on tape: uses TSM
    - retention set to 31 days
      - A full backup is systematically performed and kept before any ORACLE software upgrade
      - **Full** - every 2 weeks
      - **Incremental** (differential or cumulative) – daily
      - **Archive logs** - every 30 minutes
  - Backup on disk: all data files into the flash recovery area
    - retention set to 2 days
      - **Full** - at database creation
      - **Incremental** – daily

- Oracle Critical Patch Upgrade (CPU) are applied asap, typically within two weeks from the publishing date
  - validation period of typically one week (often tight…)
- Oracle software upgrades are typically performed once or twice per year
  - version installed on the validation RAC and tested by the application owners and Tier 1 sites for one month
- Minor upgrades discussed in LCG-SCM and 3D
- Major version updates deferred to the MB
- Oracle patches are only made for recent versions and therefore it is essential to update accordingly

# 3D Operations and Monitoring

- 3D Monitoring (including site availability) are available eg via
  - http://oms3d.cern.ch:4889/streams/main.php
  - This page is now included in ATLAS and LHCb experiment dashboards
- SAM test will be added
  - need to understand security impact
- Streams configuration is a Tier 0 responsibility
  - Agreed to start with interventions during CERN working-hours
  - Will extend to 24 x 7 if necessary
  - DB manager on duty (DBMOD) role initially covered by Tier 0 database service team
    - May move to a rota across based on first experience

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- Agreed with the GGUS team to introduce database report type into next GGUS release (22 February)
  - Will switch 3D monitoring to feed into GGUS ticketing system with the GGUS release
- All Tier 1 database teams will contact their ROC to be added as a new support unit before mid-February
  - All sites have already email lists created and used in the 3D streams monitoring
- All interventions on production databases will be announced in advance as EGEE broadcasts via GOCDB

# Summary

- Security and backup proposals have been presented to the experiments/WLCG community
  - Accepted by experiments and sites representatives during the database workshop
- Tier 0/1 status
  - 3D responsibilities now integrated within the service
  - hardware expansion on schedule
  - All phase 1 sites in ATLAS setup
  - Two of the four phase 2 sites already under test
- GGUS, integration plan and notification procedure defined
- Will now work on SAM & GOCDB integration
- Ready for experiment milestones in March & April
  - Will have a 3D DBA workshop at SARA in March