Oracle structures on database applications development

LCG Database Deployment and Persistency Workshop

18-Oct-2005

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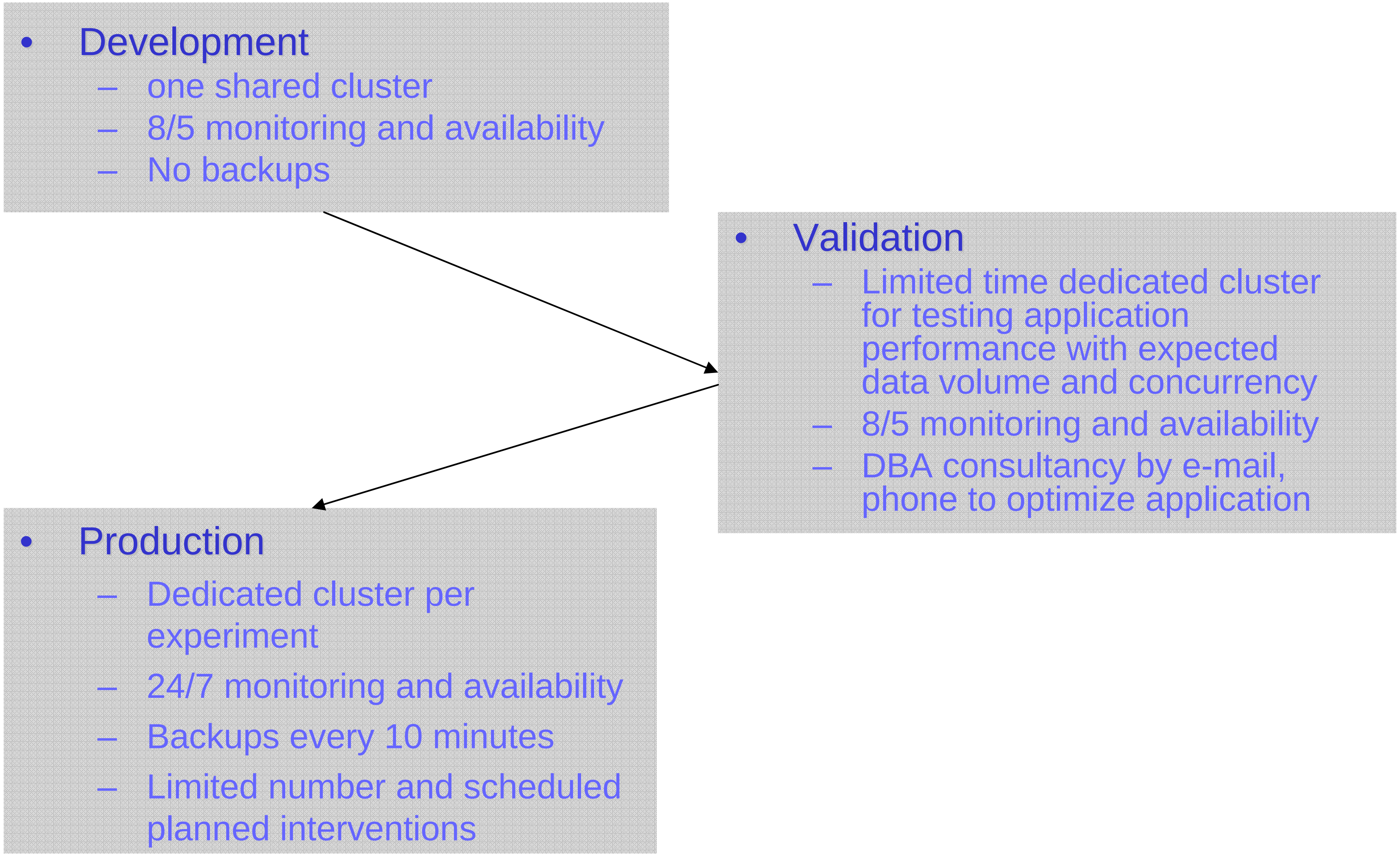
Objectives

- Increase security
- Improve scalability
- Allow resource management
- Better definition of development stages
- Smother transition between stages
- Facilitate DBAs work (better organization)

Oracle reference (oradoc.cern.ch)

- Schemas (users, accounts)
  - Collection of database objects owned by a database user and with the same name as that user.
- Profiles
  - a named set of specified resource limits
- Roles
  - named groups of related privileges that you grant, as a group, to users or other roles.
- Tablespaces
  - logical storage units which group related logical structures together
- Services
  - groups of applications with common attributes, service level thresholds, and priorities

Development stages



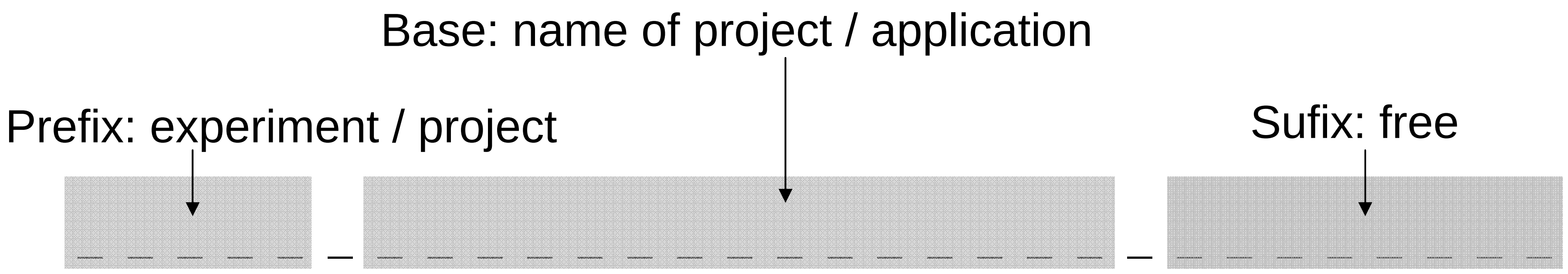
- Development
  - one shared cluster
  - 8/5 monitoring and availability
  - No backups

- Validation
  - Limited time dedicated cluster for testing application performance with expected data volume and concurrency
  - 8/5 monitoring and availability
  - DBA consultancy by e-mail, phone to optimize application

- Production
  - Dedicated cluster per experiment
  - 24/7 monitoring and availability
  - Backups every 10 minutes
  - Limited number and scheduled planned interventions

Naming convention

- Restriction: maximum 30 characters



Base: name of project / application

Prefix: experiment / project

Sufix: free

```
CMS_TRANSFERMNGM_R
CMS_TRANSFERMNGM_SC3_R
LHCB_RICHHPD_TEST_APP
ATLAS_BOOKKEEPING_ROLE_LYON
LCG_FTS_LHCB_W
```

Profiles

- **Developer / owner (cern_dev_profile)**
  - Account locked for 1 minute after 5 failed login attempts
  - Password expires every 365 days
  - 10 days to change password after first warning then account locked
  - Maximum 10 simultaneous sessions of same user
  - Sessions killed after 2 full days of inactivity
  - Password needs to comply with secure password function

- **Application (cern_app_profile)**
  - Account locked for 1 minute after 10 failed login attempts
  - Password never expires *(might change to a general password policy)*
  - Unlimited simultaneous sessions (DB limit ~500 for all users)
  - Sessions killed after 2 full days of inactivity
  - Password needs to comply with secure password function

Roles

- Developer / owner (cern_dev_role)
  - Creates/drops objects (tables, indexes, …)

ALTER SESSION
CREATE CLUSTER
CREATE DATABASE LINK
CREATE MATERIALIZED VIEW
CREATE PROCEDURE

CREATE ROLE
CREATE SEQUENCE
CREATE SESSION
CREATE SYNONYM
CREATE TABLE

CREATE TRIGGER
CREATE TYPE
CREATE VIEW
QUERY REWRITE
ADVISOR
PLUSTRACE

- Application (cern_app_role)
  - No object creation

ALTER SESSION
CREATE SESSION
CREATE SYNONYM

CREATE VIEW
QUERY REWRITE

Accounts, policy & convention

- Development
  - Developer profile and role
  - If 1 account with no suffix
    - LCG_GRIDVIEW
  - If more accounts login as suffix
    - CMS_TRACKER_MANJO
    - CMS_TRACKER_CANALI

- Production
  - Owner account
    - Developer profile and role
    - LHCB_COOL
  - Reader/writer, application accounts
    - Application profile and role
    - (ATLAS_DAQ_R and ATLAS_DAQ_W) or, ALICE_COOL_APP

Application roles

- Objective: Fine grain access control
- Roles with specific access privileges to objects
  - Can be password protected
  - Administrated by application owner

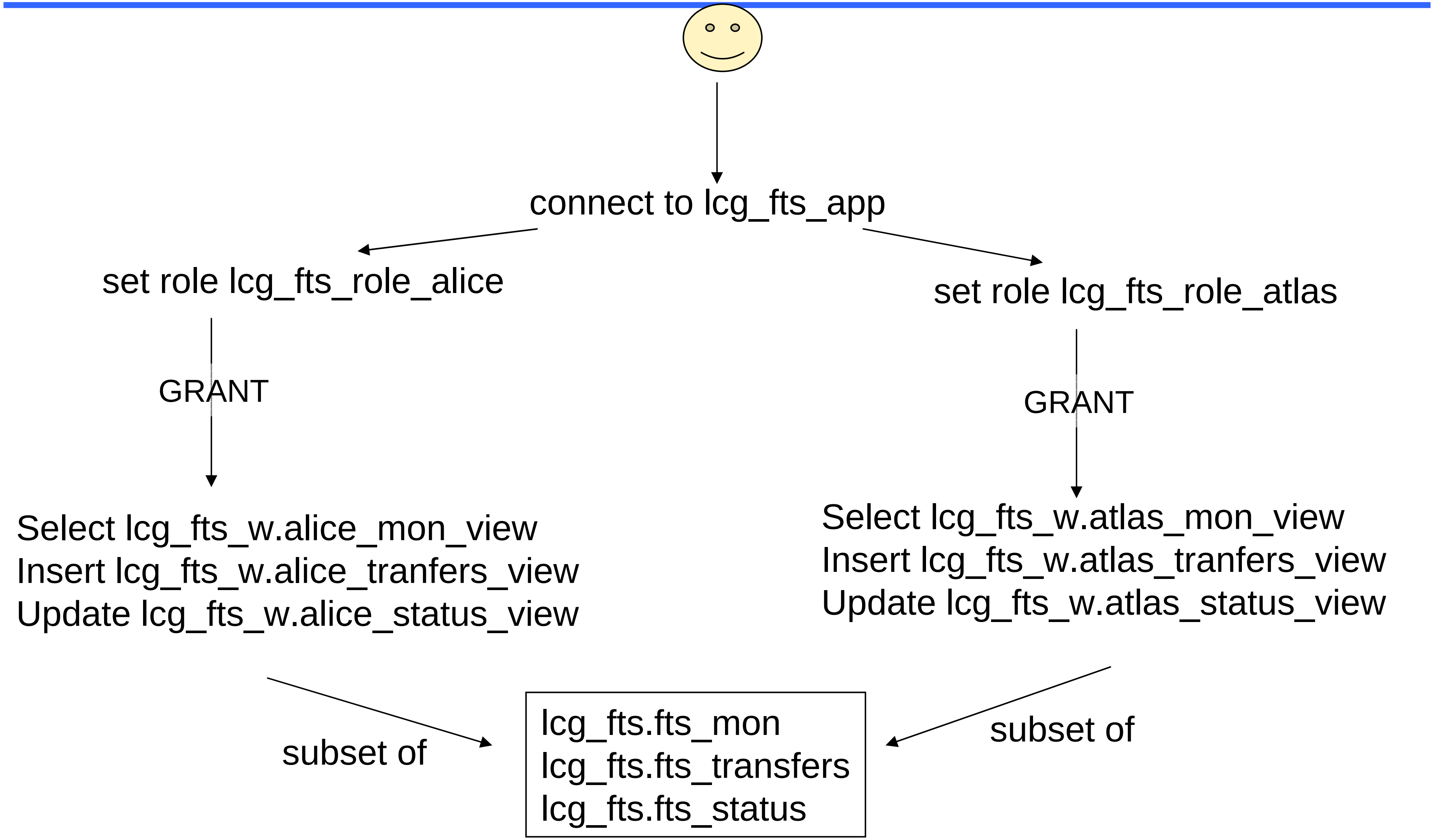
OWNER (LCG_FTS):

```
SQL> create role lcg_fts_role_alice identified by x1z;
SQL> create view lcg_fts_alice_transfers as
  select * from lcg_fts_transfers where VO=‘ALICE’;
SQL> grant select, insert, update on
  lcg_fts_alice_transfers to lcg_fts_role_alice;
```

APPLICATION (LCG_FTS_APP):

```
SQL> set role lcg_fts_role_alice identified by x1z;
SQL> insert into lcg_fts_alice_tranfers values ...
```

Application roles



connect to lcg_fts_app

set role lcg_fts_role_alice

GRANT

Select lcg_fts_w.alice_mon_view
Insert lcg_fts_w.alice_tranfers_view
Update lcg_fts_w.alice_status_view

set role lcg_fts_role_atlas

GRANT

Select lcg_fts_w.atlas_mon_view
Insert lcg_fts_w.atlas_tranfers_view
Update lcg_fts_w.atlas_status_view

subset of

lcg_fts.fts_mon
lcg_fts.fts_transfers
lcg_fts.fts_status

subset of

Tablespaces and quotas

- *Transparent to user*
- *Tablespace name should not be application dependent*
  - *Do not specify tablespace on object creation*

- Development
  - Shared tablespace (DATA01)
  - Maximum 500MB quota

- Production
  - Dedicated tablespace (project_DATA01)
  - Unlimited quota (disk space limit)
  - Special tablespaces for certain datatypes, data (read-only)

Services

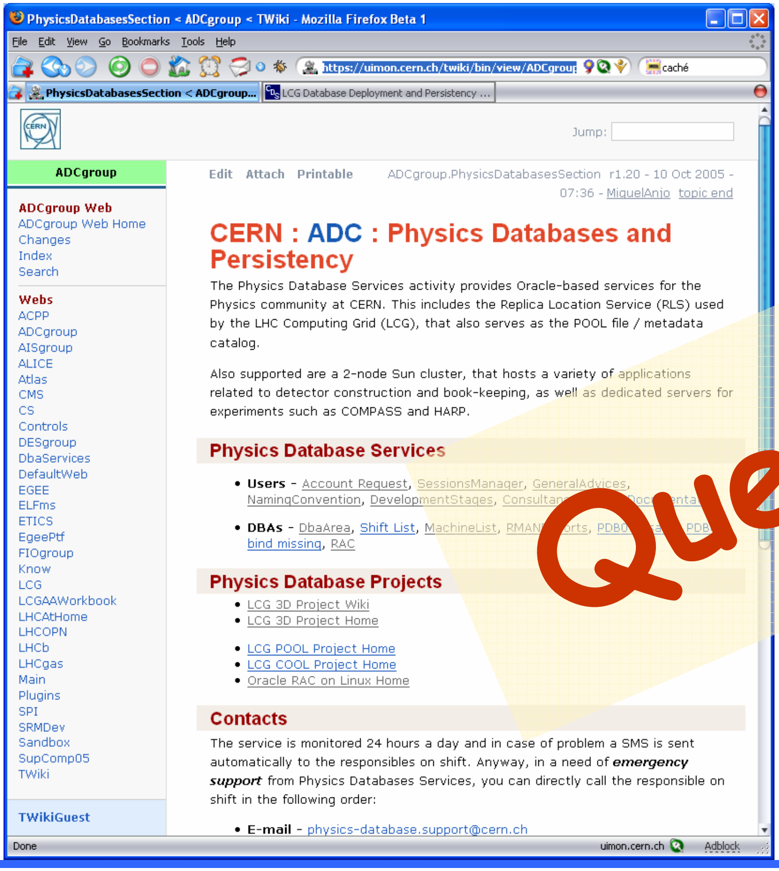
- Allows set priorities, monitor individual applications
- Same as application name
- Preferred cluster node or least loaded node
- Better scalability and resource management
- Individual monitor and statistics
- Easier management by DBAs

Connection to DB

- tnsnames.ora
  - One entry per application
  - Allow client side load-balancing
  - Might change without warning (application should be ready to read from afs/dfs)
- Server + service name
  - Service name = application_name.cern.ch
  - Server and service name might change without warning (application should be ready to change at any time, not hard coded)
  - We try to keep as stable as possible (with IP alias)

Support and Accounts

- https://uimon.cern.ch/twiki/bin/view/ADCgroup/PhysicsDatabasesSection
- Physics-databases.support@cern.ch



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LCGAAWorkbook
LHCAtHome
LHCOPN
LHCb
LHCgas
Main
Plugins
SPI
SRMDev
Sandbox
SupComp05
TWiki

TWikiGuest

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CERN : ADC : Physics Databases and Persistency

The Physics Database Services activity provides Oracle-based services for the Physics community at CERN. This includes the Replica Location Service (RLS) used by the LHC Computing Grid (LCG), that also serves as the POOL file / metadata catalog.

Also supported are a 2-node Sun cluster, that hosts a variety of applications related to detector construction and book-keeping, as well as dedicated servers for experiments such as COMPASS and HARP.

Physics Database Services

- **Users** - Account Request, SessionsManager, GeneralAdvices, NamingConvention, DevelopmentStages, Consultan[illegible] Documenta[illegible]
- **DBAs** - DbaArea, Shift List, MachineList, RMAN[illegible]orts, PDB0[illegible]sa[illegible] PDB[illegible] bind missing, RAC

Physics Database Projects

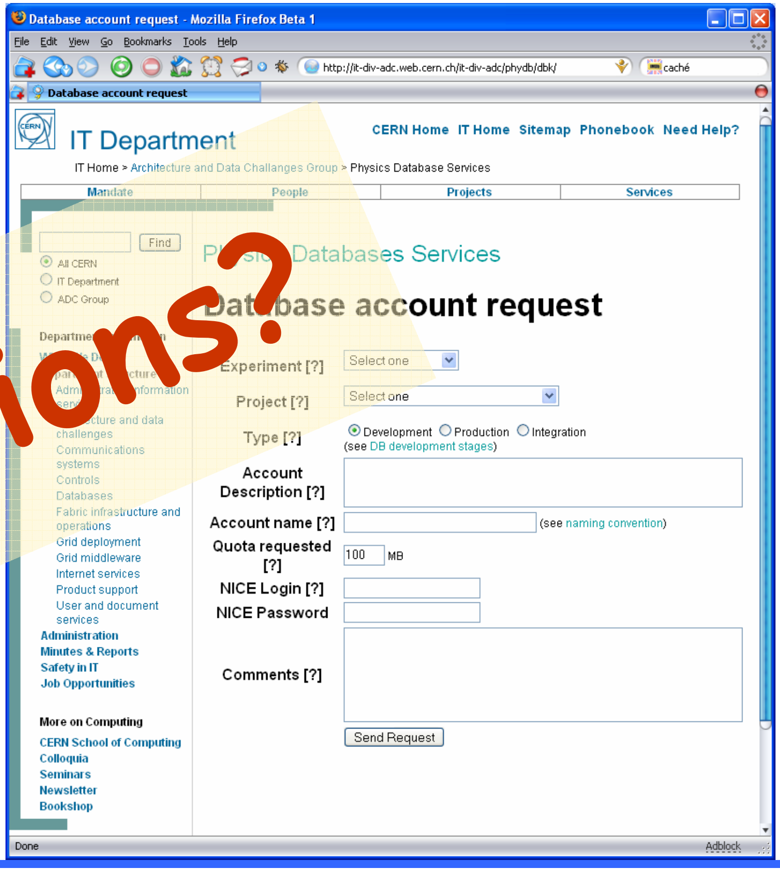
- LCG 3D Project Wiki
- LCG 3D Project Home
- LCG POOL Project Home
- LCG COOL Project Home
- Oracle RAC on Linux Home

Contacts

The service is monitored 24 hours a day and in case of problem a SMS is sent automatically to the responsibles on shift. Anyway, in a need of ***emergency support*** from Physics Databases Services, you can directly call the responsible on shift in the following order:

- **E-mail** - physics-database.support@cern.ch

Done
uimon.cern.ch
Adblock



Database account request - Mozilla Firefox Beta 1

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Experiment [?] Select one
Project [?] Select one
Type [?] ● Development ○ Production ○ Integration
(see DB development stages)
Account Description [?]
Account name [?] (see naming convention)
Quota requested [?] 100 MB
NICE Login [?]
NICE Password
Comments [?]
Send Request

Questions?