Oracle CERN Openlab Projects Status Review

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Work on the following subjects since my arrival (April 2006)

- Joint Software Testing Programme
- Oracle Data Guard Automatic Failover
- Application Design, Development and Scalability on Oracle RAC

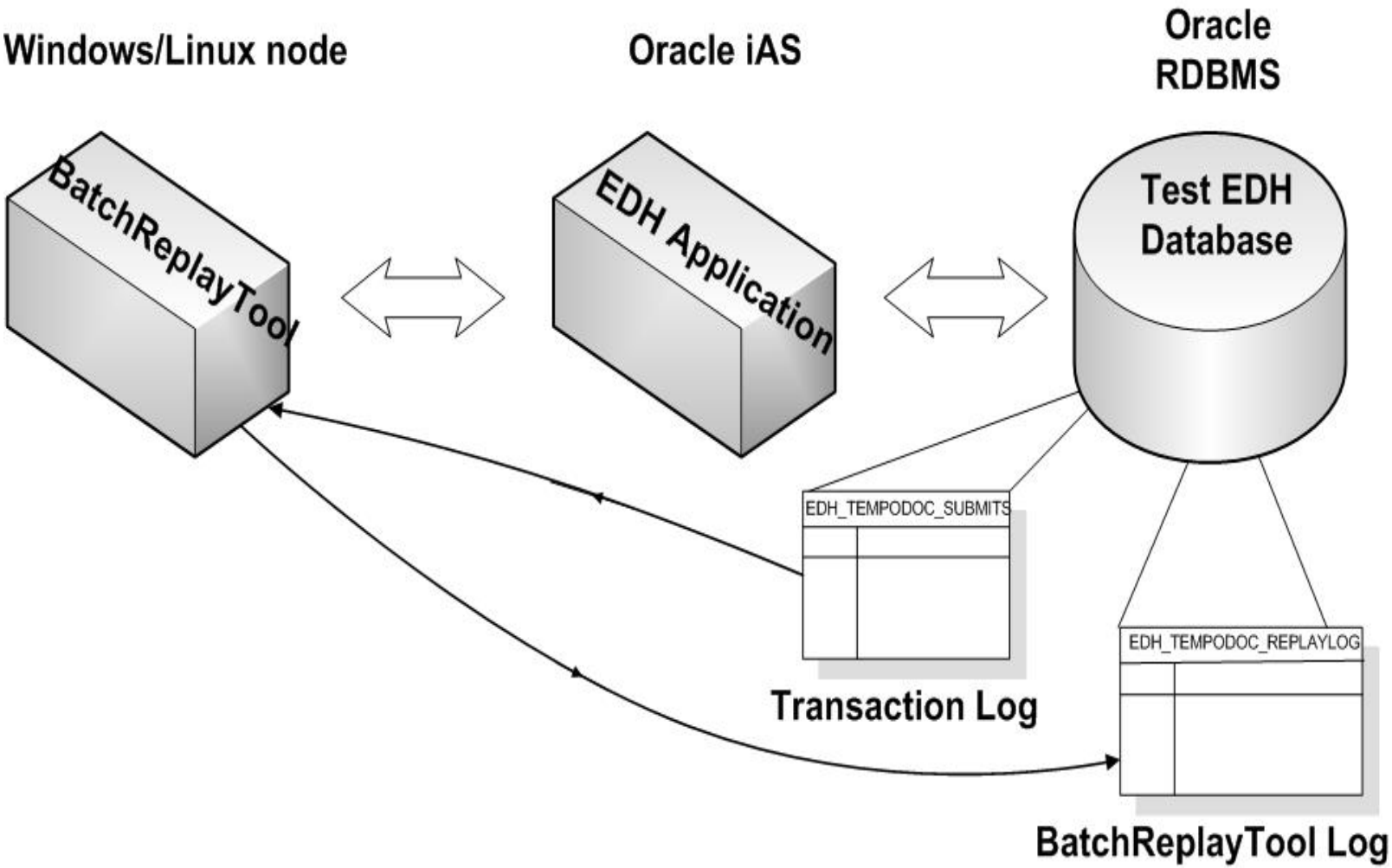
Objectives of the programme:

- To test in the CERN environment Oracle releases for performance and functionality
- To test the compatibility of CERN in-house built software with new releases of Oracle products with primary focus on the database
- Have software engineers from organizations and companies work directly together

CERN has a set of applications for which automatic regression testing is possible:

- **EDH** (Electronic Document Handling)
- **CASTOR** (CERN Advanced STORage manager)
- **HRT** (Human Resources Toolkit)
- **CET** (CERN Expenditure Tracking)

EDH Testing Scheme



EDH regression testing
Objectives

Three types of tests:

- Change of EDH Application Version
- Change of Oracle RDBMS for testing
- Upgrade of Oracle RDBMS

Tests include:

- Change of tuning parameters
- Transaction log replay

Measuring of the effects:

- Automatic Workload Repository reports
- Statistics on the features used
- Validation of the created EDH documents

Testing progress so far…

- Installation of several intermediate development releases of the RDBMS
- EDH import on each of the versions
- Functionality of EDH
- Performance of the RDBMS

- Types of bugs identified:
  - ✓ RDBMS installation type issues
  - ✓ RDBMS kernel issues
  - ✓ BatchReplayTool issues

- Overall test results are good

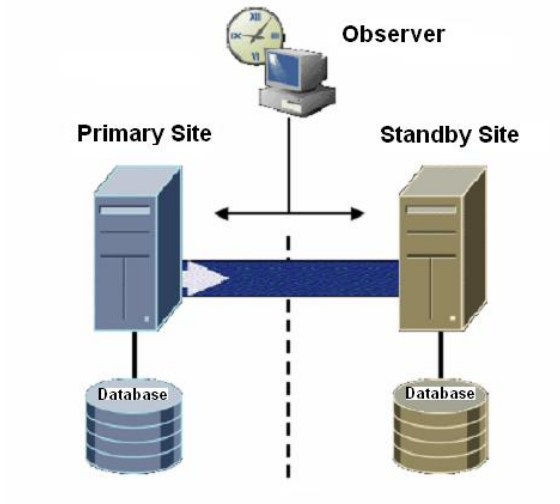
Future plans

- RDBMS upgrade testing
- Testing mixed, old client/new server configurations
- Testing of new Oracle functionality
- More performance testing
- Participation in upcoming testing programmes

Oracle Data Guard Automatic Failover

Objectives of the programme:

- Test following Data Guard solutions on RDBMS 10gR2 :
  - ✓ Automatic Failover
  - ✓ Inter patchset SQL Apply
  - Test Data Guard Automatic Failover mechanism with focus on:
    - ✓ Data size
    - ✓ Time to switch



- To deploy in production Data Guard Automatic Failover mechanism on selected CERN service, in order to reduce downtime implied by major software / hardware issues and upgrades.

Progress and future plans

Progress:

- Test primary and physical standby databases installed and configured
- Manual failover and switchover tested
- Data Guard Broker installed and configured
- Fast Start Failover tested upon:
  - ✓ Shutdown abort
  - ✓ Network outage
  - ✓ Reboot/shutdown of the host

Future Plans:

- Configuring and testing TAF and connect time failover
- Test the solution with copies of real databases
- Implement in production

Application Design, Development and Scalability on Oracle RAC

- The process of designing/tuning the applications for RAC scalability is not always easy and straightforward.
- CERN developers will need recommendations and guidance in order to produce RAC scalable software.
- Such a set of recommendations really are universally useful also for non-RAC databases

Objectives of the programme:

- To examine real CERN cases and to study RAC scalability and related issues on:
  - ✓ **PVSS** (Prozeßvisualisierungs- und Steuerungs-system)
  - ✓ **POOL** (Pool of persistant objects for LHC)
- To design and develop general techniques and recommendations to improve RAC scalability

Progress and future plans

Progress:

- PVSS testing group meetings attended
- RAC scalability issues were implemented and successfully tested by the group

Future Plans:

- Further PVSS scalability testing
- Creating of document, containing explanation of design techniques ensuring scalability on RAC
- Start analyzing POOL
- Other RAC scalability studies

Programme's Feedback

The feedback is circulated between the people involved.

Oracle EMEA

Monica Marinucci Lopez	Management of the programmes
June Farmer	Management of the programmes
Graeme Kerr	Technical liaison

Oracle Development

Andrew Holdsworth	Manager Joint Software Testing
Bjørn Engsig	Primary Development Contact
Michael Hallas	Data Guard Automatic Failover

CERN Openlab

Sverre Jarp	Chief Technologist Officer
Mats Moller	IT-DES Group leader
Eric Grancher	IT-DES-DIS Section Leader

Q&A

Oracle database virtualization

Atle Rudshaug

(Openlab summer student)

Oracle database virtualisation

Context:

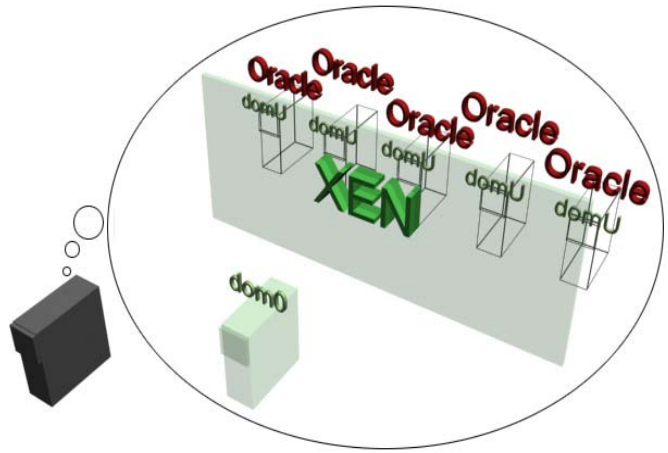
- Increasing number of databases, increasing power of machines (2/4/8/… cpu per machine, 2/4/… cores per CPU), machine management overhead.
- Virtualisation techniques are mainstream, increasing attention and ease on Linux.

Objectives of the programme:

- Use of it for Oracle databases? What gains can be expected, which new questions to be investigated?
- Including inter-instance resource management.

Oracle database virtualisation

Results:



- Work done by Atle Rudshaug and Eric Grancher
- Prototype with Linux / Xen.
- Very encouraging results:
  - ✓ Atle found interesting ways of managing the network (with security benefits)
  - ✓ Resource management tests with several instances gave good results.
- Promising ideas and technologies.
- Article and notes to be published.

Q&A

Thank You!

(BACKUP) Batch Replay Tool

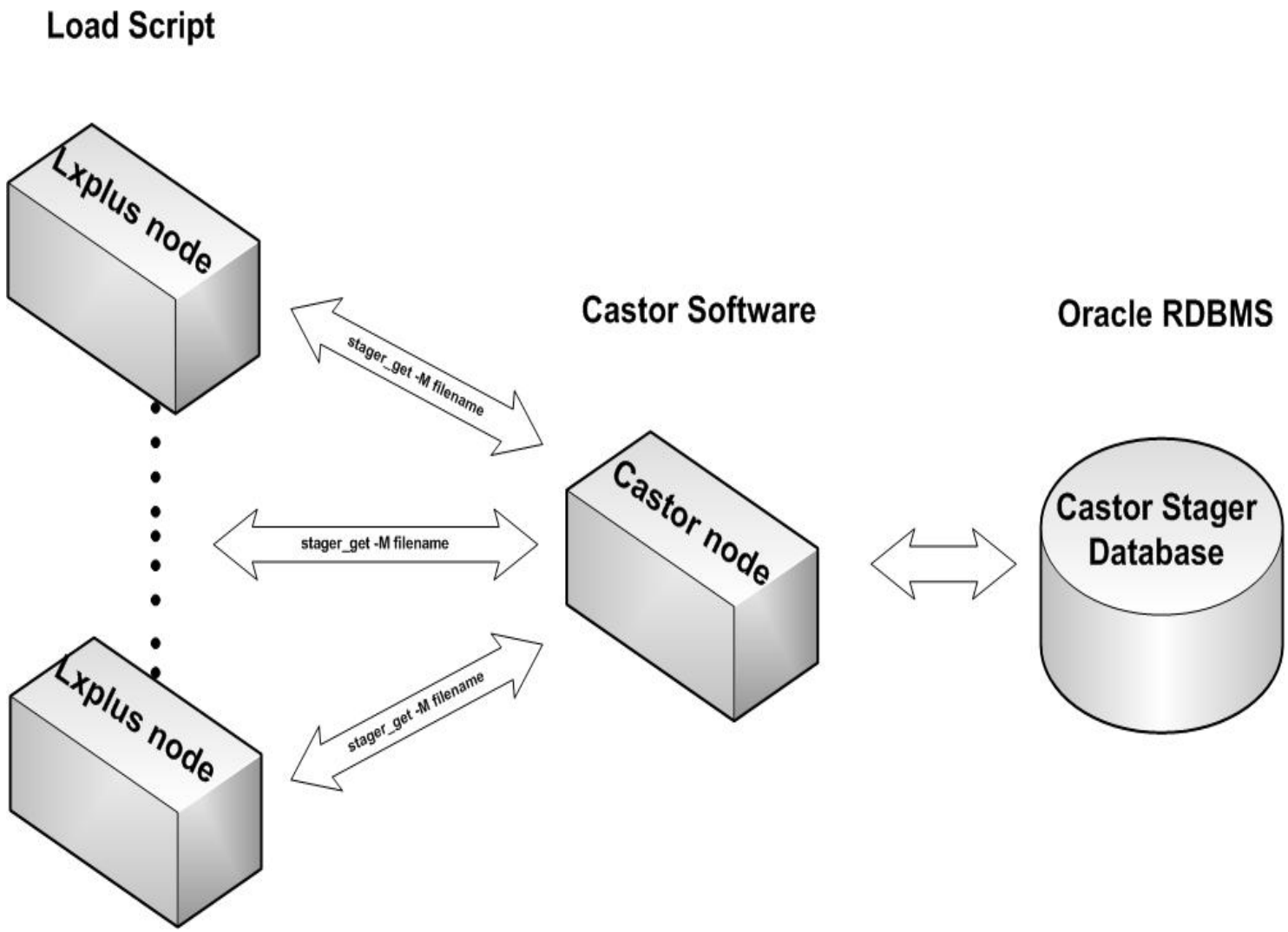
Java application developed by *Istvan Kallai* (IT-AIS)

Main Features:

- Uses EDH transaction log
- Generates requests as specified in the transaction log
- User-configurable:
  - To replay a time period
  - To replay the activities of (a) user(s)
  - To make a delay between two requests

* One-thread tool, multi-threading replay is investigated

(BACKUP) CASTOR Test environment



(BACKUP) Data Guard Automatic Failover Schema