Oracle technical update for CERN physics services

CERN openlab II quarterly review 31 January 2007

Dawid Wojcik



Quarterly review



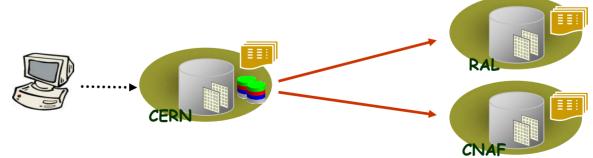
- Database recovery tests in the streams environment
- Streams optimizations
- Streams monitoring
- Physics services expansion
- Storage configuration
- Data Guard
- RAC monitoring
- Quarterly Summary
- Future Plans (PoW 2007)



Database recovery in the streams environment

Eva Dafonte Pérez

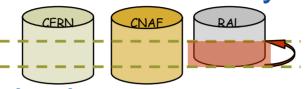
- Objectives
 - simulate real scenarios of failure at one or more sites
 - perform recoveries on source or destination database
 - document all tests results, report feedback, resolve issues
- Streams test environment



Recovery scenarios

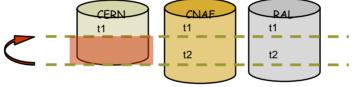


Point-in-time recovery on destination database

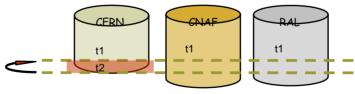


Point-in-time recovery on source database

• Latest data on source was not applied on destination



• Apply process has applied some transactions from the source database after point-in-time recovery



- Recovery on source and/or destination
 - Tablespace point-in-time recovery



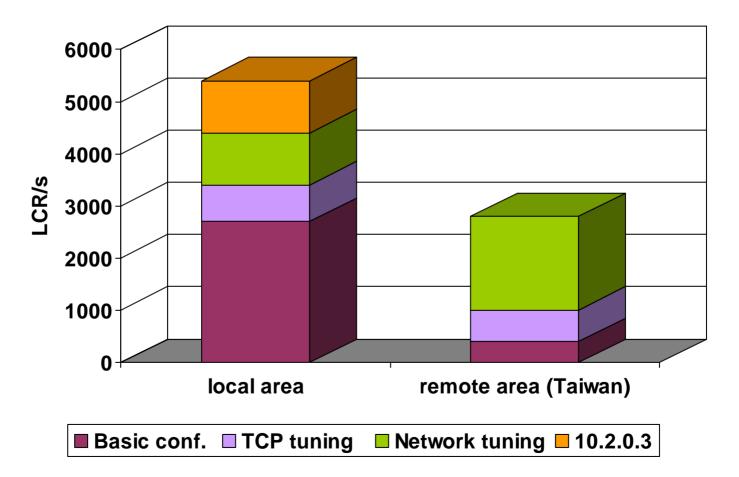
All scenarios have been tested

- Oracle Recovery Manager (RMAN) does the job well
- More tests to come on production streams setup
- Some problems encountered:
 - Issues resolved
 - Bug fixes done



Streams throughput optimizations

Streams performance



Streams monitoring

Zbigniew Baranowski

Requested features:

- Visualization of streams topology
- Status of streams connections
- Error notifications
- Monitoring of streams performance (latency, throughput, etc.)
- Monitoring of resources related to the streams performance (streams pool memory, redo generation)

Architecture:

- 'strmmon' daemon written in Phython
 - collects streams and instances info
 - sends errors and warnings
- End-user web application http://oms3d.cern.ch:4889/streams/main.php

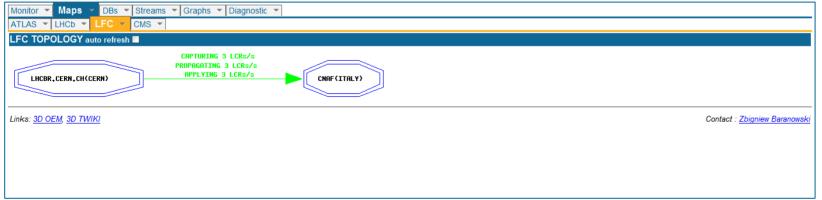
Streams monitoring



Monitor view

	24-01-07 18:20:37			
Databases	Streams	Captures	Propagations	Applies
otal Monitored Databases	Total Streams Setups	Total Capture Processes	Total Propagation Processes	Total Apply Processes
20	8	8	11	20
Up	Up	Up	Up	Up
19	7	7	11	18
Down	Down	Down	Down	Down
1	1	1	0	2
Sites down	Streams down	Captures down		Applys down
SARADB.GRID.SARA.NL	INTR.CERN.CH=>LCGDB1.GRIDKA.DE	STRMADMIN 3D CAPTURE@INTR.CERN.CH		STR APPLY ATLAS 3D TRIUMF@TRAC.TRIUMF.
				MUON CALIB STR APPLY@INTR.CERN.CH

Connection view



Physics services expansion



- Hardware and software upgrade of physics services at CERN
 - hardware resources has been doubled
 - move from RHEL3 to RHEL4 (32 bit)
- Good opportunity to review
 - Installation procedures & scripts
 - storage configuration
 - network configuration
 - HA solutions
 - online RAC migration using Oracle Data Guard (described later)

Storage configuration



- Oracle ORION tests with two different multipathing solutions
 - RHEL3 Qlogic
 - RHEL4 device mapper
 - Equal performance observed, no problems with multipathing failover
- Storage configuration scripts prepared for fast ASM deployment with multipathing failover
 - storage hardware configuration scripts
 - device mapper configuration scripts

Data Guard



- Database migration using Oracle Data Guard (physical standby)
 - Prepared and tested necessary procedures
 - Carried out in production environment
 - Overall downtime minimized to 20 minutes
 - Two RAC databases migrated so far (more to come)
- Future plans
 - More Data Guard tests
 - Oracle Enterprise Manager (OEM) Data Guard tests

RAC monitoring



New features implemented

- Monitoring of production services
 - all production clusters' services
- Monitoring of Oracle Clusterware (CRS)
 - all clusterware services for deployed RACs
- Unavailability tracing
 - instances unavailability
 - clusterware services unavailability
 - availability plots for specified periods

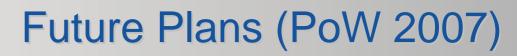
00					🤕 RA	CMON - R	AC monit	toring sys	stem - Mo	zilla Firef	fox	000
<u>F</u> ile <u>E</u> dit <u>V</u> iew	Hi <u>s</u> tory	<u>B</u> ookmarl	ks <u>T</u> ools <u>H</u> e	elp								0
ASM Prod Servic			ailability									
atlr 🕷 cmsr 🕷 compr					\bigcirc	🥑 ch - gi	raph.php	(PNG Ima	age, 340x	180 pb 🧲	000	
Last update: 25-01			and the state of t		Avai	labili	ty for	ora_a	atlr_a	tlr3_	inst	
Cluster: atir - RAC for ATLAS (monitoring enabled) last update: 25-01-2007 22-22 Instance Availability												
matanee	last week	last 31 days	December 2006		0	-			1.			
atlr1 (itrac15)	<u>99.07%</u>	<u>99.52%</u>	<u>100%</u>		22:23	02:10	05:57	09:43	13:30	17:17	21:03	
atlr2 (itrac16)	<u>100%</u>	<u>99.87%</u>	<u>99.85%</u>		ar	Jan	Jan	Jan	Jan	Jan	Jan	
atir3 (itrac19)	98.72%	<u>99.58%</u>	<u>99.98%</u>		19	20	21	22	53	24	3	
atlr4 (itrac20)	<u>99.6%</u>	<u>99.4%</u>	<u>99.49%</u>		Done				we	bh06.ce	ern.ch 🎢	
Average availability:	99.35%	99.59%	99.83%									

Quarterly Summary



Oracle Streams and Data Replication Services

- Single Point of Contact: E. Dafonte Pérez (CERN) G. Kerr (Oracle)
- Participants: M. Bogusz
- Streams monitoring feedback to OEM development
 - Participants: Z. Baranowski
- Highly available database services based on RAC/ASM
 - Procedures review, RAC monitoring, Data Guard tests
 - Single Point of Contact: D. Wojcik (CERN) G. Kerr (Oracle)





Oracle Streams and Data Replication Services

- Single Point of Contact: E. Dafonte Perez (CERN) G. Kerr (Oracle)
- Participants: D. Duellman (CERN) P.McElroy, A. Downing (Oracle)

Oracle Enterprise Manager

- Single Point of Contact: C. Lambert (CERN) A. Bulloch (Oracle)
- Participants: D. Wojcik, M. Kierebinski, Z. Baranowski, A. Wiecek (CERN) – G. Kerr (Oracle)

Oracle Data Guard

- Single Point of Contact: A. Topurov (CERN) G. Kerr (Oracle)
- Participants: E. Dafonte, M. Girone, E. Grancher, D. Wojcik (CERN)

Highly available database services based on RAC/ASM

- Single Point of Contact: D. Wojcik (CERN) G. Kerr (Oracle)
- Participants: M. Girone (CERN)