



ArcelorMittal

DB2 Backup/Recovery setup at ArcelorMittal

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Agenda

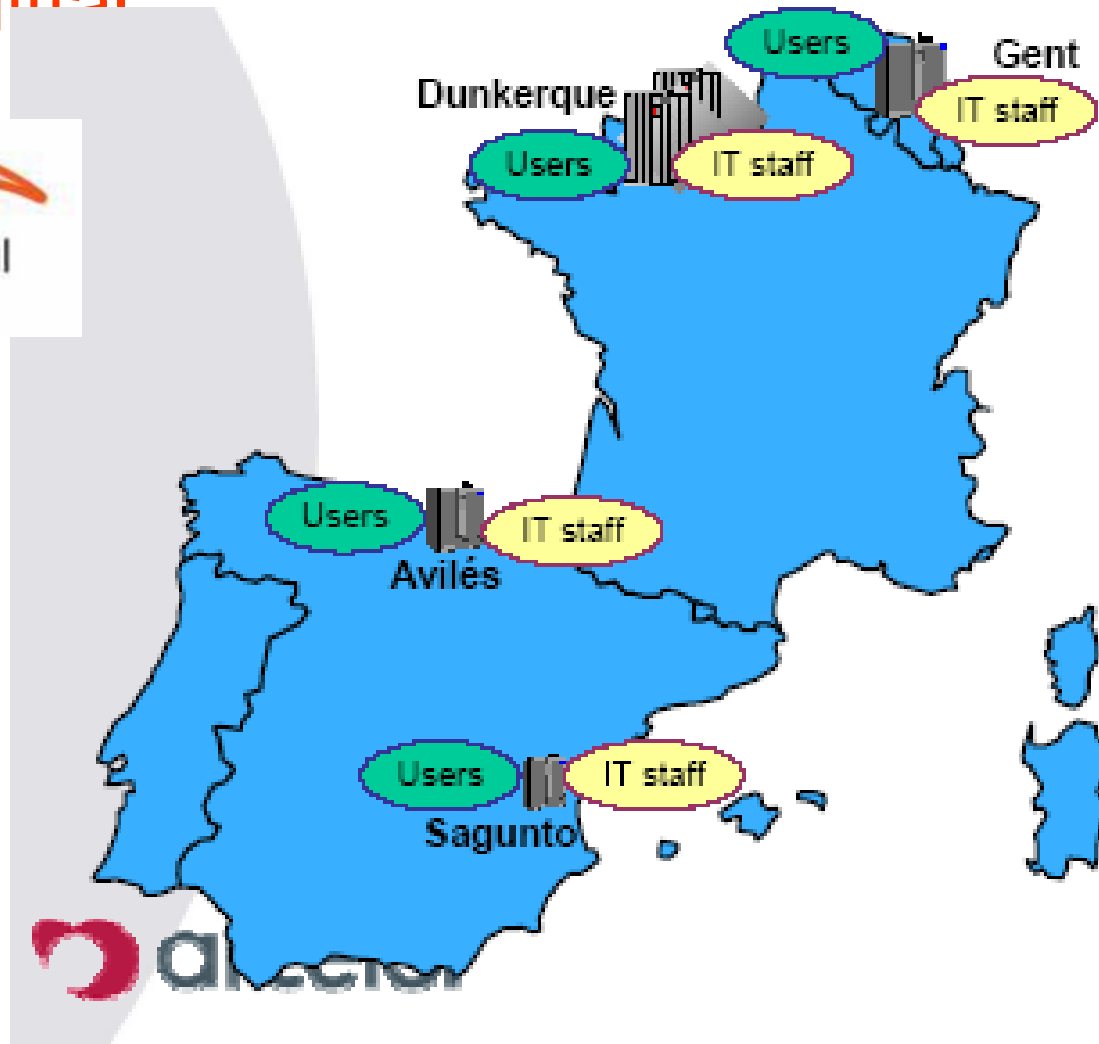
- Introduction : Company overview
- Current infrastructure Western Europe
- DB2 Backup setup
- DB2 Recovery setup
- Future ?

My company : ArcelorMittal

- Former merger of Arcelor and Mittal Steel (2006)
 - World's number one steel company – also mining
 - 263 000 employees in more than 60 countries
 - Revenue 78 billion US\$ in 2010
 - With 90 million tons of steel produced
 - 8% of world steel production
- Sidmar :
 - Located in Ghent Belgium
 - 5 million tons flat carbon steel
 - 4600 people



ArcelorMittal



Current mainframe infrastructure WE

- 2x Z10 (active/passive) 2x8500 Mips
- 3 production sysplex : 33 LPAR
- 2 sandbox sysplex : 5 LPAR

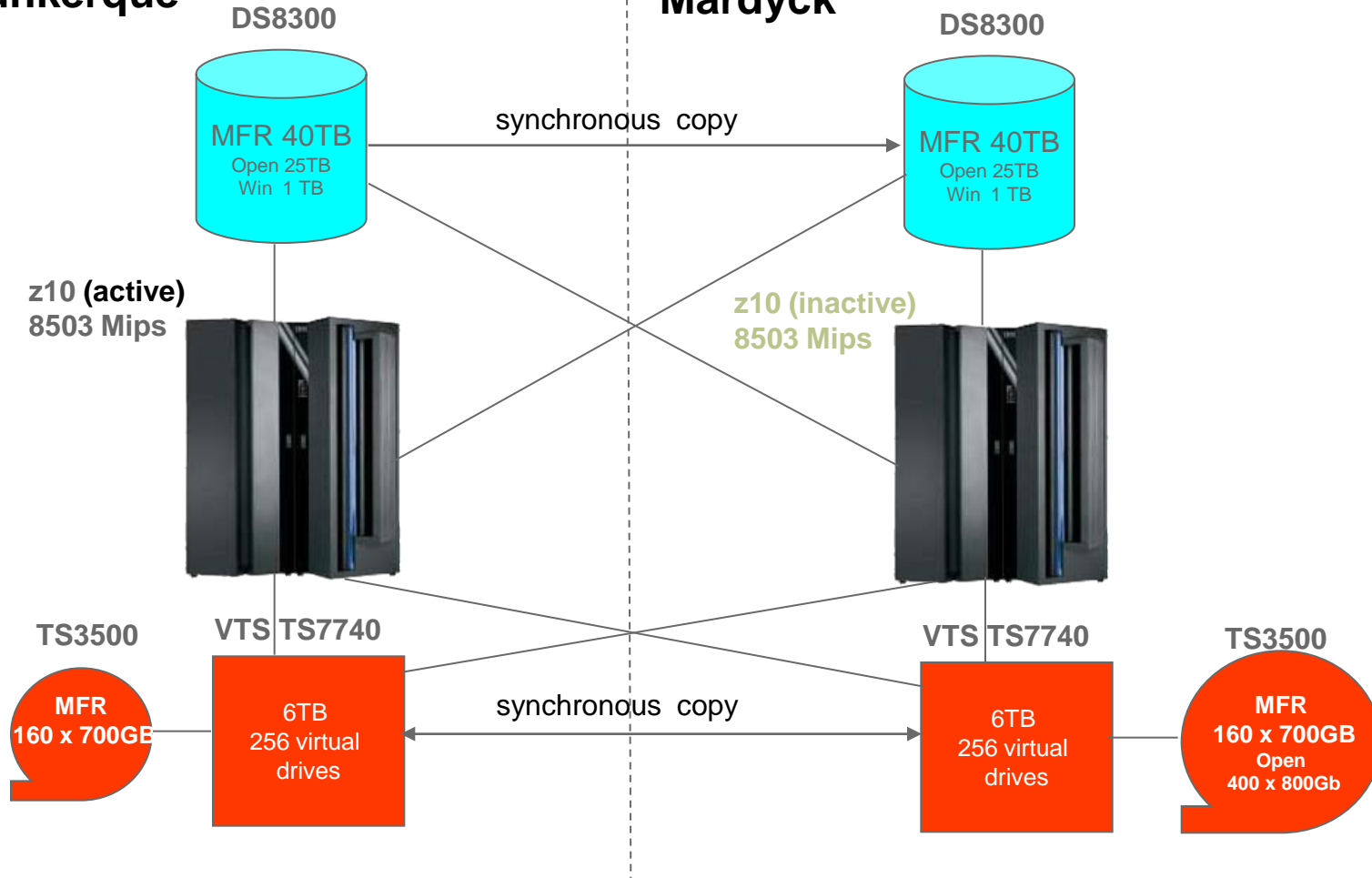
- 4 production datasharing groups (2 members)
 - 4 production sites (Sidmar-ALZ-Aviles-Sagunto)
- 10 production non-datasharing systems
 - Liege-Dunkerque-Florange-Guegnon-(Marseille)

- 9 integration-development-test datasharing groups
- 12 integration-development-test non-datasharing systems

Current mainframe Infrastructure DK

Dunkerque

Mardyck



Current mainframe infrastructure WE

- Converging Heterogeneous systems :
 - Result of multiple consolidations
 - Lot of legacy
 - 4 DBMS IMS CICs Natural ...
 - Development tools ; middleware ;
 - Still lot of differences :
 - Naming conventions ; codepages ...
 - 4 RACF databases ;
 - Different local practices and SLA
 - Stops
 - Interfaces , problem management, languages, etc ..

Current mainframe infrastructure WE

- Migrating from z/OS 1.9 to z/OS 1.11
- Migrating from DB2 V9 CM to NFM
- Migrating to DB2 Connect V9.5/V9.7
- IMS V10
- Migrating from CICS 2.3 to CICS 4.1
- Other Dbms : DLI ADABAS IDMS VSAM

Current mainframe infrastructure WE

- DB2 system group : 4 p
 - Single SMP environment with SW distribution to all LPARs
 - Single naming conventions libraries
 - Single system setup (SMS, RACF, bufferpools, VCAT ...)
 - SW maintenance , migrations, system performance
 - Daily maintenance : backup, recovery, reorg, runstats jobs
 - Second level support
- DB2 DBA's : 1 or more FTE per site
 - DDL changes , application performance
 - Interface with development teams ; first level support

DB2 Backup setup and strategies

- Full SMS storage management for TS and IX
 - All TS and IX are stogroup defined
 - 3 DB2 stogroups/VCATs per DB2 : db2x, db2xD, db2xl
 - 1 ICF catalog per DB2
 - 2 SMS stogroups per DB2 : TS and IX all 3390-27
 - SMSDCFL = DB2TS
 - SMSDCIX = DB2IX
 - TS Compression + Sliding scale : MGEXTSZ = YES PRIQ=-1
 - SMS dataclass SECQ=-1
 - Extended addressability DSSIZE 4-8-16-32Gb
 - Dynvol count = 6 for DB2 catalog, DSN1COPY max 6 x 123 extents
 - No striping of DB2 VSAM
- All SMS stogroups are in remote copy (PPRC)

DB2 Backup setup and strategies

- Full SMS storage management for active and archive logs
- Active logs :
 - Dual (separate SMS stogroup)
 - PPRC
 - Striped 4 stripes
 - Checkpoint frequency = 15 min
- Archive logs :
 - Directly on VTS (virtual disk) retpd between= 8d & 30d
 - Dual (one stays cached in VTS)
 - Saving in DFHSM cycles, tapes + faster recovery

DB2 Backup setup and strategies

- DB2 COPY utility (TS only) (some env with DB2 Automation Tool)
 - Weekly full image copy :
 - Only changed objects since last FIC
 - Based on RTS
 - Daily incremental image copy (10%,30%)
 - Online Reorg with inline image copy
 - Copies always taken to dasd and migrated to HSM afterwards (duplex ML2)
 - SHRLEVEL CHANGE non disruptive
 - CHECKPAGE per default
 - DSNUM ALL (non-partitioned)

DB2 Backup setup and strategies

- DB2 COPY utility (TS only)
 - FIC if last IIC < 7 days
 - Only FIC if table has been changed since last FIC :
 - Read-only tablespaces are not copied again
 - Inactive tablespaces migrated to ML2 after 60 days
 - RTS : SYSIBM.SYSTABLESPACESTATS
 - COPYLASTTIME IS NULL OR
 - REORGLASTTIME - A.COPYLASTTIME > 0 OR
 - LOADRLASTTIME - A.COPYLASTTIME > 0 OR
 - COPYUPDATEDPAGES > 0 OR
 - COPYCHANGES > 0 ;

DB2 Backup setup and strategies

- CLEANUP OF OLD IMAGE COPIES:
 - Fixed naming convention : *DB2IM.&ssid.dbname.tsname.timestamp*
 - MODIFY RECOVERY TABLESPACE db.ts DELETE DATE
 - Rexx clist
 - Calculate MODIFY DATE from SYSIBM.SYSCOPY :
 - Keep all image copies needed for PIT \leq SLA period
 - Keep 1 FIC older SLA if table has not changed since
 - Delete image copies afterwards that are no longer in SYSIBM.SYSCOPY for existing tablespaces

DB2 Backup setup and strategies

- DFDSS BACKUP :
 - No backup of DB2 sms stogroups
 - Volume dumps of DB2 TS sms stogroups every month to be kept 6 months
- We do not use :
 - Index COPY
 - Backup copy datasets (COPYDDN2)
 - Recovery site copies (RECOVERYDDN)
 - Concurrent COPY
 - BACKUP SYSTEM
 - (QUIESCE)

DB2 Backup setup and strategies

- Some extra things we do :
 - Unload of subset of DB2 catalog tables to EBCDIC flat files to be able to reconstruct DDL after DROP of an object
 - Generate DEFINE CLUSTER commands for DSNDB01 and DSNDB06 objects with good priqt,secqty needed for DB2 catalog recovery)

DB2 Recovery setup and strategies

- SLA : be able to do a DB2 recovery between current timestamp and x days in past (x = 7 to 31 site dependent) .
- Normal RECOVERY :
 - Very rare in production environments
 - Sometimes after failing LOAD LOG NO utility (REORG in past)
- Point-in-time RECOVERY :
 - Very rare in production environments because of Referential Integrity
 - Recovery done by application programs
 - No tools to undo SQL from DB2 log
 - Sometimes in infocenter environments

DB2 Recovery setup and strategies

- DRP RECOVERY :
 - DRP tested on sandbox sysplex with test DB2
 - SLA : 4 hours for production (after decision to start DRP)
 - DB2 recovery :
 - easy because of full pprc
 - Do not care about dataloss during rolling disaster
 - DB2 V9 : automatic GRECP recovery
 - DB2 V10 : delete CF structures at restart
- RECOVERY of catalog/directory :
 - Tested once a year or at new release
 - Stop db2 + delete VSAM's of DSNDB01,DSNDB06
 - Restart db2 + recovery of DSNDB01,DSNDB06
 - PIT recovery not tested

DB2 Recovery setup and strategies

- RECOVERY of DROPPED objects :
 - Recreate DDL from catalog extract if not available
 - DSN1COPY from image copy or DFDSS volume dump
 - No log processing ; no tools to get SQL from db2 log

Future



Questions ?

- Email :

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