

## Moving your data from Escon to Fibre: “A success story”

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# Agenda

- **A success story:**  
**EFFIGIE (MGEN) disk resource evolution**
  
- **Use of Data Management and Migration (DM&M)**  
**to manage production data**



# Customer identification



## ■ Business

- Health insurance dedicated to the French departments of :  
National Education, Sport, Research, Culture and Environment

## ■ Members

- Nearly 3 million insurance contributors

## ■ GCOS 8 systems

- |                    |             |
|--------------------|-------------|
| □ OLYMPUS TA52     | Production  |
| □ 2 x CDA8500      | Production  |
| □ 2 x MediaServer8 | Production  |
| □ JUPITER 753-2    | Development |
| □ FDA2100          | Development |



# Disk replacement project

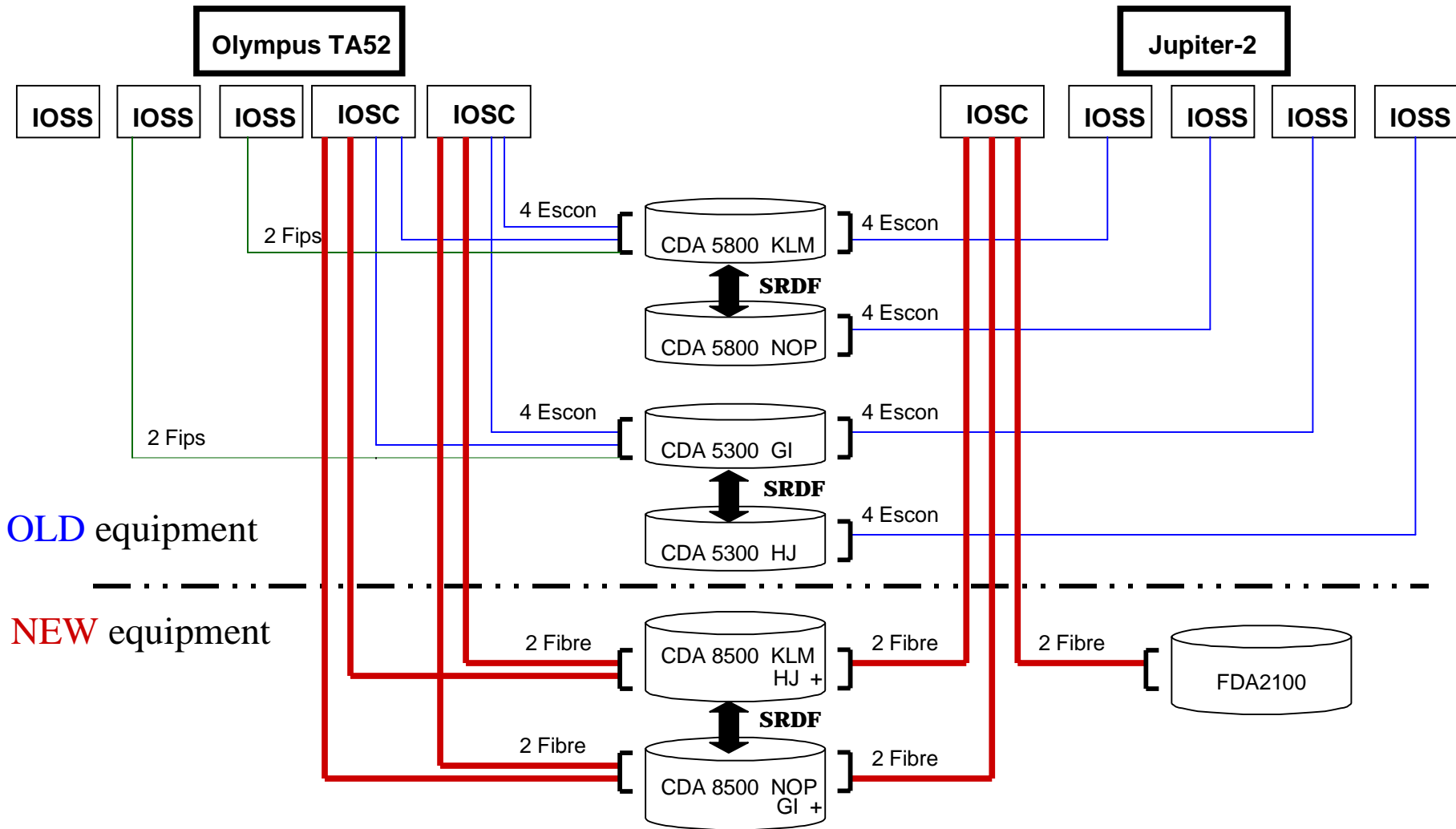
## ■ EFFIGIE decided a disk evolution for his GCOS 8 production system:

- OLD equipment: 2 \* CDA 5300 (216 GB) + 2 \*CDA 5800 (360 GB)  
4 ESCON Channels per CDA, SRDF
- NEW equipment: 2 \* CDA 8530 (576 GB)  
2 Fibre Channels per CDA, SRDF

## ■ CDA 8500 installation planning:

- Oct 8-9: Startup and BIN file preparation
- Oct 19: CDA 8500 subsystem installations
- Oct 24-28: SRDF installation
- Nov 15: Replicate data production with DM&M
- Nov 23: Replicate GCOS 8 system with cartridge saves

# Evolution of the customer disk configuration



# Production data on disk CDA 5300 & 5800

## ■ Disk space organization on volume sets:

- 9,966,000 Links spread over 915 removable type K3CPK
- 109 Volume Sets
- 297 UMCs filled with IDS2 data bases, print files, objects, libraries, JCLs, temporary files . . .

## ■ GCOS 8 disk system:

- 15 permanent type MSK3C devices for 43,000 Links
- Two Volume sets which contain the system UMC(s) and SYS\_5.1
- All This data has been moved using standard FMS Savemast and Restoremast processes

# CDA 8530: ASD configuration

- 2 Subsystems with 16 Disks of 36 GB, Simplex
- Each HDA is defined with 4 Units of 9 GB
  - SRDF: 2 units for source volumes (R1) + 2 Units for target volumes (R2)
- Each Unit is configured with 9 logical devices with 12,374 cylinders

Unité	sub	UL	ASD	cylindres	Nb Llinks
AA	.0	AA0	MALFC	556	253 536
	.1	AA1	MALFC	556	253 536
	.2	AA2	MALVC	1 668	760 608
	.3	AA3	MALVC	1 668	760 608
	.4	AA4	MALVC	1 668	760 608
	.5	AA5	MALVC	1 668	760 608
	.6	AA6	MALVC	1 668	760 608
	.7	AA7	MALVC	1 668	760 608
	.8	AA8	MALVC	1 254	571824
			total	12 374	5 642 544

Example using  
« unit 0 »

- Available disk space per subsystem:
  - 16 HDA \* 2 Units (R1) \* 9 Logical devices = 288 Logical devices
    - 64 MALFC of 556 cylinders for 253,536 llinks
    - 192 MALVC of 1,668 cylinders for 760,608 llinks
    - 32 MALVC of 1,254 cylinders for 571,824 llinks

# Data replication considerations

- **Same amount of disk space is reserved for production data on CDA 8530 as with CDA 5300 & 5800**
  - 915 logical devices type K3CPK (CDA 5300 & 5800) for a total of 19,329,375 available Links
  - 348 ASD logical devices (CDA 8530) for a total of 20,415,354 Links
- **The new CDA 8530 increases the data capacity at GCOS unit level by a factor of 270%**
- **At GCOS unit level there are 9 ASD logical devices instead of 6 K3CPK devices**
- **Review the DM&M ALLOCMATRIX and adjust value if necessary**

# DM&M space allocation controls

```

- - - - - SPACE ALLOCATION CONTROLS MATRIX - - - - -
C          CATLOG          FILESZ MAX NO  BYPASS DEV          AFTER
O C P  SPACE ..... EXTENTS ..... THRESH EXTENT  AVAIL LESS          EXTENT
L I B THRESH MAX NO MIN NO MAX SZ MIN SZ  BYPASS ALLOCA  THAN LLINK  ALLOCATION
- - - - -
1 N Y    0    256    1 32767 32767 32767    6          0          0
2 N Y    0    256    1 32767 32767 32767    6          0          0
3 N Y    0    256    1 32767 32767 32767    6          0          0
4 N Y    0    256    1 32767 32767 32767    6          0          0
5 Y Y    0    256    1 32767 32767 32767    1          0          0
- - - - -

```

- Each time one extent is to be created for files larger than 32K
  - a new device will be selected, so the benefits are:
    - for large batch files that happen to be on the same actuator with database files, it minimizes the amount of time that any one actuator is busy servicing a batch file
    - help the performance of the batch system because a single program processing multiple large batch files concurrently is more likely to have the data spread across multiple actuators thus allowing more concurrent I/O
    - for any of the data files that have a lot of I/O it is desirable to ensure that these files are spread across many actuators, regardless of their size



# DM&M CLONE JCL

- **JCL example to copy Volume Set VAD-ACO1 on CDA 5300/5800 to Volume Set WAD-ACO1 on the new CDA 8530:**

```
$      SELECT  DMM/IDENT
$      GLOBAL  JCL=(CP1)
$      SELECT  SUPT/JCL/CASE
$      FILSYS
$      PRIVITY
$      NOTE    MIGRATION VOLSET VAD-ACO1 SUR VOLSET WAD-ACO1
CLONE SOURCE/ADLACO1 ,VAD-ACO1 / ,DESTINATION/ADLACO1 ,WAD-ACO1 / ,
SINCE/SYNC/ ,BUFFSZ/80KW/ ,MATRIX/5/

UMCENAME FROMNAME/ADLACO1 ,VAD-ACO1 / ,TONAME/ADLACO1 ,WAD-ACO1/
```

# Disk replication organization

- **Daily FMS production saves of CDA 5300 & 5800 were executed before any subsequent step**
- **The disk replication operation was done in one shot while system production was stopped, to avoid any busy files**
- **TEX procedures have been created to:**
  - Build CLONE & UMCRENAME JCL for each Volume Set
  - Submit all JCLs to GCOS
  - Verify the CLONE execution reports (RC 23)
- **GCOS system scheduler has been set to allow 4 CLONE processes in parallel in order to optimize the copy flow**

# DM&M copy performance

## ■ Example of CLONE elapse times:

CLONE of Volume Sets from CDA 5300 & 5800 (Escon) to CDA 8530 (Fibre)								
VOLSET	% FULL	LINKS	K3CPK LD	GCOS UNIT	ASD LD	GCOS UNIT	DATA	ELAPSE
XL-AE02	93	500.000	26	12	9	9	DB	00:28:18
XG-AC03	62	141.000	11	11	4	4	DB	00:06:59
XG-TC05	37	219.000	34	31	12	12	BATCH	00:14:35
XL-XC01	75	462.000	29	23	10	10	BATCH	00:23:48

## ■ Disk space replication summary:

- 107 Volume Sets of 9,648,000 Links were replicated in 2h30
- 4 CLONE jobs executed in parallel
- 107 CLONE executions “error free”

# Use of DM&M to manage production data

## ■ **Fast disk to disk copy allows the FMS administrator to perform daily activities such as:**

- Point in time copy of data - snapshots
  - i.e. a Database of 833.651 Links copied in 19 minutes (Fibre to Fibre)
- Fast disk space reorganization
  - Faster than FMS Savemast / Restoremast
  - More efficient operation than Squish
- UMC restructuring
  - Rename the UMC
  - Move data to a different level in the hierarchy structure
- Cooling off “hot spot”
  - Improve I/O performance by distributing file extents across devices using the ALLOCMATRIX directives
- Provides an alternative to disk save operations

**DM&M speed up FMS operations  
so disk space administration tasks  
may occur daily without reducing  
the production windows**

