H04

HALDB Migration and Conversion Aid

Session 1

Christian Koeppen





technical conference

How to Setup a Conversion Project

Primary Selection Panel



This is the first panel when running the product CLIST. We are connected to an IMS environment called "PROD"

Our intention is to do a DBD conversion.



We would have been connected to the last project. There has been none yet.

We go and add a conversion project.



This panel allows for other functions as well. We want to create (=add) a new project.



The first thing it does is to ask for a project name. You should add a meaningful description for future reference.

The next thing is do create a project tracking dataset. This is a VSAM KSDS. It will store all data related to this project. If you wipe this dataset out, the project will need to start from the beginning.

SmarTerm - (IBM 3270 mod 2)	
In the call wave properties connections Window refe	. a x
Command ===>	•
Project Tracking and Staging KSDS Allocation	
DSN: <u>vegas.project.tracking.ksds</u>	
DATACLAS:	
Space: <u>15</u> in CYL Volser	
0 >> 2,15	-
Coverage to 12/16/13 [Secure Marco Ligner L	115
🖌 start 🛛 Niko-Ostok tu. 🖉 Storfers (1941, 🔛 Usvessillet te. 🦉	10.116

This panel is there to set the dataset name, some space allocation and additional parameter.

If you are not using SMS you need to specify a volser.

If you are using SMS you could specify a DATACLAS if your installation needs one. Most installations assign the SMS constructs in their ACS routines using the dataset name.

JCL will be created to allocate and to initialize the VSAM KSDS. Submit the JCL and check the output for zero return code. If all is fine, leave the ISPF VIEW panel.

We now start setting the parameter for our project. All parameter are predefined. They are taken from the environment. When you define an environment, you see the same panels.



Do we have **multiple** DBDs that are to be converted to **one** HALDB?

Do we want the data collector to run separate?

- Y Unload reads the database again
- N We must accept the partitioning scheme created then.

Do we want the implementation one big JCL?

- Y Restart within that JCL is now the user's problem
- N Each action is presented as a single JOB.

At what point in the conversion shall we delete the "old" datasets?

"2" You are constraint for disk space

R SmarTerm - (IBM 3270 mod 2)	
an nie zikt view Propertes Gemetikons Window neb	. 8 x
IMS HALDB Conversion and Maintenance Aid Command ===> ■	*
Datasets RESLIB : IMS710.SDFSRESL :	
MACLIB : IMS710.SDFSMAC	
LOADLIB : PECK.IHC.V2.LOAD	
DFSVSAMP : <u>PECK.COMMON.JCL</u> Member name: <u>VSAMP</u>	
MDALIB 1: PECK.COMMON.MDALIB	
RECON MDA located in: <u>4</u> 1 RESLIB 2 MDALIB 1 3 MDALIB 2 4 Specify RECON datasets	
u ■ 0 >>	2,15
B 6H 1277 B 16H 1270 B 6M 1270	
Farling, pour P	2 A A 11 11 1

These are settings you should not modify. They are entered initially when defining the environment.

However, selection "4" may be needed for test databases.



This should be used only if your recons cannot be dynamically allocated. We will discuss this together with "how to deal with test databases".

Defining the DBD libraries.

SmarTerm - (IBM 3270 mod 2)	×
a Me Edit Wew Properties Corrections Window web	ж
IMS HALDB Conversion and Maintenance Aid @ Command ===>	1
DBD Libraries DBDLIB 1: PECK.COMMON.DBDLOAD 2:	
4: 5: 6:	
7: 8: 9:	
a o >> 2,15	
B EN 227	-
e Hép, peací P	1
Anstantian 🖗 Max- Outlaak bu. 🖶 Smart arm - 1344. 🔄 US VEGIS HEP 56.	Υ.

There should be no need to have this list changed.

Converting the DBD

SmarTerm - [IBM 3270 mod 2]				
and File Roll View Properties Connections Window Help				đĸ
	1 P U	1		
IMS	HALDB	Conv	ersion and Maintenance Aid	^
Command ===>				
	DBD	Conv	ersion Rules	
Multi DSG:	2	1	To single DSG	
Harti boot	-	â	Leave as is	
		3	Ask during Conversion	
			not out ing control or of	
Convert VSAM to OSAM:	2	1	Yes	
	-	2	No	
		3	Ask during Conversion	
Change DBD name:	1	1	Yes	
	_	2	No	
Second Cost Access				
Selection Exit:	5	1	Yes	
		2	No	
		3	Ask during Conversion	
Heal Index Pointer:	1	1	Yes	
		5	No	
		3	Ask during Conversion	
				~
8			0 >> 2,15	
B 188 2070 B KM 2270 B KM 1271				
For Hilly, parts 17		ALCONOM 10	A.A	

Does our DBD have multiple DSGs that were created because of space constrains?

Do we want to go to OSAM?

Y

Take advantage of OSAM Sequential Buffering Caution: adjust the buffer pool definition

Do we want to change the DBD name?

Y Add the DBD to the online system.
Change all PSBs.
Check if the application looks for the DBD name in the PCB.
N All RECON information of the "old" DBD will be lost.

Selection Exit is not discussed.

Pointer healing is only a choice for method 1 (evaluation not together with unload). The normal IMS utilities are used. All secondary index pointer will need healing.

5	SmarTerm - [IBM 3270 mod 2]		
f	d File Edit View Properties Connections Window H		Minimize
Щ,		na (b.) m (t.)	
	IMS	HALDB Conversion and Maintenance Aid	*
	Command ===>		
		Save Source Statements	
	DPD Sources 1	1 No	
	DBD Source. I	1 HU 2 Yee	
	Source File.	LEGAS DRD SOURCE DDS	
	5001001110.	VE010:000:000K0E:P00	
	IDCAMS Source: 1	1 No	
		2 Yes	
		3 Yes, but no DELETE file	
	Member Name:	3 1 DBD Name	
		2 Partition Name	
		3 DD Name	
	Del File:	VEGAS.IDCAMS.DELETE.PDS	
	Def File:	VEGAS.IDCAMS.DEFINE.PDS	
			_
	D1 .	0 >>	2.15
1		0 >>	2,10
i Fi	- Hele parts F1)	
	The state of the s		

The implementation process will create the JCL to save the DBD source and/or the IDCAMS statements.

The member name of the IDCAMS should be selected based on usage.

® Sm	arTerm - [IBM 3270 mod 2]				8
and File	Fight View Properties Connections Window Help	p ⊫an Larina		. 4	×
		a prim			a
1	IMS	HALDB	Conve	ersion and MaintenanceAid	
1	Command ===>				
				More: +	
		Par	t1t10	n Definition Rules	
	Combine Database peop	anda.		E000 (purpos of database percende)	
	COMDITIE Dalabase Fec	orus:		2000 (Humper of darabase records)	
	Main DB Partition:	2	1	Fixed Number of Partitions 1	
	noin bo rortition	-	ê	Fixed Partition Size (MB) 2048	
			3	Ask during Conversion	
			4	Specifu High Keus	
			<i>.</i>		
	Index Partition:	2	1	Fixed Number of Partitions 1	
		-	2	Fixed Partition Size (MB) 1024	
	PDB Conversion:	5	1	Use existing Keys or Partitions	
			2	Create new Partition boundaries	
			3	Ask during Conversion	
	0500 0			Constitution of Boostitutions	
	DEDB Conversion:	1	1	Same Number of Partitions	
			C, C,	New Partition boundaries	
	Additional Partition	ing La		to be created?	
		ing co	yours		
1				0 // 2,15]
Faithle	period particular and particular and an an and an	,			-
A	art 🕺 🕅 Skor - Ostivá D 🗮 Startford -	rma 193	DAMES NO.	A DECEMBER OF A	

How to partition the main database? Automatic: Select option

Automatic: Select option "2" User definition

My favorite: "2"

How to partition the secondary indexes? My favorite: "2"

<u>Note</u>: Index partitions and primary database partitions are **not** aligned at the same boundaries. They have different keys.



How to name the partitions?

The names will be checked against the RECON. There must not be a DBD or partition using the same name currently in the recon. You may be asked for a different partition name.

```
narTerm - [IBM 3270 mod 2]
----- IMS HALDB Conversion and Maintenance Aid
 Command ===>
                       Space Allocation Rules
                       for PHDAM and PHIDAM
   HDAM RAA Size:
                       1
                            1 Clone from DBD
                               (1) and increase 10 percent
                            5
                            3 Ask during Conversion
   Overflow Size:
                            1 Clone from original dataset
                       1
                               (1) and increase 10 percent
                            2
                              Ask during Conversion
                            3
  Byte limit:
                            1
                               Same as old DBD
                       1
                            2
                               None
                            3 Ask during Conversion
   SMS Allocation:
                       3
                            1
                               Yes Dataclass: _
                            2
                               No, ask for Volume serial
                              Yes, no Dataclass
                            3
 2
                                               0
                                                                2,15
                                                      >>
```

This tool is not a database optimizer. It assumes that your current DBD definitions are ok. If you know you have a performance problem, you can deal with it now.

Size of RAA was ok?

Byte limit was ok? No cascading there?

```
narTerm - [IBM 3270 mod 2]
---- IMS HALDB Conversion and Maintenance Aid
 Command ===>
                       Space Allocation Rules
                       for PSINDEX datasets
                               Copy from old Index
  Free Space per CI:
                       1
                             1
                             5
                               Set to 10 percent
                             3 Ask during Conversion
                             1 Copy from old Index
  Free Space per CA:
                       1
                               Set to 10 percent
                             2
                             3 Ask during Conversion
   Dataset Allocation:
                       2
                             1 Fit to current need
                             2
                               Add 10 percent
                             3 Ask during Conversion
   SMS Allocation:
                               Yes Dataclass: _
                             1
                       3
                             2
                               No, ask for Volume serial
                             3 Yes, no Dataclass
   CI Size:
                           (1, 2, 4, 6, 8, 12) in Kbytes
                       4_
                                               0
                                                                 2,15
 >>
```

Secondary index databases normally have many inserts and deletes. Keep in mind that changing the index source segment will change the secondary index key.

The dataset should have VSAM FRSPC parameter.

Guideline: FRSPC(10,10): that fills up each CI to 90% and leaves 18 CI empty (assuming a CISZ of 4k.

The dataset will grow. If not by the number of records, by the amount of CA splits. CA splits are not a bad thing. You do not have to reorg a KSDS because of CA splits.

```
marTerm - [IBM 3270 mod 2]
---- IMS HALDB Conversion and Maintenance Aid
 Command ===>
                        Space Allocation Rules
                        for ILDS datasets
  Free Space per CI:
                        1
                             1
                                Do not specifu
                             5
                                Set to 10 percent
                             3 Ask during Conversion
  Free Space per CA:
                        1
                             1
                                Do not specify
                                Set to 10 percent
                             2
                                Ask during Conversion
                             3
   Dataset Allocation:
                        2
                             1
                                Round to full Cylinder
                             2
                                Add 10 percent
                             3 Ask during Conversion
   SMS Allocation:
                        3
                             1
                                Yes Dataclass: _
                             2
                                No, ask for Volume serial
                             3 Yes, no Dataclass
   CI Size:
                            (1, 2, 4, 6, 8, 12) in Kbytes
                        4____
                                                0
                                                                  2,15
 >>
```

The ILDS (indirect list dataset) is needed for pointer healing. If no pointers are to heal, the ILDS can be empty.

The online system does not update the ILDS. Only reorganization reload updates the ILDS.

Conclusion: You do not want VSAM FRSPC defined. When pointer healing is needed, you want the tightest packing to increase the buffer handler hit ratio.

Downside: reorg will create many CI and CA splits. The ILDS should then be reorganized after the reorganization.

DEDB Setup Parameter:



We do not handle DEDBs in this workshop.

SDEPs: Full function does not have this segment type. You do not have the utility to cycle of the segments. This program has to be written.

Subset pointer: Full function does not have these pointers. If the application uses and needs those, an application change is required.

RMNAME: The randomizing of DEDBs is different.

Converting AREA definitions into PHDAM RAA definitions



This deals with parameter used in a PHDAM database that are to be created out of the information we can get from the DEDB.

Note: Converting DEDBs to HALDB is not an easy task. But if you need secondary indexing this is what you may have to do.

Specifying a JOB statement for the JCL to be created.

R SmarTerm - [IBM 3270 mod 2]	
	- 0 4
IMS HALDB Conversion and Maintenance Aid Command ===>	-
JCL Defaults	
JOB statement: //JOBNAME JOB ACCT.PGMR.CLASS=A.MSGCLASS=X	
//* //* //*	
Allocation Rules for UNLOAD file Set the maximum database size to use disk allocation Database Size Limit (MB) <u>200</u> Unit name for tape allocation: <u>TAPE</u> Unit name for disk allocation: <u>SYSDA</u>	
0 >> 2,15	
Ten Hele and Ten H	4
🖬 start 🖉 blox-dalok b., 🗉 Smerfam-(100.) 🛛 jas vegas HP be. 🗧	LOR PM

This is the end of defining a conversion project. We will see how to reuse this when the project is done.

Running the Conversion

Project Start Panel



You can see the current project. If this is not the one, go and select the project you want to work on. Only one user can be on the same project at a time.

Project Work Panel

am Fak Edt Vew Properties Connections Wordse Help D 26 월 월 월 월 월 월 월 월 월 월 월 월 월 월 7 월 7 IMS HALDB Conversion and Maintenance Aid Command ===> ■	
Command ===>	*
IMS HALDB Conversion and Maintenance Aid Command ===>	^
Command ===>	
Project Verk Depol	
Project work Panel Environment: PROD	
Project: Las vegas	
_ Select Function	
0 Catur Deparator	
1 Continue with Current Project	
2 Show Status of Denject	
3 Recreate JCL of current phase	
4 Restart at current or prior level	
5 Restart from beginning	
Project Desc: H04 Class	
Project KSDS: VEGAS.PROJECT.TRACKING.KSDS	
	-
■ 0 >> 2,15	
B INN 2010 B INN 2010 B INN 2010	
For Hall, perce 11	A

You can change the parameter of your project now. Once the DBDs are selected, certain parameter can not be changed anymore.

On a fresh start, we can select only "1". Since there are no DBDs selected yet, it will go and ask for the DBDs.

DBD Selection

■ SmarTerm - [IBM 3270 mod 2]	×
and File fait Vew Properties Connections Window Help	5 K
Command ===>	
DBD Conversion selection	
Select one of the provided DBD libraries or specify a DBD library 1 PECK.COMMON.DBDLOAD 2 3 4 5 6 7 8 9	
Specify a DBDLIB dataset name	
DBD <u>*</u> "*" for list of DBDs	
	2
Faithly press?	

You first select from the DBD library list. If your DBD is not in that list, you may enter a different one. This will be the library we will be using to obtain the "old" DBD and store the "new" DBD.

How do I get my "old" DBD back?

B SmarTerm - [IBM 3270 mod 2]								
and File Edit View Properties Cannedions Win	daw Help							- 8 K
	008 20	7						
	TMS HALDB	Conversion	and I	Maintenance	e Aid	Rou	1 of 91	^
Command ===>	110 111200	0011101 02011	and .	a free of the free	S	ccoll ===>	PAGE	
oundru							1 Hote	
				Select a	11 080	s unu mant		
Select	DBD			but onlu	one s	election a	t a time	
	AREA							
-	AREAT							
	DBVHDJ05							
-	DEDB1							
	DEDB2							
-	D2XHD.305							
	HD01							
	HDD2							
Ť	HDO2TT							
-	HDU1							
-	HOUP							
_	HDX2							
-	HTDAM2							
	HTDD2							
-	HTDO2							
-	HTDDA							
-	HTDU2							
-	HIDVE							_
	nionn			-			14.17	~
8				0		>>	14,17	
<u>[] imi uuo]]] imi uuo]]] imi uuo]]</u>								
For Hilly, parts FT	art ann - 1184	AS VINCES HERE THE					1.0	4

We select the DBD to be converted. More than one DBD can be selected. However, secondary indexes and logical related databases are automatically added.

When we are done selecting DBDs, we press PF3 (end).

DBDs currently in the project list



This is the list of DBDs that will get converted. PF3 will leave this panel.

Confirmation:



This is now the last chance to add additional DBDs.

From now on you will be prompted only to answer questions or to submit JCL.

Prompt for the unload dataset name



You can see that this name was constructed using the high level qualifier from our options.

The JCL created will also use the parameter specified on the JCL panel. It will allocate the file as tape when the database is larger than the specified amount.

Output from Data Collector

Part	Roots	010	All	Segments	00	Prefix Bytes	010
Total	24	100.00		1,325	100.00	24,694	100.00
1	24 Par Key: 00 F0 Par	100.00 titioning 004023 F0F0F0F4F titioning	for 0F2F for	1,325 DBD HDO2 3 DBD SIO21	100.00	24,694	100.00
Part	Roots	00	All	Segments	010	Prefix Bytes	010
Total	24	100.00		24	100.00	888	100.00
1	24	100.00		24	100.00	888	100.00

This is the report created by the data collector. We can see how the partitioning will be done and what the high keys are for each partition. The last partition will be defined as X'FF'.

Project Checkpoint



This is to allow you to interrupt the project at certain stages. In this case we have done the evaluation and the unload. We are now "ready to rock and roll".

The next steps are:

- Cleanup the RECON if we use the same DBD name
- Generate the new DBDs
- Save DBD source (optional)
- Create the partitions
- Allocate the new files
- Save IDCAMS statements (optional)
- Initialize the new files
- Reload the databases (including the indexes)

This is the panel you get when interrupting the project.

E SmarTerm - [IBM 3270 mod 2]		
and File Edit View Properties: Cannections: Window Help		- d x
Command and	n and Maintenance Aid	×
command ===>		
The project has been ha	lted	
Current Environment	PROD	
Current Project	Las Vegas	
Project Phase	Sunc Unload	
Project Status	To be done	
		0.000
The most likely reason Doce it finishes you ma	is that Batch work is not u continue with the proju	t finished yet
	g concento aren eno proje	
		2
8	0 >>	2,15
📑 188 2070 📑 188 2070 📑 188 2071 🚥 189 3270		
Fair Help, parts F1		

When pressing "enter" we are back in the work panel

Show Status

We selected "2" from the work panel. This is what we get:

SmarTerm - (IBM 3270 mod 2) Constant Mathematical Mathematic											
Der	@ % @ # E	0 4 7	• 00 B	Ø 🛛 7							- 0
Com	mand ===>	·	IMS H	ALDB Conve	ersion	n and Mai	intenance	Aid	R	ow 1 of	5 ^
	DBD(s) in Project Las Vegas										
S	DBD	Туре	Prim D	BD Log. Rel.	Curre	ent Level	l	Curre	ent Stat	US	
	HD05	D			Sunc	Unload		To be	done		
	SI021	x	HD02		Sync	Unload		To be	done		
	SI023	х	HD02		Sync	Unload		To be	e done		
	SI022	x	HD02		Sync	Unload		To be	e done		
	SI024	×	HD02		Sync	Unload		To be	e done		
***	*******	(XXXXX)	*****	****** Bo	ottom	of data	*******	******	*****	******	***
										0.45	~
	1		_				0	>>	·	2,15	
East Made autors P	1 III IIII 2276 III	EM 3271	EM 3270								
										-	

We know this already from the previous screen.

Restart at an earlier Level

#Fib Edit Vew Repetter Connection Window Help D 같 요즘 박 한 한 같은 같은 가 같고 한 것 같 ?	
Deele self wear the Representation and Maintenance Aid Row 1 of 12	<u> </u>
TMS HALDB Conversion and Maintenance Aid Row 1 of 12	^
Command ===>	
Project Restart	
Current Phase: Sync Unload	
Sel Project Phase	
_ Collect DBDs	
_ Collect Datasets	
_ Save Old source	
_ Selection Exit	
_ Enter Keys	
New DBD Source	
_ Unload	
Single JCL start	
Partition Layout	
HALDB Preparation	
End Unload	
Sunc Unload	

	-
I 0 >> 2,15	
B 18H 200 B 1827 - 102 H 200 -	_
Fairble pare 1	4

Restart



Recreate JCL

🖩 SmarTerm - [IBM 3270 mod 2]												
an Fie fait Vew Reporter Connections Minima Help												
Г				IMS	HALDB Conv	ersion a	and Main	tenance	Aid	Row 1	l of §	5 ^
	Com	mand ===:	>									
			-									
	DBD(s) in Project Las Venas											
	bbb(a) in Project Les Veges											
	S	DBD	Tupe	Prim	DBD Log.	Current	Level		Current	Status		
			dre		Rel.							
												-
		HD02	D			Do DBD	gens		Submitt	ted		
		SI021	x	HD02		Do DBD	gens		Ended r	ormally		
		SI023	х	HD02		Do DBD	gens		Ended r	ormally		
		SI022	x	HD02		Do DBD	dens		Ended r	normallu		
		SI024	x	HD02		Do DBD	gens		Ended r	ormally		
	***	*******	*****	****	******** B	ottom of	data *	*******	******	*******	****	6 ¥
												-
		1						0	>>	2	15	
1	1884 207	0 100 IAM 2270 100	EM 1278 mm							£,		
Fait	The second secon											
											-	

B SmarTerm - [IBM 3270 mod 2]								
and File Rolls. View Properties: Cannettons: Win	dan Help			- 8 K				
	IMS HALDB Conversion a	and Maintenance	Aid	*				
Command ===>								
	Project Work Panel	Environment:	PROD					
		Project:	Las Vegas					
3 9	Select Function							
	Setup Parameter							
	L Continue with Currer	nt Project						
	2 Show Status of Proje	BCT						
	A Recreate JLL of Curr	rent phase						
	A Restart at current (or prior level						
	5 Restart from beginn	ing						
	Project Deec: HA4 Class							
	Project KSDS: UFCAS DD	DIFCT TRACKING	KSDS					
	Project Kaba, veona.PR	JOEGT . TRHCKING.	KJDJ					
				-				
21		0	>>	2 15				
Tel 100 000 100 100 100 100 100 100		0		6,10				
Fulle per l								
W Max- Make - Make								

End of Project

```
SmarTerm - [IBM 3270 mod 2]

III File Edit View Properties Connections W
                                                                            ----- IMS HALDB Conversion and Maintenance Aid -----
 Command ===>
     The conversion project is at its end.
     The following activities are still necessary:
     1. If you changed the DBD Names
            Define the new DBDs to your online system.
            Change all PSBs to the new DBD name.
     2. Run ACBGENs
     3. Change applications that have the PSINDEX DBD as PCB
         if the index has SX (Key increased by 4)
     4. Activate everything (Online Change)
     N Say Y if all has been done
         Say N if not (and you need this as a reminder)
                                                    0
                                                                       2,15
 >>
🙀 telox - Ostkok tx... 🗟 Smorf arm - (1994.) 🗳 Las ve
                                                                          0.6
start
```



Do we need any data?

Do we want to run another project using the same setting?

Test Databases

Set all parameter to automatic. Specify "one big JCL" Predefine the project setting. You may have to give them their own RECONs for batch applications. Next session: how to transport partition definitions to other RECONs Give it to the programmer. Let them use the "reuse project dataset" at the end.