

ADABAS

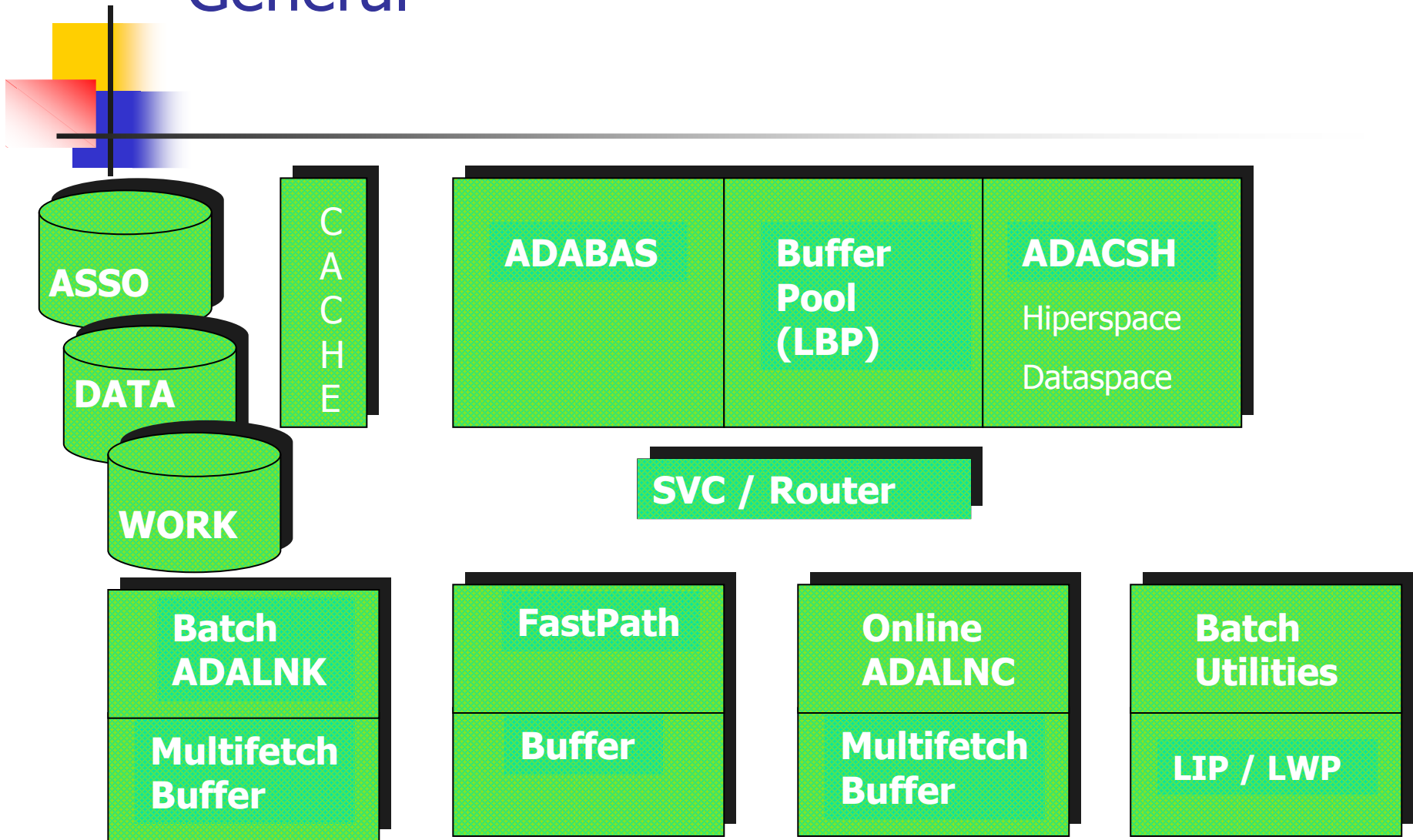


All About Caches and Buffers

Natural Conference in Boston, PA
August 17-20, 2008

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General





Content

- General
- Disk Cache
- ADABAS Buffer Pool (LBP)
- ADABAS Dynamic Caching (ADACSH)
- ADABAS FastPath (AFP)
- ADABAS Multifetch
- ADABAS Batch Utilities
- Evaluation



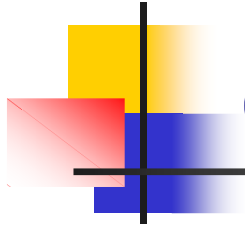
General

Cache (IBM 1968)

- Speed up data transfer
- Permanent and temporary
- Memory and disk cache

Buffer

- Temporary memory location
- CPU instructions can access buffers
- Accessible in different order

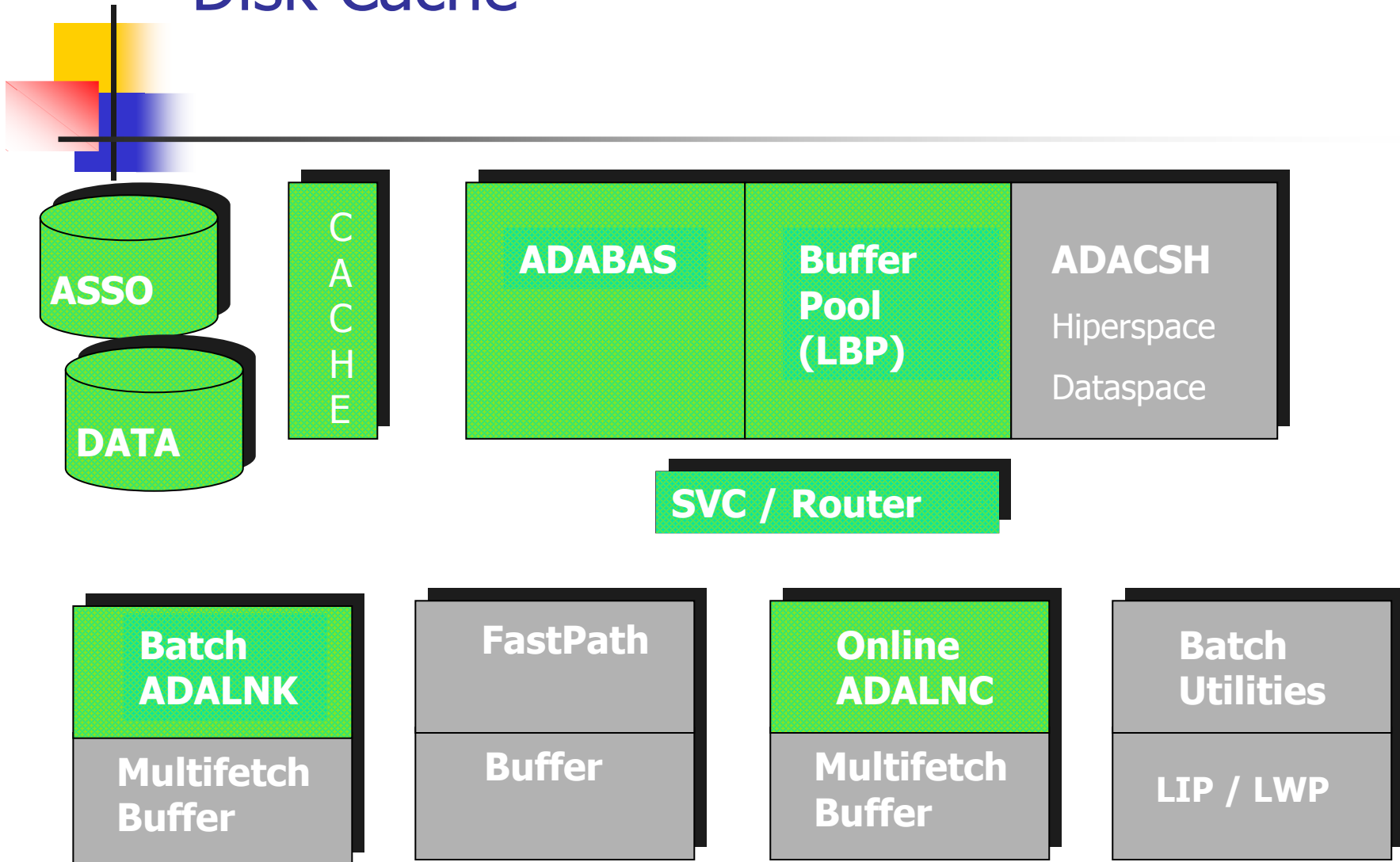


General

Main Reasons for Cache and Buffers

- Save CPU Time
- Save I/Os
- Faster Response Time

Disk Cache





Disk Cache

Self-controlling caches

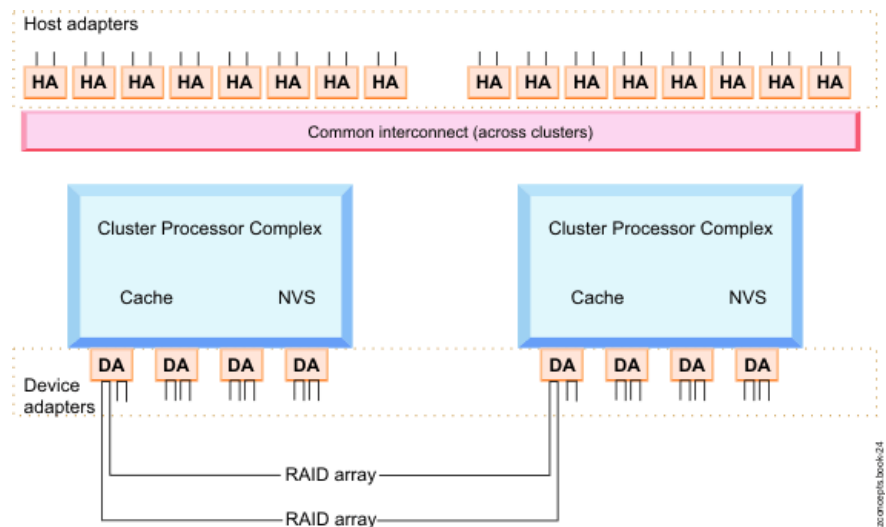
- IBM 9340 Direct Access Storage Subsystem, controller w/ 64MB cache
- EMC² w/ their Symmetrix series (4800 and 5500 Integrated Cached Disk Array) >1GB cache

Two-level cache design

- RAMAC (based on 9340 design) involves the packaging of a RAID-5 disk architecture in the form of a DASD drawer, each drawer incorporates 64MB cache.

Disk Cache

- If blocks are highly scattered or the update frequency is low →
- Then controller caching can cause longer I/O response times





Disk Cache

- **ADABAS Parameters**

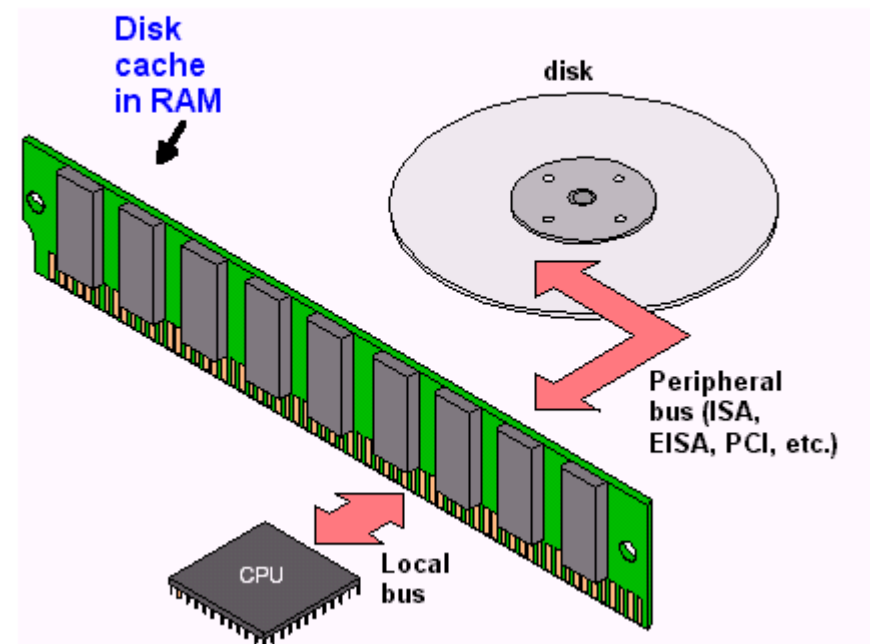
Controller caching for several components (OS/390, z/OS, VM/ESA, and z/VM only)

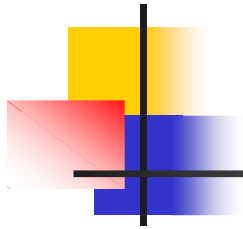
- ASSOCACHE=YES/NO
- DATACACHE=YES/NO
- WORKCACHE=YES/NO
- SORTCACHE=YES/NO
- TEMPCACHE=YES/NO
- NO = blocks are not pre-read

Disk Cache

- Staging area

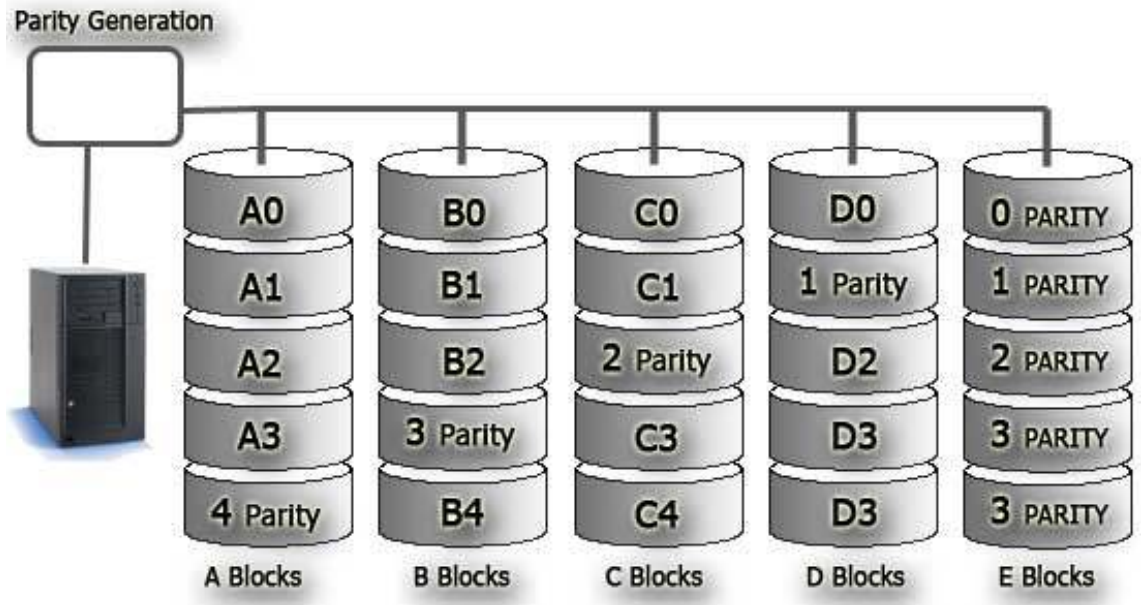
From Computer Desktop Encyclopedia
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Disk Cache

- RAID (Redundant Array of Inexpensive Disks)



RAID 5 example



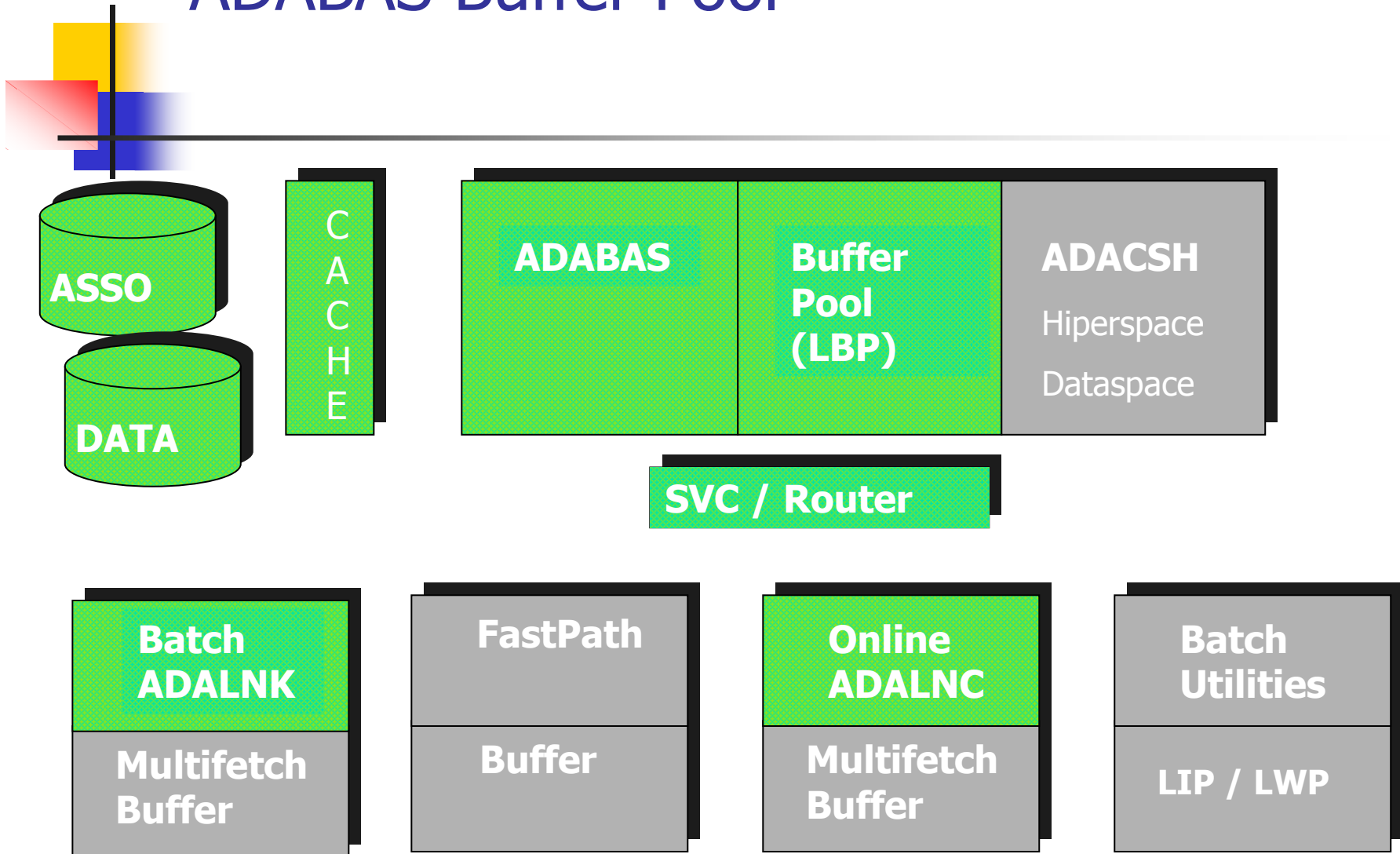
Disk Cache

Interesting links

Storage control cache resource management

<http://www.research.ibm.com/journal/rd/403/burton.pdf>

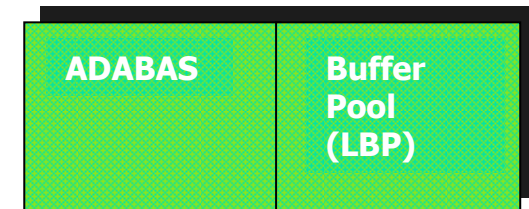
ADABAS Buffer Pool





Buffer Pool (LBP)

- Hold ASSO and DATA blocks to be read or updated
- Depends on the size, blocks will be overwritten and read again, when needed
- Parameter LBP=
- Buffer Efficiency nnnn: relation of logical to physical calls
- Larger Buffer = Less I/O



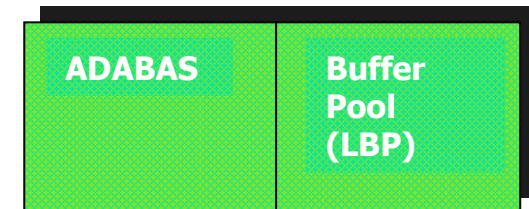
ADARUN
LBP=288000000



Buffer Pool (LBP)

Typical size

- Small DB: 5MB
- Medium DB: 10-20MB
- Large DB: 30-50MB
- Very Large DB: 70+MB

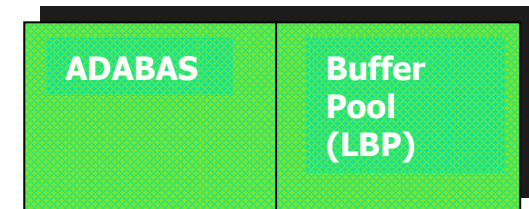


ADARUN
LBP=288000000



Buffer Pool (LBP)

- Various block sizes waste various amounts of LBP?
LBP is divided into 256 byte slots
 - Assume 3390 device: ASSO block size 2544
 - $2544 / 256 = 10$ slots
 - $1,000,000 / 2544 = 394 * 10 = 3940 * 256 = 1,008,640$ bytes in LBP



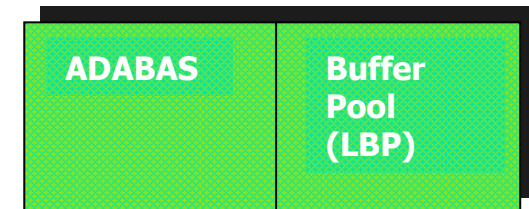
ADARUN

LBP=288000000



Buffer Pool (LBP)

- Various block sizes waste various amounts of LBP?
LBP is divided into 256 byte slots
 - Assume 8392 device: ASSO block size 4092
 - $4092 / 256 = 16$ slots
 - $1,000,000 / 4092 = 245 * 16 = 3920 * 256 = 1,003,520$ bytes in LBP
- ➔ Conclusion
Larger block sizes save very little in the buffer pool



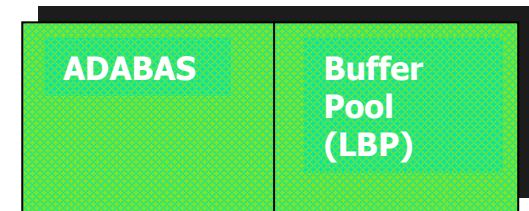
ADARUN

LBP=288000000



Buffer Pool (LBP)

	READS	WRITES
ASSO	40289592	1845776
DATA	36277886	559482
WORK	53619	1076842
PLOG	26	1007043
CLOG	0	0
Total	76621123	4489143



Number of logical reads divided by physical reads = buffer efficiency

Log. reads 1,002,131,139
 Buffer eff. 13.0

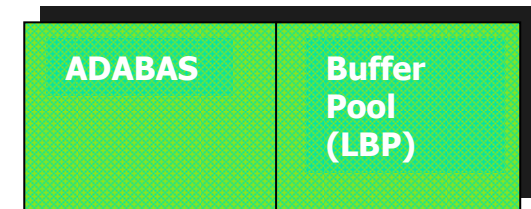
1,002,131,139 /
 76,567,478 = 13.088..



Buffer Pool (LBP)

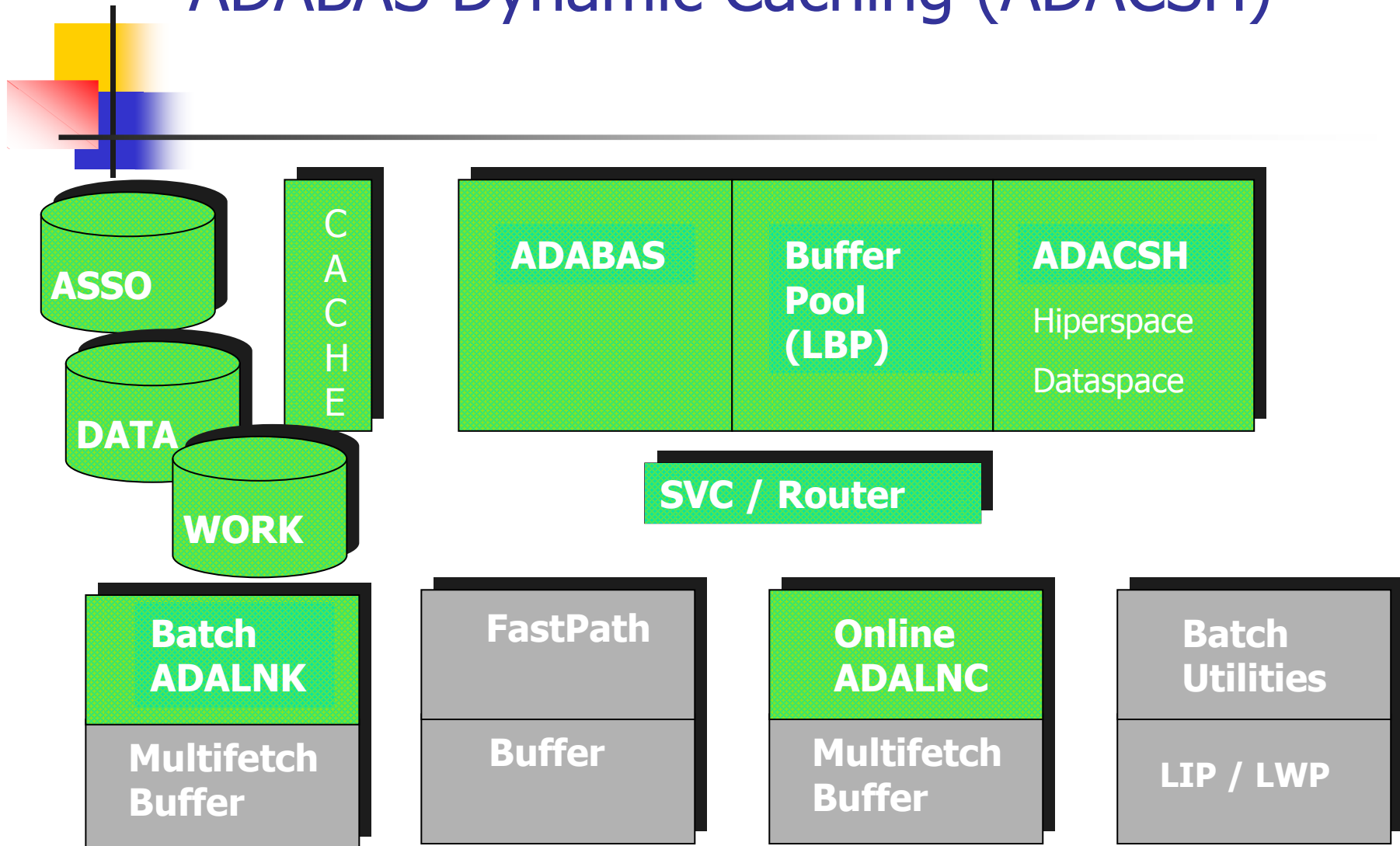
	READS	WRITES
ASSO	52152	29018
DATA	58013	24530
WORK	12167	1373812
PLOG	61	1378579
CLOG	0	0
Total	122393	2805939

Log. reads **303,114,151**
 Buffer eff. **2751.0**

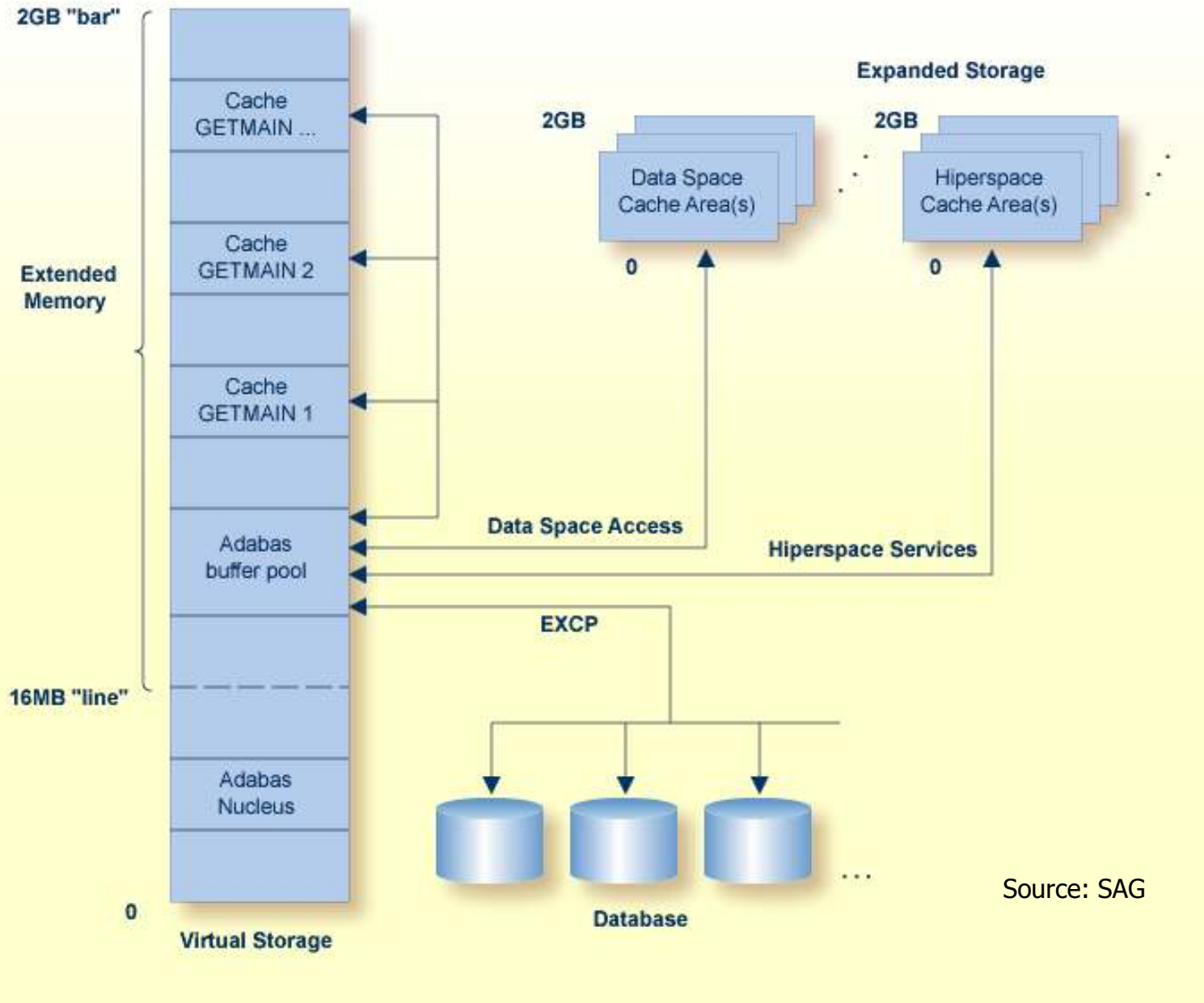
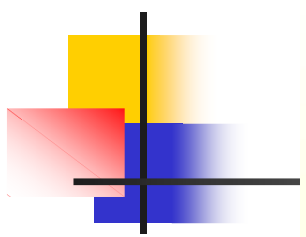


Number of logical reads divided by physical reads = buffer efficiency

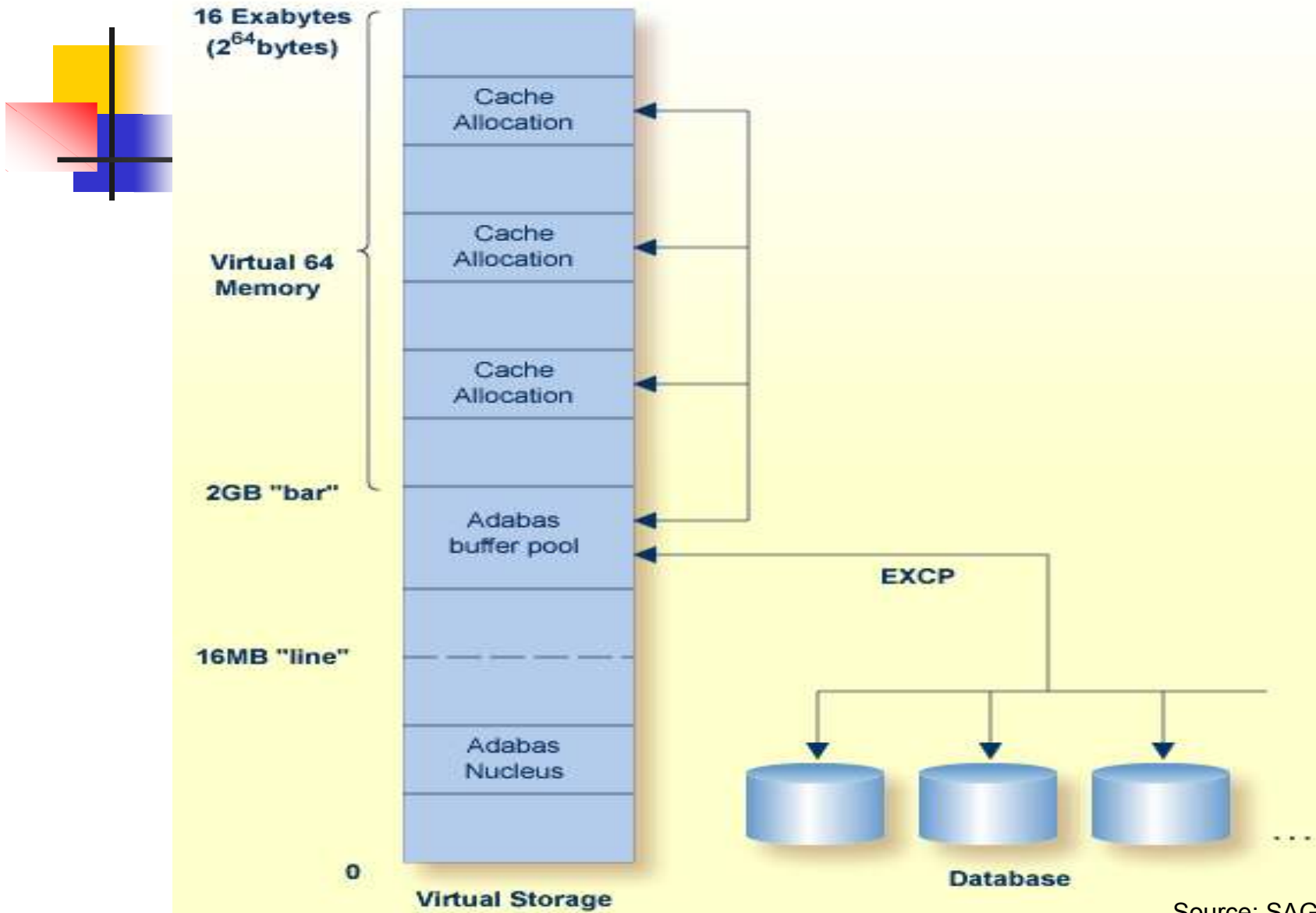
ADABAS Dynamic Caching (ADACSH)



ADABAS Dynamic Caching – Extended Memory + Expanded Storage



ADABAS Dynamic Caching – 64-bit Storage



Source: SAG

ADABAS Dynamic Caching (ADACSH)

Extended Memory

Fastest option for caching

Data Space

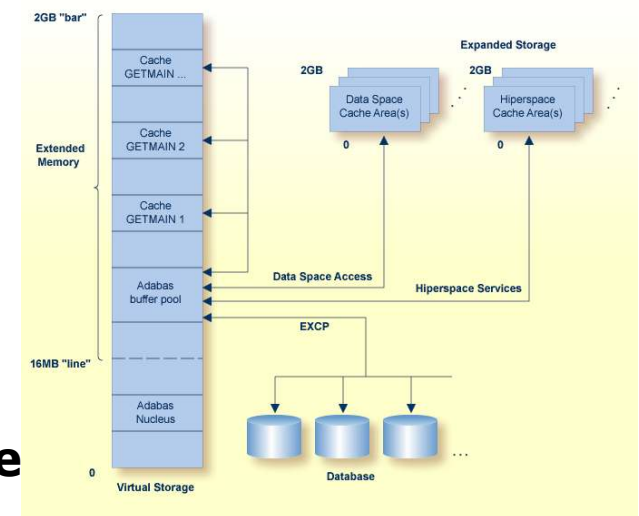
Slightly slower than using extended memory

Expanded Storage – Hiperspace

Relatively slow compared to data space or extended memory access

64-bit Storage

- Cache spaces are allocated in chunks of virtual storage
- Above the 2GB bar in 64-bit virtual address space





ADABAS Dynamic Caching (ADACSH)

- **A buffer in addition to the Adabas buffer pool (read only)**

- **For selectable data**

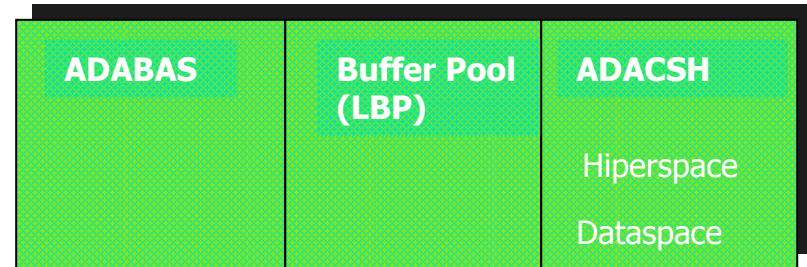
- User-specific - RABNs
- User specified file(s)
- WORK parts 2 and 3

- **Cache buffer location**

- Extended memory
- Data space
- Hiperspace (depending on operating system)
- Virtual 64-bit storage

- **CBUFNO = *n***

- Read-ahead buffers (to the end of track)
- Affects L2/L5, L3/L6, L9, and S1 (non-DE search)



ADABAS Dynamic Caching (ADACSH)

ADARUN Example

```
ADARUN ASSOCACHE=YES
ADARUN CACHE=YES
ADARUN CACTIVATE=YES
ADARUN CASSOMAXS=16M
ADARUN CBUFNO=2
ADARUN CCTIMEOUT=14400
ADARUN CDATAMAXS=16M
ADARUN CDEMAND=180
ADARUN CDISPSTAT=NO
ADARUN CEXCLUDE=FINN
ADARUN CFILE=(025,1,B,E)
ADARUN CFILE=(037,1,B,E)
ADARUN CFILE=(040,1,A,E)
ADARUN CFILE=(046,1,B,E)
ADARUN CFILE=(111,1,B,E)
```

ADABAS	Buffer Pool (LBP)	ADACSH
		Hiperspace
		Dataspace

```
ADARUN CMAXCSPS=1
ADARUN CRETRY=900
ADARUN CWORKSTORAGE=EXTENDED
ADARUN CWORK2FAC=3
ADARUN CWORK3FAC=18
ADARUN DATACACHE=YES
ADARUN WORKCACHE=YES
```

A=ASSO, D=DATA, B=both, E=extended, memory,
D=DATASPACE, H=HYPERSPACE, V=VIRTUAL64



ADABAS Dynamic Caching

SYSAOS – ADABAS Cache Facility

- Define File Cache
- Files with Caching
- Maintain File Cache
- Maintain Cache Spaces
- Maintain Cache Parameters
- Cache Session Summary

ADABAS Dynamic Caching (ADACSH)

- Maintain Cache Parameters -

```
Display Cache Space Stats. NO__          (CDISPSTAT)
Minimum Buff. Efficiency . _____180   (CDEMAND)
Elapsed Time (GETMAIN) .. _____900 sec (CRETRY)
Time of Inactivity ..... _____14400 sec (CCTIMEOUT)
Max. No. Permitted ..... 1                (CMAXCSPS)

Max. ASSO Cache Size ..... __16777216 _   (CASSOMAXS)
Max. DATA Cache Size ..... __16777216 _   (CDATAMAXS)
WORK Memory Type ..... EXT                (CWORKSTORAGE)
Percent WORK2 RABNs ..... 3 %             (CWORK2FAC)
Percent WORK3 RABNS ..... 18 %            (CWORK3FAC)
```

Read-ahead Caching

```
Number of Buffers ..... 2                (CBUFNO)
Command Types Excluded . F_____ FIND    (CEXCLUDE)
                        Included . P/L/H    PHYS/LOGI/HIST
```

ADABAS Dynamic Caching (ADACSH)

DBID xxx

- Files with Caching -

PCFF002

File Level

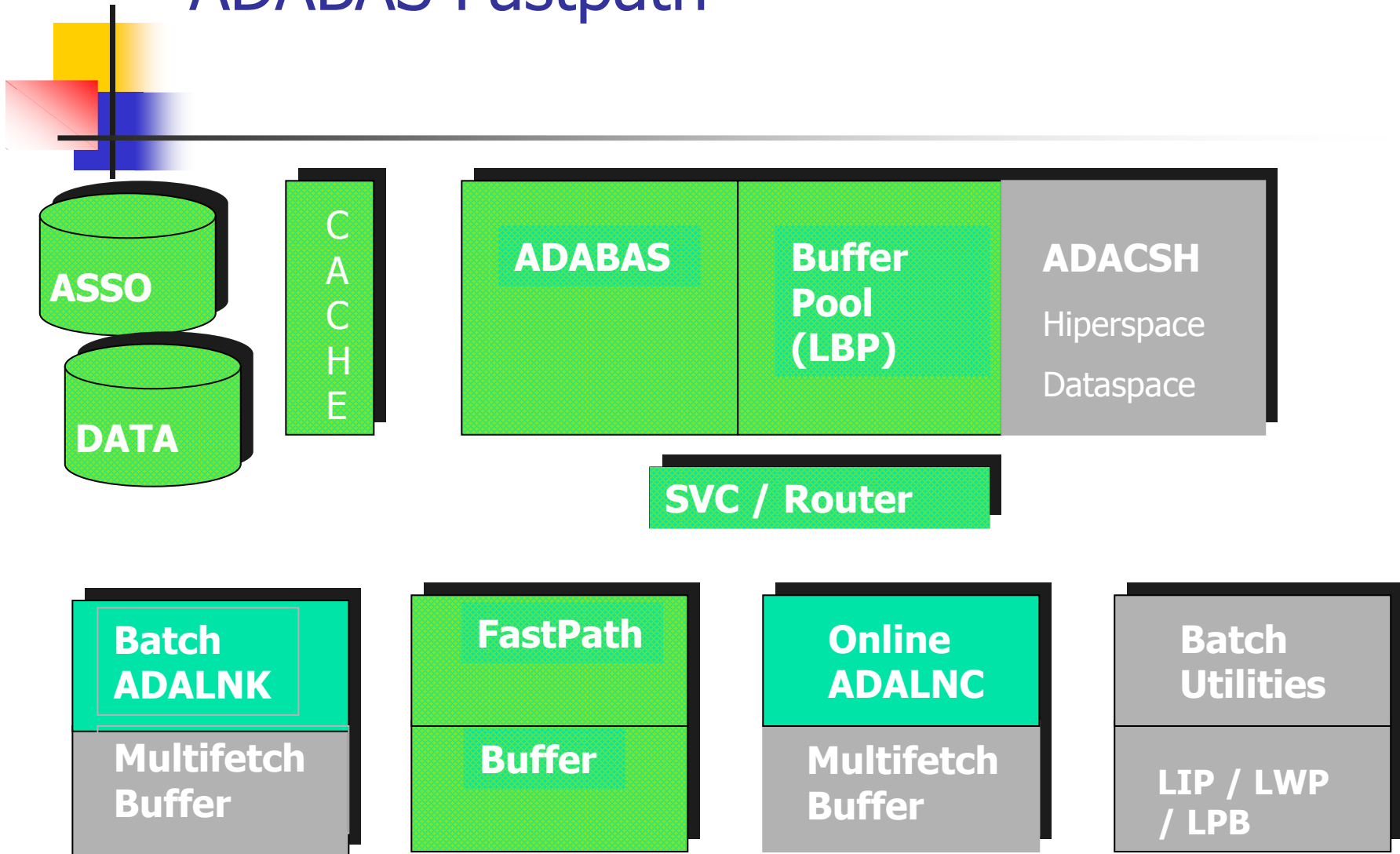
Sel	File	File Name	Cache Type	State
---	-----	-----	-----	-----
	25	CIRCULATION-ORG	Asso/Data	Disable/NotAcc
	37	PARAMETERS	Asso/Data	Active
	40	DRW-MKT-DRW-CMPT	Asso	Active
	46	OUTLET	Asso/Data	Active
	111	GEOCODE-2	Asso/Data	Active

Specify 'DI' (Display), EN (Enable) DE (Delete) or DS (Disable) for a file

ADABAS Dynamic Caching (ADACSH)

+-----+-----+-----+-----+-----+				
+ A D A B A S Dynamic Caching Session S U M M A R Y +				
+ 2,751.0	Current ADABAS Buffer efficiency			+
+ 1,885.0	Projected non-cache buffer efficiency			+
+ 13	Active RABN ranges			+
+ 21	RABN ranges defined			+
+-----ASSO-----DATA-----WORK-----+				
+ Cache Writes	45,944	28,355	30	+
+ Read EXCPs	26,801	20,826	2,965	+
+ Cache Reads	22,801	27,822	461	+
+ Total Reads	49,602	48,648	3,426	+
+ Efficiency	45.9	57.1	13.4	+
+-----+-----+-----+-----+-----+				
+ RABNS Read	8,820	9,852		+
+ REOT EXCPs	1,596	2,691		+
+ Ave RBS/REOT	5.5	3.6		+
+-----+-----+-----+-----+-----+				
+ Max cache	16,384K	16,384K	122,624K	+

ADABAS Fastpath

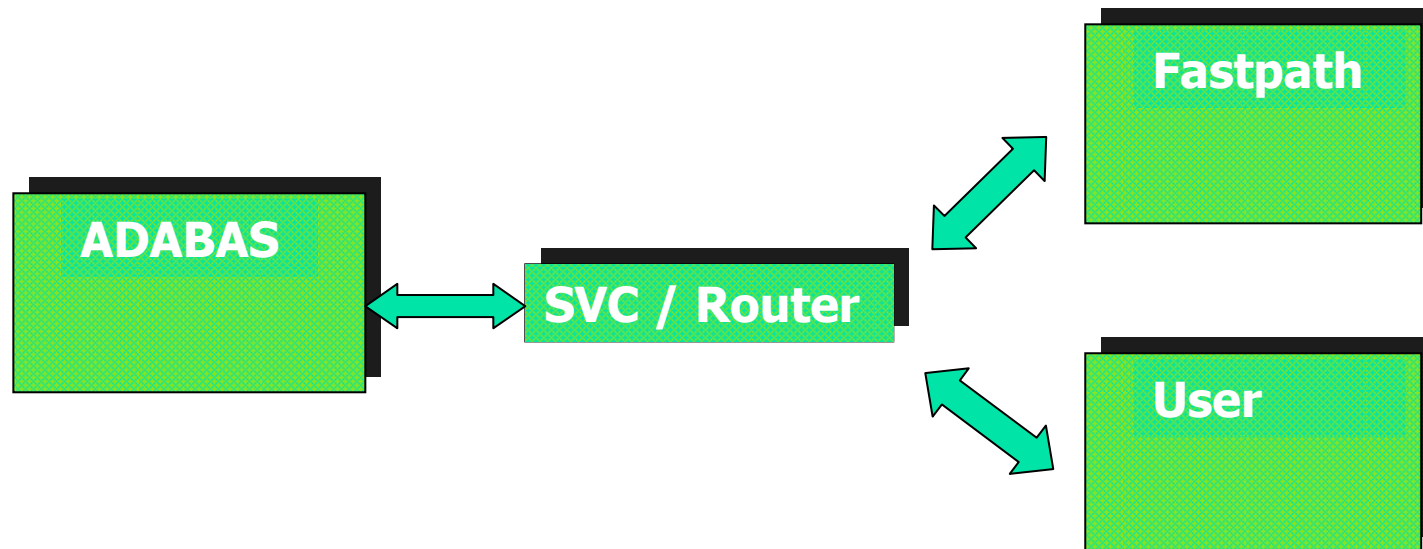


ADABAS Fastpath

Buffer Approach

Reduces (?)

- Region-to-region communication
- Cross memory services





ADABAS Fastpath

Can Reduce

- Adabas CPU consumption
- Application CPU consumption
- Online response times
- Batch elapsed times
- Overall costs



ADABAS Fastpath

Avoids DB processing functions

- command queue processing
- format pool processing
- buffer pool scanning
- I/O (potentially)
- decompression



ADABAS Fastpath

Identifying popular data

- AFPLOOK, tool from AFP
- AFP statistics
 - Buffer
 - Exeptions
 - Jobs
 - File
- Performance monitors as APAS/Insight, Review, TRIM



ADABAS Fastpath Services

SYSAFP or SYSMW742 / MENU

- System Settings
- Maintenance
- Buffer Statistics and Interaction
- Buffer History
- Printing Facility
- Special Services
- Afplook
- About Adabas Fastpath



ADABAS Fastpath Services - Performance

- Buffer Parameters
- File Parameters
- Monitoring File Parameters

ADABAS Fastpath Services - Performance

- General Information -

Buffer Type: Global Name: ADAAFP75 SVC: 214 DB: 247 **
Connected to: Buffer Status : Active
Started: May 6,2008 at: 18:45 Ave Memory Val: 104
Address: 172CB400 Size(k): 163999 Session Number: 261

----- Buffer Statistics -----

Access Type	Attempts (71%)	Successes (54%)
Read-ahead:	73,230,185 (43%)	51,629,022 (70%)
Direct:	48,179,109 (28%)	13,561,116 (28%)
RCs:	1,468,718 (0%)	1,468,718 (3%)
Others:	44,450,178 (29%)	
Total:	167,328,190 (100%)	66,658,856 (39%)

ADABAS Fastpath Services – Buffer Parms

- General Parameters -

Buffer: Global ADAAFP75 Node ID: 247 **

Main Parameters	Value	Initial Allocation	Peak Usage	Commands Ignored
Size(k)..Min: 60000	164000	163999	79%	
Maximum Jobs:	50		2	0
RB Length Limit:	24576			0
Set Length Limit:	2048			0
Read-ahead Memory Sizes(k):	4	8	16	32

Other Parameters	Value		Value
Direct Set Expansion:	12	Set Concurrency:	7
Freespace Index Entries:	768	Average Item Size:	256
Log every n minutes:	60	Keep for n days:	30
Autorestart:	Y	Restart every n Hrs:	0
Direct Access:	ON	Read-ahead Processing:	ON
FIND SX/L1:	ON	READ PHYSICAL L2:	ON
READ LOGICAL L3:	ON	HISTOGRAM L9:	ON

ADABAS Fastpath Services – File ParmS

File Summary from Global ADAAFP75 Node Id 247 **

Database: 134 SVC 214

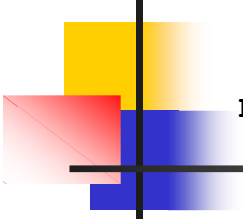
C	File	Attempts	Optimized	Set Usage(k)	Status
—		759248 (1%)	623271 (1%)		Optimizing
—	6	1112178 (1%)	876637 (1%)	109	Optimizing
—	10	225482	197820	1	Optimizing
—	11	1337904 (1%)	23448	132	Optimizing
—	12	2900355 (2%)	548693 (1%)	2990 (3%)	Optimizing
—	14	6472561 (5%)	1646593 (2%)	25637 (22%)	Optimizing
D	15	5262823 (4%)	352647 (1%)	29558 (26%)	Optimizing
—	16	674394 (1%)	667634 (1%)	256	Optimizing
—	17	4607319 (4%)	4035362 (6%)	5835 (5%)	Optimizing
—	19	5420167 (4%)	3641511 (5%)	707 (1%)	Optimizing
—	22	1882078 (2%)	1750072 (3%)	1495 (1%)	Optimizing
—	24	222962	170610	209	Optimizing
Totals:		123064222 100%	66780445 100%	115628 100%	

Mark with D(etail),F(ile Sets),S(ervices)

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ADABAS Fastpath Services



File Details from Global ADAAFP75 Node Id 247 ** F12210MB

Database: 134 SVC 214 File: 15

----- Optimization Summary -----

Access Type	Attempts	(96%)	<-----	Successes	(6%)
Read-ahead:		(0%)			(0%)
Direct:	5,265,233	(96%)		354,307	(6%)
RCs:	113	(0%)		113	(0%)
Others:	206,824	(3%)			
Total:	5,472,170	(100%)		354,420	(6%)

Updates:	1,260	Over-reads:	(100%)
----------	-------	-------------	--------

Set Limit(k): 163999	Set Expansion: 12	Update Sensitivity: R
Set Id Length Limit: 2048	RB Length Limit: 24576	Set Concurrency: 7
Status: 00 D0 Last RC:	Next Event: 0:00	Addr: 177FDE00

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ADABAS Fastpath Services

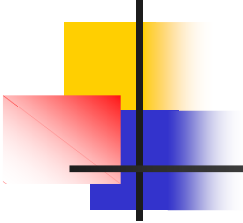
File Summary from Global ADAAFP75 Node Id 247 **

Database: 134 SVC 214

C	File	Attempts	Optimized	Set Usage (k)	Status
-		759248 (1%)	623271 (1%)		Optimizing
-	6	1112178 (1%)	876637 (1%)	109	Optimizing
-	10	225482	197820	1	Optimizing
-	11	1337904 (1%)	23448	132	Optimizing
-	12	2900355 (2%)	548693 (1%)	2990 (3%)	Optimizing
-	14	6472561 (5%)	1646593 (2%)	25637 (22%)	Optimizing
F	15	5262823 (4%)	352647 (1%)	29558 (26%)	Optimizing
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Totals:		123064222 100%	66780445 100%	115628 100%	

Mark with D(etail),F(ile Sets),S(ervices)

ADABAS Fastpath Services



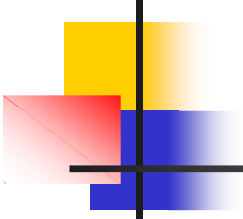
Set Summary from Global ADAAFP75 Node Id 247 **

Database: 134 SVC 214 File: 15

				Number of Items....			Memory (k)....		Efficiency Ratings		
C	CC	De	Sets	In Use	Peak	Optimized	In Use	Peak	Set	Memory	Growth
D	S1	AE	14	42585	42927	179540	6465	6508	9	27	0.25
_	S1	AP	9	7670	7696	29065	6834	6842	9	4	0.03
_	S1	DO	23	8775	30369	146736	3664	21088	9	5	0.04

Mark with D(etail),F(ull Set List)

ADABAS Fastpath Services



Set Summary from Global ADAAFP75 Node Id 247 **

Database: 134 SVC 214 File: 15

Command: S1 Primary Descriptor: AE Number of Sets: 14

Efficiency Ratings: Set: 9 Memory: 27 Growth: 0.25

Items - Optimized: 179540 Added: 46521 Collisions: 184

Current: 42585 Peak: 42927 Free: 56

Removed: 3936 RLU: 3936 Overwrites:

Set Resets:

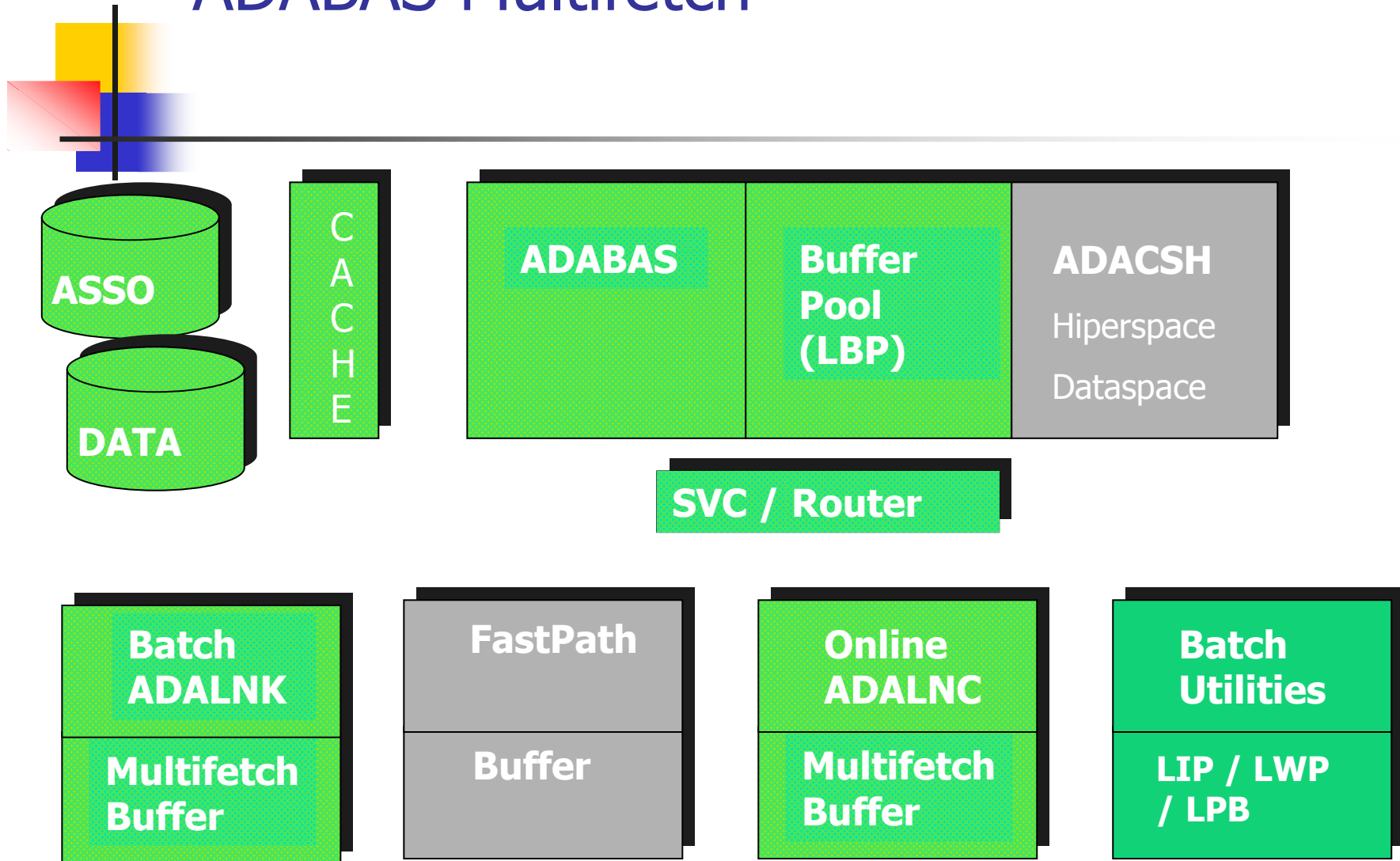
Memory- Used(k): 6465 Peak(k): 6508 Free(k): 8



ADABAS Fastpath – Tuning

- Global Buffer Size: approx. 2MB+ for a file
- Log every nn minutes, e.g. 60
- Max jobs = all batch initiators + CICS regions
- Max files
- Coordinate ECSA space
- Set up a separate Fastpath for each log. DB
- Establish a percent savings threshold
- Exclude certain commands from a file

ADABAS Multifetch



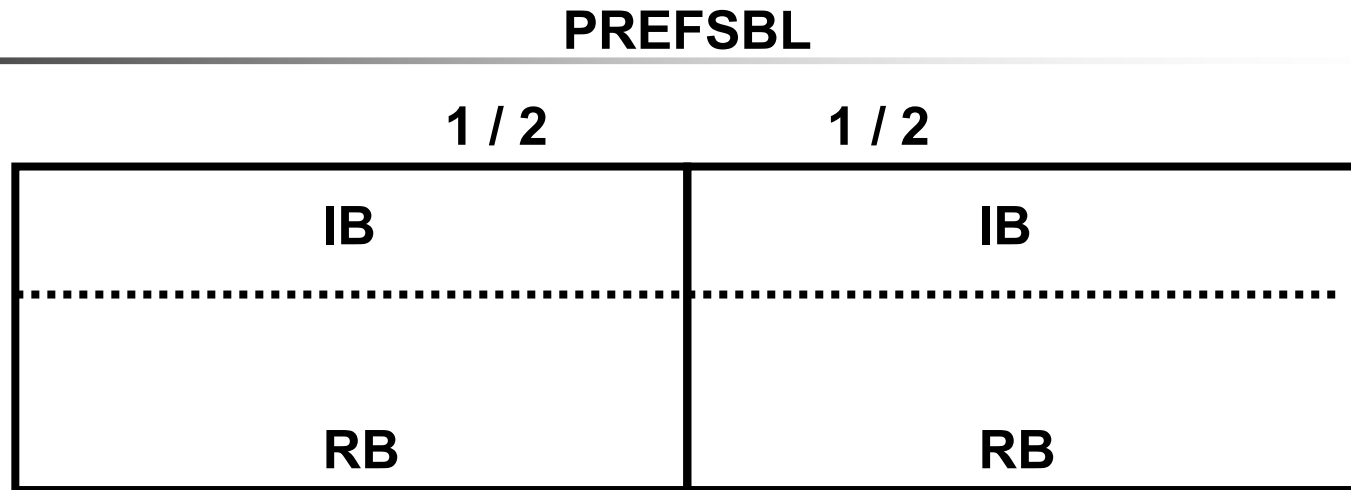
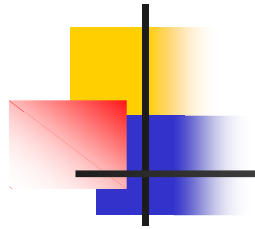


ADABAS Multifetch

Read Ahead Approach

- Prefetch (old – now subset of multifetch)
 - Stored in the ISN Buffer
- Multifetch (new)
 - Stored in the Record Buffer

ADABAS Multifetch - ADAMLF PREFSBL USAGE



FOR EXAMPLE:

PREFSBL	=	64K
1 / 2	=	32K
EACH IB	=	8K
EACH RB	=	24K



ADABAS Multifetch

DETERMINE RBL = (PREFSBL / 2) X (3/4)

1ST CALL - ONE RECORD RETURNED (NO MLF)

2ND CALL - NUMBER OF RECORDS THAT CAN FIT IN 1/8 RBL

3RD CALL - NUMBER OF RECORDS THAT CAN FIT IN 1/8 RBL

4TH CALL - NUMBER OF RECORDS THAT CAN FIT IN 1/2 RBL

5TH CALL - NUMBER OF RECORDS THAT CAN FIT IN RBL

:::

5+n CALL - NUMBER OF RECORDS THAT CAN FIT IN RBL

PREFSBL = 65K, RBL = (65K / 2) X (3/4) = 24,573 PREFNREC = 200

CALL#	IBL	RBL	ISNQ*	
1	8,190	100	1	← 1 REC, NOTE RBL=100
2	8,190	3,071	30	← 1/8 RBL
3	8,190	3,071	30	← 1/8 RBL
4	8,190	12,286	122	← 1/2 RBL
5	8,190	24,573	200	← MAX REACHED
6	8,190	24,573	200	
7	8,190	24,573	200	
8	8,190	24,573	200	
9	8,190	24,573	200	
10	8,190	24,573	200	
11	8,190	24,573	200	
12	8,190	24,573	200	
13	8,190	24,573	200	
14	8,190	24,573	17	← EOF

Source: Jim Poole

tor
ulting.com



ADABAS Multifetch

- Batch (controlled by ADARUN parameters)
 - PREFETCH=YES | OLD | NO
 - PREFIFIL=123,234,991
 - PREFICMD=L1/L3/L9
 - PREFSBL=size of one MLF sequence
 - PREFTBL=n*PREFSBL
 - PREFNREC=max number of MLF <= always use
- Online
 - READ/FIND/HISTOGRAM MULTI-FETCH [number]
 - → NATPARAM, NTDS
 - Online faster than batch: improved algorithm
 - FIND (12) MULTI-FETCH 5 VEHICLES WITH COLOR = "RED"

<http://storrconsulting.com/sc520-nat044.html>

See also Jim Poole's presentation

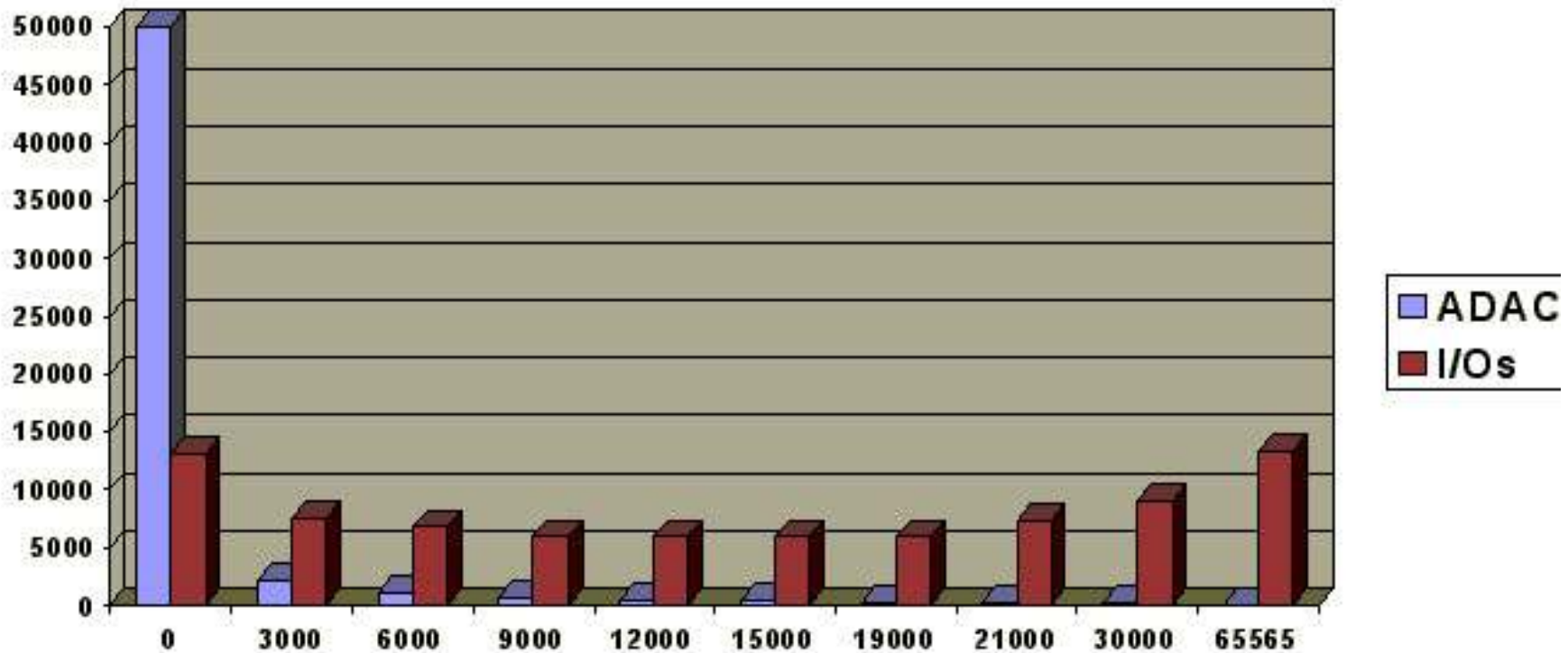


ADABAS Multifetch

- **Batch - ADAMLF**
 - ASYNC Processing
 - Batch only
 - Can do updates
 - Control via //DDCARD and ADARUN parms

- **Online - NATMLF**
 - SYNC Processing
 - Online or batch
 - NO updating
 - Control via program

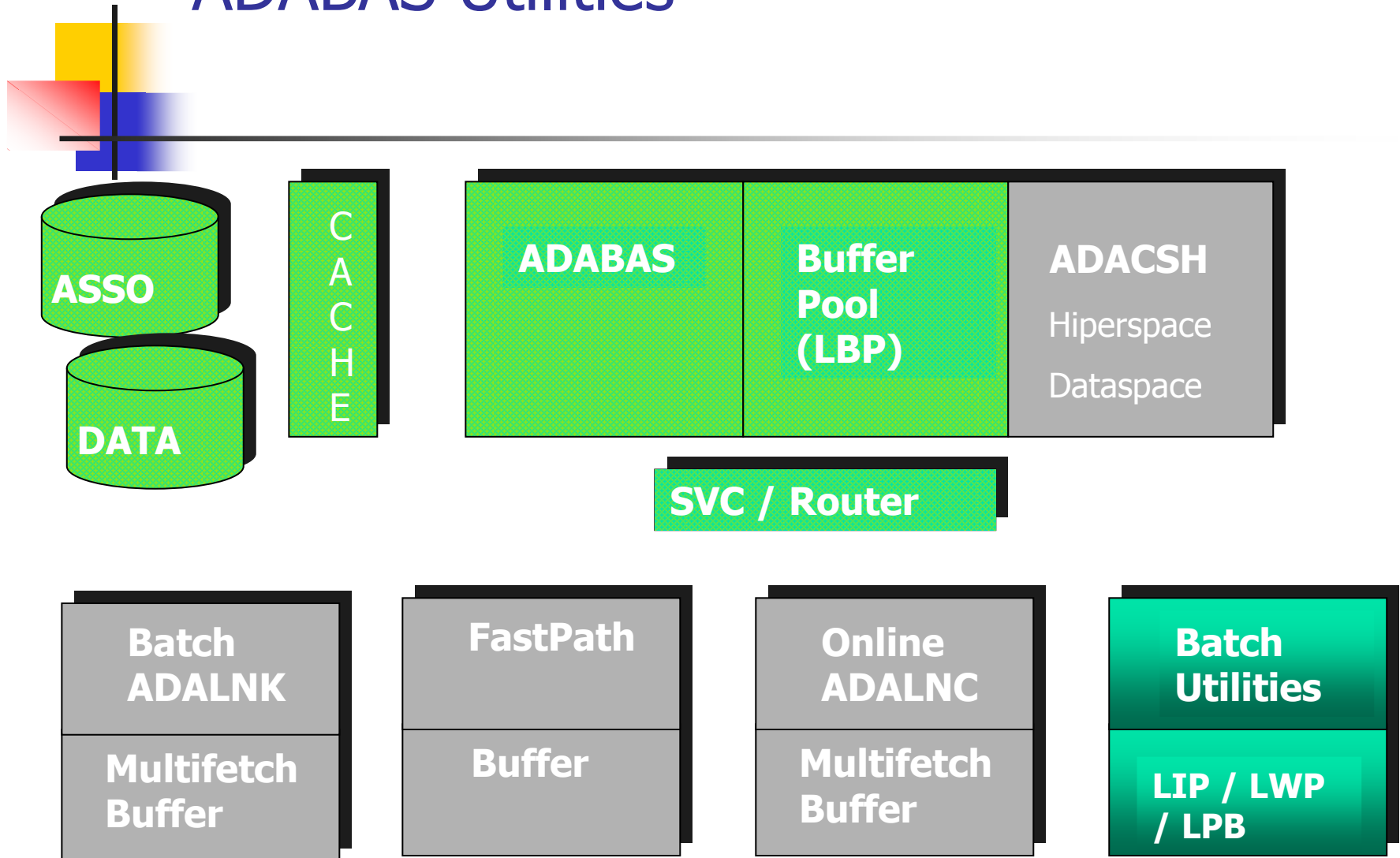
ADABAS Multifetch



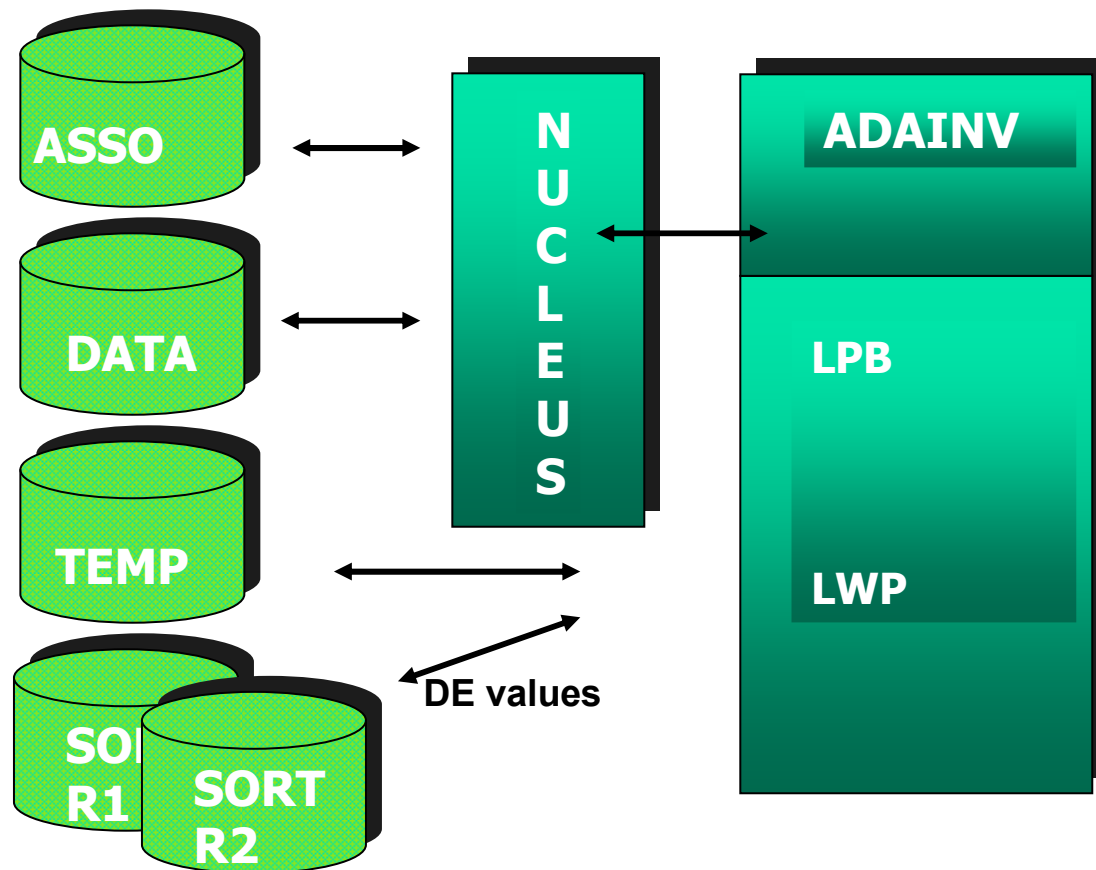
- READ (50,000) VIEW1 BY ISN with different PREFSBL.
- ADABAS Calls w/o Multifetch = 50,000
- ADABAS Calls with Multifetch: see figure
- Number of I/Os with and w/o Multifetch are approx. the same but can be different depends on the size of the ADABAS buffer pool

Dieter W. Storr

ADABAS Utilities



ADABAS Utilities - ADAINV



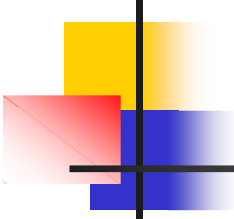
Also: Region Size !

**Internal Prefetch
Buffer, max 32,760
or default from
ADARUN LU=**

**Work Pool – sort DE
values**

TEMPSIZE

SORTSIZE



ADABAS Utilities – ADAINV

What TEMP Size? – From AOS

TEMP Storage - ADAINV

```

File Number ..... 001
Field-Name to be inverted .. AA
Average descriptor-length .. 8           ( Default = Field-Length )
Max. Number of records ..... 20122145   ( Default = TOPISN       )

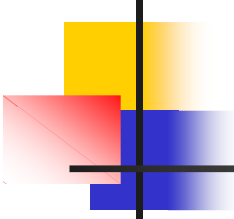
Device Type ..... 3390
No. of records to delete ...           ( ADALOD Delete only    )
DBID ..... 431                          ( PROD-DATA-BASE )
Password (if required) .....

```

```

Required TEMP-Blocks ..... 18729
                Cylinder .... 209

```



ADABAS Utilities – ADAINV

What SORT Size? – From AOS

SORT Storage - ADAINV

```

File Number ..... 001
Number of records ( Default:  TOPISN ) ..... 135811802
Name of the field to be processed ..... AA
Average compressed descr. length (in Bytes)
of the biggest descriptor ..... 8
Occurences of periodic groups ..... 1
Occurences of multiple fields ..... 1
SORT device-type ..... 3390
LWP-parameter ..... 500000000
Database-ID ..... 34
Password (if required) .....
-----
Required number of blocks (minimum) ..... 842678
Required number of cyls. (minimum) ..... 9364

```

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ADABAS Utilities - ADAINV

DDSORTR1	335774	reads	335776	writes
DDTEMPR1	0	reads	1	writes
DDASSOR1	1933	reads	444918	writes



ADABAS Utilities - ADAINV

At job or step level: **REGION=1000M** (for example)

```
ADAINV INVERT FILE=001
```

```
ADAINV SUPDE='S1=AB(1,9),CD(1,8)'
```

```
ADAINV TEMPDEV=3390,TEMPSIZE=9963,SORTDEV=3390,SORTSIZE=16605
```

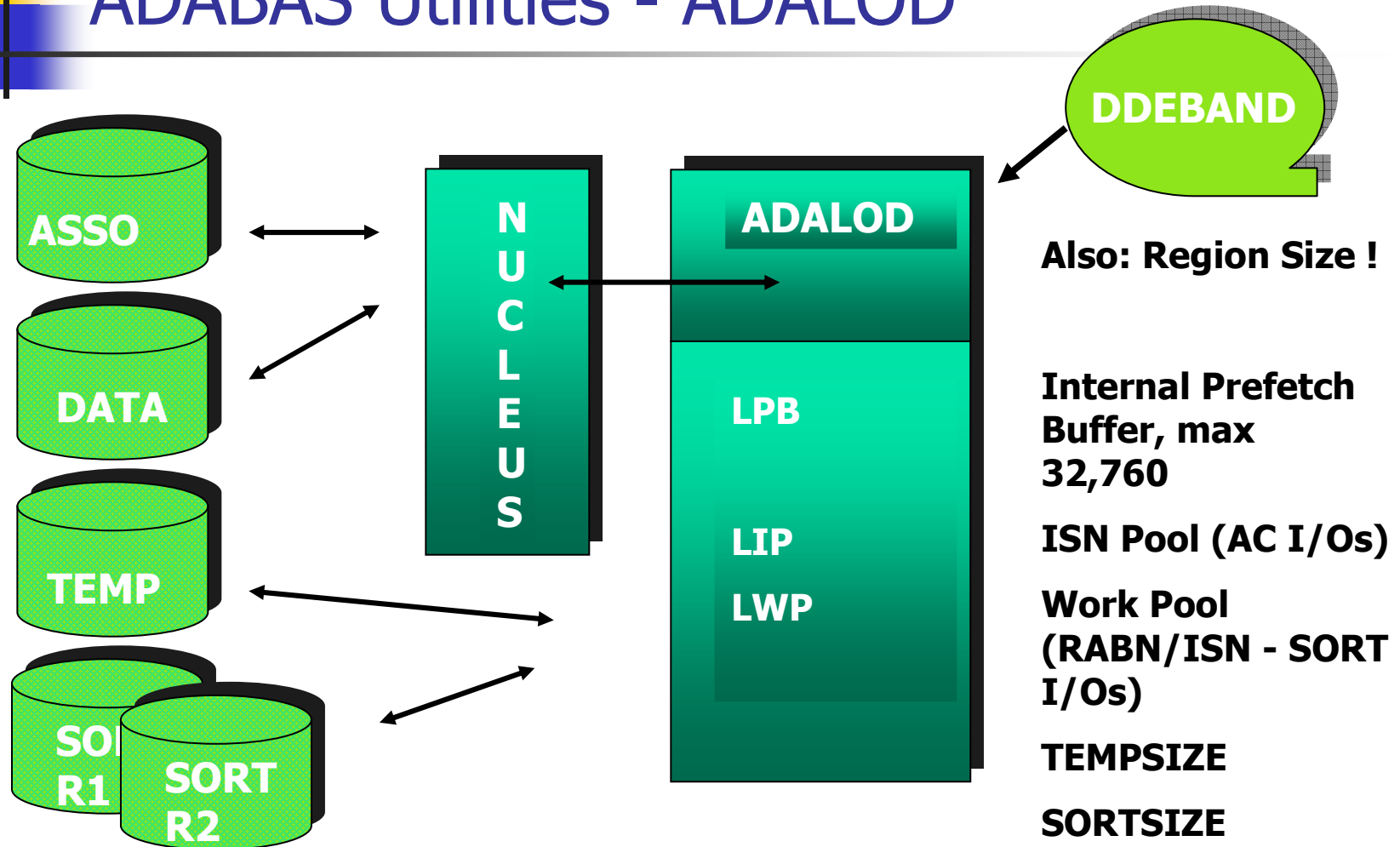
```
ADAINV LPB=32767,LWP=500000K
```

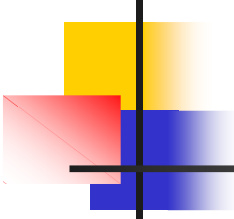
Processing Statistics:

```
0 Blocks used on TEMP dataset (0%)
576053 Blocks used on SORT Part 1 (77%)
0 Blocks used on SORT Part 2 (0%)
```

```
I Descriptor I NR of ISNS I
I-----I-----I
I      S1      I 135649250 I
I-----I-----I
```

ADABAS Utilities - ADALOD





ADABAS Utilities – ADALOD - LOAD

What TEMP Size? - From ADACMP

TEMP Space Estimation

I	Device	I	Blocksize	I	Number of	I
I		I	(bytes)	I	Blocks	Cyls
I	-----	I	-----	I	-----	I
I	3390	I	8,904	I	31,157	347
I	-----	I	-----	I	-----	I

The Largest Descriptor is AE, it will occupy 31154 TEMP blocks.



ADABAS Utilities – ADALOD - LOAD

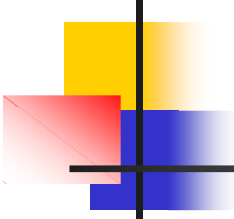
What SORT and LWP Sizes? – From ADACMP

SORT Space estimation

```
-----
```

I Device	I Blocksize	I LWP	I Nr of	I
I	I (bytes)	I (bytes)	I Blocks	I Cyls
I	I	I	I	I
I 3390	I 8904	I 159744 (Minimum)	I 62370	I 693
I	I	I 1048576 (Default)	I 62550	I 695
I	I	I 40894464 (Optimum)	I 74700	I 830
I	I	I	I	I

```
-----
```



ADABAS Utilities – ADALOD - LOAD

What TEMP Size? – From AOS

TEMP Storage - ADALOD LOAD

```

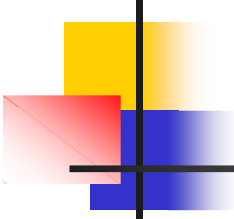
File Number ..... 001
Field-Name to be inverted ..
Average descriptor-length ..          ( Default = Field-Length )
Max. Number of records ..... 20122145 ( Default = TOPISN      )
  Make sure to multiply TOPISN by ALL occurrences of PE and/or MU
Device Type ..... 3390
No. of records to delete ...          ( ADALOD Delete only   )
DBID ..... 431                       (PROD-DATA-BASE)
Password (if required) .....

```

```

Required TEMP-Blocks ..... 40751
                          Cylinder .... 453

```



ADABAS Utilities – ADALOD - LOAD

What SORT and LWP Sizes? – From AOS

SORT Storage - ADALOD LOAD

```
File Number ..... 001
Number of records ( Default:  MAXISN ) ..... 30000119

Average compressed descr. length (in Bytes)
of the biggest descriptor ..... 10
Occurences of periodic groups ..... 1
Occurences of multiple fields ..... 1
SORT device-type ..... 3390
LWP-parameter ..... 700000000
Database-ID ..... 431
Password (if required) .....

-----
Required number of blocks (minimum) ..... 1376383
Required number of cyls. (minimum) ..... 15294
```



ADABAS Utilities – ADALOD - LOAD

What SORT and LWP Sizes? – From SL24 Document #515125

- Normally, LWP is used to avoid writing to DDSORT dataset
- Provides better performance than physical I/Os
- Space has to be available in the DDSORT in case LWP isn't big enough
- Not enough space of LWP = has to be written to DDSORT dataset
- **Higher LWP needs a bigger DDSORT dataset.**



ADABAS Utilities – ADALOD - LOAD

```
ADALOD LOAD FILE=001,NAME='MID-SIZED-FILE'  
ADALOD ISNSIZE=4  
ADALOD LWP=40000000  
ADALOD LIP=20000000  
**ALOD LPB=default from ADARUN LU=)  
ADALOD ISNREUSE=YES  
ADALOD DSSIZE=6300000B  
ADALOD UISIZE=2160B  
ADALOD NISIZE=108000B,INDEXCOMPRESSION=YES  
ADALOD MAXISN=3000000  
ADALOD TEMPDEV=3390,TEMPSIZE=16605, SORTDEV=3390, SORTSIZE=19926
```

Processing Statistics:

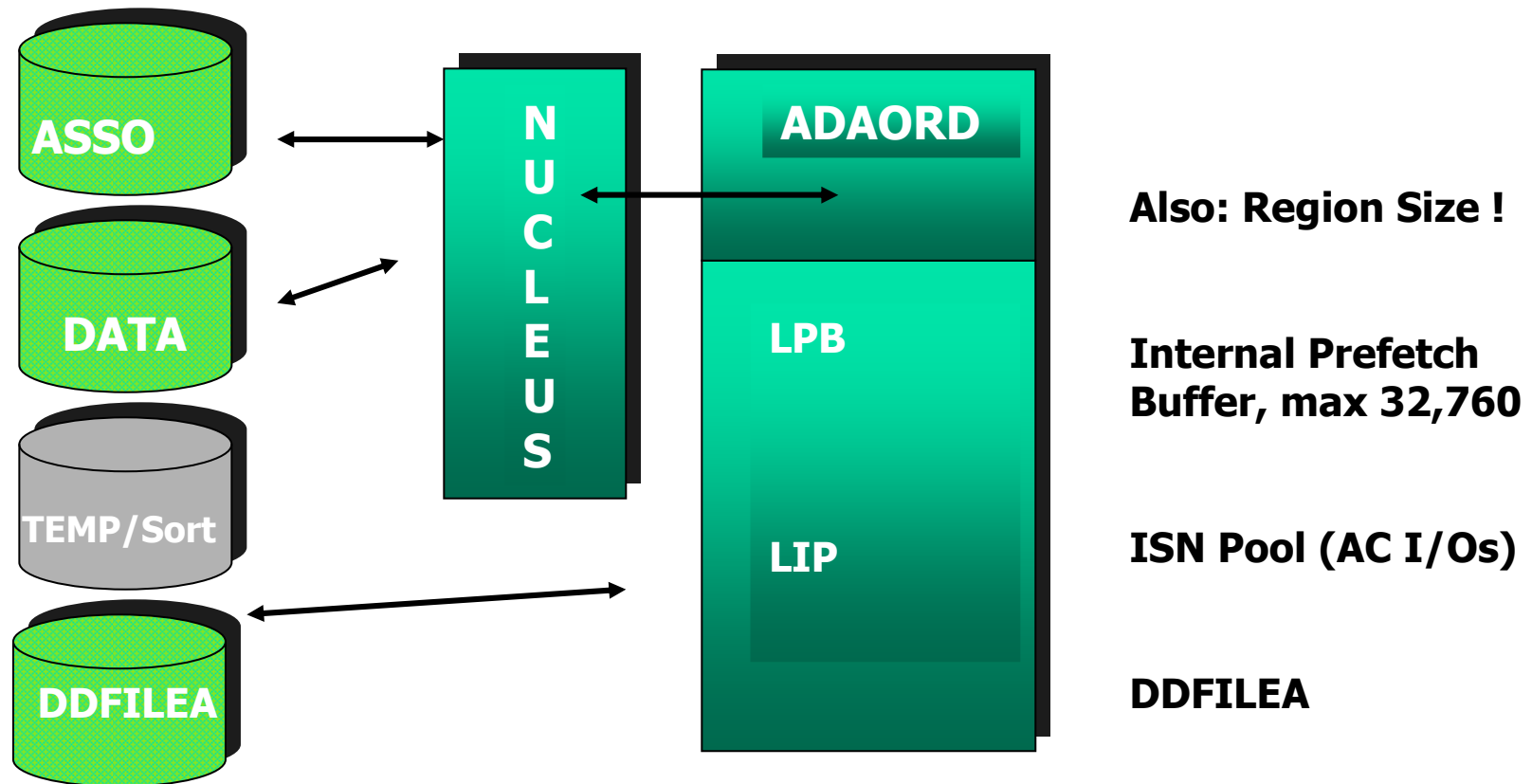
```
19812641 Input Records Processed  
    33356 blocks used on TEMP-Dataset (2%)  
    420871 blocks used on SORT Part 1 (46%)  
         0 blocks used on SORT Part 2 (0%)  
26817204381 bytes of DATASTORAGE used to store records
```



ADABAS Utilities – ADALOD - LOAD

ADALOD	REG=0M	REG=1G
7.4.4	LWP=32M	LWP=700M
	LIP=90M	LIP=200M
Elapsed Time	02:37	01:57
CPU Time	11:32	04:49

ADABAS Utilities - ADAORD



August 2008

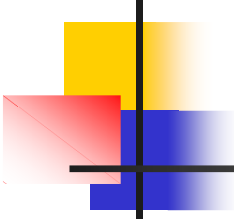
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ADABAS Utilities – ADAORD

- REORASSO: LPB
- REORDATA: LPB, LIP
- REORDB: LPB, LIP
- REORFASSO: LPB
- REORFDATA: LPB, LIP
- RESTRUCTUREDDB: LPB
- RESTRUCTUREF: LPB (why not LIP?)
- STORE: LIP



ADABAS Utilities – ADAORD

No TEMP and SORT – DDFILEA only - from AOS

DDFILEA Storage - ADAORD

	Code	Reorder	Maximum Space Required
	----	-----	-----
DB -Function :	A	Asso	
	B	Data	Bytes
	C	DB	Blocks
	D	Restruct DB	Cylinder ..
FILE -Function :	E	FAsso	Blocksize ..
	F	FData	
	G	File	
	H	Restruct File	
	.	Exit	

```

Code ..... -
File .....
Device ... 3390
DB-ID .... 431      (PROD-DATABASE) W. Storr
                        Detlev
August 2008                dstorr@storrconsulting.com

```



ADABAS Utilities – ADAORD

LPB = max 32760 but not more than the LU definition
Int. User Buffer (LU).. 65535

```
ADAORD REORFILE FILE=002
ADAORD NISIZE=2000B,UISIZE=600B,DSSIZE=4000B
ADAORD MAXISN=1000000,INDEXCOMPRESSION=YES
ADAORD LPB=32760
```

```
ADAORD REORASSO
ADAORD MAXFILES=999
ADAORD LPB=32760
ADAORD DBINDEXCOMPRESSION=YES
```

```
ADAORD REORFILE FILE=003
ADAORD ASSOPFAC=10,
ADAORD DATAPFAC=10, SORTSEQ=LF
ADAORD ISNSIZE=4
ADAORD INDEXCOMPRESSION=YES
ADAORD LPB=32760, LIP=180000K
```



ADABAS Utilities – ADAORD

To decrease the number of ASSO I/O operations, when recreating the address converter (AC)

$LIP = (ISNSIZE + RABNSIZE) * \text{number of records}$

$LIP = (4 + 4) * 140,000,000$

$LIP = 1,120,000,000$ (=best performance) ??????

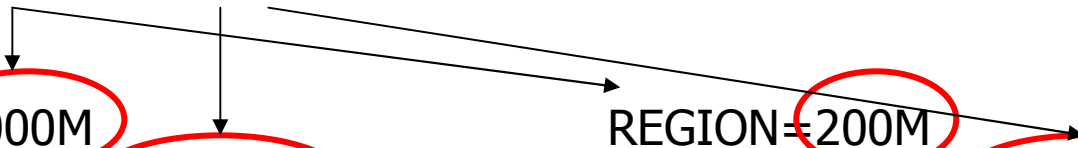
Job or steplib: REGION>1120M (for example)



ADABAS Utilities – ADAORD

ADA744:

ADAORD REORDER ASSOCIATOR and DATASTORAGE of single file
different REGION and LIP sizes



REGION=1000M
LPB=32767,LIP=500000K
Start: 2008-07-14 10:04:04
Stop: 2008-07-15 13:08:54
(27 hours 8 min)
CPU 21MIN 45.75
135,649,250 Data Storage
Records Processed.
Largest record has 549 bytes
1 hour between tape switches

REGION=200M
LPB=32767,LIP=180000K
Start: 2008-07-28 10:08:39
Stop: 2008-07-29 01:24:00
(15 hours 16 min)
CPU 21MIN 10.69
135,649,250 Data Storage
Records Processed.
Largest record has 549 bytes
30 min between tape switches

ADABAS Utilities – ADAORD

RMF V1R9 Data Set Delays - Job Line 1 of 9
Command ==> Scroll ==> CSR
Samples: 60 System: S254 Date 07/14/08 Time: 16.00.00 Range: 120 Sec
Jobname: STSTMPM7 EXCP Rate 575.1 Connect: 28%

LIP=50000K

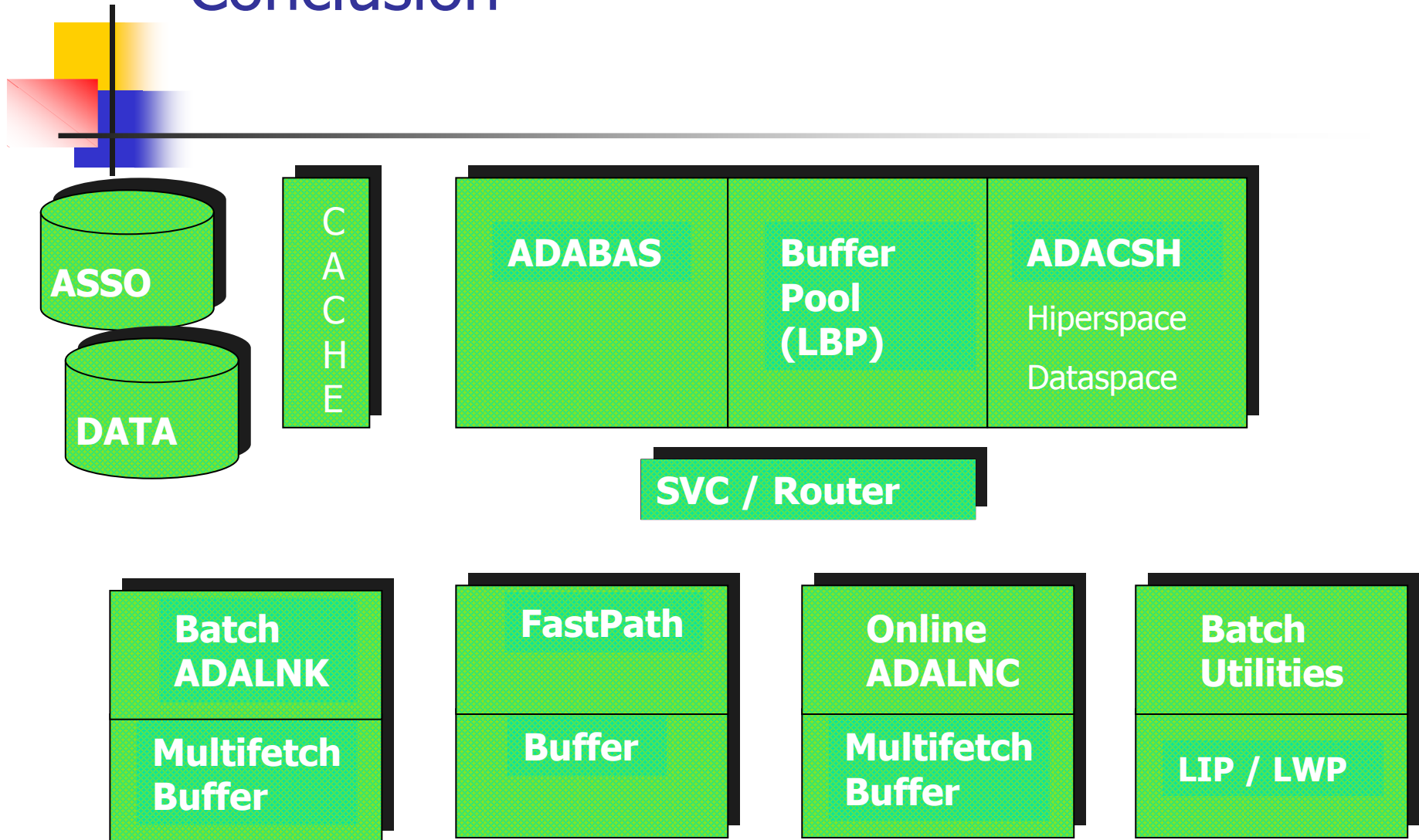
ASID	----- Data Set Name -----	Volume	Num	DUSG%	DDLY%
0888	ADABAS.MPM.STST7.DATA	ADA444	7001	10	10
	ADABAS.MPM.STST7.DATA	ADA408	7037	7	5
	ADABAS.MPM.STST7.DATA	ADA440	7220	7	0
	ADABAS.MPM.STST7.ASSO	ADA402	703D	5	0
	ADABAS.MPM.STST7.DATA	ADA409	710D	3	0
	ADABAS.MPM.STST7.ASSO	ADA436	7201	3	0
	ADABAS.MPM.STST7.DATA	ADA434	7130	2	0
	ADABAS.MPM.STST7.DATA	ADA428	7101	2	0
	ADABAS.MPM.STST7.DATA	ADA445	701D	2	0

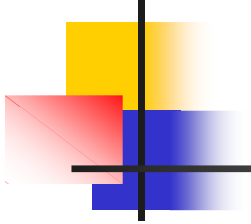
RMF V1R9 Data Set Delays - Job Line 1 of 4
Command ==> Scroll ==> CSR
Samples: 60 System: S254 Date 07/28/08 Time: 16.00.00 Range: 120 Sec
Jobname: STSTMPM7 EXCP Rate 1,145.0 Connect: 47%

LIP=18000K

ASID	----- Data Set Name -----	Volume	Num	DUSG%	DDLY%
0234	ADABAS.MPM.STST7.ASSO	ADA402	703D	30	3
	ADABAS.MPM.STST7.DATA	ADA427	710A	13	3
	ADABAS.MPM.STST7.ASSO	ADA436	7201	8	2
	ADABAS.MPM.STST7.ASSO	ADA453	711D	2	0

Conclusion





Thank you!



Questions?