

Experiences with Adabas Replicator and Mass Data

Sacramento, CA









Harbor of Monterey, California – Sea Otters



Highway 1, California – Near Big Sur



Elephant Seals - up to 6.9 m, 22.5 ft



Contents

- Environment
- Reasons for Replication
- Basics
- Definitions – Add/Modify Files – Online and Batch
- How to Check Source and Target Files
- Recovery After a Crash – PLOGs and Replay
- Problems
- Solutions
- Monitors – SAG and Self-written
- Conclusion



Environment

Mainframe Adabas Database

- 203 files loaded – 186 to be replicated
- Many files contain 50,000,000 – 160,000,000 ISNs

	CYL	Blocks	Gbytes
ASSO	119,676	32,312,502	76.56
DATA	388,947	58,342,040	275.15



Number of Update Commands Monthly Allowance Roll

DATE	HR	QTR	CMD COUNT	CMD COUNT	PCT TOTAL CMDS	PCT TOT IO	SUM TOT IO	SUM TOT IO
100315	19	78	874,107	=====	11.4	11.2	=====	755,656
100315	19	79	1,488,111	=====	19.4	18.9	=====	1,278,291
100315	20	80	1,517,170	=====	19.8	19.6	=====	1,324,734
100315	20	81	1,581,223	=====	20.6	20.5	=====	1,386,234
100315	20	82	1,467,842	=====	19.1	19.5	=====	1,318,488
100315	20	83	740,750	=====	9.6	10.3	=====	697,749
100315	21	84	11,484		0.1	0.1		9,958

➤ **7.6 million update commands in 90 min**

➤ **85.214 commands per min**

➤ **1,421 cmds per sec**

➤ **6 million update commands per hour**

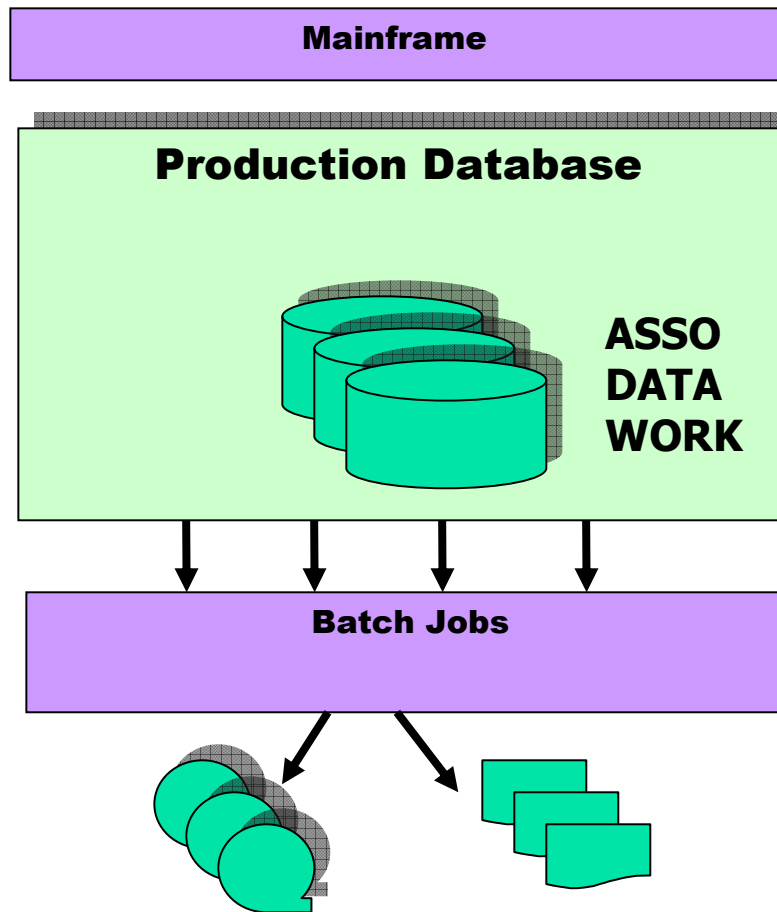
Test: Larry Frazin



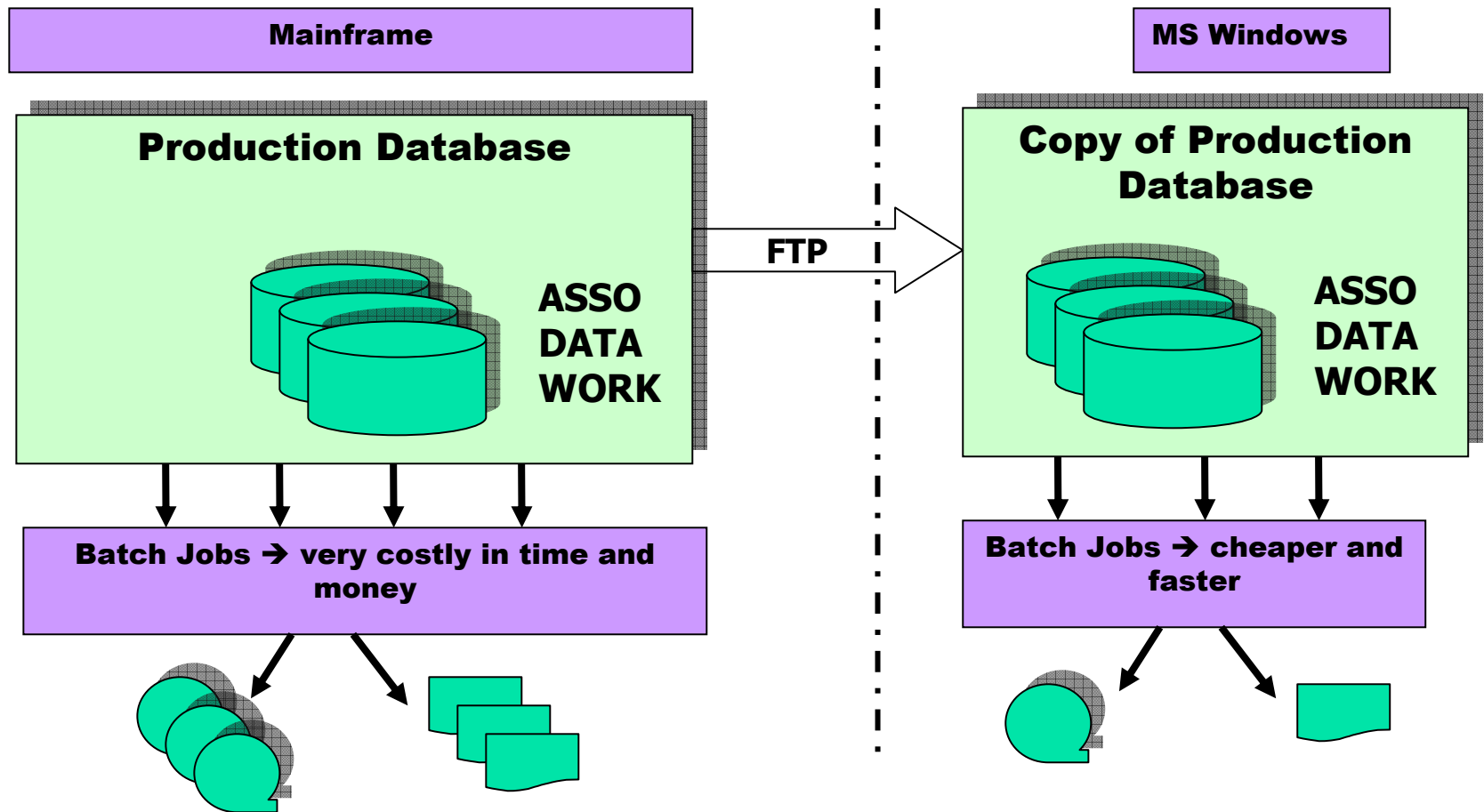
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Mainframe and PC Solutions

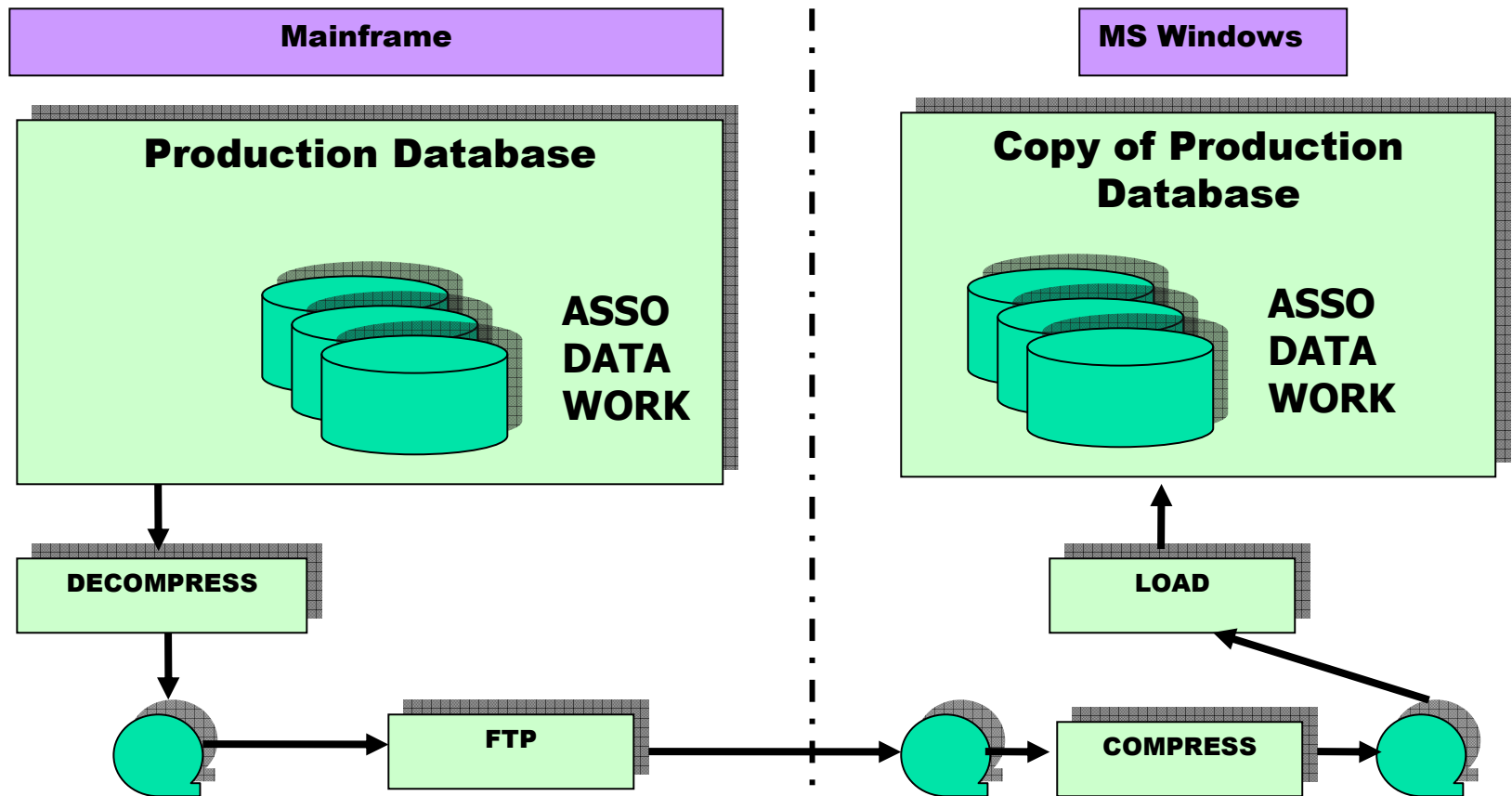
Reasons for Replication



Reasons for Replication



Reasons for Replication

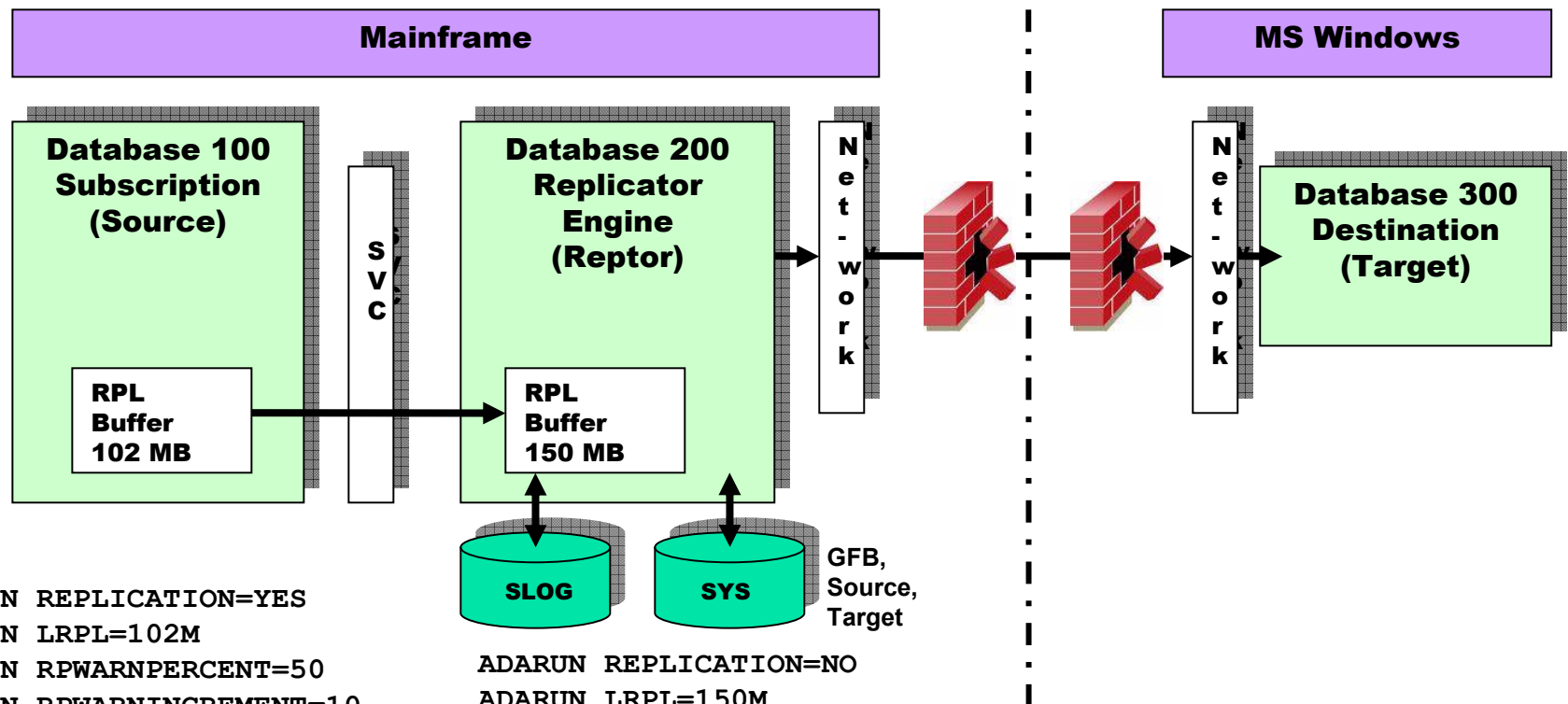




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Basics of Event Replication Define Databases



```
ADARUN REPLICATION=YES
ADARUN LRPL=102M
ADARUN RPWARNPERCENT=50
ADARUN RPWARNINCREMENT=10
ADARUN RPWARNINTERVAL=60
ADARUN RPWARNMESASGELIMIT=5
```

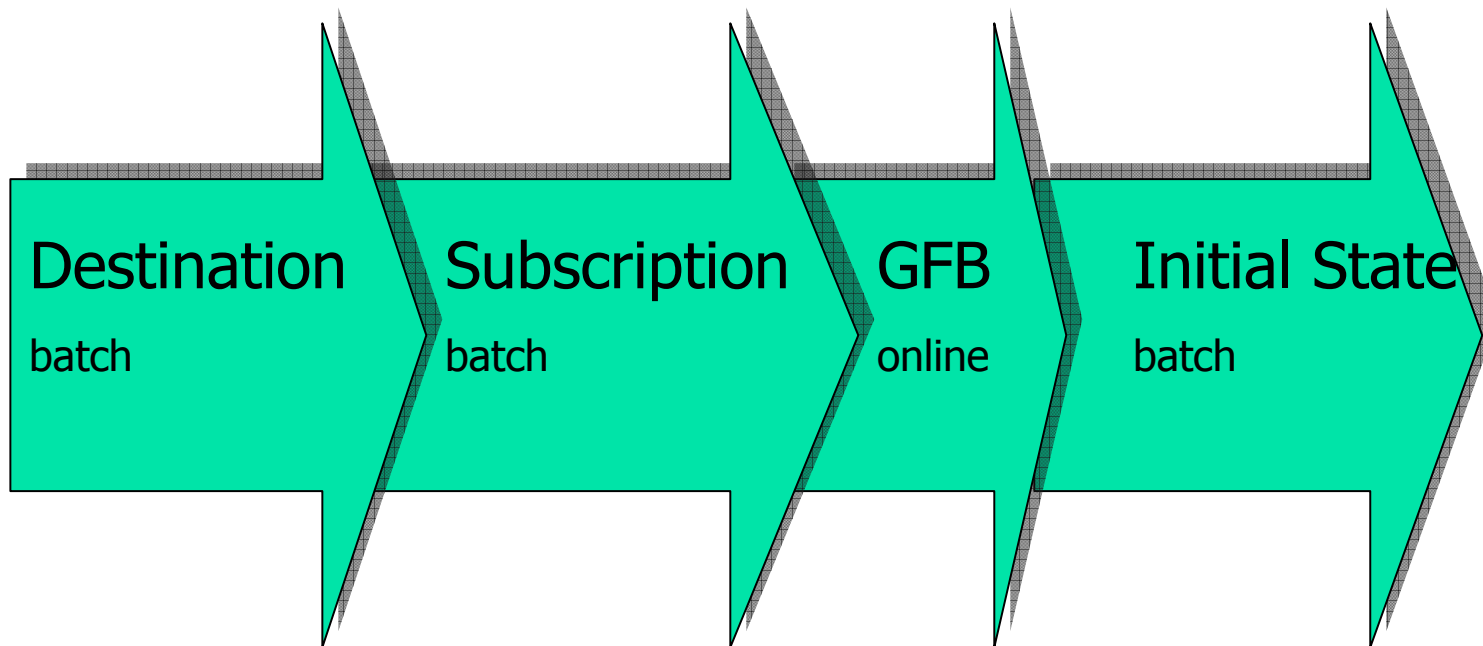
```
SLOG
SYS
GFB, Source, Target

ADARUN REPLICATION=NO
ADARUN LRPL=150M
ADARUN RPLPARMS=FILE
ADARUN RPWARNxxxxxx=xxxxx
ADARUN LOGINUTTRANSACTION=30
ADARUN (?) REOCDPLOGININFO=YES
```



Event Replicator – How to Set-up Files

- Create the definitions
- Load into the Replicator Engine (REPTOR)





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Online: Event Replicator Subsystem - Reptor -

10:25:48
Vers 3.1.1

***** A D A B A S EVENT REPLICATOR SUBSYSTEM *****
Main Menu

2009-01-09
M-RP0010

	Code	Function
	----	-----
	A	Administrator Functions
→	D	Destination Definitions
	F	Transaction Filter Definitions
→	G	Global Format Buffer Definitions
→	I	Initial-State Definitions
	Q	Input Queue Definitions
	R	Resend Buffer Definitions
→	S	Subscription Definitions
	?	Help
	.	Exit
	----	-----

Code ... _

Command ==>

Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---

Help

Exit



Event Replicator – How to Set-up Files

LOGON SYSRPT

```
ADARPD DESTINATION NAME='D300006'  
ADARPD DTYPE=ADABAS  
ADARPD DREPLICATEUTI=NO  
ADARPD DACTIVE=NO  
ADARPD DTLADABAS=0  
ADARPD DRETRYINTERVAL=GLOBAL  
ADARPD DRETRYCOUNT=GLOBAL  
ADARPD DLOG=YES ← for SLOG  
ADARPD DTLASSIGN=2 ← 0  
ADARPD DTLCOMP=2 ← 0  
ADARPD DTLSLOGREAD=2 ← 0  
ADARPD DTLSLOGWRITE=2 ← 0  
ADARPD DAIFILE=6, DAIDBID=100, DATFILE=6, DATDBID=300  
ADARPD DAREPLICATEUTI=NO  
ADARPD DAERROR=ALTACTION
```

Examples from Larry Frazin



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Event Replicator – How to Set-up Files

```
ADARPD SUBSCRIPTION
ADARPD SSTATUS=CURRENT
ADARPD NAME='S100006'
ADARPD SDESC='DB100/006 TO 300/006'
ADARPD SACODE=0
ADARPD SACTIVE=YES
ADARPD SDESTINATION='D300006'
ADARPD SINCREMENTIS=NO
ADARPD SIDESTINATION='D300006'
ADARPD STLFILTER=0
ADARPD STLINPUT=2      ← 0
ADARPD STLOUTPUT=2   ← 0
ADARPD SWCODE=0
ADARPD STLMATCH=0
ADARPD STLNOMATCH=0
ADARPD STLIGNORE=0
ADARPD SDEACTIVATE=YES
ADARPD SFILE=6, SFDBID=100
ADARPD SFREPLICATEINSERT=YES
ADARPD SFREPLICATEUPDATE=YES
ADARPD SFREPLICATEDELETE=YES
ADARPD SFREPLICATENOTCHANGED=YES
ADARPD SGFORMATBI='G100006'
ADARPD SGFORMATAI='G100006'
```

Examples from Larry Frazin



Mainframe and PC Solutions

Event Replicator – How to Set-up Files

```
ADARPD INITIALSTATE NAME='I100006'  
ADARPD   IMAXREQ=1  
ADARPD   IDESTINATION='D300006'  
ADARPD   ISUBSCRIPTION='S100006'  
ADARPD   IFILE=6, IDBID=100
```

Examples from Larry Frazin



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Event Replicator – How to Set-up Files

Global Format G100006

From Predict

```
FB='AA,8,P,AB,50,A,AC,15,A,AD,8,A,AE,10,A,AF'  
',1,A,AG,10,A,AH,8,A,AI,8,A,AM1,5,P,AM2,5'  
' ,P,AM3,5,P,AM4,5,P,AM5,5,P,AM6,5,P,AM7,5'  
' ,P,AM8,5,P,AM9,5,P,AM10,5,P,AM11,5,P,AM1'  
'2,5,P,AM13,5,P,AM14,5,P,AM15,5,P,AM16,5, '  
'P,AM17,5,P,AM18,5,P,AM19,5,P,AM20,5,P,AM'  
'21,5,P,AN,2,U,AO,2,U,AP,8,A,AT,8,A,AQ,5, '  
'P,AR,5,P,AV,8,A,AX1,7,P,AX2,7,P,AX3,7,P, '  
'AX4,7,P,AX5,7,P,AX6,7,P,AX7,7,P,AX8,7,P, '  
'AX9,7,P,AX10,7,P,AX11,7,P,AX12,7,P,AX13, '  
'7,P,AX14,7,P,AX15,7,P,AX16,7,P,AX17,7,P, '  
'AX18,7,P,AX19,7,P,AX20,7,P,AX21,7,P,AX22 '  
' ,7,P,AX23,7,P,AX24,7,P,AX25,7,P,AX26,7,P '  
' ,AX27,7,P,AX28,7,P,AX29,7,P,AX30,7,P,AX3 '  
'1,7,P,AX32,7,P,AX33,7,P,AX34,7,P,AX35,7, '  
'P,AX36,7,P,AX37,7,P,AX38,7,P,AX39,7,P,AX '  
'40,7,P,AX41,7,P,AX42,7,P,AX43,7,P,AX44,7 '  
' ,P,AX45,7,P,AX46,7,P. '
```

Examples from Larry Frazin



Event Replicator – How to Set-up Files

- Activate replication on the Subscription (Source) DB with new ADADBS function

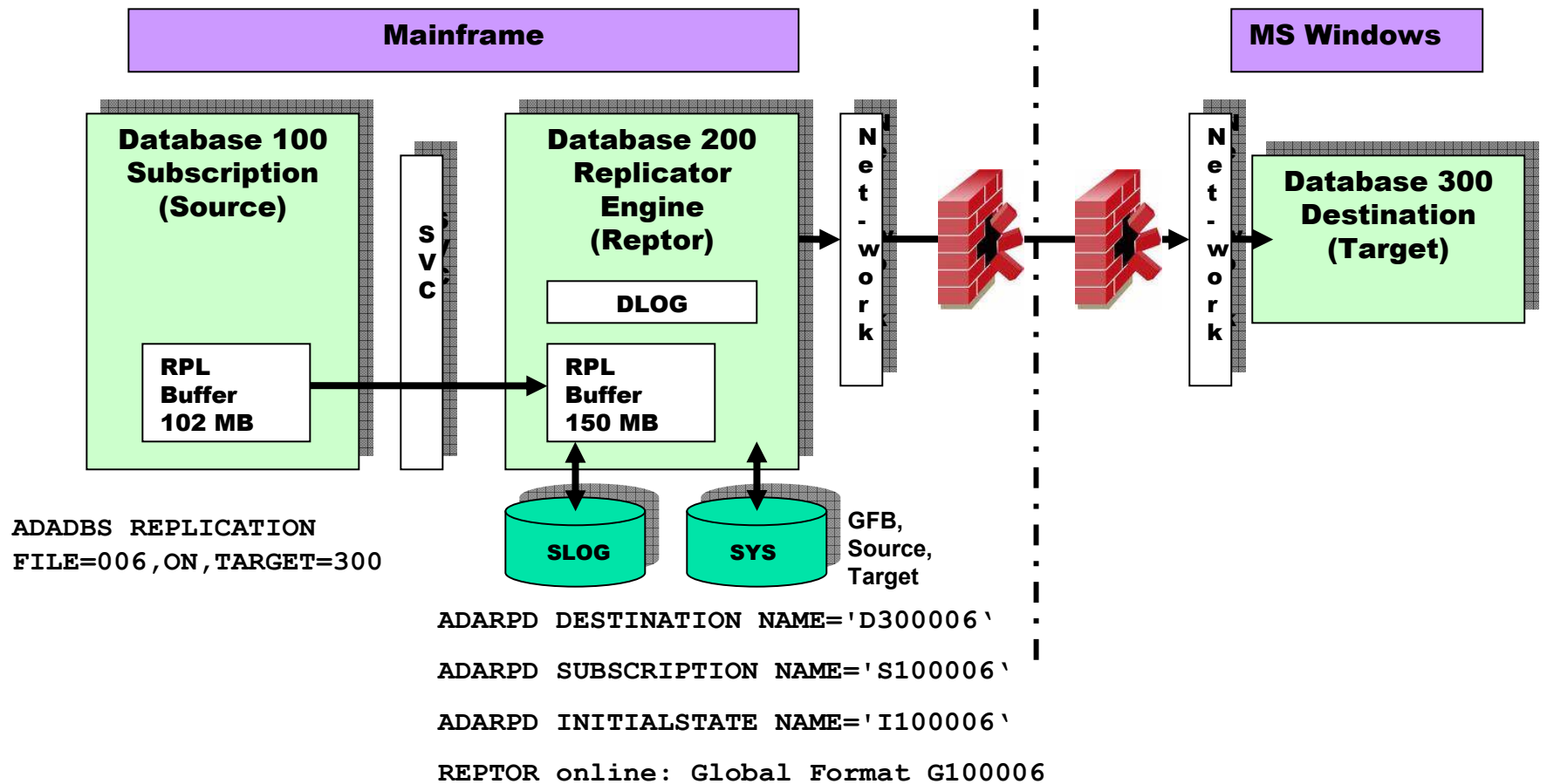


```
ADADBS REPLICATION FILE=006,ON,TARGET=300  
batch
```



Basics of Event Replication

Define Replications





Replicator – Set-up Files in Batch

Instead of using online functions

Unload existing definitions

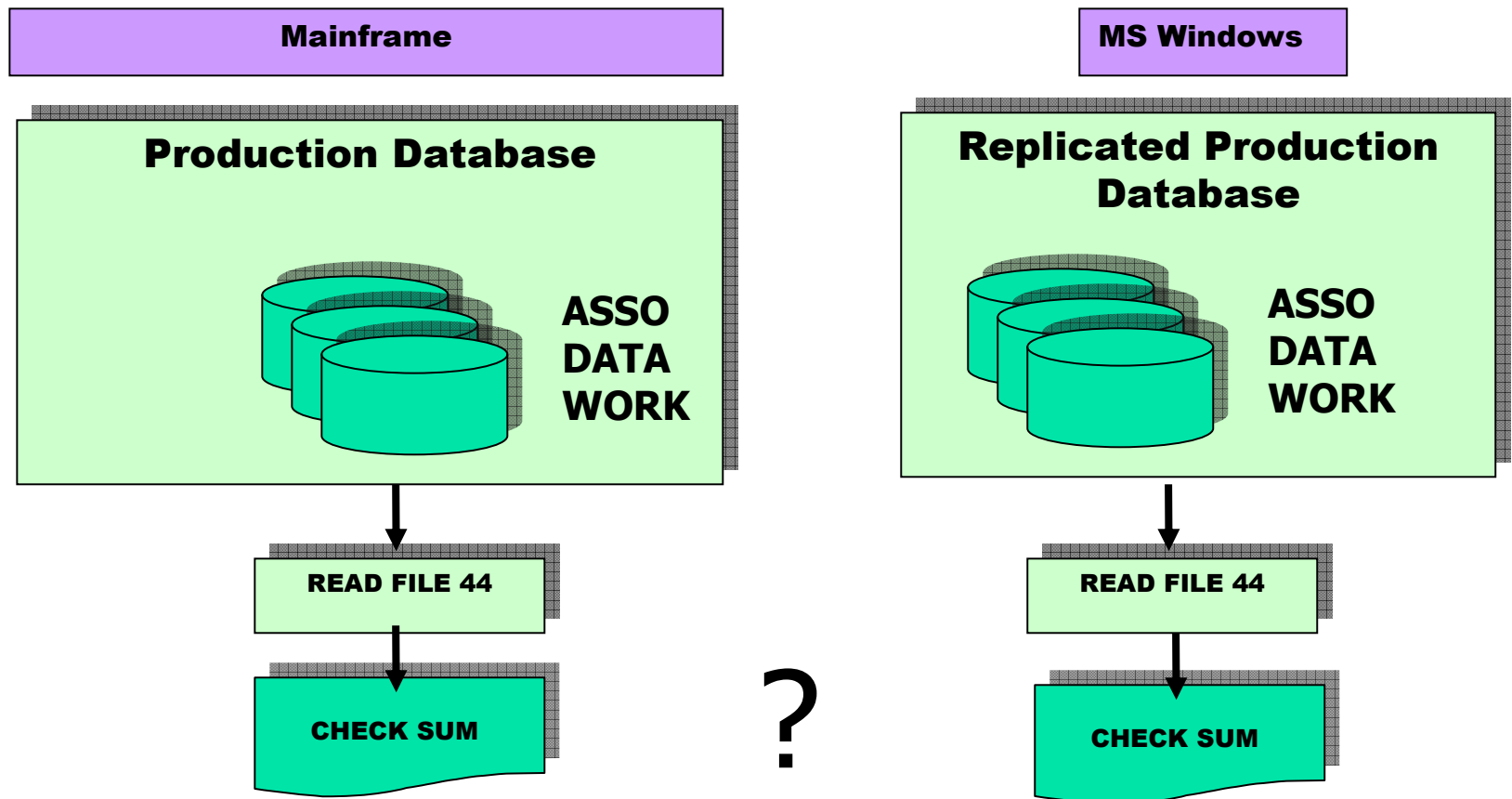
```
LOGON SYSRPT  
RPULD ENTITY=DE ,NAME=D1910* ,DBID=00302 ,FNR=010 ,RELATED=N  
*  
RPULD ENTITY=SB ,NAME=S0390* ,DBID=00302 ,FNR=010 ,RELATED=N  
*  
RPULD ENTITY=IS ,NAME=I0390* ,DBID=00302 ,FNR=010 ,RELATED=N
```



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Are Source and Target Data Identical ?





Are Source and Target Data Identical?

<snip>

```
R1. READ          MULTI-FETCH #MULTIFETCH CONTRIB
  ADD POST-TAX-CNTRB-AMT      TO #POST-TAX-CNTRB-AMT
  ADD PRE-TAX-CNTRB-AMT      TO #PRE-TAX-CNTRB-AMT
  ADD DB-POST-TAX-CNTRB-AMT  TO #DB-POST-TAX-CNTRB-AMT
  ADD DB-PRE-TAX-CNTRB-AMT   TO #DB-PRE-TAX-CNTRB-AMT
  ADD LOG-COUNTER            TO #LOG-COUNTER
END-READ
```




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Mainframe and PC Solutions

Are Source and Target Data Identical?

→ WINDOWS :

CONTRIBUTION FILE CHECK SUMMARY

POST-TAX-CNTRB-AMT	27,673,968.59
PRE-TAX-CNTRB-AMT	29,942,205,909.37
DB-POST-TAX-CNTRB-AMT	26,347,293.89
DB-PRE-TAX-CNTRB-AMT	25,380,190,817.46
LOG-COUNTER	839,887,724

RECORDS READ: 146,223,112

→ MAINFRAME :

CONTRIBUTION FILE CHECK SUMMARY

POST-TAX-CNTRB-AMT	27,658,136.50
PRE-TAX-CNTRB-AMT	29,942,205,909.37
DB-POST-TAX-CNTRB-AMT	26,331,461.80
DB-PRE-TAX-CNTRB-AMT	25,380,189,014.44
LOG-COUNTER	840,074,151

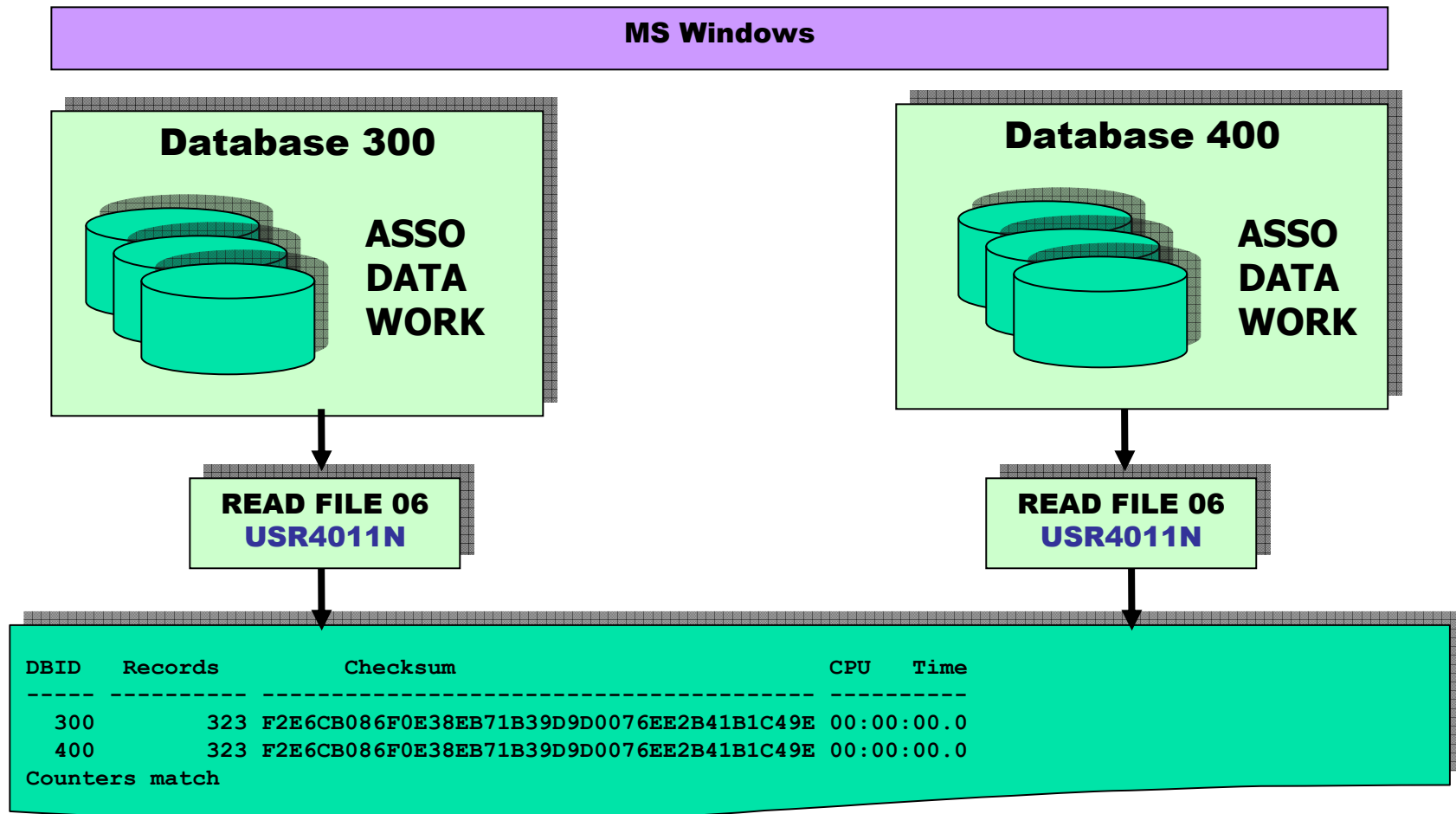
Records Read: 146,223,098 With Multifetch = 800



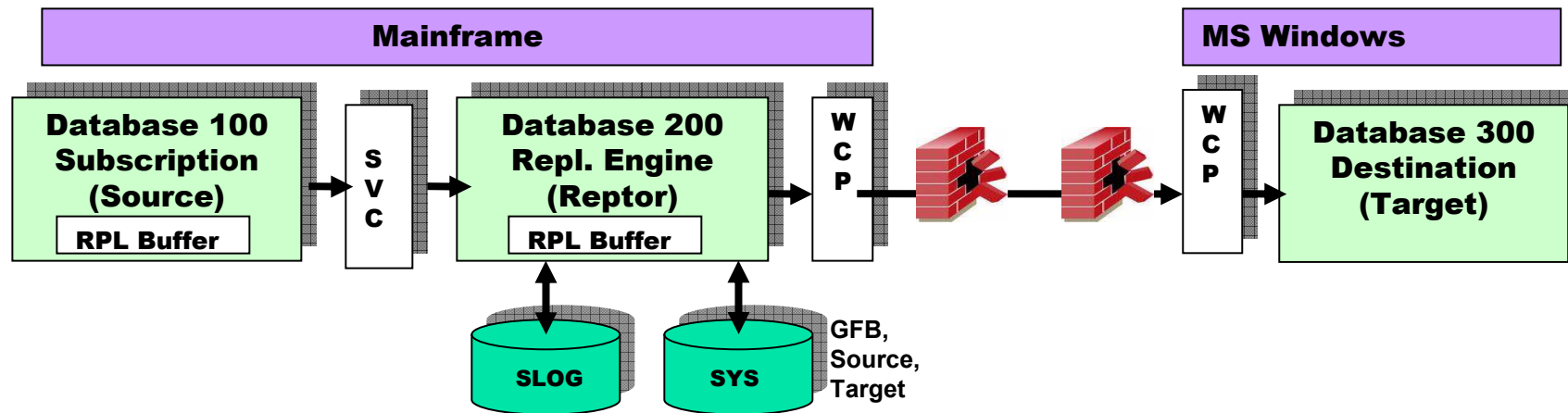
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Create Hash Code of a File Using USR4011N



Event Replicator – File Changes



#1: lock file

#2: SLOG empty ?

#3: close destination

#4: change file

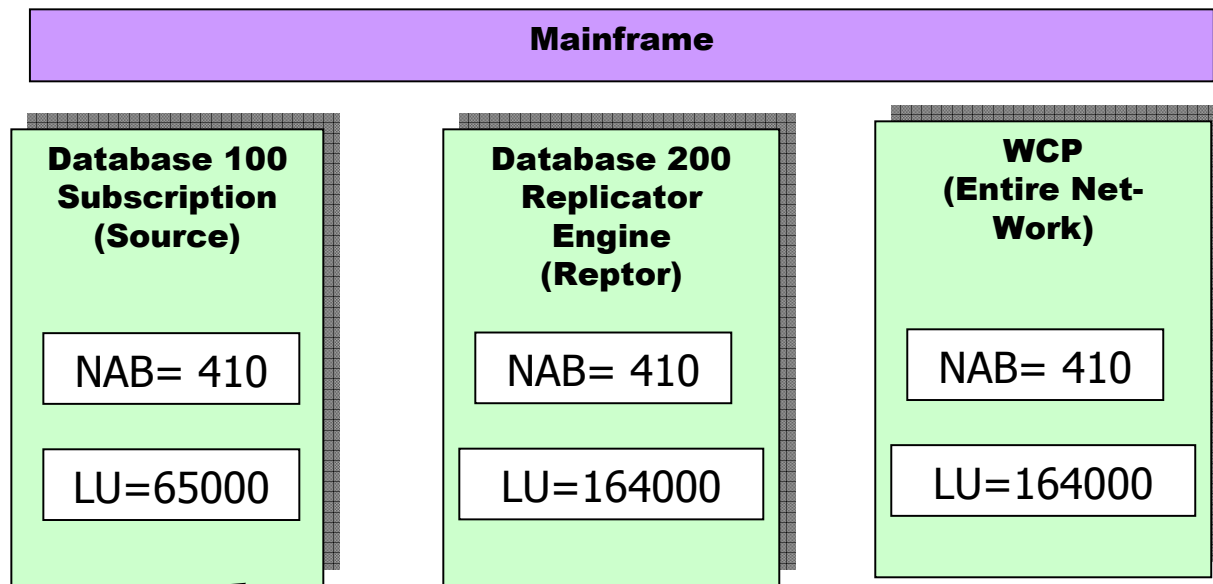
#5: change file

#6: unlink/link / update GFB

#7: unlock file

#8: open destination

Parameter Recommendations from SAG



NAB (≥ 410) and LU ($\geq 164,000$)
Greater than or equal as the value of the subscription DB



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Parse High Water Marks

15:00:05		***** A D A B A S BASIC SERVICES *****						2009-03-01		
DBID 134		- High Water Marks -						PACUH02		
Pool / Queue	I	Size	I	Used	I	%Used	I	Date	Time	I
Attached Buffer(NAB)	I	614400	I	224768	I	36.5	I			I
Command Queue (NC)	I	19200	I	2688	I	14.0	I	2009-02-27	19:31:12	I
Format Pool (LFP)	I	2000000	I	1999888	I	99.9	I	2009-02-27	10:47:05	I
Hold Queue (NH)	I	1134056	I	65520	I	5.7	I	2009-02-28	23:01:05	I
ISN-List Table (LI)	I	5000	I	1340	I	26.8	I	2009-02-28	15:51:58	I
Seq. Cmd. Table(LQ)	I	20000	I	11600	I	58.0	I	2009-02-23	14:14:02	I
User Queue (NU)	I	312312	I	108724	I	34.8	I	2009-02-25	09:04:56	I
Unique DE Pool (DUQ)	I	60000	I	5312	I	8.8	I	2009-02-23	19:00:40	I
Security Pool (LCP)	I	10000	I	0	I	0.0	I			I
UQ File List (UQF)	I	96360	I	34052	I	35.3	I	2009-02-26	11:13:55	I
ATM Trans. IDs (XID)	I	0	I	0	I	0.0	I			I
Work Pool (LWP)	I	1500000	I	609796	I	40.6	I	2009-02-24	16:22:20	I
Redo Pool (LRDP)	I	0	I	0	I	0.0	I			I
Replication (RPL)	I	104857600	I	401232	I	0.3	I			I



Mainframe and PC Solutions

Other Problems

SYSAOS: Date and Time Fields Are Empty

```

16:00:14          ***** A D A B A S  BASIC  SERVICES  *****          2009-04-01
DBID 134          - High Water Marks -          PACUH02

Pool / Queue      I      Size      I      Used      I %Used I      Date      Time      I
-----
Attached Buffer(NAB) I      819200 I      187136 I      22.8 I      ?????????????????????? I
Command Queue  (NC) I      19200 I      2688 I      14.0 I      2009-03-31 11:27:01 I
Format Pool    (LFP) I      2000000 I      1877740 I      93.8 I      2009-04-01 15:50:30 I
Hold Queue     (NH) I      1134056 I      53844 I      4.7 I      2009-03-30 20:09:08 I
ISN-List Table (LI) I      5000 I      1608 I      32.1 I      2009-03-31 11:27:33 I
Seq. Cmd. Table(LQ) I      20000 I      12032 I      60.1 I      2009-04-01 14:11:45 I
User Queue     (NU) I      312312 I      101640 I      32.5 I      2009-04-01 10:14:50 I
Unique DE Pool (DUQ) I      60000 I      1624 I      2.7 I      2009-03-30 19:46:44 I
Security Pool  (LCP) I      10000 I      0 I      0.0 I
UQ File List   (UQF) I      96360 I      34480 I      35.7 I      2009-04-01 11:13:02 I
ATM Trans. IDs (XID) I      0 I      0 I      0.0 I
Work Pool      (LWP) I      1500000 I      442648 I      29.5 I      2009-03-30 19:05:52 I
Redo Pool      (LRDP) I      0 I      0 I      0.0 I
Replication    (RPL) I      104857600 I      549608 I      0.5 I      ?????????????????????? I

```



Troubleshooting Errors and Solutions

Source DB stopped 22 files to replicate (why?).
These 22 files were marked inactive for replication.

UTILONLY=YES ← ADADBS needs exclusive control

ADADBS REPLICATION FILE=001 ,MODIFY ,ACTIVATE ,TARGET=312

.

ADADBS REPLICATION FILE=022 ,MODIFY ,ACTIVATE ,TARGET=312

SAG: use SYSAOS function 'Modify file parameters' to activate w/o stopping users



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Troubleshooting Errors and Solutions

Source DB stopped file 6 to replicate (why?) – the DBA didn't stop

```
14:52:00          ***** A D A B A S  BASIC  SERVICES  *****          2009-05-07
DBID 39           - Display File Layout -                               PDRF042
*****
*   File 6       *   ST-ADA-CALC-EDAT
*****

Records loaded ..... 326          Date loaded ..... 2007-10-20 12:17:32
TOP ISN ..... 326          Date of last update .. 2009-05-03 15:14:02
Max ISN expected ... 1271      Max Compr Rec Lngth .. 5060
Minimum ISN ..... 1          Asso/Data Padding .... 10%/10%
Size of ISN ..... 3 Bytes     Highest Index Level .. 3
Number of Updates .. 28       RPLUPDATEONLY. No     Indx Comp ..... Yes
ISN Reusage ..... Yes        USERISN ..... No     PGMREFRESH ..... No
Space Reusage ..... Yes      MIXDSDEV ..... No    NOACEXTENSION .. No
ADAM File ..... No          Spanned rec .. No     MU/PE indices .. 1
Ciphared File ..... No      Replication .. No    Privileged Use . No
Coupled Files ..... None
Blk per DS Extent .. 0
Blk per UI Extent .. 0          Total Changed Blks ... 17
Blk per NI Extent .. 0          Multi Client File .... 0
Free space available for file extents: At least 134 Extents
PF1----- PF2----- PF3----- PF4----- PF6----- PF7----- PF8----- PF12-----
```




Mainframe and PC Solutions

Replay with PLOGs – ADARPL -

SYSRPTR / Administrator Functions / Global Values

ARF00045: Default info updated

16:44:30 ***** A D A B A S EVENT REPLICATOR SUBSYSTEM ***** 2009-03-19
Global Values M-RP1110

General Values

TLOG Values

```

-----
Subtasks ..... 3
Max Output Size ..... 100000
EntireX Broker Stub Name ... BKIMBTSO
Input Request Msg Limit .... 10
Input Request Msg Interval ..... 60
Verify Mode ..... N
Format Buffer Validation ... N
Record PLOG information .... Y
Max Record Size ..... 32767
Max Variable Record Size ... 32767
Retry Interval..... 0
Retry Count..... 10
Log Input Transaction ..... 075 (SLOG)
Subtask Activation Wait .... 10
Open Destinations at Start . Y

```

```

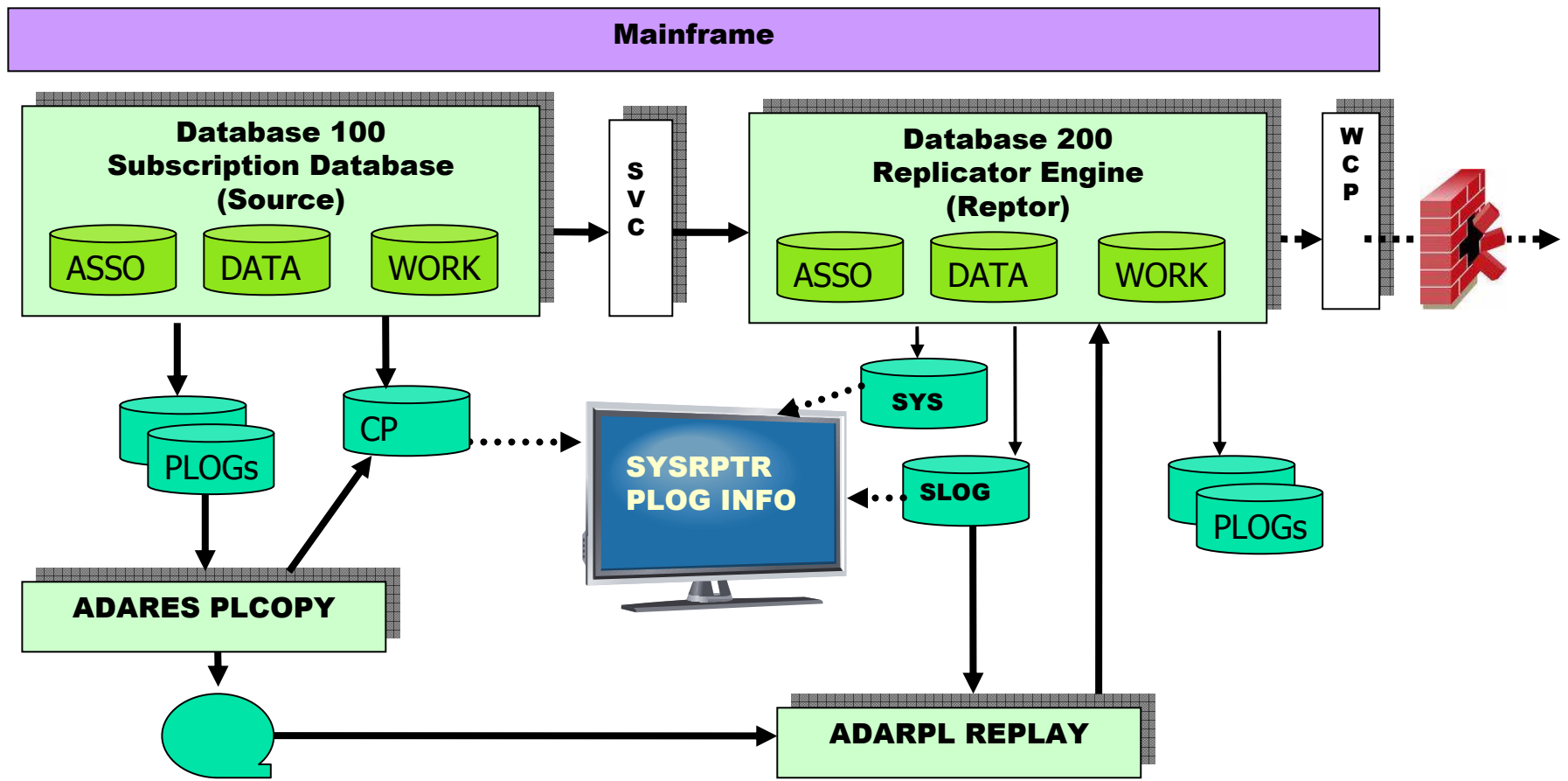
-----
Maximum RPL Usage ..... 50 %
Restart RPL Usage ..... 40 %
Input Queue Level ..... 0
No Match Level ..... 0
Queue Completion Level ..... 0
Completion Level ..... 0
Request Received Level ..... 0
Request Rejected Level ..... 0
Request Error Level ..... 0
Status Request Level ..... 0
I-State Start Request Level .. 0
I-State Completion Level ..... 0
Retransmit Request Level ..... 0

```



Mainframe and PC Solutions

Replay with PLOGs





Replay with PLOGs

SYSRPTR / Administrator Functions / PLOG Information

```

10:12:11          ***** A D A B A S  EVENT REPLICATOR SUBSYSTEM *****          2009-03-24
                               Replication Replay - PLOG List                               M-RP2055

Replay   Date       Time       PLOG Dataset Name
-----
-        2009/03/21  19:01:35  ADABAS.PLOG.PRODE.D032209.T203003
-        2009/03/23  07:00:10  ADABAS.PLOG.PRODE.D032309.T120104
-        2009/03/23  13:01:05  ADABAS.PLOG.PRODE.D032309.T180014
I      2009/03/24  19:00:13  ADABAS.PLOG.PRODE.D032309.T180527
-
-
-
-
-
-
-
-
-
-
Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---

```



Replay with PLOGs

SYSRPTR / Administrator Functions / PLOG Information

```
10:14:02          ***** A D A B A S  EVENT REPLICATOR SUBSYSTEM *****          2009-03-24
                   Replication Replay - PLOG Information                               M-RP2056
```

```
PLOG Data Set Name ..... ADABAS.PLOG.PRODE.D032309.T180527
Start Date and Time ..... 2009/03/24 19:00:13
End Date and Time ..... 2009/03/24 19:05:27
PLOG Session Number .....          590
From Block Number .....          38640
To Block Number .....          38701
Last PLOG in session .....          N
```

```
Command ==> 10:14:02
```

```
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
```



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Parse High Water Marks

```
000038 /*-----*
000039 /* Create High Water Marks of Subscription DB by using SYSAOS ---*
000040 /*-----*
000041 //RPLSTAT EXEC PGM=NATBATCH,REGION=0M,
000042 // PARM=' PARM=SYPROD,SYS=STRSY5,AUTO=ON,IM=D,STACK=(LOGON SYSAOS;MENU) '
000043 //STEPLIB DD DISP=SHR,DSN=ADABAS.LOADLIB ADABAS
000044 // DD DISP=SHR,DSN=ADABAS.PGMLIB NATURAL
000045 // DD DISP=SHR,DSN=ADABAS.PARMLIB NATPARM
000046 //DDCARD DD DISP=SHR,DSN=ADABAS.CONTROL.CARD(PRODN)
000047 //CMPRINT DD DISP=(,PASS),SPACE=(TRK,(10,10),RLSE),
000048 // DSN=ST.ADADBA.DIETER.HWM.SUBDB
000049 //CMSYNIN DD *
000050 A,134
000051 U
000052 H
000053 ,,,FIN
```



Replay with PLOGs

SYSRPTR / Administrator Functions / Initiate Replay / Synchronized

```
17:41:39          ***** A D A B A S  EVENT REPLICATOR SUBSYSTEM *****          2009-03-19
                               Initiate Replication Replay                               M-RP2010

                               Synchronized

DBID ..... _____
Automated ..... N (Y or N)
Timeout ..... 900 _____

From Date/Time ..... _____
To Date/Time ..... _____
Start Date/Time ..... _____

Destination Name List ..... _ * _____
Subscription Name List .... _ * _____

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help           Exit           Sub   Sel                               Menu
```

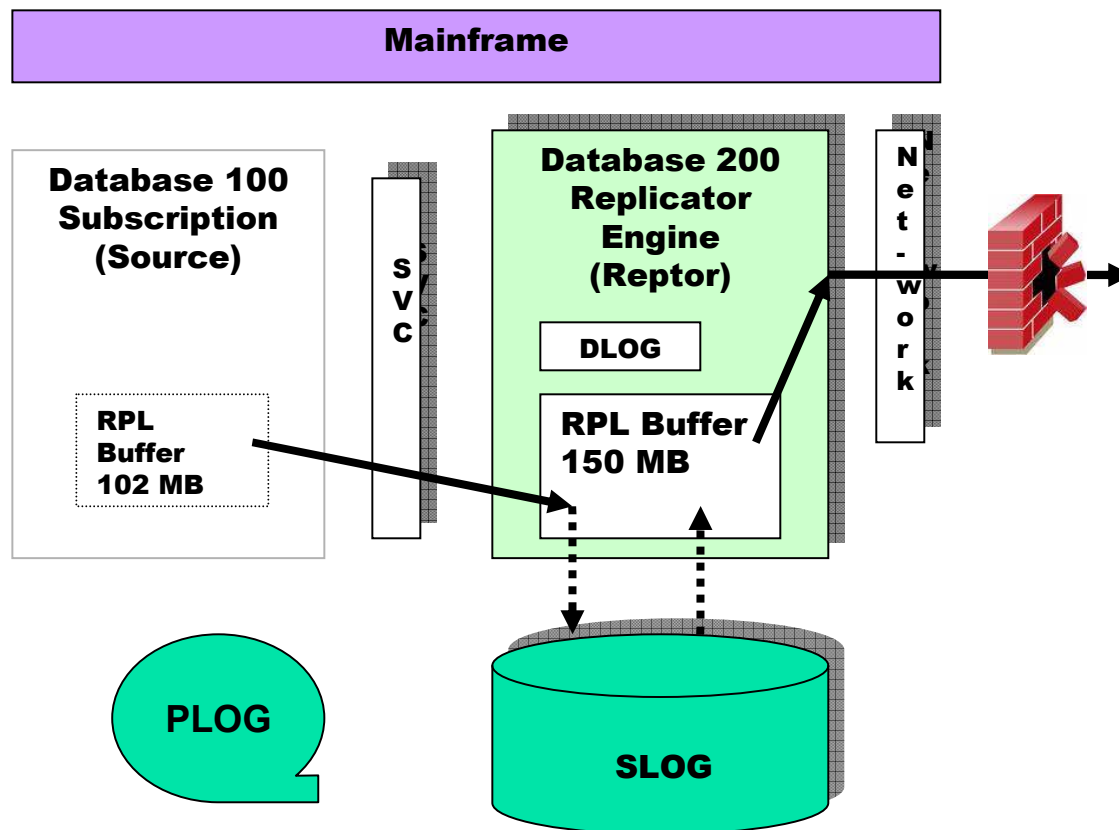


Replay with PLOGs

- ADARPL utility can be run in three modes
 - Synchronized - recommended
 - Unsynchronized
 - Replay-only

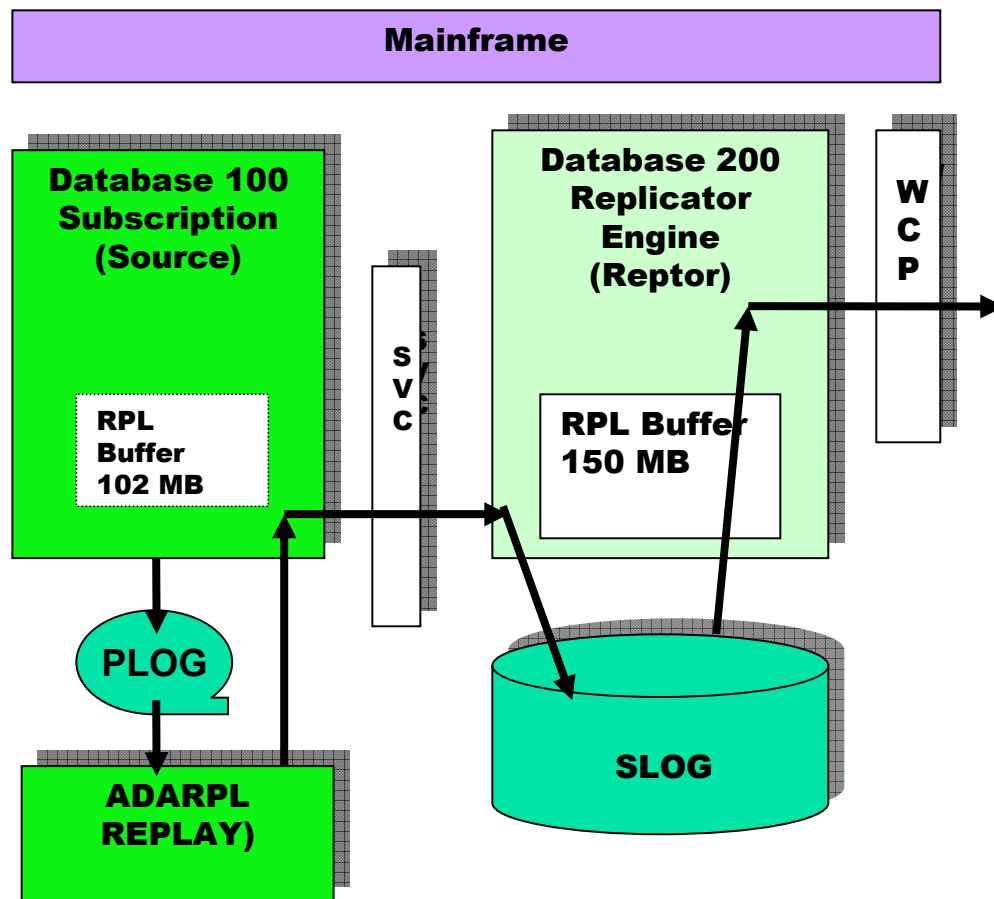
http://documentation.softwareag.com/adabas/ark221/arf/admin/arfarepl.htm#arfarepl_modes

Replay with PLOGs – Replication Pool and SLOG



- **Input Phase:** all compressed records are stored into RPL buffer
- **With LOGINPUT-TRANSACTION** all transactions will end into SLOG (threshold)
- **Assignment and Subscription Phase** back to the RPL buffer
- **Output Phase** – if delogged transaction is fully processed then marked for deletion from SLOG and RPL pool

Replay with PLOGs



Synchronized Mode

- Suspends new ADABAS transactions
- Reactivates files, subscriptions, destinations that are inactive
- Writes all new data to SLOG
- Synchronizes after the REPLAY new ADABAS transaction

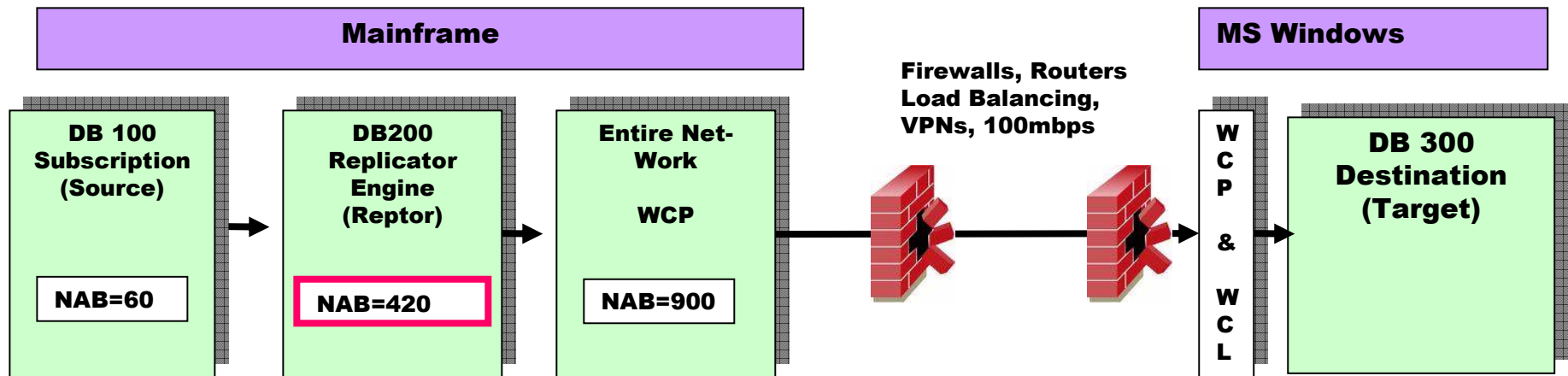
Don't use HALT command for Reptor if data is in SLOG. A Reptor restart will delete this leftover.



NAB Overflow



NAB Overflow



ADAF18 A1 cmd to DBID 300 FNR 18 RSP 254 subcode 3 ISN 185

RC 254 =

An internal error occurred during processing of an attached buffer (buffer overflow)

Subcode 3 =

CQEFLAG is not equal to CQEFAB plus CQEFW16 ← ??



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NAB Overflow - Solutions

Replicator: NAB 420 is too small and should be increased
 Each File in a transaction needs ONE Attached Buffer, e.g. 15

The actual high-water-marks
 for the major pools (except bufferpool)

AREA	ADARUN PARM	HIGH-WATER-MARK
AB -POOL	NAB= 420	1715456 (99 %)
CQ -POOL	NC = 23040	1920 (8 %)
DUQ -POOL	LDE= 100000	871 (0 %)
FI -POOL	LFP= 300000	29888 (9 %)
HQ -POOL	NH = 560056	700 (0 %)
RPL -POOL	LRPL= 157286400	149875480 (95 %)
SC -POOL	LCP= 10000	0 (0 %)
TBI -POOL	LI = 12000	804 (6 %)
TBS -POOL	LQ = 20000	864 (4 %)
UQ -POOL	NU = 4000	17248 (1 %)
UQF -POOL	NU = 4000	3168 (0 %)
WORK-POOL	LWP= 500000	53112 (10 %)
XID -POOL	XID=	(0 %)

NAB =
41 * 10 * number of Source DBs *
number of files in one transaction

NAB = 41 * 10 * 1 * 15 = 6150



Mainframe and PC Solutions

Monitor NAB Overflow





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Mainframe and PC Solutions

Monitor - Parse DDPRINT for Errors

Read DDPRINT of Active REPTOR Nucleus

```
000010 //EJESLNK EXEC PGM=EJESLNK
000011 //* EJESEXT DD SYSOUT=*
000012 //EJESEXT DD DSN=ADABAS.EXTRACT.DDPRINT,
000013 //          DISP=(NEW,CATLG,DELETE),VOL=(,,20),
000014 //          UNIT=MISCDA,BUFNO=20,RECFM=FB,LRECL=240,
000015 //          SPACE=(240,(100,50),RLSE),AVGREC=K,RETPD=30
000016 //EJESOUT DD SYSOUT=*,RECFM=VB,LRECL=240
000017 //EJESIN DD *
000018     ST REPTMPM
000019     FIND RETMPM
000020     :S
000021     FIND DDPRINT
000022     :E
000023 //
```

EXAMINE DDPRINT FOR 'ADAF54' and others



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Mainframe and PC Solutions

Monitor - Parse DDPRINT for Errors

NAB too small – overflow – RC254 SC3– parsed DDPRINT

SC3 = CQEFLAG is not equal to CQEFAB plus CQEFW16

<snip>

017528	ADAF18	ET cmd to DBID	187 FNR	RSP	254 subcode	3		
017529	ADAF18	A1 cmd to DBID	187 FNR	18 RSP	254 subcode	6	ISN	186
017530	ADAF18	ET cmd to DBID	187 FNR	RSP	254 subcode	3		
017531	ADAF18	ET cmd to DBID	187 FNR	RSP	254 subcode	3		
017532	ADAF18	A1 cmd to DBID	187 FNR	18 RSP	254 subcode	3	ISN	185
017533	ADAF18	E1 cmd to DBID	187 FNR	14 RSP	113 subcode		ISN	237158
017534	ADAF18	E1 cmd to DBID	187 FNR	14 RSP	113 subcode		ISN	237186

017534 AB -POOL NAB= 420 1715456 (99 %)

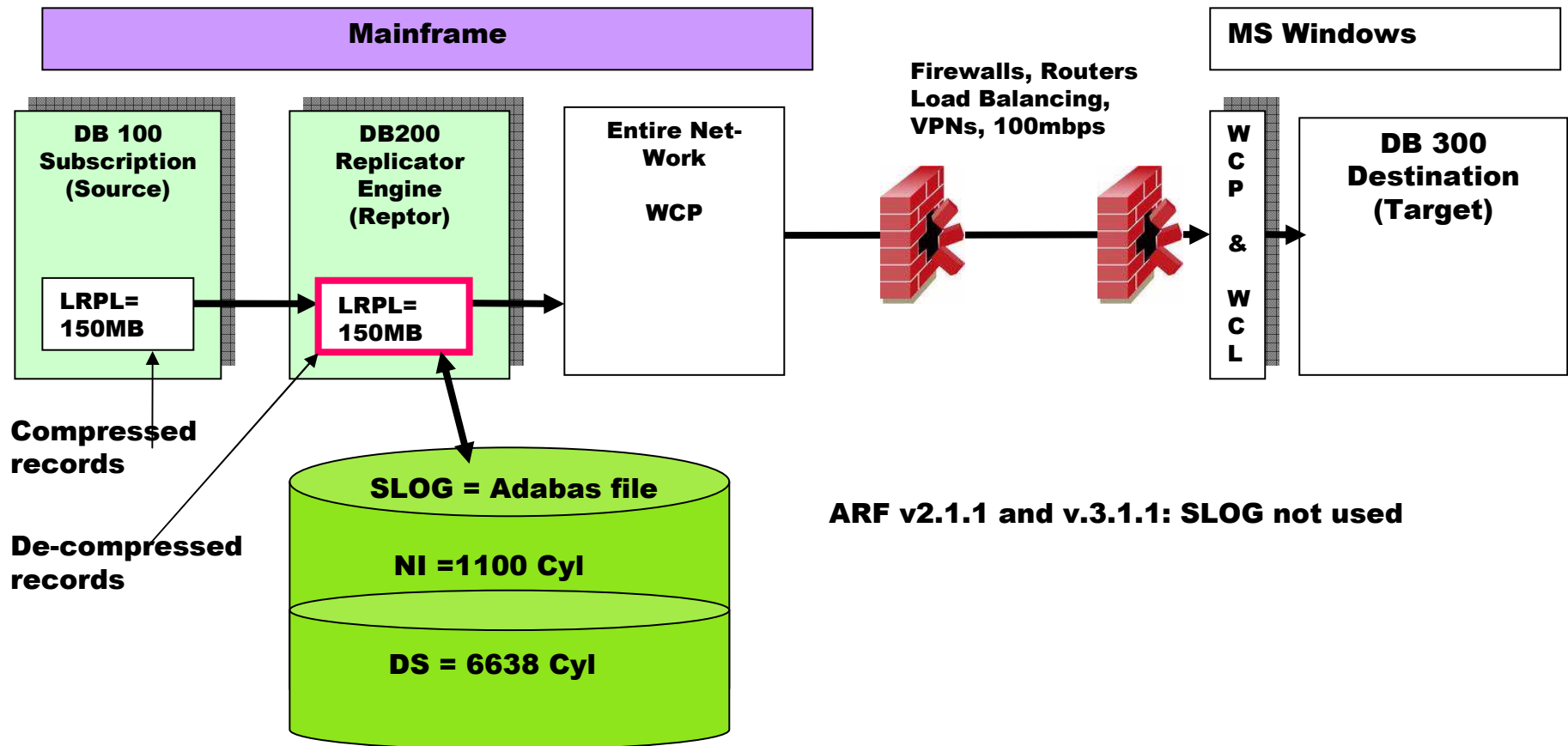
017534 RPL -POOL LRPL= 157286400 149875480 (95 %)

FNR/RSP/CNT: 0 254 4
FNR/RSP/CNT: 14 113 224
FNR/RSP/CNT: 15 113 4
FNR/RSP/CNT: 18 113 11
FNR/RSP/CNT: 18 254 4
FNR/RSP/CNT: 20 113 25
FNR/RSP/CNT: 22 113 6



**Replicator
Buffer (RPL)
Overflow**

Problem: RPL Buffer Overflow





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Mainframe and PC Solutions

Problem: RPL Buffer Overflow

17:12:43
DBID 302 (REPTOR)

***** A D A B A S BASIC SERVICES *****
- High Water Marks -

2010-01-06
PACUH02

Pool / Queue	I	Size	I	Used	I	%Used	I	Date	Time	I
Attached Buffer(NAB)	I	1720320	I	207104	I	12.0	I			I
Command Queue (NC)	I	23040	I	384	I	1.6	I	2010-01-06	16:58:06	I
Format Pool (LFP)	I	300000	I	9056	I	3.0	I	2010-01-06	15:52:33	I
Hold Queue (NH)	I	560056	I	672	I	0.1	I	2010-01-06	16:03:55	I
ISN-List Table (LI)	I	12000	I	0	I	0.0	I			I
Seq. Cmd. Table(LQ)	I	20000	I	740	I	3.7	I	2010-01-06	15:52:32	I
User Queue (NU)	I	1236312	I	5544	I	0.4	I	2010-01-06	15:52:24	I
Unique DE Pool (DUQ)	I	100000	I	66	I	0.0	I	2010-01-03	19:44:02	I
Security Pool (LCP)	I	10000	I	0	I	0.0	I			I
UQ File List (UQF)	I	384360	I	432	I	0.1	I	2010-01-06	15:52:24	I
ATM Trans. IDs (XID)	I	0	I	0	I	0.0	I			I
Work Pool (LWP)	I	500000	I	62072	I	12.4	I	2010-01-03	19:44:02	I
Redo Pool (LRDP)	I	0	I	0	I	0.0	I			I
Replication (RPL)	I	157286400	I	156829332	I	99.7	I			I

PF1----- PF2----- PF3----- PF4----- PF6----- PF7----- PF8----- PF12-----
 Help Exit Refresh Menu



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Mainframe and PC Solutions

Problem: RPL Buffer Overflow

Replication pool overflow – Reptor Log / DDPRINT:

```
<snip>
ADAF18 A1 cmd to DBID 187 FNR 44 RSP 224 subcode 16448 ISN 135811694
ADAF54 2009-02-05 20:56:41 Replication error: Adabas destination D187044
ADAF54 Source DBID 134 FNR 44, Target DBID 187 FNR 44
ADAF18 A1 cmd to DBID 187 FNR 44 RSP 224 subcode 16448 ISN 135811695
20:57:13 ADAL03 00312 2009-02-05 20:57:12 Command-Log DDCLOGR1 started
21:05:16 ADAF1U 00312 Reptor replication pool overflow
21:05:16 ADAF1U 00312 Failed to allocate 864 bytes for output transaction
21:05:17 ADAF2N 00312 Destination D187044 deactivated
21:05:17 ADAF2N 00312 due to replication pool overflow
21:05:17 ADAF5Q 00312 All transactions from database 134
21:05:17 ADAF5Q 00312 that ended before 2009-02-05 19:39:45
21:05:17 ADAF5Q 00312 have been processed for destination D187044
21:05:17 ADAF2M 00312 Subscription S134006 deactivated
21:05:17 ADAF2M 00312 due to last destination deactivation
21:05:17 ADAF5P 00312 The Reptor has no information about transactions
21:05:17 ADAF5P 00312 from database 134 for subscription S134006
<snip>
```

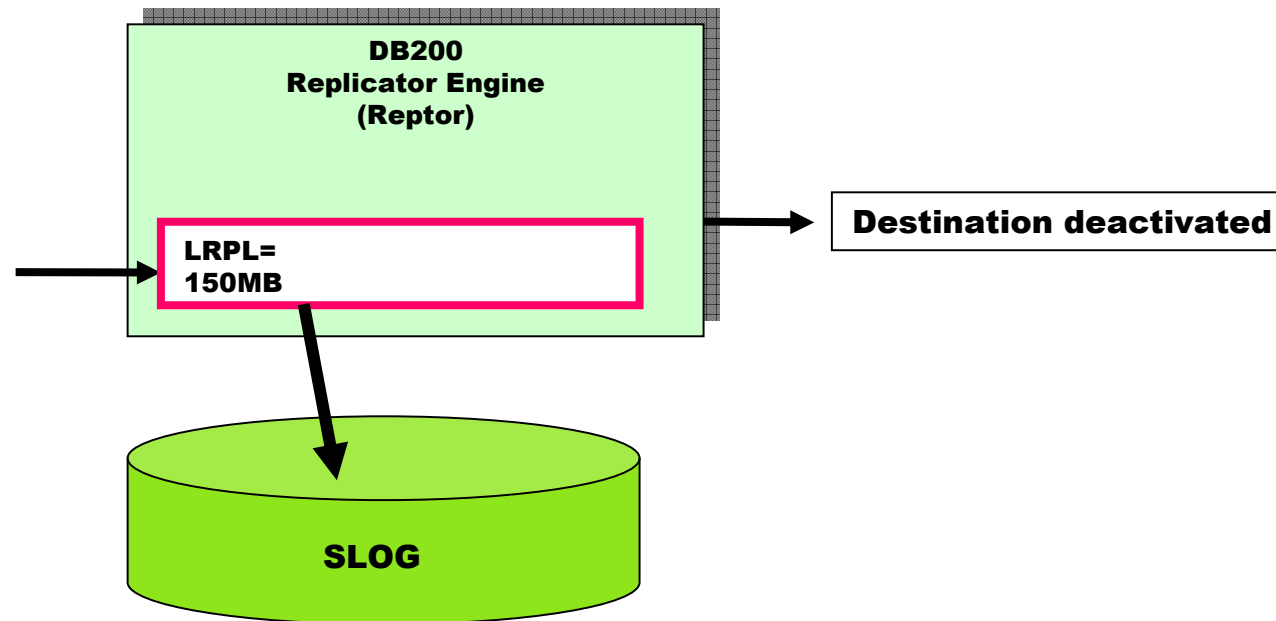


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Mainframe and PC Solutions

Problem: RPL Buffer Overflow

```
16:37:27 ADAF1U 00302 Reptor replication pool overflow
16:37:27 ADAF1U 00302 Failed to allocate          332 bytes for Input image
16:37:27 ADAF2N 00302 Destination D251144 deactivated
16:37:27 ADAF2N 00302 due to replication pool overflow
```





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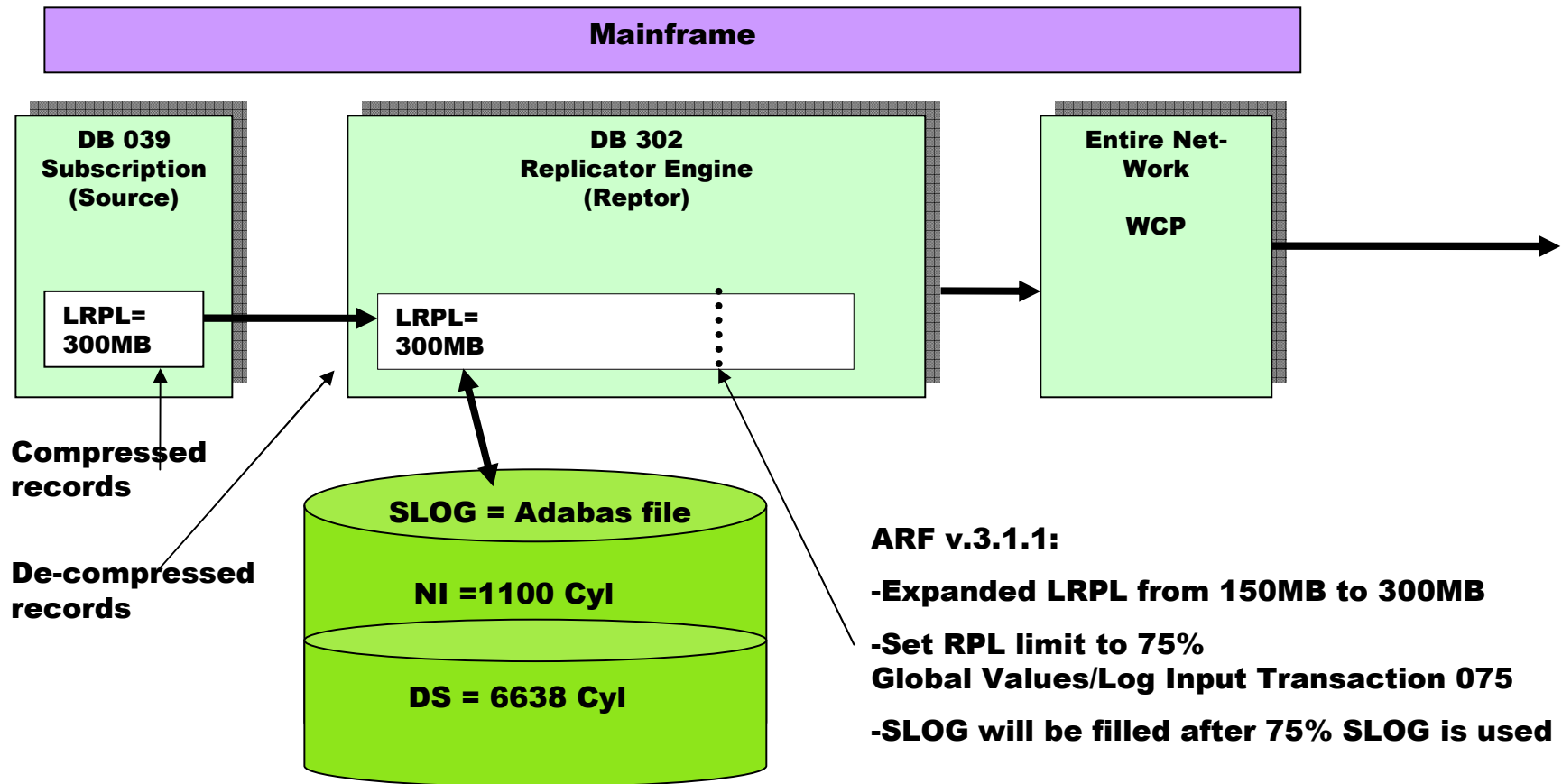
Mainframe and PC Solutions

Problem: RPL Buffer Overflow

```
17:31:06          ***** A D A B A S  BASIC  SERVICES *****          2010-01-06
DBID 302 (REPTOR)          - Display File Layout -          PDRF042
*****
* File 30          *          ST-SLOG
*****

Records loaded ..... 248233          Date loaded ..... 2006-04-18 15:46:24
TOP ISN ..... 1003880          Date of last update .. 2010-01-06 17:01:42
Max ISN expected ... 5000655          Max Compr Rec Lngth .. 5060
Minimum ISN ..... 1          Asso/Data Padding .... 2%/1%
Size of ISN ..... 4 Bytes          Highest Index Level .. 3
Number of Updates .. 2804008          RPLUPDATEONLY. No      Indx Comp ..... Yes
ISN Reusage ..... Yes          USERISN ..... No      PGMREFRESH ..... No
Space Reusage ..... Yes          MIXDSDEV ..... No     NOACEXTENSION .. No
ADAM File ..... No          Spanned rec .. No     MU/PE indices .. 1
Ciphered File ..... No          Replication .. No     Privileged Use . No
Coupled Files ..... None          Universal Encoding ... Yes
Blk per DS Extent .. 0
Blk per UI Extent .. 0
Blk per NI Extent .. 0          Multi Client File .... 0
Free space available for file extents: At least 134 Extents
```

Solution: RPL Buffer Overflow





Monitor RPL Buffer / SLOG Overflow





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Mainframe and PC Solutions

Monitor HWM / SYSAOS in Batch

```
000038 //*-----*
000039 //* Create High Water Marks of Reptor DB 302 by using SYSAOS ---*
000040 //*-----*
000041 //RPLSTAT EXEC PGM=NATBATCH,REGION=0M,
000042 // PARM=' PARM=SYPROD ,SYS=STRSY5 ,AUTO=ON ,IM=D ,STACK=(LOGON SYSAOS ;MENU) '
000043 //STEPLIB DD DISP=SHR,DSN=ADABAS.LOADLIB ADABAS
000044 // DD DISP=SHR,DSN=ADABAS.PGMLIB NATURAL
000045 // DD DISP=SHR,DSN=ADABAS.PARMLIB NATPARM
000046 //DDCARD DD DISP=SHR,DSN=ADABAS.CONTROL.CARD (PRODN)
000047 //CMPRINT DD DISP=( ,PASS) ,SPACE=(TRK,(10,10),RLSE) ,
000048 // DSN=ST.ADADBA.DIETER.HWM.REPTOR
000049 //CMSYNIN DD *
000050 A,302
000051 U
000052 H
000053 ,,,FIN
```

PARSE



Monitor RPL Buffer / SLOG Check in Batch

```
//*-----*
//* Create SLOG report by using SYSAOS / Replication Maintenance ---*
//*-----*
//RPLSTAT1 EXEC PGM=NATBATCH,REGION=0M,
// PARM=' PARM=SYPROD,SYS=STRSY7,AUTO=ON,IM=D,STACK=(LOGON SYSAOS;MENU) '
//STEPLIB DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.LOADLIB ADABAS
// DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.PGMLIB NATURAL
// DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.PARMLIB NATPARM
//DDCARD DD DISP=SHR,DSN=ADABAS.CONTROL.CARD(TESTY)
//CMPRINT DD DSN=ST.ADADBA.STDWS.SLOG302,
// DISP=(,CATLG),SPACE=(TRK,(10,10),RLSE)
//CMSYNIN DD *
O,302
X
F
B
,,FIN
/*
```



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Mainframe and PC Solutions

SLOG is not empty

```
13:28:06          ***** A D A B A S  BASIC  SERVICES *****          2010-03-10
Replicator 302          - Replicator Statistics -          PRPTS10
Replicated trans / messages / bytes  Received from input queues
-----
Total trn.                80,554  Messages ...
Pending ..                13      Bytes .....
Messages                  Commits ....
Tot msgs .                Backouts ...
Bytes sent to all destinations
Tot bytes.                Deleted totals from input queues
-----
SLog statistics for items          Messages ...
-----                          Bytes .....
Delogged .                35,476  Commits ....
Logged ...                42,665  Backouts ...
On file ..                7,228
Replay dbid/token cnt .
Destination slog cnt ..    372
More: press PF8

PF1--- PF3--- PF4----- PF5----- PF6----- PF7--- PF8--- PF12-----
Help   Exit   Refresh   DBID/Token   Dest. SLOG   +       Menu
```



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Mainframe and PC Solutions

Problems and Solutions - SLOG check

```
000104 /** -----
000105 /** OPEN the destination
000106 /** -----
000107 //RPLOPEN EXEC PGM=NATBATCH,REGION=0M,
000108 // PARM=' PARM=SYPROD,SYS=STRSY5,AUTO=ON,IM=D,STACK=(LOGON SYSAOS;MENU) '
000109 //STEPLIB DD DISP=SHR,DSN=ADABAS.LOADLIB ADABAS
000110 // DD DISP=SHR,DSN=ADABAS.PGMLIB NATURAL
000111 // DD DISP=SHR,DSN=ADABAS.PARMLIB NATPARM
000112 //DDCARD DD DISP=SHR,DSN=ADABAS.CONTROL.CARD (PRODN)
000113 //CMPRINT DD SYSOUT=*
000114 //CMSYNIN DD *
000115 O,312
000116 X
000117 A
000118 K,,D187044
(snip)
000215 K,,D187047
000216 .
000217 .
000218 ,,FIN
000219 /*
```



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**Problem:
Response Code
153 from the
Target DB**



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Problem: RSP 153 from the Target DB

- Applied 1,5 million STORES in the source database 39
- Most of them were replicated in the target database 251
- 8 STORES received RSP 153 and were not replicated (14:48-14:49)

```
Start date= 2010-028      Start time= 13:11:36
January 28, 2010, Thursday
14:48:18 ADAF54 00302 Replication error: Adabas destination D251144
14:48:18 ADAF54 00302  Source DBID      39 FNR    144, Target DBID    251 FNR    144
ADAF18  N2 cmd to DBID    251 FNR    144 RSP    153 subcode 16448 ISN      4908013
ADAF54 2010-01-28 14:48:17 Replication error: Adabas destination D251144
ADAF54  Source DBID      39 FNR    144, Target DBID    251 FNR    144
ADAF18  N2 cmd to DBID    251 FNR    144 RSP    153 subcode 16448 ISN      4908014
(snip)
```

RSP 153:

Previous Adabas call still in process. DB/FNR .../....

'CALL Adabas' was issued by a user while a previous call for the user was still being processed.



Solution: RSP 153 from the Target DB

Fixed the problem:

- Did a REPLAY on the Reptor database with PLOG from the source database
- REPLAY repeated all STOREs
- REPLAY function changed the N2 (store with ISN) command to A2 (update) command if the ISN already exists in the target database

Prevent the problem:

- Improve Adabas on Windows (target) by
 - Reduced the buffer flush time
 - Put also the ASSO on fast disks, e.g. SAN or disk arrays (EMC)



Mainframe and PC Solutions

Monitor RSP 153





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Mainframe and PC Solutions

Monitor RSP 153 - Parse High Water Marks

```
000038 /*-----*
000039 /* Create High Water Marks of Reptor DB 302 by using SYSAOS    ---*
000040 /*-----*
000041 //RPLSTAT EXEC PGM=NATBATCH,REGION=0M,
000042 // PARM=' PARM=SYPROD ,SYS=STRSY5 ,AUTO=ON ,IM=D ,STACK=(LOGON SYSAOS ;MENU) '
000043 //STEPLIB      DD DISP=SHR,DSN=ADABAS.LOADLIB                ADABAS
000044 //              DD DISP=SHR,DSN=ADABAS.PGMLIB                NATURAL
000045 //              DD DISP=SHR,DSN=ADABAS.PARMLIB                NATPARM
000046 //DDCARD       DD DISP=SHR,DSN=ADABAS.CONTROL.CARD (PRODN)
000047 //CMPRINT      DD DISP=( ,PASS) ,SPACE=(TRK,(10,10),RLSE) ,
000048 //              DSN=ST.ADADBA.DIETER.HWM.REPTOR
000049 //CMSYNIN      DD *
000050 A,302
000051 U
000052 H
000053 , , ,FIN
```



Monitor RSP 153 - Parse DDPRINT for Errors

NAB too small – overflow – RC254 SC3– parsed DDPRINT

SC3 = CQEFLAG is not equal to CQEFAB plus CQEFW16

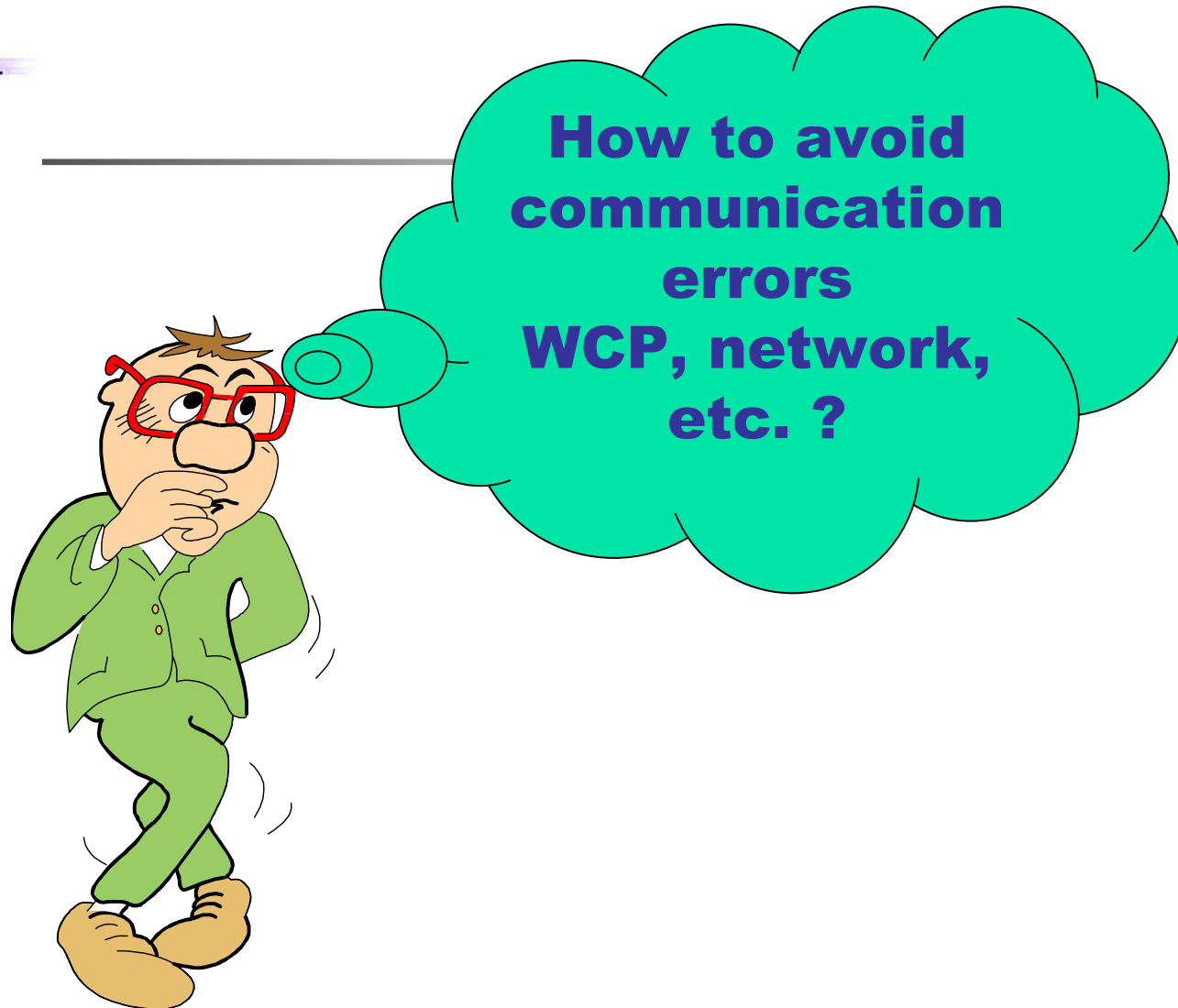
<snip>

```
017528  ADAF18  ET cmd to DBID   187 FNR      RSP   254 subcode      3
017529  ADAF18  A1 cmd to DBID   187 FNR      18 RSP   254 subcode      6 ISN          186
017530  ADAF18  ET cmd to DBID   187 FNR      RSP   254 subcode      3
017531  ADAF18  ET cmd to DBID   187 FNR      RSP   254 subcode      3
017532  ADAF18  A1 cmd to DBID   187 FNR      18 RSP   254 subcode      3 ISN          185
017533  ADAF18  E1 cmd to DBID   187 FNR      14 RSP   113 subcode      ISN          237158
017534  ADAF18  E1 cmd to DBID   187 FNR      14 RSP   113 subcode      ISN          237186
```

```
*****
017534  AB  -POOL    NAB=      420    1715456 ( 99 %)
*****
```

```
*****
017534  RPL -POOL    LRPL= 157286400 149875480 ( 95 %)
*****
```

```
FNR/RSP/CNT:  0 254 4
FNR/RSP/CNT: 14 113 224
FNR/RSP/CNT: 15 113 4
FNR/RSP/CNT: 18 113 11
FNR/RSP/CNT: 18 254 4
FNR/RSP/CNT: 20 113 25
FNR/RSP/CNT: 22 113 6
```





Mainframe and PC Solutions

Communication Problem: Entire Net-Work (WCP)

RC 148: Adabas nucleus not active – subcode 8224
RC 224: Entire Net-Work (WCP) – reply timeout
Target DB or Net-Work (WCP) is down

<snip>

ADAF54 2009-02-03 11:07:14 Replication error: Adabas destination D187044

ADAF54 Source DBID 134 FNR 44, Target DBID 187 FNR 44

ADAF18 OP cmd to DBID 187 FNR RSP 148 subcode 8224

ADAF54 2009-02-03 11:07:14 Replication error: Adabas destination D187044

ADAF54 Source DBID 134 FNR 44, Target DBID 187 FNR 44

ADAF18 A1 cmd to DBID 187 FNR 44 RSP 148 subcode 8224 ISN 146148454

11:07:15 ADAFCQ 00312 Destination D187044 is being closed

11:17:46 ADAF8N 00312 Close request received for destination D187044

11:17:46 ADAF8W 00312 Destination D187044 closed on all tasks

<snip>



Communication Problem: Entire Net-Work (WCP) System Management Hub Check

WCP0602E Node is unreachable.

It may not be active or there may be a configuration problem.

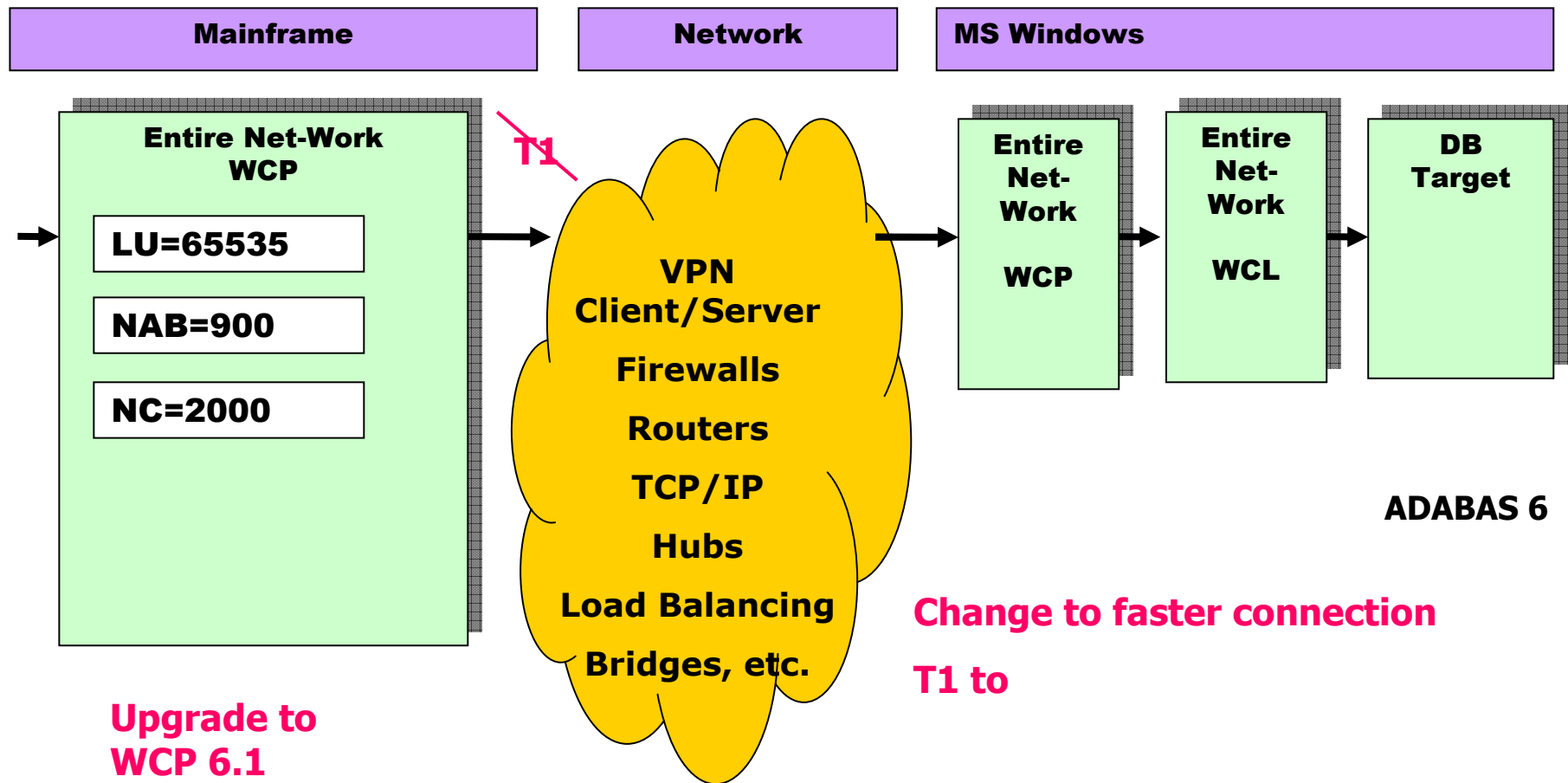
Detailed error response was: XTS1061E: TCP/IP Connection refused



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Mainframe and PC Solutions

Slow Communication: Entire Net-Work (WCP)

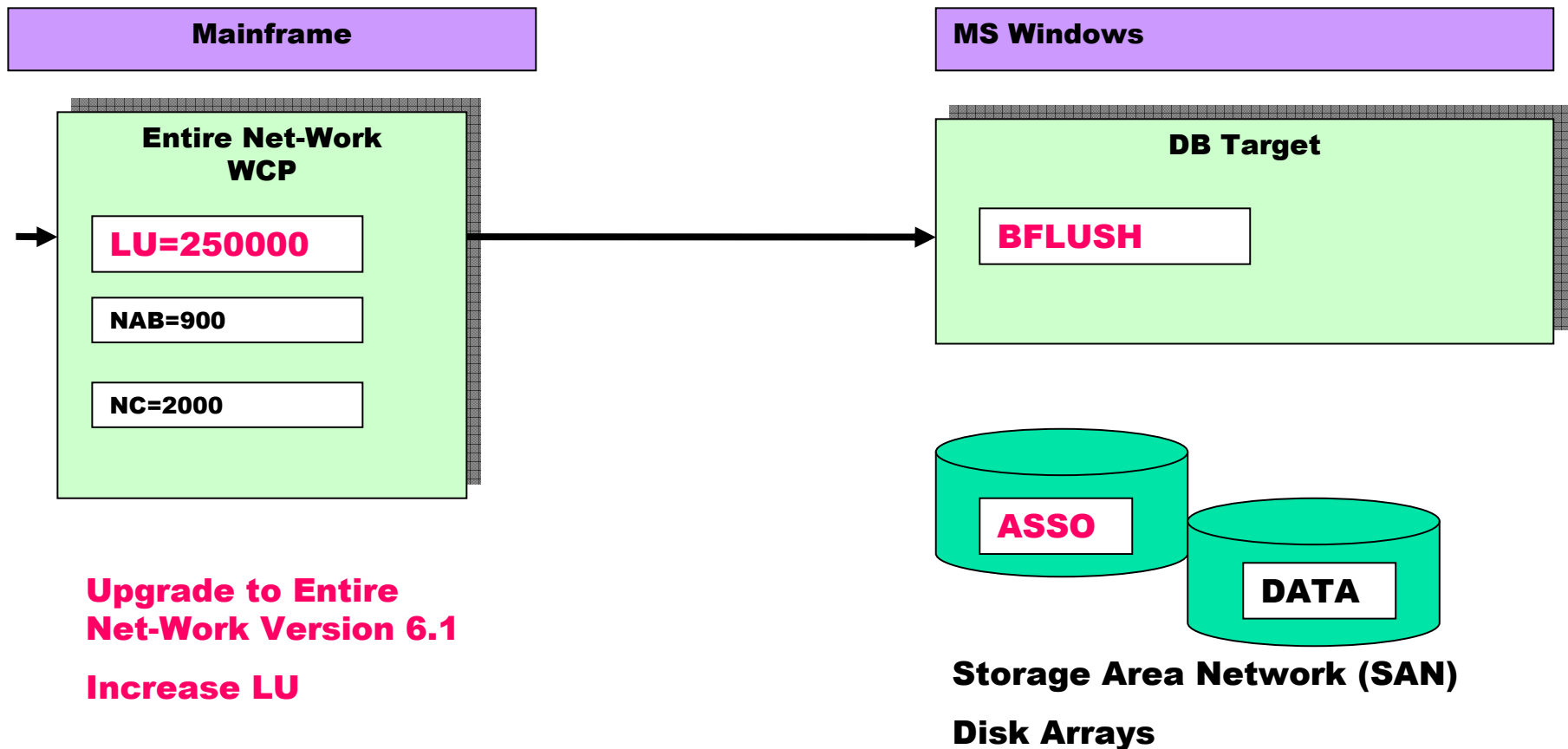




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Mainframe and PC Solutions

Communication Problem: Entire Net-Work (WCP)





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Mainframe and PC Solutions

Monitor the Network





Server Activity

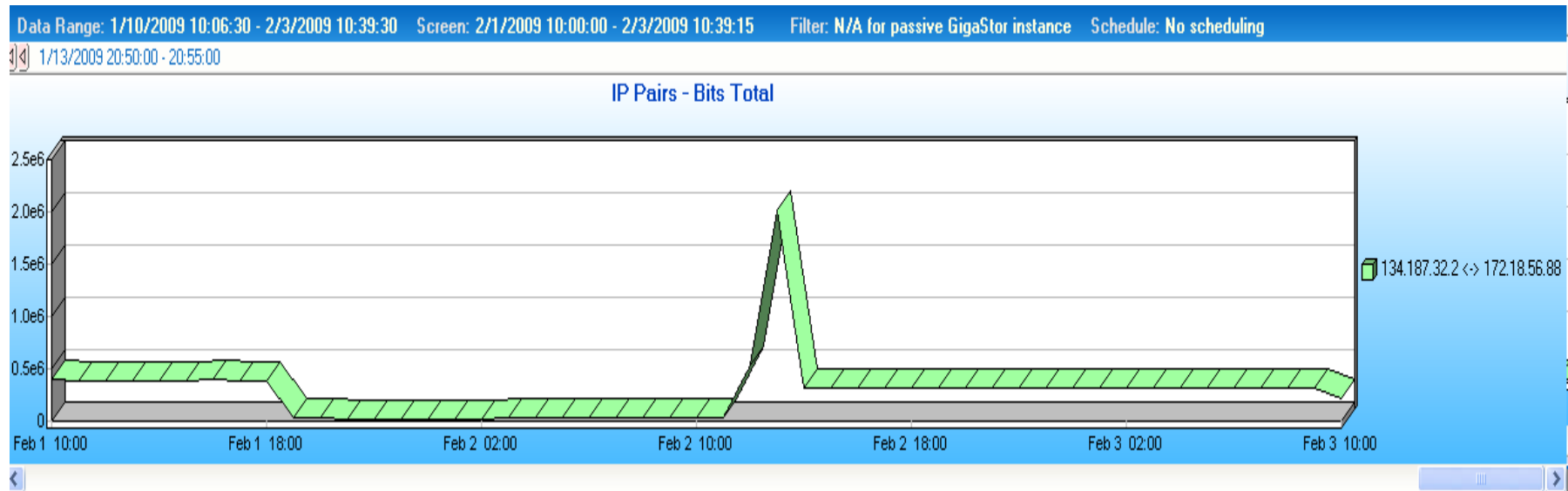
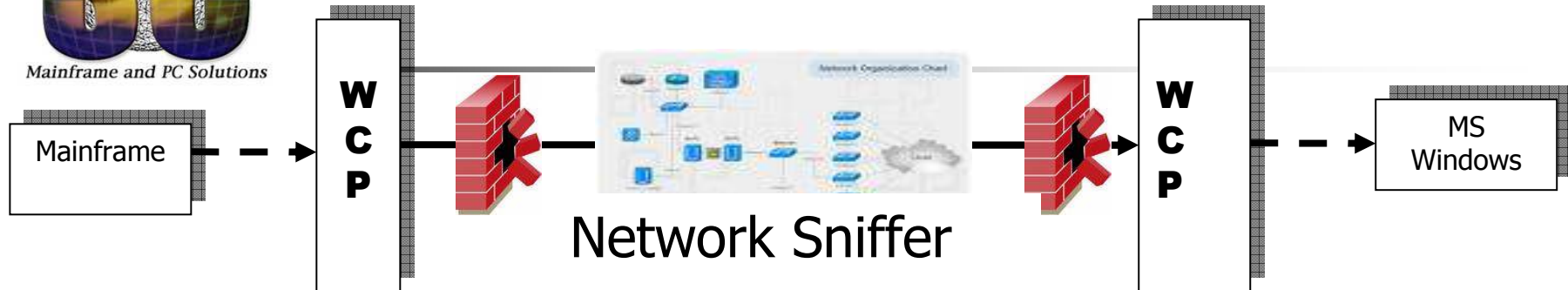
Pink = DB drive
Yellow = log file





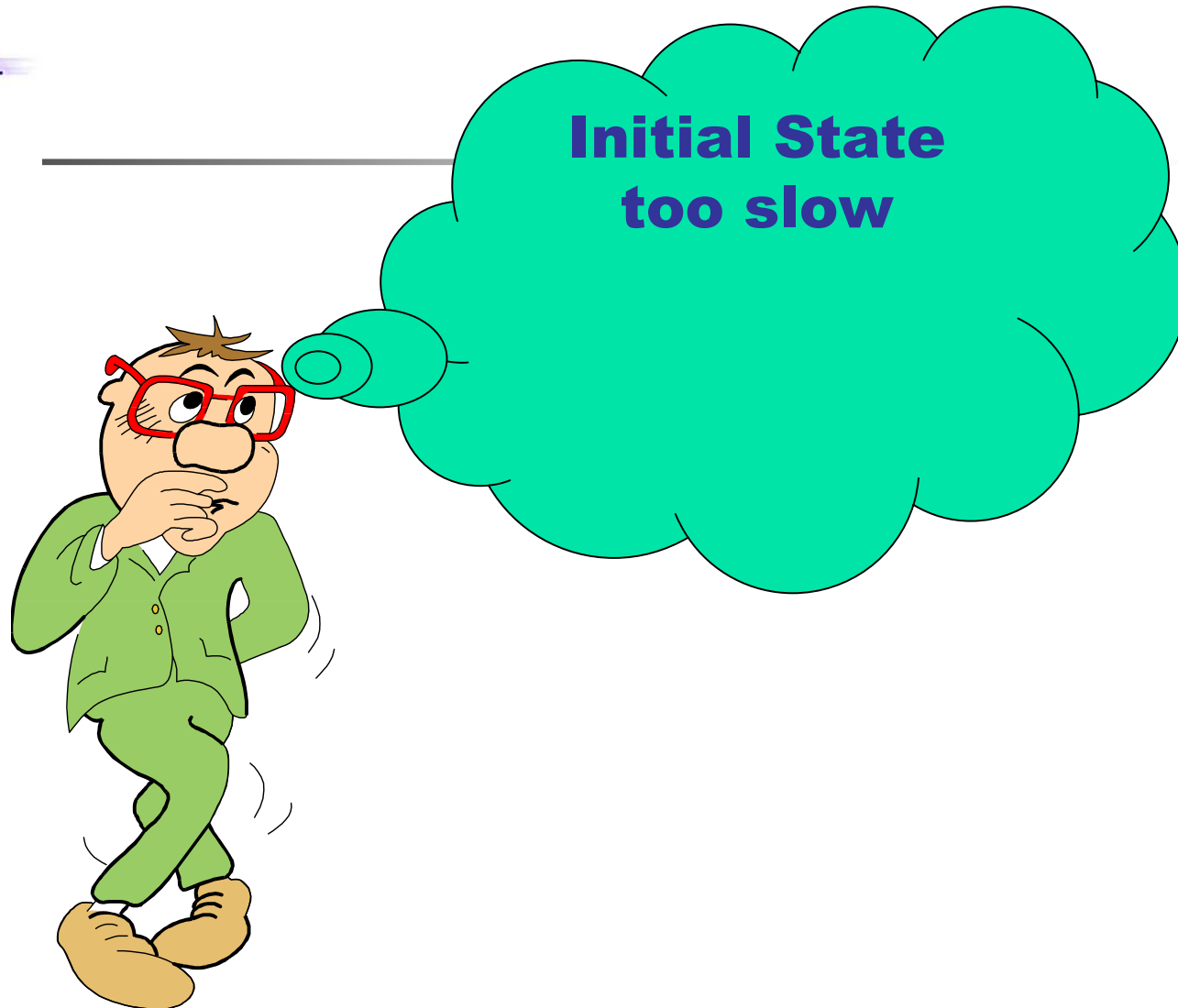
Mainframe and PC Solutions

Monitor the Network





Mainframe and PC Solutions





Initial State too slow

- Files for initial state too big, for example 150 mill. Records
- Initial state would take 3-4 days
- Therefore:
 - DECOMPRESS by ISN directly from Subscription DB
 - FDT from mainframe to Windows
 - Compress with USERISN
 - LOAD with USERISN

**How to avoid
a replication
delay ?**

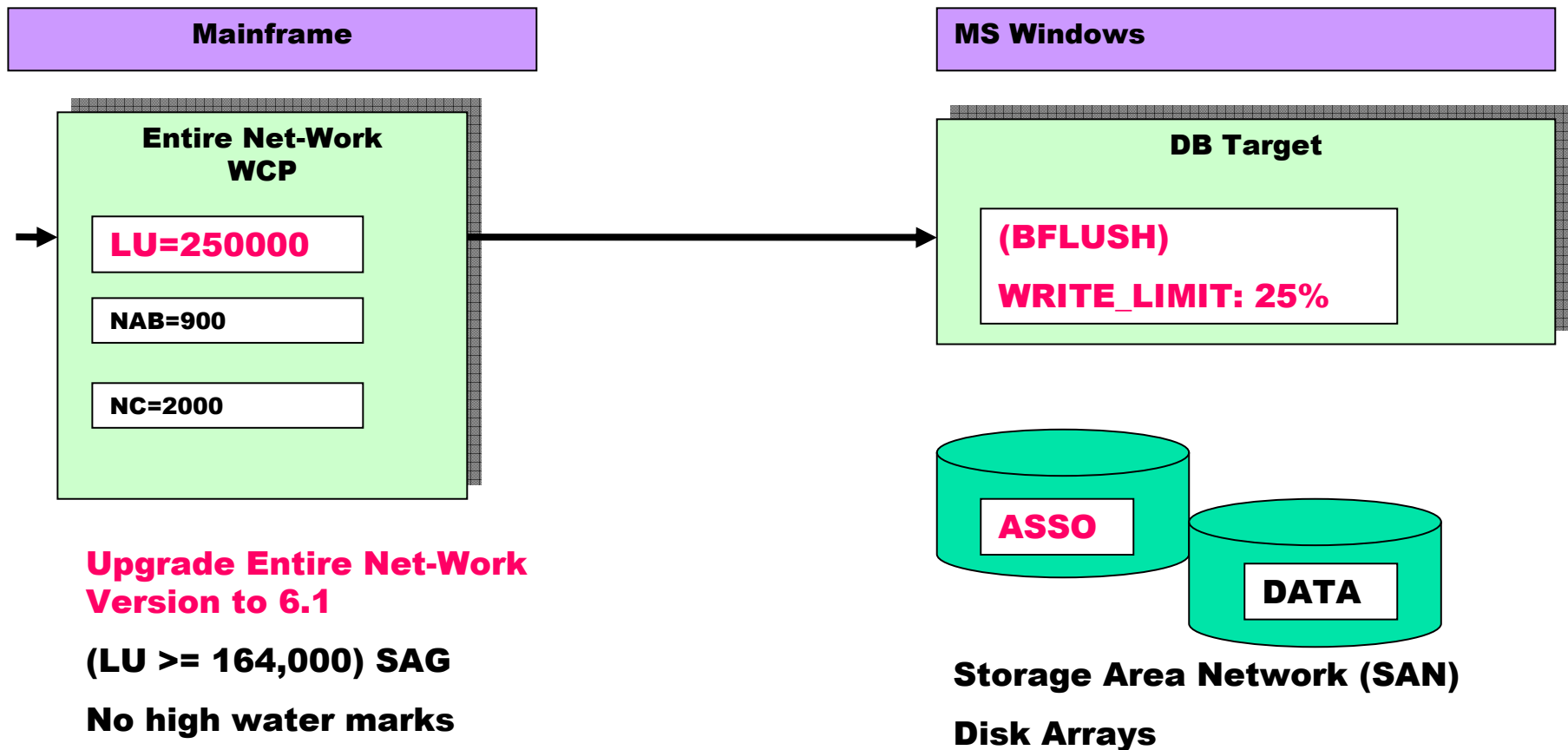




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Mainframe and PC Solutions

Replication Delay





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Mainframe and PC Solutions

MS Windows

DB 251
Target

Check Adabas HWM - Target

%ADAOPR-I-STARTED, 27-JAN-2010 14:57:15, Version 6.1.8.03 (Windows)
Database 251, startup at 27-JAN-2010 11:32:44
ADANUC Version 6.1.8.03, PID 3388

ADANUC Version 6.1.8.03

Database 251 High Water Marks on 27-JAN-2010 14:57:05

Area/Entry	Size	In Use	High Water	%	Date/Time
-----	----	-----	-----	-	-----
User Queue	20	1	2	10	27-JAN-2010 11:36:35
Command Queue	-	1	2	-	27-JAN-2010 11:36:15
Hold Queue	-	0	100	-	27-JAN-2010 11:35:55
Client Queue	50	5	6	12	27-JAN-2010 11:36:15
HQ User Limit	10,000	-	100	1	27-JAN-2010 11:35:55
Threads	30	1	2	6	27-JAN-2010 11:36:15
Workpool	1,000,000	0	250,016	25	27-JAN-2010 11:32:45
ISN Sort	125,000	-	0	0	
Complex Search	125,000	-	0	0	
Attached Buffer	10,485,760	13,312	46,080	0	27-JAN-2010 14:55:16
ATBX (MB)	20	0	0	0	
Buffer Pool	314,572,800	314,499,072	314,524,672	99	27-JAN-2010 14:17:05
Protection Area	665,590				
Active Area	199,677	-	23	0	27-JAN-2010 13:59:15
Group Commit	50	1	1	2	27-JAN-2010 11:35:55
Transaction Time	900	-	10	1	27-JAN-2010 14:02:55

%ADAOPR-I-TERMINATED, 27-JAN-2010 14:57:15, elapsed time: 00:00:00



Mainframe and PC Solutions



**How can I
automate and
improve the
monitor
process?**



Parse DDPRINT for Errors

Read DDPRINT of Active REPTOR Nucleus

```
000010 //EJESLNK EXEC PGM=EJESLNK
000011 //* EJESEXT DD SYSOUT=*
000012 //EJESEXT DD DSN=ADABAS.EXTRACT.DDPRINT,
000013 //          DISP=(NEW,CATLG,DELETE),VOL=(,,20),
000014 //          UNIT=MISCDA,BUFNO=20,RECFM=FB,LRECL=240,
000015 //          SPACE=(240,(100,50),RLSE),AVGREC=K,RETPD=30
000016 //EJESOUT DD SYSOUT=*,RECFM=VB,LRECL=240
000017 //EJESIN  DD *
000018     ST REPTMPM
000019     FIND RETMPM
000020     :S
000021     FIND DDPRINT
000022     :E
000023 //
```



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Mainframe and PC Solutions

Parse DDPRINT for Errors

```
(snip)
0720 RW1.
0730 READ WORK 1 #ADALOG-LINE      /* read one ADALOG
0740 ** --          Check Error Lines
0750   IF  SUBSTRING(#ADALOG-LINE-TEXT,01,12) = 'Start date= ' OR
0760       SUBSTRING(#ADALOG-LINE-TEXT,10,06) = 'ADAF54' OR
0770       SUBSTRING(#ADALOG-LINE-TEXT,01,06) = 'ADAF18' OR
0780       SUBSTRING(#ADALOG-LINE-TEXT,10,06) = 'ADAFQC' OR
0790       SUBSTRING(#ADALOG-LINE-TEXT,10,06) = 'ADAF2A' OR
0800       SUBSTRING(#ADALOG-LINE-TEXT,10,06) = 'ADAF2D' OR
0810       SUBSTRING(#ADALOG-LINE-TEXT,10,06) = 'ADAF2B' OR
0820       SUBSTRING(#ADALOG-LINE-TEXT,01,06) = 'ADAF54' OR
0830       SUBSTRING(#ADALOG-LINE-TEXT,10,06) = 'ADAF8Y'
0840   ADD 1 TO #LC
0850   #SEQ := #LC
0860   #TEXT := #ADALOG-LINE-TEXT
0870   WRITE WORK FILE 2 #OUTPUT-LINE
0880   END-IF

->CONT'
```



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Mainframe and PC Solutions

Parse DDPRINT for Errors

NAB too small – overflow – RC254 SC3– parsed DDPRINT

SC3 = CQEFLAG is not equal to CQEFAB plus CQEFW16

<snip>

```
017528 ADADF18 ET cmd to DBID 187 FNR RSP 254 subcode 3
017529 ADADF18 A1 cmd to DBID 187 FNR 18 RSP 254 subcode 6 ISN 186
017530 ADADF18 ET cmd to DBID 187 FNR RSP 254 subcode 3
017531 ADADF18 ET cmd to DBID 187 FNR RSP 254 subcode 3
017532 ADADF18 A1 cmd to DBID 187 FNR 18 RSP 254 subcode 3 ISN 185
017533 ADADF18 E1 cmd to DBID 187 FNR 14 RSP 113 subcode ISN 237158
017534 ADADF18 E1 cmd to DBID 187 FNR 14 RSP 113 subcode ISN 237186
```

```
*****
017534 AB -POOL NAB= 420 1715456 ( 99 %)
*****
```

```
*****
017534 RPL -POOL LRPL= 157286400 149875480 ( 95 %)
*****
```

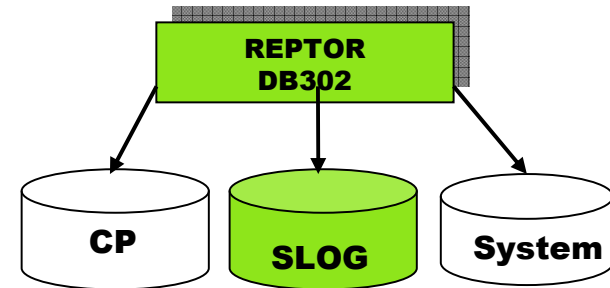
```
FNR/RSP/CNT: 0 254 4
FNR/RSP/CNT: 14 113 224
FNR/RSP/CNT: 15 113 4
FNR/RSP/CNT: 18 113 11
FNR/RSP/CNT: 18 254 4
FNR/RSP/CNT: 20 113 25
FNR/RSP/CNT: 22 113 6
```



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Mainframe and PC Solutions

SLOG Check in Batch



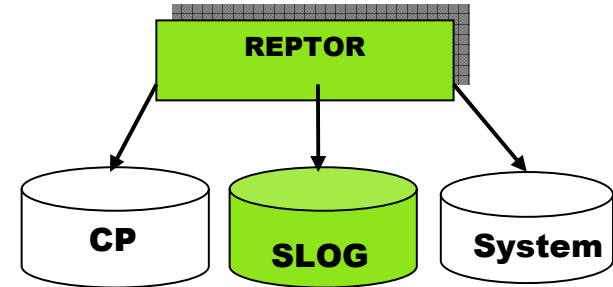
```

/*-----*
/* Create SLOG report by using SYSAOS / Replication Maintenance ---*
/*-----*
//RPLSTAT1 EXEC PGM=NATBATCH,REGION=0M,
// PARM=' PARM=SYPROD ,SYS=STRSY7 ,AUTO=ON ,IM=D ,STACK=(LOGON SYSAOS ;MENU) '
//STEPLIB DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.LOADLIB ADABAS
// DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.PGMLIB NATURAL
// DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.PARMLIB NATPARM
//DDCARD DD DISP=SHR,DSN=ADABAS.CONTROL.CARD(TESTY)
//CMPRINT DD DSN=ST.ADADBA.STDWS.SLOG302,
// DISP=(,CATLG),SPACE=(TRK,(10,10),RLSE)
//CMSYNIN DD *
O,302
X
F
B
,,FIN
/*
  
```



Mainframe and PC Solutions

SLOG is not empty



```

13:28:06          ***** A D A B A S  BASIC  SERVICES  *****          2010-03-10
Replicator 302          - Replicator Statistics -          PRPTS10
Replicated trans / messages / bytes  Received from input queues
-----
Total trn.                80,554  Messages ...
Pending ..                13      Bytes .....
Messages                  Commits ....
Tot msgs .                Backouts ...
Bytes sent to all destinations
Tot bytes.

Deleted totals from input queues
-----
Slog statistics for items
-----
Delogged .                35,476  Messages ...
Logged ...                42,665  Bytes .....
On file ..                7,228   Commits ....
Replay dbid/token cnt .   Backouts ...

Destination slog cnt ..   372

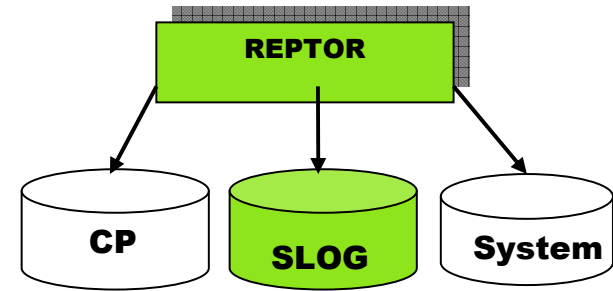
More: press PF8
  
```

```

PF1--- PF3--- PF4----- PF5----- PF6--- PF7--- PF8--- PF12-----
Help   Exit   Refresh   DBID/Token  Dest. SLOG   +     Menu
  
```



SLOG is not empty



15:32:44 ***** A D A B A S BASIC SERVICES ***** 2010-03-24
 Replicator 302 - Individual Destination SLOG Statistics - PRPTS10

Dest Name	Total logged	Total deleted logged
-----	Total items on slog file	Total items to be deleted on slog file
-----	-----	-----

D191112

D191113

D191116	8
---------	---

SLOG on file level

D191118

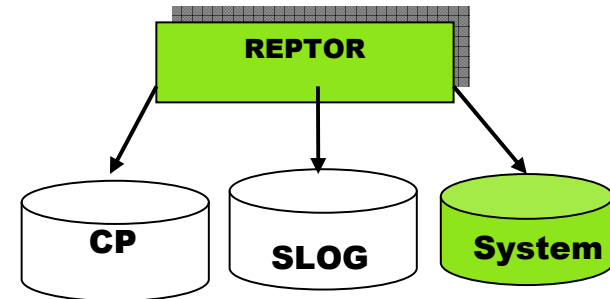
PF1-----	PF2-----	PF3-----	PF6-----	PF7-----	PF8-----	PF12-----
Help		Exit				Menu



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Mainframe and PC Solutions

Subscription Check in Batch



```

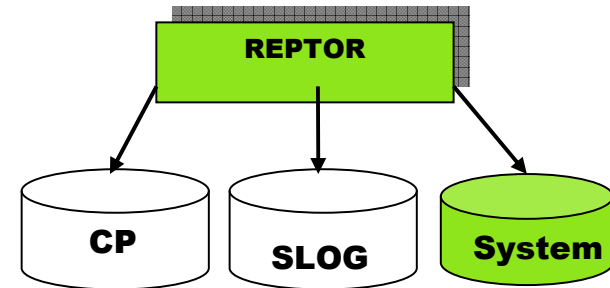
//*-----*
//* Create SUBS report by using SYSAOS / Replication Maintenance ---*
//*-----*
//RPLSTAT1 EXEC PGM=NATBATCH,REGION=0M,
// PARM=' PARM=SYPROD ,SYS=STRSY7 ,AUTO=ON ,IM=D ,STACK=(LOGON SYSAOS ;MENU) '
//STEPLIB DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.LOADLIB ADABAS
// DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.PGMLIB NATURAL
// DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.PARMLIB NATPARM
//DDCARD DD DISP=SHR,DSN=ADABAS.CONTROL.CARD(TESTY)
//CMPRINT DD DSN=ST.ADADBA.STDWS.SUBS302,
// DISP=(,CATLG),SPACE=(TRK,(10,10),RLSE)
//CMSYNIN DD *
O,302
X
F
R
} empty lines for number of pages
,,FIN
//
  
```



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Destination Check in Batch

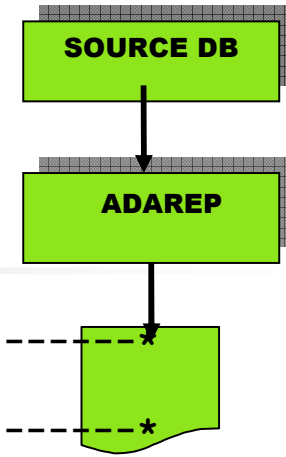


```
//*-----*
//* Create DEST report by using SYSAOS / Replication Maintenance ---*
//*-----*
//RPLSTAT1 EXEC PGM=NATBATCH,REGION=0M,
// PARM=' PARM=SYPROD ,SYS=STRSY7 ,AUTO=ON ,IM=D ,STACK=(LOGON SYSAOS ;MENU) '
//STEPLIB DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.LOADLIB ADABAS
// DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.PGMLIB NATURAL
// DD DISP=SHR,DSN=ADABAS.ALIAS.SYPROD.PARMLIB NATPARM
//DDCARD DD DISP=SHR,DSN=ADABAS.CONTROL.CARD(TESTY)
//CMPRINT DD DSN=<font color=red>ST.ADADBA.STDWS.SUBS302,</font>
// DISP=(,CATLG),SPACE=(TRK,(10,10),RLSE)
//CMSYNIN DD *
O,302
X
F
D
,,FIN
//
```




Mainframe and PC Solutions

Replication Check in Batch - ADAREP



```

// *-----*
// * ADABAS REPORT V8 - ST.ADADBA.CNTL(ADAREPV8)
// *-----*
(snip)
//SYSIN      DD *
ADAREP REPORT
ADAREP NOFDT,NOSTD
  
```

(snip) per file:

```

*****
*                                     *
* File          6 (ST-ADA-CALC-EDAT) *          2010-03-09  13:59:15
*                                     *
*****
  
```

(snip)

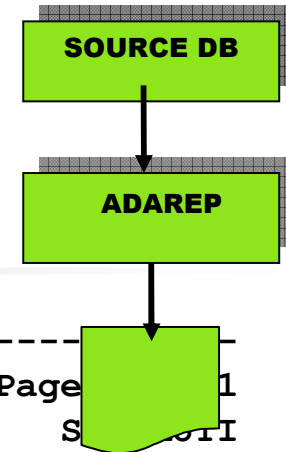
```

File is replicated:
  Replicator target ID      = 302
  Collect before images of updates = Yes
  
```

To be parsed



Replication Check in Batch Parse Program



2010-03-09 14:15:36
DWSRPLRP

Adabas Replicator Report

Page 1
S [Redacted]

A D A R E P V8.1 SM3 DBID = 00039 Started 2010-03-09
13:59:15

FNR	RPL	STATUS	TDB
6	YES	active	302
7	YES	active	302
8	YES	active	302
9	YES	active	302
10	YES	active	302
11	YES	active	302
12	YES	active	302
13	YES	active	302
14	YES	active	302

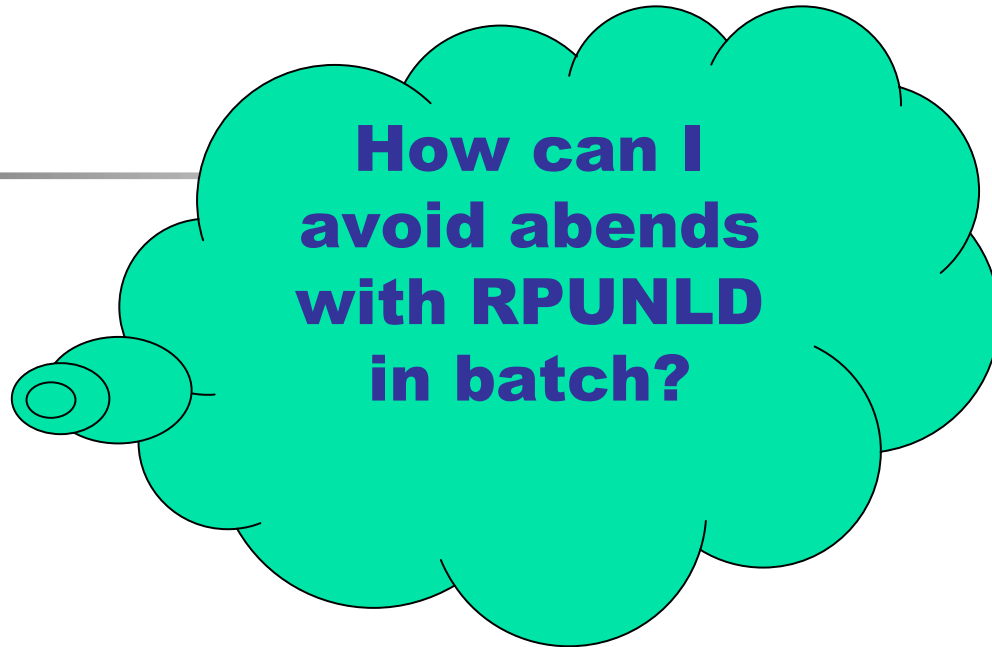
(snip)

135 NO n/a
137 NO n/a



Event Replicator Administration (ARM)

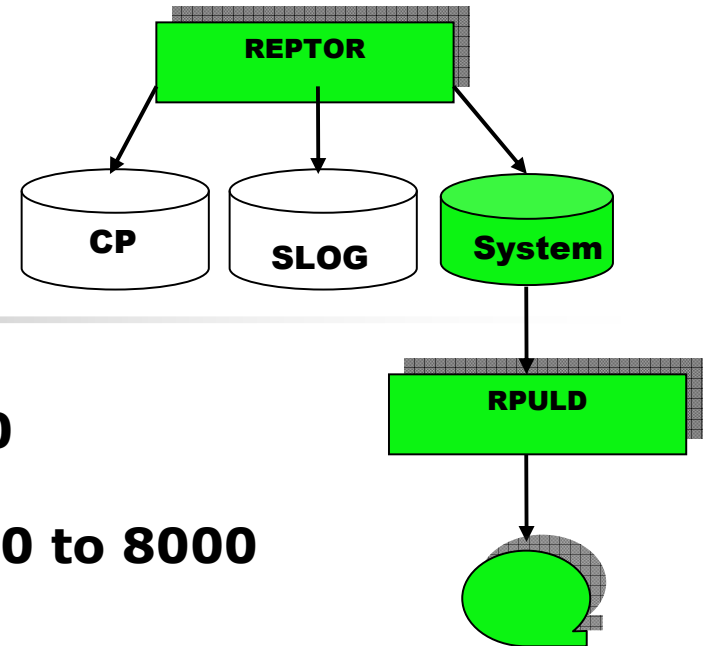
- Web-based graphical user interface that can be used to perform administrative tasks for Event Replication for Adabas. It runs in Software AG's System Management Hub
- ? ? ? ?





RPUNLD in Batch

- **LS in Reptor = from 59,904 to 149,760**
- **Natural parameter: EDPSIZE from 1000 to 8000**
- **Job Region Size = 1GB**

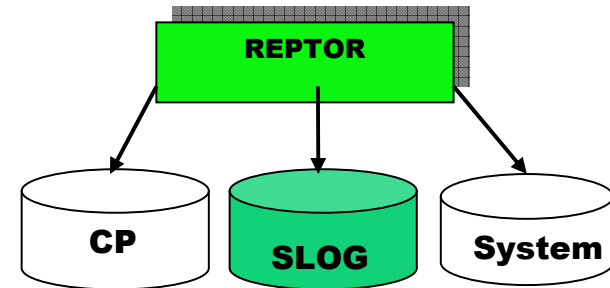


```
//CMSYNIN DD *  
LOGON SYSRPTR  
SYSPROF  
RPULD NAME=*,DBID=302,FNR=010,RELATED=Y  
FIN  
===  
RPLD NAME=*,DBID=302,FNR=10,REPLACE=Y
```





SLOG Turned Off



15 April 2010

```
15:49:14 ADAF2M 00302 Subscription S039144 deactivated
15:49:14 ADAF2M 00302 due to last destination deactivation
15:49:14 ADAF5Q 00302 All transactions from database 39
15:49:14 ADAF5Q 00302 that ended before 2010-04-08 16:35:32
15:49:14 ADAF5Q 00302 have been processed for subscription S039144
15:49:14 ADAF2L 00302 Replication deactivated for DBID/File 39/ 144
15:49:14 ADAF2L 00302 due to last subscription deactivation - S039144
15:49:14 ADAF5Q 00302 All transactions from database 39
15:49:14 ADAF5Q 00302 that ended before 2010-04-08 16:35:32
15:49:14 ADAF5Q 00302 have been processed for file 144
15:49:21 ADAF2N 00302 Destination D191144 activated
15:49:21 ADAF2N 00302 due to explicit request (DBS/AOS/opcmd)
15:49:27 ADAF8N 00302 Open request received for destination D191144
15:49:27 ADAF8U 00302 Destination D191144 opened on all tasks
```

15:49:27 ADAFRY 00302 SLOG turned off for destination D191144

**Why is Reptor
Acting Unusual
Under Stress?**

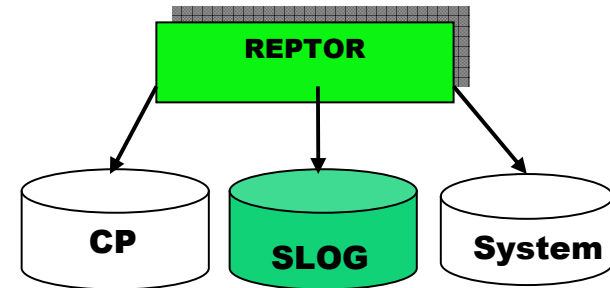




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Mainframe and PC Solutions

Reptor Under Stress



Reptor Abend U0065 at 0016AA66 = ADARPS+006A66

```
10:45:52 ADAF5Q 00302 that ended before 2010-04-20 17:03:11
10:45:52 ADAF5Q 00302 have been processed for file 20
10:45:55 ADAFRY 00302 SLOG turned off for destination D191020
10:45:55 ADAF8N 00302 Close request received for destination D191020
10:45:55 ADAN59 00302 Abend U0065 at 0016AA66 = ADARPS+006A66
10:45:55 ADAN59 00302 00000008 00000000 8016AA66 31A398E0 (R0-R3)
10:45:55 ADAN59 00302 00000000 00000000 449D29C0 00054FF8 (R4-R7)
10:45:55 ADAN59 00302 3157D3FC 0016A960 00053000 00054000 (R8-RB)
10:45:55 ADAN59 00302 315AA000 315AB000 31080000 0000003C (RC-RF)
10:45:55 ADAM99 00302 ADABAS Abend code 00000041 00000000
10:45:55 078D3000 80019E26 0002000D 00000000 (PSW, EC Info)
10:45:55 00000000_00013870 00000000_00000041 (R0-R1)
10:45:55 00000000_000550F8 00000000_000533D4 (R2-R3)
10:45:55 00000000_00055D68 00000000_00000000 (R4-R5)
10:45:55 00000000_00055DCE 00000000_000545EC (R6-R7)
10:45:55 00000000_000545EC 00000000_00055B84 (R8-R9)
```

(snip)

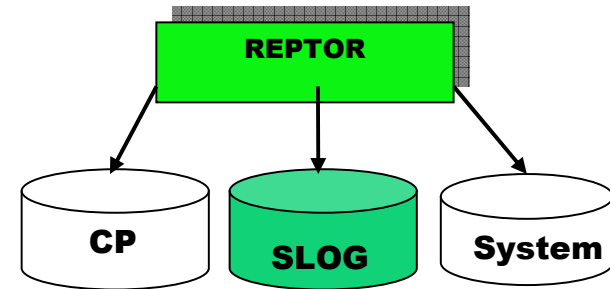
Restarted Reptor



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Mainframe and PC Solutions

Reptor Under Stress



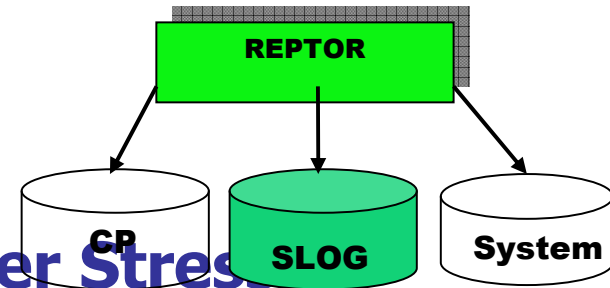
Replicated Records Measured on the Target Database

Report Time	Rpted RC	Time Differ	Seconds	Total Records	Rec Per Second
2010/04/23 07:24:05	1,564,092				
2010/04/23 07:37:48	1,656,733	13:43	823	92,641	113
2010/04/23 08:15:04	1,902,986	37:16	2236	246,253	110
2010/04/23 08:47:27	2,101,398	32:23	1943	198,412	102
2010/04/23 08:54:25	2,145,171	06:58	418	43,773	105
2010/04/23 09:13:09	2,237,220	18:44	1124	92,049	82
2010/04/23 09:51:49	2,428,858	38:40	2320	191,638	83
2010/04/23 10:15:54	2,556,922	24:05	1445	128,064	89
2010/04/23 10:42:03	2,690,992	26:09	1569	134,070	85
2010/04/23 10:55:30	2,766,535	13:27	807	75,543	94
2010/04/23 11:07:13	2,829,072	11:43	703	62,537	89
2010/04/23 11:18:49	2,892,120	11:36	696	63,048	91
2010/04/23 12:52:34	3,324,097	33:45	2025	431,977	213
2010/04/23 13:04:35	3,377,015	12:01	721	52,918	73
(after restart of the Reptor - it repeats already replicated records)					
2010/04/23 17:35:18	52,802	46:05	2765	34,381	12



Mainframe and PC Solutions

Reptor under Stress



- **Reptor couldn't be monitored (SYSAOS)**
- **SYSAOS locked only for the Reptor database**
- **Batch report (ADAREP SLOG file) went into wait**
- **Display DDPRIINT of Reptor was not possible**
- **Cancelled Reptor with dump**
- **Restarted Reptor**
- **Reptor came up and repeated already replicated records**

ADAF54 2010-04-24 00:08:32 Replication error: Adabas destination D191027

ADAF54 Source DBID 39 FNR 27, Target DBID 191 FNR 27

ADAF18 N2 cmd to DBID 191 FNR 27 RSP 113 subcode ISN 2717024

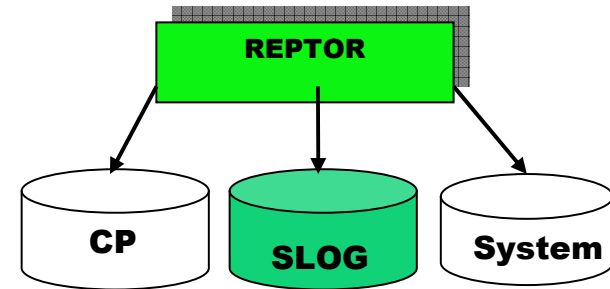
ADAF54CV The record to be inserted already exists on the target DBID/file

ADAF54CW The insert is part of a transaction with the resend flag set.

ADAF54CY The record will be updated..



Reptor Under Stress



SYSOUT > 7mm lines → Reptor cancelled with dump

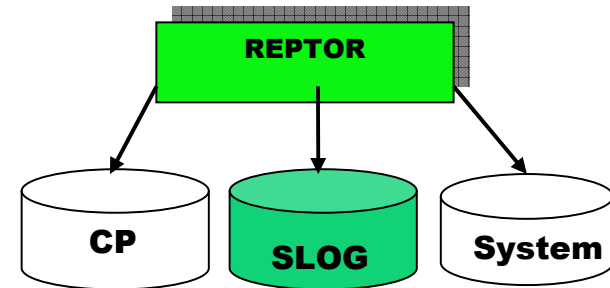
```
ADAF18  N2 cmd to DBID   191 FNR   31 RSP   113 subcode       ISN       31942
ADAFCV  The record to be inserted already exists on the target DBID/file
ADAFCY  The record will be updated.
ADAF54  2010-04-23 16:40:15 Replication error: Adabas destination D191031
ADAF54  Source DBID     39 FNR     31, Target DBID   191 FNR     31
ADAF18  N2 cmd to DBID   191 FNR   31 RSP   113 subcode       ISN       31943
ADAFCV  The record to be inserted already exists on the target DBID/file
ADAFCY  The record will be updated.
ADAF54  2010-04-23 16:40:15 Replication error: Adabas destination D191031
ADAF54  Source DBID     39 FNR     31, Target DBID   191 FNR     31
ADAF18  N2 cmd to DBID   191 FNR   31 RSP   113 subcode       ISN       31944
ADAFCV  The record to be inserted already exists on the target DBID/file
ADAFCY  The record will be updated.
```



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REPLAY



A D A R P L V8.1 SM1 DBID = 00039 Started

2010-04-28 18:16:06

Parameters:

ADARPL REPLAY

ADARPL FILES=006,007,009,010,012,013,016,019,021,023,028,033,034,037

ADARPL FILES=039,040,041,043,047,048,051,058,059,060,061,063,066,066

ADARPL FILES=067,068,071,072,076,077,078,080,081,082,083,084,086,088

ADARPL FILES=090,091,092,093,094,096,097,099,103,104,105,106,109,110

*** ADARPL FILES=111,113,116,119,123,124,125,130,131,133,135,137,138,140

ERROR-009, Parameter error, too many values in a list

Check the parameter input.

Supply no more than the maximum number of parameter

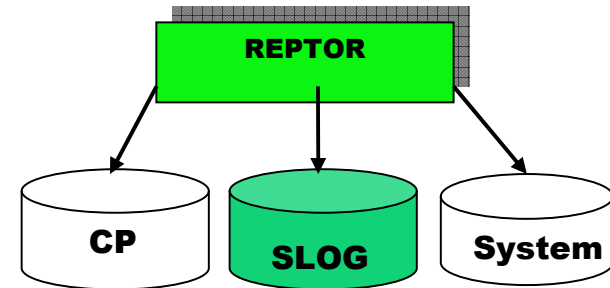
values permitted, and rerun the job.

A D A R P L Terminated

2010-04-28 18:16:06



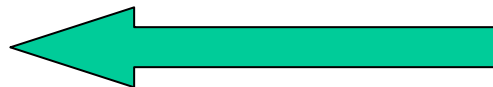
REPLAY



A D A R P L V8.1 SM1 DBID = 00039 Started 2010-05-03 15:38:21

Parameters:

ADARPL REPLAY, LRPL=300000K



ADARPL FILES=052,085,087,094,107,108,112,132,146,147,159,162,163,164

ADARPL FILES=165,167,173,214

Initialization handshake for Reptor 302 successful, token = 24115

A D A R P L: Error occurred during execution:

ERROR-139, ADARPL Replication pool overflow

Increase LRPL parameter and rerun the job

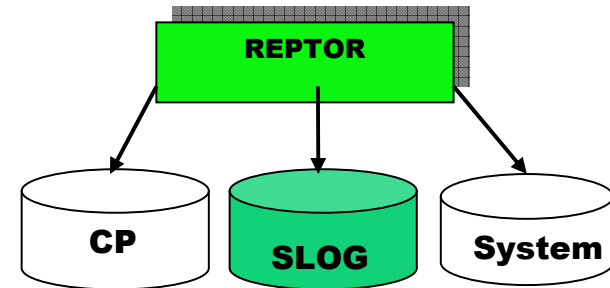
A D A R P L Terminated

2010-05-03 15:40:16

LRPL of Source and Reptor =314,572,800 – 0% and 1.9% used



REPLAY



A D A R P L V8.1 SM1 DBID = 00039 Started 2010-05-03 17:31:58

Parameters:

ADARPL REPLAY

ADARPL LRPL=300000K

ADARPL FILES=052,085,087,094,107,108,112,132,146,147,159,162,163,164

ADARPL FILES=165,167,173,214

Initialization handshake for Reptor 302 successful, token = 24116

A D A R P L: Error occurred during execution:

ERROR-140, Unexpected REPTOR response 254 subcode 6 location 1

A D A R P L Terminated

2010-05-03 17:39:25

NAB of Source and Reptor = 20.3% and 11.5% used



**SYSAOS –
Reptor C/E
Nice to have!**





C/E Requests

- **Destination statistics**
AOS: Code O / X / F / D
 - **Destination Statistics - PRPTS04**
PF4 - Refresh the screen should change the date
 - **Selected Destination Statistics -PRPTS04**
There is no refresh key – you have to go back to the destination statistics and page forward to destination 200+ and select again
 - **See example →**



Mainframe and PC Solutions

C/E Requests

15:32:46

Replicator 302

***** A D A B A S BASIC SERVICES *****
- Destination Statistics -

2010-04-22
PRPTS04

Mark	Dest Name	Type	Total replicated transactions	Total pending trans
-	-----	----	-----	-----
-	D191020	Abas	771	
-	D191021	Abas		
S	D191022	Abas	4,332	2,432
-	D191023	Abas		
-	D191024	Abas		
-	D191025	Abas		
-	D191026	Abas		
-	D191027	Abas		
-	D191028	Abas		
-	D191029	Abas		
-	D191030	Abas		
-	D191031	Abas		
-	D191032	Abas		
-	D191033	Abas		

Select detail information by marking with 'S'

PF1----- PF2----- PF3----- PF4----- PF7----- PF8----- PF12-----
 Help Exit Refresh - + Menu



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C/E - Requests

15:27:51

***** A D A B A S BASIC SERVICES *****

2010-04-22

Replicator 302

- Selected Destination Statistics -

PRPTS04

Selected Dest Name : D191022

Selected Dest Type : Adabas

Time tran committed

Total replicated transactions .

3,808 2010/04/22 15:11:26

Total pending transactions

2,956

Total messages sent

0

Total commits

0

Slog logged count

0

Slog delogged count

2,680

Items for destination on slog .

0

Items to delete from slog

0

Bytes sent to destination

0

Pending bytes for destination .

0

Pending messages

0

Number of BT's

0 Time of last ET

Number of ET's

3,806 2010/04/22 15:28:41

Press 'Enter' to continue

PF1-----

PF2-----

PF3-----

PF4-----

PF7-----

PF8-----

PF12-----

Help

Exit

Menu



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C/E – Requests – GFB in Batch

16:56:23

***** A D A B A S EVENT REPLICATOR SUBSYSTEM *****

2010-06-11

List of Global Format Buffers

M-RP1130

Sel	Name	Sel	Name	Sel	Name	Sel	Name
-	G039006	-	G039020	-	G039034	-	G039048
-	G039007	-	G039021	-	G039035	-	G039049
-	G039008	-	G039022	-	G039036	-	G039050
-	G039009	-	G039023	-	G039037	-	G039051
-	G039010	-	G039024	-	G039038	-	G039052
-	G039011	-	G039025	-	G039039	-	G039053
-	G039012	-	G039026	-	G039040	-	G039054
-	G039013	-	G039027	-	G039041	-	G039055
-	G039014	-	G039028	-	G039042	-	G039056
-	G039015	-	G039029	-	G039043	-	G039057
-	G039016	-	G039030	-	G039044	-	G039058
-	G039017	-	G039031	-	G039045	-	G039059
-	G039018	-	G039032	-	G039046	-	G039060
-	G039019	-	G039033	-	G039047	-	G039061

Command ==>

Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
Help Gen Exit Add Repos - + Menu

June 2010

dstorr@storrconsulting.com

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Conclusion - Evaluation

++

Replication to Adabas on Windows
saves money and time

....

....

--

Reptor under stress caused problems

....

....

The End

