



GSE Belux DB2

Thursday 6 December 2012

DB2 V10 upgrade experience @ BNP Paribas Fortis



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Agenda



- ✓ **Configuration**
- ✓ **Business Case**
- ✓ **Install Setup**
- ✓ **Preparation**
- ✓ **Move to CM**
- ✓ **Move to NFM**
- ✓ **System monitoring**

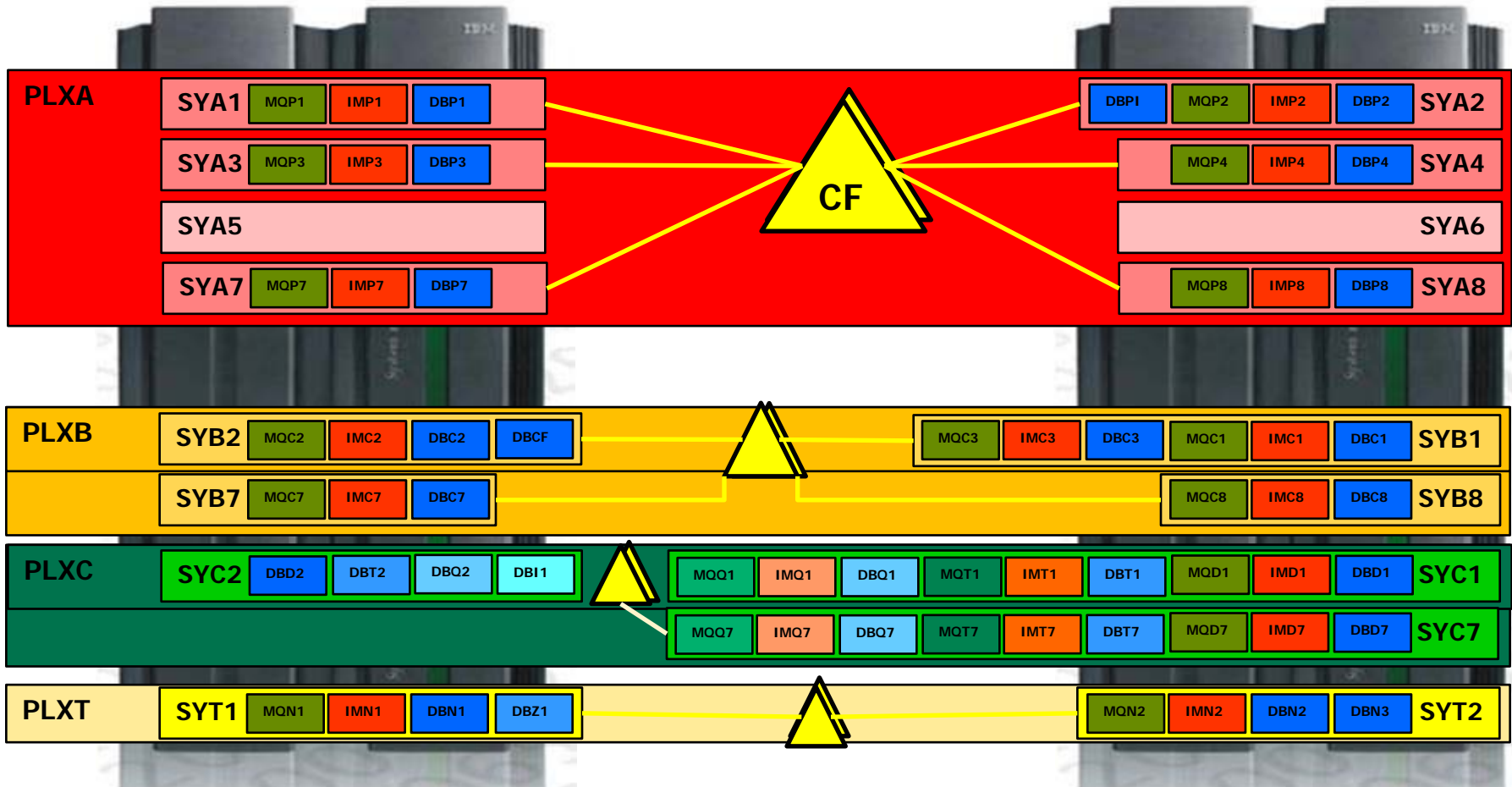




- ✓ **Data Sharing**
 - **6 Group's**
 - **26 subsystems**
- ✓ **Two stand alone Subsystems**
- ✓ **Static SQL is used for all applications**
- ✓ **LDAP is only Dynamic SQL application**



Configuration





- ✓ **Business Case made on 5% CPU gain**
 - **DB2 code changes**
 - **Use of 1MB page frames**
 - **Buffer pool changes**
- ✓ **Potential extra benefits**
 - **HASH objects**





✓ SMP

- ✓ New SMP environment by DB2 version
- ✓ One Global environment
- ✓ TEST environment (TRGT+DLIB)
- ✓ PROD environment (TRGT+DLIB)





✓ Packaging

- **Dump with ADRDSSU to file**
- **Variable definition by Environment**
- **Creation of MIGRATION SKELET**
 - **JCL**
 - **ZPARM**
 - **DECP**
 - **DATA**
- **Send file to target environment**
- **Generate Executable Unit for scheduler**





- ✓ **Install extra maintenance**
- ✓ **Migrate Catalog & Directory to SMS**
- ✓ **PRIVATE - DRDA**
- ✓ **DBRM in plan's**
- ✓ **Rebind**
- ✓ **Plan Table**





✓ Install extra maintenance

- V9 NFM in production on 04/06/2011
- Upgrade to last RSU level
- Verify APAR's
 - PK56922 Toleration SPE
 - II14477 info V9 to V10 migration
- Check all software dependent of DB2





- ✓ **Migrate Catalog & Directory to SMS EA**
 - **HLQ changes for naming standard**
 - **C&D**
 - **ACTLOG**
 - **WORKDB**
 - **BSDS**
 - **During Wintertime Change**
 - **User indexes on C&D VCAT defined**
 - **Free Space in SMS Storage Group**
 - **Migration - Reorg**





✓ PRIVATE - DRDA

- No remote SQL used
- ZPARM PRIVATE_PROTOCOL=NO
 - UK65971 DRDA may fail with -551
 - UK67641 New AUTH value
- Cleanup old System Software
- Rebind Application Software
 - PLAN
 - PACKAGE





✓ DBRM in plan's

- **Cleanup old System Software**
- **List Old Application Software**
 - **Request rebind**
 - **Remaining rebound with
REBIND PLAN (xx) COLLID(yy)**





✓ Rebind

- **Shortly before upgrade to CM**
- **Standard rebind process**
- **Free of all inactive**

✓ Plan Table

- **Unicode**
- **New format 64 columns**



Move to CM



- ✓ **Planning**
- ✓ **Large Page frames**
- ✓ **Application Changes - Access Path**
- ✓ **Problems**

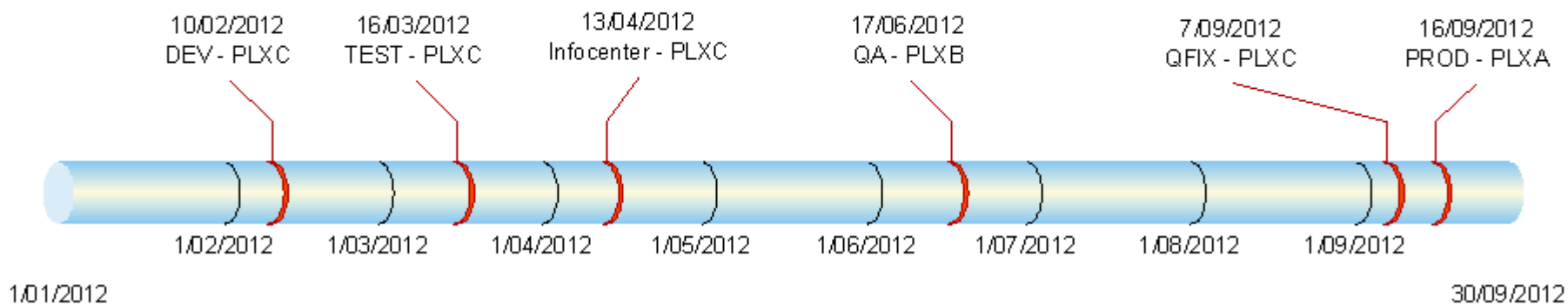


Move to CM



✓ Planning

Compatibility mode
1/2012 – 9/2012





✓ Large Page frames

- Buffer pool must be **PAGEFIX YES**
- **REAL** memory available
- **IEASYSxx LFAREA** parameter
- **Created at IPL**
- **Can be used by 4K and 1M pages**





✓ Large Page frames z/OS command

```
COMMAND INPUT ==> /D VS,LFAREA
```

```
RESPONSE=SYA2
```

```
IAR019I 11.36.48 DISPLAY VIRTSTOR 251
```

```
SOURCE = 00
```

```
TOTAL LFAREA = 2560M
```

```
LFAREA AVAILABLE = 0M
```

```
LFAREA ALLOCATED (1M) = 2560M
```

```
LFAREA ALLOCATED (4K) = 0M
```

```
MAX LFAREA ALLOCATED (1M) = 2560M
```

```
MAX LFAREA ALLOCATED (4K) = 1M
```





✓ Large Page frames DB2 command

-DIS BUFFERPOOL(BP11) SERVICE=4

```
DSNB401I  -DBP2 BUFFERPOOL NAME BP11, BUFFERPOOL ID 11, USE COUNT 925
DSNB402I  -DBP2 BUFFER POOL SIZE = 160000 BUFFERS  AUTOSIZE = NO
           ALLOCATED           = 160000    TO BE DELETED     =           0
           IN-USE/UPDATED      = 1652
DSNB406I  -DBP2 PGFIX ATTRIBUTE -
           CURRENT = YES
           PENDING = YES
           PAGE STEALING METHOD = LRU
DSNB404I  -DBP2 THRESHOLDS -
           VP SEQUENTIAL       = 10
           DEFERRED WRITE      = 3    VERTICAL DEFERRED WRT = 2, 0
           PARALLEL SEQUENTIAL =50    ASSISTING PARALLEL SEQT= 0
DSNB999I  -DBP2 DSNB1DBP  SERVICE( 4 )OUTPUT
DSNB999I  -DBP2 4K PAGES 100
DSNB999I  -DBP2 1M PAGES 159900
DSN9022I  -DBP2 DSNB1CMD '-DIS BUFFERPOOL' NORMAL COMPLETION
```





✓ Application Changes - Access Path

- Most AP unchanged or better (>90%)
- Remaining AP REBIND after 2 weeks
 - N – IN list index scan
 - IN – IN list direct table access
 - NR – Range-List index scan
- OPTIMIZE FOR 1 ROW very high CPU usage
 - Result set much larger than 1
 - Removed optimize clause
 - DB2 V10 will not use access paths with sorts
 - New ZPARM OPT1ROWBLOCKSORT





✓ Problems DB2

- **LOB object invalid in DSNTIJPA**
 - due to old DB2 V8 problem
 - Not a real problem but DROP/CREATE done to solve it
- **REBIND automatically done between V9 and V10 subsystem**
 - Due to AUTOBIND=YES ZPARM
 - AUTOBIND=COEXIST can bypass this
- **MSTR high CPU usage in some cases, extra maintenance**
- **S0C4 Abend in V9 package, solved with rebind (PM64485)**
- **ALTER INDEX BP(X) to BP(Y)**
 - Problem in IMS due to REASON 00C200BB
 - Mismatch in buffer pool
 - STOP/START of DB2 where command was issued
 - Open APAR PM72201 no fix available (target 31/12/2012)





✓ Problems Vendor Tools

- **BMC SQL-Apply**
 - **AUTHORIZATION EXIT ROUTINE - fixed by BPU4604**
- **BMC UNLOAD Plus**
 - **Security problems**
- **BMC Change Manager / Catalog Manager**
 - **Volatile**
 - **MEMBER CLUSTER**
 - **SEGSIZE 0**
- **BMC REORG**
 - **Corrupted data**
 - ❖ **rows lost - fixed by BPU4573**
 - ❖ **UPDATE of Decimal field**
 - **S0C4 in SHRLEVEL REFERENCE**
 - **Timeout application Threads during REORG**





✓ **Problems Vendor Tools**

- **BMC Mainview for IMS**
 - **More then 10% overhead**
 - **Overhead is in APPL CPU**
 - **BQI12944 Solves the CPU Overhead**
 - **BQI1488 Solves the incorrect statistics in FA record**

✓ **Problems In-house Tools**

- **REXX programs**
 - **+361 when trying to do a second connection**
 - **Changed SQLcode checking**



Move to NFM



- ✓ **Planning**
- ✓ **Extra Maintenance**
- ✓ **Problems**

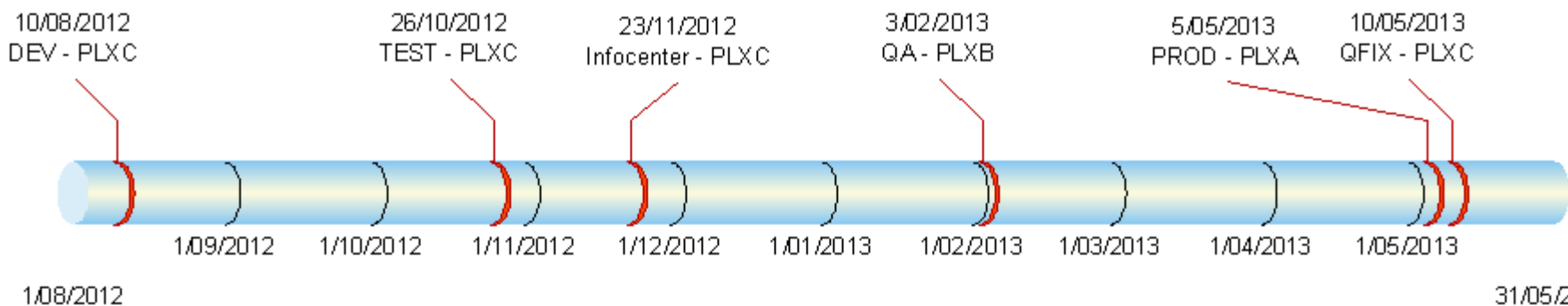


Move to NFM



✓ Planning

New functions mode
8/2012 – 5/2013





✓ Extra Maintenance

- **Several new ZPARM's**
- **DPSEGSZ=0 for compatibility**
- **CATMAINT in maintenance**
 - **CATMAINT UPDATE UNLDDN PM55333**





✓ Problems

- **Implicit casting**
 - Active after NFM
 - Not dependent on DECP
- **SYSDBASE Failed Catmaint convert**
 - At restart : **CONVERSION PHASE PREVIOUSLY COMPLETED**
 - No cleanup done/No IC taken
 - IC at ENFM000B step of restart
 - Cleanup will be checked/done in DSNTIJNF



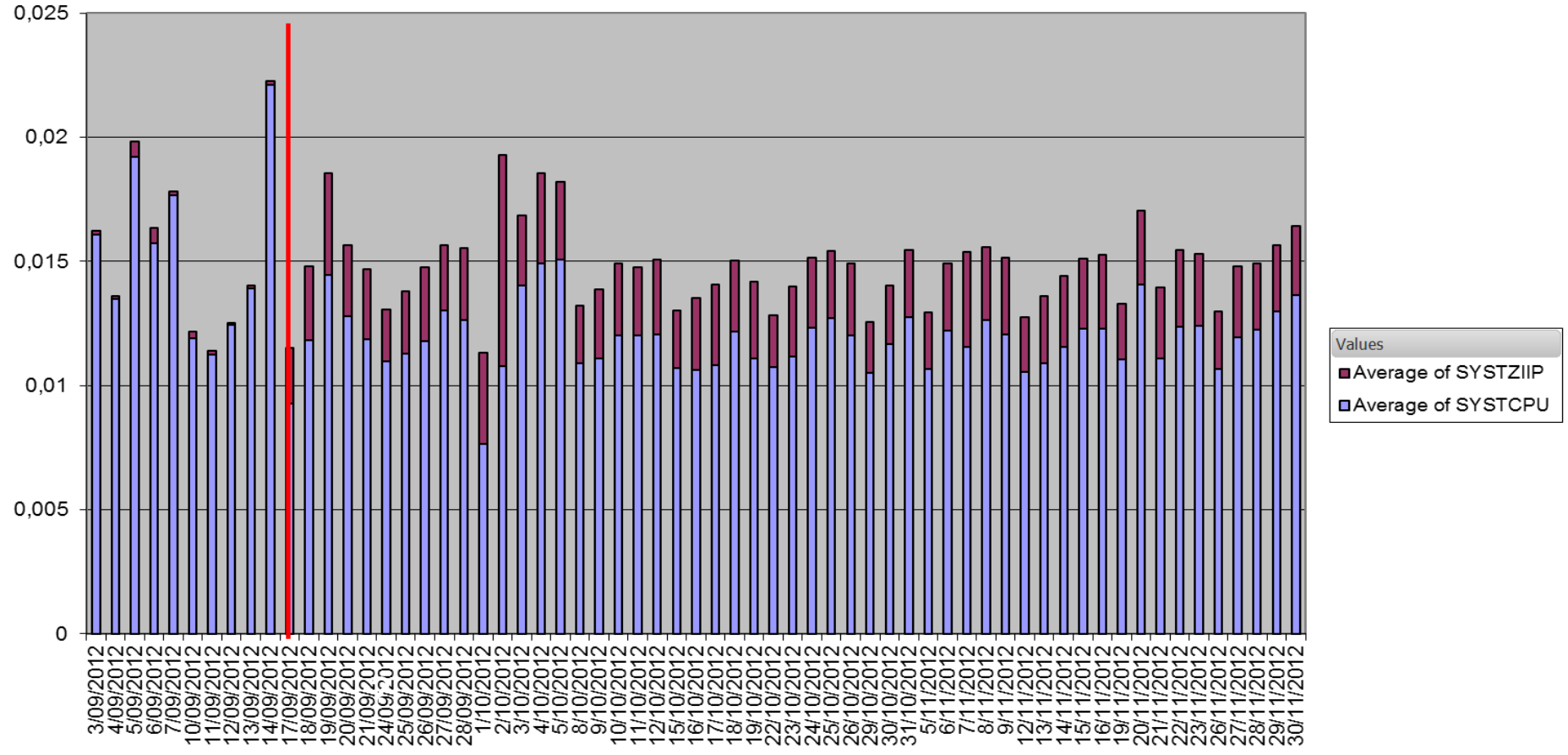
System monitoring



✓ STC CPU average Data Sharing Group BNP

MEMBERNAME ▾ WDAY ▾ COMPANY ▾

Average of SYSTCPU Average of SYSTZIIP



DATE ▾



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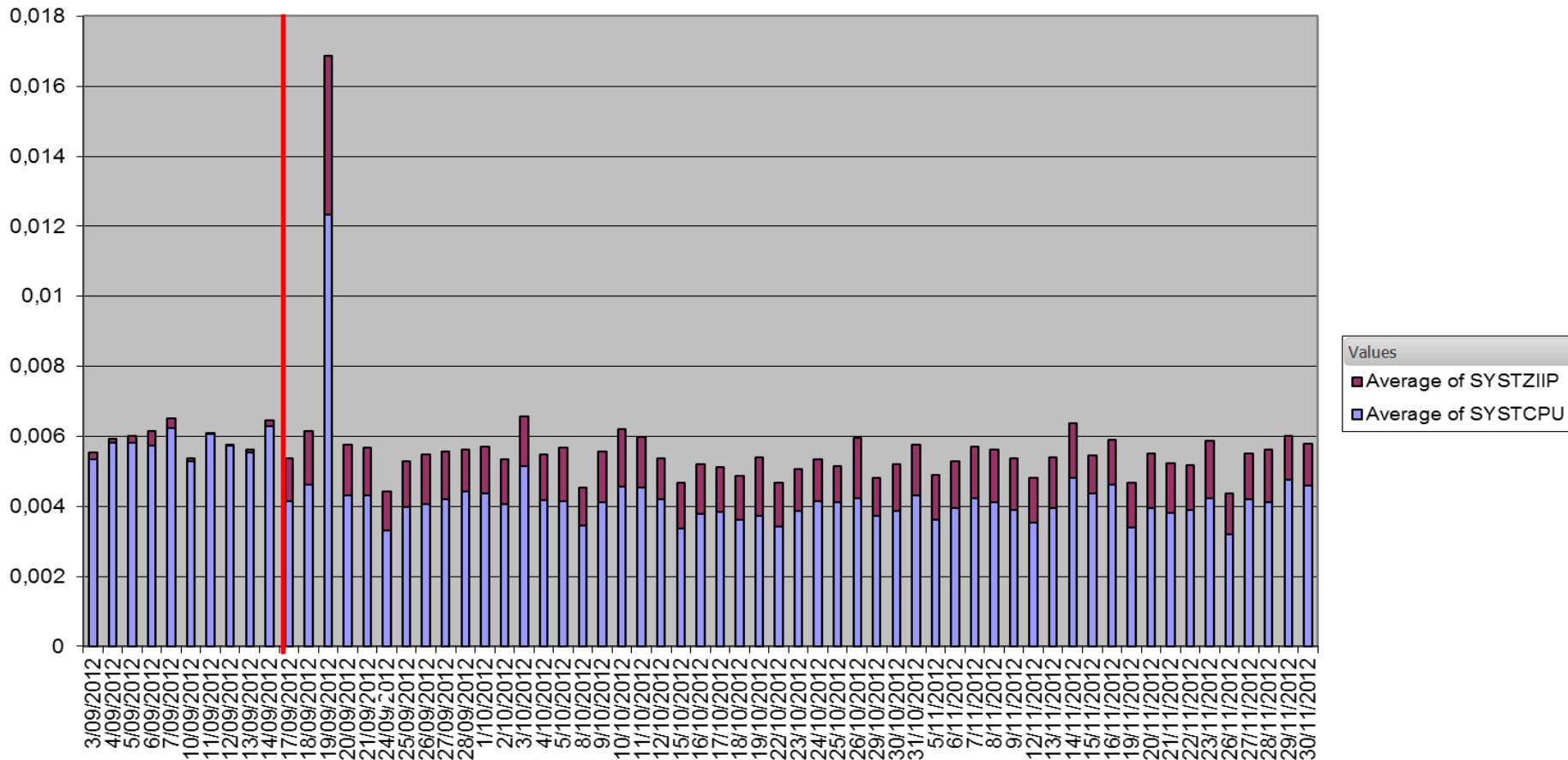
System monitoring



✓ STC CPU average One Subsystem

MEMBERNAME ▾ WDAY ▾ COMPANY ▾

Average of SYSTCPU Average of SYSTZIIP



DATE ▾



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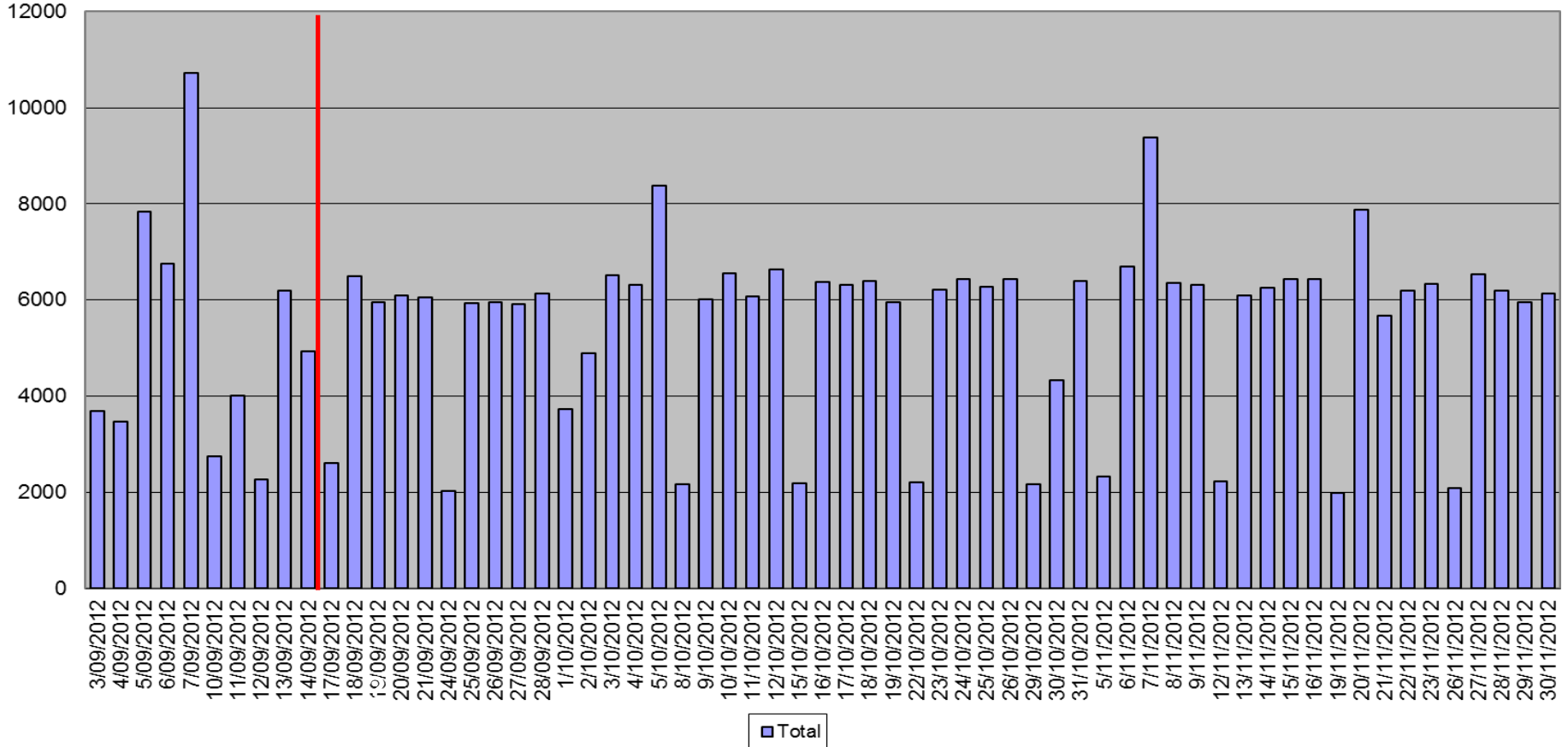
System monitoring



✓ Total Getpage average Data Sharing Group BNP

MEMBERNAME PERIOD COMPANY WDAY

Average of GETPAGES



DATE



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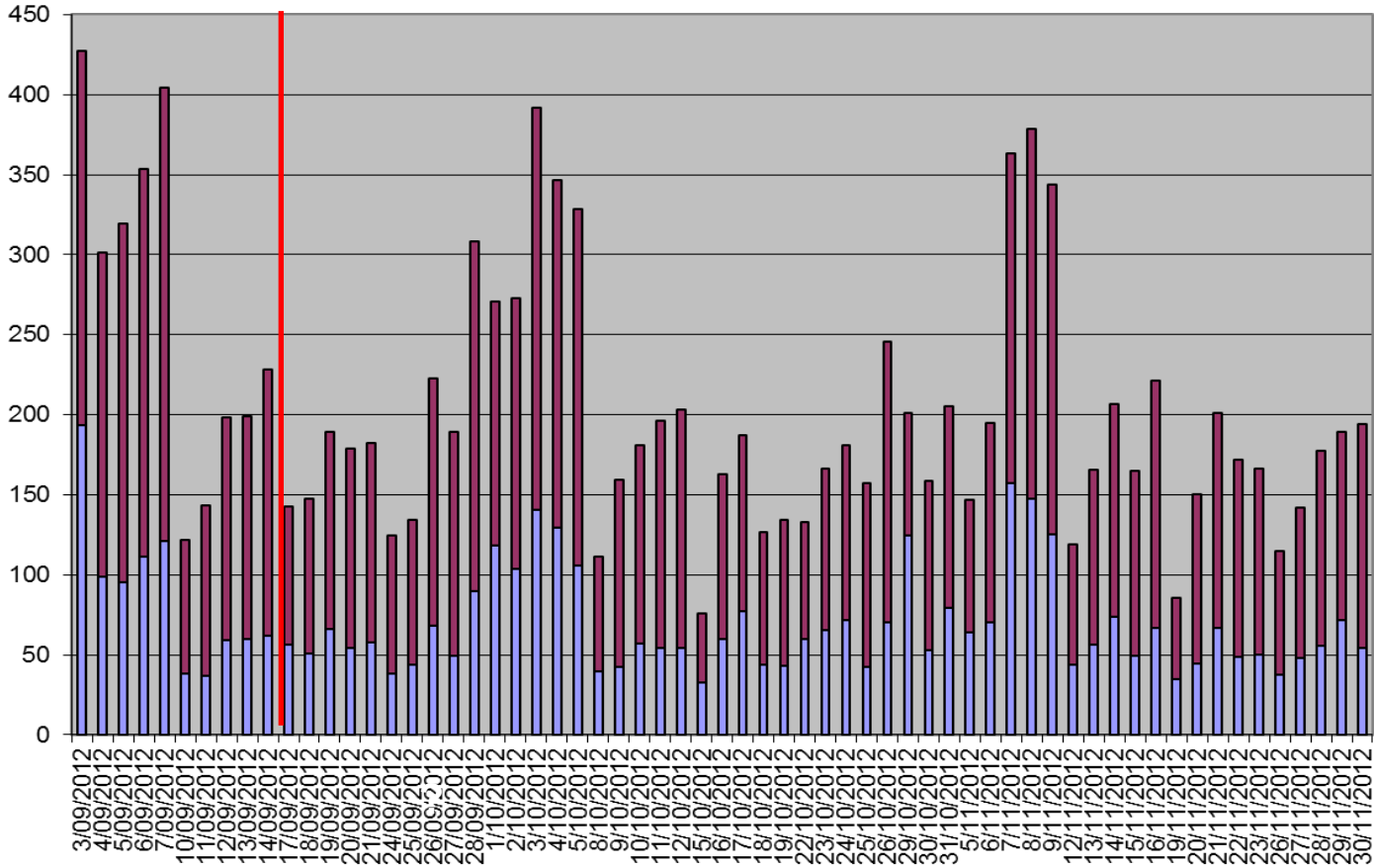
System monitoring



✓ Read average Data Sharing Group BNP

MEMBERNAME COMPANY WDAY

Average of SYNC_PAGES_READ Average of ASYNC_PAGES_READ



Values

- Average of ASYNC_PAGES_READ
- Average of SYNC_PAGES_READ

DATE



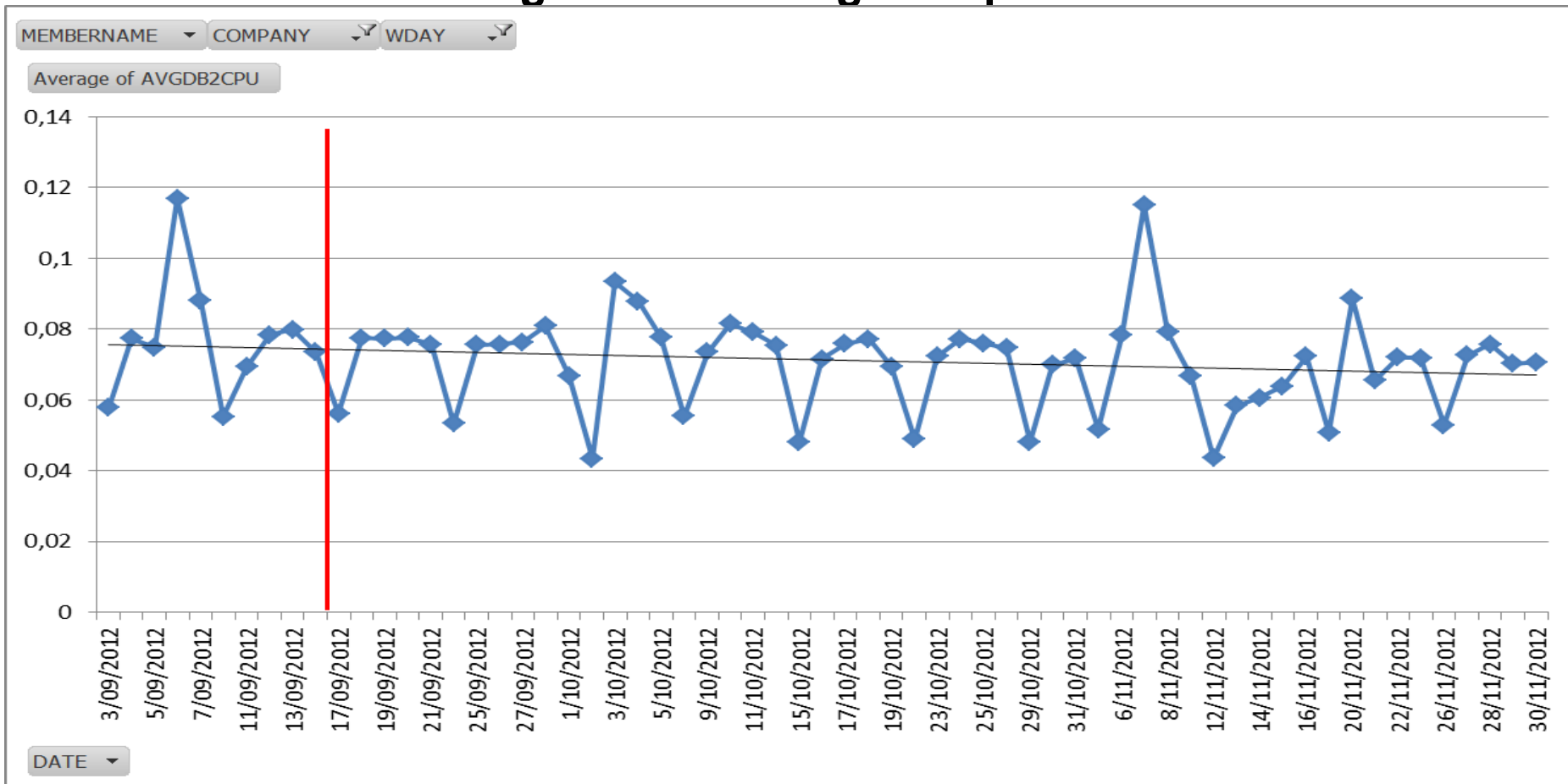
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System monitoring



✓ Total DB2 CPU average Data Sharing Group BNP



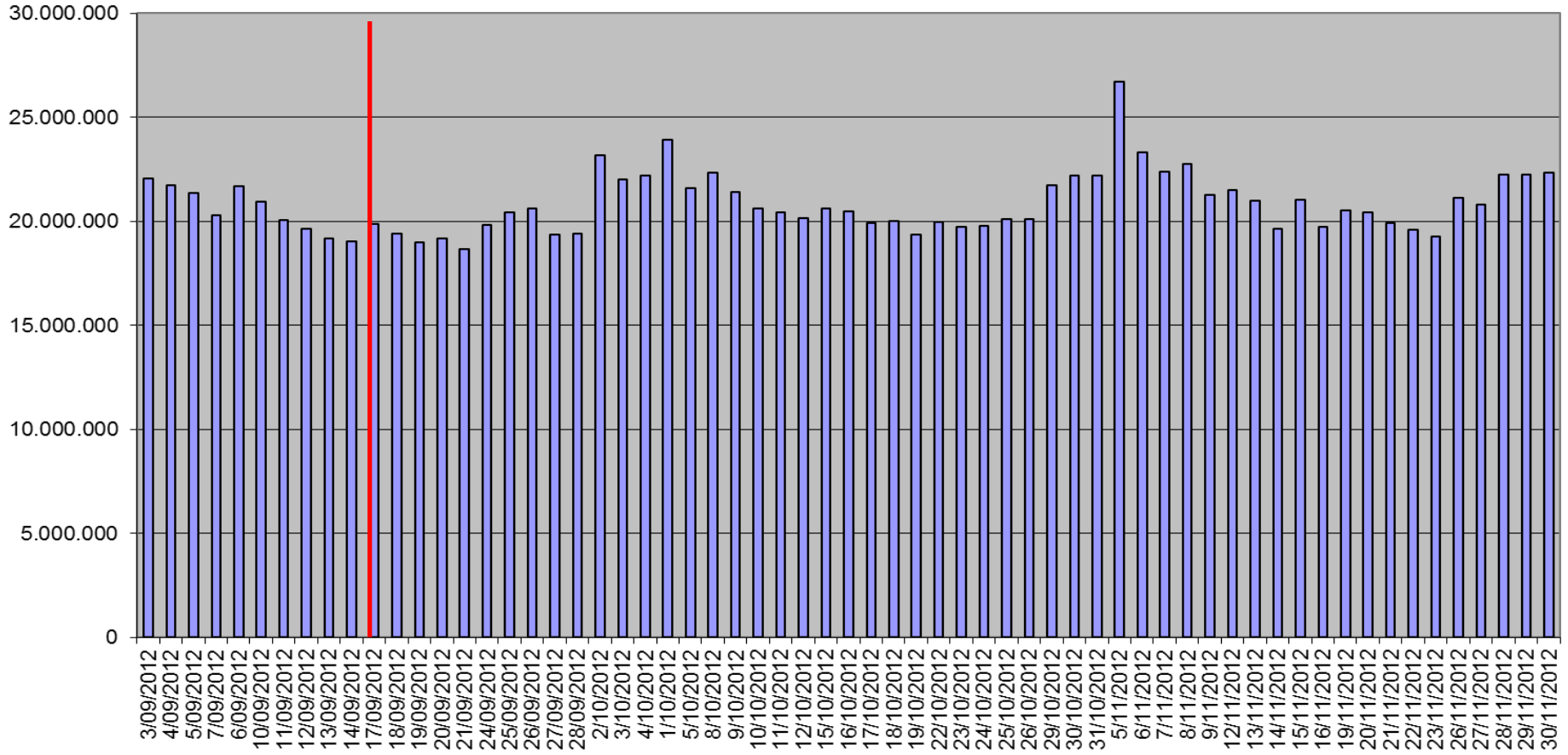
System monitoring



✓ DB2 Online Transactions Data Sharing Group BNP

MEMBERNAME COMPANY WDAY

Sum of THREADS



DATE

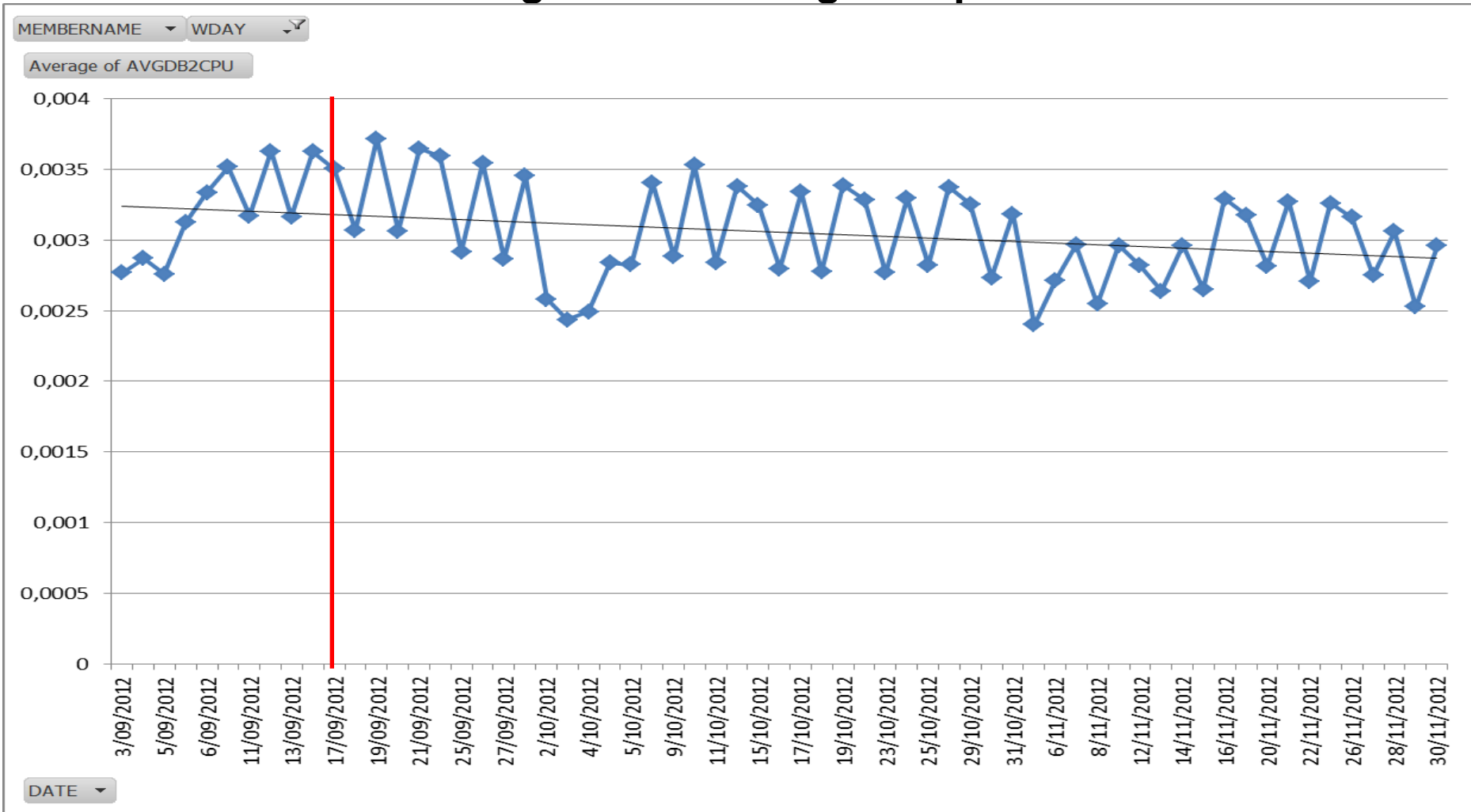


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System monitoring

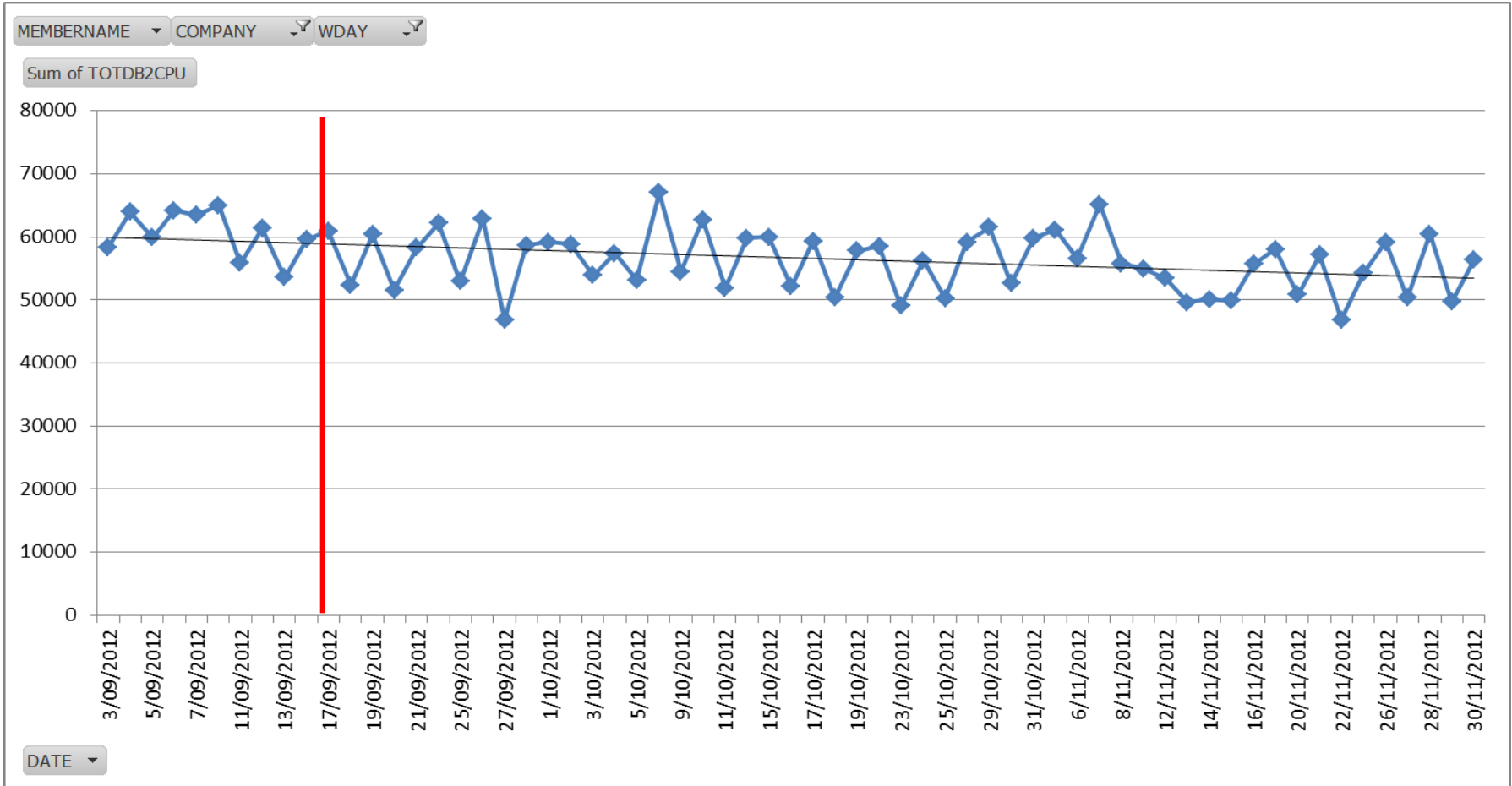
✓ Online DB2 CPU average Data Sharing Group BNP



System monitoring



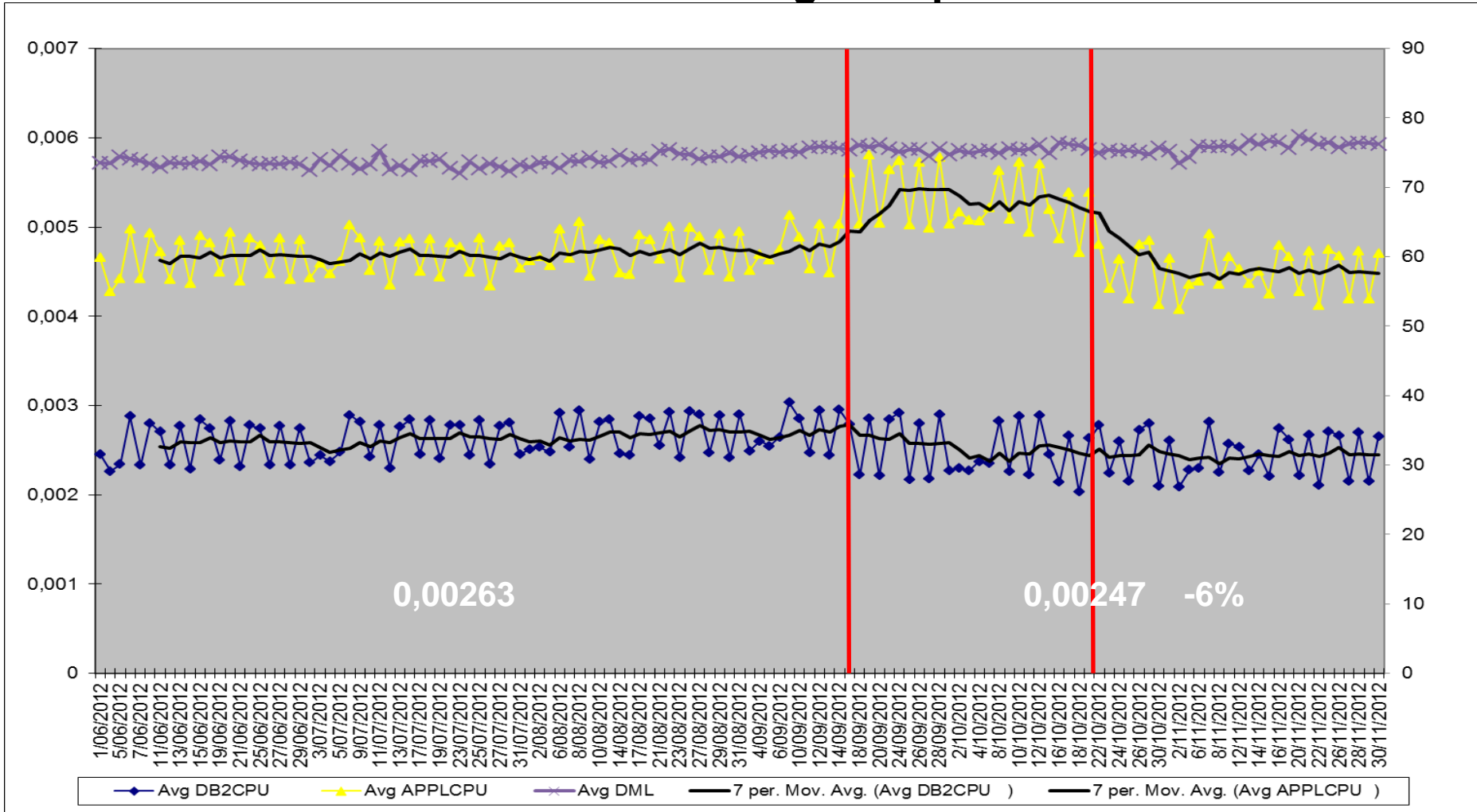
✓ Online DB2 CPU Total Data Sharing Group BNP



System monitoring



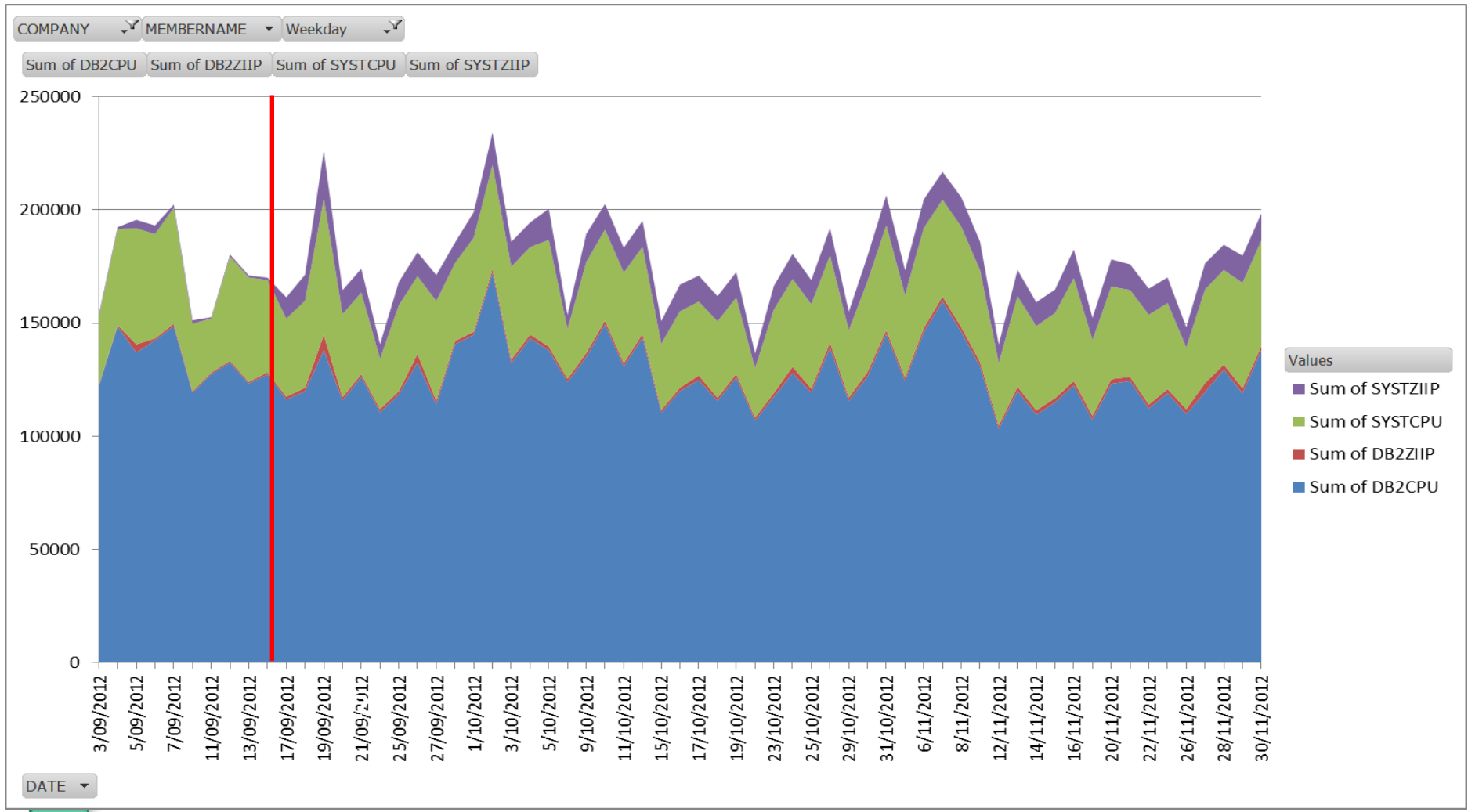
✓ One Online Transaction Data Sharing Group BNP



System monitoring



✓ Total DB2 CPU Data Sharing Group BNP



System monitoring



✓ Total DB2 CPU Data Sharing Group BNP

	DB2 CPU	STC CPU	DB2 ZIIP	STC ZIIP	CPU	ZIIP
V9	132.841	40.767	1.047	1.573	173.608	2.620
V10	126.774	37.997	1.942	11.154	164.771	13.096
	95,43%	93,21%	185,48%	709,09%	94,91%	499,85%



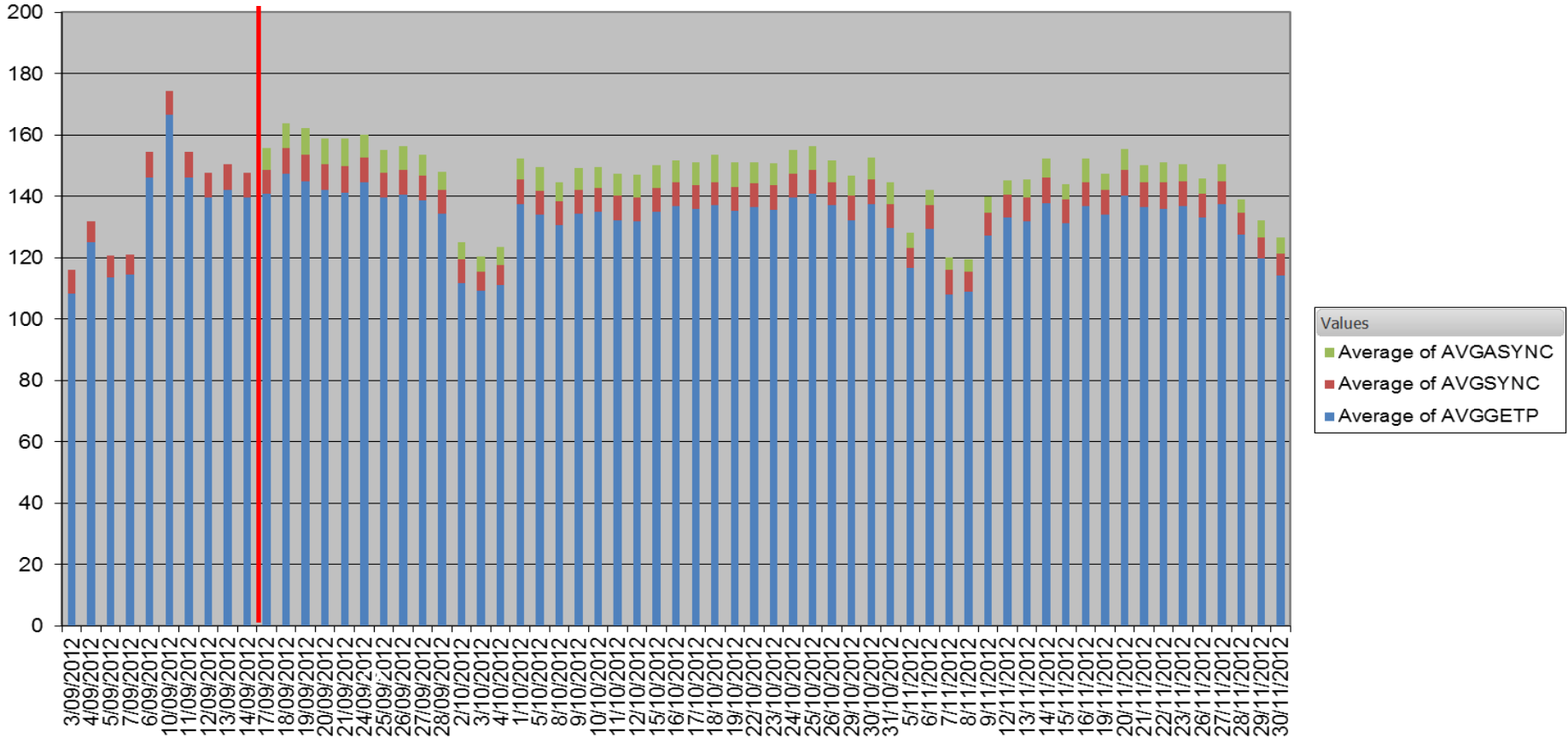
System monitoring



✓ Online DB2 average I/O Data Sharing Group BNP

MEMBERNAME COMPANY WDAY

Average of AVGGETP Average of AVGSYNC Average of AVGASYNC



DATE



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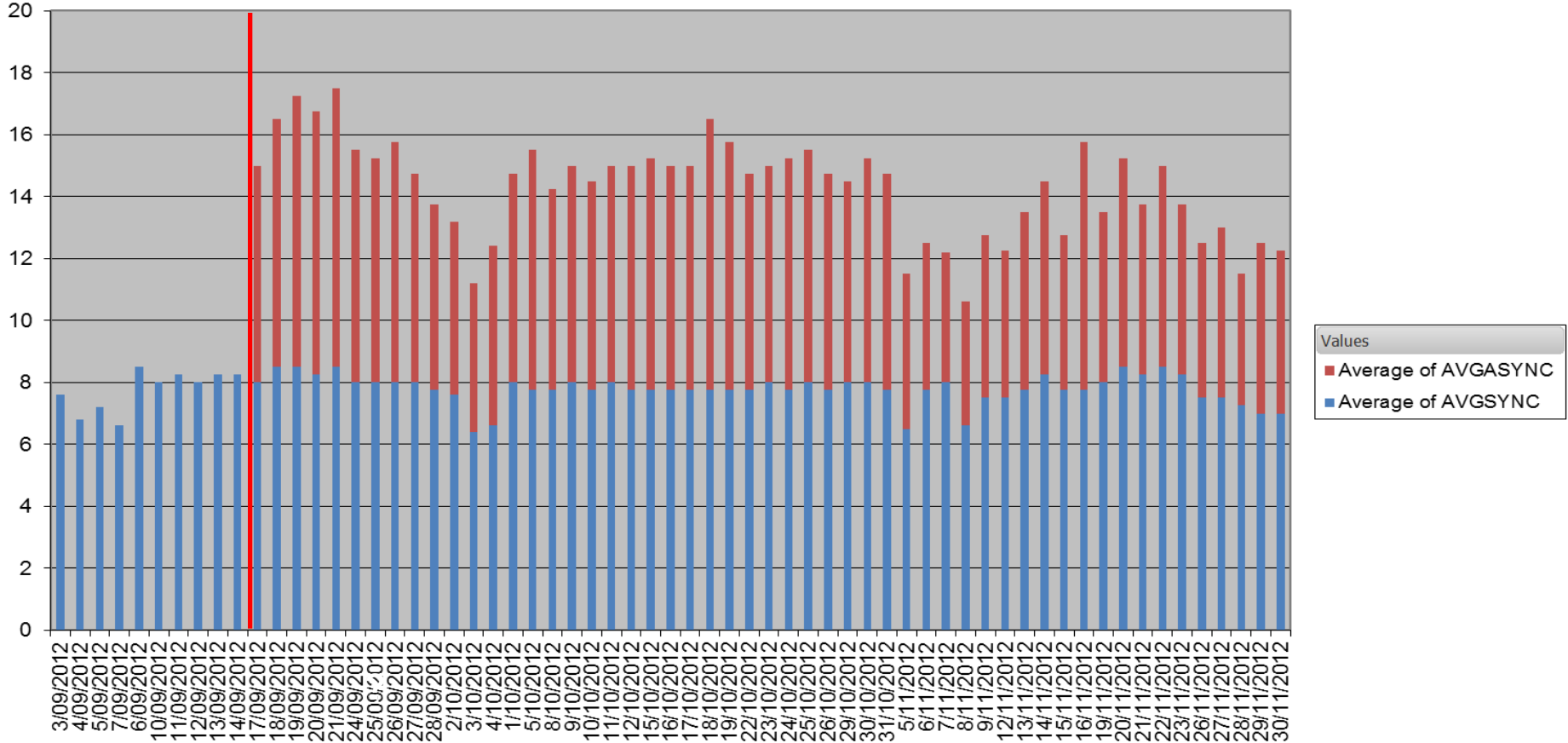
System monitoring



✓ Online DB2 average I/O Data Sharing Group BNP

MEMBERNAME COMPANY WDAY

Average of AVGSYNC Average of AVGASYNC



DATE



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