Performance Improvement on DB2 Server for VSE/VM version 7.5

World Alliance of VM and VSE 2008

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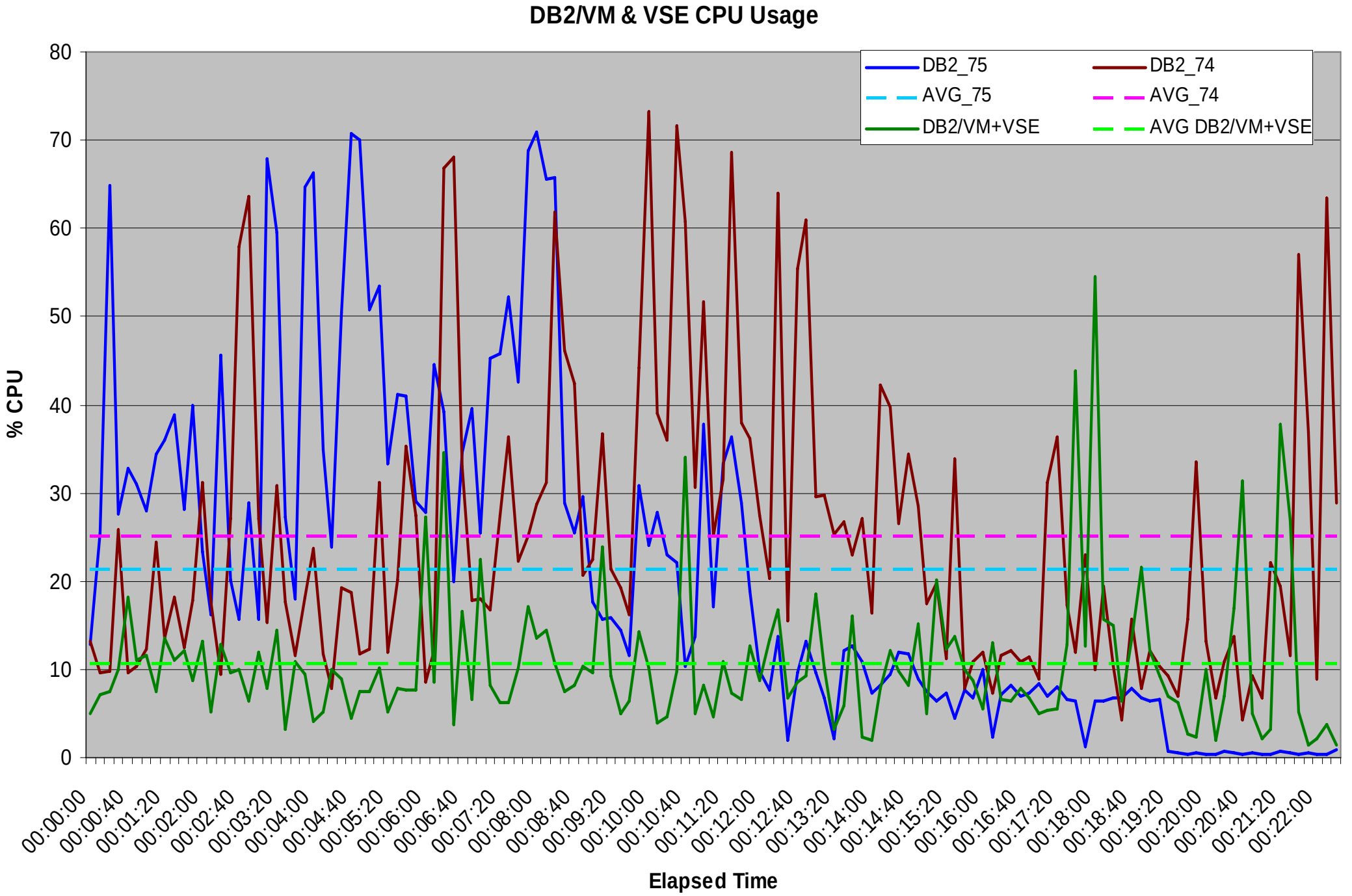
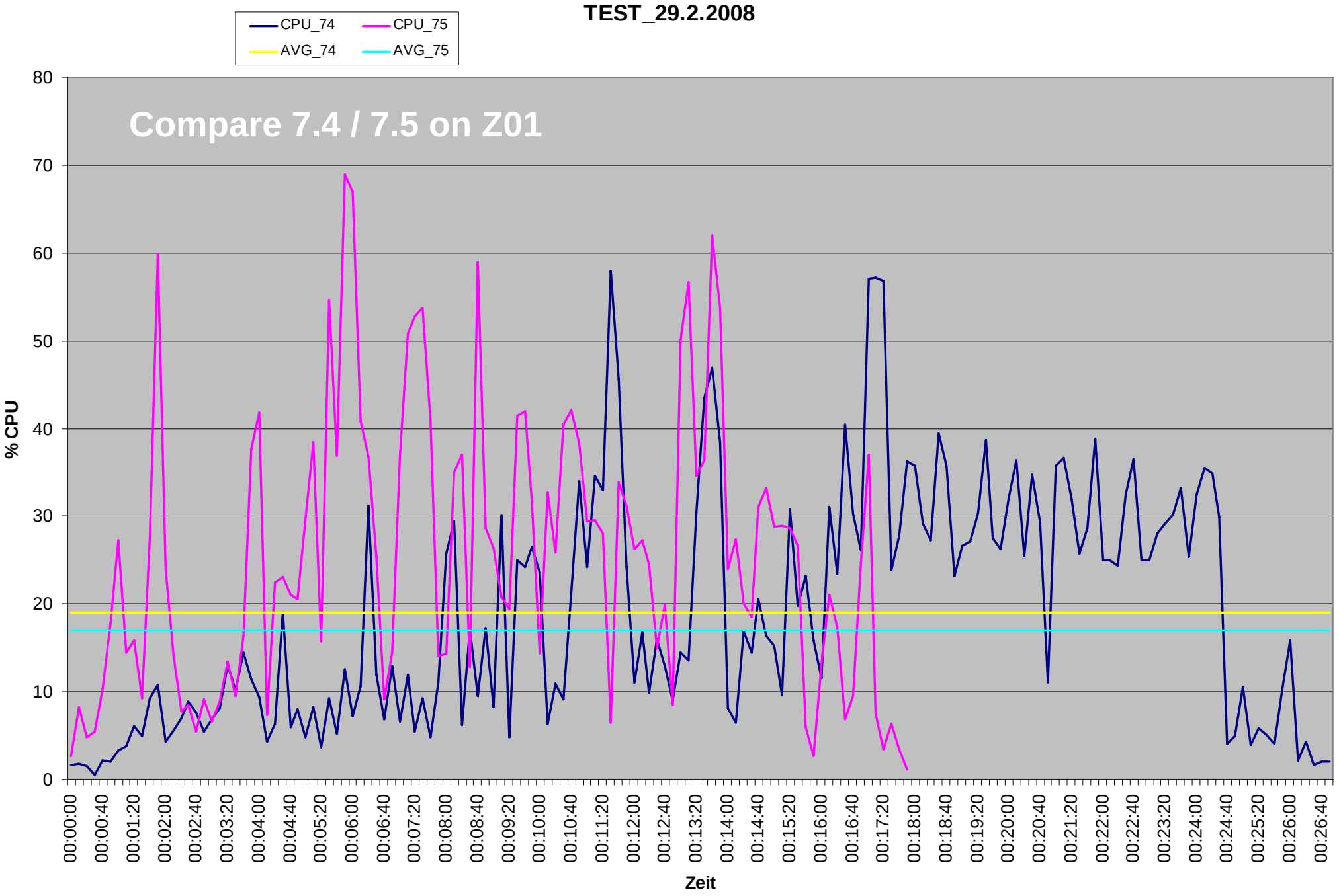
Agenda

- DB2 7.5 Proof of Concept – Results
- Benefits of DRDA Communication Performance Enhancements
- Multirow Insert or Buffered Insert over DRDA – An inside out analysis
- Connection Pooling – An inside-out analysis
- Related APAR's and technotes

DB2 Load Test - Results

- Test duration varied
  - No remarkable changes in response time!
  - DB2/Linux DB access at least as performant as DB2/VM
  - Duration changed due to user experience in repeating the same scenario 3 times
- Concurrency of application execution varied
  - 2. test with DB2/VSE 7.4: 6 links used at the same time
  - 3. test with DB2/VSE 7.5: 10 links used concurrently

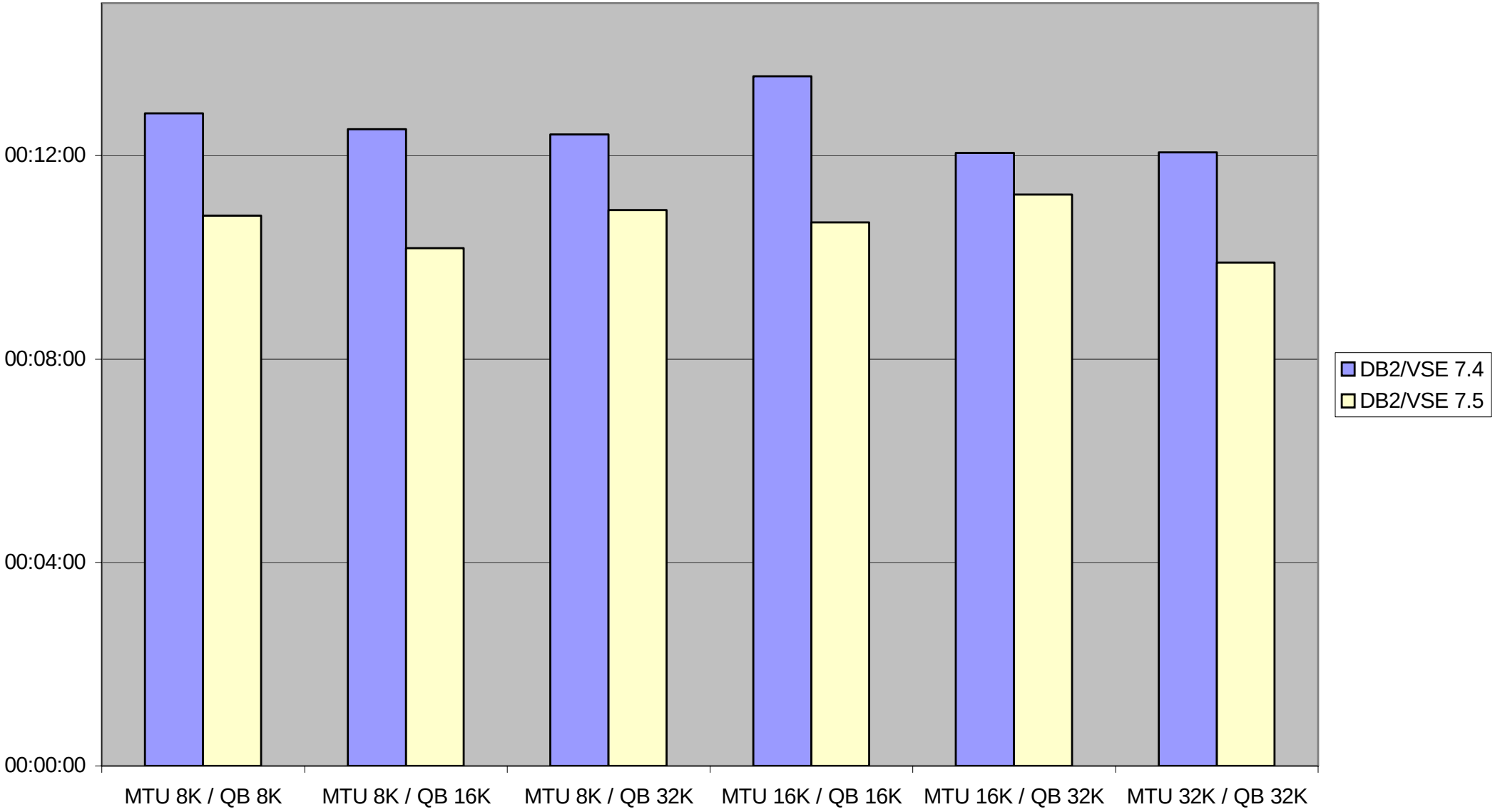

DB2/VM & VSE CPU Usage
% CPU
Elapsed Time
DB2_75
DB2_74
AVG_75
AVG_74
DB2/VM+VSE
AVG DB2/VM+VSE
0
10
20
30
40
50
60
70
80
00:00:00
00:00:40
00:01:20
00:02:00
00:02:40
00:03:20
00:04:00
00:04:40
00:05:20
00:06:00
00:06:40
00:07:20
00:08:00
00:08:40
00:09:20
00:10:00
00:10:40
00:11:20
00:12:00
00:12:40
00:13:20
00:14:00
00:14:40
00:15:20
00:16:00
00:16:40
00:17:20
00:18:00
00:18:40
00:19:20
00:20:00
00:20:40
00:21:20
00:22:00


TEST_29.2.2008
CPU_74
CPU_75
AVG_74
AVG_75
Compare 7.4 / 7.5 on Z01
% CPU
Zeit
0
10
20
30
40
50
60
70
80
00:00:00
00:00:40
00:01:20
00:02:00
00:02:40
00:03:20
00:04:00
00:04:40
00:05:20
00:06:00
00:06:40
00:07:20
00:08:00
00:08:40
00:09:20
00:10:00
00:10:40
00:11:20
00:12:00
00:12:40
00:13:20
00:14:00
00:14:40
00:15:20
00:16:00
00:16:40
00:17:20
00:18:00
00:18:40
00:19:20
00:20:00
00:20:40
00:21:20
00:22:00
00:22:40
00:23:20
00:24:00
00:24:40
00:25:20
00:26:00
00:26:40

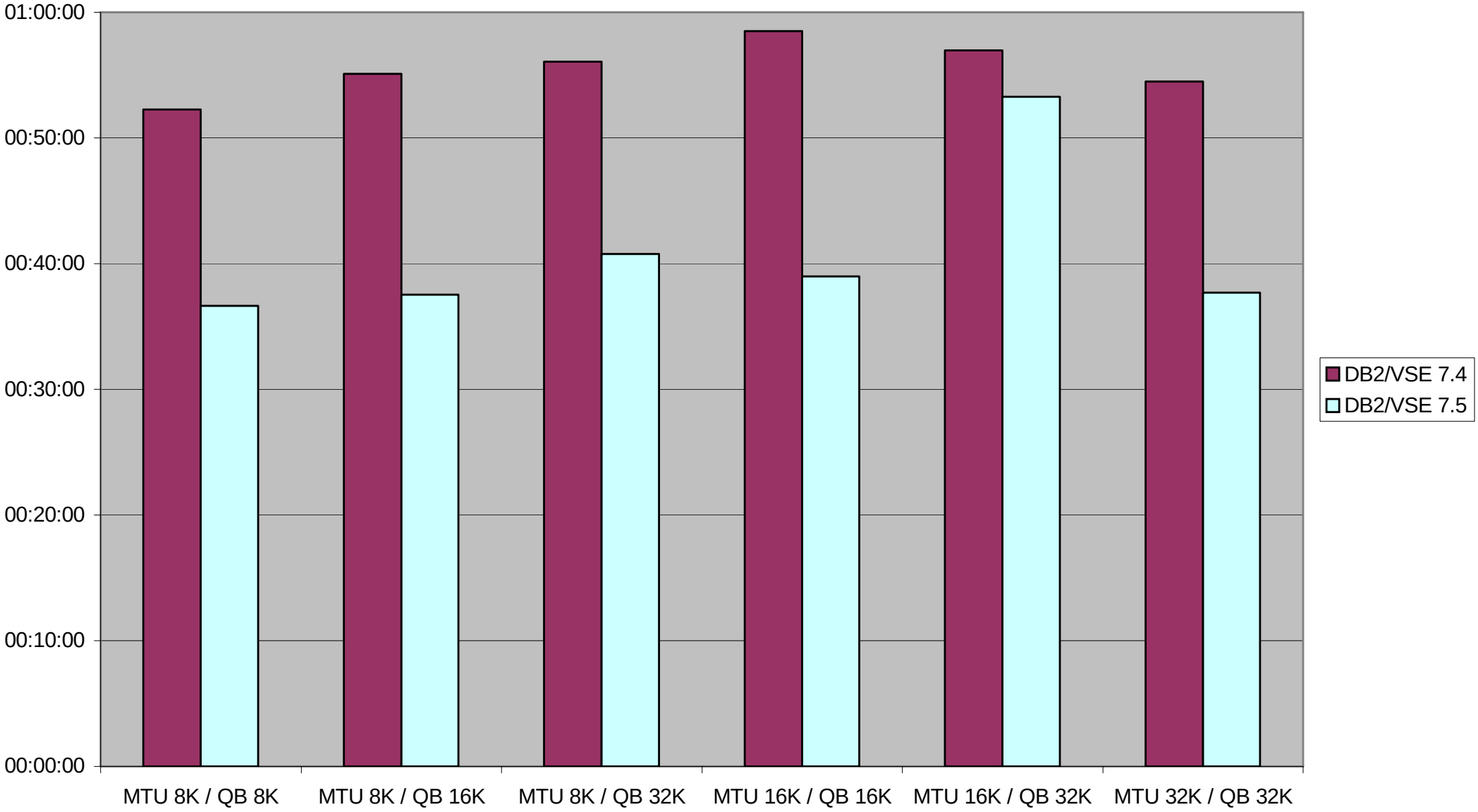
DB2 Batch Test

- Batch tests with 7.4 / 7.5 and different MTU-Size and/or query block size for
  - DBSU
  - Customer application
- Read only applications

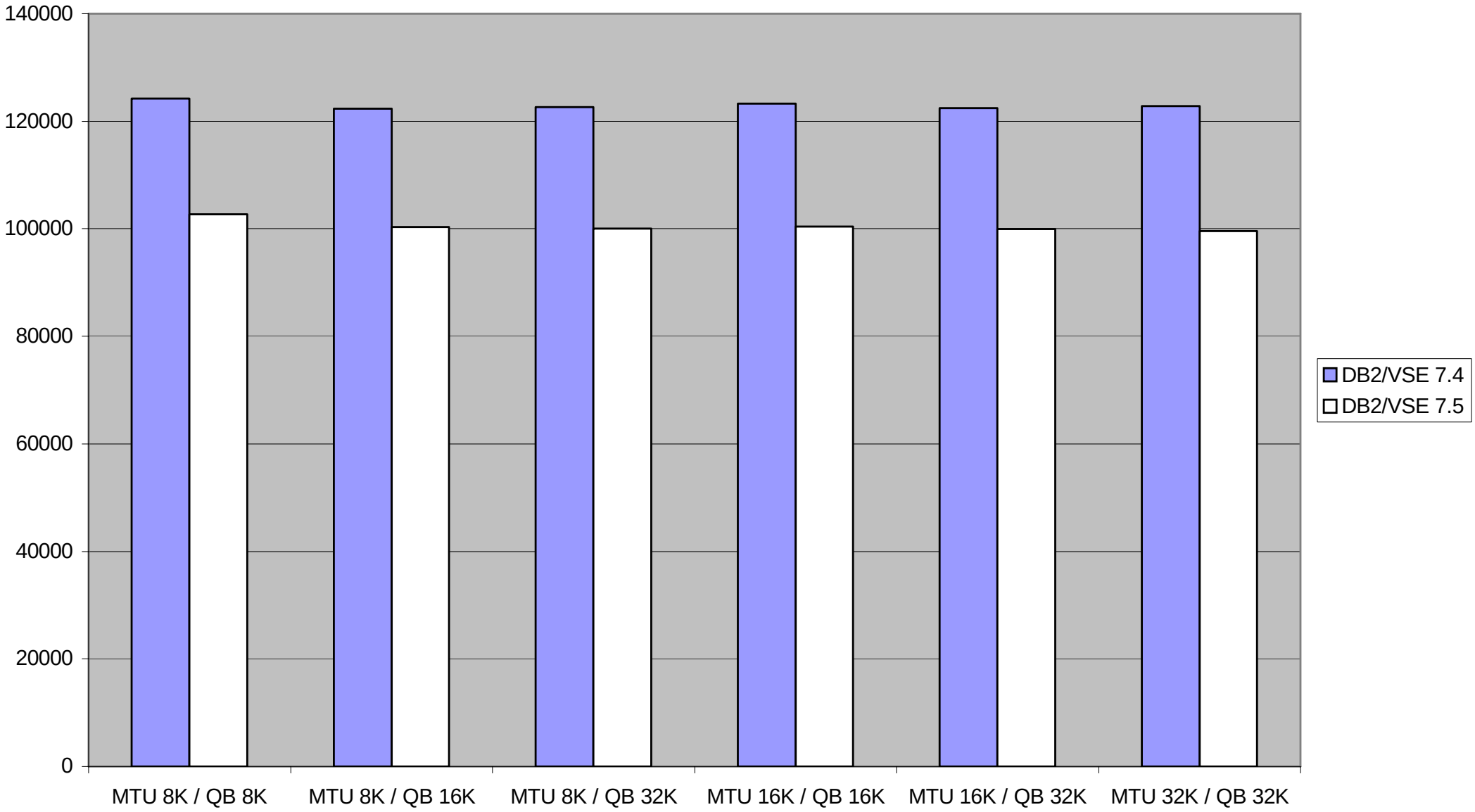
Laufzeit DBSU



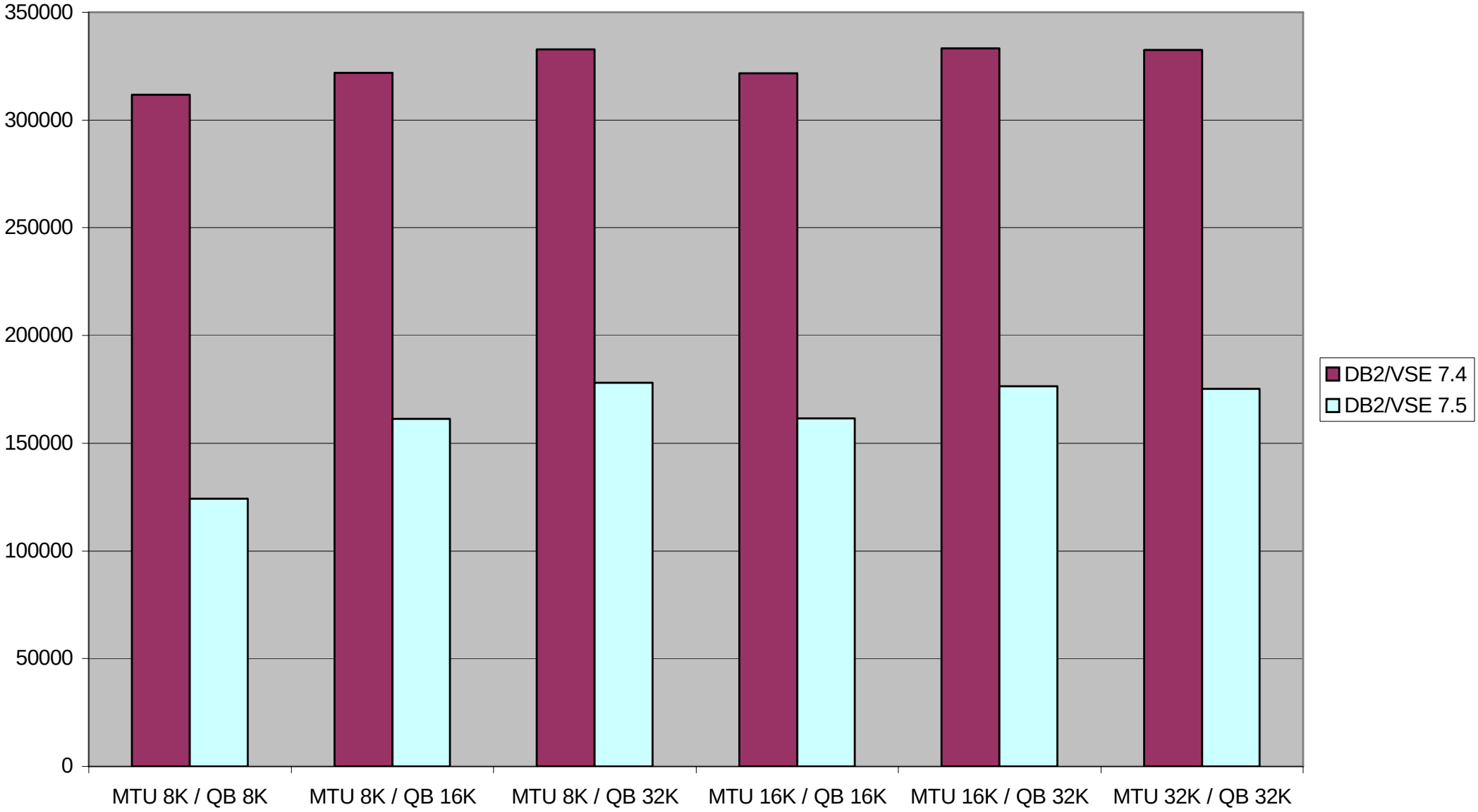
Laufzeit Applikation



CPU Verbrauch DBSU



CPU Verbrauch Applikation



DB2 7.5 PoC - Conclusion

DB2/VSE 7.5 Client Edition

- Gives some relief in CPU usage
  - nearly 20% relative to the average usage with 7.4
- A higher concurrency didn‘t cause higher (peak) CPU usage
- Peak CPU usage increased by 30% relative to DB2/VM
  - 17 % increase in total (with 7.5)
- Batch jobs show dramatic differences in CPU usage and runtime comparing 7.4 to 7.5 on VSE
  - DBSU about 20% less CPU relative to 7.4
  - Application about 50% less CPU relative to 7.4

DRDA Communication Performance Enhancements

Benefits of this feature: (Enhanced communi-cation via TCPIP CSI Assembler Interface)

-8 to 10 % faster response time

-Leaner code size for Batch and Online Resource Adapter

Multirow Insert or Buffered Insert over DRDA

Benefits of this feature:

-DBSU DATALOAD performance improved **10 times !!**

-Similar Performance for Batch Applications with Homogenous INSERTs

-PUT calls like INSERTs calls also can reap the benefit of this feature

Multirow or Buffered Insert in DB2 on VSE – An Inside-out analysis

- Target users
- Usage Considerations and Limitations
- Recent Updates and Fixes
- More information on this feature

Mutirow Insert Target Users

This feature can be leveraged by

- *VSE Batch applications over DRDA via TCP/IP*
- *VM Applications over DRDA via TCP/IP*
- *Database Service Utility (DBSU) DATALOAD facility*
- *NOT usable for Online users applications* including *ISQL* running on
- *NOT usable for ISQL application on VSE and VM*

MRI Usage Considerations and Limitations

Mutirow has following restrictions

- COMMIT must be issued after a batch of INSERTs otherwise there could be data integrity issues
- AUTOCOMMIT option is disabled for Buffered Inserts
- Batch of INSERTS followed by non COMMIT statement might result in an incorrect SQLCODE for the non COMMIT statement that follows INSERTS

Recent Updates and Fixes for MRI

Recent APARs/Fixes available are

- PK60655 - Fixes dropped or missing rows when inserting rows by application prepped with IBLK parameter or using DATALOAD function in DBSU after applying multirow APAR

- No local fixes.

More information on this feature

- PK48616 – Documentation support for mutlirow
- Click here Technote for PK48616 for in depth technical information about using Multirow.

Connection Pooling for Online Users

Benefits of this feature:

- Subsecond response time for User transactions, if a connection is free to be allocated
- UserID switching is no more slow and happens in a blitz
- Large VSE Online applications with database accessing routines which perform CONNECT on every entry are the most benefitted

Connection Pooling Target Users

Connection pooling feature can be leveraged ***only*** by

- *Online users applications* including *ISQL* running on
- *CICS for VSE* connecting to
- *Remote Server via TCP/IP*

Connection Pooling Usage Considerations and Limitations

User locks on TCP/IP link **and** a pseudo agent unlike in private protocol only pseudo agent is locked for a user. This causes the link to not be sharable until

- CICS transaction *TERMINATES*
- User *switches* to another database by issuing a CONNECT *TO*
- User issues COMMIT *WORK RELEASE*

Connection Pooling Usage Considerations and Limitations

Wrong userid/password information causes the TCP link to get closed by the DB2 LUW server.

- This leaves a bad link in the connection pool.
- Bad link is replenished *after the error*
- The next CONNECT that uses this link will go through fine.
- But this link reestablishment *causes performance slowdown.*

Recent Updates and Fixes for CP

Fixes are available for

- S0C4 in CICS user transaction after connection forced by the server
- Implicit Connect failing with -933 with connection pooling
- CICS/ESA customization
- Connect gets -933, if done 3 minutes after CIRB
  - DB2/LUW V8 introduced DB2_SERVER_CONTIMEOUT in FP12 with default of 3 minutes (in V9 since GA)
  - DB2_SERVER_CONTIMEOUT = 0 must be set!

    (V8: LI72085 / V9: IZ07458)

More information on this feature

- APAR PK44744 - Documentation APAR for connection pooling
- APAR PK25367 – Connection Pooling feature code cover letter
- Write to DB2VSEVM@ca.ibm.com for specific questions on the feature.
- http://www.vm.ibm.com/education/lvc/lvc7db2.pdf

Local fixes available for a few known problems in DB2 Server for VSE and VM 7.5

- 0C4 in 4DD2 in ARI0OLRM and CICS termination due to AMODE/RMODE difference between application and VSE DB2 RA (PK61361)
- PWUPPER keyword missing while building the DBNAME directory
- 0C4 in ARI0OLRM when a connection is forced by the server in the connection pool and RMID not found error during CIRB (PK61361)
- 0C4 during Autocommit at the end of a batch job (PK61361)
- File Open error during VSE Batch RA trace (PK61959)

Q & A

Thank You.

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