

DB2 Server for VSE&VM Tips, Tricks, and Techniques

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Agenda

- ◆ Performance keys
- ◆ The performance hierarchy
 - Hardware and operating system
 - DB2 configuration
 - Data model
 - Application design
- ◆ Case studies

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Performance keys

- ◆ Design performance into your applications
- ◆ Optimize all of the components
- ◆ Gather information – establish a baseline
- ◆ And monitor, monitor, monitor

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Design performance in...

- ◆ Don't use system defaults
 - Use lots of Storage Pools
 - Accounting/chargeback
 - VMDSS
 - Recovery
 - Increase NPAGBUF, NDIRBUF, CHKINTVL
 - Real world example
 - BTW, change the SQLDBA password

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Design performance in...

- ◆ **EXPLAIN everything**
 - Use **ARISEXP MACRO Q**
 - **Imbedded SQL** – use precompile option
 - **Dynamic SQL**
 - Capture using ISV tools
 - Ask users for their “Top 10”

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Gather information...

- ◆ **System catalog tables**
 - **SYSTEM.SYSCATALOG**
 - CREATOR, TNAME, CLUSTERTYPE, AVGROWLEN, ROWCOUNT, NPAGES, NOVERFLOW, Timestamp
 - **SYSTEM.SYSINDEXES**
 - ICREATOR, INAME, CLUSTER, CLUSTERRATIO, FIRSTKEYCOUNT, FULLKEYCOUNT, NLEAF, NLEVELS, Timestamp

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Gather information...

- ◆ COUNTER data
 - Use CTCBL MACRO K
 - Use RXSQL
 - Extract to flat-file, then load
 - Periodic snapshots (every 5 minutes to 1 hour)
 - Reset daily

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Gather information...

- ◆ Accounting data
 - Jobname/VM userid
 - DB2 connect userid
 - Connect time (seconds)
 - Processor time (milliseconds)
 - Page buffer looks
 - Timestamp

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Gather information...

- ◆ CPU utilization and system paging
 - CP IND command
 - VSE/ESA or third-party vendor tool

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Monitor

- ◆ Periodically look for changes in data captured
- ◆ Chart or graph to spot trends
- ◆ Use Control Center to trigger reorgs
- ◆ Use CA-VM:DB/Monitor for real-time problem determination

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Performance hierarchy

- ◆ Hardware
 - More memory – real and virtual
 - Minidisk, VSAM dataset placement
 - Real world example
- ◆ Operating system
 - VMDSS
 - DCSSs for multiple database machines

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DB2 configuration

- ◆ Key COUNTER ratios
 - DBSSCALL/RDSCALL increase without bound – unless...
 - WAITLOCK/BEGINLUW minimize
 - DEADLOCK/BEGINLUW minimize
 - LPAGBUFF/PAGEREAD increase without bound
 - LDIRBUFF/DIRREAD increase without bound

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DB2 configuration

- ◆ COUNTERs to monitor
 - `CHKPOINT` adjust `CHKINTVL`
 - `ESCALATE` adjust `NLRBS`, `NLRBU`

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Data model

- ◆ Tune indexes
 - Put most selective column first in composite indexes
 - Make sure you have the right clustering index
 - Eliminate indexes you don't use
 - `SYSTEM.SYSUSAGE`
 - `EXPLAIN` tables

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Data model

- ◆ One table per DBSpace almost always
- ◆ Avoid joins – denormalize
- ◆ Table design
 - VARCHARs placed last use sparingly
 - Place columns that change together adjacent

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Application design

- ◆ DB2 is not “VSAM on steroids”
 - Real world examples
- ◆ The best I/O is the one you don't perform
- ◆ Consider stored procedures
- ◆ No SELECT *

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Application design

- ◆ Keep LUWs as short as possible frequent commits
- ◆ Lock as little as possible ISOLATION CS
- ◆ Consider dynamic SQL vs. host variables

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Distributed applications

- ◆ Tune Isolation level and Blocking in drivers
- ◆ Issue frequent commits remember: pseudo-conversational
- ◆ Filter catalog tables on retrieval
- ◆ Use look-aside catalogs

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DBSU is an application

- ◆ Use COMMITCOUNT
- ◆ SET UPDATE STATISTICS off
- ◆ SET ISOLATION CS

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Don't forget!

- ◆ Update statistics on SYS0001, SYS0002 – SYS000n
- ◆ Periodic SQLCIREO
 - Take an archive first!
- ◆ Use DVERIFY SQLEND parm – especially before ARCHIVE

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Summary

- ◆ If you're not in a crisis, change one thing at a time and evaluate the results
- ◆ Start at the top of the “performance hierarchy” and work down – small changes can yield big dividends
- ◆ Remember: you're never done – new users, larger data volumes, new applications

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Warning!

- ◆ Withdrawal from service **January 31, 2001**
 - SQL/DS V3.5
 - DB2 Server for VSE&VM V5

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Resources

- ◆ www.thefillmoregroup.com
- ◆ www.software.ibm.com/data/db2/vse-vm

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