Improving VSAM Application Performance

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INNOVATION Data Processing
Providing a Long Line of Solutions...

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Agenda...

- **INTRODUCTION... INNOVATION who, why, what, how and what’s new**
- **IAM...** leverages the speed and efficiency of z Systems disk with zHPF IO support, including EMC VMAX, Hitachi VSP G1000 and IBM DS8000, to transparently accelerate VSAM application performance.

**NOTE: Click here for Animated Show View.**

Remember the excuse...
The Devil made me do it!

[Image of The Devil Made Me Do It sign]
Today it’s the Cloud, Big Data, Analytics, Mobile and Social...!

- z/VM and LINUX on z Systems
- GREATER AMOUNT OF DATA across
- A VERY LARGE NUMBER OF VOLUMES
- USE TECHNOLOGY to IMPROVE PERFORMANCE and EFFICIENCY
- AUTOMATE to ELIMINATE HUMAN ERROR

Who is INNOVATION Data Processing?

"INNOVATION... striving to be the best... offering products to the market that are faster, more efficient and easier to use... with the same functionality as any other’s solutions for z/OS, z/VM and Linux on z Systems."

Quite Simply... INNOVATION is Your Best Partner!

The INNOVATION Promise...

"when customers use INNOVATION Solutions in conjunction with anyone’s Enterprise Storage, INNOVATION Solutions make that storage perform at its very best."
INNOVATION Software Solutions make Enterprise Disk & Tape Storage look its very best...

FDR/ABR • FDRINSTANT • FDRPAS • FDRPASVM • FDRSOS • SOSINSTANT • FDR/UPSTREAM • RESERVOIR • IAM • FATSCOPY

Supporting...
EMC, Hitachi and IBM Disk Storage...
• Local Replication...
  – FlashCopy, Clone, TimeFinder, Snap, ShadowImage
• Remote Replication...
  – PPRC, SRDF, TrueCopy, GDPS, GDDR, (ConGroup)

Business Resiliency...
• SysPlex, HyperSwap/ AutoSwap, GDPS/GDDR
• EAV Large Volume and zHPF High Performance FICON...
  – PAV, Midaw, HyperPAV, EAV, zHPF

Supporting...
Data Domain, EMC, IBM and ORACLE Tape Storage Systems...
• FICON attach Physical Tape
• Virtual Tape Hardware Systems
• Mainframe Virtual Tape Software
• Data Reduction....
  – Compression
  – Data Duplication

Presented to

IAM
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What is IAM?

• Extremely Reliable High Performance indexed access method
  – Well established, over 40 years, with over a thousand licenses sold
• A transparent alternative to VSAM for batch and CICS applications
  – Supports KSDS, ESDS, RRDS and Alternate Index.
  – Delivers CPU time reductions, as well as I/O time and channel usage savings
  – Provides hardware or software data compression techniques
  – Minimizes manual tuning
• Continuously evolving to be responsive to customer needs

How does IAM Answer Today Challenges...
Cloud, Big Data, Analytics, Mobile and Social!

• GREATER AMOUNT OF DATA
• A VERY LARGE NUMBER OF VOLUMES
• USE TECHNOLOGY to IMPROVE PERFORMANCE and EFFICIENCY
• AUTOMATE to ELIMINATE HUMAN ERROR
What’s New in the New just released... IAM V9.2

- Performance Improvements... IAM V 9.2 improvements continue to demonstrate significant performance benefits over VSAM, even if VSAM files are SMS Extended Format using System Managed Buffering (SMB).
- New zHPF Channel Technology... z/HPF I/O instructions and IAM Enhanced Format Files, increase z Systems channel capacity, reducing channel connect time, batch application run time & CICS response time.
- Better Storage Memory Usage... New 64-bit virtual storage I/O buffers, can keep more files open concurrently, with no application changes.
- Transparently accept almost all VSAM RLS file control options.
- Greater scope and finer precision in reports tracking IAM usage

Continual Improvements for Better Performance...

IAM Performance Improvement Strategies
- Index in virtual storage eliminates index component I/O and buffers
- IAM Dynamic Real Time Tuning
  - Selects best buffer management technique
  - Decides on, acquires & manages an appropriate number of buffers
- Record based overflow eliminates I/O overhead of CI and CA splits
- Data Compression increases data transfer per I/O to reduce EXCP counts
Continual Improvements for I/O Performance Savings
SEA / Output Management Software TRMS Component

- TRMS Database Savings 80% reduction in I/O

I/O Savings make for a Better User Experience
Infor-Lawson Enterprise Resource Planning Application

- IAM Reduced VSAM EXCPS by 99%
Continual Improvements Lower Resource Consumption
Infor-Lawson Enterprise Resource Planning Application

• IAM Reduced CPU Time by 40.6%

What’s New in the New IAM...
Transparently Employ new zHPF Channel I/O Technology...

IAM’s use of z/HPF architecture I/O is automatic.
• A primary benefit of z/HPF is increased channel capacity, typically a reduction in channel connect time.
  • IAM zHPF tests show an average 26% reduction in connect time.
• An additional benefit may be some reduction in job or transaction elapsed time.
  • IAM zHPF tests show an average 4% reduction in job or transaction elapsed time.
• IAM, in the face of an I/O error using z/HPF I/O, will automatically retry the I/O with a standard CCW channel program & temporarily suspend z/HPF on the volume for the dataset where I/O error occurred.
• New fields in IAMINFO reports & SMF records now distinguish I/O’s using z/HPF from ECKD-CCW.

Storage System Requirements for IAM zHPF support:
• IBM: DS8700 or DS8800 at 6.2 level and above.
• HDS: Hitachi Virtual Storage Platform G1000 at microcode level 80-02-01 or higher.
• EMC: Contact EMC for current information on an appropriate VMAX microcode level.
IAM and EMC VMAX with zBoost (zHPF) mCode...

• IAM V9.2 improvements over Pre-zBoost mCode
  – 20% Reduction in Connect Time using conventional EXCP
  – 28% Reduction in Connect Time using zHPF

• zBoost also improves IAM zHPF I/O over IAM EXCP I/O
  – 11% Reduction in Connect Time using zHPF

What's New in the New IAM...
Better 64-bit Storage Memory Usage...

Transparently use 64-bit virtual storage for I/O buffers, without any application program changes

• 64-bit virtual storage buffers can help lower demands on 31-bit addressable storage, and enable large CICS, IAM/RLS, IAM/PLEX, or other long running address spaces to have more files open concurrently.

• If 64-bit virtual buffers will help eliminate virtual storage constraints, users can set it as a default in the IAM Global Options, or use IAM overrides apply it to individual address space(s), without any application program changes.
  – Currently IAM does not default to using 64-bit virtual storage for buffers because of the potential for a slight CPU time penalty, particularly in SRB time. The increase can be attributed primarily to page fix processing for 64-bit virtual storage.
What's New in the New IAM... New CICS Exit

Transparencyly accept almost all VSAM RLS file control options.

CICS File Control EXIT, along with other internal coding changes

- IAM/RLS & IAM/PLEX now accept VSAM RLS file control options
  - Including UNCOMMITTED, CONSISTENT, REPEATABLE, and NOSUSPEND.
- CICS application programs, without change, can now transparently use these RLS file control options for IAM/RLS and IAM/PLEX files.

What's New in the New IAM...

Greater scope and finer precision in reports

IAMSFMFVS Report and SMF Interval Record Enhancements

- IAMSFMFVS now uses 64-bit numbers for various statistics such as EXCP counts that may otherwise exceed a 32-bit value.
- IAMSFMFVS provides report output in CSV format for further analytics
- Support for SMF interval records now enables reporting on datasets being used by long running address spaces, such as CICS or IAM/RLS.
What to learn more?


Thank you!