

Cheryl's Hot Flashes #23

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Session 2109

Agenda

- The New Face of z/OS
- Training
- IBM Health Checker
- IEASYS Findings
- Solid State Drives
- Allocxx Update
- Sysprog Resources
- Mark's MVS Utilities
- User Experiences
 - HiperDispatch
 - CICS Compression
 - WLM & DB2 Buffer Pools
 - Uniprocessors
 - Outsourcing Issues
- New Function APARs
- Interesting APARs
- WSC Items & Others
- MTTR

The New Face of z/OS

The New Face of z/OS

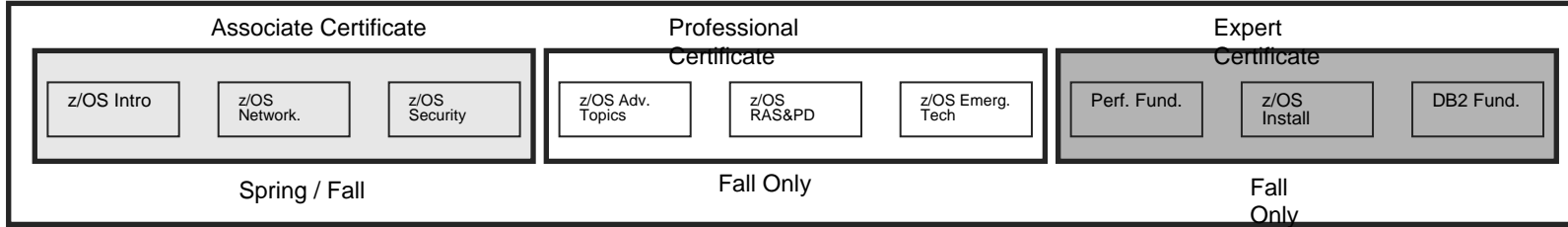
- Last SHARE I met these two enthusiastic young mainframers – **Dustin Ratliff** (on left) and **Don Mizanin** from **Progressive Insurance**.
- Progressive understands the future of the mainframe, and is proving it by their investment in people like Dustin (1.5 years in mainframes) and Don (3 years in mainframes).
- These two have been able to use several of the opportunities that Progressive provides such as:
 - Summer internships
 - The Marist Institute for Data Center Professionals (IDCP) z/OS program
 - Hiring within the company
 - Web-based training opportunities
 - A mentoring program for people within Progressive and new hires
 - SHARE
 - Several other internal training opportunities
- This is really exciting! How many of these techniques is your company using?
 - If you have some additional ideas, please let me know

Training

- IDCP – Marist College Institute for Data Center Professionals
 - Affiliated with Marist College’s School of Computer Science
 - Support from the National Science Foundation (NSF)
 - Provides non-credit & credit-bearing 10-12 week courses
 - System programmer and Application programmer tracks
 - Prepares students for IBM certification (e.g. z/OS Mastery Exam)
 - Priced at about \$300/credit hour – good deal!
 - All courses are instructor led and taught on-line; student time zone and geography are irrelevant
 - Web site at www.idcp.org/learnzos
 - About 200 students have participated in z/OS training
 - My favorite section – zTidbitz (if you have good eyes, check out ‘Extended Addressability’ or ‘z/OS 1.11’)

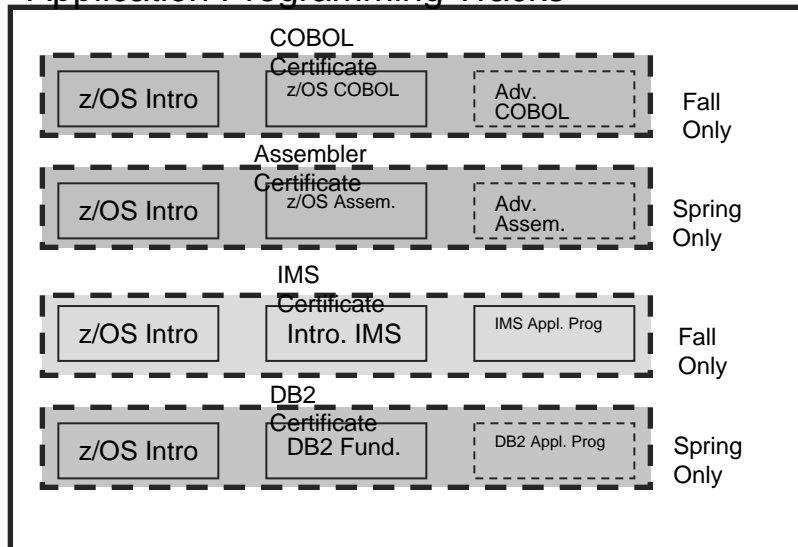
Training (zTidBits extract)

z/OS Certificate Program Overview



System Programming Track

Application Programming Tracks



- Certificates: 7
- Unique Courses: 16

IBM Health Checker for z/OS

- Great method to automate part of your job!
- IBM provides over 150 checks to make sure the system is running well and efficiently. Best practices,
- <http://www.ibm.com/systems/z/os/zos/hchecker/>
- On that website, click on link: *checks available for multiple z/OS components and elements* to see all checks
- Framework lets users & other vendors participate (e.g. CA has 80 checks for their products now and expects 250 by May)
- [SA22-7994-09](#) – IBM Health Checker for z/OS
- Every installation should be using these!

IBM Health Checker for z/OS

- Here are some Health Checks that everyone should be using:
 - CSV_LPA_CHANGES - This check compares the sizes of the various link pack areas to the sizes in this IPL and will issue a message if any of the LPA sizes have changed.
 - VSM_PVT_LIMIT - This checks to see if the size of the private region changed since the last IPL. If the private region below the line changed by 1M or more, or if the extended private region above the line changed by 512M or more, exception checks are issued.
 - ASM_LOCAL_SLOT_USAGE – This check notifies you if the usage on any local page data set is over 30% because performance issues can occur when you exceed that usage.
 - All migration checks.

IBM Health Checker for z/OS

- User can modify settings:

- VSM_PVT_LIMIT –

```
UPDATE,  
CHECK(IBMVSM,VSM_PVT_LIMIT),  
INTERVAL(ONETIME),  
SEVERITY(LOW),  
PARM('PVT(1M),EPVT(512M)'),  
DATE('20040405')
```

- This check produces message IGVH101E
- You can add message to automation package

IEASYSxx Findings

- 70 parameters (that you can get wrong or right)
- You should use the defaults for most
- Only code the changes
- Some poor defaults should be changed:
 - REAL=76K (should be 0)
 - LOGLMT=500 (should be 999999)
 - No CLPA (should be CLPA)
 - No PRESCPU (should be PRESCPU)
- Some good defaults should be used
 - RSU=0 (don't specify RSU=nn!)

Solid State Drives

- IBM provides a free downloadable SAS-based tool, FLASHDA
 - Determines which data sets would be good candidates for SSDs
 - Link is <http://www.ibm.com/systems/z/os/zos/downloads/flashda.html>
 - Uses SMF type 42, s/t 6 records (data set I/O) and SMF type 74, s/t 5 records (cache subsystem device)
 - Two APARs are first required –
 - [OA25559](#) (DFSMS 1.8–1.10, 2Apr2009) - *New Function - D/T2107 Solid State Drives and Disk Encryption.*
 - [OA25688](#) (DFSMS 1.8–1.10, 31Mar2009) — D/T2107 New Function: Solid State Drives.
- FLASH10690 — Solid State Drives (SSD) Data Analysis for DS8000 System z Attached: AG Storage Offering
 - Free service from the AG (Americas Group) Storage ATS (Advanced Technical Support) to AG customers
 - Analyzes your SMF data at their site and sends you back the results
 - Analysis is more thorough than FLASHDA and uses SMF type 42, s/t 5 & 6 (storage class and data set I/O), as well as SMF types 70–78 (all RMF or CMF)
- Of course, I know that they're doing it for marketing purposes, but you still need the information to make informed decisions.

ALLOCxx Update

- New SYSTEM parameter
 - Format:
SYSTEM IEFBR14_DELMIGDS(LEGACY/NORECALL)
REMIND_INTV(90/seconds)
TAPELIB_PREF(EQUAL/BYDEVICES)
TEMPDSFORMAT(UNIQUE/INCLUDELABEL)
VERIFY_UNCAT(FAIL/TRACK/MSGTRACK)
 - Releases:
 - IEFBR14 & REMIND – z/OS 1.11 only
 - TAPELIB – z/OS 1.11 and z/OS 1.8-1.10 with APAR OA26414
 - VERIFY – z/OS 1.10-1.11 with APAR OA27917
 - TEMPDS – z/OS 1.12
- New commands – SETALLOC and D ALLOC

Sysprog Resources

- See SHARE session 2205 from Denver
 - *Fully Wired Hot Topics Denver Mile High City Edition*
 - Definitely carefully read the Trademarks page!
 - Freebie tools and goodies for sysprogs
 - This is excellent!

Mark's MVS Utilities

- **Mark Zelden**

- Many free utilities
- <http://home.flash.net/~mzelden/mvsutil.html>
- Started site in 1997
- Close to 450,000 hits since inception
- Also available on CBT file 434 – <http://www.cbttape.org>
- Over 100 PDS members containing REXX EXECs and CLISTs, ISPF edit macros, samples jobs and documentation.
- Updated often

Mark's MVS Utilities

- **RXSTOR64**

- Display 64-bit private storage usage and MEMLIMIT by ASID
- Shared memory objects on z/OS 1.5 and above
- Large memory objects on z/OS 1.9 and above if LFAREA is specified at IPL time
- 64-bit common on z/OS 1.10 and above
- System wide summaries similar to
D VS,HVSHARE & D VS,HVCOMMON

Mark's MVS Utilities

Mark's MVS Utilities

- **IPLINFO**

- Originally just the “IPL” section as an assembler program
- Converted to REXX as a learning exercise
- Many more sections today – about 2600 lines of code

Mark's MVS Utilities

User Experiences - HiperDispatch

- HiperDispatch on z/OS 1.11
 - Certain conditions may result in heavy SIGP signaling
 - May cause high LPAR management CPU time and low capture ratio
 - Can occur where CPs are often in “no work” waits
 - Seems to occur only with WebSphere systems
 - Local fix is to turn off HiperDispatch
 - APAR [OA32286](#) opened March 11, 2010

User Experiences - CICS Compression

- Repeat from last SHARE because it's so important!
- CICS/TS 3.2 and 4.1
 - Option in the MCT to compress CICS SMF records (default in 4.1, but you can override it – DON'T!).
 - This only applies to type 110, subtype 1 (majority of CICS SMF records).
 - Significantly reduces SMF size using standard z/OS compression.
 - Some examples: 60% reduction in tapes; frequency of SMF dumps reduced from every 5-8 minutes to every 39-61 minutes; frequency of SMF dumps reduced from every 11 minutes to every 32 minutes.
 - IBM results show that type 110 records are reduced from 32K to 6K (80% reduction in size).

User Experiences –DB2 Buffer Pools

- IBM recommends that you page fix buffer pools
 - Improves response and CPU, but you can hurt other work if too much is fixed
 - Page fixing can provide a 10% reduction in CPU time per transaction
- APARs allow WLM to manage the size of DB2 9 buffer pools dynamically based on goals
 - [OA18461](#) (z/OS 1.9-1.11, 12Aug2009) — *Updates to WLM Dynamic Buffer Pool Management*. This provides updates to WLM to support this function, and contains documentation updates.
 - [PK75626](#) (DB2 9, 13Jan2010) — *Enable Automatic WLM Buffer Pool Management*. This APAR description explains the new methodology.

User Experiences – DB2 Buffer Pools

- Turn on with DB2 command:
 - ALTER BUFFERPOOL AUTOSIZE(YES)
- Feedback
 - Users report that this is fantastic, especially with several DB2 systems in the same LPAR
- References
 - Redbook – [SG24-7330](#) - *DB2 9 Technical Overview*
 - See **Willie Favero's** January 7, 2010 blog for his recommendation.
<http://it.toolbox.com/blogs/db2zos>

User Experiences –DB2 Buffer Pools

- DB2 can alter the buffersize by up to +/-25%
- Changed size is remembered across DB2 restarts
- Warning from Redbook – each DB2 system can fix up to 80% of real storage for buffer pools, but if multiple DB2 systems it is possible to page fix 100% of storage!
- Small glitch – falls over in z/OS 1.11 for one customer; ETR pending

User Experiences - Uniprocessors

- Uniprocessor Considerations
 - When only one CP is assigned to an LPAR, it is still possible for the system to hang
 - With faster processors, this condition is happening more frequently
 - Suggestions:
 - WSC White Paper – [WP100925](#) (12/15/2006) – *Managing CPU-Intensive Work on Uniprocessor LPARs*
 - See SHARE session 2208, Bit Bucket x'27', **Skip Robinson**
 - Redbook [SG24-6472-03](#) - *System Programmer's Guide to Workload Manager*, Chapter 12 (16Jan2010)
 - WSC [FLASH10169](#) (8/23/2003) – *zSeries & Parallel Sysplex Performance: Sharing Resources on Uni-Processors and Migrating from ICMF*

User Experiences - Outsourcing

- The benefit of outsourcing is to lower costs and is usually achieved by merging with other customers into one site
- It can be a wonderful cost-saving solution or a nightmare
- Most frequent causes of friction:
 - Latent demand
 - Poorly worded contract
 - Back-end costs
 - Incorrect estimate of workload
 - High penalty for new workloads
 - Latest problem – guaranteed MIPS or MSUs without benefit of zPCR

User Experiences - Outsourcing

- Protect yourself
 - Have contract reviewed by experts before signing
 - Retain technical staff to monitor charges from outsourcer
 - Determine up front whether you want to allow latent demand to be freed
 - Ensure that you or outsourcer run zPCR to determine expected results from a change
 - Determine method of identifying if jobs are taking more CPU time
 - Ensure in contract that you aren't forced to keep silent if contract isn't working

User Experiences - Outsourcing

- Protect yourself
 - Have contract define service level objectives and how they are to be measured
 - Have contract define how response times and resource usage will be measured

New Function APARs

- IO11698 (z/OS 1.11, OPEN) – New Function
 - SMP/E is adding SAF checks for security.
 - You may not be able to do any maintenance if you install PTF without preparing for it. (There is a HOLD on it.)
 - Extremely Important for you to take action.
 - See **Marna Walle's** session 2222, pages 50-52 for instructions and workaround.

New Function APARs

- PK85856/PK85899 (DB2 V8–V9, z/OS 1.10, 8Aug2009) — *New Function*
 - DFSORT Support for Additional zIIP Offload by DB2 Utilities.
- OA26832 (z/OS 1.10, 24Jun2009) — *New Function for Providing Expanded Service Unit Values in the SMF Type 30*
 - This is especially important for the z9 and z10 processors that can currently cause overflow of these fields.

Interesting APARs

- [OA31055](#) - (z/OS 1.10-1.11, 15Feb2010) — *Concurrent Copy Causes System-Wide Performance Degradation in z/OS 1.10*
 - After upgrading to z/OS 1.10, concurrent copy jobs were taking longer and the CPU utilization was higher. Flags: HIPER, IPL.
- [OA31960](#) - (CF hardware, OPEN) — *Application Slowdown, Batch Running Longer Than Expected, Requests to CF Structure Going ASYNC*
 - The cause of this problem is due to faulty CF (Coupling Facility) micro-code, and is most noticeable during intensive activity by DB2 image copy jobs or write-intensive DB2 reorg jobs. This occurs at CFCC Release 16.0, Service Level 2.12 or higher. You can determine your CFCC level with a **D CF** command. The APAR shows how to determine if there is a slowdown, and instructs you to contact your IBM CE if one exists. Flags: HIPER, PERFORMANCE.

Interesting APARs

- [PM07146/PM07167/PM08330](#) (Java SDK 5 & 1.4.2, 26Feb2010) — *Gen APAR: 64-bit [31-bit] Java for z/OS SDK 5 Service Refresh (SR11 FP1) the PTF for the APAR Delivers the Latest Cumulative Service*
 - These APARs provide several performance improvements for Java. The first APAR is for 64-bit Java SDK 5, the second for 31-bit Java SDK 5, and the third is for 31-bit Java SDK 1.42.
- [OA29388](#) (z/OS 1.90-1.11, 28Oct2009) — *High CPU Console Address Space After Message IEE286I*
 - Message IEE286I is "Console Delayed Message Buffer Full. Messages Lost." Flags: HIPER.

Interesting APARs

- PK69111 (DB2 8-9, 24Oct2009) — *Millions of IFCID 173 Records Filling up SMF Buffers IFCID173 & DB2 SQLCODE -905.*
 - Although this was opened in July 2008, it was only recently fixed. This affects the DB2 SMF type 102 record. See our Tuning Letter 2009 No. 4 (pages 13-19) for an explanation of IFCIDs.
- PK94888 (DV2 8-9, 21Oct2009) — *DB2 Support for z/OS V1R9.0 Sysplex Routing Services zIIP Awareness. APAR PK38867 for DB2 provided support for DB2's use of zIIPs*
 - This caused incorrect weighted data to be sent back to WLM, which could result in poor balancing and performance. This APAR will correct that data so that favoring of members that have zIIPs is now solely done by WLM. Flags: none, but I think this should be flagged as PERFORMANCE.

Interesting APARs

- II14438 (Omegamon 410, re 19Oct2009) — *Known Issues Causing High CPU Utilization in Omegamon DB2 and Performance Tuning Tips COMPID 5655OPE00*
 - This is an extremely important Informational APAR if you are running Omegamon for DB2.
- OA30246 (z/OS 1.9-1.11, 18Nov2009) — *XRC zIIP Eligible Work Runs on Standard CPs Rather than zIIPs When HiperDispatch is Enabled*
 - This occurs for SRB running at dispatch priority 254 or 255. Flags: HIPER, FUNCTIONLOSS.

Interesting APARs

- [OA28856](#) (z/OS 1.9–1.11, 12Aug2009) — *SDSF Performance Issues on z/OS 1.9 Using JES2 to Collect Data*
 - This is an older APAR (April) that was closed in August. It relates to performance problems that began with z/OS 1.9. See also — [PK86058](#) and [OA28918](#). Flags: HIPER.
- [OA30024/OA31396](#) (z/OS 1.8, 19Feb2010) — *VSAM Does Not Write SMF Type X'64' Records for Non-SMS Managed End of Volume Failures*
 - There is an error in the APAR title and description. The problem occurs with the SMF type 64 record (not X'64", which would be record type 100).

Interesting APARs

- OA30197 (z/OS 1.0-1.11, 22Sep2009) — *SMF Type30 Field SMF30ASI New at HBB7750, But Not Documented in the ID Section in the SMF Manual*
 - z/OS 1.10 added field SMF30ASI (Address Space Identifier) to the record, but didn't add it to the manuals. The manual has been updated.
- PK95003 (WAS 6.1, 2Feb2010) — *Extend SMF Record 120 With CP/zAAP Utilization per Job*
 - This sounds like a neat APAR to keep a watch on.

Interesting WSC Items

- PR3776 — *z/OS Performance "HOT" Topics — Webinar*
 - **Kathy Walsh** from WSC presents a session called "Hot Topics" at each SHARE conference (and other conferences). See session 2100 for Seattle. This is always a popular and extremely valuable session. For the first time, she also presented it in a webinar to several hundred customers. Her presentation and the webinar are available from this link. Don't miss it! I hope this is the start of many more to come. (22Sep2009)
- TD103516 — *Specialty Engines zIIP and zAAP Software Update*
 - This is important for any installation that has or is planning to have specialty processors. (Updated 17Aug2009)

Interesting WSC Items

- ICF Catalog Management Recommendations & Guidelines (Technote FAQ - T1010487, 9Oct2009)
 - http://www-01.ibm.com/support/docview.wss?rs=112&context=SWG90&dc=DA470&dc=DA480&dc=DA490&dc=DA4A20&dc=DA410&dc=DA400&dc=D600&dc=DB550&dc=DB520&dc=DA4A30&q1=SMF&uid=isg3T1010487&loc=en_US&cs=utf-8&lang=en
- REDP-4212-00 – ICF Catalog Backup and Recovery: Catalog RecoveryPlus Update
 - This describes how and when to use either the IBM Integration Catalog Forward Recovery Utility (ICFRU) and/or the Mainstar Catalog RecoveryPlus product. (13Dec2006)

Interesting Redbooks

- SG24-7779-00 – *Batch Modernization on z/OS*
 - This provides techniques to modernize your current batch programs, such as the use of Java, agile computing, DFSORT/ICETOOL, and enhancements to traditional languages. This 476-pagebook is a must-have for your applications staff. (2Dec2009)
- SG24-6366-01 – *Introduction to the New Mainframe: z/OS Basics*
 - This is the first textbook in a planned series for training in mainframes. It's a fantastic book (all 740 pages!).
- SG24-7748-00 – *Introduction to the System z Hardware Management Console*
 - This is a self-study guide that can be used by anyone needing to use the HMC. There are questions at the end of each chapter. The first chapter provides a beginners view of hardware. (4Feb2010)

Useful IBM Links

- z/OS 1.11 Information Center
 - <http://publib.boulder.ibm.com/infocenter/zos/v1r11/index.jsp>
 - The new documents are in html format, enabling more hits with search engines like Google.
 - Prior to migration, you should review the Changes section of relevant manuals. For example, increases in the SMF type 30 service unit fields aren't mentioned in the migration manuals, but are mentioned in the SMF manual.
- IBM Support Portal
 - A new view of customized support
 - <http://www.ibm.com/software/genservers/portal/support>

MTTR – Mean Time to Recovery

- MTTR is the time to take down a system and re-IPL it. IBM is working on a multi-phase plan to reduce MTTR.
- MTTR can take 15 minutes to 1.5 hours depending on . . .
- I participated in Redbook residency in May. Look for [SG24-7816](#) – *System z Mean Time to Recovery Best Practices*.
- **Frank Kyne**, Project leader, is giving SHARE session 2235 this week on MTTR. The presentation has LOTS of good suggestions. The Redbook has even more.
- Two items from his presentation:
 - IPCS command: IPCS VERBX BLSAIPST MAIN formats the IPST control block. This shows the steps and their time during IPL. The Redbook explains most of the steps.
 - Redbook [SG24-7328](#) – *z/OS Planned Outage Avoidance* is terrific! It provides suggestions on avoiding IPLs.
- An ITSO residency is an absolutely wonderful experience!

Interesting WSC Items

- Conferences on WSC
 - WSC link - <http://www-1.ibm.com/support/techdocs/atmastr.nsf>
 - Look at left side – select Auxiliary Material
 - Then select Conferences, display by date
 - Get presentations for conferences
 - This is just starting, but I hope it will grow
- Plea to IBM Presenters
 - Your material is essential for all customers
 - The SHARE proceedings are soon closed to non-members
 - Please post your sessions on the WSC site!

See You in Boston!

Cheryl Watson Walker with partner, husband, and best friend Tom Walker

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