

# *Bit Bucket x'2B'*

Ed Jaffe, [edjaffe@phoenixsoftware.com](mailto:edjaffe@phoenixsoftware.com)

Tom Conley, [pinncons@rochester.rr.com](mailto:pinncons@rochester.rr.com)

Sam Knutson, [SKnutson@geico.com](mailto:SKnutson@geico.com)

Skip Robinson, [robinsjo@sce.com](mailto:robinsjo@sce.com)

SHARE 119  
Session 11702  
Anaheim, CA  
10 August 2012





*A Command in Time Saves Nine*  
(Ed Jaffe)

# Automatic Commands Using z/OS UNIX Facilities

- There are many ways to automatically issue commands at given times or intervals
  - Keep in mind that 'commands' need not be just something listed in one of the 'System Commands' books. A 'command' can start a procedure, invoke a Rexx, submit a job, etc.
- Some use JES2 automatic commands
- Some use CBT freeware such as 'AUTO'
- Some use for-sale automation packages
- There are other home-grown, freeware and for-sale solutions as well
- This is also cron under z/OS UNIX

# What is cron?

- "cron is the time-based job scheduler in Unix-like computer operating systems. cron enables users to schedule jobs (commands or shell scripts) to run periodically at certain times or dates. It is commonly used to automate system maintenance or administration, though its general-purpose nature means that it can be used for other purposes, such as connecting to the Internet and downloading email."
- Cron is driven by a crontab (cron table) file, a configuration file that specifies shell commands to run periodically on a given schedule. The crontab files are stored where the lists of jobs and other instructions to the cron daemon are kept. Users can have their own individual crontab files and often there is a system wide crontab file (usually in /etc or a subdirectory of /etc) which only system administrators can edit.
- <http://en.wikipedia.org/wiki/Cron>

# Getting Started for First-time cron Users

- Create the /etc/spool directory:
  - `mkdir -m 755 /etc/spool`
  - `chmod 755 /etc/spool`
  - `ln -s /etc/spool /usr/spool`
- Create the /etc/cron directory:
  - `mkdir -m 755 /etc/cron`
  - `chmod 755 /etc/cron`
  - `ln -s /etc/cron /usr/lib/cron`
- Create the /etc/spool/cron, /etc/spool/cron/atjobs and /etc/spool/cron/crontabs directories:
  - `mkdir -m 755 /etc/spool/cron`
  - `chmod 755 /etc/spool/cron`
  - `mkdir -m 755 /etc/spool/cron/atjobs`
  - `chmod 755 /etc/spool/cron/atjobs`
  - `mkdir -m 755 /etc/spool/cron/crontabs`
  - `chmod 755 /etc/spool/cron/crontabs`
- Start the cron daemon:
  - `_BPX_JOBNAME=CROND /usr/sbin/cron &`

# Contents of a crontab File

- Each statement consists of six fields, separated by blanks. The first five give a date and time in the following form:
  - A minute, expressed as a number from 0 through 59
  - An hour, expressed as a number from 0 through 23
  - A day of the month, expressed as a number from 1 through 31
  - A month of the year, expressed as a number from 1 through 12
  - A day of the week, expressed as a number from 0 through 6 (with 0 standing for Sunday)
- An asterisk (\*) stands for all possible values. For example, \* as day of month means to run every day of the month.
- A set of numbers separated by commas, or a range of numbers x-y is supported.
- If you give specific days for both day of the month and day of the week, the two are ORed together. Here are some examples:
  - 0 0 \* \* \* -- Midnight every day
  - 0 0 \* \* 1-5 -- Midnight every weekday
  - 0 0 1,15 \* \* -- Midnight on 1st and 15th of month
  - 0 0 1 \* 5 -- Midnight on 1st of month and every Friday
- The sixth field is a z/OS UNIX command that your shell executes at the specified time.
- Use the crontab command to edit, list, or remove crontabs
  - crontab [-e|-l|-r] [-u user] [file]

# Issuing a System Command From z/OS UNIX

- There are numerous cost-option solutions, including one with which I am intimately familiar ☺, but in the Bit Bucket everything we look for is FREEEEEEEEEEEEEEEE!
- The REXX CONSOLE interface looked promising, and would likely work just fine, but I wanted to write ZERO code—not even Rexx.
- I decided to download OECONSOL from IBM's z/OS UNIX Tools & Toys page.
  - <http://www-03.ibm.com/systems/z/os/zos/features/unix/Toys/oeconsol.html>
  - From download to up and running took all of about 15 minutes!
- It is a single flat file containing an HLASM program surrounded by JCL necessary to assemble and link edit it into an APF-authorized library and z/OS UNIX executable.
- I customized only the job card, APF library DSN, and `PATH='/bin/oeconsol'`. It ran the first time.

# Issuing a System Command From z/OS UNIX

Job Step	Job Step Name	Job Step Description	Job Step Status	Job Step Completion Time
00000100	OECONSOLE	OECONSOLE JOB	00000100	00000100
00000200	ASMA90	ASMA90 PGM=ASMA90, PARM='NODECK,OBJECT,TERM,NOXREF'	00000200	00000200
00000300	SYSLIB	SYSLIB DD DSN=SYS1.MACLIB, DISP=SHR	00000300	00000300
00000400	SYSMOD	SYSMOD DD DSN=SYS1.MODGEN, DISP=SHR	00000400	00000400
00000500	SYSUT1	SYSUT1 DD DSN=SYS1.SYSUT1, UNIT=VIO, SPACE=(CYL,(1,1))	00000500	00000500
00000600	SYSPRINT	SYSPRINT DD SYSOUT=*	00000600	00000600
00000700	SYSLIN	SYSLIN DD DSN=SYS1.OBJSET, UNIT=VIO, SPACE=(80,(800,100)), DISP=(,PASS)	00000700	00000700
00000800	SYSTEM	SYSTEM DD SYSOUT=*	00000800	00000800
00000900	SYSIN	SYSIN DD *	00000900	00000900
00001000	OECONSOLE	OECONSOLE AMODE 31	00001000	00001000
00001100	OECONSOLE	OECONSOLE RMODE ANY	00001100	00001100
00001200	OECONSOLE	OECONSOLE TITLE 'OECONSOLE - OpenEdition Command'	00001200	00001200
00001300	OECONSOLE	**** Start of Specifications ****	00001300	00001300
00001400	OECONSOLE	* * * * *	00001400	00001400
00001500	OECONSOLE	*01* MODULE NAME = OECONSOLE	00001500	00001500
00001600	OECONSOLE	* * * * *	00001600	00001600
00001700	OECONSOLE	*01* DESCRIPTIVE NAME = OpenMVS command to issue MVS operator cmds	00001700	00001700
00001800	OECONSOLE	* * * * *	00001800	00001800
00001900	OECONSOLE	*01* FUNCTION = This program uses the extended console interface to	00001900	00001900
00002000	OECONSOLE	* issue operator commands. The command output is	00002000	00002000
00002100	OECONSOLE	* written to STDOUT.	00002100	00002100
00002200	OECONSOLE	* * * * *	00002200	00002200
00002300	OECONSOLE	*01* INPUT =	00002300	00002300
00002400	OECONSOLE	* * * * *	00002400	00002400
00002500	OECONSOLE	*01* OUTPUT =	00002500	00002500
00002600	OECONSOLE	* The console output is written to the terminal (STDOUT).	00002600	00002600
00002700	OECONSOLE	* * * * *	00002700	00002700
00002800	OECONSOLE	*01* MESSAGES =	00002800	00002800
00002900	OECONSOLE	* The following messages may be written to the terminal:	00002900	00002900
00003000	OECONSOLE	* * * * *	00003000	00003000
00003100	OECONSOLE	* Extended console activation failed RC=xx,RSN=xx'	00003100	00003100
00003200	OECONSOLE	* Extended console activation failed RC=''	00003200	00003200
00003300	OECONSOLE	* Extended console deactivation failed RC=xx,RSN=xx'	00003300	00003300
00003400	OECONSOLE	* Error retrieving operator message RC=xx,RSN=xx'	00003400	00003400
00003500	OECONSOLE	* * * * *	00003500	00003500
00003600	OECONSOLE	* * * * *	00003600	00003600
00003700	OECONSOLE	*01* CHANGE ACTIVITY =	00003700	00003700
00003800	OECONSOLE	* * * * *	00003800	00003800
00003900	OECONSOLE	**** End of Specifications ****	00003900	00003900
00004000	OECONSOLE	* * * * *	00004000	00004000



# Issuing a System Command From z/OS UNIX

```
.
...
.
R11      EQU      11                      00072700
R12      EQU      12                      00072800
R13      EQU      13                      00072900
R14      EQU      14                      00073000
R15      EQU      15                      00073100
*                                              00073200
          TITLE 'OECONSOL   - Mapping Macros' 00073300
*-----* 00073400
*                                              * 00073500
*          Required mapping macros              * 00073600
*                                              * 00073700
*-----* 00073800
          IEAVG132 ,                      MDB prefix 00073900
          IEAVM105 ,                      MDB          00074000
          IEAVG131 ,                      Console status area 00074100
          IEZVG111 ,                      Operparm parameter area 00074200
          END ,                          00074300
/*                                          00074400
//LKED1      EXEC PGM=IEWL,PARM='XREF,LET,LIST,NCAL,RENT,REFR,AC=1', 00074500
//          COND=(04,LT) 00074600
//SYSLMOD DD DISP=SHR,DSN=          <--- APF Authorized Library 00074700
//SYSLIN DD DSN=&&OBJSET,DISP=(OLD,PASS) 00074800
//          DD DDNAME=SYSIN 00074900
//SYSUT1 DD DSN=&&SYSUT1,UNIT=VIO,SPACE=(CYL,(1,1)) 00075000
//SYSPRINT DD SYSOUT=* 00075100
//SYSIN DD * 00075200
          ENTRY OECONSOL 00075300
          NAME OECONSOL(R) 00075400
//LKED2      EXEC PGM=IEWL,PARM='XREF,LET,LIST,NCAL,RENT,REFR,CASE=MIXED,X 00075500
//          PATHMODE(1,7,5,5)',COND=(4,LT) 00075600
//SYSLMOD DD PATH=' ',          <--- Path name 00075700
//          PATHOPTS=(OWRONLY,OCREAT,OTRUNC), 00075800
//          PATHMODE=(SIRWXU,SIRGRP,SIXGRP,SIROTH,SIXOTH) 00075900
//SYSLIN DD DSN=&&OBJSET,DISP=(OLD,DELETE) 00076000
//          DD DDNAME=SYSIN 00076100
//SYSUT1 DD DSN=&&SYSUT1,UNIT=VIO,SPACE=(CYL,(1,1)) 00076200
//SYSPRINT DD SYSOUT=* 00076300
//SYSIN DD * 00076400
          ENTRY OECONSOL 00076500
          NAME oeconsol(R) 00076600
/*                                          00076700
```

# Putting it Together

## My crontab file:

```
>cat my_crontab
```

```
0 * * * * oeconsol 'd asm'
```

```
30 * * * * oeconsol 'd asm'
```

## Activating the crontab (on behalf of user SYSOPER):

```
>crontab -u sysoper my_crontab
```

```
N 0000000 MVS60      2012217 06:30:01.22 SYSOPER9 00000290 IEA630I  OPERATOR SYSOPER  NOW ACTIVE,    SYSTEM=MVS60    , LU=OMVS
NC0000000 MVS60      2012217 06:30:01.24 SYSOPER  00000290 D ASM
MR0000000 MVS60      2012217 06:30:01.27 SYSOPER  00000090 IEE200I 06.30.01 DISPLAY ASM 627
LR                               627 00000090 TYPE      FULL STAT   DEV  DATASET NAME
DR                               627 00000090 PLPA      100% FULL   8203 SYS2.MVS60.PAGE.PLPA
DR                               627 00000090 COMMON    55%   OK   8203 SYS2.MVS60.PAGE.COMMON
DR                               627 00000090 LOCAL     90%   OK   8203 SYS2.MVS60.PAGE.LOCAL1
DR                               627 00000090 LOCAL     22%   OK   8030 SYS2.MVS60.PAGE.LOCALA
ER                               627 00000090 PAGEDDEL  COMMAND IS NOT ACTIVE
...
N 0000000 MVS60      2012217 07:00:01.30 SYSOPER2 00000290 IEA630I  OPERATOR SYSOPER  NOW ACTIVE,    SYSTEM=MVS60    , LU=OMVS
NC0000000 MVS60      2012217 07:00:01.32 SYSOPER  00000290 D ASM
MR0000000 MVS60      2012217 07:00:01.35 SYSOPER  00000090 IEE200I 07.00.01 DISPLAY ASM 667
LR                               667 00000090 TYPE      FULL STAT   DEV  DATASET NAME
DR                               667 00000090 PLPA      100% FULL   8203 SYS2.MVS60.PAGE.PLPA
DR                               667 00000090 COMMON    55%   OK   8203 SYS2.MVS60.PAGE.COMMON
DR                               667 00000090 LOCAL     90%   OK   8203 SYS2.MVS60.PAGE.LOCAL1
DR                               667 00000090 LOCAL     22%   OK   8030 SYS2.MVS60.PAGE.LOCALA
ER                               667 00000090 PAGEDDEL  COMMAND IS NOT ACTIVE
```



# Unhealthy Health Checks

## (Tom Conley)

# Unhealthy Health Checks

- CA PTF RO12080 added 4 Health Checks to IDMS R17
- Unfortunately we started having hangs on shutdown
- The hangs were related to the IDMS Health Checker task not shutting down cleanly
- RO42739 supposedly fixed the problem
- Er, not quite, we continued to get hangs at shutdown
- CA had no answer at the time, so we asked CA if disabling the health checks would eliminate the hangs
- CA agreed, so we disabled all IDMS health checks
- Added the following statements to HZSPRMxx:  
ADDREPLACE POLICY STMT(DEL\_CAIDMS)  
DELETE CHECK(CA\_IDMS,\*)  
DATE(20120426)  
REASON('VENDOR SOFTWARE ERROR')



# Not Your Father's CA-1

(Tom Conley)

# Not Your Father's CA-1

- Installed CA-1 R12.6 on a new LPAR
- Needed to init TMC with tape range 1A0000-1F9999
- I used to use TMSFORMAT with TMSUX2U and TMSUX2E exits, but that's just so '90's
- Couldn't find the exit source in use on other LPARs, so I tried to find another solution
- Manual recommended TMSXTEND instead of TMSFORMAT for alphanumeric volume support, but TMSXTEND only works on an existing TMC, and I needed to format a new TMC
- Eventually I got lucky and stumbled upon TMSBLDVR, a utility that says it creates TMSXTEND control cards
- BUT, it also initializes new TMC's with alphanumeric volume support

# Not Your Father's CA-1

- Here's the JCL I ran:

```
//FRMTTMC EXEC PGM=TMSBLDVR,PARM=NEW
//TMSRPT80 DD SYSOUT=*
//TMCNEW   DD DSN=TCONLEY.TMC,DISP=SHR
//SYSIN    DD *
ADDVOL 1A0000-1A9999
ADDVOL 1B0000-1B9999
ADDVOL 1C0000-1C9999
ADDVOL 1D0000-1D9999
ADDVOL 1E0000-1E9999
ADDVOL 1F0000-1F9999
ADDDSNB 2000000
/*
```

- It would have saved me about 4 hours of time if the TMSFORMAT doc would have referenced TMSBLDVR
- I submitted a doc update form to CA, since TMSBLDVR is how all TMC's should be created now



Give 'Em the Old Razzle Dazzle  
(Tom Conley)



# Give 'Em the Old Razzle Dazzle

- While installing CA-1 R12.6 recently, I got the following messages from TMSINIT:

TMSHCS01 Initializing CA 1 Health Checks

TMSHCS02 Adding check: CA1\_Vrfy\_Security\_Exit\_FUNC

TMSHCS02 Adding check: CA1\_Vrfy\_Security\_Exit\_YSVC

TMSHCS02 Adding check: CA1\_TMC\_Audit\_Placement

TMSHCS02 Adding check: CA1\_Free\_DSNB\_Medium\_THRSH

TMSHCS02 Adding check: CA1\_Vrfy\_Security\_Exit\_PSWD

TMSHCS02 Adding check: CA1\_used\_DSNB\_free\_chain

TMSHCS02 Adding check: CA1\_Vrfy\_Mixed\_Expdt\_Option

TMSHCS02 Adding check: CA1\_Audit\_Vrfy\_Within\_Med\_THRSH

TMSHCS02 Adding check: CA1\_Audit\_Vrfy\_Within\_Low\_THRSH

TMSHCS02 Adding check: CA1\_Free\_DSNB\_Low\_THRSH

TMSHCS02 Adding check: CA1\_Free\_DSNB\_Quick\_Scan

TMSHCS02 Adding check: CA1\_Vrfy\_Option\_DCHG

TMSHCS02 Adding check: CA1\_Vrfy\_Option\_LCHG

TMSHCS02 Adding check: CA1\_Vrfy\_Option\_TCHG

# Give 'Em the Old Razzle Dazzle

- Like other CA products, CA-1 is dynamically installing its own health checks
- But, when I went to the SDSF CK option, these health checks did not show up
- Did some digging, and found that CA health checks require two other started tasks, CAMASTER and CAHCHECK
- According to the CA Common Services doc, CAMASTER comes up "automatically" at IPL time
- I discovered that SYS2.CCS.CAILPA wasn't cataloged correctly, so I corrected the catalog and IPL'd
- After the IPL, the CAMASTER and CAHCHECK started tasks came up normally
- But how? There's no subsystem, no CAS9 init step, etc., so how do you "automatically" get a task at IPL?

# Give 'Em the Old Razzle Dazzle

- I searched CA for CAMASTER and CAHCHECK, came up empty, and finally opened a case
- They pointed me to TEC570878 (it was hit number 130 on my search, no idea why I missed it, now it comes up as hit lucky number 13)
- TEC570878 explains how CA front-ends TSO RIM module IKJEFXSR in LINKLIB
- SYS2.CCS.CAILPA contains two modules, CCSEFXSR and an alias IKJEFXSR
- At IPL time, z/OS finds the CA version of IKJEFXSR in LPALIB, which takes precedence over the IBM version of IKJEFXSR in LINKLIB
- IKJEFXSR in LPALIB is an alias to CA's replacement module CCSEFXSR

# Give 'Em the Old Razzle Dazzle



- CCSEFXSR initializes the environment required to bring up CAMASTER and CAHCHECK
- When CCSEFXSR completes, it transfers control to the "real" IKJEFXSR in LINKLIB, so TSO can actually initialize
- Big deal Conley, why should we care?
- I like to know how things really work. I had fun researching this...



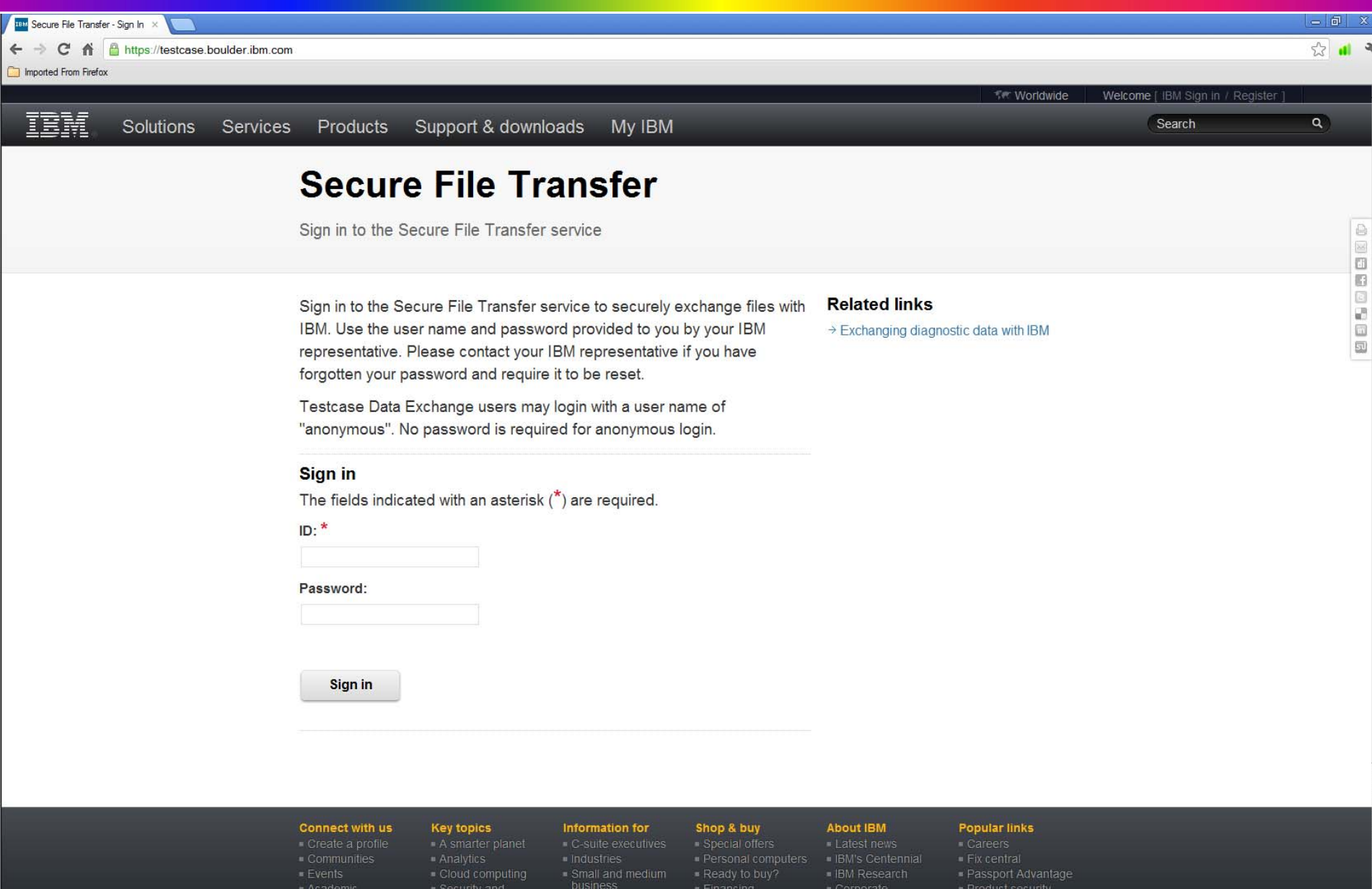
# Dealing with Insecurity

## (Tom Conley)

# Dealing with Insecurity

- There's a long-standing requirement for IBM to provide a method of transferring dumps and other data securely over the public Internet
- Many customers are now requiring encryption for any data sent over the public Internet
- If your mainframe is on the Internet, and you send data directly to IBM, you currently have no way to encrypt that data
- IBM is still working on the mainframe solution
- If you have to download to your PC, and then send to IBM, you also have no way to encrypt that data
- UNTIL NOW!!
- A few weeks ago, a colleague told me about entering `testcase.boulder.ibm.com` into a web browser
- What I got back blew me away!

# Dealing with Insecurity



The screenshot shows a web browser window with the address bar displaying `https://testcase.boulder.ibm.com`. The page header features the IBM logo and navigation links: Solutions, Services, Products, Support & downloads, and My IBM. A search bar is located on the right side of the header. The main content area is titled "Secure File Transfer" and includes a sub-header "Sign in to the Secure File Transfer service". Below this, there is a paragraph explaining the service and a link to "Exchanging diagnostic data with IBM". A "Sign in" section follows, with a note that fields marked with an asterisk are required. The form includes input fields for "ID:" and "Password:", and a "Sign in" button. The footer contains several columns of links: "Connect with us", "Key topics", "Information for", "Shop & buy", "About IBM", and "Popular links".

Secure File Transfer - Sign In

← → ↻ 🏠 <https://testcase.boulder.ibm.com> ☆ 📶 🔑

Imported From Firefox

Worldwide Welcome | IBM Sign In / Register |

IBM Solutions Services Products Support & downloads My IBM Search

## Secure File Transfer

Sign in to the Secure File Transfer service

Sign in to the Secure File Transfer service to securely exchange files with IBM. Use the user name and password provided to you by your IBM representative. Please contact your IBM representative if you have forgotten your password and require it to be reset.

Testcase Data Exchange users may login with a user name of "anonymous". No password is required for anonymous login.

### Sign in

The fields indicated with an asterisk (\*) are required.

ID: \*

Password:

Sign in

### Related links

→ [Exchanging diagnostic data with IBM](#)

#### Connect with us

- Create a profile
- Communities
- Events
- Academic

#### Key topics

- A smarter planet
- Analytics
- Cloud computing
- Security and

#### Information for

- C-suite executives
- Industries
- Small and medium business

#### Shop & buy

- Special offers
- Personal computers
- Ready to buy?
- Financing

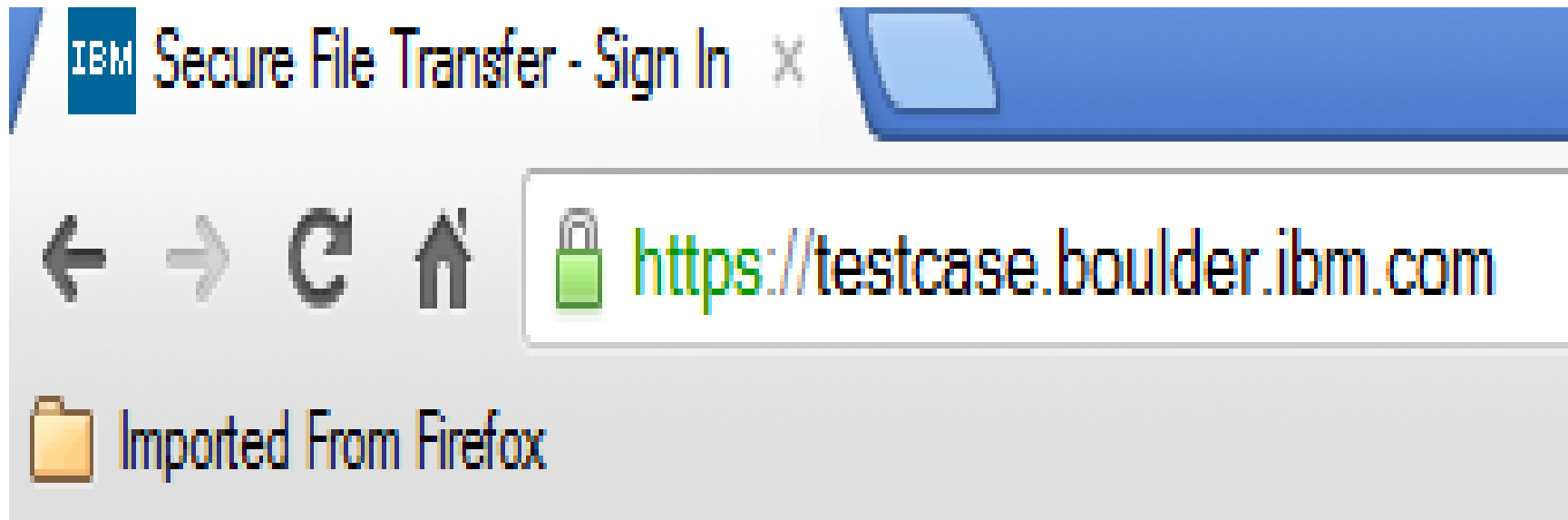
#### About IBM

- Latest news
- IBM's Centennial
- IBM Research
- Corporate

#### Popular links

- Careers
- Fix central
- Passport Advantage
- Product security

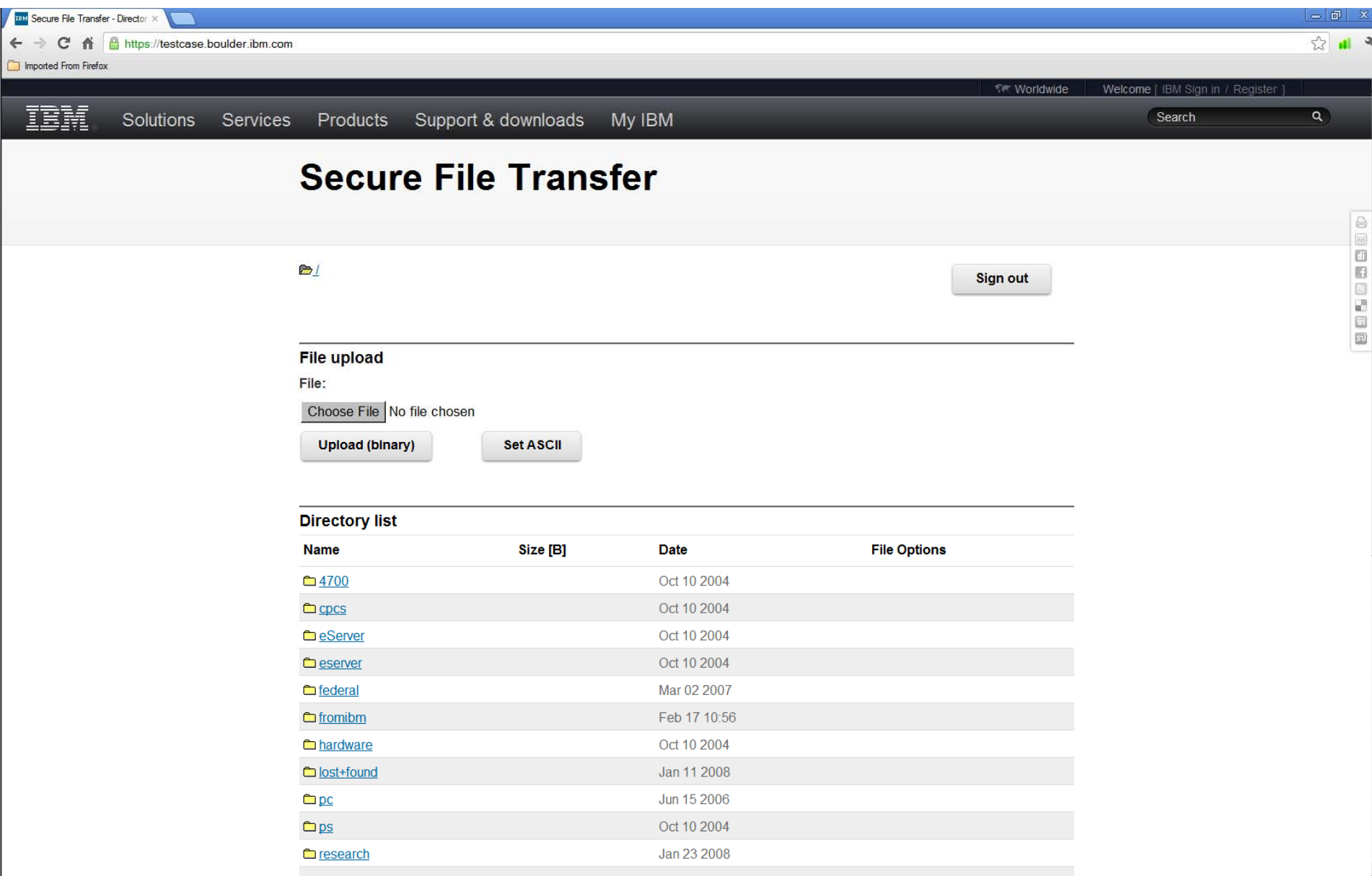
# Dealing with Insecurity



That's right, there's a padlock followed by <https://testcase.boulder.ibm.com>. After I picked myself up off the floor, I tried to logon



# Dealing with Insecurity



Secure File Transfer - Director x

https://testcase.boulder.ibm.com

Imported From Firefox

Worldwide Welcome [ IBM Sign in / Register ]

Search

## Secure File Transfer

Sign out

### File upload

File:

Choose File No file chosen

Upload (binary) Set ASCII

### Directory list

Name	Size [B]	Date	File Options
<a href="#">4700</a>		Oct 10 2004	
<a href="#">cpcs</a>		Oct 10 2004	
<a href="#">eServer</a>		Oct 10 2004	
<a href="#">eserver</a>		Oct 10 2004	
<a href="#">federal</a>		Mar 02 2007	
<a href="#">fromibm</a>		Feb 17 10:56	
<a href="#">hardware</a>		Oct 10 2004	
<a href="#">lost+found</a>		Jan 11 2008	
<a href="#">pc</a>		Jun 15 2006	
<a href="#">ps</a>		Oct 10 2004	
<a href="#">research</a>		Jan 23 2008	

# Dealing with Insecurity

## Secure File Transfer



Sign out

---

### File upload

File:

Choose File No file chosen

Upload (binary)

Set ASCII

---

### Directory list

Name	Size [B]	Date	File Options
------	----------	------	--------------

# Dealing with Insecurity



- This a big development for sites needing to securely send and/or receive files to/from IBM
- It does require you to download to your PC and transfer via a browser
- Your manager and their managers should rest easier once you show them that you can safely transfer data to and from IBM over the public Internet
- A big "Thank You" to IBM for providing this function - but please tell us next time you give us hugely useful new function, so maybe we can go out and use it.....



# LARGEss

(Sam Knutson)

# Large Pages

- IBM introduced large page support in the z10 hardware and z/OS 1.9
- Large pages are 1M and are not pageable
- Current processors performance tied closely to cache performance
- Using large 1M pages made up of 256 contiguous 4K frames can improve TLB performance
- Good References:
  - PRS3189 z/OS 1.9: Overview of Large Page Support by Kathy Walsh on IBM Techdocs
  - z/OS Large Page Support session presented by Elpida Tzortzatos (IBM) at SHARE in Seattle

# Large Pages

- Large Frame Area size can be specified via the LFAREA keyword in IEASYSxx, or system parms
- The LFAREA parameter can be specified as:
  - LFAREA = xx%
  - LFAREA = xxxxxxM
  - LFAREA = xxxxxxG
  - LFAREA = xxxxxxT
- Default for the LFAREA is zero I coded 4G in IEASYS00 and override for each LPAR that needs more
- The maximum that can be specified for the LFAREA is 80% of the online storage at IPL above 4G

# Large Pages

- DB2 stops at 80% but only considers the single DB2 subsystems world view i.e. DSNB542I
- This can lead to **IRA401E 04,CRITICAL PAGEABLE STORAGE SHORTAGE**
- Using Large Pages does not relieve you of the need to carefully coordinate with the DB2 DBAs for specifications on page fixed buffer pools
- We use a small access database application that keeps track of allocations for each subsystem, with totals by LPAR so we can plan real storage allocations and DB2 buffer pools together. This also builds the DB2 ALTER statements to implement and backout changes.

# Large Pages

- Unauthorized users (not DB2) require READ access to facility class IARRSM.LRGDPAGES
- Java 6 SR1 or newer supports use with switch -Xlp1M
- DB2 V10 is an exploiter CPU benefit may be substantial assertions of a few percent
  - PAGEFIX(YES) BP required + z10 or newer + z/OS 1.9 or newer
  - HIS may be useful to measure impact for LPAR along with traditional CPU metrics
  - RMF Monitor I and III enhanced to support
- My strategy was to implement Large Pages then leap frog the DB2 V10 roll out
- Allocated default of 4G in all LPARS and then...



# Large Pages

RMF V1R13 Storage Memory Objects Line 1 of 537  
Command ==> \_ Scroll ==> CSR

Samples: 120 System: BSYS Date: 08/10/12 Time: 09.34.30 Range: 120 Sec

System Summary											
Memory Objects			Frames			Area Used %					
Common	Shared	Large	Common	Fixed	Shared	1 MB	Common	Shared	%	1 MB	
43	12	4704	11110	5326	128K	4704	0.1	0.0		23.0	

Jobname	C	Service Class	ASID	Total	Memory Comm	Objects Shr	Large	Frames 1 MB	Total	Bytes Comm	Shr
DB2TDBM1	S	ONLUSR	0257	3452	0	2	3422	3422	1188G	0	160G
DB23DBM1	S	ONLUSR	0361	1309	0	2	1282	1282	1186G	0	160G
DB2UDBM1	S	ONLUSR	0263	415	0	1	0	0	152G	0	128G
DB2ADBM1	S	ONLUSR	0266	233	0	1	0	0	148G	0	128G
BBNS001S	S	STCMED	0416	229	0	1	0	0	10.9G	0	50.0M
BBNS001	S	SYSSTC	0298	227	0	1	0	0	10.0G	0	50.0M
OPSMVS	S	SYSSTC	0042	206	0	0	0	0	416M	0	0
DB26DBM1	S	ONLUSR	0265	195	0	1	0	0	148G	0	128G
MSMTC	S	STCMED	0243	144	0	0	0	0	4673M	0	0
HZSPROC	S	SYSSTC	0080	131	0	1	0	0	8323M	0	1024K
DFHSM	S	SYSSTC	0073	128	0	0	0	0	128M	0	0
RBN7ACRS	S	SYSSTC	0304	91	0	0	0	0	4043M	0	0

- RMF Monitor I and III enhanced to support
  - SMF 71
- Some support in ISV products requesting more

# Large Pages



- **IRA120E LARGE FRAME SHORTAGE**

**Explanation:** The system detected a shortage of large frames. This message is issued, when 80% of all large frames in the system are in use. If the shortage becomes critical, message IRA121E is issued.

**System Action:** The system continues to honor allocation requests for large frames until the entire area is used.

## **Related messages**

- **IRA121E CRITICAL LARGE FRAME SHORTAGE**
- **IRA122I LARGE FRAME SHORTAGE RELIEVED**

# IRA120E LARGE FRAME SHORTAGE

- What to do?
- Nothing
- You are not out of large pages just 80%
- **IRA120E** is issued as a hi-lite red message and sounds like many other very critical resource shortage messages from SRM
- If you hit 95% **IRA121E** will be issued just DON'T PANIC 4K pages will be used instead so →



# Large Pages



- APAR OA39941 MESSAGES IRA120E AND IRA121E SHOULD BE INFORMATIONAL (open)

**ERROR DESCRIPTION:** SRM monitors large frame usage and issues message IRA120E when 80% of all large frames in the system are in use and then issues message IRA121E when 95% of all large frames in the system are in use. These messages were implemented as highlighted action messages but they are really only informational messages.

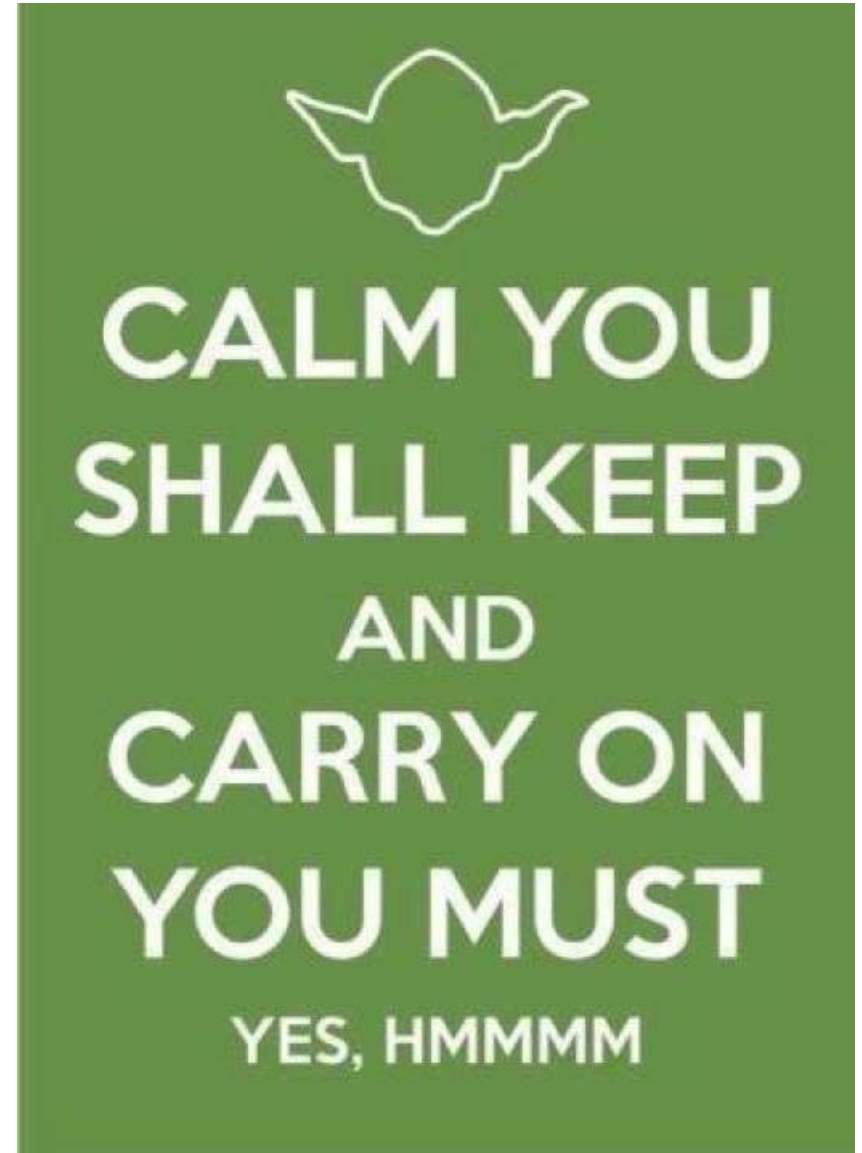
**LOCAL FIX:**


# Large Pages

- The APAR OA39941 text is expected to be updated to document that IBM will **not** turn on the `SYSI_Resource_Constrained` bit in the answer area mapped by the `IWMWSYSI` macro returned by the `IWMWSYSQ` macro. This currently indicates that there is a serious constraint situation when there is a large frame shortage
- In addition to the hi-lite **IRA120E** and **IRA121E** messages you can be impacted by IBM or ISV software reacting to the indicated constraint. Suppression of these messages might not be the complete answer rather putting on the resolution for OA39941 is best
- Thruput Manager detected this condition reported by WLM and temporarily stopped initiating batch issued its own hi-lite WTO message **DTM8172E WLM INDICATES SYSTEM RESOURCES CONSTRAINED ON BSYS**

# Large Pages


- You probably still want to automate the new informational message perhaps only to email it to your team so you can monitor changes in large page consumption and make adjustments to insure optimal performance
- Just remember →






Move It or Lose It  
(Skip Robinson)




- 
- We have a project to bring in new DASD subsystems
  - Requires moving all data from old to new
  - We strive to minimize system disruption
  - Tight deadlines for ending old maintenance contracts
  - These days most volumes are migratable with minimal outage
  - In worst case, rolling IPL of shared systems
  - Some volumes movable via DFDSS, some via TDMF
  - Some volumes movable via 'native' facilities
  - XCF couple data sets via SETXCF COUPLE
  - JES2 checkpoint via dialog
  - SMF data sets via SMFPARM manipulation
  - Local page data sets via PAGEADD/PAGEDEL



- Problem: what to do with JES2 spool?
- Shared and 'always open' to all MAS members
- Cannot be migrated one system at a time
- Given eons, volumes can be \$drained/\$deleted/\$added
- Often requires several IPL iterations to complete
- With infrequent outages, can be a long and painful process
- Riding to the rescue: **\$MSPL Migrate Spool**
- New function in z/OS R13
- Culmination of years of SHARE requirements
- Allows spool volumes to move totally on the fly
- Volumes can be moved one to one or combined/reconfigured
- Eliminates the need for even rolling outages


- 
- I prepared by searching IBMLINK SIS on '\$MSPL'
  - Got three hits:
  - OA36844 VARIOUS ERRORS
  - OA37847 VARIOUS ERRORS
  - OA31806 NEW FUNCTION - TOLERATION APAR TO ALLOW LOWER LEVEL JES2 RELEASES TO COEXIST WITH NEW FUNCTION BEING SHIPPED IN Z/OS1.13
  - Did not see any show stoppers for testing in sandbox


- Harrumph--couldn't get it to work at all
- \$MSPL (spolbx),TARGET=spolby
- \$HASP003 RC=(52),M SPL(SPOLBX) - NO SELECTABLE ENTRIES FOUND
- \$HASP003                      MATCHING SPECIFICATION
- Couldn't discern anything useful from message manual
- Finally enlisted the aid of Dr. Google for msg/RC
- Pointed to some obscure Q&A for this symptom
- Which pointed to OA36158:
- "ENABLE THE Z/OS 1.13 SPOOL MIGRATION FUNCTION"
- I had never installed OA36158/UA64366 ;-(((


- 
- Opened an SR to whine about SIS not showing OA36158 for "\$MSPL"
  - By the next day keyword had been added to OA36158
  - Search on "\$MSPL" now shows four APARs including OA36158
- 
- Sad ending: with time constraints I cannot use \$MSPL for production JESPLEX
  - Even if PTF installed now, no time to test and migrate
  - Must resort to full outage with DSS moves from another system
  - Safe, trusted means although maximally disruptive
  - Hopefully the last time...



Lock It Up and Throw away the Key  
(Skip Robinson)

- 
- Once upon a time, 'someone' changed production PARMLIB
  - Set PPT entry for JES2 in SCHEDxx to require data set authorization
  - 'He' does not know to this day why 'he' did that
  - For several years (!) all was sweetness and light
  - Existing RACF profiles allowed full access by JES2
  - Then one day someone (else) created a new profile
  - A Generic profile that happened to encompass SYS1.HASPCCKPT
  - The very next outage happened to be non-rolling IPL
    - I.e. all systems were down (don't remember why)
  - First system to IPL got JES2 S913 abend on CKPT

- 
- We were in a world of hurt
  - Without JES2, we were dead in the water
  - VTAM and TCPIP could not be run SUB=MSTR
  - So could not logon to TSO to change RACF
  - RACF database was accessible from other systems
  - RACF can manipulate profiles only on its own system
  - Workaround was to mount database on another plex
  - Used RVARY to make prod database primary on sandbox
  - Fixed profile for SYS1.HASPCCKPT to permit JES2
  - Re-IPLed production system with RACF fixed

- 
- But there is a better way if you're set up for it
  - Must have RACF subsystem available
  - `SUBSYS SUBNAME(RACF)`
  - `INITRTN(IRRSSI00)`
  - `INITPARM('RACF,M')`
  - Start the RACF task
  - Logon to a console (!!!)
  - Respond to prompts for userid and password
  - You can then...
  - Issue RACF commands authorized for your userid
  - Read command responses on the console
  - Fix most any security problem
  - Note: does not require TSO/E segment



- Works with SMCS (VTAM) consoles
  - Note that if SMCS is available, TSO most likely is too
- Works with OSC consoles using e.g. PuTTY
- Does NOT work with HMC OpSysMsg console
  - IEE847I LOGON NOT VALID FOR EXTENDED MCS CONSOLE
- Lessons...
- Prepare for console logon ahead of time just in case
- Do NOT include JES2 in your PPT
- Allow default to z/OS internal entry
- See Init&Tuning Reference chapter on SCHEDxx
- Contains a chart of all internal entries/attributes
- PARMLIB overrides internal entries
- Suggest removing PARMLIB entries that duplicate internals

## Acknowledgements Both Knowing and Unknowing



- Roy Mathur, GEICO
- Ricky Jackson, GEICO
- Keith Martens, GEICO
- Patty Little, IBM
- John Burg, IBM
- Laura Blodgett, IBM
- Elpida Tzortzatos, IBM
- Bob Rogers, IBM
- Tom Wasik, IBM



See You in San Frisco...