Bit Bucket X'28'

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Don't They Make a Great Virtual Couple?

(Bob Shannon presented by Ed Jaffe)

Virtual Sysplex Problem

- Virtual Sysplexes are supported under z/VM:
  - Comprised of one or more z/OS guests
  - And one or more Virtual Coupling Facilities (VCF)
- Virtual Coupling Facility:
  - A type of VM Guest
  - Provides the same services as a CF LPAR
  - Simulated VCFs are dispatched on CPs
  - QUICKDSP (quick dispatch) is specified to insure responsiveness
- When the CEC reached 95-100% busy, performance of the Virtual Sysplexes became abysmal
- The XCFAS on guests in Virtual Sysplexes used 50-75% of the cycles
- When the XCFAS requests a synchronous service, it spins until it receives a response
- Since the processor was so busy, the VCFs weren't dispatched properly which caused all the XCFAS on the guests to spin which added insult to injury

Virtual Sysplex Problem

- z/VM 6.1 supports dispatching VCFs on a real ICF, so we added an ICF
- This worked very well; the VCFs were properly dispatched and the XCFAS stopped spinning
- We still need capacity, the Virtual Sysplex problem has been resolved

[Note from presenter: Bob's experience illustrates the difference between z/VM processor 'simulation' and z/VM processor 'virtualization'. You can simulate zAAP, zIIP, IFL, ICF or n-way CPs on any number of physical CPs: Great for certain kinds of testing, but ... beware!]

ISPF Command Shell Game

(Ed Jaffe)

ISPF Command Shell (Option 6)

- Allows long commands to be issued.
- Maintains history of up to ten previous commands in ISPF profile. Point-and-shoot to retrieve a saved command.

```
000329   6,'PGM(ISRPTC) SCRNAME(CMD)'
```

```
  Menu  List  Mode  Functions  Utilities  Help
──────────────────────────────────────────────────────────────────────────────
                              ISPF Command Shell
ISPF Command ===> ____________________________________________________________

Enter TSO or Workstation commands below:

===> _
──────────────────────────────────────────────────────────────────────────────
──────────────────────────────────────────────────────────────────────────────

Place cursor on choice and press enter to Retrieve command

=> define alias(name('alias1') relate('catalog.usrcat01.vmvssy1')) catalog('ca
=> unmount filesystem('zfs.z113.version.zfs') remount(rdwr)
=> unmount filesystem('zfs.z113.version.zfs') remount(read)
=> listc level(omvs)
=> exec ejesdnld exec
=>
```

TSOCMD Command

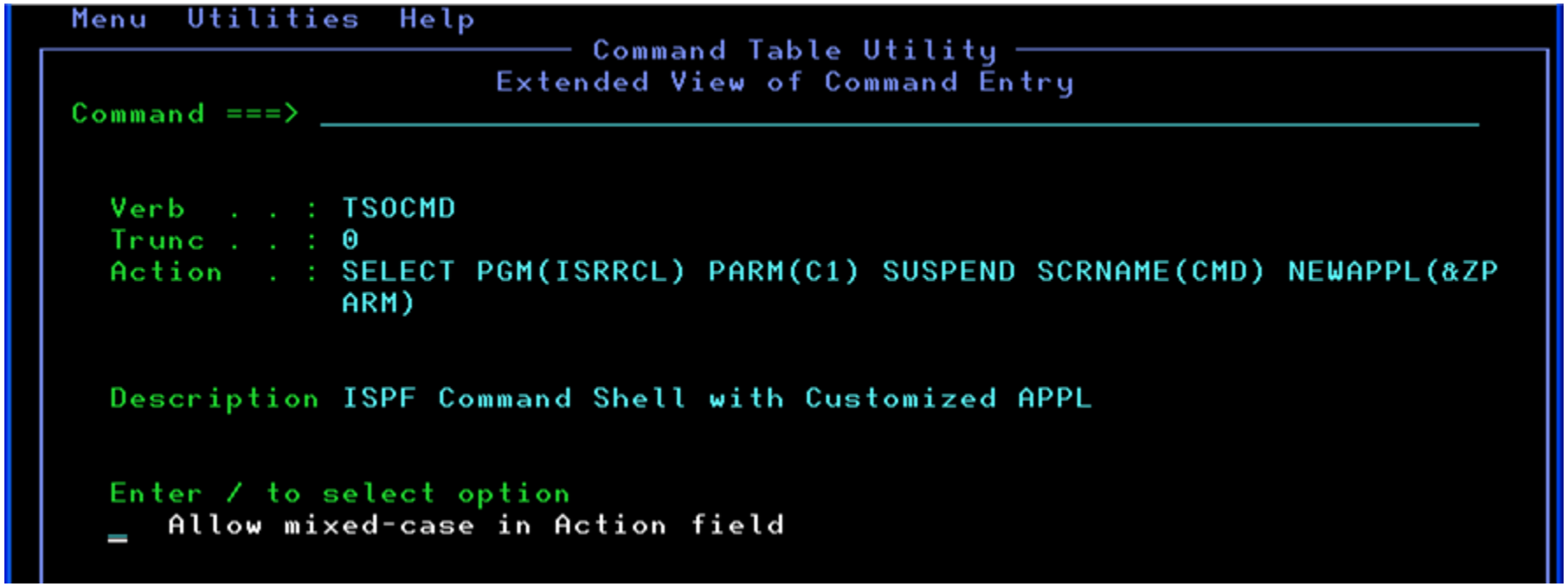
- Defined in ISPCMDS command table.
- Invokes ISPF Command Shell from any panel.
- END or EXIT (F3) returns to original panel.
- Separate history maintained for each ISPF APPL.

```
     Verb       T  Action
____ TSOCMD     0  SELECT PGM(ISRRCL) PARM(C1) SUSPEND SCRNAME(CMD)
```

```
  File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
EDIT       SYS2.MVSUTIL.CNTL(EPHCATJC) - 01.06            Columns 00001 00072
Command ===> tsocmd                                        Scroll ===> CSR
****** ******************************** Top of Data ********************************
000001 //EPHCATJC JOB 1,JAFFE,MSGCLASS=T,NOTIFY=&SYSUID,TIME=NOLIMIT
000002 //*MAIN CLASS=VERYSLOW,SYSTEM=MVS60
000003 //BPXBATCH EXEC PGM=BPXBATCH,REGION=0M
000004 //STDIN      DD   PATH='/etc/booksrv/booksrv.stdin',
000005 //         PATHOPTS=(ORDONLY)
000006 //STDOUT     DD   PATH='/etc/booksrv/booksrv.stdout',
000007 //         PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
000008 //         PATHMODE=SIRWXU
000009 //STDERR     DD   PATH='/etc/booksrv/booksrv.stderr',
000010 //         PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
000011 //         PATHMODE=SIRWXU
```

TSOCMD Command With APPL Parm

- Define a TSOCMD override that accepts APPL parameter.
  - TSOCMD A1 – Process commands for APPL=A1
  - TSOCMD ISR – Process commands for APPL=ISR
  - TSOCMD with no PARM – Process commands for APPL=ISP
- Put this in one of your site command tables. Do not customize ISPCMDS! Do not create your own ISPCMDS!



Is It Politically Correct To Invoke ISPF Services From Your PC?

(Ed Jaffe)

Remote TSO Commands Via SSH

- puTTY is a popular SSH client for Windows. It has batch capabilities that allow you to securely issue remote commands via SSH and capture the response at the PC.
- My examples use plink with userid/password. You can also use pagent with digital certificates instead.
- You specify the remote connection properties name, the userid and password, and the file containing the remote commands. (Yes, you can issue multiple commands!)
- The TSO shell command is used to issue a TSO/E command from SSH. In this example, we will issue LISTC LEVEL(SYS2). Surrounding quotes are required if there are any non-blank special characters.

```
C:\junk>type sshcmd.bat
"c:\program files\putty\plink" -v -load mvs60_ssh -l %1 -m %3.cmd -bat
ch -pw %2 mvs60.phx > %3.output

C:\junk>type listc_sys2.cmd
tso "listc level(sys2)"
C:\junk>_
```

Remote TSO Commands Via SSH

```
C:\junk>sshcmd edjx2 [redacted] listc_sys2

C:\junk>"c:\program files\putty\plink" -v -load mvs60_ssh -l edjx2 -m
listc_sys2.cmd -batch -pw [redacted] mvs60.phx  1>listc_sys2.output
Looking up host "mvs60.phx"
Connecting to 192.168.10.193 port 22
Server version: SSH-2.0-OpenSSH_5.0
We claim version: SSH-2.0-PuTTY-Release-0.53b
Using SSH protocol version 2
Doing Diffie-Hellman group exchange
Doing Diffie-Hellman key exchange
Host key fingerprint is:
ssh-rsa 1024 e0:24:b7:53:fe:b9:65:38:28:28:08:38:9b:da:66:7d
Using username "edjx2".
Sent password
Access granted
Opened channel for session
Started a shell/command
listc level(sys2)
Server sent command exit status 0
```

```
C:\junk>type listc_sys2.output
NONVSAM ------- SYS2.AAKQMOD0
     IN-CAT --- CATALOG.MCATB.PHXHQ
NONVSAM ------- SYS2.ADCDUTIL.CNTL
     IN-CAT --- CATALOG.MCATB.PHXHQ
NONVSAM ------- SYS2.ADZIMOD0
     IN-CAT --- CATALOG.MCATB.PHXHQ
NONVSAM ------- SYS2.ADZISRC0
     IN-CAT --- CATALOG.MCATB.PHXHQ
NONVSAM ------- SYS2.APFLIB
     IN-CAT --- CATALOG.MCATB.PHXHQ
NONVSAM ------- SYS2.APPC.TRACE60
     IN-CAT --- CATALOG.MCATB.PHXHQ
NONVSAM ------- SYS2.APPC.TRACE70
     IN-CAT --- CATALOG.MCATB.PHXHQ
```

ISPF Under SSH

- If you ALLOCATE a file, it is freed as soon as the command ends! This is because the command runs in a z/OS UNIX forked procedure (BPXAS address space).

```
EDJX2:/u/edjx2: >cat /rexx1
/* REXX */
address TSO "ALLOC DD(SAMPLE) DA('SYS1.SAMPLIB') SHR REUSE"
address TSO "LISTALC"
EDJX2:/u/edjx2: >/rexx1
/dev/fd0
/dev/fd1
SYS1.SAMPLIB
EDJX2:/u/edjx2: >tso lista
lista
NULLFILE
/dev/fd1
EDJX2:/u/edjx2: >
```

- Fortunately, allocations performed in REXX persist for as long as the outermost REXX is running. So everything needs to be wrapped inside a single REXX.

ISPF Under SSH

- DYNAMNBR is an issue. TSO/E ALLOCATE does not use DALPERMA (the SVC99 key that makes a file permanently allocated). z/OS UNIX forked procedures have a "hard wired" value of DYNAMNBR=100. You will hit this limit very quickly.
- I tried specifying DYNAMNBR=999 in the BPXAS PROC but it made no difference. IBM confirms DYNAMNBR=100 cannot be changed for z/OS UNIX forked procedures. (Maybe there is a ZAP?)

```
IKJ56220I DATA SET ISP.SISPSAMP NOT ALLOCATED, TOO MANY DATA SETS+
IKJ56220I MAXIMUM NUMBER OF DATA SET ALLOCATIONS ALLOWED BY YOUR SESSION HAS BEEN REA
CHED, YOU SHOULD FREE UNUSED DATA SETS
***  ALLOCATING MISC    ***
IKJ56220I DATA SET ISF.SISFPLIB NOT ALLOCATED, TOO MANY DATA SETS+
IKJ56220I MAXIMUM NUMBER OF DATA SET ALLOCATIONS ALLOWED BY YOUR SESSION HAS BEEN REA
CHED, YOU SHOULD FREE UNUSED DATA SETS
IKJ56220I DATA SET GDDM.SADMSYM NOT ALLOCATED, TOO MANY DATA SETS+
IKJ56220I MAXIMUM NUMBER OF DATA SET ALLOCATIONS ALLOWED BY YOUR SESSION HAS BEEN REA
CHED, YOU SHOULD FREE UNUSED DATA SETS
IKJ56220I FILE XDCJSTEP NOT ALLOCATED, TOO MANY DATA SETS+
IKJ56220I MAXIMUM NUMBER OF DATA SET ALLOCATIONS ALLOWED BY YOUR SESSION HAS BEEN REA
CHED, YOU SHOULD FREE UNUSED DATA SETS
EDJX2:/u/edjx2: >
```

ISPF Under SSH

- BPXWDYN is an alternative to TSO/E ALLOCATE and FREE. It came from the z/OS UNIX world.
- It's considerably more difficult to use than ALLOCATE for concatenated data sets, but it uses the DALPERMA SVC99 key and so gets around the DYNAMNBR=100 limit.
- BPXWDYN can be CALLed from many environments, including CLIST. But then you run up against the 100 character PARM= limit. [Sigh.] Sometimes trying to get something done in z/OS is like navigating a mine field.
- The easiest way to use BPXWDYN is from REXX. It accepts any length input and populates the S99MSG stem with any applicable error messages.
- The desire to use BPXWDYN gave us a reason to rewrite our "crusty" decades-old ISPF allocation CLIST in REXX.

ISPF Under SSH

- This example invokes ISPF GUI from SSH prompt using a REXX called launchispf which obtains the workstation IP address from the ssh_client variable.

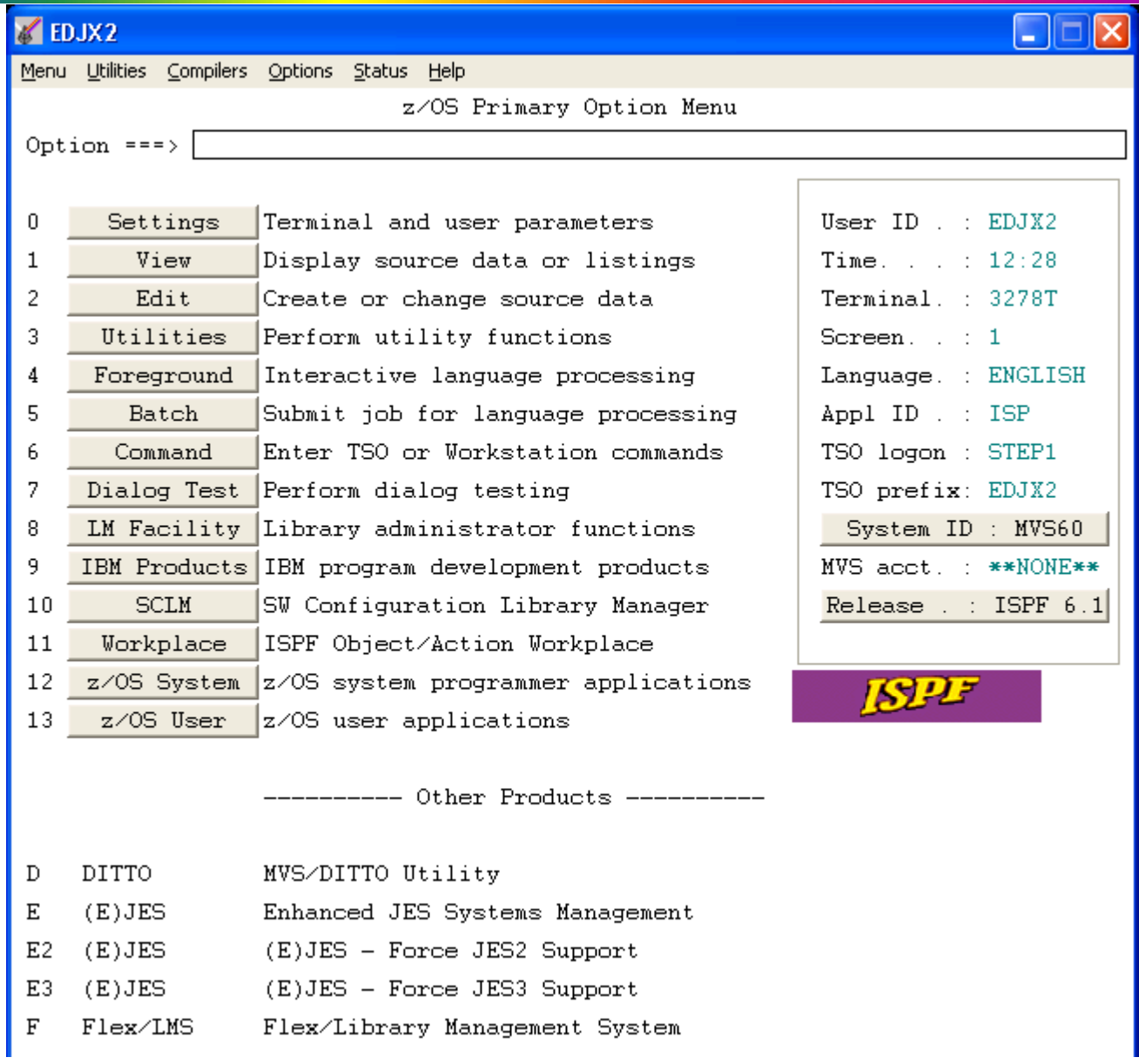
```
EDJX2:/u/edjx2: >cat /launchispf
/* rexx */

  address syscall
  ssh_client = environment(ssh_client)
  parse var ssh_client ssh_client_ip ssh_client_port .

  address tso
  "ex 'sys2.cmdproc(ispalloc)'"
  "ispstart gui(ip:"ssh_client_ip") guiscrw(132) guiscrd(43) frame(fix)"
EDJX2:/u/edjx2: >/launchispf
Procedure Name is BPXAS
*** Allocating SYSPROC ***
*** Allocating SYSEXEC ***
*** Allocating ISPPROF ***
*** Allocating ISPTABL ***
*** Allocating ISPLLIB ***
*** Allocating ISPPLIB ***
*** Allocating ISPMLIB ***
*** Allocating ISPTLIB ***
*** Allocating ISPSLIB ***
*** Allocating ISPILIB ***
***  Allocating MISC   ***
```

ISPF Under SSH

- ISPF GUI window created on PC desktop.
- Interactive ISPF functions are available.
- WSA provides file transfer, PC edit, remote PC commands, etc.
- No TSO/E session. SSH.



Linkage to Make Remote ISPF Service Calls

```
C:\junk>type ispfcmd.bat
@echo off
rem ************************************************************
rem * Invocation parameters:                                   *
rem * 1) The mainframe userid                                  *
rem * 2) The mainframe password                                *
rem * 3) The command enclosed within quotes                    *
rem ************************************************************
set cmd=%3
set cmd=%cmd:"=%
>%0.cmd  echo %cmd%
call sshcmd %1 %2 %0
del %0.cmd
type %0.output
C:\junk>_
```

```
EDIT       /u/edjx2/ispfcmd                          Columns 00001 00072
Command ===> _                                         Scroll ===> CSR
****** ***************************** Top of Data ********************************
000001 /* REXX */
000002 IspfCmd:
000003   parse upper arg command
000004   address TSO
000005   "ex 'sys2.cmdproc(ispalloc)'"
000006   "ispstart cmd("command")"
000007   /* "logoff" Local fix for OA33918 */
000008   exit 0
****** **************************** Bottom of Data ******************************
```

A Sample Remote ISPF Service Call

```
VIEW        EDJX2.CLIST(COPYMEM) - 01.01                Columns 00001 00072
Command ===> _____________________________________________ Scroll ===> CSR
000001 /* REXX */
000002 CopyMem:
000003   parse upper arg fromlib tolib mem
000004   "ispexec lminit dataid(fromlibi)" ,
000005                   "dataset('" || fromlib || "')" ,
000006                   "enq(shr)"
000007   if rc > 0 then do
000008     drc = rc
000009     say " Unable to allocate" fromlib || "."
000010     say " LMINIT return code was" drc
000011     return 8
000012   end
000013   say fromlib "has been allocated."
000014   "ispexec lminit dataid(tolibi)" ,
000015                   "dataset('" || tolib || "')" ,
000016                   "enq(exclu)"
000017   if rc > 0 then do
000018     drc = rc
000019     say " Unable to allocate" tolib || "."
000020     say " LMINIT return code was" drc
000021     return 8
000022   end
000023   say tolib "has been allocated."
000024   "ispexec lmcopy fromid(" fromlibi ")" ,
000025                   "frommem(" mem ")" ,
000026                   "todataid(" tolibi ")" ,
000027                   "replace"
000028   if rc > 0 then do
000029     drc = rc
000030     say " Unable to copy member" mem
000031     say " LMCOPY return code was" drc
000032     return 8
000033   end
000034   say "Member" mem "has been copied from",
000035       fromlib "to" tolib || "."
000036   "ispexec lmfree dataid(" fromlibi ")"
000037   "ispexec lmfree dataid(" tolibi ")"
000038   return 0
****** ***************************** Bottom of Data ******************************
```

Invoking the Sample Remote ISPF Service Call

```
C:\junk>ispfcmd edjx2 [redacted] "./ispfcmd copymem edjx2.a.cntl edjx2.b.cn
tl mymem"
Looking up host "mvs60.phx"
Connecting to 192.168.10.193 port 22
Server version: SSH-2.0-OpenSSH_5.0
We claim version: SSH-2.0-PuTTY_Release_0.60
Using SSH protocol version 2
Doing Diffie-Hellman group exchange
Doing Diffie-Hellman key exchange with hash SHA-256
Host key fingerprint is:
ssh-rsa 1024 e0:24:b7:53:fe:b9:65:38:28:28:08:38:9b:da:66:7d
Initialised AES-256 SDCTR client->server encryption
Initialised HMAC-SHA1 client->server MAC algorithm
Initialised AES-256 SDCTR server->client encryption
Initialised HMAC-SHA1 server->client MAC algorithm
Using username "edjx2".
Sent password
Access granted
Opened channel for session
Started a shell/command
Server sent command exit status 0
Disconnected: All channels closed
Procedure Name is BPXAS
*** Allocating SYSPROC ***
*** Allocating SYSEXEC ***
*** Allocating ISPPROF ***
*** Allocating ISPTABL ***
*** Allocating ISPLLIB ***
*** Allocating ISPPLIB ***
*** Allocating ISPMLIB ***
*** Allocating ISPTLIB ***
*** Allocating ISPSLIB ***
*** Allocating ISPILIB ***
***  Allocating MISC   ***
EDJX2.A.CNTL has been allocated.
EDJX2.B.CNTL has been allocated.
Member MYMEM has been copied from EDJX2.A.CNTL to EDJX2.B.CNTL.
 EDJX2.ISP00000.SPFLOG1.LIST has been kept.
```

Customer Update 2/23/11 2:14 PM

```
*** Electronic submission by customer via SR tool, version 2.0
*** Preferred contact method: IBM Service Request (SR) notification.
*** Customer contact full name: Edward Jaffe
*** Telephone: 310-338-0400x318
*** Email: edjaffe@phoenixsoftware.com
.
Additional comments
IIIIIIIIII   TTTTTTTTTTT
IIIIIIIIII   TTTTTTTTTTT
    II           TT
    II           TT
    II           TT
    II           TT
    II           TT
    II           TT
    II           TT
    II           TT
IIIIIIIIII       TT
IIIIIIIIII       TT
WW        WW  0000000000000  RRRRRRRRRRR   KK        KK   SSSSSSSSSS
WW        WW  0000000000000  RRRRRRRRRRRR  KK       KK   SSSSSSSSSSS
WW        WW  00         00  RR        RR  KK      KK    SS        SS
WW        WW  00         00  RR        RR  KK     KK     SS
WW        WW  00         00  RR        RR  KK    KK      SSS
WW        WW  00         00  RRRRRRRRRRR   KKKKKKK        SSSSSSSS
WW   WW   WW  00         00  RRRRRRRRRRR   KKKKKKK         SSSSSSSS
WW  WWWW  WW  00         00  RR    RR      KK    KK              SSS
WW WW  WW WW  00         00  RR     RR     KK     KK              SS
WWWW    WWWW  00         00  RR      RR    KK      KK    SS        SS
WWW      WWW  0000000000000  RR       RR   KK       KK   SSSSSSSSSSS
WW        WW  0000000000000  RR        RR  KK        KK   SSSSSSSSSS
.
```

IBM Update 2/24/11 5:11 AM

```
Action Taken: Thanks, Ed, for that response! =)
Action Plan: Await PTF availability (4/28).
```

DIAG Trap Vigilance is Not Vigilantism

(Ed Jaffe)

DIAG-Trap Certification Is Elusive

- We run with a full complement of DIAG TRAPs enabled.
- DIAG TRAPs help find bugs. The most well known are the storage-related DIAG TRAPs:
  - IgvInitCpool, IgvInitGetmain, IgvInitFreemain, IarSt64InitGet, IarSt64InitFree, IarCp64InitGet, IarCp64InitFree.
- We also use DIAG TRAPs to set initial non-zero values for registers to help find bugs in programs that use registers without properly initializing them.
  - IeaInitRegsTask – Initializes access registers 2-13 and the high order halves of GPRs 2-13 to X'FFFFFFFF' when a TCB is created.
  - IeaInitArSrb - Initializes the access registers and high order halves of the GPRs to X'FFFFFFFF' when an SRB is initially dispatched.
- Doing this we have uncovered numerous bugs in IBM and non-IBM code:
  - The most common issues are programs that switch into AR mode and then use a base register pointing to some data in the primary address space without first loading a zero ALET into the associated AR. The program gets lucky if the AR just happens to have zeros in it.
  - Now we're starting to see issues with the high order halves of the GRPs not being initialized.

DIAG-Trap Certification Is Elusive

- We find these bugs for one reason and one reason alone—because the organizations that develop the "problem" products are not using these DIAG TRAPs in their own development and test environments.
- If they were, they would catch these bugs themselves.
- Every time we find a new bug this way, we ask the support team to pass along to the developers a suggestion that they and their test folks enable whichever DIAG TRAP "caught" them in order to facilitate better testing in the future.
  - Unknown if anyone has listened to our "suggestions".
- DIAG TRAP testing requires vigilance. Products from any vendor that doesn't do DIAG TRAP testing can suddenly fail when a PTF or a new release is installed.

Recent Case In Point—Tivoli Storage Manager

- We recently upgraded from TSM 5.5.3 to 5.5.5.
- Most everything else seemed to be working, but client sessions were being unilaterally rejected by the server.
- We ran TCP/IP packet traces and TSM traces which showed valid data being sent to the server by the clients. The developers claimed the server code in that area had not been changed.
- After analyzing two SVC dumps produced by SLIP IF tracing, TSM support provided us with the following ZAP which completely solved the issue:

```
NAME ANRSERV ANRMMCPY#C
*
VER 001E B9020033 ==> LTGR 3,3
VER 002A B9200036 ==> CGR  3,6
VER 0032 B90400B3 ==> LGR  11,3
*
REP 001E 07001233 ==> NOP/LTR  3,3
REP 002A 07001936 ==> NOP/CR   3,6
REP 0032 070018B3 ==> NOP/LR   11,3
```

APAR
PM32781

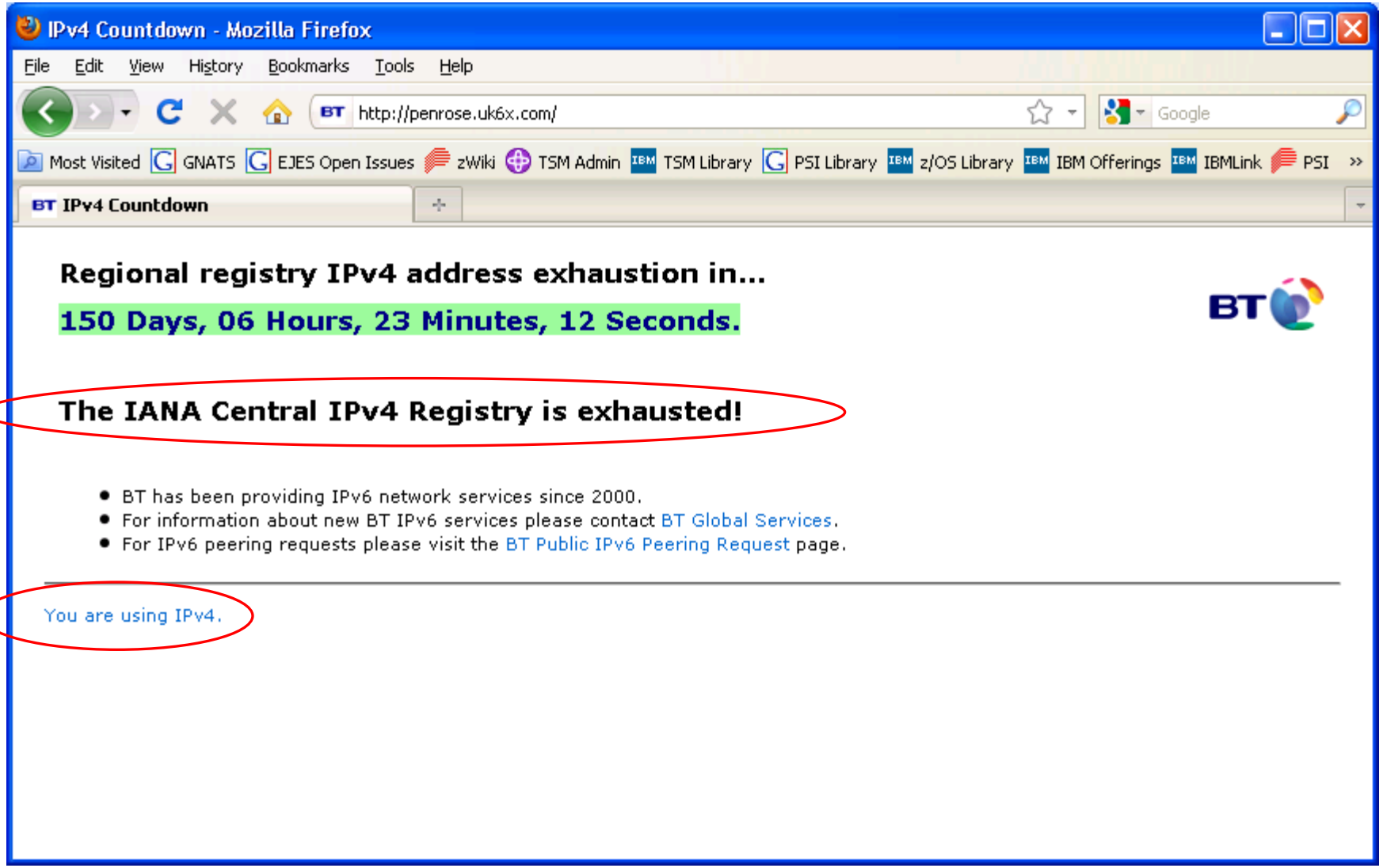
Recent Case In Point—Tivoli Storage Manager

- Apparently, the code in the failing routine had not been changed. Rather, some compiler option or pragma changed which caused the compiler to generate "grande" (64-bit) instructions instead of ordinary 32-bit instructions in a program that was never enhanced to properly handle the high order halves of the GPRs.
- The developers were grateful because they think this might be the cause of some unexplained problems they have seen at other sites.
- For the record, I'm not picking on TSM. Rather, I'm pointing out that so long as z/OS software providers test without DIAG TRAPs, certain bugs will get past them. YOU and I will be the ones to catch them!
- If you find bugs like this, be sure to insist they alter their test environment(s) to include the DIAG TRAPs.
- Stay alert; head on a swivel; be careful out there!

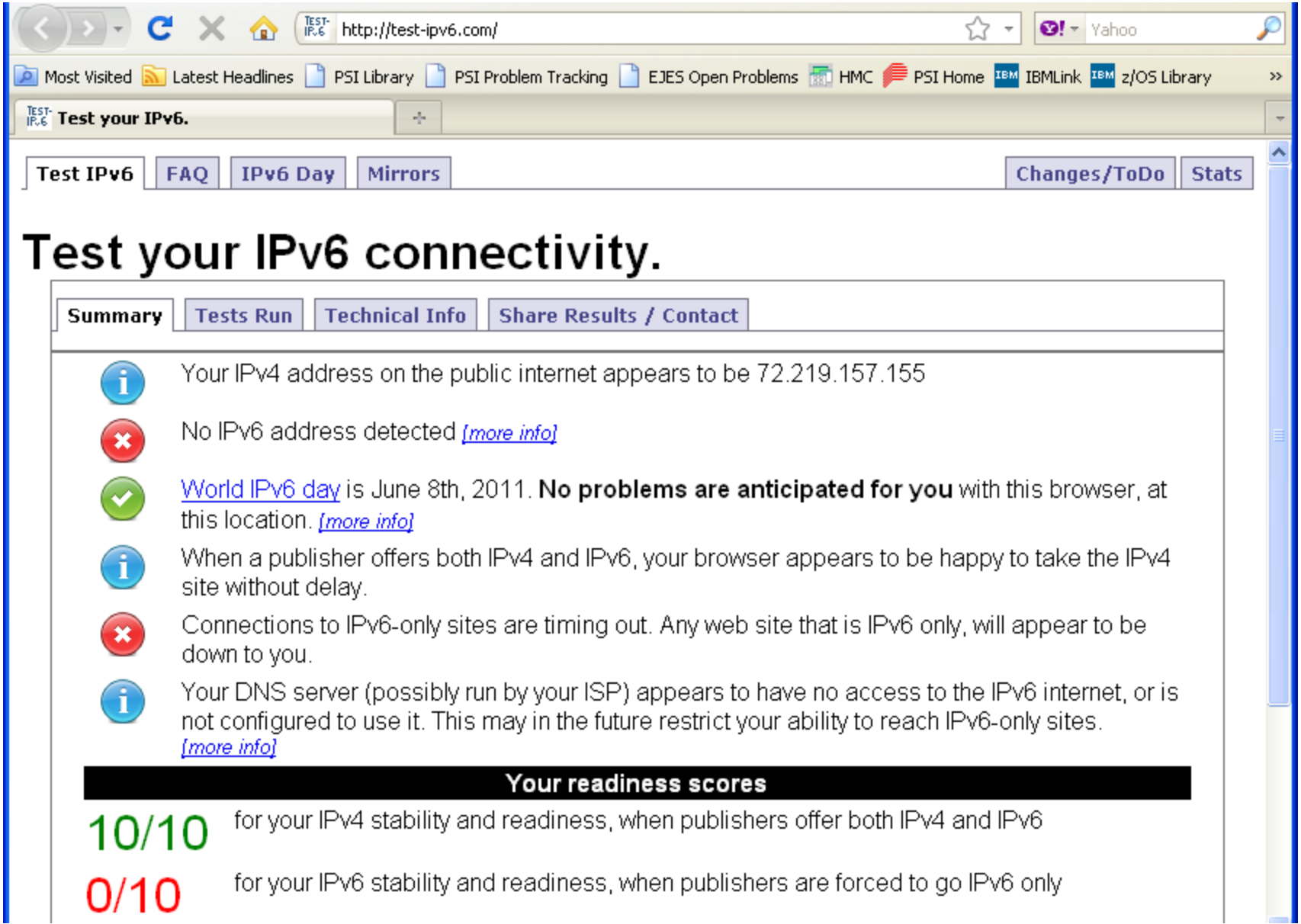
IPv6 Ready? Set? Go?

(Ed Jaffe)

I Assume Everyone Is Ready For This. Not!



Test IPv6 Readiness At http://test-ipv6.com



Mass Transmit

(Sam Knutson)

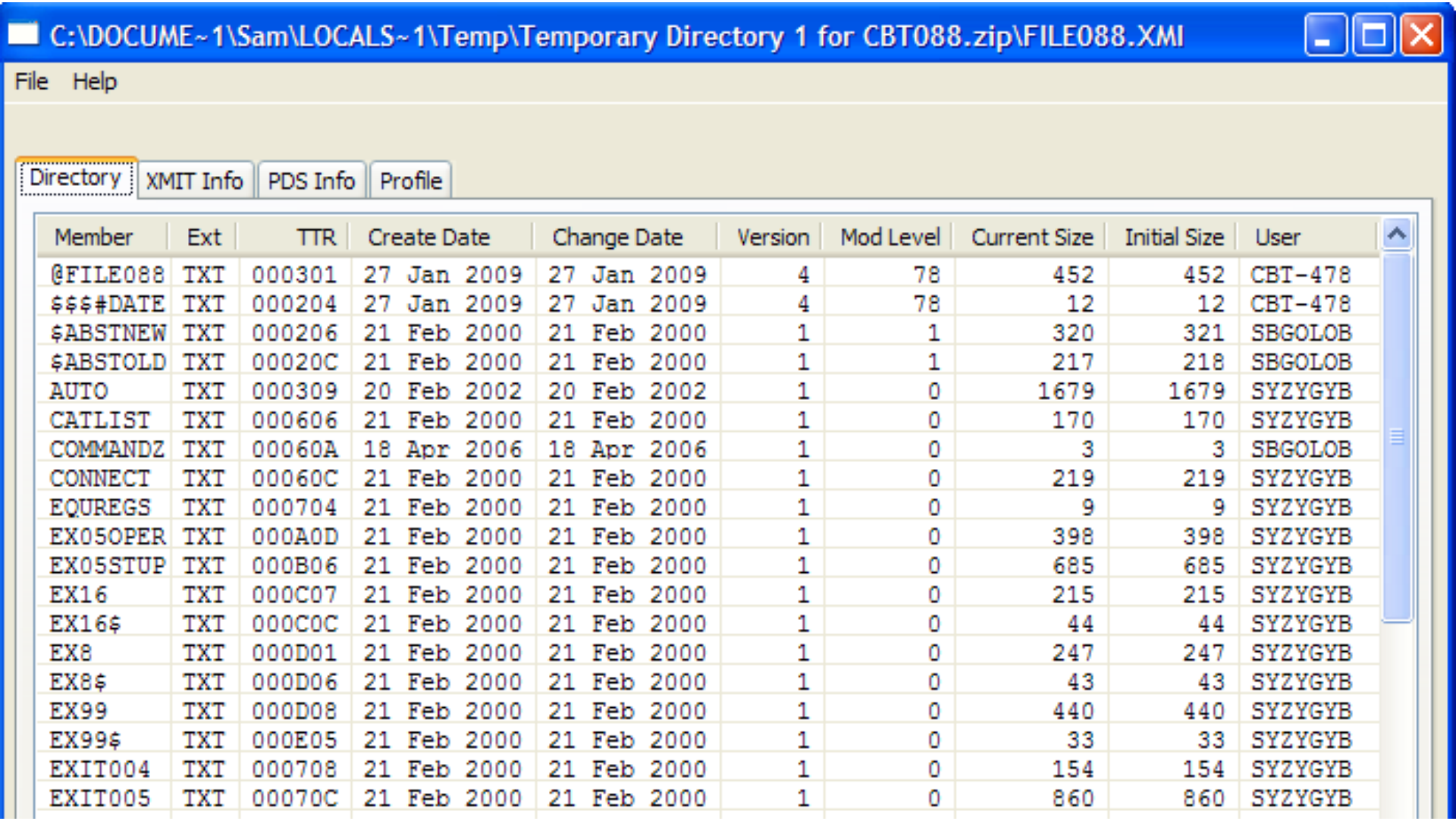
UnXMIT

- **TSO TRANSMIT into a data set very useful to archive or transfer PDS or PDSE data sets (PS also supported)**
  - Preserves ISPF stats
  - Portable file easy to move as binary even outside z/OS
- **Zipped XMIT very common format for freeware and Tools and Toys downloads on z/OS**
- **XMIT Manager Windows GUI to view contents of XMIT files one of the most beloved PC applications by MVS Sysprogs http://www.cbttape.org/njw/**
  - free
  - may not work as well or at all on Windows 7
  - closed source no further updates or release of source expected
- **Good source of general XMIT information David Alcock's UnXMIT page http://planetmvs.com/unxmit/index.html**

UnXMIT

- There is a great new option! UnXMIT by DeWitt Knapp
- Unpacks TSO/E XMIT files from z/OS system to desktop systems. Converts text members from EBCDIC to ASCII. Supports PDS and PDS/E. Supports XMIT files stored inside XMIT files. Software is written entirely in JAVA using SWT
- Minor limitations documented UnXmit does not support XMIT files that originated from sequential files nor does it support XMIT files that originated from load libraries; furthermore UnXMIT does not support XMIT files that originated from undefined record formatted PDS (RECFM=U).
- Download now from SourceForge (55M) http://unxmit.sourceforge.net/
- Author very responsive to enhancement requests and bug reports and UnXMIT has evolved rapidly

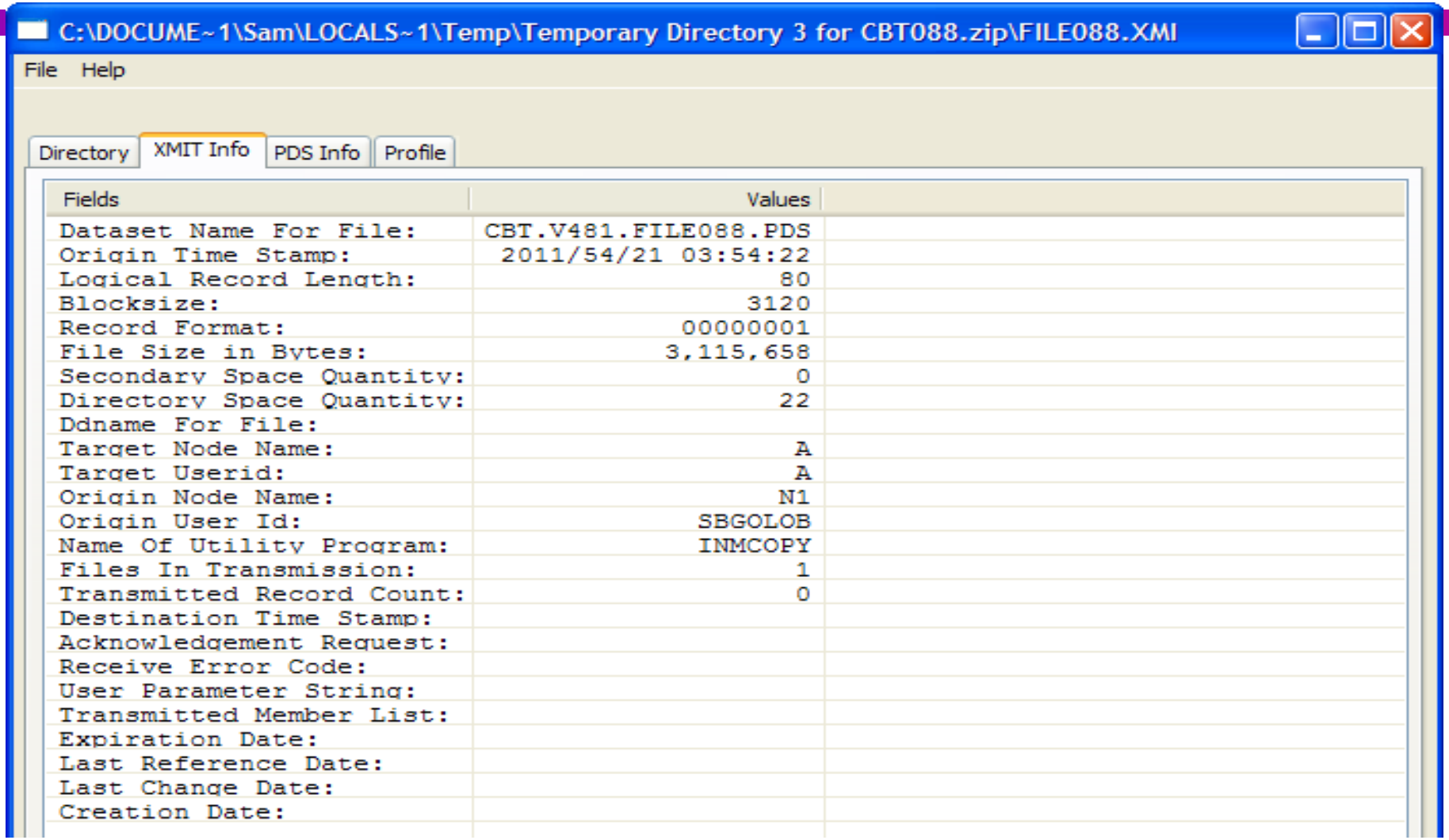
UnXMIT screen shots Directory



Member	Ext	TTR	Create Date	Change Date	Version	Mod Level	Current Size	Initial Size	User
@FILE088	TXT	000301	27 Jan 2009	27 Jan 2009	4	78	452	452	CBT-478
$$$#DATE	TXT	000204	27 Jan 2009	27 Jan 2009	4	78	12	12	CBT-478
$ABSTNEW	TXT	000206	21 Feb 2000	21 Feb 2000	1	1	320	321	SBGOLOB
$ABSTOLD	TXT	00020C	21 Feb 2000	21 Feb 2000	1	1	217	218	SBGOLOB
AUTO	TXT	000309	20 Feb 2002	20 Feb 2002	1	0	1679	1679	SYZYGYB
CATLIST	TXT	000606	21 Feb 2000	21 Feb 2000	1	0	170	170	SYZYGYB
COMMANDZ	TXT	00060A	18 Apr 2006	18 Apr 2006	1	0	3	3	SBGOLOB
CONNECT	TXT	00060C	21 Feb 2000	21 Feb 2000	1	0	219	219	SYZYGYB
EQUREGS	TXT	000704	21 Feb 2000	21 Feb 2000	1	0	9	9	SYZYGYB
EX05OPER	TXT	000A0D	21 Feb 2000	21 Feb 2000	1	0	398	398	SYZYGYB
EX05STUP	TXT	000B06	21 Feb 2000	21 Feb 2000	1	0	685	685	SYZYGYB
EX16	TXT	000C07	21 Feb 2000	21 Feb 2000	1	0	215	215	SYZYGYB
EX16$	TXT	000C0C	21 Feb 2000	21 Feb 2000	1	0	44	44	SYZYGYB
EX8	TXT	000D01	21 Feb 2000	21 Feb 2000	1	0	247	247	SYZYGYB
EX8$	TXT	000D06	21 Feb 2000	21 Feb 2000	1	0	43	43	SYZYGYB
EX99	TXT	000D08	21 Feb 2000	21 Feb 2000	1	0	440	440	SYZYGYB
EX99$	TXT	000E05	21 Feb 2000	21 Feb 2000	1	0	33	33	SYZYGYB
EXIT004	TXT	000708	21 Feb 2000	21 Feb 2000	1	0	154	154	SYZYGYB
EXIT005	TXT	00070C	21 Feb 2000	21 Feb 2000	1	0	860	860	SYZYGYB

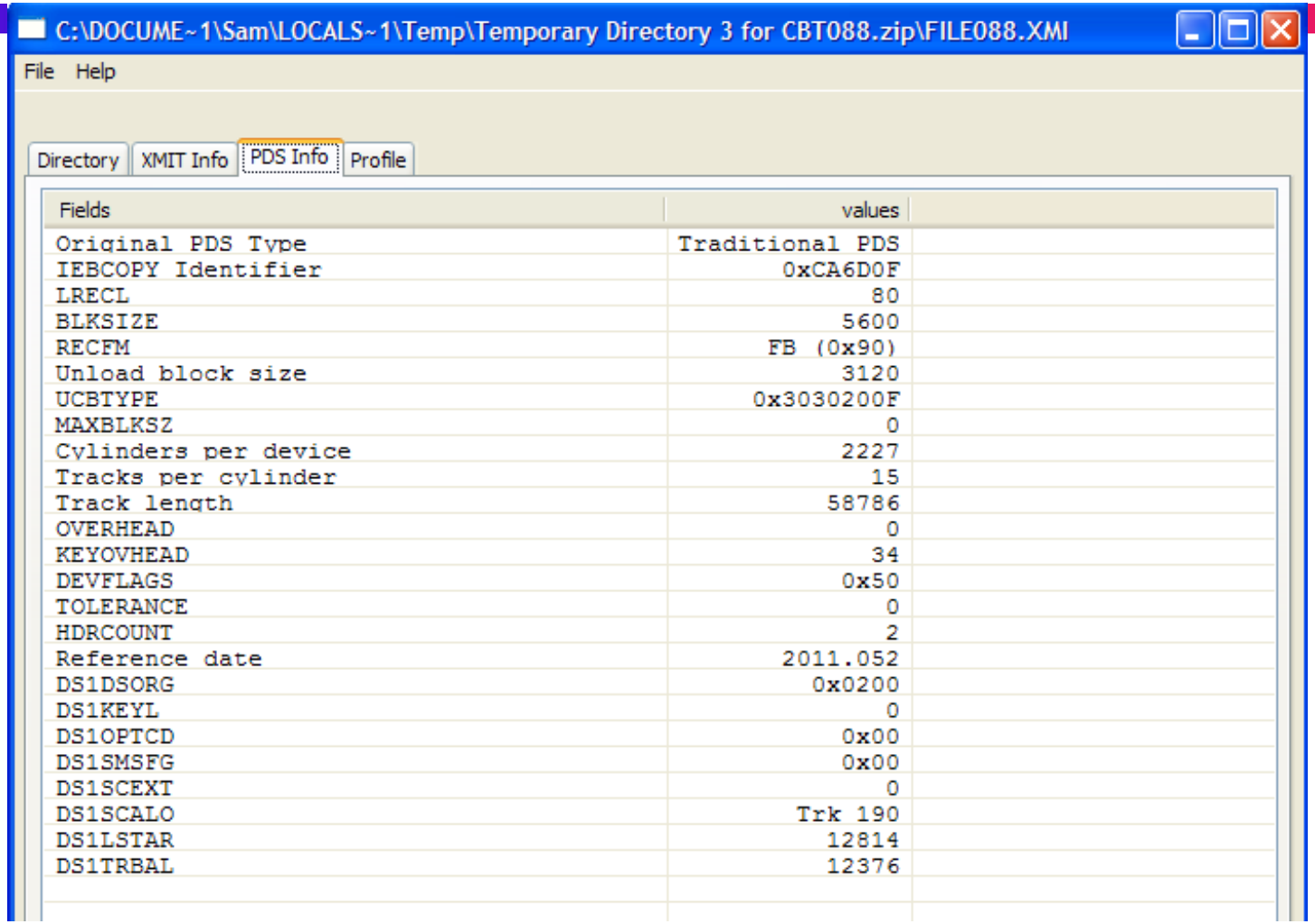
- You may select members to extract (Save) or simply double click to open in an editor you have associated with .TXT

UnXMIT screen shots XMIT Info



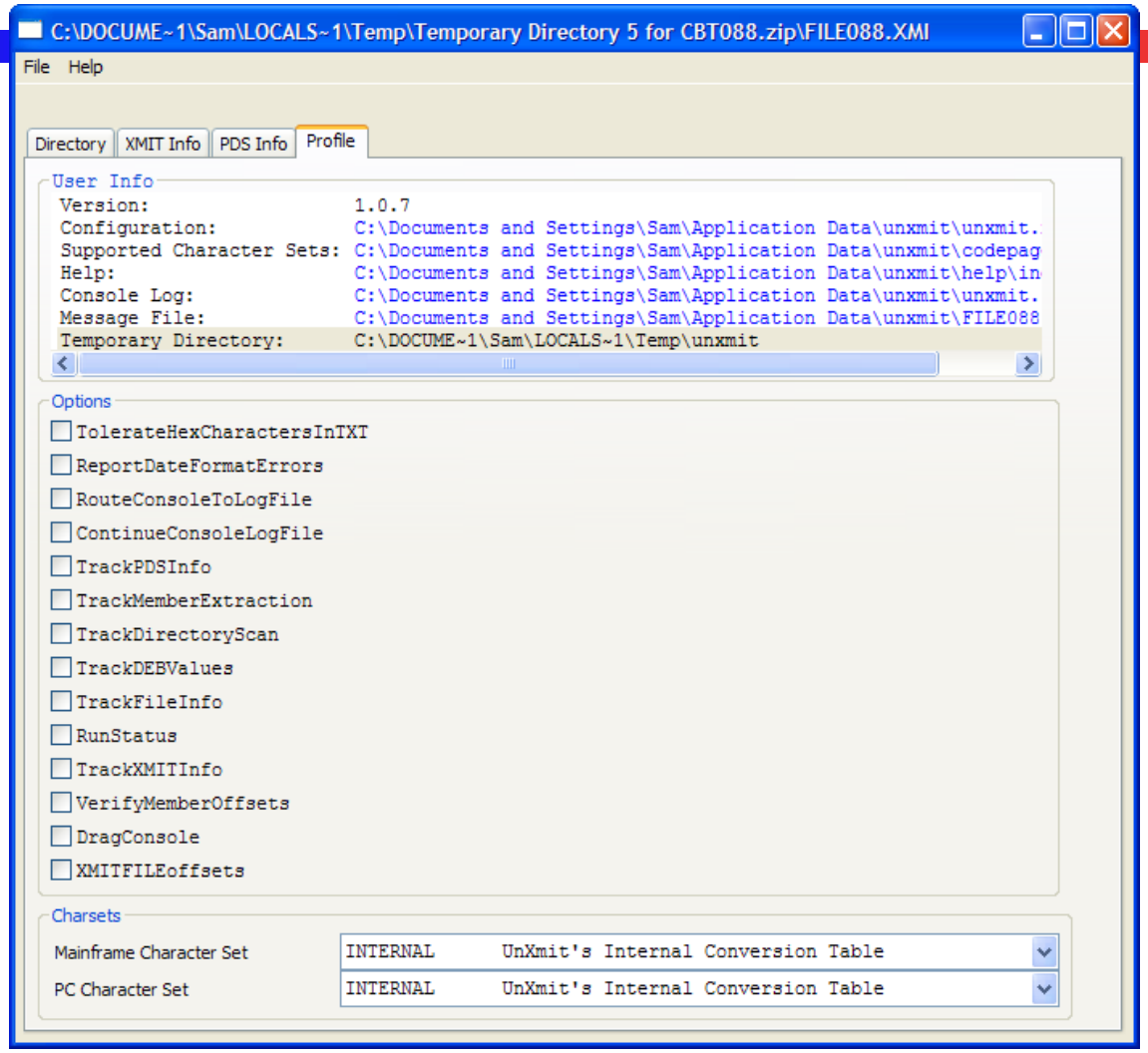
- This tab contains information concerning the XMIT wrapper (read-only)

UnXMIT screen shots PDS Info



- This tab contains information concerning the original PDS unloaded from the z/OS system (read-only)

UnXMIT screen shots Profile



- This tab contains user information about this installation of UnXMIT and allows setting options mostly related to debugging and Character Sets to use

UnXMIT making XMIT files on z/OS

- **TSO/E TRANSMIT syntax**

```
TRANSMIT  (or XMIT)
   (addresseelist)
   COPYLIST/NOCOPYLIST
   DATASET(dsn)/DSNAME(dsn)/DDNAME(ddname)/FILE(ddname)/
   TERMINAL
   ENCIPHER
   EPILOG/NOEPILOG
   FULLSCREEN/LINE/LINE(nn)
   LOG/NOLOG/LOG(ALL)
   LOGNAME(name)
   LOGDATASET(dsname)/LOGDSNAME(dsname)
   MEMBERS(memberlist)
   MESSAGE/MSG/MSGDDNAME(ddname)/MSGFILE(ddname)/
   MSGDATASET(dsname)/MSGDSNAME(dsname)
   NOTIFY/NOTIFY(ALL)/NONOTIFY
   OUTDDNAME(ddname)/OUTFILE(ddname)/
   OUTDSNAME(dsname)/OUTDSN(dsname)
   PARM(parameters)
   PDS/SEQ
   PROLOG/NOPROLOG
   SYSOUT(sysout class or *)
```

UnXMIT making XMIT files on z/OS

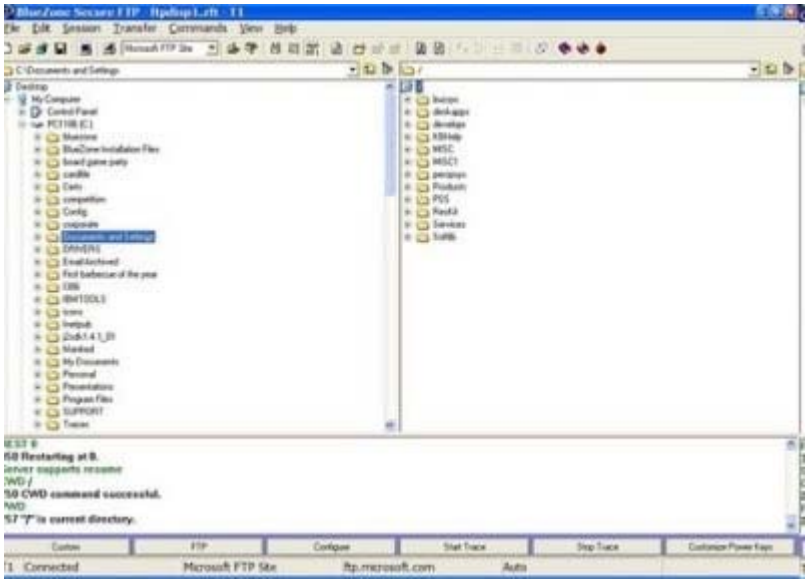
- XMIT a.b DA(your.data) OUTDATASET(your.data.XMI) is about the minimum but still too much for me so I have a simple REXX allows easy use from ISPF 3.4 or TSO READY
- Bluezone Secure FTP still best free Windows GUI FTP client for working with z/OS
  http://www.rocketsoftware.com/bluezone/products/secure-ftp/features

```
/* REXX MAKEXMI */
/* Xmit PDS into data set for FTP

 PARSE UPPER ARG dsn
 @dsn = dsn
 @dsn2 = STRIP(@dsn,B,"'")
say 'Processing' @dsn 'into XMIT format'

Address "TSO"
     "XMIT MVS.IBMUSER",
      "PDS",
      "NOLOG",
      "SYSOUT(X)",
      "DATASET(" || @dsn || ")",
      "OUTDATASET('" || @dsn2 || ".XMI')"

Return 0
```



I've Been Moved

(Sam Knutson)

New CPU z196

- zEnterprise announced last summer and if you missed it you can watch it on YouTube "zEnterprise launch" http://youtu.be/iMNX22A07uc
- YouTube IBMSystemZ Channel http://www.youtube.com/user/ibmsystemz
- 2817-725 (M66) →

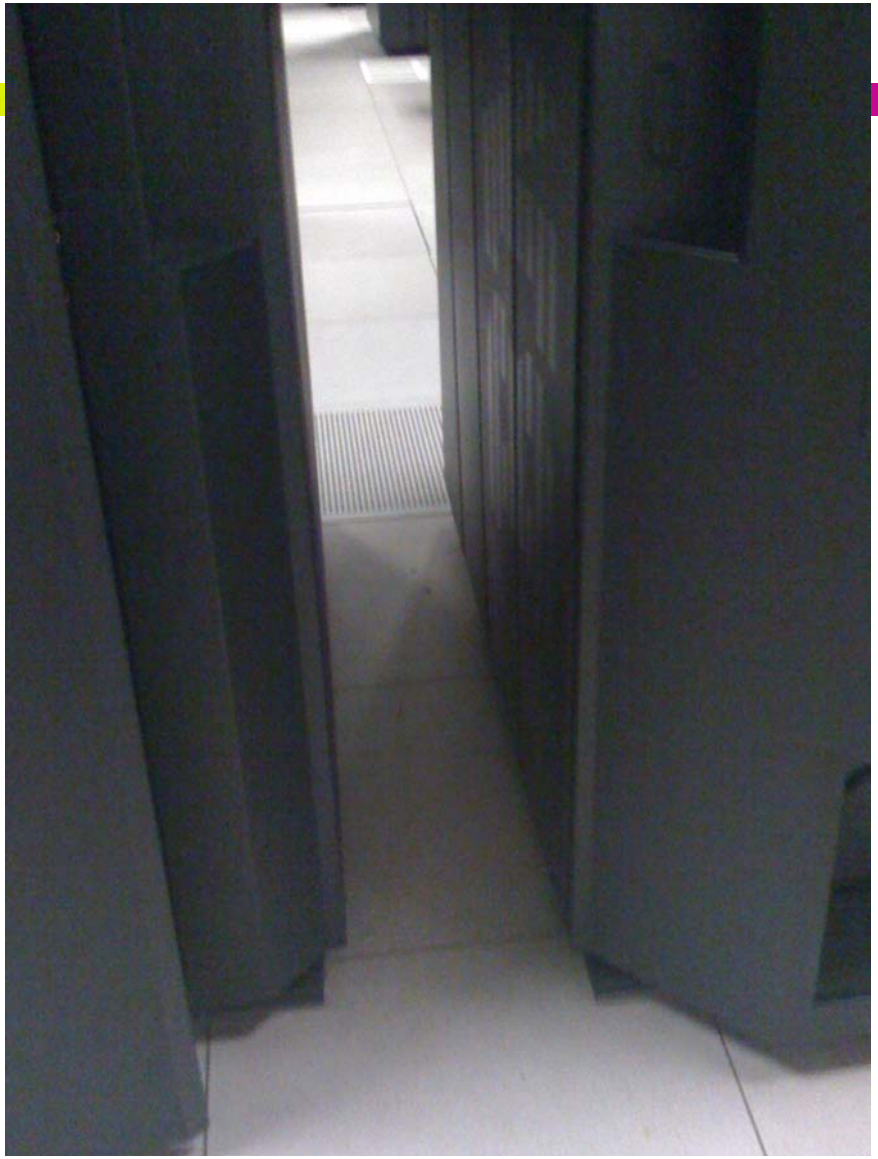
New CPU z196

- 2817 delivered 12/31/10
- Live with production 1/23/10
- Fewer and Faster CPs
  - zPCR
  - CP3000 study
- Memory is an even better value on z196 than on z10
- Plan Ahead Memory makes it easier to avoid an outage to add memory later
- Not a z196 →

New CPU z196

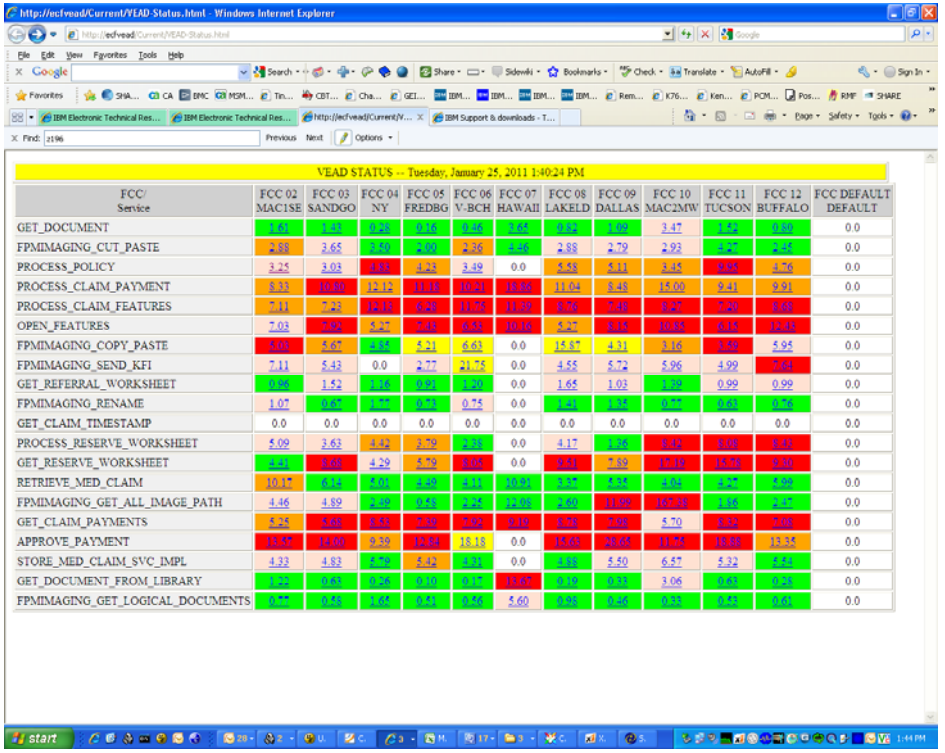
- Fiber Quick Connect (FICON trunking) .. Yes
- DC Power .. No
- Overhead cabling .. No
- H20 Cooling .. No

- ICB-4 links migrated to PSIB
- OSA-ICC adoption
- One new HMC
- Driver 86 updates for other HMCs
- CFSIZER used to review structures



New CPU z196

- Migration from z10 to z196 was without incident great support from IBM
- Monday morning application and z/OS monitoring showed CPU utilization rising and failures to meet Service Levels for a key application on 1 LPAR
- Other LPARs performing as expected
- IBM support engaged



VEAD STATUS -- Tuesday, January 25, 2011 1:40:24 PM

FCC/ Service	FCC 02 MAC1SE	FCC 03 SANDGO	FCC 04 NY	FCC 05 FREDBG	FCC 06 V-BCH	FCC 07 HAWAII	FCC 08 LAKELD	FCC 09 DALLAS	FCC 10 MAC2MW	FCC 11 TUCSON	FCC 12 BUFFALO	FCC DEFAULT DEFAULT
GET_DOCUMENT	3.61	3.43	0.28	0.18	0.46	3.64	9.82	3.09	3.47	3.42	0.80	0.0
FPMIMAGING_CUT_PASTE	2.88	3.65	2.50	2.00	2.26	4.46	2.88	2.79	2.93	4.27	2.25	0.0
PROCESS_POLICY	3.25	3.03	4.83	4.23	3.49	0.0	5.58	5.11	3.45	9.85	4.76	0.0
PROCESS_CLAIM_PAYMENT	8.33	10.80	12.12	11.18	10.21	18.86	11.04	8.48	15.00	9.41	9.91	0.0
PROCESS_CLAIM_FEATURES	7.11	7.21	14.13	6.20	11.75	11.09	8.76	7.18	8.47	7.20	8.68	0.0
OPEN_FEATURES	7.03	7.92	5.37	7.40	8.43	10.36	5.27	8.18	10.55	6.15	12.14	0.0
FPMIMAGING_COPY_PASTE	8.08	4.67	4.84	5.21	6.61	0.0	15.87	4.31	3.16	3.59	5.95	0.0
FPMIMAGING_SEND_KFI	7.11	5.43	0.0	2.77	21.75	0.0	4.55	5.72	5.96	4.99	7.64	0.0
GET_REFERRAL_WORKSHEET	0.86	1.52	1.16	0.91	1.20	0.0	1.65	1.03	1.29	0.99	0.99	0.0
FPMIMAGING_RENAME	1.07	0.67	1.77	0.73	0.75	0.0	1.41	1.34	0.77	0.61	0.76	0.0
GET_CLAIM_TIMESTAMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PROCESS_RESERVE_WORKSHEET	5.09	2.63	4.42	2.79	4.28	0.0	4.17	3.36	8.42	5.08	8.42	0.0
GET_RESERVE_WORKSHEET	4.41	5.68	4.29	5.79	8.05	0.0	9.43	7.89	17.19	15.78	9.30	0.0
RETRIEVE_MED_CLAIM	10.17	6.14	5.01	4.89	4.11	10.81	3.57	4.58	4.04	4.27	5.89	0.0
FPMIMAGING_GET_ALL_IMAGE_PATH	4.46	4.89	2.49	0.58	2.24	12.04	2.60	11.09	167.38	1.86	2.47	0.0
GET_CLAIM_PAYMENTS	5.25	5.68	8.53	7.80	7.92	9.19	8.70	7.08	5.70	8.32	7.08	0.0
APPROVE_PAYMENT	13.57	14.00	9.59	12.84	18.18	0.0	13.61	28.84	11.75	18.88	13.35	0.0
STORE_MED_CLAIM_SVC_IMPL	4.33	4.83	5.79	5.42	4.21	0.0	4.88	5.50	6.57	5.32	5.84	0.0
GET_DOCUMENT_FROM_LIBRARY	1.22	0.61	0.28	0.10	0.17	12.67	0.19	0.13	3.06	0.63	0.25	0.0
FPMIMAGING_GET_LOGICAL_DOCUMENTS	0.77	0.58	1.65	0.51	0.56	5.60	0.98	0.46	0.33	0.53	0.61	0.0

Drilling down to the problem

- SEV1 PMR's with CICS and LE
- Hardware PMH
- CRITSIT critical help provided by IBM WSC
- Determined that one program was using signficant amount of CPU using HIS and Application Profile tool
- Move Character Long instructions in this one application program found to be using the majority of the time
- Significant use of MVCL "pad fill" created a bottleneck with page-mover functions in the hardware
- Problem determination might have been difficult or impossible without HIS
  - Analysis of SMF 113 used to understand LPAR level performance
  - HIS sampling used to drill down to actual code and instructions causing the problem

HIS

- Hardware Instrumentation Facility introduced on z10
- SMF 113 records and optionally data files to USS
- Enable the CPU MF (CPU Measurement Facility) on the HMC
- start HIS at IPL
- automate HIS002I HIS INITIALIZATION COMPLETE
- F HIS,B,TT='HIS00',PATH='/tmp/',CTRONLY,CTR=ALL
- If you just want counters you can use /tmp and don't need a special filesystem for this
- If you are going to collect samples those can be quite large you probably don't want to chance filling up /tmp create and use a sufficiently large file system
- Collecting just the counters to the 113 records like this I have not seen any overhead.

SMF 113

- MXG provides support to format these with SAS www.mxg.com
- Discussing with other vendors opportunities to exploit data

- SHARE in Anaheim Sessions all provide great depth on this interesting data
  - Exploring the SMF 113 Processor Cache Counters and LSPRs by Peter Enrico (Enterprise Performance Strategies Inc,)
  - CPU MF - the "Lucky" SMF 113s - z196 Update and WSC Experiences by John Burg (IBM Corporation)
  - Using And Getting Benefit From SMF 113 Records - Customer Experience by Meral Temel (Garanti Technology)

Microcode Update

- N29799 MCL089 for I390/PU-ML LIC
- Performance issue seen on customer applications which heavily use the Move Char Long (MVCL), Move Char Long Extended (MVCLE) and Move Char Long Unicode (MVCLU) instructions
- Available February 23 to all customers
- Concurrent to install
- Product Engineering built and validated fix after recreate in IBM Poughkeepsie Lab
- We normally update processor microcode monthly. Evaluate your schedule for applying microcode updates for all devices and consider you may want to apply them more frequently than recommended for less mature devices
- IBM recommendation is apply microcode quarterly

COBOL Code updates

- Application moved data in and out of 96K buffer repeatedly
- Application COBOL program was updated to reduce unneeded character manipulation
- LE options set to clear storage long history not easily changed
- Application use of buffer analyzed and determined it that it was never read without having been written
- several small changes would benefit CPU use
  - COBOL INITIALIZE includes this buffer in scope
  - Moved buffer from 05 level to 01 level outside the scope of the INITILIZE
  - Moves of spaces to the buffer were done to logically clear it but only the first byte was checked
  - Changed MOVE SPACES TO WS-DATA to MOVE SPACES TO WS-DATA (1:1) in two places

Summary

- z196 is an impressive upgrade and one that any customer should have no concerns about adopting
- zBX is disruptive technology similar to parallel Sysplex and IBM should be able to help you understand how it fits into the ecology of your shop
- Hardware and Software have bugs preperation is priceless
- Setup HIS to generate 113 records also consider collecting WLM type 99 records. These along with LOGREC, OPERLOG, SYSLOG, System Trace and other key components make up your z/OS "Flight Recorder"
- SHARE that 113 SMF data with IBM WSC
- If you have a problem don't waste time ask for help open software and hardware problems in a timely fashion

Archive SMFarchive

(Skip Robinson)

Not Your Daddy's SMF

- For more or less ever, SMF recording was to VSAM
- Multiple MANx data sets sucked up data AFAP
- Periodically MANx files would be…
  - Dumped by IFASMFDP immediately or ultimately to tape
    - Triggered by indication of MANx data set full
  - Emptied (ZEROEd) after dumping
  - Switched to next available MANx data set round robin
- Lots of problems
  - MANx data sets filled up fast on a busy system
  - Out of control tasks could swamp all MANx data sets
  - Even with emergency buffering, SMF data could be lost
  - No prioritization of record types possible
  - Records were FIFO without regard to customer's needs
- Solution in z/OS R9 was SMF Logger
- MANx replaced by system logger offload data sets

SMF Recording to Log Stream

- Recording to log stream solved many chronic problems
  1. Much faster than write to MANx VSAM
  2. Less chance of losing data due to high rate
  3. Data can be directed to multiple log streams by type
- Some early usage problems
  - Traditional style archiving to tape was awkward
  - No such thing as 'ZEROing' to eliminate already dumped data
- OA27037 introduced ARCHIVE option
  - Read log stream by date to some designated end time
  - Write out records not previously ARCHIVEd
  - Mark processed records as ARCHIVEd
- ARCHIVE required date range parameter(s)
  - Bad date or other corruption could halt dumping
  - Little or no diagnostic information to isolate problem
  - Manual intervention required to salvage data

OA34589: the Final Solution?

- OA34589 allows ARCHIVE with no DATE parameter
- Simply dumps all records not previously ARCHIVEd
- Starts with oldest non-ARCHIVEd records
- Marks dumped records as 'ARCHIVEd'
- Stops at current time
- Also adds diagnostic information for debugging
  - I haven't seen any problems yet
- Management of data now similar to old MANx style
- But you still get logger speed and flexibility
- I recommend…
  - One day retention (minimum allowed) in log stream definition
  - Multiple ARCHIVE jobs per day
- Conclusion: SMF log stream is ready for prime time
  - Disclaimer: I've said that before ;-)

Acknowledgments Both Knowing and Unknowing

- Paul Scott, Phoenix Software International.
- DeWitt Knapp (UnXMIT)
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- James Harkness (IBM)
- Bob Rogers (IBM)
- Kathy Walsh (IBM)
- John Burg (IBM)
- Charles Webb (IBM)

See You in Orlando…