IBM Software Group

27th ALCS User Group Meeting, London, 24 – 26 May 2011

ALCS Development Status

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What we've achieved

- Since the last User Group
  - 14 requirements completed
  - 9 enhancements
  - 57 defects
  - ALCS books published on IBM Online Library every April
    - Updates to books on our website when maintenance released
      - http://www.ibm.com/tpf/alcs/library.htm
- ... And items are in progress
  - Other enhancements in this presentation
  - Also in the Requirements presentation
- ... And at the same time we've continued to …
  - Respond to and progress your support needs

What we've achieved (continued)

➢ User guides

- We have added to the Guides and Samples page on the ALCS web site:
  - WAS OLA Sample Application and Guide
  - z/OS TCP/IP Packet Trace Guide
  - MQ Bridge Guide for 2.4.1
  - Message Trace Facility Guide
- We hope to add more guides
  - Suggestions welcome - alcs@uk.ibm.com

Not completed user requirements

Requirement	APAR/PTF	Requirement description
ATC0184*		Handle new (non-allocated) fixed file better

* Reported as in progress at the last meeting

ATC0184
Handle new (non-allocated) fixed file better

- Requirement
  - Don't give an error on read of a non-allocated fixed file record.
    Return a record, initialised with the correct id, along with a return code indicating that the record has not yet been allocated. Allocate on write.
  - In all cases where an un-initialised, not previously read record is read, using the correct id (per the DBGEN), then return a record with the id initialised, and the rest of the record initialised to x'00'.
- Proposed Solution to last User Group
  - Change to Recoup required as above is only apparent when using FNDPC
  - Possible approach - ALCS to allocate the new fixed file record for FNDPC
- Reconsidered
  - Risk with this approach - runaway program could use up a lot of pool
  - Rather be safe and return error
  - We will reject this requirement

Completed user requirements

Requirement	PTF	Requirement description
ATC0251*	UK51851	User Fields on bottom line of 3270
ATC0270*	UK61482	Make VFA hit rate by pool display online
ATC0288*	UK53534	Enhance display of load module status
ATC0302**	UK63875	ALCS online message trace facility
ATC0300**	UK47537	Websphere application server Optimized local adapters
ATC0293**	UK52593	Allow more than one RHOST IP address for TCPIPALC
ATC0299**	UK50624	Allow MQTERM display to be defined CRAS AT1-AT16
ATC0289**	UK51853	Show previous DSN on the ROC for ZASEQ

* Reported as in progress at the last meeting

** Requirement in the previous top 10 (Dec 2008)

*** Requirement not top 10 but included in other work

Completed user requirements …

Requirement	PTF	Requirement description
ATC0246**	UK67152	Allow system limits greater than 64K
ATC0294**	UK46952	APIDC callable service added
ATC0296**	UK46438	#ETX added as ASCII EOM character
ATC0268**	UK47174	Make DXCSRG record access mix report optional
ATC0282**	UK50921	Record calling program instead of TPFDF program in ST Pool Event Log
ATC0309***	UK61966	Exits for third party debugging

* Reported as in progress at the last meeting

** Requirement in the previous top 10 (Dec 2008)

*** Requirement not top 10 but included in other work

ATC0251
User Fields on bottom line of 3270

- Provided by PTF UK51851
- Requirement
  - Have the ability to add the current date, CRN, CRAS status to the right side of the bottom protected line.
- Solution
  - SCTGEN option SHOWCRN (default No) to show CRN on bottom line
    - Date form in this case restricted to maximum 11 chars
      - To accommodate ISO and 3 letter month format (DD MMM YYYY)
    - Date field to remain where it is. CRN field added in fixed position after date field
  - SCTGEN option SHOWCRAS (default No) to overwrite end of user text
    - 32 byte system message or user text followed by double space
    - 10 byte CRAS=ATNNN or CRAS=PRC followed by single space

```
ALCS 2.3.1 Sysname up to 32 char  CRAS=AT101 14 MAR 2006   PYEYTC03
```

ATC0270
Make VFA hit rate by pool display online

- Provided by PTF UK61482
- Requirement
  - Count DASD Reads and Writes separately by size to enable calculation of VFA Hit rates.
- Solution
  - Provide both DASD read/write rates and VFA Hit rates
  - New command ZSTAT DASD shows rates by pool size
    - Mean Ln VFA DASD I/O per second
    - Mean Ln VFA READs per second ...
    - Mean Ln VFA WRITEs per second ..
  - New command ZSTAT HITRATE
    - Mean Ln VFA READs per second
    - Mean Ln FINDs per second and hit rate

```
                    Lines      1 to      8 of      8  Columns   1 to  60 of  60
                    Active:  5   4   3   2  *1*
DXC8590I CMD M  07.23.10 STAT
Mean L1 VFA READs per second ..............431.03
Mean L1 FINDs per second ..................958.07     55.02
Mean L2 VFA READs per second ..............430.83
Mean L2 FINDs per second ..................958.19     55.04
Mean L3 VFA READs per second ...............0.00
Mean L3 FINDs per second ...................0.18    100.00
Mean L4 VFA READs per second ...............0.00
Mean L4 FINDs per second ...................0.00
```

ALCS TCPIP system IALMH 27/09/89

MA C 17/030

ATC0288
Enhance ZPCTL with application program info

- Provided by PTF UK53534
- Requirement (part 3)
  - Display the program version information in a load module
- Solution
  - New format for ZPCTL command

```
ZPCTL DISPLAY DXCAA001,PROGRAMS
```

```
Program   Version   Module                Program   Version   Module
CSC1      00        DXCAA001              CPM5      00        DXCAA001
CPM7      00        DXCAA001              CTH4      00        DXCAA001
...
```

ATC0288 (continued)
Enhance ZDPRG with load module information

- Provided by PTF UK53534
- Requirement (part 4)
  - Display all of the load modules which include a certain program, and the program version in each load module
- Solution
  - New format for ZDPRG command

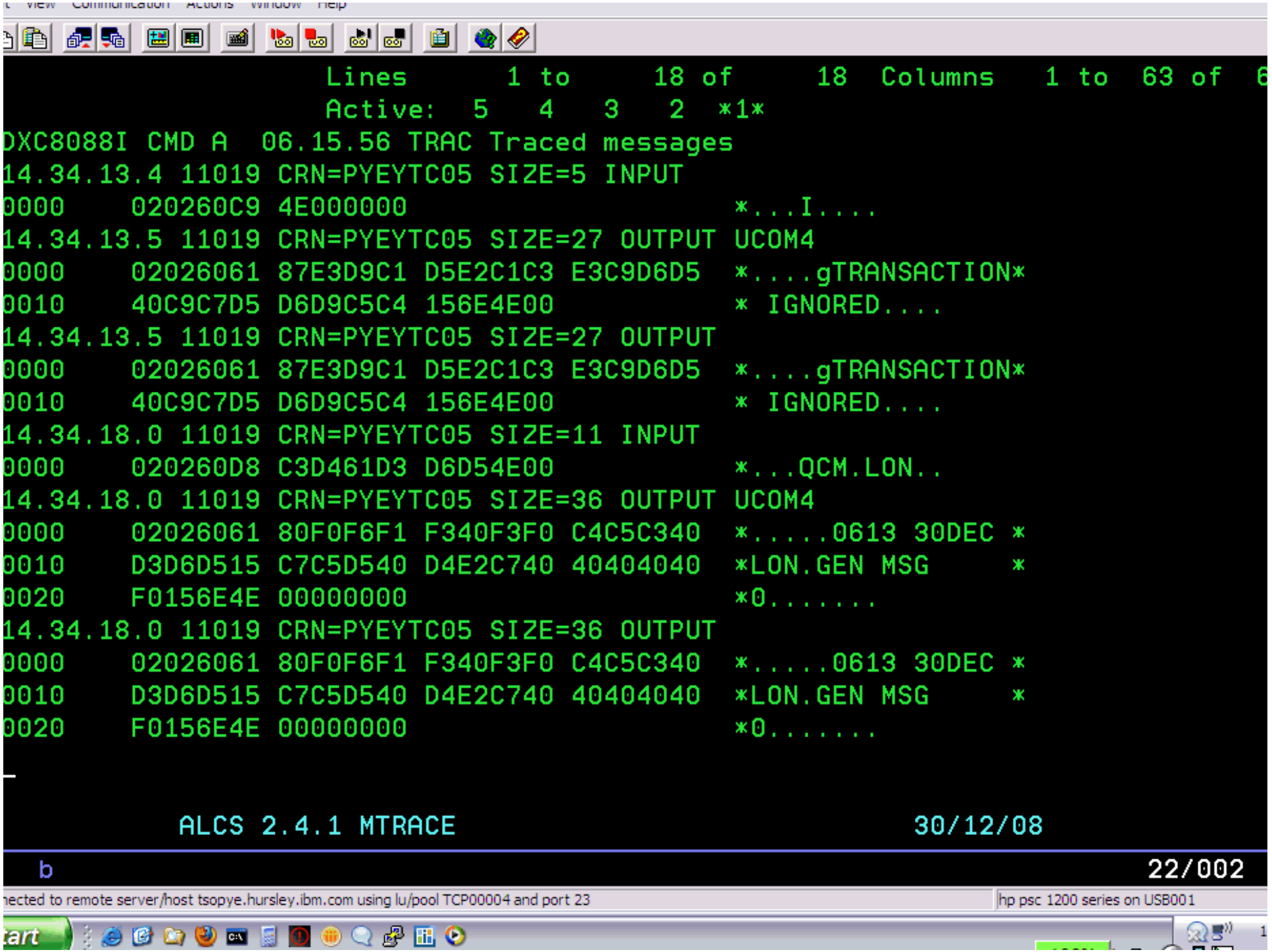
```
ZDPRG ETAI,MODULES
Program   Version  Module     CRN
ETAI      02       PRDEA#E9   *SYSTEM*
ETAI      03       PRE00123   *SYSTEM*
ETAI      04       PRE00145   PYEY0723
```

ATC0302
Add a facility to trace all input and output messages

- Provided by PTF UK63875 / UK63880
- Requirement
  - A consistent method of tracing messages coming to and going from ALCS.
- Solution
  - ALCS message trace facility
    - trace input and output messages to a wrap around online trace area for selected communication resources.
    - for use on production and test systems
  - ZTRAC Msg Start/Stop/Clear/Display the online message trace
    - minimal overhead
    - maximum of eight (generic, or non-generic) communication resources concurrently.

ATC0302
Add a facility to trace all input and output messages

- Trace points
  - just before control is passed to an application
  - at the start of ROUTC or SEND-type monitor-request macro processing.
- Callable services UMSGT1 and UMSGT2 provided to perform any additional tracing.
- Two ECB controlled exits AMG1 and AMG2 allow the online trace message display to be customized.
- SCTGEN
  - Option to place trace area above the bar (below the bar is default)
    - AMODE64=([VFA],[MSGTRACE])
  - Trace Area size can be specified from 64K to 2M
    - MSGTRACE={64K|aK|bM|NO}
  - New option on PAGE to allow paging of the online trace area


Lines 1 to 18 of 18 Columns 1 to 63 of 6
Active: 5 4 3 2 *1*
DXC8088I CMD A 06.15.56 TRAC Traced messages
14.34.13.4 11019 CRN=PYEYTC05 SIZE=5 INPUT
0000 020260C9 4E000000 *...I....
14.34.13.5 11019 CRN=PYEYTC05 SIZE=27 OUTPUT UCOM4
0000 02026061 87E3D9C1 D5E2C1C3 E3C9D6D5 *....gTRANSACTION*
0010 40C9C7D5 D6D9C5C4 156E4E00 * IGNORED....
14.34.13.5 11019 CRN=PYEYTC05 SIZE=27 OUTPUT
0000 02026061 87E3D9C1 D5E2C1C3 E3C9D6D5 *....gTRANSACTION*
0010 40C9C7D5 D6D9C5C4 156E4E00 * IGNORED....
14.34.18.0 11019 CRN=PYEYTC05 SIZE=11 INPUT
0000 020260D8 C3D461D3 D6D54E00 *...QCM.LON..
14.34.18.0 11019 CRN=PYEYTC05 SIZE=36 OUTPUT UCOM4
0000 02026061 80F0F6F1 F340F3F0 C4C5C340 *.....0613 30DEC *
0010 D3D6D515 C7C5D540 D4E2C740 40404040 *LON.GEN MSG *
0020 F0156E4E 00000000 *0.....
14.34.18.0 11019 CRN=PYEYTC05 SIZE=36 OUTPUT
0000 02026061 80F0F6F1 F340F3F0 C4C5C340 *.....0613 30DEC *
0010 D3D6D515 C7C5D540 D4E2C740 40404040 *LON.GEN MSG *
0020 F0156E4E 00000000 *0.....
ALCS 2.4.1 MTRACE 30/12/08
b
22/002
nected to remote server/host tsopye.hursley.ibm.com using lu/pool TCP00004 and port 23
hp psc 1200 series on USB001

ATC0300
XML and SOAP Support

- Requirement
  - z/TPF offers XML and SOAP support, can ALCS?
- IBM Response and Analysis
- ☺ Requirement was conditionally accepted
  - Native ALCS implementation equivalent to z/TPF not realistic nor necessary
    - Leverage what z/OS already provides instead (traditional ALCS strategy)
    - Adopt the z/TPF design and APIs where appropriate
  - WAS on z/OS
    - Full SOAP stack
    - Embedded XML parser
    - J2EE environment in which to build wrappers and other tooling … as well as new business logic
  - Connecting ALCS to WAS will require further investigation

ATC0300
Websphere App Server Optimized local adapters

- Provided by PTF UK47537 / UK47603
- Implements support for WAS optimized local adapters
  - IBM WAS for z/OS 7.0.0.4 (5724-J08) or later is required to use this support
- You can create a web service to represent business logic implemented as a servlet or an Enterprise Java Bean (EJB). The application that gets control for the web service call can delegate to a connector call to ALCS. Using this approach, ALCS applications can be exposed externally as web services. All the necessary WAS external support and administration is in place.
- ALCS Web site Guides :
  - How to use the WAS Bridge or make OLA calls in ECB controlled programs
  - WAS Sample Application Guide - includes a description of message flows, usage scenarios and sample servlet application.

ATC0293
Include the TCP/IP remote host address in DXC2985I

- Provided by PTF UK52593

- Requirement
  - TCP/IP remote host address in DXC2985I (MATIP Session Closed)
- Solution
  - Message has been updated to include remote host address

- Also …
  - Update to the COMDEF RHOST TCPIPALC terminal, ability to set the primary and up to three alternate IP addresses of the remote host or gateway.
  - For a TCP/IP connection where ALCS is the client, ability to set the primary and up to three alternate IP addresses of the remote system.
  - Corresponding updates to OCTM COMTC

ATC0299
Allow MQTERM to be defined CRAS

- Provided by PTF UK50624

- Requirement
  - MQTERM with TERM=3270DSP can be assigned AT1-AT16. However, they can not be assigned AT1-AT16 in COMDEF

- Solution
  - Allow COMDEF to assign AT1-255 and AP1-255 for MQTERM and WASTERM (3270DSP or 3270PRT).
  - Corresponding updates to OCTM COMTC

ATC0289
Show previous DSN on the ROC for ZASEQ

- Provided by PTF UK51853
- Requirement
  - Show previous DSN on the ROC for ZASEQ.
- Solution

```
zaseq sin,dsn=sin.number.eight
DXC8734I CMD M  21.55.17 ASEQ  Sequential file SIN before update
File Device   Status  Type Volume Data-set-name
SIN  3380     CLOSED  IN          SIN88888
DISP=(OLD,KEEP,KEEP)         0 Blocks read/written

DXC8729I CMD M  21.55.17 ASEQ  Sequential file SIN update complete
File Device   Status  Type Volume Data-set-name
SIN  3380     CLOSED  IN          SIN.NUMBER.EIGHT
DISP=(OLD,KEEP,KEEP)         0 Blocks read/written
```

ATC0246
Allow system limits bigger than 64K

- Provided by APAR UK67152
- Requirement
  - We can not restrict some applications which need to do more than 64K of GETFCs. This is a potential serious risk if the application goes into a real loop. Extension of the system limits to 4 bytes from the current 2 will allow any limit to be set. The same applies, of a lesser seriousness to the ECB life limit as well.
- Solution
  - The SLIMC limits for ECBLIFE and GFS have been increased from 2 bytes to 4 bytes. Maximum value increased from 65,535 to 2,147,483,647.
  - The C/C++ api slimc() allows the same values
  - Some spare fields in the ECB Descriptor (DXCECBD) have been used for the expanded fields above. If user fields have been defined using those spare areas, those user changes will have to be re-engineered.

ATC0246
Allow system limits bigger than 64K

- Implementation
  - This has been implemented avoiding need for re-assemblies
  - SLIMC is object compatible
  - SLIMC macro expansion may differ in length (larger and smaller)
  - Some spare fields in the ECB Descriptor (DXCECBD) have been used for the expanded fields above. If user fields have been defined using those spare areas, those user changes will have to be re-engineered.
- Warning! - Not an excuse to reduce diligence
- Increasing dispense limit to 2 billion allows an entry to deplete the pool
  - Very large values have the same effect as setting no limit

ATC0294
Add the ability for user exits to use APIDC macro

- Provided by PTF UK46952
- Requirement
  - New DXCIWE callable service to be implemented for APIDC
- Solution
  - APIDC implemented as a callable service
  - With the restrictions
    - ECBADDR=YES is not supported
    - Register 0 (RAC) is corrupted
  - List of macros that can be called from installation wide monitor exits.
    - APIDC, COMCC, CPDMP, DECBC, DXCPKEY, DXCSAVE, GLOBZ, TIMEC, WTOPC

ATC0296
Add #ETX AS ASCII EOM character

- Provided by PTF UK46438
- Requirement
  - Add #ETX as one of EOM character when check EOM in DXCSND
- Solution
  - #ETX added to Ending Sequence Symbol List:

Character	Hex	HLASM	C symbol
End-of-message	X'4E‘	#EOM	_EOM
End-of-message-unsolicited	X'5F‘	#EOU	_EOU
End-of-message-incomplete	X'6D'	#EOI	_EOI
End-of-text	X'03‘	#ETX	_ETX

  - Updates to CPQS, DXCCOMS, DXCCOMT, DXCCOMX, DXCCOM3, DXCDTP03, DXCSLCSN, DXCSND, DXCSOCA, DXCSRG0

ATC0268
Make DXCSRG record access reports optional

- Provided by PTF UK47174
- Requirement
  - Make the report of record access-mix by record type and by record ID optional to reduce CPU use.
- Solution
  - Implement new exec parameter RAM|NORAM
    - PARM=(DXCCDDW0,RAM|NORAM)
    - Used to decide whether to call the accumulation routine or not
    - The record access-mix by record type and by record ID charts are included in the report by default. You can choose to omit them, and enable the DXCSRG job to run faster, by specifying the NORAM parameter

ATC0282
Real program name when STLOG ON

- Provided by PTF UK50921
- Requirement
  - When STLOG ON, records used by TPFDF display the TPFDF program and not the real program, to debug and solve some problems it is useful that real program name appears
- Solution
  - Updated the scope of the SCTGEN ASTAMP parameter
  - When the ASTAMP is specified, then the name of the application program which requested TPFDF to find, file, dispense or release the record is used as program stamp for the physical record (last file, dispense, and release stamps), for the ST Events log (file, find, dispense and release events), and for the pool file error messages.
  - TSTAMP is the default

ATC0309
Exits for third party debugging software

- Provided by PTF UK61966
- Requirement
  - User Exit for CGTD and HOOKC Macro for C/C++ Trace for TPF Software
- Solution
  - New SCTGEN parameter USRTSK1={NO|YES}
  - New installation-wide monitor exits:
    - USRTSK1 - called when ALCS starts and SCTGEN USRTSK1=YES is coded.
    - USRENBK - called during conversational trace ENTER/BACK processing.
    - USRGTIS - called during conversational trace instruction stepping.
  - New ECB controlled exits
    - ATRD - ALCS calls this exit during the conversational trace display routine.
    - ATRE - ALCS calls this exit when processing conversational trace messages.

Other Completed enhancements

UK45182	ZPERF SU command support
UK59412	PDAR
UK44293	Allow for EAV volumes
UK54661	Allow up to 4000 sockets on a single server.
UK56981	TCP/IP trace data increased from 32 bytes to 372 bytes
UK58033	Capture input messages for tracing to diagnostic file.
UK55210	Include ASCU list in MATIP Session Open.
UK61468	Addition of the lodic_ext api from TPF 4.1.
UK65431	Use storage blocks from Type 1 SUs for small heap requests

ZPERF SU command support

- Provided by PTF UK45182
- Allow ALCS to monitor the use of Type 1, Type 2, and Type 3 storage units – and display the information online.
- New ZPERF command format
  - ZPERF SU

```
DXC5166I CME M  23.09.46 PERF  SU
                                 --------------Peak ECB -----------
SU       ECB  %    Mean        Max   Act  Prog   Tod
TYPE-1   100.00       1         2        CSC3   2011.125 14.05.31
TYPE-2     0.00       *
TYPE-3     0.00       *
```

A problem with ZRSTR (1994 - 2010)

Steps involved in System Restore

- Start ALCS from restored backup datasets
  - ALCS initialisation starts pool, pre-dispenses records of each pool size.
  - In Idle state ALCS will use a little pool (message responses, performance monitor)
- ZRSTR replaces records on ALCS database with records from log files
  - Some of these records could be the same file addresses as those pre-dispensed
- Restore completes and ALCS is cycled to Norm
  - ALCS continues to give out addresses from the pre-dispense ring that were obtained before the restore and these may overlay the restored records

PDAR – Pool Dispensing Array for Restore

- Provided by PTF UK59412 / UK59587
- A table structure containing reserved long term records pool for restore.
  - The PDAR structure is created at system restart unless it already exists.
  - ZPDAR can also create or delete the structure and display status.
- New initial state for ALCS – RESTORE same as IDLE state but …
  - Initial pool dispensing will take place from the PDAR structure.
  - If no PDAR, the standard ALCS pool dispensing mechanism is used
  - If PDAR is exhausted, the standard ALCS pool dispensing mechanism is used.
- Any other initial state then PDAR will not be used
  - The PDAR records remain reserved and will not be dispensed

PDAR – Pool Dispensing Array for Restore

- PDAR creation
  - For each pool reserve 1/1000 of the total number of available records
    - Maximum 500, Minimum 10
    - New ECB exit – APDR called once for each pool size if present
      - can adjust the ratio, maximum, minimum or set number of records to reserve

- PDAR Structure
  - PDAR Control Record #KPTRI(17) AF60
  - PDAR Table Record L3 Pool AF61
  - Chain chase descriptor in CZ01

```
                    Lines      1 to      8 of      8  Columns   1 to  53 of  53
                    Active:                 *1*
DXC5407I CME M  08.51.34 PDAR  Dispensing is inactive

 Reserved records counts :

 LT L1 ..........42
 LT L2 ..........23
 LT L3 ..........56
 LT L4 ..........65

           ALCS TCPIP system IALMH                    27/09/89
MA    C                                                    11/002
```

Allow for EAV volumes

- Provided by PTF UK44293
- ALCS messages updated to allow for EAV volumes.

Allow up to 4000 sockets on a single server

- Provided by PTF UK54661
- MAXCONN – the maximum number of concurrent connections allowed for a TCP/IP resource defined with TERM=SERVER increased from 1024 to 4000.

TCP/IP trace data increased from 32 to 372 bytes

- Provided by PTF UK56981
- ALCS TCP/IP trace captures the first 372 bytes of the data
  - For each data block, ALCS Diagnostic Tape Post-processer shows:

```
TCP/IP type hh.mm.ss.iii CRN-crn LEN-size
data
...
```

Where

- type IN | OUT (data block received | sent on TCP/IP connection)
- size Data block size (number of bytes)
- data First 372 bytes of the data block in hex. Each line shows up to 36 bytes.

TCP/IP trace data increased from 32 to 372 bytes

- New Installation wide User exit USRTCP8
- ALCS calls this exit when TCP/IP trace is active, before writing each record to the diagnostic sequential file.
- Use this exit to write the record to a different location (perhaps a user sequential file) or to prevent the record from being written.
- ALCS enters USRTCP8 in table key with the following conditions:
  - param_1 The address of the TCP/IP trace record mapped by SD0DR.
  - param_2 The address of a field containing the length of the trace record.

Capture input messages for tracing to diagnostic file

- Provided by PTF UK58033
- If diagnostic trace is active for a terminal
  - Record input message on Diagnostic file for DTP processing

Enable RONIC for allocatable pool

- Provided by PTF UK61529
- RONIC will recognise when a record is addressable but not allocated (it is after the end of dataset but the pool ordinal is less than the maximum).

Addition of the lodic_ext api from TPF 4.1

- Provided by PTF UK61468
- The lodic_ext api is an extension of the lodic() api and provides interface compatibility with the TPF version of lodic_ext.
- Some return values are different and some TPF options are not supported.
- Each lodic_ext function calls the equivalent assembler LODIC macro to execute the api.

Include ASCU list in MATIP Session Open

- Provided by PTF UK55210
- ALCS updated to include ASCU list in MATIP Session Open.

Use storage blocks from Type 1 SUs for small heap requests

- Provided by APAR UK65431
- When an entry makes a single heap request (MALOC or malloc()) a type 3 storage unit is acquired.
- If the request is for a small amount then storage use may be very inefficient

Type 1

ECB

Data Blocks

DECBs

Type 2

HLL Block

DSA

Type 3

MALOC

malloc

Enhancements in progress

AM37819	Large e-mail support
AM39292	Loop Detector
AM33370 / AM22459	ZDMOD

Large e-mail support

- Currently under development – AM37819
- This modification will contain "large outbound" support by allowing ALCS applications (but not ZMAIL) to use multiple DXCSMTM records chained together via the standard FCH.
- First "block" is in core and the overflows are on file
  - together they form one message

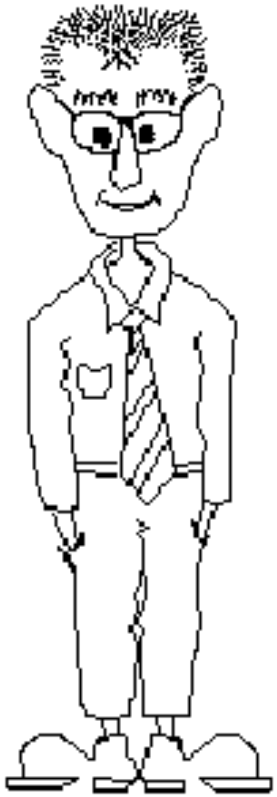
ALCS Monitor Loop Detector

- Currently under development – AM39262
- Alert the operator if an ALCS dispatcher task (CPULOOP) loop is detected
- Use the Application Loop Timeout routine to determine if we are running within the monitor and set an indicator if this is the case
- Reset this indicator at the top of the CPU loop (DXCDSP)
- If the flag is not reset, it indicates that ALCS is in a loop condition
  - After several continuous occurrences
    - Send a WTO alert message (up to 5 times)

ZDMOD

- Currently under development – AM33370 / AM22459
- Display Module Information
  - Module storage addresses, offsets and size
  - Segment (CSECT) names
  - Function names
  - Binder/Compiler information and timestamps
  - Address - operand
  - Wildcard support
- Majority of code ported from z/TPF, new subtask required on ALCS

Any Questions ?



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