

CICS TS v5.1 User Experience

Larry Lawler
Unicom Global

Monday February 4th, 2013 - 4:30 PM
Session Number **12416**

Larry.Lawler@UnicomGlobal.com
www.linkedin.com/pub/larry-lawler/18/698/877/



CICS TS v5.1 User Experience

- z114-M10 – L04 with 1 IFL, and 1 zIIP processor
- z/VM with an average of 10 LPARs
- z/OS 1.13 as a z/VM Guest, with 1.5Gig of memory
- 15+ CICS regions running at all times on our z/VM Guest. We run all 5 supported CICS releases, from TS 3.1 to 5.1
- No DB2, No MQ, No IMS, Mostly VSAM datasets.

CICS TS v5.1 Beta Experience

- Installed 6 of the Beta drops, before the GM drop
- Observed 64-bit addressing support being enhanced on each drop. Sometimes the same control block field changed in several drops.
- Had a problem on one drop because we forgot to delete and redefine Local and Global Catalog datasets.

CICS TS v5.1 User Experience

- CICS TS 5.1 64-bit command level Assembler
- CICS TS 5.1 Loader Domain Changes
- Other CICS TS 5.1 Control Block Changes
- Wish List
- Questions

CICS TS v5.1 64-bit Assembler



CICS TS v5.1 64-bit Assembler

- CICS TS 5.1 has provided the ability to execute assembler programs in 64-bit AMODE.
- This does not imply 64-bit RMODE is supported !
- LE assembler not supported by CICS or LE
- There is no PPT option to indicate you want 64-bit task related storage
- If you are in 64-bit amode and you issue EXEC CICS GETMAIN64, then CICS will give you 64-bit storage, if not CICS will give you only 31-bit storage !

Using 64-bit Assembler

- New “stubs” are provided for 64-bit assembler: DFHEAG and DFHEAG0 replace DFHEAI and DFHEAI0
- Currently the DFHEISTG will always be non 64-bit storage, even though TCAPCDSA, TCAEISTG and the DFHEISTG prefix area has been enhanced to support 64-bit chains
- CEDF screen layout doesn't currently support displaying 64-bit addresses anyway
- **SYSSTATE AMODE64=YES** is required for proper generation of 64-bit **DFHEIENT** and **DFHECALL** Macros

Other 64-bit assembler items

- Depending on SYSSTATE, the DFHEISTG macro's work area at the beginning of the area has increased in size from x'0F8' to a size of x'188' or x'200'
- DFHEIENT must be coded a new way, with STATREG, and STATIC parameters: **DFHEIENT CODEREG=*, DATAREG=(13), STATREG=(R10), STATIC=LITERALS**
- STATREG= generates a LARL statement like this:
LARL R10,LITERALS Load static storage base

EXEC CICS Cmds generate: **LLGT R15,=V(DFHEG1)**

AMODE64 DFHEISTG



- +DFHEISTG DSECT ,
- +DFHEISA DS 18FD F4SA
- +DFHEIBP DS AD EIB pointer
- +DFHEICAP DS AD COMMAREA pointer
- +DFHEIR13 DS AD Register 13
- +DFHEIVER DS H Version
- +DFHEIV00 DS H Used by DFHECALL
- +DFHEIRS3 DS F Used by DFHECALL
- +DFHEIPL DS 64A Parameter list
- +DFHEITP1 DS A Used by DFHECALL
- +DFHEITP2 DS A Used by DFHECALL
- +DFHEITP3 DS A Used by DFHECALL
- +DFHEITP4 DS A Used by DFHECALL
- +DFHEITG1 DS AD Used by DFHECALL
- +DFHEITG2 DS AD Used by DFHECALL
- +DFHEITG3 DS AD Used by DFHECALL
- +DFHEITG4 DS AD Used by DFHECALL
- + DS 4FD Reserved
- See: <http://tinyurl.com/Share2013SF-Assembler>

AMODE64 DFHEIENT



- DFHEIENT CODEREG=*,STATREG=(10),EIBREG=(12),DATAREG=(13),STATIC=LITERALS
- + STMG R14,R12,8(R13) Save callers registers
- + JAS R1,DFH0020D Setup base & skip constants
- + DC AL4(DFHEIEND-DFHEISTG) Length of storage
- + DC V(DFHEAG0) Entry point
- + DC AL2(0) Version

- +DFH0020D DS 0H
- + LLGT R15,4(,R1) Load entry point
- + BASR R14,R15 Call DFHEAG0
- + LARL R10,LITERALS Load static storage base
- + USING LITERALS,10
- + LGR R13,R1
- + USING DFHEISTG,R13
- + LG DFHEIBR,DFHEIBP
- + USING DFHEIBLK,DFHEIBR

- See: <http://tinyurl.com/Share2013SF-Assembler>

EXEC CICS GETMAIN64



```
• *      EXEC  CICS GETMAIN64 FLENGTH(EIS_LENGTH) SET(R8)
• *      SHARED CICS DATAKEY NOSUSPEND NOHANDLE
•      DFHECALL =X'0C121800280000301800000000' , , , ,      +
•      (FB_4,EIS_LENGTH) , (PTR8__RG,R8)
• +      LA      1,DFHEIPL
• +      LA      14,=X'0C121800280000301800000000'
• +      SR      15,15
• +      SR      0,0
• +      STM     14,0,0(1)
• +      SR      14,14
• +      LA      15,EIS_LENGTH
• +      LA      0,DFHEITG1
• +      STM     14,0,12(1)
• +      OI      20(1),X'80'
• +      LLGT    15,=V(DFHEG1)
• +      BASR    14,15
• +      LG      R8,DFHEITG1
```

• See: <http://tinyurl.com/Share2013SF-Assembler>

Other 64-bit assembler items

- The Epilog code generated by DFHEIRET is significantly different than non 64-bit assembler:
- LG 13,128(,DFHEIPLR) Get Caller's save area
- SGR 1,1 Clear R1 for FREEMAIN
- LLGT 15,=V(DFHEAG0) @of 64-bit FREEMAIN Rtn.
- BASR 14,15 Free storage
- LMG 14,12,8(13) Restore callers 64bit Regs
- BR 14 Return to caller
- See: <http://tinyurl.com/Share2013SF-Assembler>

Wish List



- Enhance: EXEC CICS GETMAIN64 with an option to get 64-bit storage in 31-bit amode.
- Due to the massive changes to the DFHEISTG area and the fact that we need to support multiple CICS releases, GETMAINing 64-bit storage at PLTPI or startup time, for a down the line EXIT or 64-bit program to use requires 2 load module versions of the same initialization program. Even though the GETMAINing program only stores the 64-bit address for future use.

Questions ?



Control Blocks Changed in TS v5.1

Control Blocks moved to 64-bit (VSCR)

Control block fields added, deleted, or changed

Some Loader Domain Control Blocks

- APE Active Program Element
- CPE Current Program Element
- CSECTL CSECT List
- LDA Loader Domain Anchor area

CICS TS v5.1 Loader



- The CICS TS Loader has been improved in TS v5.1 to move all the CPE, APE and CSECT List control blocks into 64-bit addressable storage (31-bit VSCR)
- New CPE Chain added from the Library Resource (PLIBE) to keep track of all programs loaded from that Library. This is done for support of Application Bundles.
- Another major improvement to the loader domain was that LOAD requests for Threadsafe tasks no longer have to switch to the Loader “RO” TCB. LLACOPY and BLDL still use the RO TCB

CICS Loader Domain Anchor Area



LDA 1EE12000 POINTERS

Page 2

-> LDA Display R=6.8 Term DL13 APPLID CICSTS51 Date 01/28/13 Time 16:19:20

Prefix=LD_* LDA @ Address: 1EE12000

LDA_Field_Name-----> Offset Field-Description-----> Field-Contents-->

PLIBE_FIRST_ADDRESS	+013C	First Global PLIBE address	----->	1EE17030
PLIBE_LAST_ADDRESS	+0140	Last Global PLIBE address	----->	1FEF3030
CPE_FIRST_ADDRESS	+0158	First Global CPE address		00000048 40994338
CPE_LAST_ADDRESS	+0160	Last Global CPE address		00000048 4098EB18
APE_FIRST_ADDRESS	+0188	First Global APE address		00000048 40A01CC8
APE_LAST_ADDRESS	+0190	Last Global APE address		00000048 40A1C788
NIU_FIRST_ADDRESS	+01A8	First Global APE NIU address		00000048 40A21708
NIU_LAST_ADDRESS	+01B0	Last Global APE NIU address		00000048 40A13488
LDWE_FIRST_ADDRESS	+01CC	First Global LDWE address	----->	1EE121BC

Impact of CICS TS 5.1 Loader changes

- Loader domain CPE chains are now 64-bit addresses!
- (CPE_NEXT, CPE_PRIOR)
- Loader domain APE chains are now 64-bit addresses!
(APE_NEXT, APE_PRIOR, APE_OLDER_APE, APE_YOUNGER_APE, APE_OLDER_APE_NIU, APE_YOUNGER_APE_NIU)
- The PPTE loader domain token address, is now 64-bit !
(PPTE_LOADER_TOKEN) points to the Loader Domain's corresponding 64-bit CPE entry

CICS PPTE Pointer Change



PPTES CICSCHNL POINTERS

V4.1.0

-> PPTES Display R=6.8 Term DL13 APPLID CICSTS51 Date 01/28/13 Time 15:37:33

Prefix=PPTE_* PPTE @ Address: 1FE68ED0

FieldNm	Offset	-----Field-Description----->	<-----Field-Contents-----
---------	--------	------------------------------	---------------------------

LANG_TOKEN	+0080	Language Token	-----> 1FEF1BC4
LOADER_TOKEN	+0088	Loader Token	00000048 409360A8
LOCK_OWNERS_PTA_PTR	+00B8	PTA @of program lock owner	-----> 1FD375D0

64-Bit CPE addresses



CPEZOOM CICSCHNL NOFLAGS

V4.1.0

-> CPEZOOM Display R=6.8 Term DL19 APPLID CICSTS51 Date 01/29/13 Time 19:14:15

Prefix=CPE_* CPE @ Address: 00000048_409360A8

---CPE_Field-Name--- Offset -----Field-Description----- --Field-Contents--

LENGTH	+0000	CPE Length in Hex.	x00F0
LENGTH	+0000	CPE Length in Decimal	Bin16 240
EYE_CATCHER	+0002	CPE Eye Catcher	>DFHLDCPE
NEXT	+0010	-> next CPE in chain	00000048 40936198
PRIOR	+0018	-> previous CPE in chain	00000048 40935FB8
PROGRAM_NAME	+0024	CPE Program name	CICSCHNL
TTRK	+002C	CPE track and record address	x00841301
TT	+002C	CPE track number	x0084
PROGRAM_LENGTH	+003C	Program Length in Hex.	x032FE8
PROGRAM_LENGTH	+003C	Program Length in Decimal	Bin24 208872
ENTRY_POINT_OFFSET	+0041	Program Entry point offset	x000028
PDB_CREATION_STCK	+0068	Time PDB created	03/15 08:36:52.71
USES	+0070	#of times this CPE was used	Bin32 12
LOAD_COUNT	+0078	#of times program was loaded	Bin32 5
APE_CHAIN_SIZE	+007C	#of APEs chained to this CPE	Bin32 1
APE_CHAIN_FIRST	+0090	@of First APE for this program	00000048 40A21708
APE_CHAIN_LAST	+0098	@of Last APE for this program	00000048 40A21708
GLOB_PTR	+00C8	-> back to global anchor area	-----> 1EE12000
BIG_LENGTH	+00D0	Program Length in Hex.	x00032FE8
BIG_LENGTH	+00D0	Program Length in Decimal	Bin32 208872
BIG_ENTRY_POINT_OFFSE	+00D4	Entry offset	x00000028
PLIBE_PTR	+00D8	-> to corresp. PLIBE	-----> 1FF85030
DS_CONCAT_NUM	+00DC	Data set rel. number	Bin08 1

64-Bit APE addresses



APEZOOM CICSCHNL NOFLAGS			V4.1.0
-> APEZOOM Display R=6.8 Term DL19 APPLID CICSTS51 Date 01/29/13 Time 19:16:27			
Prefix=APE_* APE @ Address: 00000048_40A21708			
---APE_Field-Name---	Offset	Field-Description	--Field-Contents--
LENGTH	+0000	APE Length in Hex.	x00C0
LENGTH	+0000	APE Length in Decimal	Bin16 192
EYE_CATCHER	+0002	APE Eye Catcher	>DFHLD APE
PROGRAM_NAME	+0010	Program name	CICSCHNL
NEXT	+0018	-> next APE in Global APE Chain	00000048 40A21288
PRIOR	+0020	-> prev APE in Global APE Chain	00000048 40A217C8
OLDER_APE	+0028	-> older APE in CPE's chain	00000048 40936110
YOUNGER_APE	+0030	-> younger APE in CPE's chain	00000048 40936110
OLDER_APE_NIU	+0038	-> older APE in APE NIU chain	00000048 40A21408
YOUNGER_APE_NIU	+0040	-> younger APE in APE NIU chain	00000048 40A1BD08
OWNING_CPE	+0048	Address of owning CPE	00000048 409360A8
PDB_CREATION_STCK	+0058	Time PDB created	01/28 15:58:20.49
COPY_NUMBER	+0064	Copy no. of the APE	Bin32 5
LOAD_POINT	+0068	Load point of program	-----> 21112FF0
ENTRY_POINT	+006C	Entry point of program	-----> A1113018
PROGRAM_LENGTH	+0070	Program Length in Hex.	x00032FE8
PROGRAM_LENGTH	+0070	Program Length in Decimal	Bin32 208872
STORAGE_SIZE	+0078	Prog.Storage Allocated in Hex.	x00032FF0
STORAGE_SIZE	+0078	Prog.Stg. Allocated in Decimal	Bin32 208880
SUBPOOL_DATA@TOKEN	+007C	Program subpool used	00000036 1ED2A8E4
SUBPOOL_DATA@DSA	+0084	DSA used	Bin32 4
CSECT_LIST_SIZE	+0088	#of CSECT list blocks chained	Bin32 1
CSECT_LIST_CHAIN_NEXT	+0090	CSECT chain next pointer	00000048 40B37D88
CSECT_LIST_CHAIN_PREV	+0098	CSECT chain prev pointer	00000048 40B37D88
ON_NIU_TIME	+00A0	Time APE put on NIU chain	01/28 15:58:46.44
LIBRARY_TOKEN	+00B0	LIBRARY Token	01000000 1FF85030
PLIBE_PTR	+00B0	-> to corresp. PLIBE	-----> 1FF85030
DS_CONCAT_NUM	+00B4	Data set rel. number in concat	Bin08 1

64-Bit CSECT List addresses



Page 1

CSECTS DFH*

-> CSECTS Display R=6.8 Term DL13 APPLID CICSTS51 Date 01/28/13 Time 15:12:04

CsL No.	-Module-	Use#	APE_64bit_Address	Load_Pt@	-Entry@-	Mod.Len.	
No.	--Name--	Vers	CSECTList_Address	-CSECT@-	-Offset-	PTFlevel	--Date-- -Time-

	DFHTCP	1	00000048	40A04788	00041B00	80041C18	x2C00
1	DFHTCP	6.8	00000048	40B146A8	00041B00		GM01 I
2	DFHTCORS	6.8	00000048	40B146D0	00041EB0	+x3B0	GM01 I
3	DFHTCCOM	6.8	00000048	40B146F8	00042188	+x688	GM01 I
4	DFHTCCSS	6.8	00000048	40B14720	00042550	+xA50	GM01 I
5	DFHTCTI	6.8	00000048	40B14768	000426C8	+xBC8	GM01 I
6	DFHTCSAM	6.8	00000048	40B14790	00042750	+xC50	GM01 I
7	DFHTCAM	6.8	00000048	40B147B8	00042B60	+x1060	GM01 I
8	DFHTCTRN	6.8	00000048	40B147E0	00043A50	+x1F50	GM01 I

	DFHAIP	2	00000048	40A01E48	00082000	000860F0	x9170
1	DFHAICBP	6.8	00000048	40B10F28	00082000		GM01 I
2	DFHCPI	6.8	00000048	40B10F50	000821C8	+x1C8	GM01 I
3	DFHEIG	6.8	00000048	40B10F78	00083110	+x1110	GM01 I
4	DFHEIGA	6.8	00000048	40B10FA0	00085A98	+x3A98	GM01 I
5	DFHEIP	6.8	00000048	40B10FE8	00085FD8	+x3FD8	GM01 I
6	DFHEIPA	6.8	00000048	40B11010	0008ABA8	+x8BA8	GM01 I

Remaining Topics



- Order of magnitude improvement in the Loader domain for Threadsafe tasks, which can load their own programs without Queuing up on the Loader TCB. Are the bulk of your tasks still on the QR TCB?
- The single RO or Loader TCB is still used for: SAF calls, BLDLs, LLACOPYs, NEWCOPYs, PHASEINs and QR task LOADs!
- Are your Loader Domain Global user exits: XLDLOAD and XLDELETE Threadsafe, so they can be driven on Multiple TCBs ?

Wish List



- Create a new TCB for SAF/RACF requests, that is separate from the Loader TCB
- Option when defining a “Library” resource via CEDA or RDO to indicate you want a separate TCB for this Library.
- When defining a Program via CEDA, or EXEC CICS Create; allow the specification of a single Library definition.

Control Blocks Changed in TS v5.1

- The following macros are provided in dataset:
&alias..CICSTS51.CICS.SDFHMAC
- CSA Common System Area
- (OFL) CSA Optional Features List
- TCA Task Control area (contig)
- SIT System Initialization Table
- SSA Static Storage area
- AFCB Authorized Facilities Control Block
- AICB Application Interface Control Block
- See: <http://tinyurl.com/Share2013SF-Changes>

TCA Changes in TS v5.1

TCA 1EE91700 PTR64

V4.1.0

-> TCA Display R=6.8 Term DL19 APPLID CICSTS51 Date 01/30/13 Time 11:07:10

TCA @ Address: 1EE91700

FieldNm Offset -----Field-Description-----> <-----Field-Contents-

TCALCDSA	+0010	CURRENT KERNEL STACK ENTRY	1FDD71D0
TCARTNSV	+00A0	INTERNAL RETURN REGISTER SAVE ARE	00041048
TCALGR1	+00A8	Save area for R1 in DFHLFM UNSTAC	201C00D0
TCALGR14	+00B0	Save area for R14 in DFHLFM UNSTA	00041048
TCAEISTG	+00D8	Command Level Assembler storage a	201C0030
TCAPCHS	+0130	High-Level-Language save area add	201C0030
TCAPCDSA	+0138	DYNAMIC STORAGE HEADER ADDRESS	201C0008
TCAREGPT	+0188	EXEC CICS registers area address	1FE285B0
TCAEIUSA	+0240	@of EIUS. User part of the >EIS a	1FE28008

AICB Changes in TS v5.1

AICB 008BDB40 POINTERS

V4.1.0

-> AICB Display R=6.8 Term DL19 APPLID CICSTS51 Date 01/30/13 Time 11:17:43

Prefix=DFHAI* AICB @ Address: 00082114

FieldNm Offset -----Field-Description-----> <-----Field-Contents-

RMI	+0008	RMI Call Entry point address	----->	000860F0
EXC	+000C	EXEC CICS command entry point@	----->	000860FA
ASM	+0010	Assembler: DFHEIENT & DFHEIRET Rtn@	----->	0008ACBC
DLI	+0014	DL/I Call address (zOS Only)	----->	00087786
CTT	+0018	EIP Take Token Routine@	----->	0008A214
CGM	+001C	EIP Special GETMAIN	----->	00089C62
CFM	+0020	EIP Special FREEMAIN	----->	00089F56
EIP	+0024	DFHEIP00 - ADCON List	----->	00087CBC
CPI	+0028	Common Programming Interface (CPI)	----->	000822DC
DLA	+0030	DL/I AIB type calls (zOS only)	----->	000876C8
CHG	+0034	Hired gun Program Check locations	----->	0008AB90
RMI_64	+0040	64-bit RMI Call Entry point address	----->	000860F0
EXC_64	+0044	64-bit EXEC CICS command entry@	----->	0008321C
ASM_64	+0048	64-bit ASM DFHEIENT & DFHEIRET Rtn@	----->	00085BA4
CGM_64	+004C	64-bit EIP Special GETMAIN	----->	00089C62
CFM_64	+0050	64-bit EIP Special FREEMAIN	----->	00089F56
CHG_64	+0054	64-bit Hired gun Program Check loc.	----->	00085A78

Questions ?



CICS TS v5.1 User Experience

Larry Lawler
Unicom Global

Monday February 4th, 2013 - 4:30 PM
Session Number **12416**

Larry.Lawler@UnicomGlobal.com
www.linkedin.com/pub/larry-lawler/18/698/877/

