z390 Portable Mainframe Assembler and Emulator

Don Higgins don@higgins.net
Automated Software Tools Corporation

August 14, 2007
8191

z390 Presentation

- **Overview**

- **Macro Processor**

- **Assembler and Linker**

- **Emulator**

- **Hello World Demo**

- **What's new since February SHARE presentation**

- **Questions and Answers**

z390 Overview

- **z390 Open Source Java Project**

- **Execute HLASM compatible macro code**

- **Assemble HLASM compatible programs**

- **Link object code into z390 load modules**

- **Execute load modules on any J2SE platform**

z390 Open Source Project

- **z390 project www.z390.org downloads**

- **InstallShield for Windows and file image for Linux**

- **Java source and z390.jar executable**

- **Documentation included and also available online**

- **Demos and regression tests included**

- **Submit problem and enhancement requests online**

- **Join z390 project email group for update notices**

z390 Macro Processor

- **Expands macro code into BAL source code**

- **Extensions to AREAD and PUNCH for file I/O**

- **Library with MVS compatible common macros**

- **VSE and BS2000 common macro support**

- **Extendable parser for EXEC CICS and EXEC SQL**

- **Extendable SOA application generator using TCP/IP**

- **Option to run assembler as parallel task**

z390 Assembler and Linker

- **Assemble expanded BAL source into object code**

- **Supports assembly of all opcodes in latest POP**

- **Link multiple object files into load module**

- **Options to set AMODE and RMODE**

- **Options for listing and trace files**

z390 Emulator (1 OF 2)

- **Execute z390 load modules on any J2SE platform**

- **Execute all problem state instructions including DFP**

- **z390 macro generated SVC support includes:**
  - **GETMAIN, FREEMAIN, LINK, LOAD, DELETE**
  - **WTO, WTOR, TGET, TPUT, TIME, ESPIE, ESTAE**
  - **OPEN, CLOSE, GET, PUT, READ, WRITE, CHECK**

- **Options for interactive TEST and TRACE debugging**

Click on view and follow link to header & footer to enter
Copyright and Author information

z390 Emulator (2 of 2)

- **CMDPROC macro and svc for multi-tasking**

- **CTD and CFD macros to convert HFP, BFP, and DFP**

- **TN3270 screen I/O using TGET, TPUT**

- **TCPIO macro and svc to support TCP/IP sockets**

- **EXEC CICS compatible transaction processor**

- **2 GHZ Intel dual processor executes over 2.5 MIPS**

- **See online benchmark report with timings**

z390 Hello World Demo

- **To install and run z390 demo on Windows XP:**

- **Download and install J2RE 5.0+**

- **Download and install z390 v1.3**

- **Double click on z390 icon to start GUI interface**

- **Enter the command: ASMLG DEMO\DEMO**

- **Enter: notepad demo\demo.log to view log file**

Hello World Demo source file (MLC)

- **DEMO   SUBENTRY**

- **WTO   'HELLO WORLD'**

- **SUBEXIT**

- **END**

Hello World Demo source BAL

- **DEMO CSECT**

- **……**

- **BRAS 1,*+(WTO#2_EOT-*+1)/2*2**

- **DC   AL2(WTO#2_EOT-*,0),C'HELLO WORLD'**

- **WTO#2_EOT EQU ***

- **SVC   35**

- **…….**

- **END**

Hello World Assembler Listing (PRN)

- 　　　　　　　　　　　　　　. …
- **00005A A715000A** 　　　　　27　　BRAS
- **00005E 000F0000C8C5D3D3** 　28　　DC
- **00006D** 　　　　**00006D** 　29 WTO#2_EOT EQU *
- **00006E 0A23** 　　　　　30　　SVC　35
- 　　　　　　　　　　　　　　…..
- 　　　　　　　　　　　　　　END

Hello World hex object file (OBJ)

- .ESD ESD=0001 LOC=00000000 LEN=00000088 TYPE=CST NAME=DEMO

- ….

- .TXT ESD=0001 LOC=00000050 LEN=10
  50F0D00850D0F00418DFA715000A000F

- .TXT ESD=0001 LOC=00000060 LEN=0D
  0000C8C5D3D3D640E6D6D9D3C4

- .TXT ESD=0001 LOC=0000006E LEN=10
  0A2341F0000058D0D004980CD01458E0

- …..   (Note this format requires option OBJHEX)

Hello World Linker Listing (LST)

- **LZ390I V1.3.00a Current Date 01/16/07 Time 19:16:00**

- **LZ390I program = demo\demo.OBJ**

- **LZ390I options = bal objhex nolistcall**

- **LZ390I ESD=DEMO   LOC=00000000 LEN=00000088**

Hello World Execution Log

- **EZ390I V1.3.00a Current Date 01/16/07 Time 19:16:00**

- **EZ390I program = demo**

- **EZ390I options = bal objhex nolistcall**

- **HELLO WORLD**

- **EZ390I Stats total instructions   = 13**

- **EZ390I Stats current date 01/16/07 time 19:16:00**

Hello World Execution Trace file (TRE)

- ,,,,,,,

- **800FFFD2 0 A715000A   BRAS R1=00002300 S2(000FFFE6)=0A23 SVC**

- **800FFFFE6 0 0A23   SVC   I1=23 WTO R1=ADDR(AL2(LEN),AL2(FLAGS),C'MSG')**

- **EZ390I HELLO WORLD**

- **800FFFFE8 0 41F00000   LA   RF=00000000 S2(00000000)**

- **...,,**

Hello World Interactive TEST log

- **test cmd: g svc**

- **test break on g svc**

- **800FFFE6 0 0A23   SVC   I1=23 WTO R1=ADDR(AL2(LEN),AL2(FLAGS),C'MSG')**

- **test enter command or h for help**

- **test cmd: g**

- **HELLO WORLD**

What is New since February Presentation

- **Support Decimal Floating Point (DFP) instructions**

- **EXEC CICS compatible transaction manager**
  - **Multiple local/remote client sessions**
  - **EXEC ABEND, FREEMAIN, GETMAIN**
  - **EXEC HANDLE, IGNORE, LINK, LOAD**
  - **EXEC PUSH, POP, RECEIVE, RELEASE**
  - **EXEC RETURN, SEND, XCTL**

- **VSE and BS2000 macro support**

- **VSAM KSDS, RRDS, ESDS, LDS in development**

z390 Questions and Answers

- **What is the primary use of z390?**

- **Why is z390 open source?**

- **How is the Java source maintained?**

- **What are the minimum requirements?**

- **What limitations are there?**

- **Who is using z390?**

Trademark Acknowledgements

- **IBM Corporation – z/OS, HLASM, CICS**

- **Microsoft – Windows XP and 2000**

- **Sun Microsystems – J2SE, J2RE**

Click on view and follow link to header & footer to enter
Copyright and Author information