Running Classic Operating Systems with Hercules

Jay Maynard, Global MAINTECH Corporation
SHARE 97, 25 July 2001, Minneapolis, Minnesota

Mailing address:

Jay Maynard

Global MAINTECH Corporation

7836 Second Avenue South, Suite 1

Bloomington, MN 55420

(281) 477-8331 voice

(208) 248-3975 fax

jmaynard@globalmt.com (work)

jmaynard@conmicro.cx (home)

http://www.conmicro.cx

1

Agenda

- Overview
- OS/360
- VM/370
- MVS 3.8
- Others

global **MAINTECH** corp.

- Why classic OSes?
  - Well, you have to run *something*…
  - Public domain
  - Nostalgia
  - Preserving history
- What's available?
- Where do you get it?
- How do you run it?
- What can you do with it?

global MAINTECH corp.

Hercules isn't very useful without something to run on it. Finding bugs got much easier once we had real code to run, too.

The classic OSes discussed here are all public domain, and IBM has said that they do not object to people distributing them freely.

OS/360: history and availability

- The OS that made IBM, and nearly unmade it
- Ancestor to modern OSes
- Widely and freely distributed
- Version 21.8F preserved by Rick Fochtman
- The first classic OS that ran on Hercules
- Stock OS, nearly complete
- Mods tapes becoming available but not integrated into distributions yet

There are a couple of libraries that are not in Rick's distribution: SYS1.DN554, which contains service aids such as IMASPZAP, and the FORTRAN H source library. SYS1.DN554 has been rebuilt, and may be obtained from the hercules-390 mailing list files area; FORTRAN H may be obtained from Jay Moseley's compilers page.

The CBT site (http://www.cbttape.org) contains a few mods tapes that have been recently contributed. The biggest find there is the retrofit of MVS JES2 to MVT, which will make operation of the system more familiar to MVS folks. There are also a bunch of utilities and command processors available.

The documentation on the web site does not include one critical bit of information that applies to all of these OSes: Hercules 2.x defaults to running in ESA/390 mode. You need to make sure the config file contains the line

```
ARCHMODE S/370
```

In order to run properly. If you allow the system to default to 390 mode, you'll get the message

```
HHC107I: IPL failed: invalid IPL PSW: 00000000 0000080
```

in the Hercules control panel.

OS/360: operation

- Surprisingly similar to MVS
- Main difference is in missing facilities
  - Biggest omission is HASP/ASP
- Memory management in single address space
- Limited documentation available
- Do not define more than 8 MB of main storage if using TSO

global MAINTECH corp.

If you don't plan to run TSO, you can define up to 15 MB main storage. The standard MVT IEAIPL00 program will loop if you try to define 16 MB. TSO will act very strange with more than 8 MB main memory, with random hangs and dumps.

The standard MVT reader proc will exit if you send an end of file after your deck of cards, with the eof parameter, instead of allowing it to present intervention required. This is unlike later systems, where intervention required is treated as an I/O error.

OS/360: facilities

- Line mode TSO under TCAM
- OS compilers
  - FORTRAN G, H
  - COBOL H
  - ALGOL
  - RPG
  - Assembler F
- Other compilers: Stanford Pascal, PL360, SNOBOL 4

global MAINTECH corp.

Jay Moseley's page on compilers for MVS has docs on how to run the compilers listed here, as well as downloads of the ones not included with the OS. The URL is
http://jaymoseley.terrashare.com/compiling/compile.htm .

VM/370: history and availability

- Early experimental virtual memory and timesharing OS
- Unwanted stepchild for many years
- Large, devoted following despite IBM
- Release 6 preserved by Bob Abeles
- Waterloo mods tape included with distribution

global MAINTECH corp.

- Pregenerated system, release 6, PUT level 627
- Restore images saved immediately after initial generation
- IPL standalone restore program, load two 3330 volumes, and IPL system
- Up and running in 15 minutes
- Distribution tapes supplied for you to do your own gen
- Small amount of work needed to exploit Hercules once loaded
- CBT CD-ROM, rfc822.org

global MAINTECH corp.

The pregenerated system is built for a 158 with 2 MB of real memory. A CP gen is needed to make use of more. This procedure is documented in the archives of the hercules-390 mailing list.

The distribution tapes come with a level 616 PUT tape. The 627 tape was lost, so if you gen your own system, 616 is all you'll be able to make.

Documentation on loading the system is contained in the README.txt file in the essentials directory in the distribution.

VM/370: operation

- Very simple system to operate
- MAINT user predefined, but no others
- Console on 1052 device
- Add new users by editing directory source and applying with DIRECT command
- H390-VM mailing list at Yahoo! Groups

global MAINTECH corp.

Basic startup info is contained in the README.txt file in the essentials directory in the distribution.

VM/370: facilities

- Basic VM/370 without program products
  – No XEDIT, EDGAR, RSCS
- EDIT has line and rudimentary 3270 modes
- Can run OS/360 and MVS guests, with suitable directory entries
- Language compilers available on Waterloo tape

The Waterloo tape contains many useful programs as well as language compilers. The first file on the tape has a listing of what's there. The tape is in VMFPLC2 format, so to read the first file, attach it to your Hercules system, then do:

```
VMFPLC2 REW
VMFPLC2 READ * * A
```

The first file, named ABSTRACT ABSTRACT, will be loaded to your A-disk.

MVS: history and availability

SHARE
Technology · Connections · Results

- IBM's flagship OS for years
- Originally freely available, with source code
- Version 3.8J distribution ordered in May 2000
- Prepared for distribution by Jay Maynard
- Generation debugged and documented by Volker Bandke and Jay Moseley

global MAINTECH corp.

The MVS distribution on the CBT CD and at rfc822.org is all of the tapes that IBM shipped in May 2000 that do not contain copyrighted material. MVS 3.8 could be ordered from IBM until March 1, 2001, and many Hercules users did just that – which is probably why they finally dropped it.

- The hard way: two-stage sysgen using MVS 3.7 starter system
- Takes a few hours, start to finish
- Documentation and sample JCL: http://www.bsp-gmbh.com/hercules/herc_mvs.html
- Distribution tapes on CBT CD and at rfc822.org
- 900 MB needed (3 3350s) plus 200 MB for install (2 3330s)
- The easy way: Volker Bandke's turnkey CD

global MAINTECH corp.

Generating MVS 3.8 is done using the SMP4 install method. This was the recommended way to do it, and does work, though SMP4 isn't the quickest tool to use. The system may be maintained with SMP once installed.

Volker's turnkey CD allows running with the main DASD images on the CD, and includes four disks of CBT tape files, five 2314s for SORTWORK, and many other goodies. With it, you can go from start to running system in just a few minutes. Unless you really want to build your own system, I strongly recommend this package.

MVS: operation

- JES2, VTAM
- 3270 console
- Some modern facilities missing, but not many

global MAINTECH corp.

MVS: facilities

- No program products
  - VTAM 2, not ACF/VTAM
  - No ISPF
- OS/360 compilers will run unchanged
  - http://jaymoseley.terrashare.com/compiling/compile.htm
- RPF freely available for Hercules users
  - http://www.bsp-gmbh.com/hercules/herc_rpf.html
  - Basic SPF-style facilities

Jay Moseley's page has a world of useful information on installing and running the compilers from OS/360 on MVS. Many shops did exactly that in the days when 3.8 was current.

RPF has some differences from SPF and ISPF, but it's close enough that you'll feel at home with it right away.

Other OSes

- DOS/VS r34
  - Basic OS only
  - http://www.conmicro.cx/hercules/dosrel34.aws
  - Program directory in PDF form at
    http://www.conmicro.cx/hercules/dosrel34pgmdir.pdf
- TSS
  - Believed to be public domain
  - Both TSS/360 and TSS/370
- MTS, MUSIC, Ultimate
- What have you got?

Some work has been done with DOS/VS, and it has been successfully IPLed and run, but there's no consolidated documentation page on it yet.

TSS/360 is at this point strictly historical, as it only ran on the 360/67, which used a virtual memory facility that's not completely compatible with the later one in the 370. At this point, we don't know if the TSS/360 tape will be needed to get TSS/370 running. Neither tape has any IBM copyright notices on the label, and, according to IBM's lawyers, that means that they do not consider the contents copyrighted.

MTS, MUSIC, Ultimate, and other 360 and 370 OSes should run on Hercules, but have not been tested yet. Anyone with distributions that can be redistributed is welcome to get in touch with me or other Hercules developers and give it a go.

Information on the web

- Hercules home page: http://www.conmicro.cx/hercules
  - Installation and operation documentation
  - Downloads
- Hercules mailing list:
  http://groups.yahoo.com/group/hercules-390
- Hercules on Windows:
  http://www.bsp-gmbh.com/hercules
- Mirrors of many sites:
  http://source.rfc822.org/pub/mirror/hercules

global MAINTECH corp.