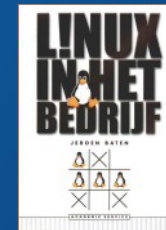# Running your own mainframe on Linux (for fun and profit)

Who am I?

- Jeroen Baten
- Lifetime innovator
- Job title : IT Solutionist
- Author of 8 books
- Dad of 5 girls

Who am I ? (in pics)

My main project

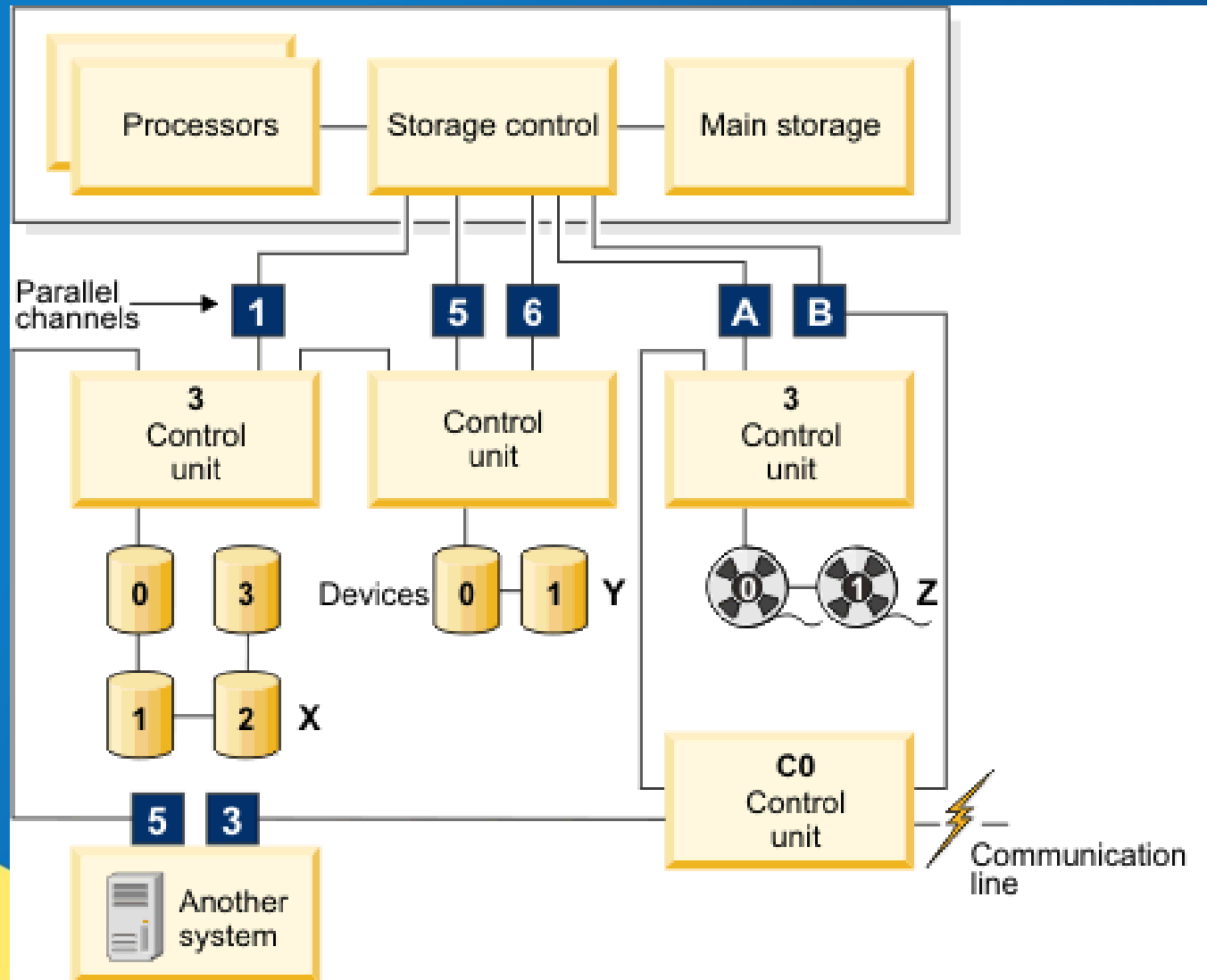- LibrePlan
- Web-based project management appl.
- Very cool!

Let me start with apologies first...

Talking the same language… can still cause a culture clash.
With respect to the code of conduct:
Please forgive me where applicable.
(Trick: Dutch people take everything literally!)

ANGLO-DUTCH TRANSLATION GUIDE

WHAT THE BRITISH SAY	WHAT THE BRITISH MEAN	WHAT THE DUTCH UNDERSTAND
With all due respect …	I think you are wrong.	He is listening to me.
Perhaps you would think about … I would suggest …	This is an order. Do it or be prepared to justify yourself.	Think about this idea and do it if you like.
Oh, by the way …	The following criticism of the purpose of the discussion is …	This is not very important.
I was a bit disappointed that …	I am very upset and angry that …	It doesn't really matter.
Very interesting …	I don't like it.	They are impressed.
Could you consider some other options?	Your idea is not a good one.	They have not yet decided.
Please think about that some more.	It's a bad idea. Don't do it.	It's a good idea. Keep developing it.
I'm sure it's my fault.	It's not my fault.	It was their fault.
That is an original point of view.	Your idea is stupid.	They like my ideas!

SOURCE NANETTE RIPMEESTER   HBR.ORG

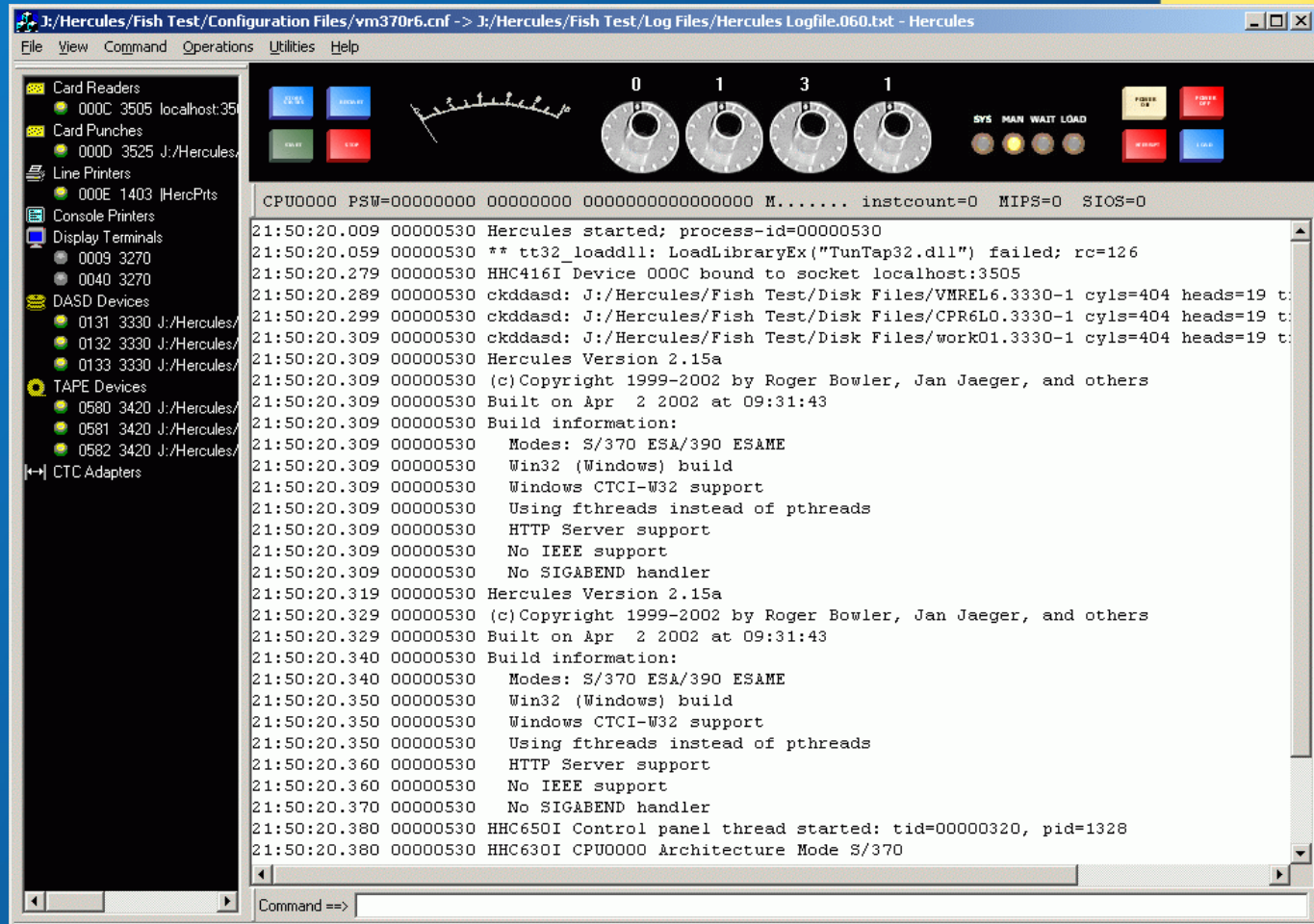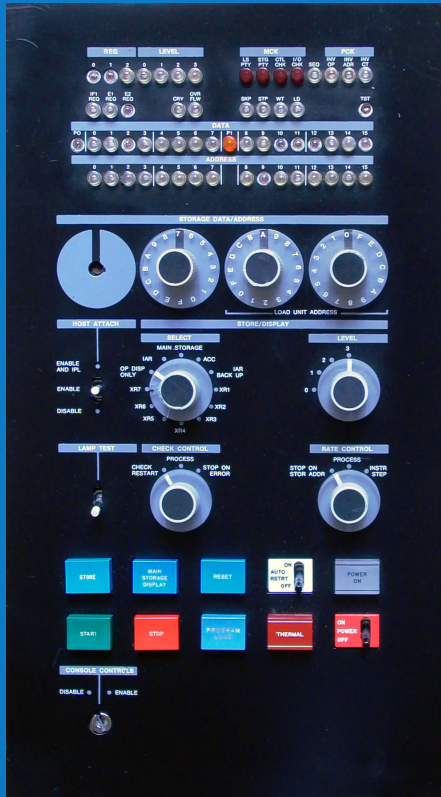# What is a mainframe?

Mainframe= Massive hardware parallelisation

What is "Hercules"

- A IBM Mainframe emulator for:
    - System/370
    - ESA/390
    - 64-bit z/Architecture.
- Hercules runs under Linux, Windows, Solaris, FreeBSD, and Mac OS X

How does it look?

What does it do?

- Run software (duh!)
- Many OS in public domain available
  - If you have a license **and the hardware**: OS/390, z/OS, VSE/ESA, z/VSE, VM/ESA, z/VM, TPF/ESA, z/TPF
  - Otherwise: OS/360, DOS/360, DOS/VS, **MVS,** VM/370, TSS/370, **Linux :-)**

What **not** to do….

- Google "hercules project"
  - www.hercules-390.org
    - "Last updated $Date: 2010-03-09"
- Follow site to:
  - http://www.ibiblio.org/jmaynard/
- Easy start: Volker's MVS 3.8J turnkey system version 3
- Jay Maynard, at jmaynard@conmicro.cx
- Lights are on but nobody's home!
- A long time I thought he was deceased but then I found this: https://gitlab.com/esr/upside/wikis/People

You decide what to think

Then, on May 1st, 2018:

"I ate'nt dead."

and

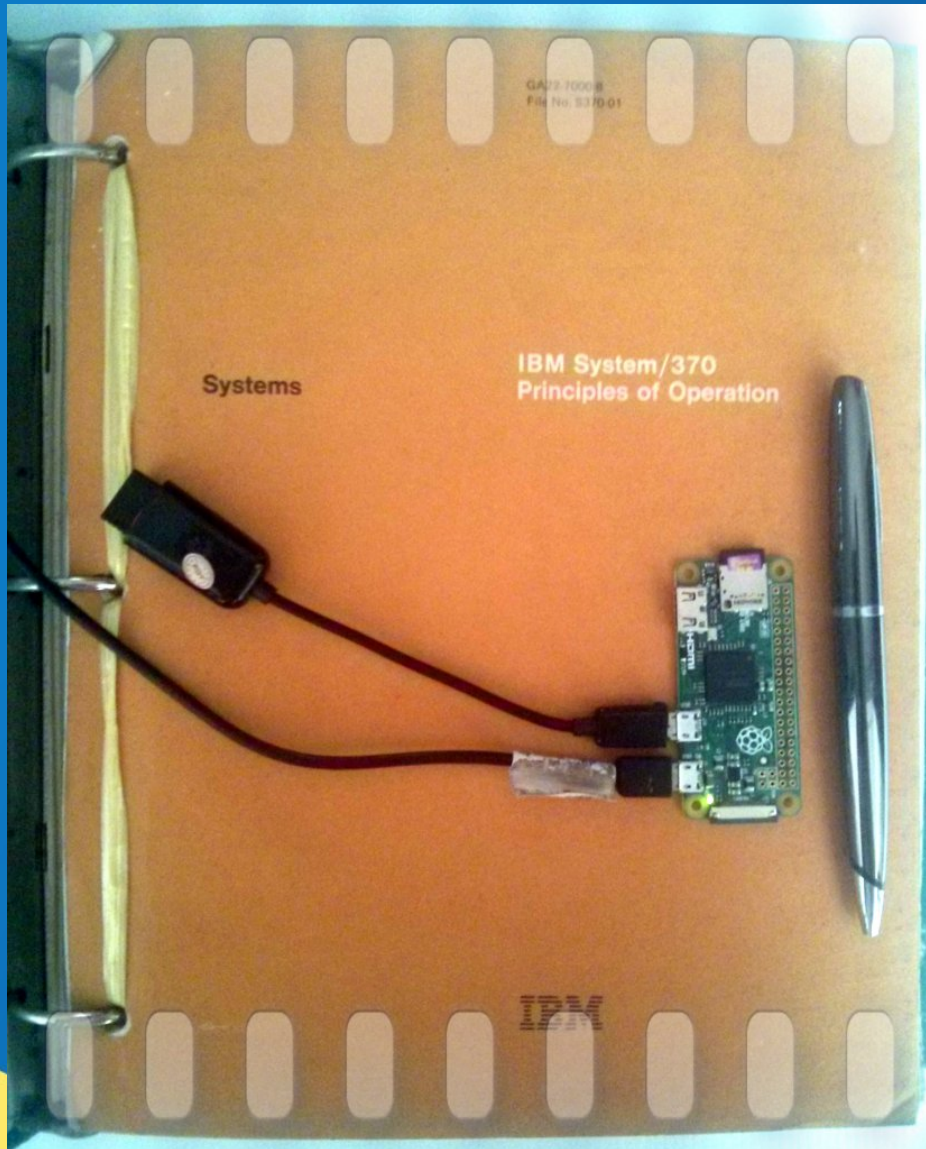"I may not be involved in Hercules any more, but I haven't gone anywhere."

What to do!

- Main site: http://www.hercules-390.eu
- Main list: hercules-390@yahoogroups.com (7K members?)
- Easy start: MVS 3.8j Tur(n)key 4- System
  - http://wotho.ethz.ch/tk4-/
  - Download: http://wotho.ethz.ch/tk4-/tk4-_v1.00_current.zip
  - Last update: http://wotho.ethz.ch/tk4-/tk4-_v1.00_update_08.zip
- Start learning: https://www.youtube.com/user/moshe5760/videos
- Moshix has ~~25~~ 60+ YouTube video howtos!
- Youtube: kumar ITChannel: 20 tutorial videos

What you need

- PC with Linux (or Windows, I know)
- Or Raspberry Pi
- 3270 terminal emulator (tn3270)
- Hercules software
- Some Operating System distribution

Very small mainframe

Lingo to understand

- DASD: Direct Attached Storage Device (harddisk)

- TSO:Time Sharing Option (multi-user)

- JES2: Job Entry System (job queue)

- CICS: front-end to transactional software

- Datasets: created assigned space for stuff

- Catalog: system list of available stuff

What you will see (logon)

What it look like (menu)

Demo time!

Hercules performance?
Comparing an i7 processor to a real IBM Z14


```
 System TK4-   2018-07-09  21:02:18.88                    Line 1 of 91   13%
       MISLEADING INDICATORS OF PERFORMANCE SAMPLING    (MIPS)
 TEST 1-RR(F):        344,471,236 INSTRUCTIONS PER SECOND
 TEST 2-RR(S):        242,954,324 INSTRUCTIONS PER SECOND
 TEST 3-RX(F):        133,315,557 INSTRUCTIONS PER SECOND
 TEST 4-RX(S):         66,706,690 INSTRUCTIONS PER SECOND
 TEST 5-SS(F):         17,783,468 INSTRUCTIONS PER SECOND
 TEST 6-SS(S):          4,890,429 INSTRUCTIONS PER SECOND
 TEST 7-FP(E):         NOT PERFORMED
 TEST 8-FP(D):         NOT PERFORMED
 TEST RESULTS FOR CPUID=000006113033/SYSID=TK4-/RR-TEST-COEF=1/ADJC=    60951
```

X 16,877907008

```
 System SYS1   2018-07-09  22:03:10.3                     Line 1 of 103  82%
       MISLEADING INDICATORS OF PERFORMANCE SAMPLING    (MIPS)
 TEST T1 RR(F-32):    5,813,953,488 INSTRUCTIONS PER SECOND
 TEST T2 RR(S-32):      766,871,165 INSTRUCTIONS PER SECOND
 TEST T3 RX(FAST):    5,434,782,608 INSTRUCTIONS PER SECOND
 TEST T4 RX(SLOW):      403,063,280 INSTRUCTIONS PER SECOND
 TEST T5 SS(FAST):      200,682,319 INSTRUCTIONS PER SECOND
 TEST T6 SS(SLOW):       40,346,984 INSTRUCTIONS PER SECOND
 TEST T7 FP(E-32):    NOT PERFORMED
 TEST T8 FP(D-64):    NOT PERFORMED
 TEST T9 RR(F-64):    NOT PERFORMED
 TEST TA RR(S-64):    NOT PERFORMED
 TEST RESULTS FOR CPUID=0006D5E62818/SYSID=SYS1/SNAME=ADCD    /ADJC=      439

         AVERAGE I/O RATE(S) (IO/SEC) SINCE IPL
 CP0:      7.29      CP1:
```

Update apr 2018

- Moshix now has 61 video tutorials
- Moshix made tk4 system available:
    - Send TSO login request to MOSHEPRT1@GMAIL.COM
- Current S-390 mailgroup age stats:
    - Average age: 62.6, standard deviation 12.4

Playing with hardware
Suppose I want to hookup a real terminal to Hercules?

Or just the experience…
The GitHub cool-retro-term (https://github.com/Swordfish90/cool-retro-term) project

My new friends

- During the preparation of this talk I made a few new friends:
    - A lot of guys in the S-390 mailgroup
    - Moshe Bar of the Moshix youtube channel
    - Sam Golob (maintainer of the CBT tape)
- In short: a wonderful new world!
- For Fun and Profit!

Thank you for your attention

Questions for me?: jeroen@jeroenbaten.nl