

Running Alan Cox's Fuzix OS on a Z80 emulator

📅 January 6, 2015 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218>) 👤 slp
(<https://web.archive.org/web/20170831181146/https://sinrega.org/?author=1>) 📁 Blog
(<https://web.archive.org/web/20170831181146/https://sinrega.org/?cat=1>)

This past Halloween, Alan Cox announced Fuzix OS

(<https://web.archive.org/web/20170831181146/https://plus.google.com/+AlanCoxLinux/posts/a2jAP7Pz1gj>), a project for building a UNIX-like operating system for 8 bit computers, based on UZI (<https://web.archive.org/web/20170831181146/http://www.dougbraun.com/uzi.html>) sources. This OS targets a number of physical machines, both old and homebrew computers, and some emulators too.

The easiest and more approachable way for trying Fuzix OS is running it on `cpmsim`, which comes bundled inside the Z80pack

(<https://web.archive.org/web/20170831181146/http://www.autometer.de/unix4fun/z80pack/>) package. If want to give it a try the easy way, just continue reading.

Getting and building SDCC and Z80pack

SDCC (Small Device C Compiler)

(<https://web.archive.org/web/20170831181146/http://sdcc.sourceforge.net/>) is an specialized C compiler for microcontrollers. For building SDCC, we're going to need some other software packages on our distro:

- GCC (I'm not sure if an specific version is need. As refernce, I've used 4.8)
- GCC C++
- bison
- flex
- boost-devel

We're also going to check out an specific revision from SVN, as the latest tarball lacks some features required by Fuzix. Once checked out, the usual configure & make recipe will do the trick:

```
1.  svn checkout http://svn.code.sf.net/p/sdcc/code/trunk sdcc-code -r9145
2.  cd sdcc-code/sdcc
3.  ./configure --prefix=/usr --disable-pic14-port --disable-pic16-port
4.  make
5.  sudo make install
```

<https://sinrega.org/?p=218>

Go

MAR AUG SEP

31

2016 2017 2018

[6 captures](#)

4 Mar 2016 - 31 Aug 2017

▼ About this capture

```
1. wget http://www.autometer.de/unix4fun/z80pack/ftp/z80pack-1.24.tgz
2. tar xzvf z80pack-1.24.tgz
3. cd z80pack-1.24/cpmsim/srcsim
4. make -f Makefile.linuxc
5. cd ../srctools
6. make
```

Creating Fuzix OS disk images

Now it's time to get our hands dirty with the code we're really interested in. The build process is still a bit crude, but improving day by day. Let's see:

```
1. git clone https://github.com/EtchedPixels/FUZIX.git
2. cd FUZIX/Standalone
3. make
4. cd ../Kernel
5. sed 's/TARGET=../TARGET=z80pack/' Makefile > Makefile.tmp && mv Makefile.tmp
   Makefile
6. make
```

At the moment (probably, this is going to be fixed in a near future), we need to manually copy the userspace library to an specific location (/opt/fcc):

```
1. cd ../Library
2. make
3. cd libs
4. make
5. cd ..
6. sudo mkdir -p /opt/fcc/lib /opt/fcc/include /opt/fcc/bin
7. sudo cp -a libs/crt0.rel libs/c.lib libs/syslib.lib /opt/fcc/lib
8. sudo cp -a include/* /opt/fcc/include
9. sudo cp -a tools/fcc tools/binman tools/syscall /opt/fcc/bin
```

Now we can continue building the userspace utils and putting everything together inside two disk images:

```
1. cd ../Applications/util
2. make
3. cd ../../Kernel/platform-z80pack
4. ./createdrives
```

At this point, you should have two new files named `drivea.cpm` (a floppy disk with the kernel and a small number of binaries) and `drivei.cpm` (a hard disk for mounting on `/usr` with the binaries that doesn't fit on the floppy) inside `kernel/platform-z80pack`.

<https://sinrega.org/?p=218>

Go

MAR AUG SEP

31

2016 2017 2018



▼ About this capture

[6 captures](#)

4 Mar 2016 - 31 Aug 2017

simulator. In my case, as I've put the sources for z80pack on \$HOME/sources/z80pack-1.24, I just need to do this:

1. `rm $HOME/sources/z80pack-1.24/cpmsim/disks/drive*`
2. `cp drivea.cpm drivei.cpm $HOME/sources/z80pack-1.24/cpmsim/disks`
3. `cd $HOME/sources/z80pack-1.24/cpmsim`
4. `./cpmsim`

You should be greeted by Fuzix, asking you for a boot device:

1. `slp@linux-zz59:~/sources/z80pack-1.24/cpmsim> ./cpmsim`
- 2.
3. `#####`
4. `# # # # #`
5. `# # # # #`
6. `# #####`
7. `# # # # #`
8. `# # # # #`
9. `#####`
- 10.
11. `Release 1.24, Copyright (C) 1987-2014 by Udo Munk`
- 12.
13. `CPU speed is unlimited`
- 14.
15. `Bootting...`
- 16.
17. `-`
18. `FUZX version 0.1`
19. `Copyright (c) 1988-2002 by H.F.Bower, D.Braun, S.Nitschke, H.Peraza`
20. `Copyright (c) 1997-2001 by Arcady Schekochikhin, Adriano C. R. da Cunha`
21. `Copyright (c) 2013-2015 Will Sowerbutts <will@sowerbutts.com>`
22. `Copyright (c) 2014 Alan Cox <alan@etchedpixels.co.uk>`
23. `Devboot`
24. `480kB total RAM, 416kB available to processes (15 processes max)`
25. `Enabling interrupts ... ok.`
26. `bootdev:`

Enter 0 as boot device, log in with as root, and mount the hard disk on /usr.

1. `bootdev: 0`
2. `Mounting root fs (root_dev=0): OK`
3. `Starting /init`
4. `init version 0.8.1ac`
5. `06login: root`
- 6.
7. `ssh# mount /dev/hda /usr`
8. `05ssh# id`
9. `05uid=0(root) gid=0(root)`

<https://sinrega.org/?p=218>

Go

MAR AUG SEP

31

2016 2017 2018



▼ About this capture

[6 captures](#)

4 Mar 2016 - 31 Aug 2017

```

14.  FFFFF U U Z I X
15.  F U U Z I X X
16.  F U U Z I X X
17.  F UUUUU ZZZZZZ III X X
18.  ssh#

```

That's it. Now you can start playing around, getting familiar with Fuzix at its code. If you like the feeling, the beauty of the 8 bit simplicity, then perhaps you'll consider running it on a physical machine, like one of the N8VEM (<https://web.archive.org/web/20170831181146/http://n8vem-sbc.pbworks.com/w/page/4200908/FrontPage>) boards, or Will Sowerbutts' FPGA based socz80 (<https://web.archive.org/web/20170831181146/http://sowerbutts.com/socz80/>) (if you have a DE0-nano board, you can try my port to this hardware).

Happy (8 bit) hacking!

18 thoughts on "Running Alan Cox's Fuzix OS on a Z80 emulator"

**GAVIN MCDONALD**

January 7, 2015 at 01:27 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-186>)

Can you please inform how to make the Javascript language work with this operating system. It is necessary to support the Javascript language for proper operating system operatings.

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=186#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&replytoocom=186#respond))

**SLP**

January 7, 2015 at 10:27 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-188>)

Heh, good one 😊

But, hey, trying to build a Javascript interpreter that fits into 48K could be a fun exercise. I'll try to keep this in mind for a future boring evening.

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=188#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&replytoocom=188#respond)) ^

<https://sinrega.org/?p=218>

Go

MAR

AUG

SEP



31



2016

2017

2018



▼ About this capture

[6 captures](#)

4 Mar 2016 - 31 Aug 2017

189)

Thanks for the post. I followed your post but I am getting this...

FUZIX version 0.1

Copyright (c) 1988-2002 by H.F.Bower, D.Braun, S.Nitschke, H.Peraza

Copyright (c) 1997-2001 by Arcady Schekochikhin, Adriano C. R. da Cunha

Copyright (c) 2013-2015 Will Sowerbutts

Copyright (c) 2014-2015 Alan Cox

Devboot

480kB total RAM, 416kB available to processes (15 processes max)

Enabling interrupts ... ok.

bootdev: 0

Mounting root fs (root_dev=0): OK

Starting /init

panic: no /init

System halted, bye.

help?

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=189#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&replytocom=189#respond))

**SLP**

January 18, 2015 at 14:49 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-192>)

I've just tried again, and it works here. Did "Applications/util/init" build successfully?

I also advise you to check out revision "14b844a063e08bdfec00c7b094a34151d2dbf10" from FUZIX's repo, since it's changing a lot these days, and sometimes is partially broken.

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=192#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&replytocom=192#respond))

**FSL**

March 2, 2015 at 19:56 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-209>)

Should have wrote this earlier. I got this error Ubuntu 1204, then I tried it on Arch and it works fine. Thanks.

<https://sinrega.org/?p=218>

Go

MAR AUG SEP

31

2016 2017 2018

[6 captures](#)

4 Mar 2016 - 31 Aug 2017

▼ About this capture

**FOX MULDER**

March 15, 2015 at 16:37 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-218>)

Did you figure out what was wrong? I get the same error on my macbook. While everything (after some tweeking) compiled fine.

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=218#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&replytocomment=218#respond))

**FSL**

March 18, 2015 at 14:02 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-219>)

No, not really. Luckily, I had an Arch Linux VM at hand, so I did not bother to take a look inside.

**FS**

January 15, 2015 at 21:09 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-190>)

Continued... I did some debugging, I think its failing at this check

```
if (!((getperm(ino) & OTH_EX) &&
(ino->c_node.i_mode & F_REG) &&
(ino->c_node.i_mode & (OWN_EX | OTH_EX | GRP_EX)))) {
    udata.u_error = EACCES;
    goto nogood;
}
```

in Kernel/syscall_exec.c

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=190#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&replytocomment=190#respond))

**AUGUST**

February 16, 2015 at 04:46 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-199>)



<https://sinrega.org/?p=218>

Go

MAR

AUG

SEP



31



2016

2017

2018

[6 captures](#)

4 Mar 2016 - 31 Aug 2017

▼ About this capture

```
Starting /init
init version 0.8.1ac
06login: root

ssh# mount /dev/hda /usr
05mount: Unknown error
ssh#
```

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=199#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&REPLYTOCOM=199#RESPOND))**FSL**March 2, 2015 at 19:58 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-210>)

It does give this error but the apps are loaded. Try a command like `yes`, it should work.

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=210#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&REPLYTOCOM=210#RESPOND))**LARRY S.**March 28, 2015 at 04:31 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-226>)

Finally got FUZIX to boot after fixing some undefined globals in the user space programs. _toupper did not get linked even though it seems to be present in syslib. This kept several important programs, including init, from building. Finally got it straightened out by inserting a macro for toupper into the files that would not build. Boots perfectly now! Thanks for your efforts with this project. I grew up on CP/M and 8-bit systems and I have always had a soft spot for them.

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=226#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&REPLYTOCOM=226#RESPOND))**LARRY S.**March 28, 2015 at 18:26 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-227>)

Further: drivea.dsk image wouldn't build at first because it got filled up before all the user space programs could be copied to it. Had to move rmdir to drivei.dsk

<https://sinrega.org/?p=218>

Go

MAR AUG SEP

31

2016 2017 2018

[6 captures](#)

4 Mar 2016 - 31 Aug 2017

▼ About this capture

**SIMCITY BUILDIT CHEATS****([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTP://WWW.REDDIT.COM/R/EASYGET/](https://web.archive.org/web/20170831181146/http://www.reddit.com/r/easyget/))**April 15, 2015 at 11:44 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-232>)

Hi there, You've done a great job. I'll definitely digg it and personally suggest to my friends. I'm confident they'll be benefited from this web site.

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=232#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&replytocom=232#respond))**DUNGEON HUNTER 5 HACK TOOL ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTP://NP-FOTO.RU/?OPTION=COM_K2&VIEW=ITEMLIST&TASK=USER&ID=15645](https://web.archive.org/web/20170831181146/http://np-foto.ru/?option=com_k2&view=itemlist&task=user&id=15645))**April 22, 2015 at 15:34 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-233>)

You actually make it seem so easy with your presentation but I find this matter to be actually something which I think I would never understand. It seems too complicated and very broad for me. I am looking forward for your next post, I'll try to get the hang of it!

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=233#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&replytocom=233#respond))**UDO MUNK**April 22, 2015 at 20:21 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-234>)

I have made it a bit easier for those who have problems to build them self. You'll find ready to use disk images at the z80pack repository, that I build from time to time. This is just to have a look about the project status, you definitely should learn to build it your self.

REPLY ([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=234#RESPOND](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218&replytocom=234#respond))**GAME OF WAR FIRE AGE****([HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTP://WWW.REDDIT.COM/R/GAMEOFWARFIREAGEHACK/](https://web.archive.org/web/20170831181146/http://www.reddit.com/r/gameofwarfireagehack/))**May 10, 2015 at 11:33 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-236>)

Go

MAR

AUG

SEP



31



2016

2017

2018

[6 captures](#)

4 Mar 2016 - 31 Aug 2017

▼ About this capture

REPLY (HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=236#RESPOND)

**HOW TO HACK CROSSY ROAD****(HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTP://CROSSYROADCHEATS-HACK.COM/)**

June 9, 2015 at 18:58 (https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-237)

Wow, superb blog layout! How long have you been blogging for?
you made blogging look easy. The overall look of your web site is
wonderful, as well as the content!

REPLY (HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=237#RESPOND)

**Z-LXXX**

February 11, 2017 at 08:34 (https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218#comment-292)

I'd love to build Fuzix myself but Fuzix for Z80pack does not build for me for ages now...
;-)

REPLY (HTTPS://WEB.ARCHIVE.ORG/WEB/20170831181146/HTTPS://SINREGA.ORG/?P=218&REPLYTOCOM=292#RESPOND)

LEAVE A REPLY

Your email address will not be published. Required fields are marked *

Comment

Name *



<https://sinrega.org/?p=218>

Go

MAR

AUG

SEP



31



2016

2017

2018

[6 captures](#)

4 Mar 2016 - 31 Aug 2017

▼ About this capture

Website

POST COMMENT

[◀ My answers to Interstellar questions \(https://web.archive.org/web/20170831181146/https://sinrega.org/?p=200\)](https://web.archive.org/web/20170831181146/https://sinrega.org/?p=200)

RECENT POSTS

Enabling KVM virtualization for Raspberry Pi 2

<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=139>

Enabling HYP mode on the Raspberry Pi 2

<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=268>

Running Alan Cox's Fuzix OS on a Z80 emulator

<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=218>

flexVM 2.1: Un año de trabajo y 158 tickets de SCRUM

<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=267>

My answers to Interstellar questions

<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=200>

LAST TWEETS

<https://web.archive.org/web/20170831181146/http://twitter.com/sergiolpascual>

See me on Twitter

<https://web.archive.org/web/20170831181146/http://twitter.com/sergiolpascual>

Follow @sergiolpascual

<https://web.archive.org/web/20170831181146/https://twitter.com/sergiolpascual>

RECENT COMMENTS

<https://sinrega.org/?p=218>

Go

MAR AUG SEP

31

2016 2017 2018

[6 captures](#)

4 Mar 2016 - 31 Aug 2017

▼ About this capture

○ Fred Leen on Enabling KVM virtualization for Raspberry Pi 2
(<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=139#comment-341>)

○ kohl's st patricks day shirts
(<https://web.archive.org/web/20170831181146/http://buff.ly/2mJruwF>) on Desarrollando un videojuego sencillo (Parte II - Bucle principal y mapa del nivel)
(<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=88#comment-293>)

○ URL (<https://web.archive.org/web/20170831181146/http://www.ckui5suo.net/>) on Enabling KVM virtualization on ARM (Allwinner A20)
(<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=266#comment-298>)

○ Muhammad Faisal on Enabling KVM virtualization for Raspberry Pi 2
(<https://web.archive.org/web/20170831181146/https://sinrega.org/?p=139#comment-340>)

ARCHIVES

📅 March 2015 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201503>)

📅 February 2015 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201502>)

📅 January 2015 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201501>)

📅 December 2014 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201412>)

📅 November 2014 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201411>)

📅 September 2014 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201409>)

📅 July 2014 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201407>)

📅 May 2014 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201405>)

📅 February 2014 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201402>)

📅 December 2013 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201312>)

📅 November 2013 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201311>)

📅 August 2013 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201308>)

📅 December 2012 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201212>)

Go

MAR

AUG

SEP



31



2016

2017

2018



▼ About this capture

[6 captures](#)

4 Mar 2016 - 31 Aug 2017

- February 2012 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201202>)
- November 2011 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201111>)
- September 2011 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201109>)
- July 2011 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201107>)
- February 2011 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201102>)
- November 2010 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201011>)
- July 2010 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201007>)
- April 2010 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201004>)
- January 2010 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=201001>)
- December 2009 (<https://web.archive.org/web/20170831181146/https://sinrega.org/?m=200912>)



sparkling Theme by Colorlib (<https://web.archive.org/web/20170831181146/http://colorlib.com/>) Powered by WordPress (<https://web.archive.org/web/20170831181146/http://wordpress.org/>)

