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Posts

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Chat (IRC)



Posted by u/[deleted] 2 years ago

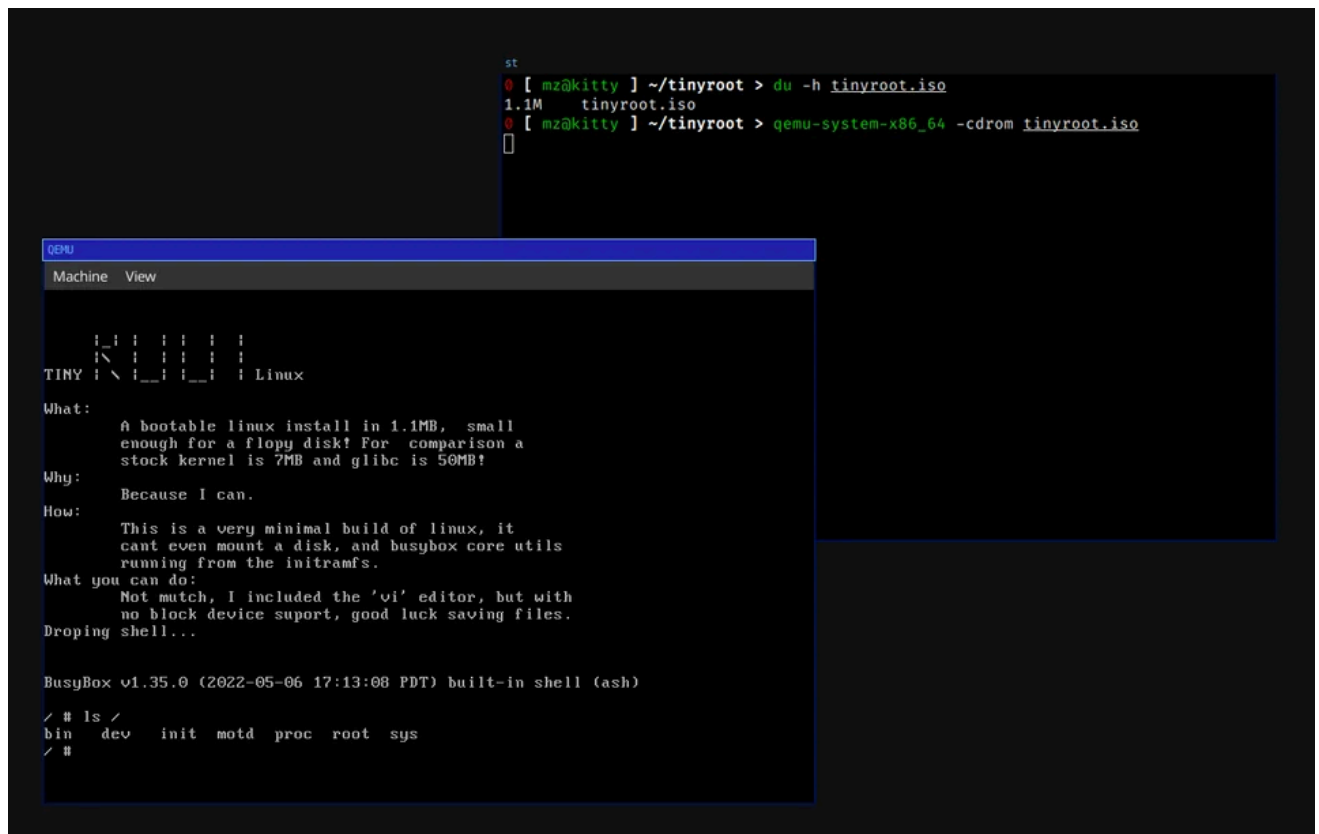


1.4k



# I see your gentoo, and present tinyROOT linux, a 1.1 MB linux "distro". [DETAILS AND ISO IN COMMENTS]

Software Release



141 Comments



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a new universe and sauce has arrived. WcDonald's is here and our power level is higher than ever

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What are your thoughts?

**B**

*i*

<c>

A^

TT

...

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boogelymoogely1 · 2 yr. ago

Just realized CPUs have enough cache that you could have Gentoo with DWM stored entirely in L3 cache on a 5800X3D



381



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ADAMPOKE111 · 2 yr. ago

Ultimate minimalism and speed.



102



Reply

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dasgudshit · 2 yr. ago

Genuine question: what can you do with such a small os?



25



Reply

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Twerking4theTweekend · 2 yr. ago

Execute binaries. What more do you need? 😊 Seriously though, you can run everything in a RAMdisk on a small form factor device and leave enough room for whatever application you're wanting to run as that device's main feature.



33



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ancientweasel · 2 yr. ago

Save money on embedded device hardware.



13



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I want to see that.

↑ 57 ↓ Reply Share ...



boogelymoogely1 · 2 yr. ago

Same lmao

↑ 1 ↓ Reply Share ...



MassiveStomach · 2 yr. ago

But why? How many cache misses do you have with the OS? Wouldn't you want the running programs in cache. Or maybe I'm missing something.

↑ 5 ↓ Reply Share ...



vDeep · 2 yr. ago

Because you can

↑ 35 ↓ Reply Share ...



MassiveStomach · 2 yr. ago

It is wayyyyy less efficient to have an OS in cache though. Just because you have a nice house doesn't mean you need to drag it around. Give that room to the programs right? Or I really think I'm missing something.

↑ 3 ↓ Reply Share ...



hoeding · 2 yr. ago

It really depends if your work is done by systemcalls or in userspace. If you call into libc in a hot loop you're gonna want to end up with libc in the cache. If we are just talking about using the cache as a disk then yes, that is a bad idea.

↑ 10 ↓ Reply Share ...



MassiveStomach · 2 yr. ago

the hot parts of libc would already be in cache while running a program....that's what ....cache does.....

OP was talking about jamming a barebones linux kernel and keeping it in cache and i was just pointing out as someone who has been optimizing programs for close to 20 years is a bad idea as that's not what cache is for.



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Booty\_Bumping · 2 yr. ago

Wouldn't you want the running programs in cache.

Caching is not so predictable, it would be very difficult to guarantee an entire program is being cached, with all the kernel context switching pulling in unrelated pages to the cache. The OS is constantly playing hot potato with all sorts of things that aren't important for the performance of what you actually want to run.

But if you can fit the entire OS and program into cache, you are guaranteed to have little to no main memory access once everything has been loaded at least once.

↑ 1 ↓ Reply Share ...

[deleted] · 2 yr. ago

- ISO Download: <https://github.com/10maurycy10/tinyroot/blob/main/tinyroot.iso?raw=true>
- Assorted notes: <https://github.com/10maurycy10/tinyroot>

↑ 132 ↓ Reply Share ...



Mithrandir2k16 · 2 yr. ago

Oh, an iso link in the comments.. at that size you could've pasted it directly into the comments. Maybe base64 encoded?

↑ 209 ↓ Reply Share ...



agent-squirrel · 2 yr. ago

I tried, it's too big for a comment and pastebin doesn't support the size of the text unless you pay for it. It's also such a large amount of text it slows my browser to a crawl and the clipboard takes a solid 10 seconds to paste.

↑ 92 ↓ Reply Share ...



ForceBlade · 2 yr. ago · *edited 2 yr. ago*

1.1mbps it text as base64 way more than the 10000char limit here

↑ 40 ↓ Reply Share ...



JuhaJGam3R · 2 yr. ago

Yeah, the limit is 10 kB and this surpasses it hundred-fold.



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ForceBlade · 2 yr. ago

Not sure why I didn't apply that thought process before commenting but yes easily surpassed.

↑ 12 ↓ Reply Share ...



OkCarpenter5773 · 2 yr. ago

there is a way... zip it until its less than 9kb, and then post b64 here 😏

↑ 8 ↓ Reply Share ...



LulzCop · 2 yr. ago

Posting the URL is in a sense excellent compression

↑ 9 ↓ Reply Share ...

[deleted] · 2 yr. ago

Cant, most of the data is already compressed.

↑ 7 ↓ Reply Share ...



augugusto · 2 yr. ago

Hot about encoding to emoji?

↑ 6 ↓ Reply Share ...



Johannes\_K\_Rexx · 2 yr. ago

What we need here is a Borg compression algorithm.

↑ 3 ↓ Reply Share ...

[deleted] · 2 yr. ago

Ziping zip files doesn't do much

↑ 9 ↓ Reply Share ...



OkCarpenter5773 · 2 yr. ago

really? is there a way of infinite compression?

↑ -3 ↓ Reply Share ...

[deleted] · 2 yr. ago



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OkCarpenter5773 · 2 yr. ago

oh welp thats sad

you can compress 129 bytes of data by hashing into 128 bit hash and then breaking it

actually its an awesome idea, gonna implement really easily breakable cipher (for example 4 bits to 2 bits + one bit checksum) and then i can compress like that forever (not really optimal tbh...)

↑ 1 ↓ Reply Share ...



ayekat · 2 yr. ago

you can compress [...] data by hashing

With hashing, you can "compress" anything to any size, really.

The challenge is *decompressing* it and getting back the original data. AFAIK decompressing hashed data is still being worked on.

↑ 1 ↓ Reply Share ...

[Continue this thread →](#)



redditor2redditor · 2 yr. ago

Base64, binary, Usenet binaries..it's all black magic to me.

↑ 7 ↓ Reply Share ...



theuniverseisboring · 2 yr. ago

An ISO so tiny it could have been uploaded to Discord CDN without Nitro

↑ 57 ↓ Reply Share ...



Li0nX · 2 yr. ago

the first thing i thought about it

↑ 15 ↓ Reply Share ...



Artemis-4rrow · 2 yr. ago



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↑ 17 ↓ Reply Share ...



brimston3- · 2 yr. ago

[Chat~Governance~Reddit.773093021b1c5d7b904d.js](#) on this webpage is bigger than that iso.

↑ 37 ↓ Reply Share ...



Kikiyoshima · 2 yr. ago

But the true question is, can I add a program to run at boot on it and distribute it all via PXE?

↑ 9 ↓ Reply Share ...



zokier · 2 yr. ago

fyi, you can skip the separate initramfs build step and bake it directly into the kernel image as described here: <https://docs.kernel.org/filesystems/ramfs-rootfs-initramfs.html#populating-initramfs>

↑ 6 ↓ Reply Share ...



darkguy2008 · 2 yr. ago

Wow this is super interesting... But, why? I mean, what can you do with it or what do you see possible to be done with it?

↑ 2 ↓ Reply Share ...



Xemulated · 2 yr. ago

[deleted] · 2 yr. ago

Linux on a Floppy

I'd love to see Linux on an L4 ROM Cache. If you burn your Clib to ROM that's really close to the CPU, it will speed everything up. It will take 9.3M Transistors for this Distro to boot off the CPU though.

↑ 124 ↓ Reply Share ...

[deleted] · 2 yr. ago

L4 ROM? Linux could easily live inside the L3 cache for some of the new Epyc/Ryzen CPUs.



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Mathisbuilder75 · 2 yr. ago

Would an OS inside the CPU be super fast?

↑ 34 ↓ Reply Share ...



Elistic-E · 2 yr. ago

I don't really know hardware or OSES at that level but I think the answer would be along the lines of a few trains of thought, mostly:

1.) yes

2.) that cpu memory is used and needed for work, so while yes there's a cost of having far less cpu memory to do operations on. I'd wager it's akin and next level to somehow loading your OS into a ramdisk and booting that

3.) bottlenecks are elsewhere so the positive impact may not be felt - eg speed of getting data into the cpu from memory/disk. I'd imagine a good little chunk of the kernel may already make it fairly consistently into cpu cache as is, too.

In short I'd wager your OS at its core may be wicked fast but the moment it does "work" it'd probably be near impossible to tell it apart from another OS - if it was pinned to cache (theoretically, somehow) and the cache wasn't large it may be slower.

↑ 50 ↓ Reply Share ...

TLUL · 2 yr. ago

Isn't loading the OS from a ramdisk pretty much what livecds do? There's a boot param in the Arch iso to preload everything so you can take the disk out after.

↑ 12 ↓ Reply Share ...

OmegaMetor · 2 yr. ago

You can have them load into RAM but they typically won't by default

↑ 3 ↓ Reply Share ...

[deleted] · 2 yr. ago

I think you could probably rig the S-RAM cache controller to not put the part of the OS that would normally go into an S-RAM L3 into a ROM L3 along with common algorithms and never put that stuff in L3 S-RAM.





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doubleEdged · 2 yr. ago

As for the cache size limitations, I'm curious how it'd work with the 5800X3D. That's 64MB of bonus L3 stacked on top of the die, big enough for a basic installation with block device mounting. I still can't think of a valid usecase though lol

↑ 1 ↓ Reply Share ...

[deleted] · 2 yr. ago

That 64MB of L3 S-RAM could be 384MB of ROM, even if you still had 32MB of S-RAM and split the transistors to S-RAM in half, that's 192MB of ROM

↑ 1 ↓ Reply Share ...

ImprovedPersonality · 2 yr. ago

It kind of is already? Modern CPUs have several megabytes of cache. That's more than enough to put all the frequently used OS functions into cache. I expect most of your frequently used syscalls to be cached most of the time.

↑ 21 ↓ Reply Share ...

[deleted] · 2 yr. ago · edited 2 yr. ago

A problem with cache design is the more you have, the slower it is (well, with L1, L2 and less so with L3) The more transistors your cache uses, the more latency there is, that's why L1 Cache doesn't go above 128KB, using Rocket Lake as an example, it's 32KB of instruction L1 and 48KB of Data L1 per core, the more transistors you add, the less it acts as fast as L1 cache. 80 Kilobytes per core L1, there's 8 bits per byte and there's 1,024 bytes per kilobyte (base 2 maths) and there's 6 transistors per bit, that's 4M Transistors per core just for L1. The thing about ROM vs S-RAM is ROM is 1 transistor per bit, so in the space you put 1KB of S-RAM, you can have 6KB of ROM

So what if a CPU was optimized to have those syscalls in ROM? If it's accessed so commonly, you're wasting valuable transistor space by putting it in S-RAM when you can just put it in ROM. CPUs aren't usually designed with that level of frugality, it's mostly ASICs that do stuff like this, that's why Bitcoin ASICs have a high hash rate, simple redundant functions close to the CPU.

↑ 11 ↓ Reply Share ...

ImprovedPersonality · 2 yr. ago



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↑ 7 ↓ Reply **Share** ...

ILikeToBuildShit · 2 yr. ago

Any CPU you've ever used is an ASIC. The specific application, funnily, is general purpose computing lol

↑ 1 ↓ Reply **Share** ...

[deleted] · 2 yr. ago

The more things something is designed to do, the less it does well.

↑ 1 ↓ Reply **Share** ...

ILikeToBuildShit · 2 yr. ago

Yea...

↑ 2 ↓ Reply **Share** ...

spicybright · 2 yr. ago

Has anyone tried this before?

↑ 13 ↓ Reply **Share** ...

[deleted] · 2 yr. ago

I'm pretty sure micro-controllers do something like this.

↑ 19 ↓ Reply **Share** ...

paul\_h · 2 yr. ago

Minix is already inside intel cpus, and used in the power up cycle I believe

↑ 14 ↓ Reply **Share** ...

Sol33t303 · 2 yr. ago

Minix is stored on the motherboard however.

It'd be impossible to fit everything the IME has directly onto the CPU

↑ 11 ↓ Reply **Share** ...

paul\_h · 2 yr. ago



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[deleted] · 2 yr. ago · *edited 2 yr. ago*

Now imagine we could replace Minix with a small linux installation...

Or has this already been done?

↑ 4 ↓ Reply Share ...

brimston3- · 2 yr. ago

I don't think this can be done. The management engine payload has to be signed with intel's key or it won't write or load. There might be an exploit nobody knows about, but intel has been pretty quick to patch security issues in ring -2.

↑ 7 ↓ Reply Share ...

[deleted] · 2 yr. ago

You can turn off Management engine

↑ 2 ↓ Reply Share ...

[deleted] · 2 yr. ago

On *some* machines.

↑ 1 ↓ Reply Share ...

keastes · 2 yr. ago

Hap\_enable anyone?

↑ 1 ↓ Reply Share ...

[deleted] · 2 yr. ago

Oh, right, that makes sense.

↑ 1 ↓ Reply Share ...

postmodest · 2 yr. ago

The IME's existence is the most delicious irony of the history of Linux (and GNU).

Imagine HURD in ROM....

↑ 1 ↓ Reply Share ...



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ESP32 microcontrollers do it.



1



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PAPPP · 2 yr. ago

I was playing with [floppinux](#) about a year ago (and fixing it to actually work on 486 and 586 class hardware, because that's the sort of thing I spend time on). It's modern Linux parts (5.x kernels, modern musl, etc.) that still fits on a floppy.

Since these things usually work essentially by loading an init[rd | ramfs] into RAM then booting that, they should just naturally get cached on modern machines.



3



Reply

Share



AcidicAndHostile · 2 yr. ago

TomsRtBt

Used to time my dialup download for that 1.4MB floppy install. Was usually about a minute.



35



Reply

Share



[deleted] · 2 yr. ago

And Tom's included LUA as a scripting language.



11



Reply

Share



kulonos · 2 yr. ago

1. tomsrtbt is

"The most GNU/Linux on one floppy disk"  
for:

rescue recovery panic & emergencies

tools to keep in your shirt pockets

whenever you can't use a hard drive

Tomsrtbt stands for:

"Tom's floppy which has a root filesystem and is also bootable."

2) Design goals



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keep it self contained, build under itself

try to make it behave like a normal system

rescue and recovery functions get priority

### 3) Contents

What you have is... AHA152X AHA1542 AIC7XXX BUSLOGIC DAC960 DEC\_ELCP(TULIP)  
EATA EEXPRESS/PRO/PRO100 EL2 EL3 EXT2 EXT3 FAT FD IDE-CD/DISK/TAPE IMM INITRD  
ISO9660 JOLIET LOOP MATH\_EMULATION MINIX MSDOS NCR53C8XX NE2000 NFS NTFS  
PARPORT PCINE2K PCNET32 PLIP PPA RTL8139 SD SERIAL/\_CONSOLE SLIP SMC\_ULTRA  
SR ST VFAT VID\_SELECT VORTEX WD80x3 .exrc 3c589\_cs agetty ash badblocks  
basename boot.b buildit.s busybox bz2bzImage bzip2 cardmgr cardmgr.pid cat chain.b  
chattr chgrp chmod chown chroot clear clone.s cmp common config cp cpio cs cut  
date dd dd-lfs debugfs ddate df dhcpcd-- dirname dmesg domainname ds du  
dumpe2fs e2fsck echo egrep elvis ex false fdflush fdformat fdisk filesize find findsuper  
fmt fstab grep group gunzip gzip halt head hexdump hexedit host.conf hostname  
hosts httpd i82365 ifconfig ile init inittab insmod install.s issue kernel key.lst kill killall  
killall5 ld ld-linux length less libc libcom\_err libe2p libext2fs libtermcap libuuid lilo  
lilo.conf ln loadkmap login ls lsattr lsmod lua luasocket man map md5sum mitem  
mkdir mkdosfs mke2fs mkfifo mkfs.minix mknod mkswap more more.help mount mt  
mtab mv nc necho network networks nmclan\_cs nslookup passwd pax pcmcia\_core  
pcnet\_cs pidof ping poweroff printf profile protocols ps pwd rc.0 rc.S rc.custom  
rc.custom.gz rc.pcmcia reboot rescuept reset resolv.conf rm rmdir rmmod route rsh  
rshd script sed serial serial\_cs services setserial settings.s sh shared slattach sleep sln  
sort split stab strings swapoff swapon sync tail tar tcic tee telnet telnetd termcap test  
tomshexd tomsrtbt.FAQ touch traceroute true tune2fs umount undeb-- unpack.s  
unrpm-- update utmp vi vi.help view watch wc wget which xargs xirc2ps\_cs yecho yes  
zcat

↑ 2 ↓ Reply Share ...

jhaluska · 2 yr. ago

So smol he had to drop extra letters to make it fit.

↑ 27 ↓ Reply Share ...

Fr0gm4n · 2 yr. ago

Not to be confused with [Tiny Core](#), which is the distro that grew from the death of Damn Small Linux in 2008.

↑ 18 ↓ Reply Share ...



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Tiny Core is neat and all but I liked using Damn Small Linux better. Just used it for basic stuff- but definitely enjoyed my time with it. Tiny Core... needs a dark mode. All that white and bright detail is a literal eyesore for me

4 **Reply** **Share** ...

Mars2k21 · 2 yr. ago

1.1 MB? Going into my downloads folder asap thanks

51 **Reply** **Share** ...



Comment deleted by user · 2 yr. ago

[deleted] · 2 yr. ago

Terry A. Davis would be proud. Although it lacks a HolyC compiler and an elephant with blue eyes

23 **Reply** **Share** ...

chipredacted · 2 yr. ago

For now

7 **Reply** **Share** ...

Killing\_Spark · 2 yr. ago

Does this have networking and NFS support, and if no how much would it blow up the size?

8 **Reply** **Share** ...

navneetmuffin · 2 yr. ago

This is some madlad work.

7 **Reply** **Share** ...

BQE2473 · 2 yr. ago

Just like Tiny OS.



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Penny\_is\_a\_Bitch · 2 yr. ago

but can it run Crysis?

↑ 25 ↓ Reply Share ...

[deleted] · 2 yr. ago

no.

↑ 73 ↓ Reply Share ...

[deleted] · 2 yr. ago

Just stream your game on other computer and output it (through some ffmpeg black magic fuckery) in ASCII characters :)

↑ 18 ↓ Reply Share ...

coltstrgj · 2 yr. ago

But then it wouldn't be 1.1 Mb.

↑ 10 ↓ Reply Share ...

ForceBlade · 2 yr. ago

We'll have to settle for ~ 5 for some sort of netcat and enough for static networking - the remote can run the ffmpeg capture>ascii stream with a predefined col and line length for the destination

↑ 5 ↓ Reply Share ...

brimston3- · 2 yr. ago

You can get automatic network config/dhcp and so forth for 1-3kb by enabling the correct applets in busybox. Just make sure you only pick the nic driver you need to bake in.

But to get streaming video support, you would have to really strip the heck out of ffmpeg to get it under 200kb or whatever the remaining size budget is. You also won't have a real graphics driver, probably only VESA framebuffer driver, so no hw acceleration.

If you just want to do netcat + libcaca, I bet that will work now inside 1MB, since you don't need x11 for that. (You don't even need the libcaca part on



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8



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darkguy2008 · 2 yr. ago

But.... *could* it?



1



Reply

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nosnerps · 2 yr. ago

Dammit buddy, how am I supposed to explain the size of my linux iso folder now?!



5



Reply

Share



warpedspockclone · 2 yr. ago

Great idea. Renaming homework/ to linux-distros/



3



Reply

Share



Down200 · 2 yr. ago

Or as I've taken to calling it, Linux+Homework/



4



Reply

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probablyExistingMan · 2 yr. ago

[r/smol](#) linux distro



13



Reply

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GLIBG10B · 2 yr. ago

`make tinyconfig`



4



Reply

Share



[deleted] · 2 yr. ago

Now get a tinyconfig kernel booting, and you have just 250MB for userland + bootloader.



4



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redditbloooows ·





...

...

...

-----No drivers?-----

.....

.....





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bartholomewjohnson · 2 yr. ago

You could fit this directly in CPU cache.

↑ 2 ↓ Reply Share ...

Exponential\_Rhythm · 2 yr. ago

Wow, I've written Source Engine scripts bigger than that.

↑ 2 ↓ Reply Share ...

Xanza · 2 yr. ago

A little impractical, but pretty cool nonetheless.

↑ 3 ↓ Reply Share ...

Down200 · 2 yr. ago

Says an Arch user?

↑ 4 ↓ Reply Share ...

Shamin\_Yihab · 2 yr. ago

Says an Arch user?

↑ 4 ↓ Reply Share ...

TDplay · 2 yr. ago

Says an Arch user?

↑ 3 ↓ Reply Share ...

adamkex · 2 yr. ago

Surely one can install Gentoo once that's installed though!



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earthman34 · 2 yr. ago

Wait, it's 1Mb and there's a window manager?

↑ 1 ↓ Reply Share ...

[deleted] · 2 yr. ago

no, the 1MB image is running in qemu.

↑ 13 ↓ Reply Share ...

darkguy2008 · 2 yr. ago

Ohh, what is your WM then? looks cool

↑ 1 ↓ Reply Share ...

[deleted] · 2 yr. ago

sway

↑ 1 ↓ Reply Share ...

darkguy2008 · 2 yr. ago

Really? But you have cascading windows, I've never used sway but it's marketed as a replacement for i3 which is a tiling WM (and I hate them), did you change it through a setting or something?

↑ 1 ↓ Reply Share ...

[deleted] · 2 yr. ago

Yup, you can change it. (Default can be change in the config, you can also switch modes with mod-shift-space)

↑ 1 ↓ Reply Share ...

darkguy2008 · 2 yr. ago

This is great, thanks for sharing as well! I haven't used Wayland because of the lack of a good WM like Openbox, and if Sway works like that then it might be my cup of tea. Plus, I can also test your tinyROOT



Thanks!



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brimston3- · 2 yr. ago

Back in the 2.4-2.6 linux days, we could do this. It's probably possible now with a *lot* more work.



5



Reply

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[deleted] · 2 yr. ago

No



1



Reply

Share



[deleted] · 2 yr. ago

See Kolibri OS for that



3



Reply

Share



earthman34 · 2 yr. ago

Had me going for a second.



1



Reply

Share



[deleted] · 2 yr. ago

Look at KolibriOS, it's 0.3 mb smaller and has a desktop environment



1



Reply

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[deleted] · 2 yr. ago



DS\_1900 · 2 yr. ago

TheEbolaDoc · 2 yr. ago

once you download my divine intellect 2MB distribution ... \o/ xD



1



Reply

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[deleted] · 2 yr. ago

Aren't you a clever one, good job.



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Thadeu\_de\_Paula · 2 yr. ago

It is really good projects like this. Even it was only as a conceptual. I think it is effective not only by who use it but also to point out at the bigger distros and show how things can be very very useful and still small and running on old hardware.

Believe or not, it is of much inspiration to the deal on harsh times with creavity 

 1   Reply Share ...

Gaffclant · 2 yr. ago

This would have been nice to have like a month ago when I was looking for a really small ISO lol

 1   Reply Share ...

derklempner · 2 yr. ago

Does nobody remember [QNX](#)?

 1   Reply Share ...

SacredMilk\_OG · 2 yr. ago

Cool ;)

 1   Reply Share ...

ioncehackedmyschool · 2 yr. ago

This is fucking beautiful

 1   Reply Share ...