The dosemu HOWTO

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This is the 'Frequently Asked Questions' (FAQ) / HOWTO document for dosemu. The most up-to-date version of the dosemu-HOWTO may be found in dspsun.eas.asu.edu:/pub/dosemu.

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1 The preliminaries

1.1 What is dosemu, anyway?

To quote the manual, "dosemu is a user-level program which uses certain special features of the Linux kernel and the 80386 processor to run MS-DOS in what we in the biz call a 'DOS box.' The DOS box, a combination of hardware and software trickery, has these capabilities:

o the ability to virtualize all input/output and processor control instructions

o the ability to support the word size and addressing modes of the iAPX86 processor family's "real mode," while still running within the full protected mode environment

o the ability to trap all DOS and BIOS system calls and emulate such calls as are necessary for proper operation and good performance

o the ability to simulate a hardware environment over which DOS programs are accustomed to having control.

o the ability to provide MS-DOS services through native Linux services; for example, dosemu can provide a virtual hard disk drive which is actually a Linux directory hierarchy."

1.2 What's the newest version of dosemu and where can I get it?

The newest version of dosemu is `dosemu0.52` and can be ftp'ed from the following sites:

```
dspsun.eas.asu.edu:/pub/dosemu/
tsx-11.mit.edu:/pub/linux/ALPHA/dosemu/
```

However, pre-release versions are also available for developers and ALPHA testers. They may be found in

```
dspsun.eas.asu.edu:/pub/dosemu/Development/
tsx-11.mit.edu:/pub/linux/ALPHA/dosemu/Development
```

and have names of the form `pre0.53_??`. The pre-release code has the distinct advantage that it is compatible with the most recent Linux kernels. Also, it includes new features (most notably X support). Remember that this is ALPHA code, however: there may be serious bugs and very little documentation for new features.

1.3 Where can I follow the development?

If you want to follow the development of dosemu, you should consider subscribing to the MSDOS channel on Linux-activists. To subscribe, send mail to `linux-activists-request@niksula.hut.fi`. Your mail HEADER or FIRST LINE must contain the line:

```
X-Mn-Admin: join MSDOS
```

To post to the list, send mail to linux-activists@niksula.hut.fi. Your mail HEADER or FIRST LINE must contain the line:

```
X-Mn-Key: MSDOS
```

1.4 What documentation is available for dosemu?

The dosemu manual (`dosemu.texinfo`) written by Robert Sanders has not been updated in some time but is still a good source of information. It is distributed with dosemu.

The "dosemu Novice's Altering Guide" or DANG is a road map to the inner workings of dosemu. It is designed for the adventurous, those who wish to modify the source code themselves. The DANG is maintained by Alistair MacDonald (`am20@unix.york.ac.uk`) and is posted once in a while to the MSDOS channel of Linux Activists.

The EMU success list (EMUsuccess.txt) is a list of all programs that have been reported to work with dosemu. It is posted once in a while to the MSDOS channel of Linux Activists. The most recent version can be found on dspsun.eas.asu.edu:/pub/dosemu.

And then, of course, there is the dosemu FAQ/HOWTO. But you already know about that, don't you. It is also posted once in a while to the MSDOS channel of Linux Activists. The most recent version can be found on `dspsun.eas.asu.edu:/pub/dosemu`.

1.5 How do I submit changes or additions to the HOWTO?

The preferred method is to edit the file, `dosemu-HOWTO-xx.x.sgml` to incorporate the changes, create a diff file by typing something like

```
diff original-file new-file
```

and send it to `deisher@dspsun.eas.asu.edu`. If you do not know SGML, that's ok. Changes or new information in any form will be accepted. Creating the diff file just makes it easier on the HOWTO maintainer. :-)

2 Compiling and installing dosemu

2.1 Where are the installation instructions?

The installation instructions are in the file, "QuickStart", included in the distribution.

2.2 Why won't dosemu 0.52 compile?

(7/9/94)

There is a bug in the makefile of dosemu 0.52. The makefile expects the source to be located in `/usr/src/dosemu????`. Either install the source under `/usr/src` or try `make clean ; make config ; make dep ; make all`.

Of course, this is not the only possible reason (see below).

2.3 How can I be a bone-head when installing dosemu?

a.k.a. Top Ten Stupid Mistakes installing dosemu (7/9/94)

```
1. Don't read the QuickStart Guide.
2. Try to compile with a kernel older than 1.0.8.
3. Try to compile with an *unpatched* kernel >= 1.0.8.
4. Try to compile with a kernel older than 1.1.12.
5. Use dosemu with a kernel that does not have IPC compiled in.
6. Compile with gcc older than 2.5.8 or libc older than 4.5.21.
7. Forget to edit your /etc/dosemu.conf file.
8. Forget to run "FDISK /mbr" on your hdimage.
9. Forget to run "mkpartition" when using partition access.
10. Don't compile dosemu with sufficient priveledges (i.e., root).
```

[Please send me your stupid mistakes for inclusion in this list. I promise you will remain anonymous. ;-)]

3 Hard disk setup

3.1 How do I use my hard disk with dosemu?

First, mount your dos hard disk partition as a Linux subdirectory. For example, you could create a directory in Linux such as /dos (mkdir -m 755 /dos) and add a line like

```
/dev/hda1       /dos     msdos   umask=022
```

to your /etc/fstab. (In this example, the hard disk is mounted read-only. You may want to mount it read/write by replacing "022" with "000" and using the -m 777 option with mkdir). Now `mount /dos`. Now you can add a line like

```
lredir d: linux\fs/dos
```

to the AUTOEXEC.BAT file in your hdimage (see the comments on LREDIR below). On a multi-user system you may want to use

```
lredir d: linux\fs\${home}
```

where "home" is the name of an environmental variable that contains the location of the dos directory (/dos in this example).

———————

Tim Bird (Tim_R_Bird@Novell.COM) states that LREDIR users should

be careful when they use LREDIR in the autoexec, because COMMAND.COM will continue parsing the autoexec.bat from the redirected drive as the same file offset where it left off in the autoexec.bat on the physical drive. For this reason, it is safest to have the autoexec.bat on the redirected drive and the physical drive (diskimage) be the same.

———————

Robert D. Warren (`rw11258@xx.acs.appstate.edu`) reported (4/28/94) that

I boot off a small hdimage file (less than 1 MB - and twice as large as needs be at that), and the next to last line in my config.sys file on the hdimage boot image is:

```
install=c:\lredir.exe LINUX\FS\home/dos
```

This will execute lredir just before the command interpreter runs. And I have successfully run it with both command.com and 4DOS. This eliminates the offset problem using lredir in autoexec.bat.

3.2 Can I use my stacked/double-spaced/super-stored disk?

At this time, compressed drives cannot be accessed via the redirector (lredir or emufs). However, many people have had success by simply uncommenting the

```
disk { wholedisk "/dev/hda" }        # 1st partition on 1st disk
```

line in their dosemu config file. Others have had success using

```
disk { partition "/dev/hda1" 1 }
```

and running the `mkpartition` utility (included in the dosemu distribution).

[WARNING: Make sure your dos partitions are not mounted and writeable from Linux while you are using dosemu with wholedisk or partition access. This is an easy way to destroy the data on your dos partition.]

If LILO is installed, the above will not work. However...

Thomas Mockridge (`thomas@aztec.co.za`) reported (8/5/94) that

To boot dosemu with LILO and Stacker 4.0 I did a little work around...

1. `dd` the MBR to a file. (or norton utility, etc., first 512 bytes)
2. Boot dos (from full boot not emu), do a fdisk /mbr, make your dos partition active with (dos) fdisk.
3. Copy the new MBR to a file.
4. Replace the original MBR
5. Copy the second MBR to /var/lib/dosemu/partition.hda? (Whichever is your dos partition)
6. Set dosemu.conf

```
disk {partition "/dev/hda? ?"}
```

7. Start dosemu and and voila! No LILO.

Holger Schemel (`q99492@pbhrzx.uni-paderborn.de`) reported (2/10/94) that

Works even fine under DOSEMU with MS-DOS 6.0. If you have problems, then you have to edit the file 'DBLSPACE.INI' manually and change the disk letter to the letter your drive gets under DOSEMU.

Darren J Moffat (`moffatd@dcs.gla.ac.uk`) also reported (3/27/94)

"...use 6.2 if you can get it!! Just make sure you have a lilo boot disk on hand since dos 6{.2} will change the MBR of the boot HD."

3.3 I get an error message about my config.sys file but it looks fine.

Corey Sweeney (`corey@amiganet.xnet.com`) reported (12/8/93) that

Sometimes when loading config.sys you will get a error message saying something like "error in line 6 of config.sys". The problem will go away if you add several carriage returns at the end of your config.sys.

3.4 Is it safe to use dosemu with DOUBLE?

Joep Mathijssen (`joep@tm.tno.nl`) reported (7/9/94) that

Last night I installed DOSEMU-0.52 on a DouBle'd disk (compressed file system for Linux). But when I tried to put a system on my hdimage, I got an "ERROR ON DRIVE C:" message. After putting the hdimage

on a normal filesystem, it worked fine. Afterwards, I found the my compressed filesystem was ruined. Ah well, DouBle is an Alpha version, so problems like these can be expected.

4 Serial ports and mice

4.1 Where are the (microsoft compatible) mouse drivers?

Tom Kimball (tk@pssparc2.oc.com) reported (11/24/93) that

Several people said to use a different mouse driver and suggested some. I found a couple that seem to work fine.

```
oak.oakland.edu:/pub/msdos/mouse/mouse701.zip   (mscmouse)
oak.oakland.edu:/pub/msdos/mouse/gmous102.zip   (gmouse)
```

4.2 Why doesn't the mouse driver work?

Scott D. Heavner (sdh@fishmonger.nouucp) reported (11/27/93) that

If you start the mouse driver and it just hangs (it might actually take 30-60s), but if you are waiting longer than a minute for the mouse driver to start, remove any "timer" lines in your config file.

4.3 Why does dosemu clobber COM4?

Rob Janssen (rob@pe1chl.ampr.org) reported (3/24/94) that

According to jmorriso@bogomips.ee.ubc.ca, "dosemu still clobbers COM4 (0x2e8, IRQ 5). 0x2e8 isn't in ports{} in config. I have to run setserial /dev/cua3 irq 5 on it after dosemu exits."

This is caused by your VGA BIOS. I have found that by enabling the IO port trace and seeing where it was clobbered.

Disable the "`allowvideoportaccess on`" line in config and it will work fine. When you then have problems with the video, try to enable more selective ranges of IO addresses (e.g., 40-43).

4.4 How do I use dosemu over the serial ports?

Corey Sweeney (corey@amiganet.xnet.com) reported (12/8/93) that

If you plan to be using dosemu over a serial line, telnet session, or just don't want to use raw console mode, then you will probably want to get to know the termcap file. For those who don't know, the termcap file is usually located in the `/etc` directory. It contains the information on what sequences of characters to send to your terminal, and what sequences of characters from your terminal represent what keystrokes. If when you hit F5, and it does not work, it will usually be the fault of a incorrect termcap entry. (To learn more about termcaps look up the termcap man page.)

Now the information in the termcap relates to entries in the dosemu code. So after you put `k5=\E[[E` in your termcap, whenever your terminal sends `\E[[E`, dosemu translates that and says "he hit the k5 key!" Then it is up to dosemu to figure out what the proper scancode for the k5 key is, and push that into the buffer in some magical way. To determine the scancode, it looks up in a little table in termio.c. In termio.c under the line which (currently) says

```
#define FUNKEYS 20
```

There exist several lines following the form

```
{NULL, "termcap code", scancode} /* name of key */
```

so when it says

```
{NULL, "k5", 0x3f00} /* F5 */
```

it's saying that `0x3f00` is the scancode for F5, and that when the person activates the k5 sequence (defined in the termcap) to stuff the F5 scancode into the buffer.

Now that's all fine and dandy for analyzing how dosemu does this, but you probably want to be able to do something with this new information. Well you can add functionality for the F11 and F12 keys (and any other keys that you can find the scancode for).

All you have to do is add a line to the termio.c table that says:

```
{NULL, "ka", 0x8500} /* F11 */
```

Then to actually get it to read the line you just put in, add one to the FUNKEYS number.

```
#define FUNKEYS 21
```

Then add a "ka" entry to your termcap. After that, every time you hit the sequence stored in your termcap for ka, your dos program recognizes an "F11."

Warning: Make sure that ka is not in use in your termcap. If it is you are headed for trouble.

Note: The scancode for F12 is `0x8600`.

4.5 How can I switch between dosemu and a shell over the serial line?

John Taylor (`taylor@pollux.cs.uga.edu`) reported (5/25/94) that

I am running Linux 1.1.13 and want to point out a great feature that should be protected and not taken out (IMHO). With the 52 version, I can run the program, "screen." From screen, i can invoke dos -D-a. What is really great (IMHO) is the screen commands (the CTRL-A cmds) still work. This means I can do a CTRL-A C and add another unix shell, and switch between the two (DOS / UNIX). This allows me to use dosemu over the serial line really well, because switching is made easy.

5 Multiple users and Non-interactive sessions

5.1 Can I use dosemu on a multi-user system?

Corey Sweeney (`corey@amiganet.xnet.com`) reported (12/8/93) that

If you are running dosemu on a system in which more then one person may want to run dosemu, then you may want to change the directory of your hard drive image. Currently in the `/etc/dosemu.conf` file there exists the line saying that the hard drive image is "hdimage". If you change this to `/var/lib/dosemu/hdimage` then people do not have to worry about what directory they are in when they run dosemu, and hdimage does not have to be moved each time you upgrade to the next patch level.

If you do do this for multi-user dosemu, then you will want to make the hdimage in `/var/lib/dosemu` read-only for everyone but the dosemu administrator.

Note that you can use the new emufs.sys thing to mount a "public" directory and/or a "private" directory (a sub-directory in each person's home directory).

[Note: Users may also create a personal configuration file named `~/.dosrc` (same format as `/etc/dosemu.conf`) to run their own copy of dos.]

5.2 How can I run dos commands non-interactively?

I have been meaning to write an article on this for quite some time but have not gotten around to it. Here are some hints from others:

Dan Newcombe (`newcombe@aa.csc.peachnet.edu`) reported (1/27/94) that

Here is an idea (untested) to be able to run a DOS command from the command line (or menu choice, etc...) without modifying the acutal emulator. [Your dos partition is assumed to be mounted under Linux, already.]

Suppose you wanted to run wp60.exe with the parameter "`wp60 d:\doc\paper.txt`". You would do something like "`dosrun wp60 d:\doc\paper.txt`". "`dosrun`" would be a linux shell program that would a) edit/modify/recreate the dos `autoexec.bat` from your dos partition and b) simply run dosemu (e.g., "`dos -C >/dev/null`". Step a) would somehow keep all the stuff you'd normally want in `autoexec.bat` (e.g., mouse.com) and the last line would be "`wp60 d:\doc\paper.txt`".

On the dosemu side, beforehand, you would have to modify the `config.sys` file (located in hdimage) so that it 1) uses emufs to access the dos partition as `D:`, 2) sets "`COMPSEC=D:\` (I think. I don't have a DOS manual around.), and 3) sets "`shell=c:\command.com /p`".

The idea is that for each time that you load the DOS emulator, you will recreate an autoexec.bat that is specific to that session. What makes it specific is that the last line will execute the program you want. The modifications on the hdimage are to tell the emulator/DOS that you want to use (and effectivly) boot off of D:, which will be the actual DOS partition.

If you do not use hdimage and access the DOS filesystem directly upon boot-up of DOSEMU, then this will work, and you don't have to go through the hdimage part of this all.

Daniel T. Schwager (danny@dragon.s.bawue.de) reported (7/2/94) that

You can use different dosemuf.conf files (and different hd-boot-images with different autoexec.bat's) and call dosemu like

```
$ dos -F my_quicken_q_exe_dosemu.conf
```

Dietmar Braun (braun@math20.mathematik.uni-bielefeld.de) reported (7/4/94) that

This is no problem at all when you use the redirector of dosemu. It is possible to redirect a drive letter to a linux path given by an environment variable.

So I have a shell script named "DOS" which does something like

```
mkdir /tmp/dos.\$\$
DOSTMP=/tmp/dos.\$\$; export DOSTMP
```

and then a little trick to get "echo $* > $DOSTMP/startup.bat" really working (actually a small C Program which turns '/' in '\' and terminates lines correctly for messy dos with cr/lf pairs and adds ^Z at the end of the file), creates startup files, links and so on in this directory, and then starts dosemu. Within "autoexec.bat" drive c: is redirected from hdimage to this tmp-directory, which has links for $HOME and $PWD.

So if I want to see my filenames shortened to 8.3 I can type "DOS dir" and I get my current directory listing. So I have full DOS multi user (I don't have any DOS partition and redirecting to Linux preserves user permissions) and multi tasking. (dosemu sessions are completely independent). I did this once to be able to use a dos driver for my printer. My printcap df is actually a DOS program. So you can even make DOS executables act as lpr filters.

6 dosemu and Netware

6.1 How do I get Netware access from dosemu?

James B. MacLean (jmaclean@fox.nstn.ns.ca) reported (11/28/94) that

Dosemu now supports pdipx (an IPX over pktdrvr) and pdether (uses Novell's MLID spec) to access Novell LAN's via the built in packet driver. The packet driver sits at interrupt 0x60, and abids by the normal paket driver rules. That said, beware of trying any DOS TCP/IP just yet. Single access can be made by:

```
1) cd ./net
2) cp libpacket.c.single libpacket.c
3) cp pktnew.c.single pktnew.c
4) recompile DOSEMU
5) run dosemu
6) load pdether as described by its docs (pdipx is another method)
```

```
7) load netx
8) enjoy netware access :-)
```

If you need special access to your NIC, read on. By default dosemu will not get interrupts from the kernel. That said, if you'd like to give your NIC to dosemu for it to control, maybe for access to Netware on the network through a NETX client, I do have a driver (Silly Interrupt Generator) to put in the kernel that any program, like dosemu can use to get at the interrupt for your NIC. I use it in DOSEMU to access a Novell Lite network in the past until the packet driver existed.

Any interested parties should E-mail me (`jmaclean@fox.nstn.ns.ca`) and I'll pass along some directions.

Want multiple DOSEMU's access to Novell?

```
1) compile current [pre-release] DOSEMU
2) follow directions in ./v-net/dosnet.README
3) carry on from 5) above.
```

6.2 The Netware-HOWTO

Lauri Tischler (`ltischler@fipower.pp.fi`) has authored this section of the HOWTO (Thanks Lauri!!!). This is Rev. 0.1, 26 Nov 1994.

IMPORTANT NOTE: This information applies to the pre-release versions of dosemu (pre0.53_??) only!

This is my first attempt to write some kind of advice on how to connect to a Netware server from your Linux box.

Due to the first attempt and the scope of this note, it is not a real HOWTO, not even a 'mini-HOWTO'. You might call it a 'nano-HOWTO' if you like.

As in most sites the Netware is really just an extension to PC's running DOS and DOS applications (Windows is JUST another DOS-application), the Netware providing fileserver and printing support, I will concentrate on getting the connection via DOSEMU only.

It is possible to access Netware server via NFS from Linux directly, but that requires the Novell NFS nlm-module for the server. Unless you have $x000 of extra dough around you better forget it. Besides all the applications are DOS programs anyway, so you can't run them in Linux native mode. Also, if there is filenamelength limitations in Novell NFS it is quite useless in *nix environment. (I really don't know NFS, never seen the beast).

So, how to get the connection to the Netware server, that is the question.

We have a Netware network with 3 servers and appr. 110 PC's connected to it. It is TOTALLY Dos/Windows environment, running 'Novell standard' Ethernet_802.3 frames, really very ordinary commercial REAL LIFE setup.

I use in my PC (in addition to DOS) Linux 1.1.65 and Dosemu pre0.53_35 and it works in my machine with my hardware and our network. The following may or may not work on Your pile of iron.

1) Linux kernel requirements (NONE). There is a config parameter 'IPX-SUPPORT'. It makes no difference to use it or not to use it. It is provided for future hooks to kernel. There are no working hooks which use it,

not at least in dosemu, not in various configurations I have tested.

2) dosemu requirements (FEW) Here is a fragment of dosemu.conf file. Comment out ipxsupport on and pktdriver novell_hack

```
#************************ NETWORKING SUPPORT ****************************
#
#    Turn the following option 'on' if you require IPX/SPX emulation.
#    Therefore, there is no need to load IPX.COM within the DOS session.
#    The following option does not emulate LSL.COM, IPXODI.COM, etc.
#    NOTE: MUST HAVE IPX PROTOCOL ENABLED IN KERNEL !!
#ipxsupport on
#
#    Enable Novell 8137->raw 802.3 translation hack in new packet driver.
#pktdriver novell_hack
```

The ipx support does not work yet in dosemu and the novell_hack has been disabled in the latest dosemu (pl35). There is a gallant effort for better support, look at directory v-net for info, but we are not there yet.

In stock dosemu release (at least in pre0.53_35) in directory net the two files pktnew.c and libpacket.c are the experimental multi-version. They do not work yet. You need to copy the single-versions over the original multi-versions.

```
cp pktnew.c.single pktnew.c
cp libpacket.c.single libpacket.c
```

Remake your dosemu, normally 'make most' and we are almost there.

Test your newly made dosemu and when you are convinced that everything is on order, continue..

3) The shell.

To connect to Netware server you need the driver (ipx) and the shell (netx or vlm).

As a driver you can use either PDIPX, which is really an ipx-to-packet driver shim, or PDETHER which is also ipx-to-packet driver shim, but masquerading as an ODI compliant driver. Which one to use depends really on what frametypes is your Netware server using.

```
a) If the Netware runs on Ethernet_802.3  use PDIPX
b) If the Netware runs on Ethernet_II     use PDETHER
```

If you use PDIPX, you just load

```
PDIPX
NETX
```

and voila there You are, connected...

You can use PDIPX on Ethernet_II frame but then you need to run program called econfig against PDIPX, see Novell docs for info.

If you use PDETHER, because PDETHER is an ODI driver, you load..

```
LSL
PDETHER
IPXODI
NETX
```

and again You should be connected... Because PDETHER is an ODI driver, there must be corresponding section in Your net.cfg file. Read the PDETHER.DOC for info.

There is NO WAY to use PDETHER on Ethernet_802.3 frames. If your Netware runs on 802.3 and you MUST use ODI drivers then you need to run both frametypes on Netware server. You need to load the NIC-driver second time in your server. This time specifying Ethernet_II frame, like I do..

```
load SMCE32 port=6810 Name=Nv Frame=Ethernet_802.3    ; 'novell' frame
load SMCE32 port=6810 Name=Nl Frame=Ethernet_II       ; 'normal' frame
bind ipx to Nv Net=E1
bind ipx to Nl Net=E2
```

Both nets E1 and E2 are really the same net. If I use original PDIPX I connect to E1 with PDETHER I connect to E2.

Some people might want to use VLM drivers, because in DOS environment they are much faster. Don't bother, for reasons unknown, in DOSEMU the VLM drivers are dogs.

With above mentioned setup it IS POSSIBLE to connect to Netware server and even do some usefull work, but slowly.

Here is some benchmarking I did using NETX and VLM shells, with and without packetburst. The test-program was TESTNET.EXE, available somewhere in NetWire. It tests the network transfer speed. I can saturate my ethernet with two stations running at full tilt. Maximum aggregate speed is appr. 900 kilobytes/sec. I'm using SMC Elite 32 EISA board in Server and SMC Elite Ultra in workstation.

	NETX	VLM(0)	VLM(3)
Dos6.2	620	560	760
DosEmu	107	111	60

The figures denote transferspeed in kilobytes/second. VLM(0) means packetburst disabled, VLM(3) packetburst enabled. You can see that the connection with dosemu is not very fast, barely usable.

Few months ago I had a NE2000 clone in my box, with DOS6.2/NETX it would run to appr. 460 kbs. I could live with that. There is still work to be done.

I am well aware that I'm missing a lot of things in here, like

- multiuser dos-session, I don't think it works yet, anyway the speed would be comparable to dead snail.

- tcp-connections from dosemu, I havn't the faintest idea, the only *nix machine in our net is my Linuxbox.

Also I may have totally mixed the working and not working things. As the Dosemu as well as the Kernel are evolving, living things it is sometimes difficult to keep up with the beasts. I do apologize for any mistakes and will gratefully accept and include any corrections and additions to this note.

We all know that the DOSEMU is still ALPHA but it is not really far from BETA. There is some interesting work going on by Vinod G Kulkarni and others, read the relevant pieces in dosemu release (READMEs and such).

Regards, Lauri Tischler ltischler@fipower.pp.fi

7 dosemu and X-windows

7.1 Can I run dosemu in console mode while running X?

Ronald Schalk (`R.Schalk@uci.kun.nl`) reported (1/17/94) that

Yes, no problem. Just remember to use ctrl-alt-<Fn> to go to a Virtual Console (VC), and you can run any Linux application (dosemu is a linux-application). I've got almost always WP5.1 in a dos session.

[Note: Use ctrl-alt-F7 to switch back to X from dosemu.]

[Note: Some people have reported problems when dosemu is started before X]

7.2 Is it possible to run dosemu in an xterm?

Evmorfopoulos Dimitris (`devmorfo@mtu.edu`) reported (12/10/93) that

It is possible to run dosemu under an xterm, but without any graphics, and with no more than 128 characters.

H. Peter Anvin (`hpa@hook.eecs.nwu.edu`) adds (2/6/94)

no more than 128 characters... unless you use a special font. Someone has an IBM PC (CP 437) X font for use with ANSI-graphics on BBS's, as well as a patch for Xterm that *might* include character translation (for letters like `\305`, `\304`, `\326` for example.

8 Video and sound

8.1 Exiting from dosemu gives me a screen full of garbage.

Keith A Grider (`kgrider@magnus.acs.ohio-state.edu`) reported (12/5/93) that

I have seen many postings concerning this with exit from X as well as exiting from a graphic dos screen. it seems to be prevalent among ATI graphic card users as well as a few others. The problem is that the font information for the vga text screen is not being saved. The only way I have been able to fix it is to download the `vgalib-090.tar.gz` file from sunsite.unc.edu. It is (I believe) in the `pub/Linux/GCC directory`. You get a lot of stuff that is not directly used to solve this problem, but in the fonts directory that is created when you untar the file, there are 2 files of interest, runx and restorefont. Read the README file in this

directory. Copy runx and restorefont to a directory in your path. when runx is used, for example, it saves the font information in tmp/fontdata. I use a file called fix which consists of the line:

```
restorefont -r /tmp/fontdata
```

so that it is easy to 'fix' a vt when I go there from X (i.e. `ctrl-alt-f2`). This should also work for dosemu. I think the XFree86 people know about the problem and are working on a solution as this is a bit of a kluge.

8.2 How do I get dosemu to work with my Trident/Actix/other video card?

[The screen flickers violently, displays the video BIOS startup message, and hangs.]

Andrew Tridgell (`tridge@nimbus.anu.edu.au`) reported (1/29/94) that

I found with early versions it would work if I used:

```
ports { 0x42 }
```

but that sometimes my machine would crash when it was cycling the video bios in dosemu. This is because you're allowing the VGA bios to re-program your clock, which severely stuffs with Linux.

This prompted me to write the readonly and masking patches for dosemu, which I believe are still in the latest version. I now use:

```
ports { readonly 0x42 }
```

and it boots dosemu more slowly, but more reliably.

Tim Shnaider (`tims@kcbbs.gen.nz`) also reported (1/18/94) that

One way of fixing this is to use the GETROM program to dump your video bios to a file and edit the config file in the `/etc/dosemu` directory There will be a few video lines. Here is my video line

```
video { vga console graphics chipset trident memsize 1024 vbios_file
/etc/dosemu/vbios }
```

where vbios is the file generated by typing

```
getrom > vbios
```

Douglas Gleichman (`p86884@tcville.edsg.hac.com`) reported (9/1/94) that (with the ATI Graphics Ultra)

For DOSEMU 0.52 you need to add this line to your dosemu.conf file:

```
ports  { 0x1ce 0x1cf 0x238 0x23b 0x23c 0x23f 0x9ae8 0x9ae9 0x9aee 0x9aef }
```

The board self test will list a failure but graphics programs will run fine.

8.3 Why doesn't my soundcard software work with dosemu?

Hannu Savolainen (hsavolai@cs.Helsinki.FI) reported (3/21/94) that

The DOSEMU and any DOS program with it run under control of a protected mode operating system. This means that the memory is not mapped as the program expects. If it somehow manages to start DMA based recording with SB, the recorded sound doesn't find it's way to the application. It just destroys some data in the memory.

James B. MacLean (jmaclean@fox.nstn.ns.ca) reported (6/19/94) that

Sorry to disappoint, but at this time DOSEMU does not support directly the necessary interception of interrupts or DMA generally required for sound card access via DOSEMU :-(.

It's bound to happen at some future date though :-),

9 Other Hardware

9.1 How do I get my xxxxx device working under dosemu?

Corey Sweeney (corey@bbs.xnet.com) reported (5/30/94) that

Here is a log of my adventures trying to get devices working under dosemu. So far I've gotten my voice mail system working and my scanner half working. Here's how:

1. Look in your manual and find if your card uses any ports. If your manual gives you some, put them in your config file at the "ports" line. Remember that sometimes you need to have several ports in a row, and the first one might be the only one documented.

2. Try it out. If it doesn't work, or you don't have a manual (or your manual is as crappy as my AT&T manual:) then run dosemu with "`dos -D+i 2> /tmp/io.debug`". Run your device software, then exit dosemu. Look through `/tmp/io.debug` and find any port numbers it might give you. Try adding those to the port lines and try running dosemu again.

3. If you still fail then you may need interrupts. Find out what interrupt the card uses and get the SIG.tgz (silly interrupt generator) from somewhere on tsx-11.mit.edu. Install it as specified in the instructions.

and that's about it...

Question: What if my card uses DMA? Answer: Your screwed.

10 Problems and fixes

10.1 Why does dosemu 0.52 fail under kernels newer than 1.1.30?

(8/5/94)

Dosemu 0.52 is not compatible with kernels newer than 1.1.30. This problem will be fixed in dosemu 0.53.

10.2 I've enabled EMS memory in dosemu.conf but it does not help.

Rob Janssen (rob@pe1chl.ampr.org) reported (7/11/94)

Don't forget to load the provided ems.sys from the config.sys file.

10.3 How do I get rid of all those annoying "disk change" messages?

(8/11/94)

Grab and install klogd. Try

```
sunsite.unc.edu:/pub/Linux/system/Daemons/sysklogd1.2.tgz
```

10.4 Why is the cursor position wrong?

(7/9/94)

This is a known bug in dosemu 0.52. It will be fixed in dosemu 0.53.

10.5 Why does my busmouse act funny under dosemu 0.52?

James B. MacLean (jmaclean@fox.nstn.ns.ca) reported (7/8/94) that

Busmouse support is quite ALPHA at this time (as is DOSEMU :-)), and will be continually refined for a while :-). Look for better support in the upcoming releases.

10.6 Why won't dosemu run a second time after exiting in console mode?

Aldy Hernandez (aldy@sauron.cc.andrews.edu) reported (7/8/94) that

You should disable your video and/or bios caching.

10.7 Some dos applications still do not detect DPMI under dosemu0.52.

James B. MacLean (jmaclean@fox.nstn.ns.ca) reported (6/19/94) that

At this time (as of 0.52 release) DOSEMU is still growing with respect to DPMI. It will run certain DPMI programs, but has a ways to go yet. As suggested there needs to be more of the calls implemented, etc. Please be patient :-), as it's bound to come in time.

10.8 Why does dosemu give "divide overflow" errors after running for more than 24-hours?

(1/17/94)

This is a known bug. It will (hopefully) be fixed in an upcoming release. For now, you can simply exit dosemu and start it again.

10.9 Why will dosemu run in a term but not in the console?

JyiJiin Luo (jjluo@casbah.acns.nwu.edu) reported (4/19/94) that

I experienced exactly the same problem before. I figured out all the video shadow in my AMI BIOS must be disabled. Now dosemu runs fine on my system.

10.10 How can I speed up dosemu?

Mark Rejhon (mdrejhon@undergrad.math.uwaterloo.ca) reported (4/7/94) that

TIP: Speed up your DOS "dir" listings by about 25%-50% or so by typing `break off` at the DOS prompt or including it in autoexec.bat.

TIP: Use the nnansi.com ANSI driver to speed up the "dir" output even more at roughly 50%-100% more. It works properly in non-graphics mode, unlike turbo.com.

Joel M. Hoffman (joel@rac1.wam.umd.edu) reported (4/23/94) that

Ironically, I've found that it's sometimes faster to run dosemu in an Emacs terminal emulator rather than directly to the console. Emacs's output optimization is what makes the difference here.

Put the following in your .emacs:

```
(defun do-dos ()
  (interactive)
  (terminal-emulator "dos" "/usr/local/bin/dos" ()))
```

and then "emacs -f do-dos" will run the dosemu inside the buffer. Make sure you emacs window is 25x80, of course.

Pete Heist (heistp@rpi.edu) reported (5/13/94) that

If you compile it with the "`-funroll-all-loops`" option you will get MUCH faster screen output. Some other parts of the emulator will run much faster as well. Realize that the consequence of this is a larger executable which eats a little more memory, even though it's demand loaded.

Georg Wiegand (gw@gwcomp.e.open.de) reported (5/16/94) that

You also can use the keyword `HogThreshold` in `/etc/dosemu.conf`. The greater the following number the more calculating-time dosemu gets. For example, I use "`HogThreshold 60000`" on my 386/87-20 laptop.

10.11 My CDROM drive has problems reading some files under dosemu.

Vinod G Kulkarni (vinod@cse.iitb.ernet.in) reported (4/7/94) that

When a CDROM is mounted from linux and used from within DOSEMU (mapped drive), there could be some problems. The cdrom driver (iso9660) in the kernel tries to find out the type of the file (i.e. binary or text). If it can't find, it tries to guess the type of the file using a heuristic. This heuristic fails under some circumstances when a (almost) text file is to be treated as binary. (I do not know if it is a bug or feature.)

The result of this is that if you copy such a file from cdrom (from linux itself, and not necessarily dosemu), the resulting file will be usually bigger than original file. (Blanks get added before ^J,^M.) So a program running in dosemu gives an error or hangs, which may be mistaken as problem of dosemu.

Rob Janssen (pe1chl@rabo.nl) reported (8/10/94) that

The way to solve this is to turn off conversion altogether. Pass the option "-o conv=binary" to the mount command mounting the CDROM, or use the following in /etc/fstab:

```
/dev/cdrom      /cdrom          iso9660 conv=binary,ro
```

No patches to the kernel are necessary.

10.12 Where did the debugging output go?

As of dosemu0.49pl4, stderr is automatically redirected to /dev/null. Try "dos -D+a 2>debug" to turn on debugging information and redirect it to the file "debug".

10.13 Why does dosemu lock up after one keystroke?

(12/17/93)

You need to turn on the keyboard interrupt in the dosemu config file. Add a line to the config file:

```
keybint on
```

Shouldn't be a problem in dosemu0.52.

10.14 Why are my keystrokes echoed ttwwiiccee??

Nick Holloway (alfie@dcs.warwick.ac.uk) reported (2/22/94) that

After running dos after playing with some stty settings, I was getting doubled key presses. I can now reveal what the reason is!

It only happens when dos is run on the console with 'istrip' set. This is (I think) because the raw scancodes are mutilated by the 'istrip', so that key release events look like key press events.

So, the input processing needs to be turned off when using the scan codes on a console (it wouldn't be a good idea to do it for tty lines).

10.15 Why are characters < 128 highlighted and blinking?

Chris Kuehnke (Christian.Kuehnke@Informatik.Uni-Oldenburg.DE) reported (3/21/94) that

I think I've found a bug in dosemu0.50pl1; with a MDA card displayed characters > 128 automagically appeared as highlighted and blinking.

This patch fixed the problem for me [but on the other hand, maybe I'm totally wrong ;-)]:

```
--- video.c~    Sat Mar 19 00:50:25 1994
+++ video.c     Sat Mar 19 20:36:10 1994
@@ -721,7 +721,7 @@
   int x, y, i, tmp;
   unsigned int s;
   static int gfx_flag = 0;
-  char c;
+  u_char c;
   us *sm;

   if (d.video >= 3)
```

11 Contributing to the dosemu project

11.1 Who is responsible for dosemu?

(3/18/94)

Dosemu is built upon the work of Matthias Lautner and Robert Sanders. James B. MacLean (jmaclean@fox.nstn.ns.ca) is responsible for organizing the latest releases of dosemu.

History of dosemu

Version	Date	Person
0.1	September 3, 1992	Matthias Lautner
0.2	September 13, 1992	Matthias Lautner
0.3	???	Matthias Lautner
0.4	November 26, 1992	Matthias Lautner
0.47	January 27, 1993	Robert Sanders
0.47.7	February 5, 1993	Robert Sanders
0.48	February 16, 1993	Robert Sanders
0.48pl1	February 18, 1993	Robert Sanders
0.49	May 20, 1993	Robert Sanders
0.49pl2	November 18, 1993	James MacLean
0.49pl3	November 30, 1993	James MacLean

```
0.49pl3.3  December 3, 1993    James MacLean
0.50       March 4, 1994       James MacLean
0.50pl1    March 18, 1994      James MacLean
0.52       June 16, 1994       James MacLean
```

11.2 I want to help. Who should I contact?

The dosemu project is a team effort. If you wish to contribute, see the DPR (DOSEMU Project Registry). A current copy may be found in `dspsun.eas.asu.edu:/pub/dosemu`.