

107 – DOS and Fedora 9 Dual Boot

DOS and Fedora 9 are installed on the same VM.

Requirements:

- DOS 6.21 image file
<http://www.allbootdisks.com/download/dos.html>
- Fedora 9 CD ISO files
<http://iso.linuxquestions.org/>
- VMWare Server 1.05
<http://www.vmware.com/products/server/>

Desired Installation:

Location	Type	Boot Code	Usage	Size
MBR		Microsoft		
/dev/sda1	Primary		DOS	20 MB
/dev/sda2	Primary	GRUB	/boot	100 MB
/dev/sda3	Primary		swap	512 MB
/dev/sda4	Extended			
/dev/sda5	Logical		/	4000 MB

Create VM:

- Custom
- OS: Other, Version: Other
- Access rights: Not private (uncheck)
- VM Account: User that powers on the VM
- # processors: One
- 512K memory
- Bridged networking
- SCSI Adapter: BusLogic
- Create a new virtual disk
- SCSI
- 5 GB drive, do not allocate space now (uncheck)
- Add a floppy drive if one was not already added

Edit virtual machine settings

- Set floppy to use DOS 6.21 floppy image file.

Boot virtual machine

- Run fdisk at DOS prompt
- Create Primary DOS partition, 20 MB
- Make partition active
- Display partition information to check you have one small and active primary partition.
- Exit fdisk (which will do a reboot)

Format new partition, copy floppy files to it, verify.

- format c: /s /v:dos
- copy *.* c:

- c:
- dir | more

Power off VM

“Remove” floppy and insert Linux CD

- Edit VM settings
- Disconnect floppy (Remove check: Connect at power on, Use physical drive)
- Insert Linux Installation CD (Check: Connect at power on, Use ISO image: browse to Fedora ISO file)

Power on VM

- At this point you should boot into DOS and get a C: prompt
- This is because the default BIOS boot order is floppy, then hard drive, then CD. The floppy is not connected so the system is booted from the hard drive.
- Power off VM

Change BIOS boot order

- Start up VM
- Immediately after BIOS screen, click inside console and press F2 to enter SETUP. If you weren't fast enough and end up in DOS again, power off the VM and try again!
- Right arrow over to Boot tab, Enter to open
- Move CD-ROM drive above Hard Drive
- New boot order should be Floppy, then CD, then hard drive
- Exit BIOS saving changes.
- The Fedora CD should now boot up.

Fedora 9 Install - Network

- Use DHCP for network settings.
- Manually set hostname to name of your vm + .localdomain

Fedora 9 Install – Custom Partitions

- For disk partitioning choose Create custom layout.
- Add a 100 MB boot partition (primary)
- Add a 512 MB swap partition (primary)
- Add a 4000 MB / partition in the extended partition.

Fedora 9 Install – Boot Loader

- Install boot loader on /boot partition (not MBR)
- Under Boot loader operating system list add DOS for /dev/sda1.
- Default boot should be Linux (not DOS)

Fedora 9 – The rest of it

- For software check just Software Development and click the radio button for Customize Later

Test the system

- If the 2nd partition is active, the system will show the GRUB screen and pressing any key will show both OS to boot from
- If the first partition is active, only DOS will boot.

Here is the resulting system:

Partition Table

```
[root@spare01 ~]# fdisk -l
```

```
Disk /dev/sda: 5368 MB, 5368709120 bytes
255 heads, 63 sectors/track, 652 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x000a8420
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1		1	3	24066	4	FAT16 <32M
/dev/sda2	*	4	16	104422+	83	Linux
/dev/sda3		17	81	522112+	82	Linux swap / Solaris
/dev/sda4		82	652	4586557+	5	Extended
/dev/sda5		82	591	4096543+	83	Linux

Mounts

```
[root@spare01 ~]# mount
/dev/sda5 on / type ext3 (rw)
proc on /proc type proc (rw)
sysfs on /sys type sysfs (rw)
devpts on /dev/pts type devpts (rw,gid=5,mode=620)
/dev/sda2 on /boot type ext3 (rw)
tmpfs on /dev/shm type tmpfs (rw)
none on /proc/sys/fs/binfmt_misc type binfmt_misc (rw)
sunrpc on /var/lib/nfs/rpc_pipefs type rpc_pipefs (rw)
fusectl on /sys/fs/fuse/connections type fusectl (rw)
gvfs-fuse-daemon on /home/rsimms/.gvfs type fuse.gvfs-fuse-daemon
(rw,nosuid,nodev,user=rsimms)
```

/boot

```
[root@spare01 ~]# ls /boot
config-2.6.25-14.fc9.i686      lost+found
efi                            System.map-2.6.25-14.fc9.i686
grub                          vmlinuz-2.6.25-14.fc9.i686
initrd-2.6.25-14.fc9.i686.img
```

/boot /grub

```
[root@spare01 ~]# ls /boot/grub/
device.map      grub.conf      minix_stagel_5    stage2
e2fs_stagel_5  iso9660_stagel_5  reiserfs_stagel_5  ufs2_stagel_5
fat_stagel_5   jfs_stagel_5     splash.xpm.gz      vstafs_stagel_5
ffs_stagel_5   menu.lst        stagel            xfs_stagel_5
```

grub.conf

```
[root@spare01 ~]# cat /boot/grub/grub.conf
# grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE:  You have a /boot partition.  This means that
#           all kernel and initrd paths are relative to /boot/, eg.
#           root (hd0,1)
#           kernel /vmlinuz-version ro root=/dev/sda5
#           initrd /initrd-version.img
```

```

#boot=/dev/sda2
default=0
timeout=5
splashimage=(hd0,1)/grub/splash.xpm.gz
hiddenmenu
title Fedora (2.6.25-14.fc9.i686)
    root (hd0,1)
    kernel /vmlinuz-2.6.25-14.fc9.i686 ro root=UUID=273c505c-1fe5-4d67-
8772-e734b4206032 rhgb quiet
    initrd /initrd-2.6.25-14.fc9.i686.img
title DOS
    rootnoverify (hd0,0)
    chainloader +1

```

UUID of /dev/sda5

```

[root@spare01 ~]# dumpe2fs /dev/sda5 | grep UUID
dumpe2fs 1.40.8 (13-Mar-2008)
Filesystem UUID:          273c505c-1fe5-4d67-8772-e734b4206032
[root@spare01 ~]#

```

MBR boot code (conventional)

```

[root@spare01 ~]# xxd /dev/sda | more
0000000: fa33 c08e d0bc 007c 8bf4 5007 501f fbfc  .3.....|..P.P...
0000010: bf00 06b9 0001 f2a5 ea1d 0600 00be be07  .....
0000020: b304 803c 8074 0e80 3c00 751c 83c6 10fe  ...<.t.<.u.....
0000030: cb75 efcf 188b 148b 4c02 8bee 83c6 10fe  .u.....L.....
0000040: cb74 1a80 3c00 74f4 be8b 06ac 3c00 740b  .t.<.t.....<.t.
0000050: 56bb 0700 b40e cd10 5eeb f0eb febf 0500  V.....^.....
0000060: bb00 7cb8 0102 57cd 135f 730c 33c0 cd13  ..|...W...s.3...
0000070: 4f75 edbe a306 ebd3 bec2 06bf fe7d 813d  Ou.....}.=
0000080: 55aa 75c7 8bf5 ea00 7c00 0049 6e76 616c  U.u.....|..Inval
0000090: 6964 2070 6172 7469 7469 6f6e 2074 6162  id partition tab
00000a0: 6c65 0045 7272 6f72 206c 6f61 6469 6e67  le.Error loading
00000b0: 206f 7065 7261 7469 6e67 2073 7973 7465  operating syste
00000c0: 6d00 4d69 7373 696e 6720 6f70 6572 6174  m.Missing operat
00000d0: 696e 6720 7379 7374 656d 0000 0000 0000  ing system.....
00000e0: 0000 0000 0000 0000 0000 0000 0000 0000  .....
00000f0: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000100: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000110: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000120: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000130: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000140: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000150: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000160: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000170: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000180: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000190: 0000 0000 0000 0000 0000 0000 0000 0000  .....
00001a0: 0000 0000 0000 0000 0000 0000 0000 0000  .....
00001b0: 0000 0000 0000 0000 2084 0a00 0000 0001  .....
00001c0: 0100 04fe 3f02 3f00 0000 04bc 0000 8000  ....??.?.....
00001d0: 0103 83fe 3f0f 43bc 0000 cd2f 0300 0000  ....?.C..../....
00001e0: 0110 82fe 3f50 10ec 0300 01ef 0f00 0000  ....?P.....
00001f0: 0151 05fe bf8b 11db 1300 7bf8 8b00 55aa  .Q.....{...U.

```

Boot code in /dev/sda2 partition (GRUB)

```
[root@spare01 ~]# xxd /dev/sda2 | more
0000000: eb48 9000 0000 0000 0000 0000 0000 0000  .H.....
0000010: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000020: 0000 0000 0000 0000 0000 0000 0000 0000  .....
0000030: 0000 0000 0000 0000 0000 0000 0000 0302  .....
0000040: 8000 0080 4524 0100 0008 fa90 90f6 c280  ....E$.
0000050: 7502 b280 ea59 7c00 0031 c08e d88e d0bc  u....Y|.l.....
0000060: 0020 fba0 407c 3cff 7402 88c2 52be 7f7d  . ..@|<.t...R..}
0000070: e834 01f6 c280 7454 b441 bbaa 55cd 135a  .4....tT.A..U..Z
0000080: 5272 4981 fb55 aa75 43a0 417c 84c0 7505  RrI..U.uC.A|.u.
0000090: 83e1 0174 3766 8b4c 10be 057c c644 ff01  ...t7f.L...|.D..
00000a0: 668b 1e44 7cc7 0410 00c7 4402 0100 6689  f..D|.....D...f.
00000b0: 5c08 c744 0600 7066 31c0 8944 0466 8944  \..D..pf1..D.f.D
00000c0: 0cb4 42cd 1372 05bb 0070 eb7d b408 cd13  ..B..r...p..}....
00000d0: 730a f6c2 800f 84ea 00e9 8d00 be05 7cc6  s.....|..
00000e0: 44ff 0066 31c0 88f0 4066 8944 0431 d288  D..f1...@f.D.1..
00000f0: cac1 e202 88e8 88f4 4089 4408 31c0 88d0  .....@.D.1....
0000100: c0e8 0266 8904 66a1 447c 6631 d266 f734  ...f..f.D|f1.f.4
0000110: 8854 0a66 31d2 66f7 7404 8854 0b89 440c  .T.f1.f.t..T..D.
0000120: 3b44 087d 3c8a 540d c0e2 068a 4c0a fec1  ;D.}<.T.....L...
0000130: 08d1 8a6c 0c5a 8a74 0bbb 0070 8ec3 31db  ...l.Z.t...p..1.
0000140: b801 02cd 1372 2a8c c38e 0648 7c60 1eb9  .....r*....H|`..
0000150: 0001 8edb 31f6 31ff fcf3 a51f 61ff 2642  ....l.l.....a.&B
0000160: 7cbe 857d e840 00eb 0ebe 8a7d e838 00eb  |..}.@.....}.8..
0000170: 06be 947d e830 00be 997d e82a 00eb fe47  ...}.0....}.*...G
0000180: 5255 4220 0047 656f 6d00 4861 7264 2044  RUB .Geom.Hard D
0000190: 6973 6b00 5265 6164 0020 4572 726f 7200  isk.Read. Error.
00001a0: bb01 00b4 0ecd 10ac 3c00 75f4 c300 0000  .....<.u.....
00001b0: 0000 0000 0000 0000 0000 0000 0000 0000  .....
00001c0: 0000 0000 0000 0000 0000 0000 0000 0000  .....
00001d0: 0000 0000 0000 0000 0000 0000 0000 0000  .....
00001e0: 0000 0000 0000 0000 0000 0000 0000 0000  .....
00001f0: 0000 0000 0000 0000 0000 0000 0000 55aa  .....U.
```