NT OS Loader + Linux mini−HOWTO

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Bernd Reichert, <reichert@dial.eunet.ch>

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1.Abstract

This document describes the use of the Windows NT boot loader to start Linux. This procedures have been tested with Windows NT 4.0 WS and Linux 2.0.

2.How does the NT OS Loader work

The NT OS loader likes to have the boot sector from the other operating systems available as a file. It reads this file and starts the operating system selected, i.e. either Windows NT in different Modes or any other OS.

3.Tips on how to install Windows NT and Linux on the same System

3.1 Windows NT installation

Try to install Windows NT first. If you want to use NTFS for your Windows NT−partition, keep in mind, that the todays production version of Linux cannot access NTFS partitions. An alpha driver that can read NTFS−Partitions is available at `http://www.informatik.hu-berlin.de/~loewis/ntfs`. You may create a separate FAT−Partition for data exchange or you have to use DOS−formatted floppies.

3.2 Partitioning

Another Mini−howto recommends not to use NTs "Disk Administartor" to create the Linux swap− and root−partitions. It is sufficient to see the free space there. I also recommend to use linux's fdisk later.

3.3 Linux installation

Now boot linux from diskettes, create the swap and root−partition. Fdisk assumes the ntfs−partition to be a HPFS−partition. This is normal. Boot again from diskettes and install Linux as you like.

Just in case the installation procedure suggests that you could mount the HPFS partition which it has found: Ignore it.

3.4 Lilo

When you come to the Lilo−Section, specify your Linux−root−partition as your boot device because the Master Boot Record (MBR) of your harddisk is owned by Windows NT. This means that the root−entry and the boot−entry in your `/etc/lilo.conf` have the same value. If you have a IDE−harddisk and your Linux−partition is is the second partition, your boot−entry in `/etc/lilo.conf` looks like:

```
boot=/dev/hda2
```

If you have two disks and your Linux resides on the first partition of your second disk, your boot−entry in `/etc/lilo.conf` looks like:

```
boot=/dev/hdb1
```

Run lilo with a kernel that matches your system. Check the kernel by booting from diskette first if you are not sure.

If you cannot boot Windows NT now, you have a problem. I hope you have created a repair−disk recently.

4.Bootpart

There is a NT−programm called bootpart written by G. Vollant that can do the jobs from the next two points for you. Bootpart is available at `http://ourworld.compuserve.com/homepages/gvollant/bootpart.htm`.

If you want to know how things are working together, use the procedures described in point 5 and 6.

5.The Linux part of the work

You have to boot from diskettes until the NT−part is fixed.

Now you have to peel the bootsector from your Linux−root−Partition. With /dev/hda2 as your linux−partition, the dd−command is:

```
# dd if=/dev/hda2 of=/bootsect.lnx bs=512 count=1
```

There is something wrong if your bootsect.lnx has more than 512 bytes.

Now copy the file bootsect.lnx to a DOS−formated floppy if this is your way to transfer files to the NTFS−Windows−partition.

You can copy it with

```
# mcopy /bootsect.lnx a:
```

or with

```
# mount −t msdos /dev/fd0 /mnt
# copy /bootsect.lnx /mnt
# umount /mnt
```

6.The Windows NT part of the work

Copy the file from the diskette to `C:\\bootsect.lnx`. I don't tell you how to do that.

What lilo.conf is for linux is `c:\\boot.ini` for Windows NT. Remove the, system− and the read−only−attribute before you can modify it with:

```
C:\attrib -s -r c:\boot.ini
```

Now change the file boot.ini with an editor, notepad for example, as follows:

```
[boot loader]
timeout=30
default=multi(0)disk(0)rdisk(0)partition(1)\WINNT
[operating systems]
multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows NT Workstation ...
multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows NT Workstation ...
C:\BOOTSECT.LNX="Linux"
```

Only the last line has been added in this example. Restore the attributes after you have saved `boot.ini` with:

```
C:\attrib +s +r c:\boot.ini
```

After a shutdown of your Windows NT and a restart your should see the following:

```
  OS Loader V4.00

  Please select the operating system to start:

  Windows NT Workstation Version 4.0
  Windows NT Workstation Version 4.0 [VGA mode]
  Linux

Select Linux and see

  LILO loading zImage ....
```

7.Play it again Sam

A new copy of bootsect.lnx must be transfererd to `C:\BOOTSECT.LNX` evry time the bootsector of your linux−partition has been modified. This happens for example when you install a new kernel with lilo. As you can see such a system in not ideal for testing experimental kernels.

8.Troubleshooting

If things do not work as expected, check bootability with a floppy disk. With `/dev/hdb1` as your Linux−partition, your `/etc/lilo.conf` has the following entries:

```
root=/dev/hdb1
boot=/dev/fd0
```

Run lilo with a diskette inserted. Now try to boot from the diskette. If your Linux on `/dev/hdb1` can't be started, the NT OS loader will also fail to start it. If you see a lot of `01 01 01 01`, your root−disk is not accessible. Check whether all your disks are known by the bios.

If the floppy boots your Linux partition, you can peel of your boot−sector for the NT OS loader with:

```
# dd if=/dev/fd0 of=/bootsect.lnx bs=512 count=1
```

You can keep this diskette as your rescue−diskette just in case your Windows NT installation breaks.

9.References

- The Linux+WindowsNT mini−HOWTO
- The FAQ for FreeBSD 2.X

10.Acknowledgements

- Thanks to Xiaoming Yi <z3c20@ttacs.ttu.edu> for the tip that the procedures work also with other disks than the first one.
- Thanks to Frank Dennler <Frank.Dennler@zkb.ch> for the diskette−trick.

11.Feedback

Any comments are welcome.
