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Network boot with PXE

REMOTE BOOT

PXE lets you start your computer by downloading a boot image from the network. We'll show you how to use PXE to install Linux.

BY KRISTIAN KISSLING

Some people call it “Pixie,” but PXE is actually an acronym for “Preboot Execution Environment.” This Intel [1] specification dates back to the 1990s.

PXE lets a client computer connect to a server and download a boot image over the network. This technology was designed for terminal-based computing environments, where a thin client device without on-board storage must find and download a boot image. Since then, admins have found other uses for PXE – for instance, as a tool for network installation of normal PCs.

A PXE server can save an admin mileage when installing a large number of computers – connect to the network, boot, and install. The best thing is that setting up this whole constellation just involves a couple of simple steps.

Santa's Little Helper

Consider two computers: Santa (a client) and LittleHelper (a server). Santa will retrieve data from LittleHelper via the network. Santa doesn't need you to do much; just change the boot sequence in the BIOS and move PXE boot up to the top. The BIOS on Santa's NIC will look

for a DHCP server (LittleHelper, in this case), and Santa will then obtain a boot image. LittleHelper assumes the role of a proxy DHCP server and tells Santa where to find the boot image.

The boot image doesn't need to be on LittleHelper's own hard disk – LittleHelper can simply supply a path to the boot image on another computer. Santa picks up the boot image from the specified location and uses **TFTP** to down-

GLOSSARY

TFTP: Trivial File Transport Protocol (RFC 1350). A simple file transfer protocol that only supports reading or writing of files. TFTP does not support features like privilege management or user authentication. In contrast to FTP, TFTP will run on a connectionless protocol such as UDP.

tion file called *default*; press *I* to insert text, and enter the following lines:

```
default linux
prompt 1
timeout 30
label linux
kernel linux
append initrd=
initrd splash=silent
showopts
```

Press Esc and then `:wq` to store these settings – you need to be root for all of this. Then go to the `/tftpboot` directory and download the two files you need off the network (this is for the openSUSE 10.3 installation):

```
# wget
http://download.opensuse.
org/distribution/
SL-OSS-factory/
inst-source/boot/i386/
loader/initrd

# wget
```

```
http://download.opensuse.
org/distribution/
SL-OSS-factory/
inst-source/boot/i386/
loader/linux
```

You can replace these files with versions for openSUSE 10.2 or SUSE Linux 10.1 as required.

New Day - New System

To start with the installation, change the boot sequence on the Santa client, and power the client on. A line will show you that the client is looking for the PXE server (Figure 2). If it quits, you can assume that something is awry with your *dhcpd.conf*.

If everything works out fine, you should see the boot menu. At the prompt, press Enter to boot openSUSE, or select the matching installation from the start menu for Ubuntu. The client will then load the kernel and the root filesystem.

If you want to rely on Internet repositories to complete the installation, you

will need Internet access, which means connecting to a router.

In some cases, you might need to add the http or ftp source for the installation repository manually.

Alternatively, you can use a local Ubuntu or openSUSE repository on LittleHelper for the install instead of retrieving the files from the Internet. ■

INFO

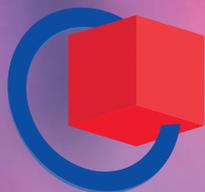
- [1] Intel PXE specification:
<http://www.pix.net/software/pxeboot/archive/pxespec.pdf>
- [2] Linux Terminal Server Project:
<http://www.ltsp.org>

THE AUTHOR

Kristian officially studied German philology, history and social science in Berlin but wasted a lot of his time with computers. He got hooked on Linux in the 90s and now works as an editor for LinuxUser.



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