

Using PNP devices with LTSP

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Relevant links:

- <http://www.ltsp.org/> - The homepage of the Linux Terminal Server Project

NOTE: This document only applies to Linux Kernel 2.2.x (probably also with older kernels). The `isapnp` and `pnpdump` programs are not needed anymore with the 2.4.x kernels since they have PNP support built-in.

1 When do you need this document?

This document is intended for people who are using the LTSP and who have a client machine with PNP devices (a PNP sound card, for example). If your client works fine or if you don't have any PNP devices, you don't need this document.

2 Disabling PNP on the card

Some PNP cards have the possibility to turn off PNP by using jumpers. If this is possible you should try to disable PNP and set the IRQ, DMA and IO range manually. However, you should first try to find out which IRQ's, DMA's and IO ranges are already used.

If you have a Windows installation on your client machine currently, you will either have to change the settings of the card in Windows manually, or just rerun *Check for new hardware*, in order for Windows to use the new settings too.

3 Letting your BIOS configure the PNP devices

Some BIOSes support PNP and have an option *Non-PNP OS* (Award) or something similar. By turning on this option, the BIOS will configure the PNP devices.

If you have a Windows installation on your client machine currently, you will either have to change the settings of the card in Windows manually, or just rerun *Check for new hardware*, in order for Windows to use the new settings too.

4 The last option: ISAPNP

4.1 Step 1: Modifying the server side configuration

4.1.1 isapnp

To use and activate PNP under Linux, you should use the isapnp utilities. Copy the files *isapnp* and *pnpdump* to the bin directory of the NFS root directory of LTSP (usually */tftpboot/lts/ltsroot/bin*).

If these files are not on your system, you should install the isapnp-*.rpm files from your RedHat distribution.

4.1.2 The LTSP initialization files

Next, you need to add the following lines to your */tftpboot/lts/ltsroot/etc/rc.local*, just before the kernel modules are loaded:

```
#####  
# Load ISAPNP configuration  
#  
  
ISAPNP='get_cfg ISAPNP'  
if [ "${ISAPNP}" ]; then  
    /bin/isapnp ${ISAPNP}  
fi
```

This step only has to be done once on each server. The next two steps have to be repeated for each client.

4.2 Step 2: Creating a PNP data file with PNP dump on the client machine

Change the *UI_MODE* of the client machine in */tftpboot/lts/ltsroot/etc/lts.conf* to *SHELL*.

Now, boot the client machine. You will be put into a bash shell. Type the following commands:

```
bash# pnpdump > /tmp/pnp.out
```

Now, copy the file */tmp/pnp.out* on the client machine to the server. (for example by using a floppy).

4.3 Step 3: Installing the ISAPNP file

Now, move the *pnp.out* file to the directory */tftpboot/lts/ltsroot/etc/isapnp.clientname*.

In *lts.conf*, add the following line to the just configured client:

```
ISAPNP = /etc/isapnp.clientname
```

Read the *isapnp.conf* man file for more information about modifying this file.