Research and Development

How to Boot LTSP Clients From Local Harddrive Using Grub

Jan 31st, 2014 12:00 am

Sometimes PXE booting LTSP clients is not possible - e.g. if the device doesn't have PXE enabled NIC. If the client device has a local harddrive, it's possible to install the image locally and use Grub to boot it. Everything else works still the same, just kernel loading and NBD mount are replaced by using the local harddrive. The image is placed on the harddrive as a single file and it is not uncompressed.

This does not make the LTSP client mobile and it still requires wired network connection to work. Changing the image not to require a wired connection is possible, though.

Grub and image can be installed e.g. with a live CD or a live USB stick or even by first PXE booting the device and then using the LTSP client itself to do the installation.

The testing here was done with Ubuntu 13.10 live CD and the internal harddrive was completely formatted using traditional DOS partition table. If you are using Ubuntu to do this, Ubuntu 12.10 or newer is required as Grub version in Ubuntu 12.04 is too old for loading kernel and initramfs image from loopback mounts.

Partitioning

First we need to create a partition that holds the image. The partition can be either normal partition or LVM partition. You can use e.g. fdisk or cfdisk to create the partitions.

A single partition is enough, but if you want to also enable local swap, it might be a good idea to create a second swap partition.

```
1 # fdisk /dev/sda
2
3 Command (m for help): p
4
5 Disk /dev/sda: 128.0 GB, 128035676160 bytes
6 97 heads, 20 sectors/track, 128901 cylinders, total 250069680 sectors
```

```
7  Units = sectors of 1 * 512 = 512 bytes
8  Sector size (logical/physical): 512 bytes / 512 bytes
9  I/O size (minimum/optimal): 512 bytes / 512 bytes
10 Disk identifier: 0xd16eac62
11
12    Device Boot      Start         End      Blocks   Id  System
13 /dev/sda1   *        2048    62916607    31457280   83  Linux
```

After creating the partition you need to format it and mount it somewhere (here /mnt/disk):

```
1 mkfs.ext4 /dev/sda1
2
3 mkdir -p /mnt/disk
4 mount /dev/sda1 /mnt/disk
```

To get Grub installed on the disk, we need call grub-install command, that creates boot directory under the specified root directory path:

```
1 grub-install --root-directory=/mnt/disk/ /dev/sda
```

There should be now files under /mnt/disk/boot/.

Now you need to somehow copy the i386.img file from the LTSP server to /mnt/disk/.

Next we need a custom grub.cfg file that tells Grub how to load the kernel and initrd.img from inside the LTSP image. Below is a basic example that does that. Replace (hd0,1) with the partition you are using. The syntax is specified here: http://www.gnu.org/software/grub/manual/grub.html#Device-syntax

/mnt/disk/boot/grub/grub.cfg

```
1  set default="0"
2
3  function load_video {
4    if [ x$feature_all_video_module = xy ]; then
5      insmod all_video
6    else
7      insmod efi_gop
8      insmod efi_uga
9      insmod ieee1275_fb
10     insmod vbe
11     insmod vga
12     insmod video_bochs
13     insmod video_cirrus
14   fi
15 }
16
17 if loadfont unicode ; then
18   set gfxmode=auto
19   load_video
20   insmod gfxterm
21   set locale_dir=$prefix/locale
22   set lang=fi_FI
23   insmod gettext
24 fi
25 terminal_output gfxterm
26
27 insmod gzio
28 insmod part_msdos
29 insmod ext2
30 insmod squash4
31 insmod biosdisk
32 insmod regexp
```

```
insmod loopback
insmod usb_keyboard
insmod lvm

menuentry "LTSP local image" {
    loopback loop "(hd0,1)/i386.img"
    set root='(loop)'

    linux   /boot/vmlinuz ro quiet splash init=/sbin/init-ltsp root=/dev/sda1 loop="i386.img"
    initrd  /boot/initrd.img

    loopback -d loop
}
```

That’s it. Unmount /mnt/disk and reboot from the local harddrive. If you want to update the image, you can copy new i386.img to the harddrive. No other changes are needed.

```
umount /mnt/disk
```

Posted by vmlintu

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Jan 31st, 2014 12:00 am grub, localboot, ltsp

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Comments

Computerhirn • 2 years ago • edited

Hi,

you wrote:

"Changing the image not to require a wired connection is possible, though."

Would you please be so kind and describe how.

Thanks in advance.

Bye,

Reply • Share ›

Franz Beslmeisl • 4 years ago

You say "Changing the image not to require a wired connection is possible, though."

But how? This would interest me very much because I would like to make fat client laptops that start the ltsp-image locally in class where there is neither network nor wlan but can acquire all needed images by getting connected once in a while by cable.

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anbi • 5 years ago

is it possible to copy the ltsp client chroot from ltsp server to local partition? How to boot it? This may be useful for laptop client! Thanks

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mabosk • 5 years ago

Hi, how do you create the i386.img?

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anbi ➚ mabosk • 5 years ago

ltsp-update-image (debian doesn't use NBD image as Ubuntu does)

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