CDServer−HOWTO

Randolph Tata

randy@talcon.com

v1.00, 23 September 2000

Revision History

Revision v1.00	23 September 2000	Revised by: rjt
Conversion from linuxdoc sgml to DocBook v3.1		
Revision v0.10	1 September 2000	Revised by: rjt
Conversion to linuxdoc sgml from text/html		
Revision v0.01	18 August 2000	Revised by: rjt
First version released in text and html. Still need to add section on kernel modifications and creating more loop devices.		

The CD Server HOWTO describes the steps and commands you can use to setup your own CD Server using Linux and some built−in Unix commands along with other freely available software packages. The CD Server can then share the CD's via the network to Windows and/or other client machines.

Table of Contents

1. Introduction

With disk space becoming less expensive (30GB IBM 7200rpm for $160 in 08/2000), it is now viable to use an Open Source software−based CD Server solution, instead of paying $800−$4,000 for a software, thin−server, or CD Jukebox solution.

I've setup my CD Server on a P120 with 64MB RAM, using one of these large drives.

1.1. Intended Audience

This HOWTO is specifically directed toward System Administrators and uses Linux for the examples. It should work with other flavors of Unix provided that they have a loop device or a method of mounting a CD image file within the directory tree as a block device using the iso9660 file system.

1.2. Things You'll Need

The commands and utilities needed to setup your own CD Server are already included in most (if not all) Linux distributions.

- Linux Distribution (This HOWTO uses Linux−Mandrake for the examples)
- dd − Converts and copies a file (a standard Unix command)
- mount − Mounts and Unmounts filesystems (a standard Unix command)
- Samba − A Windows SMB/CIFS fileserver for Unix
- NFS (optional) − Network File System (usually included in Linux distributions)

Caveats

> The Linux−Mandrake distribution I'm using (7.0), only has support for 8 loop devices compiled into the kernel (see Section 3 to increase this number). In short, you'll only be able to share 8 CD's on a network at most with this default value, to share more than 8, you'll need to do a little more work.

1.3. Suggested Reading

Using Samba by: Robert Eckstein, David Collier−Brown, Peter Kelly 1st Edition November 1999, O'Reilly and Associates, Inc. ISBN 1−56592−449−5,

---

1.4. Copyright

1.5. Disclaimer

Use the information in this document at your own risk. I disavow any potential liability for the contents of this document. Use of the concepts, examples, and/or other content of this document is entirely at your own risk.

All copyrights are owned by their owners, unless specifically noted otherwise. Use of a term in this document should not be regarded as affecting the validity of any trademark or service mark.

Naming of particular products or brands should not be seen as endorsements.

You are strongly recommended to make a backup of your system before major installation and should make backups at regular intervals.

1.6. News

This is the first sgml release (version 1.00). SGML source for this document is available. Any additions/changes should be made to the sgml source, not derivative formats.

This documents home page is at the Open CD Server Project site page in case you need the latest version, or there is a problem with the page format you are viewing.

If you have the capacity it would be nice to make the CDServer−HOWTO available in a number of formats and languages.

1.7. Credits

In this version I have the pleasure of acknowledging

```
Mark F. Komarinski    markk (at) linuxdoc.org         LDP Author Guide
Jorge Godoy           godoy (at) metalab.unc.edu      LDP Author Guide
David C. Merrill      dcmerrill (at) mindspring.com   LDP Author Guide
Stein Gjoen           sgjoen (at) nyx.net             HOWTO−Template
Gregory Leblanc       gleblanc (at) cu−portland.edu   HOWTO−Template
Greg Ferguson         gferg (at) sgi.com              HOWTO−Template
```

1.8. Translations

No Translations yet.

Any comments or suggestions can be mailed to my email address at Talcon Information Systems: <randy@talcon.com>.

2. Procedure

Summary of Steps

- Create a large partition to hold the CD Image Files.
- Copy the CD to an image file using the "dd" command.
- Mount the CD image file within the directory tree.
- Share the directory on the network using Samba, NFS, etc.

2.1. Creating the ISO Images

Choose (or create) a file system with the largest available disk space on it. Keep in mind that CD−ROM's can hold around 640MB of data, so if you want to share 8 full CD's on your network, you'll need 5.1GB of space available.

```
Login as root or "su" to root.

bash# df -h

Filesystem            Size  Used Avail Use% Mounted on
/dev/hda5             1.4G   82M  1.3G   6% /
/dev/hda1              15M  827k   14M   6% /boot
/dev/hda7             2.4G 1008M  1.3G  43% /usr
/dev/hda8            23.6G 11.7G 11.7G  50% /home
```

Here the /home filesystem has the most available space, so it is the most suitable filesystem to use for dumping the CD images to.

```
bash# cd /home
bash# mkdir image
bash# cd image
```

Now, copy the CD to an iso image. You must know the device name of your CD−ROM drive (usually /dev/cdrom, it could be /dev/scd0 for SCSI CD−ROM's) I'll use the Mandrake distribution CD−ROM as an Example:

```
bash# dd if=/dev/cdrom of=mndrk71.iso
```

The "if=" is the input file, the "of=" is the output file. You should see a message stating the number of records in and number of records out (hopefully with no i/o errors).

2.2. Mounting the ISO Images

The next step is to mount the iso image file. Let's create a directory under /mnt to place the mounted file.

```
bash# cd /mnt
bash# mkdir iso
bash# cd iso
bash# mkdir mndrk71
```

Now mount the ISO image file to this newly created directory

```
bash# mount −o loop −t iso9660 −r /home/image/mndrk71.iso /mnt/iso/mndrk71
```

The "−o loop" means use the option that mounts a file as a block device. The "−t iso9660" means that the file is in the iso9660 CD−ROM format. The "−r" means to mount read−only.

Now you can:

```
bash# cd mndrk71
bash# ls −al
```

You should see a listing (ls) of the files and directories that are on the actual CD (only now they're inside the iso image file, and that's what you're currently looking at!)

2.3. Mounting the Image upon System Restart

Now that we've manually mounted the image, and made sure it works, an entry needs to made in the /etc/fstab file so that the image is remounted on the next system startup. It's important to make the entry AFTER the entry for the parent filesystem, e.g. /home (I use vim, but Emacs, Joe, Pico or Jed will work just as well):

```
bash# vim /etc/fstab
```

After the line that looks like the following (or whichever filesystem you've placed your images):

```
/dev/hda8 /home ext2 defaults 1 2
```

Insert the following line with your text editor:

```
/home/image/mndrk71.iso /mnt/iso/mndrk71 iso9660 ro,loop,auto 0 0
```

2.4. Sharing it on a Windows Network using Samba

You'll need to have Samba installed and working to perform the next steps (that's outside the scope of this instruction). If it's not yet installed, consult your Linux distribution's instructions for installing the Samba package. Or you can visit the Samba website at http://us1.samba.org/samba/samba.html for installation instructions, binaries, and/or the source code.

To share your mounted CD's on a windows network, simply create a stanza in the /etc/smb.conf file similar to the following:

```
[cdimages]
  comment = All Shared CD Images
  path = /mnt/iso
  public = yes
  writable = no
```

This will share all the subdirectories under the /mnt/iso directory on the network. To mount the share to a local drive (in this case the I: drive), bring up an MS−DOS Prompt on the Windows machine and type the following:

```
C:\> net use I: \\yourlinuxmachine\cdimages
```

Each CD image will now appear as a subdirectory on the I: drive of your Windows machine.

To mount ONLY the Mandrake CD image to a drive letter (we'll use M:, the root drive of which, will correspond exactly to the CD as if it was just inserted in the CD−ROM drive), create the following stanza in the /etc/smb.conf file.

```
[mndrk71]
  comment = Mandrake Linux 7.1
  path = /mnt/iso/mndrk71
  public = yes
  writable = no
```

Then, at your MS−DOS Prompt, mount it with the following command:

```
C:\> net use m: \\yourlinuxmachine\mndrk71
```

Note:

> The Samba smb.conf file stanzas presented here are simplified, and not entirely secure. Many more options exist for a Samba share which limit who can mount the shares, control how user authentication is performed, whether the share is even browseable through Network Neighborhood on the Windows machines.

2.5. Sharing the Images on a Unix network using NFS

Make sure that NFS is running and configured correctly on your Linux machine, then add the following to the /etc/exports file using your own preferred options:

```
# sample /etc/exports file
       /mnt/iso            (ro,insecure,all_squash)
```

Now, when typing "showmount −e yourlinuxmachine" you should see that the /mnt/iso is included in the exports list.

3. Adding Support for More Loop Devices

The Linux−Mandrake distribution I'm using (7.0), only has support for 8 loop devices compiled into the kernel. In short, you'll only be able to share 8 CD's on a network with this default value. To support more than the default, you'll need to follow this section. If you're new to Linux, you've going to learn some cool things by accomplishing this.

3.1. Tweaking the Kernel

To increase the number of loop devices supported by the kernel, you'll need to edit the /usr/src/linux/drivers/block/loop.c file.

If you find that the kernel sources are not installed on your machine, you'll need to consult your Linux Distribution's documentation on how to install them (the Kernel Sources come with all distributions − it's part of the GPL licensing).

Change the number in the following line to however many loop devices you'll need.

```
#define MAX_LOOP 16
```

Compile the new kernel or module as the case may be. If you need some help getting started with this, read /usr/src/linux/README.

3.2. Creating the Loop Devices in /dev

The mknod command creates the devices in /dev. The loop devices have a major number of "7", and the minor numbers begin at "0". If your MAX_LOOP was defined as 8 in /usr/src/linux/drivers/block/loop.c, you should have loop0 thru loop7 in /dev. To create the /dev/loop8 device, use the following command (subsitute the appropriate number for the "8" in the example below).

```
mknod −m660 /dev/loop8 b 7 8
```

Check Owner/Group & Permissions on the new file. You can change the owner and group with the following command:

```
chown root.disk /dev/loop8
```

You can change the permissions using the following command:

```
chmod 666 /dev/loop8
```