Use of XMM Distribution CD-ROMs.

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Introduction

XMM¹ distribution CD-ROMs are written according to the ISO 9660 format, currently without Rock Ridge extensions. The CD-ROMs are written in the XMM SOC CD production systems (XCDPSA/B) which are running Windows NT and the Rimage CD production software.

The ISO 9660 format is an international standard specifying the logical format for files and directories on a CD-ROM or CD-ROM image. Some other common logical formats such as the Joliet (for Windows) and the Rock Ridge are extensions of ISO 9660.

The Rock Ridge extension to the ISO 9660 file system is designed to support UNIX file system information (such longer filenames and deeper directory structures). CD-ROMs written in this logical format, keep all the characteristics of Unix files and directories, including case. However, the ISO 9660 format without the Rock Ridge Extensions is unable to keep the case of file names, except under specific conditions which are Operating System dependent.

This Technical Note describes the procedures to follow in order to read these CD-ROMs under Solaris and Linux.

Solaris

Under Solaris 2.6, 2.7 and 2.8, any user can access the contents of a CD-ROM by simply introducing it into the CD-ROM drive unit and accessing the files. This is so due to the volume management service, which detects the presence of the CD-ROM media and automatically mounts it on /cdrom/cdrom0.

The Solaris volume managment service is configure usually to mount automatically ISO 9660 formatted CD-ROMs with Rock Ridge extensions, since this is the Unix "de facto" standard. However, if the CD-ROM is not Rock Ridge "compliant" , Solaris makes an automatic mount with file names and directories translated to lower case. To allow for non Rock Ridge CD-ROMs preserve the upper case in their file names and directories, it is necessary to modify the volume management configuration. This is usually a System Administrator task (root), since this file is not writable by any other user.

By introducing into the volume management configuration the "nomaplcase" mount option, non Rock Ridge "compliant" CD-ROMs are mounted automatically with file names and directories in upper case. The volume management service uses the Removable Media Mount configuration file (`/etc/rmmount.conf`) to specify the cdrom mount options. Check with the System Administrator that this file provides the "nomaplcase" option to mount automatically ISO 9660 with non Rock Ridge extensions. We provide at the end of this document (Appendix A) an example of a correct /etc/rrmount.conf file.

In case an automatic mount is not possible, Solaris allows the System Manager (and only to the root user) to mount any non Rock Ridge CD-ROM as:

```
# mount -F hsfs -o ro,nomaplcase /dev/dsk/c0t6d0s2 /mnt
```

where the `/dev/dsk/c0t6d0s2` is the system specific device name, and the /mnt is the mount point where we want to get the CD-ROM mounted. It could be also the /cdrom/cdrom0 mount point as referred above.

Linux

To mount an ISO 9660 CD-ROM under Linux does not depends on the Linux distribution we use. All the standard distributions, like RedHat, SuSE, Caldera, TurboLinux,

Mandrake, Debian, Slackware, etc, behave in this respect the same. Therefore we will treat the matter in a Linux-flavour independent manner.

Linux is capable of mounting automatically a CD-ROM like Solaris. However, it is much more common to have access to the root account in many Linux workstations. However, we will treat both cases as we did with Solaris.

Linux has not a volume management service like Solaris to help users mount automatically CD-ROMs. Instead, it uses specific options in the entries of the file /etc/fstab which correspond to the CD-ROM drives, to alllow any user to mount a CD-ROM as it would be root.

The following line is a typical line in the /etc/fstab of a Linux box, which provides any user the capability to mount CD-ROMs:

```
/dev/hdc    /cdrom    iso9660    ro,noauto,user,exec    0    0
```

where the meanings of the different fields are:
- `/dev/cdrom`: This is the CD-ROM device specification. Depends on the type of CD-ROM drive in use in the system, either IDE (hd drives) or SCSI (sd drives).
- `/cdrom`: This is the mount point where the cdrom will get mounted.
- `iso9660`: This is the standard format for CD-ROMs. Notice that here does not specifies any more options beyond simply ISO9660 format.
- `ro`: Read only.
- `noauto`: This is to tell the system during a boot to not mount the CD-ROM.
- `user`: This is what really makes the thing. This option allows any user to mount the cd-rom.
- `exec`: This is to allow the execution of binaries contained in the CD-ROM. Irrelevant in this context.

The remaining two numbers in the line are not meaningful in this respect.

If the line shown above is present in your /etc/fstab configuration file, you may simply give the following command to get the CD-ROM mounted:

```
# mount /cdrom
```

To umount it, simple execute the command:

```
# umount /cdrom
```

The procedure outlined before does not contemplates the case for an ISO 9660 non Rock Ridge CD-ROM. In order to mount one such CD-ROM, we should ask root to modify the /etc/fstab file to introduce the following line:

```
/dev/hdc    /cdrom    iso9660    ro,noauto,user,exec,map=off    0    0
```

The option map=off is what disables the change to lower case of file names and directories, and it is equivalent to the "nomaplcase" option under Solaris.

In case that we have access to the root account, we could execute the mount command directly. Thus, the following command would mount a non Rock Ridge ISO 9660 CD-ROM, on /cdrom:

```
# mount -t iso9660 -o map=off /dev/cdrom /cdrom
```

Relax option for Linux

The option explained previously may still not work under Linux with standard ISO 9660 cd-roms, producing the annoying version number appended to the file name or directory. To solve this, Linux allows to relax the checking of filenames, thus allowing to access any file either in upper or in lower case.

To apply this option we should ask the root of your Linux box to modify the /etc/fstab file as follows:

```
/dev/hdc     /cdrom      iso9660     ro,noauto,user,owner,check=r  0     0
```

where the relax option is indicated by the check=r keyword.

Now when you insert a cd-rom it is mounted automatically and you see its contents in lower case. However, any attempt to acces now any file or directory in upper-case will succeed. This is the meaning of the relax option.

Notes for Solaris 2.6, 2.7 and 2.8

Solaris 2.6

The automatic mounting of cd-roms by the volume management under Solaris 2.6 was unable to recognize the mount options specified in the `/etc/rmmount.conf` file. This is a known bug under Solaris 2.6 which is remedied with the patch 108075-01. This patch is available at http://sunsolve.sun.com.

Solaris 2.7

Solaris 2.7 Kernels below 106541-14 automatically mount correctly any ISO 9660 non Rock Ridge CD-ROMs. However, the Kernel 106541-14 breaks the volume management service and makes it unable to interpret correctly the mount options in `/etc/rmmount.conf`. Sun currently do not have a patch to remedy this problem, but it can provide the binaries for rmmount of the previous kernel, which work correctly under the new kernel.

Solaris 2.8

We do not know about any problems with this version of Solaris regarding automatic mounting of ISO 9660 non Rock Ridge CD-ROMs. Our Solaris 8 tested version is the last Solaris 2.8, release 10/2000.

Appendix A: Example of `/etc/rmmount.conf` file under Solaris 2.6[1].

```
Sun Microsystems Inc.   SunOS 5.6       Generic August 1997
# more /etc/rmmount.conf
# @(#)rmmount.conf 1.3     96/05/10 SMI
#
# Removable Media Mounter configuration file.
#

# File system identification
ident hsfs ident_hsfs.so cdrom
ident ufs ident_ufs.so cdrom floppy rmscsi pcmem
ident pcfs ident_pcfs.so floppy rmscsi pcmem

# Actions
action cdrom action_filemgr.so
action floppy action_filemgr.so
action rmscsi action_filemgr.so

#
mount cdrom* hsfs -o ro -o nomaplcase
```

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[1] This file is also valid for Solaris 2.7 and 2.8.