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#!/usr/bin/perl

use Getopt::Std;

#
# geteltorito.pl: a bootimage extractor
# Script that will extract the first El Torito bootimage from a
# bootable CD image
# R. Krienke 08/2001
# krienke@uni-koblenz.de
# License: GPL
#
# Get latest version from:
# http://userpages.uni-koblenz.de/~krienke/ftp/noarch/geteltorito
#
$utilVersion="0.5";
#
# Version 0.5
# 2009/06/22
# A patch for harddisk emulation images from <colimit@gmail.com>.
# For BootMediaType=4 (harddisk emulation) SectorCount is always 1, and
geteltorito.pl
# returns just MBR. This patch guesses the correct bootimage size
# from MBR (offset+size of the first partition).
# Version 0.4
# 2007/02/01
# A patch from Santiago Garcia <manty@debian.org> to use a virtual sector
# size (vSecSize) of 512 bytes, as defined on "El Torito" specs and change
# unpack of the sector count from n to v to get the correct sector count.
# Version 0.3
# 2006/02/21
# A patch from Ben Collins <bcollins@ubuntu.com> to make the
# utility work on PPC machines (change from 'L'-encoding in pack to 'V')
# Version 0.2
# Several patches included from Nathan Stratton Treadway(nathant@ontko.com)
# to adjust the platform output as well as fixes for other minor bugs
# Version 0.1
# Initial release
#
# For information on El Torito see
# http://en.wikipedia.org/wiki/El_torito

$vSecSize=512;
$secSize=2048;
$ret=undef;$version=undef;$opt_h=undef;$loadSegment=undef;$systemType=undef;

#
# Read a particular sector from a file
# sector counting starts at 0, not 1
#
sub getSector{
    my ($secNum, $secCount, $file)=@_;
    my ($sec, $count);

    open(FILE, $file) || die "Cannot open \"$file\" \n";

    seek(FILE, $secNum*$secSize, 0);
    $count=read(FILE, $sec, $vSecSize*$secCount, 0) ;
    if( $count != $vSecSize*$secCount ){

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        warn "Error reading from file \\"$file\"\n";
    }
close(FILE);

return($sec);
}

#
# Write eltorito data into a file
#
sub writeOutputFile{
    my($name)=shift;
    my($value)=shift;

    open(OUT, ">".$name)|| die "$0: Cannot open outputfile \"\$name\" for writing.
Stop.";
    print OUT $value;
    close(OUT);
}

#
# Usage
#
sub usage{
    warn "\n$0 [-hv] [-o outputfilename] cd-image \n",
        "Script will try to extract an El Torito image from a \n",
        "bootable CD (or cd-image) given by <cd-image> and write \n",
        "the data extracted to STDOUT or to a file.\n",
        " -h:      This help. \n",
        " -v:      Print version of script and exit.\n",
        " -o <file>: Write extracted data to file <file> instead of STDOUT.\n",
        "\n\n";
    exit 0;
}

# -----
$ret=getopts('hvo:');

if( defined($opt_v) ){
    warn "Version: $utilVersion \n";
    exit 0;
}

if( defined($opt_h) || $#ARGV <0 ){
    usage(0);
}

if( defined($opt_o) ){
    $outputFilename="$opt_o";
}

$imageFile=$ARGV[0];

if( ! -r $imageFile ){
    die "Cannot read image/device \"$imageFile\". Aborting\n";
}

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#
# Read Sector 17 from CD which should contain a Boot Record Volume
# descriptor. This descriptor contains at its start the text ($isoIdent)
# CD001      and ($toritoSpec)
# EL TORITO SPECIFICATION
# see http://www.cdpag.com/Compact_Disc_Variations/eltoritoi.html
# for details
#

$sector=getSector(17, 1, $imageFile );
($boot, $isoIdent, $version, $toritoSpec,
 $unUsed, $bootP)= unpack( "Ca5CA32A32V", $sector );

if( $isoIdent ne "CD001" || $toritoSpec ne "EL TORITO SPECIFICATION" ){
    die "This data image does not seem to be a bootable CD-image\n";
}

#
# Now fetch the sector of the booting catalog
#
$sector=getSector($bootP, 1, $imageFile );

print STDERR "Booting catalog starts at sector: $bootP \n";

# The first 32 bytes of this sector contains the validation entry for a
# boot. The first byte has to be 01, the next byte determines the
# architecture the image is designed for, where 00 is i86, 01 is PowerPC
# and 02 is Mac. More data give info about manufacturer, etc. The
# final two bytes must contain 0x55 and 0xAA respectively (as
# defined by the El Torito standard).

$validateEntry=substr($sector, 0, 32);

($header, $platform, $unUsed, $manufact, $unUsed, $five, $aa)=
    unpack( "CCvA24vCC", $validateEntry);

if( $header != 1 || $five != 0x55 || $aa != 0xaa ){
    die "Invalid Validation Entry on image \n";
}

print STDERR "Manufacturer of CD: $manufact\n";
print STDERR "Image architecture: ";
print STDERR "x86" if( $platform == 0 );
print STDERR "PowerPC" if( $platform == 1 );
print STDERR "Mac" if( $platform == 2 );
print STDERR "unknown ($platform)" if( $platform > 2 );
print STDERR "\n";

#
# Now we examine the initial/defaultentry which follows the validate
# entry and has a size of 32 bytes.

$initialEntry=substr($sector, 32, 32);

($boot, $media, $loadSegment, $systemType, $unUsed,
 $sCount, $imgStart, $unUsed)=unpack( "CCvCCvVC", $initialEntry);

if( $boot != 0x88 ){


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        die "Boot indicator in Initial/Default-Entry is not 0x88. CD is not bootable.
\n";
}

print STDERR "Boot media type is: ";
if( $media == 0 ){
    print STDERR "no emulation";
    $count=0;
}
if( $media == 1 ){
    print STDERR "1.2meg floppy";
    $count=1200*1024/$vSecSize;
}
if( $media == 2 ){
    print STDERR "1.44meg floppy";
    $count=1440*1024/$vSecSize;
}
if( $media == 3 ){
    print STDERR "2.88meg floppy";
    $count=2880*1024/$vSecSize;
}
if( $media == 4 ){
    print STDERR "harddisk";
    $MBR=getSector($imgStart, 1, $imageFile );
    $partition1=substr($MBR, 446, 16);
    ($unUsed, $firstSector, $partitionSize) = unpack( "A8VV", $partition1);
    $count=$firstSector + $partitionSize;
}
print STDERR "\n";

# Only use the internal sector counter if the real size is unknown
# ($count==0)
$cnt=$count==0?$sCount:$count;

print STDERR "El Torito image starts at sector $imgStart and has $cnt sector(s) of
$vSecSize Bytes\n";

# We are there:
# Now read the bootimage to stdout
$image=getSector($imgStart, $cnt, $imageFile);

if( length($outputFilename) ){
    writeOutputFile($outputFilename, $image);
    print STDERR "\nImage has been written to file \"$outputFilename\".\n";
}else{
    print "$image";
    print STDERR "Image has been written to stdout ....\n";
}

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