hdiutil

Manipulate disk images (attach, verify, burn, etc).

```
Syntax
      hdiutil verb [options]

DESCRIPTION

     hdiutil uses the DiskImages framework to manipulate disk images.  Common
     verbs include attach, detach, verify, create, convert, compact, and burn.

     The rest of the verbs are currently: help, info, checksum, chpass,
     erasekeys, unflatten, fla
     plugins, udifrez, udifder
     makehybrid, and pmap.

BACKGROUND

Disk images are containers that emulat                                    sk images blur the distinction
between the disk image container and i                                    erms "attach" and "detach" are
used to distinguish the way disk images

For example, when you double-click a d                                    ge is "attached" to the system
just like an external drive. Then, the kern                               lf any file structures are
understood, the associated volumes wil
Finder.

Always consider whether a "disk image                                     e-oriented) content of the
image. For example, verify verifies that                                  created. On the other hand,
create -srcfolder creates a disk image c
in it, and then copies the specified files

COMMON OPTIONS

     The following option desc

     -verbose be verbose: prod
              This option can
              tion failed.  At
              will be detailed

     -quiet   close stdout and
              indicate success
              -quiet.

     -debug   be very verbose.  This option is good if a large amount of
              progress information is needed.  As of macOS 10.6, -debug
              enables -verbose.

     Many hdiutil verbs understand the following options:

     -plist         provide result output in plist format.  Other programs
                    invoking hdiutil are expected to use -plist rather than
                    try to parse the human-readable output.  The usual output
                    is consistent but generally unstructured.

     -puppetstrings  provide progress output that is easy for another program
                    to parse.  PERCENTAGE outputs can include the value -1
                    which means hdiutil is performing an operation that will
                    take an indeterminate amount of time to complete.  Any
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                program trying to interpret hdiutil's progress should use
                -puppetstrings.

-srcimagekey key=value
                specify a key/value pair for the disk image recognition
                system.  (-imagekey is normally a synonym)

-tgtimagekey key=value
                specify a key/value pair for any image created.
                (-imagekey is only a synonym if there is no input image).

-encryption [AES-128|AES-256]
                specify a particular type of encryption or, if not speci-
                fied, the default encryption algorithm.  The default
                algorithm is the AES cipher with a 128-bit key.

-stdinpass      read a null-terminated passphrase from standard input.
                If the standard input is a tty, the passphrase will be
                read with
                -passphra
                patibilit
                newlines

-agentpass      force the
                Useful wi
                a passphr

-recover keychain_file
                specify a
                the certi
                image was

-certificate cert_file
                specify a
                image.  c
                which can

-pubkey PK1,PK2,...,PKn
                specify a
                decimal h
                being cre

-cacert cert    specify a
                either a
                cessed by
                curl(1).

-insecurehttp   ignore SS
                signed se
                unavailab
                server name doesn't match what is in the certificate.

-shadow [shadowfile]
                Use a shadow file in conjunction with the data in the
                primary image file.  This option prevents modification of
                the original image and allows read-only images to be
                attached read/write.  When blocks are being read from the
                image, blocks present in the shadow file override blocks
                in the base image.  All data written to an attached
                device will be redirected to the shadow file.  If not
                specified, shadowfile defaults to image.shadow. If the
                shadow file does not exist, it is created.  hdiutil verbs
                taking images as input accept -shadow, -cacert, and
                -insecurehttp.

Verbs that create images automatically append the correct extension to
any filenames if the extension is not already present.  The creation
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     engine also examines the filename extension of the provided filename and
     changes its behavior accordingly.  For example, a sparse image can be
     created without specifying -type SPARSEBUNDLE by appending the
     .sparsebundle extension to the provided filename.

VERBS

     Each verb is listed with its description and individual arguments.  Arguments to
     the verbs can be passed in any order.  A sector is 512 bytes.

     help       Display minimal usage information for each verb.  hdiutil verb -help
                will provide basic usage information for that verb.

     attach image [options]
                Attach a disk image as a device.  attach will return information
                about an already-attached image as if it had attached it.
                mount is a poorly-named synonym for attach.  See BACKGROUND.

                Beware that an
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                filesystems on

                The output of
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                Common options
                -shadow, -pupp

                Options:
                -readonly
                -readwrite



                -nokernel

                -kernel



                -notremovable       Prevent this image from being detached.
                                    Only root can use this option.

                -mount required|optional|suppressed
                                    Indicate whether filesystems in the image
                                    should be mounted or not.  The default is
                                    required (attach will fail if no filesys-
                                    tems mount).
                -nomount            Identical to -mount suppressed.
                -mountroot path     mount volumes on subdirectories of path
                                    instead of under /Volumes.  path must
                                    exist.  Full mount point paths must be less
                                    than MNAMELEN characters (increased from 90
                                    to 1024 in macOS 10.6).
                -mountrandom path   Like -mountroot, but mount point directory
                                    names are randomized with mkdtemp(3).
                -mountpoint path    Assuming only one volume, mount it at path
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                        instead of in /Volumes. See fstab(5) for
                        ways a system administrator can make par-
                        ticular volumes automatically mount in par-
                        ticular filesystem locations by editing the
                        file /etc/fstab.
                -nobrowse       Render any volumes invisible in applica-
                        tions such as the macOS Finder.
                -owners on|off  specify that owners on any filesystems be
                        honored or not.
                -drivekey key=value
                        Specify a key/value pair to be attached to
                        the device in the IOKit registry.

                -section subspec   Attach a subsection of a disk image.
                        subspec is any of <offset>, <first-last>, or <start,count>
                        in 0-based sectors.  Ranges are inclusive

                The following options have corresponding elements in the
                com.apple.fram                                          ered in both
                the positive a

                -[no]verify                                             h

                -[no]ignorebad

                -[no]autoopen                                           ching

                                                                        n the

                -[no]autoopenr

                -[no]autoopenr

                -[no]autofsck

                                loaded from the Internet) that have not pre-
                                viously passed fsck are checked.
                                Preferences key: auto-fsck

        detach dev_name [-force]
                detach a disk image and terminate any associated process.
                dev_name is a partial /dev node path (e.g. "disk1").  As of OS
                X 10.4, dev_name can also be a mountpoint.  If Disk Arbitra-
                tion is running, detach will use it to unmount any filesystems
                and detach the image.  If not, detach will attempt to unmount
                any filesystems and detach the image directly (using the
                `eject' ioctl).  If Disk Arbitration is not running, it can be
                necessary to unmount the filesystems with umount(8) before
                detaching the image.  eject is a synonym for detach.

                Options:
                -force   ignore open files on mounted volumes, etc.
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verify image [options]
          compute the checksum of a "read-only" or "compressed" image
          and verify it against the value stored in the image.
          Read/write images don't contain checksums and thus can't be
          verified.  verify accepts the common options -encryption,
          -stdinpass, -srcimagekey, -puppetstrings, and -plist.

create size_spec image
          create a new image of the given size or from the provided
          data.  If image already exists, -ov must be specified or
          create will fail.  To make a cross-platform CD or DVD, use
          makehybrid instead.  See also EXAMPLES below.

          The size specified is the size of the image to be created.
          Filesystem and partition layout overhead (80 sectors for the
          default GPTSPUD layout on Intel machines) might not be available
          for the filesystem and user data in the image.
          Size specifier
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          -srcdevice device
                    specifies that the blocks of device should be used
                    to create a new image.  The image size will match
                    the size of device.  resize can be used to adjust
                    the size of resizable filesystems and writable
                    images.  Both -srcdevice and -srcfolder can run
                    into errors if there are bad blocks on a disk.  One
                    way around this problem is to write over the files
                    in question in the hopes that the drive will remap
                    the bad blocks.  Data will be lost, but the image
                    creation operation will subsequently succeed.
                    Filesystem options (like -fs, -volname, -stretch,
                    or -size) are invalid and ignored when using
                    -srcdevice.

          Common options: -encryption, -stdinpass, -certificate,
          -pubkey, -imagekey, -tgtimagekey, -puppetstrings, and -plist.
```

-imagekey di-sparse-puma-compatible=TRUE and **-imagekey** di-shadow-puma-compatible=TRUE will create, respectively, sparse and shadow images that can be attached on macOS 10.1.

-imagekey encrypted-encoding-version can select between version 1 and version 2 of the encrypted encoding. The framework preferences have a corresponding key to change the default for all images.
Version 2 is not compatible with macOS 10.2 but is more robust for SPARSE (UDSP) images. Version 1 is the default for non-sparse images.
As of macOS 10.4.7, sparse encrypted images always use version 2 and as of macOS 10.5, all encrypted images default to version 2.

General options:

-align *alignment*
: specifies a size to which the final data partition will be aligned. The default is 4K.

-type UDIF|SPA
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-fs *filesystem*
: where filesystem is one of HFS+, HFS+J (JHFS+), HFSX, JHFS+X, MS-DOS, or UDF. -fs causes a filesystem of the specified type to be written to the image. -fs can change the partition scheme and type appropriately. -fs will not make any size adjustments: if the image is the wrong size for the specified filesystem, create will fail. -fs is invalid and ignored when using -srcdevice.

-volname *volname*
: The newly-created filesystem will be named volname. The default depends the filesystem being used; HFS+'s default volume name is `untitled'. -volname is invalid and ignored when using -srcdevice.

-uid *uid*
: the root of the newly-created volume will be owned by the given numeric user id. 99 maps to the magic

```
          'unknown' user (see hdid(8)).
-gid gid  the root of the newly-created volume will be owned
          by the given numeric group id.  99 maps to
          'unknown'.
-mode mode the root of the newly-created volume will have mode
          (in octal) mode.  The default mode is determined by
          the filesystem's newfs unless -srcfolder is speci-
          fied, in which case the default mode is derived from
          the specified filesystem object.
-[no]autostretch
          do [not] suppress automatically making backwards-
          compatible stretchable volumes when the volume size
          crosses the auto-stretch-size threshold (default:
          256 MB).  See also asr(8).
-stretch max_stretch
          -stretch initializes HFS+ filesystem data such that
          it can later be stretched on older systems (which
          could only stretch within predefined limits) using
          hdiu
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-fsargs newfs_
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-layout layout
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          10.6
          create -help lists all supported layouts.

-library bundle
          specify an alternate layout library.  The default is
          MediaKit's MKDrivers.bundle.

-partitionType partition_type
          Change the type of partition in a single-partition
          disk image.  The default is Apple_HFS unless -fs
          implies otherwise.

-ov       overwrite an existing file.  The default is not to
          overwrite existing files.

-attach   attach the image after creating it.  If no filesystem is specified
          via -fs, the attach will fail per the default attach -mount required behavior.
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Image from source options (for -srcfolder and -srcdevice):
-format format Specify the final image format.  The default
               when a source is specified is UDZO.  format can
               be any of the format parameters used by
               convert.

Options specific to -srcdevice:
-segmentSize size_spec
               Note that segmented images are deprecated.
               Specify that the image should be written in segments no bigger
               than size_spec (which follows -size conventions).

Options specific to -srcfolder:
-[no]crossdev   Do [not] cross device boundaries on the source filesystem.

-[no]scrub      Do [not] skip temporary files when imaging a volume.
                Scrubbing is the default when the source is the root
                of a mounted volume.
                                                                  swap files, etc.
-[no]anyowners

-skipunreadabl                                                    on't authenticate.

-[no]atomic                                                       name them to their

-copyuid user                                                     ilege.
                                                                  rs,
                                                                  the

By default, cr                                                    ent in the source
directory.  It                                                    ile, a file owned by
someone other                                                     up that the copying
user is not in

convert image -format for
           convert image

           As with create                                          isn't part
           of the provide

                 UDRW - U
                 UDRO - U
                 UDCO - U
                 UDZO - U
                 ULFO - UDIF lzfse-compressed image (OS X 10.11+ only)
                 ULMO - UDIF lzma-compressed image (macOS 10.15+ only)
                 UDBZ - UDIF bzip2-compressed image (deprecated)
                 UDTO - DVD/CD-R master for export
                 UDSP - SPARSE (grows with content)
                 UDSB - SPARSEBUNDLE (grows with content; bundle-backed)
                 UFBI - UDIF entire image with MD5 checksum

          In addition to the compression offered by some formats, the UDIF read-only format skips
          unused space in HFS, APFS, ExFAT, and MS-DOS (FAT, FAT32) filesystems.
          For UDZO, -imagekey zlib-level=value allows the zlib compression level to be specified
          a la gzip(1).  The default compression level is 1 (fastest).

           Common options: -encryption, -stdinpass, -certificate,
           -srcimagekey, -tgtimagekey, -shadow and related,
           -puppetstrings, and -plist.
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            Other options:
            -align alignment
                        The default is 4 (2K).

            -pmap       add partition map.
                        When converting a NDIF to a any variety of UDIF,
                        or when converting an unpartitioned UDIF, the
                        default is true.

            -segmentSize [size_spec]
                        Note that segmented images are deprecated.
                        Specify segmentation into size_spec-sized segments as outfile is being written.
                        The default size_spec when -segmentSize is specified alone is
                        2*1024*1024 (1 GB worth of sectors) for UDTO images
                        and 4*1024*1024 (2 GB segments) for all other image types.
                        size_spec can also be specified
                        ??b|??k|??m|??g|??t|??p|??e like create's -size flag.

            -tasks task_co
                        W                                                    the number of
                        t
                        T                                                    ent system.

burn image
            Burn image to
            In all cases,                                                    ive has been found.
            Common options                                                   strings, and -stdinpass.

            Other options:
            -device

            -testburn
            -anydevice



            -[no]eject

            -[no]verifybur


            -[no]addpmap
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                        needed.

            -[no]skipfinalfree do [not] skip final free partition.  If
                        there is a partition map on the image speci-
                        fying an Apple_Free partition as the last
                        partition, that Apple_Free partition will not
                        be burned.  The burned partition map will
                        still reference the empty space.  The default
                        is to skip burning a final free partition.

            -[no]optimizeimage do [not] optimize filesystem for burning.
                        Optimization can reduce the size of an HFS or
                        HFS+ volume to the size of the data contained
                        on the volume.  This option will change what
                        is burned such that the disc will have a dif-
                        ferent checksum than the image it came from.
                        The default is to burn all blocks of the disk
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                    image (minus any trailing Apple_Free).

            -[no]forceclose  do [not] force the disc to be closed after
                             burning.  Further burns to the disc will be
                             impossible.  The default is not to close the
                             disc.

            -nounderrun      Disable the default buffer underrun protec-
                             tion.

            -[no]synthesize  [Don't] Synthesize a hybrid filesystem for
                             the disc.  The default is to create a new
                             (HFS/ISO) filesystem when the source image's
                             blocks could not be legally burned to a disc.

            -speed x_factor  1, 2, 4, 6, ...  `max'
                             The desired "x-factor".  e.g. 8 means the
                             drive will be instructed burn at "8x speed".

            -sizequery

            -erase

            -fullerase

            -list

makehybrid -o image sourc
            Generate a pot
            image using th
            system.  This
            drutil(1) can

            source can either be a directory or a disk image.  The generated image can
            later be burned using burn, or converted to another read-only format with convert.
            By  default, the filesystem will be readable on most modern computing platforms.
            The generated filesystem is not intended for conversion to read/write, but can
            safely have its files copied to a read/write filesystem using ditto(8).

            hdiutil supports generating El Torito-style bootable ISO9660 filesystems, which are
            commonly used for booting x86-based hardware. The specification includes several
            emulation modes. By default, an El Torito boot image emulates either a 1.2MB, 1.44MB,
            or 2.88MB floppy drive, depending on the size of the image.  Also  available are
            "No Emulation" and "Hard Disk Emulation" modes, which allow the boot image to either
            be loaded directly into memory, or be virtualized as a partitioned hard disk,
            respectively. The El Torito options should not be used for data CDs.

            Filesystem options:
            -hfs    Generate an HFS+ filesystem.
                    This filesystem can be present on an image simultaneously with an ISO9660
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        or Joliet or UDF filesystem.  On Operating Systems that understand HFS+ as well
        as ISO9660 and UDF, like Mac OS 9 or OS X, HFS+ is usually the preferred
        filesystem for hybrid images.
-iso    Generate an ISO9660 Level 2 filesystem with Rock Ridge extensions.
        This filesystem can be present on an image simultaneously with an HFS+ or Joliet or
        UDF filesystem.  ISO9660 is the standard cross-platform interchange format for
        CDs and some DVDs, and is understood by virtually all Operating Systems.
        If an ISO9660 or Joliet filesystem is present on a disk image or CD, but not
        HFS+, OS X will use the ISO9660 (or Joliet) filesystem.
-joliet Generate Joliet extensions to ISO9660.
        This view of the filesystem can be present on an image simultaneously with HFS+,
        and requires the presence of an ISO9660 filesystem.
        Joliet supports Unicode filenames, but is only supported on some Operating Systems.
        If both an ISO9660 and Joliet filesystem are present on a disk image
        or CD, but not HFS+, OS X will prefer the Joliet filesystem.
-udf    Generate a UDF filesystem. This filesystem can be present on an image
        simultaneously with HFS+, ISO9660, and Joliet. UDF is the standard interchange
        format for DVDs, although Operating System support varies based on OS version
        and UD

By default, if                                                    th all four
filesystems as                                                     the data area
of the image i                                                    rmation and
volume meta-da                                                    ng a
cross-platform                                                     to a
single filesys

Other options
-hfs-blessed-d                                                    OS X booting


                                                                  epared,
                                                                  id BootX file.

-hfs-openfolde                                                    inder
                                                                   in bless(8)

-hfs-startupfi                                                    fied size,


-abstract-file                                                     the root of the generated
                                                                  ct file

-bibliography-                                                     the root of the generated
                                                                  graphy file

-copyright-fil                                                     the root of the generated
                                                                  ght file


-application
-preparer
-publisher              Publisher string (ISO9660/Joliet).
-system-id              System Identification string
                        (ISO9660/Joliet).
-keep-mac-specific      Expose Macintosh-specific files (suchas .DS_Store) in non-HFS+ filesystems
                        (ISO9660/Joliet).
-eltorito-boot          Path to an El Torito boot image within the source directory. By default,
                        floppy drive emulation is used, so the image must be one of 1200KB, 1440KB, or
                        2880KB. If the image has a different size, either -no-emul-boot or
                        -hard-disk-boot must be used to enable "No Emulation" or "Hard Disk Emulation"
                        mode, respectively (ISO9660/Joliet).
-hard-disk-boot         Use El Torito Hard Disk Emulation mode.
                        The image must represent a virtual device with an MBR partition map and a
                        single partition.
-no-emul-boot           Use El Torito No Emulation mode. The system firmware will load the number of
                        sectors specified by -boot-load-size and execute it, without emulating any
                        devices (ISO9660/Joliet).
-no-boot                Mark the El Torito image as non-bootable. The system firmware can still
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                        create a virtual device backed by this data. This option is not recommended
                        (ISO9660/Joliet).
-boot-load-seg          For a No Emulation boot image, load the data at the specified segment address.
                        This options is not recommended, so that the system firmware can use its
                        default address (ISO9660/Joliet)
-boot-load-size         For a No Emulation boot image, load the specified number of 512-byte emulated
                        sectors into memory and execute it. By default, 4 sectors (2KB) will be loaded
                        (ISO9660/Joliet).
-eltorito-platform      Use the specified numeric platform ID in the El Torito Boot Catalog Valida-
                        tion Entry or Section Header. Defaults to 0 to identify x86 hardware
                        (ISO/Joliet).
-eltorito-specification For complex layouts involving multiple boot images, a plist-formatted string
                        can be provided, using either OpenStep-style syntax or XML syntax, represent-
                        ing an array of dictionaries. Any of the El Torito options can be set in the
                        sub-dictionaries and will apply to that boot image only. If
                        -eltorito-specification is provided in addition to the normal El Torito com-
                        mand-line options, the specification will be used to populate secondary non-
                        default boot entries.
-udf-version                                                    ified, it defaults to "1.50"

-default-volum                                                  overridden.
-hfs-volume-na                                                  onent of source.
                                                                hould be different
-iso-volume-na                                                  t should be different
-joliet-volume                                                   should be different
-udf-volume-na                                                  ould be different

-hide-all                                                       should not
                                                                ring might
                                                                will be
                                                                 option cannot
                                                                lob expression

-hide-hfs                                                       should not
                                                                 data can
                                                                FS+ only).
-hide-iso                                                       should not
                                                                data can
                                                                SO9660 only).  Per above,
                                                                archy when the hybrid is
                                                                refore, if Joliet is
                                                                also be needed to

-hide-joliet                                                    should not be exposed via the
                        Joliet filesystem, although the data can still be present for use by other
                        filesystems (Joliet only).  Because OS X's ISO 9660 filesystem uses the Joliet
                        catalog if it is available, -hide-joliet effectively supersedes
                        -hide-iso when the resulting filesystem is mounted as ISO on macOS.
-hide-udf               A glob expression of files and directories that should not
                        be exposed via the UDF filesystem, although the data can
                        still be present for use by other filesystems (UDF only).
-only-udf               A glob expression of objects that should only be exposed in UDF.
-only-iso               A glob expression of objects that should only be exposed in ISO.
-only-joliet            A glob expression of objects that should only be exposed in Joliet.

-print-size             Preflight the data and calculate an
                        upper bound on the size of the image.
                        The actual size of the generated image
                        is guaranteed to be less than or equal
                        to this estimate.
-plistin                Instead of using command-line parameters, use a standard plist
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                                from standard input to specific the parameters of the hybrid image
                                generation.  Each command-line option should be a key in the
                                dictionary, without the leading "-", and the value should be
                                a string for path and string arguments, a number for number arguments,
                                and a boolean for toggle options.  The source argument should use a
                                key of "source" and the image should use a key of "output".

          If a disk image was specified for source, the image will be attached and paths will be
          evaluated relative to the mountpoint of the image.  No absolute paths can be used in
          this case.  If source is a directory, all argument paths should point to files or directories
          either via an absolute path, or via a relative path to the current working directory.

          The volume name options, just like files in the filesystems, may need to be mapped onto
          the legal character set for a given filesystem or otherwise changed to obey naming
          restrictions.  Use drutil(1) as drutil filename myname to see how a given string would be remapped.

          The -abstract-file, -bibliography-file, -and -copyright-file must exist directly in the source
          directory, not a sub-directory, and must have an 8.3 name for compatibility with ISO9660 Level 1.

compact image options
          scans the band                                                    ing an APFS or HFS+
          filesystem, re
          used by the fi                                                    ed filesystem,
          compact may or                                                    letely unused
          band files are

          Options:
          -batteryallowe

                                                                            a compact operation.


          -sleepallowed                                                     ncels the compact operation.
                                                                            until


                                                                            cancel compact.

          Common options                                                    ted, -puppetstrings, and -plist.

info      display inform                                                    and any images that are
          currently atta

checksum image -type type
          Calculate the                                                     type.

          Common options
          -srcimagekey,

          type is one of
                UDIF-CRC
                UDIF-MD5
                DC42 - Disk Copy 4.2
                CRC28 - CRC-32 (NDIF)
                CRC32 - CRC-32
                MD5 - MD5
                SHA - SHA
                SHA1 - SHA-1
                SHA256 - SHA-256
                SHA384 - SHA-384
                SHA512 - SHA-512

chpass image
          change the passphrase for an encrypted image.  The default is
          to change the password interactively.

          Common options: -recover and -srcimagekey.  The options
          -oldstdinpass and -newstdinpass allow, in the order specified,
          the null-terminated old and new passwords to be read from the
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            standard input in the same manner as with -stdinpass.

    erasekeys image
            securely overwrite keys used to access an encrypted image,
            quickly rendering the image completely inaccessible.  Once
            erasekeys has been run on an encrypted image, there is no fea-
            sible way to recover data from the image file.

            Common options: -plist and -quiet.

    unflatten image
            unflatten a UDIF disk image, creating an OS 9-style dual-fork
            image file (no XML metadata).  If the resource fork represen-
            tation of the metadata becomes greater than 16 MB, the opera-
            tion will fail with error -39 ("End of fork").

            Common options: -encryption, -stdinpass, and -srcimagekey.

    flatten image
            Flatten a read
            single-fork fi
            XML (for the k
            (for macOS 10.

            Common options
            Since images a
            required if th

            Other options:
            -noxml      do
                        Th
            -norsrcfork do
                        no

    fsid image
            Print informat
            As usual, imag
            cal disk.  See
            detailed infor

            Common options
            -shadow and re

    mountvol dev_name
            mount the file
            lar to diskuti
            -plist.  Note
            often works in
            remount a volu

            Prior to macOS 10.5, mount/attach would treat a /dev entry as a
            disk image to be attached (creating another /dev entry).  That
            behavior was undesirable.

    unmount volume [-force]
            unmount a mounted volume without detaching any associated
            image.  Volume is a /dev entry or mountpoint.  NOTE: unmount
            does NOT detach any disk image associated with the volume.
            Images are attached and detached; volumes are mounted and
            unmounted.  mountvol will remount a volume that has been
            unmounted by unmount.

            Options:
            -force   unmount filesystem regardless of open files on that
                     filesystem.  Similar to umount -f.

    imageinfo image
```

```
            Print out information about a disk image.

            Common options: -encryption, -stdinpass, -srcimagekey, -shadow
            and related, and -plist.

            Options are any of:
            -format   just print out the image format
            -checksum just print out the image checksum

isencrypted image
            print a line indicating whether image is encrypted.  If it is,
            additional details are printed.

            Common options: -plist.

plugins     print information about DiskImages framework plugins.  The
            user, system, local, and network domains are searched for
            plugins (i.e.  ~/Library/Plug-ins/DiskImages,
            /System/Librar
            /Library/Plug-
            /Network/Libra

            Common options

internet-enable [-yes] |
            Enable or disa
            the default.
            will "unpack"
            be copied into
            image will be

            Common options
            -plist.

resize size_spec image
            Resize a disk
            containing a t
            resize the ima
            within it by a
            the end of the
            tems other tha

            resize can shr
            be converted t
            hdiutil resize
            data.  diskuti
            help hdiutil r
            can also be us

            resize is limi
            UDSP vs. UDSB), any partition scheme, the hosted filesystem,
            and the filesystem hosting the image.  In the case of HFS+
            inside of GPT inside of a UDRW on HFS+ with adequate free
            space, the limit is approximately 2^63 bytes.  Older images
            created with an APM partition scheme are limited by it to 2TB.
            Before macOS 10.4, resize was limited by how the filesystem was
            created (see hdiutil create -stretch).

            hdiutil burn does not burn Apple_Free partitions at the end of
            the devices, so an image with a resized filesystem can be
            burned to create a CD-R/DVD-R master that contains only the
            actual data in the hosted filesystem (assuming minimal data
            fragmentation).

            Common options: -encryption, -stdinpass, -srcimagekey, -shadow
            and related, and -plist.
```

```
            Size specifiers:
            -size ??b|??k|??m|??g|??t??p|??e
            -sectors sector_count | min
                           Specify the number of 512-byte sectors to
                           which the partition should be resized.  If
                           this falls outside the mininum valid value or
                           space remaining on the underlying file sys-
                           tem, an error will be returned and the parti-
                           tion will not be resized.  min automatically
                           determines the smallest possible size.

            Other options:
            -imageonly     only resize the image file, not the parti-
                           tion(s) and filesystems inside of it.
            -partitiononly only resize a partition / filesystem in the
                           image, not the image.  -partitiononly will
                           fail if the new size won't fit inside the
                           image.  On APM, shrinking a partition results

            -partitionNumb

            -growonly
            -shrinkonly
            -nofinalgap

            -limits

segment
            segment -o fir
            segment -o fir
            segment a NDIF
            around limitat
            filesystems, n
            not the segmen
            passed to segm

            Common options: -encryption, -stdinpass, -srcimagekey,
            -tgtimagekey, -puppetstrings, and -plist.

            Options:
            -segmentCount segment_count
                        Specify the number of segments.  Only one of
                        -segmentCount or -segmentSize will be honored.
            -segmentSize segment_size
                        Specify the segment size in sectors or in the
                        style of mkfile(8) (here unqualified numbers are
                        still sectors).  If the original image size is
                        not an exact multiple of the segment size, the
                        last segment will be shorter than the others.
                        Only one of -segmentCount or -segmentSize will be
                        honored.  Segmenting read/write (UDRW) images is
                        not supported (as of macOS 10.3).
```

```
            -firstSegmentSize segment_size
                        Specify the first segment size in sectors in the
                        same form as for -segmentSize.  Used for multi-CD
                        restores.
            -restricted  Make restricted segments for use in multi-CD
                        restores.
            -ov         overwrite any existing files.

    pmap [options] image
            display the partition map of an image or device.  By default,
            this report includes starting offsets and significant amounts
            of free space.  image is either a plain or special file (for
            example, a /dev/disk entry).  See NOTE ON DEV ENTRY ACCESS.

            Common options: -encryption, -stdinpass, -srcimagekey, and
            -shadow and related.

            -simple       generate MediaKit's minimal report: basic parti-

            -standard

            -complete

            -endoffsets
            -nofreespace

            -shims
            -uuids

    udifrez [options] image
            embed resource
            image.

            You must speci
            -xml file
                 Copy reso
            -rsrcfork file
                 Copy reso
            -replaceall
                 Delete al

    udifderez [options] image
            extract resour

            Options:
            -xml    emit X
            -rez    emit Rez format output

            Common options: -encryption, -stdinpass, and -srcimagekey.

EXAMPLES

    Verifying:
          hdiutil verify myimage.img
                verifies an image against its internal checksum.

    Segmenting:
          hdiutil segment -segmentSize 10m -o /tmp/aseg 30m.dmg
                creates aseg.dmg, aseg.002.dmgpart, and aseg.003.dmgpart

    Converting:
          hdiutil convert master.dmg -format UDTO -o master
                converts master.dmg to a CD-R export image named master.cdr
```

```
      hdiutil convert /dev/disk1 -format UDRW -o devimage
            converts the disk /dev/disk1 to a read/write device image
            file.  authopen(1) will be used if read access to /dev/rdisk1
            is not available.  Note use of the block-special device.

Burning:
      hdiutil burn myImage.dmg
            burns the image to optical media and verifies the burn.
      hdiutil burn myRawImage.cdr -noverifyburn -noeject
            burns the image without verifying the burn or ejecting the
            disc.  Volumes will be mounted after burning.

Creating a 50 MB encrypted image:
      hdiutil create -encryption -size 50m e.dmg -fs HFS+J

Creating a 50 MB encrypted image protected with public key only:
      hdiutil create -encryption -size 50m e.dmg -fs HFS+J \
          -pubkey F534A3B0C2AEE3B988308CC89AA04ABE7FDB5F30

Creating a 50 MB encrypte
      hdiutil create -enc
          -pubkey F534A3B

Note that these two -pubk
sponding to this public k
card.  For additional inf
sc_autch(8).

Creating an encrypted sin
      printf pp|hdiutil c

Creating a "1 GB" SPARSE
      hdiutil create -typ

Creating a "1 GB" SPARSEB
      hdiutil create -typ

Creating a new mounted vo
      hdiutil create -vol

Using a shadow file to at
then convert it back to a
time/space required to co

      hdiutil attach -own
      /dev/disk2   Apple_
      /dev/disk2s1 Apple_
      /dev/disk2s2 Apple_

      ditto /Applications,
      hdiutil detach /dev/disk2
      hdiutil convert -format UDZO Moby.dmg -shadow

Using makehybrid to create cross-platform data with files overlapping
between filesystem views.  With these files:
      albumlist.txt song2.wma     song4.m4a     song6.mp3     song8.mp3
      song1.wma     song3.m4a     song5.mp3     song7.mp3

      hdiutil makehybrid -o MusicBackup.iso Music -hfs -iso -joliet \
          -hide-hfs 'Music/*.wma' -hide-joliet 'Music/{*.m4a,*.mp3}' \
          -hide-iso 'Music/*.{wma,m4a}'

will create an image with three filesystems pointing to the same blocks.
The HFS+ filesystem, typically only visible on Macintosh systems, will
not include the .wma files, but will show the .m4a and .mp3 files. The
Joliet filesystem will not show the .m4a and .mp3 files, but will show
the .wma files. The ISO9660 filesystem, typically the default filesystem
```

```
      for optical media on many platforms, will only show the .mp3 files. All
      three filesystems will include the "albumlist.txt" files.

      Image from directory (new-style):
            hdiutil create -srcfolder mydir mydir.dmg

      Image from directory (10.1-style; of historical interest):
            du -s myFolder             # du(1) will count resource forks
            10542
            hdiutil create -sectors 10642 folder     # add ~1% for filesytem
            hdid -nomount folder.dmg
            ...
            /dev/disk1s2            Apple_HFS
            newfs_hfs -v myFolderImage /dev/rdisk1s2
            hdiutil detach disk1
            hdid folder.dmg
            ...
            /dev/disk1s2            Apple_HFS         /Volumes/myFolderImage
            sudo mount -u -t hf
            # optionally enable

            ditto -rsrcFork myF
            hdiutil detach disk
            hdiutil convert -fo

      Manually changing ownersh
            hdiutil attach myim
            ...
            /dev/disk1s2
            diskutil unmount di
            mkdir /Volumes/myVo
            sudo mount -r -t hf
            # -o owners is the

      Forcing a known image to
            hdiutil attach -ima

ENVIRONMENT

      The following environment

      com_apple_hdid_verbose
                  enable -verbos

      com_apple_hdid_debug
                  enable -debug

      com_apple_hdid_nokernel
                  similar to -no
                  -attach.

      com_apple_hdid_kernel
                  attempt to attach in-kernel first (like attach -kernel). In OS
                  X 10.4.x, in-kernel was the default behavior for UDRW and
                  SPARSE images.  On macOS 10.5, these and other kernel-compati-
                  ble images, including RAM-based images described in hdid(8),
                  will attach with a user process unless attach -kernel is used
                  or the corresponding variable is set.  If an image is not
                  "kernel-compatible" and -kernel is specified, the attach will
                  fail.  (WARNING: ram:// images currently use wired memory when
                  attached in-kernel).

      com_apple_diskimages_insecureHTTP
                  disable SSL peer verification the same way -insecurehttp does.
                  Useful for clients of DiskImages such as asr(8) which don't
                  support a similar command line option.
```

```
ERRORS

     DiskImages uses many frameworks and can encounter many error codes.  In
     general, it tries to turn these error numbers into localized strings for
     the user.  For background, intro(2) is a good explanation of our primary
     error domain: the BSD errno values.  For debugging, -verbose should gen-
     erally provide enough information to figure out what has gone wrong.  The
     following is a list of interesting errors that hdiutil can encounter:

     [ENXIO]           Device not configured.  This error is returned explic-
                       itly by DiskImages when its kernel driver or framework
                       helper cannot be contacted.  It also often shows up
                       when a device has been removed while I/O is still
                       active.  One common case of the helper not being found
                       is when Foundation's Distributed Objects RPC mechanism
                       cannot be configured.  D.O. doesn't work under dead
                       Mach bootstrap contexts such as can exist in a reat-
                       tached screen(1) session.  Root users can take advan-
                       tage o
                       access

     [EINVAL]          Invali
                       and is
                       tly no
                       to cre

     [EFBIG]           File t
                       when a
                       is too
                       This e
                       old-st

     [EAUTH]           Authen
                       libcur
                       Securi
                       enter
                       -cacer
                       peers.

     [EBUSY]           Resour
                       cannot
                       volume

     [EAGAIN]          Resour
                       DiskIm
                       to pre
                       machin
                       return
                       be obt

     EACCES vs. EPERM  EACCES and EPERM are subtly different.  The latter
                       "operation not permitted" tends to refer to an opera-
                       tion that cannot be performed, often due to an incor-
                       rect effective user ID.  On the other hand, "permis-
                       sion denied" tends to mean that a particular file
                       access mode prevented the operation.

USING PERSISTENT SPARSE IMAGES
```

As of macOS 10.5, a more reliable, efficient, and scalable sparse format, UDSB (SPARSEBUNDLE), is recommended for persistent sparse images as long as a backing bundle (directory) is acceptable. macOS 10.5 also introduced F_FULLFSYNC over AFP (on client and server), allowing proper journal flushes for HFS+J-bearing images. Critical data should never be stored in sparse disk images on file servers that don't support F_FULLFSYNC.

SPARSE (UDSP) images and shadow files were designed for intermediate use when creating other images (e.g. UDZO) when final image sizes are unknown. As of macOS 10.3.2, partially-updated SPARSE images are properly handled and are thus safe for persistent storage. SPARSE

images are not recommended for persistent storage on versions of macOS earlier than 10.3.2 and should be avoided in favor of SPARSEBUNDLE images or UDRW
images and resize.

If more space is needed than is referenced by the hosted filesystem, hdiutil resize or diskutil(8) resize can help to grow or shrink the filesystem in an image. compact reclaims unused space in sparse images. Though they request that hosted HFS+ filesystems use a special "front first" allocation policy, beware that sparse images can enhance the
effects of any fragmentation in the hosted filesystem.

To prevent errors when a filesystem inside of a sparse image has more free space than the volume holding the sparse image, HFS volumes inside sparse images will report an amount of free space slightly less than the amount of free space on the volume on which image resides. The image filesystem currently only behaves this way as a result of a direct attach action and will not behave this way if, for example, the filesystem is unmounted and remounted.

/dev Entry Access

Since any /dev entry can be treate hen and how. /dev/rdisk nodes are character-special devices, but are physical disk than the buffer cache. /dev/disk nodes, on the other hand devices and are used primarily by

It is not possible to read from a /de cess to the appropriate /dev/rdisk node can use hdiutil verbs such as en(1) to open any device which it can't open (due to EACCES) for r ss /dev entries while logged in remotely (an authorization panel is

Generally, the /dev/disk node is pr while /dev/rdisk is usable for the quick pmap or fsid. In particular, c will prevent the volume in the image from mounting (the journal will be p

Compatibility

macOS 10.0 supported the disk ir d, and zlib-compressed images. These images will not be recogniz truction). As the sparse, shadow, and encrypted formats have evolved, s patible with older OS versions (at the expense of the performance and r sparse images should not be expected to attach on versions of

With macOS 10.2, the most comn erved them without a helper process), image meta-data began being sto Copy.app "compressed" format became UDZO (breaking compat ormat which provides smaller images (especially when combined with m

In macOS 10.4.7, the resource forks previously embedded in UDIF images were abandoned entirely to avoid metadata length limitations imposed by resource fork structures. As a result, UDIF images created on 10.4.7 and later will not, by default, be recognized by either macOS 10.1 or macOS 10.0. flatten can be used to customize the type of metadata stored in the image.

macOS 10.5 introduced sparse bundle images which compact quickly but are not recognized by previous OS versions. macOS 10.6 removed support for attaching SPARSEBUNDLE images from network file servers that don't support F_FULLFSYNC.
macOS 10.7 removed double-click support for images using legacy metadata; these can be rehabilitated using flatten and unflatten, or convert.

History

Disk images were first invented to electronically store and transmit representations of floppy disks for manufacturing replication. These images of floppies are typically referred to as 'Disk Copy 4.2' images, in reference to the application that created and restored them to floppy disks. Disk Copy 4.2 images were block-for-block representations of a floppy
disk, with no notion of compression. DART is a variant of the Disk Copy 4.2 format that supported compression.

NDIF (New Disk Image Format) images were developed to replace the Disk Copy 4.2 and DART image formats and to support images larger than a floppy disk. With NDIF and Disk Copy version 6, images could be"attached" as mass storage devices under Mac OS 9. Apple Data Compression (ADC) -- which carefully optimizes for fast decompression -- was
used to compress images that were typically created once and restored many times during manufacturing.

UDIF (Universal Disk Image Format) device images picked up where NDIF left off, allowing images to represent entire block devices and all the data therein: DDM, partition map, disk-based drivers, etc. For example, it can represent bootable CDs which can then be replicated from an image.
To ensure single-fork files (NDIF was dual-fork), it began embedding its resource fork in the data fork. UDIF is the native image format for macOS.

Raw disk images from other Operating Systems (e.g. .iso files) will be recognized as disk images and can be attached and mounted if macOS recognizes the filesystems. They can also be burned with hdiutil burn.

What's New

In macOS 10.12 Apple will provide an updated hdutil command able to work with the new file system

macOS 10.7 added the ability to c , which saves time versus securely overwriting the entire image.

In macOS 10.6, pmap was rewritte GPT partition maps. Also -debug now implies -verbose for all verbs.

macOS 10.5 changed the behavio tached but no volume was mounted, the volume would be mounted. Pri effectively removes the ability to create a second /dev node from a

Examples

Mount a Disk Image:

```
$ hdiutil attach /path/to/
```

Unmount a Disk Image:

```
$ hdiutil detach /dev/disk
```

Create a Disk Image from a folders con

```
$ hdiutil create -volname                                    ng
```

Create an encrypted Disk Image from a

```
$ hdiutil create -encrypti                                  'folder -ov encrypted.dmg
```

The required password can be piped into the hdiutil command:

```
echo -n SEcurePa$$w0rd | hdiutil...
```

Burn a Disk Image file (.iso, .img or .dmg) to a DVD:

```
$ hdiutil burn /path/to/image_file
```

"The beginning of wisdom is to call things by their right names" ~ Chinese Proverb

Related macOS commands

asr - Apple Software Restore.
dd - Convert and copy a file, clone disks.
diskutil - Disk utilities - Format, Verify, Repair.
ditto - Copy files and folders.
authopen(1), hdid(8), ioreg(8), drutil(1), msdos.util(8), hfs.util(8), diskarbitrationd(8), /System/Library/CoreServices/DiskImageMounter.app.