NAME

geom_uzip - GEOM based compressed disk images and partitions

SYNOPSIS

To compile this driver into the kernel, place the following line in your kernel configuration file:

```
device xz
options zstd
options GEOM_UZIP
```

Alternatively, to load the driver as a module at boot time, place the following line in loader.conf(5):

```
geom_uzip_load="YES"
```

DESCRIPTION

The **geom_uzip** framework provides support for compressed read-only disk images. This allows significant storage savings at the expense of some CPU time on each read. Data written in the GEOM label area allows **geom_uzip** to detect compressed images which have been created with mkuzip(8) and presented to the kernel as a logical disk device via md(4). **geom_uzip** creates a unique *md#.uzip* device for each image.

geom_uzip is not limited to supporting only md(4) images. The image can also reside on a block device. (For example, a disk, USB flash drive, DVD-ROM, etc). The appropriate device node will appear with the *.uzip* suffix.

```
# gpart show da0
=>      0  7833600  da0  BSD  (3.7G)
        0  2097152    1  freebsd-ufs  (1.0G)
  2097152  5736448       - free -  (2.7G)
# gpart add -t freebsd-ufs -s 1G da0
da0b added
# dd if=/tmp/20160217_dcomp_zcomp.uzip bs=256k of=/dev/da0b
3190+1 records in
3190+1 records out
836331008 bytes transferred in 111.021489 secs (7533055 bytes/sec)
# fsck -t ffs /dev/da0b.uzip
** /dev/da0b.uzip (NO WRITE)
** Last Mounted on /mnt
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
```

```
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl groups
97455 files, 604242 used, 184741 free (2349 frags, 22799 blocks,
  0.3% fragmentation)
# mount -o ro /dev/da0b.uzip /mnt
# df /dev/da0b.uzip
Filesystem     1K-blocks    Used  Avail Capacity  Mounted on
/dev/da0b.uzip   3155932 2416968 738964    77%    /mnt
```

The **geom_uzip** device is subsequently used by FreeBSD kernel to access the uncompressed data. The **geom_uzip** driver does not allow write operations to the underlying disk image. To check which "providers" match a given **geom_uzip** device:

```
# geom uzip list
Geom name: md1.uzip
Providers:
1. Name: md1.uzip
  Mediasize: 22003712 (21M)
  Sectorsize: 512
Consumers:
1. Name: md1
  Mediasize: 9563648 (9.1M)
  Sectorsize: 512

Geom name: da0b.uzip
Providers:
1. Name: da0b.uzip
  Mediasize: 3355443200 (3.1G)
  Sectorsize: 512
Consumers:
1. Name: da0b
  Mediasize: 1073741824 (1.0G)
  Sectorsize: 512
```

geom_uzip allows mounting the root file system from a compressed disk partition by setting the vfs.root.mountfrom tunable. See loader.conf(5) for details.

DIAGNOSTICS

Several flags are provided for tracing **geom_uzip** I/O operations and TOC parsing via the following

sysctls.

kern.geom.uzip.debug
: Log level. Zero disables logging. Higher values enable more verbose debug logging for **geom_uzip**. Supported levels are from 0 (no logging) to 4 (maximum amount of logging).

kern.geom.uzip.debug_block
: Log operations involving compressed cluster number.

SEE ALSO

GEOM(4), md(4), geom(8), mkuzip(8)

HISTORY

Zstd support was added in FreeBSD 13.0.

AUTHORS

The **geom_uzip** driver was written by Max Khon <*fjoe@FreeBSD.org*>. The block de-duplication code as well as some **geom_uzip** driver optimizations have been contributed by Maxim Sobolev <*sobomax@FreeBSD.org*>. The LZMA decompression support and CLOOP 3.0 support have been added by Aleksandr Rybalko <*ray@FreeBSD.org*>.

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