

## NAME

**gptboot** - GPT bootcode for UFS on BIOS-based computers

## DESCRIPTION

**gptboot** is used on BIOS-based computers to boot from a UFS partition on a GPT-partitioned disk. **gptboot** is installed in a **freebsd-boot** partition with `gpart(8)`. For UEFI, `gptboot.efi(8)` is used instead. While conceptually similar, the details differ.

When it starts, **gptboot** first reads the GPT and determines which drive and partition to boot from, as described under *BOOTING*, below. If it does not find an eligible partition, or if the user hits a key within three seconds, **gptboot** switches from auto-boot to interactive mode. Interactive mode allows manual selection of the disk, partition, filename, and boot option flags, as described in `boot(8)`.

## IMPLEMENTATION NOTES

The GPT standard allows a variable number of partitions, but **gptboot** only boots from tables with 128 partitions or less.

## PARTITION ATTRIBUTES

**gptboot** checks and manages several attributes of GPT UFS partitions.

**bootme** Attempt to boot from this partition. If more than one partition has the **bootme** attribute set, **gptboot** will attempt to boot each one until successful.

**bootonce** Attempt to boot from this partition only one time. Setting this attribute with `gpart(8)` automatically also sets the **bootme** attribute. Multiple partitions may have the **bootonce** and **bootme** attributes set.

**bootfailed** The **bootfailed** attribute marks partitions that had the **bootonce** attribute set, but failed to boot. This attribute is managed by the system. See *BOOTING* and *POST-BOOT ACTIONS* below for details.

## USAGE

For normal usage, the user does not have to set or manage any of the partition attributes. **gptboot** will boot from the first UFS partition found.

The **bootonce** attribute can be used for testing an upgraded operating system on an already-working computer. The existing system partition is left untouched, and the new version of the operating system to be tested is installed on another partition. The **bootonce** attribute is set on that new test partition. The next boot is attempted from the test partition. Success or failure will be shown in the system log files. After a successful boot of the test partition, a user script can check the logs and change the **bootme**

attributes so the test partition becomes the new system partition. Because the **bootonce** attribute is cleared after an attempted boot, a failed boot will not leave the system attempting to boot from a partition that will never succeed. Instead, the system will boot from the older, known-working operating system that has not been modified. If the **bootme** attribute is set on any partitions, booting will be attempted from them first. If no partitions with **bootme** attributes are found, booting will be attempted from the first UFS partition found.

## BOOTING

**gptboot** first reads the partition table. All **freebsd-ufs** partitions with only the **bootonce** attribute set, indicating a failed boot, are set to **bootfailed**. **gptboot** then scans through all of the **freebsd-ufs** partitions. Boot behavior depends on the combination of **bootme** and **bootonce** attributes set on those partitions.

**bootonce + bootme**      Highest priority: booting is attempted from each of the **freebsd-ufs** partitions with both of these attributes. On each partition, the **bootme** attribute is removed and the boot attempted.

**bootme**                      Middle priority: booting is attempted from each of the **freebsd-ufs** partitions with the **bootme** attribute.

If neither **bootonce** nor **bootme** attributes are found on any partitions, booting is attempted from the first **freebsd-ufs** partition on the disk.

## POST-BOOT ACTIONS

The startup script */etc/rc.d/gptboot* checks the attributes of **freebsd-ufs** partitions on all GPT disks. Partitions with the **bootfailed** attribute generate a "boot from X failed" system log message. Partitions with only the **bootonce** attribute, indicating a partition that successfully booted, generate a "boot from X succeeded" system log message. The **bootfailed** attributes are cleared from all the partitions. The **bootonce** attribute is cleared from the partition that successfully booted. There is normally only one of these.

## FILES

*/boot/gptboot*    bootcode binary

*/boot.config*    parameters for the boot blocks (optional)

## EXAMPLES

**gptboot** is installed in a **freebsd-boot** partition, usually the first partition on the disk. A "protective MBR" (see *gpart(8)*) is typically installed in combination with **gptboot**.

Install **gptboot** on the *ada0* drive:

```
gpart bootcode -b /boot/pmbr -p /boot/gptboot -i 1 ada0
```

**gptboot** can also be installed without the PMBR:

```
gpart bootcode -p /boot/gptboot -i 1 ada0
```

Set the **bootme** attribute for partition 2:

```
gpart set -a bootme -i 2 ada0
```

Set the **bootonce** attribute for partition 2, automatically also setting the **bootme** attribute:

```
gpart set -a bootonce -i 2 ada0
```

## SEE ALSO

boot.config(5), rc.conf(5), boot(8), gpart(8)

## HISTORY

**gptboot** appeared in FreeBSD 7.1.

## AUTHORS

This manual page was written by Warren Block <wblock@FreeBSD.org>.