

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

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