

6. ### ##### 12

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 ##### ##### ##### ##### #####, #####
 ##### # ##### (##### # #####—
 #####), ##### # #####. #####
 #####, ## #####, ##### ##### ##### #
 #####, ##### # ##### #####. #
 ##### ##### ##### ##### #####, ##
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#####:

- #####.
- ##### geom_journal (##### #—
 #####).
- #####, # #####, #####
 #####, # ##### /etc/fstab.
- ##### (#####).
- #####, #####.

#####:

- #####, ##® #.
- ##### #, # #

#####.



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2.

7.X, ##
(#, #####, #####
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7.0
#####2.

geom_journal.ko #
(##) #
gjournal ##
/usr. ##
(##).

(data provider),
(journal provider).

#####

- ## /usr, ## /dev/ad0s1f,
#####
- ## /dev/ad0s1g.

- ##### gjournal, ##### /dev/ad0s1fjournal, ## #
/dev/ad0s1f #####, # /dev/ad0s1g #####.
#####.



#, ## #####, #####

(# #####, #####

#####). #

#####: #####
30% #####. #####,
1 #, #####
3.3 #. (#####
3.3 #####).

3. #####, ##### ## ##### #####

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```
##### ## ##### (##### ## ##### # # ##### ##### #####,
##### #####) ## ##### #####. ##### #####
##### ##### ##### ##### #####. ##### ##, ## #####
/usr # #####, ## ##### ##### ##### ##, ##### ##-
#####, ##### ## #####.
```

```

FreeBSD Disklabel Editor

Disk: ad0      Partition name: ad0s1      Free: 0 blocks (0MB)

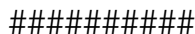
Part      Mount      Size  Newfs  Part      Mount      Size  Newfs
-----
ad0s1a    /              512MB  UFS2   Y
ad0s1b    swap          470MB  SWAP
ad0s1d    /var          1263MB UFS2+S  Y
ad0s1e    /tmp          512MB  UFS2+S  Y
ad0s1f    /usr          79151MB UFS2+S  Y

The following commands are valid here (upper or lower case):
C = Create      D = Delete      M = Mount pt.
N = Newfs Opts  Q = Finish      S = Toggle SoftUpdates  Z = Custom Newfs
T = Toggle Newfs  U = Undo      A = Auto Defaults      R = Delete+Merge

Use F1 or ? to get more help, arrow keys to select.

```

```
##### # ##### # ##### #, ##### ##### #
##### # # ##### ##### /usr. ##### ##### ##### ##### ## 1 ##
(### ## ##### ##### /usr) ### ## 2 ## (### #####
##### ## /usr, ## # /var). ## ##### ##### ##### ##### ##-
##### # ##### /usr ##### #####.
```



5

```
# #####  
### #####: /usr # /var. #####, ## #####  
#####.#####.
```

```
#####  
# #####  
# ##### # ##  
#####  
#####  
#####
```

```

FreeBSD Disklabel Editor

Disk: ad0      Partition name: ad0s1      Free: 0 blocks (0MB)

Part      Mount      Size  Newfs      Part      Mount      Size  Newfs
-----
ad0s1a    /              512MB  UFS2       Y
ad0s1b    swap           470MB  SWAP
ad0s1d    /var           1263MB UFS2+S     Y
ad0s1e    /tmp           512MB  UFS2+S     Y
ad0s1f    /usr           77103MB UFS2+S    Y
ad0s1g    swap           1024MB  SWAP
ad0s1h    swap           1024MB  SWAP

The following commands are valid here (upper or lower case):
C = Create      D = Delete      M = Mount pt.
N = Newfs Opts  Q = Finish      S = Toggle SoftUpdates  Z = Custom Newfs
T = Toggle Newfs  U = Undo      A = Auto Defaults      R = Delete+Merge

Use F1 or ? to get more help, arrow keys to select.

```

6

#####

1.

#####	#####	#####
##0#1#	/###	##0#1#
##0#1#	/###	##0#1#

#####

3.2.

#####

#####

4.

4.1. ##### gjournal

root

shutdown now

/usr # /var.

umount -/usr -/var

#####

gjournal load

#####

gjournal label ad0s1f ad0s1g

GEOM_JOURNAL: Journal 2948326772: ad0s1f contains data.
GEOM_JOURNAL: Journal 2948326772: ad0s1g contains journal.

gjournal label ad0s1d ad0s1h

GEOM_JOURNAL: Journal 3193218002: ad0s1d contains data.
GEOM_JOURNAL: Journal 3193218002: ad0s1h contains journal.



#####

(#####—
#####) #####, ##### gjournal #####
-f ### #####—
#####, #####:

gjournal label --f ad0s1d ad0s1h

#####, ##### #####
#####

#: ad0s1d.journal # ad0s1f.journal. ## #####
/var # /usr #####. #####, ## #####
#:

tuneefs --J enable --n disable ad0s1d.journal

tuneefs: gjournal set
tuneefs: soft updates cleared

tuneefs --J enable --n disable ad0s1f.journal

tuneefs: gjournal set
tuneefs: soft updates cleared

#####, ##### ##### # #####
(##### ## #, ## # ##### ##### async):

mount --o async -/dev/ad0s1d.journal -/var

mount --o async -/dev/ad0s1f.journal -/usr

/etc/fstab # ##### #: ##### #: /usr # /var:

/dev/ad0s1f.journal	-/usr	ufs	rw,async	2	2
/dev/ad0s1d.journal	-/var	ufs	rw,async	2	2

#####



#####, ### #####
#####

#####, ##### /boot/loader.conf: #####
#####(8) #####

geom_journal_load="YES"

#####! #####. #####
exit #####
(#####). ##
#####:

ad0: 76293MB XEC XE800JD-00HBC0 08.02D08 at ata0-master SATA150
GEOM_JOURNAL: Journal 2948326772: ad0s1g contains journal.
GEOM_JOURNAL: Journal 3193218002: ad0s1h contains journal.
GEOM_JOURNAL: Journal 3193218002: ad0s1d contains data.
GEOM_JOURNAL: Journal ad0s1d clean.
GEOM_JOURNAL: Journal 2948326772: ad0s1f contains data.
GEOM_JOURNAL: Journal ad0s1f clean.

#####:

GEOM_JOURNAL: Journal ad0s1d consistent.

#####, ### #####(8) #####
#####

4.2.

/dev/ad1s1d.

gjournal label ad1s1d

1 ##
-s. #####
(##### K, M ### G). ##### gjournal ##
#####

```
#####  
#####  
#####,  
#####:
```

```
# gjournal label --s 2G ad1s1d
```

```
#####,  
##### -J:
```

```
# newfs --J -/dev/ad1s1d.journal
```

4.3.

```
##### geom_journal  
#####  
#####:
```

```
options UFS_GJOURNAL #  
options GEOM_JOURNAL #
```

```
options GEOM_JOURNAL #
```

```
#####  
#  
# loader.conf
```

5.

```
#####  
#
```

```
##-  
#####: #
```

```
##-  
#####:  
#####
```

```
##-  
#####:
```

```
##-  
#####:  
#####
```

```
# cat -/boot/loader.conf
```

```
#####  
#####
```

```
##### geom_journal_load, #####,  
#####. #####,  
##### (#####  
#####).
```

```
# gjournal load
```

```
GEOM_JOURNAL: Journal 2948326772: ad0s1g contains journal.  
GEOM_JOURNAL: Journal 3193218002: ad0s1h contains journal.  
GEOM_JOURNAL: Journal 3193218002: ad0s1d contains data.  
GEOM_JOURNAL: Journal ad0s1d clean.  
GEOM_JOURNAL: Journal 2948326772: ad0s1f contains data.  
GEOM_JOURNAL: Journal ad0s1f clean.
```

```
# mount -a  
# exit  
(boot continues)
```

```
##### # geom_journal_load #####, ## /etc/fstab. #####,  
#####. # #####  
##### # #####  
#####.
```

```
##- ##### # ##### # #####  
#####: ##### # #####?
```

```
##- #####. #####  
#####: #####. ##### # #####  
#####.
```

```
##### root # ##### # #####:
```

```
# shutdown now
```

```
#####:
```

```
# umount -/usr -/var
```

```
#####:
```

```
# gjournal sync
```

```
#####:
```

```
# gjournal stop ad0s1d.journal  
# gjournal stop ad0s1f.journal
```

```
#####:
```

#####

```
# gjournal clear ad0s1d
# gjournal clear ad0s1f
# gjournal clear ad0s1g
# gjournal clear ad0s1h
```

#####:

```
# tuneefs --J disable --n enable ad0s1d
```

```
tuneefs: gjournal cleared
tuneefs: soft updates set
```

```
# tuneefs --J disable --n enable ad0s1f
```

```
tuneefs: gjournal cleared
tuneefs: soft updates set
```

(#####):

```
# mount -o rw -/dev/ad0s1d -/var
# mount -o rw -/dev/ad0s1f -/usr
```

/etc/fstab # ##### # #####:

```
/dev/ad0s1f  -/usr      ufs  rw  2  2
/dev/ad0s1d  -/var       ufs  rw  2  2
```

#####, #####, ##### geom_journal, ## ##### /boot/
loader.conf # #####.

6. ###

#####, # ###
#####, ### # #####. #####, ## #####
#####:

- ##### [#####](#), #####.
- ##### # ##### [#####](#), ##### [#####](#) [<pj@FreeBSD.org>](#) # #####(8).
- ##### # # # # # [<ivoras@FreeBSD.org>](#) # ##### [#####](#).
- ##### #####(8) # #####(8).