

Solstice Volume Manager – RAID-5

Solstice Volume Manager has the default setting of 16kB for the software RAID-5 slice. When large sequential writes are expected that value can be increased. I had chosen 512kB, a half of the maximum allowed size, because in testing I obtained higher transfer rates. As a tradeoff, in such a configuration there is slightly less useable disk space, than in a default one.

```
echo "d50 -r c1t8d0s0 c1t9d0s0 c1t10d0s0 c1t11d0s0 c1t12d0s0 -i 512k" >> tail /etc/lvm/md.tab
#
# tail /etc/lvm/md.tab
d20 -m d11
d11 1 1 c0t0d0s1
d12 1 1 c0t1d0s1
d30 -m d21
d21 1 1 c0t0d0s4
d22 1 1 c0t1d0s4
d40 -m d31
d31 1 1 c0t0d0s6
d32 1 1 c0t1d0s6
d50 -r c1t8d0s0 c1t9d0s0 c1t10d0s0 c1t11d0s0 c1t12d0s0 -i 512k
#
# metainit d50
d50: RAID is setup
#
[ On an idle system the background RAID-5 initialization process ]
[ would now take at least 45 minutes to complete. ]
#
# metastat
d40: Mirror
    Submirror 0: d31
        State: Okay
    Submirror 1: d32
        State: Okay
    Pass: 1
    Read option: roundrobin (default)
    Write option: parallel (default)
    Size: 29418687 blocks (14 GB)

d31: Submirror of d40
    State: Okay
    Size: 29418687 blocks (14 GB)
    Stripe 0:
        Device      Start Block  Dbase      State Reloc Hot Spare
        c0t0d0s6      0           No         Okay    Yes

d32: Submirror of d40
    State: Okay
    Size: 29418687 blocks (14 GB)
    Stripe 0:
        Device      Start Block  Dbase      State Reloc Hot Spare
        c0t1d0s6      0           No         Okay    Yes

d30: Mirror
    Submirror 0: d21
        State: Okay
    Submirror 1: d22
        State: Okay
    Pass: 1
    Read option: roundrobin (default)
    Write option: parallel (default)
    Size: 16776423 blocks (8.0 GB)

d21: Submirror of d30
    State: Okay
```

Size: 16776423 blocks (8.0 GB)

Stripe 0:

Device	Start	Block	Dbase	State	Reloc	Hot	Spare
c0t0d0s4		0	No	Okay	Yes		

d22: Submirror of d30

State: Okay

Size: 16776423 blocks (8.0 GB)

Stripe 0:

Device	Start	Block	Dbase	State	Reloc	Hot	Spare
c0t1d0s4		0	No	Okay	Yes		

d20: Mirror

Submirror 0: d11

State: Okay

Submirror 1: d12

State: Okay

Pass: 1

Read option: roundrobin (default)

Write option: parallel (default)

Size: 4194828 blocks (2.0 GB)

d11: Submirror of d20

State: Okay

Size: 4194828 blocks (2.0 GB)

Stripe 0:

Device	Start	Block	Dbase	State	Reloc	Hot	Spare
c0t0d0s1		0	No	Okay	Yes		

d12: Submirror of d20

State: Okay

Size: 4194828 blocks (2.0 GB)

Stripe 0:

Device	Start	Block	Dbase	State	Reloc	Hot	Spare
c0t1d0s1		0	No	Okay	Yes		

d10: Mirror

Submirror 0: d1

State: Okay

Submirror 1: d2

State: Okay

Pass: 1

Read option: roundrobin (default)

Write option: parallel (default)

Size: 20480121 blocks (9.8 GB)

d1: Submirror of d10

State: Okay

Size: 20480121 blocks (9.8 GB)

Stripe 0:

Device	Start	Block	Dbase	State	Reloc	Hot	Spare
c0t0d0s0		0	No	Okay	Yes		

d2: Submirror of d10

State: Okay

Size: 20480121 blocks (9.8 GB)

Stripe 0:

Device	Start	Block	Dbase	State	Reloc	Hot	Spare
c0t1d0s0		0	No	Okay	Yes		

d50: RAID

State: Okay

Interlace: 1024 blocks

Size: 572288064 blocks (272 GB)

Original device:

Size: 572297216 blocks (272 GB)

Device	Start Block	Dbase	State	Reloc	Hot Spare
c1t8d0s0	20426	No	Okay	Yes	
c1t9d0s0	20426	No	Okay	Yes	
c1t10d0s0	20426	No	Okay	Yes	
c1t11d0s0	20426	No	Okay	Yes	
c1t12d0s0	20426	No	Okay	Yes	

Device Relocation Information:

Device	Reloc	Device ID
c0t1d0	Yes	id1,sd@SSEAGATE_ST336607LSUN36G_3JA6W6F900007426B9YZ
c0t0d0	Yes	id1,sd@SSEAGATE_ST336607LSUN36G_3JA1EGMK00007340YZAN
c1t8d0	Yes	id1,sd@SSEAGATE_ST373307LSUN72G_3HZ67R270000741577BF
c1t9d0	Yes	id1,sd@SSEAGATE_ST373307LSUN72G_3HZ65TYJ000074148S2C
c1t10d0	Yes	id1,sd@SSEAGATE_ST373307LSUN72G_3HZ6MCEW00007424H5MM
c1t11d0	Yes	id1,sd@SSEAGATE_ST373307LSUN72G_3HZ6MCC100007424W7M2
c1t12d0	Yes	id1,sd@SSEAGATE_ST373307LSUN72G_3HZ6LAW3000074231R96

```
#
# echo y | /bin/time newfs -f 8192 -i 262144 -v /dev/md/rdsk/d50
mkfs -F ufs /dev/md/rdsk/d50 572288064 424 24 8192 8192 203 1 167 262144 t 0 -1 8 16 n
/dev/md/rdsk/d50:      572288064 sectors in 56239 cylinders of 24 tracks, 424 sectors
      279437.5MB in 722 cyl groups (78 c/g, 387.56MB/g, 1600 i/g)
```

super-block backups (for fsck -F ufs -o b=#) at:

32, 794192, 1588352, 2382512, 3176672, 3970832, 4764992, 5559152, 6353312, 7147472,

Initializing cylinder groups:

```
.....
super-block backups for last 10 cylinder groups at:
565137824, 565931984, 566726144, 567520304, 568314464, 569108624, 569902784,
570696944, 571491104, 572285264,
```

```
real      20.1
user       3.0
sys        0.3
```

```
#
#
# mount /dev/md/dsk/d50 /data
# df -k /data;df -h /data; df -o i /data
Filesystem      kbytes    used    avail capacity  Mounted on
/dev/md/dsk/d50 285988048  65560 283062608      1%    /data
Filesystem      size      used    avail capacity  Mounted on
/dev/md/dsk/d50 273G      64M    270G      1%    /data
Filesystem      iused    ifree   %iused  Mounted on
/dev/md/dsk/d50      4 1155196      0%    /data
#
# ex +/d40 /etc/vfstab
"/tmp/vfstab" 22 lines
:a
/dev/md/dsk/d50 /dev/md/rdsk/d50      /data      ufs      2      yes      -
.
:wq
"/tmp/vfstab" 23 lines
#
# cat /etc/vfstab
#device      device      mount      FS      fsck      mount      mount
#to mount    to fsck     point      type     pass      at boot   options
#
fd      -      /dev/fd fd      -      no      -
/proc    -      /proc  proc     -      no      -
/dev/md/dsk/d10 /dev/md/rdsk/d10      /      ufs      1      no      -
/dev/md/dsk/d20 -      -      swap     -      no      -
/dev/md/dsk/d30 /dev/md/rdsk/d30      /var     ufs      1      no      -
/dev/md/dsk/d40 /dev/md/rdsk/d40      /localhost ufs      2      yes     -
/dev/md/dsk/d50 /dev/md/rdsk/d50      /data    ufs      2      yes     -
#
# These two slices keep replicas of the Solaris Volume Manager
# metadvice state database.
# Under no circumstances these partitions should be resized
# or used for any other purpose.
```

```

#
#/dev/dsk/c0t0d0s7      /dev/rdisk/c0t0d0s7      /SVM      ufs      2      yes      -
#/dev/dsk/c0t1d0s7      /dev/rdisk/c0t1d0s7      /SVM      ufs      2      yes      -
#
/devices      -      /devices      devfs      -      no      -
ctfs      -      /system/contract      ctfs      -      no      -
objfs      -      /system/object      objfs      -      no      -
swap      -      /tmp      tmpfs      -      yes      -

```