

Copyright (C) 2003-12 Intel Corporation. All Rights Reserved.

RAID Volu
None defin

Physical I
ID Device
0 WDC T
1 WDC T
2 WDC T
3 WDC T
Press <CTRL-

172.30.12.200

Power

Launch

Java iKVM Viewer v1.69.21 [172.30.12.200] - Video Only - Resolution 800 X 600 - FPS 10
Virtual Media Record Macro Options User List Capture Power Control Exit

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Event Logs IPMI Boot Security Exit

Save Changes and Reset
Discard Changes and Exit
Discard Changes

Restore Defaults
Save as User Defaults
Restore User Defaults

Boot Override
IBA GE Slot 0200 v1404
USB Flash Disk 1100
UEFI: Built-in EFI Shell

←→: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Copyright (C) 2003-12 Intel Corporation. All Rights Reserved.

RAID Volume
None defined

Physical Disk
ID Device
0 WDC
1 WDC
2 WDC
3 WDC
Press <CTRL-
172.30.12.200

Java iKVM Viewer v1.69.21 [172.30.12.200] - Video Only - Resolution 752 X 413 - FPS 9
Virtual Media Record Macro Options User List Capture Power Control Exit

GNU GRUB version 2.02~beta2-36ubuntu3.7

- *Run Ubuntu - persistent live
- Try Ubuntu without installing
- Install Ubuntu
- OEM install (for manufacturers)
- Check disc for defects

Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the commands
before booting or 'c' for a command-line.

```
root@ubuntu:/etc/mdadm# echo "Create a new raid array"
```

```
Create a new raid array
```

```
root@ubuntu:/etc/mdadm# mdadm --create --verbose /dev/md2 --level=1 /dev/sda /dev/sdc
```

```
mdadm: no raid-devices specified.
```

```
root@ubuntu:/etc/mdadm# mdadm --create --verbose /dev/md2 --level=1 -n2 /dev/sda /dev/sdc
```

```
mdadm: /dev/sda appears to contain an ext2fs file system  
size=20971520K mtime=Tue Jan 31 17:22:23 2017
```

```
mdadm: Note: this array has metadata at the start and  
may not be suitable as a boot device. If you plan to  
store '/boot' on this device please ensure that  
your boot-loader understands md/v1.x metadata, or use  
--metadata=0.90
```

```
mdadm: /dev/sdc appears to contain an ext2fs file system  
size=488383620K mtime=Tue Jan 31 18:22:48 2017
```

```
mdadm: size set to 488255488K
```

```
mdadm: automatically enabling write-intent bitmap on large array
```

```
Continue creating array? y
```

```
mdadm: Defaulting to version 1.2 metadata
```

```
mdadm: array /dev/md2 started.
```

```
root@ubuntu:/etc/mdadm# █
```

```
Desktop — root@ubuntu: /etc/mdadm — ssh • ssh yavin — 80×24
~ — ssh jfrancam@ssh.cs.dixie.edu -L 5901:win-admin:5900  ~/Desktop — root@ubuntu: /etc/mdadm — ssh • ssh yavin +
root@ubuntu:/etc/mdadm# echo "Note that created a RAID level ONE array"
Note that created a RAID level ONE array
root@ubuntu:/etc/mdadm# █
```

```
Desktop — root@ubuntu: /etc/mdadm — ssh • ssh yavin — 80×24
~ — ssh jfrancom@ssh.cs.dixie.edu -L 5901:win-admin:5900  ~/Desktop — root@ubuntu: /etc/mdadm — ssh • ssh yavin +
[root@ubuntu:/etc/mdadm# cat /proc/mdstat
Personalities : [raid0] [raid6] [raid5] [raid4] [raid1]
md2 : active raid1 sdc[1] sda[0]
      488255488 blocks super 1.2 [2/2] [UU]
      [>.....]    resync =  0.8% (4208832/488255488) finish=57.5min
      speed=140294K/sec
      bitmap: 4/4 pages [16KB], 65536KB chunk

unused devices: <none>
[root@ubuntu:/etc/mdadm# echo "see the current progress of array"
see the current progress of array
root@ubuntu:/etc/mdadm# █
```

```
root@ubuntu:/etc/mdadm# ls /dev/md
md0 md1 md2
root@ubuntu:/etc/mdadm# echo "Create a filesystem on the array"
Create a filesystem on the array
root@ubuntu:/etc/mdadm# mkfs.ext4 /dev/md2
mke2fs 1.42.13 (17-May-2015)
/dev/md2 contains a ext4 file system
    last mounted on Tue Jan 31 22:19:21 2017
Proceed anyway? (y,n) y
Creating filesystem with 122063872 4k blocks and 30523392 inodes
Filesystem UUID: fd68a415-2d1c-45e8-87b8-ba2ec4f1a83d
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
    4096000, 7962624, 11239424, 20480000, 23887872, 71663616, 78675968,
    102400000

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

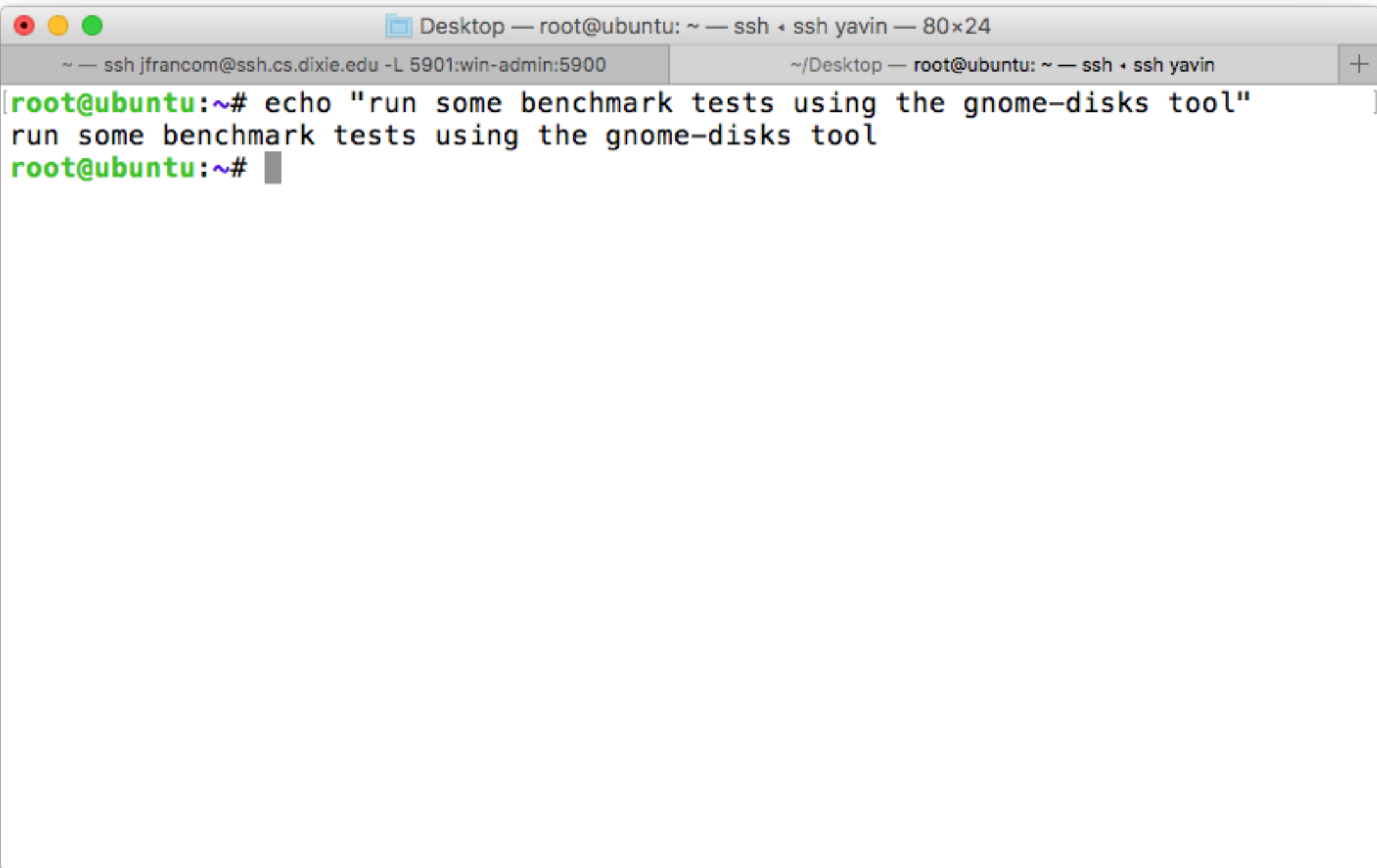
root@ubuntu:/etc/mdadm#
```

```
[root@ubuntu:~# pwd
/home/joe
[root@ubuntu:~# ls
dmraid.isw mirror raid5 stripe
[root@ubuntu:~# mount /dev/md
md0 md1 md2
[root@ubuntu:~# mount /dev/md2 mirror/
root@ubuntu:~# █
```

```
root@ubuntu:~# df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            5.9G   0 5.9G   0% /dev
tmpfs           1.2G  9.3M 1.2G   1% /run
/dev/sde4       1.5G  1.5G   0 100% /cdrom
/dev/loop0     1.4G  1.4G   0 100% /rofs
/cow            3.6G  167M 3.2G   5% /
tmpfs           5.9G  112K 5.9G   1% /dev/shm
tmpfs           5.0M   4.0K 5.0M   1% /run/lock
tmpfs           5.9G   0 5.9G   0% /sys/fs/cgroup
tmpfs           5.9G   4.0K 5.9G   1% /tmp
tmpfs           1.2G   48K 1.2G   1% /run/user/999
/dev/sde5       3.6G  167M 3.2G   5% /media/ubuntu/casper-rw
/dev/sde3       121M   54M  67M  45% /media/ubuntu/ubu1604164
/dev/sde1       2.4G   13M 2.4G   1% /media/ubuntu/usbddata
tmpfs           1.2G   0 1.2G   0% /run/user/1000
/dev/md2        459G   70M 435G   1% /home/joe/mirror
root@ubuntu:~#
```



```
Desktop — root@ubuntu: ~ — ssh • ssh yavin — 80x24
~ — ssh jfrancom@ssh.cs.dixie.edu -L 5901:win-admin:5900  ~/Desktop — root@ubuntu: ~ — ssh • ssh yavin +
root@ubuntu:~# echo "Note that since we are mirroring 2x500 G disks, my capacity
is about 500 G"
Note that since we are mirroring 2x500 G disks, my capacity is about 500 G
root@ubuntu:~# █
```

A terminal window with a title bar containing window control buttons and the text "Desktop — root@ubuntu: ~ — ssh • ssh yavin — 80x24". Below the title bar are two tabs: the first is "~ — ssh jfrancam@ssh.cs.dixie.edu -L 5901:win-admin:5900" and the second is "~/Desktop — root@ubuntu: ~ — ssh • ssh yavin". The terminal content shows a prompt "root@ubuntu:~#" followed by the command "echo \"run some benchmark tests using the gnome-disks tool\"", which is followed by the output "run some benchmark tests using the gnome-disks tool". A second prompt "root@ubuntu:~#" is shown with a cursor. The terminal text is as follows:

```
root@ubuntu:~# echo "run some benchmark tests using the gnome-disks tool"
run some benchmark tests using the gnome-disks tool
root@ubuntu:~#
```











The image shows a terminal window with a title bar that reads "joe — ssh jfranco@ssh.cs.dixie.edu -L 5901:win-admin:5900 — 80x24". Below the title bar, there are two tabs: the first is "~ — ssh jfranco@ssh.cs.dixie.edu -L 5901:win-admin:5900" and the second is "~/Desktop — joe@ubuntu: ~ — ssh jfranco@ssh.cs.dixie.edu -X". The terminal content shows a prompt "joe@yavin:~\$" followed by the command "echo \"Your screens will look a little different\"", the output "Your screens will look a little different", and a second prompt "joe@yavin:~\$" with a cursor.

```
joe@yavin:~$ echo "Your screens will look a little different"
Your screens will look a little different
joe@yavin:~$
```

500 GB RAID-1 Array

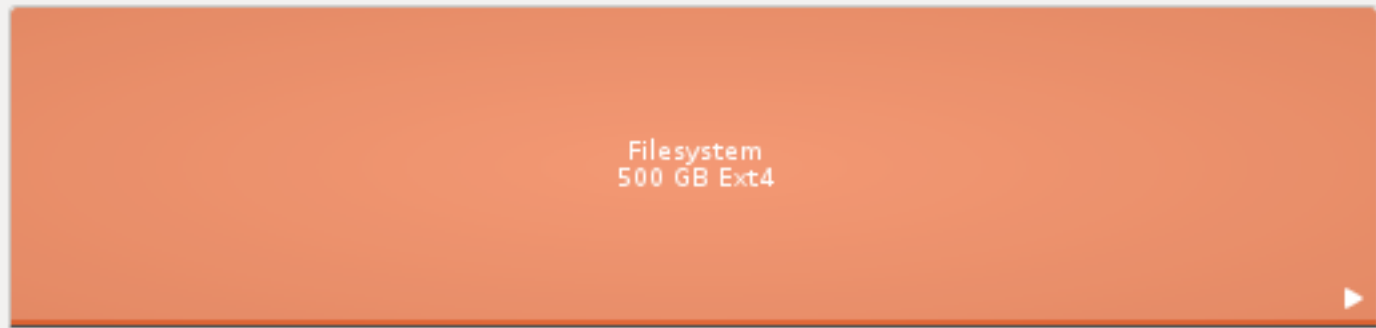
/dev/md2



-  500 GB Hard Disk
WDC WD5003ABYX-01WERA1
-  500 GB Hard Disk
WDC WD5003ABYX-01WERA1
-  500 GB Hard Disk
WDC WD5003ABYX-01WERA1
-  500 GB Hard Disk
WDC WD5003ABYX-01WERA1
-  8.0 GB Drive
USB Flash Disk
-  **500 GB RAID-1 Array**
/dev/md2
-  Block Device
/dev/md0
-  Block Device
/dev/md1
-  1.5 GB Loop Device
/cdrom/casper/filesystem.squashfs

Size 500 GB (499,973,619,712 bytes)

Volumes



Size 500 GB — 492 GB free (1.6% full)





Device /dev/md2

Contents Ext4 (version 1.0) — Mounted at </home/joe/mirror>

500 GB RAID-1 Array

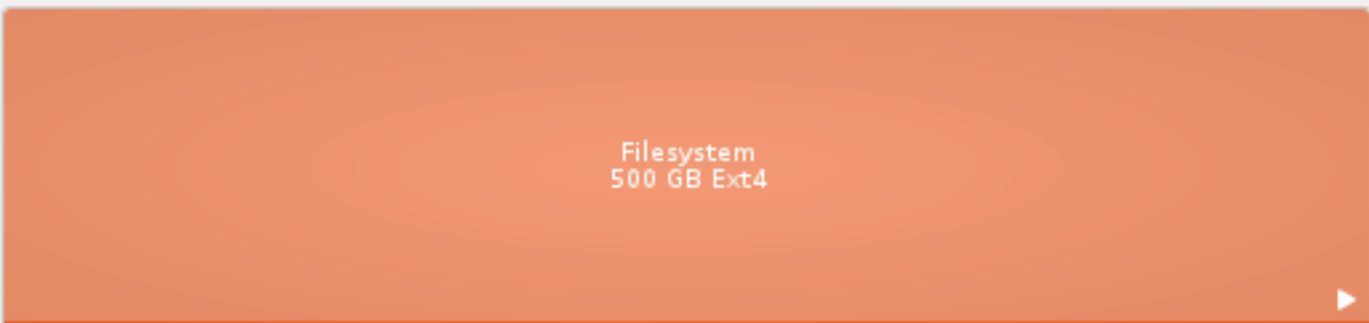
/dev/md2



-  500 GB Hard Disk
WDC WD5003ABYX-01WERA1
-  500 GB Hard Disk
WDC WD5003ABYX-01WERA1
-  500 GB Hard Disk
WDC WD5003ABYX-01WERA1
-  500 GB Hard Disk
WDC WD5003ABYX-01WERA1
-  8.0 GB Drive
USB Flash Disk
-  **500 GB RAID-1 Array**
/dev/md2
-  Block Device
/dev/md0
-  Block Device
/dev/md1
-  1.5 GB Loop Device
/cdrom/casper/filesystem.squashfs

Size 500 GB (499,973,619,712 bytes)

Volumes



Size 500 GB — 492 GB free (1.6% full)

Device /dev/md2

Contents Ext4 (version 1.0) — Mounted at [/home/joe/mirror](#)

Format Partition...

Shift+Ctrl+F

Edit Partition...

Edit Filesystem...

Change Passphrase...

Edit Mount Options...

Edit Encryption Options...

Create Partition Image...

Restore Partition Image...

Benchmark Partition...

500 GB RAID-1 Array

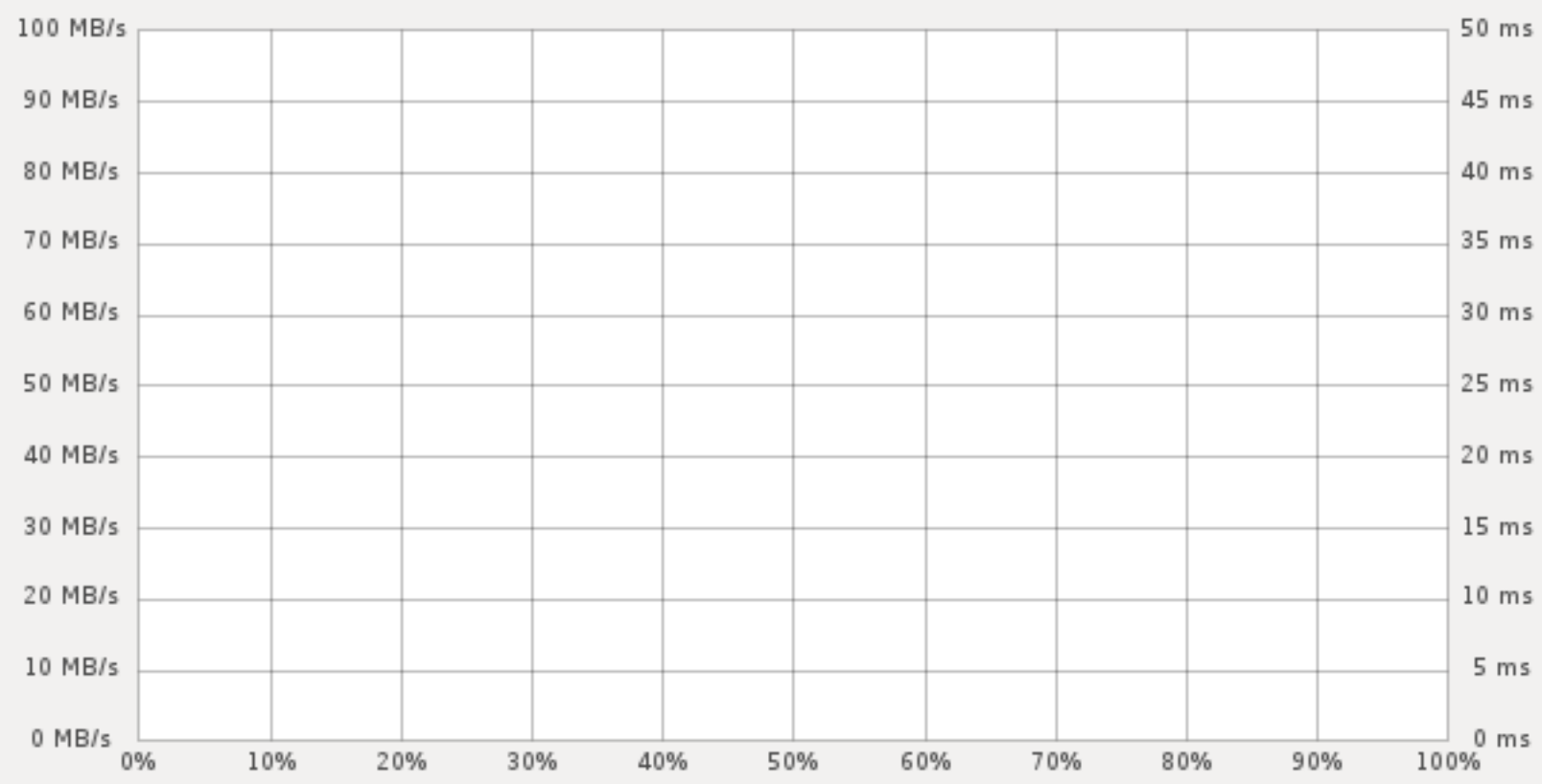
/dev/md2



- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 8.0 GB USB Flash
- 500 GB /dev/md2**
- Block Device /dev/md0
- Block Device /dev/md1
- 1.5 GB /cdrom/cdrom0

Size 500 GB (499,973,619,712 bytes)

Benchmark



Disk or Device 2 — 500 GB RAID-1 Array (/dev/md2)

Last Benchmarked No benchmark data available

Sample Size -

Average Read Rate -

Average Write Rate -

Average Access Time -

Start Benchmark...

Close

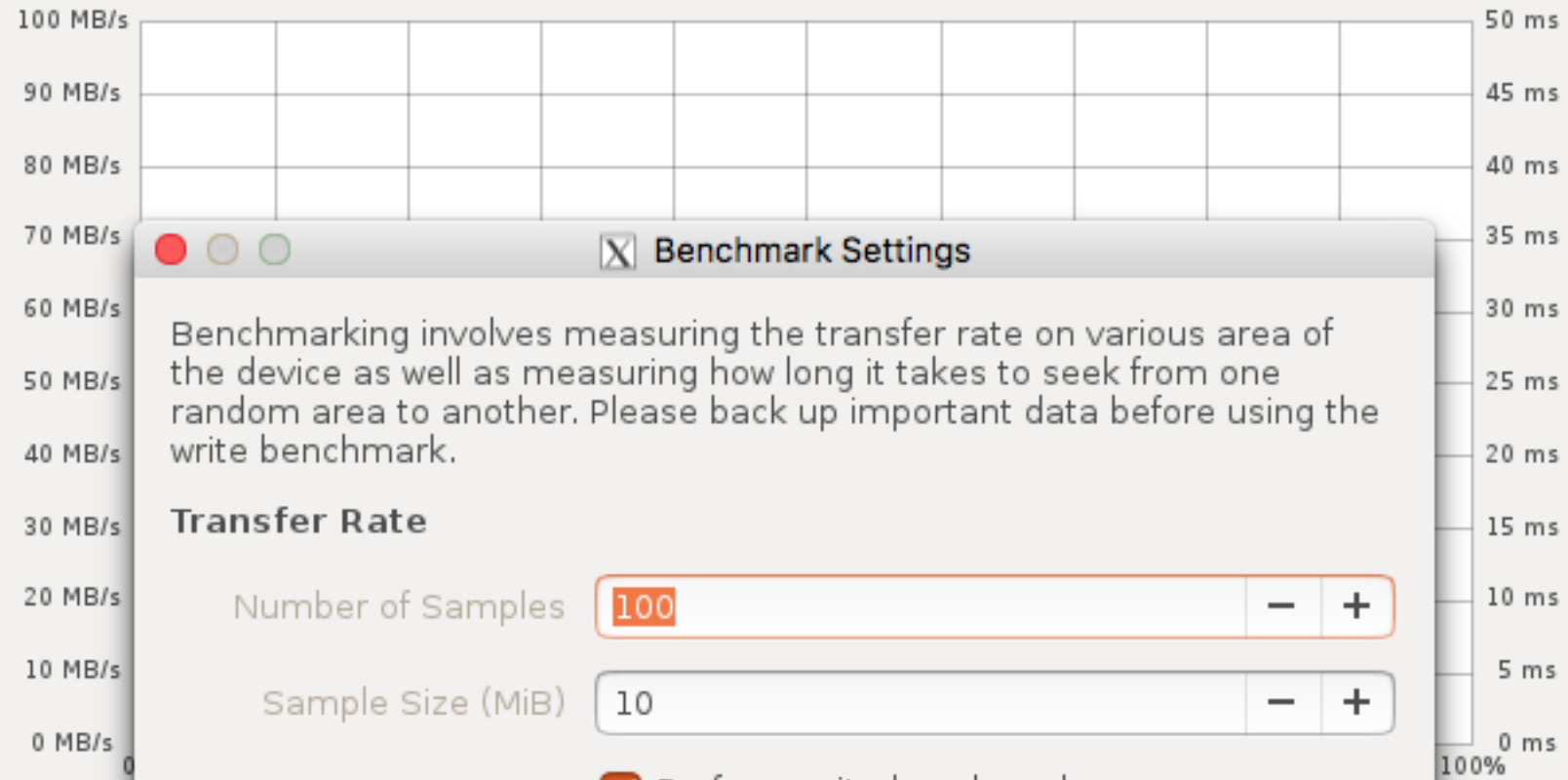
500 GB RAID-1 Array

/dev/md2



- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 8.0 GB USB Flash Drive
- 500 GB RAID-1 Array /dev/md2**
- Block Device /dev/md0
- Block Device /dev/md1
- 1.5 GB CD-ROM /cdrom/cdrom0

Size 500 GB (499,973,619,712 bytes)



Benchmark Settings

Benchmarking involves measuring the transfer rate on various area of the device as well as measuring how long it takes to seek from one random area to another. Please back up important data before using the write benchmark.

Transfer Rate

Number of Samples: - +

Sample Size (MiB): - +

Perform write-benchmark

Access Time

Number of Samples: - +

Cancel Start Benchmarking...

Start Benchmark...

Close

500 GB RAID-1 Array

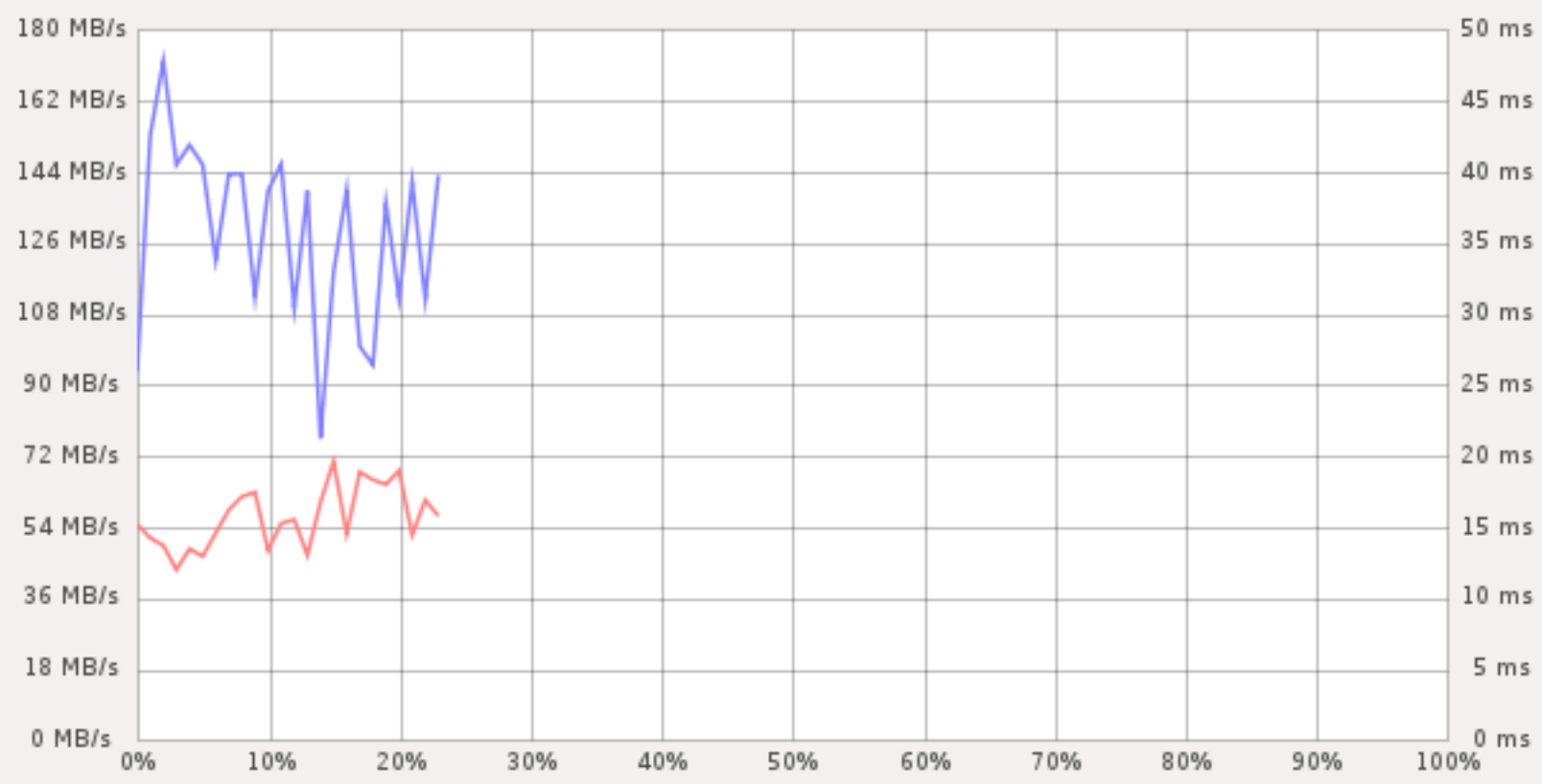
/dev/md2



- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 500 GB Hard Disk WDC WD5003ABYX-01WERA1
- 8.0 GB USB Flash
- 500 GB RAID-1 Array /dev/md2**
- Block Device /dev/md0
- Block Device /dev/md1
- 1.5 GB CD-ROM /cdrom/cdrom0

Size 500 GB (499,973,619,712 bytes)

Benchmark



Disk or Device 2 — 500 GB RAID-1 Array (/dev/md2)

Last Benchmarked Measuring transfer rate (24.0% complete)...

Sample Size 10.0 MiB (10,485,760 bytes)

Average Read Rate 128.5 MB/s (24 samples)

Average Write Rate 56.2 MB/s (23 samples)

Average Access Time -

Abort Benchmark

Close

500 GB RAID-1 Array

/dev/md2



500 GB Hard Disk
WDC WD5003ABYX-01WERA1

Size 500 GB (499,973,619,712 bytes)

500 GB Hard Disk
WDC WD5003ABYX-01WERA1

Benchmark

500 GB Hard Disk
WDC WD5003ABYX-01WERA1

500 GB Hard Disk
WDC WD5003ABYX-01WERA1

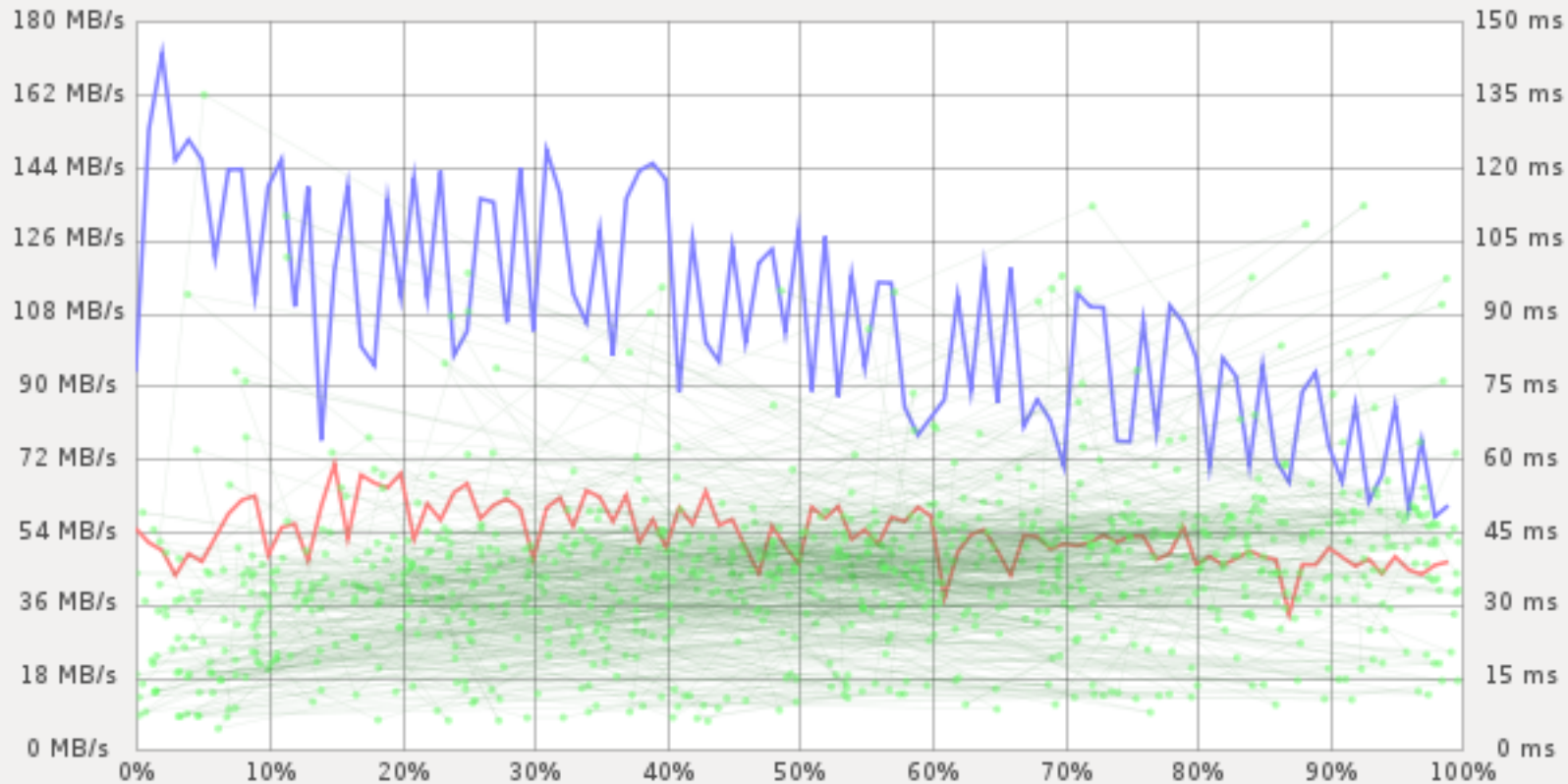
8.0 GB USB Flash
SanDisk SD9G5

500 GB RAID-1 Array
/dev/md2

Block Device
/dev/md0

Block Device
/dev/md1

1.5 GB CD-ROM
/cdrom/cdrom0



Disk or Device 2 — 500 GB RAID-1 Array (/dev/md2)

Last Benchmarked Measuring access time (92.7% complete)...

Sample Size 10.0 MiB (10,485,760 bytes)

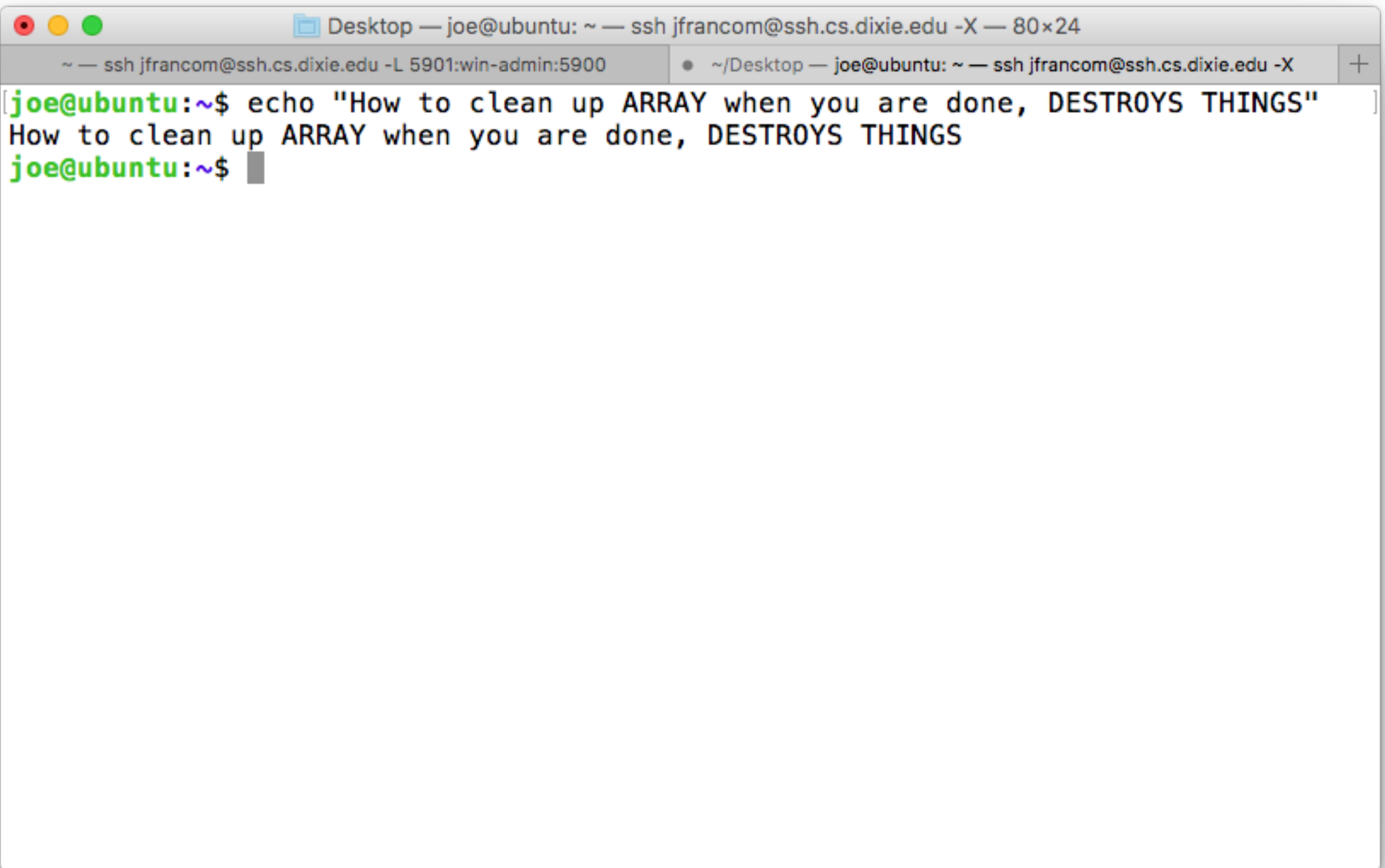
Average Read Rate 106.4 MB/s (100 samples)

Average Write Rate 53.0 MB/s (100 samples)

Average Access Time 36.03 msec (927 samples)

Abort Benchmark

Close

A terminal window with a title bar containing window control buttons and the text "Desktop — joe@ubuntu: ~ — ssh jfrancom@ssh.cs.dixie.edu -X — 80x24". Below the title bar are two tabs: the first is active and shows "~ — ssh jfrancom@ssh.cs.dixie.edu -L 5901:win-admin:5900", the second is inactive and shows "~/Desktop — joe@ubuntu: ~ — ssh jfrancom@ssh.cs.dixie.edu -X". The terminal content shows a command being executed: "joe@ubuntu:~\$ echo "How to clean up ARRAY when you are done, DESTROYS THINGS"". The output of the command is "How to clean up ARRAY when you are done, DESTROYS THINGS". The prompt "joe@ubuntu:~\$" is shown again on the next line with a cursor.

```
Desktop — joe@ubuntu: ~ — ssh jfrancom@ssh.cs.dixie.edu -X — 80x24
~ — ssh jfrancom@ssh.cs.dixie.edu -L 5901:win-admin:5900  ● ~/Desktop — joe@ubuntu: ~ — ssh jfrancom@ssh.cs.dixie.edu -X +
joe@ubuntu:~$ echo "How to clean up ARRAY when you are done, DESTROYS THINGS"
How to clean up ARRAY when you are done, DESTROYS THINGS
joe@ubuntu:~$ █
```



Desktop — joe@ubuntu: ~ — ssh jfrancom@ssh.cs.dixie.edu -X — 80×24

~ — ssh jfrancom@ssh.cs.dixie.edu -L 5901:win-admin:5900

~/Desktop — joe@ubuntu: ~ — ssh jfrancom@ssh.cs.dixie.edu -X



```
joe@ubuntu:~$ sudo mdadm -QD /dev/md2
```

```
Desktop — joe@ubuntu: ~ — ssh jfrancom@ssh.cs.dixie.edu -X — 80x24
~ — ssh jfrancom@ssh.cs.dixie.edu -L 5901:win-admin:5900  ~/Desktop — joe@ubuntu: ~ — ssh jfrancom@ssh.cs.dixie.edu -X +
Used Dev Size : 488255488 (465.64 GiB 499.97 GB)
Raid Devices : 2
Total Devices : 2
Persistence : Superblock is persistent

Intent Bitmap : Internal

Update Time : Tue Jan 31 22:38:13 2017
State : active, resyncing
Active Devices : 2
Working Devices : 2
Failed Devices : 0
Spare Devices : 0

Resync Status : 11% complete

Name : ubuntu:2 (local to host ubuntu)
UUID : 57cdb6b9:4ea0e1f9:7a1bef08:51aa6249
Events : 111

Number Major Minor RaidDevice State
0 8 0 0 active sync /dev/sda
1 8 32 1 active sync /dev/sdc
joe@ubuntu:~$
```

```
joe@ubuntu:~$ echo "Mine isn't even done resyncing yet... oh well!"
```

```
Mine isn't even done resyncing yet... oh well!
```

```
joe@ubuntu:~$ sudo mdadm --stop /dev/md2
```

```
mdadm: stopped /dev/md2
```

```
joe@ubuntu:~$ sudo mdadm --remove /dev/md2
```

```
joe@ubuntu:~$ sudo mdadm --zero-superblock /dev/sd[abcd]
```

```
mdadm: Unrecognised md component device - /dev/sdb
```

```
mdadm: Unrecognised md component device - /dev/sdd
```

```
joe@ubuntu:~$ █
```

```
joe@ubuntu:~$ sudo mdadm -QD /dev/md2
```

```
/dev/md2:
```

```
Version :
```

```
Raid Level : raid0
```

```
Total Devices : 0
```

```
State : inactive
```

```
Number Major Minor RaidDevice
```

```
joe@ubuntu:~$ █
```

```
joe@ubuntu:~$ sudo mdadm -QD /dev/md2
```

```
/dev/md2:
```

```
Version :
```

```
Raid Level : raid0
```

```
Total Devices : 0
```

```
State : inactive
```

```
Number Major Minor RaidDevice
```

```
joe@ubuntu:~$ cat /proc/mdstat
```

```
Personalities : [raid0] [raid6] [raid5] [raid4] [raid1]
```

```
unused devices: <none>
```

```
joe@ubuntu:~$ █
```