

FreeNAS - Bug #35065

Checksum Errors with certain SSD

06/15/2018 12:21 PM - Pasqualino Casciano

Status: Closed	
Priority: No priority	
Assignee: Alexander Motin	
Category: Hardware	
Target version: Backlog	
Seen in: 11.2-RC1	Needs Merging: Yes
Severity: Med High	Needs Automation: No
Reason for Closing:	Support Suite Ticket: n/a
Reason for Blocked:	Hardware Configuration: FreeNAS-11.1 CPU Intel(R) Xeon(R) CPU E3-1220 v5 @ 3.00GHz RAM 2 x Crucial 16GB Single 2133MT/s DDR4 PC4-17000 Dual Ranked x8 ECC DIMM HDD 4 x WD Red 2 TB 3.5" Power Supply Seasonic Platinum 400 Motherboard Supermicro X11SSM-F Boot Disk SANDisk SSD Plus 2.5" Case Fractal Define R5 Black (Midi Tower)
Needs QA: Yes	ChangeLog Required: No
Needs Doc: Yes	
Description	
Three user have reported recently problems with SANDisk SSD Plus 2.5" (http://a.co/0MMTCCH) and one user has reported similar problems with 3D Nand (http://a.co/4iN15b). These SSD have in common that they both use a Silicon Motion Controller (SM2246 respectively SM2256 or some variant of them).	
https://forums.freenas.org/index.php?threads/boot-disk.63829/ https://forums.freenas.org/index.php?threads/freenas-installer-sandisk-ssd-checksum-errors.64049/#post-461659 https://forums.freenas.org/index.php?threads/transcend-ssd-boot-disk-zfs-checksum-errors.64321/#post-461500	
Related issues:	
Has duplicate FreeNAS - Bug #39035: It does not support SanDisk SSD	Closed

History

#1 - 06/15/2018 12:24 PM - Pasqualino Casciano

- Hardware Configuration updated

#2 - 06/15/2018 12:47 PM - Dru Lavigne

- Status changed from Unscreened to Blocked

- Private changed from No to Yes

- Reason for Blocked set to Need additional information from Author

Please have one of those users (if you're not one of them) upload a debug from an affected system as we'll need that to diagnose what is going on.

#3 - 06/15/2018 12:58 PM - Pasqualino Casciano

I don't think that any of us has a system running with a faulty SSD as Boot device. The whole point is actually that the system is not usable with a corrupted SSD disk. I suggest that you buy a SANDisk SSD Plus 2.5" an reproduce it directly. It happend to three of us so the likelihood that it happens to you as well is extremely high. If you want to tackle this problem I don't think that there is any other way.

#4 - 06/15/2018 01:00 PM - Dru Lavigne

- Status changed from Blocked to Unscreened
- Assignee changed from Release Council to Alexander Motin
- Reason for Blocked deleted (Need additional information from Author)

Over to Sasha for his thoughts.

#5 - 06/15/2018 01:00 PM - Dru Lavigne

- Seen in changed from 11.0-U4 to 11.1-U5

#6 - 06/15/2018 01:02 PM - Pasqualino Casciano

- Hardware Configuration updated

#7 - 06/15/2018 01:06 PM - Pasqualino Casciano

- Hardware Configuration updated

Sorry, I just copy&pasted my current configuration in the Hardware Configuration Text-Box. The problem was actually observed with FreeNAS-11.1 (that's what's on the installation disk when you download it). Only later - when I found a working SSD - I updated from FreeNAS 11.1 to U5.

#8 - 06/15/2018 01:07 PM - Pasqualino Casciano

- Hardware Configuration updated

#9 - 06/15/2018 02:08 PM - Alexander Motin

- Status changed from Unscreened to Blocked
- Reason for Blocked set to Waiting for feedback

Just a guess, there were some SSDs on the market with broken TRIM or NCQ TRIM implementations, corrupting the data. It would be useful to find out whether problem is reproducible with TRIM forcefully disabled with `vfs.zfs.trim.enabled=0` loader tunable. If that help, I may need more detailed information about the SSDs (like `camcontrol identify /dev/ada0 -v`) to add them into exceptions list.

#10 - 06/16/2018 05:23 AM - Pasqualino Casciano

- Private changed from Yes to No

#11 - 06/16/2018 05:35 AM - Pasqualino Casciano

- Seen in changed from 11.1-U5 to 11.1

I have sent back both SSD that did not work. So, I cannot provide you with the requested information. I have however requested other users that still have or might have such and SSD to provide the necessary information.

#12 - 06/17/2018 01:23 AM - jon atkins

Hi, I'm one of the original users hit with this issue, using a Transcend SSD.

As I have the boot SSD mirrored with an old HDD, the system remains stable, so I can run some tests.

I'll try the disabled-trim tests mentioned above when I get a chance, but here's the "camcontrol identify" output for now.

```
# camcontrol identify /dev/ada1 -v
camcontrol: sending ATA ATA_IDENTIFY with timeout of 30000 msecs
pass9: Raw identify data:
 0: 0040 3fff c837 0010 0000 0240 003f 0000
 8: 0000 0000 3339 3139 3734 4530 4431 3038
16: 3733 3030 3030 3237 0000 ffff 0004 4e30
```

```

24: 3131 3345 3120 5453 3136 4753 5344 3633
32: 3020 2020 2020 2020 2020 2020 2020 2020
40: 2020 2020 2020 2020 2020 2020 2020 8001
48: 0000 0f00 4000 0200 0000 0007 3fff 0010
56: 003f fc10 00fb 0101 40b0 01dd 0000 0007
64: 0003 0078 0078 0078 0078 4000 0000 0000
72: 0000 0000 0000 001f 0306 0000 0048 0040
80: 03f0 0000 742b 7500 4020 7429 3400 4022
88: 407f 0003 0000 0000 fffe 0000 0000 0000
96: 0000 0000 0000 0000 40b0 01dd 0000 0000
104: 0000 0100 0000 0000 0000 0000 0000 0000
112: 0000 0000 0000 0000 0000 0000 0000 0000
120: 0000 0000 0000 0000 0000 0000 0000 0000
128: 0009 5452 414e 5343 454e 4400 0000 0000
136: 0000 0000 0000 0000 0000 0000 0000 0000
144: 0000 0000 0000 0000 0000 0000 0000 0000
152: 0000 0000 0000 0000 0000 0000 0000 0000
160: 0000 0000 0000 0000 0000 0000 0000 0000
168: 0000 0001 0000 0000 0000 0000 0000 0000
176: 0000 0000 0000 0000 0000 0000 0000 0000
184: 0000 0000 0000 0000 0000 0000 0000 0000
192: 0000 0000 0000 0000 0000 0000 0000 0000
200: 0000 0000 0000 0000 0000 0000 0000 0000
208: 0000 4000 0000 0000 0000 0000 0000 0000
216: 0000 0001 0000 0000 0000 0000 1020 0000
224: 0000 0000 0000 0000 0000 0000 0000 0000
232: 0000 0000 0000 0000 0000 0000 0000 0000
240: 0000 0000 0000 0000 0000 0000 0000 0000
248: 0000 0000 0000 0000 0000 0000 0000 a8a5

```

camcontrol: sending ATA_READ_NATIVE_MAX_ADDRESS48 with timeout of 1000 msec

pass9: Raw native max data:

```
0: 5000 af00 dd40 0140 0000 0000
```

error = 0x00, sector_count = 0x0000, device = 0x40, status = 0x50

pass9: <TS16GSSD630 N0113E1> ACS-2 ATA SATA 2.x device

pass9: 300.000MB/s transfers (SATA 2.x, UDMA6, PIO 512bytes)

```

protocol          ATA/ATAPI-9 SATA 2.x
device model      TS16GSSD630
firmware revision N0113E1
serial number     391974E0D10873000027
cylinders         16383
heads             16
sectors/track     63
sector size       logical 512, physical 512, offset 0
LBA supported     31277232 sectors
LBA48 supported   31277232 sectors
PIO supported     PIO4
DMA supported     WDMA2 UDMA6
media RPM         non-rotating

```

Feature	Support	Enabled	Value	Vendor
read ahead	no	no		
write cache	yes	yes		
flush cache	yes	yes		
overlap	no			
Tagged Command Queuing (TCQ)	no	no		
Native Command Queuing (NCQ)	yes		32 tags	
NCQ Queue Management	no			
NCQ Streaming	no			
Receive & Send FPDMA Queued	no			
SMART	yes	yes		
microcode download	no	no		
security	yes	no		
power management	yes	yes		
advanced power management	no	no		
automatic acoustic management	no	no		
media status notification	no	no		
power-up in Standby	no	no		
write-read-verify	no	no		
unload	no	no		
general purpose logging	yes	yes		
free-fall	no	no		
Data Set Management (DSM/TRIM)	yes			
DSM - max 512byte blocks	yes		256	

DSM - deterministic read	yes		any value
Host Protected Area (HPA)	yes	no	31277232/31277232
HPA - Security	no		

#13 - 06/17/2018 04:27 AM - anm nz

I am another of the users who reported this issue on the FreeNAS forums.

Disabling TRIM by setting `vfs.zfs.trim.enabled=0` appears to fix the problem.

I have just re-tested installing FreeNAS 11.1-U5 to a SanDisk "SSD Plus 120GB" SSD. With no extra tunables set, a post-install scrub of the "freenas-boot" pool produced >100 checksum errors, which is consistent with previous installs on this SSD. When I ran the installer with `vfs.zfs.trim.enabled=0` set (by editing the boot configuration in GRUB) a post-install scrub produced no errors.

(Here is my original report in the FreeNAS forums which details the testing I previously did:
<https://forums.freenas.org/index.php?threads/freenas-installer-sandisk-ssd-checksum-errors.64049/>)

Here is the output of `camcontrol identify -v` for this SSD:

```
# camcontrol identify /dev/ada2 -v
camcontrol: sending ATA ATA_IDENTIFY with timeout of 30000 msec
pass6: Raw identify data:
 0: 0040 3fff c837 0010 0000 0000 003f 0000
 8: 0000 0000 3138 3039 3136 3830 3435 3536
16: 2020 2020 2020 2020 0000 0000 0000 5545
24: 3336 3030 524c 5361 6e44 6973 6b20 5353
32: 4420 504c 5553 2031 3230 2047 4220 2020
40: 2020 2020 2020 2020 2020 2020 2020 8001
48: 4000 2f00 4000 0200 0000 0006 3fff 0010
56: 003f fc10 00fb 9101 8000 0df9 0000 0007
64: 0003 0078 0078 0078 0078 5e00 0000 0000
72: 0000 0000 0000 001f 850e 0004 0148 0040
80: 03f0 0110 346b 7d09 4123 3469 bc01 4123
88: 407f 0001 0000 0000 fffe 0000 0000 0000
96: 0000 0000 0000 0000 8000 0df9 0000 0000
104: 0000 0008 4000 0000 5001 b448 b6e8 594e
112: 0000 0000 0000 0000 0000 0000 0000 411c
120: 401c 0000 0000 0000 0000 0000 0000 0000
128: 0009 0000 0000 0000 0000 0000 0000 0000
136: 0000 0000 0000 0000 0000 0000 0000 0000
144: 0000 0000 0000 0000 0000 0000 0000 0000
152: 0000 0000 0000 0000 0000 0000 0000 0000
160: 0000 0000 0000 0000 0000 0000 0000 0000
168: 0003 0001 0000 0000 0000 0000 0000 0000
176: 2020 2020 2020 2020 2020 2020 2020 2020
184: 2020 2020 2020 2020 2020 2020 2020 2020
192: 2020 2020 2020 2020 2020 2020 2020 2020
200: 2020 2020 2020 2020 2020 2020 0000 0000
208: 0000 4000 0000 0000 0000 0000 0000 0000
216: 0000 0001 0000 0000 0000 0000 10ff 0000
224: 0000 0000 0000 0000 0000 0000 0000 0000
232: 0000 0000 0010 0010 0000 0000 0000 0000
240: 0000 0000 0000 0000 0000 0000 0000 0000
248: 0000 0000 0000 0000 0000 0000 0000 f9a5

camcontrol: sending ATA READ_NATIVE_MAX_ADDRESS48 with timeout of 1000 msec
pass6: Raw native max data:
 0: 5000 ff00 f97f 0d40 0000 0000
error = 0x00, sector_count = 0x0000, device = 0x40, status = 0x50
pass6: <SanDisk SSD PLUS 120 GB UE3600RL> ACS-2 ATA SATA 3.x device
pass6: 300.000MB/s transfers (SATA 2.x, UDMA6, PIO 512bytes)

protocol          ATA/ATAPI-9 SATA 3.x
device model      SanDisk SSD PLUS 120 GB
firmware revision UE3600RL
serial number     180916804556
WWN               5001b448b6e8594e
cylinders         16383
heads             16
sectors/track     63
sector size       logical 512, physical 512, offset 0
```

```

LBA supported      234455040 sectors
LBA48 supported   234455040 sectors
PIO supported      PIO4
DMA supported      WDMA2 UDMA6
media RPM          non-rotating

```

Feature	Support	Enabled	Value	Vendor
read ahead	yes	yes		
write cache	yes	yes		
flush cache	yes	yes		
overlap	no			
Tagged Command Queuing (TCQ)	no	no		
Native Command Queuing (NCQ)	yes		32 tags	
NCQ Queue Management	no			
NCQ Streaming	no			
Receive & Send FPDMA Queued	no			
SMART	yes	yes		
microcode download	yes	yes		
security	yes	no		
power management	yes	yes		
advanced power management	yes	no	0/0x00	
automatic acoustic management	no	no		
media status notification	no	no		
power-up in Standby	no	no		
write-read-verify	no	no		
unload	no	no		
general purpose logging	yes	yes		
free-fall	no	no		
Data Set Management (DSM/TRIM)	yes			
DSM - max 512byte blocks	yes		8	
DSM - deterministic read	yes		any value	
Host Protected Area (HPA)	yes	no	234455040/234455040	
HPA - Security	no			

#

#14 - 06/17/2018 04:52 AM - Eric Loewenthal

FWIW, I installed vanilla FreeBSD 11.1 on one of these SSDs recently and have no problems to report. However, mine has firmware UE3000RL. Rest of output is identical, apart from Serial/IDs.

#15 - 06/17/2018 08:41 PM - jon atkins

jon atkins wrote:

I'll try the disabled-trim tests mentioned above when I get a chance,

Finally had a chance to try this - and yes, turning off trim has fixed the issue on my Transcend SSD.

#16 - 06/18/2018 04:57 AM - Dru Lavigne

- Status changed from Blocked to Unscreened
- Reason for Blocked deleted (Waiting for feedback)

#17 - 06/18/2018 08:32 AM - Alexander Motin

- Status changed from Unscreened to Screened
- Severity changed from New to Med High

Looking on above identify data, none of the devices support NCQ TRIM, which was my original thought. Regular non-NCQ TRIM is not a new feature, so I would expect it to be more working. I've got one SanDisk SSD PLUS 120 GB with exactly the same UE3600RL firmware as above. I'll try to reproduce the issue as time permit (no idea when). Until that any more statistics are welcome what other SSDs are made on that crappy platform.

#18 - 06/29/2018 08:31 AM - rui silva

I can confirm that with firmware UE4500RL the situation is still the same but the setting "vfs.zfs.trim.enabled=0" did not fix the issue for me on FreeNAS-9.10.2-U6 (561f0d7a1).

#19 - 07/23/2018 08:43 AM - Alexander Motin

- Has duplicate Bug #39035: It does not support SanDisk SSD added

#20 - 07/23/2018 08:43 AM - Alexander Motin

- Has duplicate deleted (Bug #39035: It does not support SanDisk SSD)

#21 - 07/23/2018 08:44 AM - Alexander Motin

- Has duplicate Bug #39035: It does not support SanDisk SSD added

#22 - 07/24/2018 11:49 AM - Jeff Chen

I tried to use two WD Green 120GB SSD as my boot drive and had the same error. As soon as the installation finished, data started corrupting. Interestingly, the corruption doesn't happen when I use these drives as L2ARC (yet).

Here are the details of my drive:

```
camcontrol: sending ATA ATA_IDENTIFY with timeout of 30000 msecs
pass6: Raw identify data:
 0: 0040 3fff c837 0010 0000 0000 003f 0000
 8: 0000 0000 3138 3038 4143 3830 3032 3034
16: 2020 2020 2020 2020 0000 0000 0000 5545
24: 3336 3030 3030 5744 4320 5744 5331 3230
32: 4732 4730 412d 3030 4a48 3330 2020 2020
40: 2020 2020 2020 2020 2020 2020 2020 8001
```

```

48: 4000 2f00 4000 0200 0000 0006 3fff 0010
56: 003f fc10 00fb 9101 8000 0df9 0000 0007
64: 0003 0078 0078 0078 0078 5e00 0000 0000
72: 0000 0000 0000 001f 850e 0006 0148 0040
80: 03f0 0110 346b 7d09 4123 3469 bc01 4123
88: 407f 0001 0000 0000 fffe 0000 0000 0000
96: 0000 0000 0000 0000 8000 0df9 0000 0000
104: 0000 0008 4000 0000 5001 b448 b6e6 add4
112: 0000 0000 0000 0000 0000 0000 0000 411c
120: 401c 0000 0000 0000 0000 0000 0000 0000
128: 0001 0000 0000 0000 0000 0000 0000 0000
136: 0000 0000 0000 0000 0000 0000 0000 0000
144: 0000 0000 0000 0000 0000 0000 0000 0000
152: 0000 0000 0000 0000 0000 0000 0000 0000
160: 0000 0000 0000 0000 0000 0000 0000 0000
168: 0003 0001 0000 0000 0000 0000 0000 0000
176: 2020 2020 2020 2020 2020 2020 2020 2020
184: 2020 2020 2020 2020 2020 2020 2020 2020
192: 2020 2020 2020 2020 2020 2020 2020 2020
200: 2020 2020 2020 2020 2020 2020 0000 0000
208: 0000 4000 0000 0000 0000 0000 0000 0000
216: 0000 0001 0000 0000 0000 0000 10ff 0000
224: 0000 0000 0000 0000 0000 0000 0000 0000
232: 0000 0000 0010 0010 0000 0000 0000 0000
240: 0000 0000 0000 0000 0000 0000 0000 0000
248: 0000 0000 0000 0000 0000 0000 0000 7ca5

```

camcontrol: sending ATA_READ_NATIVE_MAX_ADDRESS48 with timeout of 1000 msec

pass6: Raw native max data:

```
0: 5000 ff00 f97f 0d40 0000 0000
```

error = 0x00, sector_count = 0x0000, device = 0x40, status = 0x50

pass6: <WDC WDS120G2G0A-00JH30 UE360000> ACS-2 ATA SATA 3.x device

pass6: 600.000MB/s transfers (SATA 3.x, UDMA6, PIO 512bytes)

```

protocol          ATA/ATAPI-9 SATA 3.x
device model      WDC WDS120G2G0A-00JH30
firmware revision UE360000
serial number     1808AC800204
WWN               5001b448b6e6add4
cylinders         16383
heads            16
sectors/track     63
sector size       logical 512, physical 512, offset 0
LBA supported     234455040 sectors
LBA48 supported   234455040 sectors
PIO supported     PIO4
DMA supported     WDMA2 UDMA6
media RPM         non-rotating

```

Feature	Support	Enabled	Value	Vendor
read ahead	yes	yes		
write cache	yes	yes		
flush cache	yes	yes		
overlap	no			
Tagged Command Queuing (TCQ)	no	no		
Native Command Queuing (NCQ)	yes		32 tags	
NCQ Queue Management	no			
NCQ Streaming	no			
Receive & Send FPDMA Queued	no			
SMART	yes	yes		
microcode download	yes	yes		
security	yes	no		
power management	yes	yes		
advanced power management	yes	no	0/0x00	
automatic acoustic management	no	no		
media status notification	no	no		
power-up in Standby	no	no		
write-read-verify	no	no		
unload	no	no		
general purpose logging	yes	yes		
free-fall	no	no		
Data Set Management (DSM/TRIM)	yes			
DSM - max 512byte blocks	yes		8	
DSM - deterministic read	yes		any value	
Host Protected Area (HPA)	yes	no	234455040/234455040	

I'm going to try the loader option to disable TRIM and report back the result.

#23 - 07/28/2018 08:20 PM - Jeff Chen

I can confirm that the loader tunable `vfs.zfs.trim.enabled=0` worked for me. Been running the machine for a couple of days and never any problem again.

#24 - 08/09/2018 04:22 AM - Jason Poff

- Seen in changed from 11.1 to 11.2-BETA1

```
freenas# camcontrol identify /dev/ada5 -v
camcontrol: sending ATA ATA_IDENTIFY with timeout of 30000 msec
pass13: Raw identify data:
 0: 0040 3fff c837 0010 0000 0000 003f 0000
 8: 0000 0000 3138 3131 3032 3830 3439 3233
16: 2020 2020 2020 2020 0000 0000 0000 5545
24: 3336 3030 524c 5361 6e44 6973 6b20 5353
32: 4420 504c 5553 2031 3230 2047 4220 2020
40: 2020 2020 2020 2020 2020 2020 2020 8001
48: 4000 2f00 4000 0200 0000 0006 3fff 0010
56: 003f fc10 00fb 9101 8000 0df9 0000 0007
64: 0003 0078 0078 0078 0078 5e00 0000 0000
72: 0000 0000 0000 001f 850e 0006 0148 0040
80: 03f0 0110 346b 7d09 4123 3469 bc01 4123
88: 407f 0001 0000 0000 fffe 0000 0000 0000
96: 0000 0000 0000 0000 8000 0df9 0000 0000
104: 0000 0008 4000 0000 5001 b448 b6e3 cef9
112: 0000 0000 0000 0000 0000 0000 0000 411c
120: 401c 0000 0000 0000 0000 0000 0000 0000
128: 0009 0000 0000 0000 0000 0000 0000 0000
136: 0000 0000 0000 0000 0000 0000 0000 0000
144: 0000 0000 0000 0000 0000 0000 0000 0000
152: 0000 0000 0000 0000 0000 0000 0000 0000
160: 0000 0000 0000 0000 0000 0000 0000 0000
168: 0003 0001 0000 0000 0000 0000 0000 0000
176: 2020 2020 2020 2020 2020 2020 2020 2020
184: 2020 2020 2020 2020 2020 2020 2020 2020
192: 2020 2020 2020 2020 2020 2020 2020 2020
200: 2020 2020 2020 2020 2020 2020 0000 0000
208: 0000 4000 0000 0000 0000 0000 0000 0000
216: 0000 0001 0000 0000 0000 0000 10ff 0000
224: 0000 0000 0000 0000 0000 0000 0000 0000
232: 0000 0000 0010 0010 0000 0000 0000 0000
240: 0000 0000 0000 0000 0000 0000 0000 0000
248: 0000 0000 0000 0000 0000 0000 0000 eaa5

camcontrol: sending ATA READ_NATIVE_MAX_ADDRESS48 with timeout of 1000 msec
pass13: Raw native max data:
 0: 5000 ff00 f97f 0d40 0000 0000
error = 0x00, sector_count = 0x0000, device = 0x40, status = 0x50
pass13: <SanDisk SSD PLUS 120 GB UE3600RL> ACS-2 ATA SATA 3.x device
pass13: 600.000MB/s transfers (SATA 3.x, UDMA6, PIO 512bytes)

protocol          ATA/ATAPI-9 SATA 3.x
device model      SanDisk SSD PLUS 120 GB
firmware revision UE3600RL
serial number     181102804923
WWN               5001b448b6e3cef9
cylinders         16383
heads             16
sectors/track     63
```

```

sector size          logical 512, physical 512, offset 0
LBA supported        234455040 sectors
LBA48 supported      234455040 sectors
PIO supported        PIO4
DMA supported        WDMA2 UDMA6
media RPM            non-rotating
Zoned-Device Commands no

```

Feature	Support	Enabled	Value	Vendor
read ahead	yes	yes		
write cache	yes	yes		
flush cache	yes	yes		
overlap	no			
Tagged Command Queuing (TCQ)	no	no		
Native Command Queuing (NCQ)	yes		32 tags	
NCQ Queue Management	no			
NCQ Streaming	no			
Receive & Send FPDMA Queued	no			
SMART	yes	yes		
microcode download	yes	yes		
security	yes	no		
power management	yes	yes		
advanced power management	yes	no	0/0x00	
automatic acoustic management	no	no		
media status notification	no	no		
power-up in Standby	no	no		
write-read-verify	no	no		
unload	no	no		
general purpose logging	yes	yes		
free-fall	no	no		
Data Set Management (DSM/TRIM)	yes			
DSM - max 512byte blocks	yes		8	
DSM - deterministic read	yes		any value	
Host Protected Area (HPA)	yes	no	234455040/234455040	
HPA - Security	no			

I have the same error with 11.2-BETA1.

The Issue only affects the boot drives. No other zfs pool has this error.

I have 6 of these SSDs installed. 2 as mirrored boot drives and 4 as a separate pool for VMs.

The VM Pool works fine, the boot pool is throwing checksum errors but continues to work (for now).

The loader tunable `vfs.zfs.trim.enabled=0` did not work for me.

I did not try reinstalling with this setting.

#25 - 08/09/2018 09:05 AM - Alexander Motin

Jason Poff wrote:

The loader tunable `vfs.zfs.trim.enabled=0` did not work for me.

I did not try reinstalling with this setting.

If corruption already happened, setting the tunable won't help retroactively.

#26 - 08/09/2018 11:53 PM - Jason Poff

Alexander Motin wrote:

Jason Poff wrote:

The loader tunable `vfs.zfs.trim.enabled=0` did not work for me.

I did not try reinstalling with this setting.

If corruption already happened, setting the tunable won't help retroactively.

Corruption that has already occurred, can't be fixed.

This is correct, but shouldn't the checksum counter stay at 0 after that?

I will also try a reinstall with this parameter at some point.

#27 - 08/10/2018 07:23 AM - Alexander Motin

Jason Poff wrote:

This is correct, but shouldn't the checksum counter stay at 0 after that?

Why? If data are corrupted, then each time corrupted block(s) is accessed, counter will increase. You may try `zpool status -v` to find and delete the

corrupted file, and run scrub after that to make sure nothing else corrupted has left.

#28 - 10/31/2018 04:16 PM - Chris McDowell

- Seen in changed from 11.2-BETA1 to 11.2-RC1

I may have a similar issue with an HP SSD running a marvel controller. Let me know if there is anything else I can get that may be helpful.

https://www.newegg.com/Product/Product.aspx?Item=N82E16820326780&nm_mc=AFC-C8Junction&cm_mmc=AFC-C8Junction-FlexOffers.com%2c+LLC--na--na--na&AID=12079868&PID=8192570&SID=1187656FOF28012635862403984&utm_medium=affiliates&utm_source=afc-FlexOffers.com%2c+LLC&cjevent=896bba22dd5f11e8826800580a240612

```
sudo zpool status -v freenas-boot
pool: freenas-boot
state: DEGRADED
status: One or more devices has experienced an error resulting in data
corruption. Applications may be affected.
action: Restore the file in question if possible. Otherwise restore the
entire pool from backup.
see: http://illumos.org/msg/ZFS-8000-8A
scan: resilvered 785M in 0 days 00:00:21 with 7 errors on Sun Oct 28 19:22:15 2018
config:
```

NAME	STATE	READ	WRITE	CKSUM
freenas-boot	DEGRADED	0	0	7
mirror-0	DEGRADED	0	0	14
adalp2	DEGRADED	0	0	1.06K too many errors
ada0p2	ONLINE	0	0	14 block size: 512B configured, 4096B native

errors: Permanent errors have been detected in the following files:

```
<metadata>:<0x25>
<metadata>:<0x26>
<metadata>:<0x27>
```

```
sudo smartctl -a /dev/ada1
Password:
smartctl 6.6 2017-11-05 r4594 [FreeBSD 11.2-STABLE amd64] (local build)
Copyright (C) 2002-17, Bruce Allen, Christian Franke, www.smartmontools.org
```

```
=== START OF INFORMATION SECTION ===
Device Model:      HP SSD S600 120GB
Serial Number:    HBSA18291701597
LU WWN Device Id: 5 02b2a2 01d1c1b1a
Add. Product Id:  mavlsata
Firmware Version: HC0719C1
User Capacity:    120,034,123,776 bytes [120 GB]
Sector Size:      512 bytes logical/physical
Rotation Rate:    Solid State Device
Device is:        Not in smartctl database [for details use: -P showall]
ATA Version is:   ACS-3 T13/2161-D revision 4
SATA Version is:  SATA 3.2, 6.0 Gb/s (current: 3.0 Gb/s)
Local Time is:    Wed Oct 31 15:52:14 2018 PDT
SMART support is: Available - device has SMART capability.
SMART support is: Enabled
```

```
=== START OF READ SMART DATA SECTION ===
SMART overall-health self-assessment test result: PASSED
```

```
General SMART Values:
Offline data collection status: (0x00) Offline data collection activity
was never started.
Auto Offline Data Collection: Disabled.
Self-test execution status: ( 0) The previous self-test routine completed
without error or no self-test has ever
been run.
Total time to complete Offline
data collection: ( 0) seconds.
Offline data collection
capabilities: (0x51) SMART execute Offline immediate.
No Auto Offline data collection support.
```

Suspend Offline collection upon new command.
 No Offline surface scan supported.
 Self-test supported.
 No Conveyance Self-test supported.
 Selective Self-test supported.

SMART capabilities: (0x0002) Does not save SMART data before entering power-saving mode.
 Supports SMART auto save timer.

Error logging capability: (0x01) Error logging supported.
 General Purpose Logging supported.

Short self-test routine recommended polling time: (2) minutes.
 Extended self-test routine recommended polling time: (5) minutes.

SMART Attributes Data Structure revision number: 5
 Vendor Specific SMART Attributes with Thresholds:

ID#	ATTRIBUTE_NAME	FLAG	VALUE	WORST	THRESH	TYPE	UPDATED	WHEN_FAILED	RAW_VALUE
1	Raw_Read_Error_Rate	0x002e	100	100	050	Old_age	Always	-	0
5	Reallocated_Sector_Ct	0x0033	100	100	010	Pre-fail	Always	-	0
9	Power_On_Hours	0x0032	069	100	000	Old_age	Always	-	72
12	Power_Cycle_Count	0x0032	001	100	000	Old_age	Always	-	21
171	Unknown_Attribute	0x0032	100	100	010	Old_age	Always	-	0
172	Unknown_Attribute	0x0032	100	100	010	Old_age	Always	-	0
174	Unknown_Attribute	0x0032	100	100	000	Old_age	Always	-	15
183	Runtime_Bad_Block	0x0032	100	100	000	Old_age	Always	-	0
187	Reported_Uncorrect	0x0032	100	100	000	Old_age	Always	-	0
194	Temperature_Celsius	0x0022	037	100	000	Old_age	Always	-	37
198	Offline_Uncorrectable	0x0032	100	100	000	Old_age	Always	-	0
199	UDMA_CRC_Error_Count	0x0030	100	100	000	Old_age	Offline	-	0
241	Total_LBAs_Written	0x0032	100	100	000	Old_age	Always	-	132
242	Total_LBAs_Read	0x0032	100	100	000	Old_age	Always	-	8

SMART Error Log not supported

SMART Self-test log structure revision number 1

SMART Selective self-test log data structure revision number 0

Note: revision number not 1 implies that no selective self-test has ever been run

SPAN	MIN_LBA	MAX_LBA	CURRENT_TEST_STATUS
1	0	0	Not_testing
2	0	0	Not_testing
3	0	0	Not_testing
4	0	0	Not_testing
5	0	0	Not_testing

Selective self-test flags (0x0):

After scanning selected spans, do NOT read-scan remainder of disk.
 If Selective self-test is pending on power-up, resume after 0 minute delay.

```
% sudo camcontrol identify /dev/ada1
```

Password:

```
pass1: <HP SSD S600 120GB HC0719C1> ACS-3 ATA SATA 3.x device
```

```
pass1: 300.000MB/s transfers (SATA 2.x, UDMA5, PIO 512bytes)
```

```
protocol          ATA/ATAPI-10 SATA 3.x
device model      HP SSD S600 120GB
firmware revision HC0719C1
serial number     HBSA18291701597
WWN               502b2a201d1c1b1a
cylinders         16383
heads             16
sectors/track     63
sector size       logical 512, physical 512, offset 0
LBA supported     234441648 sectors
LBA48 supported   234441648 sectors
PIO supported     PIO4
DMA supported     WDMA2 UDMA6
media RPM         non-rotating
Zoned-Device Commands no
```

Feature	Support	Enabled	Value	Vendor
read ahead	yes	yes		
write cache	yes	yes		
flush cache	yes	yes		
overlap	no			
Tagged Command Queuing (TCQ)	no	no		
Native Command Queuing (NCQ)	yes		32 tags	
NCQ Queue Management	no			
NCQ Streaming	no			
Receive & Send FPDMA Queued	no			
SMART	yes	yes		
microcode download	yes	yes		
security	yes	no		
power management	yes	yes		
advanced power management	yes	no	254/0xFE	
automatic acoustic management	no	no		
media status notification	no	no		
power-up in Standby	no	no		
write-read-verify	no	no		
unload	no	no		
general purpose logging	yes	yes		
free-fall	no	no		
Data Set Management (DSM/TRIM)	yes			
DSM - max 512byte blocks	yes		8	
DSM - deterministic read	yes		zeroed	
Host Protected Area (HPA)	no			

#29 - 11/01/2018 07:17 AM - Alexander Motin

Interesting times we are living -- price of USB stick for SSD. ;)

Have you tried to disable TRIM? Does it help as with another SSD? Just in case, could you add raw identify data from `camcontrol identify /dev/ada1`?

#30 - 11/01/2018 07:32 AM - Eric Loewenthal

Alexander, I have one each of the WD Green and the SanDisk models with the offending controller, but an older firmware version that seems to work fine. Would access to either of them be useful to you?

#31 - 11/01/2018 03:34 PM - Chris McDowell

Disabling TRIM seemed to have removed all of the errors.

```
sudo camcontrol identify /dev/ada1 -v
camcontrol: sending ATA ATA_IDENTIFY with timeout of 30000 msecs
pass1: Raw identify data:
 0: 045a 3fff c837 0010 0000 0000 003f 0000
 8: 0000 0000 4842 5341 3138 3239 3137 3031
16: 3539 3720 2020 2020 0000 0000 0000 4843
24: 3037 3139 4331 4850 2053 5344 2053 3630
32: 3020 3132 3047 4220 2020 2020 2020 2020
40: 2020 2020 2020 2020 2020 2020 2020 8001
48: 4000 2f00 4000 0000 0000 0007 3fff 0010
56: 003f fc10 00fb 0101 4bb0 0df9 0000 0007
64: 0003 0078 0078 0078 0078 4c20 0000 0000
72: 0000 0000 0000 001f e30e 0084 0144 0040
80: 07f8 011b 706b 7409 4163 7069 b401 4163
88: 207f 0005 0005 00fe fffe 0000 0000 0000
96: 0000 0000 0000 0000 4bb0 0df9 0000 0000
104: 0000 0008 4000 0000 502b 2a20 1d1c 1b1a
112: 0000 0000 0000 0000 0000 0000 0000 4018
120: 4018 0000 0000 0000 0000 0000 0000 0000
128: 0029 0000 0000 0000 0000 0000 0000 0000
136: 0000 0000 0000 0000 0000 0000 0000 0000
144: 0000 0000 0000 0000 0000 0000 0000 0000
152: 0000 0000 0000 0000 0000 0000 0000 0000
160: 0000 0000 0000 0000 0000 0000 0000 0000
168: 0000 0001 6d61 766c 7361 7461 0000 0000
176: 4d4d 3332 6731 364b 3443 4531 4d41 4254
184: 3532 3030 2020 2020 2020 2020 2020 2020
192: 2020 2020 2020 2020 2020 2020 2020 2020
200: 2020 2020 2020 2020 2020 2020 0000 0000
208: 0000 4000 0000 0000 0000 0000 0000 0000
216: 0000 0001 0000 0000 0000 0000 10ff 0000
224: 0000 0000 0000 0000 0000 0000 0000 0000
232: 0000 0000 0008 0400 0000 0000 0000 0000
240: 0000 0000 0000 0000 0000 0000 0000 0000
248: 0000 0000 0000 0000 0000 0000 0000 b5a5
```

```
pass1: <HP SSD S600 120GB HC0719C1> ACS-3 ATA SATA 3.x device
pass1: 300.000MB/s transfers (SATA 2.x, UDMA5, PIO 512bytes)
```

```
protocol          ATA/ATAPI-10 SATA 3.x
device model      HP SSD S600 120GB
firmware revision HC0719C1
serial number     HBSA18291701597
WWN               502b2a201d1c1b1a
cylinders         16383
heads             16
sectors/track     63
sector size       logical 512, physical 512, offset 0
LBA supported     234441648 sectors
LBA48 supported   234441648 sectors
PIO supported     PIO4
DMA supported     WDMA2 UDMA6
media RPM         non-rotating
Zoned-Device Commands no
```

Feature	Support	Enabled	Value	Vendor
read ahead	yes	yes		
write cache	yes	yes		
flush cache	yes	yes		
overlap	no			
Tagged Command Queuing (TCQ)	no	no		
Native Command Queuing (NCQ)	yes	32 tags		
NCQ Queue Management	no			
NCQ Streaming	no			
Receive & Send FPDMA Queued	no			
SMART	yes	yes		
microcode download	yes	yes		
security	yes	no		
power management	yes	yes		
advanced power management	yes	no	254/0xFE	
automatic acoustic management	no	no		
media status notification	no	no		
power-up in Standby	no	no		

write-read-verify	no	no
unload	no	no
general purpose logging	yes	yes
free-fall	no	no
Data Set Management (DSM/TRIM)	yes	
DSM - max 512byte blocks	yes	8
DSM - deterministic read	yes	zeroed
Host Protected Area (HPA)	no	

#32 - 11/23/2018 10:06 AM - Eric Loewenthal

Scratch that, my WD unit with older firmware suffers from this as well, despite the older firmware:

```
root@backup:~ # camcontrol identify /dev/ada3 -v | less
camcontrol: sending ATA ATA_IDENTIFY with timeout of 30000 msecs
camcontrol: sending ATA READ_NATIVE_MAX_ADDRESS48 with timeout of 1000 msecs
pass6: Raw identify data:
 0: 0040 3fff c837 0010 0000 0000 003f 0000
 8: 0000 0000 3137 3436 3431 3435 3337 3135
16: 2020 2020 2020 2020 0000 0000 0000 5545
24: 3330 3030 3030 5744 4320 5744 5331 3230
32: 4732 4730 412d 3030 4a48 3330 2020 2020
40: 2020 2020 2020 2020 2020 2020 2020 8001
48: 4000 2f00 4000 0200 0000 0006 3fff 0010
56: 003f fc10 00fb 9101 8000 0df9 0000 0007
64: 0003 0078 0078 0078 0078 5e00 0000 0000
72: 0000 0000 0000 001f 850e 0006 0148 0040
80: 03f0 0110 346b 7d09 4123 3469 bc01 4123
88: 407f 0001 0000 0000 fffe 0000 0000 0000
96: 0000 0000 0000 0000 8000 0df9 0000 0000
104: 0000 0008 4000 0000 5001 b444 a9e5 85cf
112: 0000 0000 0000 0000 0000 0000 0000 411c
120: 401c 0000 0000 0000 0000 0000 0000 0000
128: 0009 0000 0000 0000 0000 0000 0000 0000
136: 0000 0000 0000 0000 0000 0000 0000 0000
144: 0000 0000 0000 0000 0000 0000 0000 0000
152: 0000 0000 0000 0000 0000 0000 0000 0000
160: 0000 0000 0000 0000 0000 0000 0000 0000
168: 0003 0001 0000 0000 0000 0000 0000 0000
176: 2020 2020 2020 2020 2020 2020 2020 2020
184: 2020 2020 2020 2020 2020 2020 2020 2020
192: 2020 2020 2020 2020 2020 2020 2020 2020
200: 2020 2020 2020 2020 2020 2020 0000 0000
208: 0000 4000 0000 0000 0000 0000 0000 0000
216: 0000 0001 0000 0000 0000 0000 10ff 0000
224: 0000 0000 0000 0000 0000 0000 0000 0000
232: 0000 0000 0010 0010 0000 0000 0000 0000
240: 0000 0000 0000 0000 0000 0000 0000 0000
248: 0000 0000 0000 0000 0000 0000 0000 cca5
```

```
pass6: Raw native max data:
 0: 5000 ff00 f97f 0d40 0000 0000
error = 0x00, sector_count = 0x0000, device = 0x40, status = 0x50
pass6: <WDC WDS120G2G0A-00JH30 UE300000> ACS-2 ATA SATA 3.x device
pass6: 600.000MB/s transfers (SATA 3.x, UDMA6, PIO 512bytes)
```

protocol	ATA/ATAPI-9 SATA 3.x
device model	WDC WDS120G2G0A-00JH30
firmware revision	UE300000
serial number	174641453715
WWN	5001b444a9e585cf
cylinders	16383
heads	16
sectors/track	63
sector size	logical 512, physical 512, offset 0
LBA supported	234455040 sectors

LBA48 supported 234455040 sectors
 PIO supported PIO4
 DMA supported WDMA2 UDMA6
 media RPM non-rotating
 Zoned-Device Commands no

Feature	Support	Enabled	Value	Vendor
read ahead	yes	yes		
write cache	yes	yes		
flush cache	yes	yes		
overlap	no			
Tagged Command Queuing (TCQ)	no	no		
Native Command Queuing (NCQ)	yes		32 tags	
NCQ Queue Management	no			
NCQ Streaming	no			
Receive & Send FPDMA Queued	no			
SMART	yes	yes		
microcode download	yes	yes		
security	yes	no		
power management	yes	yes		
advanced power management	yes	no	0/0x00	
automatic acoustic management	no	no		
media status notification	no	no		
power-up in Standby	no	no		
write-read-verify	no	no		
unload	no	no		
general purpose logging	yes	yes		
free-fall	no	no		
Data Set Management (DSM/TRIM)	yes			
DSM - max 512byte blocks	yes		8	
DSM - deterministic read	yes		any value	
Host Protected Area (HPA)	yes	no	234455040/234455040	
HPA - Security	no			

#33 - 04/08/2019 09:19 AM - Kris Moore

- Status changed from Screened to Closed