Hard Drive Reliability Update – Sep 2014

September 23, 2014 by Brian Beach (https://www.backblaze.com/blog/author/brianb/)

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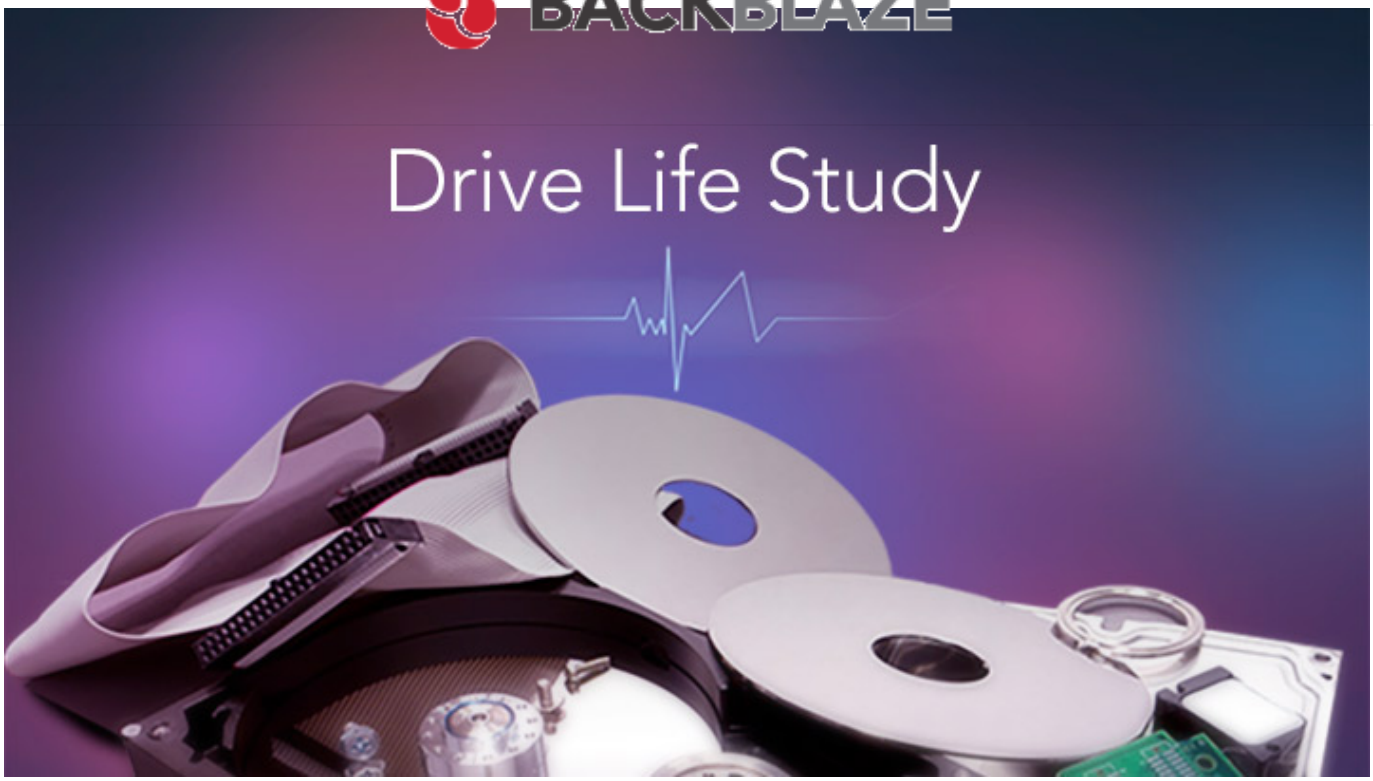


(https://www.backblaze.com/blog/wp-content/uploads/2014/09/blog-drive-study.jpg)

For the most recent *Hard Drive Reliability Statistics*, as well as the raw hard drive test data, visit Hard Drive Data and Stats (https://www.backblaze.com/b2/hard-drive-test-data.html).

At Backblaze we now have 34,881 drives and store over 100 petabytes (https://www.backblaze.com/blog/100-petabytes-of-cloud-data/) of data. We continually track how our disk drives are doing, which ones are reliable, and which

ones need to be replaced.

I did a blog post back in January, called "What Hard Drive Should I Buy?" (https://www.backblaze.com/blog/what-hard-drive-should-i-buy/) It covered the reliability of each of the drive models that we use. This month I'm updating those numbers and sharing some surprising new findings.

Reliability of Hard Drive Brands

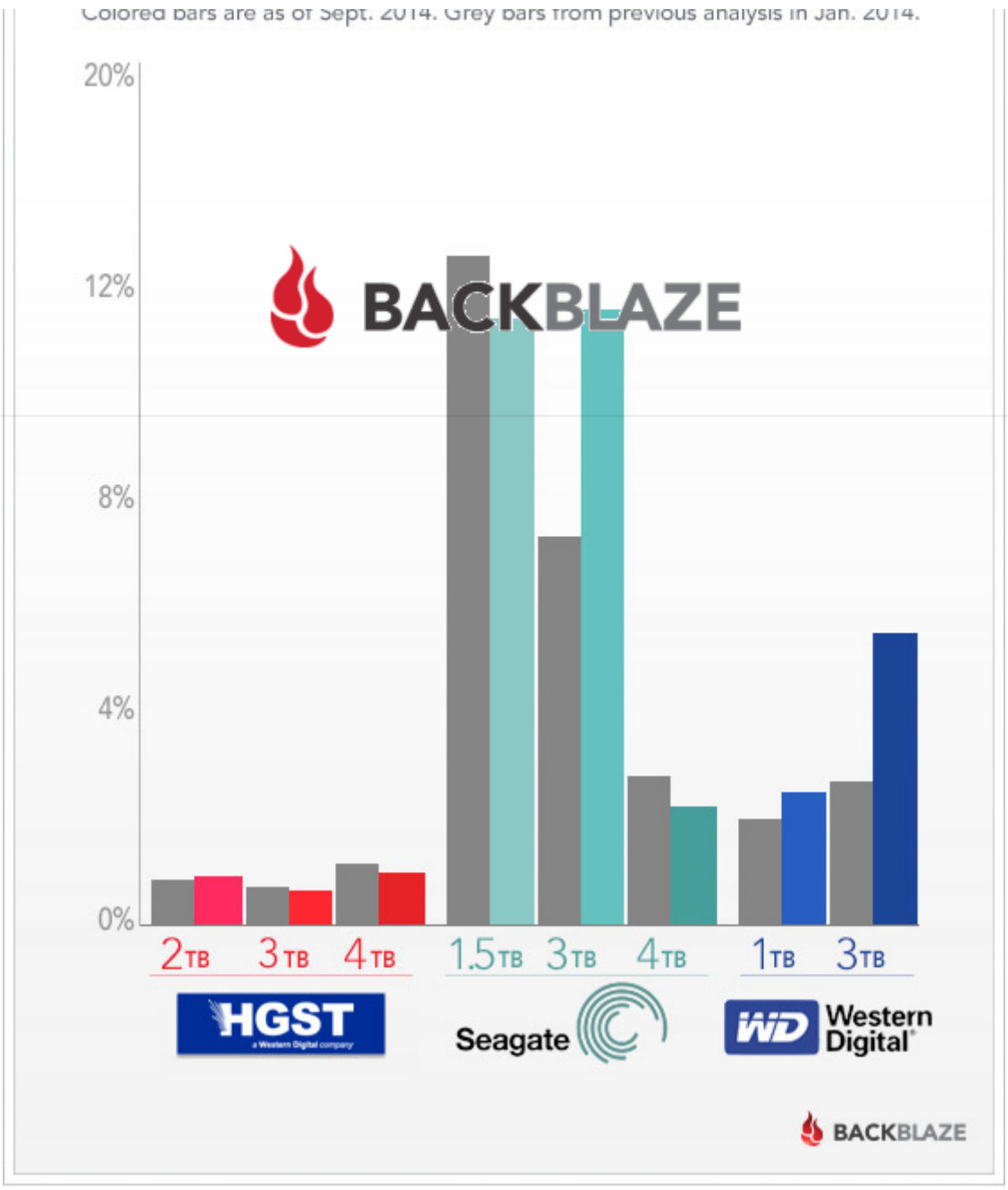
Losing a disk drive at Backblaze is not a big deal. Every file we back up is replicated across multiple drives in the data center. When a drive fails, it is promptly replaced, and its data is restored. Even so, we still try to avoid failing drives, because replacing them costs money.

We carefully track which drives are doing well and which are not, to help us when selecting new drives to buy.

The good news is that the chart today looks a lot like the one from January, and that most of the drives are continuing to perform well. It's nice when things are stable.

The surprising (and bad) news is that Seagate 3.0TB drives are failing a lot more, with their failure rate jumping from 9% to 15%. The Western Digital 3TB drives have also failed more, with their rate going up from 4% to 7%.

In the chart below, the grey bars are the failure rates up through the end of 2013, and the colored bars are the failure rates including all of the data up through the end of June, 2014.



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(https://www.backblaze.com/blog/wp-content/uploads/2014/09/blog-fail-drives-manufactureX.jpg)

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You can see that all the HGST (formerly Hitachi) drives, the Seagate 1.5 TB and 4.0 TB, and Western Digital 1.0 TB drives are all continuing to perform as well as they were

and Western Digital 1.0 TB drives are all continuing to perform as well as they were before. But the Seagate and Western Digital 3.0 TB drives failure rates are up quite a bit.

What is the likely cause of this?

It may be that those drives are less well-suited to the data center environment. Or it could be that getting them by drive farming (https://blog.backblaze.com/2012/10/09/backblaze_drive_farming) and removing them from external USB enclosures caused problems. We'll continue to monitor and report on how these drives perform in the future.

Should we switch to enterprise drives?

Assuming we continue to see a failure rate of 15% on these drives, would it make sense to switch to "enterprise" drives instead?

There are two answers to this question:

1. Today on Amazon, a Seagate 3 TB "enterprise" drive costs $235 (https://www.amazon.com/SEAGATE-Constellation-ST3000NM0033-SATA3SATA-Enterprise/dp/B00FW3M6EI/) versus a Seagate 3 TB "desktop" drive costs $102 (https://www.amazon.com/Seagate-Desktop-3-5-Inch-Internal-ST3000DM001/dp/B005T3GRLY). Most of the drives we get have a 3-year warranty, making failures a non-issue from a cost perspective for that period. However, even if there were no warranty, a 15% annual failure rate on the consumer "desktop" drive and a 0% failure rate on the "enterprise" drive, the breakeven would be 10 years, which is longer than we expect to even run the drives for.

2. The assumption that "enterprise" drives would work better than "consumer" drives has not been true in our tests. I analyzed both of these types of drives in our system and found (http://blog.backblaze.com/2013/12/04/enterprise-drive-

reliability/) that their failure rates in our environment were very similar — with the "consumer" drives actually being slightly *more* reliable.

Detailed Reliability of Hard Drive Models

This table shows the detailed breakdown of how many of which drives we have, how old they are on average, and what their failure rate is. It includes all drive models that we have at least 200 of. A couple of models are new to Backblaze and show a failure rate of "n/a" because there isn't enough data yet for reliable numbers.

Number of Hard Drives by Model at Backblaze

MODEL	SIZE	NUMBER	AVERAGE	ANNUAL FAILURE

		OF DRIVES	AGE IN YEARS	RATE
Seagate Desktop HDD.15 (ST4000DM000)	4.0TB	9619	0.6	3.0%
HGST Deskstar 7K2000 (HGST HDS722020ALA330)	2[illegible]	[illegible]	3.4	1.1%
HGST Deskstar 5K3000 (HGST HDS5C3030ALA630)	3.0TB	4593	2.1	0.7%
Seagate Barracuda 7200.14 (ST3000DM001)	3.0TB	3846	1.9	15.7%
HGST Megascale 4000.B (HGST HMS5C4040BLE640)	4.0TB	2884	0.2	n/a
HGST Deskstar 5K4000 (HGST HDS5C4040ALE630)	4.0TB	2627	1.2	1.2%
Seagate Barracuda LP (ST31500541AS)	1.5TB	1699	4.3	9.6%
HGST Megascale 4000 (HGST HMS5C4040ALE640)	4.0TB	1305	0.1	n/a
HGST Deskstar 7K3000 (HGST HDS723030ALA640)	3.0TB	1022	2.6	1.4%
Western Digital Red (WDC WD30EFRX)	3.0TB	776	0.5	8.8%
Western Digital Caviar				

Western Digital Caviar Green (WDC WD10EADS)	1.0TB	476	4.6	3.8%
Seagate Barracuda 7200.11 (ST31500341AS)	1.5TB	365	4.3	24.9%
Seagate Barracuda XT (ST33000651AS)	3.0TB	318	2.2	6.7%

We use two different models of Seagate 3TB drives. The Barracuda 7200.14 is having problems, but the Barracuda XT is doing well with less than half the failure rate.

There is a similar pattern with the Seagate 1.5TB drives. The Barracuda 7200.11 is having problems, but the Barracuda LP is doing well.

Summary

While the failure rate of Seagate and Western Digital 3 TB hard drives has started to rise, most of the consumer-grade drives in the Backblaze data center are continuing to perform well, and are a cost-effective way to provide unlimited online backup (https://www.backblaze.com/) at a good price.

Notes

9-30-2014 – We were nicely asked by the folks at HGST to replace the name Hitachi with the name HGST given that HGST is no longer an Hitachi company. To that end we have changed Hitachi to HGST in this post and in the graph.

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About Brian Beach (https://www.backblaze.com/blog/author/brianb/)

Brian has been writing software for three decades at HP Labs, Silicon Graphics, Netscape, TiVo, and now Backblaze. His passion is building things that make life better, like the TiVo DVR and Backblaze Online Backup.

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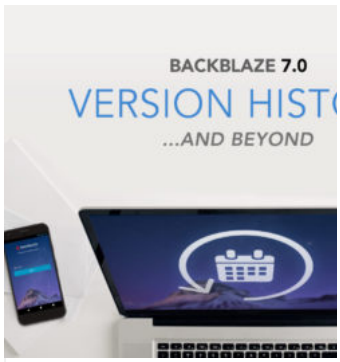

Backblaze 7.0 Version History Beyond (https://www.bac

(https://www.backblaze.com/blog/life-and-times-of-a-backblaze-hard-drive/)

(https://www.backblaze.com/blog/practical-tips-to-help-digital-nomads-stay-connected/)

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showing some new Toshibas within the mix. I therefore expected to see many more in this September update. However, it shows none. Furthermore, if I'm understanding the above sale correctly, more recent HGST drives would actually be WD mechanisms. As such, wouldn't this essentially mean the HGST results are a hodge-podge of older Hitachi-based drives and newer WD-based ones? So, can you please clarify the HGST results? And also hopefully explain why you're no longer showing any Toshiba (which I thought would more truly be "formerly Hitachi" rather than HGST) 3.5 inch drives? Thanks!

50 ^ | v 1 • Reply • Share

Ryan ➚ MemphisIsaac • 5 years ago

Perhaps I can help clear this up. I used to work for HGST during the WD transition. HGST was short for Hitachi GST (Global Storage Technology) when it was owned by Hitachi. We had a strong footing in the enterprise level SAS and consumer SATA products (and still very much do) and when we merged with WD, there was concern about the name change as all our customers knew us as "HGST". So, the decision was made to keep the HGST acronym name, even though it technically no longer stands for "Hitachi GST". That's why you will see it as "HGST, a Western Digital Company". Customers still know they are dealing with HGST, the same people and products as before, they are just now owned by WD. I am not aware of any dealings with Toshiba and we do still develop consumer SATA products, although, the enterprise stuff usually gets priority. Before Hitachi, it was IBM's HDD company. HGST Deskstar products used to be IBM Deskstar products and were some of the most reliable drive on the market.

We operated very much like our own HDD company after the merge. We actually never changed from the original IBM culture. The only thing I felt like we had in common with the WD company was HR and the benefits, which sometimes didn't align, haha. While the companies had merged, we kept our own identity, culture, and products. That's why you will see both WD and HGST brands. Just think of it as a name tweak, and nothing more.

11 ^ | v • Reply • Share ›

dosmastr ➚ Ryan • 4 years ago

Care to comment on the 75GXP drives?

^ | v • Reply • Share ›

Cockie Sunburn ➚ MemphisIsaac • 5 years ago • edited

I was wondering the same thing, based on reports of people claiming "Toshiba took over Hitachi's 3,5" business." I don't think this is correct.

Two things. Wikipedia states "To address the requirements of regulatory agencies, in May 2012 WD divested to Toshiba assets that enabled Toshiba to manufacture and sell 3.5-inch hard drives for the desktop and consumer electronics markets.[7][8]"

This probably just means Toshiba got one factory or other. From what I heard, this was a factory hit by the big floods of a while ago. Secondly, HGST (which is the WD-owned

company), also produces 3,5" Deskstars. This means they didn't sell the division, nor the IP I'd guess.

All in all I think the HGST drives above are the same Deskstars as before, with the newer ones just having an HGST label on them. Also from Wikipedia: "It was agreed that WD would operate with WD Technologies and HGST as wholly owned subsidiaries and they would compete in the marketplace with separate brands and product lines.[4][5][6]"

5 ^ | v • Reply • Share ›

CBuntrock ➚ Cockie Sunburn • 4 years ago • edited

This topic also really confused me. So as far as I understand you correctly, the HGST drives above are still sold under HGST brand and the company HGST is still WD owned. ONLY a few factories have been given to Toshiba? Because some articles say the 3,5-Business(!) has been given to Toshiba (not just factories!)... Confusing! Business includes Research and Knowledge etc. for me. Important factor! Beside this, I still buy Toshiba drives in order to keep some competition.

^ | v • Reply • Share ›

fUjiMaNia • 5 years ago

@Backblaze : Thank you for sharing this information. No regular end-user or even manufacturers will be able to test over 25k different (brand and size wise) drives to generate these great statistics.

8 ^ | v • Reply • Share ›

Shaun Forsyth • 5 years ago

Love the information guys but this is a little tantamount to scaremongering, without other information we are unable to make real informed decisions. Even based on the information above I would suspect the average life of a Seagate 3TB drive (that gets over the initial 3-4 weeks failure zone) to be around 10 years in a home users desktop machine.

I urge you to provide some more detail from the S.M.A.R.T data (as averages)

- Start/Stop Count
- Spin Retry Count
- Power Cycle Count
- Power-On Hours

This will at least allow us to compare the data centre style use to home user use of the drives.

Would also be good to see why and how you decide a drive has failed, do you use S.M.A.R.T to predict a failure and remove the drive before its really dead?

Either way, I enjoy the posts and please keep them coming.

13 ^ | v 3 • Reply • Share ›

k_man ↪ Shaun Forsyth • 5 years ago

Scaremongering? Don't you think that is a little harsh. These are comparative results like products with many points. There is a lot of good information you can use as you wish.
But there is not need to be alarmed about these numbers. Well, unless you work for Seagate.
In my case I haven't used Seagate (I use Hitachi instead) for years because I had been seeing the same issues with high failure rates.

23 ^ | ˅ 1 • Reply • Share ›

Shaun Forsyth ↪ k_man • 5 years ago • edited

A little harsh maybe, but not everyone is as well informed or understand how these technologies work.

I do have a, hmmm.... dreaded, seagate 2TB drive in my personal desktop computer and while I grip onto my desk for dear life as I say this, its working well with no problems. So for average users these drives should have no issues. I would hate for people to avoid the brand based on the extreme use case of these drives that we are lead to believe they are subjected to.

On the other hand, I read these great posts because I too have servers in data centres with comsumer drives. Normally Western Digital RE drives (OK not completely consumer). So its a great source of knowledge for me, but I shouldn't always use myself as an example.

3 ^ | ˅ • Reply • Share ›

Nick Corcodilos ↪ Shaun Forsyth • 5 years ago

Yah, well, my Seagate ST2000DM001 2TB drive just bricked after 1 year + 1 month. I've had good luck with Seagate drives for a long time, but I see the point. Think I'll risk another one? When Seagate used to have 3 and 5 year warranties, that meant something. 1 year means something, too -- Seagate doesn't stand behind its product any more.

19 ^ | ˅ • Reply • Share ›

Sgt Pinback ↪ Nick Corcodilos • 5 years ago

I have a few of the same model, ST2000DM001 - my first one died on me today I got just over 2 years out of it. I also had a couple of 5+ year 750Gb die on me both were seagate - and looking at my dead pile of 5 drives over the last year all were seagate and one WD RE3. Scratching seagate off my purchase list permenantly.

3 ^ | ˅ • Reply • Share ›

Nick Corcodilos ↪ Sgt Pinback • 5 years ago • edited

Well, I decided to give Seagate one more try. Replaced the dead M001 with another of same. It's been about two months - so far, so good. If I lose one more, I'm done with them. While WD seems to fare better, I think drives are

now so cheap and such commodities that quality has gone into the toilet everywhere. It's gotten so you have to backup your backup drives.

UPDATE 10/15: The Seagate is still going. No problems. Probably shouldn't have said that.

2 ^ | v • Reply • Share ›

Pete [illegible] Nic Circosta 2 years ago

I disagree. Some technologies are continuing to drop in price, but disk drives have not. I just ordered a replacement 4tb hgst drive for one I've had for 2 to 3 years. sadly the best deal I can find is actually $30 more than it was back then for the same specs. Some drives are slowly dropping in price, but this one and others have gone up.

1 ^ | v • Reply • Share ›

GuitarJam ➚ Shaun Forsyth • 5 years ago

I would replace that Seagate immediately. I had a contract job and 7 out of 10 of the bad drives I pulled were Seagates. The recycle dumpster were full of them. I looked at all the date codes and they seemed to die in the 2 to 3 year span. a few made it to 5 years.

10 ^ | v • Reply • Share ›

Matthew Austin ➚ Shaun Forsyth • 5 years ago

I manage an IT help desk at a small college and let me tell you I'm scared to death of the Seagate 3TB ST3000DM001. In the past 4 weeks alone I've had two of them brought in to our help desk dead and just yesterday I decided to evacuate the data from my personal 3TB ST3000DM001 because the reallocated sector count was increasing steadily and throwing SMART errors in StableBit DriveScanner. MFG dates on the drives put them all about 1.5 years old at time of failure.

So that anecdotal evidence, COMBINED with Backblaze noticing the failure rate shoot up to 15%...well that seals it for me, I would not touch a 3TB Seagate.

12 ^ | v 1 • Reply • Share ›

SLS ➚ Matthew Austin • 5 years ago

I have had this reallocated sector issue with most our 1TB and 2TB Seagate DM001's in our Servers and DVRs in under a year of use. I have come to expect that eventually all will do this, its just a matter of time. Management didn't want to approve other drives so I am stuck using it.

1 ^ | v • Reply • Share ›

phonebanshee ➚ Matthew Austin • 5 years ago

I ran into this article because I just had a ST3000DM001 die on me (good thing it was in a zfs pool). Purchased it in August 2013, RIP January 2014.

^ | v • Reply • Share ›

Jim Anderson ➚ Shaun Forsyth • 5 years ago

I'm with the rest of them when it comes to Seagate drives. In the last 5 years Seagate quality has declined very significant amount. When they reduced their warranty to 1 year from 5years you knew it was bound to happen. I have had more Seagates fail than any other manufacturer on the market right now.

7 ^ | v • Reply • Share ›

Tipografia Romania libera ➚ Shaun Forsyth • 5 years ago

Make a full backup pronto.

5 ^ | v • Reply • Share ›

Peter Novák ➚ Shaun Forsyth • 5 years ago

I have been using Seagate Barracuda drives for 10 years and until cca 500GB treshold, they were of exceptional reliability. Thus it has been quite a surprise for me when my first 1,5TB drive died out almost instantly and without warning within 2 years and the other has reached over thousand of reallocated sectors by then.

The third drive is faring moderately, I might say, because it has worked for more than 4 years. It has relocated more than 2000 sectors already and although there probably is capacity for another 2000 available, there is already thousand of unrecoverable sectors - I conclude that sectors are no more being silently relocated by drive itself (SMART), they are instead being exposed as BAD to OS (read failed...). Even the SMART internal long test ends up with read error, instead of relocating the sectors. So I'm looking for immediate repacement. And frankly, I don't know what drive should it be now.

Another 3TB Seagate has died unexpectedy after mere 1 year, another is still operational however relocated sectors are rising quickly.

Need to say, these drives have been almost always ON, that is not a typical

see more

3 ^ | v • Reply • Share ›

Keirnoth ➚ Peter Novák • 4 years ago

I'll back this person's post about the 500 GB Seagate. Anecdotal evidence, but I have a Seagate 7200.9 Barracuda 500GB that I bought 9 years ago that is still

going strong. I had to resort to using it as a boot drive because the low quality OCZ Vertex 1st gen 60 GB SSD I bought had its onboard controller die.

Got the Seagate 3TB mentioned in this post from a 2013 Amazon Black Friday sale and I'm currently running a chkdsk /R on it because it's on the edge of dying on me. OS just freezes and files read VERY slowly from the drive. Drive lasted a total of 1 1/2 years, which seems to match up with the anecdotal evidence of everyone's 3 TB dying after 1 year. Got the infamous 1.5TB 7200.11 which I had to [illegible] the thing on day 1 of purchase (latter 750 GB of the drive wouldn't format properly).

3 ^ | v • Reply • Share ›

Bernald Solano ➚ Keirnoth • 4 years ago

The 7200.9 series are good, actually really good actually, when I see people complaining, is mostly the later series.

3 ^ | v • Reply • Share ›

Peter Novák ➚ Peter Novák • 5 years ago

Correction: The still operational 1,5 TB has passed only 2,8 years of online time so far. The thousand unrecoverable is by SMART parameter 187 Reported_Uncorrect.

1 ^ | v • Reply • Share ›

Lieane ➚ Shaun Forsyth • 3 years ago

Segate 2TB drive now starting to fail .... just into it's 2nd year after purchasing as part of a custom home build in Nov 2014

^ | v • Reply • Share ›

Brandon Edwards ➚ Shaun Forsyth • 4 years ago

got 2x seagate 2.5" 500gb external paperweights myself. They were less than a year old when they failed

^ | v • Reply • Share ›

Marcus Franulovich ➚ Shaun Forsyth • 5 years ago

It isn't scaremongering. Home user here with 8 Seagate 3tb drives in a home NAS environment. 4 have failed within 19 months. Ive been doing this a long time and have never seen failures like this. The drives are rubbish. I wish this article had been out when I bought them.. could have saved myself $1,500.

3 ^ | v • Reply • Share ›

Metaxis ➚ Shaun Forsyth • 5 years ago

You should read the seminal google paper on disk failure trends:

http://static.googleusercon...

It shows that SMART only had relevant non-zero counters for 56% of failed drives, thus only being predictively helpful about half the time.

However, for drives that had non-zero SMART parameters relevant to predicting failure (scan errors, realloc, offline realloc, and probational) - the critical threshold of *all* of them was 1 (one). That's a huge signal. The research finds that if any of those parameters are non-zero, that drive has between a 14 and 39 times greater chance of failure within the next 60 days.

Other surprising results from the paper are that, after infancy, utilization rate is not strongly correlated with failure rate, and moderately high temperatures (35C - 40C!) actually decrease failure rate compared to cool or very high temps.

Though drive models and characteristics have changed plenty since 2007, many of these findings are likely to be relevant still.

3 ^ | v 1 • Reply • Share ›

Edward Iskra ➚ Metaxis • 5 years ago

The paper is from 2007, but their data was from 2005 and 2006, and reflects drives in service for up to five years. It includes data on 80 GB drive put in service in 2001! That's 14-year-old technology! The findings are more dated than you think.

"The disks are a combination of serial and parallel ATA consumer-grade hard disk drives, ranging in speed from 5400 to 7200 rpm, and in size from 80 to 400 GB. All units in this study were put into production in or after 2001. The population contains several models from many of the largest disk drive manufacturers and from at least nine different models. The data used for this study were collected between December 2005 and August 2006."

2 ^ | v 1 • Reply • Share ›

MaryReilly ➚ Shaun Forsyth • 4 years ago

Not scaremongering. I have 20 Seagate 3TB drives and in 2 years, 5 have failed completely, while 8 others have varying degrees of significant degradation. Total crap. I am changing out my remaining drives for HGST drives. The added expense is worth the reduced headache and increased piece of mind.

1 ^ | v • Reply • Share ›

Haravikk ➚ Shaun Forsyth • 5 years ago

I'm not sure about scare-mongering; you're right that it can't easily be used to make comparisons with different use-cases, as large scale storage use isn't really the same as a home-user just trundling around on the internet now and then or playing a few games.

That said, I've lost faith in Seagate entirely; I had a few Barracuda drives in one of my older

machines that ran flawlessly for five years (and were still in perfect working order when I sold them, no sign of faults in S.M.A.R.T.), but newer drives have been abysmal (two lasted just outside the 1 year warranty then died without warning).

1 ^ | v • Reply • Share ›

Tipografia Romania libera ➚ Shaun Forsyth • 5 years ago

1. What formula did you use to get this 10 years average lifespan?
2. The problem is: I used to average drives because a particular one. And one external Seagate 1G FreeagentGoFlex just died on me without any prior warning. So much for the average life. I constantly and consistently check SMART data just to make sure I will not have surprises like this. Of course, I have backups of all important stuff, in triplicate, but that is not the point.

1 ^ | v • Reply • Share ›

Shaun Forsyth ➚ Tipografia Romania libera • 5 years ago

Average Life of the Seagate 3TB (ST33000651AS) according the graph above is 2.2, in backblaze that would be (24*365)*2.2=19272 power on hours, home user desktop as mentioned in my post I would expect to have an on time on average per day of around 5 hours, (I know as a technical person, my machine is on all the time, but its sleeping, I use it around 2.5 to 6 hours a day on average). so 19272 / 5 = 3854.4 days, then 3854.4 / 365 = 10.56 years. Which is not bad, since in my first post it was a guess based on when I used to collect and service thousands of computers from business which went defunct.

I am going to take
away that you believe the smart data is not a good indicator of a drives imminent failure. However this is not what I was looking for, I was looking for averages from the smart data to indicate failure.

1 ^ | v • Reply • Share ›

Tipografia Romania libera ➚ Shaun Forsyth • 5 years ago

No way, the failure rate of a mechanical drive is not linear after the burn-in period.

4 ^ | v • Reply • Share ›

Lenin✓communist ➚ Shaun Forsyth • 3 years ago

It is my personal theory that drives fail due to spin-up and spin-down cycles. Not because of hours in service.

I only have anecdotal evidence of that but it's pretty strong anecdotal evidence, with drives working reliably 9 years or more (I usually retire them before they actually fail on me),.

dosmastr ➚ Shaun Forsyth • 4 years ago

Are these drives ever doing more than an initial Start?
if its a cloud cluster the drives probably never stop, power cycle or have to spin retry. Power on hours ZI think they are giving -- in years, as the drives run 24/7

Dilbert ➚ Shaun Forsyth • 4 years ago

The "Average Age" column in their table is the average age of these disks at the time of writing, not their life expectancy. What's relevant is the annual failure rate, which is substantially higher for those drives.

So, you have a *single* Seagate in your PC which is working fine, and you conclude that "for average users these drives should have no issues"? I had two, both died. Is that relevant for the average user?

BackBlaze has *hundreds* of these drives working perfectly fine. With 15.7% failure rate, after a single year, "only" 157 out of 1000 will fail. That's 843 drives working like a charm!

Snuffo Laughagus ➚ Shaun Forsyth • 4 years ago

I would have to disagree from personal experience from the past 5 years, Shaun.

Among other that I don't remember, I have owned drives by IBM (1994), Quantum (1994), Western Digital (1995), Toshiba (1996) Quantum (1996), Seagate (1998), several IBM Microdrives (2002), Toshiba (2006), Seagate (2010), WD (2010), Iomega EGO (2011) Samsung (2012), 2 Seagates (2013) and finally WD (2015).

Out of all the drives mentioned in this list, the only that has failed in normal use and form old age was the Quantum, that had been used in a Windows 3.1 machine until its death in 2013 (it eventually stopped spinning). And I was able to retrieve all the data on it after freezing the drive, so it was just a matter of wear. Over 19 years, an average of 4 hours a day, it gave great service. The 1996 Toshiba died in a similar manner after the laptop fell during an attempted robbery but here as well I was able to recuperate all the data on it.

The 1998 Seagate with its fluid bearing, a revolutionary concept at the time, super silent and fast (7200RPM) is still running.

The 1996 Quantum "Fireball" died after a major power surge actually FRIED the motherboard of the computer in 1998 (the famous Ice Storm of January - a 25KV line fell and zapped

Peter Rajdl ➚ Shaun Forsyth • 5 years ago

Last year I sold a FreeNas server with 5x Seagate 3tb drives. Within 3 months one drive failed. While it was being replaced a 2nd drive failed. Then 4 months later a SQL server with 4 of the same drives also suffered a failure.

^ | v • Reply • Share ›

David Wujcik ➚ Peter Rajdl • 5 years ago

That's what [illegible] spinning media...

^ | v • Reply • Share ›

Alex Chen • 5 years ago

Do you change default drive parameters in any way? For example, I know WD green drives have 5 seconds default sleep timeout. This would be very bad for data center use, I think.

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Haravikk ➚ Alex Chen • 5 years ago

In a data centre use-case I don't think a WD Green would ever get a chance to sleep, kind of defeating the main benefit of the drive (low energy consumption in infrequent usage scenarios). They're really not suited to drive array usage.

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Alex Chen ➚ Haravikk • 5 years ago

The web is full of stories of WD greens dying within weeks of server use, until sleep parameters are changed (making them effectively WD reds).

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Matt Buford ➚ Haravikk • 5 years ago

Well, I'm doing home NAS use and not DC, but...

From what I understand, the WD head parking issue was limited to specific models of green drives. They certainly don't all do that. In fact, some quick googling turned up people with red drives having issues with too much head parking too.

I've had 9 WD10EADS 1TB green drives (the same ones in this Backblaze report) in my NAS (Linux MD raid6) running 24x7 for about 5.5 years now, I have not changed any settings, and I have not had any issues. It seems that at least this model of green drive does not sleep or park the head at any short enough interval for it to ever happen. I have 47,800 power on hours, 23 start-stop-count, 23 load cycle count, and 21 power cycle count. The start-stop-count seems to be the one that indicates head parking. Apparently somehow I parked the heads twice (outside of power cycles) in 5.5 years.

Back when I bought them, 10 watts active was the norm for drives and these greens

only used 5. This made greens seem an obvious great choice for home NAS since they spin slower (less wear and tear) and used less power (which also means less heat). I've heard the stories about head parking, but never experienced it myself. I've been quite happy with these drives. If I were ready to upgrade, I would probably go with greens again, if nothing else just because they're typically cheap. Cheap, long lasting, and low power is a winning combination for my needs.

Back in 2009 WD red didn't exist. There was their normal line of drives at 10 watts, and the green line at 8 watts. Several years later Red drives were released in 2012. Red drives are very similar to green ("intellipower" RPM) and have almost identical power usage.

If I were in the market to upgrade, I'd have to do some more research to be sure, but I think I'd likely end up just buying the cheapest option between red and green (which is usually green). I'd prefer red, but I suspect I'd never notice the difference, so price wins.

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Haravikk ➚ Matt Buford • 5 years ago

Hmm, strange, I have two WD Green 1.5tb drives and a single 1tb drive, but if I don't use a script to keep them spinning all the time they'll park their heads around 10,000 times a day, indicating a delay of about 5-8 seconds, it's pretty ridiculous in fact, but it doesn't seem like they came from one bad batch or model as they were bought years apart. I've also seen WD Greens taken from media centre PCs that have ridiculous numbers for start-stop-counts which shouldn't be possible for a system that's largely idle with bursts of streaming.

Clearly not all WD Greens are created equal, so for that reason I don't think I'd trust them regardless. But the WD Reds I've used have been nothing but smooth running with less power consumption than the greens. I guess I just assumed though that the greens were intended to park their heads quickly to spend their time idle, so keeping them running would be sub-optimal.

That said, I'd still swear by the Reds for noise level; mine are almost completely silent except when spinning up initially, and they produce no audible vibration at all, even with a heap of them in a single system. I just wish I could afford to buy more of them to replace the older desktop drives I still have in my RAID.

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Matt Buford ➚ Haravikk • 5 years ago

Because it was never a problem for me I never bothered checking, but after your post I installed idle3-tools and checked out my own NAS drive's idle timer:

drivespace idle3-tools-0.9.1 # ./idle3ctl -g /dev/sdb

Idle3 timer set to 80 (0x50)

According to what I've read, that translates to 8 seconds. I wonder if the difference between our green experiences are as simple as load patterns. On one hand, 8 seconds is a long time for no IO at all. In my case, I have the OS booting from the array, so things like syslog are running and reading/writing to the disks even when I'm not streaming a video. A quick check of my disks using "vmstat -d 8" shows no idle 8 second intervals while I watched. On the other hand, I had to force to make that, in all the years I've used these disks, I never had any 8 second idle times at all (including as I was booting from CD and about to install the OS, right after the OS was installed before any server type apps were set up, or doing maintenance/uprades, etc)