

# Multi-Report

Quick Start Guide

# What is Multi-Report?

- Multi-Report was written a long time ago under a different name, with the purpose of augmenting FreeNAS 8.x (and beyond) for running SMART tests, monitoring for drive failures as FreeNAS was not very good at it reliably.
- To this day it is still augmenting for some shortcomings (scheduling NVMe drive SMART test), and to make people feel a little safer knowing the testing is going on and alarms will be generated if needed.
- SMART was designed with the intention to warn a user of pending doom within 24 hours of a failure. I will take any amount of time I can get but it could have been 2 hours or no hours as well. There are some failures that cannot be predicted and some failures happen very fast. All the data provided by this script will assist you moving forward once a failure or indication of a pending failure is identified.
- Additionally, I highly recommend running a SMART Short test once a day and run a SMART Long test once a week. If you have a lot of drives, only schedule a few drives a day (Monday), a few others (Wednesday), you get the point.
- As you look at the chart data, note that the column titles should be self-explanatory.

# Quick Setup Information

## Place script on your server (location is for an example)

- Create a new dataset titled 'scripts'. Path: /mnt/pool/scripts
  - Make the dataset:
    - Name: scripts
    - Share Type/Dataset Preset: SMB
    - SCALE: Create SMB Share checkbox
    - Submit/Save
- You should now have access to the SMB share.
- Copy the script to the 'scripts' dataset, rename the script to "multi\_report.sh".

## Setting up the CRON JOB

- Tasks -> Cron Jobs -> ADD
- Description: multi\_report
- Command (CORE): ./mnt/pool/scripts/multi\_report.sh
- Command (SCALE): cd/mnt/pool/scripts && ./multi\_report.sh
- Run As User: root (or any privileged account)
- Schedule: Custom
  - Preset: Daily
  - Minutes: 0, Hours: 2, Days: \*
  - Select DONE
- Hide Standard Output: Unchecked
- Hide Standard Error: Unchecked
- Enabled: Checked
- Save

## First and Second Run

- As a privileged user, open a shell/SSH window and change directory 'cd' to cd/mnt/pool/scripts
- First Run: Enter ./multi\_report.sh -config
  - Follow the instructions to create a multi\_report\_config.txt (configuration file).
- Second Run: Enter ./multi\_report.sh
  - The script should run without error.

## Notes:

- To customize Multi-Report run the script with the '-config' switch and select Advanced Configuration. There are a large amount of things which can be customized for almost every situation.
- In order to run SMART Self-tests on NVMe drives, you must set NVM\_Smartmontools\_74\_Override="enable". You can manually edit the multi\_report\_config.txt file or use the Advanced Configuration section.
- If you run into a real problem, search the TrueNAS forums first, and if you cannot figure it out, use the '-dump email' switch to send me the required information I need to assist you. I will return an email to you once I have looked at it. I normally get back to people in less than 24 hours, keep in mind time zones, I'm in the USA, NY (ET).

# Anatomy of the Multi-Report Email

FileMessageHelpTell me what

IgnoreDeleteArchiveReplyReply AllForwardDelete

To ManagerDoneCreate New

MoveSend to OneNoteActions

Mark UnreadCategorizeFollow Up

TranslateFindRelatedSelect

Read AloudZoom

SMART Testing Results for truenas - All is Good

Old\_multi\_report\_config.txt23 KB

multi\_report\_config.txt23 KB

Multi-Report v3.0.6Beta dtd:2024-06-01 (TrueNAS Scale 24.04.1.1)

Report Run 01-Jun-2024 @ 19:09:55

Execution Time: 2 Minutes : 8 Seconds

\*ZPool/ZFS Status Report Summary

Pool Name	Status	Pool Size	Free Space	Used Space	Frag	Read Errors	Write Errors	Cksum Errors	Scrub Repaired Bytes	Scrub Errors	Last Scrub Age	Last Scrub Duration	Total Data Read / Total Data Written
Test	ONLINE	438.30G	6.30G	432K (0%)	0%	0	0	0		---	Never Scrubbed	---	Virtual Drive
boot-pool	ONLINE	14.53G	4.94G	9.59G (63%)	2%	0	0	0	0B	0	1	00:00:06	Virtual Drive
farm	ONLINE	10.45T	7.59T	2.86T (27%)	0%	0	0	0	0B	0	15	00:00:00	372.1 TB / 10.5 TB

\*Data obtained from zpool and zfs commands.

Subject Line with Summary

Old and Current configuration files after an upgrade

Version Info (Red if "Beta")  
Date/Time of Report  
Duration of the Script

Total Lifetime Data Values for all the drives in a pool.

ReplyReply AllForward

Sat 6/1/2024 7:12 PM

Total Lifetime Data Values for all the drives in a pool.

# Anatomy of the Multi-Report Email

SMR Checking  
Yellow = Alarm Override

"0" = Compensation Value  
"(2)" = Real Value, Yellow = Alarm Override  
Purpose: To easily monitor future alarms

30 Day Rolling Average, can  
be set to Calendar Month

Spinning Rust Summary Report

Device ID	Serial Number	Model Number	HDD Capacity	RPM	SMART Status	Curr Temp	Temp Min	Temp Max	Power On Time	Start Stop Count	Load Cycle Count	Spin Retry Count	Re-alloc Scts	Re-alloc Evnt	Curr Pend Scts	Offl Unc Scts	UDMA CRC Error	Raw Error Rate	Seek Error Rate	Multi Zone Error	He Level	Last Test Age	Last Test Type (time conducted)	Total Data Read / Written	30-Day Read / Written
/dev/sdd SMR	S2X1J90CA48799	ST500LM012 HN-M500MBB	500.00G	5400	PASSED	32°C	26°C	35°C	9110	368	31521	0	0	0	0	0	0(2)	0	0	0(31)	---	0	Short offline (9088 hrs)	3.1 GB / 3.4 GB	3.1 GB / 111 MB

Total Lifetime Data Read or  
Written to the drive

SSD Summary Report

Device ID	Serial Number	Model Number	SSD Capacity	SMART Status	Curr Temp	Temp Min	Temp Max	Power On Time	Wear Level	Re-alloc Scts	Re-alloc Evnt	Curr Pend Scts	Offl Unc Scts	UDMA CRC Error	Last Test Age	Last Test Type (time conducted)	Total Data Read / Written	30-Day Read / Written
/dev/sdc	P02618119268	PLEXTOR PX-256M7VC	256.00G	PASSED	47°C	---	---	3242	100	0	0	---	0	0(3)	0	Short offline (3220 hrs)	18.2 GB / 39.7 GB	18.2 GB / <1 MB
/dev/sde	S5B3NS0NB01328R	Samsung SSD 860 EVO 1TB	1.00T	PASSED	28°C	25°C	39°C	835	100	0	---	---	---	0(6007)	0	Short offline (813 hrs)	262.4 GB / 523.7 GB	262.4 GB / 141 MB

The power state of the  
NVMe when the script is  
near completion

NVMe Summary Report

Device ID	Serial Number	Model Number	NVMe Capacity	SMART Status	Critical Warning	Curr Temp	Power State	Power On Time	Wear Level	Media Errors	Last Test Age	Last Test Type (time conducted)	Total Data Read / Written	30-Day Read / Written
/dev/nvme0	511230818150000088	Nextorage SSD NEM-PA4TB	4.00T	PASSED	GOOD	32°C	PS-4 0.0440W	988	100	0	0	Short (988 hrs)	93.1 TB / 2.6 TB	93.1 TB / 2.5 GB
/dev/nvme1	511230818150000051	Nextorage SSD NEM-PA4TB	4.00T	PASSED	GOOD	32°C	PS-4 0.0440W	988	100	0	0	Short (988 hrs)	92.9 TB / 2.5 TB	92.9 TB / 3.6 GB
/dev/nvme2	511230818150000096	Nextorage SSD NEM-PA4TB	4.00T	PASSED	GOOD	32°C	PS-3 0.0620W	987	100	0	0	Short (987 hrs)	93.0 TB / 2.6 TB	93.0 TB / 3.6 GB
/dev/nvme3	511230818150000089	Nextorage SSD NEM-PA4TB	4.00T	PASSED	GOOD	33°C	PS-3 0.0620W	988	100	0	0	Short (987 hrs)	92.9 TB / 2.5 TB	92.9 TB / 2.5 GB

How many 24 hour periods have  
past since last S.M.A.R.T. test

A Short S.M.A.R.T. Test Completed  
(987) Hours the test completed. If the last test  
was a Long test, that would be indicated here

# Anatomy of the Multi-Report Email

## Multi-Report Text Section

External Configuration File in use dtd:2024-05-31  
TrueNAS Configuration File Emailed every: Mon  
Multi Report Configuration File Emailed every: Mon  
Statistical Log Sent on: Mon  
Statistical Export Log Located: /mnt/farm/scripts/statisticalsmartrdata.csv  
Multipath set to: off  
SMR Checking Enabled  
Partition Check was run, No Errors  
Spencer was not run

Running Short Self-test for nvme0  
Running Short Self-test for nvme1  
Running Short Self-test for nvme2  
Running Short Self-test for nvme3  
Polling nvme test status...  
Short Test Time 109 seconds.  
nvme0 S.M.A.R.T. Short Self-test completed - PASS  
nvme1 S.M.A.R.T. Short Self-test completed - PASS  
nvme2 S.M.A.R.T. Short Self-test completed - PASS  
nvme3 S.M.A.R.T. Short Self-test completed - PASS

##### ZPool status report for Test #####  
pool: Test  
state: ONLINE  
config:

NAME	STATE	READ	WRITE	CKSUM
Test	ONLINE	0	0	0
ddf9b713-b60f-4ac2-b674-814a7d10fed0	ONLINE	0	0	0

errors: No known data errors

Drives for this pool are listed below:  
Virtual Drive ddf9b713-b60f-4ac2-b674-814a7d10fed0 -> sdb2 -> S/N:---

The Text Section contains:  
Configuration Information  
Test Information  
and  
Error Information

If you have an alarm on the Chart  
Section, look here for amplifying  
information.

### Zpool Status

This tells you the drive is “Virtual”,  
the gptid number, the Drive ID,  
and Drive Serial Number.  
Use this data to help identify a  
failing drive.

# Anatomy of the Multi-Report Email

```
##### ZPool status report for boot-pool #####
pool: boot-pool
state: ONLINE
scan: scrub repaired 0B in 00:00:06 with 0 errors on Sat Jun 1 03:45:07 2024
config:
```

NAME	STATE	READ	WRITE	CKSUM
boot-pool	ONLINE	0	0	0
sda3	ONLINE	0	0	0

```
errors: No known data errors

Drives for this pool are listed below:
Virtual Drive 783941e5-a2e7-4666-ae07-77082b9d58cf -> sda3 -> S/N:---
```

```
##### ZPool status report for farm #####
pool: farm
state: ONLINE
status: Some supported and requested features are not enabled on the pool.
       The pool can still be used, but some features are unavailable.
action: Enable all features using 'zpool upgrade'. Once this is done,
       the pool may no longer be accessible by software that does not support
       the features. See zpool-features(7) for details.
scan: scrub repaired 0B in 00:00:00 with 0 errors on Fri May 17 23:47:32 2024
config:
```

NAME	STATE	READ	WRITE	CKSUM
farm	ONLINE	0	0	0
raidz1-0	ONLINE	0	0	0
nvme0n1p2	ONLINE	0	0	0
nvme1n1p2	ONLINE	0	0	0
nvme2n1p2	ONLINE	0	0	0
nvme3n1p2	ONLINE	0	0	0

```
errors: No known data errors

Drives for this pool are listed below:
e2b38f27-14c4-11ef-8817-000c29c58878 -> nvme0n1p2 -> S/N:511230818150000088
e2b76c23-14c4-11ef-8817-000c29c58878 -> nvme3n1p2 -> S/N:511230818150000089
e2b4c540-14c4-11ef-8817-000c29c58878 -> nvme1n1p2 -> S/N:511230818150000051
e2b260d1-14c4-11ef-8817-000c29c58878 -> nvme2n1p2 -> S/N:511230818150000096
```

All drives for the “farm” pool are listed and identified by three things:  
gptid -> Drive ID -> Drive Serial Number

This makes it significantly easier to identify which drive actually failed by serial number.



# Anatomy of the Multi-Report Email

##### SMART status report for sdd drive (ST500LM012 HN-M500MBB : S2X1J90CA48799) #####

SMART overall-health self-assessment test result: PASSED

ID#	ATTRIBUTE_NAME	FLAG	VALUE	WORST	THRESH	TYPE	UPDATED	WHEN_FAILED	RAW_VALUE
1	Raw_Read_Error_Rate	0x002f	100	100	051	Pre-fail	Always	-	0
2	Throughput_Performance	0x0026	056	054	000	Old_age	Always	-	6116
3	Spin_Up_Time	0x0023	091	091	025	Pre-fail	Always	-	2868
4	Start_Stop_Count	0x0032	100	100	000	Old_age	Always	-	368
5	Reallocated_Sector_Ct	0x0033	252	252	010	Pre-fail	Always	-	0
7	Seek_Error_Rate	0x002e	252	252	051	Old_age	Always	-	0
8	Seek_Time_Performance	0x0024	252	252	015	Old_age	Offline	-	0
9	Power_On_Hours	0x0032	100	100	000	Old_age	Always	-	9110
10	Spin_Retry_Count	0x0032	252	252	051	Old_age	Always	-	0
11	Calibration_Retry_Count	0x0032	100	100	000	Old_age	Always	-	132
12	Power_Cycle_Count	0x0032	100	100	000	Old_age	Always	-	361
13	Read_Soft_Error_Rate	0x003a	100	100	000	Old_age	Always	-	0
181	Program_Fail_Cnt_Total	0x0022	096	096	000	Old_age	Always	-	91972053
191	G-Sense_Error_Rate	0x0022	100	100	000	Old_age	Always	-	9
192	Power-Off_Retract_Count	0x0022	252	252	000	Old_age	Always	-	0
193	Load_Cycle_Count	0x0032	097	097	000	Old_age	Always	-	31523
194	Temperature_Celsius	0x0002	064	059	000	Old_age	Always	-	32 (Min/Max 17/41)
195	Hardware_ECC_Recovered	0x003a	100	100	000	Old_age	Always	-	0
196	Reallocated_Event_Count	0x0032	252	252	000	Old_age	Always	-	0
197	Current_Pending_Sector	0x0032	252	252	000	Old_age	Always	-	0
198	Offline_Uncorrectable	0x0030	252	252	000	Old_age	Offline	-	0
199	UDMA_CRC_Error_Count	0x0036	100	100	000	Old_age	Always	-	2
200	Multi_Zone_Error_Rate	0x002a	100	100	000	Old_age	Always	-	31
240	Head_Flying_Hours	0x0032	100	100	000	Old_age	Always	-	7528
241	Total_LBAs_Written	0x0032	095	094	000	Old_age	Always	-	6812280
242	Total_LBAs_Read	0x0032	096	094	000	Old_age	Always	-	6144661
254	Free_Fall_Sensor	0x0032	252	252	000	Old_age	Always	-	0

No Errors Logged

Most recent Short & Extended Tests - Listed by test number

# 1 Short offline Completed without error 00% 9088 -

# 4 Extended offline Interrupted (host reset) 70% 9075 -

SCT Error Recovery Control: Read: Disabled Write: Disabled

Header to identify the report is for Drive ID 'sdd' and lists the Model Number and Serial Number

Lastly we have the OUTPUT of "smartctl -a"

Why did I include this in the report you ask?  
Because the more information we have to analyze, the better our decision is on what actions, if any, are required.

The Last SMART Short and Long Tests with the results.

TLDR Can also be set by the script, the default is 70 (7.0 seconds) when enabled. It is Disabled in this example.



# Closing Notes

Always backup your important data.

Always use an Uninterruptable Power Supply (UPS).

Read the User Guide (I need to update it again).

Always celebrate May the 4<sup>th</sup> “be with you”. Yea, corny.

If you find something wrong with the script or these instructions, please reach out to [joeschmuck2023@hotmail.com](mailto:joeschmuck2023@hotmail.com) with the issue, or run the script using the ‘-dump email’ switch to send me data to analyze and include a little message as well. Believe it or not, I appreciate the feedback, good or not so good.