Multi-Report

Quick Start Guide

Version 3.1

15 January 2025

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 Multi-Report detects a problem. Just call it “Peace of Mind”.
- SMART was designed with the intention to warn a user of pending Hard Drive doom within 0 to 24 hours of a failure. This is not fool proof, not a magic bullet. SMART is not perfect however if it does predict a failure and you are aware of it, you can fend off some danger. 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 running 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. The new Drive_Selftest can automate the scheduling of your SMART tests, example: Daily Short tests and Weekly or Monthly Long Tests, and you have virtually nothing to do to make that work.
- As you look at the chart data, note that the column titles should be self-explanatory.
- One major change has occurred in version 3.1, the S.M.A.R.T. testing has been removed and moved into a companion script called “Drive_Selftest”. This makes maintaining the script easier and the Drive_Selftest script can run on it’s own for those people who just want to run the smart tests easily.

Quick Setup Information

Place script on your server (location is for example only)

- 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 you created.
- Copy the script to the 'scripts' dataset, rename the script to "multi_report.sh".

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Setting up the CRON JOB

- (CORE) -> Tasks -> Cron Jobs -> ADD
- (SCALE) -> System -> Advanced -> 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

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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.

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Notes:

- To customize Multi-Report run the script with the '-config' switch and select Advanced Configuration. There are a large variety of things which can be customized for almost every situation. If you can't figure out how to do something, drop Joe a message.
- 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 that 24 hours, keep in mind time zones, I'm in the USA, NY (ET).

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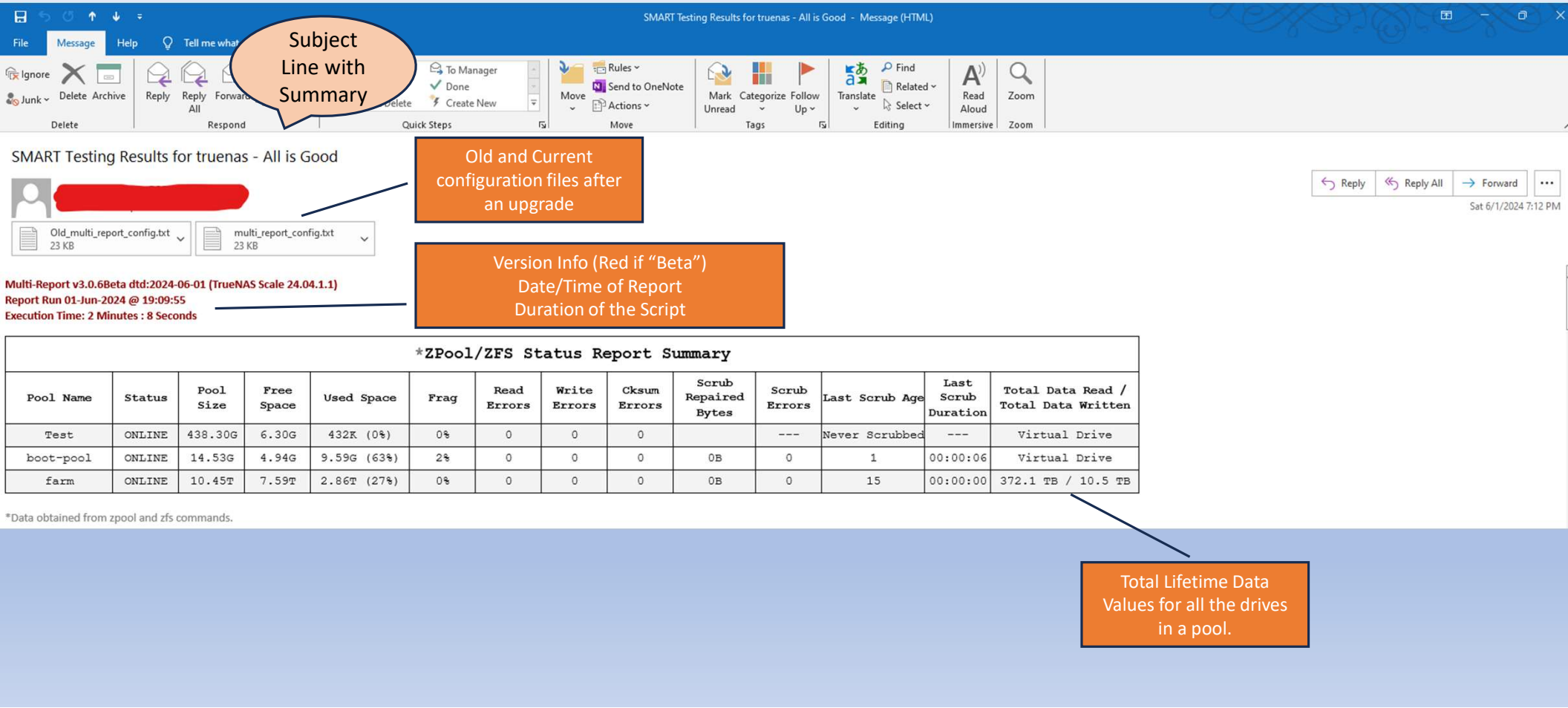
Anatomy of the Multi-Report Email



Anatomy of the Multi-Report Email

SMR Checking
Yellow = Alarm Override

"0" = Compensated Value
"(2)" = Real Value, Yellow = Alarm Override
Purpose: To easily identify new 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 Sects	Re-alloc Evnt	Curr Pend Sects	Offl Unc Sects	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 Sects	Re-alloc Evnt	Curr Pend Sects	Offl Unc Sects	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

"---" means No Value Exists

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

```
1) External Configuration File (Present) dtd:2025-01-13a
2) Statistical Data Log (Present) @ (/mnt/farm/scripts/statisticalsmartdata.csv)

Attachments:
1) TrueNAS Configuration File (All) - (Enabled)
2) Multi Report Configuration File (All) - (Enabled)
3) Statistical Log (All) - (Enabled)
4) HDD/SSD Partition Backup (All) - (Enabled)

Checks/Tests:
1) SMR Checking - (Disabled)
2) Partition Check - (Enabled) - No Errors Detected
3) Spencer - (Not Installed)
4) S.M.A.R.T Testing External File - (Enabled)
   a) Short Test Authorized Test Days (Mon, Tue, Wed, Thu, Fri, Sat, Sun) (~1 Drive(s) per day)
      (none)
   b) Long Test Authorized Test Days (Mon, Tue, Wed, Thu, Fri, Sat, Sun) (~1 Drive(s) per day)
      (none)
```

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 report for Spinner ##########
  pool: Spinner
 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 00:08:21 with 0 errors on Sun Dec 22 00:08:23 2024
config:

        NAME                                    STATE     READ WRITE CKSUM
        Spinner                                 ONLINE       0     0     0
          fe73da7e-b48d-4710-860e-3bf847568eba  ONLINE       0     0     0

errors: No known data errors

Drives for this pool are listed below:
Virtual Drive fe73da7e-b48d-4710-860e-3bf847568eba -> sdc1 -> S/N:02000000000000000001
```

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 farm ##########
  pool: farm
 state: DEGRADED
status: One or more devices are faulted in response to persistent errors.
        Sufficient replicas exist for the pool to continue functioning in a
        degraded state.
action: Replace the faulted device, or use 'zpool clear' to mark the device
        repaired.
  scan: scrub repaired 472K in 00:34:18 with 0 errors on Sat Jan 11 13:06:34 2025
config:

        NAME                                      STATE     READ WRITE CKSUM
        farm                                      DEGRADED     0     0     0
          raidz2-0                                DEGRADED     0     0     0
            f41cd7e4-df4c-4f0c-9c24-62a4343c1868  ONLINE       0     0     0
            21e5a651-701d-4150-82c6-446211a8f898  ONLINE       0     0     0
            f18e77b8-82cd-426c-b6e6-9bcc9778e511  FAULTED     15     0     0  too many errors
            cee96768-462c-437f-b35b-ab3abcd8fd0f  ONLINE       0     0     0
            d3549c3a-2f33-41b8-8fdb-4096c3fb5248  ONLINE       0     0     0

errors: No known data errors

Drives for this pool are listed below:
21e5a651-701d-4150-82c6-446211a8f898 -> nvme1n1p2 -> S/N:511230818150000096
cee96768-462c-437f-b35b-ab3abcd8fd0f -> nvme4n1p2 -> S/N:511230818150000088
d3549c3a-2f33-41b8-8fdb-4096c3fb5248 -> nvme2n1p2 -> S/N:511230818150000450
f18e77b8-82cd-426c-b6e6-9bcc9778e511 -> nvme3n1p2 -> S/N:511230818150000089  PROBLEM
f41cd7e4-df4c-4f0c-9c24-62a4343c1868 -> nvme0n1p2 -> S/N:511230818150000051
```

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.

Recently added, noting exactly the related drive, however in this example it alone does not mean the drive is faulty.

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

If you find something wrong with the script or these instructions, please reach out to 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.

And if you have a recommendation on what the default values should be within the multi_report_config.txt file, please reach out to me. If the change makes sense, I will implement it.