# HDSENTINEL GUIDE FOR SYNOLOGY DS220 PLUS

### HIGH LEVEL STEPS:

- 1. Synology NAS Web UI Setup:
  - a. Enable ssh service for Synology NAS
  - b. Create shared folder in Synology NAS to be used by hdsentinel for Synology NAS
- 2. SSH Connection Setup:
  - a. Install hdsentinel for Synology NAS
  - b. Test if hdsentinel is working for Synology NAS
  - c. Schedule background job for hdsentinel on Synology NAS to generate the disk report
- 3. Hdsentinel for Windows Setup:
  - a. Test if hdsentinel in Synology NAS is able to generate a report
  - b. Configure hdsentinel in Windows to monitor the hdsentinel disk report from Synology NAS

# DETAILED STEPS (SYNOLOGY NAS WEB UI SETUP):

# LOGIN TO SYNOLOGY NAS WEB UI

- 1. Open Web Browser and type the IP address of your Synology NAS (with port 5000)
  - a. Alternatively, you may type <u>https://finds.synology.com/</u> in your web browser to automatically find the Synology NAS:



- 2. Login to the Synology NAS with a username with administrative rights.
  - a. Confirm if the logged in user has administrative rights by going to the path below:
    - i. Control Panel -> User & Group -> User -> User Groups -> administrators (must be ticked)



# ENABLE SSH SERVICE FOR SYNOLOGY NAS

- 1. Enable SSH service on the Synology NAS by going to the path below:
  - b. Control Panel -> Terminal & SNMP -> Enable SSH Service (must be ticked). Retain the default port number:



c. Click "Apply" to save the changes

#### **CREATE SHARED FOLDER IN SYNOLOGY NAS**

- 1. Create a shared folder to be used by hdsentinel for Synology NAS by going to the path below:
  - a. Control Panel -> Shared Folder -> Create -> Create Shared Folder:



b. Use a descriptive name for the folder (in this guide, the folder name is "hdsentinel"):



- 2. Verify if the shared folder can be seen from Windows Explorer:
  - a. Identify the name of your Synology NAS for SMB by going to the path below:
    - i. Control Panel -> File Services -> SMB -> Enable SMB service (must be ticked)
    - ii. Check the value in "PC (Windows Explorer)":



- b. In Windows Explorer, check if the created shared folder can be seen:
  - i. In the folder path, type the SMB name in the previous step, and check if the "hdsentinel" folder exists:

Home	\\ds220 Share View				
Quick Copy	Paste	Move Copy to Copy	New item • New folder	Properties	Select all Select none Invert selection
í C	lipboard	Organize	New	Open	Select
→ <b>*</b> ↑	Network > ds220 hdsentinel				<b>∨ შ</b>
		Į			

#### DETAILED STEPS (SSH CONNECTION SETUP):

### LOGIN TO SYNOLOGY NAS VIA SSH

- 1. Download and install PuTTY:
  - a. URL of PuTTY is <u>https://putty.org</u>:



- 2. Open PuTTY and connect to Synology NAS via SSH:
  - a. Input the IP address of your Synology NAS (retain the default port number) and click "Open":

Session	Basic options for your PuTTY s	ession
⊡ · Terminal ⊡ · Terminal - Keyboard	Specify the destination you want to conn Host Name (or IP address)	ect to Port
Bell	192.168.xxx.xxx	22
Features	Connection type:	and the second s
Window	● SSH ○ Serial ○ Other: Teln	iet
Connection	Default Settings	Load
Data Proxy		Save
···· Proxy •·· SSH ···· Serial ···· Telnet ···· Rlogin ···· SUPDUP		Delete
	Close window on exit:	

- b. The tasks to be executed needs to have root privileges. Perform the following steps:
  - i. Login as user with administrative rights.
  - ii. Once successfully logged in, temporarily elevate privilege by typing "sudo -i" and re-entering your password for the user with administrative rights. This step is necessary to skip entering the password for each of the commands to be executed in the succeeding steps.
  - iii. If successful, the user should appear "root@[nas\_name]" on the left side of the prompt
  - iv. Sample output can be seen below:



🛃 192.168.	- PuTTY	2 <u></u> -	×
root@DS220	:~# cd /volumel/hdsentinel		-
root@DS220	:/volumel/hdsentinel#		-

# **INSTALL HDSENTINEL FOR SYNOLOGY NAS**

1. Download prerequisites:

i.

a. The DS220 Plus has an Intel processor (which can be verified in the URL below):

https://kb.sv	ynology.com/	en-global/DSM/tutorial/\	<u> What_kinc</u>	of CPU	J_do	<u>es_my_NAS_ha</u>	ive
C D thtps://kb.synology.com/en-global/DSM/tutorial/What_kind_of_CPU_does_my_NAS_have							
Synology   Knowledge Center					λ Sea	rch Knowledge Cente	r
			COIC				
DS	220 <mark>+</mark>	Intel Celeron J4025	Dual Core	2	Yes	Geminilake	DDR4 2 GB

- b. For the DS220 Plus, the 64-bit linux installer will be used. Get the URL of the download link by going to the URL below:
  - i. https://www.hdsentinel.com/hard disk sentinel linux.php

- ii. Note the URL of the download link by doing any of the following:
  - 1. Hovering the mouse on the download icon and noting the text in the status bar
  - 2. Right clicking the link, then click "copy link"
  - 3. Sample screenshot can be seen below:

← C බ bttps://www.hdsentinel.com/hard_disk_sentinel_linux.php							
List only health, temperature, drive, lowest health on	top, drives without temperature information (for example card readers) removed:						
hdsentinel -solid   awk '{print \$3, \$2, \$1}'   grep -v	hdsentinel -solid   awk '{print \$3, \$2, \$1}'   grep -v "^?"   sort -n						
3 42 /dev/sda 100 30 /dev/sdb 100 46 /dev/sdc							
Note that the spaces in hard disk model ID and serial	I number are replaced with underscore (_).						
If you have any ideas, thoughts about the automatic p will be published on this page with the name and crea	processing of output or if you have complete script(s) you want to share with other users, please send a mail and it dits of the sender of the script.						
Download Hard Disk Sentinel Linux							
Hard Disk Sentinel 32-bit Linux console version - exe	ecutable, gzip-compressed						
Hard Disk Sentinel 64-bit Linux console version - exe	ecutable, gzip-compressed						
Hard Disk Sentinel Linux console version for Raspbe	ITY PI (ARM CPU) - exect ☐ Open link in new tab						
Hard Disk Sentinel Linux console version for NAS bo	IX88 (ARMv5 CPU) - exec 🕼 Open link in InPrivate window						
Hard Disk Sentinel Linux console version for NAS bo	xes / Raspberry PI 4 (ARI						
Hard Disk Sentinel Linux console version for NAS bo	xes / Raspberry PI 4 64-b						
Can be used with Synology D220j and other S	ynology NAS models with Group of the state o						
Compatibility	G Add to Collections >						
Kernel support is required to detect and display inform	mation about SATA hard d						
<ul> <li>blackPanthor OS v16 2 SE</li> </ul>	() Web select Ctrl+Shift+X						
CentOS 5 6 and newer	Web capture Ctrl+Shift+S						
<ul> <li>Fedora 5, 6, 7, 8, 9, 10, 15 and newer</li> </ul>	🚺 Bitwarden >						
<ul> <li>Ubuntu 8.04 server kernel 2.6.24-16-server, 9</li> </ul>	.04						
Kubuntu 8.04	L <sub>p</sub> ) inspect						
Xubuntu 8.04							
Slackware 11.0							
UHU Linux 2.1 https://www.hdsentinel.com/hdslin/hdsentinel-019c-x64.gz							

- iii. The latest version when this guide is written is version 0.19. The download link may be updated in case a newer version is released
- 2. Install hdsentinel for linux by using wget command and specifying the download link in the previous step
  - a. For this guide, the command is "wget <u>https://www.hdsentinel.com/hdslin/hdsentinel-019c-x64.gz</u>":

<b>P</b> 192.168.	- PuTTY	3 <u></u>		×
root@DS220	:/volumel/hdsentinel# wget https://www.hdsentinel.com/hdslin/hdsentine	-019c	-x64.g	jz <b>i</b>

b. The installer will be downloaded and the successful download will look like the screen below:



- c. After downloading the installer, perform the following steps to prepare the installer:
  - i. Decompress the downloaded installer by typing the command below:
    - 1. "gunzip hdsentinel-019c-x64.gz"
      - a. The command doesn't return any status, but should not raise any error
  - ii. Change permission for the downloaded installer by typing the command below:
    - 1. "chmod 0755 hdsentinel-019c-x64"
      - a. The command doesn't return any status, but should not raise any error
- d. Sample screenshot after doing the previous steps to prepare the installer:

🛃 192.168.	- PuTTY			V <u>223</u>		×
root@DS220	:/volumel/hdsentinel#	gunzip hdse	entinel-0190	c-x64	.gz	^
root@DS220	:/volumel/hdsentinel#	chmod 0755	hdsentine	1-019	c-x64	
root@DS220	:/volumel/hdsentinel#					~

### TEST IF HDSENTINEL IS WORKING FOR SYNOLOGY NAS

- 1. Type the command below to check the report for the 1<sup>st</sup> hard disk:
  - a. ./hdsentinel-019c-x64 -dev /dev/sata1
  - b. There should be a detailed information for the 1<sup>st</sup> hard disk, which can look like the screen below:

J92.168.	- PuTTY	2007		×
root@DS220	:/volumel/hdsentinel# ./hdsentinel-019c-x64 -dev	/dev/sa	tal	^
Hard Disk Se	ntinel for LINUX console 0.19c.9986 (c) 2021 info@h	dsentin	el.com	
Start with -	r [reportfile] to save data to report, -h for help			
Examining ha	rd disk configuration			
HDD Device	0: /dev/satal			
HDD Model ID	: XXXXXXXXXXXXXXXX			
HDD Serial N	o: XXXXXXXXXXXXXXXX			
HDD Revision	: XXXXXXXXXXXXXXXX			
HDD Size	: XXXXXXXXXXXXXXXX			
Interface	: S-ATA Gen3, 6 Gbps			
Temperature	: 35 °C			
Highest Temp	.: 40 °C			
Health	: 100 %			
Performance	: 100 %			
Power on tim	e: XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
Est. lifetim	e: more than 1000 days			
The hard d	isk status is PERFECT. Problematic or weak sectors	were no	t found	1
and there a	re no spin up or data transfer errors.			
No actio	ns needed.			
root@DS220	:/volumel/hdsentinel#			~

- 2. Type the command below to check the report for the 2nd hard disk:
  - a. ./hdsentinel-019c-x64 -dev /dev/sata2
  - b. There should be a detailed information for the 2<sup>nd</sup> hard disk, which can look like the screen below:

P 192.168.	- PuTTY				<
root@DS220 Hard Disk Sent Start with -r	:/volumel/hdsentinel# ./hdsentinel-019c-x64 -dev / inel for LINUX console 0.19c.9986 (c) 2021 info@hd [reportfile] to save data to report, -h for help	/dev/ isent	'sata inel	12 com	^
Examining hard	disk configuration				
HDD Device 0:	/dev/sata2				
HDD Model ID :	XXXXXXXXXXXXXXXX				
HDD Serial No:	XXXXXXXXXXXXXXXX				
HDD Revision :	XXXXXXXXXXXXXXX				
HDD Size :	XXXXXXXXXXXXXXX				
Interface :	S-ATA Gen3, 6 Gbps				
Temperature :	37 °C				
Highest Temp.:	41 °C				
Health :	100 %				
Performance :	100 %				
Power on time:	XXXXXXXXXXXXXXX				
Est. lifetime:	more than 1000 days				
The hard dis	k status is PERFECT. Problematic or weak sectors w	vere	not	found	
and there are No actions	no spin up or data transfer errors. needed.				
root@DS220	:/volumel/hdsentinel#				~

# SCHEDULE BACKGROUND JOB FOR HDSENTINEL ON SYNOLOGY NAS

- 1. Type the command below to edit the background job file:
  - a. vim /etc/crontab

🛃 192.168.	- PuTTY			_		×
root@DS220	:/volumel/hdsentinel#	vim	/etc/	cron	tab	-

b. The VIM editor will be displayed:



- 2. Once in the VIM editor, perform the following steps:
  - a. Press "down" arrow four (4) times to go down four (4) lines
  - b. Press "o" key to insert a new line
  - c. We would like to generate the hdsentinel report for the Synology NAS HDDs every ten (10) minutes. Paste the following lines in the editor (right-click the mouse in PuTTY to paste the line):

\*/10 \* \* \* \* root /volume1/hdsentinel/hdsentinel-019c-x64 -dev /dev/sata1 -r /volume1/hdsentinel/hdsreport-sata1.html -html
\*/10 \* \* \* \* root /volume1/hdsentinel/hdsentinel-019c-x64 -dev /dev/sata2 -r /volume1/hdsentinel/hdsreport-sata2.html -html

d. Sample output should look like below:



e. Press "ESC" key, then type the values ":wq". The values should appear in the lower left part of the window:

<b>P</b> 192.168.	- PuTTY	-	×
MAILTO="" PATH=/sbin:/ #minute hour	bin:/usr/sbin:/usr/syno/sbin:/usr/syno/bin:/usr/local/sbin:/usr/local/bin mday month wday who command		^
*/10 * * * * */10 * * * * 0 0,1,2,3, 10 3 * 0 3 9 33 12 * 0 0 7 ~ ~	root /volumel/hdsentinel/hdsentinel-019c-x64 -dev /dev/satal -r /volumel/hdsentinel/hdsreport-satal.html -html root /volumel/hdsentinel/hdsentinel-019c-x64 -dev /dev/sata2 -r /volumel/hdsentinel/hdsreport-sata2.html -html s,5c,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23 7 1 * root /usr/syno/bin/synoschedtaskrun id=4 * 3,6 root /usr/syno/bin/synoschedtaskrun id=1 * * root /usr/syno/bin/synoschedtaskrun id=2 * * root /usr/syno/bin/synoschedtaskrun id=2 * * root /usr/syno/bin/synoschedtaskrun id=3		
~ ~ ~ ~			~

f. Press "ENTER" key to save and exit the VIM editor, it will return to the prompt:

🛃 <b>1</b> 92.168.	- PuTTY			×
root@DS220	:/volumel/hdsentinel# vim	/etc/cr	ontab	^
root@DS220	:/volumel/hdsentinel#			~

3. Logout the SSH session by typing the "exit" command two (2) times:

<b>P</b> 192.168.	- PuTTY	200	×
root@DS220 logout	:/volumel/hdsentinel# exit		^
@DS22	0 :~\$exit		~

# DETAILED STEPS (HDSENTINEL FOR WINDOWS SETUP):

# TEST IF HDSENTINEL IN SYNOLOGY NAS IS ABLE TO GENERATE A REPORT

1. Open Windows Explorer and go to the shared folder used by hdsentinel for Synology NAS to see if the background job has generated the hdsentinel output report



- 2. Open the HTML in the previous step to see the report details:
  - a. Sample for Disk 1:

Hard Disk Sentinel ×	+
$\leftarrow$ C $$ O File   ds220	/hdsentinel/hdsreport-sata1.html
Hard Disk Sentinel	
General Information	
Application Information	
Installed Version Current Date And Time	: Hard Disk Sentinel 0.19c : 8-12-22 17:30:01
Computer Information	
Computer Name MAC Address	
System Information	
OS Version Process ID Uptime	: Linux : 4.4.180+ (#42962 SMP Tue Oct 18 15:07:03 CST 2022) 3684

hysical Disk Information - Disk	#			
Hard Disk Summary				
Hard Disk Summary				
Hard Disk Number Hard Disk Device Interface Hard Disk Model ID Firmware Revision Hard Disk Serial Number	:	0 /dev/sata1 S-ATA Gen3, 6 Gbps		
Current Temperature Maximum Temperature (during Entire Lifespan)		35 °C (95 °F) 40 °C (104 °F)		
Estimated Remaining Lifetime	-	more than 1000 days		
Health Performance	:		:	100 % (Excellent) 100 % (Excellent)
The hard disk status is	s PERFEC	F. Problematic or weak sectors were	e not found a	nd there are no spin up or data transfer err
No actions needed.				
ATA Information				
Hard Disk Cylinders Hard Disk Heads Hard Disk Sectors ATA Revision Transport Version		SATA Day 2.1		
Total Sectors Bytes Per Sector Buffer Size		ONIN NEV D. I		

b. Sample for Disk 2:

Hard Disk Sentinel X	+
$\leftarrow$ C $$ $\bigcirc$ File   ds220	/hdsentinel/hdsreport-sata2.html
Hard Disk Sentinel	
General Information	
Application Information	
Installed Version Current Date And Time	: Hard Disk Sentinel 0.19c : 8-12-22 18:00:01
Computer Information	
Computer Name MAC Address	
System Information	
OS Version Process ID Uptime	: Linux : 4.4.180+ (#42962 SMP Tue Oct 18 15:07:03 CST 2022) : 10807 :

ysical Disk Information - Disk:	#			
Hard Disk Summary				
Hard Disk Number Hard Disk Device Interface Hard Disk Model ID Firmware Revision Hard Disk Serial Number		0 /dev/sata2 S-ATA Gen3, 6 Gbps		
Current Temperature Maximum Temperature (during Entire Lifespan) Power On Time		37 °C (99 °F) 41 °C (106 °F)		
Estimated Remaining Lifetime	:	more than 1000 days		
Health	:		+	100 % (Excellent)
Performance			•	100 % (Excellent)
The hard disk status is No actions needed.	S PERFECT	. Problematic or weak sectors were	not found	and there are no spin up or data transfer error
Hard Disk Cylinders	;			
Hard Disk Heads Hard Disk Sectors ATA Revision Transport Version		SATA Rev 3.1		
Total Sectors Bytes Per Sector Multiple Sectors Error Correction Bytes		Jonin 108 J. I		

# CONFIGURE SYNOLOGY NAS DISK MONITORING

- 1. Open hdsentinel for windows and go to the path below:
  - a. File -> Configure NAS Disk Monitoring



2. Click "Browse" and load the two (2) HTML files generated by the hdsentinel for Synology NAS:

Configure NAS Disk Monitoring		×
Specify Status Source(s) to monitor Network Attached Sto	orage (NAS) disk drives.	
Status Source files contain complete status of hard disk di appropriate disk drives like if they would be connected di	rives, SSDs, storage devices and Hard Dis rectly.	k Sentinel reads them to show the
Status Source files saved and updated on the NAS device,	created by (for example) Hard Disk Sent	inel Linux version.
The Auto Detect function automatically detects possible S	Status Source files (HDSReport.html) on a	available network drives.
More information: <u>How to: monitor Network Atta</u>	ached Storage (NAS) status	
Status Source	Physical Disk(s)	Browse
Model and Anthenine And Anthenine And Anthenine And Anthenine Anth	1	Add LIRI
\\ds220 \\dsentinel\\hdsreport-sata2.html	1	
		Edit
		Delete
		Jest
-		
	Auto Detect	OK Cancel

- 3. Click "OK", the two (2) HDD drives in the Synology NAS should be seen in the main window:
  - a. Sample for Disk 1:

Disk: 4, - Hard Disk Sentine	el 6.01 PRO	
le <u>D</u> isk <u>V</u> iew <u>R</u> eport <u>C</u> onfiguration <u>H</u> elp		
) & S & F & F & E & E	] 🗊 🧐 💆 🧶 👔	
	🔮 Overview 🧳 Temperature 👒 S.M.A.R.T.	🔱 Information 📄 Log 🞯 Disk Performance 🖺 Aler
ð	Hard Disk Summary	
•	Hard Disk Number	4
	Interface	Network Attached Storage (NAS) S-ATA Gen3, 6 Gb
	🚍 Status Source	\\ds220 \hdsentinel\hdsreport-sata1.html
	Hard Disk Model ID	
	Firmware Revision	
	Hard Disk Serial Number	
	Total Size	
	ATA Information	
~	Hard Disk Cylinders	
9	Hard Disk Heads	
	Hard Disk Sectors	
	ATA Revision	
Disk: 4	Transport Version	
	Total Sectors	
	Bytes Per Sector	
	Buffer Size	
<b>2</b>	Multiple Sectors	
545	Error Correction Bytes	
	Unformatted Capacity	
	Maximum PIO Mode	
	Maximum Multiword DMA Mode	
	Highest Possible Transfer Rate	S-ATA Gen3 Signaling Speed (6 Gps)
	Negotiated Transfer Rate	S-ATA Gen3 Signaling Speed (6 Gps)

b. Sample for Disk 2:

Disk: 5, - Hard Disk Sentinel 6.01 PRO

Eile Disk View Report Configuration	n <u>H</u> elp	
0000 4787	😫 🛫 🤳 🔋 🇊 🧐 🦉 🖉 🖓 🔞 🔅	
	📀 Overview 🥒 Temperature 👒 S.M.A.R.T	r. 🔱 Information 📄 Log 🚳 Disk Performance 🗋 Alerts
0	Mard Disk Summary	
	Hard Disk Number	5
	Interface	Network Attached Storage (NAS) S-AIA Gen3, 6 Gbps
0	T Status Source	\\ds220 \hdsentinel\hdsreport-sata2.html
	Hard Disk Model ID	
	Firmware Revision	
•	Hard Disk Serial Number	
0	lotal Size	
	See ATA Information	
	Hard Disk Cylinders	
Ø	Hard Disk Heads	
	Hard Disk Sectors	
	ATA Revision	
0	Transport Version	
7 A.	Total Sectors	
	Bytes Per Sector	
	Multiple Sectors	
DISK; 5	Error Correction Bytes	
	Unformatted Capacity	
	Maximum PiO Mode	
	Hisbert Dessible Transfer Pate	S ATA Gan2 Signaling Speed (6 Gar)
	Pignest Possible Transfer Rate	S-ATA Gen3 Signaling Speed (6 Gps)
	ivegotiated transfer Rate	S-AIA Gens Signaling Speed (o Gps)

END OF GUIDE

### CREDITS:

1. Janos Mathe | hdsentinel creator | <u>www.hdsentinel.com</u> | <u>info@hdsentinel.com</u> | <u>www.facebook.com/HDSentinel</u>

### **REFERENCES:**

- 1. Marcus Wagner's guide to Synology DS416Play
- 2. Ronald San Jose's guide to Synology DS420J

Guide Creation Details:

- By: Vince Leonardo
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