

A close-up, black and white photograph of a hard drive platter, showing the circular surface and the surrounding mechanical components. The image is partially obscured by a blue overlay on the left side.

What Computer Forensics Teams Need Today: Speed, Automation & Overcoming Complexity in Data Imaging

MEET OUR PEOPLE

A FRACTION OF ATOLA TEAM



WALTER FANGL

CEO, ATOLA EUROPE



YULIA SAMOTEYKINA

DIRECTOR OF MARKETING



OLEXANDR CHALYI

HEAD OF
SOFTWARE ENGINEERING



- Founded in 2003
- In digital forensics since 2012
- Data recovery background
- Focus on R&D (80% of staff are engineers)
- HQ (manufacturing, sales, financial) in Canada, R&D in Ukraine



SSD: 8 TB takes 4-5 hours to image

Overall Pick 



SAMSUNG 870 QVO SATA III SSD 8TB 2.5" Internal Solid State Drive, Upgrade Desktop PC or Laptop Memory and Storage for IT Pros, Creators, Everyday Users, MZ-77Q8T0B

★★★★★ (20.5K)

500+ bought in past month

\$562⁸³ List: \$849.99

Delivery **Mon, Feb 10**

Ships to Germany

Add to cart

More Buying Choices

\$507.62 (4 used & new offers)



SanDisk 8TB Extreme Portable SSD - Up to 1050MB/s, USB-C, USB 3.2 Gen 2, IP65 Water and Dust Resistance, Updated Firmware - External Solid State Drive - SDSSDE61-8T00-G25

★★★★★ (73.2K)

400+ bought in past month

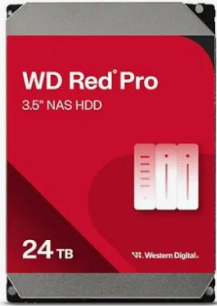
\$598⁰⁵ List: \$699.99

Delivery **Mon, Feb 10**

Ships to Germany

Add to cart

HDD: 18 TB takes 24-30 hours to image



Western Digital

24TB WD Red Pro NAS Internal Hard Drive HDD - 7200 RPM, SATA 6 Gb/s, CMR, 512 MB Cache, 3.5" - WD240KFGX

★★★★★ (5.2K)

50+ bought in past month

Save 12%

\$499⁰⁰ List: \$569.99

Lowest price in 30 days

FREE delivery

Add to cart

More Buying Choices

\$494.01 (27 used & new offers)



WD Ultrastar DC HC580 WUH722424ALE6L4 - Hard Drive - 24 TB - Internal - 3.5" (8.9 cm) - SATA 6Gb/s - 7200 RPM - Buffer: 512 MB

★★★★★ (8)

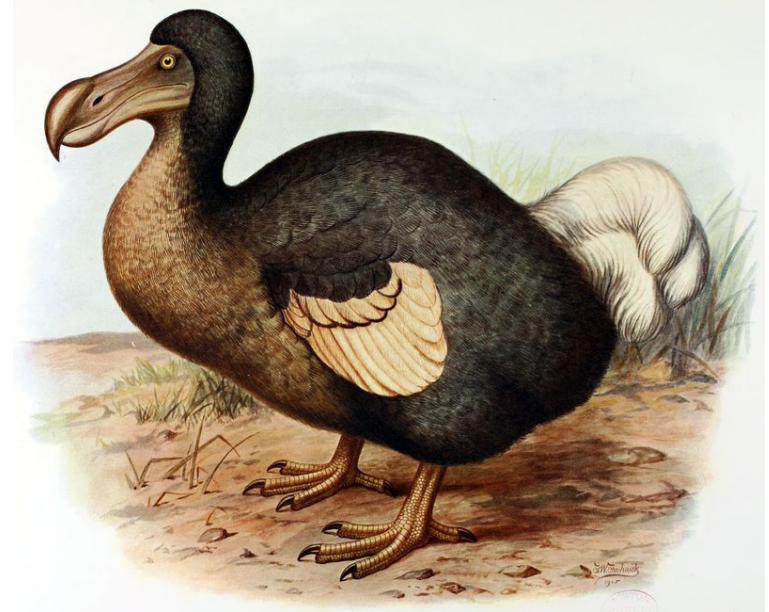
\$449⁰⁰ Typical: \$535.59

FREE delivery Feb 4 - 10

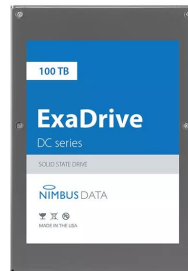
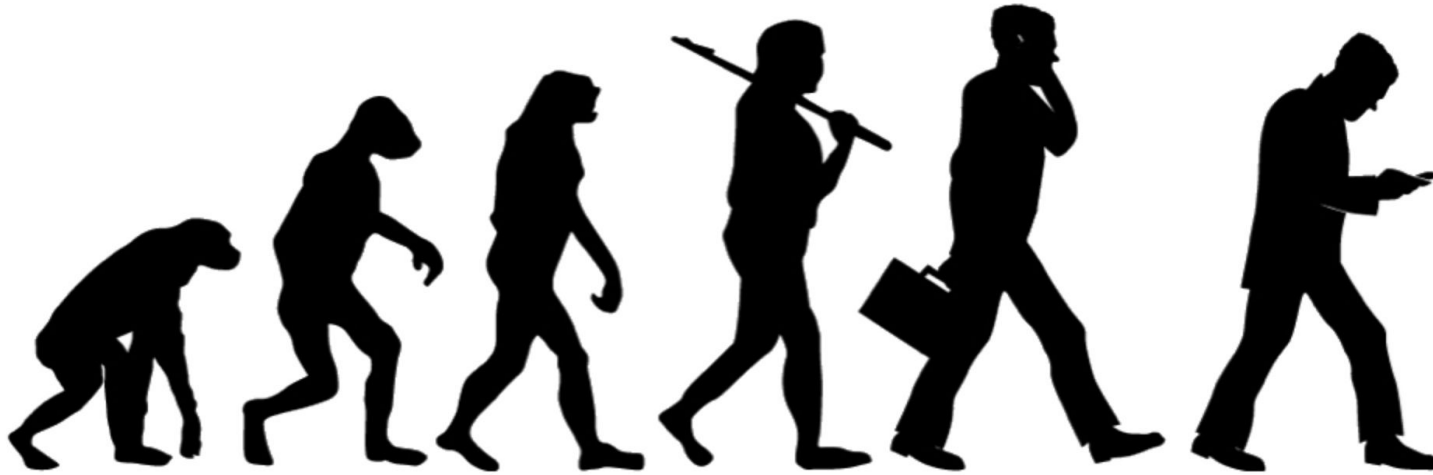
Add to cart

“Rotating storage is going the way of the dodo”

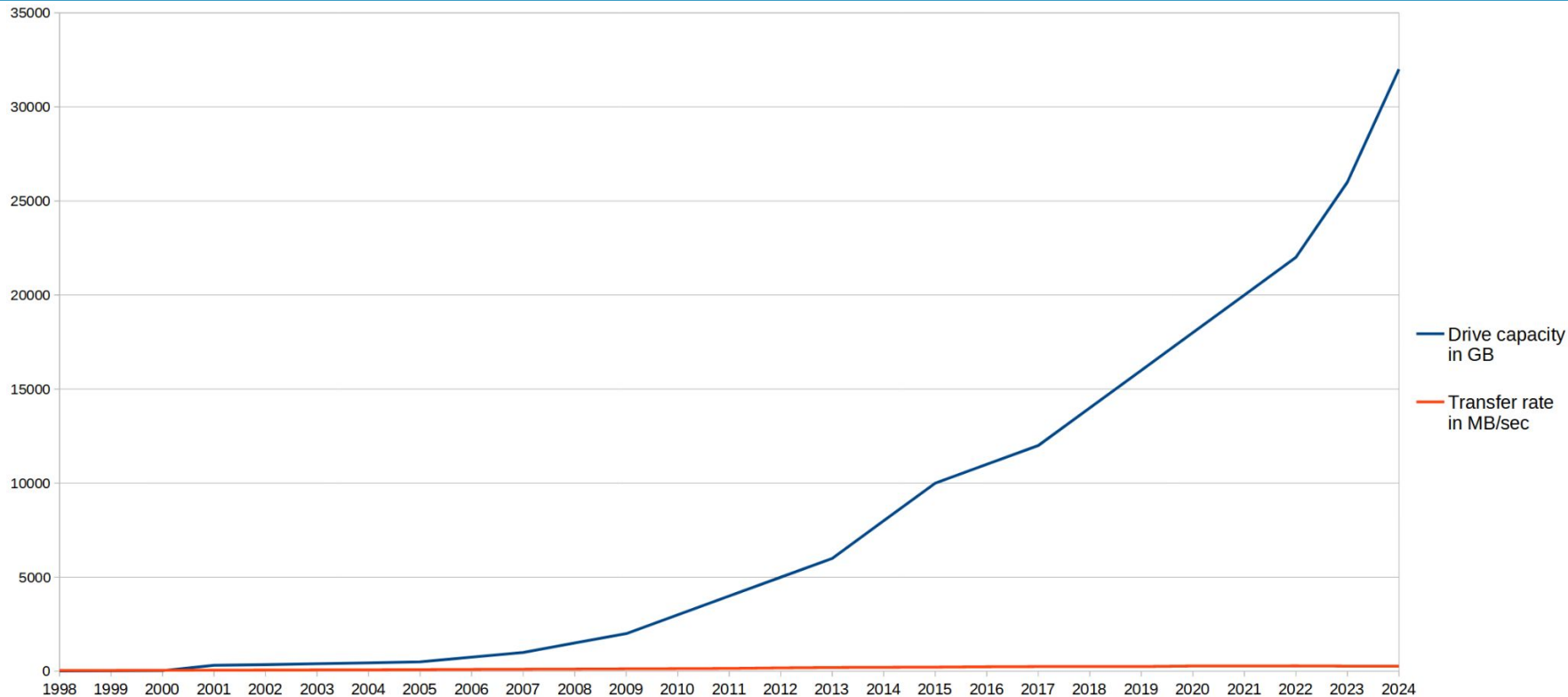
Linus Torvalds, Linux Creator, 2012



Slow evolution of storage technology



Growth of capacity vs. read/write speed



Maxtor
DiamondMax
100GB



Hitachi
DeskStar
500GB



WD
20EADS
2TB



HGST
Ultrastar He6
6TB



Seagate
Barracuda
14TB

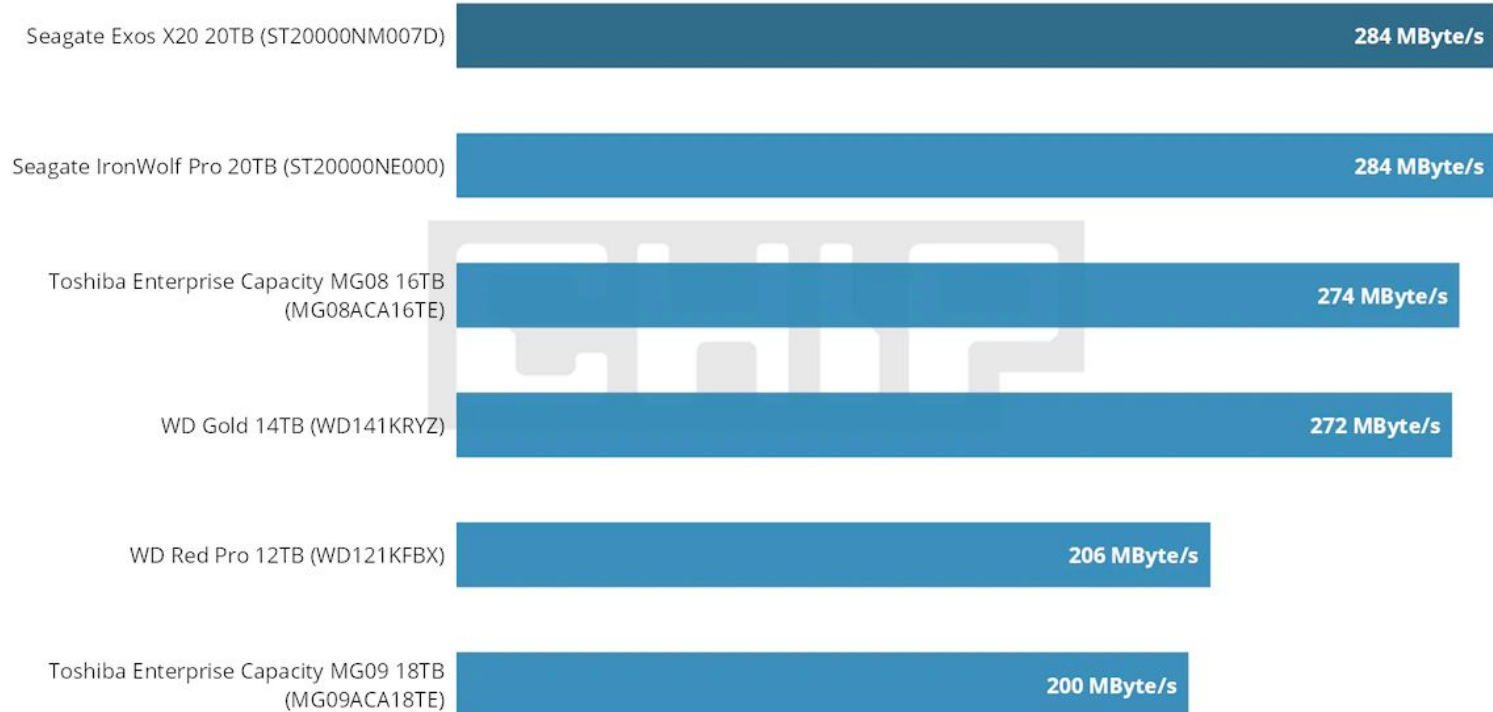


Seagate
Exos X Mosaic
32TB



Time of imaging

Transferrate Lesen



(größere Werte sind besser)

Time of imaging



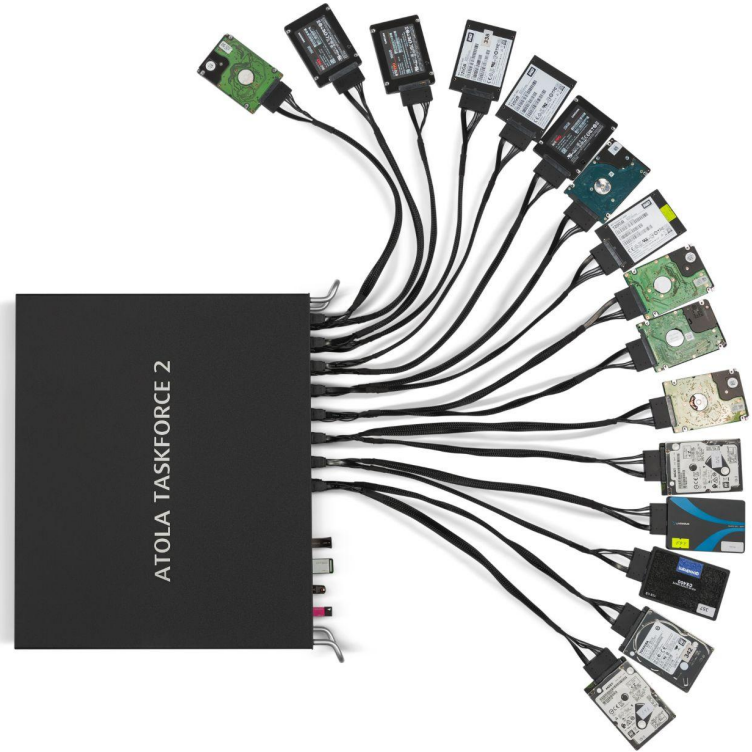
TaskForce 2 released in 2023



Parallel imaging of 26 drives

- 8 SATA
- 8 SAS/SATA
- 4 NVMe/PCIe SATA (M.2, U.2)
- 4 USB
- IDE
- Extensions: Apple PCIe SSD, NVMe, Thunderbolt

16 SATA drives simultaneously



Imaging of 25+ drives

Xeon CPU with 16 cores

Server-grade Supermicro motherboard

16GB ECC RAM

25 TB/hour

2 x 10 Gbit Ethernet

Source switch on all ports



Imaging at top native speed of the drives

The screenshot displays the Atola Technology software interface during a disk imaging operation. The top navigation bar includes a home icon with a notification badge, 'CASES', 'REPORTS', the Atola Technology logo, 'DEVICES', and a menu icon. A left sidebar contains icons for Diagnose, Image, Logical, RAID, Wipe, and Other. The main content area shows the target device: Samsung SSD 850 PRO 256GB S39KNX0J743780L, with a 'Healthy' status and 'SATA 1' interface. The case ID is 282, and there is 1 target. The 'Imaging data...' section features a progress bar at 93% and a legend. Performance statistics are shown: Pass: 1 of 1, Sectors imaged: 466,100,224, Speed: 550 MB/s, Sectors scheduled: 500,118,192, Errors: 0, and Estimated time: 35 s. A real-time speed graph plots ms against sectors, with markers at 464,002,816, 464,777,984, 465,596,672, and 463,999,488. A 'Log' section shows a message 'Imaging started' at 2023/07/20 15:10:42. A 'Target HEX viewer' shows 'Signatures : 461942'. At the bottom, there is a 'PAUSE' button, a 'VIEW SETTINGS' link, and a status bar with various error codes: Link: PHY, Status: ERR, INDX, CORR, DREQ, DRSC, FAULT, DRDY, BUSY, Error: AMNF, TONF, ABRT, IDNF, UNC, ICRC.

Atola
TECHNOLOGY

Home 2 CASES REPORTS DEVICES

Samsung SSD 850 PRO 256GB S39KNX0J743780L
256 GB

Healthy SATA 1 Case ID: 282 1 target

Imaging data... LEGEND

93%

Pass: 1 of 1 Sectors imaged: 466,100,224
Speed: 550 MB/s Sectors scheduled: 500,118,192
Errors: 0 Estimated time: 35 s

ms

464,002,816 464,777,984 465,596,672 463,999,488

Log

Date ↑	Message
2023/07/20 15:10:42	Imaging started

Target HEX viewer
Signatures :
461942

PAUSE VIEW SETTINGS

Link: PHY Status: ERR INDX CORR DREQ DRSC FAULT DRDY BUSY Error: AMNF TONF ABRT IDNF UNC ICRC

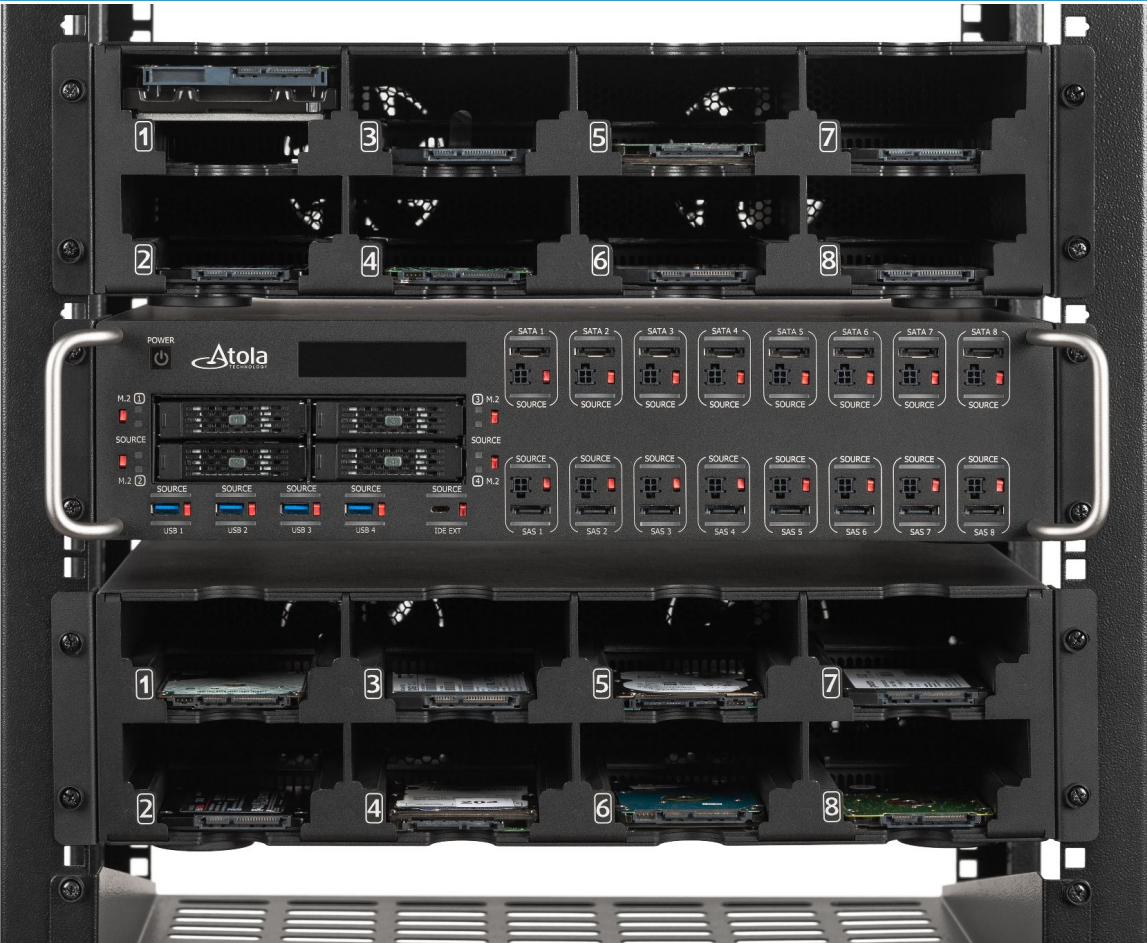
All components designed to sustain top speeds



Multi-user system, access from any device



Use it on a server rack



Express mode

- Diagnose
- Image
- Logical
- RAID
- Wipe
- Other

Express mode

Self-launching imaging mode. Express mode gains control over all Source ports the moment it is activated. Target ports remain available for other tasks.

1. Specify Express mode settings below and click Activate.
2. Plug device into a Source port: SATA, SAS, USB, IDE, NVMe.
3. Imaging will start automatically!
4. If imaging doesn't start and corresponding front LED is off, check Home screen.

Select ports for Express mode

NVME 1	NVME 3	SATA 1	SATA 2	SATA 3	SATA 4	SATA 5	SATA 6	SATA 7	SATA 8			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
NVME 2	NVME 4											
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>											
USB 1	USB 2	USB 3	USB 4	IDE	SAS 1	SAS 2	SAS 3	SAS 4	SAS 5	SAS 6	SAS 7	SAS 8
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

CANCEL SELECT

Start imaging only if diagnostics has no issues

Image settings preset Type: Damaged

Set case details CHANGE

REMOVE TAB

ACTIVATE Select ports and Target folder for at least one tab to activate Express mode

Express mode

- Diagnose
- Image
- Logical
- RAID
- Wipe
- Other

Express mode

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1. Specify Express mode settings below and click Activate.
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3. Imaging will start automatically!
4. If imaging doesn't start and corresponding front LED is off, check Home screen.

USB 1-4 SAS 1-8

SATA 1-8

NONE



Ports

USB 1-4 SAS 1-8

CHANGE

Target folder

//NAS459P11/homes/Yulia/images

SELECT FOLDER

What image files to create

Template: E01, Single file, Compressed

CHANGE

Diagnose source device before imaging

Start imaging only if diagnostics has no issues

Image settings preset

Changing specific imaging settings is available in deactivated Express mode only

Type

Yulia preset



Set case details

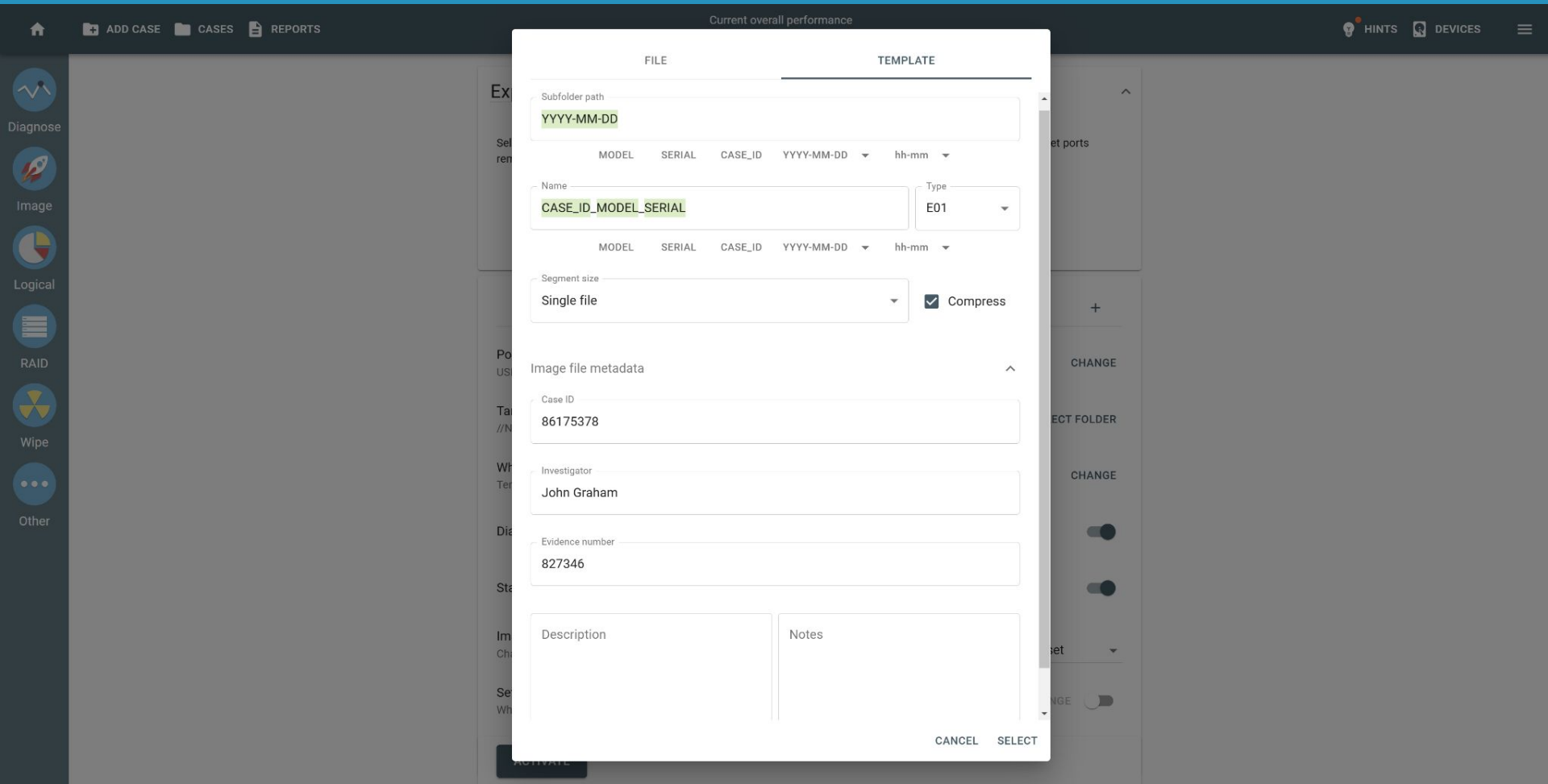
When device has no case, it creates one and fills in the pre-entered case details.

CHANGE



ACTIVATE

Express mode



Express mode



Diagnose



Express



Logical



RAID



Wipe



Other

Active

Imaging	SAS 6 SEAGATE ST3300657SS-H 3SJ372DS	12%	2 hours left
Imaging	SAS 5 SEAGATE ST3300657SS 6SJ765J10000B3490VE1	14%	2 hours left
Imaging	USB 4 SanDisk pSSD 00944b7c8	19%	2 hours left
Imaging	SATA 1 WDC WD5002ABYS-70B1B0 WDWMASY8189982	9%	3 hours left
Imaging	SATA 2 Hitachi HTS725050A9A364 100529PCK404VLHY7RWJ	8%	4 hours left
Imaging	USB 2 Samsung PSSD T7 S5TKNS0T300082T	10%	3 hours left
Imaging	SATA 5 HyperX Fury 3D 240GB 50026B77840022F1	9%	an hour left
Imaging	USB 3 SanDisk Cruzer Spark 4C530000011015114320	73%	8 minutes left
Imaging	SATA 6 TOSHIBA DT01ACA050 93LJPYDLS	10%	3 hours left
Imaging	SATA 3 Samsung SSD 870 EVO 500GB S6PXXNZ0R607674Z	3%	4 hours left
Imaging	USB 1 KXG50ZNV 256G NVMe TO 0123456789ACB	19%	an hour left

SATA

<input checked="" type="checkbox"/> 1 ST3160811AS 5PT0DR8A 160 GB Case: 76 target ●	<input checked="" type="checkbox"/> 2 ST1000LM024 HN-M101MBB S32XJ9EDC03827 1 TB Case: 430 target ●	<input checked="" type="checkbox"/> 3 ST16000NM001G-2KK103 WL2013X5 16 TB Case: 23 target ●
<input checked="" type="checkbox"/> 4 ST3000DM001-9YN166 Z1F168R5 3 TB Case: 190 target ●	<input type="checkbox"/> 5 Device not detected source ●	<input type="checkbox"/> 6 Device not detected source ●
<input type="checkbox"/> 7 Device not detected source ●	<input type="checkbox"/> 8 Device not detected source ●	

SAS

NVME

<input checked="" type="checkbox"/> 1 KINGSTON SEDC1500M960G 50026B72829E9B20 960 GB Case: 376 target ●	<input type="checkbox"/> 2 Device not detected target ●	<input checked="" type="checkbox"/> 3 WD_BLACK SN770 500GB 22153H803571 500 GB Case: 460 target ●
<input checked="" type="checkbox"/> 4 WD Blue SN570 250GB 2209B1456803 250 GB Case: 442 target ●		

USB

CONTINUE

Multi-Launch

unlimited number of drives

a few seconds ago

a few seconds ago

a minute ago

a minute ago

a minute ago

a minute ago

a minute ago

a minute ago

17 minutes ago

19 minutes ago

20 minutes ago



Diagnose



Image



Logical



RAID



Wipe



Other

Active

Wiping SAS 1 SEAGATE ST3300657SS-H 3SJ372DS	26%	22 minutes left
Wiping SATA 2 WDC WD10JPVT-75A1YT0 WXF1C12Y0097	5%	2 hours left
Wiping SAS 4 SEAGATE ST373455SS 3LQ1GY2C	77%	2 minutes left
Wiping USB 1 ST9500424AS S2V04DLH	10%	an hour left
Wiping USB 3 ADATA USB Flash Drive 21B03215801700B0	24%	24 minutes left
Wiping SATA 3 ST320LT014-9YK142 W0Q326G4	18%	36 minutes left
Wiping SATA 4 HGST HTS545050A7E680 RB697AMBG0ULNN	10%	an hour left
Wiping SATA 1 WD2500AAKS-00F0A0 WCAT1F625038	18%	36 minutes left
Wiping SATA 5 KINGSTON SUV400S37120G 50026B726A041902	24%	24 minutes left
Wiping USB 2 ST500LT012-9WS142 S0V76J8Y	12%	an hour left
Wiping SATA 6 ST16000NM001G-2KK103 WL2013X5	0%	16 hours left

Completed

Multi-launch

What's inside a damaged drive?



Types of damage



- scratches on platters
- logical errors
- damaged heads
- freezing drives
- PCB failure
- firmware issues
- worn-out magnetic layer

Robust routine testing



- 600+ drives
- 200+ damaged drives

Identifying the problem - diagnostics

 ST500DM002-1BD142 S2AB7G2C
500 GB

SATA 3

Case ID:
Not assigned

Creation date: 07/07/2020 13:11 PM
TaskForce serial: 95959595
Location: SATA 3
Device model: ST500DM002-1BD142
Size: 500 GB (500,107,842,016 bytes)
Case investigator:

Software version: 2020.3
TaskForce IP: 10.0.0.43
Write protection: Off
Device serial: S2AB7G2C
Device firmware: KC45
Case description:

Diagnostics completed. Device has issues

Results

No major hardware or firmware issues found

SMART reports that there are defects in the media.

35% of the disk is not associated with any partition.

Estimated imaging time: 1 hour 16 minutes. However, it may take longer if imaging engine encounters bad sectors.

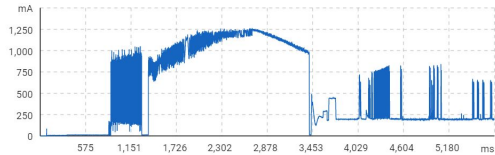
1. Circuit board

Device is powered on. A power cycle is needed...

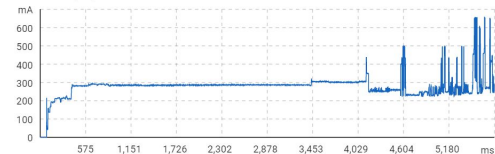
Powering down the device...

Applying power and watching spin-up currents...

Current oscillogram (12V):



Current oscillogram (5V):



Logical sector size: 512 bytes. Physical sector size: 4,096 bytes

Circuit board check passed

2. Heads

Detecting device family

Detected 2 heads: 0 1

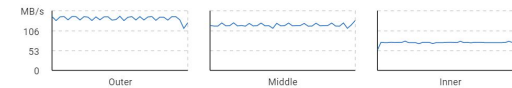
Performing media access timing verification separately for each head.

Using the following LBA ranges for this test: Outer: 0 - 320,032, Middle: 488,226,567 - 488,546,599, Inner: 976,453,135 - 976,773,167

Head #0 speed graph



Head #1 speed graph



Head #	Speed	Sectors processed	Freeze count	Read errors	Head status
0	102 MB/s	334,381	0	0	OK
1	108 MB/s	625,709	0	0	OK

Media access timing verification shows no damage to the head stack

Head stack check passed

Elapsed: 5.8 sec.

3. Media surface

Media scan is in progress...

Verifying starting sectors (LBA: 0 - 600,064)

0 error(s) found

Speed: 134 MB/s

Verifying middle sectors (LBA: 488,386,583 - 488,986,647)

0 error(s) found

Speed: 121 MB/s

Verifying ending sectors (LBA: 976,173,103 - 976,773,167)

0 error(s) found

Speed: 74 MB/s

Average speed: 109 MB/s

Media surface check passed

Elapsed: 9.1 sec.

4. Firmware

Device is not locked.

Device identification data is valid.

Max address according to device ID: 976,773,167

Native max address (ext): 976,773,167

Max Address from DCO: 976,773,167.

Reported capacity appears logically correct.

Performing SMART checks...

SMART reports that there are defects in the media.

Power cycles: 1975 Smart status: Fail Powered on: 135 days 19 hours

#	Attribute Name	Value	Worst	Threshold	RAW	Status
1	Read Error Rate	111	98	6	37177424	OK
3	Spin-Up Time	100	100	0	0	OK
4	Start/Stop Count	98	98	20	2722	OK
5	Reallocated Sectors Count	100	100	36	0	OK
7	Seek Error Rate	69	60	30	60271162258	OK
9	Power-On Hours	97	97	0	3259	OK
10	Spin Retry Count	100	100	97	0	OK
12	Power Cycle Count	99	99	20	1975	OK
194	Temperature Celsius	32	46	0	140737488355360	OK
195	Hardware ECC Recovered	42	33	0	37177424	OK
197	Current Pending Sector Count	100	99	0	8	FAIL
198	(Offline) Uncorrectable Sector Count	100	99	0	8	FAIL
199	UltraDMA CRC Error Count	200	185	0	3984	OK
240	Head Flying Hours	100	253	0	281019710180537	OK
241	Total LBAs Written	100	253	0	2724965092	OK
242	Total LBAs Read	100	253	0	2280403494	OK

Reading SMART temperature...

Firmware check passed

Elapsed: 0.2 sec.


5. File system

Found partition at sector 63 (type NTFS). Partition size: 320 GB.

35% of the disk is not associated with any partition.

File system structures check complete.

Identifying the problem - diagnostics

 Hitachi HTS545025B9A300...00 100826PBN203DSJWH8M Case ID:
250 GB SATA 2 Not assigned

Creation date: 02/19/2020 8:46 AM Software version: 2020.1
TaskForce serial: 95959595 TaskForce IP: 10.0.0.43
Location: SATA 2 Write protection: Off
Device model: Hitachi HTS545025B9A300 Device serial: 100826PBN203DSJWH8M
Size: 250 GB (250,059,350,016 bytes) Device firmware: PB20C60F
Case investigator: Case description:

Diagnostics completed. Device has major issues

Results

Read errors detected. Suggestion: device must be imaged before attempting file recovery.

Device appears to be unstable; severe issues with this device can occur. Suggestion: device must be imaged before attempting file recovery.

SMART reports that there are defects in the media.

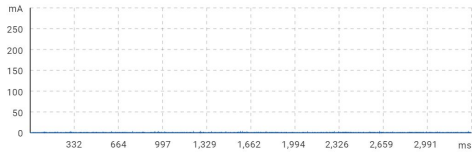
1. Circuit board

Device is powered on. A power cycle is needed...

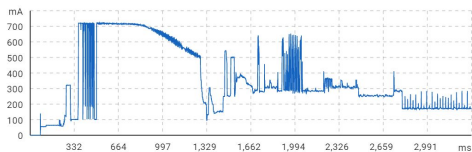
Powering down the device...

Applying power and watching spin-up currents...

Current oscillogram (12V):



Current oscillogram (5V):



2. Heads

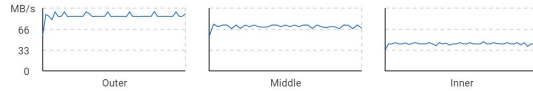
Detecting device family

Detected 2 heads: 0 1

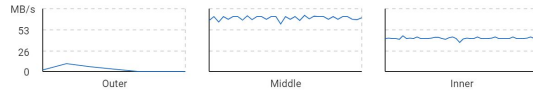
Performing media access timing verification separately for each head.

Using the following LBA ranges for this test: Outer: 0 - 366,320, Middle: 244,015,423 - 244,381,743, Inner: 488,030,847 - 488,397,167

Head #0 speed graph



Head #1 speed graph



Head #	Speed	Sectors processed	Freeze count	Read errors	Head status
0	65 MB/s	603,676	0	0	OK
1	46 MB/s	332,493	0	5	OK

Media access timing verification shows no damage to the head stack

Head stack check passed

Elapsed: 25.4 sec.

3. Media surface

Media scan is in progress...

Verifying starting sectors (LBA: 0 - 600,064)

11 error(s) found

Verifying middle sectors (LBA: 244,198,583 - 244,798,647)

0 error(s) found

Verifying ending sectors (LBA: 487,797,103 - 488,397,167)

0 error(s) found

Read errors detected. Suggestion: device must be imaged before attempting file recovery.

Device appears to be unstable; severe issues with this device can occur. Suggestion: device must be imaged before attempting file recovery.

Elapsed: 107.6 sec.

4. Firmware

Device is not locked.

Device identification data is valid.

Max address according to device ID: 488,397,167

Native max address (ext): 488,397,167

Max Address from DCO: 488,397,167.

Reported capacity appears logically correct.

Performing SMART checks...

SMART reports that there are defects in the media.

Power cycles: 4110 Smart status: Fail Powered on: 307 days 16 hours

#	Attribute Name	Value	Worst	Threshold	RAW	Status
1	Read Error Rate	91	91	62	2883593	OK
2	Throughput Performance	100	100	40	0	OK
3	Spin-Up Time	202	202	33	64424509441	OK
4	Start/Stop Count	98	98	0	4112	OK
5	Reallocated Sectors Count	1	1	5	0	FAIL
7	Seek Error Rate	100	100	67	0	OK
8	Seek Time Performance	100	100	40	0	OK
9	Power-On Hours	84	84	0	7384	OK
10	Spin Retry Count	100	100	60	0	OK
12	Power Cycle Count	98	98	0	4110	OK
191	G-Sense Error Rate	100	100	0	0	OK
192	Power-off Retract Count	97	97	0	717	OK
193	Load/Unload Cycle Count	93	93	0	75830	OK
194	Temperature Celsius	171	171	0	201866921696	OK
196	Reallocation Event Count	58	58	0	2278	OK
197	Current Pending Sector Count	40	40	0	3075	FAIL
198	(Offline) Uncorrectable Sector Count	100	100	0	0	OK
199	UltraDMA CRC Error Count	200	200	0	0	OK
223	Load/Unload Retry Count	100	100	0	0	OK

Firmware check passed

Elapsed: 0.3 sec.

5. File system

File system test can't be started because the device had issues during one of the previous checks.

Multi-pass imaging algorithm



TOSHIBA MK5061GSY 41BD0KUT
500 GB

Damaged
SATA 1

Case ID:
atola-266

Settings

BACK

PASSES

HASHES

MISCELLANEOUS

Pass	Timeout	Jump on error	Max read block size	What to image
1	1s	1,000,000	4,096	All sectors
2	5s	20,000	4,096	
3	5s	4,096	4,096	
4	5s	256	256	
5	60s	1	256	

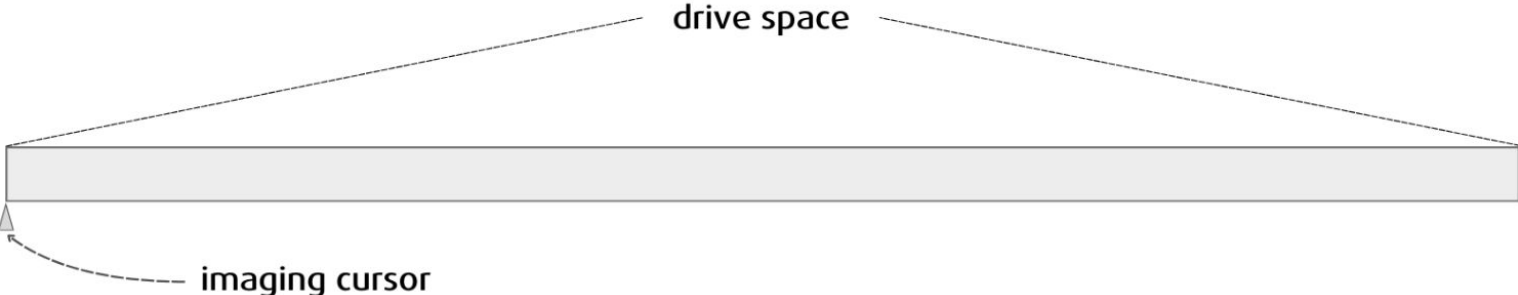
+ ADD PASS

RESTORE TO DEFAULT

START

Current settings: DEFAULT DAMAGED CUSTOM

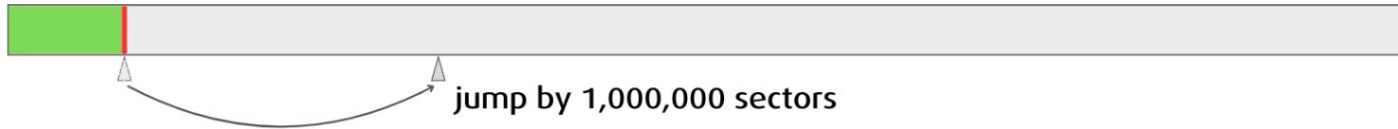
Multi-pass imaging algorithm



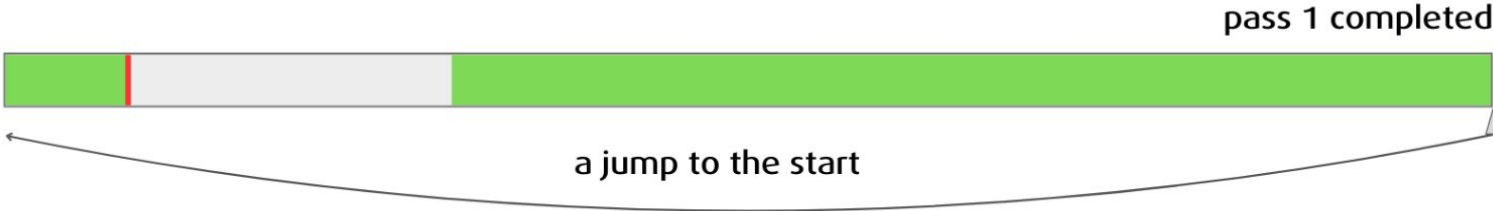
imaging started...



Multi-pass imaging algorithm

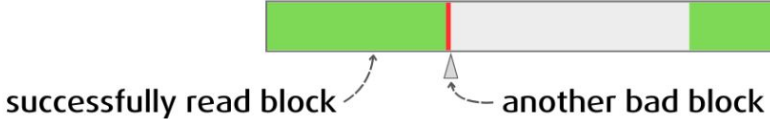


Multi-pass imaging algorithm



Multi-pass imaging algorithm

pass 2



Multi-pass imaging algorithm

Atola TECHNOLOGY

CASES REPORTS DEVICES

ST3160811AS
160 GB SATA 1 Case ID: Not assigned 1 target

Imaging data...

97%

Pass: 2 of 5 Sectors imaged: 306,118,608
Speed: 55 MB/s Sectors scheduled: 312,581,808
Errors: 16 Estimated time: 1m 0s

Log

Date	Message
2018/11/21 13:14:44	Jump to sector 7,350,048
2018/11/21 13:14:57	Can't read sectors 9,214,784 - 9,218,879 (UNC)
2018/11/21 13:14:57	Jump to sector 9,234,784
2018/11/21 13:15:07	Can't read sectors 9,234,784 - 9,238,879 (Timeout)
2018/11/21 13:15:07	Jump to sector 9,254,784
2018/11/21 13:15:20	Can't read sectors 20,479,360 - 20,483,455 (UNC)
2018/11/21 13:15:20	Jump to sector 20,499,360

PAUSE VIEW SETTINGS

Link: PHY Status: ERR INDX CORR DREQ DRSC FAULT DRDY BUSY Error: AMNF TONF ABRT - - IDNF - - UNC ICRC ?

Multi-pass imaging algorithm

1 CASES REPORTS Atola TECHNOLOGY DEVICES ≡

Diagnose
Image
Hash
Wipe
Other

Samsung SSD 860 PRO 256GB S418NF0KB07041E
256 GB

SATA 1

Case ID:
Not assigned

1 target

Imaging data...

42%

Pass: 2 of 5 Sectors imaged: 210,708,080
Speed: 14 MB/s Sectors scheduled: 500,118,192
Errors: 1,536 Estimated time: 2 h 57 m

ms

231,807,360 232,496,288 233,161,920 231,807,184

Date ↑	Message
2020/06/14 19:11:57	Jump to sector 208,376,300
2020/06/14 19:12:03	Can't read sectors 208,574,656 - 208,578,751 (Timeout)
2020/06/14 19:12:03	Jump to sector 208,594,656
2020/06/14 19:12:08	Can't read sectors 208,615,136 - 208,619,231 (Timeout)
2020/06/14 19:12:08	Jump to sector 208,635,136
2020/06/14 19:12:14	Can't read sectors 208,639,232 - 208,643,327 (Timeout)
2020/06/14 19:12:14	Jump to sector 208,659,232
2020/06/14 19:12:20	Can't read sectors 208,663,328 - 208,667,423 (Timeout)
2020/06/14 19:12:20	Jump to sector 208,683,328

PAUSE

VIEW SETTINGS

Link: **PHY** Status: **ERR** **INDX** **CORR** **DREQ** **DRSC** **FAULT** **DRDY** **BUSY** Error: **AMNF** **TONF** **ABRT** **IDNF** **UNC** **ICRC** **?**

Imaging time: a damaged drive

The screenshot shows the Atola Insight Forensic software interface. The main window displays the progress of a disk imaging operation. The progress bar is at 61% completion, with a red section indicating the current progress. The estimated time left is 102 hours, 59 minutes, which is highlighted with a red box. The overall speed is 59 KB/s, with a link to "Why the speed is so slow?". The software also shows the number of sectors imaged, sectors left, last attempted block, and total errors (4,611).

Imaging data... 61%

0 976,773,167

Pass: 4 of 5

Overall speed: 59 KB/s [Why the speed is so slow?](#)

Estimated time left: **102 hours, 59 minutes**

Found signatures: 195161

Pause [Imaging settings](#)

Sectors imaged: 68,469,345

Sectors left: 42,959,744

Last attempted block: 100,892,000

Total errors: 4,611

[Legend](#)

ms

835 668 501 334 167

470,663,567 115,265,439 114,527,743 105,595,295 101,591,655

Target Hex Viewer	Log																														
	<table border="1"><thead><tr><th>Date</th><th>Message</th></tr></thead><tbody><tr><td>7/14/2017 5:11:10 PM</td><td>Cannot read block of data at 100,952,160 - 100,952,415 (Timeout)</td></tr><tr><td>7/14/2017 5:11:22 PM</td><td>Cannot read block of data at 100,950,112 - 100,950,367 (Timeout)</td></tr><tr><td>7/14/2017 5:11:36 PM</td><td>Cannot read block of data at 100,948,064 - 100,948,319 (Timeout)</td></tr><tr><td>7/14/2017 5:11:58 PM</td><td>Cannot read block of data at 100,946,016 - 100,946,271 (Timeout)</td></tr><tr><td>7/14/2017 5:12:18 PM</td><td>Cannot read block of data at 100,943,968 - 100,944,223 (Timeout)</td></tr><tr><td>7/14/2017 5:12:50 PM</td><td>Cannot read block of data at 100,939,616 - 100,939,871 (Timeout)</td></tr><tr><td>7/14/2017 5:13:10 PM</td><td>Cannot read block of data at 100,937,568 - 100,937,823 (Timeout)</td></tr><tr><td>7/14/2017 5:13:22 PM</td><td>Cannot read block of data at 100,935,520 - 100,935,775 (Timeout)</td></tr><tr><td>7/14/2017 5:13:34 PM</td><td>Cannot read block of data at 100,933,472 - 100,933,727 (Timeout)</td></tr><tr><td>7/14/2017 5:13:46 PM</td><td>Cannot read block of data at 100,931,424 - 100,931,679 (Timeout)</td></tr><tr><td>7/14/2017 5:14:00 PM</td><td>Cannot read block of data at 100,929,376 - 100,929,631 (Timeout)</td></tr><tr><td>7/14/2017 5:14:21 PM</td><td>Cannot read block of data at 100,927,072 - 100,927,327 (Timeout)</td></tr><tr><td>7/14/2017 5:14:33 PM</td><td>Cannot read block of data at 100,925,024 - 100,925,279 (Timeout)</td></tr><tr><td>7/14/2017 5:14:46 PM</td><td>Cannot read block of data at 100,922,976 - 100,923,231 (Timeout)</td></tr></tbody></table>	Date	Message	7/14/2017 5:11:10 PM	Cannot read block of data at 100,952,160 - 100,952,415 (Timeout)	7/14/2017 5:11:22 PM	Cannot read block of data at 100,950,112 - 100,950,367 (Timeout)	7/14/2017 5:11:36 PM	Cannot read block of data at 100,948,064 - 100,948,319 (Timeout)	7/14/2017 5:11:58 PM	Cannot read block of data at 100,946,016 - 100,946,271 (Timeout)	7/14/2017 5:12:18 PM	Cannot read block of data at 100,943,968 - 100,944,223 (Timeout)	7/14/2017 5:12:50 PM	Cannot read block of data at 100,939,616 - 100,939,871 (Timeout)	7/14/2017 5:13:10 PM	Cannot read block of data at 100,937,568 - 100,937,823 (Timeout)	7/14/2017 5:13:22 PM	Cannot read block of data at 100,935,520 - 100,935,775 (Timeout)	7/14/2017 5:13:34 PM	Cannot read block of data at 100,933,472 - 100,933,727 (Timeout)	7/14/2017 5:13:46 PM	Cannot read block of data at 100,931,424 - 100,931,679 (Timeout)	7/14/2017 5:14:00 PM	Cannot read block of data at 100,929,376 - 100,929,631 (Timeout)	7/14/2017 5:14:21 PM	Cannot read block of data at 100,927,072 - 100,927,327 (Timeout)	7/14/2017 5:14:33 PM	Cannot read block of data at 100,925,024 - 100,925,279 (Timeout)	7/14/2017 5:14:46 PM	Cannot read block of data at 100,922,976 - 100,923,231 (Timeout)
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Link: **PHY** Status: ERR INDX CORR DREQ DRSC FAULT DRDY **BUSY** Error: AMNF TONF ABRF IDNF UNC ICRC

Multi-pass imaging algorithm: Reverse imaging

Home ADD CASE CASES REPORTS Current overall performance 0 B/h HINTS DEVICES

TOSHIBA MK5061GSY 41BD0KUT 500 GB **Damaged** SATA 1 Case ID: atola-266

Settings BACK

Edit imaging pass

Pass 1

Timeout 1 Unit seconds

Max read block size 4,096 sectors

Jump on error 1,000,000 sectors

What to image All sectors

Start LBA 0 End LBA 976,773,167

Do not use head map SELECT

Pattern for unreadable sectors (HEX) 00 LOAD

Reverse direction

Disable read look-ahead

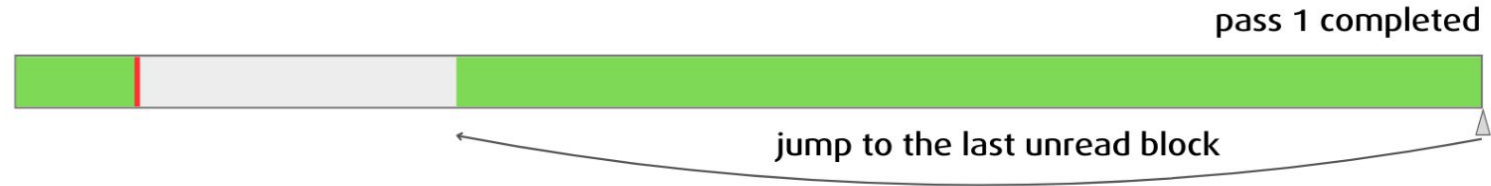
CANCEL SAVE

START Current settings: DEFAULT DAMAGED DAMAGED...

Link PHY Status: ERR INDX CORR DREQ DRSC FAULT DROD BUSY Error: AMNF TONF ABRT IDNF UNC ICRC

Multi-pass imaging algorithm: Reverse imaging

reverse imaging option



Multi-pass imaging algorithm

Imaging data...

LEGEND



99%

Pass:	5 of 5	Sectors imaged:	1,998,702,896
Speed:	 34 KB/s	Sectors scheduled:	2,000,409,264
Errors:	85,926	Estimated time:	8 h 48 m

1. Time-saving
2. High success rate
3. Gentle treatment of the media
4. Fully automated

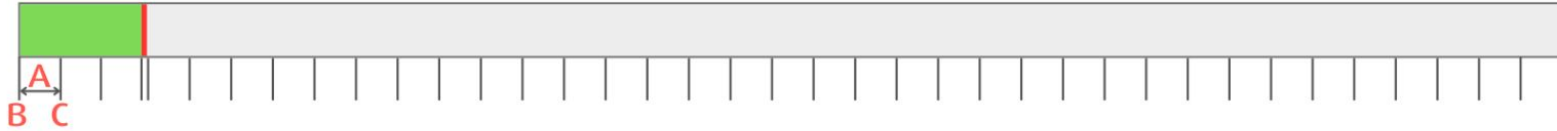
Hashing a damaged drive

linear hashing



Segmented Hashing

hashes of predefined segments



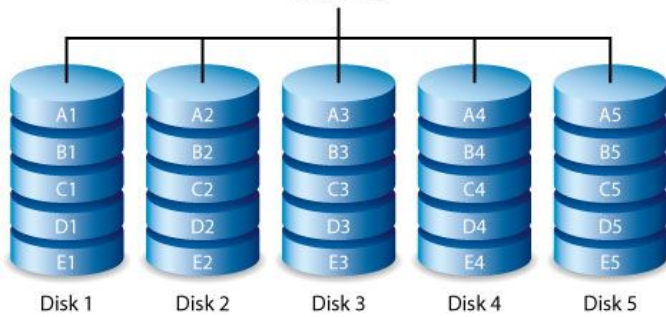
	A	B	C	D	
1	07516243b1448188c21588058171fc68	0	8388607		
2	a60a5a885d8105de4b4fe2d709bc39d9	8388608	16777215		
3	ee049cc72bfe704b39bc3bc470b0ac84	16777216	25165823		
4	60012c7e0a346574107e79d81055442e	25165824	33554431		
5	90f52962bbc20e0134b4acd06b89099c	33554432	41943039		
6	e5314db38ca4ebc5076488566f703b49	41943040	50331647		
7	c1a07f9c9d19a2051d3becdb962fedfb	50331648	58720255		
8	6b3b1f2586b7b60c064ed77d7bcb2497	58720256	67108863		
9	c9a04a7d84c68231635676b1c7b1057f	67108864	75497471		
10	37a7c995b411f9aab6701311e984ca3e	75497472	83886079		
11	acba3e4cff1f2949aed9751506aba26	83886080	92274687		
12	b809ed82b43501c44b64cb32d5de6032	92274688	100663295		
13	3310c61aace8edbe15f1f1928e0bf92e	100663296	109051903		
14	5ddaec511afbfe716b9cefcd2a704a0	109051904	117440511		
15	3e0ebd9f01eb5b02b730308e9bfa99b3	117440512	125829119		
16	86e8555e17b524a9f9bf3531e546790b	125829120	134217727		
17	d471779fa3d1706a5f38e2d4d4a4736c	134217728	142606335		
18	118881def5f6b51350765df175ffbf2a	142606336	150994943		

SegHash on GitHub

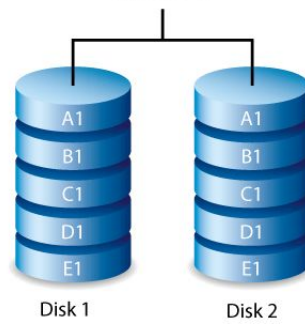
<https://github.com/atola-technology/seghash>

The most common RAID types

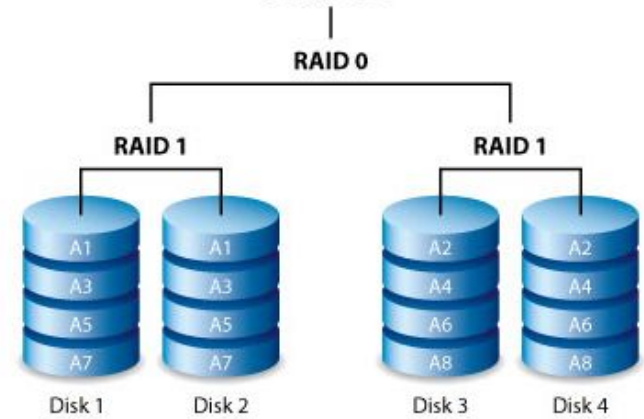
RAID 0



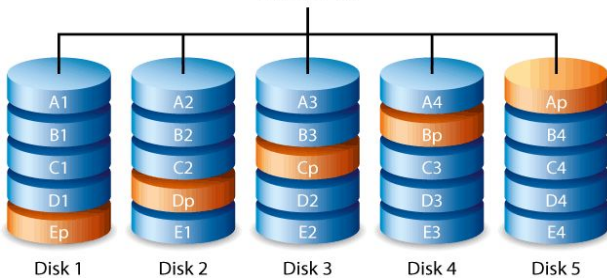
RAID 1



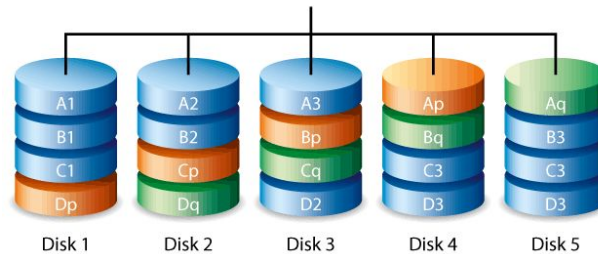
RAID 10



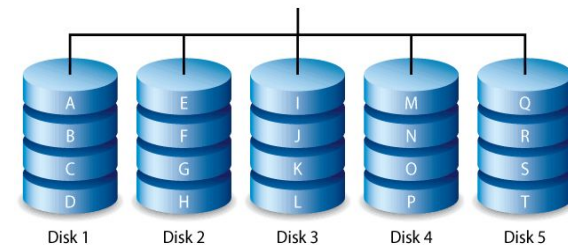
RAID 5



RAID 6



JBOD



RAID parameters

- type / level
- drive order
- start LBA
- block size
- block order (RAID 5, 6)
- number of drives



RAID variability

10 drives

RAID 0



43 million
configuration variants



RAID 5



132 million
configuration variants

RAID autodetection

The screenshot displays the Atola Technology RAID autodetection interface. The top navigation bar includes a home icon, a notification badge, and menu items for 'ADD CASE', 'CASES', and 'REPORTS'. The Atola Technology logo is centered, and 'DEVICES' is on the right. A vertical sidebar on the left contains icons for 'Diagnose', 'Image', 'Logical', 'RAID', 'Wipe', and 'Other'. The main content area is divided into two panels. The left panel, titled 'RAID configuration', shows 'RAID type' as RAID 5, 'Start LBA' as 0, 'Block size' as 64 KB (most frequent), and 'Block order' as Left asymmetric. Below this is a table of RAID members:

Member	Device	Capacity	File System	Health
1	WDC WDS240G2G0A-00JH30 20470	240 GB	MBR	Unknown
2	WDC WDS240G2G0A-00JH30 20485	240 GB	MBR	Unknown
3	WDC WDS240G2G0A-00JH30 20485	240 GB		
4	WDC WDS240G2G0A-00JH30 20485	240 GB		
5	WDC WDS240G2G0A-00JH30 20485	240 GB	NTFS	

Below the table are buttons for 'ADD DEVICES', 'ADD MISSING DEVICE', and a 'Drag device here to remove' area. The bottom of this panel has 'PARTITIONS' and 'HEX VIEWER' tabs. The 'PARTITIONS' tab shows a table with one entry:

Partition	Start LBA	Name	Type	Size
0	Unknown - 534 MB	111,595,520		

The right panel, titled 'Autodetection', has a 'PAUSE' button and a description: 'Background analysis of RAID devices/images. It shows hints to help you find RAID configuration faster. The most probable configurations will appear at the top.' Below this is a progress bar for 'Stage 1. Analyzing devices' at 62% completion, with 'Processed sectors: 1,871,872'. At the bottom of the interface are three buttons: 'GO TO IMAGE', 'GO TO LOGICAL', and 'UNMOUNT RAID'.

Data analysis and
parameters
automated try-out

RAID reassembled

The screenshot displays the Atola Technology software interface. At the top, there are navigation options: 'ADD CASE', 'CASES', and 'REPORTS'. The 'Atola TECHNOLOGY' logo is centered, and 'DEVICES' is on the right. A sidebar on the left contains icons for 'Diagnose', 'Image', 'Logical', 'RAID', 'Wipe', and 'Other'. The main content area is divided into two panels. The left panel, titled 'RAID configuration', shows a RAID 5 setup with 5 drives, a block size of 64 KB, and a left symmetric order. Below this is a table of drive details. The right panel, titled 'Autodetection', shows the progress of Stage 2 (Detecting RAID configuration) at 58% completion. A 'Possible configuration' box indicates that RAID 5 with a 64 KB block size and left symmetric order has been detected and applied. At the bottom, there are buttons for 'GO TO IMAGE', 'GO TO LOGICAL', and 'UNMOUNT RAID'. The 'PARTITIONS' and 'HEX VIEWER' tabs are visible at the bottom of the RAID configuration panel.

Atola TECHNOLOGY

RAID configuration

RAID type: RAID 5, Start LBA: 0, Block size: 64 KB (most frequent), Block order: Left symmetric

Drive	Device ID	Capacity	File System
1	WDC WDS240G2G0A-00JH30 20470	240 GB	MBR Unknown
2	WDC WDS240G2G0A-00JH30 20485	240 GB	NTFS
3	WDC WDS240G2G0A-00JH30 20485	240 GB	
4	WDC WDS240G2G0A-00JH30 20485	240 GB	
5	WDC WDS240G2G0A-00JH30 20485	240 GB	MBR Unknown

ADD DEVICES ADD MISSING DEVICE Drag device here to remove

PARTITIONS HEX VIEWER

Partition	Name	Type	Size
1 No label NTFS - 57 GB 100%	\$RECYCLE.BIN	Folder	
2 No label NTFS - 534 MB	DS2	Folder	
3 Storage NTFS - 900 GB 100%	Encase files	Folder	
	ExFAT	Folder	

Autodetection PAUSE

Background analysis of RAID devices/images. It shows hints to help you find RAID configuration faster. The most probable configurations will appear at the top.

Stage 2. Detecting RAID configuration 58%
Checked variants: 3,388 out of 5,760

Possible configuration
RAID 5, block size: 64 KB, order: Left symmetric APPLIED

GO TO IMAGE GO TO LOGICAL UNMOUNT RAID

All parameters
detected
automatically

Overall time: 2
minutes

Imaging a RAID

The screenshot shows the Atola software interface for configuring a RAID imaging case. The top navigation bar includes 'ADD CASE', 'CASES', 'REPORTS', and 'DEVICES'. The main area displays the RAID configuration: 'Devices 5, Block size: 64 KB, Left symmetric' and '960 GB'. The RAID type is 'RAID 5' and the Case ID is 'Not assigned'. A table lists the partitions and their contents:

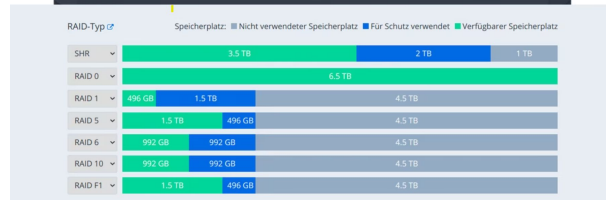
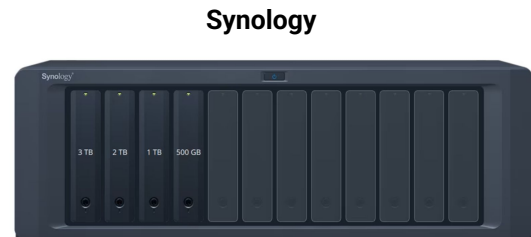
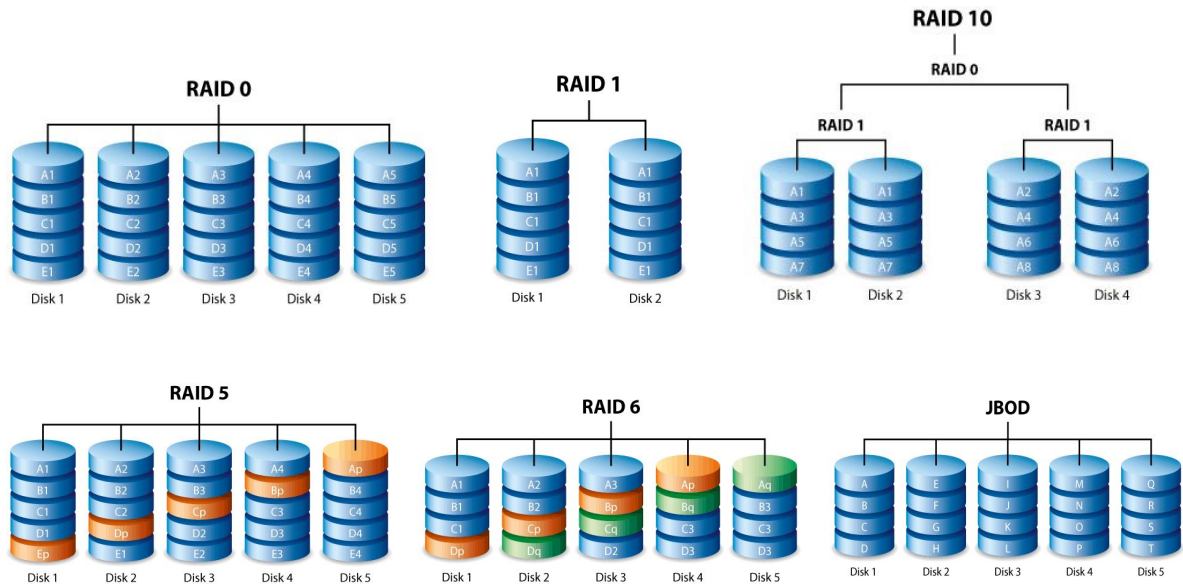
Partition	Name	Type	Size
<input type="checkbox"/> 0	System Reserved NTFS - 52 MB	Folder	
<input checked="" type="checkbox"/> 1	No label NTFS - 57 GB	Folder	
<input type="checkbox"/> 2	No label NTFS - 534 MB	Folder	
<input checked="" type="checkbox"/> 3	Storage NTFS - 900 GB	Folder	

The 'Filters' section on the right allows for customizing the imaging process. It includes a 'Custom' dropdown, 'INCLUDE' and 'EXCLUDE' buttons, and lists of included and excluded files/folders. The 'Include' list contains: 'Audio, Pictures, Videos', 'Archives, Databases, Documents, +2' (Between 1 KB and 50 MB, Modified between 02/01/2002 and 02/01/2020). The 'Exclude' list contains: 'Documents, Emails' (Modified between 05/01/2005 and 01/01/2008) and 'Manually selected: Partition 4/\$RECYCLE.BIN'. A 'CONTINUE' button is at the bottom left, and 'Current settings: 2022 logical' is at the bottom right.

Image either:

- the entire RAID
- selected partitions
- logical imaging of files and folders

Supported RAID types

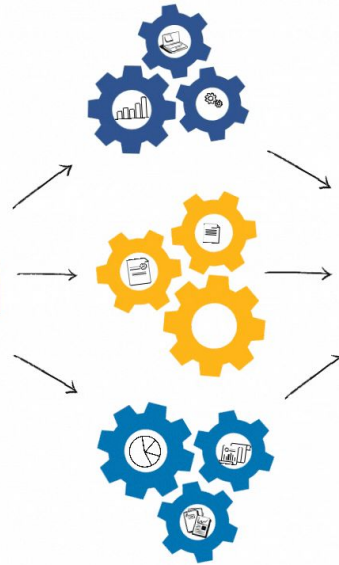


Coming in 2026: QNAP

imaging



analysis



reporting



Workflow
Automation

=
faster data
processing

- GET Get available Source drives
- GET Start imaging
- GET Start logical imaging
- GET Diagnose drive
- GET Check task status
- GET Stop running task
- GET Download report
- POST Login as user
- GET Show API documentation

Start imaging

Launches imaging from a source drive plugged into the specified Source port into a the specified network target folder. By default, target image is a compressed E01 but the file format can be changed in the parameters.

Two mandatory parameters: `source` and `targetFolder`. Other parameters have default values, which can be adjusted.

Examples:

- `http://TASKFORCE_IP/api/start-image?source=SATA4&targetFolder=//Server/Share`
- `http://TASKFORCE_IP/api/start-image?source=SATA4 SDSSDA120G Z32081RL&targetFolder=//10.0.0.14/Share`

QUERY PARAMETERS

<p><code>source</code> required</p>	<p>string</p> <p>Source identifier. It can be specified in two ways: 1) Source port; 2) Source port, drive model and serial</p> <p>Examples:</p> <ul style="list-style-type: none"> • Source port: <code>SATA4</code> • Source port, drive model and serial: <code>SATA4 SanDisk SDSSDA120G 171108456213</code> <p>Acceptable port names are SATA1, SATA2, SATA3, SATA4, SATA5, SATA6, SAS1, SAS2, SAS3, SAS4, SAS5, SAS6, USB1, USB2, USB3, USB4, IDE1, EXT1 and, for TaskForce 2 only: SATA7, SATA8, SAS7, SAS8, NVME1, NVME2, NVME3, NVME4.</p>
<p><code>targetFolder</code> required</p>	<p>string</p> <p>Network folder path where target image is created. Supports Linux and Windows formats of path separators (slashes, backslashes).</p> <p>Examples:</p> <ul style="list-style-type: none"> • <code>//10.0.0.14/Share</code> • <code>//MyServer/Shared-folder</code>

Web API

for scripts
or
automation
tools

CONFIGURE WORKFLOW

1. CREATE WORKFLOW TaskForce-AXIOM EDIT

2. DEFINE WORKFLOW

ELEMENTS

- Image
- Merge
- Hardware Imager
- AXIOM Process
- AutoPsy
- powershell

WORKFLOW - TASKFORCE-AXIOM

```
graph TD; A((Hardware Imager)) --> B[AXIOM Process];
```

ELEMENT DEFINITIONS

- Starting point (evidence type/format)
- Application (not configured)
- Application (configured)
- ◇ Pass/fail (condition)

SAVE WORKFLOW CANCEL



Search

Active

Imaging (API)

SATA 2 Samsung SSD 860 PRO 256GB S418NF0KB07068A
2354808-dfg

2%

7 hours left

Imaging (API)

SATA 3 Samsung SSD 850 PRO 128GB S24ZNX0HC02402P

63%

3 hours left

Imaging (API)

SAS 1 TOSHIBA MG03ACA100 867GK07YF

12%

2 hours left

Imaging (API)

SAS 2 SEAGATE ST373455SS 3LQ1GY2C

35%

8 hours left

Imaging (API)

SAS 3 SEAGATE ST3300657SS 6SJ765J10000B3490VE1

9%

2 days left

Imaging (API)

SATA 6 WDC WDS120G1G0A-00SS50 171710A0077B
347659

26%

13 hours left

Imaging (API)

SATA 1 Samsung SSD 860 PRO 256GB S418NF0KB07041E

22%

16 hours left

Imaging (API)

USB 1 SanDisk Cruzer Glide 4C531001511021112224

34%

20 minutes left

Imaging (API)

SATA 5 WDC WDS120G1G0A-00SS50 171710A0035F

13%

an hour left

Imaging (API)

USB 3 Corsair Voyager GS 0708397D06944E57

3%

3 hours left

Automate



Diagnose



Image



Hash



Wipe



Other

Coming in 2026

