# **Disk Clone Industrial**



## **USER MANUAL**

Ver. 1.0.0 Updated: 9 June 2020

## Contents

Legal Statement	4
Introduction	4
Cloning Data	
Erasing Confidential Data	

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System Requirements	. /
Software Licensing	. 7
Software Updates.	.8

Getting Started.	
Launching and initial Configuration1	
Navigating Disk Clone	
Disk Layout Editor	6
Editing Disk Bay Layouts	8
Layouts Export and Import2	
Layouts Advanced Features	3
Disk Explorer	5
Disk Bays View	
Local Devices View	
My Computer View3	3

Using Disk Clone	
Disk Clone	
Mount Disk Image	
Disk Erase	
Processing Report	
Labels and Reports	
Disk Processing Reports	
Disk Labels	
Compact Operating Modes	

Disk Batches	59
Create / Delete Batches	
Assign Disk Bays to Batches	
From Disk Bays View	62
From Edit menu	
Edit Batch Attributes	63

Advanced Tools	65
File Browser	65

Disk Viewer	7
S.M.A.R.T. Monitor	

Troubleshooting and System Recovery	72
Common Troubleshooting Tips	
Application Log	
Hardware Diagnostic File	

Preferences	
General Settings	_
Clone Sources	
Company Information	
Technician Information	
Processing Report	
Disk Label Presets	
Disk Viewer	
Error Handling	
E-mail Notifications	

Appendix	
Glossary	
Erase Disk Concepts	
How fast?	
Erase Methods (Sanitation Standards)	
Name Tags	

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## Introduction

**Disk Clone Industrial** (drive duplication unit) is a vital tool used to manage and protect data. Why to clone:

- **Simplest case:** Hard Disk Upgrade! **Disk Clone** can help to upgrade hard disk from old small disk to a new larger one without re-installations of operating system and the applications
- **OS Transfer:** Cloning a disk with ANY OS installation enables to transfer OS to another hard drive or much faster SSD without reinstalling
- **Make a Duplicate Disk:** If all the data on the current system installed disk are important, it is necessary to do a complete backup of the source disk by cloning it to a target disk
- **Data Recovery:** In order to avoid secondary damage to the hard disk during data recovery, it is necessary to clone the disk and then restore what you want from the cloned disk
- "REBOOT AND REFRESH": an option for public computers
- **"RESET"**: to return a system to an original configuration with no personal data before selling or giving a computer away
- Set up multiple computers with identical configurations

#### **Related information**

File Browser on page 65

## **Cloning Data**

*Disk cloning* is an act of copying the contents of a computer's physical drive byte by byte onto another physical drive. The contents are typically saved as a disk image file and transferred to a storage medium, which could be another computer's hard drive or removable media such as a DVD or a USB drive.

**Disk Clone Industrial** is an affordable industrial-grade disk duplication hardware solution supporting parallel cloning of multiple disks. Easy to use, extremely quiet and energy efficient. Supports cloning physical disks, *ISO* images or compressed *Disk Images* to different type of media: HDD/SSD/NVMe/USB.

Related tasks Disk Clone Related information Clone Sources on page 80

## **Erasing Confidential Data**

Modern methods of data encryption are deterring network attackers from extracting sensitive data from stored database files.

Attackers (who want to retrieve confidential data) become more resourceful and look for places where data might be stored temporarily. For example, the Windows **DELETE** command merely changes the files attributes and location so that the operating system will not look for the file. The situation with *NTFS* is similar.

One avenue of attack is the recovery of data from residual data on a discarded hard drive. When deleting confidential data from hard drives, removable disks or USB devices, it is important to extract all traces of the data so that recovery is not possible.

Most official guidelines regarding the disposal of confidential magnetic data do not take into account the depth of today's recording densities nor the methods used by the OS when removing data.

Removal of confidential personal information or company trade secrets in the past might have been performed using the **FORMAT** command or the **FDISK** command. Using these procedures gives users a sense of confidence that the data has been completely removed.

When using the **FORMAT** command Windows displays a message like this:

Important: Formatting a disk removes all information from the disk.

The **FORMAT** utility actually creates new *FAT* and *ROOT* tables, leaving all previous data on the disk untouched. Moreover, an image of the replaced *FAT* and *ROOT* tables is stored so that the **UNFORMAT** command can be used to restore them.

FDISK merely cleans the Partition Table (located in the drive's first sector) and does not touch anything else.

**Disk Clone Industrial** is able to erase data on entire drive with a choice of One Pass Zeros and One Pass Random international disk sanitizing standards

Related tasks Disk Erase Related information Erase Disk Concepts on page 96

## **Disk Clone Overview**

#### **Disk Clone for Industrial Systems**



This edition of **Disk Clone** is designed to provide a software solution for industrial workstations, configured to service disks in high volumes. **Disk Clone for Industrial Systems** is distributed as a software package that may be installed on a disk erase workstation and used to examine, erase and even write images to individual or batches of disks. Highly customizable, the software is able to conform to any company standards - erasure standards, examination type, reporting, error handling are only a subset of the configurable settings **Disk Clone** supports. All elements of **Disk Clone** operations may be documented in XML reports, PDF certificates, or even printable labels for erased hard drives. Versatile, easy to navigate and rich in features, **Disk Clone for Industrial Systems** is the ideal disk cloning solution for corporations to securely erase and clone hard drives as well as their images - simply and efficiently.

Customizable interface allows to define layouts, batches and processing automation. Supports cloning Hard Disk Drives, solid state drives (SSD) and latest NVMe disks, SATA and SAS disks, external disks via eSATA and USB. Cloning any file systems and operating systems: Windows, Linux/Unix, MacOS.

**Disk Clone** is a powerful software that delivers the following main features:

- Parallel cloning of up to 20 disks from a single source
- Clone ALL known file systems and operating systems
- Fast erase data on entire drive, supports parallel erasing of large numbers of drives (hardwarelimited)
- Destroy data with a choice of One Pass Zeros or One Pass Random international disk sanitizing standards
- **Disk Clone** allows you to write an image or copy a *Master Disk/Partition* to newly erased hard drives with its cloning feature
- Sanitize and clone external disks (USB drives, external HDD/SSD) connected to both USB 2.0 and 3.1 ports
- Auto-erase mode sanitizes disks and prints certificates without of any user interaction
- Hot-swap operations are fully supported, erase could be auto-initiated upon HDD plug-in

- Browse file systems on disk volumes and inspect particular sectors Hex Viewer on a low level
- · Print different types of labels to be attached to hard disks after erase completion
- Provides enhanced information about disks and their attributes including S.M.A.R.T. monitoring
- And more...

#### **Related information**

Erase Methods (Sanitation Standards) on page 98

### System Requirements

**Disk Clone Industrial**is designed to run on Linux and Windows operating systems with the following minimum requirements:

#### Workstation

- IBM PC compatible machine
- Intel Pentium or higher
- 2 Gb of RAM
- 100Mb of free disk space

#### Video

VGA (1024x768) resolution or better

#### **Operating Systems**

- Windows XP or higher
- Linux Kernel 2.x or higher

#### **Drive Storage**

Disk types supported:

- IDE
- ATA
- SSD
- SATA
- eSATA
- SCSI
- NVMe

Disk Clone Industrial works with all drives supported by the Operating System with read/write access

#### **Related information**

Disk Clone Installation and Distribution on page 12

## **Software Licensing**

**Disk Clone Industrial** is supplied with a security USB key that contains number of licenses being purchased (one license is required per slot where HDD/SSD is plugged into).



#### Figure 1: Security USB license key

This key must be inserted into any USB slot on the PC before running **Disk Clone** software, otherwise authorization error appears.

## **Software Updates**

**Disk Clone** has a built-in update client to ensure you always have access to the latest version of the application. To update, use the file menu bar to navigate to **Help** > **Check for Updates** 

0	Disk Clo	ne Industrial S	oftware Updates	? ×
	0	Disk Clone Industrial™ v. 1.1.21 This wizard will help you update the software to be up to date or rollback updates to the previous version.		
	Your version is the latest! Software update is not available			
		Version	Installed	Status
		1.1.21	12-Mar-2020	New Version
		1.0.5	2020-03-12 15:27	First setup
	D	Rollback curr	ent version to the pre	viously installed version
Help				Close

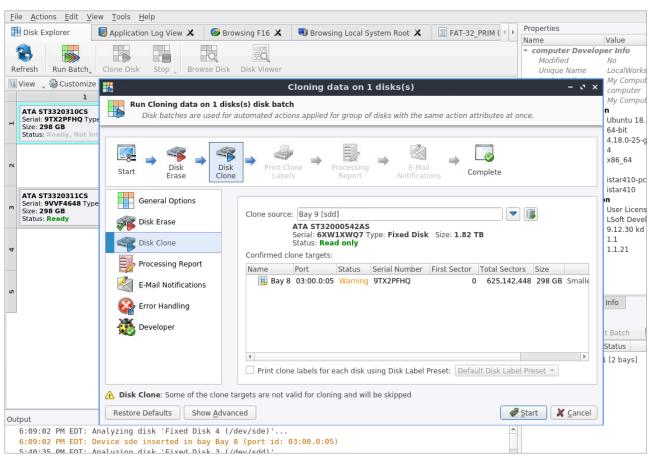
#### Figure 2: Checking for updates

Update dialog contains history of previously installed versions and updates.

If a new version or update is detected it can be downloaded and installed on the next wizard steps.

Note: Disk Clone stores your previously installed versions so you may roll back to any of your older versions at any time.

## **Getting Started with Disk Clone Industrial**



#### This section describes the key features of **Disk Clone Industrial** and explains basic functionality.

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	Disk Explorer 🛛 😡 Application I	Log View 🗙 🥝 Browsing F16 🗶	🕲 Browsing
Re	efresh Run Batch, Clone Disk S	stop, Browse Disk Disk Viewer	
Ē	View 🛫 🎲 Customize 🧅		
	1	2	
1	ATA ST3320310CS Serial: 9TX2PFHQ Type: Fixed Disk Size: 298 GB Status: Ready, Not Initialized ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Status: Ready		
2		One Pass Zeros: pass 1 of 1 (0x00 82% complete 00:00:11 elapsed 00:00:01 left	N
e	ATA ST3320311CS Serial: 9VVF4648 Type: Fixed Disk Size: 298 GB Status: Ready	NO DISK	N
4		ATA ADATA SP900 Serial: 2F3020020939 Type: Fixed Disk, SSD Size: 477 GB Status: Waiting	
-	e <u>A</u> ctions <u>E</u> dit <u>V</u> iew <u>T</u> ools <u>H</u> elp Disk Explorer	Log View 🗙 🥏 Browsing F16 🗶	🖏 Browsing L
		Browse Disk Disk Viewer	· · · · · · · · · · · · · · · · · · ·
Ę	View 🛫 🎯 Customize 🛫		
	1	2	
1	ATA ST3320310CS Serial: 9TX2PFHQ Type: Fixed Disk Size: 298 GB Status: Ready, Not Initialized	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Status: Ready	NO
2		ERASED	N O
e	ATA ST3320311CS Serial: 9VVF4648 Type: Fixed Disk Size: 298 GB Status: Ready	NO DISK	N O
4		ATA ADATA SP900 Serial: 2F3020020939 Type: Fixed Disk, SSD Size: 477 GB Status: Read only	

Fi	e <u>A</u> ctions <u>E</u> dit <u>V</u> iew <u>T</u> ools <u>H</u> elp	D	
	Disk Explorer 🛛 😡 Application I	Log View 🗶 🛛 💐 Browsing Loca	al System Root 🗶  📓 F4
R	efresh Run Batch, Clone Disk S	Stop, Browse Disk Disk Viewe	r
ŧ	View 🛫 🎯 Customize 🛫		
	1	2	3
1	From sda 49% complete 00:00:09 elapsed 00:00:08 left	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Status: Ready	NO DI
2		ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GB Status: Ready	NO DI
m	ATA ST3320311CS Serial: 9VVF4648 Type: Fixed Disk Size: 298 GB Status: Busy	NO DISK	NO DI
4		ATA ADATA SP900 Serial: 2F3020020939 Type: Fixed Disk, SSD Size: 477 Status: Ready	GB
<u>F</u> il∉	e <u>A</u> ctions <u>E</u> dit <u>V</u> iew <u>T</u> ools <u>H</u> elp		
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Re	Fresh Run Batch, Clone Disk Stop, E	Browse Disk Disk Viewer	* co
<u>ا</u>	/iew 🛫 🎡 Customize 🛫		
	1	2	3
-		T32000542AS SXW1XWQ7 ixed Disk Size: 1.82 TB Ready	NO DISK S
2	Disk batch processing completed	Cloning data on 1 dis	sks(s) – ୯×
m	ATA Seri Results Overview Processing Attrib	utos Log	

	Cloning data on 1 disks(s)	– 🖙 🗙 <mark>oce</mark>
	Disk batch processing completed successfully	<b>wo</b> אוויינ
ATA Seri Size Stat	Results Overview     Processing Attributes     Log       Title     Status     Erased (Wiped)     Cloned     Started at     Duration	ser <b>sio</b> cen egis
	▼ ■ Bay 8         Success         Erased         Cloned         29/04/2020 18:43:25         00:00:46         Cloning sde completion           ✓ Disk Erase         Success         No Errors         29/04/2020 18:43:25         00:00:17         Disk Erase completion	2 00
	Cloning sde Success No Errors 29/04/2020 18:43:44 00:00:27 Cloning sde comple	
	<ul> <li>Cloning data on 1 disks(s) completed successfully</li> <li>Disk labels are available to print</li> </ul>	Print Labels w B
	<ul> <li>Disk Processing Report skipped</li> <li>Batch Processing Notification skipped</li> </ul>	tle D
	✓ Show this	s dialog next time
_		🥔 ОК
		0 🗙

## **Disk Clone Installation and Distribution**

**Disk Clone Industrial** is distributed as a software solution with a DVD-ROM and security USB license. DVD-ROM contains two installations:

- DiskCloneIndustrial-Setup.exe installation for Windows OS
- **DiskCloneIndustrial.run** installation for the Linux OS

Simply install the application into your data erasure workstation environment and configure it.

## Launching and initial Configuration

Note: Before launching Disk Clone make sure the security USB stick is plugged into the workstation's USB slot.

Upon first launching the application you will encounter the **Disk Bay Layout Wizard**.

	Create new Disk Bay Layout wizard	?	×
Generate D	isk Bay Layout		
hardware layo the predefine	s are presented by disk bay controls grouped in rows to simulate out for easy maintenance and visual hot-swap operations. Selec d chassis layouts [ <b>recommended</b> ] or let the application <b>gener</b> fining the number of bay rows and amount of disk bays for each	t one of <b>ate a</b>	
You can edit	the active disk bay layout at any time in Disk Bay Layout tabl	oed view	
	<ul> <li>Load predefined layout</li> <li>30-Destroyer</li> <li>Generate default disk bay layout</li> <li>Disk bay rows: 4 Disk bays per row: 8</li> <li>Automatically generate disk bays for all discovered disks</li> </ul>		
	Execute	Cance	el

#### Figure 3: Disk Bay Layout Wizard

This menu allows you to initialize **Disk Clone** to display your hardware in an intuitive way. To illustrate the purpose of this read this section on Disk Bay Layouts. This initial configuration can be done in 1 of 3 ways:

#### Load predefined layout

Here you can find 1 of our predefined layouts that may fit your system. If an appropriate layout is not listed you may try the next option

#### Generate default Disk Bay layout

Define your hardware in terms of a disk array arranged in a X by Y grid of disks. You may make adjustments to this later so this may just be a template to start from

#### Automatically generate Disk Bays for all discovered disks

Defines your *Disk Bay* layout based on the disks recognized by your system's device manager. The disks will be placed in their own individual row when the layout is generated. The result could be looking as the following:

🔠 Disk Explorer	Application Log	View 🗶 🔛 SMAR	T Monitor 🗶
🚷 🛛 🛼			Q
Refresh Run Batch	Clone Disk Stor	Browse Disk	)isk Viewer
🕎 View 🔍 🎲 Customize			
🔹 Disk Bays 🗲		2	2
Local Devices	00:11.0:01	🗏 Bay 6 Ready	03:00.0:03
My Computer	к	ATA ADATA SP900 Serial: 2F3020020939 Type Size: 477 GB Status: Ready	: Fixed Disk, SSD
🗏 Bay 2 No Disk	00:11.0:02	🗏 Bay 7 No Disk	03:00.0:04
NO DI	sк	NO D	ISK
🗏 Bay 3 No Disk	03:00.0:00	🗏 Bay 8 Ready	03:00.0:05
NO DI	sк	ATA ST3320310CS Serial: 9TX2PFHQ Type: F Status: Ready	ixed Disk Size: 298 GB
🗏 Bay 4 Ready	03:00.0:01	🗏 Bay 9 Ready	03:00.0:06
Bay 4 Ready ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Size: 233 GB Status: Ready		Bay 9 Ready     ATA ST32000542AS     Serial: 6XW1XWQ7 Type: Fi Status: Ready	
ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Size: 233 GB		ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fi	
ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Size: 233 GB Status: Ready	Fixed Disk 03:00.0:02	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fi Status: Ready	xed Disk Size: 1.82 TB 03:00.0:07
ATA SAMSUNG HM250HI Serial: S2OTJ9AZA43374 Type: Size: 233 GB Status: Ready Bay 5 No Disk	Fixed Disk 03:00.0:02	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fi Status: Ready Bay 10 Ready ATA ST3320311CS Serial: 9VVF4648 Type: Fi	xed Disk Size: 1.82 TB 03:00.0:07
ATA SAMSUNG HM250HI Serial: S2OTJ9AZA43374 Type: Size: 233 GB Status: Ready Bay 5 No Disk N O D I	Fixed Disk 03:00.0:02	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fi Status: Ready Bay 10 Ready ATA ST3320311CS Serial: 9VVF4648 Type: Fi	xed Disk Size: 1.82 TB 03:00.0:07 xed Disk Size: 298 GB
ATA SAMSUNG HM250HI Serial: S2OTJ9AZA43374 Type: Size: 233 GB Status: Ready Bay 5 No Disk N O D I	Fixed Disk 03:00.0:02 5 K	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fi Status: Ready Bay 10 Ready ATA ST3320311CS Serial: 9VVF4648 Type: Fi Status: Ready	xed Disk Size: 1.82 TB 03:00.0:07 xed Disk Size: 298 GB
ATA SAMSUNG HM250HI Serial: S2OTJ9AZA43374 Type: Size: 233 GB Status: Ready Bay 5 No Disk N O D I Output 11:27:57 AM EDT:	Fixed Disk 03:00.0:02 S K Analyzing disk	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fi Status: Ready Bay 10 Ready ATA ST3320311CS Serial: 9VVF4648 Type: Fi	xed Disk Size: 1.82 TB 03:00.0:07 xed Disk Size: 298 GB
ATA SAMSUNG HM250HI Serial: S2OTJ9AZA43374 Type: Size: 233 GB Status: Ready Bay 5 No Disk N O D I Output 11:27:57 AM EDT: 11:27:56 AM EDT:	Fixed Disk 03:00.0:02 S K Analyzing disk Device sdb inse	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fi Status: Ready Bay 10 Ready ATA ST3320311CS Serial: 9VVF4648 Type: Fi Status: Ready	xed Disk Size: 1.82 TB 03:00.0:07 xed Disk Size: 298 GB proversion (port id: 03:)
ATA SAMSUNG HM250HI Serial: S2OTJ9AZA43374 Type: Size: 233 GB Status: Ready Bay 5 No Disk N O D I U U U U U U U U U U U U U U U U U U U	Fixed Disk 03:00.0:02 S K Analyzing disk Device sdb inse Removing disk '	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fi Status: Ready Bay 10 Ready ATA ST3320311CS Serial: 9VVF4648 Type: Fi Status: Ready 'Fixed Disk 1 (/derted in bay Bay 6	xed Disk Size: 1.82 TB 03:00.0:07 xed Disk Size: 298 GB pev/sdb)' (port id: 03: v/sdb)'
ATA SAMSUNG HM250HI Serial: S2OTJ9AZA43374 Type: Size: 233 GB Status: Ready Bay 5 No Disk N O D I Coutput 11:27:57 AM EDT: 11:27:56 AM EDT: 11:27:40 AM EDT: 11:27:39 AM EDT: 10:09:01 AM EDT:	Fixed Disk 03:00.0:02 S K Analyzing disk Device sdb inse Removing disk ' Device sdb remo Current versior	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fi Status: Ready ATA ST3320311CS Serial: 9VVF4648 Type: Fi Status: Ready 'Fixed Disk 1 (/de rted in bay Bay 6 Fixed Disk 1 (/de ved from bay Bay 1 is up to date	xed Disk Size: 1.82 TB 03:00.0:07 xed Disk Size: 298 GB pev/sdb)' (port id: 03: v/sdb)'
ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Size: 233 GB Status: Ready Bay 5 No Disk N O D I 11:27:57 AM EDT: 11:27:56 AM EDT: 11:27:40 AM EDT: 11:27:39 AM EDT: 10:09:01 AM EDT: 10:08:58 AM EDT:	Fixed Disk 03:00.0:02 S K Analyzing disk Device sdb inse Removing disk ' Device sdb remo Current versior Initialization	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fi Status: Ready ATA ST3320311CS Serial: 9VVF4648 Type: Fi Status: Ready 'Fixed Disk 1 (/de rted in bay Bay 6 Fixed Disk 1 (/de ved from bay Bay 1 is up to date	xed Disk Size: 1.82 TB 03:00.0:07 xed Disk Size: 298 GB pev/sdb)' (port id: 03: v/sdb)'
ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Size: 233 GB Status: Ready Bay 5 No Disk N O D I 11:27:57 AM EDT: 11:27:56 AM EDT: 11:27:40 AM EDT: 11:27:39 AM EDT: 10:09:01 AM EDT: 10:08:58 AM EDT: 10:08:58 AM EDT:	Fixed Disk 03:00.0:02 S K Analyzing disk Device sdb inse Removing disk ' Device sdb remo Current versior Initialization Ready	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fi Status: Ready ATA ST3320311CS Serial: 9VVF4648 Type: Fi Status: Ready 'Fixed Disk 1 (/de rted in bay Bay 6 Fixed Disk 1 (/de ved from bay Bay 1 is up to date	xed Disk Size: 1.82 TB 03:00.0:07 xed Disk Size: 298 GB price (port id: 03: (port id: 03 6 (port id: 03

Figure 4: Disk Bay View (automatically generated)

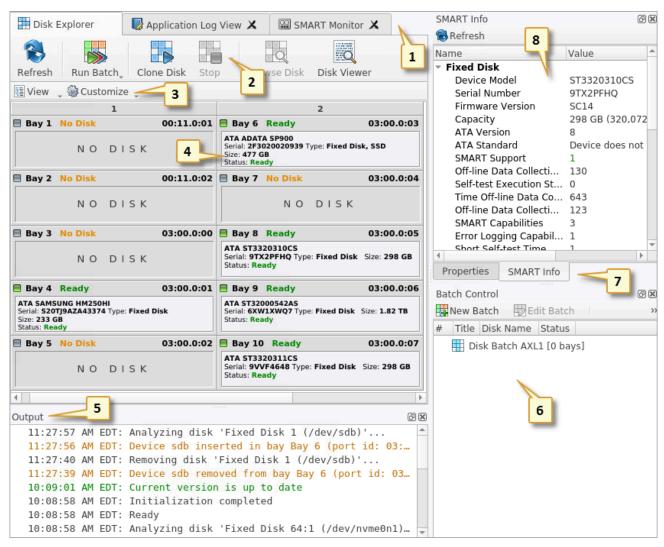
🛄 Disk Explorer 🛛 😡 Applic	ation Log Vie	ew X	🖼 SMART Mor	nitor 🗙	
🗞 🛼 🖡					
Refresh Run Batch Clone D	isk Stop	Brow	se Disk 🛛 Disk V	iewer	
📱 View 🖕 🆓 Customize 🧅					
lame	Port	Status	Total Sectors	Platform Name	Serial Number
- 📰 Bay 6	03:00.0:03	Ready	1,000,215,216	/dev/sdb	2F3020020939
Ø Unallocated Space		Ready	2,047		
🥪 SSD (/dev/sdb1)		Ready	1,000,210,432		
Ø Unallocated Space		Ready	2,736		
🗰 Bay 7	03:00.0:04	No Disk			
🔫 🏢 Bay 8	03:00.0:05	Ready	625,142,448	/dev/sde	9TX2PFHQ
🥪 FAT-32_PRIM (/dev/sde1)		Ready	91,013,120		
🍖 Local Disk (/dev/sde2)		Ready	392,495,104		
🥪 Extended Partition		Ready	141,615,104		
👻 🏢 Bay 9	03:00.0:06	Ready	3,907,029,168	/dev/sdd	6XW1XWQ7
Ø Unallocated Space		Ready	2,047		
🥪 NT-1 (/dev/sdd1)		Ready	1,890,312,192		
🥪 F-1 (/dev/sdd2)		Ready	2,016,698,368		
Ø Unallocated Space		Ready	16,560		
- 🧮 Bay 10	03:00.0:07	Ready	625,142,448	/dev/sda	9VVF4648
🥟 Unallocated Space		Ready	2,047		
🥪 FAT-32_PRIM (/dev/sda1)		Ready	91,013,120		
🥪 ExFat-1 (/dev/sda2)		Ready	392,495,104		
Unallocated Space		Ready	505		
👻 🥪 Extended Partition		Ready	141,615,104		
Ø Unallocated Space		Ready	63		
🥪 NTFS-111 (/dev/sda5)		Ready	45,942,784		
Ø Unallocated Space		Ready	62		
🥪 NTFS-222 (/dev/sda6)		Ready	95,670,272		
Ø Unallocated Space		Ready	1,921		
🥏 Unallocated Space		Ready	16,567		
(					

#### Figure 5: Disk Bay Tree View (automatically generated)

Related information Security Hardware Disk Layout Overview on page 16

## **Navigating Disk Clone**

Once the **Disk Clone** application is launched the main application's dashboard appears. From here you can use any of **Disk Clone**'s tools on your system. This section describes the main components of the application. The full functionality and features of these components are discussed in their corresponding sections later.



#### Figure 6: Disk Clone Industrial application dashboard

Where:

#### 1 - Tabbed Windows

Here you can navigate between Disk Clone tabbed windows such as Disk Explorer, Application Log etc..

#### 2 - Command Toolbar

The command toolbar is a dynamic toolbar that allows the user to perform Tabbed Window-specific actions (depending on the context).

#### 3 - View Selection

This *View Selection* (only available in **Disk Explorer View**) allows you to manipulate how the *Bays* are displayed in the **Windowed View** as well as manipulating with type of graphics used to show the *Bays* in **Disk Bay View**.

#### 4 - Windowed view

Contains the window that is currently active. By default you can see here all *HDD/SSD/USB* disks attached to the workstation.

#### 5 - Output window

Contains the log of operations **Disk Clone** has performed.

#### 6 - Batch control window

The *Batch control* window is an easily accessible interface to create, delete and manipulate disk batches.

#### 7 - Advanced tool tabs

These tabs allow to navigate between the different *Advanced Tool* windows.

#### 8 - Advanced tool window

This window shows the data for the *Advanced Tool* selected. The window can be moved, popped out and resized.

To browse through each of these *Views* click on the appropriate tab. You may also open a *View* from the **View** menu.

<u>F</u> ile <u>A</u> ctions <u>E</u> dit	<u>View</u> <u>T</u> ools <u>H</u> elp		_	
🛗 Disk Explorer 🖊	<ul> <li>Disk Bays</li> </ul>		SMART Monitor 🗶	Proper
	Local Devices			Name v con
8	My Computer		Q	v con M
Refresh 🖊 Run Batc	Customize	+	sk Disk Viewer	UI
🔄 View 🖕 🎲 Custom	<u>W</u> indows	•	✓ Properties	No Na
:	<u>O</u> rganize	Þ	SMART Info	Pá
Bay 1 No Disk	Siosk Mode	Ctrl+T	✓ Output	Ctrl+O ys
NOD	ISK	Serial: 2F30200209 Size: 477 GB	🖌 Batch Control	Ol Pl
		Status: Ready		K.

To open any closed View just select it from the **View** menu.

The status bar at the bottom of the workspace shows the current status of the application or status of the activity in progress.

#### Related information Using Disk Clone on page 35

**Property Views** 

## **Disk Layout Overview**

The purpose of **Disk Bay Layouts** is to match **Disk Clone**'s graphical disks' representation to your actual hardware configuration making it easy to manage disks for cloning, erasure and more. To illustrate this let's look at the example, using the hardware below:



Figure 7: Example of a generic disk array

In the example above we have a generic disk array consisting of 16 disks arranged in a 4x4 grid. The machine using these disks would see the disks similarly to **Disk Clone**'s **Local Devices** View:

📰 Disk Explorer 🛛 😼 Applicati	ion Log View	X 🖼 SMART Monitor X		
	R rowser Dis	k Viewer		
View Scustomize	1			
	Una FAT-3	32 ExFat-1 (/dev/sda2)		ES-222 (/ 1 Una
Local Devices	Size dev/	File System: exFAT Size: 187		FS-222 (/ I Una v/sda6) Size
My Computer	File S			e System: N
Size: 298 GB	Size:		Size 2	e: 45.6 GB
🚲 sdb 📃				
SSD Ready		D (/dev/sdb1)		Unall
ATA ADATA SP900	Size: 1 File	e System: NTFS Size: 477 GB		Size: 1
Serial: 2F3020020939 Type: Fixed Disk, SSD Size: 477 GB				
Sdc 📄		4		
Ready	Unallocate Size: 233 C			
ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374	5120. 200			
Type: Fixed Disk Size: 233 GB				
	L			
sdd 🗖				
	Unall( NT	-1 (/dev/sdd1)	F-1 (/dev/sdd2)	Unally
Ready		-1 (/dev/sdd1) e System: NTFS Size: 901 GB	F-1 (/dev/sdd2) File System: FAT32 Size: 9	
Ready ATA ST32000542AS Serial: 6XW1XWQ7				
Ready ATA ST32000542AS				
Ready ATA ST32000542AS Serial: 6XW1XWQ7				62 GB Size: ł
Ready ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB	Size: 1 File	e System: NTFS Size: 901 GB	File System: FAT32 Size: 9	
Ready ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB sde Ready ATA ST3320310CS	Size: 1 File	e System: NTFS Size: 901 GB RI Local Disk (/dev/sde2) File System: Unknown Size: 18	File System: FAT32 Size: 9	62 GB Size: ł
Ready ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Sde Ready	Size: 1 File	RI File System: NTFS Size: 901 GB Local Disk (/dev/sde2) File System: Unknown Size: 18	File System: FAT32 Size: 9	62 GB Size: ł
Ready ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB sde Ready ATA ST3320310CS Serial: 9TX2PFHQ Type: Fixed Disk	Size: 1 File	RI File System: NTFS Size: 901 GB Local Disk (/dev/sde2) File System: Unknown Size: 18	File System: FAT32 Size: 9	62 GB Size: 1
Ready ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB sde Ready ATA ST3320310CS Serial: 9TX2PFHQ Type: Fixed Disk	Size: 1 File	RI File System: NTFS Size: 901 GB Local Disk (/dev/sde2) File System: Unknown Size: 18	File System: FAT32 Size: 9	62 GB Size: 1
Ready ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Serial: 9TX2PFHQ Type: Fixed Disk Size: 298 GB	Size: 1 File FAT-32_PF dev/sde1) File System Size: 43.4	E System: NTFS Size: 901 GB Local Disk (/dev/sde2) File System: Unknown Size: 18 G	File System: FAT32 Size: 9	62 GB Size: 1
ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB sde Ready ATA ST3320310CS Serial: 9TX2PFHQ Type: Fixed Disk Size: 298 GB Output 11:27:57 AM EDT: Analyzing	Size: 1 File FAT-32_PF dev/sde1) File System Size: 43.4 disk 'Fix	E System: NTFS Size: 901 GB Local Disk (/dev/sde2) File System: Unknown Size: 18 G	File System: FAT32 Size: 9	62 GB Size: 1
ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB sde Ready ATA ST3320310CS Serial: 9TX2PFHQ Type: Fixed Disk Size: 298 GB Output 11:27:57 AM EDT: Analyzing	Size: 1 File FAT-32_PF dev/sde1) File System Size: 43.4 disk 'Fix b inserted	e System: NTFS Size: 901 GB Local Disk (/dev/sde2) File System: Unknown Size: 18 ed Disk 1 (/dev/sdb)' in bay Bay 6 (port id: 03:	File System: FAT32 Size: 9	62 GB Size: 1
Ready ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Serial: 9TX2PFHQ Type: Fixed Disk Size: 298 GB Output 11:27:57 AM EDT: Analyzing 11:27:56 AM EDT: Device sdl 11:27:40 AM EDT: Removing of	Size: 1 File FAT-32_PF dev/sde1) File System Size: 43.4 disk 'Fix b inserted disk 'Fixe	e System: NTFS Size: 901 GB Local Disk (/dev/sde2) File System: Unknown Size: 18 ed Disk 1 (/dev/sdb)' in bay Bay 6 (port id: 03:	File System: FAT32 Size: 9	62 GB Size: 1
ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Serial: 9TX2PFHQ Type: Fixed Disk Size: 298 GB Output 11:27:57 AM EDT: Analyzing 11:27:56 AM EDT: Device sdl 11:27:39 AM EDT: Removing of 11:27:39 AM EDT: Device sdl 10:09:01 AM EDT: Current ve	Size: 1 File FAT-32_PF dev/sde1) File System Size: 43.4 disk 'Fixe b inserted disk 'Fixe b removed ersion is	e System: NTFS Size: 901 GB Local Disk (/dev/sde2) File System: Unknown Size: 18 ed Disk 1 (/dev/sdb)' in bay Bay 6 (port id: 03: d Disk 1 (/dev/sdb)' from bay Bay 6 (port id: 03 up to date	File System: FAT32 Size: 9	62 GB Size: 1
Ready         ATA ST32000542AS         Serial: 6XW1XWQ7         Type: Fixed Disk Size: 1.82 TB         Sde         Ready         ATA ST3320310CS         Serial: 9TX2PFHQ Type: Fixed Disk         Size: 298 GB         Output         11:27:57 AM EDT: Analyzing         11:27:56 AM EDT: Device sdl         11:27:39 AM EDT: Device sdl	Size: 1 File FAT-32_PF dev/sde1) File System Size: 43.4 disk 'Fixe b inserted disk 'Fixe b removed ersion is	e System: NTFS Size: 901 GB Local Disk (/dev/sde2) File System: Unknown Size: 18 ed Disk 1 (/dev/sdb)' in bay Bay 6 (port id: 03: d Disk 1 (/dev/sdb)' from bay Bay 6 (port id: 03 up to date	File System: FAT32 Size: 9	62 GB Size: 1
ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Sde Ready ATA ST3320310CS Serial: 9TX2PFHQ Type: Fixed Disk Size: 298 GB Output 11:27:57 AM EDT: Analyzing 11:27:56 AM EDT: Device sdi 11:27:40 AM EDT: Removing of 11:27:39 AM EDT: Device sdi 10:09:01 AM EDT: Current vo 10:08:58 AM EDT: Initializa 10:08:58 AM EDT: Ready	Size: 1 File FAT-32_PF dev/sde1) File System Size: 43.4 disk 'Fix b inserted disk 'Fixe b removed ersion is ation comp	e System: NTFS Size: 901 GB Local Disk (/dev/sde2) File System: Unknown Size: 18 ed Disk 1 (/dev/sdb)' in bay Bay 6 (port id: 03: d Disk 1 (/dev/sdb)' from bay Bay 6 (port id: 03 up to date	File System: FAT32 Size: 9	62 GB Size: 1

#### Figure 8: Local Devices View

Now imagine inserting a *HDD* into the bottom-leftmost *Bay* of the disk array. Even finding the device in a list of 15 other disks would be tedious and not very intuitive. This is when creating a **Disk Bay Layout** is extremely useful. By creating a 4x4 **Disk Bay Layout** we can map the physical ports to their corresponding *Bay* in **Disk Clone** and visually see our disk array like this:

🔠 Disk Explorer	😼 Application Log	View 🗶 🔛 SMART Mo	nitor 🗙
Refresh Run Batch	Clone Disk Sto	Browse Disk Disk	Q /iewer
🔢 View 📮 🎲 Customize	·		
• Disk Bays 🗲		2	
Local Devices	00:11.0:01	🗏 Bay 6 Ready	03:00.0:03
My Computer	к	ATA ADATA SP900 Serial: 2F3020020939 Type: Fixe Size: 477 GB Status: Ready	d Disk, SSD
🗏 Bay 2 No Disk	00:11.0:02	🗏 Bay 7 No Disk	03:00.0:04
NO DIS	5 K	NO DIS	к
Bay 3 No Disk	03:00.0:00	🗏 Bay 8 Ready	03:00.0:05
NO DIS	5 К	ATA ST3320310CS Serial: 9TX2PFHQ Type: Fixed I Status: Ready	Disk Size: 298 GB
🗏 Bay 4 Ready	03:00.0:01	🗏 Bay 9 Ready	03:00.0:06
ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: F Size: 233 GB Status: Ready	ixed Disk	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed D Status: Ready	isk Size: 1.82 TB
🗏 Bay 5 No Disk	03:00.0:02	🗏 Bay 10 Ready	03:00.0:07
NO DIS	5 К	ATA ST3320311CS Serial: 9VVF4648 Type: Fixed D Status: Ready	visk Size: 298 GB
•			•
Output			© ×
11:27:57 AM EDT: A	Analyzing disk	'Fixed Disk 1 (/dev/s	db)' 📤
11:27:56 AM EDT: D	⊖evice sdb inse	erted in bay Bay 6 (po	rt id: 03:…
		Fixed Disk 1 (/dev/sd	
		oved from bay Bay 6 (p	ort id: 03
10:09:01 AM EDT: 0			
10:08:58 AM EDT: I	[nitialization]	completed	
		compresed	
10:08:58 AM EDT: F	Ready	'Fixed Disk 64:1 (/de	(

#### Figure 9: Disk Bays View

Assuming that the *Bays* were mapped correctly finding the correct disk to manipulate with is now much easier in the **Disk Bays** *View* than it would have been in *Disk Bays View* on page 28 or Local Devices View on page 31. You can now select the bottom-leftmost disk in the **Disk Bays** View and perform any necessary actions on it.

#### **Related information**

Editing Disk Bay Layouts on page 18 Export and Import of Disk Bay Layouts on page 22 Layouts Advanced Features on page 23

#### **Editing Disk Bay Layouts**

To create or edit current *Disk Bay Layout* select **Edit > Edit Disk Layout** in the menu or use a shortcut **CTRL + M**.

0							
File	Actions	Edit	View Tools	Help			
	Disk Explor		New Batch			Er	ase Log View
-		1	Edit Batch				
			Delete Batch				
<u>[</u> []	View 🖕 🎯		Edit Disk Bay Lay	out	Ctrl+M		
	7 - P		Select All		Ctrl+A	10	- P F - P
	Bay7 R		Select All		CurrA	79	🗏 Bay 5 R
-	ATA WDC V Serial: Z2H2		Assign Bays to		Þ		ATA TOSH Serial: 85E
	Status: Rea		Detach Bays				Status: Rea
							🗏 Bay6 R
N							ATA ST32 Serial: 6XV
							Status: Rea

Figure 10: Opening the Disk Bay Layout View

This will bring you to the **Disk Bays Layout** *View* where you can manipulate, save, import and create *Disk Bay Layouts*.

🖽 Disk Explorer 🛛 😺 Application Log	View 🗶 🖼 SMART Monitor 🗶
Refresh Run Batch, Clone Disk Sto	p Browse Disk Disk Viewer
🕎 View 🖕 🎒 Customize 🖕	
Use '+' symbols to add disk bays at proper direction. Drag'n'drop	vout 😥 Done 🔛 Cancel
Bay 2 Port: 00:11.0:02 Platform Name: Unassigned	Bay 7 Port: 03:00.0:04 Platform Name: Unassigned
Bay 3 Port: 03:00.0:00 Platform Name: Unassigned	Bay 8 Port: 03:00.0:05 Platform Name: Unassigned
Bay 4 Port: 03:00.0:01 Platform Name: Unassigned	Bay 9 Port: 03:00.0:06 Platform Name: Unassigned
Bay 5 Port: 03:00.0:02 Platform Name: Unassigned	Bay 10 Port: 03:00.0:07 Platform Name: Unassigned
Output	@ X
11:27:40 AM EDT: Removing disk	erted in bay Bay 6 (port id: 03:… 'Fixed Disk 1 (/dev/sdb)' oved from bay Bay 6 (port id: 03… n is up to date
,	'Fixed Disk 64:1 (/dev/nvme0n1) 🚽

#### Figure 11: Disk Bays Layout View

There are 2 types of layouts:

- **Free Grid Layout** allows user to place *Disk Bay* widget at any position, change *Bay* widget size and its alignment (vertically or horizontally) individually for each *Bay*. Hence, user can create relatively accurate mocking layout of actual (physical) disk *Bay* slots located on hardware chassis
- **Table Layout** is similar to *Disk Bay Layout* from previous versions. However, now user can re-size or select *Disk Bay* widgets by using row and column headers

#### Creating a new layout

To create a new layout select either >**Free Grid** or **Table** layout option and start adding *Disk Bays* using circled "+" symbols.

View         Weta           Use '+' symbols to add disk bays at proper direction           Drag'n'drop disk bay controls by mouse at desired by           Double-click on labels to edit its value. Click Done to	location. 🛛 📴 Clear layo	out 🔡 Done	Cancel
Bay 17 Port: Removable Platform name: Unassigned Bay 19 Port: 1-02-00 Platform name: Unassigned	t: Unassigned Unassigned	Port: Unassigned e: Unassigned	)
Bay 21 Port: 0-01-00 Platform name: Unassigned Bay Locked	Bay 18 Port: Platform name: U	Bay 24 Por Platform name:	
$\oplus$	Œ		

#### Figure 12: Editing Disk Bay Layout

If predefined layout already exists click **Clear Layout** to remove it and create a new one.

#### Editing Disk Bay layout

- Click on circled "+" signs to add new Disk Bay widget on a side of existing one. New Disk Bay widget size will be corresponded to adjusted Disk Bay
- To re-size *Disk Bay* use mouse to drag it's right side or bottom
- To set *Disk Bay* vertically-oriented use mouse to drag it's right side to shrink it until it changes to vertical state.
- To delete *Bay(s)* select it and press **Delete** keyboard key or use service menu by clicking "gear" icon on left upper corner
- Use mouse to drag-n-drop selected *Disk Bay* widgets to new location. If hovered location is invalid *Disk Bay* widgets will be highlighted with crossed sign
- To change disk label or port, click on corresponded labels on disk widget to start editing
- To change *Disk Bay* attributes use menu by clicking on "gear" sign on selected *Bay*
- **Important:** Due to different hard disk controller manufacture standards and platform limitations physical disk port address format may vary.
- **Note:** If both platform name and disk port are assigned to *Disk Bay* widget then platform name is used for *Disk Bay* mapping.

#### **Disk Bay Layout Wizard**

To create a new layout using the wizard click **Customize** > **New Layout Wizard**. This will launch the **Disk Bay Layout Wizard** 

	Create new Disk Bay Layout wizard		×
Gener	ate Disk Bay Layout		
hardware the prede layout b	disks are presented by disk bay controls grouped in ro layout for easy maintenance and visual hot-swap op afined chassis layouts [ <b>recommended</b> ] or let the app y defining the number of bay rows and amount of disk edit the active disk bay layout at any <b>time</b> in <b>Disk B</b> a	erations. Select one lication <b>generate a</b> bays for each row.	of
	<ul> <li>Load predefined layout</li> <li>30-Destroyer</li> <li>Generate default disk bay layout</li> </ul>		
	Disk bay rows: 4 Disk bays per row: 8		
		Execute Ca	ncel

#### Figure 13: Disk Bay Layout Wizard

This configuration of a new layout can be done in 1 of 3 ways:

#### Load predefined layout

Here you can find one of our predefined layouts that may fit your system. If an appropriate layout is not listed you may try the next option.

#### Generate default Disk Bay layout

Define your hardware in terms of a disk array arranged in a X by Y grid of disks. You can make adjustments to this later so this may just be a template to start from. Table-style layout will be created.

#### Automatically generate Disk Bays for all available physical ports

Defines your *Disk Bay* Layout based on the disks recognized by your system's Device Manager. The disks will be placed in their own individual row when the layout is generated.

**Warning:** Make sure to save the layout by clicking **Done** otherwise your layout WILL be lost.

With the old layout cleared out you now have a new layout ready to be configured to your machine.

#### Saving and Reverting changes

Click **Done** button to commit any changes to the application View layout.

**Note:** Done will apply current change to the application session so the changes will be seen in the *Disk Bays* View and even be loaded in future application launch. These changes will not affect the .dbl file.

Click **Cancel** to revert any changes you made to the layout.

#### **Export and Import of Disk Bay Layouts**

Once a *Disk Bay* Layout is configured it can be saved and later used with other **Disk Clone** configurations. This is done with the **Export** and **Import** features.

#### Exporting a Disk Bay Layout

Layouts are saved using the *Disk Bay* Layout command tool bar's commands. Select **Customize** then **Export Layout as...** in the drop down list of commands. This will open a dialogue where the layout can be configured by setting the *Title*, *Description*, *File name* and path to save the layout to. Once these settings are configured click **Save** and the layout will be saved as a .dbl file in the specified location.

💾 Save disk b	bay layout as	23
	ave disk bay layout in separate profile provide <b>file name, title</b> with brief <b>ription</b> for future reference and dick <b>Save</b> button to confirm the action.	
Title:		
Description:	Disk bay layout profile	
Disk bay layo	out profile: disk-bay-layout.dbl	 cel

Figure 14: Export Disk Bay Layout dialog

#### Title

Enter any label to distinguish newly created *Disk Bay* Layout to differentiate it among other *Disk Bay* Layouts.

#### Description

Describe all the specs and features of the new *Disk Bay* Layout.

#### Layout profile name

Select the name of the file that the *Disk Bay* Layout will be saved as. File extension should remain as **.dbl**.

#### Importing a Disk Bay Layout

Saved *Disk Bay* Layouts are imported into separate application sessions using the **Import** feature. In the command tool bar select **Customize** and **Import Layout**. Select the desired *Disk Bay* Layout (.dbl file) in the file explorer window and click **Open**.

This will import the *Disk Bay* Layout into the current application session. Finally, click **Done** to update the disks in the **Disk Explorer** and the import should be complete.

#### Layouts Advanced Features

Once a *Disk Bay* Layout is created there are a number of actions that can be performed to format or manipulate the layout and appearance of the disks in the **Disk Clone** application.

#### Locking Disks

In order to prevent accidental deletion of important disks **Disk Clone** supports locking of disks. Once a disk is locked no write operations are allowed to be performed on the drive. To do this simply find the disk that needs to be locked and execute **Bay Locked** menu command from the **Change disk bay attributes** drop down menu:

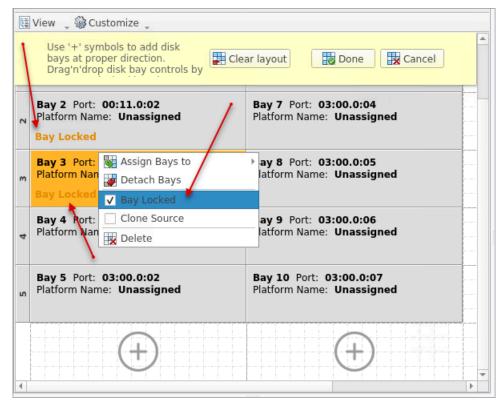


Figure 15: Locking a disk to prevent accidental destruction

ų	View 🛫 🎡 Customi	ze "	-	_		
		1			2	
01 10	🗏 Bay 1 No Disk	00:1	1.0:01	📄 Bay 6	Read only Locked	03:00.0:03
1	N O	DISK		ATA ADAT Serial: 2F3 Size: 477 ( Status: Re	020020939 Type: Fixed D GB	isk, SSD
	Bay 2 No Disk	00:1	1.0:02	🗏 Bay 7	No Disk	03:00.0:04
2	NO	DISK			NO DISK	
	Bay 3 No Disk	03:0	00:0:00	Bay 8	Ready	03:00.0:05
m	N O	DISK			320310CS X2PFHQ Type: Fixed Dis eady	k Size: 298 GB
	Bay 4 Ready	03:0	00.0:01	Bay 9	Ready	03:00.0:06
4	ATA SAMSUNG HM250H Serial: S20TJ9AZA43374 Size: 233 GB Status: Ready				000542AS W1XWQ7 Type: Fixed Disk ady	Size: 1.82 TB
	🗏 Bay 5 No Disk	03:0	0.0:02	🗏 Bay 10	0 Ready	03:00.0:07
ŝ	N O	DISK			320311CS VF4648 Type: Fixed Disl ady	Size: 298 GB

Figure 16: Locked Bay

#### Locking Clone Source

Disks that are planned to be used as master copy for Disk Clone could be marked in *Disk Bay* Layout by selecting *Disk Bay* and clicking **Clone Source** from the **Change disk bay attributes** drop down menu. Hence, disks marked this way will be protected from accidental destruction and also will be available in devices' list as source for disk cloning.

#### Saving and Reverting changes

Click **Done** button to commit any changes to the application *View* layout.

**Note:** Done will apply current change to the application session so the changes will be seen in the *Disk Bays* View and even be loaded in future application launch. These changes will not affect the *.dbl* file.

Click **Cancel** to revert any changes you made to the layout.

### **Disk Explorer**

The **Disk Explorer** is a default *View* and interface for the **Disk Clone** application. All the attached *HDD/ SSD/USB* disks are visualized can be selected and manipulated here. New procedures like erasure can be initiated from here as well as displaying statuses and progress for actions performed with disks. There are **3** available main Views: Disk Bays View on page 28, Local Devices View on page 31 and My Computer View on page 33

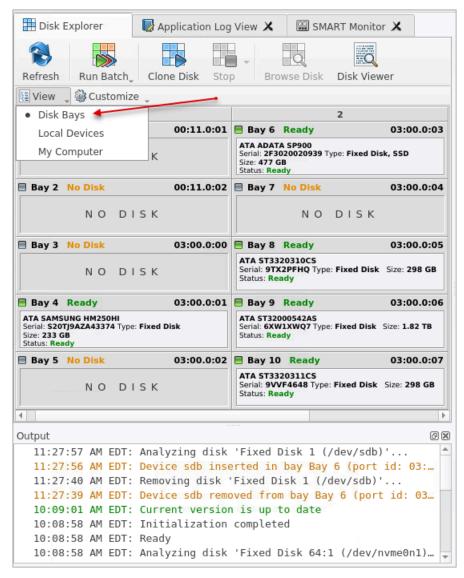


Figure 17: Disk Bays View

Refresh       Stop       Stop       All       File Browser       Disk Viewer         Disk Bays       Una       FAT-32       ExFat-1 (/dev/sda2)       Inrest (/dev/sda2)         Disk Bays       Una       FAT-32       ExFat-1 (/dev/sda2)       Inrest (/dev/sda2)         Size       298 GB       Una       Inrest (/dev/sda2)       Inrest (/dev/sda2)         Size       298 GB       Inrest (/dev/sda2)       Inrest (/dev/sda2)       Inrest (/dev/sda2)         Size       298 GB       Inrest (/dev/sda2)       Inrest (/dev/sda2)       Inrest (/dev/sda2)         Size       298 GB       Inrest (/dev/sda2)       Inrest (/dev/sda2)       Inrest (/dev/sda2)         Size       298 GB       Inrest (/dev/sda2)       Inrest (/dev/sda2)       Inrest (/dev/sda2)         Size       298 GB       Inrest (/dev/sda2)       Inrest (/dev/sda2)       Inrest (/dev/sda2)         Size       312       Inrest (/dev/sda2)       Inrest (/dev/sda2)       Inrest (/dev/sda2)         Size       Size       3374       Inrest (/dev/sda2)       Inrest (/dev/sda2)         Size       Size       123 GB       Inrest (/dev/sda2)       Inrest (/dev/sda2)         Size       Size       123 GB       Inres (/dev/sda2)       Inrest (/dev/sda2)	)
Disk Bays       Una       FAT-32       ExFat-1 (/dev/sda2)       Una       I NTF5-: 1 dev/sda2)         My Computer       id Disk       Size       Gav/sda1)       File System: exFAT Size: 187 GB       Una       I NTF5-: 1 dev/sda6)       File System: NTF5-: 1 dev/sda6)         Size: 298 GB       Size: 42       File System: exFAT Size: 187 GB       Una       I NTF5-: 1 dev/sda6)       File System: NTF5-: 1 dev/sda6)         Size: 298 GB       Unalls       Size: 42       Size: 42       Size: 42       Size: 42         Size: 300020939       Type: Fixed Disk, SSD       Size: 477 GB       Unalls       Size: 233 GB         Size: 300020939       Size: 233 GB       Unallocated       Size: 233 GB       Size: 233 GB         Size: 30002039       Size: 233 GB       Unalls       Size: 233 GB       F-1 (/dev/sdd2)         Size: 30002039       Size: 233 GB       Size: 233 GB       F-1 (/dev/sdd2)         Size: 233 GB       Size: 233 GB       Size: 233 GB       F-1 (/dev/sdd2)         Strate: Status Size: 1.82 TB       File System: NTFS Size: 901 GB       F-1 (/dev/sdd2)         File System: FAT32 Size: 962 GB       Size: 1       Size: 1       Size: 962 GB	GB
Disk Bays       Una       FAT-32       ExFat-1 (/dev/sda2)       Una       I       NTFS-: (1/dev/sda2)         Size       Gav/sda1)       File Sys       File Sys       File Sys       Gav/sda5)       File Sys         Size:       298 GB       Gal)       File Sys       Size: 42       File Sys       Size: 43.6 GB       File Sys       Size: 43.6 GB       Size: 33.6 GB       Size: 1       Size: 1       Size: 1       Size: 1       Size: 1       Size: 1       Size: 233 GB       F-1 (/dev/sdd2)       File System: FAT32 Size: 962 GB       Size: 1       File System: Size: 10 GB       File System: FAT32 Size: 962 GB       Size: 26 GB       Size	GB
<ul> <li>Local Devices My Computer My Computer My</li></ul>	GB
My Computer       size       dev/ glas       Size       if ile System: exFAT Size: 187 GB       Size       if dev/sda6) File System: N Size: 43         Size       sdb Ready       Imalk       SSD (/dev/sdb1) Size: 1       SSD (/dev/sdb1) File System: NTFS Size: 477 GB       SSD (/dev/sdb1) File System: NTFS Size: 477 GB         Imalk       SSD (/dev/sdb1) Size: 1       SSD (/dev/sdb1) File System: NTFS Size: 477 GB       SSD (/dev/sdb1) File System: NTFS Size: 477 GB         Imalk       Size: 233 GB       Imalk       Size: 233 GB       Size: 233 GB         Imalk       Size: 1       NT-1 (/dev/sdd1) File System: NTFS Size: 901 GB       F-1 (/dev/sdd2) File System: FAT32 Size: 962 GB	) " ( Size n: N' GB Unall
Size: 298 GB   Size: 33   Size: 43     File System: N   Size: 43     Size: 45.6 GB     Unall   Size: 1     Size: 477 GB     Size: 1   File System: NTFS Size: 477 GB     Size: 233 GB     Size: 233 GB     Size: 233 GB     Size: 33 GB     Size: 30<	GB Unall
Ready   ATA ADATA SP900   Serial: 2F3020020939   Type: Fixed Disk, SSD Size: 477 GB     Unalli   Size: 1        File System: NTFS Size: 477 GB     Image: Size: 1        Serial: S2019AZA43374   Type: Fixed Disk, Size: 233 GB     Image: Size: 1     Image: Size: 233 GB     Image: Size: 1     Image: Size: 233 GB     Image: Size: 33 GB     Image: Size: 32000542AS   Image: Size: 3200542AS <t< th=""><th></th></t<>	
ATA ADATA SP900 Serial: S2020920939 Type: Fixed Disk, SSD Size: 477 GB Size: 1 File System: NTFS Size: 477 GB Unallocated Size: 233 GB Unallocated Size: 233 GB Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GB Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Unalli Size: 1 File System: NTFS Size: 901 GB F-1 (/dev/sdd2) File System: FAT32 Size: 962 GB	
Serial: 2F3020020939         Type: Fixed Disk, SSD Size: 477 GB         Sdc         Ready         ATA SAMSUNG HM250HI         Serial: S20TJ9AZA43374         Type: Fixed Disk Size: 233 GB         Sdc         Sdc         Ready         ATA SAMSUNG HM250HI         Serial: S20TJ9AZA43374         Type: Fixed Disk Size: 233 GB         Sdc         Ready         ATA ST32000542AS         Serial: 6XW1XWQ7         Type: Fixed Disk Size: 1.82 TB         Image: Sde         Serial: 6XW1XWQ7         Type: Fixed Disk Size: 1.82 TB	Size:
Type: Fixed Disk, SSD Size: 477 GB SdC Ready ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GB SdC Ready ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB MT-1 (/dev/sdd1) File System: NTFS Size: 901 GB F-1 (/dev/sdd2) File System: FAT32 Size: 962 GB	
Ready       Unallocated         ATA SAMSUNG HM250HI       Size: 233 GB         Serial: S20TJ9AZA43374       Type: Fixed Disk Size: 233 GB         Yppe: Fixed Disk Size: 233 GB       Unall         NT-1 (/dev/sdd1)       F-1 (/dev/sdd2)         File System: NTFS Size: 901 GB       File System: FAT32 Size: 962 GB         Serial: 6XW1XWQ7       Type: Fixed Disk Size: 1.82 TB	
ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GB Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB	
ATA SAMSONG HM250H1         Serial: S20TJ9AZA43374         Type: Fixed Disk_Size: 233 GB         Image: Size State         Market Size: 1         Image: Size State         Image: Size State         Image: Size State         Image: Size State         Image: State         Image: State         Image: State         Image: State	
Type: Fixed Disk Size: 233 GB sdd Ready ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB NT-1 (/dev/sdd1) File System: NTFS Size: 901 GB F-1 (/dev/sdd2) File System: FAT32 Size: 962 GB	
Ready       Unalli,       NT-1 (/dev/sdd1)         ATA ST32000542AS       Size: 1       File System: NTFS Size: 901 GB       F-1 (/dev/sdd2)         Serial: 6XW1XWQ7       File System: NTFS Size: 901 GB       File System: FAT32 Size: 962 GB         sde       State       State       State	
ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB       Size: 1       File System: NTFS Size: 901 GB       File System: FAT32 Size: 962 GB	
Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB	Unall
Type: Fixed Disk Size: 1.82 TB	Size: 1
sde	
67.5 GB (72	B (72,506,93
Ready FAT-32_PRI Local Disk (/dev/sde2)	B (72,300,93
ATA ST3320310CS Serial: 9TX29EHO Type: Eixed Dick File System: Unknown Size: 187 GB	
Serial: 9TX2PFHQ Type: Fixed Disk Size: 298 GB Size: 43.4 G	
Output	
11:27:57 AM EDT: Analyzing disk 'Fixed Disk 1 (/dev/sdb)'	Ø
11:27:56 AM EDT: Device sdb inserted in bay Bay 6 (port id: 03:00.0:03)	Ø
11:27:40 AM EDT: Removing disk 'Fixed Disk 1 (/dev/sdb)'	Ø
11:27:39 AM EDT: Device sdb removed from bay Bay 6 (port id: 03:00.0:03) 10:09:01 AM EDT: Current version is up to date	Ø
10:08:58 AM EDT: Initialization completed	0
	Ø
10:08:58 AM EDT: Ready	Ø

Figure 18: Local Devices View

🗒 Disk Explorer 🛛 😺 Application	Log View 🗙	🖼 SMART Mo	nitor 🗙				
		2					
	-						
Refresh Disk Viewer Map Network	Share Mount	Disk Image					
📴 View 🖕 🎲 Customize 🖕							
Disk Bays	Name		Status	Туре	File System	Volume Name	Size
Local Devices	Onallocate	ed Space	Ready	Unallocated	Unallocated		1.00
My Computer     e	➢ FAT-32_PF	IM (/dev/sda1)	Ready	Volume	FAT32	FAT-32_PRIM	43.4
FAI-32_PRIM (/dev/sda1)	🥯 ExFat-1 (/	dev/sda2)	Ready	Volume	exFAT	ExFat-1	18
ExFat-1 (/dev/sda2)	Onallocate	ed Space	Ready	Unallocated	Unallocated		25
Ø Unallocated Space	Onallocate	ed Space	Ready	Unallocated	Unallocated		31.
Unallocated Space	NTFS-111	(/dev/sda5)	Ready	Volume	NTFS	NTFS-111	21.
NTFS-111 (/dev/sda5)	Onallocate	ed Space	Ready	Unallocated	Unallocated		31.
Unallocated Space	NTFS-222	(/dev/sda6)	Ready	Volume	NTFS	NTFS-222	45.0
NTFS-222 (/dev/sda6)	🔵 Unallocate	ed Space	Ready	Unallocated	Unallocated		96
Unallocated Space	Onallocate	ed Space	Ready	Unallocated	Unallocated		8.09
Unallocated Space							
✓ I sdc							
Unallocated Space							
▼ 🞯 sdd							
Unallocated Space							
NT-1 (/dev/sdd1)							
F-1 (/dev/sdd2)							
Unallocated Space	_						
→ 🞯 sde	4						Þ
Output							ØX
11:27:57 AM EDT: Analyzing di	sk 'Fixed Di	sk 1 (/dev/s	db) '				<u>ه</u>
11:27:56 AM EDT: Device sdb i					3)		
11:27:40 AM EDT: Removing dis							
11:27:39 AM EDT: Device sdb r					03)		12
10:09:01 AM EDT: Current vers							
10:08:58 AM EDT: Initializati	on completed						
10:08:58 AM EDT: Ready							
10:08:58 AM EDT: Analyzing di	sk 'Fixed Di	sk 64:1 (/de	ev/nvme	0n1)'			*

#### Figure 19: My Computer View

An additional toolbar helps to execute frequently performed tasks. It contains the following buttons with drop-down menus:

#### View

The disk explorer supports a range of different *Views* to use when performing **Disk Clone** actions, each with their own customizable settings for different use cases.

#### Customize

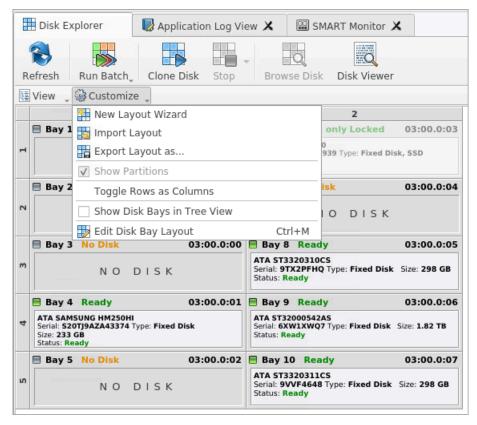
These settings (different for each View) let you customize appearance for better experience for each *View*.

#### **Related information**

Preferences on page 75 Disk Bays View on page 28 Local Devices View on page 31 My Computer View on page 33

#### **Disk Bays View**

This *View* displays the disks configured in the Disk Layout Editor. The *Bays* are grouped by their row, colored by the batch color, and show the current status of the disk. If any operations are being performed on the disk the operation status and progress are displayed.



#### Figure 20: Disk Bays View

#### Customize menu New Layout Wizard

Launches the Disk Bay Layout Wizard

#### **Import Layout**

Imports saved (exported) layout (\*.dbl)

-	Import disk bay	y layout	- 2 ×
Look in:	🧰 /root	- 0 0	0 🙉 🗉 🗏
Computer	Name snap disk-bay-layout.dbl	Folder	Date Modified 4/28/2:57 AM 5/13/20 1:56 PM
File <u>n</u> ame:			Open
Files of type:	Disk Bay Layout Files (*.dbl)		▼ X Cancel

Figure 21: Disk Bay Layout Import

### Export Layout as..

Exports custom (built) layout (\*.dbl)

							File V	reisioi	•
] Bay 2-3	Ready			PhysicalDrive10	🗏 Bay			ttribu	
Unallocate			Save disk b	ay layout as			Hard		Informa mation
Size: <b>465</b> C									mber
] Bay 2-4	To sa	ve disk bay l	ayout in separate	e profile provide <b>fil</b> e	e name, ti	t <b>le</b> wit	h brief	F	anguage on
Unallocate Size: 233 G	desc	ription for f	future reference	and click Save but	ton to confir	m the	action		r Version
	Disk bay laye	out profile:	disk-bay-layou	t.dbl					ition Cod le Langu
	Title:	Disk Bay L	ayout						ate 1e Edition
t 'C:\F	Description:	Disk bay l	ayout profile						ies
e for d									turer
									rget OS SMART Ir
hysical av Bav				Save	e	Can	cel		JMARTI
hysical									
ay Bay	2-7 (port	id: Unas	ssigned)				NCAN F	attri	Edit
-	Drive13)'.					#		Title	Disk N
	2-6 (port Drive12)'.		ssigned)				III E	rase A	XLz [2 bay
-	2-5 (port		ssigned)						

Figure 22: Disk Bay Layout Export

#### **Show Partitions**

Show or hide additional layout for partitions and volumes.

### **Toggle Rows as Columns**

This setting can be toggled on/off to display the rows (defined by the *Disk Bay* Layout) as columns in the **Disk Bays** *View*.

### Show Disk Bays in Tree View

Switches **Disk Bays** *View* to *Tree View* for user convenience and customization related to the one configured in Disk Layout Editor.

🛗 Disk Ex	📰 Disk Explorer 🛛 😺 Application Log View 🗙				ART Monit	or 🗙	
Refresh	Run Batch	Clone Disk	Stop	Browse Disk	Disk Vie	wer	
🛯 View 🖵	🖗 Customiz	e "					
Name	🚹 New Lay	out Wizard			tch Name	Platform Name	Serial I*
- Row :	lmport L	ayout					
Bay	Export L	ayout as					
Bay	✓ Show Pa	artitions	,				
🔳 Bay	Show Liv	ve Volumes					
👻 🖪 Bay				/dev/sdc	S20TJ9		
- 🌒 S	v low Removable Devices					/dev/sdc	S20TJ9
6		y Chassis Rov					
📕 Bay		-					
- 🖬 Row 🕻		nassigned Bay	-				
👻 🧮 Bay	✓ Show Di	sk Bays in Tre	e View			/dev/sdb	2F302
- 📆 S	둸 Edit Disl	k Bay Layout		Ctrl+M		/dev/sdb	2F302
6	Unallocated	Space		Ready			
- 🥪	SSD (/dev/so	db1)		Ready			
	SSD (/dev,			Ready			36EF-9
	Unallocated	Space		Ready			
Bay			03:00.0:04				
T 🗮 Bay			03:00.0:05			/dev/sde	9TX2P
▼ @7 so		1 ( / day / ad c 3 )	03:00.0:05	3		/dev/sde	9TX2P
10 10 10 10 10	Local Disk (/	(/dev/sde1)		Ready Ready			
	Extended Pa			Ready			
	Extended re	n a d V fi		nearry			▼ 

Disk Explorer	ation Log Vie	ew X	SMART Mor	nitor X	
Refresh Run Batch_ Clone D	isk Stop	Brow	se Disk Disk V	lewer	
🖫 View 🖉 🍘 Customize 🖉					
Name	Port	Status	Total Sectors	Platform Name	Serial Number
- 🔣 Bay 6	03:00.0:03	Ready	1,000,215,216	/dev/sdb	2F3020020939
Onallocated Space		Ready	2,047		
🥪 SSD (/dev/sdb1)		Ready	1,000,210,432		
Ø Unallocated Space		Ready	2,736		
📕 Bay 7	03:00.0:04	No Disk			
- 🔣 Bay 8	03:00.0:05	Ready	625,142,448	/dev/sde	9TX2PFHQ
🥪 FAT-32_PRIM (/dev/sde1)		Ready	91,013,120		
🧑 Local Disk (/dev/sde2)		Ready	392,495,104		
🥪 Extended Partition		Ready	141,615,104		
👻 🧮 Bay 9	03:00.0:06	Ready	3,907,029,168	/dev/sdd	6XW1XWQ7
Unallocated Space		Ready	2,047		
🥪 NT-1 (/dev/sdd1)		Ready	1,890,312,192		
🥪 F-1 (/dev/sdd2)		Ready	2,016,698,368		
Ø Unallocated Space		Ready	16,560		
- 🗰 Bay 10	03:00.0:07	Ready	625,142,448	/dev/sda	9VVF4648
Unallocated Space		Ready	2,047		
🥪 FAT-32_PRIM (/dev/sda1)		Ready	91,013,120		
🥪 ExFat-1 (/dev/sda2)		Ready	392,495,104		
Unallocated Space		Ready	505		
👻 🥪 Extended Partition		Ready	141,615,104		
Ø Unallocated Space		Ready	63		
🧼 NTFS-111 (/dev/sda5)		Ready	45,942,784		
Ø Unallocated Space		Ready	62		
🧼 NTFS-222 (/dev/sda6)		Ready	95,670,272		
Ø Unallocated Space		Ready	1,921		
Ø Unallocated Space		Ready	16,567		
(					

#### Figure 23: Tree View Layout

#### **Edit Disk Bay Layout**

Opens Disk Layout Editor for current layout customization or creating a new layout.

#### **Related information**

Disk Explorer on page 25 Local Devices View on page 31 My Computer View on page 33 Disk Layout Overview on page 16

#### **Local Devices View**

Local Devices View shows all disks recognized by OS and available for application in a List View:

🛗 Disk Explorer 🛛 😺 Applicati	ion Log View 🗙 🖼 SMART Monitor 🗙	
Refresh Stop Stop All File B	rowser Disk Viewer	
🔃 View 🖕 🎯 Customize 🖕		
sda       □       Show System Devices         Reac       ✓       Show not Ready Devices         ATA ST332       □       Show Removable Devices         Serial: 9VVI       □       Show Removable Devices         Size: 298 G       □       Compact View	ces 2 ExFat-1 (/dev/sda2) Una I NTFS-: I NTFS-222 (/ I File System: exFAT Size: 187 GB Size I dev/ dev/sda2)	<b>Una</b> Size
sdb     Image: sdb       Read only       ATA ADATA SP900       Serial: 2F3020020939       Type: Fixed Disk, SSD       Size: 477 GB		nallı ze: 1
Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GB	Unallocated Size: 233 GB	
Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB		nallı ze: t
sde 🗧 Ready	FAT-32 PRI Local Disk (/dev/sde2) 67.5 GB (72,500	6,93:

#### Figure 24: Local Devices View

#### Customize menu

#### **Show System Devices**

Displays the disk where OS installed

#### **Show Not Ready Devices**

Displays devices not yet initialized and used by OS

#### Show Removable Devices

Displays all removable and externally connected disks (such as USB's)

#### **Compact View**

Changes the layout of the *Disk View* from display block to inline block orientation.

ATA ST32000542AS SCSI Disk Device Serial: 6XW1E6SZ Type: Fixed Disk Size: 1.82 TB
ATA ST31608155V SCSI Disk Device Serial: 9RXDBQ6T Type: Fixed Disk Size: 149 GB
ATA ST3320310C5 SCSI Disk Device Serial: 9TX2RBAL Type: Fixed Disk Size: 298 GB
ATA 5T3320310C5 5C5I Disk Device Serial: 9TX09ETC Type: Fixed Disk Size: 298 GB

#### **Related information**

Disk Explorer on page 25 Disk Bays View on page 28 My Computer View on page 33

#### **My Computer View**

**My Computer** *View* presents the *Disk Bay* Layout in a standard list form, much like the disks in *Windows Explorer*. *Disk Bays* are grouped by row and can be colored according to their batch color. Information such as disk status, serial number, partitioning are shown in list form next to their respective *Disk Bays*. Properties window at the right side displays attributes of the currently selected object.

📰 Disk Explorer 🛛 😡 Application Log View	X SMART Monitor X
	Mount Disk Image
🔄 View 🖉 🖓 Customize 🖉	
- Show My Computer	Size Date Created Date Modified
👻 🥪 sda 🗌 Show System Disk	100 bytes 4/29/20 5:16 PM 4/29/20 5:16 PM
Ø U ✓ Show Unallocated Partitions	g.blf 64.0 KB 4/29/20 5:16 PM 4/29/20 5:16 PM
F Show Devices	gContainer000000000000000000000000000000000000
V E	gContainer000000000000000000000000000000000000
Ø U ✓ Show Removable Disks	
U Show Not Ready Devices	
<ul> <li>N V Navigator Pane</li> </ul>	
▼ 🗐 \$Extend	
✓ ◯ \$RmMetadata	
🗎 \$Txf	
StrafLog Unallocated Space	
NTFS-222 (/dev/sda6)	
Unallocated Space	
Unallocated Space	
▼ @ sdc	
Unallocated Space	
▼ 🦃 sdd	
Unallocated Space	
NT-1 (/dev/sdd1)	
F-1 (/dev/sdd2)	
Unallocated Space	
▼ 🖗 sde 🔍 🔻 4	

Figure 25: My Computer View

#### **Customize menu**

#### **Show My Computer**

Displays all devices that are detected by the system Device Manager.

#### **Show System Disk**

Displays the disk containing the Operating System. This is *off* by default to prevent accidental erasure of the system.

#### Show Unallocated Partitions

Displays partitions that may not yet been formatted.

#### **Show Devices**

Switches between display of devices (physical disks containing volumes) and "volumes only" display.

#### Show Removable Disks

Displays removable media storage (USB Flash Disk, External USB etc.).

#### **Show Not Ready Devices**

Displays devices that may not yet been initialized and accessed by the OS.

#### **Navigator Pane**

Shows/hides **Navigator Pane** (on the right side of *the View*)

#### **Related information**

Disk Explorer on page 25

Disk Bays View on page 28 Local Devices View on page 31

## **Using Disk Clone**

**Disk Clone Industrial** is a powerful industrial tool to provide disk cloning and erasure solutions for large workstations with many disks. The features in the **Disk Clone Industrial** software are built with this goal in mind. This section describes the key features of the software and how they are used to erase/clone single disks and images to large batches. The software is highly customizable and this guide will help get you started with configuring **Disk Clone Industrial** for your system and using it to the full potential.

### **Disk Clone**

To clone a disk (or image to a disk) follow the steps below.

Navigate to the Disk Bays View on page 28 and select a disk to clone. For multiple selection use Ctrl
+Left Mouse Click or row\column selection buttons. If none of drives is selected, the user must select
the source and targets on the next step.

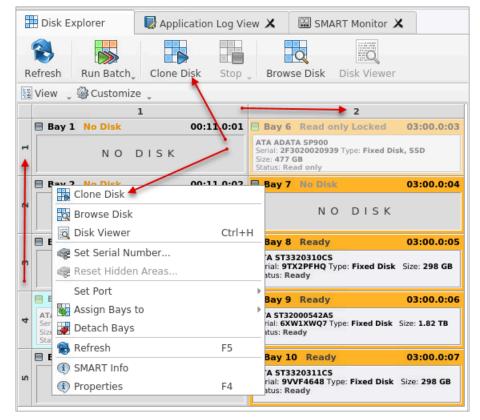


Figure 26: Disk Bays View disk's selection

 Click Clone Disk in main or context menus (Actions > Clone Disk as alternative) and select targets (if one disk was selected in previous step) or select source (if multiple disks were selected) and click Clone.

	Disk Explorer	Application Log Vi	ew 🗶 🔛 SMART Monitor 🕽	×
R	efresh Run Batch	Clone Disk Stop	Browse Disk Disk Viewer	
ų	View 🛫 🎲 Customiz	ze 🖕		
	Select clone targo Clone.	ets and click <b>Clone</b> to in	itiate Disk 🔡 Clone	Cancel
1	NO	DISK	Serial: 2F3020020939 Type: Fixed Dis Size: 477 GB Status: Read only	sk, SSD
	Bay 2 No Disk	00:11.0:02	Bay 7 No Disk	03:00.0:04
2	N O	DISK	NO DISK	
	🗏 Bay 3 No Disk	03:00.0:00	🗏 Bay 8 Ready	03:00.0:05
m	NO	DISK	ATA ST3320310CS Serial: 9TX2PFHQ Type: Fixed Disk Status: Ready	Size: 298 GB
	Bay 4 Read only	Clone Source03:00.0:01	🗏 Bay 9 Ready	03:00.0:06
4	ATA SAMSUNG HM250H Serial: S20TJ9AZA43374 Size: 233 GB Status: Read only	I Type: Fixed Disk	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Status: Ready	Size: 1.82 TB
	🗏 Bay 5 No Disk	03:00 0:02	🗏 Bay 10 Ready	03:00.0:07
2	NO	DISK	ATA ST3320311CS Serial: 9VVF4648 Type: Fixed Disk Status: Ready	Size: 298 GB

Figure 27: Targets selection for cloning

I	Disk Explorer	Application Log Vi	ew 🗶 🔛 SMART Monitor 🕽	<
R	🚯 🛛 📷 efresh Run Batch	Clone Disk Stop	Browse Disk Disk Viewer	
E	View 🛫 🎲 Customiz	e -		
	Cancel			
1	NO	DISK	Serial: 2F3020020939 Type: Fixed Dis Size: 477 GB Status: Read only	sk, SSD
	Bay 2 No Disk	00:11.0:02	Bay 7 No Disk	03:00.0:04
2	NO	DISK	NO DISK	
	🗏 Bay 3 No Disk	03:00.0:00	🗏 Bay 8 Ready	03:00.0:05
m	N O	DISK	ATA ST3320310CS Serial: 9TX2PFHQ Type: Fixed Disk Status: Ready	Size: 298 GB
	🗎 Bay 4 Read only (	Clone Source03:00.0:01	🗏 Bay 9 Ready	03:00.0:06
4	ATA SAMSUNG HM250H Serial: S20TJ9AZA43374 Size: 233 GB Status: Read only		ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Status: Ready	Size: <b>1.82 TB</b>
	🗏 Bay 5 No Disk	03:00.0:02	🗏 Bay 10 Ready	03:00.0:07
S	N O	DISK	ATA ST3320311CS Serial: 9VVF4648 Type: Fixed Disk Status: Ready	Size: 298 GB

Figure 28: Source selection for cloning

- 3. Next is the main work cycle settings' dialog. Available (configurable) options are:
  - General Settings on page 76
  - Disk Erase on page 44
  - Disk Clone on page 35
  - Processing Report
  - E-mail Notifications on page 92
  - Error Handling on page 90

	Cloning data on 1 disks(s) – 🗸 🗙									
Run Cloning data on 1 disks(s) disk batch Disk batches are used for automated actions applied for group of disks with the same action attributes at once.										
Start → Start → Disk Erase → Disk Erase → Disk	Print Clone Labels     Processing Report     Processing R									
General Options Close Cl	Clone source: Bay 8 [sde] ATA ST3320310CS Serial: 9TX2PFHQ Type: Fixed Disk Size: 298 GB Status: Read only									
Processing Report	Confirmed clone targets:           Name         Port         Status         Serial Number         First Sector         Total Sectors         Size									
E-Mail Notifications	Bay 10 03:00.0:07 Ready 9VVF4648         0         625,142,448 298 GB									
Error Handling	Print clone labels for each disk using Disk Label Preset: Default Disk Label Preset *									
<ul> <li>Press Start to begin batch process</li> <li>Restore Defaults Show <u>A</u>dvance</li> </ul>										

#### Figure 29: Cloning options

User is able to review and edit cloning options:

### **Clone Source**

Selected bay or image as a source for cloning

#### **Confirmed clone targets**

Selected targets (Bays) where to clone

**Print clone labels for each disk using Disk Label Preset** is an optional feature for providing a specific label for each disk in work cycle according to presets.

### **P**Note:

Batch General Options									
Dick Frace	Clone source: Bay 4	[sdc]							
Disk Erase	ATA SAMSUNG HM250HI								
Clone Disk Clone	Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GB Status: Read only								
	Confirmed clone targ	jets:							
Batch Report	Name Port	Status	Serial Number F	irst Sector Total Sectors Size					
E-Mail Notifications	Bay 4 03:00	0.0:01 Target declined	S20TJ9AZA43374	0 488,397,168 233					
	🐺 Bay 9 03:00	).0:06 Ready 👌	6XW1XWQ7	0 3,907,029,168 1.82					
Error Handling	😾 Bay 10 03:00	0.0:07 Ready	9VVF4648	0 625,142,448 298					
	4			4					
X	Print clone labels	for each disk using Dis	k Label Preset: Defa	ault Disk Label Preset 🔻					
	Start copy to sector:	0							
Disk Clone: Some of the clone t	argets are not valid for o	cloning and will be skipp	ped						
Restore Defaults Show <u>A</u> dvar	ced			Start Zancel					

Figure 30: Targets will be DECLINED if configuration is invalid

**Start copy to sector** stands for specifying a sector where the cloning starts and considered as a advanced feature activated by pressing **Show Advanced** button:

	r j		Batch General Options										
			Disk Erase	Clone		Bay 4 [sdc]	NG HM250HI			-			
	-	-	Disk Clone	Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GB Status: Read only Confirmed clone targets:									
		70	Batch Report	Name		Port	Status	Serial Number	First Sector	Total Sectors	Size		
		2	E-Mail Notifications	He .	Bay 4	03:00.0:01	Target declined	S20TJ9AZA43374	ι O	488,397,168	233		
		-			Bay 9	03:00.0:06	Ready	6XW1XWQ7	0	3,907,029,168	1.82		
	•		Error Handling		Bay 10	03:00.0:07	Ready	9VVF4648	0	625,142,448	298		
						labels for ea	ch disk using Dis	k Label Preset: D	efault Disk Lal	oel Preset 👻	4		
1	Δ	Disk	<b>Clone</b> : Some of the clone	e targets are	e not val	id for cloning	g and will be skipp	ped					
	P	Restor	e Defaults Show <u>A</u> dv	/anced	-	-				Start X	<u>C</u> ancel		

**4.** When all the settings are verified press **Start** button. The work cycle starts and user is able to see the progress in **Disk Bays** and **Local Devices** Views. The progress bar represents the percentage

of disk space processed. As the procedure progresses the percentage increases and estimated time is recalculated.

Note: If preliminary Disk Erase on page 44 procedure is configured and selected (activated), it starts first, right before an actual cloning.

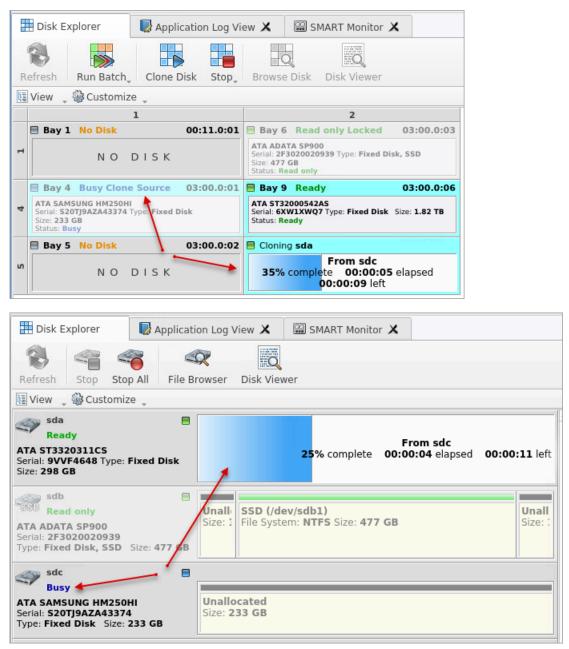
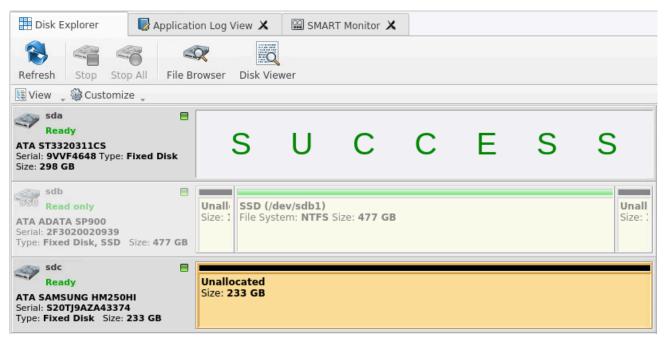


Figure 31: Disk Clone Progress (Local Devices & Disk Bays Views)

📰 Disk Explorer 🛛 😡 Applicati	on Log View 🗶 🔛 SMAR	T Monitor 🗙
8 9 4		Clone Disk
Refresh Stop Stop All File Br	owser Disk Viewer	Browse Disk     Disk Viewer     Ctrl+H
Sda Ready ATA ST3320311CS	<b>25%</b> со	Set Serial Number
Serial: 9VVF4648 Type: Fixed Disk Size: 298 GB		Assign Bays to
ATA ADATA SP900 Serial: 2F3020020939 Type: Fixed Disk, SSD Size: 477 GB	Unalle SSD (/dev/sdb1) Size: 1 File System: NTFS S	S Stop F5
sdc Busy		SMART Info     Properties     F4
ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GB	Unallocated Size: 233 GB	

Figure 32: User is able to STOP the process at any time (main menus and context menu)

When the work cycle is succeeded (or failed) the Processing Report on page 49 dialog appears for reviewing and further actions.



🖽 Disk Explorer 🛛 😺 Application Log	View 🗙 🖼 SMART Monitor 🗙
Refresh Run Batch, Clone Disk Stor	p Browse Disk Disk Viewer
🔄 View 🖕 🎯 Customize 🖕	
1	2
Bay 3 No Disk 03:00.0:00	Bay 8 Ready Erased; Cloned; 03:00.0:05
NO DISK	SUCCESS
Bay 4 Ready 03:00.0:01	Bay 9 Ready 03:00.0:06
ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GB Status: Ready	ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Status: Ready
Bay 5 No Disk 03:00.0:02	Bay 10 Read only Clone Source Erased; Cloned; 03:00.0:07
NO DISK	ATA ST3320311CS Serial: 9VVF4648 Type: Fixed Disk Size: 298 GB Status: Read only

Figure 33: Disk Clone Success (Local Devices & Disk Bays Views)

### **Related tasks**

Disk Erase on page 44 Mount Disk Image on page 42 **Related information** Clone Sources on page 80 Disk Label Presets on page 86

# Mount Disk Image

To use image file as a data source for one or several disks

**1.** To open the Mount Disk Image dialog do one of the following:

Run Disk Batch AXL1 die Disk batches are used	s <b>k batch</b> for automated actions applied for group of disks with the same action attribute	es at once.
	Print Clone     Batch       Batch       Report       Notifications	
Batch General Options Close Erase Disk Erase Disk Clone Disk Clone E-Mail Notifications Constant Clone Error Handling	Clone source: <select clone="" source="">  Confirmed clor    Name   Ø Bay 4   Ø Bay 4   Ø Bay 9   Ø Bay 10</select>	Total Sectors         Size           0         488,397,168         233           0         3,907,029,168         1.82           0         625,142,448         298
Disk Clone: No valid clone so     Restore Defaults Show Ad		k Label Preset 🔹

Figure 34: Mount Disk Image selection

	ion Read/Write a also use mount		disk image	e files for the mas	ster-copy source.				
#	Disk Bay	Port	Status	Platform Name	Serial Number	Partitioning	First Sector	Total Sectors	Size
- 🕫 🛙	Disk Bays as clor								
1		00:11.0:01	No Disk						
2	🗌 📕 Bay 2	00:11.0:02							
3		03:00.0:00	No Disk						
4	🗸 🗰 Bay 4	03:00.0:01	Read only	/dev/sdc	S20TJ9AZA43374	MBR (Basic)	C	488,397,168	233 GB
5	🔲 🇰 Bay 5	03:00.0:02	No Disk						
6	🗌 🇰 Bay 6	03:00.0:03	Read only	/dev/sdb	2F3020020939	MBR (Basic)	1 0	1,000,215,216	477 GB
7		03:00.0:04	No Disk						
8	🗌 🧰 Bay 8	03:00.0:05	Ready	/dev/sde	9TX2PFHQ	MBR (Basic)	C	625,142,448	298 GB
9	🗌 🇰 Bay 9	03:00.0:06	,	/dev/sdd	6XW1XWQ7	MBR (Basic)	C	3,907,029,168	1.82 TB
10	D 🗌 🇮 Bay 10	03:00.0:07	Ready	/dev/sda	9VVF4648	MBR (Basic)	C	625,142,448	298 GB
	Iounted disk ima	5							
N	o mounted Disk	Images					Ļ		
		Add maste	r-copy sour	re (virtual disk) e	emulated from disk	imaga fila: 🗊	Mount Disk I	nage Clo	se Disk Image

Figure 35: Mount Disk Image selection (Preferences)

2. Mount Disk Image dialog appears:

4	Mount Disk Image ×							
Select file name to mount(open) disk image from file. Successfully opened disk image will appear in <b>devices tree</b> and will be assigned to <b>virtual</b> disk bay.								
Disk Image file name:	C:\Users\user\disk_images\							
Caption (Display name	: Use default (generated) Disk Image name							
	OK Cancel Help							

Figure 36: Mount Disk Image dialog

# Disk Image file name

Full path to the image file

# Caption (Display name)

Enter any label to distinguish newly opened (mounted) disk image among other devices and disks.

3. Confirm and open disk image

Click **OK** to mount a Disk Image.

If disk image opens successfully then disk image node appears in **Disk Explorer** *View* and will be available as a clone source in Clone Sources on page 80 tab and in drop-down list of clone sources in task dialog.

## **Related tasks**

**Disk Clone** 

# Disk Erase

Fast disk erase is a core part of **Disk Clone** functionality. Individual disks (or batches of disks) can be erased during the process of cloning according to the standards with just a few clicks.

**Note:** User is not able to activate the Erase Procedure without subsequent Cloning. For effective erasure using more than 20 required international sanitation standards (U.S. DoD 5220-22M, Canadian OPS-II, British HMG IS5 Enhanced, US Army AR380-19, German VSITR, Peter Gutmann etc.) use *LSoft*'s premium product **KillDisk Industrial** https://www.killdisk-industrial.com

To add an erase procedure to the work cycle:

1. Navigate to the **Erase Disk** tab when you go through the clone settings and check the **Use Disk Erase** box as shown below.

	Cloning data on 1 disks(s) – 🗸 🗙
Run Cloning data on 1 disks Disk batches are used for autor	<b>(s) disk batch</b> mated actions applied for group of disks with the same action attributes at once
Start	Print Clone Processing Report Processing Complete
General Options          General Options         Disk Erase         Disk Clone         Processing Report         E-Mail Notifications         Error Handling	Use Disk Erase         Erase method:       One Pass Random [1 pass]         ✓       Verify erasure of         10%       on each disk
✓ Press Start to begin batch process     Restore Defaults   Show Advance	

# Figure 37: Erase Tab

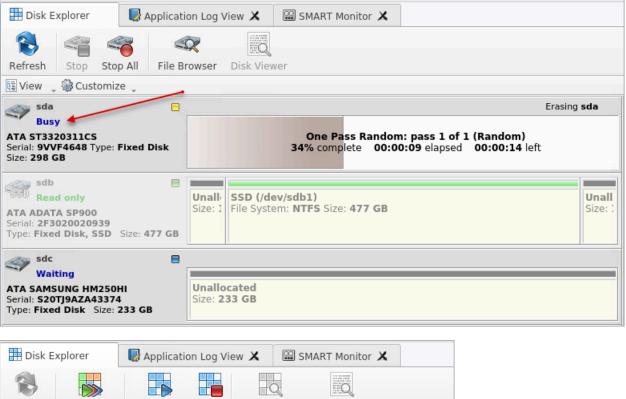
- **2.** The **Disk Erase Options** tab provides settings' configuration for the **Disk Clone** erase procedures. The same erase options for each batch could be set through Edit Batch Attributes on page 63 dialog. Choose the erase method from dropdown list.
- **3.** If erasure verification is required select it and set a percentage of disk to be verified after erase procedure.

After the erasure is completed this feature scans the entire drive evenly and verifies the integrity of the erase operation. This option is the percentage of the sectors to check across the disk. Most standards specify 10% as an accurate sample size for the verification.

4. Click Start button to begin the disk erase process (with the following cloning)

5. Observe erase process

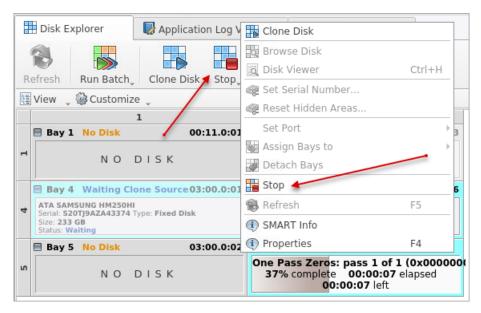
When the *Erase* procedure begins you see the disk area representation as a progress bar as well as an erase method and its progress. The progress bar represents the percentage of disk space processed. As the procedure progresses the percentage increases and estimated time is recalculated.



	<b>N</b>	t 🍋				55Q	8			
R	Refresh Run Batch Clone Disk Stop				Browse D	isk – Disk Vie	ewer			
Ę	View 🖕	🚱 Customize	ų.							
		1	L		2					
	🗏 Bay 🗄	L No Disk	00:	11.0:01	🗏 Bay 6	Read only Loo	cked	03:00.0:03		
1	NO DISK				ATA ADATA SP900 Serial: 2F3020020939 Type: Fixed Disk, SSD Size: 477 GB Status: Read only					
	🗏 Bay 4	4 Waiting Clo	ne Source03:	00.0:01	Bay 9 Ready 03:00.0:06					
4	ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GB: Status: Waiting				ATA ST32000542AS Serial: 6XW1XWQ7 Type: Fixed Disk Size: 1.82 TB Status: Ready					
	🗏 Bay 🗄	5 No Disk	03:	00.0:02	😑 Erasing :	sda				
2		NOE	DISK		One Pass Zeros: pass 1 of 1 (0x00000 37% complete 00:00:07 elapsed 00:00:07 left					

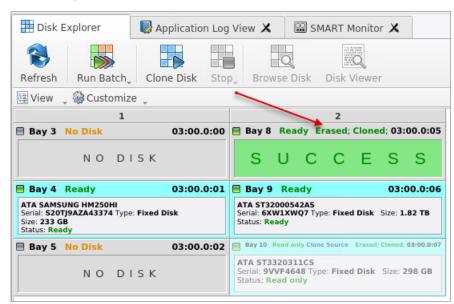
Figure 38: Disk Erase Progress (Local Devices & Disk Bays Views)

User is able to STOP the process at any time (main menus and context menu)



When the erasing is done with no errors, the final stage starts immediately: data cloning from source to all the successfully erased disk(s).

When all the procedures are completed the Disk Bays and Local Devices Views report the status of the work cycle



🖽 Disk Explorer 🛛 😡 App	lication Log View 🗙	SMAR	T Monitor 🗙							
Refresh Stop Stop All F	ile Browser Disk Vie	*								
📴 View 🖕 🎲 Customize 🖕										
sda Ready ATA ST3320311CS Serial: 9VVF4648 Type: Fixed Dis Size: 298 GB	. <b>*</b> S	U	С	С	Е	S	S			
sdb Read only ATA ADATA SP900 Serial: 2F3020020939 Type: Fixed Disk, SSD Size: 477	Size: 1 File Sys	lev/sdb1) tem: NTFS S	Size: <b>477 GB</b>				Unall Size: :			
sdc Ready ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GB	Unallocated Size: 233 GB									

# Figure 39: Disk Erase (and Cloning) Completed (Local Devices & Disk Bays Views)

At the final stage user is able to review results (logs, processing reports and attributes) and print Disk (clone) Labels for processed disks.

Results Overview	Processing	) Attributes	Log				
ītle	Status	Erased (W	(iped)	Cloned	Started at	Duration	
🕶 🏹 Bay 10	Success	Erased		Cloned	14/05/2020 08:59:25	00:00:37	Cloning sda completed successfu
🖋 Disk Erase	Success	No Errors			14/05/2020 08:59:25	00:00:18	Disk Erase completed successful
Notice that the two sets the tw	Success			No Errors	14/05/2020 08:59:45	00:00:17	Cloningisda completed successfu
<ul> <li>Cloning data</li> <li>Disk labels a</li> </ul>			54666	5514113			Print Labels

# Figure 40: Summary

# **Related information**

Erase Methods (Sanitation Standards) on page 98 Processing Report on page 49 Labels and Reports on page 51

# **Processing Report**

Once **Disk Clone** finishes processing all the tasks, a summary dialog appears. It contains all of the information regarding to the operation(s). For example, it includes information like disks operated on, status of cloning and erasure, logs and all associated labels and reports.

C	oisk batch pro	cessing com	pleted succe	essfully	r			
Result	s Overview	Processing	Attributes	Log				
Title		Status	Erased (W	iped)	Cloned	Started at		Duration
- 🖗 E	Bay 10	Success	Erased		Cloned	28/05/2020	15:03:10	00:00:34
v	Disk Erase		No Errors			28/05/2020	15:03:10	00:00:16
✓	Cloning sde	Success			No Errors	28/05/2020	15:03:28	00:00:17
4								Þ
<b>v</b>	Cloning data	on 1 disks(	s) completed	succe	ssfully			
<b>1</b>	Disk labels a	re available	to print				Print	Labels
4	Disk Process	ing Report h	ias been issu	ed		Browse	0	pen
<ul> <li>Image: A start of the start of</li></ul>	Batch Proces	sing Notifica	ation has bee	en sent	to: testing@	lsoft.net		
						✓ Show t	his dialog	next time

### Figure 41: Example of task complete dialog

**Results Overview** window contains the options for the successful erasure:

# Title

All the devices processed are displayed with their success/failure status in TreeList-format.

### Status

An actual status (success/fail)

# Erased

Status of the disk erase operation

### Cloned

Status of the disk clone operation

# Started at

Time & date of operation's start

# Duration

Duration of the operation

**Processing Attributes** window contains all the status and attributes of the operations (as more detailed View)

Results Overview Processing	Attributes Log	
Name	Value	Description
Batch Title	Cloning data on 1 disks(s)	
Started	28/05/2020 16:21:14	
Elapsed Time	00:00:34	
Result	Success	
Virtual	Yes	
Disk Erase Attributes		
Title	Disk Erase	
Range	Whole disk	
<ul> <li>Error Handling Options</li> </ul>		
Use Disk Lock	No	
Ignore Lock Errors	Yes	
Ignore Read Errors	Yes	
Ignore Write Errors	Yes	
Ignore Preceding Errors	Yes	
4		•

# Figure 42: Summary Processing Attributes sample

Log window shows an actual Log file.

1	esults Overview	Processing Attributes Log
	4:21:49 PM 8	EDT: Batch Processing Notification
	4:21:49 PM H	EDT: Cloning data on 1 disks(s) completed successfully
	4:21:30 PM H	EDT: Erase Report
	4:21:30 PM 8	EDT: Disk Erase completed successfully
	4:21:30 PM 8	EDT: Processing sequence completed
	4:21:30 PM 8	EDT: Erasing sde completed successfully
	4:21:14 PM 8	EDT: Killing data Fixed Disk 4 (/dev/sde) started
	4:21:14 PM 8	EDT: Processing sequence started
	4:21:14 PM H	EDT: Applied developers size correction in 0.3%
	4:21:14 PM H	EDT: Erasing sde - initiating
	4:21:13 PM H	EDT: Enqueued process Erasing sde
	Disk Erase /	Attributes
	4:21:12 PM 8	EDT: Initializing processing sequence

### Figure 43: Log view sample

Clickable options are:

#### **Print Labels**

Allows user to examine, customize, change options and print Disk Labels on page 55 by pressing the **Print** Labels button.

#### **Disk Processing Report**

Specifies the path to the saved Disk Processing Report. Allows user to examine the *.xml* disk processing report by pressing the **Browse** (to navigate to the containing folder) or **Open** buttons.

# **Related information**

Labels and Reports on page 51

# Labels and Reports

**Disk Clone** maintains the highest standards in cloning as well as in disk erasure. The software provides extensive documentation options for those operations with Reports and Labels features

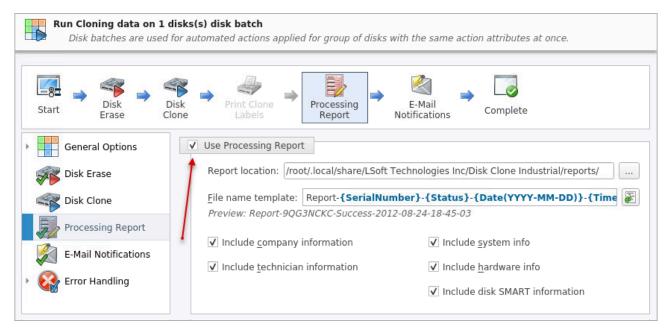
#### **Related information**

Disk Processing Reports on page 51 Disk Labels on page 55

# **Disk Processing Reports**

Disk Clone gives you the option to save XML reports for all the operations it performs on a disk(s).

In order to get the reports generated, simply select and configure them during the process of Disk Clone on page 35 setting or in Processing Report Preferences.



# **Report Location**

Specifies the path for XML-files to save.

#### File name template

Allows user to use Name Tags on page 99 for building a file name. **Preview** shows how the tags build the file name string.

These reports may include (selected by user) all the information regarding to the **Disk Clone** procedures, such as:

Company Information	Disks
Name	Device Size
License	Device Type
Location	Serial Number
Phone	Revision
Disclaimer	Product Number
Technician Information	Name     Geometric Information
Name	Partitioning Scheme
Comments	
	Batches
System & Hardware Info	Name
OS version	Disks
Architecture	Time
Kernel	
Processors	Additional Attributes
Manufacturer	Fingerprint Information
Erase Attributes	Initialization
	Erase Result
Erase verify	
Passes     Mathead	Bay     Time and Date Started
Method	Disk Information
Verification passes	Status
Error Handling Attributes	Result
Errors terminate	Time Elapsed
Skip interval	Errors
Number of Retries	Name of operation
Source Lock	
Ignore Write Error	
Ignore Read Error	
Ignore Lock Error	

Report-9VVF4648-Success 2020-05-27-16-56-19.xml 🗙
xml version="1.0" encoding="UTF-8"?
<report created="27/05/2020 16:56:19" kernel-version="9.12.30 kd" provider="Disk Clone Industrial" version="1.1.21"></report>
<pre></pre> <pre>// <pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>
<technician></technician>
<name>Technician</name>
<note></note>
Company (provider) Information
<company></company>
<name></name>
<pre><li>licensed&gt;</li></pre>
<li>location&gt;</li>
<pre><pre></pre></pre>
<disclaimer>I hereby state that the data erasure has been carried out in accordance with the instructions given by software provider.</disclaimer>
<pre></pre>
<task></task>
<pre><device></device></pre>
<pre><title title="Name">sda</title></pre>
<pre><serial-number title="Serial Number">9VVF4648</serial-number></pre>
<platformname title="Platform Name">/dev/sda</platformname>
<pre><pre><pre><pre>conduct title="Product Name"&gt;ATA ST3320311CS</pre></pre></pre></pre>
<type title="Type">Fixed Disk</type>
<pre><revision title="Product Revision">SCl3</revision></pre>
<pre><size title="Size">298 GB</size></pre>
<pre><geometry></geometry></pre>
<pre><pre><pre><pre><pre><pre><pre><pre></pre></pre></pre></pre></pre></pre></pre></pre>
<total-sec title="Total Sectors">625,142,448</total-sec>
<first-sec title="First Sector">0</first-sec>
<pre><bps title="Bytes per Sector">512</bps></pre>
<spt title="Sectors per Track">63</spt>
<tpc title="Tracks per Cylinder">255</tpc>

```
<title>Disk Erase</title>
        <erase method="One Pass Zeros" passes="1" verification="no"/>
        <! -- Additional report attributes -- >
        <kill-disk>
            <fingerprint write="no">Erased by Disk Clone Industrial</fingerprint>
<diskinit initialize="yes"/>
             <range first="0" total="625,142,448"/>
       </kill-disk>
       <!--Processing results-->
<results>
            <started title="Started at">27/05/2020 16:55:43</started>
<elapsed title="Duration">00:00:16</elapsed>
<process>
                 <name title="Name">Erasing sda</name>
                 <started title="Started at">27/05/2020 16:55:43</started>
<elapsed title="Duration">00:00:16</elapsed>
                 <errors title="Errors">No Errors</error</pre>
                 <result title="Result">Erased</result>
            </process>
            <errors title="Errors">No Errors</errors>
<result title="Result">Erased</result>
  </results>
</task>
   <task>
       <title>Disk Clone</title>
        <!--Cl
        <clone start-sector="0">
            <clone-source>sdc</clone-source>
        </clone>
        <name title="Name">Cloning sda</name>
        <started title="Started at">27/05/2020 16:56:01</started>
        <elapsed title="Duration">00:00:17</elapsed>
       <provs title="Errors">No Errors</provs
<result title="Result">Cloned</result>
  </task>
  <!--System (OS) Information-->
<sysinfo>
        <os version="Ubuntu 18.10" platform="64-bit"/>
  <type>x86_64</type>
</sysinfo>
     --Hardware Information-->
  <hardware>
        <manufacturer>BIOSTAR Group</manufacturer>
        <model>A10N-8800E</model>
       <host name="istar410-pc"/>
  <cpu logical="4"/>
</hardware>
  <conclusion>Disk bay processing completed successfully</conclusion>
/report>
```

Figure 44: XML reports' samples:

# **Disk Labels**

**Disk Clone** allows you to print *Disk Labels* to place on erased disks with its *Print Label* features. Disk Labels with process results and essential disk information could be issued for any disk processing (such as Disk Erase or Disk Clone). These labels may be completely customizable to print on any sized sheet with any dimension. Simply specify the parameters and **Disk Clone** will prepare the printable labels for you.

# Activating a Disk Clone Labels feature

When configuring a main work cycle select Print clone labels for each disk using Disk Label Preset

Run Cloning data on 1 disks Disk batches are used for au	(s) disk batch utomated actions applied for group of disks with the same action attribute:	s at once.
Start Start	Print Clone Processing Report Notifications Complete	
General Options	Clone source: Bay 4 [sda]	▼ []
Disk Clone	Serial: S20TJ9AZA43374 Type: Fixed Disk Size: 233 GE Status: Read only Confirmed clone targets:	1
Processing Report	Name Port Status Serial Number First Sector Total S	
E-Mail Notifications	Bay 10 03:00.0:07 Ready 9VVF4648 0 625,	142,448 298 GB
Error Handling	✓ Print clone labels for each disk using Disk Label Preset: Default Disk	Label Preset 👻
	Start copy to sector: 0	
Press Start to begin batch process	sing	
Restore Defaults Show <u>A</u> dvance	ed 🥥	<u>S</u> tart X <u>C</u> ancel

Figure 45: Activating Print Clone Labels feature

# Accessing the Print Labels Option

Upon the completion of a work cycle **Disk Clone** you will see a report dialog. In the list of completed tasks you will see the **Print Labels** button. Click it to enter the **Print Label Dialog**.

Results Overview	Processing	g Attributes Log			
Title	Status	Erased (Wiped)	Cloned	Started at	0
🕶 🎦 Bay 10	Success	Erased	Cloned	28/05/2020 16:21:1	4 (
🖋 Disk Erase	Success	No Errors		28/05/2020 16:21:1	4 (
🖋 Cloning sd	e Success		No Errors	28/05/2020 16:21:3	1 (
(					
🖋 Cloning dat	a on 1 disks(	s) completed succe	ssfully		
🖋 Disk labels	are available	to print		Print Labels	
🥔 Disk Proces	sing Report I	nas been issued	B	rowse Open	
	ssing Notific	ation has been sent	t to: testina@	lsoft.net	

# Figure 46: Opening Print Label Dialog

#### **Print Label Dialog**

This dialog allows you to configure the labels and prepare them for printing. The top of the dialog shows a list of the drives that will have labels generated for them. At any point in the operation a sample of the label is shown in the **Preview** window on the left side. The right side of the dialog has the styling and template configuration options.

4	Print Dis	k Labels – 🗸 🗙
4	Printed labels on self-adhesive media are used for individ drop-down box, create new or edit existing template if ne Click <b>Continue</b> button to preview and print labels.	ual tagging of processed disks. Select appropriate template from ecessary.
Prev	riew Template: DK-2205 (95 x 62 mm) <b>Cloned by Disk Clone Industrial</b> Date: 14/05/2020 Time: 08:59:45 HDD: ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374; Size: 233 GB Method: ; Result: Success COMPANY	Page template         Template:       DK-2205 •         Print start position:         Row:       1 •         Page:       Column:         1 •         Page:       Custom; label size:         95 x 62 mm; orientation:       Landscape; predefined template:         Print options         Default printer for labels: <use default="" printer=""> •         Skip print preview</use>
		X Close V Print

### Figure 47: Print Label Dialog

#### Page template options

The print label dialog gives you an access to a number of predefined standard presets and custom templates you may create. These templates may be easily selected without opening any additional dialogs. All the details of the selected template will be displayed below the selection box.

#### **Print Start Position**

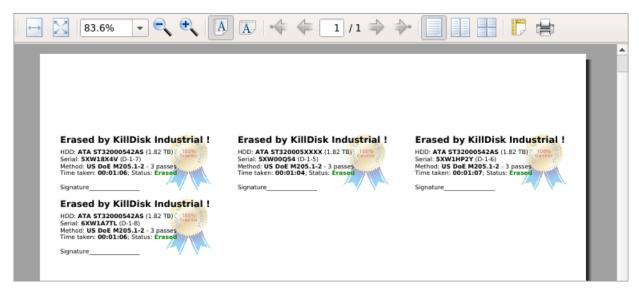
The print start position section of the dialogue allows you to select what label on the page start printing from. The labels won't always start from the 1x1 position so you can adjust this setting accordingly.

#### **Print Preview and Printing**

Once all the settings are configured you may see the *Print Preview* by clicking the **Continue** button. The *Preview* displays what the print is going to look like and from here the print job can be sent to a printer that is configured in the system.

# **Skip Print Preview**

Disable system *Print Preview* dialog and print labels immediately.



### Figure 48: Example of a Print Preview

#### **Related information**

Disk Label Presets on page 86

# **Compact Operating Modes**

Disk Clone has advanced operating modes simplifying product usage in the industrial environments.

#### Touch Mode & Kiosk Mode

Compact operating modes added to simplify routing tasks. In these modes user have an access only to the features being used most frequently.

To switch to compact modes, select **Kiosk Mode** (or **Touch Mode**, depending on the product configuration) from the **View** menu. Also, you can press **Ctrl+T** to switch to and return back from compact modes.

All menus, toolbars and other supplementary windows, like *Properties* and *Output* will be hidden while operating in compact mode. Access to commands is through floating menu at the bottom left corner of application's main window.

E Disk Bay 1-1 No Disk	01:00.0:07	E Disk Bay 1-3 Ready	01:00.0:05	🗐 Disk Bay 3-1 No Disk	01:00
NO DISK		ATA TS32GSSD370 Serial: C434630270 Type: Fixed D Size: 29.8 GB	isk, SSD	NO DISK	
E Disk Bay 1-2 No Disk	01:00.0:06	🗏 Disk Bay 1-4 No Disk	00:11.0:03	🗏 Disk Bay 3-2 No Disk	00:11
NO DISK		NO DISK		NO DISK	
Disk Bay 2-1 Rearly 01:00.0:00 1 ATA 5T32000542AS Serial: 6XW1A75W Type: Fixed Disk Size: 1.82 TB Disk Bay 2-2 Rearly 01:00.0:01 1 ATA 5T32000542AS Serial: 6XW1A8NV Type: Fixed Disk Size: 1.82 TB	Disk Bay 2-3 Teady 01:00.0:02  ATA 5T320005XXXX Serial: 6XW1F85P Type: Fixed Disk Size: 1.82 TB		NO DISK	2	NODISK
<b>I</b>				1 🔊 [	

There are 2 compact modes available:

- Touch Mode designed to support portable touch-screen monitors
- **Kiosk Mode** works similar to previous one but also supports mouse and designed to support commercial grade monitors. It attempts to show as many *Disk Bays* as possible at once, simplifying visual control and ongoing processes for operator. This mode still supports mouse and giving access to most advanced features.

To switch from compact mode back to windowed operating mode click the most right button (blue computer monitor) at the bottom.

# **Disk Batches**

**Disk Batches** are used to organize disks into groups depending on what the disks are being used for, type of disk or the desired operation to be performed on them: **Erase**, **Clone** and combinations. User is free to use disk batches in any manner. Disks can be added or removed from *Batch* at any time.

🗄 Disk Explo	rer 🗵 🔛 Disk bays layout 🗵 😱	SMART Monito	r 🗵		
Erase ba	tch• Examine batch• Stop	Refre	sh 📄 Erase Disk 🔻 🏹 Assign	Detac	h
🔄 View 👻 🏟	Settings 👻				
	1		2		Removable disks
<b>D-1</b> phy-1:7 US Navy	y-1:7 ATA ST32000542AS		U N A S S I G N E D	E USB-1 Removable	Kingston DataTraveler 2.0 Serial: Platform ID: sdh Type: Removable Disk Size:
<b>D-2</b> phy-1:6 US Navy	ATA ST2000DM001-9YN1 Serial: W1E1STPR Platform ID: sdf Type: Fixed Disk Size: 1.82 TB	HP-4 phy-0:4 Emerald	ST32000542AS Serial: 6XW11E68 Platform ID: sdi Type: Fixed Disk Size: 1.82 TB		
<b>D-3</b> phy-1:5 US Navy	ATA ST32000542AS Serial: <b>5XW1D3WH</b> Platform ID: <b>sde</b> Type: <b>Fixed Disk</b> Size: <b>1.82 TB</b>	HP-6 phy-0:6 Emerald	ATA ST32000542AS Serial: 6XW1FL05 Platform ID: sdj Type: Fixed Disk Size: 1.82 TB		
D-4 phy-1:1 US Navy	ATA ST320005XXXX Serial: 6XW0BS9W Platform ID: sdd Type: Fixed Disk Size: 1.82 TB	<b>HP-7</b> phy-0:7 Emerald	ATA ST32000542AS Serial: 6XW0073J Platform ID: sdk Type: Fixed Disk Size: 1.82 TB		k batches may have
<b>D-5</b> phy-1:0 Extra	ATA ST32000542AS Serial: 6XW17N7A Platform ID: sdc Type: Fixed Disk Size: 1.82 TB	BDB-2 Unassigned Emerald	UNASSIGNED		ctive colors for easier navigation
<b>D-6</b> phy-1:3 Extra	ATA ST32000542AS Serial: 5XW0N6DB Platform ID: sdb Type: Fixed Disk Size: 1.82 TB	🗏 USB-DI /dev/sdl	NO DISK		

# Figure 49: Disk Batches distinguished by color

Once disks are batched together they may be treated as a group and similar settings may be set for this batch. Likewise, operations may be performed on these batches - initiating the operation on a batch performs the operation on all the disks in the batch.

### Related tasks

Assign Disk Bays to Batches on page 62 **Related information** Create / Delete Batches on page 60 Edit Batch Attributes on page 63

# **Create / Delete Batches**

### Create a Disk Batch

Disk batches are created using the *Batch Control* toolbox.

# **F** Note:

If you can't find the Batch Control toolbox make sure that you have a proper View activated. To do this navigate to the file menu bar and click **View** > **Windows** > **Batch Control**. There should be a check mark next to the Batch Control View.

In the *Batch Control* toolbox click **New Batch**. This will open the *Create a New Batch* configuration wizard. After configuring batch settings click **Finish** and the new batch will appear in the *Batch Control* window.

Batch	Сс	ntrol					@ X
Nev	ΝĒ	Batch	📆 Edit B	Batch	h 🛛 🙀 Remo	ve All	🙀 Delete Batch
#		Title	Disk Na	me	Status		
•	D	isk Batc	h AXL1 [	3 ba	ys]		
	1	Bay 4	/dev/sd	a	Read only		
			/dev/sd		New Batch		
	3	Bay 9	/dev/sc	He	New Batch		
					Edit Batch		
					Remove All		
				X	Delete Batch		

Figure 50: Batch Control Toolbox

### Adding disks to a Disk Batch

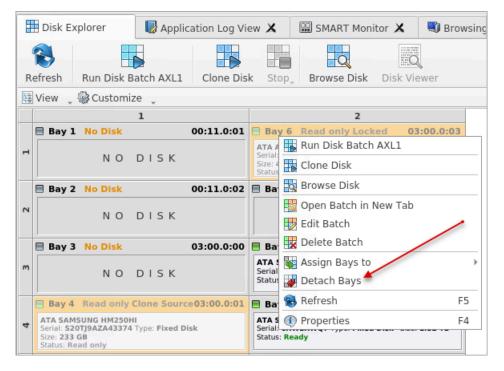
Disk Bays can be added to Batches in several ways:

- From **Disk Bays** View
- From Edit menu

Read Add Disks to Batches for more information.

### Removing disks from a Disk Batch

Disks are removed from a Batch in a very similar way to the way they are attached. Follow the same steps as with *Adding Disks* but select bays that are attached to batches and choose the **Detach Bays** command.



### **Deleting Batches**

Batches can be deleted by selecting the batch in the *Batch Control* toolbar and choosing the **Delete Batch** or **Remove All** commands.

### Edit batch attributes

Batch attributes can be edited at any time after batch created. See: Edit Batch Attributes on page 63

# Note:

Disk batch attributes changed every time if altered in confirmation dialog.

#### **Related tasks**

Assign Disk Bays to Batches on page 62 Related information Disk Batches on page 59 Edit Batch Attributes on page 63

# **Assign Disk Bays to Batches**

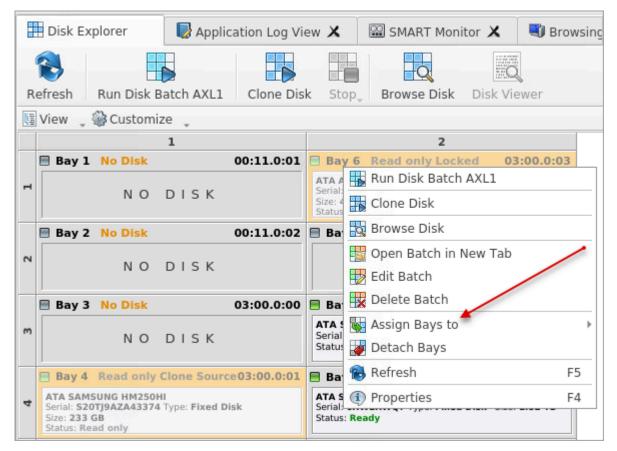
*Disk Bays* can be assigned to existing disk *Batches* in order to apply same batch attributes for selected tasks (disk erase, cloning etc).

# Note:

Single Disk Bay can only belong to one Batch.

Disk Bays are assigned to Batches in one of several ways:

# From Disk Bays View

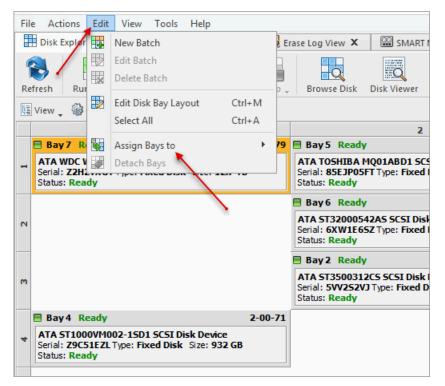


### Figure 51: Assign Disk Bay through the Disk Bays View

1. In the Disk Bays View: select the disk(s) that you'd like to place in a Batch.

- **2.** Right-click on the disk.
- 3. Hover the Assign Bays to option to see a list of available Batches.
- 4. Select the desired Batch from the list to place the selected disk into.

# From Edit menu



### Figure 52: Assign Disk through the Edit menu bar

- 1. In the Disk Explorer: select the Disk Bay(s) that needs to be assigned
- 2. Click Edit menu bar
- 3. Hover the Assign Bays to action to see a complete list of available Batches
- **4.** Click on the desired Batch. The selected Bay(s) will be assigned to that Batch.

# Edit Batch Attributes

After creating a new *Disk Batch* user is able to work with *Edit Batch* window where the *Disk Batch* settings may be changed. For existing *Disk Batches* it is possible to access this window by selecting the desired *Batch* in the *Batch Control* toolbox and clicking **Edit Batch**.

#### **Batch General Options**

These are *General Settings* for the *Batch* (such as Title, Color, how the Batch is displayed etc.)

Edit Disk Batch AXL1 disk b Disk batches are used for a	<b>atch properties</b> utomated actions applied for group of disks with the same action attributes at once.
Start $\Rightarrow$ $\stackrel{\ref{eq:start}}{\underset{Frase}{\overset{\ref{eq:start}}}{\overset{\ref{eq:start}}{\overset{\ref{eq:start}}{\overset{\ref{eq:start}}{\overset{\ref{eq:start}}{\overset{\ref{eq:start}}{\overset{\ref{eq:start}}}{\overset{\ref{eq:start}}{\overset{\ref{eq:start}}}{\overset{\ref{eq:start}}{\overset{\ref{eq:start}}}{\re$	→ Print Clone Batch Report → Batch Report → Complete Complete
Batch General Options	
Company Information	Title: Disk Batch AXL1 Color: Use colored disk bay background to visually distinguish disk battches.
Technician Information	Autoload disk batch in separate tabbed view
Disk Erase	<ul> <li>✓ Ignore unplugged or empty disk bays</li> <li>✓ Show notification dialog after batch processing</li> </ul>
Disk Clone	<ul> <li>✓ Show Houndation dialog <u>in</u>ten batch processing</li> <li>✓ Show start (this) dialog <u>b</u>efore batch processing</li> </ul>
Batch Report	
E-Mail Notifications	Batch processing Order ID
- 🚱 Error Handling	Alpha-numerical ID for multiple batch processing
SMART Diagnostics	
Press <b>OK</b> to save batch settings	
Restore Defaults Show Advance	ed 🖉 OK 🛛 🎽 Cancel

# Figure 53: Batch Editor - General Settings

### **Company Information**

These settings allow user to configure *Company Information* for Batch Processing Reports.

It is the same form as in **Preferences** > **Company Information** 

### **Technician Information**

This setting allows user to configure *Technician Information* for Batch Processing Reports.

It is the same form as in **Preferences** > **Technician Information** 

# Disk Erase

These settings configure *disk erase* settings for the Batch. Erase methods, verification and report settings can be changed here.

### Disk Clone

This feature allows user to configure either a disk or disk image for cloning to all the disks in the batch. Available for *Erase Batches* with examined disks only.

Read Clone Sources on page 80 for description of each attribute.

### **Batch Report**

These settings give user an option to toggle whether or not to issue an erasure XML report upon erase and configure the options to include (like a name, destination, S.M.A.R.T. details etc.). Options for issuing individual XML reports for the particular disks in the batch can be configured.

Read Processing Report on page 83 for description of each attribute.

### **Email Notifications**

User can turn on email notifications for Batch operations and attach a *Certificate*, *XML Report* and *Erase Log* to the email.

Read E-mail Notifications on page 92 for description of each attribute and SMTP settings configuration.

## **Disk Labels**

User can turn on displaying and printing disk labels after Batch operation is completed. As well as configuring a default printer and customizing label templates.

Read Disk Label Presets on page 86 for description of each attribute.

#### Error Handling

For each Batch error handling attributes can be set individually. S.M.A.R.T. attributes may also be configured in error handling by clicking **SMART Diagnostics** button.

Read Error Handling on page 90 for description of each attribute.

#### **Related information**

Disk Batches on page 59 Create / Delete Batches on page 60

# **Advanced Tools**

**Disk Clone** offers a number of advanced tools to work in conjunction with the software to make operations easier to perform and the disks easier to navigate. **Disk Clone** makes it possible to browse through disks on both: a file level and a low, hexadecimal (HEX) level. Disk health analysis with its S.M.A.R.T. monitor as well as logs/reports export to the external databases fully supported in **Disk Clone Industrial** version. This section describes each of these features:

- File Browser
- Hexadecimal Viewer

# **File Browser**

**Disk Clone** includes a built-in *File Browser* for examining the contents of disks for verification purposes, for hard drives' selection control or for erased files validation after erase. Details on using this feature are discussed in this section.

#### **Opening the Browsing View**

To browse the contents of a specific disk from the *Disk Bay* Layout View simply select the desired disk and click **Browse Disk** in the action toolbar or select the related command from the context menu. Shortcut is **Ctrl-B**.

	Disk Explorer	n Log Vie	ew X	🖼 SMART Monitor 🗙 🛯 🖏 Browsing
(	⊗ 🖪			
R	efresh Run Disk Batch AXL1 Cl	lone Dis	k Sto	p, Browse Disk Disk Viewer
鼲	View 🛫 🎯 Customize 🛫			
	1			2
	Bay 1 No Disk 00:3	1.0:01	🗏 Bay	6 Read only Locked 03:00.0:03
-	NO DISK			Run Disk Batch AXL1
	NO DISK		Serial: Size: 4 Status	📆 Clone Disk
	Bay 2 No Disk 00:1	11.0:02	🗏 Baj	🙀 Browse Disk 🗲
2				🎇 Open Batch in New Tab
	NO DISK			🔣 Edit Batch
	Bay 3 No Disk 03:0	00:0:00	🗏 Ba	🙀 Delete Batch
m			ATA Serial	🙀 Assign Bays to 🔹 🕨
	NO DISK			😻 Detach Bays
	Bay 4 Read only Clone Source03:	00.0:01	🗏 Ba	😢 Refresh 🛛 🕹 F5
4	ATA SAMSUNG HM250HI Serial: S20TJ9AZA43374 Type: Fixed Disk		ATA S	Properties     F4
	Size: 233 GB Status: Read only			Ready

Figure 54: Launching the File Browser

This will open the File Browser tab:

🔠 Disk Explorer 🛛 📾 Browsing s	idb 🗙 😡 Application Log View 🗶 🖼 SMART Monitor 🗶 📑
Refresh	
🖓 Customize 🖕	
Unallocated Space	* Name
- 🦻 SSD (/dev/sdb1)	5117e79e-ea24-4f67-99fb-0e3fc9fe0e95}_OnDiskSnapshotProp
🛍 ! Lost & Found !	6f5bfe46-07e8-402e-bef1-a6abd1199206}_OnDiskSnapshotProp
SExtend	85620973-8dda-4593-8f7f-fdd6ce350bca}_OnDiskSnapshotProp
🕨 🛍 \$Recycle.Bin	afae643a-6afb-46aa-9550-3b8a40fb31fe}_OnDiskSnapshotProp
🗎 45c68d3ae9182d17df1d0a896	{cef7934b-ea77-4af5-8c22-b5abc6b07e34}_OnDiskSnapshotProp
🕨 🚞 Boot	e650ad7b-71fc-45f3-82c3-bfbf161a4b58}_OnDiskSnapshotProp
👻 🞑 Cakewalk Projects	ea7cf5fc-3e98-48e3-973f-a9f25cd94cd6}_OnDiskSnapshotProp
🗎 Audio Data	
Picture Cache	
👻 🞑 test	
audio	
Config.Msi	
Documents and Settings	
- 🧃 INSTALLED	
NOTEPAD++	r l

# Figure 55: File Browser Window

The File Browser tab displays files and folders on the disk being selected.

The *File Browser* tabbed View may also be manipulated by navigating to the **Customize** button at the top. Here you have options to adjust:

# **Show System Files**

Toggles advanced disk information (system files) being shown

### **Show Unallocated Partitions**

Toggles the unallocated disk partitions being shown

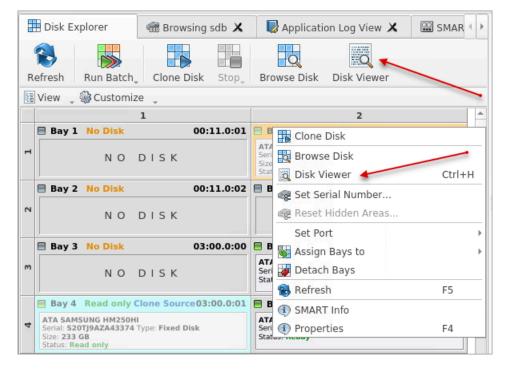
# **Navigator Pane**

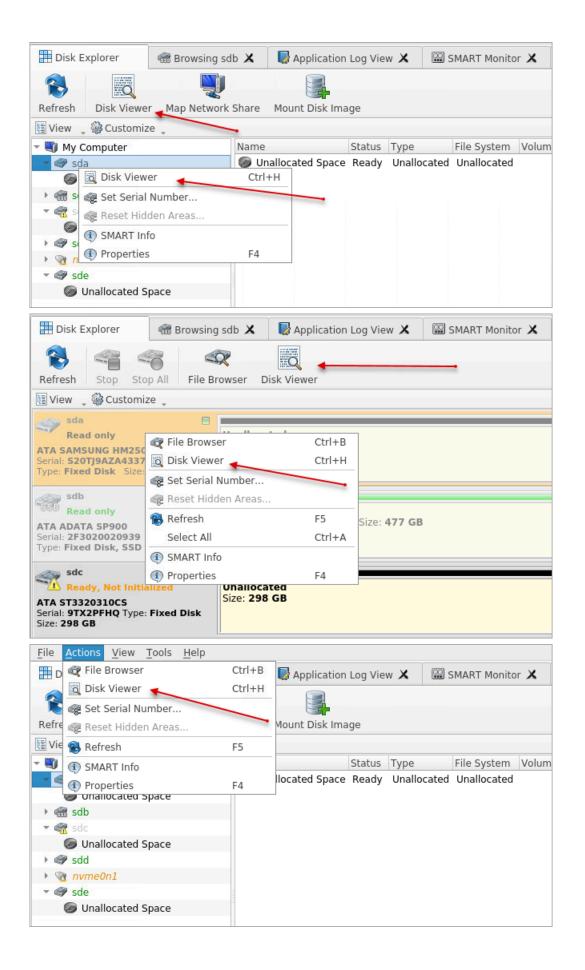
Toggles the Navigator Pane View ON and OFF.

Note: Found deleted files appear in their original directory (before they were deleted). The ! Lost & Found ! folder is a virtual directory created for found deleted files with not discovered directory information.

# **Disk Viewer**

*Disk Viewer* allows users to view the contents of connected drives on a sector's level in a hexadecimal, ASCII and Unicode representations. User is able to launch *Disk Viewer* on all main **Disk Explorer** Views (**Disk Bays, Local Devices, My Computer**) as well as through the main menu bar. Shortcut is **Ctrl-H**.





🖲 SMART Monitor 🗙		🕽 Bro	owsir	ng Lo	ical S	Syste	m R	oot	×	so	la - D	Disk \	view	er 🗙	•		Templates @ Master Boot Record > 17 1 1 1 0:000 2
60	P		F	3		-5	X										No template Value
Back Forward	Find	Na	aviga	te _	Fil	e Bro	owse	r									Master Boot Record 33COF
Che un				. 1	_											_	GUID Partition Table 0302A
🎡 Settings 🛫 🗛 AS		UU	11000	le													NTFS templates 0000
Offset	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	NTFS Boot Sector
000000000000	22	C0	E A	8E	D0	DC	00	70		8E					C0	1.	NTES MET FILE Record
0000000000000	22	CO	ГА	OE	00	БС	00	π	гр	-			• •		~~		FAT Templates FAT Boot Sector
000000000016	1E	7E	06	57	BF	00	7E	B9	00	02	FC	F3	Α4	СВ	BE		FAT32 Boot Sector
000000000032	7F	AC	30	80	74	42	83	6	0F	81	FE	FF	7F	75	F2		FAT Directory Entry 55AA
									•••	-						11	exFAT templates
000000000048	BD	7E	33	C9	32	FF	В4	0E	AC	3C	00	74	04	CD	10		exFAT Boot Sector
000000000064	F7	E3	06	33	C0	CD	16	CD	19	41	BE	14	7F	EB	E9		exFAT Directory Entry
000000000080	DP	7E	72	DE	DE	CC	70		DE	F8	7E	20	55	٨٨	75		Hierarchical File System (HFS
		. –	. –			. –			DE	ΓO						1	HFS+ Volume Header
000000000096	33	C0	50	B8	00	7C	50	CB	B4	41	BB	AA	55	CD	13	1	HFS+ Catalog Node
000000000112	38	81	FB	55	ΔΔ	75	32	F6	C1	01	74	2D	1E	33	CO		HFS+ File Record
														55	~~	1	Linux Extended File Systems t
000000000128	50	83	C6	09	AD	50	83	ΕE	04	AD	50	33	CO	50	B8	1	Ext2/3/4 Superblock
000000000144	7C	50	B8	01	00	50	B8	10	00	50	B8	00	42	16	1F		Ext2/3/4 Inode
000000000160	E4	CD	12	83	C /	10	1F	ΕB	A6	33	DB	8E	C3	BB	00		Unix (UFS) File System templa
																	UFS Superblock
000000000176	AC	8A	F0	AD	8B	C8	B8	01	02	CD	13	EB	92	0D	0A		UFS Inode
000000000192	63	74	69	76	65	20	70	61	72	74	69	74	69	6F	6E		B-tree (BtrFS) File System te
														•••			BtrFS Superblock
000000000208	6E	6F	74	20	00	٥F	15	θE	64	21	00	θD	0A	45	12	-	Logical Dick Managor (LDM) +
4															÷		Bookmarks Data Inspector Find Results
									Sector	: [			0 (0	x0)	O	ffset	:: 0 (0x0) <b>Read Only</b> 🖲 🛃

Figure 56: Disk Viewer with the MBR Template

**Disk Clone** also offers a list of templates to help display the organization of the sectors on the disk by colored sections. The above uses the *MBR* template, below is a template for *NTFS* file system boot sector.

SMART Monitor 🗙		🕽 Bro	wsin	ig Lo	cal S	Syste	m Ro	oot ,	x		sda -	Disk	View	er 🗡	(	•	Templates
60	P	1	6	\$		-9	8				-						NTFS Boot Sector  No template Partition Records
Back Forward	Find	Na	viga	te	File	e Bro	wse	r									Master Boot Record 33COF
				_										-		_	GUID Partition Table
🎲 Settings 🛫 🗛 ASO	CII	UUr	icod	е											-	-	NTFS templates
Offset	00	01	02	02	04	05	06	07	08	0	10	1.	L 12	12	14	15	NTFS Boot Sector 62.60
	-	1.24.27	1250		-							-				13	NTFS MFT File Record 142
0000000000000	33	CO	FA	8E	DO	BC	00	7C	FE	8 8	E D8	8 8	3 F4	8E	C0	1	FAT Templates 49.08
000000000016	1E	7E	06	57	BF	00	7E	R9	00	0	2 F(	F	3 A4	CB	BE		FAT Boot Sector
																	FA132 Boot Sector
000000000032	7F	AC	30	80	74	42	83	C6	0	8	I H	: FI	E 7F	/5	F2		PAT Directory Entry
000000000048	BD	7E	33	C9	32	FF	Β4	0E	A	3	C 00	) 74	1 04	CD	10		exFAT templates 0
000000000064	F7	E3	06	22	<b>C</b> 0	CD	16	CD	10	1	1 BE	1	1 7F	ED	EO		exFAT Boot Sector 7EB9
		20															exFAT Directory Entry 512
000000000080	DB	7E	72	DE	BE	FE	7D	AD	BE	E F	B 7E	3	) 55	AA	75		Hierarchical File System (HFS HFS+ Volume Header
000000000096	33	C0	50	<b>B</b> 8	00	7C	50	CR	B4	1 4	1 BE	×Δ	\$ 55	CD	13	•	HFS+ Catalog Node
																	HFS+ File Record
000000000112	38	81	FВ	55	AA	75	32	۲b	C1	L 01	1 /4	21	) 1E	33	CO	1	Linux Extended File Systems t
000000000128	50	83	C6	09	AD	50	83	EE	04	I AI	56	) 33	3 CO	50	B8		Ext2/3/4 Superblock
000000000144	70	50	B8	01	00	50	B8	10	00	) 5(	Э B8	3 00	9 42	16	1F		Ext2/3/4 Inode
				-	•••		20									1	Unix (UFS) File System templa
000000000160	F4	CD	13	83	C4	10	1F	EB	A6	5 3	3 DE	8 8	E C3	BB	00	1	UFS Superblock
000000000176	AC	8A	F0	AD	8B	C8	B8	01	02	2 CI	) 13	B EI	3 92	0D	ΘA		UFS Inode
							70	61			_						B-tree (BtrFS) File System te
000000000192	63	74	69	/0	05	20	70	01	14		4 69	, /	1 69	0F	θE	•	BtrFS Superblock
000000000208	6E	6F	74	20	66	6F	75	6E	64	2	1 00	0	) 0A	45	72		Logical Dick Managor /LDM) +
•															Þ	*	Bookmarks Data Inspector Find Results
									Secto	r: [			0 (0	x0)	Of	ffset	t: 0 (0x0) Read Only 🛛 🐯

# Figure 57: NTFS Boot Sector Template

The Disk Viewer also includes a Find feature for locating specific data in the low-level disk View

# **Find what**

Input the characters you are searching for in ANSI, Hex or Unicode

### **Search Direction**

If you have an idea of where the data may be located specify where to search

# Not

Use

Search for characters that do not correspond to the Find what parameter

#### Ignore case

Disables case-sensitivity in the search

### Select between Regular Expressions and Wildcards

#### Per block search

To speed up the search process (if you are familiar with the location of the data in the data block) you may specify a search with an offset of the object

File	Actions	Edit	View	Tools Help		
SMAR	RT Monit	or 🗙		🎤 Find text – 🗸 🗙	-	ØX
	-		0		0:0	00 🎾 »
	$- \bigcirc$		P	Find what	Offset	Value 📤
Back	Forwar	d	Find	ANSI: sensitive data	000	33C0F Фм
🎯 Sett	tings 🏢	A ASC	CII [	Hex: 73 65 6E 73 69 74 69 76 65 20 64 61 74 61	00B	<b>Q</b> [4]
0	ffset		00		00B	62,60
0000	000000	000	33	Unicode: 散彌螢癞慤慴	00D	142
	000000		1E		00E	49,08
			7F	Find options	010	1E7E0 57BF
	000000				015	0
	000000		BD	Search direction: Search down 🔻 🗌 Not 🗌 Ignore case	016	7EB9
0000	000000	64	F7		018	512 🚽
0000	000000	080	DB	Use: Regular expressions 👻		Þ
0000	000000	96	33			6 X
0000	000001	.12	38	Per block search		*
0000	000001	28	50	Search for provided criteria at every offset position in each data block starting from beginning	011	
0000	000001	.44	7C	of the object or from <b>current cursor</b> position.		
0000	000001	60	F4	Calculate first block from: 🔘 Current cursor position 💿 Beginning of object		
0000	000001	.76	AC	Offset in block: 0 Block size: Default record si 💌 (bytes)		
0000	000001	.92	63			
0000	000002	08	6E		1	
4				Restore Defaults Find All X Close r	Find I	Results
				Sector: 0 (0x0) Offset: 0 (0x0) Read Or	ıly	• 🔣

#### Figure 58: Finding Data

Disk Viewer's Navigate feature allows:

#### Go to Offset

Jumps to the particular offset that needs to be entered manually in a decimal or hexadecimal format

### Go to Sector

Jumps to the particular sector or cluster on the disk

# **Partition Table**

Jumps to the sector where partition table is located

# **Particular Partition**

Lists all partitions and allows to jump to the boot sectors, to the beginning and to the end of any available partition.

	Navig	ate 🗸	G File	Rrows	er													
ι	<mark>≫</mark> Go	to C	Offset				Ctrl	+Shift+	G									
	≫Go	o to S	ecto	r			Ctrl	+G		09	10	11	12	13	14	15		
	···									8E	D8	BE	00	7C	BF	00		3À
	Pa	rtitio	n Tab	le						1C	06	СВ	$\mathbf{FB}$	в9	04	00		. <sup>1</sup>
										0F	85	0E	01	83	C5	10		<u>1∕2</u> 3⁄4
	Un	alloo	ated	Spac	e [1.0	00 MI	B]			46	11	05	C6	46	10	00		âñ
	Pri	imary	/ NTF	S [1.8	2 TB	]				В	oot S	ecto	r (2,04	48)				
	Un	Unallocated Space [1.09 MB]									oot S	ecto	r Cop	y (3,9	07,02	26,943	3)	
	7C 68 01 00 68 10 00 B4								42	\$MFT (6,293,504)								
	9F 83 C4 10 9E EB 14 B8								01	¢		(0,29.	5,504	)				
	8A 76 01 8A 4E 02 8A 6E							03	\$MFT Mirror (2,064)									

Figure 59: Disk Viewer Navigation Options

# S.M.A.R.T. Monitor

**Disk Clone** supports displaying S.M.A.R.T. information. Just navigate to the file menu bar and selecting **Tools** > **SMART Monitor**. It opens the S.M.A.R.T. monitor window shown below:

🛗 Disk Explorer	🐨 Browsi	ng sdb 🗙 🛛 🔯 A	pplication Log View	X SMART	Monitor 🗙		
Start Pause Stop	Refresh						
🎯 Settings 🖕							
Monitor All Disks		Serial Number	Firmware Version	Read Error Rate	Reallocated		
Monitor Active Disk	us HI	S20TJ9AZA43374	2AC101C4	1227	0		
		2F3020020939	5.8.2	8589934592	0		
Refresh Every	►	9TX2PFHQ	SC14	95590441	49		
sdd ST320	00542AS	6XW1XWQ7	CC34	138336773	0		
sde ST332	0311CS	9VVF4648	SC13	15432029	0		

Figure 60: S.M.A.R.T. Monitor

### S.M.A.R.T. Information

The S.M.A.R.T. monitor displays a list of all discovered disks and shows the S.M.A.R.T. information next to them in table format. The following S.M.A.R.T. information is shown as separate columns:

- Display Name
- Device Model
- Serial Number
- Firmware Version
- Read Error Rate
- Reallocated Sectors Count
- Spin-up Retries
- Command Timeout
- Reallocated Event Count
- Current Pending Sectors

- Reported Uncorrectable Errors
- Soft Read Error Rate
- Read Error Retry Rate

# **Configurable Settings**

These are the parameters to be configured in the **Settings** drop-down menu on a toolbar:

# **Monitored disks**

Here you have the option to either display All Disks seen by the system or only the Active (processing) disks.

# **Refresh Rate**

This specifies the interval in seconds between updates to the S.M.A.R.T. information displayed when the S.M.A.R.T. monitor is running.

# Running the S.M.A.R.T. Monitor

The S.M.A.R.T. monitor can either be refreshed manually or run to keep the information current. To run the S.M.A.R.T. monitor simply click the **Start** button in the action toolbar. To pause or stop auto-refreshing sequence click **Pause** or **Stop** buttons in *View's* toolbar accordingly.

# **Note:**

S.M.A.R.T. monitoring is a process that requires a lot of resources. It can slow down erase/clone process significantly. We advise you to avoid querying S.M.A.R.T. information very often.

# **Troubleshooting and System Recovery**

In the event that you experience any technical difficulties with **Disk Clone** you may choose to either troubleshoot the system yourself or, if you have an active support and updates (you receive 1 year free with your purchase), contact our support team and attach your application log and hardware configuration file (hardware diagnostic)

# **Common Troubleshooting Tips**

### Disk data is not erased

Ensure you are not erasing the system disk from the application.

### Erased the wrong disk

Stop the operation as soon as possible. Once data is sanitized by erase features it will no longer be accessible. Use a tool like **Active@ File Recovery** (https://www.filerecovery.com) to recover any data that has not been sanitized yet

# **Application Log**

This *Log View* reflects every *action* taken by the application and displays messages, notifications and other service information. Use the messages in this screen to observe and further analysis of the recovery process.

To open and activate Application Log View do one of the following:

- From main menu choose Tools > Application Log or
- Use F8 keyboard shortcut at any time

It is best to save the log file to a physical disk (different from the disk that holds the deleted data). By doing this you reduce the risk of writing over the data that you are trying to recover.

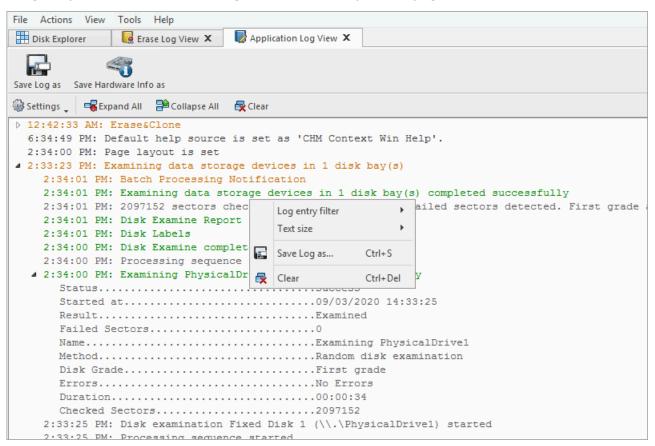


Figure 61: Application Log View

🛄 Disk Explorer	🏽 Browsing sdb 🗶	😡 Application Log View 🗙	🖼 SMART Monitor 🗙	🖏 Browsing Local System Root 🎽
	4			
Save Log as Save I	Hardware Info as			
🏟 Settings 🧅 🖷 Ex	pand All 🛛 Ҏ Collapse All	🛃 Clear		
Log entry filter	→)ening in File Bro	owser: sdb		
Text size	pening in File Bro	owser: sdb		
2:14:28 PM EDT	: cioning data on 1 (	disks(s)		
1:43:05 PM EDT	: Platform Message -	Code:24; File Name:/dev/	sdf; Position: 0; Blo	ock:0; System Error: 5
1:43:05 PM EDT	: Platform Message -	Code:24; File Name:/dev/	sdf1; Position: 0; B	lock:0; System Error: 5
1:43:05 PM EDT	: Removing disk 'Remo	ovable Disk 5 (/dev/sdf)'		
1:43:05 PM EDT	: Storage removed Rem	novable Disk 5 (/dev/sdf)		
1:42:45 PM EDT	: Analyzing disk 'Rem	novable Disk 5 (/dev/sdf)	·	
1:42:44 PM EDT	: No positive bay ID	for: sdf		
1:42:44 PM EDT	: Data storage detec	ted Removable Disk 5 (/de	v/sdf)	
11:54:29 PM ED	T: Opening in File B	rowser: Local System Root		
11:54:22 PM ED	T: Cloning data on 1	disks(s)		
8:00:10 AM EDT	: System suspend mode	<pre>ware Info as Mall Collapse All Clear pening in File Browser: sdb pening in File Browser: sdb coning data on 1 disks(s) Latform Message - Code:24; File Name:/dev/sdf; Position: 0; Block:0; System Error: 5 Latform Message - Code:24; File Name:/dev/sdf1; Position: 0; Block:0; System Error: 5 emoving disk 'Removable Disk 5 (/dev/sdf)' torage removed Removable Disk 5 (/dev/sdf)' to positive bay ID for: sdf ata storage detected Removable Disk 5 (/dev/sdf) opening in File Browser: Local System Root Cloning data on 1 disks(s) /stem suspend mode is set ON alidating disk 'Fixed Disk 4 (/dev/sde)' alidating device content of sde</pre>		
8:00:08 AM EDT	: Validating disk 'F	ixed Disk 4 (/dev/sde)'		
8:00:08 AM EDT	: Validating device	content of sde		
7:59:50 AM EDT	: Disk Clone			
7:59:49 AM EDT	: Validating disk 'F:	ixed Disk 4 (/dev/sde)'		
7.50.40 AM EDT	· Validating device	content of sde		

#### Figure 62: Application Log View

## Save Log As

Opens a standard **save as** dialog. Save the actual application log file to the local disk (default extension is *.log*)

#### Save Hardware Info as

Opens a standard **save as** dialog. Save the *disk diagnostic file* to the local disk (default extension is *.xml*)

With sub-menu the following items are available:

## Log entry filter

Shows or hides specific entry types in *Log View*:

#### Minimum details

Shows non-critical warning entries

#### **Maximum details**

Shows advanced entries related to the application behavior and data analysis

## Text size

Changes text size to Large, Normal orSmall

## Expand All

Expands a tree log data if available

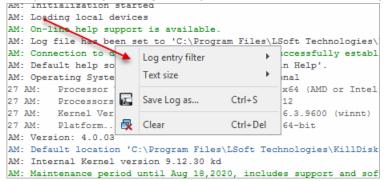
#### Collapse All

Collapses a tree log data if available

## Clear

Clear log for current application sessions

It is possible to go through the options with the context menu (right mouse click).



#### Figure 63: Context menu

**Tip:** We recommend that you attach a copy of the log file to all requests made to our technical support group. The entries in this file will help us to resolve certain issues.

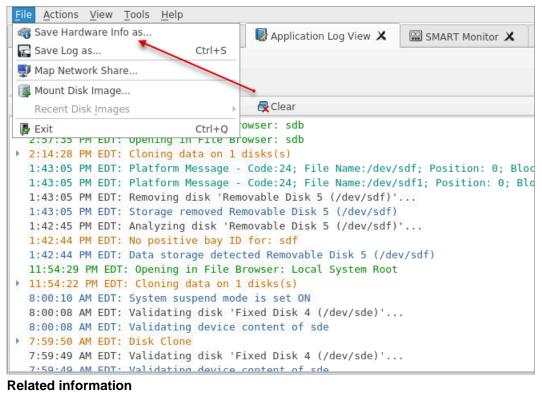
## Hardware Diagnostic File

If you want to contact our technical support a file that contains a summary of your local devices is helpful.

**Disk Clone** allows you to create a summary listing file in XML format. This data format is "humanreadable" and can help our technical support staff to analyze your computer configuration or point out disk failures or abnormal behavior.

Create a hardware diagnostic file from the **File** menu by clicking the **Save Hardware Info as...** button.

**Note:** To save time when contacting our technical support staff we highly recommend that you provide us with a hardware diagnostic file.



Application Log on page 72

# Preferences

**Disk Clone Preferences** window is the central location where **Disk Clone** features can be configured. These features are divided into several tabs.

To open Preferences dialog:

- From main menu choose Tools > Preferences... or
- Use F10 keyboard shortcut at any time

Preferences dialog could be open from other task dialogs to change related settings.

- General Settings on page 76
  - Environment
  - Sound Notifications
  - Action Triggers
- Clone Sources
- Company Information
- Technical Information
- Processing Report
- Disk Label Presets
  - Disk Label Templates
- Disk Viewer
- Error Handling
  - S.M.A.R.T. Diagnostics

- E-Mail Notifications
  - SMTP Server Setting

**Preferences** allow users to configure all the global settings for the application.

**Notice:** When **General Settings**, **Disk Label Presets**, **Error Handling** or **E-mail Notifications** command initiated smaller subset of these settings is available to modify.

# **General Settings**

The **General Settings** allow to configure general application settings as well as the visual aspects of the application.

These are configurable options pertaining to the applications functionality.

General Settings	General Settings General application settings		
Environment Sound Notifications	Device Control Layout Default Serial Number detection method	: SMART *	Local Devices Initialization Initialize fixed disks
Clone Sources	Computer ID Use this Computer ID: BIOS Serial Num	ber  Vone	<ul> <li>✓ Initialize removable disks</li> <li>☐ Initialize CD/DVD/BD disks</li> <li>☐ Initialize floppy disks</li> </ul>
Technician Information	Application Log File Settings Log file location: /root/.local/share/LSc	, oft Technologies Inc/Disk Clone Industrial/	
Disk Label     Templates	Application log detail level: O Minim Initialize application log when applicati O Append to existing log file	-	
Disk Viewer	<ul> <li>Overwrite existing log file</li> <li>Create new log with file name:</li> </ul>	DiskClone-{Date(YYYY-MM-DD)}_{Time(HHmmss)}.txt	
SMART SMART Diagnostics E-Mail Notifications		Preview: DiskClone-2012-08-24_184503.txt	
SMTP Server Settings			

#### **Device Control Layout**

These settings control visual disk behavior in Disk Explorer on page 25 and allow to Show or Hide system disk and devices which are not ready (offline)

## **Default Serial Number detection method**

Select how **Disk Clone** retrieves the disk serial number by default. Values are: **SMART**, **IOControl** & **WMI** 

#### **Local Devices Initialization**

Select which types of devices appear in **Disk Clone** by default: **Fixed disks**, **Removable disks**, **CD/DVD/BD** and **Floppies** 

## **Computer ID**

Configure how the **Disk Clone** workstation is identified in logs & reports. Values are: **None**, **BIOS Serial Number**, **Motherboard Serial Number** 

## **Application Log File Settings**

These settings apply to the log file generated by the application. All operations performed in a **Disk Clone** session will be saved in this log.

#### Log file location

Allows the user to specify where the application log file is saved. By default this is set to a **Disk Clone** installation directory

#### Application log detail

Manipulate the amount of details included in the logs. Options are: **Minimum** and **Maximum** 

#### Initialize application log when application starts

This setting configures whether **Disk Clone** generates a new log file for every session (erasing the log of the previous session) or appends new sessions to one log file. Moreover, logs can be placed to the files being named using naming pattern specified

#### Environment

These are configurable options pertaining to the applications user interface and user experience.

Environment General applica	ition look'n'feel options
Application style: Default toolbars style:	Blue style   Image: Style     Large lcons, with text under icon   Image: Style
Default help source:	Microsoft HTML Help File (CHM)

#### **Application style**

Configures the color scheme used in the application. Values are: **Blue**, **Olive**, **None** (Use **OS default**) and **Silver** 

Environment General application look'n'feel options					
Application style:	None [Use OS default]				
Default toolbars style:	Blue style Olive style				
Default help source:	None [Use OS default] Silver style				

#### **Default toolbars style**

Configures how icons are shown in the toolbar. Values are: Large icons, no text, Large icons, with text beside icon, Large icons, with text under icon, Small icons, with text beside icon, Small icons, no text

Environment General applica	tion look'n'feel options	
Application style:	None [Use OS default]	¥
Default toolbars style:	Large Icons, with text under icon	~
Default help source:	Large Icons, no text Large Icons, with text beside icon	
	Large icons, with text under icon Small Icons, with text beside icon Small Icons, no text	

🔠 Disk Explorer	📾 Browsing sdb 🗙	😡 Application Log View 🗙	SN ↓
😵 🛼 🛼		•	
🔢 View 🖕 🎡 Customi	ze 🛫		
	1	2	

## Figure 64: Large icons, no text

	Disk Explorer	🐨 Browsing sdb 🗙	Application Log View 🗙 🛛 🕮 SN 🖣
1	Refresh	Run Batch 🔋 🚺 Clo	ne Disk
ţ	View 🛫 🆓 Customiz	e "	
		1	2
	Refresh Run Batch		
	🗏 Bay 1 No Disk	00:11.0:01	Bay 6 Read only Locked 03:00.0:03

## Figure 65: Large icons, with text beside icon

🔠 Disk E	Refresh Run Batch Clone Disk	sdb 🗙	😡 Application	n Log View 🗙	🔛 SN 4 🕨	
Refresh	Run Batch	Clone Disk	Stop ,	Browse Disk	Disk Viewer	
📱 View ्	, 🎡 Customiz	e "				
Refresh       Run Batch       Clone Disk       Stop       Browse Disk       Disk Viewer         Image: Clone Disk       Stop       Bay 6       Read only Locked       03:00.4         Image: Clone Disk       O0:11.0:01       Bay 6       Bay 6       O3:00.4						
🗏 Bay	1 No Disk	00:	11.0:01	🗏 Bay 6 Read	only Locked	03:00.0:03
1	NO	DISK		Serial: 2F30200209 Size: 477 GB		k, SSD

## Figure 66: Large icons, with text under icon

	Disk Explorer	🍘 Browsing sdb 🗙	BApplication Log View 🗙	SN 4 ►
1	Refresh 🛛 😽 Run B	atch 🛫 📊 Clone Disk	Stop 💡 💀 Browse Disk	>>
Į.	View 🛫 🆓 Customiz	e "		
		1	2	
	🗏 Bay 1 No Disk	00:11.0:01	🗏 Bay 6 Read only Locked	03:00.0:03
٦	N O	DISK	ATA ADATA SP900 Serial: 2F3020020939 Type: Fixed Disk Size: 477 GB Status: Read only	, SSD

## Figure 67: Small icons, with text beside icon

	Disk Explorer	📾 Browsing sdb 🗙	B Application Log View 🗙	SN ↓
148	view 🚽 🦏 Customiz	.e _	-	
		1	2	
-		-	-	
17	Bay 1 No Disk	Customize 2 1 2		

Figure 68: Small icons, no text

## **Default help source**

If available, user can select help documentation source to be addressed when requested. Values are: **PDF**, **CHM** and **On-line web help** 

Environment General applica	ition look'n'feel options	
Application style:	None [Use OS default]	۷
Default toolbars style:	Large Icons, with text under icon	¥
Default help source:	Microsoft HTML Help File (CHM) Help file document (PDF) Microsoft HTML Help File (CHM) On-line web help	~

## **Reset All Dialogs**

Pressing the button resets all the changes to default state.

### **Sound Notifications**

These are configurable options related to application sounds: you can use either predefined values or assign your own sounds (<User defined sound file>)

Use Sound No	tifications		
Select either	one of predefined sound notification tunes for each status of process completion or select your own audio file from local system.		
Absolute or i	elative path is accepted.		
Success:	Chime click bell [default]	▼	
With Warnings:	Chime dim [default]	~	
With Errors:	Digi error [default]	~	
Absolute or rel Success: ( With Warnings: ( With Errors: [ Failure: ( E	Chime chord [default]	~	1
	None Chime chord [default] Digi pulse Digi warn Etc space		
	Pad space <user defined="" file="" sound=""></user>		

## **Use Sound Notifications**

Toggles sound tones being used for notifying the user of the completion of a task, errors and notification during an operation: **Success/With Warnings/With Errors/Failures** 

## **Action Triggers**

Configure actions performed while application is running

Action Triggers Application action settings		
Automatically check for software of Action after all processes complete:	None	e media

## Automatically check for software updates

If this option set, application will check for a new updates during every start up

#### Action after all processes complete

Select either **None**, **Hibernate**, **Shutdown** or **Restart** system after all processes have been finished

CAUTION: You will have 30 seconds to abort system hibernation, restart or shutdown.

## Export erase certificates and application log to all detected removable media

Upon erase completion all certificates and logs will be automatically exported to attached USB disks (removable media)

# **Clone Sources**

This preferences tab allows you to select a master-copy disk to use for cloning to other disks after they have been erased.

ctivity.					y source slot for disk clo <b>image</b> files for the mas		inserted in these bays wi	ll be locked to	deny any applica	ition Read/Write	
ŧ	0	Disk B	ау	Port	Status	Platform Name	Serial Number	Partitioning	First Sector	Total Sectors	1
4 🚓	Ava	ilable	disks			J					-
1	•	/ 🏨	Bay 2-1	Unassigned	Read only	\\.\PhysicalDrive8	S1G8CRW3	MBR (Basic)	0	1,953,525,168	
2	Γ		Bay 2-2	Unassigned	Ready	\\.\PhysicalDrive9	Z9C305TD	MBR (Basic)	0	1,953,525,168	1
3			Bay 2-3	Unassigned	Ready	\\.\PhysicalDrive10	5VV2S2VJ	MBR (Basic)	0	975,724,592	
4	E	] 🏥	Bay 2-4	Unassigned	Ready	\\.\PhysicalDrive11	5VY35C2Z	MBR (Basic)	0	488,397,168	1
5		] 🏥	Bay 2-5	Unassigned	Ready	\\.\PhysicalDrive12	Z9C51EZL	MBR (Basic)	0	1,953,525,168	1
6	E		Bay 2-6	Unassigned	No Disk						
7			Bay 2-7	Unassigned	Ready, Not Initialized	\\.\PhysicalDrive14	50026B7782B88D29	RAW (Basic)	0	234,441,648	
8			Bay 2-8	Unassigned	Ready	\\.\PhysicalDrive15	85EJP05FT	MBR (Basic)	0	1,953,459,632	1
9			Bay 3-1	Unassigned	No Disk						
1	0 [		Bay 3-2	Unassigned	No Disk						
1	1 [		Bay 1-1	Unassigned	Read only	\\.\PhysicalDrive0	FED10752060801341365	MBR (Basic)	0	234,441,648	
1	2 [		Bay 3-3	Unassigned	No Disk						
1	3 [		Bay 3-4	Unassigned	No Disk						
	4 [			Unassigned							
1	5 [		Bay 3-6	Unassigned	No Disk						
c										3	>

## Selecting a Disk for cloning

Any disk recognized by **Disk Clone** may be used as a master-copy for *Cloning*. Simply find the disk under the **Available Disks** column and check the box next to the desired *Disk Bay*. This disk will be locked and read/write operations will be restricted for it until the cloning operation is complete.

### Selecting a Disk Image for cloning

Additionally to cloning a disk, cloning can be done from a mounted disk image. In the *Disk Clone* preferences tab:

1. At the bottom of the dialog, click Mount Disk Image

	Mount	t Disk Image	×
Select file name disk bay.	to mount(open) disk image from file. Successfully	y opened disk image will appear in <b>device</b>	es tree and will be assigned to virtual
-	C:\Users\user\disk_images\		
caption (Display name)	ose derdare (generated) osse image name	ОК	Cancel Help

## Figure 69: Mount Disk Image dialog

- 2. To the right of the "Disk Image file name" field click the ... button
- 3. Find the desired disk image in the *file explorer* and click **Open**

- 4. Fill in the "Display name" text box with a desired name for the image and click OK
- 5. The mounted disk image should appear under **Disk Images** in the Master-copy sources window.
- **Note:** To avoid repeating steps 1-4 every time the application is launched check the "*Autoload mounted Disk Images at every application start*" box. This will complete the mounting process automatically in the future.

## Related tasks Mount Disk Image on page 42 Disk Clone

# **Company Information**

These settings allow user to configure Company Information for Erase Certificates.

Set       Remove	Company Infor General com		to present on erase c	ertificate
Add company supervisor signature field to certificate	Set	Remove	Business name: Location: Phone:	Acme Clouds Inc.         1111 Front Str. East, Toronto, Ontario, M5V 9S1         (416) 223-8062         I hereby state that the data erasure has been carried out in accordance with the instructions given by software provider.

To specify a *Company Logo* image just use the **Set** and **Remove** buttons. It allows you to select a desired image with local *File Explorer*. Most of the image formats are supported: JPEG, TIFF, BMP, PNG etc. The logo will be previewed in the *Company Logo* space.

**Tip:** It is recommended to use company logo with resolution suitable for printing (300dpi) with a side not exceeding 300px.

Add all the company information to the related fields.

When the **Add company supervisor signature field to certificate** checkbox is selected the required field is added to the actual certificate.

#### **Related information**

**Erase Certificate** 

# **Technician Information**

This setting allows user to configure *Technician Information* for Erase Certificates.

Technician Int	(operator) information to present on erase certificate
Operator name:	John Smith
Comments:	
	<ul> <li>Add technician (operator) signature field to certificate</li> </ul>

Add Operator name and Comments to the related fields.

When the **Add technician (operator) signature field to certificate** checkbox is selected the required field is added to the actual certificate.

**Related information** 

Erase Certificate

# **Processing Report**

These settings allow you to configure the XML reports generated by **Disk Clone**.

Processing Report Unified xml-fo	rmatted Report file contains processing reports for all disks, syste	em and hardware information generated to dedicated location using file name temp	olate.
Report location: C:	\Users\user\reports\		
File name template:	Report-{SerialNumber}-{Status}-{Date(YYYY-MM-DD)}-{T	īme(HH-mm-ss)}	<b>*</b>
Preview: Report-9QG3	General		
✓ Include company ✓ Include technicia	(Apprecision)	<ul> <li>✓ Include system info</li> <li>✓ Include hardware info</li> </ul>	
	{OS} {UniquelD}	✓ Include disk SMART information	
	Date and Time Device Attributes		
	Processing		
	Item Processing		
	Item Processing		

## **Report Location**

User may configure where XML erasure reports are saved

## File name template

Here you may specify the *template* for the XML reports. The main tags available are:

Available element:	Tag:
Serial ID	{Serial ID}
Erasure Status	{Status}
Date of Erasure	{Date(YYYY-MM-DD)}
Time of Erasure	{Time(HH-mm-ss)}

There are additional tags available (see the tags section in Appendix)

## Include company information

Optionally adds the company information (defined in Company Information) into the XML erasure report

### Include technician information

Optionally adds the technician information (defined in Technician Information) into the XML erasure report

## Include system info

Ensures that the system-specific information is saved in the XML report, such as:

- Operating system
- Kernel version
- Architecture (x86, x64)

## Include hardware info

Ensures that the system-specific information is saved in the XML report, such as:

- Motherboard manufacturer
- Motherboard description
- Host (name, domain)
- CPU (logical, physical)
- Memory

## Include S.M.A.R.T. information for each disk

Optionally adds an additional information about disk health based on S.M.A.R.T. attributes into the XML erasure report.

The **Disk Clone** XML report contains the following parts:

## Table 1: XML Report Parameters (sample)

Type of Information	Specific data
Technician Information	Name
	Note
Company Information	Name
	Licensed
	Location
	Phone
	Disclaimer
System Information	OS version
	Platform
	Kernel
Hardware Information	Motherboard Manufacturer
	Motherboard Description
	Number of Processors

Type of Information	Specific data
Erase Attributes	Erase Verify
	Passes
	Method
	Verification Passes
Error Handling Attributes	Errors Terminate
	Skip interval
	Number of Retries
	Lock
	Source?
	Ignore Write?
	Read?
	Lock?
Disks	Device Size
	Device Type
	Serial Number
	Revision
	Product Number
	Name
	Geometric Information
	Partitioning Scheme
Additional Report Attributes	Fingerprint Information
	Initialize disk?
Results	Bay
	Time and Date Started
	Disk Information
	Status
	Result
	Time Elapsed
	Errors
	Name of operation
Conclusion	Overall result of the operation

## **F** Note:

If internal tag <task> is present the *Result* is appeared inside.

#### **Related information**

Name Tags on page 99

# **Disk Label Presets**

These preferences help to adjust label settings for the **Disk Clone** system globally. Labels may be formatted for any printer, page or label type (device) using **Disk Clone** highly customizable labels' features.

abel preset:	Default Disk Label F	Preset	v	
abel title: 【	ProcessedAs} by {	AppName}	Erased by Disk Clone Industrial	
HDD: {Produ Serial: {Serial	Started} Time: {Tin uctID} alNumber}; Size: { athod}: Result: {Sta	Size}	Date: 23,0,0,2019 Time: 08:43.39 HOD: 51500630A5 ATD Dovice Serial: 9QG3NOCK, Size: 1.8TD Mitchoit: NIST-800-88 (Three Passes). Result: Success	
Rich text fo	ormatting	Word wrap	COMPANY	
Add certific	ate logo	Add signature line		
✓ Append	Aztec 2D barcode Code 39 1D			
Barcode	Code 93 1D	^{TimeStarted}^{OrderID}^{Sequ	uence 0#}^{ProcessType}^{Method}^	{Status}
Preview:	Code 128 1D	XL-546453PF-D002^03^Erase^NIST-80	00-88 (Three Passes) ^ Success	
Format:	QR Code	Encoding: Not specified 👻	Error correction level (0-8): 0	Size, mm: 25
t Options				
			-	
efault printe	r for labels: <use d<="" td=""><td>efault printer&gt;</td><td></td><td>Print Test Labe</td></use>	efault printer>		Print Test Labe

## Label preset

Displays and let you select a default Label Preset or create a new one. Add New Label Preset button

allows you to create a custom label preset with your own specifications. **Delete** button keletes the selected label preset

## Label title

Allows you to set a title to be printed (in bold) at the top of the labels. It can be company name, batch name or any other descriptors you may consider useful to identify the operation. Static text can be typed in or any dynamic attributes (tags) can be inserted at current cursor's position. Click **Insert Name Tag** 

button 🚈 to insert predefined tag from the drop-down list

### Label Area

Label's content for the preset. Static text can be typed in or any dynamic attributes (tags) can be inserted

at current cursor's position. Click **Insert Name Tag** button *is* to insert predefined tag from the dropdown list. Click **Clear Pattern** button to empty all label's area

#### Label Attributes

You can use RTF formatting and set Word Wrapping behavior using related check boxes

## Add signature line

Toggling this "ON" places a line at the bottom of the label for the technician to sign off on upon completion of the wipe

#### Add certificate logo

Includes the logo used in the certificate as a label's watermark background

#### Label preview

Displays a preview of one label with the current input settings. Refreshes when any adjustments are made to the settings.

#### **Print options**

Define options for label printing including special label printers (Brother QL-570 etc.):

### **Default printer**

Define printer to be used exclusively to print labels from the list of installed printers

### Print output adjustments

The print output adjustments section of the dialogue allows you to *vertically* or *horizontally* displace the position measured in specific *print units* to adjust to different printers.

**Print test label** command will let you print *Disk Label* sample to verify your settings and selected layout attributes.

			DK-1202	-
Label Template Preview		Default template:		2
		Print start positio	DK-2205	
		Row: 1 🗘 0	Column: 1 🗢 🔪	
[]				1
		Page: <b>Custom</b> ; I orientation: <b>Lan</b> predefined temp	abel size: <b>62 x 29 mm</b> ; <b>Iscape</b> ; late: <b>Yes</b> ;	
	COMPANY			
		_		

Default template: Avery 5160 🔽 📑 📝
Print start position: Row: 4 🗬 Column: 3 🖨
Page: Letter / ANSI A; page size: 8.5 x 11 in; 30 labels per page; label size: 2.64 x 1 in; orientation: Portrait; predefined template: Yes;

### Page template

The print label dialog gives you an access to a number of predefined standard templates and to any custom templates you may create. These templates may be easily selected without opening any additional dialogs. The details of the selected template are displayed below the selection box. If your specific labels

differ from any of the templates available the 🕒 button allows you to create a custom template with your

own specifications. Additionally, the 应 button allows you to modify an existing template and the button deletes the selected template.

## **Print Start Position**

The *print start position* section of the dialogue allows you to select what label on the page is the one to start from. The labels won't always start from the 1x1 position, so you can adjust this setting accordingly.

## Creating a new template

Upon clicking the button the following *template editor* window appears. Descriptions of the *template editor* options are listed below.

Template title: Label template	
Image: Template title:       Label template         Preview       Image: Template         Image: Template title:       Image: Template         Image:	Page         ● Page size         Label Layout         ● Full page label         ● Label grid         Rows: 10       Columns: 3         Label spacing         Horizontal: 2.000 mm
	Actual label size: 67.3 x 23.99 mm
	OK Cancel

Figure 70: Create a New Disk Label Template

## **Template Title**

Here you may create a custom title for your template. This is the name to refer this template when selecting it in the *Print Label* dialog.

## Page

Here you can specify the dimensions of the page used to print the labels. This may be selected from the list of standard sizes or defined using exact measurements.

## **Page margins**

Page margins are defined for the top, bottom, left and right sides of the page.

#### Label Layout

These settings define how the labels appear on the page. You may define the spacing in between labels on the page and the dimensions of the label grid. Once you've enter the proper measurements **Disk Clone** will take care of the formatting.

## Size units

The units of measurement may vary between millimeters, inches, pixels and points. If a value in entered in one measurement and the unit size is changed the appropriate conversion will take place.

## **Disk Viewer**

These settings allow user to set hexadecimal *View* settings, font and interaction.

Disk Viewer Disk Viewer allows to inspect to	ow-level disk's sectors and file system structures
Hexadecimal offsets	
Lines to scroll on a wheel roll: 3	Pages to scroll on a PgUp/PgDown: 1
Show ASCII column 🗹 Show U	JNICODE column
Bytes per line: 16	
Font name: Courier New	▼ Font size: Medium ▼ Largest Large Medium Smaller Smallest

### **Hexadecimal offsets**

Toggles offset format between decimal and hexadecimal

### Show ASCII column

Toggles display content in ASCII format

### Show UNICODE column

Toggles display content in UNICODE format

## Lines to scroll

Number of lines to scroll for a single mouse wheel sweep

## Pages to scroll

Number of pages to skip for a single PageUp or PageDown click

## **Bytes per line**

Defines amount of bytes per line in binary display

## Font name

Select any monospace font available for better experience

## Font size

Font size to be used in binary view

# **Error Handling**

**Disk Clone** has a wide capabilities to handle errors during continuous disk processing. Those are the advanced settings to configure **Disk Clone**'s error handling.

In case of critical Read/Write errors:	
Abort entire group processing	Ignore preceding result
Abort only failed item from group processing	Use disk lock
O Ignore error for group processing	✓ Ignore disk lock errors
Terminate process after number of errors: 10 🖨	Ignore Read errors
Number of Read/Write attempts: 3 🚖	Ignore Write errors
Rely upon disk performance	
Consider slow-performed (low average Read/Write rate) disks as critical Rea	d/Write error

## Error handling attributes

Disk Clone allows user to select 1 of 3 ways to handle Read/Write Errors:

## Abort entire disk group processing

This means that if user runs a *Batch* erase and one of the disks has errors the erase process for ALL the disks in the batch is terminated

## Abort only failed disk from group processing

This is the suggested setting. Failed disks return an error and terminate the erase process. But other disks in the batch are not interrupted from the erase operation

### Ignore error for disk grouping

Ignores the read/write error and continues erasing wherever is possible on the disk. No active or forth going operations are terminated

## Terminate process after number of errors

Sets the error threshold to a certain amount before the disk operation is terminated and deemed unsuccessful

## Number of Read/Write attempts

Sets the number of attempts **Disk Clone** makes to perform an operation when an error is encountered before it stops execution

## Ignore preceding results

Errors (if any) on previous steps (i.e. *Examination*) are ignored and following steps (i.e. *Erase*, *Clone*) will be performed. If turned off the errors on previous steps will stop all further actions

## **Use disk lock**

Locks disks from being used by any other applications

### Ignore disk lock errors

Errors encountered with Disk Clone not being able to access locked disks are ignored

## Ignore read/write errors

Toggle whether errors should appear for read/write errors

### **Rely upon disk performance**

Set a minimum acceptable read/write speed in megabytes per second for disks to flag under-performing drives.

## S.M.A.R.T. Diagnostics

S.M.A.R.T. attributes may also be used in error handling. So threshold limits may be set on some or on all of the disks S.M.A.R.T. parameters. This may speed up processing by immediately terminating operations with unusable drives

Use S.M.A.R.T. attributes do determine threshold limits to terminate any long-going disk action, such as Erase or Disk Examine to avoid unstable behavio due to disk failures, if any of define SMART attributes rules criteria is met.			
Critical device status attributes			
🔲 [003] Spin-Up Time	Might indicate either a controller or a spindle bearing problem		
[005] Reallocated Sectors Count	Indicates how many defective sectors were discovered on the drive and remapped using a spare sectors poo		
[010] Spin-up Retries	Indicates severe controller or bearing problem		
[197] Current Pending Sectors	Indicates how many suspected defective sectors are pending for further investigation		
[198] Off-line Uncorrectable	Indicates how many defective sectors were found during the off-line scan		
Device error attributes			
[007] Seek Error Rate	Frequency of the errors during disk head positioning		
[013] Soft Read Error Rate			
<ul> <li>[187] Reported Uncorrectable Errors</li> </ul>	The number of UNC errors, i.e. read errors which Error Correction Code (ECC) failed to recover		
[200] Write Error Rate	Rate of errors during write operations		
[201] Soft Read Error Rate			
[250] Read Error Retry Rate			
Drive lifetime information			
<ul> <li>[004] Start/Stop Count</li> </ul>	Estimated remaining life, based on the number of spin-up/spin-down cycles		
[009] Power-On Hours Count	Estimated remaining lifetime, based on the time a device was powered on		
[192] Power-Off Retract Cycles	The number of unexpected power outages when the power was lost before a command to turn off the disk		
[240] Head Flying Hours	Time a disk head spent in the data zone, rather than in the parking area or on a head ramp		
<			
Select All Select None			

**Note:** Query execution for S.M.A.R.T. attributes is time and resource consuming operation. It can interrupt disk erasure procedure for several seconds. Thus it is recommended to validate these attributes not very frequently

## **Related information**

S.M.A.R.T. Monitor on page 71

# **E-mail Notifications**

Disk Clone can deliver results of its sanitation process by e-mail.

Run Cloning data on Disk batches are use	L disks(s) disk batch d for automated actions applied for group of disks with the same action attributes at once.
Start Erase	Disk Clone Print Clone Labels Processing Report Processing
General Options	✓ Use E-Mail Notifications       ✓ Send to:       testing@lsoft.net
Disk Clone	E-Mail attachments:
E-Mail Notifications	1

XML Report and Application Log files can be sent to the email specified, just check the related option.

When user selects **Use E-Mail Notifications** option the next set of options: **SMTP Server Settings** will be available for configuration in these Preferences.

## **SMTP Server Settings**

These settings allow configuring mailer settings for delivering erasing/wiping reports to user's mailbox. *Simple Mail Transport Protocol* (SMTP) is responsible for transmitting e-mail messages and needs to be configured properly.

	Settings for e-mail notification
Free To:	e Account 🕜 Custom Account
	johnsmith@johnsmith.com
From:	reports@killdisk.com
Server:	smtp-server.com
Port:	80 🖨 Choose any port number within range from 25 to 5000
<ul> <li>✓ 5</li> </ul>	MTP Server Authorization
Hear	name: reports@killdisk.com
User	

### Account Type

**Disk Clone** offers you a free *SMTP* account located on **www.smtp-server.com** that can be used for sending reports out. By default all the required parameters are pre-filled and configured properly. The only field you need to type in is the e-mail address where reports will be sent to. If your corporate policy does not allow using services other than its own you need to switch this option to *Custom Account* and configure all the settings manually. Ask your system/network administrator to get these parameters.

То

Type an e-mail address where erasing/wiping reports will be sent to

## From

Type an e-mail address which you expect these reports to come from

## SMTP Server

**Disk Clone** offers you the use of smtp-server.com for a free *SMTP* account. This account is pre-configured for **Disk Clone** users. Ask your system/network administrator to get the *SMTP* server name to be used in the *Custom Account* 

## SMTP Port

For the free *SMTP* account **Disk Clone** allows you to use smtp-server.com on port *80*. This is a standard port being used by all web browsers to access the Internet. This port most likely is open on a corporate and home networks. Other ports can be filtered by and closed by a network firewall. Ask your system/network administrator to set up a proper *SMTP* port for the related *SMTP* server.

## **SMTP Server authorization**

To avoid spam and other security issues some *SMTP* servers require each user to be authorized before sending e-mails. In this case a proper *username* and *password* are required. Ask your system/network administrator to get proper configuration settings.

# Appendix

# Glossary

## **BIOS** settings

**B**asic Input **O**utput **S**ubsystem is the program a personal computer's microprocessor uses to get the computer system started after you turn it on. It also manages data flow between the computer's operating system and attached devices such as the hard disk, video adapter, keyboard, mouse and printer. A typical method to access the BIOS settings screen is to press F1, F2, F8, F10 or ESC during the boot sequence.

## **Boot priority**

BIOS settings allow you to run a boot sequence from a floppy drive, a hard drive, a CD/DVD-ROM drive or a USB device. You may configure the order that your computer searches these physical devices for the boot sequence. The first device in the order list has the first boot priority. For example, to boot from a CD/ DVD-ROM drive instead of a hard drive, place the CD/DVDROM drive ahead of the hard drive in priority.

## **CSV-file**

A comma-separated values (**CSV**) file is a delimited text file that uses a comma to separate values. Each line of the file is a data record. Each record consists of one or more fields, separated by commas. The use of the comma as a field separator is the source of the name for this file format. A *CSV-file* typically stores tabular data (numbers and text) in plain text, in which case each line will have the same number of fields.

## **Data Cluster**

A cluster or *allocation unit* is a unit of disk space allocation for files and directories. To reduce the overhead of managing on-disk data structures, the filesystem does not allocate individual disk sectors by default, but contiguous groups of sectors, called clusters. A cluster is the smallest logical amount of disk space that can be allocated to hold a file. Storing small files on a filesystem with large clusters will therefore waste disk space; such wasted disk space is called *slack space*. For cluster sizes which are small versus the average file size, the wasted space per file will be statistically about half of the cluster size; for large cluster sizes, the wasted space will become greater. However, a larger cluster size reduces bookkeeping overhead and fragmentation, which may improve reading and writing speed overall. Typical

cluster sizes range from 1 sector (512 B) to 128 sectors (64 Kb). The operating system keeps track of clusters in the hard disk's root records or MFT records. (See lost cluster).

## **Deleted boot records**

All disks start with a boot sector. In a damaged disk (if the location of the boot records is known) the partition table can be reconstructed. The boot record contains a file system identifier.

## ISO

An International Organization for Standardization ISO-9660 file system is a standard CD-ROM file system that allows you to read the same CD-ROM whether you're on a PC, Mac, or other major computer platform. Disk images of ISO-9660 file systems (ISO images) are a common way to electronically transfer the contents of CD-ROMs. They often have the filename extension .ISO (though not necessarily), and are commonly referred to as "ISOs".

## Lost cluster

A cluster that has an assigned number in the file allocation table, even though it is not assigned to any file. You can free up disk space by reassigning lost clusters. In DOS and Windows you can find lost clusters with the ScanDisk utility.

## **MFT records**

*Master File Table*. A file that contains the records of every other file and directory in an NTFS-formatted hard disk drive. The operating system needs this information to access the files.

## **Root records**

*File Allocation Table*. A file that contains the records of every other file and directory in a FAT-formatted hard disk drive. The operating system needs this information to access the files. There are FAT32, FAT16 and FAT versions.

## Sector

The smallest unit that can be accessed on a disk. Tracks are concentric circles around the disk and the sectors are segments within each circle.

## S.M.A.R.T.

**S.M.A.R.T.** (*Self-Monitoring, Analysis and Reporting Technology*; often written as *SMART*) is a monitoring system included in computer hard disk drives (*HDDs*), solid-state drives (*SSDs*) and *embedded MultiMediaCards (eMMC*) drives. Its primary function is to detect and report various indicators of drive reliability with the intent of anticipating imminent hardware failures. When **S.M.A.R.T.** data indicates a possible imminent drive failure, software running on the host system may notify the user so preventative action can be taken to prevent data loss, and the failing drive can be replaced and data integrity maintained.

## **Unallocated space**

Space on a hard disk where no partition exists. A partition may have been deleted or damaged or a partition may not have been created.

## Windows system caching

Windows reserves a specified amount of volatile memory for file system operations. This is done in RAM because it is the quickest way to do these repetitive tasks.

## Windows system records

The Windows registry keeps track of almost everything that happens in Windows OS. This enhances performance of the computer when doing repetitive tasks. Over time, these records can take up a lot of space.

# Erase Disk Concepts

## **Erasing Confidential Data**

Modern methods of data encryption are deterring network attackers from extracting sensitive data from stored database files.

Attackers (who want to retrieve confidential data) become more resourceful and look for places where data might be stored temporarily. For example, the Windows **DELETE** command merely changes the files attributes and location so that the operating system will not look for the file. The situation with *NTFS* is similar.

One avenue of attack is the recovery of data from residual data on a discarded hard drive. When deleting confidential data from hard drives, removable disks or USB devices, it is important to extract all traces of the data so that recovery is not possible.

Most official guidelines regarding the disposal of confidential magnetic data do not take into account the depth of today's recording densities nor the methods used by the OS when removing data.

Removal of confidential personal information or company trade secrets in the past might have been performed using the **FORMAT** command or the **FDISK** command. Using these procedures gives users a sense of confidence that the data has been completely removed.

When using the **FORMAT** command Windows displays a message like this:

Important: Formatting a disk removes all information from the disk.

The **FORMAT** utility actually creates new *FAT* and *ROOT* tables, leaving all previous data on the disk untouched. Moreover, an image of the replaced *FAT* and *ROOT* tables is stored so that the **UNFORMAT** command can be used to restore them.

FDISK merely cleans the Partition Table (located in the drive's first sector) and does not touch anything else.

**Disk Clone Industrial** is able to erase data on entire drive with a choice of One Pass Zeros and One Pass Random international disk sanitizing standards

# How fast?

An actual speed depends on many factors:

- HDD speed: RPM and SATA/SCSI/SAS type the most important factor
- Disk Controller speed: SAS (6 Gbps/12 Gbps), SATA III (6Gbps), SATA II (3 Gbps), SATA I (1.5 Gbps)
- Computer overall performance (CPU + RAM)

For most modern computers and disks (manufactured within the last 5-7 years) *SATA III* standard is supported, so erase speed is limited by HDD throughput (disk write speed) only.

Our tests give the results: **10 GB per minute (in average) per pass** with decent computer configuration and disks with age of up to 5 years old.

For example, 2 TB *Toshiba* disk has been erased on Windows platform with one pass within 3 hours and 32 minutes, 14 TB *Western Digital* disk - within 18 hours 53 minutes.

The following snapshots are real-test certificates for erasing of:

1) **2 TB** *Toshiba* (manufactured in 2015) *SATA III* (6 Gbps) 7200 rpm disk with One Pass Zeros showing the average speed of **9** GB/min per pass



2) **14 TB** *Western Digital* (manufactured in 2019) SATA III (6 Gbps) 7200 rpm disk with One Pass Zeros showing the average speed of **12** GB/min per pass



Memory: 15.8 GB

# **Erase Methods (Sanitation Standards)**

## One Pass Zeros or One Pass Random

When using One Pass Zeros or One Pass Random standard, the number of passes is fixed and cannot be changed. When the write head passes through a sector, it writes only zeros or a series of random characters.

# Name Tags

## General

**{Computer ID}** Workstation (computer) ID

**{OS}** Operating System name

**{AppName}** Application name

**{AppVersion}** Application full version

**{KernelVersion}** Kernel version

Date & Time

**{UniqueID}** Generated unique 8 symbols ID

Tags to represent current date in different formats:

## **{Date(YYYYMMDD)}** Complete date in full form without delimiters

{Date(YYYY-MM-DD)} Complete date in full form with delimiters

**{Date(YYMMDD)}** Complete date in short form without delimiters

{Date(YYYY)} Year in full form

**{Date(YY)}** Year in short form

**{Date(Month)}** Full month name as literal

**{Date(MM)}** Month as digital with leading zero

**{Date(DD)}** Day of month with leading zero

## **{Time(HHmmss)}** Time with hours, minutes and seconds without delimiters

**{Time(HH-mm-ss)}** Time with hours, minutes and seconds with delimiters

{Time(HH)} Hours with leading zero **{Time(mm)}** Minutes with leading zero

**{Time(ss)}** Seconds with leading zero

# Disk

Values for these name tags retrieved from context device:

**{Serial ID}** Disk serial number, retrieved from OS or from S.M.A.R.T. attributes

**{Platform ID}**Disk platform identification (may be vary due to OS format)

**{Product ID}** Disk manufacturer Id

**{Model}** Disk model name (if available)

**{Size}** Disk size in gigabytes

**{Sectors}** Disk size in sectors

# **Processing attributes**

Disk processing attributes based on execution conditions:

**{Method}** Erase method

**{Passes}** Erases passes description

**{Verified}** Verification attribute

**{DateStarted}** Process start date

**{TimeStarted}** Process start time

**{TimeElapsed}** Process elapsed time

**{Status}** Overall completion status for group processing or separate disk processing status.

**{StatusCode}** Overall process result digital code

# Item processing attributes

Item processing attributes based on execution conditions:

| Appendix | **101** 

# {ProcessType}

Process type name

# {ProcessedAs}

Process short name

# {Range}

Processed disk range