

TOSHIBA Storage Utilities Version 3.11

User's Manual Version 1.0



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Explanation of marks in this document



Describes functions, restrictions, and matters for reference.



Describes additional instructions and notes.

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Revision History of Storage Utilities

Version	Revision Date	Description
3.00	September 2015	Initial version
3.10	November 2015	Add the following models of Toshiba Q300 to supported SSDs. Model Number on the label (the part number printed on the bottom of packaging box): HDTS812 (HDTS812*ZSTA), HDTS824 (HDTS824*ZSTA), HDTS848 (HDTS848*ZSTA), HDTS896 (HDTS896*ZSTA) Note: An asterisk mark (*) is different for each destination. Add Microsoft [®] Windows 10 to supported operating systems.
3.11	February 2016	Add the following models of Toshiba Q300 Pro to supported SSDs. Model Number on the label (the part number printed on the bottom of packaging box): HDTSA25 (HDTSA25*ZSTA), HDTSA51 (HDTSA51*ZSTA), HDTSA1A (HDTSA1A*ZSTA) Note: An asterisk mark (*) is different for each destination.

Safety Precautions

This section lists important precautions which users of our product(s) (and anyone else) should observe in order to avoid injury to human body and damage to property and to ensure safe and correct use of our products. Please be sure that you understand the meanings of the labels and graphic symbols described below before you move on to the detailed descriptions of the precautions, and comply with the precautions stated.

Explanation of Labels

NOTICE

Indicates practices that may cause property damage¹ and other problems, but not personal injury 1. Property damage is defined as damage to a customer or third party's machines and equipment.

Explanation of Graphic Symbols

Prohibited	Instructions
Indicates prohibited actions.	Indicates actions that must be undertaken for safety purposes.

General Use

NOTICE

NOTICE		
Prohibited	Do not remove the drive from your system while the system is powered on. It may cause damage to the drive.	
Prohibited	Do not change any configuration files of this application. To do so could harm your system.	
D Instructions	If your system or the Storage Utilities is terminated abnormally while Storage Utilities is running, your system or the drive may be damaged or data may be lost. Please backup your data before you use the Storage Utilities.	

Use of Secure Erase and Drive Backup

	NOTICE		
Prohibited	Do not power off while the Secure Erase or Drive Backup is running as this could corrupt the drive or your system.		
Prohibited	Do not run Secure Erase or Drive Backup on a battery driven system. Be sure to supply power to the system via the AC adapter.		
D Instructions	Be sure to backup of your data before erasing data or backing up drive because data erased by Secure Erase or data overwritten by Drive Backup cannot be recovered.		
D Instructions	The bootable media creating process will delete all your data stored on the media. Back up your data before creating any bootable media.		
Instructions	If your system or the Storage Utilities is terminated abnormally while Secure Erase is running, the drive may be in a password lock state. If the drive is in a password lock (Security Locked) state, please contact a customer support center.		

1. Introduction

This manual describes the procedure for installing and using TOSHIBA Storage Utilities (hereinafter "Storage Utilities"). Please read carefully the DISCLAIMER and Safety Precautions section before using the application Storage Utilities.

The Storage Utilities is software for management of TOSHIBA Solid State Drives (hereafter "TOSHIBA SSDs") and optimize their performance.

The Storage Utilities provides the following features:

- Drive Information
 - Displays various information of the drives
- Performance Optimizer
 Optimizes performance of the
- Optimizes performance of the TOSHIBA SSD by TRIM command
 Diagnostic Scan
 Scane the whole or part of the TOSHIBA SSD for read errors
- Scans the whole or part of the TOSHIBA SSD for read errors
 Over Provisioning
- Reserves free space in the TOSHIBA SSD to improve performance
- System Optimizer Tunes your system configuration in a manner designed to optimize performance of the system drive
 Secure Erase
- Erases all data on the TOSHIBA SSD
- Supplementary Tools
 Provides Linux[®] bootable media creation function for data erasing and drive backup and USB flash drive capacity restore function.

2. System Requirements

Storage Utilities requires the following:

- a) Supported SSDs
 - TOSHIBA SSD Q300 Model Number on the label (the part number printed on the bottom of packaging box): HDTS712 (HDTS712*ZSTA), HDTS724 (HDTS724*ZSTA), HDTS748 (HDTS748*ZSTA), HDTS796 (HDTS796*ZSTA), HDTS812 (HDTS812*ZSTA), HDTS824 (HDTS824*ZSTA), HDTS848 (HDTS848*ZSTA), HDTS896 (HDTS896*ZSTA)
 - TOSHIBA SSD Q300 Pro Model Number on the label (the part number printed on the bottom of packaging box): HDTS412 (HDTS412*ZSTA), HDTS425 (HDTS425*ZSTA), HDTS451 (HDTS451*ZSTA), HDTSA25 (HDTSA25*ZSTA), HDTSA51 (HDTSA51*ZSTA), HDTSA1A (HDTSA1A*ZSTA)
 Note: An asterisk mark (*) is different for each destination.

b) Supported Hardware

Computers that satisfy requirements of supported operating system.

c) Disk space

12 MB of available disk space

d) Supported operating systems

- Microsoft Windows 10 (x86 and x64)
- Microsoft Windows 8.1 (x86 and x64)
- Microsoft Windows[®] 7 (x86 and x64) with SP1

We have terminated the support for Windows 8 aligning with the end of support by Microsoft Corporation.

e) File system

Works only on storages formatted with NTFS.

f) Screen resolution

32 bits color and greater than 800 x 600 pixels

- g) Adobe[®] Reader X or later
- h) Internet Explorer[®] 8 or later



3. Installation Guide

To install Storage Utilities follow these steps:



 Requires username and password of administrator account in order to be installed by general users.

- 1) Save the "Storage_Utilities_v3.11.exe" to a folder on your computer.
- 2) Double-click the "Storage_Utilities_v3.11.exe" to start the Storage Utilities Setup Wizard.
- 3) Select language by Choosing Setup Language and click "*Next* >".

TOSHIBA Storage Utilities - InstallShield Wizard	×
Choose Setup Language Select the language for the installation from the choices below.	Z
Chinese (Simplified) English (United States)	
InstallShield	Cancel

4) Click "Next >" on the Welcome to TOSHIBA Storage Utilities Setup Wizard.

TOSHIBA S	torage Utilities - InstaliShield Wizard	
	Welcome to the InstallShield Wizard for TOSHIBA Storage Utilities The InstallShield Wizard will install TOSHIBA Storage Utilities on your computer. To continue, click Next.	
< Back Next > Cancel		

5) Review the License Agreement, If you agree with it, click "*l accept* ..." and then click "*Next* >".

TOSHIBA Storage Utilities - InstallShield Wizard	×
License Agreement Please read the following license agreement carefully.	2
End User License Agreement	^
TOSHIBA CORPORATION	
PLEASE CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS BEFORE INSTALLING, USING THIS SOFTWARE ("SOFTWARE"). IF YOU DO NOT AGREE TO THE TERMS AND CONDITIONS OF THIS END USER LICENSE AGREEMENT ("AGREEMENT"), DO NOT INSTALL OR USE THE SOFTWARE.	Ū
I do not accept the terms of the license agreement	
InstallShield Cance	şl

6) Click "Next >" to install to the default folder, or click "Change..." to install to a different folder and then click "Next >".

	TOSHIBA Storage Utilities - InstallShield Wizard
	Destination Location older where setup will install files.
	Install TOSHIBA Storage Utilities to: C:\Program Files (x86)\TOSHIBA\Storage UtilitiesChange
InstallShield -	< <u>B</u> ack Next> Cancel

7) Click "*Install*" to start the installation.



8) Click "Finish" when the InstallShield Wizard complete dialog box appears.

TOSHIBA Storage Utilities - InstallShield Wizard			
Setup Status		5	
The InstallShield Wizard is installing TOSHIBA Storage Utilities			
Installing			
C:\Program Files\TOSHIBA\Sto	orage Utilities\TosStoSdlU.dll		
InstallShield		_	
	Cancel		
TOSHIBA St	orage Utilities - InstallShield Wizard		
	InstallShield Wizard Complete		
	The InstallShield Wizard has successfully installed TOSHIBA		
	Storage Utilities. Click Finish to exit the wizard.		

Finish

Cancel

S.....

< <u>B</u>ack

4. Storage Utilities Usage 4.1. Start Storage Utilities

You can start the Storage Utilities application by one of the following ways:

Requires username and password of administrator account in order to be started by a general user. Note

Click the "Start" button then choose "All Programs" -> "TOSHIBA" -> "Storage Utilities" -> "Storage Utilities" Click on "Storage Utilities" icon on the system tray and select "Open" from the pop-up menu.

^{TOSHIBA} Storage Utilities ²			
Drive Information	Storage Utilities enables optimizing of the supported Toshiba Storage.		
Performance Optimizer	Select a button on the left-hand to start.		
Diagnostic Scan	CCD		
Over Provisioning	Solid State Drive SSD		
System Optimizer	3 Solid State Drive		
Secure Erase	A newer version of Storage Utilities has been released. Been update Information for Storage Utilities		
Supplementary Tools	If there is a new drive firmware or Storage Utilities release information, notify me in a pop-up window. Gopyright(C) 2013-2016 TOSHIBA CORPORATION All Rights Reserved.		

1 Menu

Drive Information : Goes to the Drive Information screen (See 4.2. Drive Information) : Goes to the Performance Optimizer screen (See 4.3. Performance Optimizer) Performance Optimizer Diagnostic Scan : Goes to the Diagnostic Scan screen (See 4.4. Diagnostic Scan) Over Provisioning : Goes to the Over Provisioning screen (See 4.5. Over Provisioning) System Optimizer : Goes to the System Optimizer screen (See 4.6. System Optimizer) : Goes to the Secure Erase screen (See 4.7. Secure Erase) Secure Erase Supplementary Tools : Goes to the Supplementary Tools screen (See 4.8. Supplementary Tools) **2** Title Button i (Information) : Displays the product information and license agreement. ? (Help)

- (Minimize) X (Exit)
- : Displays User's Manual
 - : Minimizes the Storage Utilities application
 - : Closes the Storage Utilities application

3 Update Information for Storage Utilities

Display if there is update information for Storage Utilities.

Click "Update Information for Storage Utilities", display current version and the latest version of the Storage Utilities. Click "Detailed Information" to see more detailed information.

Click "Update" to start download of Storage Utilities and you can update to the latest version.

If update target file has been locked, you may need to restart your system. To get updated information and detailed information, and to update, you need to connect to the Internet. Note

	_
Storage Utilities ×	
A newer version of Storage Utilities has been released. Would you like to update?	
Current version : Storage Utilities 3.10	
Latest version : Storage Utilities 3.20	
Detailed Information	
<u>U</u> pdate <u>C</u> ancel	
Downloading Storage Utilities	
Downloading the latest version.	
After downloaded, installer will run automatically.	
Cancel	
TOSHIBA Sorage Utilities - InstallShield Wizard	×
Welcome to the InstallShield Wizard for TOSHIBA Storage Utilities The InstallShield Wizard will update the installed version (3.11.5001) of TOSHIBA Storage Utilities to version 3.20.4704. To continue, click Next.	'n
< Back Next > Car	

4 Checkbox of Update Notice for Firmware / Software If you want to be notified about firmware and software update information by a pop-up window, enable the checkbox.

If checkbox is enabled and it is connected to the Internet, it detects update information at computer startup and every 24 hours.

4.2. Drive Information

The Drive Information displays summary and support features about the drives connected to your system.

4.2.1. Summary

The "Summary" tab displays status and summary of the selected drive.

TOSHIBA Sto	age Utilities	? _ ×
Drive Information	The Drive Information feature enables displaying various information about the drives.	out
Performance Optimizer	Drive Capacity Q: (C:) TOSHIBA Q300 Pro 238.47 Q: (D:) TOSHIBA Q300 Pro 119.24	GB
Diagnostic Scan	Summary Support Features 1 Support Features 2 & Status	
Over Provisioning	2 Status This drive working normally.	
System Optimizer	2 Normal 3 SMART	
Secure Erase	Model Number : TOSHIBA Q300 Pro Serial Number : 83GS100CTOEY Firmware Version : JURA0001 5 Update Information	
Supplementary Tools	ATA Version : ACS-2 SATA Version : Rev 3.1 SATA Speed : 1.5Gbit/s, 3.0Gbit/s, 6.0Gbit/s	

1 Select a Drive

Displays the list of all available drives on your system.

In the Select a Drive list, click the name of drive for which you want to view the information.

	 Displays warning icon A on drive list when the status is caution or warning. Displays information icon I on the drive list when there is firmware update. If the status is caution or warning, and if there is firmware update, displays warning icon
Information	 When a SSD is Read Only Mode (status is warning), it may take time to recognize the SSD, or may not recognize the SSD.

2 Status

Displays the information about status of the selected drive.

Based on the indications of the SSD endurance, the status shall be displayed as normal, caution, or warning. The meter indicates the change in the status.

When using NAND Flash memory storage, the individual storage cell can be gradually damaged by frequent reading and/or rewriting.

Normal (green): Drive working normally.

Caution (yellow): Rewrite cycle has exceeded the rated cycle for the device. The rated cycle is the upper limit designated by TOSHIBA for operational reliability. It is strongly recommended to back up the drive and replace it, as the drive has exceeded the limit and reliability may be compromised. Warning (red): Drive is Read Only Mode by lifetime or failure. Try to rescue the data by backing up the drive immediately. Discontinue use of the drive once data has been backed up to a separate device. If the drive is in Read Only Mode, you may still be able to read stored data in order to back up the data. However, if the mode is caused by another issue, back up may not be possible.

Please see "4.9.3. How to Run Drive Backup on Linux Operating System" for drive backup.

3 SMART Information

Click "**SMART**" to display the SMART information. Click "**Export**" to export the SMART information to CSV format file. Then, right-click to use copying function.



ID	Attribute Name	Value	Worst Value	Threshold	RAW Value
09	Power-on Hours Count	100	100	0	0000000023A
0C	Power Cycle Count	100	100	0	00000000408
A7	SSD Protect Mode	100	100	0	000000000000000000000000000000000000000
A8	SATA PHY Error Count	100	100	0	00000000001
A9	Bad Block Count	100	100	10	00000000064
AD	Erase Count	194	194	0	000000000000
C0	Unexpected Power Loss Count	100	100	0	000000002EE
C2	Temperature	75	38	20	003E00120019

SMART attribute items are as follows:

ID	Hex value of SMART attribute
Attribute Name	Name of SMART attribute
Value	Normalized current value of the attribute
Worst Value	Lowest value in the past
Threshold	Normalized threshold value for the drive
RAW Value	Raw value assigned to SMART attribute

Detailed information about SMART attribute is as follows:

ID	Attribute	Explanation
09	Power-on Hours Count	Value is fixed.
		Raw Value shows the cumulative number of power-on hours
		since factory shipping.
0C	Drive Power Cycle Count	Value is fixed.
		Raw Value shows the cumulative number of power on/off cycles
		since factory shipping.
A7	SSD Protect Mode	Value is fixed.
		Raw Value (Byte 0) reports the current mode of the drive.
		0: Read/Write Mode
		Others: Read Only Mode
A8	SATA PHY Error Count	Value is fixed.
		Raw Value shows cumulative number of errors in SATA physical
		layer since factory shipping.
A9	Total Bad Block Count	Value shows the normalized number of spare area in the drive.
		When this attribute falls below the threshold, performance of the
		drive may significantly slow down.
AD	Erase Count	Value shows the maximum normalized cumulative number of
		erase cycles per block since factory shipping.
C0	Unexpected Power Loss Count	Value is fixed.
		Raw Value shows the cumulative number of unexpected power
		loss since factory shipping.
C2	Temperature	Value shows the thermal sensor value in the drive, which is
		subtracted the centigrade temperature from 100.
		Raw Value shows current, minimum, and maximum centigrade
		temperature.

Byte1-0: Current centigrade temperature Byte3-2: Minimum centigrade temperature (since factory
shipping)
Byte5-4: Maximum centigrade temperature (since factory
shipping)

4 Drive Summary

Displays model name, serial number, firmware version, ATA version, SATA version, SATA speed.

5 Update Information

Displays updating information of firmware. If you want to refer to updating information for firmware, click "*Update Information*".

Storage Utilities			×
	i	A newer version of firmware for this drive has been released. Would you like to check our web site for more information?	
		Model Number : TOSHIBA Q300 Pro Current FW version : JURA0101 Latest FW version : NEWFW2	
		<u>QK</u> <u>C</u> ancel	

4.2.2. Support Features

The Support Features display detailed information of the selected drive on the "Support Features 1", and "Support Features 2 & Status" tabs.

TOSHIBA Stora	ge Utilities	TOSHIBA Storage Utilities				
Drive Information	The Drive Information feature enables displaying various information about the drives.	Drive Information Information				
	Select a Drive :	Select a Drive :				
Performance Optimizer	Drive Capacity ©, (C:) TOSHIBA Q300 Pro 238.47 GB ©, (D:) TOSHIBA Q300 Pro 119.24 GB	Drive Capacity Optimizer © 1054BA Q300 Pro 2.38.47.68 Optimizer 119.24.61 119.24.61				
Diagnostic Scan	Summary Support Features 1 Support Features 2 & Status	Scan Summary Support Features 1 Support Features 2 & Status				
Over Provisioning	Peature Explanation NCQ Native Command Queuing HDM Host Initiated Power Management	Over Explanation Status Provisioning SMART Self-Monitoring Analysis and Reporting Technology Enabled				
System Optimizer 2	HUM Hot Instated Yover Management TRIM Data Set Management RZM Returning Zero After Trim Trusted Computing Interface for security component Sentize Sentize Verice Operation	APM Advanced Power Management Enabled DIPM Device Initiated Power Management Enabled DIPM Device Initiated Power Management Enabled Write Cache Violatie Write Cache Enabled				
Secure Erase	Service Service Operation IEEE 1667 Authentication for Transient Storage Devices	Security Pessivid System Disabled Security Loded Security Loded Status Disabled Security Frozen Security Frozen Status Enabled				
Supplementary Tools	2. Detailed information	Supplementary Tools 4 Detailed Information				

1 Select a Drive

Displays the list of all available drives on your system. In the Select a Drive list, click the name of drive for which you want to view the information.

2 Support Features 1

Displays unchangeable support features of the selected drive. Non-supported features are displayed in grey.

3 Support Features 2 & Status

Displays changeable support features of the selected drive and displays for each feature the enable or disable status.

Non-supported features are displayed in grey.

4 Detailed Information

Click "*Detailed Information*" to see Identify information of the selected drive. Click "*Export*" to export the detailed information to a CSV format file. Then, use the right-click to access the copying function. Enter keyword, and click "*Search*" to search the detailed information.

Detailed Information displays the data acquired from the result of IDENTIFY DEVICE command. Refer to ATA specifications for detail. <u>http://www.t13.org/</u>

		Identify Information		×
			Sea	arch
Word	Bit	Description	Value(Hex)	^
0		General configuration	0040	
	15	0 = ATA device	0	
	14:8	Retired	00	
	7	Removable cartridge drive (Obsolete)	0	
	6	Fixed device (Obsolete)	1	
	5:3	Retired	0	
	2	Response incomplete	0	
	1	Retired	0	
	0	Reserved	0	
1		Number of default logical cylinders (Obsolete)	3FFF	
2		Specific configuration	C837	
3		Number of default logical heads (Obsolete)	0010	
4-5		Retired	0000000	
6		Number of logical sectors per logical track (Obsolete)	003F	
7-8 -		Reserved for assignment by the Compact Flash Association	0000000	~
			Export Cl	ose

4.3. Performance Optimizer

The Performance Optimizer helps to keep the TOSHIBA SSD of its optimum performance with the TRIM function. This function informs the device which data is no longer valid or unused (i.e. deleted files). This reduces wear by allowing the device to no longer manage the invalid/unused data. You do not need to use this feature because supported operating systems support TRIM natively. However, please use this feature if you have disabled the setting of TRIM. The Performance Optimizer can be run manually or automatically by using the Scheduler. The result of executing the Performance Optimizer can be viewed in the Log Information screen.

Do not run Defragmentation and the Performance Optimizer simultaneously. Make sure to disable Defragmentation or disable the schedule of Defragmentation before running the Performance Optimization.
 The optimization feature does not work on TOSHIBA SSD Q300.

Drive Information	The Performance Optimizer feature by TRIM command.	ıre enable	s optimizing perf	ormance of the SSI
Performance Optimizer	Select a Drive : Drive Q. (C:) TOSHIBA Q300 Pro Q. (D:) TOSHIBA Q300 Pro	Capacity 238.47 GB 119.24 GB	NONE	Next Execution NONE NONE
Diagnostic Scan				
Over Provisioning	Layout of Drive :			
System Optimizer 2			Used Area	
Secure Erase			Free Area f	or Optimization
Supplementary Tools			3	nalyze <u>S</u> tart

1 Select a Drive

Displays the list of all available drives on your system.

In the Select a Drive list, click the drive for which you want to optimize performance.

2 Layout of Drive, Progress Bar

Displays the used area, free area, and free area for the optimization of the selected drive in different colors. Displays progress of optimizing task and analyzing task on Progress Bar.



3 Analyze, Start / Stop

Click "*Analyze*" to analyze the usage of the selected drive and display the analysis result in the Layout of the Drive field.

Click "*Start*" to optimize performance of the selected drive. During execution of optimization, click "*Stop*" to stop the optimization process. When finished, the execution result of performance optimization is shown in the Log Information screen.



- The optimization feature does not work on the SSD that has less than 1 GB of free drive space.
 - The optimization feature does not work while your computer is running on battery.

The optimization feature does not work on the SSD in Read Only Mode (status is warning).

4.4. Diagnostic Scan

The Diagnostic Scan can scan the whole or part of the TOSHIBA SSD for read errors.

There are two kinds of the Diagnostic Scan: Quick Scan and Full Scan.

The Quick Scan runs self-test routine on one part of the drive. In the next scanning, the Quick Scan runs self-test routine on another part of the drive. When running the Quick Scan repeatedly, the whole of drive will be scanned. Typically, it takes several minutes to complete a Quick Scan. The Quick Scan can be run manually or automatically by using the Scheduler.

The Full Scan runs self-test routine on the whole drive. Typically, it may take several tens of minutes or more to complete a Full Scan. The Full Scan can be run only manually.

The result of executing the Diagnostic Scan can be viewed in the Log Information screen.

TOSHIBA Sto	rage Utilities
Drive Information	The Diagnostic Scan feature enables scanning the whole or part of the drive for read errors.
Performance Optimizer	Drive Capacity Schedule Setting Next Execution Q (C:) TOSHIBA Q300 Pro 238.47 GB NONE NONE Q (D:) TOSHIBA Q300 Pro 119.24 GB NONE NONE
Diagnostic Scan	Quick Scan
Over Provisioning	Runs self-test routine on a part of the selected drive. Full Scan Runs self-test routine on the whole of the selected drive at a time.
System Optimizer	2
Secure Erase	
Supplementary Tools	3 <u>Start</u>
	To the Scheduler screen

1 Select a Drive

Displays the list of all available drives on your system. In the Select a Drive list, click the drive that you want to scan.

2 Scan, Progress Bar

 Quick Scan
 : Check this option to run self-test routine on one part of the selected drive.

 Full Scan
 : Check this option to run self-test routine on the whole of the selected drive.

 Displays progress of scanning task.

3 Start / Stop

Click "*Start*" to scan the selected drive. During execution of the scan, click "*Stop*" to stop the scan process. When finished, the result of the scan is shown in the Log Information screen.



The Diagnostic Scan feature does not work while your computer is running on battery. The Diagnostic Scan feature does not work on the SSD in Read Only Mode (status is warning).

4.5. Over Provisioning

The Over Provisioning feature allows you to reserve free space in the TOSHIBA SSD.

The reserved area in the SSD is used mainly as a work area for garbage collection. By raising the efficiency of garbage collection, it can assist in preventing performance degradation.

The sizes of reserved area can be changed from 0% to 30% of available free space. The reserve area can be allocated and released at any time. The result of executing the Over Provisioning can be viewed in the Log Information screen.



toshiba Sto	rage Utilities
Drive Information	The Over Provisioning feature enables reserving free space in the SSD in order to improve performance.
Performance Optimizer	Drive Capacity Schedule Setting Next Execution ① ① (C:) TOSHIBA Q300 Pro 238.47 GB NONE NONE ② ①:) TOSHIBA Q300 Pro 119.24 GB NONE NONE
Diagnostic Scan	2 Select a Partition : D: ✓ Qver Provisioning Size : ✓ 3
Over Provisioning	
System Optimizer	Used Area 111 MB 1% Free Area 119.13 GB 99% Over Provisioning Area 0 MB 0%
Secure Erase	
Supplementary Tools	To the Log Information screen

1 Select a Drive

Displays the list of all available drives on your system.

In the Select a Drive list, click the drive for which you want to run Over Provisioning.

2 Select a Partition

Select the partition on which you want to run Over Provisioning.

3 Over Provisioning Size

Select the percentage of reserve area to free area in the selected partition to specify the size of reserve area you want to allocate for Over Provisioning.

4 Layout of Drive, Progress Bar

Displays the used area, free area, and the Over Provisioning area in different colors, in the case of analyzing the selected partition. Displays the capacity and occupancy ratio in the right side of the legend of each area. Displays progress of Over Provisioning task on Progress Bar.

5 Analyze, Allocate / Release

Select the size of "**Over Provisioning Size**", and click "*Analyze*" to analyze the usage of the selected drive and display the analysis result in the Layout of Drive field. The Over Provisioning Area has not been allocated as of the analyzed stage.

Click "*Allocate*" to allocate the specified size of reserve area on the selected partition. When finished, the result of allocating is shown in the Log Information screen. Click "*Release*" to release the allocated reserve area. When finished, the result of releasing allocated reserve area is shown in the Log Information screen.



- The Over Provisioning feature does not work on the SSD that has less than 1 GB of free drive space.
- The Over Provisioning feature does not work while your computer is running on battery. The Over Provisioning feature does not work on the SSD in Read Only Mode (status is warning).

4.6. System Optimizer

The System Optimizer feature allows you to tune your system configuration to optimize performance of the system drive.

toshiba Sto	rage Utilities
Drive Information	The System Optimizer feature enables tuning your system configuration to optimize performance of the system drive.
Performance Optimizer	DIPM Disabled V Recommendation setting : Enabled DIPM (Device Initiated Power Management) is the power management feature that is effective in reducing the power consumption. DIPM should be enabled on the system drive.
Diagnostic Scan	Superfetch / Prefetch Disabled No tuning required. Superfetch / Prefetch is a Windows technology designed to reduce load times by preloading frequently used applications into memory. No
Over Provisioning	2 Superfetch / Prefetch should be disabled in the case of the SSDs, because the SSD is fast storage. However in the case of the HDDs, Superfetch / Prefetch is strongly recommended to be enabled.
System Optimizer	
Secure Erase	
Supplementary Tools	3 дрріу

1 DIPM

Displays the current setting and the recommended setting for DIPM (Device Initiated Power Management). Select the value you want to set.

DIPM is the power management feature that is effective in reducing the power consumption. DIPM should generally be enabled on the drive.

2 SuperFetch[®] / Prefetch

Displays the current setting and the recommended setting for SuperFetch / Prefetch. Select the value you want to set.

Windows SuperFetch /Windows Prefetch is a Windows technology designed to reduce load times by preloading frequently used applications into memory. SuperFetch/Prefetch is generally not needed for TOSHIBA SSDs and should be disabled. In the case of HDD, SuperFetch/Prefetch is strongly recommended to be enabled.

3 Apply

Click "*Apply*" to apply the specified setting value on your system. You will likely need to restart your system to apply the configuration change.

	Storage Utilities	×
?	You must restart your system for the configuration changes to take effect. Would you like to restart your system immediately?	
	<u>Y</u> es <u>N</u> o	

4.7. Secure Erase

Secure Erase is designed to erase all data stored on the TOSHIBA SSD including user data, OS or recovery OS. There are four kinds of Secure Erase. Normal Secure Erase and Enhanced Secure Erase are part of Security Erase Unit command. Block Erase (BLOCK ERASE EXT command) and Cryptographic Erase (CPRYPTO SCRAMBLE EXT command) are part of Sanitize Device feature set.

Block Erase and Cryptographic Erase can be selected for drives that support the Sanitize Device feature set. We recommend Block Erase or Cryptographic Erase, which are safer than Normal Secure Erase and Enhanced Secure Erase, when the drives support the Sanitize Device feature set.

The table below shows four types of Secure Erase methods and whether they are available on the Non-SED (Not Self Encrypting Drive) and/or the SED (Self Encrypting Drive).

	Non-SED	SED
Normal Secure Erase	Logical Erase	Logical Erase
	(Physical Erase) (*1)	Crypto Erase
Enhanced Secure Erase	Logical Erase	Logical Erase
	Physical Erase	Crypto Erase
Block Erase	Logical Erase	Logical Erase
	Physical Erase	Physical Erase
		Crypto Erase
Cryptographic Erase	-	Crypto Erase

Logical Erase : Runs a logical erasing process designed to clear data on the logical-physical conversion table.

Physical Erase : Runs a physical erasing process designed to clear data on NAND flash memory.

Crypto Erase : Runs a sanitize operation designed to change the internal encryption keys that are used for user data. (*1) In the case of TOSHIBA SSD Q300, Normal Secure Erase runs physical erase.

There are two versions of Secure Erase, one on Windows OS, and one on Linux OS.

The Secure Erase on Windows OS cannot be run on the primary drive (bootable drive), but can be run on the secondary drive. Refer to "4.9.2.How to Run Secure Erase on Linux Operating System", when you perform Secure Erase by the primary drive (bootable drive).

The table below shows the support for Secure Erase on Windows OS. Please use Secure Erase on Linux OS if your system is non-supported OS.

	Windows 7	Windows 8.1 Windows 10
Normal Secure Erase	Support	Non-support
Enhanced Secure Erase	Support	Non-support
Block Erase	Support	Non-support
Cryptographic Erase	Support	Non-support



Remove the user password on the drive before running the Secure Erase. (For information on how to remove the user password on the drive, refer to your system's user manual.)

To run the Secure Erase on Windows operating systems, perform the following steps: 1) Click Secure Erase menu.

2) If you accept the conditions, check "I understand" and click "Yes".



3) The "Secure Erase" screen is displayed.

TOSHIBA Storage Utilities				
Drive Information	The Secure Erase feature enables deleting all data on the drive.			
Performance Optimizer	Drive Status Capaci 1 Quive : Status Capaci Quive : Status Capaci <th>GB</th>	GB		
Diagnostic Scan	Select a erasing method. Please refer to user's manual for the detailed of each erasing method.			
Over Provisioning	While the Secure Erase is running, do not power off, and/or do not remove the drive from you system. It may cause damage to the drive and/or may lead malfunction.	r		
System Optimizer	2 © Enhanced Secure Erase Estimated required time: ≤0 h 2 min ○ Block Erase			
Secure Erase	Cryptographic Erase			
Supplementary Tools		art		

1 On the drive list, select the drive on which you want to run Secure Erase.

2 Select erasing method.

Normal Secure Erase and Enhanced Secure Erase will be displayed estimated required time. The estimated required time show the estimated time in 2 minutes that obtained from Word 89 and Word 90 on "IDENTIFY DEVICE data". It shows in hour (h) and minute (min).



3 Click "Start".

4) If you accept the conditions, check "I understand" and click "Yes", and start Secure Erase.



5) Displays the progress for the Secure Erase task on Progress Bar.

	Estimated time remaining: 0:01:58
6) [Displays the completion screen after Secure Erase finished. Storage Utilities
	Secure Erase completed successfully.
	ОК
In	 The length of the erasure time depends on the capacity of the target drive. The Secure Erase feature on Windows OS does not work on the SSD in Read Only Mode (status is warning). Refer to "4.9.2.How to Run Secure Erase on Linux Operating System".

4.8. Supplementary Tools

The Supplementary Tools feature enables additional functions for the Storage,

4.8.1. Bootable USB Creator

The Bootable USB Creator creates the bootable USB of Linux operating systems for erasing data and drive backup. Creating the bootable USB requires the capacity of about 250 MB. Prepare a USB flash drive of 256MB or above to create the bootable USB.



Create a bootable USB by following steps. 1) Select "*Bootable USB Creator*" tab.

TOSHIBA Storage Utilities			
Drive Information	The Supplementary Tools feature enables various additional functions for the storage.		
Performance Optimizer	Bootable USB Creator Steps for Bootable CD/DVD USB Flash Drive Capacity Restore Create the USB bootable media for data erasing and drive backup. Select a USB flash drive :		
Diagnostic Scan	Drive		
Over Provisioning	Step 1. Select a media and then click "Start" to create a bootable media.		
System Optimizer	Step 2. Restart your system from the created bootable media. Check your computer manual for instructions for booting from USB devices.		
Secure Erase	Step 3. After restart, select a Secure Erase button (data erasing function) or a Supplementary Tools button (drive backup function), and execute processing.		
Supplementary Tools	2 <u>Start</u>		

Select a USB flash drive for creating the bootable USB from the drive list box. If a USB is not shown in the drive list box, close the Storage Utilities and insert an empty USB into a port on your system before starting the Storage Utilities. Then start the Storage Utilities.

- Click "*Start*" to create a bootable USB.
 While creating the bootable USB, click "*Stop*" to stop the process.
 A Progress Bar is displayed while the system creates a bootable USB.
- 2) When you create the bootable USB for the first time, if you accept the conditions, then click "Yes", You can start downloading the bootable module. During the download, the progress screen is displayed. If you have already downloaded, please skip to step 3.

	Storage Utilities	×
?	You need to download the bootable module to create a bootable media. Do you really want to download the bootable module?	
	<u>Y</u> es <u>N</u> o	

3) If you accept the conditions, check "I understand" and click "Yes", and start creating the bootable USB.



4) After the completion of the bootable USB, if you want to shutdown and restart your system from the bootable USB, click "**Yes**".

	Storage Utilities 🛛 🕹
0	The bootable media was created successfully. Shutdown your computer and boot from the bootable media for Secure Erase or Drive Backup. Would you like to restart your computer immediately?
	<u>Y</u> es <u>N</u> o



Size of USB flash drive will be set to about 250MB when creating the bootable USB. See "4.8.3. USB Flash Drive Capacity Restore" for restoring the capacity of USB flash drive. Your system may not restart using the created bootable USB depending on some computer operations. (See 4.9.1.How to boot from the bootable media)

4.8.2. Steps for Bootable CD/DVD

"Steps for Bootable CD/DVD" tab describes the steps to create CD/DVD bootable media for data erasing and drive backup.

The Storage Utilities does not include any CD/DVD media creation functions. Besides the Storage Utilities, optical disc authoring software is necessary when creating CD/DVD bootable media. You will be unable to create CD/DVD bootable media if optical disc authoring software is not installed in your computer.



- 1) Start optical disc authoring software.
- 2) Select "Step for Bootable CD/DVD" tab. Click "Open ISO File Folder".

toshiba Sto	rage Utilities
Drive Information	The Supplementary Tools feature enables various additional functions for the storage.
Performance Optimizer	Bootable USB Creator Steps for Bootable CD/DVD USB Flash Drive Capacity Restore Follow these steps to create CD/DVD bootable media for data erasing and drive backup. In addition to this utility, optical disc authoring software is necessary when creating CD/DVD bootable
Diagnostic Scan	media. Unable to create CD/DVD bootable media if optical disc authoring software is not installed in your computer. Step 1. Please start optical disc authoring software.
Over Provisioning	Step 2. Press "Open ISO File Folder" then check stored location of the ISO file and then import ISO file to optical disc authoring software from stored location. Step 3.
System Optimizer	Write the ISO file to CD/DVD media using optical disc authoring software. Step 4. Restart your system from the created bootable media. Check your computer manual for instructions for booting from CD/DVD.
Secure Erase	Step 5. After restart, select a Secure Erase button (data erasing function) or a Supplementary Tools button (drive backup function), and execute processing.
Supplementary Tools	Open ISO File Folder.

3) When you create CD/DVD bootable media for the first time, if you accept the conditions, then click "Yes", and start downloading the bootable module. During the download, the progress screen is displayed. If you have already downloaded, please skip to step 4.

	Storage Utilities	×
?	You need to download the bootable module to create a bootable media. Do you really want to download the bootable module?	
	<u>Y</u> es <u>N</u> o	

4) If you accept the conditions, then click "Yes".



5) Check stored location of the ISO file and then import the ISO file to optical disc authoring software from stored location.



6) Write the ISO file to CD/DVD media using optical disc authoring software.

4.8.3. USB Flash Drive Capacity Restore

Size of USB flash drive will be set to about 250MB when creating the bootable USB.
Restore the capacity of the USB flash drive by following steps:
1) Select "USB Flash Drive Capacity Restore" tab.

toshiba Sto	rage Utilities
Drive Information	The Supplementary Tools feature enables various additional functions for the storage.
Performance Optimizer	Bootable USB Creator Steps for Bootable CD/DVD USB Flash Drive Capacity Restore Size of USB flash drive will be set to about 250MB when creating the bootable media to the USB flash drive. Please select USB flash drive to restore and click "Start".
Diagnostic Scan	Select a USB flash drive : Drive (G:) ¹ Bar USB Flash Disk USB Device
Over Provisioning	
System Optimizer	
Secure Erase	
Supplementary Tools	2 <u>Start</u>

Select a USB flash drive from the drive list box. If the USB is not shown in the drive list box, close the Storage Utilities and insert the created bootable USB into a port on your system before opening the Storage Utilities. Then start the Storage Utilities.

2 Click "Start".

1

2) If you accept the conditions, then check "*I understand*" and click "Yes".

Storage Utilities	×
Restore the capacity will permanently delete all data on the USB flash drive. The deleted data can not be recovered. Make sure to backup your necessary data before running.	
Do you want to erase data on the USB flash drive and restore its capacity?	
<u>Y</u> es <u>N</u> o	

3) Displays the completion screen after USB Flash Drive Capacity Restore is finished.



4.9. Operation Features on Linux Operating System

Provides features which can be operated using the bootable media created by Supplementary Tools.

4.9.1. How to boot from the bootable media



- To boot your computer from the bootable media, perform the following steps: 1) Power on your computer.
- 2) Start BIOS SETUP UTILITY.
- 3) Select Boot menu.
- 4) Select Boot Device Priority in the Boot Options menu.
- 5) Specify the created bootable media as 1st Boot Device in the Boot Device Priority menu.
- 6) Save the configuration changes and exit BIOS SETUP UTILITY.

Information	•	In AMD chipset, Storage Utilities may not work. The created bootable media (Linux) may not start in a computer with USB3.0. However, if the BIOS is updated to the latest version, there is a possibility that a computer with USB3.0 will be able to boot. When the bootable media (Linux) does not start with an internal CD/DVD drive, it may start with an external USB CD/DVD drive.

4.9.2. How to Run Secure Erase on Linux Operating System

The Secure Erase on Linux OS can be run on the primary drive (bootable drive) or the secondary drive. Secure Erase on Linux OS by following steps:

N	ot	е	

Remove the user password on the drive before running the Secure Erase. (For information on how to remove the user password on the drive, refer to your system's user manual.)

- 1) Boot from the bootable media. (See 4.9.1. How to boot from the bootable media)
- 2) Click Secure Erase menu.

•



4) The "Secure Erase" screen is displayed.

Information

Click "Start".

3

-	Information	Select a Drive:					
	Performance	Drive	Status	Capacity	Serial		
	Optimizer	0:TOSHIBA Q300 Pro 1:TOSHIBA Q300 Pro			Y3IS1032T0MW		
2	Diagnostic Scan			119.24 GB	83GS100CTOEY		
	Over Provisioning		anual for t is running,	do not power	each erasing method. off, and/or do not remove the drive fro and/or may lead malfunction.	om	
	System Optimizer 2	Normal Secure Eras Enhanced Secure Er	e	Estimated re	quired time:≤ 0 h 2 min quired time:≤ 0 h 2 min		
	Secure Erase	Block Erase Cryptographic Erase	9				
V	Supplementary Tools				3 5	art	
0	n the drive li	st select the drive	on wh		want to run Secure Erase		
0				licit you	want to full becure Erase	•	

or Sanitize Frozen.

5) If you accept the conditions, check "I understand" and click "Yes", and start Secure Erase.

	Storage Utilities
4	After starting Secure Erase, the data on the selected drive can not be recovered, including user data, OS and recovery OS. Please backup your necessary data before running the Secure Erase.
	☑ I understand.
	Do you want to run the Secure Erase?
	Yes No

6) Displays the progress for the Secure Erase task on Progress Bar.

1 % Now erasing Start		
Ŭ	1 %	
Start	Now erasing	
		Start





7)

The length of the erasure time depends on the capacity of the target drive. SSD in Read Only Mode (status is warning) may fail in erasing depending on the status of the drive.

4.9.3. How to Run Drive Backup on Linux Operating System

Backup the drive that needs to be rescued.



Backup drive on Linux OS by following steps:

- 1) Boot form the bootable media. (See 4.9.1. How to boot from the bootable media)
- 2) Click Supplementary Tools menu.

Information



4) The "Supplementary Tools (Drive Backup)" screen is displayed.

2	Drive Information	Backup the drive data to another drive.
	Performance Optimizer	Use normal drive or new drive as the destination drive. Drive Backup aimed to rescue data as much as possible, and Drive Backup will not save area for read errors.
-	Opunizei	Source Drive:
	Diagnostic	1:TOSHIBA Q300 Pro(119.24 GB) S/N:83GS100CTOEY V Status
Q	Scan	Destination Drive:
		2 0:TOSHIBA Q300 Pro(238.47 GB) S/N:Y3IS1032T0MW
	Over Provisioning	Time Detailed Progress
6	System Optimizer	
	Secure Erase	
,	Supplementary Tools	3 Ignore read errors. 4 Start
1.1		
:	Select the sou	urce SSD for Drive Backup from source drive list.

2 Select a SSD from the Destination Drive list.



If the destination drive has the capacity equal to or more than the source drive, it may be possible to use a non-supported SSD as the destination drive. However, since it is non-supported SSD, the status of drive is not displayed.

- **3** If you wish to ignore the read errors, enable the checkbox.
- 4 Click "Start".
- 5) If you accept the conditions, check *"I understand"* and click "Yes" and start Drive Backup.

	Storage Utilities
!	Drive Backup will overwrite all data on the destination drive, including user data, OS and recovery OS. The overwritten data can not be recovered. Please migrate contents to another drive from the destination drive before running the Drive Backup.
	☑ I understand.
	Do you want to run the Drive Backup?
	Yes No

6) Displays the progress for the backup process on detailed progress.

Est	imated time left:0:43:04	
	1 %	
🖌 Ignore read errors.	Backup in progress	Stop

7) Displays the completion screen after Drive Backup finished.



The SSD may enter Read Only Mode due to some problem with the file system. It may be possible to correct this condition by running check disk (CHKDSK) after Drive Backup. Drive Backup is intended to rescue as much data as possible, but the Drive Backup will not copy data in areas where it encounters read error.

4.10. Scheduler

The Scheduler allows you to schedule the time to run the Performance Optimizer and Diagnostic Scan.



Do not run Defragmentation and the Performance Optimizer simultaneously. Make sure to disable Defragmentation or disable the schedule of Defragmentation before running the performance optimization.

	Capacity	Schedule Setting	Next Execution
C:) TOSHIBA Q300 Pro	238.47 GB	NONE	NONE
(D:) TOSHIBA Q300 Pro	119.24 GB	NONE	NONE
<u> </u>	Mar also	1st week	~
() Daily	Week:		
O D <u>a</u> ily	Week:		
○ D <u>a</u> ily ○ <u>W</u> eekly	wee <u>k</u> : Weekly Da <u>v</u> :	Sunday	¥
	-	Sunday	
○ <u>W</u> eekly	Weekly Da <u>y</u> : <u>T</u> ime of execu	Sunday tion: PM 12:00	¥

1 Select a Drive

Displays the list of all available drives on your system. In the Select a Drive list, click the drive for which you want to set an automated scheduled optimizing or scanning.

2 Schedule Task

Select the task from the dropdown list box.

Enable the schedule

Check the "*Enabled this schedule*" box to set an automated scheduled optimizing or scanning. Then, set the interval, time, day and week to run the optimizing or scanning task.

4 OK/Cancel

3

Click "OK" to register the schedule setting.

4.11. Log Information

Log Information displays the result of executing the Performance Optimizer / Diagnostic Scan / Over Provisioning / Secure Erase task.

	l	Log Information	1 ×
Result : 2		<u>The task to display</u> :	All Tasks 🗸 🗸
Drive TOSHIBA Q300 Pro TOSHIBA Q300 Pro (D:) TOSHIBA Q300 Pro	Execution Time 2015/05/20 18:48 2015/05/20 18:47 2015/05/20 18:13 2015/05/20 18:12 2015/05/20 18:12 2015/05/20 18:12 2015/05/20 18:11 2015/05/20 18:11	Task Name Performance Optimizer Performance Optimizer Diagnostic Scan(Full) Performance Optimizer Over Provisioning(Release) Over Provisioning(Allocate) Diagnostic Scan(Quick) Performance Optimizer Performance Optimizer	Result No NTFS partition on the drive. (1008) No NTFS partition on the drive. (1008) Successfully completed. (5000) Successfully completed. (4000) Successfully completed. (4000) Canceled. (2002) Canceled. (2002) Successfully completed. (1000)
			3 Export Close

1 The task to display

Select the task result from dropdown list box that you want to view.

2 Result

Displays the result of executing the Performance Optimizer / Diagnostic Scan / Over Provisioning / Secure Erase task.

3 Export / Close

Click "*Export*" to export the log information to CSV format file. Click "*Close*" to close the Log Information dialog.

4.12. Export System Information

Export system information (without user information) and drive information of supported drive.

Select "About Storage Utilities..." from title button (i), and click "Export System Information" to export system information to text format file.



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