



**Products Claims Testing
Claims Test ADPC0028
ITRenew – Phase 1**

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Whilst we make every endeavour to ensure the accuracy of the information provided here and that the recommendations are made to the best of our ability they may be subject to inaccuracies or change.

REVISION HISTORY

23/02/2017 Revision 1.0 issued to Steve Mellings



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1.0 Executive Summary

This is the final report detailing the findings in relation to the execution of the ADISA Testing Methodology on Claims Test ADPC0028 submitted by ITRenew in December 2016. The claims test was carried out in accordance with ADISA Claims Testing (ACT) v1.0 and supporting document ADISA Testing Methodology v1.0, both of which are available from ADISA.

The claim made for the drive was:

“The Teraware Digital Asset Disposition Platform version 3.0 can, using Teraware SAS/SATA SSD sanitisation method and by following instructions within Teraware User Guide v 1.0, forensically sanitise the solid state devices supplied within this claim, removing all user data such that it is unrecoverable using techniques aligned to ADISA Risk Levels 1 or 2 as outlined in section 3. Upon successful sanitisation, it produces a Certificate of Sanitisation to validate this.”

Four devices were submitted as part of this test and these are listed below:

VENDOR	FAMILY	MODEL	CAPACITY	INTERFACE	RISK LEVEL	TEST LEVEL	CERT LISTING NAME
SanDisk	Lightning Series	LB150S	150GB	SAS-SSD	1,2,3,4	2	SanDisk Lightning Series SLC 150GB SAS-SSD
HP/HGST	HGST Ultrastar SSD800MM	MO0400JDVEU	400GB	SAS-SSD	1,2,3,4	2	HP 400GB 12Gbs SFF Enterprise SAS-SSD
Intel	535 Series	SSDSC2BW480H6	480GB	SATA-SSD	1,2	1	Intel 535 Series 480GB SATA-SSD
Samsung	750 EVO Series	MZ-750500BW	500GB	SATA-SSD	1,2	1	Samsung 750 EVO Series 500GB SATA-SSD

Table 1 – Devices Tested

After testing it is confirmed that the ITRenew claim is true for the devices tested up to Test Level 1 results. Those devices are:

- Intel 535 Series – Model SSDSC2BW480H6
- Samsung 750 EVO Series – MZ-750500BW

After testing it is confirmed that the ITRenew claim is true for the devices tested up to Test Level 2 results. Those devices are:

- San Disk Lightning Series – Model LB150S
- HP/HGST Ultrastar SSD800MM – Model MO0400JDVEU

2.0 Test Level 1 Testing

2.1 Simple Methodology.

This test phase is designed to evaluate the claim made by recreating an attack by a threat adversary utilising standard COTS forensic tools and techniques.

For each computer hard drive (Seagate and Samsung) device the following methodology is performed:

1. Structured data, the string "ISRG", was written to every logical block address on the hard drive.
2. The device was then imaged using Access Data/FTK.
3. The device was then erased using the Aiken Software in accordance with the manufacturers instructions.
4. The device was then imaged and analysed using Access Data/FTK.

2.2 Test Results.

Test Level 1 Summary Results

Test Level 1 replicated an attack on these devices being made by an aggressor with capabilities outlined below.

Risk Level	Threat Actor and Compromise Methods	Test Level
1 (Very Low)	Casual or opportunistic threat actor only able to mount high-level non-invasive and non-destructive software attacks utilising freeware, OS tools and COTS products.	1
2 (Low)	Commercial data recovery organisation able to mount non-invasive and non-destructive software attacks and hardware attacks.	1

The Results of Test Level 1

Hard Drive/Model	Result
San Disk Lightning Series 150GB – Model LB150S	PASS
HP/HGST Ultrastar SSD800MM 400GB – Model MO0400JDVEU	PASS
Intel 535 Series 480GB – Model SSDSC2BW480H6	PASS
Samsung 750 EVO Series 500GB – Model MZ-750500BW	PASS

Pass means that Teraware Digital Asset Disposition Platform version 3.0 can, using Teraware SAS/SATA SSD sanitisation method and by following instructions within Teraware User Guide v 1.0 mitigate the threat posed by the Threat Actors holding the capabilities outlined by Test Level 1 on the tested devices and the claim made can be confirmed.

3.0 Test Level 2 Testing

3.1 Simple Methodology.

This test phase is designed to evaluate the claim made by recreating an attack by a threat adversary utilising standard intrusive/destructive testing tools designed to read data directly off a chip.

During this phase structured data was written to the drive, which was then forensically imaged in accordance with legal guidelines. Each drive was then placed into the IT Renew Teraware Digital Asset Disposition Platform v3.0 and a data erasure job created as defined in the user manual.

The data erasure job was then executed on the ITRenew Teraware. Upon completion of the sanitisation job each drive was connected to a forensic analysis workstation and in accordance with the ADISA Threat Matrix, forensic analysis techniques were applied to recover data from the hard drive.

Then both the controller chip and NAND memory storage chips were removed and placed into chip reading devices. Forensically sound images of the controller chip and NAND memory storage chips were then created and analysed.

The two forensic images were then compared and contrasted to ensure that all structured data had been removed. For this test there is no tolerance for remnant structured data and the result is a straight Pass or Fail.

3.2 Test Results.

Test Level 2 Summary Results

Test Level 2 replicated an attack on these devices being made by an aggressor with capabilities outlined below.

Risk Level	Threat Actor and Compromise Methods	Test Level
3 (Medium)	Commercial computer forensics organisation able to mount both non-invasive/non-destructive and invasive/non-destructive software and hardware attack, utilising COTS products.	2
4 (High)	Commercial data recovery and computer forensics organisation able to mount both non-invasive/non-destructive and invasive/non-destructive software and hardware attack, utilising both COTS and bespoke utilities.	2

The Results of Test Level 2.

Hard Drive/Model	Result
San Disk Lightning Series 150GB – Model LB150S	PASS
HP/HGST Ultrastar SSD800MM 400GB – Model MO0400JDVEU	PASS

Pass means that Teraware Digital Asset Disposition Platform version 3.0 can, using Teraware SAS/SATA SSD sanitisation method and by following instructions within Teraware User Guide v 1.0 mitigate the threat posed by the Threat Actors holding the capabilities outlined by Test Level 2 on the tested devices and the claim made can be confirmed.

4.0 Summary and Conclusions

Claims Test Result: Pass on all devices tested against the test levels submitted.

Claims Test Carried Out By: Professor Andrew Blyth, PhD.

Test Facility: University of South Wales

Signature:

A handwritten signature in black ink, appearing to read 'A Blyth', with a large, stylized flourish extending from the end.

Date: 22nd February 2017

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Appendix A Claims Test Application Form (copy)



Form Number ADPC0028

Section 1 – Applicant Information

Company Name: ITRenew Inc.
Address: 8356 Central Avenue, Newark, CA 9560
General Contact
Name: Matt Mickelson
Phone: 001 408 799 4118
Mobile: 001 408 799 4118
E-Mail: matt.mickelson@itrenew.com

Section 2 – Applicant Software Information

Manufacturer: ITRenew Inc.
Version of software: Teraware v3.00

Technical/physical architecture of claims test applicant software.

The Teraware platform discovers the target device and capabilities to formulate a multi-step, forensic-level, sanitisation protocol for a solid state device.

STEP 1: CRYPTOGRAPHIC ERASE – Teraware designates the first step in the process to address the devices that support the means to delete the cryptographic key between the flash controller and the NAND flash. This step uses one of several possible commands best suited to address the cryptographic key erasure.

STEP 2: PRNG OVERWRITE – Teraware applies a pseudorandom pre-deterministic data pattern to the device that covers all user block address.

STEP 3: BLOCK ERASE – Teraware will issue a firmware based command that will trigger a back-end block erase command to the NAND flash that will eliminate all data from the user provisioned data areas and also the reserved blocks of the NAND. This step uses one of several possible commands best suited to address the block erase command.

STEP 4: OVERWRITE ERASE – Teraware performs another overwrite step that is designed to prepare the device for re-use by remapping the poor performing NAND blocks and re-write the bad block table. To execute this process, Teraware may issue a firmware based technique that will perform a full medium overwrite of the drive. If the device does not offer a means of self-overwrite, Teraware shall issue a host overwrite method.

STEP 5: MEDIA VERIFICATION – Teraware performs a full verification of all user-provisioned blocks of the device to confirm the absence of any user data or unstructured data patterns.

Best practice usage guide for usage of software being tested. (Please enclose any manuals)

Teraware_User_Guide_v1.0.pdf

Host Information for claims test applicant software to run on. To be shipped by test claimant.

1 x Teraware Appliance (contains the application and deployment system)
1 x Dell CS24-TY server w/LSI SAS 9211-4i HBA (processing station)
Teraware User Guide

Section 3 – Test Hardware Information

VENDOR	FAMILY	MODEL	CAPACITY	INTERFACE	RISK LEVEL	TEST LEVEL	CERT LISTING NAME
SanDisk	Lightning Series	LB150S	150GB	SAS-SSD	1,2,3,4	2	SanDisk Lightning Series SLC 150GB SAS-SSD
HP/HGST	HGST Ultrastar SSD800MM	MO0400JDVEU	400GB	SAS-SSD	1,2,3,4	2	HP 400GB 12Gbs SFF Enterprise SAS-SSD
Intel	535 Series	SSDSC2BW480H6	480GB	SATA-SSD	1,2	1	Intel 535 Series 480GB SATA-SSD
Samsung	750 EVO Series	MZ-750500BW	500GB	SATA-SSD	1,2	1	Samsung 750 EVO Series 500GB SATA-SSD

ADISA Threat Matrix

Risk Level	Threat Actor and Compromise Methods	Test Level
1 (Very Low)	Casual or opportunistic threat actor only able to mount high-level non-invasive and non-destructive software attacks utilising freeware, OS tools and COTS products.	1
2 (Low)	Commercial data recovery organisation able to mount non-invasive and non-destructive software attacks and hardware attacks.	1
3 (Medium)	Commercial computer forensics organisation able to mount both non-invasive/non-destructive and invasive/non-destructive software and hardware attack, utilising COTS products.	2
4 (High)	Commercial data recovery and computer forensics organisation able to mount both non-invasive/non-destructive and invasive/non-destructive software and hardware attack, utilising both COTS and bespoke utilities.	2
5 (Very High)	Government-sponsored organisations or an organisation with unlimited resources and unlimited time capable of using advanced techniques to mount all types of software and hardware attacks to recover sanitised data.	3

Section 4 – The Claim

The Teraware Digital Asset Disposition Platform version 3.0 can, using Teraware SAS/SATA SSD sanitisation method and by following instructions within Teraware User Guide v 1.0, forensically sanitise the solid state devices supplied within this claim removing all user data such that it is unrecoverable using techniques aligned to ADISA Risk Levels 1 or 2 as outlined in section 3. Upon successful sanitisation, it produces a Certificate of Sanitisation to validate this.

Claim Technical Contact at applicant.

Name: Matt Mickelson

Phone: 408-799-4118

Mobile: 408-799-4118

E-mail: matt.mickelson@itrenew.com

Acceptance

I, Matt Mickelson of ITRenew confirm that the information outlined in this document is an accurate and true reflection of the claims made by our product wishing to undergo the ADISA testing method.

Signed on behalf of ITRenew

SIGNED:

NAME: Matt Mickelson

TITLE: Director, Product Management

DATE: 12/09/2016

Claim Accepted by:

Signed on behalf of University of South Wales

SIGNED:

NAME: Andrew Blyth

TITLE: Professor

DATE:

Signed on behalf of ADISA

SIGNED:

NAME: Steve Mellings

TITLE: Director

DATE: