

Self-Encrypting Drive Market and Technology Report



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9460 Carmel Road
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Tel (408) 978-8184

www.tomcoughlin.com

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Executive Summary

The major conclusions from this report are:

- ***By 2017 we project that 100% of all HDDs shipped will be SED capable, driven by implementation of this capability into commercial HDD controllers***
- ***By 2018 about 11% of all HDDs shipping units will shift to SED enabled or promoted products, driven by security adoption demand.***
- ***By 2018 the high, median and low estimates for SED enabled adoption for SED HDDs are 85 M, 70 M and 54 M units.***
- ***By 2014 almost all SSDs were SED capable and by 2015 they all have this capability.***
- ***Although actual SSD SED feature implementation in 2018 is 100% in about 236 M SSDs, the projected actual SSDs from that year intended for security and data protection purposes is estimated at less than 24 M units.***

Introduction

In July and August 2011, in cooperation with members of the Trusted Computing Group storage working group, Coughlin Associates conducted a survey of a number of interested parties on the use of encryption to provide security in various types of electronic equipment that use storage devices. Those interviewed included storage device suppliers (hard disk drives and solid state drives), systems OEMs, security software companies, storage controller suppliers and others. This report is based upon an updated version of that survey that includes further information collected in November through March 2014.

Based upon input from the interviews, we created a list of drivers for the use of self-encrypting drives (SEDs) as well as factors that limit their use in the market, both historically as well as in the near future. In this report we examine each of these positive and negative factors and look at their historical impact on the SED market and the implications of these factors in the future growth of SEDs, both HDDs and SSDs.

In addition to input from the interviews we also used public information such as press releases, reports and presentations to look at both past projections and factors driving or moderating future growth. We include references and material from these sources as appropriate in this report.

In the course of our analysis we came to realize that there was more than one type of metric for the growth of SED devices. The first metric is the growth of **SED capable devices**. SED capable devices have self-encryption built into the basic architecture of the device. Data coming into and out of the device are encrypted or can be encrypted if this feature is enabled. The second metric is the growth of **Security enabled** SED devices. These devices are SED capable and either the vendor sells these products for security applications or sells these products with software that enables their use for security applications. The third metric is the growth of **Security adoption** using SEDs. The first metric enables the second and third metrics but not all SED capable devices are sold for security purposes or actually used for protecting the privacy of data. Thus security adoption will by its nature be slower than SED capability and Security enabled growth.

We base our projections upon a simplified version of the Bass Diffusion Model⁹. This model is a mathematical model that projects growth of a market based upon accelerating and resisting factors. As a result of the interaction of these factors the resulting growth curve has a familiar s-shape. An analysis of the factors leading to s-curve growth is given in the report appendix. In our projection for security adoption we assume that all the SED capable devices sold to date are actually used for or intended to be used for, the protection of data. We use historical data on SED HDDs and appropriate growth factors for several HDD markets to project security adoption in each of these markets and by aggregating these projections, arrive at a projection of security adoption growth for HDDs. High, median and low estimates for security adoption are based upon high, median and low estimates for total HDD shipments.

Separately we make projections for the growth of SED capable storage devices, arguing that once the demand for these devices in a given market exceeds some threshold value that all HDDs intended for that market will become SED capable devices within some reasonable period of time. We review our earlier projections and provide new projections based upon new information collected in the intervening three years.

Historical data for SED SSDs is becoming available. Due to the importance of secure erase (i.e., changing the encryption key to scramble the data) for making data inaccessible on a SSD, our earlier prediction that SED capable SSDs would become widespread more quickly than for HDDs has largely proven correct

Technology Options for Data at Rest

Self-encrypting hard disk drives were first introduced by Seagate Technology in 2007. These initial products were called Full Disk Encryption (FDE) drives under the brand name DriveTrust. FDE drives were introduced by Seagate in advance of a SED

About the Authors:

Tom Coughlin



Tom Coughlin, President, Coughlin Associates is a widely respected storage analyst and consultant. He has over 30 years in the data storage industry with multiple engineering and management positions at high profile companies.

Dr. Coughlin has many publications and six patents to his credit. Tom is also the author of Digital Storage in Consumer Electronics: The Essential Guide, which was published by Newnes Press. Coughlin Associates provides market and technology analysis as well as Data Storage Technical

Consulting services. Tom publishes the *Digital Storage Technology Newsletter*, the *Media and Entertainment Storage Report*, and other industry reports. Tom is also a regular contributor on digital storage for Forbes.com.

Tom is active with SMPTE, SNIA, the IEEE (he is Director for IEEE Region 6 and active in the Consumer Electronics Society) and other professional organizations. Tom is the founder and organizer of the Annual Storage Visions Conference (www.storagevisions.com), a partner to the International Consumer Electronics Show, as well as the Creative Storage Conference (www.creativestorage.org). He is the general chairman of the annual Flash Memory Summit. He is a Senior member of the IEEE, Leader in the Gerson Lehrman Group Councils of Advisors and a member of the Consultants Network of Silicon Valley (CNSV). For more information on Tom Coughlin and his publications. go to www.tomcoughlin.com.

Walt Hubis



Walt Hubis is a storage architect and the owner of Hubis Technical Associates. He provides expertise related to storage interface and storage security standards organizations with a focus on protocols and software interfaces and how innovative and disruptive computer storage technologies impact these standards. Walt has over twenty-five years of experience in storage systems engineering in both development and managerial positions and has authored several key patents in RAID and other storage related technologies. He is the vice-chair of the SNIA SSSI Initiative and has served as the Chair of the Trusted Computing Group Key Management Services Subgroup, Chair of the IEEE SISWG P1619.3 Key Management subcommittee, and Secretary of the IEEE Security in Storage work group (SISWG). Walt is a sought-after speaker at industry conferences. He holds a Bachelor of Science degree in Electrical Engineering. For more information on Walt and his activities, go to www.hubistech.com.

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We also thank all the industry participants and experts who participated in discussions with us on the market in the course of the preparing this report.

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THE 2015 SELF-ENCRYPTING DRIVE MARKET AND TECHNOLOGY REPORT

By: Tom Coughlin, Coughlin Associates & Walt Hubis, Hubis Technology

Learn about the trends in self-encrypting hard disk drives and solid state drives in this updated comprehensive report. This report goes over the history of self-encrypted storage devices, distinguishes between self-encrypted drive security adoption and capability adoption and makes projections for the growth of both for both hard disk and flash memory based self-encrypted solid state drives for both client and enterprise applications.

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