



# Self-Encrypting Drives



# Client Security: Pre-Boot Authentication

- **Transparency: Master boot record and OS are unmodified**
- **Protected from malicious software: Authentication occurs before OS (and any malicious software) is loaded**
- **The master boot record can't be corrupted: The entire drive, including the master boot record, is encrypted**

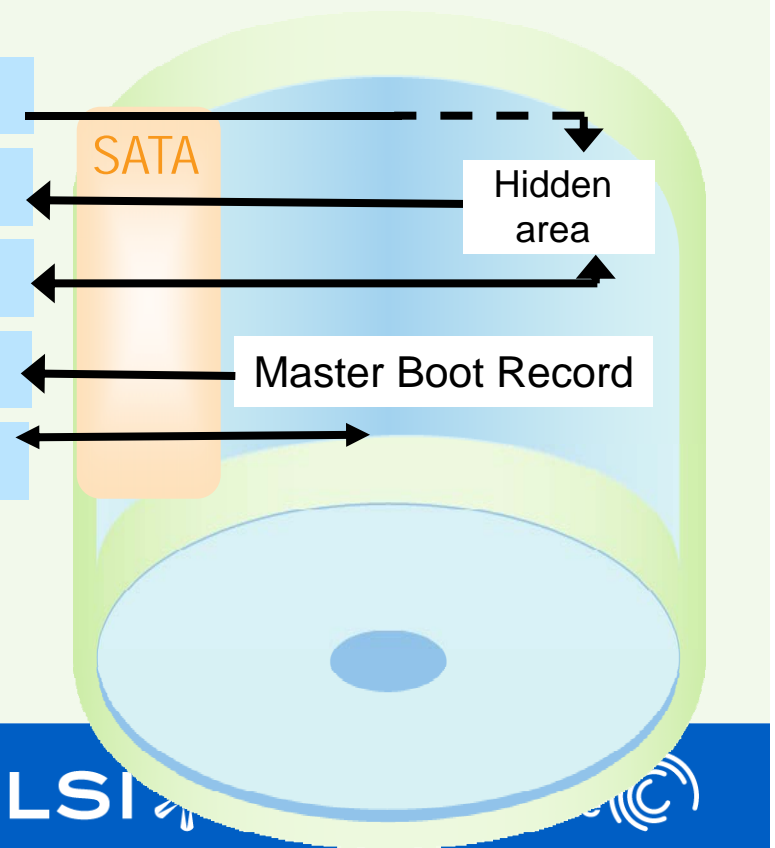
1. BIOS attempts MBR read; drive redirects to pre-boot area

2. Drive loads pre-boot OS

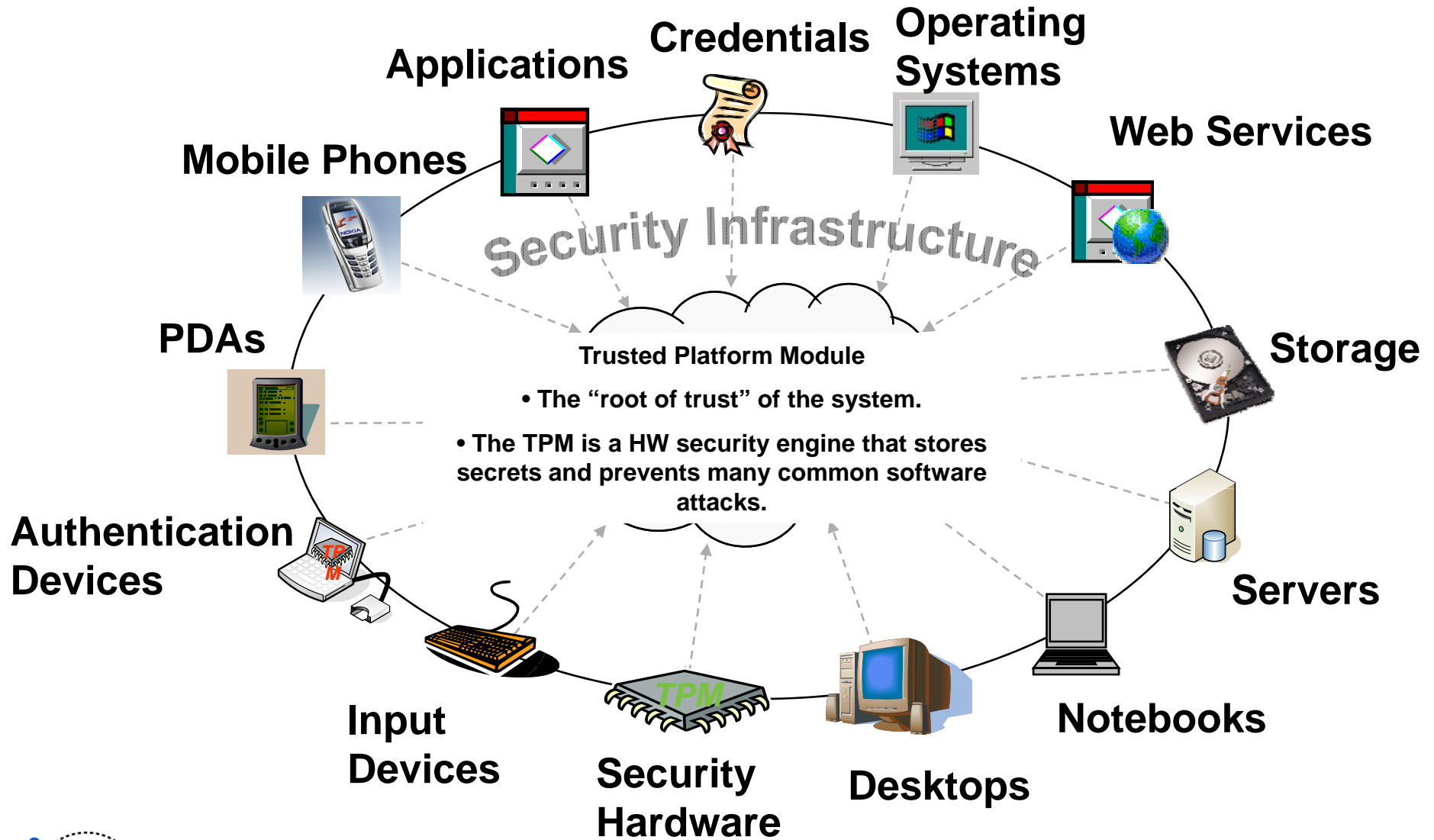
3. User enters authentication credentials for drive to verify

4. If authentication successful, drive loads original MBR

5. Normal operation commences



# Trusted Computing Group: Activities



# Trusted Storage Standardization



**Published Storage Specifications**



# IT Retires Hard Drives Constantly

All Drives are Eventually Retired

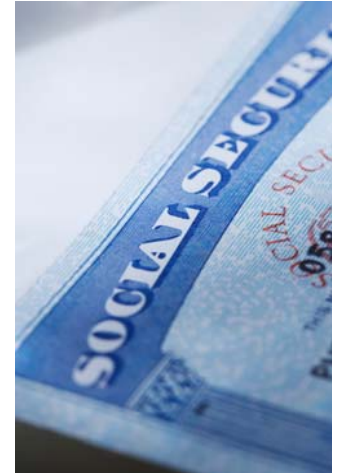
- End of Life
- Returned for Expired Lease
- Returned for Repair / Warranty
- Repurposed

50,000 drives leave data centers daily

Exposure of data is expensive - \$14 million on average

90% of retired drives are still readable (IBM study)

A simple, efficient, secure way to make retired hard drive data unreadable is needed.



# How the Drive Retirement Process Works

## Retirement Options



Retire Drive

- Replace
- Repair
- Repurpose

Drive Retirement is:

*Expensive*

*Time-consuming*

*Error-prone*

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IRON MOUNTAIN

*which lost a tape with 150,000 Social Security numbers stored at an Iron Mountain warehouse, October 2007<sup>1</sup>*

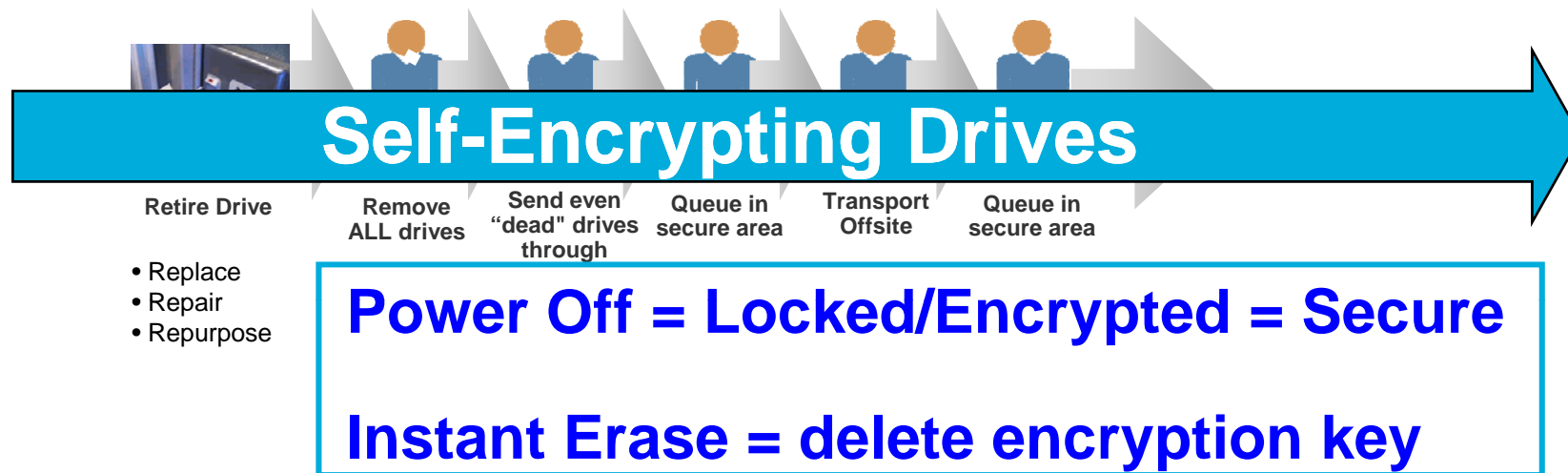
Data recovery specialists at Kroll Ontrack Inc. retrieved 99% of the information stored on the charred Seagate hard drive's platters over a two day period.

- May 7, 2008 (Computerworld)

1. <http://www.usatoday.com/tech/news/computersecurity/2008-01-18-penney-data-breach>



# Drive Retirement: Self-Encrypting Drives



Reduces IT operating expense

- Eliminates the need to overwrite or destroy drive
- Secures warranty and expired lease returns
- Enables drives to be repurposed securely

Provides safe harbor for data privacy laws



# Performs at Full Drive Speed



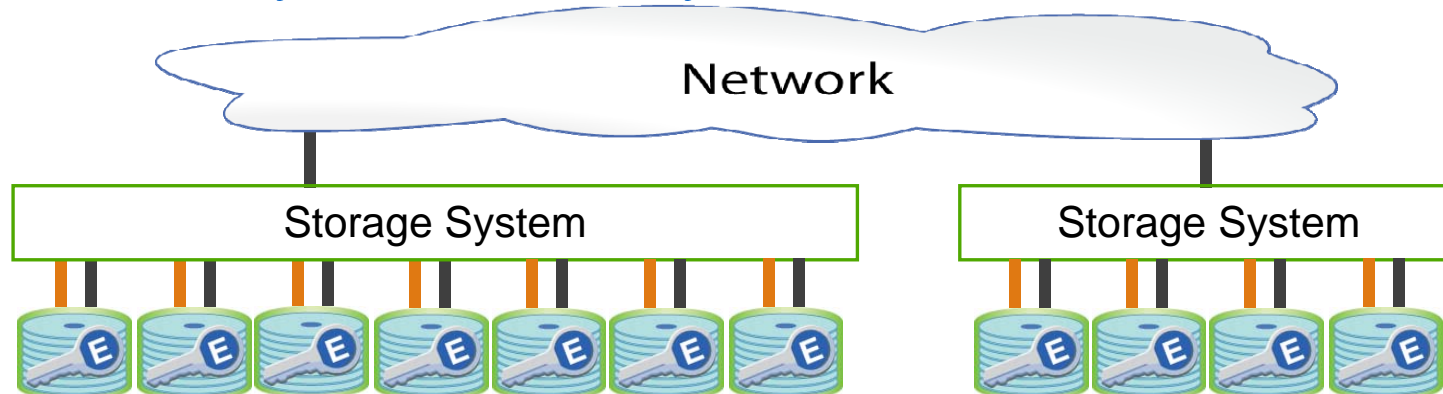
Encryption engine speed

Matches

Port's max speed

The encryption engine is in the controller ASIC

## Scales Linearly, Automatically



All data can be encrypted, with no performance degradation  
No need to classify which data to encrypt





# Self-Encrypting Drives

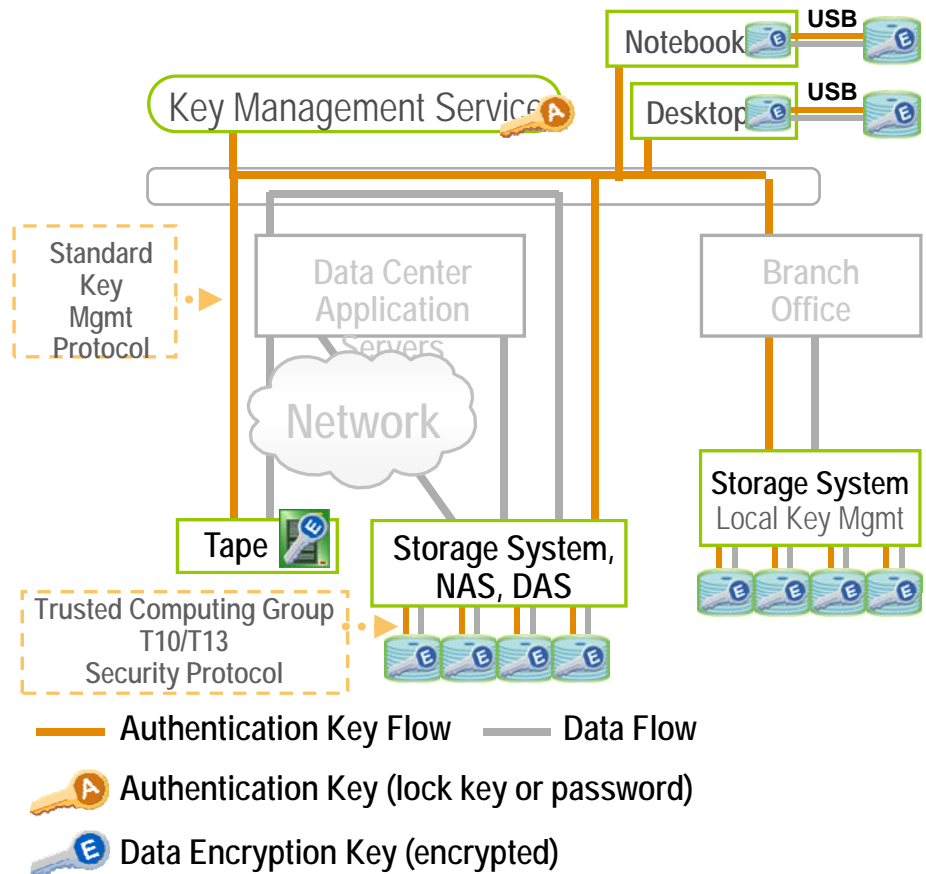
- Simplified Management
- Robust Security
- Compliance “Safe Harbor”
- Cuts Disposal Costs
- Scalable
- Interoperable
- Integrated
- Transparent

“Many organizations are considering **drive-level security for its simplicity** in helping secure sensitive data through the hardware lifecycle from initial setup, to upgrade transitions and disposal,”

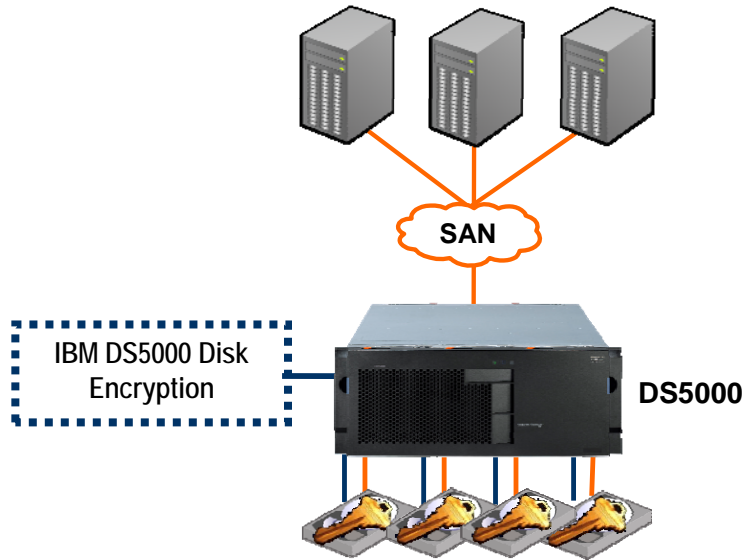
Eric Ouellet  
Research Vice President  
Gartner



# Self Encrypting Drives/Data Center



## LSI SafeStore™ Encryption Services and SED As demonstrated with IBM DS5000 Disk Encryption



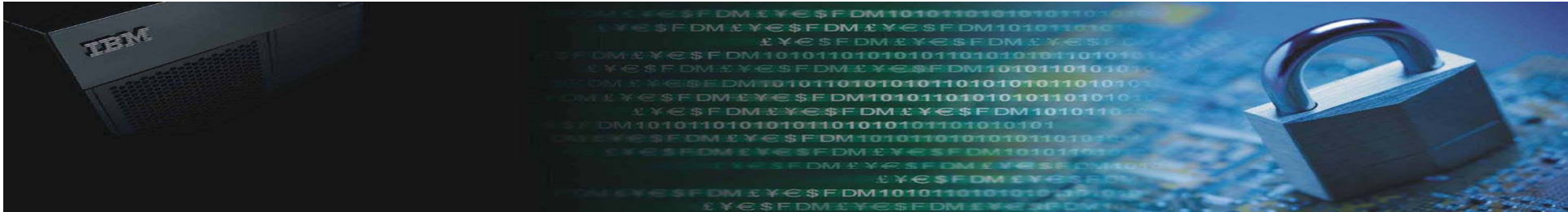
### Part 2:

- Exercise #1 - Getting Started
- Exercise #2 - Securing a Volume Group
- Exercise #3 – Instant Secure Erase

### Part 1:

- Exercise #1 – SED pre-boot authentication
- Exercise #2 – Data Center with SED





## Storage Encryption and Key Management

Encryption built into the infrastructure (not on top)

- **New Key Management automation software**
- **New IBM self-encrypting disk drive offering**
- **Enhanced IBM self-encrypting tape offerings**

Over 3,500 security professionals worldwide

Over \$1.5B investment in security in 2008

Tivoli Key Lifecycle Manager

System Storage DS8000 Disk System

System Storage TS1130 Tape Drive

System Storage LTO4 Tape Drive

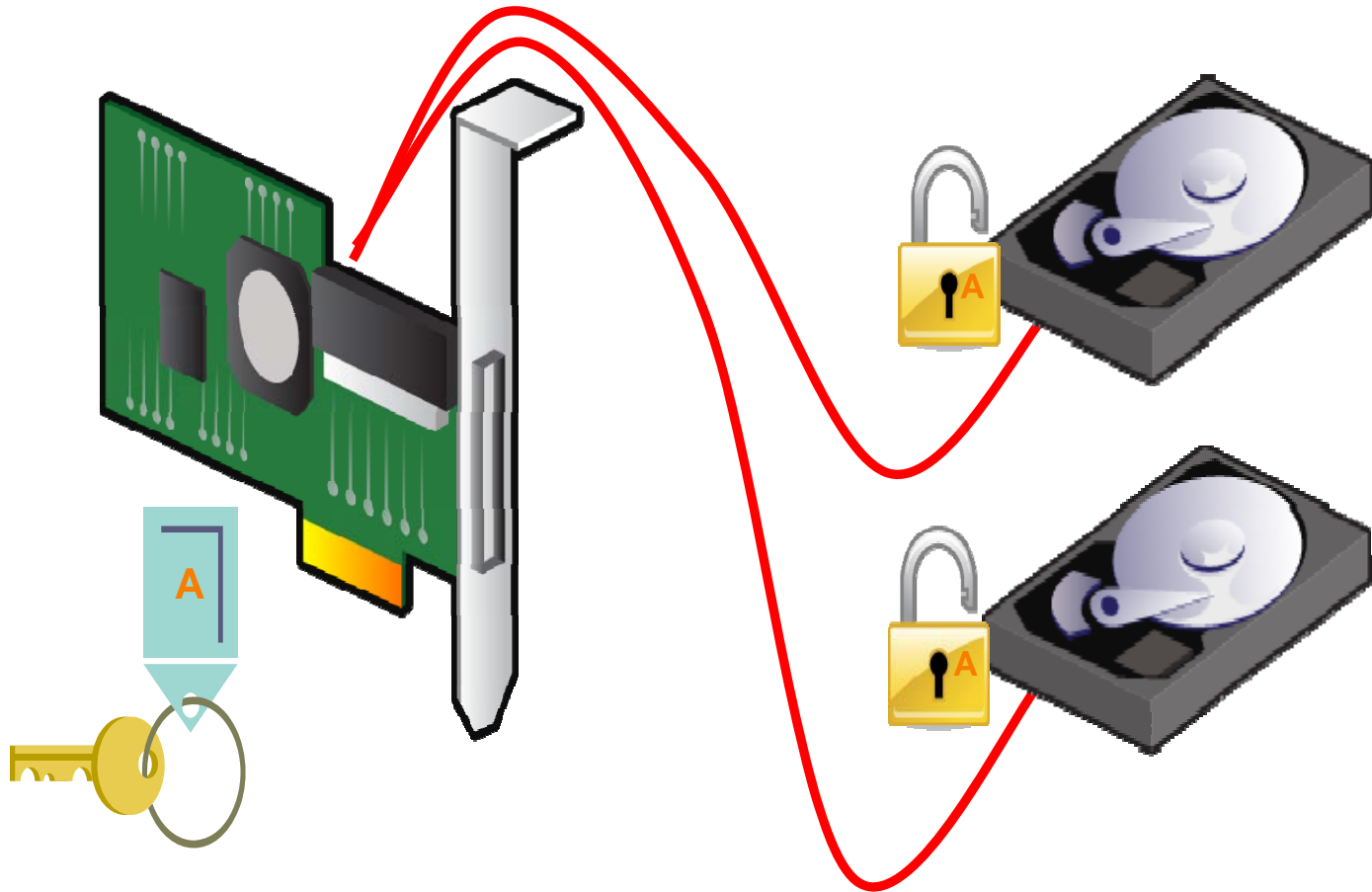
IBM ISS Security & Privacy Services

“What separates IBM from the pack is its ability to provide a complete and extensible Storage Encryption architecture, including an *enterprise key management capability*.”

Jon Oltsik, Enterprise Strategy Group, August 2008



# LSI MegaRAID Demo



*Secure*

*Simple*

*Affordable*

*High performance*



# More Information

- Self-Encrypting Drive whitepapers, webcasts, performance demo  
[www.fdesecurityleaders.com](http://www.fdesecurityleaders.com)

- Storage Networking Industry Association (SNIA)  
Storage Security Industry Forum (SSIF)  
[www.snia.org/forums/ssif/knowledge\\_center](http://www.snia.org/forums/ssif/knowledge_center)



- Trusted Computing Group  
[www.trustedcomputinggroup.org](http://www.trustedcomputinggroup.org)

