RSACONFERENCE2013

Deployment Strategies for Effective Encryption

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WYNDHAM WORLDWIDE

Deployment Strategies for effective encryption

- encryption internals are built on complex mathematics and number theory
- your successful encryption program requires a CISSP, CISA and PMP, not necessarily a PhD
- effective encryption strategy requires **attention to detail**, **good design**, combined with good **project management** and **documentation**
- your encryption strategy must reflect this

It’s 2013 – where’s the encryption?

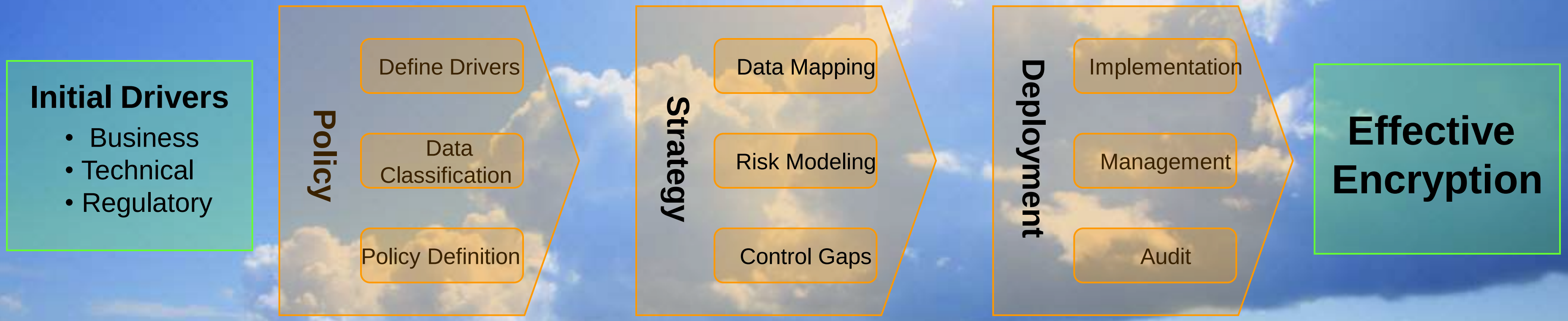
- many roll-outs are nothing more than stop-gap solutions
- *Getting it done* often takes precedence over key management, documentation, processes, etc.
- many organizations lack required security expertise
- these and more combine to obstruct encryption from being ubiquitous
- adds up to a significant need for an effective encryption deployment strategy

3 steps to effective encryption

1. define your requirements
2. know where your sensitive data resides
3. create detailed implementation plans

- when implementing your encryption strategy, it’s imperative to remember that your encryption project, and information security is a **process**, **not a product**.

Encryption nirvana scenario



Initial Drivers

- Business
- Technical
- Regulatory

Policy

- Define Drivers
- Data Classification
- Policy Definition

Strategy

- Data Mapping
- Risk Modeling
- Control Gaps

Deployment

- Implementation
- Management
- Audit

Effective Encryption

Common deployment mistakes

- Thinking encryption projects are plug and play
  - until they have to deal with key management
  - don’t forget about legacy systems
- Going to a vendor too early
  - vendors sell hardware/software
  - you need requirements, project plans, implementation plans, etc.
- Not giving enough time to design and testing
  - an effective encryption roll-out takes time
  - requires significant details
  - **you can’t rush this!**

Encryption strategy

- mathematics of cryptography is rocket science
  - most aspects of information security, compliance and audit aren't
- good computer security is attention to detail and good design, combined with effective project management
  - enterprise encryption strategy must reflect this
- not everyone will need encryption across the board
- policies need to be determined first as to what requires encryption
  - strategy of *"let's just encrypt everything"* demonstrates confusion

Analyze your encryption needs

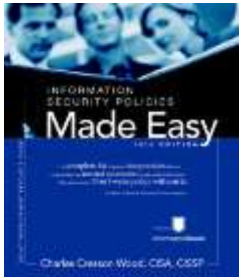
- protect data from loss and exposure
- prevent access to the system itself?
- does software need to access the files after encryption?
- data to be transported securely? via what means?
- how much user burden is acceptable?
- how strong does the encryption need to be?
- do you need to match the solution to the hardware?
- regulatory, contractual, organizational policy
- **ask a lot of questions at this point!**
  - and when you are done, ask a lot more

Drivers and requirements

- If you don’t know your drivers, you’re driving blind.
- Business
  - customer trust
  - intellectual property
- Technical
  - AES, PGP, BitLocker, etc.
  - mobile devices
- Regulatory
  - PCI / SoX / EU / ISO-17799
  - State data breach laws

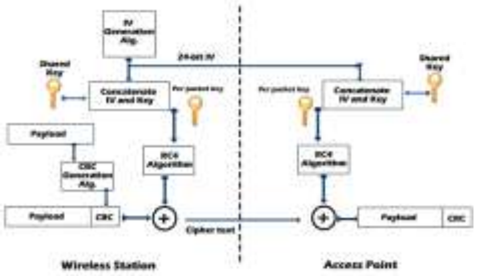
Image source: http://www.whattofix.com/blog/archives/2008/05/peace-for-pachy.php

Documentation and policies


INFORMATION SECURITY POLICIES
Made Easy
Charles Cresson Wood, CISA, CISSP

- Encryption **must** be supported by policies, documentation and a formal risk management program
  - shows work adequately planned and supervised
  - demonstrates internal controls studied and evaluated
- Policy must be
  - endorsed by management
  - communicated to end-users and business partners / 3rd-parties that handle sensitive data. If it can't meet company's policies, don't give others access to the data
  - encryption responsibility should be fixed with consequences for noncompliance

Encryption processes



- encryption is a process intensive endeavor
- must be well-defined and documented
- if not implemented and configured properly, can cause system performance degradation, operational hurdles and locking yourself out of your own data
- improperly configured encryption processes give false sense of security
  - perception that confidentiality of sensitive information is protected when it's not

It’s all about the data

- Identify all methods of data input/output
- storage media
  - smartphones, USB, laptops, removable, SSD, and more
- business partners and other third parties
- understand all applicable regulations and laws
- high-risk areas
  - laptops
  - wireless
  - data backups
  - others

Requirements analysis

WALLY, WE DON'T HAVE TIME TO GATHER THE PRODUCT REQUIRE-MENTS AHEAD OF TIME.

- define business, technical, and operational requirements and objectives for encryption
- define policies, architecture, and scope of encryption requirements
- conduct interviews, review policy documents, analyze current and proposed encryption strategy to identify possible security gaps
- determine liabilities
- better requirements definition directly correlates to successful encryption program

Understand your encryption options

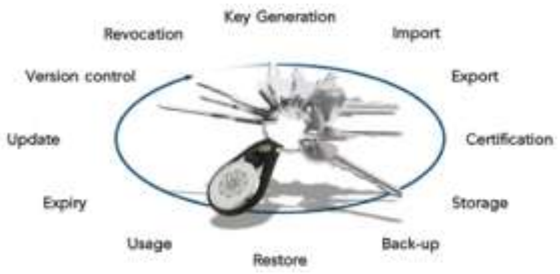
- **full-disk / host-based encryption (at rest)**
  - data encrypted at creation, first possible level of data security
- **appliance-based**
  - data leaves host unencrypted, then goes to dedicated appliance for encryption. Quickest to implement; but can be costly
- **storage device encryption**
  - data transmitted unencrypted to storage device
  - easiest integration into existing backup environments
- **tape**
  - data encrypted on tape drive; easy to implement
  - provides protection from both offsite and on-premise information loss
- **database**
  - database encrypted tables inside the database, protected by native DBMS access controls

Key management (KM)

- Key management is a big deal; don’t underestimate it
- generation, distribution, storage, recovery and destruction of encryption keys
- encryption is 90% management and policy, 10% technology
- most encryption failures due to ineffective KM processes
- 80% of 22 SAP testing procedures related to encryption are about KM
- effective KM policy and design requires significant time and effort

Key management fundamentals

Ask lots of the fundamental questions:



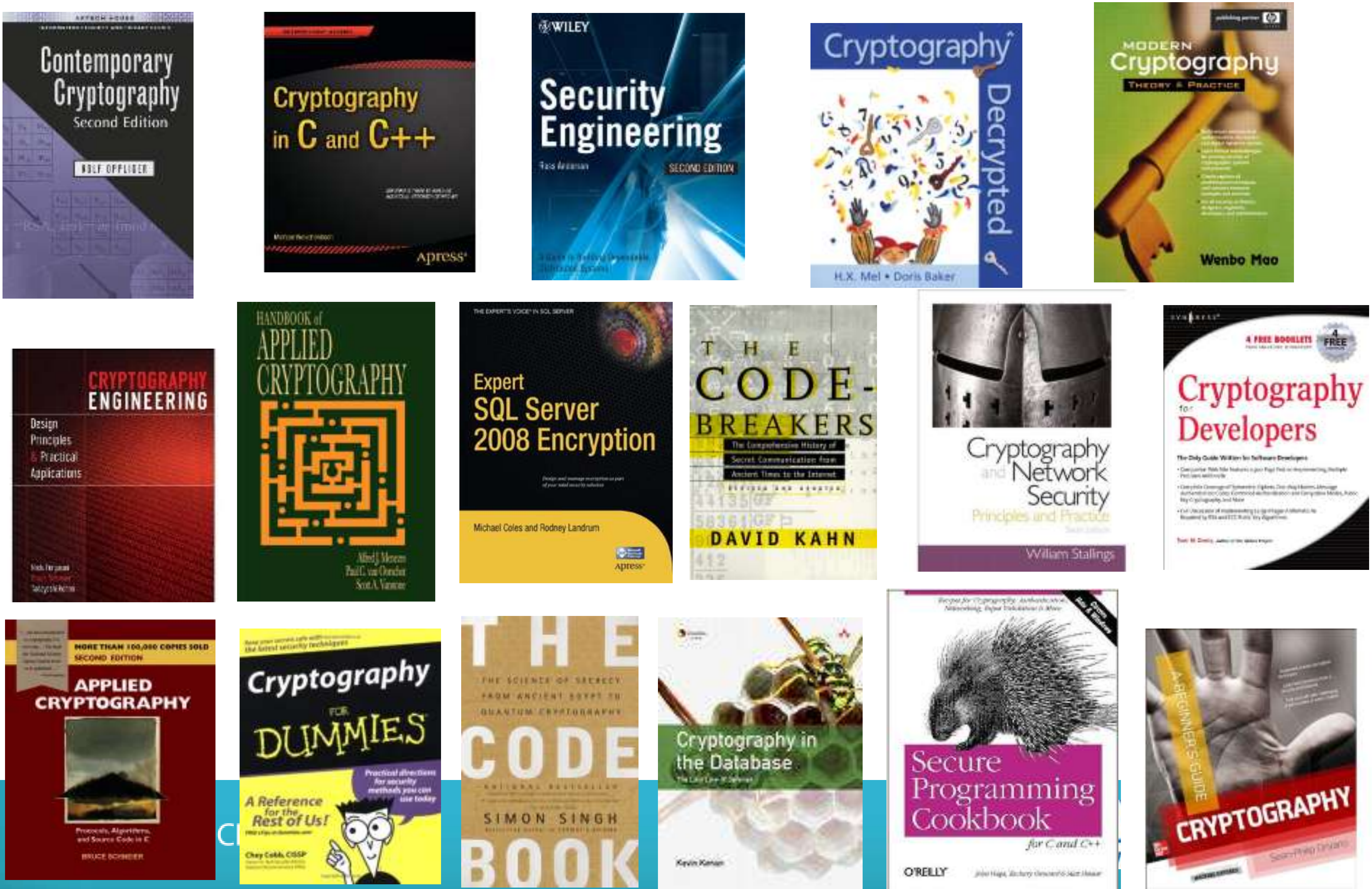
- how many keys do you need?
- where are keys stored?
- who has access to keys?
- how will you manage keys?
- how will you protect access to encryption keys?
- how often should keys change?
- what if key is lost or damaged?
- how much key management training will we need?
- how about disaster recovery?

Encryption is a long journey

Immediate steps in the long-term encryption expedition

- prioritize based on specific requirements and compensating controls
- identify your most sensitive/confidential data and know where it resides
  - organizations that don’t have an effective data classification program usually fail at their data encryption projects - *Gartner*
- know which regulatory mandates matter most
- leverage DLP to more effectively identify sensitive content that resides on the network and at the endpoint

There’s a book for that



Summary

- organizations that do not have an effective data classification program usually **fail** at their data encryption projects
- creating an **effective deployment strategy** is the difference between strong encryption and an audit failure
- encryption is about **attention to detail**, **good design** and **project management**.

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