Enterprise Key Management Infrastructure (EKMI)

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OASIS IDtrust Workshop
Barcelona, Spain
October 22, 2007
Why do you need EKMI?

- Avoid going to jail
  - UK's Regulation of Investigatory Powers (RIPA) Act 2000 Part 3\(^1\)

- Avoid breach-related charges
  - TJX charge of $216M\(^2\)

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2: [http://www.sec.gov/Archives/edgar/data/109198/000095013507005281/b66678tje10vq.htm](http://www.sec.gov/Archives/edgar/data/109198/000095013507005281/b66678tje10vq.htm)
Why do you need EKMI?

- **Regulatory Compliance**
  - PCI-DSS, PCSA, HIPAA, FISMA, SB-1386, etc.
  - Impending Massachusetts H213 bill
- **Avoiding fines** - ChoicePoint $15M, Nationwide Building Society £1M
- **Avoiding lawsuits**
  - Accenture, BofA, TD Ameritrade, TJX (multiple)
- **Avoiding negative publicity**
  - VA, IRS, Fidelity, E&Y, Citibank, BofA, WF, Ralph Lauren, UC, 300+ others
The Encryption Problem

- Define Policy
- Generate
- Encrypt
- Decrypt
- Escrow
- Authorize
- Recover
- Destroy
- Audit

---------and on and on---------
Key Management Silos
EKMI Harmony

Application 1

Application 2

Application 3

Application 4

LAN

EKMI

PKI

SKMS

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The Encryption Solution

- Define Policy
- Generate
- Protect
- Escrow
- Authorize
- Recover
- Destroy
- Audit

SKS Server

- Encrypt
- Decrypt

WAN

SKS Server

- Encrypt
- Decrypt

- Encrypt
- Decrypt

- Encrypt
- Decrypt

- Encrypt
- Decrypt
What is an EKMI?

An Enterprise Key Management Infrastructure is:

“A collection of technology, policies and procedures for managing all cryptographic keys in the enterprise.”
EKMI Characteristics

- A single place to define EKM policy
- A single place to manage all keys
- Standard protocols for EKM services
- Platform and Application-independent
- Scalable to service millions of clients
- Available even when network fails
- Extremely secure
EKMI Components

- Public Key Infrastructure
  - For digital certificate management; used for strong-authentication, and secure storage & transport of symmetric encryption keys

- Symmetric Key Management System
  - SKS Server for symmetric key management
  - SKCL for client interactions with SKS Server
  - SKSML protocol

- EKMI = PKI + SKMS
SKMS Big-Picture

1. Client Application makes a request for a symmetric key
2. SKCL makes a digitally signed request to the SKS
3. SKS verifies SKCL request, generates, encrypts, digitally signs & escrows key in DB
4. Crypto HSM provides security for RSA Signing & Encryption keys of SKS
5. SKS responds to SKCL with signed and encrypted symmetric key
6. SKCL verifies response, decrypts key and hands it to the Client Application
7. Native (non-Java) applications make requests through Java Native Interface
The Sharing Problem - (DHS-PCII)

Private Sector PCI Data + Encryption Key = PCI Ciphertext

DHS Personnel

Key shared out-of-band

First Responder

Encryption Key shared out-of-band

Internet

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The Sharing Problem - Multiplied

Private Sector PCI Data
(Tens of thousands?)

Encryption Keys

DHS Personnel
(180,000+)

First Responders
(50 States,
3000+ Counties,
20,000+ Cities)
The Sharing Problem - Solved*

Private Sector PCI Data
(Tens of thousands?)

First Responders
(50 States,
3000+ Counties,
20,000+ Cities)

DHS Personnel
(180,000+)

Internet

SKS Server

PCII Database
The Retail Solution

Store 1

Store N

WAN

SKS Server

Back-Office Database

Bank Settlement

Fraud Analysis
The Healthcare Solution

EMT 1 Laptop

EMT N Laptop

Wireless MAN

AP

SKS Server

ER Application and Database

Patient Registration

ER Nurse

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The Financial Solution
EKMI TC Goals

- Standardize Symmetric Key Services Markup Language (SKSML)
- Create Implementation & Operations Guidelines
- Create Audit Guidelines
- Create Interoperability Test-Suite
33 EKMI TC Members/Observers

- FundServ*
- MISMO
- NuParadigm Government Systems
- PA Consulting (UK)
- PrimeKey (Sweden)
- Red Hat
- StrongAuth*
- US Dept. of Defense
- Visa International*
- Wave Systems

- Wells Fargo
- WISeKey (Switzerland)
- OS Software company
- Database SW company
- PKI SW company (Canada)
- Storage/Security SW company
- Storage/Security SW company
- Govt. Agency (New Zealand)
- Individuals representing Audit and Security backgrounds*

* Founder Members
Burton Group on EKMI

"The life cycle of encryption keys is incredibly important. As enterprises deploy ever-increasing numbers of encryption solutions, they often find themselves managing silos with inconsistent policies, availability, and strength of protection. Enterprises need to maintain keys in a consistent way across various applications and business units," said Trent Henry, senior analyst, Burton Group. "EKMI will be an important step in addressing this problem in an open, cross-vendor manner."

Conclusion

“Securing the Core” should have been Plan A from the beginning – but it’s not too late for remediation.

OASIS EKMI TC is driving new key-management standards that cuts across platforms, applications and industries.

Get involved!
Resources

- OASIS EKMI TC Resources
  - Use Cases, SKSML Schema, Presentations, White Papers, Guidelines, etc.
- www.strongkey.org - Open Source SKMS implementation
- www.issa.org - Article on SKMS in February 2007 issue of ISSA Journal