Multi-Layered Security in Road Tolling Services

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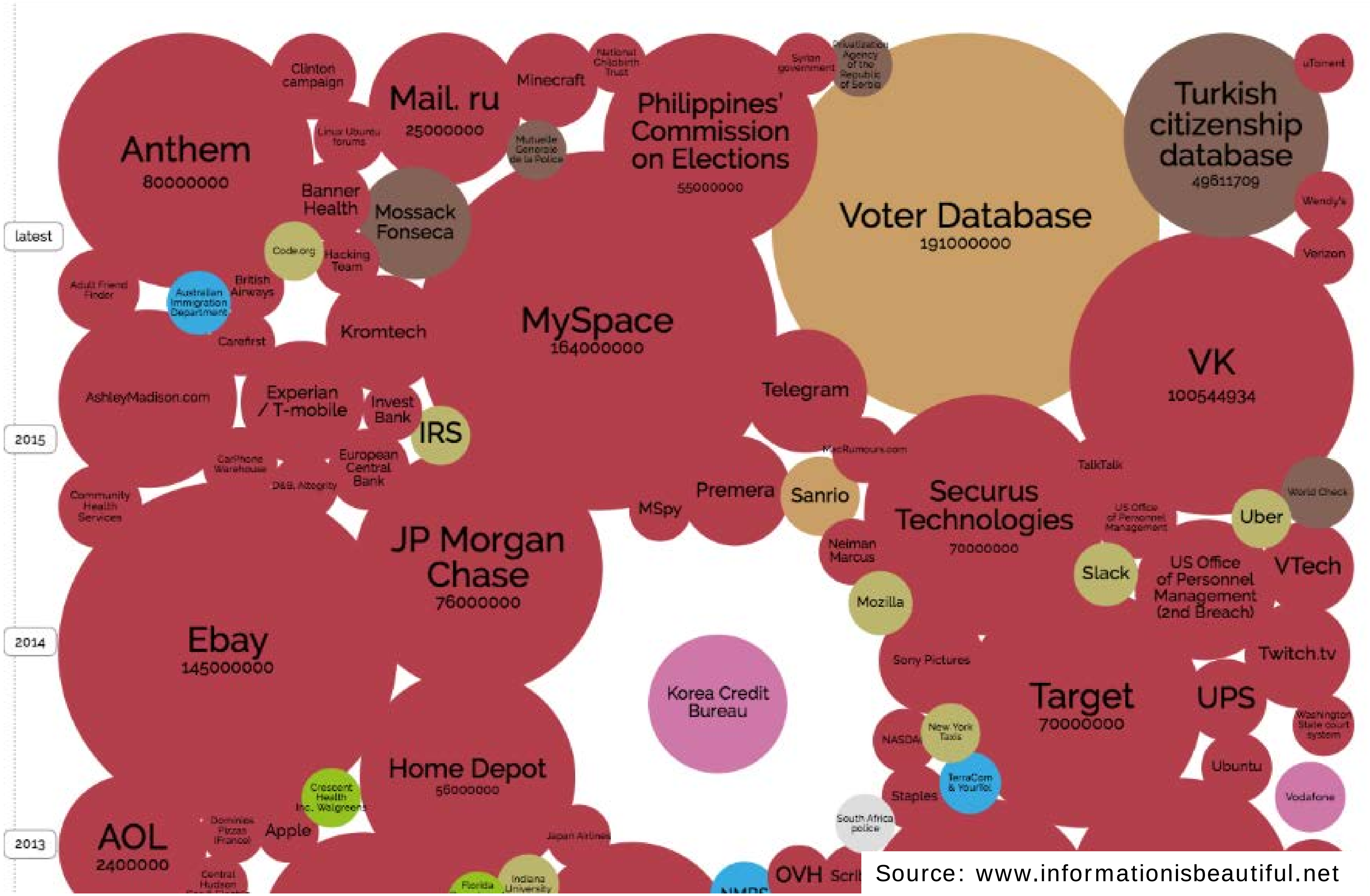
IBTTA
DENVER SEPT 11-14 2016
84TH ANNUAL MEETING & EXHIBITION

High profile data breaches



Source: www.informationisbeautiful.net

Key questions

- What would happen if you had a data breach?
- Would you be able to detect it?
- Would you be able to identify:
  - What systems and data were affected?
  - How did they do it?
  - Who did it?
  - Is it really over?
  - Could it happen again?

… or would it go unnoticed until it appeared in the press or social media?

Introduction

- Tolling service providers are typically required to comply with multiple security and data protection standards.

- These can be classified into 3 groups:
  - Legal requirements
  - Contractual requirements
  - Business requirements / best practices

Common data security standards

- Payment Card Industry Data Security Standard (PCI-DSS)
- Federal & local information security standards
- Federal & local data protection and privacy laws
- Safe Harbor agreements
- Evidential standards (for roadside images etc.)
- Financial standards
- ... others may apply

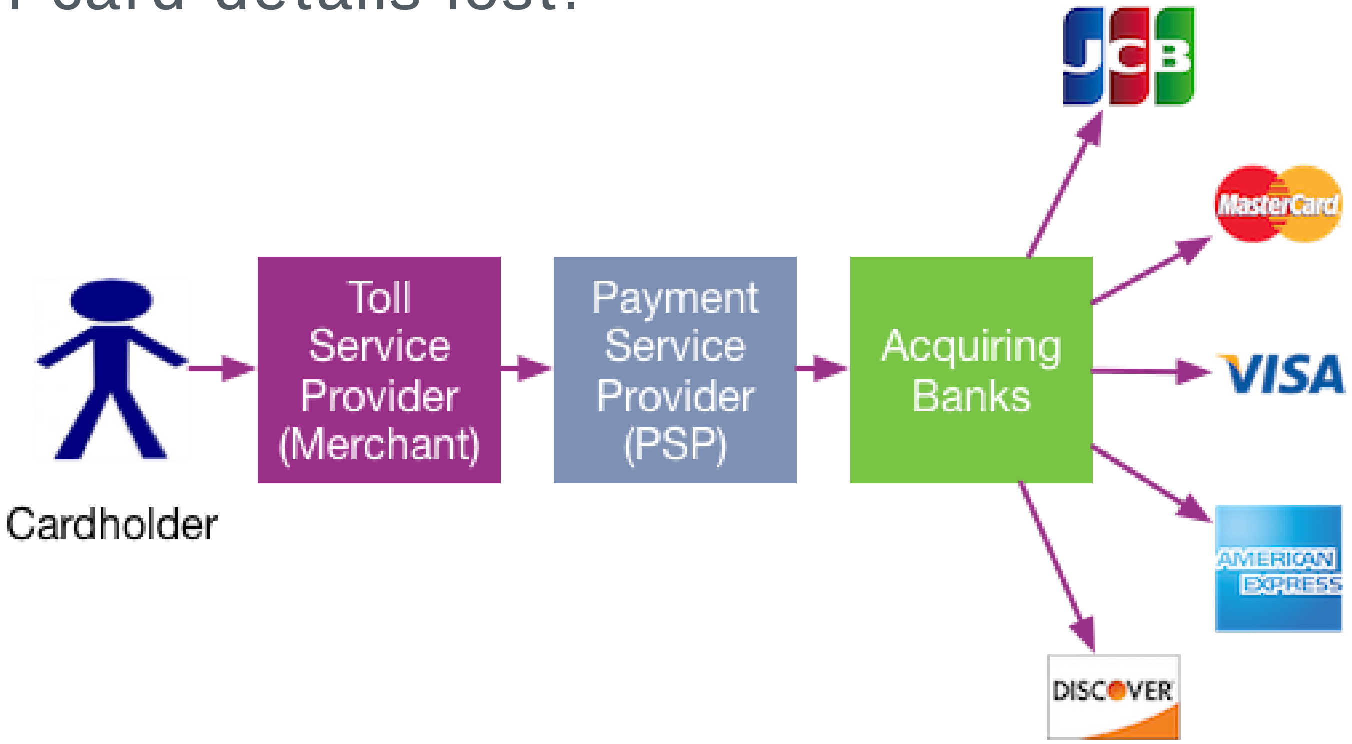
Reality

- The extent to which these standards are actually implemented and enforced is typically dependent on:
  - Whether they are legal / regulatory requirements
  - The appetite of the client to enforce contractual requirements
  - The risk appetite of the service provider

- PCI-DSS is a regulatory standard and generally well understood in the industry. Typically implemented on a ‘per contract’ basis.
- ISO27001 is often a *contractual* requirement but in practice it seems to be rarely implemented.
- The effort required to implement and operate an ISO27001 Information Security Management System is considerable and often under-estimated.

Payment Card Data

- The Payment Card Industry places regulations on acquiring banks who are required to oversee the compliance of their merchants.
- Merchants can face big fines for loss of cardholder data – dependent on the number of card details lost.



PCI-DSS Merchant Levels

- The merchant level and security controls required depends on the number of payment card transactions processed annually.

Level	Annual payment card transactions	Quarterly ASV Scans	Validation
1	**over 6 million**	**Required**	**Annual on-site review and Report on Compliance (RoC) by a Qualified Security Assessor**
2	over 1 million	Required	Annual Self-Assessment questionnaire
3	over 20,000	Required	Annual Self-Assessment questionnaire
4	under 20,000	Required	*Determined by the merchant's acquiring bank*

PCI-DSS Scope

- PCI-DSS scope is limited to the **Cardholder Data Environment**
- Multiple payment channels broadens the scope:
  - website
  - IVR
  - phone
  - mobile applications
  - batch payment processes
  - point of sale terminals
  - postal mail
- The scope (and risk) can be reduced significantly by not storing card holder data in your own system and tokenizing the data via a specialist Payment Service Provider.

HEALTH WARNING: If you’re not tokenizing card data you should be!

What is ISO27001?

- **ISO27001** is a specification for an Information Security Management System (ISMS)

- An ISMS is a framework of:
  - Policies
  - Procedures
  - Technical controls

- Together these form an organization's information risk management processes.

- An ISMS can be used as an ‘umbrella’ to include controls to meet applicable information security standards under a single framework.

ISO27001 Scope

Misconception: It’s all about IT

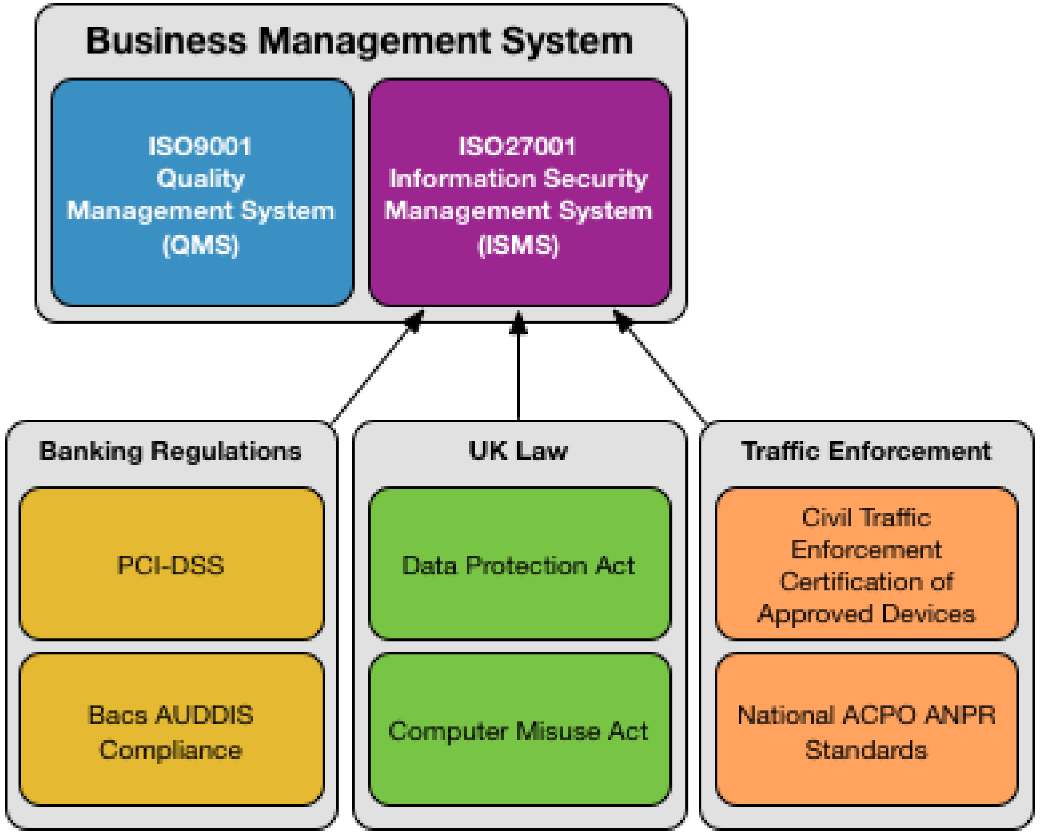
- ISO27001 impacts the whole organization
- It’s important to clearly identify which of the **114** ISO27001 controls are applicable to your organization (Statement of Applicability)

ISO27001 – 114 controls across 14 areas

1. Security policies
2. Organization
3. Human resources
4. Asset management
5. Access control
6. Cryptography
7. Physical & environmental security
8. Operational Security
9. Communications and network security
10. Systems acquisition, development & maintenance
11. Supplier relationships
12. Security incident management
13. Business continuity
14. Compliance

Compatibility with other ISO Standards

- ISO27001 is often implemented alongside other ISO standards (e.g. ISO9001) as part of a wider business management system (BMS).


Business Management System
ISO9001 Quality Management System (QMS)
ISO27001 Information Security Management System (ISMS)
Banking Regulations
PCI-DSS
Bacs AUDDIS Compliance
UK Law
Data Protection Act
Computer Misuse Act
Traffic Enforcement
Civil Traffic Enforcement Certification of Approved Devices
National ACPO ANPR Standards

ISO27001 Certification Path

1. Strategy

- Obtain management backing
- Ensure adequate skills and resources

2. Risk Assessment

- Define scope – people, sites, projects
- Inventory of information assets
- Conduct risk assessment (using a recognized methodology)
- Prepare Statement of Applicability
- Prepare Risk Treatment Plan (ISO27002)

3. ISMS Implementation Phase

- Develop ISMS implementation plan
- Policies
- Procedures
- Technical controls

4. ISMS Operation

- Start operating the ISMS
- Collate evidence (records, logs etc.)
- Carry out internal audits
- 'PLAN, DO, CHECK, ACT' cycles

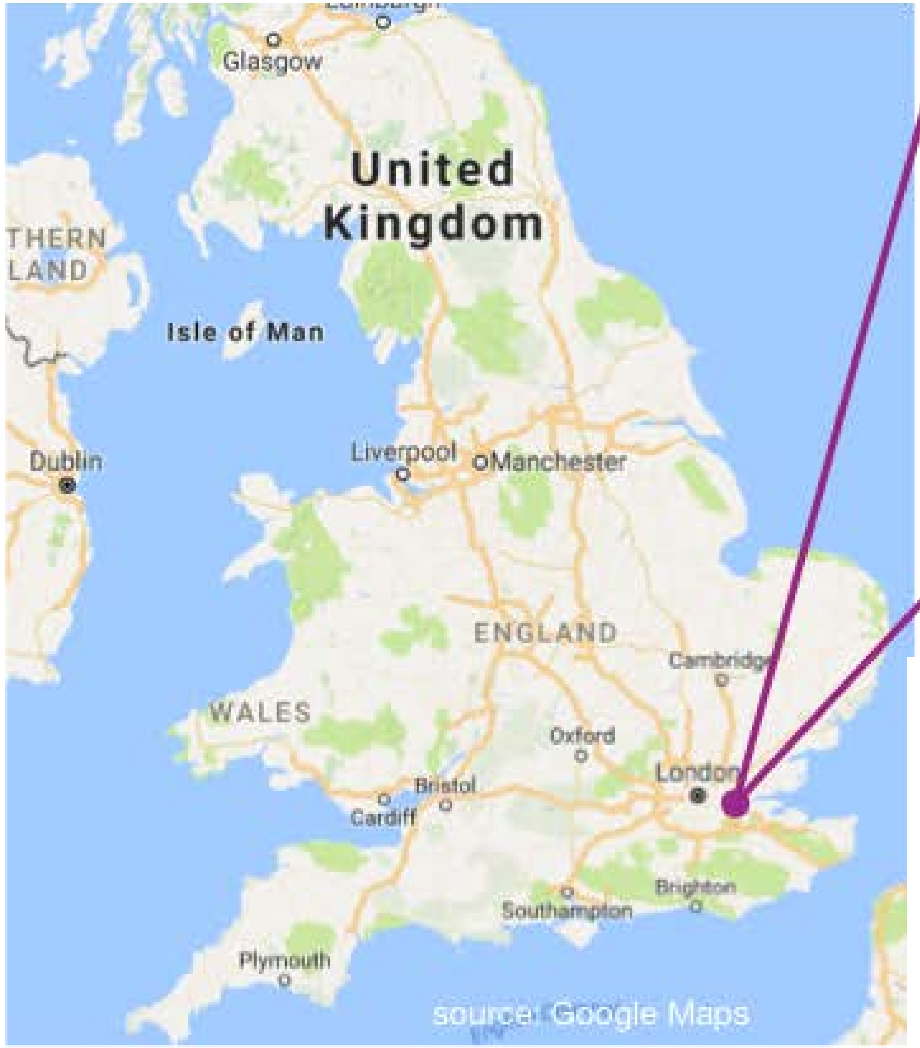
5. Pre Certification

- Internal compliance review
- External Pre-certification assessment
- External Certification audit

6. Post Certification

- Operate the ISMS routinely
- Annual surveillance audits
- Re-certification audit every 3 years

Case Study: Dartford Crossing



Source: Highways England

Dart Charge

- Queen Elizabeth II Bridge (1991)
- 2 tunnels (west: 1963, east: 1980)
- Video free-flow tolling system (since Nov 2014)
- Up to 180,000 toll transactions daily
- ~25,000 payment card transactions daily
- ~1 million account holders
- ~ £100m ($133m) toll revenue per annum

Dartford External Oversight

- **PCI-DSS Level 1**
  - Quarterly external ASV scans
  - Annual on-site audit by QSA and Report on Compliance
- **UK Government Security Policy Framework (SPF):**
  - Formal security risk assessment methodology (IS1/2)
  - Annual penetration testing (external and internal) by government approved (CHECK) security assessor.
  - Annual government cyber security review
- **UK Data Protection Act**
  - Registration with Information Commissioner Office
- **Driver Vehicle and Licensing Authority (DVLA)**
  - Six monthly compliance audits
  - Annual on-site compliance audits
- **Certification of Approved Devices (CoAD)**
  - Certification of data transfer from roadside for evidential purposes by the Vehicle Certification Agency

Key points

- A increasing number of tolling projects are now requiring ISO27001 certification
  - It is becoming an important differentiator for UK Government service providers

- It is expensive to implement ISO27001 on a per-project basis

- A more cost effective strategy would be to attain ISO27001 at an organizational level and increase scope to incorporate new projects at re-certification

- Organizations who have ISO27001 certification will increasingly have a competitive advantage.

Key questions

- Should service providers expect client contracts to pay for their ISO27001 certification?

- Should the onus be on service providers to implement ISO27001 as best practice to protect their own reputation and customer data? The risk ultimately lies with the service provider’s CEO.

- Are we moving to a position where some road tolling projects will only be available to service providers with ISO27001 certification? In the UK and Ireland this seems to already be the case.

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Thank you

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