THALES

Fare collection solutions

Cybersecurity and account based systems

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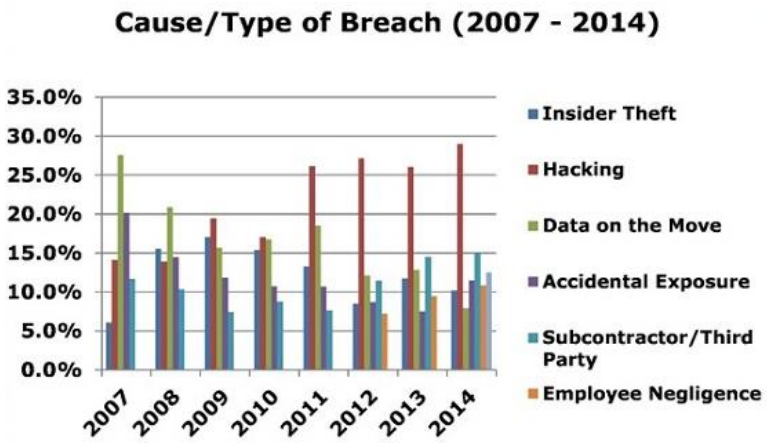
Security breaches – some facts

In a more and more connected world, a proliferation of sophisticated and targeted cyber attacks e.g. against

- Governments,
- Critical infrastructures
- Industrial control system

Consequences of Cyber attacks:

- Financial fraud, disrupted reputation, industrial espionage, etc.



Source: Identity Theft Resource center

Examples of 2015:

- Carbanak, a cyberheist worth 1b$ over 100 banks worldwide
- Kaspersky revealed infiltration of its internal systems

Source: crn.com

Fare collection changes over the last few years

- Technology moved very quickly over the past few years
- Smart mobility raised needs new technological needs
- Public transport industry had to catch up with the new paradigm

Key areas where security is at stake

Fare collection

- Security design national standards (ITSO, Calypso, SDOA…)
- Media and fare intrinsic security

Network/IT

Identity protection & privacy

- Compliance to national privacy rules

Payment standard compliance

- EMV, PCI…

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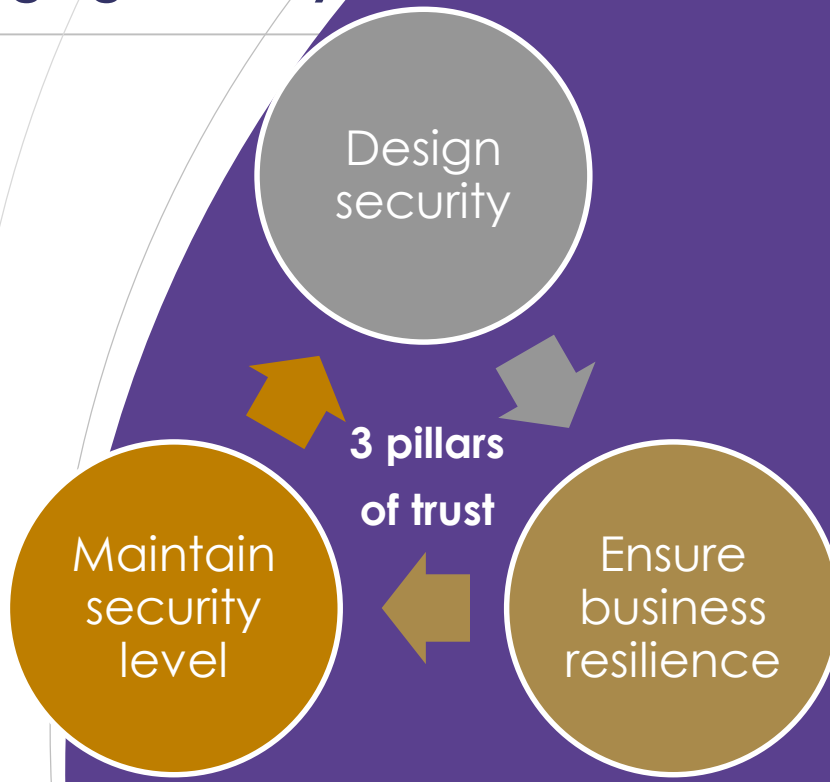
What are we trying to achieve by managing security?

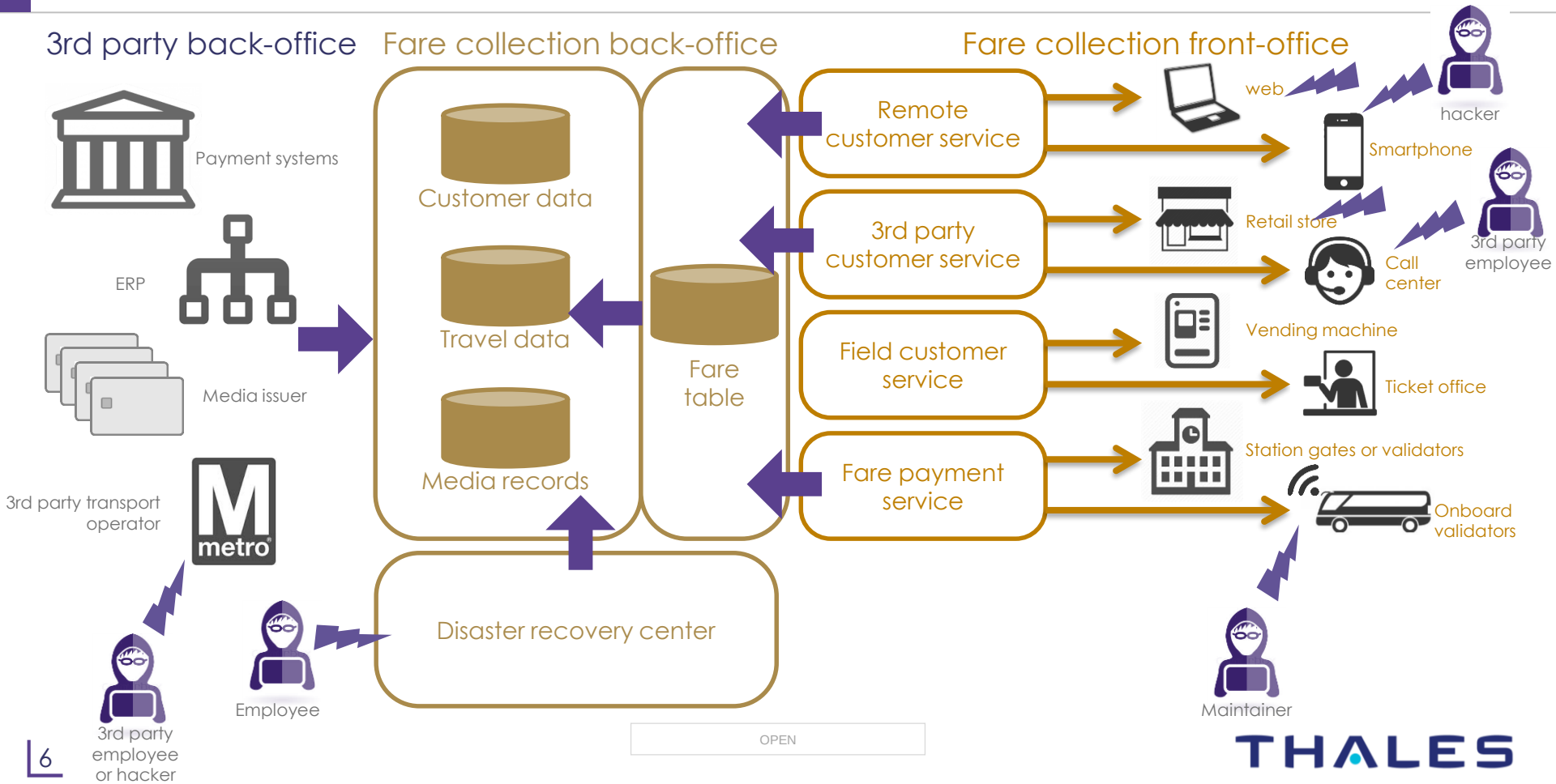
To be evaluated in case of security exposure

- What the financial consequences can be
- How the communication and company image can be damaged
- How the company organization would react
- How resistant is the infrastructure, how fast would it recover
- What level of service it would possible to deliver…

Awareness leads to taking actions and build TRUST



Examples of threat sources in new fare collection solutions



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Typical attack scenario

Initial Intrusion

Target: end-user computer system

- USB key or email attachment
- Known software vulnerability to download .exe
- Remote Desktop control

Intrusion in depth

Target: authentication servers

- Get progressive access to global information system
- Back Door opening

Search for strategic data

Target : application servers & end user terminals

- Keyword based document search
- VIP mailbox scan

Data exfiltrated

- Information gathering
- Massive or discrete data exfiltration

Tips to manage security risks

Tip 1: Standardized security services and processes

Tip 2: Security by design

- For existing solutions, set up basics like:
  - pen testing,
  - reinforced network & IT infrastructure, use probes & logs
  - hardened execution environment,
  - robust identity management…
- For new solutions: software architecture, coding rules, certified building blocks…

Tips to manage security risks

Tip 3: Communication: Cloud to end-point security

- Use appropriately security hardware (HSM) and a security broker for critical credentials (keys, identity management…)

Tip 4: Data storage: encrypt stored privacy-sensitive data

Tip 5: Consider outsourcing security

- ISO 20000/27000 certified « Security-as-a-Service »: 24/7 alert monitoring, incident, problem & crisis management, access control, disaster recovery…

Key take-aways

- **Do not take cyberthreats lightly,**
  - prepare organization, processes and tools accordingly
- **Avoid silos and "CSO-as-a-guru"**
  - integrate smart and affordable security for everyone in your company
- **Mobile, cloud and big data are here and will last**
  - don't refuse them because of security but design security accordingly
- **There are now suitable data/identity protection solutions using encryption**
  - consider them seriously
- **Use external help for design, review, audits…**