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Information Security for Privacy Protection

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JAIST

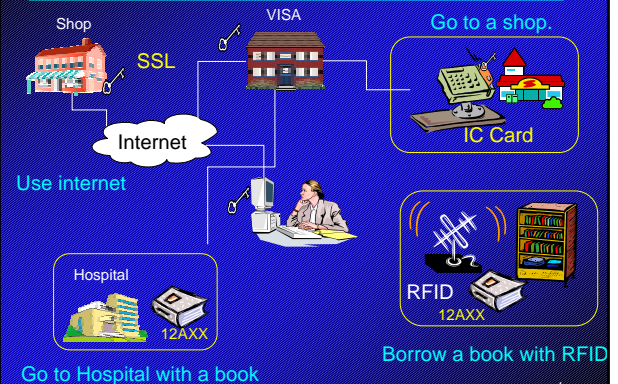
Abstract

- How and Why our privacy has been leaked out?
- What is a solution to protect our privacy?
→ Information Security
- Recent research interest on information security to enhance our privacy.

Outline

- Our life has been digitalized.
- Our privacy has been leaked out.
- Subjects of Information Security.
- Recent research of information security
 - Protect your system even if your key has been stolen
 - Protect your key against electronic consumption
 - Protect your privacy against collusion

Our life has been digitalized

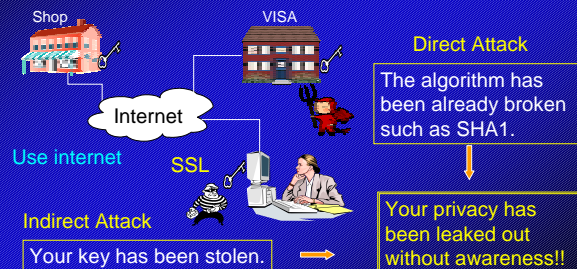


Our privacy has been leaked out

It seems secure by encryption.

→ Theoretical security analysis is necessary.

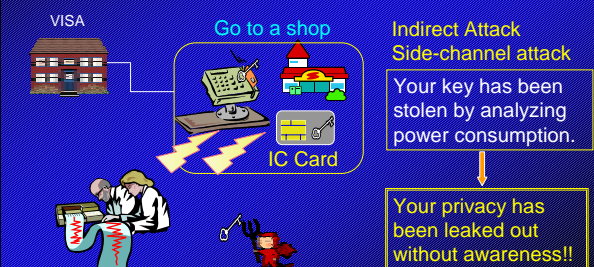
Fault tolerance system is required: it stands if a key is stolen.



Our privacy has been leaked out

It seems secure: IC card, secure number theory, never stolen the card, and face-to-face communication without Internet.

→ Realistic security analysis is necessary: implementation



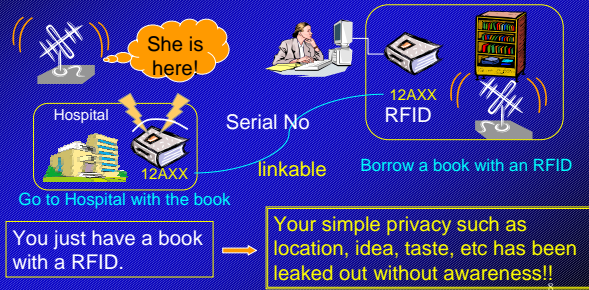
Our privacy has been leaked out

It seems secure through secure channel.
 → Anonymity is necessary for protocol.



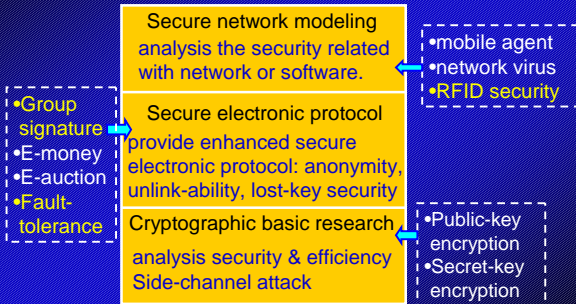
Our privacy has been leaked out

Privacy information has expanded: location, taste, opinion, idea...
 → Unlink-ability is necessary for protocol.



What shall we do?

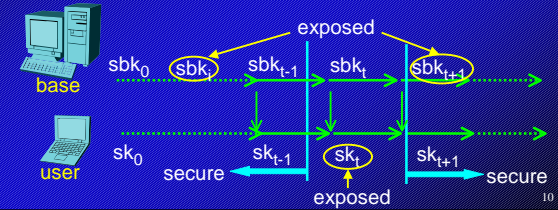
We need information security !



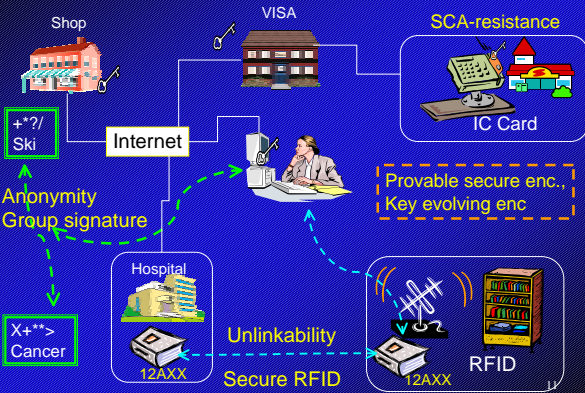
Fault tolerant system-key-evolving system

Minimize the damage when a secret key is lost or broken.

- A secret key is divided into two devices, user and base.
- Key evolution over time is achieved by user and base.
- User and base are exposed repeatedly
- Any user key except those exposed user keys remains secure.



Security Integration



Concluding Remarks

- We have seen how our privacy has been leaked out without awareness.
- We have shown that information security protect our privacy.
- We will give a way that user can control her/his privacy level: sometimes link-ability is fine.
- We will provide the minimum integration that enhance various system security.