Significance of Cyber Security & Human Rights

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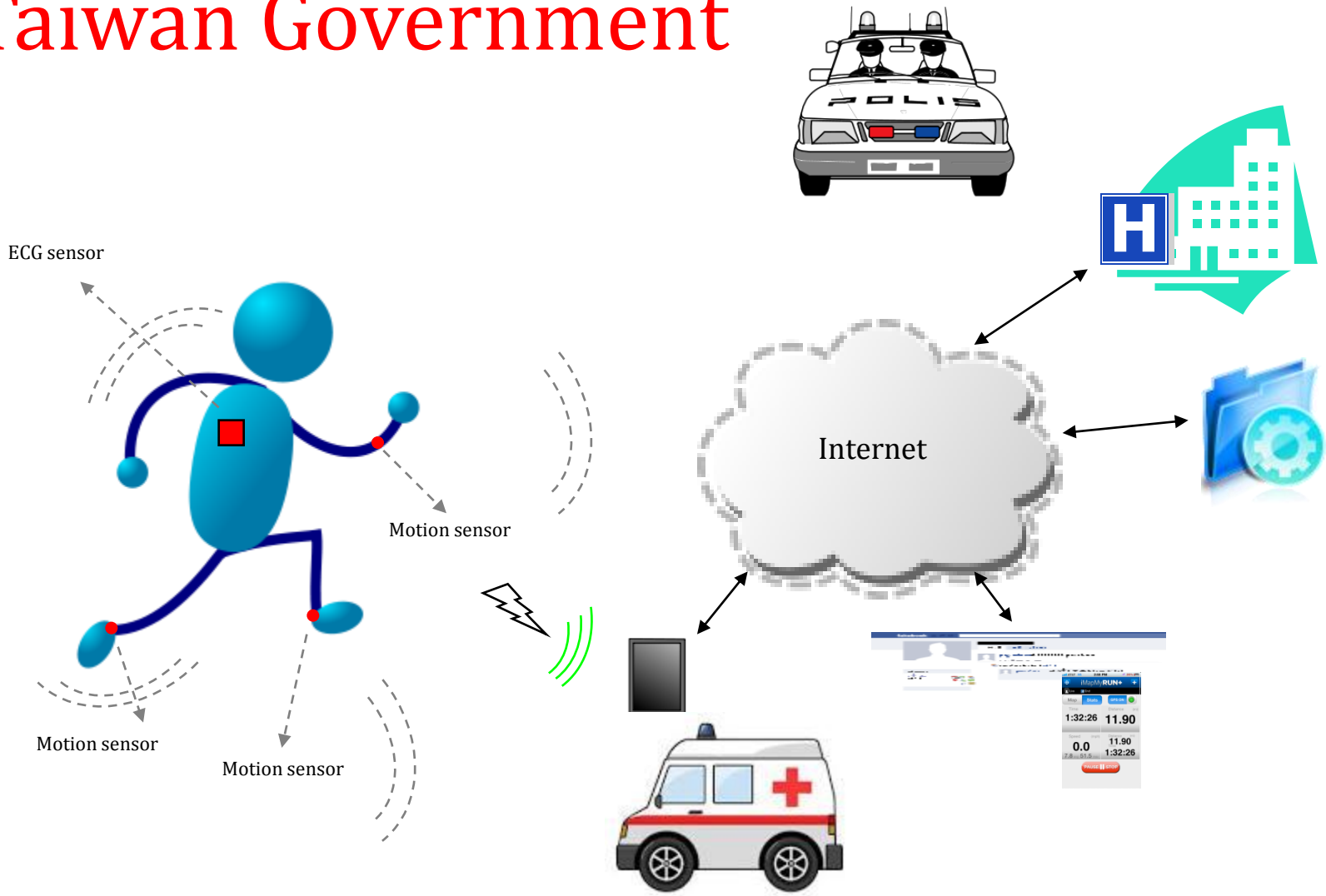
Samsung Admits Its Smart TV Is Spying On You

December 2012: a vulnerability in Samsung Smart TVs that allows an intruder to take control of the devices that are connected to the same network.

November 2013: LG's Smart TVs are sending personal information back to the company's servers about what channels you watch and viewing habits.

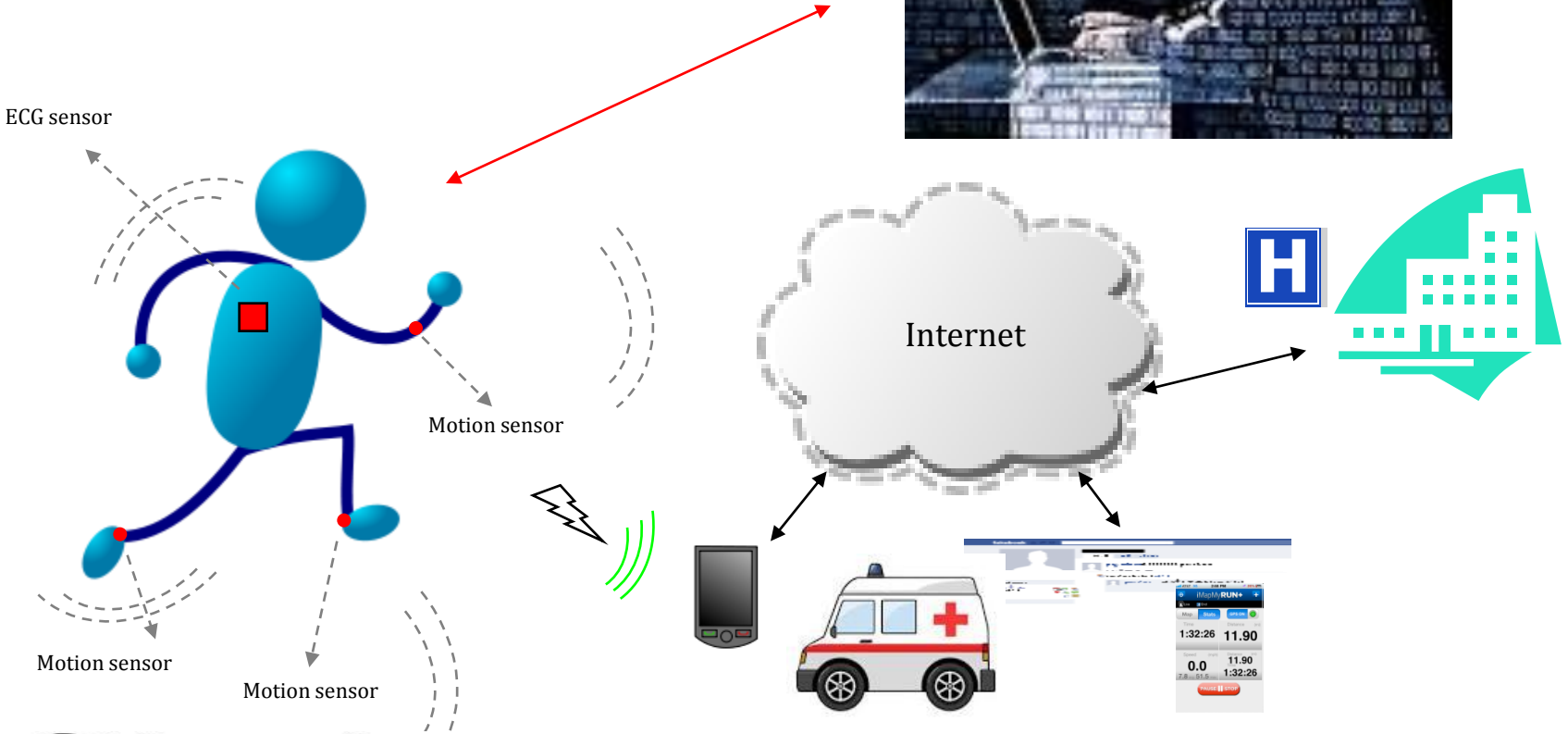
July 2013: Another vulnerability allowed hackers to remotely crash Samsung Smart TV without doing much efforts

Taiwan Government



People Connecting to Things

What happens?



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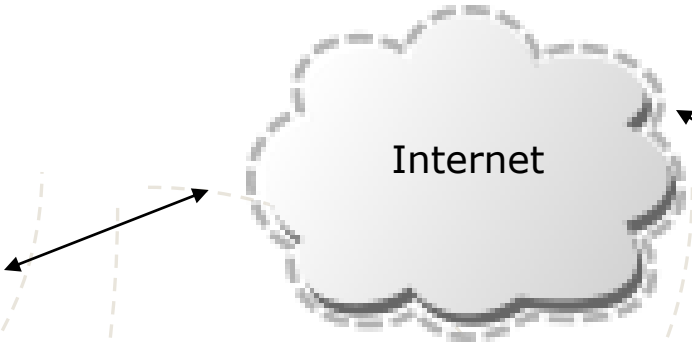
Terrorists could hack pacemakers like in Homeland, say security experts

Smart Fridge



For The First Time, Hackers Have Used A Refrigerator To Attack Businesses

JULIE BORT | JAN 17, 2014, 12.06 AM

Issues

Consequences...

- Loss of Individual Privacy
- Authentication
- Loss of Confidentiality
- Loss of Credibility
- Data manipulation (Denmark Example)
- Data Protection (Not possible to tamper with)
- Data Maintenance (Update/ Modify when needed, like change of address in AADHAR card etc)

Problems that can lead to...

- Blackmailing
- Trolling
- DOS and DDOS Attacks
- Replay attack (Creating Delay)
- Intersection
- Fabrication
- Modification
- Interception

Concepts

Basic Concepts of Security

- Confidentiality : limiting information access and disclosure to authorized users -- "the right people" -- and preventing access by or disclosure to unauthorized ones -- "the wrong people".

- Authentication : process by which a system/person verifies the identity of a User who wants access to some resource.

  Access Control is normally based on the identity of the User who requests access to a resource

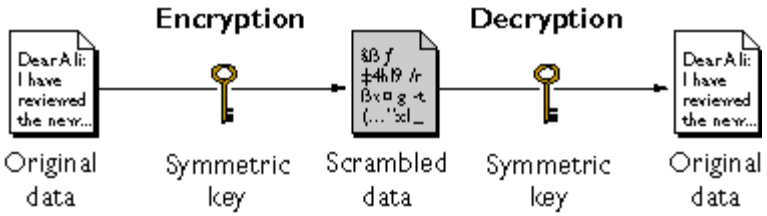
Methods

- Symmetric Key Encryption
- Asymmetric /Public Key Encryption

Symmetric Key Encryption

- It is a form of computerized cryptography using a single encryption key to guise an electronic message.
- Its data conversion uses a mathematical algorithm along with a secret key, which results in the inability to make sense out of a message.
- Symmetric encryption is a two-way algorithm because the mathematical algorithm is reversed when decrypting the message along with using the same secret key.

Symmetric Key Encryption Cont'd...



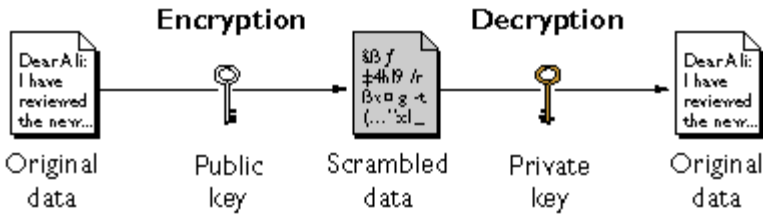
Asymmetric/ Public Key Encryption

- Public-key encryption involves a pair of keys-a public key and a private key-associated with an entity that needs to authenticate its identity electronically or to sign or encrypt data.

- Each public key is published, and the corresponding private key is kept secret.

- Data encrypted with your public key can be decrypted only with your private key.

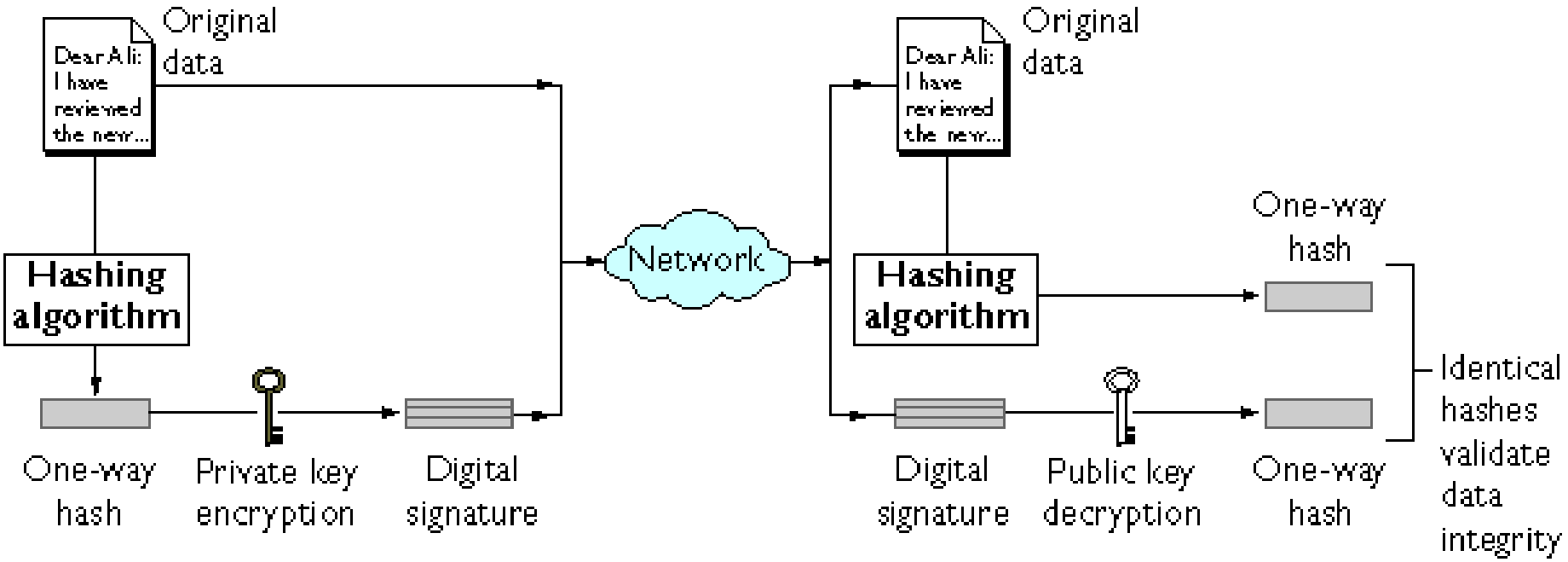
Asymmetric/ Public Key Encryption - Cont'd...



Some Definitions

- Hashing: Extracting the sensitive part of a message of fixed size such that any change in the massage reflects in hashing of that message
- Message Digest: Hashed Message
- Digital Signature: is encrypted message digest.
- It is basically a way to ensure that an electronic document (e-mail, spreadsheet, text file, etc.) is **authentic.**

Authentication Using Digital Signature



Authentication Methods

- Passwords
- Biometrics
  - Finger
  - Hand
  - Face
  - Iris
  - CAPTCHAs (Limited Applicability)

Digital Certification

- The Digital Certificate is a common credential that provides a means to verify identity of an entity.
- A trusted organization assigns a certificate to an individual or an entity that associates a public key with the individual.
- The person or entity to whom a certificate is issued is called the subject of that certificate.

Digital Certification

- The trusted organization that issues the certificate is a Certification Authority (CA) and is known as the certificate's issuer.

- A trustworthy CA will only issue a certificate after verifying the identity of the certificate's subject.

SSL

- Secure Sockets Layer (SSL) is a standard protocol used for the secure transmission of documents over a network.
- It creates a secure link between a Web server and browser to ensure private and integral data transmission.
- SSL uses Transport Control Protocol (TCP) for communication.

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Cyberspace – Human Rights

- Virtual World of Internet
- Laws governing this area

IT ACT 2000

- The **Information Technology Act, 2000** (also known as **ITA-2000**, or the **IT Act**) .
- It is an Act of the Indian Parliament (No 21 of 2000) notified on 17 October 2000.
- It is the primary law in India dealing with cybercrime and electronic commerce.

What does IT Act 2000 legislation deals with?

- Legal Recognition of Electronic Documents
- Legal Recognition of Digital Signatures
- Offenses and Contraventions
- Justice Dispensation Systems for cyber crimes.

IT Act 2008

- IT (Amendments) Act 2008, it effected from 2009.
- It introduced section 66A, 69.

Notable features of the ITAA 2008 are:

1. Focusing on data privacy
2. Focusing on Information Security
3. Defining cyber café
4. Making digital signature technology neutral
5. Defining reasonable security practices to be followed by corporate