A quoi servent les protocoles délimiteurs de distance

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CLERMONT'ECH

LIMOS

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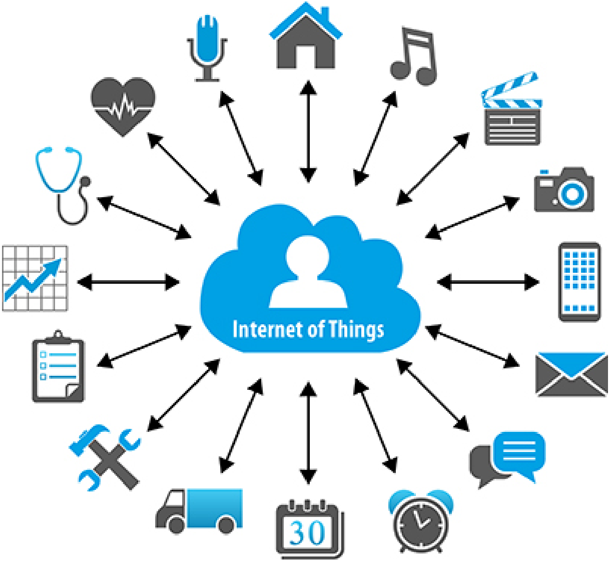
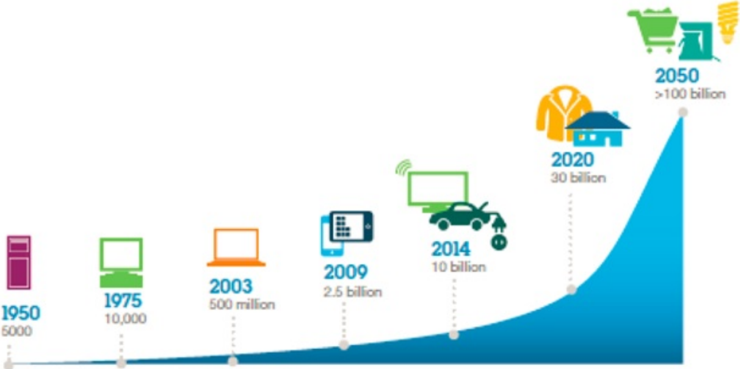
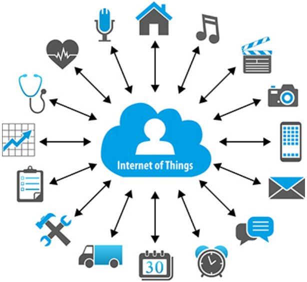
IoT



IoT


1950
5000
1975
10,000
2003
500 million
2009
2.5 billion
2014
10 billion
2020
30 billion
2050
>100 billion

Reasons of the Succes of IOT



Usage

- Monitoring services
- Hyperconnectivity
- Avaibility
- Open data

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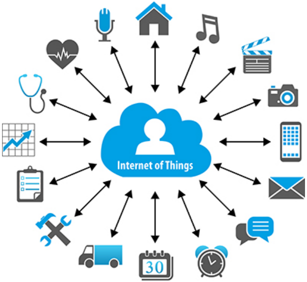

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Technology

- Wireless Communications :
  Wifi, 3G, 4G, Bluethooth, Sigfox ...
- Batteries
- CPU
- Sensors
- Price

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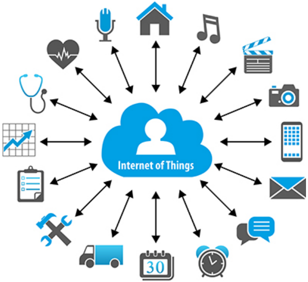

Usage

- Monitoring services
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Security ?

- Open data

Technology

- Wireless Communications :
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- Price

Proximity Devices Everywhere

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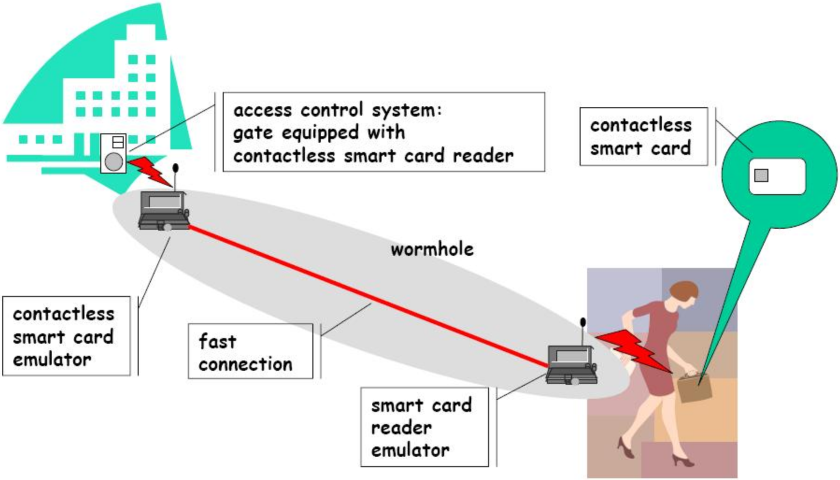
What security do we want ?

“Wormhole Attack”

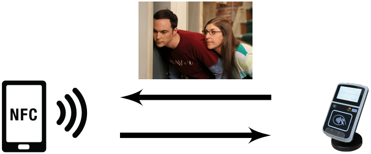


Video

- Buy two Zürich transports ticket

Intruder : Eavesdropper VS Curious Verifier

Eavesdropper

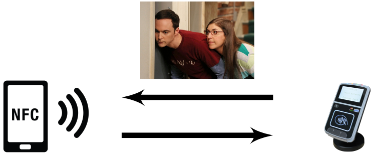


Prover P

Verifier V

Intruder : Eavesdropper VS Curious Verifier

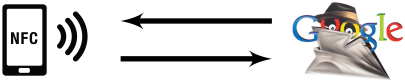
Eavesdropper



Prover P

Verifier V

Curious Verifier

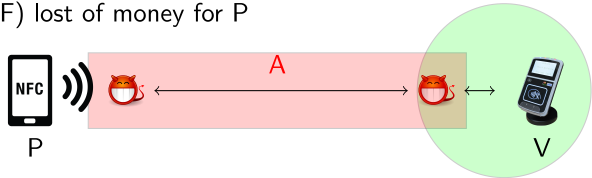


Prover P

Verifier V

Properties : Threats against honest provers

Mafia Fraud (MF) lost of money for P



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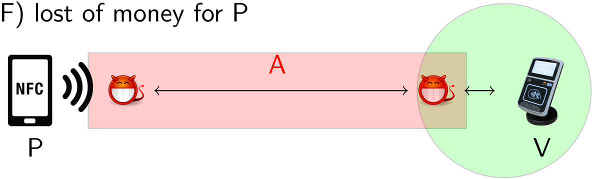
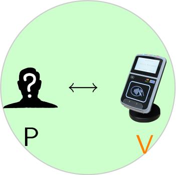
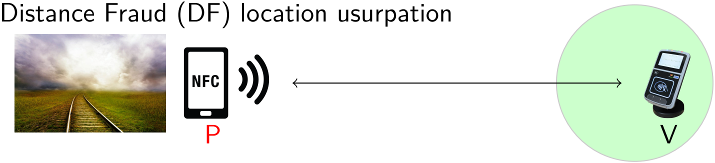


User tracking



Properties : Threats with malicious Provers

Distance Fraud (DF) location usurpation



Properties : Threats with malicious Provers

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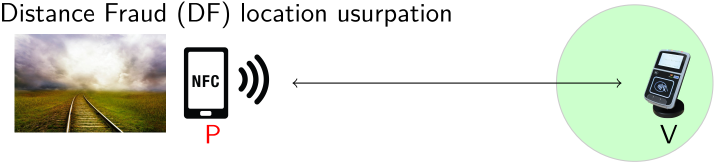
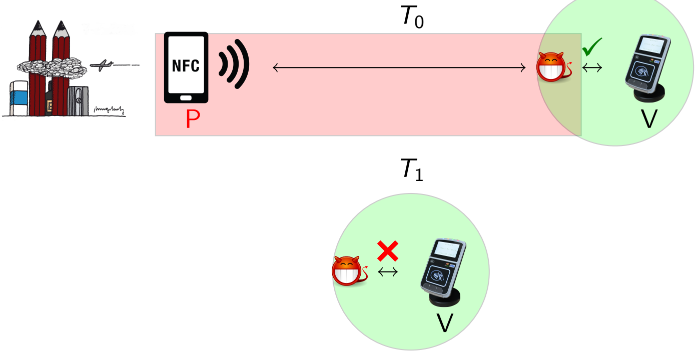
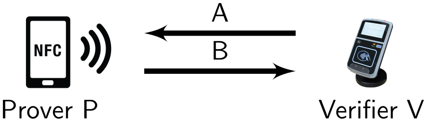


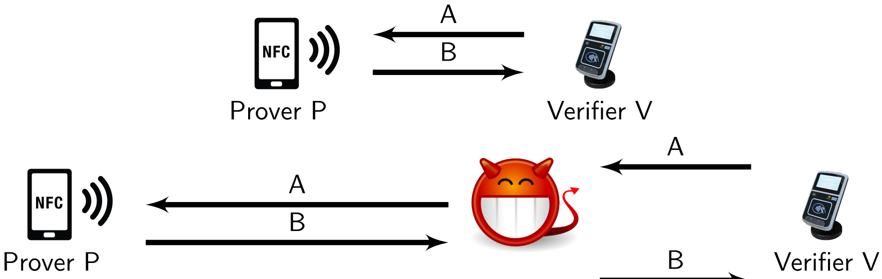
Terrorist Fraud(TF) lost of money for V



Distance Bounding Idea



Distance Bounding Idea



A

B

Prover P

Verifier V

A

A

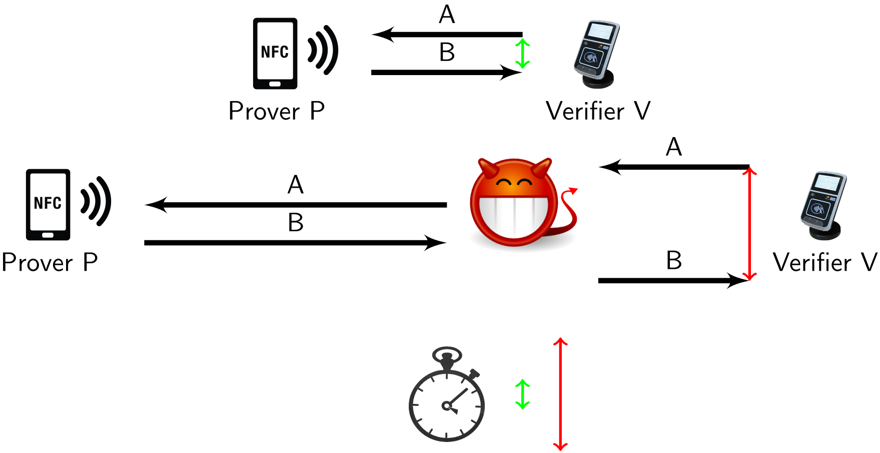
B

B

Prover P

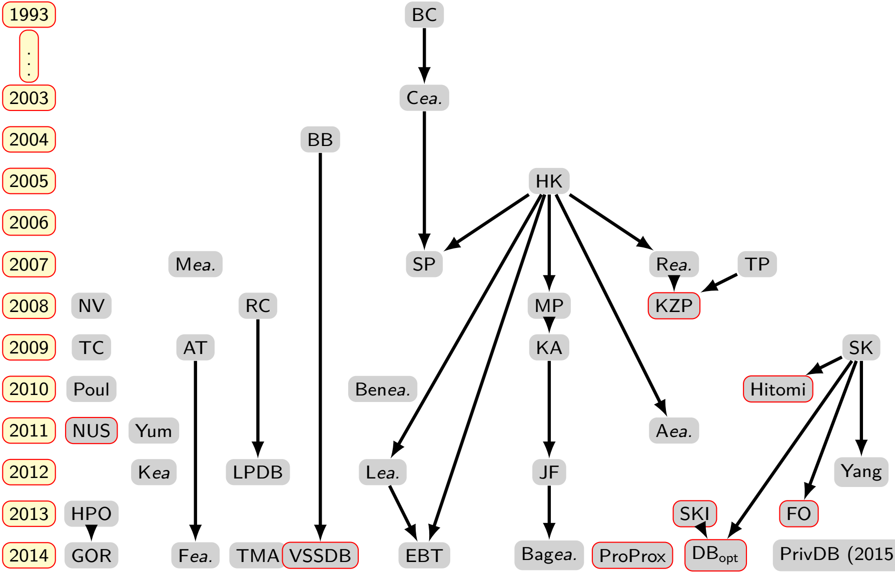
Verifier V

Distance Bounding Idea



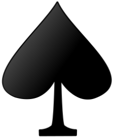
Solution against MF : Distance Bounding (Brands and Chaum, 1991)

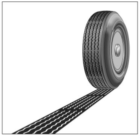
Survey : 42 protocols from 1993 to 2015.



Conclusion

- Designing secure IoT is difficult
- Distance Bounding can help to improve security
- We propose SPADE and TREAD, two new secure DB protocols





Thank you for your attention !

Questions ?