



Managing Threats and Vulnerabilities in the Future Internet

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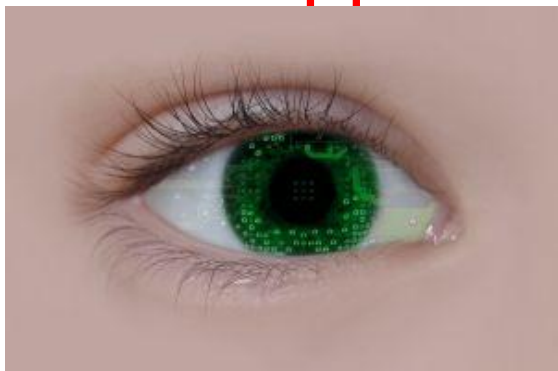
A world of change

- The **technology** is changing
- The **society** is changing
- The **attackers** are changing



The technology is changing

- **Mobile** phones
- **Smart** environments
 - Smart power meters,
 - Smart homes, appliances
 - Smart cars, city cars
- **Disappearing** computers



Things Babies Born in 2011 Will Never Know

- The separation of work and home
- Wires
- Forgetting
 - (almost) nothing is forgotten on the Internet
- Hiding
 - Can you hide in an on-line world?
 - Privacy?



Source: http://finance.yahoo.com/family-home/article/111745/things-babies-born-in-2011-will-never-know?mod=family-kids_parents

The society is changing

- New ways of interaction:
social networks
 - Who are your friends?
- **Always “available”** culture:
 - People are accessible 24/7 for work and fun
 - Important decisions are taken “on the go” from a mobile phone
- We **depend** on technology



The attackers are changing



*“... potential (cyber)attacks against network infrastructures may have widespread and devastating consequences on our daily life: **no more electricity or water at home, rail and plane accidents, hospitals out of service**”*

Viviane Reding

VP of European Commission



European Cybersecurity Month



*“in tomorrow’s world **if the internet isn’t secured, nothing will be ...**”*

Neelie Kroes

VP of the European Commission



What did we do?

- Created three **working groups** of experts in
 - Malware and Fraud
 - Smart Environments
 - Cyberattacks
- Brainstorm on Emerging Threats
- Created a list
 - of research areas
- Got feedback from **the Industrial Advisory Board**



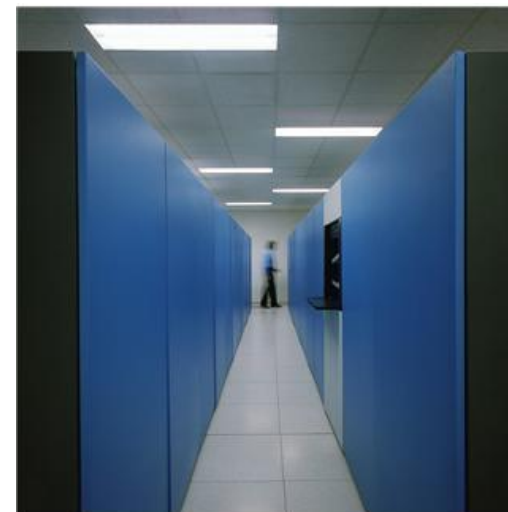
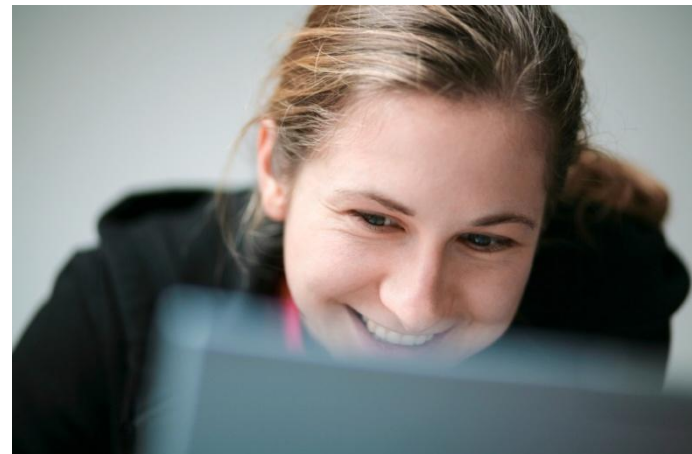
This is what they came up with





Malware and Fraud

- Malicious **Hardware**
 - Compromised routers, processors,
- Attacks Against the **Cloud**
- Advanced Malware
 - Propagating in **social networks**
- **Mobile** Malware
 - Malware for mobile devices (e.g. phones)
- Information Risks – **Data** gathered
 - Government-collected data
 - Data collected by service providers
- **Targeted** Attacks



Smart Environments

- **Accessibility**
 - Routers, ad hoc networks, smart meters, etc.
- System **Complexity** - maintainability
 - Too many sensors/computers in a smart home
 - Are all my devices up-to-date?
- Attacks against the non-ICT component
 - False sensor data
 - Heat, radiation, pressure, etc.



Cyber attacks



tagxedo.com

Cyber attacks

- Web **Services** and Applications
- **Privacy**
 - Target private data e.g. in social networks
- **Critical Infrastructures**
 - Power supply?
 - Emergency services? 911 (US) 112 (EU)
- Smart, **Mobile** and Ubiquitous Appliances
- **Insiders**
- Network **Core** Attacks



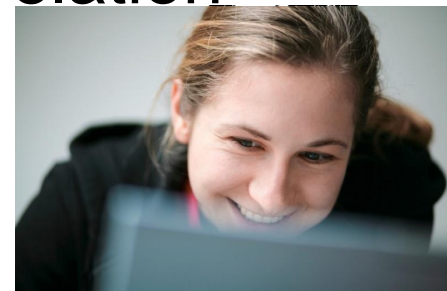
Suggested Research Areas

- Privacy
- Targeted attacks
- New and Emerging technologies
- Mobility
- Usable Security



Big Data and Privacy

- Help users gain control of their data
- Protect them from disclosing their data
 - Do I really need to send all these tracking cookies around?
- Detect attempts
 - to correlate data
 - to de-anonymize user accounts by correlation



Targeted Attacks

- Collect and analyze **data**
 - Of targeted attacks
- Create **data repositories**
 - Exchange Data among **international** partners
- New **Defense** approaches
- Understand the **financial** motives and structures behind these attacks
- Prevention at the **ISP** level



New and Emerging Technologies

- Cloud Computing
- Social Networks
- Smart meters
- SCADA networks



Mobility

- Mobile phones
- New tools
 - To be deployed on smart phones
 - for attack detection/prevention



Usable Security

- Focus on the weakest link
 - i.e. human beings
- Interdisciplinary efforts
 - Engineering, system security, psychology, etc.



Summary

- Everything is changing
 - Technology, society, attackers
- We need to understand new attacks
- Focus on
 - Privacy and Big Data
 - Targeted attacks
 - New and Emerging technologies
 - Mobility
 - Usable Security
- <http://www.syssec-project.eu/d4.2>



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