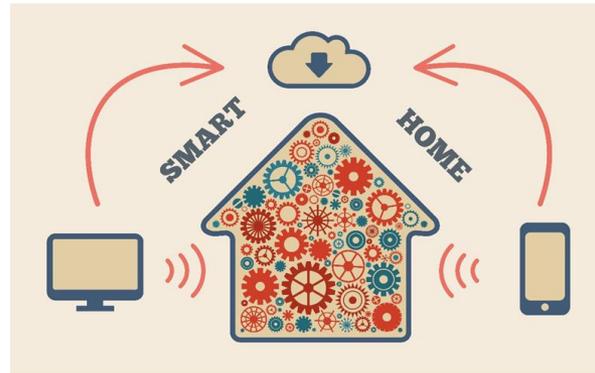




ENISA Thematic Landscape on Smart Homes



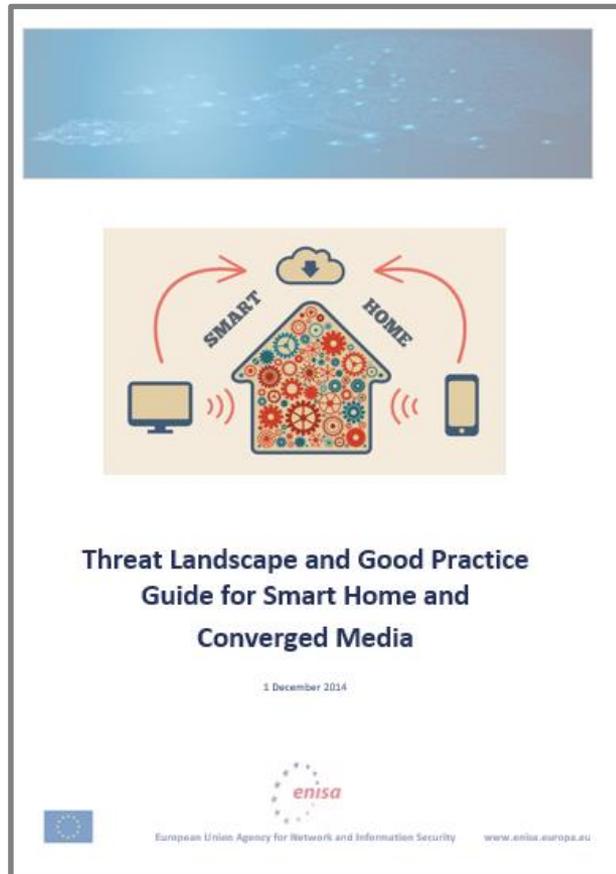
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Authors of the study and acknowledgements



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Acknowledgements

- Colleagues
- Informal expert group



Agenda

- Introduction
- Scope and goal of the report
- Methodology
- Identified valuable assets
- Identified threats
- Identified vulnerabilities and risks
- Existing good practices
- Next steps
- Conclusions





Introduction

- Smart home and home automation
 - Remote control and users' preferences
 - Increase of home automation over the years
 - More affordability of smart home devices
- Policy context
 - EU Cyber Security Strategy
 - ENISA Regulation
 - COM Recommendation on energy efficiency





Scope and goal of the report

- Focuses on (cyber-) threats related to smart home with particular focus on converged media and television
- Deepens the annual ENISA Threat Landscape
- Follows similar approach of other ENISA thematic threat landscapes
- Aims to identify security challenges, associated risks and required countermeasures





Methodology

- **Documentary sources – publicly available information**
 - 166 documents processed
 - Documents in several languages
 - Search engines for academic sources and journal articles also used
- **Interview and group discussion with the expert group**
 - Five experts from academia and industry sector
 - Semi-structured interviews to gather experts' knowledge



Identified valuable assets

- Asset groups identified
 - Within each asset group, specific assets identified
- Example:

Sensors



Audio/Visual



Home Appliances



People/Living



Identified threats

- Threats' groups identified
 - Within each threat group, threats identified
- Example:

Unintentional damage (accidental)



Outage



Eavesdropping / Interception / Hijacking





Identified vulnerabilities and risks

- Vulnerabilities arising from
 - Business models and economic incentives
 - Ownership and administration models
 - Home being smart (pervasive and persistent insecurity)
- Risks
 - Crime
 - Privacy, surveillance and data protection



Existing good practices

- Smart home and converged media design and architecture choices
 - Careful consider security of cloud-based smart home design
 - Keep critical software separate from non-critical apps
 - Choose systems that allow secure communication
- Device security measures
 - Design with security in mind
 - No fixed, default passwords
- Network and communications security measures
 - Secure local video streaming
 - Secure 3rd party service connections
- Policy measures, including standardisation
 - Certifications for individuals and companies installing home networks
 - CENELEC SmartHouse Roadmap project

- Taking this threat landscape as a reference and follow-up on cyber security measures
 - Good practices and recommendations for smart homes
- Security of exchange with other smart infrastructures



**Smart Grid:
energy optimization**



**Smart Cities:
information hub
and data provider**



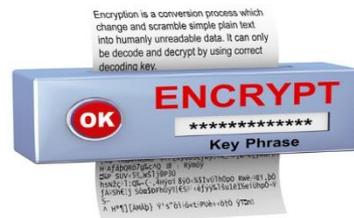
**Smart Health:
monitor health and
improve quality of life**

- Not all smart homes created equally
 - Traditional home automation / Interoperability protocols (smart TV as hub is a sub-set of this) / Isolated smart gadgets
 - These routes have their own peculiarities but also shared issues and vulnerabilities
 - Design choices here likely to have significant impacts upon both individual security and collective security in the ecosystem
- Threats identified to all asset groups
 - All groups of threats found some application across the asset groups and all asset groups had threats identified to them



Conclusions (2/3)

- Economic factors generates vulnerabilities
 - Start-ups, small electronics companies, kickstarters, and large scale appliance and utility companies
 - Lack security expertise
 - Lack security budget
 - Lack security research networks
 - “Smart” as add on to core function, security and privacy a distant afterthought
 - Market doesn’t seem to tolerate “smart” costing too much more than “non-smart”
- Applying “basic” information security could have big impacts



Conclusions (3/3)

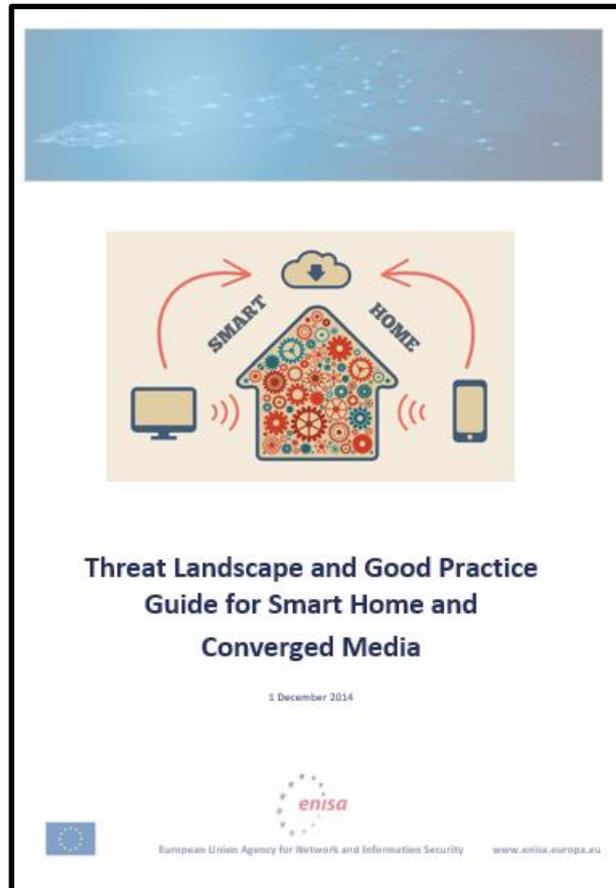
- Interests of different assets owners in the smart home are not necessarily aligned
- Some research and experience from parallel more established or linked industries (e.g. cable/satellite TV, hotels, Wi-Fi) but still need for further research, e.g. in the following areas:

- Role of smart home in emergency response
- Impact upon smart home of natural disasters
- Criminology of smart home
- Liability and insurance issues related to smart home



- Smart home will be significant for privacy

- Set of sensors in a smart home will be a source of close, granular and intimate data on inhabitants and visitors
- Data has commercial, law enforcement value



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