The Internet of Things: an Overview

Understanding the Issues and Challenges of a More Connected World

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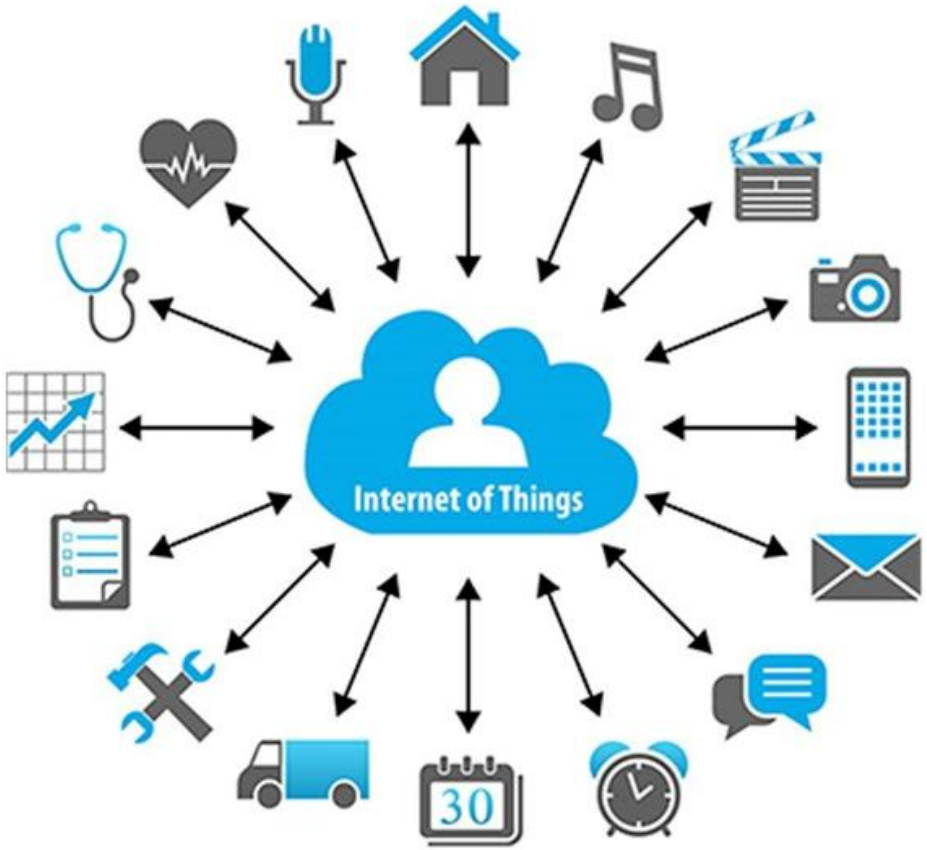
ISOC Whitepaper

Presentation by Sander Bakkum

Introduction



Market trends driving IoT

- Ubiquitous connectivity
- Widespread adoption of IP-based networking
- Computing economics
- Miniaturization
- Advances in data analytics
- Rise of cloud computing

Contents

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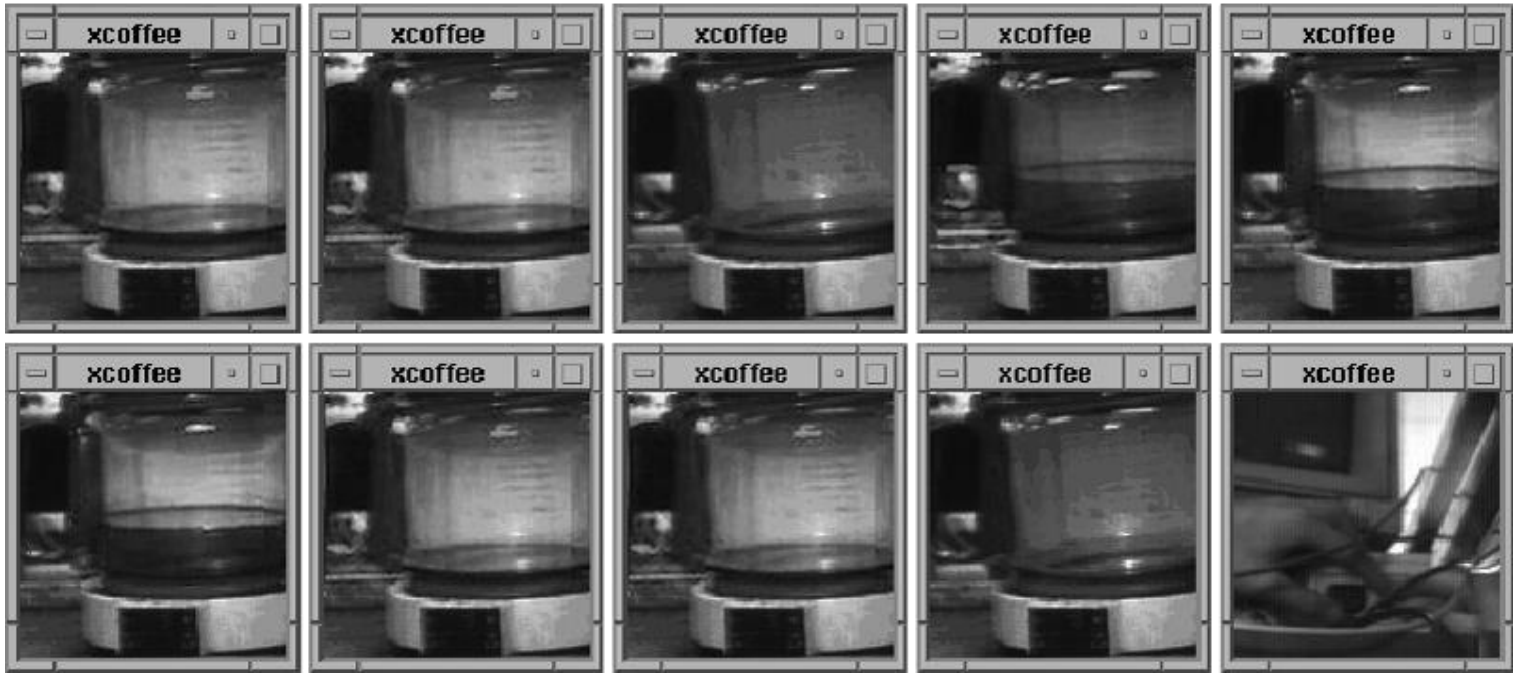
What is the Internet of Things?



What is the Internet of Things?

"The extension of network connectivity and computing capability to objects, devices, sensors and items not ordinarily considered to be computers."

Communications models

RFC 7452: Four common models

Device-to-Device communications

FIGURE 1

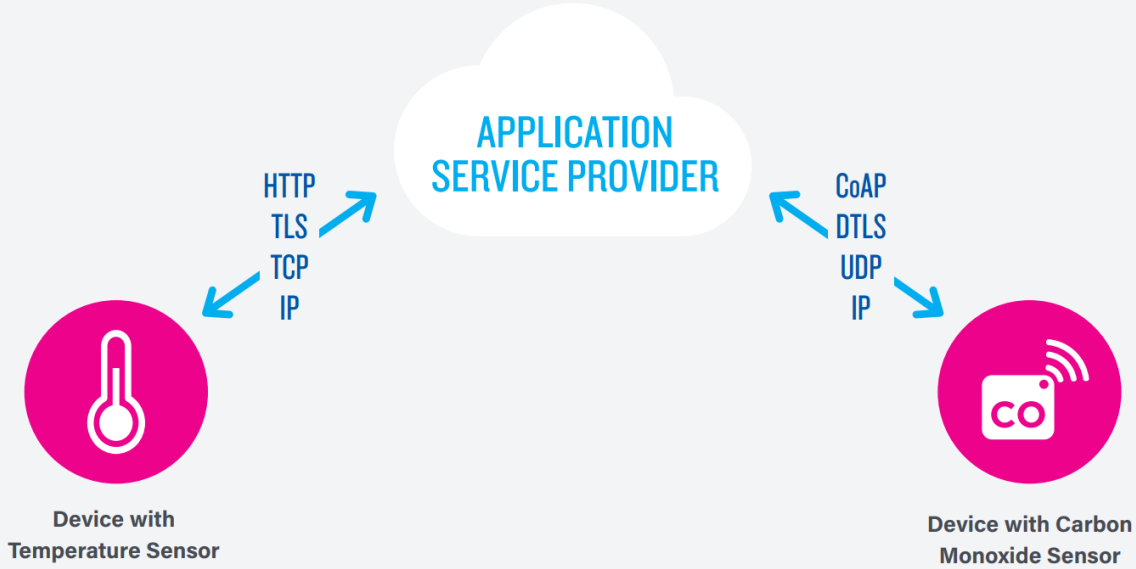
Example Of Device-To-Device Communication Model

SOURCE: Tschofenig, H., et.al., Architectural Considerations in Smart Object Networking. Tech. no. RFC 7452. Internet Architecture Board, Mar. 2015. Web. https://www.rfc-editor.org/rfc/rfc7452.txt.

Device-to-Cloud communications

FIGURE 2

Example Of Device-To-Cloud Communication Model



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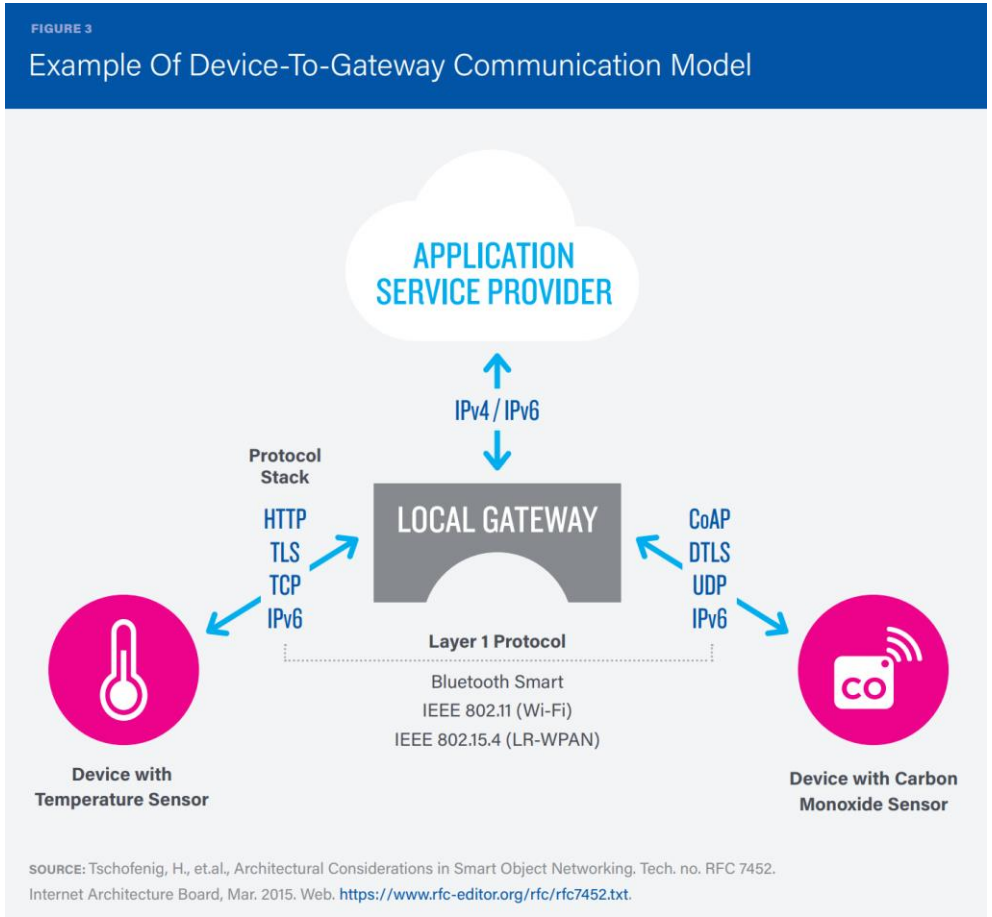
Device-to-Gateway communcations

FIGURE 3

Example Of Device-To-Gateway Communication Model



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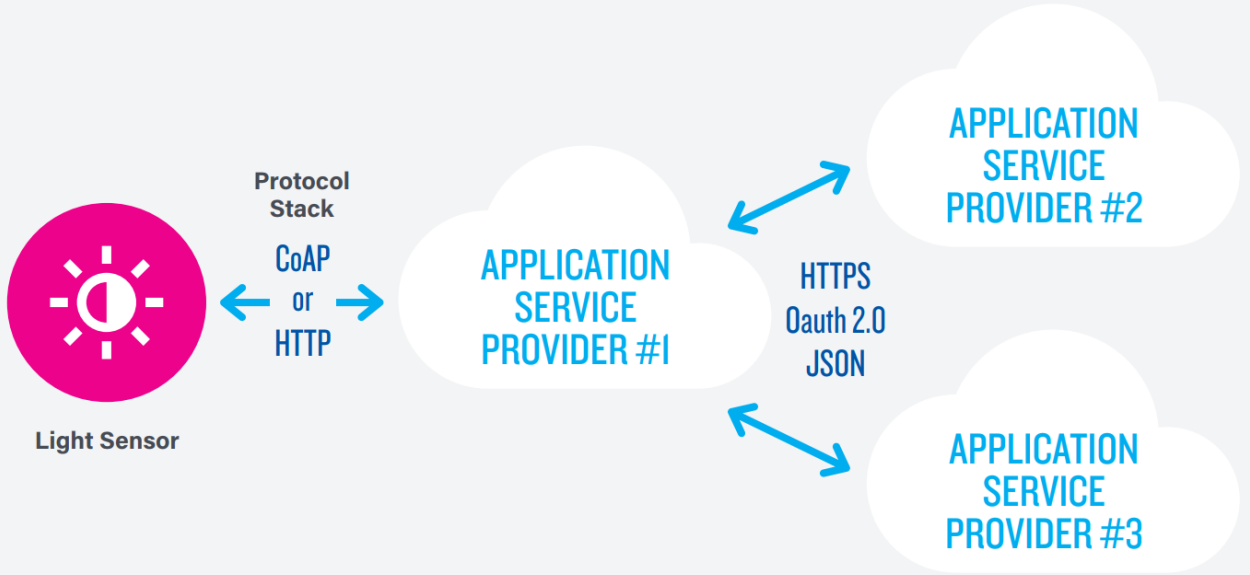
Back-End Data-Sharing Model

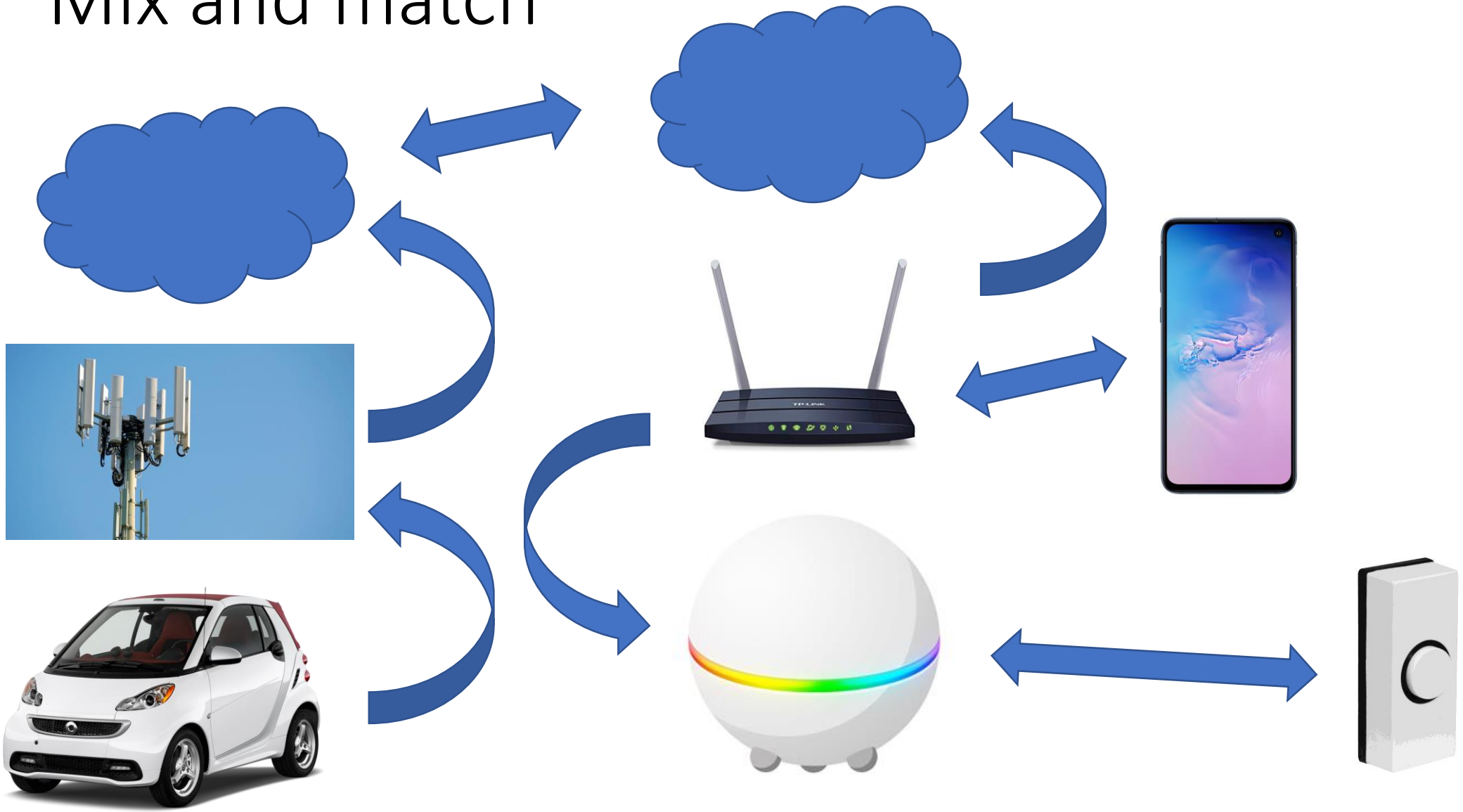
FIGURE 4

Back-End Data-Sharing Model



SOURCE: Tschofenig, H., et.al., Architectural Considerations in Smart Object Networking. Tech. no. RFC 7452. Internet Architecture Board, Mar. 2015. Web. https://www.rfc-editor.org/rfc/rfc7452.txt.

Mix and match



What issues are raised by the Internet of Things?

- Security
- Privacy
- Interoperability and standards
- Legal, regulatory and rights
- Emerging economy and development

Security

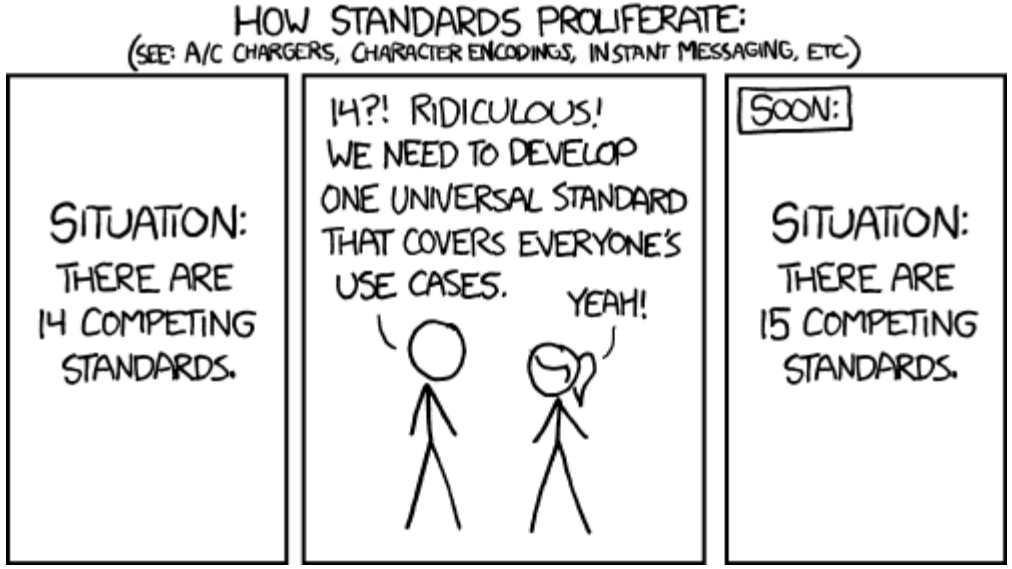
- Massive scale
- Homogeneity
- Short support lifecycle
- Upgradability
- Transparency
- Physical access
- Breach notification
- Community projects

Privacy considerations

- Transparency
- User owns many devices
- Public vs. private space
- Individuality
- Big data analytics
- Sharing is social

Interoperability and standards

- Vendor lock-in
- Technical and cost constraints
- Time constraints
- Technical risks
- Devices behaving badly
- Legacy systems
- Configuration



Regulatory, legal and rights

- Data discrimination
- Law enforcement
- Liability

Emerging economy and development

- Sustainability
- Providing basic human needs

Conclusion

- Our world is becoming “smarter”
- Many considerations
- Many stakeholders
- Collaboration is key

Questions?