

Standard for an Architectural Framework for the Internet of Things (IoT)

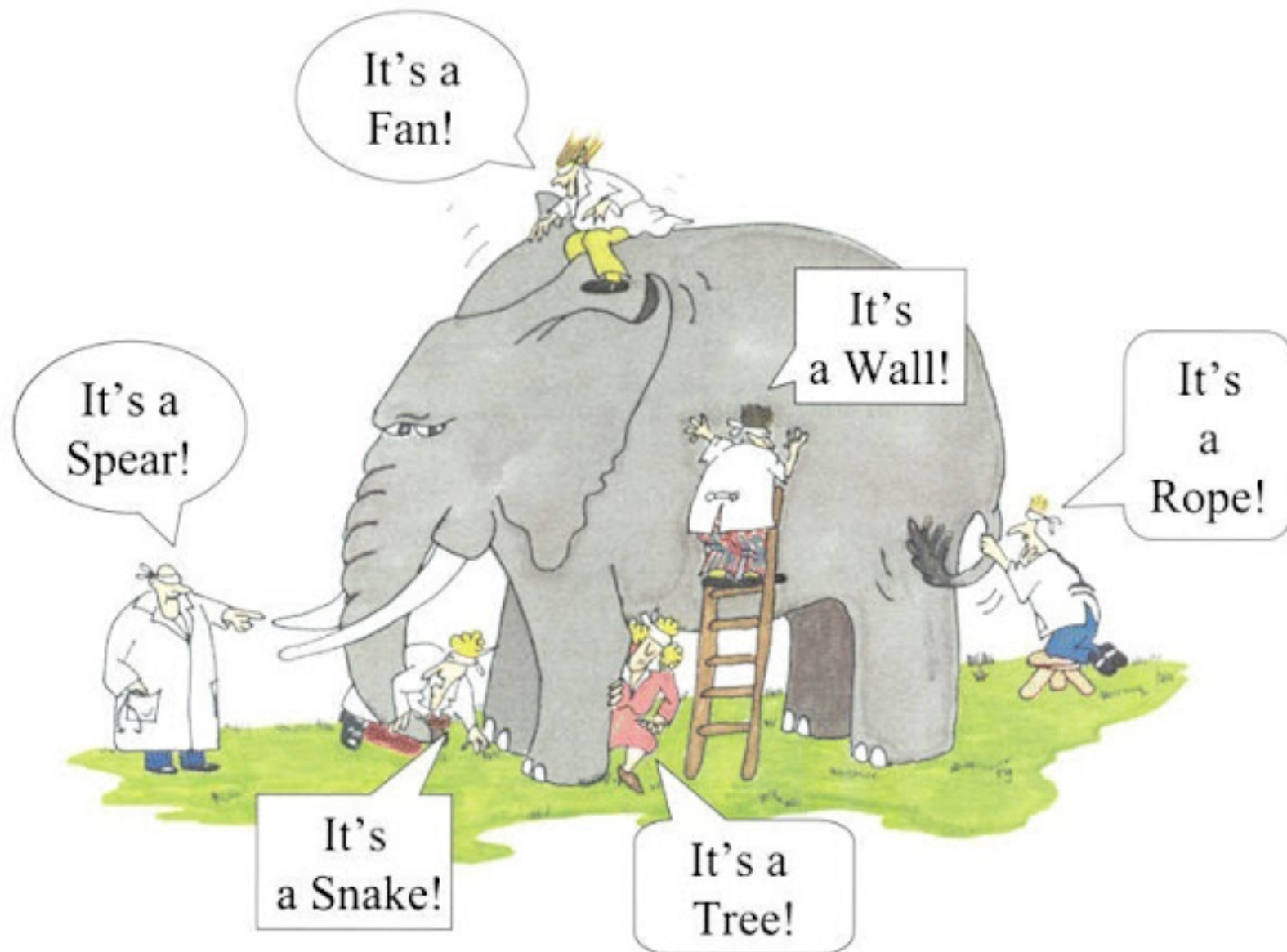
IEEE P2413

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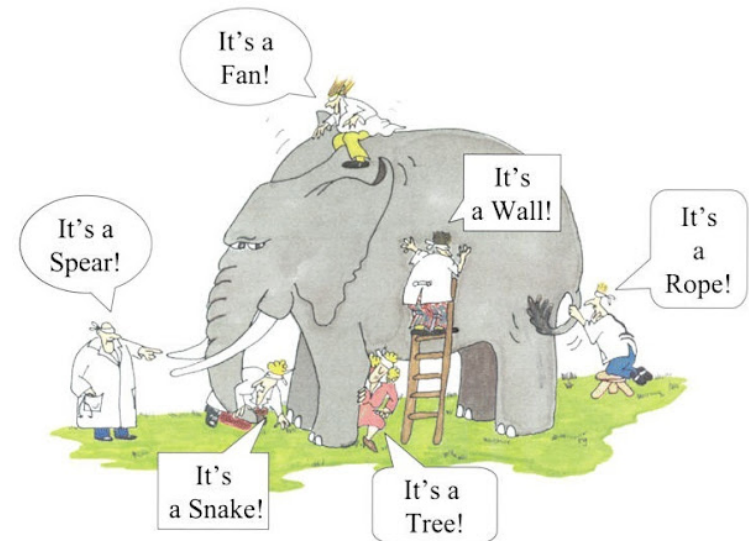
IEEE Internet of Things

Worldwide IoT Workshops

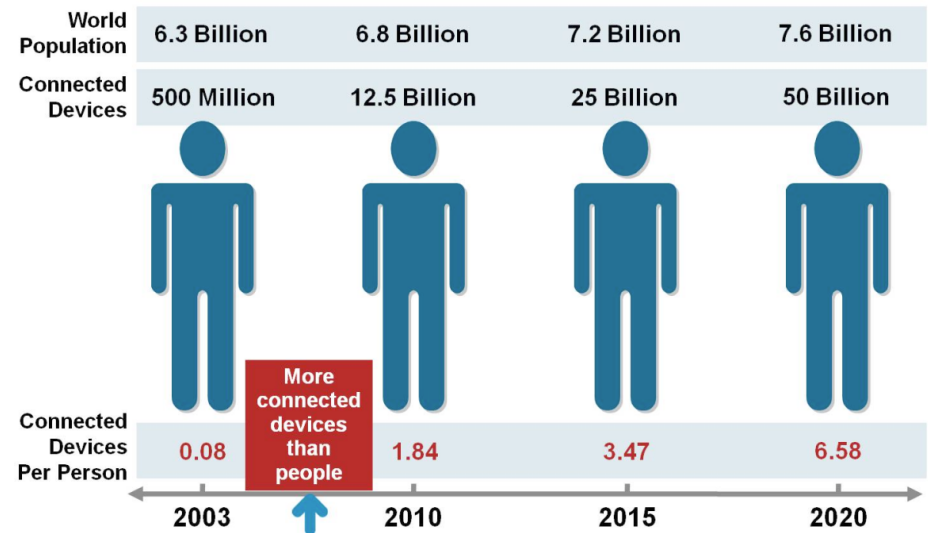
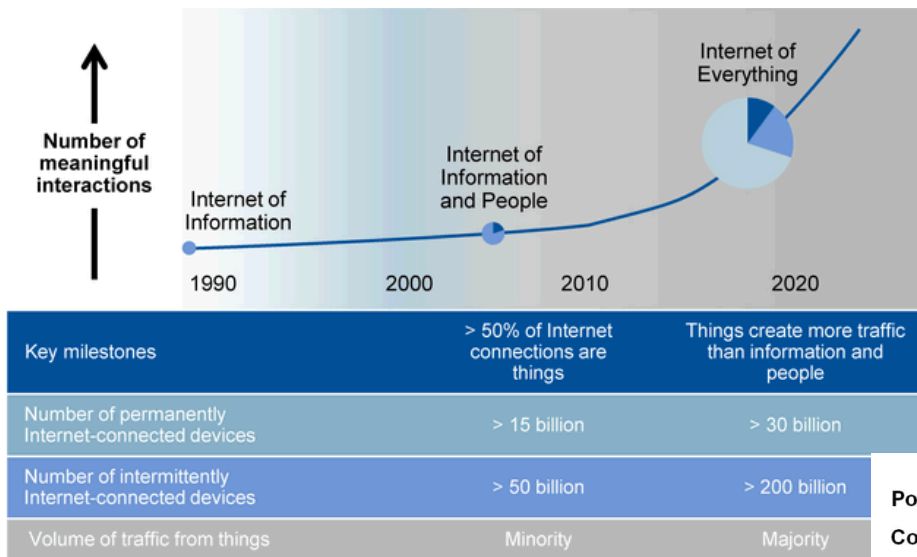
- 2012: Beijing, China and Milan, Italy
- 2013: Shenzhen, China and Mountain View, CA, USA
- 2014: IEEE IoT World Forum, Seoul, Korea (6-8 Mar)
- 2014: 18-19 September in Mountain View, California

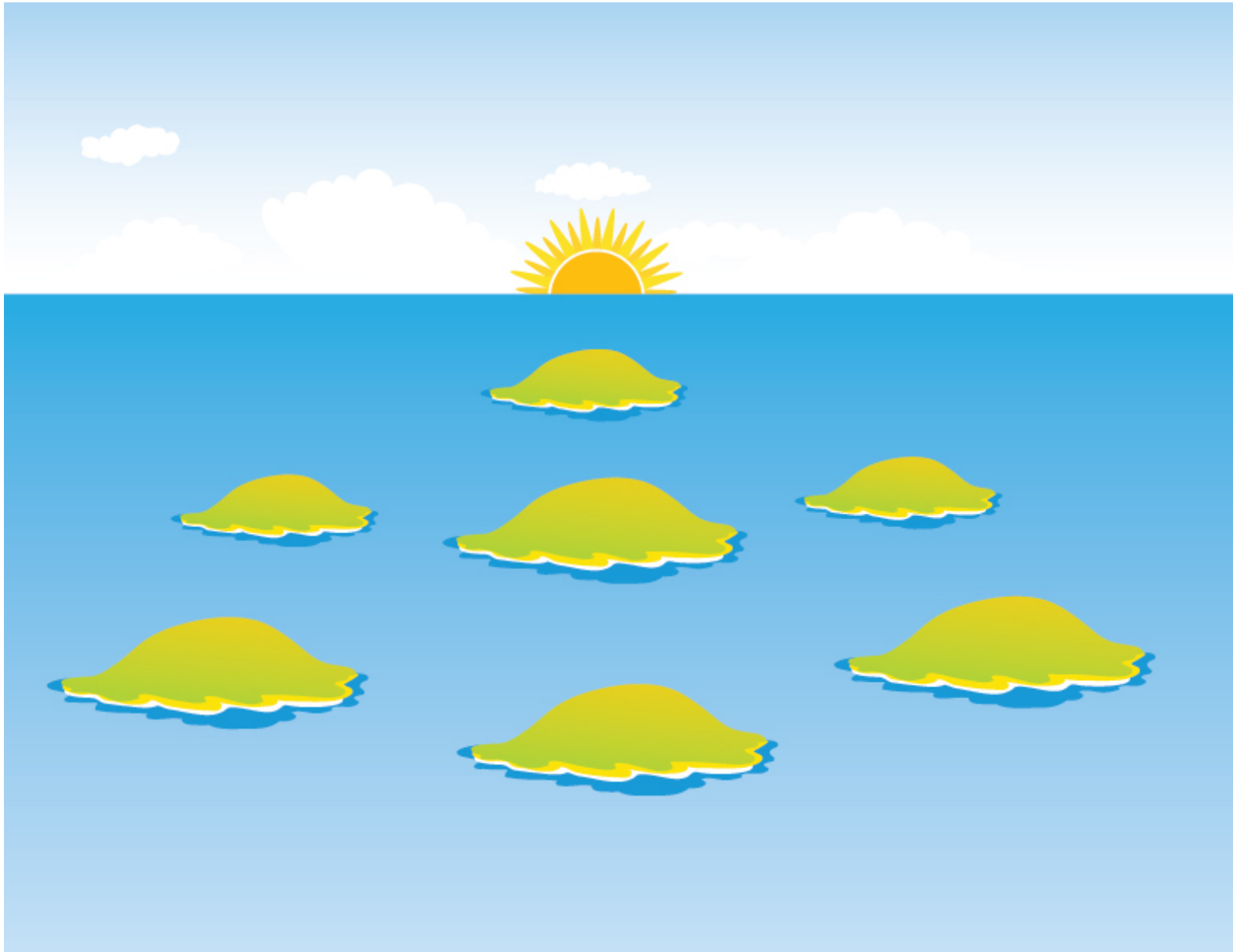
Hosting IoT industry roundtables and webinars

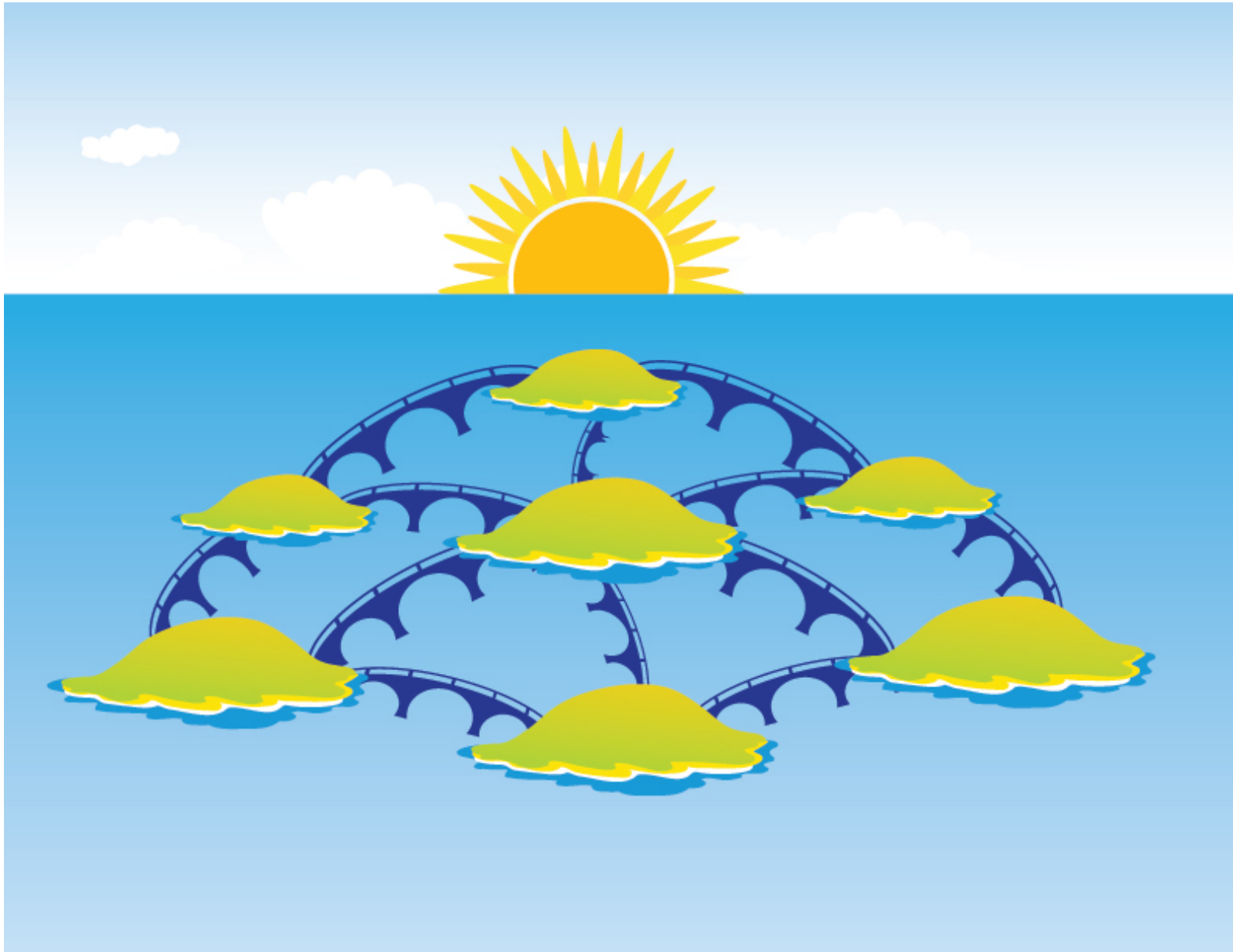
- 2012: Milan Roundtable
- 2013: Roundtables in Korea and USA
- 2014: Webinars introducing IEEE P2413
- 2014: Industry roundtables in US, Europe, and Asia



IoT Pervasiveness









IEEE STANDARDS ASSOCIATION



The Birth of IEEE P2413

P2413 is an outgrowth of a multi-year series of IoT Standards workshops and roundtables to understand requirements by vested stakeholders in the evolving IoT environment.

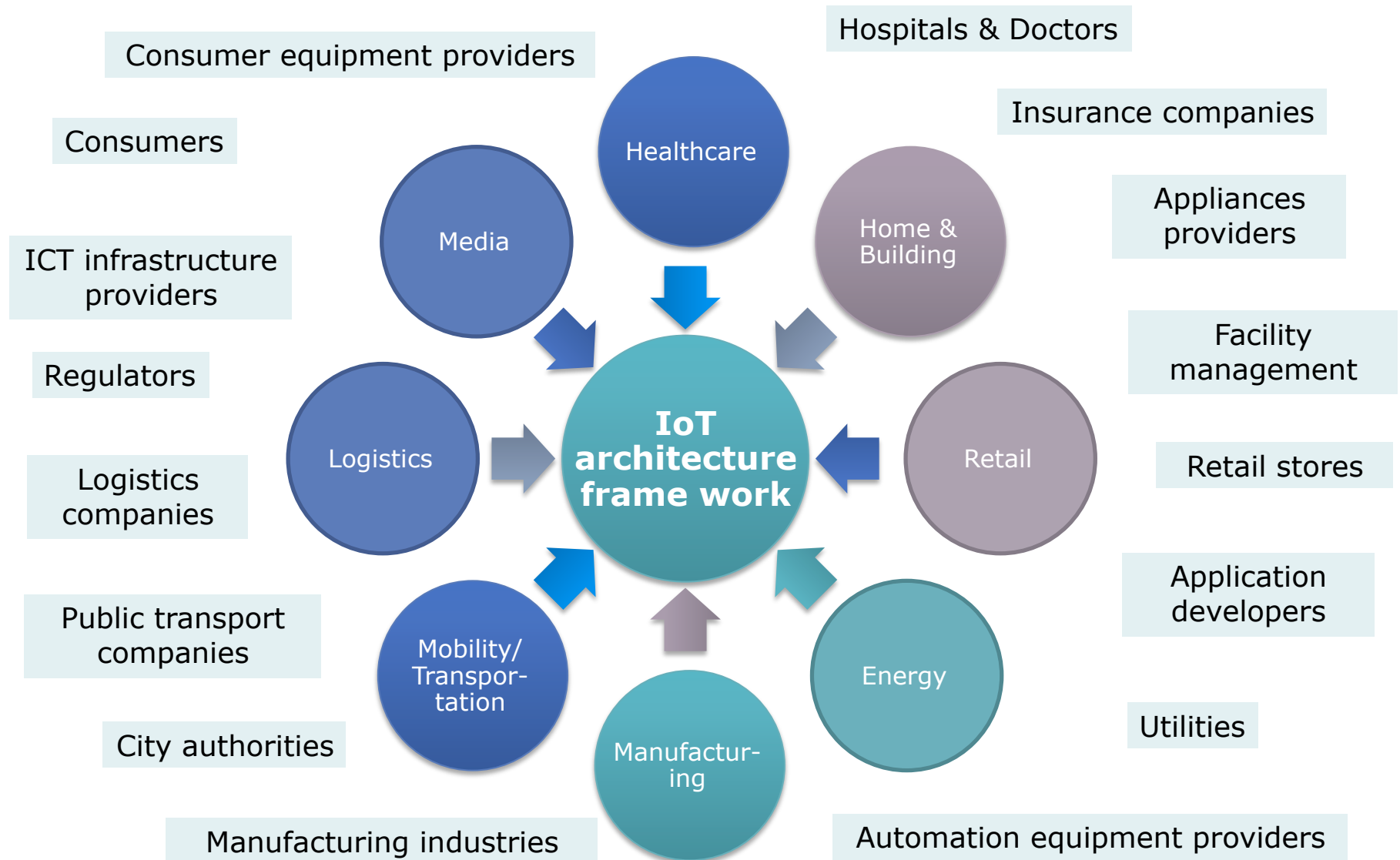
P2413 was initiated through the guidance of the IEEE-SA's Industry Strategic IoT Team with a focus to integrate market needs with the developing IoT technology landscape.

The IEEE-SA Corporate Advisory Group (representing 200+ industry members) provides sponsorship for P2413 to maintain a balanced focus on industry / market / technology and standards eco-system requirements within the development framework.

IEEE P2413 Purpose and Motivation

- The Internet of Things (IoT) is a key enabler for many emerging and future “smart” applications and technology shifts in various technology markets. This ranges from the Connected Consumer to Smart Home & Buildings, E-Health, Smart Grids, Next Generation Manufacturing and Smart Cities. It is therefore predicted to become one of the most significant drivers of growth in these markets.
- Most current standardization activities are confined to very specific domains and stakeholder groups. They therefore represent islands of disjointed and often redundant development. The architectural framework defined in this standard will promote cross-domain interaction, aid system interoperability and functional compatibility, and further fuel the growth of the IoT market.

IoT Application Domains & Stakeholders*



IEEE P2413 Goals

- Accelerate the growth of the IoT Market by enabling cross-domain interaction and platform unification through increased system compatibility, interoperability and functional exchangeability
- Define an IoT architecture framework that covers the architectural needs of the various IoT Application Domains
- Increase the transparency of system architectures to support system benchmarking, safety, and security assessments
- Reduce industry fragmentation and create a critical mass of multi-stakeholder activities around the world
- Leverage the existing body of work

IEEE P2413 External interactions

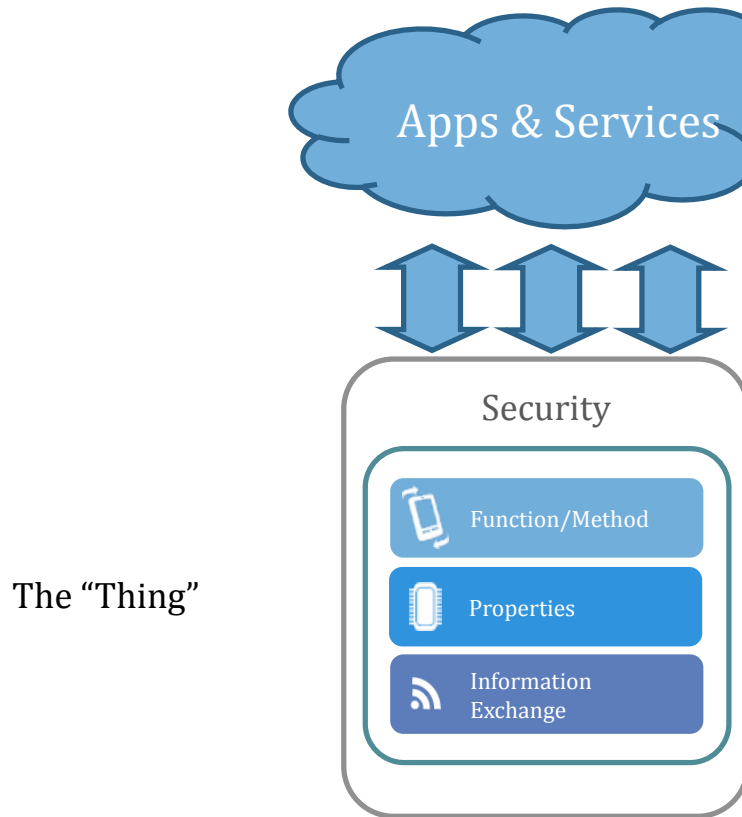
- For a unified IoT Architectural Framework it is essential to interact with standardization activities for IoT-based vertical applications to
 - Cover the various applications, their requirements and specific IoT functionalities in the IoT Architectural Framework
 - Ensure that the framework can be referenced by these standardization activities
- Besides interactions with standardization activities within IEEE, P2413 will strive to establish liaisons with other standardization bodies.
- Discussions are underway with IEEE 802.24, IEC SG8, oneM2M, and IIC

IEEE P2413 Scope

- This standard defines an Architectural Framework for the IoT, including descriptions of various IoT domains, definitions of IoT domain abstractions, and identification of commonalities between different IoT domains.
- The Architectural Framework for IoT provides:
 - reference model that defines relationships among various IoT domains (e.g., transportation, healthcare, etc.) and common architecture elements
 - reference architecture that:
 - builds upon the reference model
 - defines basic architectural building blocks and their ability to be integrated into multi-tiered systems
 - addresses how to document and mitigate architecture divergence.
 - blueprint for data abstraction and the quality "quadruple" trust that includes protection, security, privacy, and safety.

IEEE P2413 Definitions

- The Group accepted the definition of the “Thing”:

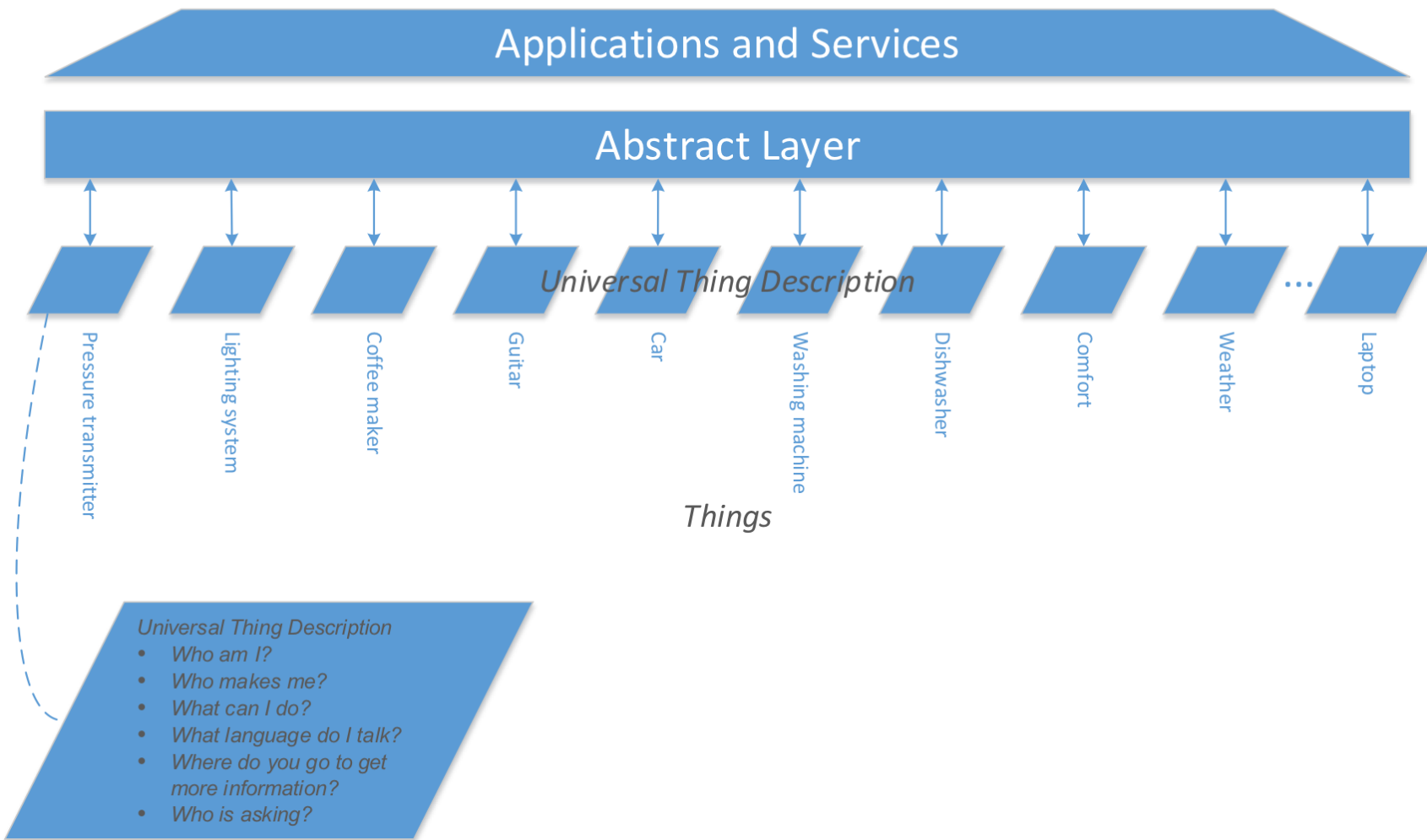


The “Thing”

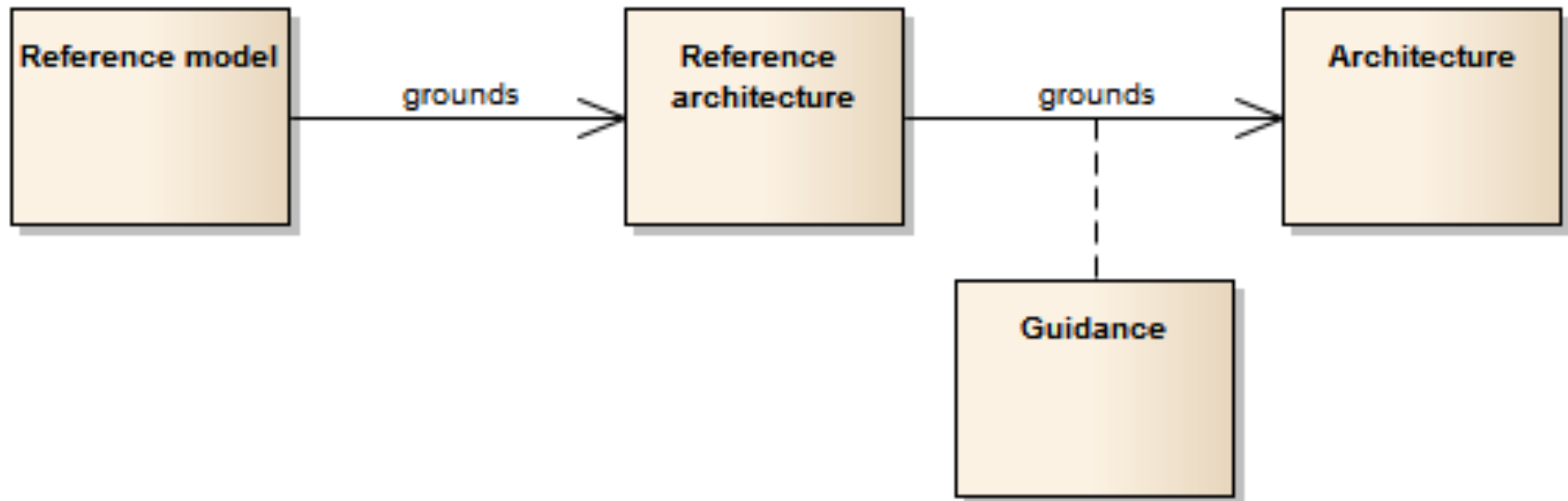
Notes:

- Things, Apps, and Services can be integrated into what would be abstracted as a “Thing”
- Information exchange could be “horizontal” (subscribe/publish as an example) or vertical, or both
- Properties could be real or virtual

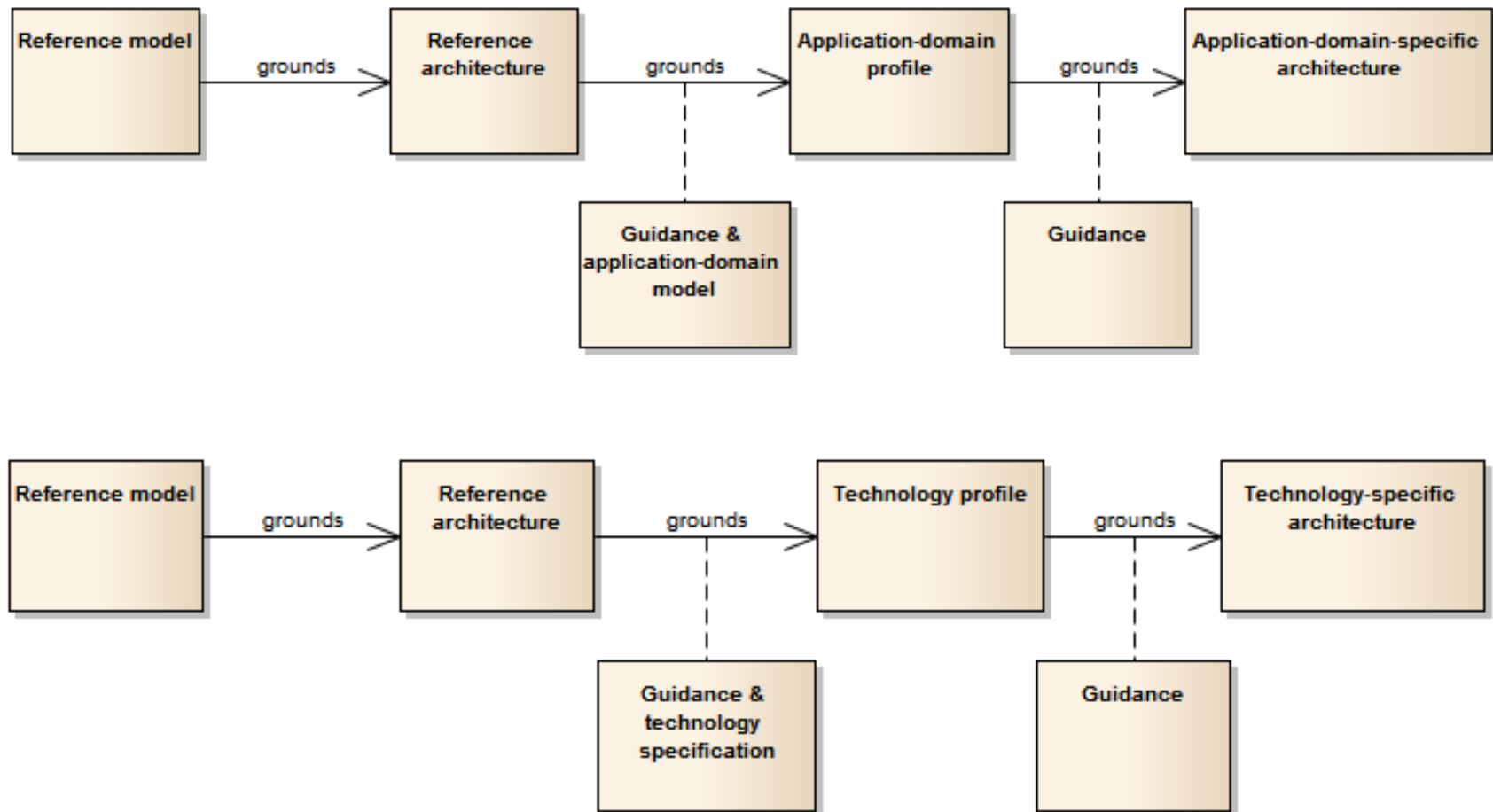
IEEE P2413 Application Framework



IEEE P2413 Structure



IEEE P2413 Potential Profiles



IEEE P2413 Membership

1. Alcatel-Lucent
2. Cisco Systems
3. dZhON Pty. Ltd.
4. Emerson
5. General Electric
6. Hitachi, Ltd.
7. Honeywell International
8. Huawei Technologies
9. Infocomm Development Authority (IDA)
10. Institute for Information Industry (III)
11. Kaspersky Lab
12. NIST
13. Qualcomm Inc.
14. Renesas
15. Rockwell Automation
16. Schneider Electric
17. Senslytics
18. Siemens AG
19. STMicroelectronics
20. Toshiba Corporation
21. Wipro
22. Yokogawa Electric Corporation

IEEE P2413 Organization

- To accelerate the development process P2413 has launched a number of Sub-Working Groups:
 - Scope and Applicability
 - Standardization Landscape
 - Networking
 - Reference Model
- Work completion timeline: 2016

IEEE P2413 Working Group Meetings

- First WG Meeting: 10-11 July 2014, Hosted by Siemens in Munich, Germany
- 2nd WG Meeting: 16-17 September 2014, Hosted by STMicroelectronics in Santa Clara, CA USA
- 3rd WG Meeting: Teleconference, 28 October 2014
- 4th WG Meeting: Teleconference, 17 December 2014
- 5th WG Meeting: 22-23 January 2015 in Taipei, Hosted by Institute for Information Industry (III).
- 6th WG Meeting: 27-28 April 2015 in Grenoble, Hosted by Schneider Electric
- 7th WG Meeting: 27-30 July 2015, Hollywood Beach, Florida USA
- 8th WG Meeting: 3-6 November 2015, Asia (TBD)

P2413 – Conclusions

- P2413 recognizes the evolving transformational integration and convergence across technology and application domains.
- P2413's goal is to provide an extensible integrated architectural framework that will continue to evolve and unify the standards creation effort.
- P2413 will continue to deepen industry engagement by leveraging global IoT workshops, webinars, roundtables and other tools of the IEEE IoT Initiative.
- P2413 is an open community and all are welcome to participate and to share perspectives on addressing and preparing for the inter-connected world of 2020.

Thank you!

Join the IEEE P2413 Working Group
<http://grouper.ieee.org/groups/2413/>

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