ZigBee Alliance

Standards for the wireless IoT

DOE Connected Lighting Workshop
16 November 2015
Roy Harvey, OSRAM SYLVANIA
ZigBee in brief

- ZigBee Alliance was founded in 2002
- Focus is on low-power wireless networking specifications, application standards, and certification programs for the Internet of Things
- Specifies all layers, from Application to Physical
- Addresses consumer, commercial, and industrial markets
- Broad application space ranging from point-to-point controls for consumer electronics to city-wide mesh networks
- Comprehensive compliance testing program
- 430 members; 1400 certified products
The ZigBee Alliance creates, maintains and delivers specifications, standards and solutions for the wireless Internet of Things.
CURRENT

ZigBee Alliance Members

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NEW MEMBERS IN 2015

ADOPTER 51
PARTICIPANT 9
PROMOTER 2

total 62
ZigBee Certified Dashboard
September 30, 2015

Total Certifications: 1392

End Product Mix (lifetime)

- ZigBee Smart Energy 47%
- ZigBee Home Automation 21%
- ZigBee Light Link 17%
- ZigBee Telecom Services 1%
- Manufacturer Specific Profile 8%
- Green Power 1%
- ZigBee Health Care 1%
- ZigBee Gateway 1%
- ZigBee Building Automation 1%
- ZigBee Retail Services 0%
- ZigBee Input Device 0%
- ZigBee Remote Control 2%

Monthly Growth: 2.00% (12 Month Average)

Top 10 Product Certifiers

- Philips
- Legrand
- Schneider Electric
- Landis+Gyr
- Itron
- Osram Sylvania
- LG Electronics
- Busch-Jaeger
- Secure Meters
- Silver Spring Networks
ZigBee Certified Products
Last 12-months
(Through 31-August-2015)

- ZigBee Building Automation, 3
- ZigBee Remote Control, 3
- ZigBee Smart Energy, 44
- ZigBee Light Link, 81
- ZigBee Compliant Platform, 70
- ZigBee Home Automation, 42
Open, Global Standards Grow the Market

- Single product can be deployed globally
- Consumer choice of products
- Product Competition
  - Quality
  - Product Feature Innovation
- Buyer choice of suppliers
  - No vendor lock-in to specific chip manufacturer
  - Multiple sources for interoperable end products
Creating Requirements-based Standards

- Market Requirements Document (MRD)
  - Contains use cases, high-level market requirements

- Technical Requirements Document (TRD)
  - MRD must be approved by a marketing group
  - Defines requirements in technical manner
  - Document is written

0.7
- Interop ready
- Mfgs begin testing devices with each other and relevant functions
- Becomes gating events
- Implementable version

0.9
- Certification-ready
- Only mfg product from gating events
- Final language clean-up

1.0
- Final version
- First certified products
- Golden units created, located at test houses

ZigBee Change Control Board (CCB) also used for modifications to released standards
- Test and interoperability issues
- Bug fixes

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ZigBee and the Internet

LAN/WAN: Ethernet, WiFi, Cellular, Cable, Fiber, etc

ZigBee Coordinator
ZigBee Router
ZigBee End Device
ZigBee Coordinator/Gateway (optional)
# ZigBee Standards

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<th>ZigBee 3.0</th>
<th>ZigBee IP</th>
<th>ZigBee NAN</th>
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<th>Network</th>
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<th>ZigBee PRO with Green Power</th>
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“The Connected Lighting Alliance announced today its endorsement of ZigBee Light Link as the preferred common open standard for residential connected lighting applications, simplifying choices for both lighting companies and consumers. …

This decision represents the first time an alliance of leading lighting companies has unanimously endorsed a common open standard for wireless lighting solutions.”

Press release by The Connected Lighting Alliance, July 15, 2013
ZigBee 3.0: Simpler, More Interoperable

- ZigBee 3.0 is the unification of ZigBee application standards
- The base device specification provides consistent behavior for nodes connecting to a ZigBee network
- Supports a uniform application space as the concept of profiles has been removed
- Provides enhanced security for the network

- A ‘base device’ defines:
  - Environment required for the base device
  - Initialization procedures of the base device
  - Commissioning procedures of the base device
  - Security procedures of the base device
Some lighting-related Industry Partners

ZigBee PRO is the only wireless technology specified by BACnet International

ZigBee Light Link is the only wireless technology endorsed by TCLA

ZigBee is the only protocol designated by EMerge in its Occupied Space standard

ZigBee Alliance works closely with IEEE 802.15.4 and uses its MAC/PHY layers

ZigBee Alliance and Thread Group are evaluating under liaison agreement the feasibility of using ZigBee’s application layer with Thread’s network layer
ZigBee and the future of lighting

- Lighting is ubiquitous and is the ideal foundation for ZigBee mesh networks and the wireless IoT
- Lighting was the largest category of ZigBee Certified Products in the past year
- ZigBee enables the wide span of lighting applications, from a few lamps in a room to city-wide street-lighting networks
- Lighting has synergy with other systems in smart buildings:
  - occupancy sensors for lighting/HVAC/security
  - lights activated by security system
  - lights controlled by ADR via building automation system

ZigBee standards and products are helping lighting systems move beyond sources of illumination to become sources of information