Aligning Standards to Maximize Bluetooth™ Market

Tom Siep
Member Group Technical Staff
Texas Instruments

Bluetooth is a trademark Telefonaktiebolaget L M Ericsson, Sweden
Overview

◆ Specification Versus Standards
◆ What is being “Standardized”
◆ Standards-Specific Additions to the Bluetooth Specification
◆ Status of the Draft Standard
◆ Plans for Future Bluetooth/IEEE Collaboration
My Involvement with Bluetooth

- TI Short Distance Wireless Business Unit formed
- Chief Technical Editor, IEEE802.15 WPAN™ Standards
- Lead Technical Editor, IEEE802.15.1
- Editorial interface between BSIG and 802.15.1
- Author
  - "An IEEE Guide: How to Find What You Need in the Bluetooth Spec"
- Bluetooth Specification Section Owner, L2CAP

WPAN is a trademark of the IEEE
Specification versus Standard
The Specification Artist

Helps people see the world in a new way.
The Standards Engineer

Codifies well-understood phenomena

and

applies them to well-known problems
Specification vs. Standard

- Starts with a blank canvas
- Free format
- Usually evolves
- Often describes an implementation
- Says many (perhaps different) things to many people
- Sometimes “you had to be there”
- Inspires

- Starts with defined goal
- Format dictated by Standard
- Evolution by formal means
- Implementation Independent
- Unambiguous
- All you need to know is right there (or in the references)
- Communicates
IEEE Project 802 Standards

ISO OSI Layers | IEEE 802 Standards
---|---
1. Physical | Physical (PHY)
2. Data Link | Medium Access (MAC)
3. Network | Internet Protocol (IP)
4. Transport | Transport Control Protocol (TCP)
5. Session | 
6. Presentation | 
7. Application | x.400 and X.500 Email

Hardware

Software
How Does That Relate to Bluetooth?
Constructing the Draft

802.15.1

1. Overview
2. References
3. Definitions
4. Acronyms
5. General Description
6. WPAN Architecture

PHYsical Layer
- Radio

Medium Access Control
- Baseband
- Link Manager Protocol
- L2CAP
- HCI

Service Access Points
- PICS Proforma
- MAC Formal Definition
- Bibliography

Generic Access Profile
- Timers
- Optional Paging Scheme
- Test Mode
- Config. MSCs
802.15.1 SDL

❖ Derived a picture of what the structure of the BT spec is in IEEE terms.
❖ Helped to uncover holes in existing spec
❖ Enables bench testing and validating of components
❖ Provides a common language between the SIG and the IEEE
❖ Generation of TTCN from SDL is possible
Implications for the future of Standards

◆ Normative SDL makes an unambiguous Standard

◆ Working SDL models can be used to extend currently working Standards, minimizing the danger of breaking the protocol

◆ SDL makes the relationship between Standards and Test Suites explicit
The Process of Creating a Standard

1. Project Authorization
2. Establish Criteria for Standard
3. Make Changes to Obtain WG Approval
4. Prepare Draft for Circulation
5. WG Letter Ballot
6. WG Reviews Returned Ballots
7. Resolvable Negatives?
8. Technical Changes?
9. Sponsor Ballot
10. New Negative Votes?
11. Proceed to Standards Board Approval

You are here
Project 802.15.1 Status

- Presented to Working Group and then IEEE 802 Executive Committee September 00
- Delayed for Bluetooth V1.1 publication
- Confirmation Letter Ballot started 9Feb01, ends 11Mar01
- Comment Resolution at March01 IEEE meeting in Hilton Head, SC.
- LAN/MAN 802.15 Sponsor Ballot(s) during the Summer or Fall
- RevCom will submit Final Draft Std for approval upon successful completion of the Sponsor Ballot
Future Bluetooth/IEEE Collaboration

◆ IEEE 802.15 continues to work with the Bluetooth Special Interest Group
  ■ Submission of Errata
  ■ “Early” updates of the Spec from the SIG – current version of Draft includes v1.1 Bluetooth Specification
  ■ Plans for future revisions of
    ✷ Version 1.x
    ✷ Future versions

◆ There now is an overlap of “ownership” of the two documents.
IEEE: Contact Information

- **Jim Carlo,**
  IEEE802 LAN/MAN Standards Committee Chair
  - jcarlo@ti.com
  - Tel&Fax: +1 214 853 5274

- **Susan Tatiner,**
  IEEE-SA Director Standards Publishing Programs
  - s.tatiner@ieee.org
  - Tel: +1 732 562 3830

- **Tom Siep -**
  IEEE P802.15.1 Editor
  - siep@ti.com
  - Tel: +1 972 480 6786
Backup Slides

(likely not shown)
IEEE: An Overview

- Established in 1884 (AIEE & IRE)

- Membership was 360,00 Dec99;
  66% USA & 33% Non-USA

- Produces 30 percent of the world's published literature in electrical engineering, computers and control technology,

- Holds annually more than 300 major conferences

- Has more than 800 active standards with 700 under development.
IEEE P802 LAN/MAN

- IEEE Project 802 Local and Metropolitan Area Network Standards Committee
- Accredited by ANSI, Sponsored by IEEE Computer Society
  - Ethernet, Token Ring, Wireless, Cable Modem Standards
  - Bridging, VLAN, Security Standards
- Meets three times per year
  (400 individuals, 15% non-US)
- Develops equivalent IEC/ISO JTC 1 standards
  JTC 1 series of equivalent standards are ISO 8802-nnn
- IEEE URLs
  - 802 http://www.ieee802.org/
  - 802.15 http://www.ieee802.org/15/
IEEE 802 Standards Principals

- **Due Process** through established rules and procedures
- **Consensus** highly desired, near unanimity is generally the rule
- **Openness** where all individuals, world-wide, have access to the process
- **Balance** maintained by having balloting group include both developers and users
- **Right to Appeal** both procedural and technical issues at any time during the process
More Detail of IEEE P802 Structure

1) Logical Link Control

2) Medium Access Control

3) Physical Layer

4) Medium Access Control Management

5) Physical Layer Management

Service Access Points

Station Mgmt

PHY Mgmt

MAC Mgmt

SAP

SAP

SAP

SAP

SAP

LLC

MAC

PHY