Aligning Standards to Maximize Bluetooth™ Market

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Bluetooth is a trademark Telefonaktiebolaget L M Ericsson, Sweden1

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

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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"

http://standards.ieee.org/catalog/press/index.html#Bluetooth

◆ Bluetooth Specification Section Owner, L2CAP

WPAN is a trademark of the IEEE

Specification versus Standard

versus

The Specification Artist

Helps people see the world in a new way.

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The Standards Engineer

Codifies well-understood phenomena

and

applies them to well-known problems
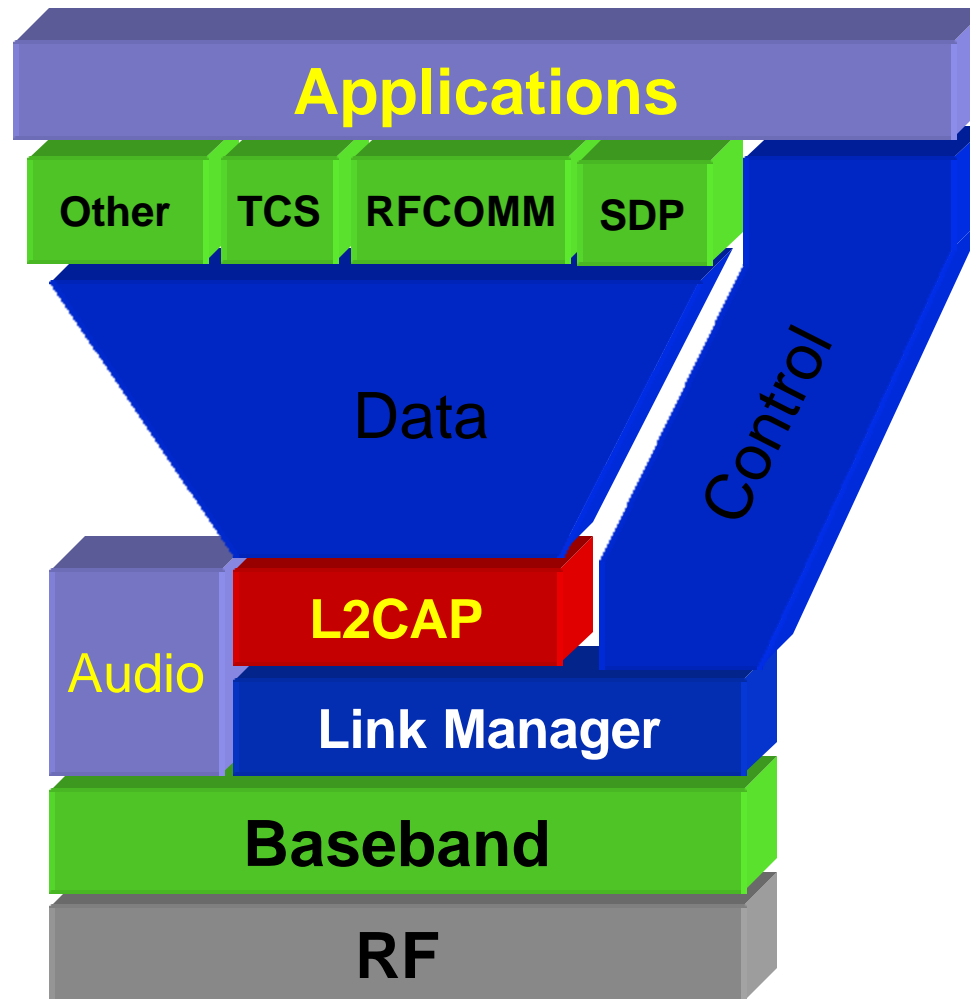
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Specification vs. Standard

❖ 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)
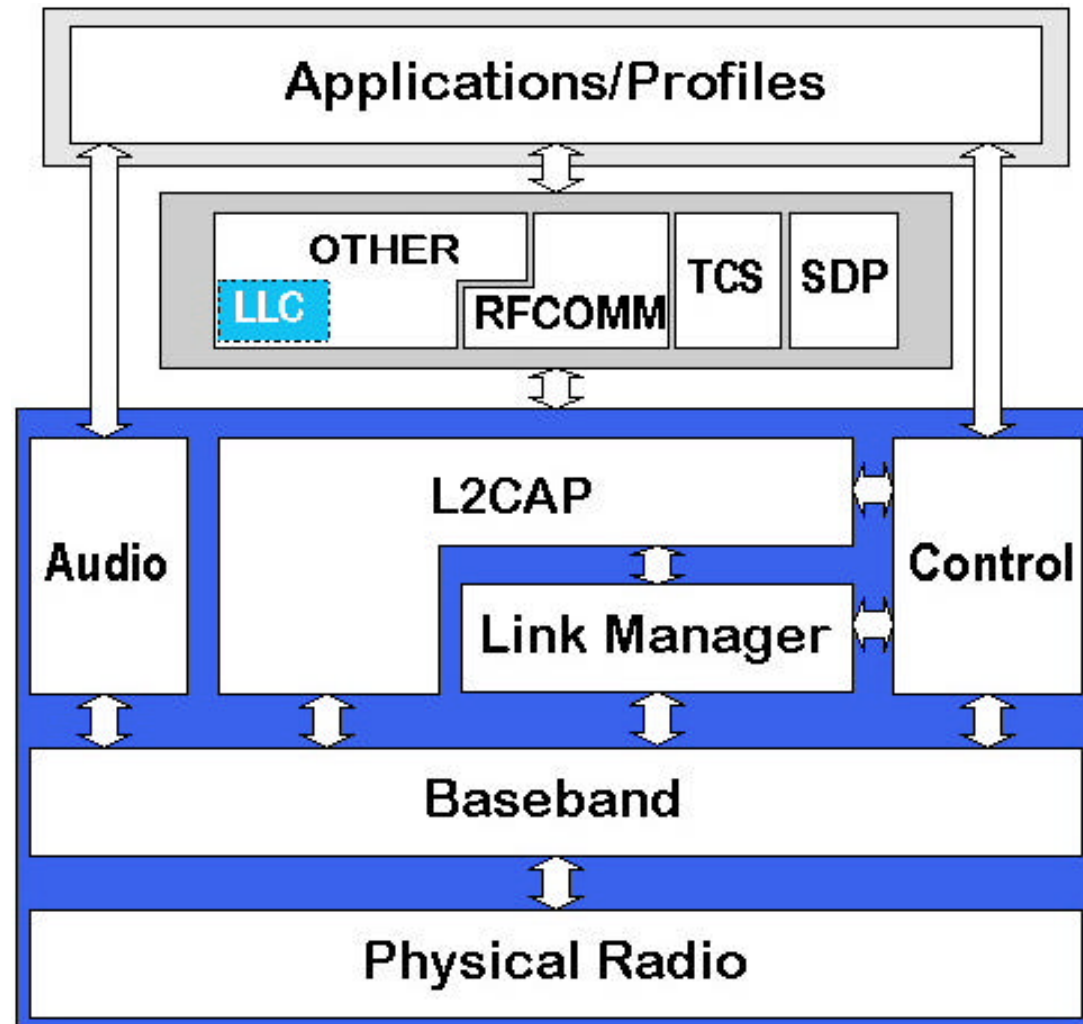
• Communicates

Bluetooth Specification

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Bluetooth Specification

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IEEE Project 802 Standards

ISO OSI Layers:

7	Application	← x.400 and X.500 Email
6	Presentation	
5	Session	
4	Transport	← Transport Control Protocol (TCP)
3	Network	← Internet Protocol (IP)
2	Data Link	
1	Physical	

IEEE 802 Standards:

- Logical Link Control (LLC)
- Medium Access (MAC)
- Physical (PHY)

Hardware

Software

ISO OSI Layers

IEEE 802 Standards

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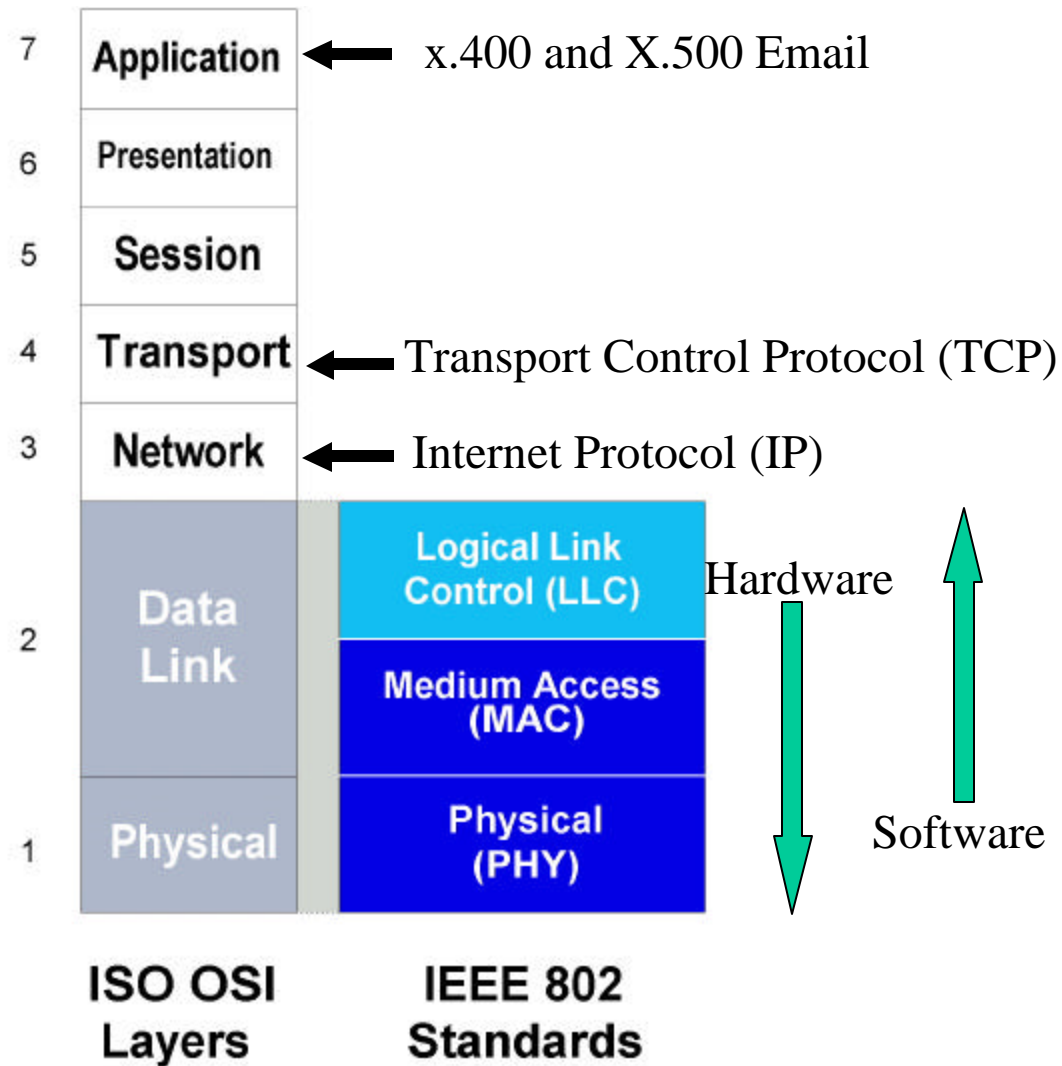
How Does That Relate to Bluetooth?
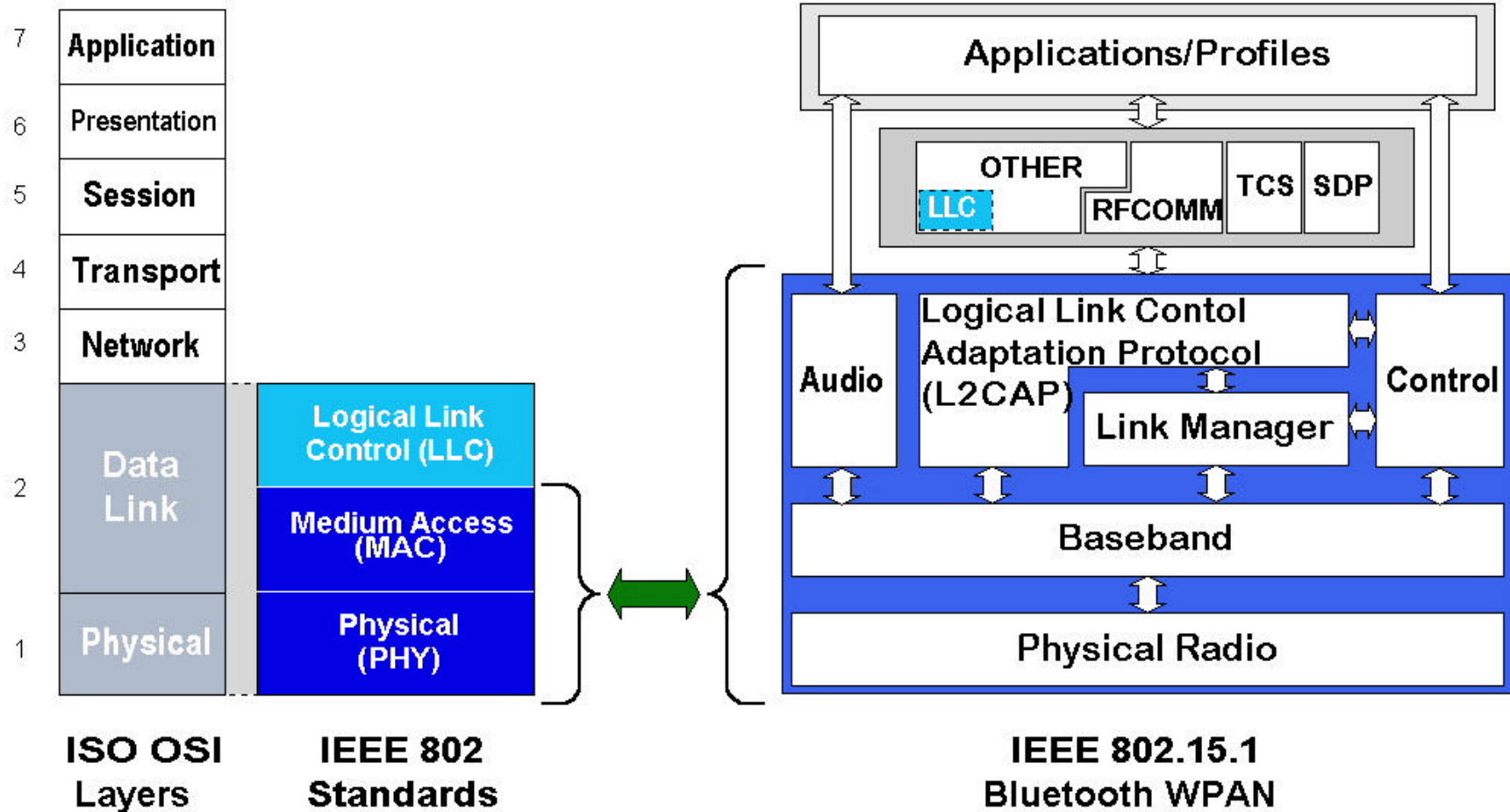
Constructing the Draft

802.15.1

1 Overview

2 References

3 Definitions

4 Acronyms

5 General Description

6 WPAN Architecture

7 PHYsical Layer

7 Radio

8, 9, 10, 11 Medium Access Control

8 Baseband

9 Link Manager Protocol

10 L2CAP

11 HCI

11 Service Access Points

A PICS Proforma

B MAC Formal Definition

H Bibliography

C Generic Access Profile

D Timers

E Optional Paging Scheme

F Test Mode

G Config. MSCs

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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

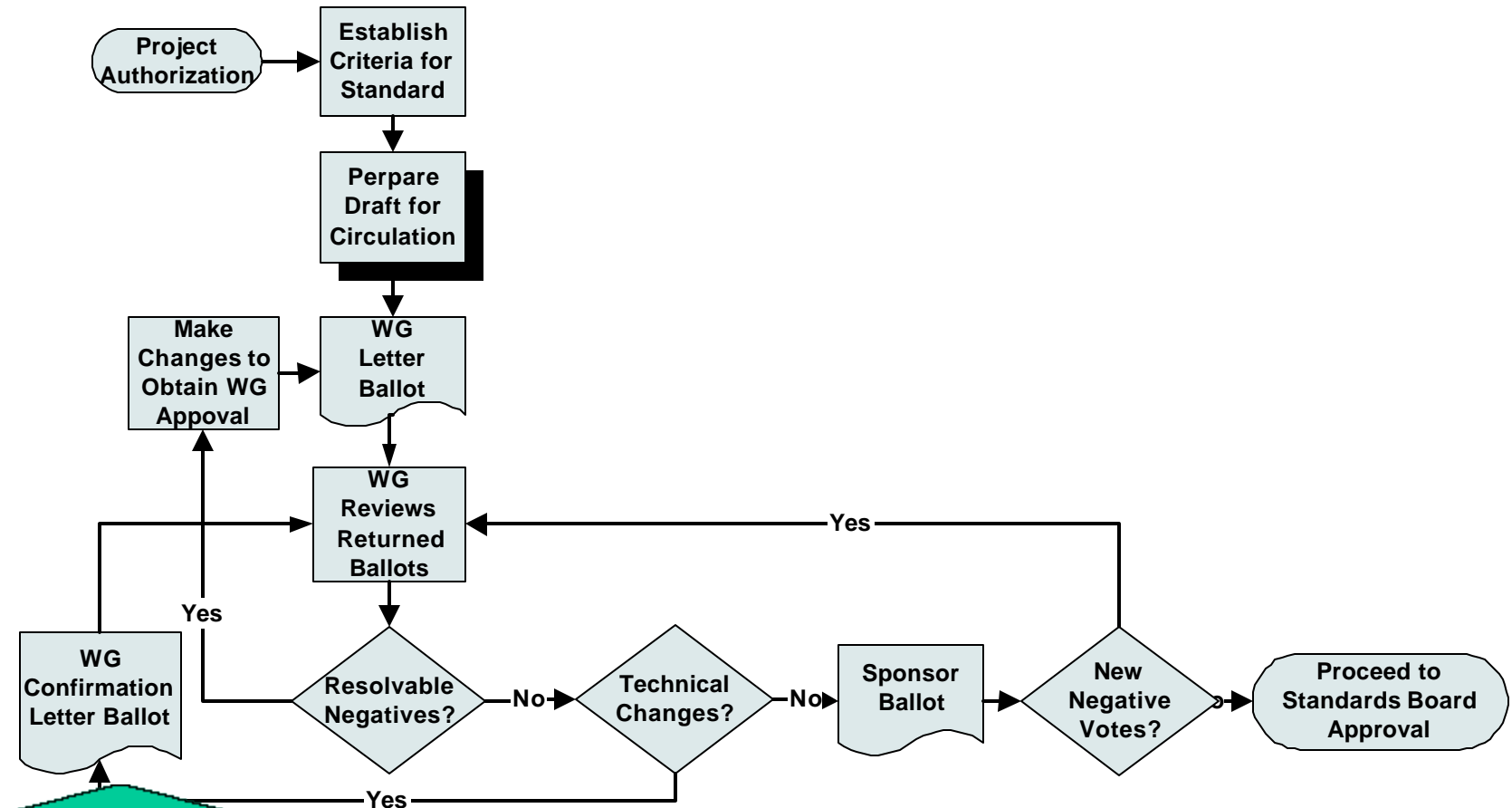◆ Generation of TTCN from SDL is possible

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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

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The Process of Creating a Standard

Project Authorization → Establish Criteria for Standard

Establish Criteria for Standard ↓ Perpare Draft for Circulation

Perpare Draft for Circulation ↓ WG Letter Ballot

Make Changes to Obtain WG Appoval → WG Letter Ballot

WG Letter Ballot ↓ WG Reviews Returned Ballots

WG Reviews Returned Ballots ↓ Resolvable Negatives?

Resolvable Negatives? — Yes → Make Changes to Obtain WG Appoval

Resolvable Negatives? — No → Technical Changes?

Technical Changes? — Yes → WG Confirmation Letter Ballot

Technical Changes? — No → Sponsor Ballot

Sponsor Ballot → New Negative Votes?

New Negative Votes? — Yes → WG Reviews Returned Ballots

New Negative Votes? → Proceed to Standards Board Approval

You are here (WG Confirmation Letter Ballot)

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Project 802.15.1 Status

◆ Presented to Working Group and then IEEE 802 Executive Committee September00

◆ 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

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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.

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More Information

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Backup Slides

(likely not shown)

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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.

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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/

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IEEE 802 Standards Principals

◆ **<u>Due Process</u>** through established rules and procedures

◆ **<u>Consensus</u>** highly desired, near unanimity is generally the rule

◆ **<u>Openness</u>** where all individuals, world-wide, have access to the process

◆ **<u>Balance</u>** maintained by having balloting group include both developers and users

◆ **<u>Right to Appeal</u>** both procedural and technical issues at any time during the process

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More Detail of IEEE P802 Structure

1) Logical Link Control

SAP

LLC

SAP

2) Medium Access Control

MAC

4) Medium Access Control Management

MAC Mgmt

SAP

3) PHYsical Layer

SAP

PHY

SAP

PHY Mgmt

SAP

Station Mgmt

5) PHYsical Layer Management

Service Access Points

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