

Understanding IEEE Wireless LAN Standards Nomenclature and Process

Why on earth is it important to know the standards making process? In our world of sensationalist journalism, it's good to have some perspective in which to gather information and to make decisions. It seems like every other week we read about a new standard or another new technology coming out of the industry standards associations. The trade rags create a publishing frenzy about it, but at the end of the day we are left wondering what we should do about it. This article will try to provide a little better perspective on how long to wait before taking a serious look at the “new technologies” that are hyped by the press.

IEEE Standards Nomenclature

The IEEE Standards making body consists of literally thousands of members covering hundreds of different standards ranging from safety practices to all manner of communications technologies. The IEEE 802 subcommittee deals with Local Area Network (LAN) and Metropolitan Area Network (MAN) technologies. The 802 subcommittee is further subdivided into smaller subcommittees as indicated by the addition of a dot notation. For example, 802.11 is the wireless LAN subcommittee, 802.15 is for wireless personal area networks, and 802.16 is for metropolitan area networks.

IEEE 802 Subcommittee	Description
802.1	Bridging and Management
802.2	Logical Link Control
802.3	CSMA/CD Access Method
802.5	Token Ring Access Method
802.11	Wireless LANs
802.12	Demand Priority Access
802.15	Wireless Personal Area Networks
802.16	Broadband Wireless MANs
802.17	Resilient Packet Rings

IEEE 802.11 Standards Process

Since we are interested in Wireless LANs, we'll concentrate on just the 802.11 subcommittee here. The 802.11 subcommittee (or WG for “Working Group”) works on the 802.11 Wireless LAN standard only. All of the letters that you see behind the 802.11 designation - e.g. 802.11b, 802.11i, etc., are proposed or ratified amendments to the original 802.11 standard. Although they are often referenced as if they are independent standards, it isn't proper to do so.

The amendments are developed by subcommittees of the 802.11 Working Group (WG). These subcommittees are designated as Study Groups (SG) or Task Groups (TG). A Study Group is a group of interested persons who define the purpose of the amendment and the charter of the Task Group. That is,

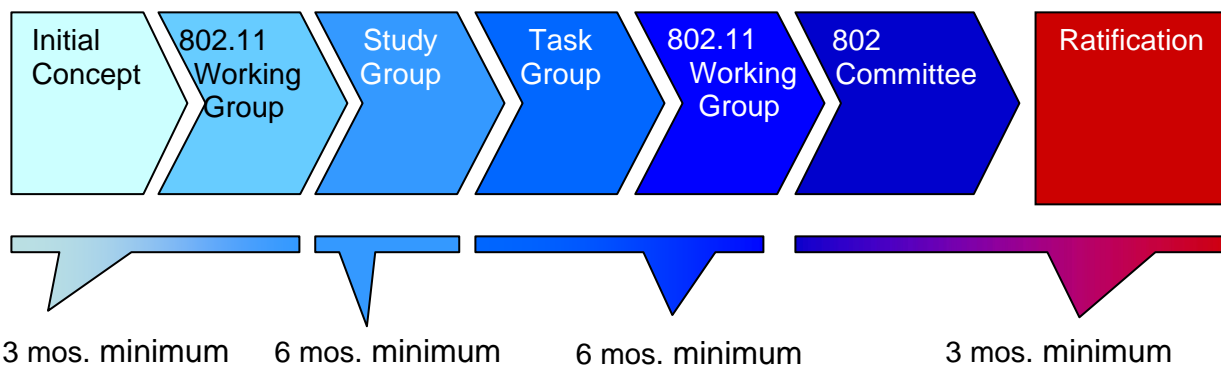
what problem the proposed amendment is trying to address and how the Task Group will know when the problem has been solved. After the Study Group has written a charter, a Task Group is sanctioned by the 802.11 WG. The Task Group either fulfills the charter, resulting in an amendment or a recommendation, or disbands. All of this occurs under the scrutiny of the 802.11 Chairperson.

Since certain motions can only be made at official meetings, and the 802.11 WG only meets once per quarter, the Study Group process generally requires at least six months before a Task Group can be formed. Once a Task Group is formed, a formal call for proposals is made, presentations of the proposals are given, each is voted upon, and then the amendment writing process can begin. This takes another six months of calendar time.

Once the amendment is written, it is circulated to the 802.11 voting membership for submission of comments and subsequent voting. This commentary and voting process is done for as many iterations as necessary until all comments are resolved and an 80% favorable majority for acceptance is reached. The commentary and voting process is generally a minimum of six months, usually much longer.

Once the amendment has passed subcommittee voting, it is recommended for ratification to the 802.11 chairperson, who in turn will recommend it to the IEEE 802 committee. Assuming no process hitches or objections from other 802 subcommittees, the amendment becomes ratified.

To summarize the timeline diagrammatically:



Needless to say, developing a standard is a time consuming process. Under the best of conditions, where people are already in agreement without a discussion, the standards process takes a minimum of one-and-a-half years from the time that you first read about it in the trade magazines until it is ratified. If there is a lot of discussion or controversy, it will take much, much longer. The 802.11 WG meetings are held quarterly and attended by over one thousand participants. Roughly 70% of those participants have earned voting status. Therefore, producing a ratified amendment is like writing a novel with 700 authors.

The story isn't over after ratification. Once ratified, the amendment is officially published. But before it becomes useful, it must be accepted by the industry through inclusion in products, and compatibility testing must be performed - ideally through an impartial organization like WiFi. Only when an interoperable product is produced does the consumer see any benefit.

Here is a quick summary of the current subcommittees and their status as of July 2005:

<i>802.11 Original WLAN in 2.4GHz band</i>	<i>Ratified</i>
<i>802.11a 54Mbps WLAN in 5GHz band</i>	<i>Ratified</i>
<i>802.11b 11Mbps WLAN in 2.4GHz band</i>	<i>Ratified</i>
<i>802.11c MAC bridging supplement</i>	<i>Ratified</i>
<i>802.11d Multiple regulatory domain support (international roaming)</i>	<i>Ratified</i>
<i>802.11e Quality of Service</i>	<i>Task Group</i>
<i>802.11f Inter-AP protocol</i>	<i>Rec.Practice</i>
<i>802.11g 54Mbps WLAN in 2.4GHz band</i>	<i>Ratified</i>
<i>802.11h Spectrum Managed 802.11a (Dynamic Freq Selection, Tx Power Control)</i>	<i>Ratified</i>
<i>802.11i Security</i>	<i>Ratified</i>
<i>802.11j Japan regulatory support</i>	<i>Task Group</i>
<i>802.11k Radio resource measurements (external RF tools support used in WLAN mgmt)</i>	<i>Task Group</i>
<i>802.11m Maintenance & interpretation of IEEE 802.11 standards</i>	<i>Task Group</i>
<i>802.11n High throughput PHY & MAC at 2.4GHz</i>	<i>Task Group</i>
<i>802.11p Wireless Access for Vehicular Environments (WAVE)</i>	<i>Task Group</i>
<i>802.11r Fast Inter-AP Transition (FIAT) (aka Fast Roaming)</i>	<i>Task Group</i>
<i>802.11s ESS Mesh Networking</i>	<i>Task Group</i>
<i>802.11t Wireless Test & Measurement</i>	<i>Task Group</i>
<i>802.11u Wireless Interface to External Networks</i>	<i>Task Group</i>
<i>802.11v Wireless Network Management</i>	<i>Task Group</i>
<i>802.11w Protected Management Frames</i>	<i>Task Group</i>

The Bottom Line

Next time you see an article about IEEE wireless standards, carefully scrutinize the claims of the article and take note of the phase of the amendment to the standard. Is it just an early idea? Is it a Study Group? Has a Task Group been formed? If so, how long has it been working? Has it been ratified? Is any compatibility testing going on?

Asking these simple questions will give you some much needed perspective on when a “new standard” may actually affect your workplace.

More detailed information on each amendment can be found at:
<http://grouper.ieee.org/groups/802/11/index.html>