

Exhibit 1008

IEEE P802.11
Wireless LANs

**Proposal for PAR and 5 Criteria for Very High Throughput
(VHT) SG for below 6 GHz operation**

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Abstract

This document provides a proposed PAR and 5 Criteria for IEEE 802.11 VHT SG project for below 6GHz carrier frequency operation. The PAR form is copied from the IEEE web site official PAR submission form.

The PAR Copyright Release and [Signature Page](#) must be submitted by FAX to +1-732-875-0695 to the [NesCom Administrator](#).

If you have any questions, please contact the NesCom Administrator.

Once you approve and submit the following information, changes may only be made through the NesCom Administrator.

Submittal Email: eldad.perahia @intel.com
Type of Project: Amendment to Standard
1.1 Project Number: 802.11 2007
1.2 Type of Document: Standard
1.3 Life Cycle: Full
1.4 Is this project in ballot now? No
2.1 Title of Standard: Draft Amendment to STANDARD [FOR] Information Technology-Telecommunications and information exchange between systems-Local and Metropolitan networks-Specific requirements-Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: Enhancements for Very High Throughput for operation in bands below 6GHz
3.1 Name of Working Group: Wireless LAN Working Group
Contact information for Working Group Chair Bruce Kraemer Email: bkraemer@ieee.org Phone:
Contact Information for Working Group Vice Chair Adrian Stephens Email: adrian.p.stephens@ieee.org Phone: (503) 616-3800
3.2 Sponsoring Society and Committee: IEEE Computer Society/Local and Metropolitan Area Networks (C/LM) Contact information for Sponsor Chair: Paul Nikolich Email: p.nikolich@ieee.org Phone: 857-205-0050 Contact information for Standards Representative: Email: Phone:
3.3 Joint Sponsor:/ () Contact information for Sponsor Chair: Email: Phone: Contact information for Standards Representative: Email: Phone:

4.1 Type of Ballot: Individual	
4.2 Expected Date of Submission for Initial Sponsor Ballot: 2011-12	
4.3 Projected Completion Date for Submittal to RevCom: 2012-13	
5.1 Approximate number of people expected to work on this project: 100	
<ul style="list-style-type: none"> 5.2 Scope of Proposed Standard: The scope of this project is to define an amendment that shall define standardized modifications to both the 802.11 physical layers (PHY) and the 802.11 Medium Access Control Layer (MAC) so that modes of operation can be enabled that are capable of supporting: <ul style="list-style-type: none"> A maximum multi-STA throughput (measured at the MAC data service access point), of at least 1Gbps and a maximum single link throughput (measured at the MAC data service access point), of at least 500Mbps. Below 6GHz carrier frequency operation excluding 2.4GHz operation and ensuring backward compatibility and coexistence with legacy IEEE802.11a/n devices in the 5GHz unlicensed band. 	<ul style="list-style-type: none"> Old Scope:
5.3 Is the completion of this standard is dependent upon the completion of another standard: No If yes, please explain:	
5.4 Purpose of Proposed Standard: The purpose of the project is to improve the 802.11 wireless local area network (LAN) user experience by providing significantly higher BSS throughput for existing WLAN application areas and to enable new market segments for operation below 6 GHz including distribution of multiple multimedia/data streams.	Old Purpose:
5.5 Need for the Project: As wireless networks are deployed, users are able to transition applications from fixed, non-wireless links to the convenience, freedom and versatility of wireless links. These transitions create an evolutionary demand to enhance the wireless network to support new classes of applications with higher bandwidth requirements. Wireless networks are particularly in need of continual enhancements since the link is by definition shared. This project will meet that evolving need for higher bandwidth in the projected completion timeframe and enable the transition of the next class of applications.	
5.6 Stakeholders for the Standard: Semiconductor manufacturers, personal computer manufacturers, enterprise networking device manufacturers, consumer electronic device manufacturers.	
Intellectual Property	
6.1.a. Has the IEEE-SA policy on intellectual property been presented to those responsible for preparing/submitting this PAR prior to the PAR submittal to the IEEE-SA Standards Board?	

<p>Yes</p> <p>If yes, state date: 2008-05-12</p> <p>If no, please explain:</p> <p>6.1.b. Is the Sponsor aware of any copyright permission needed for this project? No</p> <p>If yes, please explain:</p> <p>6.1.c. Is the Sponsor aware of possible registration activity related to this project? No</p> <p>If yes, please explain:</p>
<p>7.1 Are there other standards or projects with a similar scope? No</p> <p>If yes, please explain:</p> <p>and answer the following: Sponsor Organization:</p> <p>Project/Standard Number:</p> <p>Project/Standard Date: 0000-00-00</p> <p>Project/Standard Title:</p>
<p>7.2 Future Adoptions</p> <p>Is there potential for this standard (in part or in whole) to be adopted by another national, regional, or international organization? No</p> <p>If Yes, the following questions must be answered:</p> <p>Technical Committee Name and Number:</p> <p>Other Organization Contact Information:</p> <p>Contact person:</p> <p>Contact Email address:</p>
<p>7.3 Will this project result in any health, safety, security, or environmental guidance that affects or applies to human health or safety? No</p> <p>If yes, please explain:</p>
<p>7.4 Additional Explanatory Notes: (Item Number and Explanation)</p> <ul style="list-style-type: none"> • The project may include the capability to handle multiple simultaneous communications. • The multi-STA throughput is defined as the sum of the MAC SAP throughputs across all active transmissions within a set of STAs. • The 1Gbps maximum multi-STA throughput may be achieved when considering multiple simultaneously actively-communicating STAs, e.g., a BSS with 1 AP and at least 3 STAs. • Though the primary metric used in the scope of the project deals with MAC SAP throughput, the intent is to provide enhancements over IEEE802.11n on the following inter-dependent performance indicators: throughput at the MAC data SAP, range of operation, aggregate network capacity (spectrum efficiency), power consumption (peak and average).
<p>8.1 Sponsor Information:</p> <p>Is the scope of this project within the approved scope/definition of the Sponsor's Charter? Yes</p> <p>If no, please explain:</p>

Five Criteria**17.5.1 Broad Market Potential**

A standards project authorized by IEEE 802 shall have a broad market potential.

Specifically, it shall have the potential for:

a) Broad sets of applicability.

- According to InStat and ABI Research, demand for WLAN is expected to grow at a 34% Compound Annual Growth Rate (CAGR) over the next five years. Over 75% of all home-networking connections and over 95% of all mobile PC network connections will be via WLAN links by 2011. More than 12% of mobile phones are expected to include Wi-Fi connectivity by 2011.
- New uses such as multimedia, simultaneous transmission of multiple high rate video streams, audio, and on-line gaming, immersive environments and collaborative communications, will drive the need for higher throughput in the home, enterprise and outdoor environments.
- As usage increases in the outdoor, corporate and other high-density environments (e.g. a 20% increase in number of hotspots is expected between 2008 and 2011), bandwidth restrictions of a shared media will start to occur.
- This is very similar to what happened in the wired Ethernet market where the need for higher throughput drove the development and adoption of Fast Ethernet (100 Mbps). The need for higher throughput drove switching and 100Base-TX adoption, then Gigabit Ethernet (GbE), then 10GbE. While a switching technology would be desirable for WLAN, this is not technically feasible. 802.11 developments have followed a similar progression from 1 & 2 Mbps, to 11 Mbps, to 54 Mbps, to 300 and 600 Mbps. The next logical step in wireless LAN technology is to further increase the BSS data throughput.
- In parallel to the traditional legacy usage for WLAN, the ITU has opened up the possibility for nomadic 1Gbps IMT-Advanced WLAN technology, providing a means for broadening even further the applicability of WLAN technologies.

b) Multiple vendors and numerous users.

A wide variety of vendors currently build numerous products for the WLAN marketplace. According to ABI Research Wireless LAN revenues is expected to surpass \$6B by 2011 and it is anticipated that the majority of those vendors, and others, will participate in the standards development process and subsequent commercialization activities.

According Wi-Fi Alliance the community of Wi-Fi users in 2008 is estimated to count more than 250M members.

c) Balanced costs (LAN versus attached stations).

WLAN equipment is accepted as having balanced costs. The development of Gigabit Wireless capabilities will not disrupt the established balance

17.5.2 Compatibility

IEEE 802 defines a family of standards. All standards shall be in conformance with the IEEE 802.1 Architecture, Management, and Interworking documents as follows: 802.

Overview and Architecture, 802.1D, 802.1Q, and parts of 802.1f. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with 802.

Each standard in the IEEE 802 family of standards shall include a definition of managed objects that are compatible with systems management standards.

Compatibility with IEEE 802 requirements will be accomplished by keeping the MAC SAP interface the same as the existing 802.11 standard. The proposed amendment shall introduce no 802.1 architectural changes. The MAC SAP definition shall not be altered, ensuring that all LLC and MAC interfaces are compatible to and in conformance with the IEEE 802.1 Architecture, Management and Internetworking standards. New managed objects shall be defined as necessary in a format and structure consistent with existing 802.11 managed objects. Backward compatibility and coexistence with legacy devices will be granted for the 5GHz bands.

17.5.3 Distinct Identity

Each IEEE 802 standard shall have a distinct identity. To achieve this, each authorized project shall be:

a) Substantially different from other IEEE 802 standards.

This project will result in a wireless LAN with higher throughput than that provided by 802.11a, 802.11b, 802.11g and 802.11n. The goal is to increase the overall system throughput by considering new technologies, for the both PHY and MAC layers, operating below the 6GHz band.

VHT will allow a corporate or home user to roam from high-throughput, dense cells to wider area networks in a seamless manner while maintaining full support for the installed base security, management, diagnostics and backbone infrastructure. This will be supported by maintaining backwards compatibility to 802.11 standards like for instance 802.11 i/w for security, 802.11s for mesh networking, 802.11 k/v for network management.

The VHT amendment may consider applications described by IMT-Advanced for nomadic WLAN systems.

IEEE P802.15 TG3c intends to support higher physical data rates than those currently defined by P802.15 task group 3, and similar to those targeted by this proposal. However, the applications of 802.11 and 802.15 are different. 802.15 defines standards for short-range wireless *personal* area networks, 802.11 defines standards for relatively longer-range wireless *local* area networks. The different requirements of each group will result in different standards that satisfy the purpose and scope defined in each project's PAR.

b) One unique solution per problem (not two solutions to a problem).

There is no other wireless LAN standard providing significantly higher throughput than 802.11vht operating in bands below 6GHz.

c) Easy for the document reader to select the relevant specification.

The 802.11vht amendment will differentiate itself from other IEEE 802 wireless standards via the title which stresses the specification of gigabit speed WLAN technology.

17.5.4 Technical Feasibility

For a project to be authorized, it shall be able to show its technical feasibility. At a minimum, the proposed project shall show:

a) Demonstrated system feasibility.

Feasibility of multiple STAs 1Gbps and single link 500Mbps MAC SAP throughput links has been assessed in simulations and presented in documents 11-08-0307-01-0vht (<https://mentor.ieee.org/802.11/file/08/11-08-0307-01-0vht-on-the-feasibility-of-1-gbps-for-various-mac-phy-architectures.ppt>) and 11-08-0535-00-0vht (<https://mentor.ieee.org/802.11/file/08/11-08-0535-00-0vht-phy-and-mac-throughput-analysis-with-80-mhz-for-vht-below-6-ghz.ppt>) for 80MHz bandwidth operation.

The following documents are additional examples that support the feasibility of elements of gigabit wireless technology:

- Gigabit MIMO OFDM Testbed (Siemens) <http://iaf-bs.de/projects/gigabit-mimo-ofdm-testbed.en.html>
- 8x8 MU-MIMO Testbed (NTT): Performance Evaluation of 8x8 Multi-User MIMO-OFDM Testbed in an Actual Indoor Environment, IEEE PIMRC'06

Additional candidate technologies that may contribute to achieve the targeted throughput encompass time/frequency/space multiplexing: OFDMA, SDMA and more generally Multi-User MIMO transmissions. These technologies have demonstrated feasibility in the cellular context.

b) Proven technology, reasonable testing.

Until the full extent of the user models referenced in the IEEE802.11vht PAR is understood, the study group cannot completely assess the extent of reasonable testing for those technologies. However, 802.11 is a mature technology which has a wide variety of legacy devices and a proven track record, with hundreds of millions of devices shipping each year and the increased capabilities envisioned for the baseband and RF parts necessary to implement the proposed amendment are in line with the current progress in semiconductor technology.

c) Confidence in reliability.

Analysis of current WLAN products and new academic research provides confidence in the reliability of the technology that will be developed by the project. There are currently reliable WLAN solutions. The study group envisions that the project will result in similar or improved reliability over current levels.

17.5.4.1 Coexistence of 802 wireless standards specifying devices for unlicensed operation

A working group proposing a wireless project is required to demonstrate coexistence through the preparation of a Coexistence Assurance (CA) document unless it is not applicable. The Working Group will create a CA document as part of the WG balloting process. If the Working Group elects not to create a CA document, it will explain to the EC the reason the CA document is not applicable.

The working group will create a CA document as part of the WG balloting process.

17.5.5 Economic Feasibility

For a project to be authorized, it shall be able to show economic feasibility (so far as can reasonably be estimated) for its intended applications. At a minimum, the proposed project shall show:

a) Known cost factors, reliable data.

Support of the proposed standard will likely require a manufacturer to develop a modified radio, modem and firmware. This is similar in principle to the transition between 802.11b or 802.11g and 802.11n, or between 802.11a and 802.11n. The cost factors for these transitions are well known and the data for this is well understood.

b) Reasonable cost for performance.

The new standard will provide manufacturers the ability to support gigabit per second wireless throughput speeds. In general, the cost factor changes needed to implement the technology envisioned by the study group are well within the capabilities of existing technology. Competition between manufacturers will ensure that costs remain reasonable.

c) Consideration of installation costs.

The proposed standard has no known impact on installation costs.