



Q&A

Wi-Fi Alliance Certification of IEEE 802.11g

1. Q: Will 802.11g make 802.11a obsolete? If not, why?

A: No, ultimately we believe that most products will include both technologies because they are complementary. The fact that they operate in different bands allows them to be used at the same time. This allows 802.11g to complement 11a by adding three additional channels in the 2.4GHz band to the existing 802.11a channels. This creates more network capacity to allow for additional users. Both technologies have advantages that, when used in combination, offer an even stronger product. Another advantage of 802.11a is that the 5GHz base has more capacity around the world. Currently there are 13 channels in North America (including U-NII and ISM bands); 8-19 channels in Europe; and 5-12 channels in Asia. The more channels you have, the more aggregate throughput you can have.

2. Q: What role will 802.11a play in the market?

A: Products supporting 802.11a or dual-band (802.11a and 802.11g) will be available for a variety of customers. Larger enterprises and high density applications like conference centers will benefit the most from the use of the additional 5GHz channels to support more users and network growth/scalability. We also see 802.11a as playing a potentially significant role in establishing communications among consumer electronics devices like DVD players, set top boxes, home servers and televisions.

3. Q: How will the range compare between 802.11g and 802.11a products?

A: Products based on 802.11a use the 5GHz band. Physics dictate that higher frequencies have a larger path-loss (greater spatial attenuation) and therefore shorter range than lower frequencies, if all other variables are the same. So, it is expected that 802.11g, which uses the 2.4GHz band will have a greater range than 5GHz products - for the same data rate. It should also be noted that due to higher interference in the 2.4GHz band than currently in the 5GHz band, the range of 802.11g products might be affected more in noisy and congested environments. Specific implementation details of different vendors, such as power output, receiver sensitivity, antenna design and other factors will also affect the range.

4. Q: How soon will dual band 802.11g and 802.11a products be available?

A: Dual band IEEE 802.11g and 802.11a products are expected to be available very soon, most likely within the first half of 2003. The Wi-Fi Alliance will begin certification of dual band and single band products with 802.11g support soon after the 802.11 standard has been approved.

5. Q: Are there any potential interoperability issues with 802.11g pre-standard products?

A: The IEEE 802.11g standard is not final. Therefore there is a potential for pre-standard products to be based on different 802.11g drafts, and thus multi-vendor interoperability cannot be assured. Interoperability will only be assured when the Wi-Fi Alliance has its final interoperability test plan, and all products get tested.

6. Q: When will the first Wi-Fi CERTIFIED 802.11g products be in the market?

A: The Wi-Fi Alliance expects to start testing for interoperability immediately after the IEEE approves the 802.11g standard. Wi-Fi CERTIFIED 802.11g products would be available in the market within a few weeks of that date. Until that time, 802.11g products may be Wi-Fi CERTIFIED for 802.11b operation only. A capabilities label will be required.

7. Q: Do you see 802.11g products replacing 802.11b products?

A: There will be market segments and applications where 802.11g products will replace 802.11b products, while in others 802.11b will continue to dominate. The increased throughput for 802.11g comes with a price, which is a required higher signal-to-noise ratio that results in a shorter range, higher susceptibility to interference and a more intensive signal processing that results in higher power consumption. For some applications such as mobile handsets and PDAs, power consumption will remain a major concern, and these are expected to continue to use 802.11b for a longer period of time. For other markets, such as home networking, 802.11g products will probably replace 802.11b products due to the increased throughput.

8. Q: What are the performance differences between 802.11g and 802.11a?

A: Performance is made of multiple parameters, including:

Maximum data rate is similar for 802.11a and 802.11g products, using the same OFDM modulation. However, when an 802.11g product is supporting backward compatibility with 802.11b products, the 802.11g network aggregate throughput available for actual data transport will be substantially lower.

Maximum range is somewhat longer for 802.11g products due to the lower "path-loss" in the 2.4GHz band, compared to the 5GHz band, used for 802.11a products.

System capacity: 802.11a products offer more channels than 802.11g products, and have the potential to offer higher system capacity.

It should also be noted that these parameters are subject to specific implementation by the different vendors.

9. Q: Will 802.11g have an advantage in Europe until regulations are resolved for 802.11a?

A: For some countries, amendment of 2.4 GHz regulations is required in order to allow OFDM operation even in the 2.4 GHz band. On the other hand, the adoption of 802.11a devices in Europe requires Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) that should be implemented and are parts of the upcoming IEEE 802.11h standard, which is expected to be approved by the end of 2003. In the US, the FCC is expected to start a revision of the 5 GHz rules which may lead to DFS and TPC becoming required too, probably in the "middle band" mentioned above. Eventually, products from both technologies will be equally capable of being marketed world-wide.

10. Q: Will 802.11g products be more or less affected by cordless phones or microwave ovens than 11b products?

A: 802.11b is slightly more robust against in-band interference due to the S/N characteristics of CCK vs. OFDM. In practice, implementation plays an important role. This means that there will be interference types and levels that will affect 11b products as well as 11g products, and interference levels that will not affect either 11b or 11g, but also a small range of interference level that will affect only 11g products and not 11b products.

11. Q: Will 802.11g products be more or less affected by cordless phones or microwave ovens than 11a products?

A: Currently the 5GHz band is "cleaner" from interference than the 2.4GHz band. However, both bands are unlicensed, and with the emergence of products creating interference in the 5GHz band (there are already three cordless telephone products working in the 5.8GHz band, representing the top four 11a channels), 11a products may eventually be affected by interference much like 11g products. At the same time, one must acknowledge that the 5GHz band has more bandwidth than the 2.4GHz band for unlicensed devices, and thus there is more room to avoid such interference.

12. Q: How many simultaneous users will an 802.11g access point be able to handle as compared to an 802.11b access point?

A: The theoretical maximum number of users per access point and the practical number of users utilizing an access point are two different things. There is nothing inherent to the 802.11g standard that makes it capable of handling more users. Theoretically, the access point implementation dictates the number of users capable of sharing its bandwidth. However, since 802.11g offers higher aggregate throughput than 802.11b, it can in practice serve the same "per-user" bandwidth to more users.

Press and analyst contact:

C. Brian Grimm

Wi-Fi Alliance

910.686.0870

briang@wavecoms.com

rev. 4/3/2003