



Wi-Fi CERTIFIED Wi-Fi Direct™

Frequently Asked Questions

What exactly is Wi-Fi CERTIFIED Wi-Fi Direct? Wi-Fi CERTIFIED Wi-Fi Direct is an upcoming certification program from the Wi-Fi Alliance that defines a new way for Wi-Fi devices to connect to each other. Wi-Fi devices will be able to make direct connection groups quickly and conveniently to do things like print, sync, and share content - even when an access point or router is unavailable. Connections based on the specification will work at typical Wi-Fi speeds and range, protected by WPA2™-certified security protocols and including WMM® Quality of Service mechanisms. Only Wi-Fi Alliance member companies will be able to use the Wi-Fi Direct mark to indicate that their products implement this specification.

When will devices certified under the Wi-Fi Direct program be available? We expect Wi-Fi Alliance member companies to begin designing and testing products implementing the standard underlying Wi-Fi Direct in mid-2010, and to begin certifying products in late 2010.

Why is this kind of connectivity needed? We don't always have access to a Wi-Fi access point/hotspot, or don't want to join one. But more and more, we carry content and applications with us that we want to share, print, display, or synch. A quick, convenient Wi-Fi Direct link makes it easy to do all of these things and more.

Why is Wi-Fi the right technology for device group connectivity? Wi-Fi performance, range, and demonstrated interoperability deliver the best user experience of any peer-to-peer technology available. Moreover, Wi-Fi is already widely included in handsets, consumer electronics, and other devices, so there is no need for an additional radio (saves on device component costs, power consumption, space, processing power, etc.) just to satisfy the growing need for dynamic connections among groups of electronics. Wi-Fi has the speed, range, and security features to easily handle even the most demanding applications and content. Wi-Fi Direct means that the Wi-Fi feature on your device is even more useful than before. And because it's Wi-Fi CERTIFIED, it will easily work in the traditional Wi-Fi networking mode as well.

Will products certified under the Wi-Fi Direct program interoperate with my other Wi-Fi devices? Yes. A Wi-Fi CERTIFIED Wi-Fi Direct device will be able to make device group connections with existing 802.11 a/g/n Wi-Fi CERTIFIED gear.

Will legacy devices be upgradeable to support the specification underlying the Wi-Fi Direct certification program? The Wi-Fi Direct certification program does not require new hardware to operate, so some vendors may offer software upgrades. However, it's important to note that interoperability between devices certified under the Wi-Fi Direct program and legacy



devices is a key element of the underlying specification, so even non-upgraded devices can join a network certified as Wi-Fi Direct.

How many devices can connect? A Wi-Fi Direct-certified network can be one-to-one, or one-to-many. The number of devices in a Wi-Fi Direct-certified group network is expected to be smaller than the number supported by traditional standalone access points intended for consumer use. Connection to multiple other devices is an optional feature that will not be supported in all Wi-Fi Direct-certified devices; some devices will only make 1:1 connections.

Will Wi-Fi Direct work with legacy devices? Yes. A legacy Wi-Fi CERTIFIED station device can connect with a Wi-Fi Direct device.

Will Wi-Fi Direct work on 802.11 a/b/g/n? Wi-Fi Direct products can work on 802.11 a, g and n Wi-Fi standards. Users can match Wi-Fi Direct products just like any other Wi-Fi CERTIFIED products. All Wi-Fi Direct devices operate in the 2.4 GHz frequency band and can connect to 802.11g and some 802.11n devices. In addition, some Wi-Fi Direct devices work in the 5 GHz frequency band to connect to 802.11a and some 802.11n. Many devices operate in both frequency bands.

Will Wi-Fi Direct be easy to use? Yes. Wi-Fi Direct devices will include Wi-Fi Protected Setup, which makes it very easy to set up a connection and enable security protections. In many cases, this will be as simple as pushing a button on each device.

How fast will Wi-Fi Direct be? Wi-Fi CERTIFIED Wi-Fi Direct supports typical Wi-Fi speeds, which can be as high as 250 Mbps. Even at lower speeds, Wi-Fi provides plenty of throughput for transferring multimedia content with ease. The performance of a particular group of Wi-Fi Direct devices depends on whether the devices are 802.11a, g, or n, as well as the particular characteristics of the devices and the physical environment.

How far will a Wi-Fi Direct connection travel? Wi-Fi CERTIFIED Wi-Fi Direct devices work just like any Wi-Fi device, with ranges up to 200 meters. They can connect from just a few feet away, but also across a home. This means that making a Wi-Fi Direct group connection will be convenient, even when devices aren't in immediate proximity to one another.

Can a device simultaneously connect to a regular Wi-Fi network and a group of Wi-Fi Direct-certified devices at the same time? All devices certified under the Wi-Fi Direct program will allow the user to connect to an infrastructure or a Wi-Fi Direct-certified network. Some devices certified under the Wi-Fi Direct program will support connections to both an infrastructure network and Wi-Fi Direct-certified group at the same time (e.g. a laptop may support an infrastructure connection while also belonging to a Wi-Fi Direct-certified group).



Simultaneous connection to a Wi-Fi Direct-certified group and an infrastructure network is an optional feature.

Can a network based on devices certified under the Wi-Fi Direct program cross connect to an infrastructure network for internet connectivity? Yes. A single device in a Wi-Fi Direct-certified group network may share internet connectivity with other devices in the network by creating simultaneous infrastructure and Wi-Fi Direct connections. A network of devices certified under the Wi-Fi Direct program operates in a security domain separate from the infrastructure network, even when cross-connected.

How does the specification underlying the Wi-Fi Direct certification program work? The underlying specification connects devices using an approach similar to the traditional AP-to-client connection used in Wi-Fi CERTIFIED infrastructure networks. One Wi-Fi Direct-certified device will provide the connection to other participants in a group of Wi-Fi Direct-certified devices in lieu of an AP. A device certified under the Wi-Fi Direct program does not require special hardware compared to traditional Wi-Fi AP devices.

Does the specification underlying the Wi-Fi Direct certification program work on both frequency bands? Yes, the specification underlying the Wi-Fi Direct certification program supports operation in both 2.4 GHz and 5 GHz. Devices operating in the 2.4 GHz frequency band only and devices operating in both the 2.4GHz and 5 GHz frequency bands can be certified under the Wi-Fi Direct program. Not all Wi-Fi Direct-certified devices will support both frequency bands, however, so you should check which bands your devices support.

Which Wi-Fi Direct-certified device will create and manage the connection? Devices will conduct a negotiation to determine which device is most appropriate. This may be determined by considering a number of factors including but not limited to power management, number of connections supported, richness of user interface and services being offered. The Wi-Fi Direct-certified device that offers the connection manages the creation, admission to, presence and termination of that network implementing the specification underlying the Wi-Fi Direct program.

Can all devices start a network based on the specification underlying the Wi-Fi Direct program? All Wi-Fi Direct-certified devices can start a group, based on the specification underlying the Wi-Fi Direct program, but it's most likely that devices with more computing power (laptops, handsets, gaming devices) will more frequently manage the network than those with less power (digital cameras, printers, etc.).

How will security work for Wi-Fi Direct-certified products? Group networks based on the specification underlying the Wi-Fi Direct program operate in a security domain that is independent from any infrastructure network. This means that they have protection of the security features certified under the WPA2 program, but are managed separately from the



security system in the AP-based network (home, enterprise, hotspot). This means both the group networks based on the specification underlying the Wi-Fi Direct program and the infrastructure networks can be protected, but users don't need credentials for the infrastructure network to connect to the network based on the specification underlying the Wi-Fi Direct program.

If I make a Wi-Fi Direct group with another person, can they see all of the contents of my device? Not without your permission. The content available over a Wi-Fi Direct group connection is driven by the applications you are using. While there may be applications which allow an authorized user to "browse" the content on your device, most applications will have a specific focus (e.g., sharing a game application or transferring photos).

How will service discovery work? Like all Wi-Fi technologies, the specification underlying the Wi-Fi Direct program creates IP-based networks between the devices, allowing existing service discovery methods to work just as they do over a wireless LAN today - including Bonjour and UPnP.

The specification underlying the Wi-Fi Direct program defines a new pre-association discovery method, giving Wi-Fi Direct-certified devices the ability to discover devices and limited information about device services prior to association (and before having an IP address). Pre-association discovery improves the user experience - users will know whether a desired service (e.g. printing) will be available on the network implementing the specification underlying the Wi-Fi Direct program before connecting.

What about power management protocols? Are devices implementing the technology behind Wi-Fi Direct a power hog? Most Wi-Fi Direct-certified devices will be power-sensitive, and in many cases, battery-powered. Wi-Fi Direct-certified devices can support the Power Save feature certified under the WMM program, and the specification underlying the Wi-Fi Direct program also defines new power saving mechanisms.

Will Wi-Fi Direct have business uses, or is it just for consumer electronics? We expect that enterprises will discover the utility of Wi-Fi Direct over time and will leverage its features in appropriate circumstances, given their utility, security protections, and manageability. A good example of an enterprise use case is sharing access to a projector or printer without use of cables or network access.

What has been done to ensure that Wi-Fi Direct is suitable for enterprise environments? Wi-Fi Direct-certified devices will be identifiable as Wi-Fi Direct-certified devices to infrastructure access points. APs can prevent devices currently using Wi-Fi Direct from connecting to the AP, or disconnect them if already connected, while Wi-Fi Direct is in use and/or configure their parameters including channel. The technology behind the Wi-Fi Direct certification program will be important for enterprise environments, enabling applications such as file transfer, printing,



and display in the absence of a suitable WLAN. We also expect that the specification will be used in enterprises to temporarily connect mobile data terminals and other portable devices for short-term tasks such as data transfer.

Will Wi-Fi Direct replace my access point? No. Wi-Fi Direct isn't designed to be a replacement for a typical stationary access point. For most users and most scenarios a fixed AP will generally be desired in the home. Wi-Fi Direct offers the subset of typical AP functionality that is most useful for the types of on-the-go activities that Wi-Fi Direct is designed to support. APs offer multiple Ethernet ports, HW firewalls, advanced network management features, etc.

Is there lots of additional processing load in Wi-Fi Direct? Several Wi-Fi Alliance members that make devices of limited processing capabilities contributed to the specification development process to ensure that it is applicable to such devices.

How will I find Wi-Fi CERTIFIED Wi-Fi Direct products? The first Wi-Fi CERTIFIED Wi-Fi Direct products will enter the market in late 2010. Look for the Wi-Fi CERTIFIED logo and the name Wi-Fi Direct. A current list of all Wi-Fi CERTIFIED products is always available at www.wi-fi.org.

How will I know if a product includes Wi-Fi Direct certification? Look for the Wi-Fi CERTIFIED designation with the words Wi-Fi Direct included.

When will the first Wi-Fi Direct products be available? We expect the first Wi-Fi CERTIFIED Wi-Fi Direct products to enter the market in late 2010.

Is this the same as Ad Hoc mode? No, this is not Ad-Hoc mode (also known as IBSS) but an extension to the ubiquitous infrastructure mode of operation that can operate without a dedicated access point. Ad Hoc, or IBSS, mode is a legacy protocol for Wi-Fi devices, and Wi-Fi Direct is a new innovation. With the technology underlying Wi-Fi Direct, a device can maintain a simultaneous connection to an infrastructure network – this isn't possible with Ad Hoc.

Is the specification underlying the Wi-Fi Direct certification program based on the IEEE 802.11s (Mesh) or 802.11z (Direct Link Setup) standards? No. The specification underlying the Wi-Fi Direct certification program was developed within the Wi-Fi Alliance by member companies. It operates on 802.11 devices but is not linked to any specific IEEE 802.11 amendment.