

Application Note AN-4 Connecting to Multiple Hosts using Certified Wireless USB



Doc# 000-009-0090

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1 Introduction

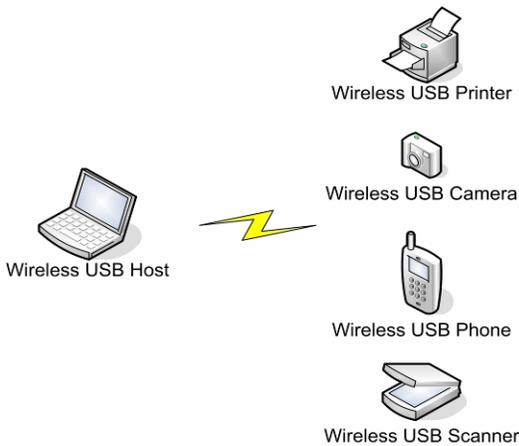
A USB system typically consists of one host (usually a PC) and many peripherals. Multiple users can share the same peripheral only by physically disconnecting the USB cable and then connecting it to a different host.¹

Certified Wireless USB, based on WiMedia UWB, is a high bandwidth wireless replacement for wired USB. As such, it utilizes the same host-peripheral model as wired USB. With wireless transfers, peripherals are no longer physically bound by a cable connection. This opens up alternative ways for multiple users to share peripherals.



2 Connecting with Multiple Hosts

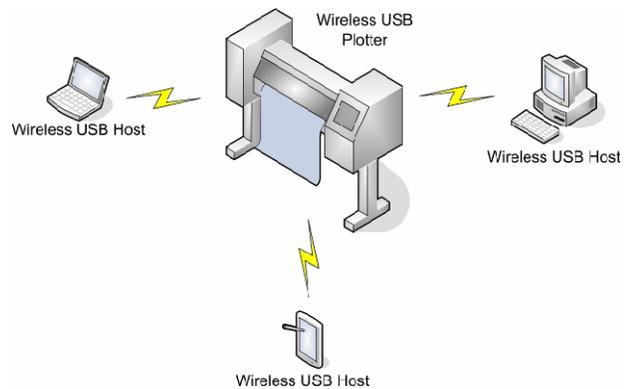
Though USB systems are designed to connect a single host with many peripherals, it is often desirable to share a single wireless peripheral with multiple users. For example, a projector is often used by several people for different presentations. A printer may take print jobs from multiple users.



One host, multiple peripherals

peripherals can only follow traffic to and from a single source. Therefore, wireless USB peripheral sharing still requires an explicit disconnection then reconnection to another host, even though there is no physical wire.

The USB protocol doesn't support connections to more than one host at a time. To simplify the protocol, USB treats peripherals as local resources rather than network ones. Unlike networking standards (ex. TCP/IP), the Certified Wireless USB protocol does not use IP numbers or routing tables to direct traffic. Most

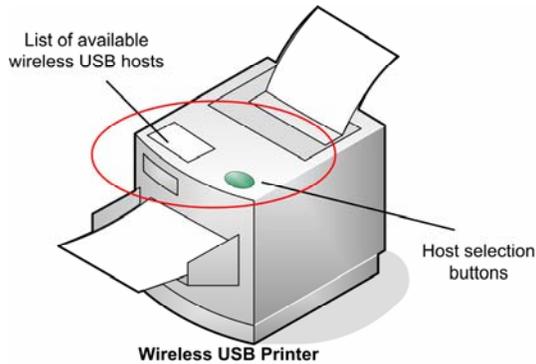


One peripheral, multiple hosts

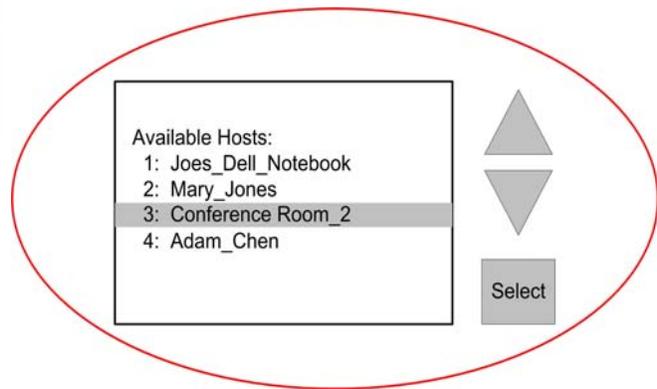
¹ USB printer sharing among PCs is also possible using a completely separate protocol like TCP/IP. In this case, sharing is not done over USB - there is still only a single USB host. The host PC (not the peripheral) manages the print traffic from the other computers.

3 Sharing Peripherals

To switch users (hosts) of a Certified Wireless USB peripheral, the existing connection must first be severed. A user then instructs the peripheral to connect to a new host. However, the wireless USB protocol does not establish a method for determining which host to connect to. The peripheral may choose the first host it detects or choose the host with the strongest signal. This may result in connecting to the wrong host (or even to the same one that it just disconnected from).



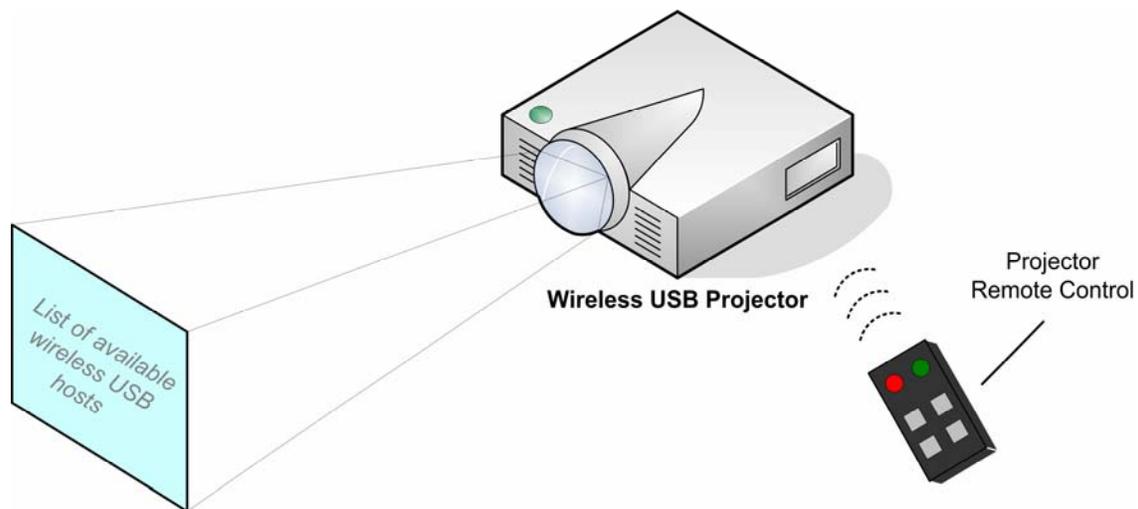
For shared peripherals, LucidPort recommends that instead of connecting automatically, peripherals first scan for available hosts. The resulting list of available wireless USB hosts can be displayed for the user to select from. (Host names are transferred to the peripheral during association.)



On a printer, the LCD display can show a constantly updated list of available wireless USB hosts whenever the printer is not connected. The user can manually select the desired host from the list. If already connected, the same button can be used to force a disconnect. After printing, the printer can retain the wireless connection unless the user specifically disconnects.

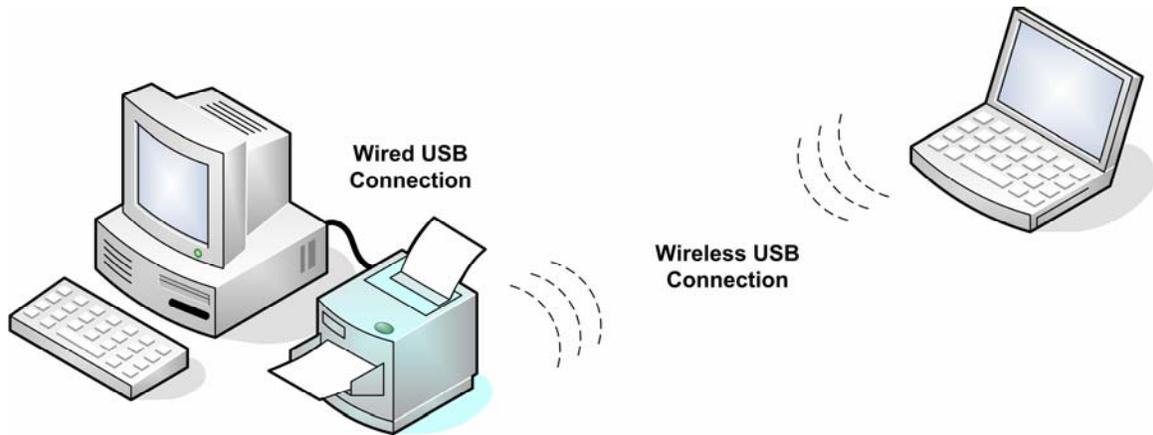
Host Selection Menu

A variant of this technique can be used with a projector. When the projector is first powered on, a list of available hosts is projected. The user chooses the desired host from a menu. When switching users, a remote control (or panel buttons) can be used to disconnect the projector and display an updated list of available wireless USB hosts.



4 Simultaneous Host Connections

While the USB protocol doesn't support connects to more than one host at a time, LucidPort's L800 Wireless USB Controller has separate wired USB and wireless USB peripheral ports. This allows a peripheral to simultaneously connect to both a wired and a wireless USB host at the same time (or automatically switch between the two connections if desired).



A shared printer using the L800 Wireless USB Controller

In this scenario, a peripheral can usually be connected through wired USB. An additional wireless USB connection can be made automatically as wireless hosts come in range. In a home office environment, a printer may be always connected (using wired USB 2.0) to a desktop computer. As the user comes in range with his notebook PC, the printer can connect to it automatically.

5 Summary

Without a cable, Certified Wireless USB peripherals are not physically constrained to a single host connection at a time. However, the wireless USB protocol only supports a single host connection at a time. Peripheral sharing is accomplished by switching that host connection when needed. LucidPort recommends that shared peripherals first scan for available hosts, then display those hosts for the user to manually select. This allows the user to actively determine who gets to use the peripheral next. This host switching technique is useful for shared peripherals like printers, scanners, and projectors.