Using a Site’s Wireless Connection

Purpose of this document
This document is intended for those needing to connect a Tax-Aide TaxWise Online (TWO) site network to the Internet when the only existing access to the Internet is a Wi-Fi connection. For background, the connection of a wired network is also introduced. The wired connection is preferable when there is a choice of access.

Level of Expertise Required
This procedure requires an intermediate level of expertise. The user should have at least an introductory level of knowledge of computers and routers.

Useful Concepts

DHCP Server. Dynamic Host Configuration Protocol (DHCP) is an auto configuration protocol used on IP networks. Computers that are connected to IP networks must be configured before they can communicate with other computers on the network. DHCP allows a computer to be configured automatically, eliminating the need for intervention by a network administrator. It also provides a central database for keeping track of computers that have been connected to the network. This prevents two computers from accidentally being configured with the same IP address.

Access Point. Access points provide wireless access to a wired network. An access point plugs into a hub, switch, or wired router and sends out wireless signals. This enables computers and devices to connect to a wired network wirelessly. If you want to connect your computers wirelessly and you have a router that provides wireless capability, you don't need an access point. Access points don't have built-in technology for sharing Internet connections. To share an Internet connection, you must plug an access point into a router or a modem with a built-in router.

Router. Routers connect Local Area Networks (LANs) to each other and to Wide Area Networks (WANs) that provide access to the Internet. If the router is termed a wireless router, then it incorporate the functions of an Access Point into the router.

Network Switch. Network switches connect devices on a LAN to one another, e.g., computers and printers. They do not connect these devices to the Internet as routers do.

CAUTION: Wireless signals deteriorate as the distance between the router and wireless equipment increases. The signal is further degraded by walls and other barriers such as concrete, tile, metal, etc., that are in the path from the router to the equipment. Be sure to test the signal strength at each device before going into full operation with a remote router.
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Introduction
The easiest and most routine way of establishing a Tax-Aide workstation wireless network for use with TaxWise Online is to gain access to the host sites network via a cable connection. This can be plugged into the WAN interface of your TAV wireless router and then that router used to wirelessly distribute the Internet connection as shown in the diagram below.

NOTE: The wired TAV router* does not need to be in the same room as your computers, if you are only using Wireless connections. It can be anywhere in the building that has a wired internet connection. A good location may be together with the host modem and router(s). This will permit the use of your own secure wireless network, without the restrictions of an unsecured wireless network. (*A TAV router is not a specific brand; it’s simply the router you provide. TAV = Tax-Aide Volunteer)

Using a Sites Internet service with a Wired Router

However, sometimes a site only has a wireless connection or a local district decides to use a cell based (Verizon, T-Mobile, etc.) data connection to gain access to the Internet. In this case a computer is used to sign on to the wireless network and gain access to the Internet. Then this connection is shared using the ‘Internet Connection Sharing” (ICS) capability built into Windows. For a good explanation of ICS and how to set it up, use the Windows Help and Support option on your computer (this is located off the “Start” button).. This shared connection can then be distributed wirelessly to other computers by configuring a wireless connection.
router as an “access point” rather than as a wireless router. When configured as an access point the router acts more like a wireless switch and does not provide DHCP or routing services, it simply provides access to the wired network for the wirelessly connected computers. This is shown in the diagram below.

Using a Site’s Wireless Internet service with a Router

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* TAV = Tax-Aide Volunteer

Implementation Steps

1. Connect the “Internet Access Computer” to the Internet and share this connection using the Sharing tab in network connection properties – see windows help “Internet Connection Sharing” system for more details. Procedure:
   a. Click Start -> Control Panel -> Network and Internet Connections -> Internet Connections
   b. Right-click on the Local Area connection and select “Properties”
   c. Click the Advanced tab and check Internet Connection Sharing
   d. Click OK
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2. Setup the wireless router. Specifically, setup the SSID to be unique and with a name not indicating this is a tax preparation computer, e.g., do not name it as IRSnetwork, TaxReturnNetwork, etc. It is strongly suggested that the SSID follow the naming convention, ‘TAV[sitename], e.g., TAVLibrary, or TAVMainSenCtr, etc. The WPA2 encryption key should also be unique. It is strongly suggested that the WPA2 security key follow the naming convention, [this year’s IRS computer password][last 8 digits of the router MAC code], e.g., Password1225F485 or Current4F512AA6, etc. The actual password wasn’t used in the last examples, for obvious reasons. The MAC code is found on the bottom of most routers.

3. Set the wireless router to “Access point” mode – or whatever your setup name is to turn the DHCP function off (the Internet Access Point computer will act as the DHCP server.) This will turn off DHCP and gateway functions in the router and allow the router to simply act as a wireless switch between wired and wireless networks.

4. Connect the wired, wireless computers, using the SSID and WPA2 encryption key you established, and networked/wired printer(s).

Likely issues

- Note that in this setup the “WAN” connection on the wireless router is not used, because using this connection would isolate the Internet Access Computer from other computers and the network printer(s).
- Since the Internet Access Computer provides the network addressing function (DHCP) this computer must be fully booted and operational before the other systems are started.

Using a Sites Wireless Internet Service without a Router

SITE EQUIPMENT

TAX-AIDE EQUIPMENT

Host Wireless Router

Wireless TWO Tax preparation computers

Wireless printer(s)

Wired USB Printer(s)
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Wireless networks, including Public WiFi networks, are allowed to be used for TWO, with the following restrictions:

- If the wireless network is unsecured, then **Windows File and Printer Sharing must be turned off** on all computers.
  
  Two cases - either:

  1. All printing must be initiated on a computer that has the target printer locally attached, because Printer Sharing must be turned off on the computers, OR
  2. All printers must be network-attached. Network printers can either be a wireless printer as shown, or a Site networked printer.

- If the wireless network is secured with WPA2 security that you have reasonable control over, meaning that the connection password is not posted on the bulletin board of the library or senior center, then Windows file and printer sharing is allowed to be turned on and any computer can print to any printer that is shared on the secured wireless network.

- The wireless computers used must be either:

  1. IRS Computer Loan Program laptops, OR
  2. AARP Tax-Aide purchased and imaged laptops, OR
  3. Site-owned or personally-owned or donated computers with NTC-registered clean malware and security scans.

**NOTE**: Other options to connect to a site’s Internet service are being investigated and tested. They will be added to this document when they are proved usable.