Home Networking for Internet Television!

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While home networks traditionally have just connected PCs, an array of consumer gadgets like smartphones, game consoles, and handhelds are also now commonly networked to each other and to the Internet. Watching televised video is one of the most popular usages of these connected consumer devices.

Accessing the Internet from a TV

Some newer *Internet-ready* televisions incorporate built-in Ethernet and/or Wi-Fi for home and Internet networking, but most existing TVs lack this support. Look for these network ports on the back of the set, or check the manufacturer's documentation to determine the TVs networking capabilities.

Configure an Internet-ready TV (sometimes called *smart TV*) for home networking using the TVs on-screen menus. The specific steps vary depending on the model of television, but as when networking computers, the TV must be connected to the home router or broadband Internet modem. For wireless connections, the correct Wi-Fi encryption key must be entered on the TV.

Using Digital Media Players for Internet Television

Digital media players connect TVs that lack built-in networking capability to the Internet for television viewing. Sometimes also called *set-top boxes*, these players are separate hardware devices that link TVs to broadband routers and modems. Video content can be streamed from the Internet to the player and then relayed to the television by standard audio-video (AV) cables. Popular brands of digital media players include Apple TV, Boxee, and Roku.

A digital media player appears on the home network as a unique device with its own IP address. To configure the player, first connect it to the TV receiver via AV cables, then follow its on-screen menus to configure the player to join the home network via Wi-Fi or Ethernet connections as available.

Watching Television Broadcasts via the Internet

Internet television services stream digital TV programs to homes. Popular online TV services in the U.S. include traditional station networks (NBC, ABC, CBS) and also independent providers (Netflix, Hulu). These services work with PCs, digital media players, and various consumer gadgets; a networked television set is not required. Many Internet TV programs are free, while others require a paid subscription to view.

Providers utilize a mix of different network protocol technologies, collectively known as Internet Protocol Television (IPTV), to deliver Internet video and audio content to consumers.

The specific method to set up Internet television varies depending on content provider, but these basic steps apply:

1. *Network the devices*. Ensure the required wired and/or wireless local connections and Internet connectivity are in place.

2. *Subscribe to the provider*. This typically involves providing a valid email address and password and, in the case of paid services, credit card number or other payment information. Subscriptions can be entered through a networked Internet TV, digital media player, or home computer.

3. *Set up the content viewer*. While a few services may simply work with standard Web browsers, others require downloading an app or other additional software to support finding and viewing video content on computers. Internet TVs and digital media players embed and pre-configure the necessary viewing support but also provide varying options to set various preferences for displaying video depending on the hardware model and content provider.

Streaming Television Programs Within and Outside the Home

A home network enables television to be distributed across devices rather than being limited to one primary TV screen. Some in the industry call this capability *place-shifting*. However, many constraints exist depending on the available devices and their configuration. Some digital video recorders (DVRs) like those from DirecTV, for example, enable Wi-Fi streaming to home computers, phones and tablets running DirecTV mobile software applications. Other types of set-top boxes like Slingbox are also designed to support place shifting. Consult product documentation to learn more about the specific features available with each.

Network Bandwidth Requirements for IPTV Television

Because digital video consumes a large amount of network bandwidth, high-speed Internet connections must be used to watch programs streamed online. Internet TV services generally perform satisfactorily with 3 Mbps and higher connection speeds. Some services support down to a minimum of 0.5 or 1 Mbps by automatically streaming a lower quality (smaller resolution) video when detecting the lower connection speed.

Network traffic congestion, either on the Internet or within the home network, also significantly affects the quality of video streaming. All video streaming systems buffer incoming data to help manage temporary fluctuations in available network bandwidth. When a network becomes saturated with traffic, streams being viewed pause (freeze) whenever the system buffers are empty and resume only when the buffers re-fill. Minimizing heavy download or other online streaming activity when watching Internet television helps avoid these video pauses.