**NETWORKING FEATURES OF WINDOWS 7**

Harrison Pierce

Computer Science

Framingham State University

# Abstract

The Windows 7 operating system features a wide array of networking features and network administrative features. A main addition with the Windows 7 update is the HomeGroup feature, described in much detail later on. Sharing files is easier than ever and a refreshed user interface design has been praised by reviewers. Network administrators can control networks with more tools than before and use remote viewing to control the computer from anywhere in the world.

Table of Contents

[Abstract 2](#_Toc526976400)

[Introduction 4](#_Toc526976401)

[Networking Features 4](#_Toc526976402)

[Using HomeGroup 5](#_Toc526976403)

[What is HomeGroup 5](#_Toc526976404)

[Joining a HomeGroup 5](#_Toc526976405)

[Leaving a HomeGroup 5](#_Toc526976406)

[Creating a HomeGroup 5](#_Toc526976407)

[Accessing Files and Printers on Other HomeGroup Computers 6](#_Toc526976408)

[Changing HomeGroup Settings 6](#_Toc526976409)

[Combine two HomeGroups 6](#_Toc526976410)

[Setting up a network 7](#_Toc526976411)

[What is needed 7](#_Toc526976412)

[Setting up a home network 7](#_Toc526976413)

[Testing the Network 8](#_Toc526976414)

[Joining and Creating a Workgroup 8](#_Toc526976415)

[Configuring multiple gateways on a network 8](#_Toc526976416)

[Connecting to a Network 8](#_Toc526976417)

[View and connect to available wireless networks 8](#_Toc526976418)

[Viewing preferred wireless networks 9](#_Toc526976419)

[Sharing and collaborating over a network. 9](#_Toc526976420)

[File sharing essentials 9](#_Toc526976421)

[Keeping network files in sync 9](#_Toc526976422)

[What is Sync Center 9](#_Toc526976423)

[Working with network files when offline 9](#_Toc526976424)

[Sharing an internet connection 10](#_Toc526976425)

[Sharing one internet connection with several computers 10](#_Toc526976426)

[Enable or disable network discovery 10](#_Toc526976427)

[Internet Gateway Device Discovery and Control 10](#_Toc526976428)

[Network Administrative Features 11](#_Toc526976429)

[Add or remove a network protocol, service or client 11](#_Toc526976430)

[Disconnecting from a network 11](#_Toc526976431)

[Wake on Lan capabilities 11](#_Toc526976432)

[Conclusion 11](#_Toc526976433)

[References 13](#_Toc526976434)

# Introduction

Upon its release in October 2009, the Windows 7 included numerous new networking features in addition to the wide range of existing network features previously available in earlier versions of Microsoft’s vastly popular computer operating system. The two main categories include, networking and network administrative features. All features of the two categories will be covered thoroughly. As a little background on the subject, Windows 7 was intended to be the next upgrade after Windows Vista which was made public roughly three years prior. Vista had received lots of criticism meaning Windows 7 needed to address the specific issues while including a fresh set of features and add-ons.[9]

Reviewers found the update to Microsoft’s closed source operating system to be a major improvement over its predecessor. [1] Though at launch it still had a few performance issues and bugs, the overall user interface was handsomely designed. In particular, the new taskbar was found to be a significant upgrade. In half a year post launch, Windows 7 sold over 100 million copies, and as of October of 2018, about 39 percent of computers run Windows 7. [2]

# Networking Features

This category covers the main networking features of the Windows 7 operating system. Sub categories include Homegroup, setting up a network, connecting to a network, Sharing and collaborating over a network, keeping network files in sync, sharing an internet connection, and troubleshooting network problems. The features included with Windows 7 make it simple and easy for the user to set up a home network, collaborate with others, or keep productive in an increasingly online oriented world. The average user will find it easy to set up, manage or share a network with Windows 7. [10]

## Using HomeGroup

### What is HomeGroup

HomeGroup is an easy way for Windows 7 users to share files and printers on a home network. Pictures, music, videos, documents, and printers all can be accessed by multiple users on the network without allowing modification of the files unless permission to do so is granted. Homegroup is automatically created when a computer is set up using Windows. If a homegroup already exists on the network, new users may join it and choose which libraries they would like to share with others. Homegroups may also be password protected, requiring guest users to enter the password before gaining access to files on homegroup. [10]

### Joining a HomeGroup

If a homegroup has already been created on the network, Windows users on the network may then join it. If a password is set, guests will need the homegroup password to join and become a member. To join a homegroup, first click the start button in the bottom left hand side of the screen with the Windows logo. Next, click the Control Panel button located on the right side of the start menu. Once the new window has been opened, a new list of settings will appear in the window. Click where it says “Choose homegroup and sharing options” which will bring the user to a page containing the name of an existing homegroup, and the option to join. [10]

### Leaving a HomeGroup

If one desires to leave a homegroup, they may do so by navigating to the same place as joining a homegroup and pressing the button that says “Leave the homegroup”. Next a window will appear asking if the user is sure they would like to leave the homegroup. Press leave homegroup again to officially exit from the homegroup.[10]

### Creating a HomeGroup

To create a HomeGroup on the network, navigate to the control panel by pressing the start button and then clicking on the control panel button on the start menu. Next, under the network header, press “Choose homegroup and sharing options”, bringing the user to the main HomeGroup page. Finally, press the create homegroup button and select the desired options and press next. It may take a few minutes for the homegroup to be configured. A password will then be generated and presented to the user instructing them to write it down or save it. At this point the homegroup has been created and the user may press the finish button to exit the setup screen. [10]

A screenshot of a social media post

Description generated with very high confidence

*Screenshot of the network category in the control panel*

### Accessing Files and Printers on Other HomeGroup Computers

In order to access a printer or files on another computer, it must be added to the HomeGroup. If this process has already been completed, it will show the other computers belonging to the homegroup in the Windows Explorer. Computers which are powered off, hibernating or in sleep mode will not appear in the Windows Explorer. Navigating to the homegroup files and folders begins with clicking the start button and clicking the user name. The user then will click on the user account name under HomeGroup on the left side of the screen. Next double click the library and folder for access. If a printer is also included in the homegroup, click the button called “Install Printer”. Once finished, the user may access the printer through the print menu.[10]

### Changing HomeGroup Settings

From the HomeGroup settings menu, found in the same place as if the user were to create, join, or leave the homegroup. Here the homegroup settings are presented, allowing which libraries and devices are linked on the network among other options. Change password, share media with devices, change advanced sharing options, and the homegroup troubleshooter are in this page.[10]

### Combine two HomeGroups

If connected to a homegroup on one network, the user connected to a different networking containing an existing homegroup, there will be a prompt to join the pre-existing one which will combine the two into one. Doing so includes the users connected to each homegroup but will not change access to the files and folders.[10]

## Setting up a network

### What is needed

Setting up a home network can be tricky. There are numerous ways to create a home network such as via wireless. Ethernet, HomePNA, and Powerline. For the sake of simplicity, only ethernet and wireless will be covered. For a wireless network, there needs to be an initial point which the computer can connect to, often referred to as a router. The router is what connects the computer to the network. Windows recognizes the signal produced by the router and gives the user the option to connect to it. A computer must also have a wireless network adapter which is what the computer uses to communicate with the router. For an ethernet connection, a wireless network adaptor is not necessary as the router is plugged directly into the computer to transfer data. There is almost always an ethernet adapter built into desktop and laptop computers. Windows 7 operating system recognizes the router by utilizing the ethernet adapter.[10]

A screenshot of a cell phone

Description generated with very high confidence

*Screenshot of the Windows 7 Start menu*

### Setting up a home network

Assuming the installation of necessary hardware has already been completed, connecting to the network using Windows 7 is extremely easy. If the network is being set up wirelessly, there is a setup wizard dedicated to walk the user through the process of connecting the machine to the network. [5]To access the wizard, first press the start button and open the control panel from the start menu. Next enter the network and internet section and press “Add a wireless device to the network” which will open a new tab with instructions on configuring the wireless device. For a wired connection all that is needed is an ethernet cable to plug into the computers ethernet adapter and the other end into the router. Windows will automatically detect the cable and network and configure it accordingly. [10]

### Testing the Network

To make sure that all the devices are working as they should, is important to test the network. Begin by pressing the Start button and clicking the username. On the left side of the window that appears, press on Network. At this point the user will be shown icons for all computers and printers on the network. It is also important to ensure network discovery and file sharing is turned on or the icons may not show up[10].

### Joining and Creating a Workgroup

A workgroup is automatically created and given a name on Windows 7. However, sharing is not automatically set up which can be done via HomeGroup.[2] Workgroup is found by first pressing the start button, then right clicking on computer and pressing properties. Then under “Computer name, domain, and workgroup settings”, press “Change settings”. A dialogue box will appear. Under Computer Name there is a Change button. Press it and another dialogue box will appear containing options to join a new workgroup by typing the full name in the space provided. To create a new workgroup, enter the name of the workgroup in the space provided and click the OK button. Creating or joining a workgroup will remove the user from any previous domain the computer is a member of. [10]

### Configuring multiple gateways on a network

Configuring a default gateway can resolve issues when a computer is trying to communicate with all computers on an intranet as well as all computers on the Internet simultaneously.[3] Two network adapters are necessary to do so. First configure a default gateway for the network adapter which is connected to the Internet. Do this by pressing the start button, control panel, then using the search bar to look up “network connections”. Click the first option labeled, “view network connections”. Right click on the network adapter to be configured and click properties. If a password is required, enter the password information. Click either Internet protocol version 4 or internet protocol version 6 and then hit properties. A dialogue box will appear prompting the user to either obtain an IP address automatically or to use the following IP address where the user can define as such. If selected to automatically obtain the IP, the default is given by the DHCP server. Otherwise the default gateway on IPv4 may be changed to an alternate configuration.[10]

## Connecting to a Network

### View and connect to available wireless networks

If a Windows 7 computer has a wireless adapter integrated, a list of all available networks can be seen. In the bottom right hand side of the task bar is a network icon indicated by a symbol in the shape of a radio frequency. This is the network button. When pressed it opens a list of all available WIFI networks within range assuming the user has a wireless adapter. To connect to one of the networks simply click on the network and press connect. If the network is secured using a passphrase or key, a prompt to enter it will appear.[10]

### Viewing preferred wireless networks

A list is kept of all the networks that the computer has been connected to before. It is sometimes referred to as preferred list or preferred wireless networks. Locating the list starts by pressing the start button and opening the control panel. Then the user must search for “manage wireless networks“ in the search bar. After doing so, the first option will bring the user to where all previous networks are listed. Windows gives the user an option to change the properties of each network by right clicking on the network and pressing Properties.[10]

## Sharing and collaborating over a network.

### File sharing essentials

Homegroups, as explained earlier, allows multiple users of Windows 7 to share and modify files and folders on a network together. When navigating the File explorer, there is a drop-down list at the top of the window called Share with which gives the option to choose individual files, and folders to share with others. What appears in the drop-down menu will depend on what type of file is being selected. Commonly found options include, Nobody, Homegroup (Read), Homegroup (Read/Write), and Specific people. Each refers to the level of permission that can be granted to other users in the homegroup. When a file is selected in the file explorer, there is an information tab at the bottom of the window with information regarding if the file is shared and if so, who has access. The final option to share files is by making a folder or file public. This allows all users on the homegroup to access the file or folder. This however does not restrict the users like using the share function.[10]

## Keeping network files in sync

### What is Sync Center

Windows 7 includes a feature called Sync Center which allows users to check the results of sync activity on a network server. Files may be stored offline when synced with a network server. Files may be accessed and edited even if the network is offline. Sync Center lets the user know if files were successfully or unsuccessfully synced with the network server. To access the Sync Center, begin by pressing the start button and in the search box, typing Sync Center. A list of results will appear. Click the tab labeled Sync Center to open. [10]

### Working with network files when offline

Windows automatically makes copies of network files which are made available offline. When the computer is no longer connected to the network there is still access to the file. The file can be opened, modified, and saved for later use. Once reconnected to the network, the file will automatically sync back on the network. To make a folder available offline, right click on the file or folder and press always available offline.[10]

## Sharing an internet connection

### Sharing one internet connection with several computers

Sharing an internet connection without the use of a router can be done using an ad hoc network. The computer the network is set up on must remain on in order for other devices to use the connection.[6] In addition, turning off the computer will reset the connection and it will no longer be shared with other devices. ICS is the tool used to set up the ad hoc network and must be enabled in the settings before use of the network. To enable ICS, begin by pressing the start button, then opening the control panel and entering the network and internet category. Next, on the left-hand side of the window the user must press the change adapter settings button. A new screen will appear. Then the user will right click on the connection that will be shared and press properties. Select the sharing tab and then select Allow other network users to connect though this computer’s connection. Once enabled, the local area connection received a static IP address. There also must be a reestablished connection between the host computer and the other network computers. [10]

### Enable or disable network discovery

Network discovery affects the computers ability to find other devices on the network and vice versa. The default setting sets the Firewall to block network discovery though it can be enabled in the settings. To enable, begin by pressing the start button and opening the control panel. Then select the network settings. On the left side of the window is an option called Advanced sharing settings. Once clicked, a new menu will appear and there is a section called Network discovery. Under this is both options to enable to disable the network discovery for that Windows 7 computer.[10]

### Internet Gateway Device Discovery and Control

Internet Gateway Device Discovery and Control (IGDDC) helps the user manage gateway devices. An example of a gateway device would be a router. This feature allows one to share their Digital Subscriber Line or cable modem internet connection with other network computers. IGDDC allows anyone on the network to connect to the internet connection remotely or open and close firewall ports. The network administrator can control IGDDC settings to prevent other users on the network from being able to access the settings.[8] IGDDC can be enabled by pressing the start button opening control panel and selecting the network category. Next press the button on the side of the window labeled change adapter settings. Then right click on the connection to share and press properties. View the sharing tab and select allow other users to connect through this computer’s internet connection check box. As an option, the user may also allow other network users to control the internet connection settings by checking the box next the label. Once this step is completed a ICS icon will appear in the network folder.[10]

# Network Administrative Features

This category mainly covers the technical settings of managing and controlling a network. Topics include adding or removing a network protocol, service or client, using the command line for networking, choosing a network location, creating and modifying network profiles, changing TCP/IP settings, and Wake on Lan capabilities.[10]

## Add or remove a network protocol, service or client

Though TCP/IP is automatically installed on windows, the user is given the ability to add other services, clients and protocols.[10] To begin, click the start icon and enter the control panel. From here select the network interface and click on change adapter settings. Next, right click on the network and clock properties. Choose where to install the new rule and press install. There will be a menu listing either client, protocol or service. Select the desired network feature and press add. A new dialogue box will appear listing items that can be added. Select one and press ok to add it.[4]

### Disconnecting from a network

To disconnect a computer from a network, it can be done via Windows 7 without unplugging any cables. To disconnect, click the start icon and enter the control panel. From here select the network interface and click on change adapter settings. Then right click on the network and click disconnect for a wireless, dial-up, or VPN, or incoming connection. For a LAN connection, click disable.[10]

## Wake on Lan capabilities

Wake on Lan allows a user to turn on a computer connected to a network remotely. Also known as a Remote Wake-up, a special data packet is sent to the computer. Even while turned off, there is still an extremely small amount of electricity going through the network adapter allowing it to listen to the network. When the special packet is sent and arrives, the network adapter can tell the computer to turn on. It is mainly used by a system administrator allowing remote access for maintenance or other tasks. The computer must have some specific hardware components to work however. [10]

# Conclusion

Microsoft’s Windows 7 operating system includes a vast number of home and administrative networking features. There are numerous newly added features as well as returning features from previous generations of the operating system. Online reviews have stated that the incremental upgrade over the previous version is far superior. Windows 7 wraps its networking settings in a neat, and easy to use interface. [10]

# References

1. “Microsoft Windows 7 Review: Microsoft Windows 7.” *CNET*, 1 Aug. 2009, www.cnet.com/reviews/microsoft-windows-7-review/.
2. “Desktop Windows Version Market Share Worldwide.” *StatCounter Global Stats*, gs.statcounter.com/windows-version-market-share/desktop/worldwide/#monthly-201808-201808-bar.
3. Bradley, Tony. “A Guide to Windows 7 Networking.” *PCWorld*, PCWorld, 19 Oct. 2009, [www.pcworld.com/article/172268/windows\_7\_networking\_guide.html](http://www.pcworld.com/article/172268/windows_7_networking_guide.html).
4. *Microsoft Support*, support.microsoft.com/en-us/hub/4338813/windows-help?os=windows-7.
5. Vandervell, Andy. “Microsoft Windows 7 Review.” *Trusted Reviews*, 26 Jan. 2016, [www.trustedreviews.com/reviews/windows-7-the-review](http://www.trustedreviews.com/reviews/windows-7-the-review).
6. Vaughan-Nichols, Steven J. “Windows 7 Networking Guide.” *Computerworld*, Computerworld, 30 Nov. 2009, [www.computerworld.com/article/2468218/microsoft-windows/windows-7-networking-guide.html](http://www.computerworld.com/article/2468218/microsoft-windows/windows-7-networking-guide.html).
7. “Windows 7 Frequently Asked Questions.” *Windows 7 Frequently Asked Questions | Information Services and Technology*, ist.njit.edu/windows-7-frequently-asked-questions/.
8. “Windows 7 Tips.” *Microsoft TechNet*, technet.microsoft.com/en-us/library/ee851557.aspx.
9. “Windows 7.” *Wikipedia*, Wikimedia Foundation, 4 Oct. 2018, en.wikipedia.org/wiki/Windows\_7.
10. *“Windows Help and Support”* software from Microsoft’s Windows 7 operating system