
UNIT 2: WI-FI USB DONGLES

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2.0 Learning Objectives

After learning this unit, you will be able to understand:

- About Wi-Fi Dongles.
- About architecture of Wi-Fi Dongles.
- About configuring Wi-Fi Dongle.

2.1 Introduction

A dongle is a small piece of computer hardware which can be connected to another device say USB to provide internet services. A dongle works with software which on installing will allow dongle to connect to internet. It is mostly connected on USB ports on computer or laptop. Dongle is associated with a device which provides wireless connectivity to devices with USB connections.



Fig 2.1 Wi-Fi dongle

Dongle is a Wi-Fi computing internet device which is fixed in USB Port available on computer or laptop. Dongle is a plug and play devices which is fixed to connect to internet. Dongles are there in many configurations and in different make which are used for locating and connecting to wireless internet connection for a laptop or desktop. They are popular computing device as they allow more flexibility and movement as compared to fixed-line internet connections. They are external devices which simplify use of secured software when attached to laptop or computer and are easy to carry and simple in use.

2.2 Motivation and Need for Wi-Fi Dongles

Dongle also known as USB Wi-Fi adapter is a plug and play device which can be used on desktop or laptops and can be connected to universal serial bus (USB) ports for connecting to wireless network. They are portable and require no telephone lines. They are easy to carry anywhere and can be connected to internet in home, office or public place. They are simple to carry and easy to handle and because of such quality, they are preferred nowadays instead of ADSL modems. They are cheap in price with high configuration and simple to connect across globe. While connecting to internet, it helps in accessing shared files, devices and documents or helps in connecting for chat on Internet. Because of their compact size and high speed, dongles are preferred as they can be used on computers or laptop on in any USB supportive designs.

As commonly available nowadays, dongle serves as fast compatible USB device which is less expensive and can be replaced fast because of its good and prompt services. They are vertical stick which is USB Wi-Fi enabled and connects fast across the internet.



Fig 2.2 Wi-Fi adapter

Wi-Fi dongle is a wireless computer network adapter which uses high frequency radio signals that can transmit and receive information using Ethernet protocol. Dongle works on the principle of sending and receiving signals that helps the receivers and transmitters that are wider in range which are normally 20 metres that works indoor. Devices such as computers connect to the network via Wi-Fi hotspots. Mobile phones, media players, and other consumer electronic devices are also capable of connecting to these networks. Wi-Fi connectivity allows you to connect to the Internet wirelessly at home, in the office, at an airport, in a coffee shop, or anywhere near a public access Wi-Fi hotspot.

Dongle or USB adapters are fast internet connectivity USB device which are manufactured by many companies. The speed of connectivity depends on speed of receiving and sending of signals, so companies nowadays are taking care of all essential features in this competitive world. They are available in various configurations from 4MBPS to 128MBPS with low price. You'll find it priced around \$50. The D-Link AC1900 Wi-Fi USB adapter is an upcoming product that should enable even greater performance.

A Wi-Fi connection in the workplace allows users to connect to the local area network immaterial of the place and location. They are mostly used nowadays for meeting, training rooms, presentation halls and for online lecturers. If the business is housed in more than one building a Wi-Fi network can connect buildings' networks to each other. It is simple and flexible and can be handled easily with wide scope in small or big business. Wi-Fi is the perfect solution for staying flexible and keeping staff connected. Since there is no need to reroute cables, moving offices as the business starts to grow has no costs attached. Opting for USB dongles and adapters instead of upgrading or installing onboard network adapters could mean substantial savings.

Check your progress 1

1. Dongle works on the principle of:
 - a. Wi-Fi technology
 - b. Leased line technology
 - c. ADSL technology
 - d. All of above

2.3 Basic architecture and working

A USB wireless adapter is known as dongle which is made of plastic cabinet having digital circuit that is used to connect the device with the internet. In earlier usage, dongle acts as hardware key which is normally applied in order to run certain network applications. It is another form of broadband wireless adapter.

In today's time, dongle comes with 3G/4G USB technology. It is compact in size and varied in configuration with various sizes and shapes. It is similar to USB flash drives and is used as flash drives or memory stick. This flash memory contains a file system with software which the host computers can load and run. In this, the software includes a driver for one or more operating systems (OSs) and a management application which will help the user to control certain applications. Normally, the flash memory is applied for software which provides routing software that will help in routing of packets to WLAN or 3G interfaces. All the necessary drivers and software are stored in the dongle by the manufacturer so that the user can conveniently use the dongle immediately (or soon) after they plug the dongle into their laptop.

Each USB dongle contains a small modem and transceiver inside the dongle, enabling the device to connect to a 3G/4G network. To access the Internet via a cellular network the OS frequently makes use of the dongle as a modem to connect to a terminal server via PPP. The OS begins by negotiating the protocol family it is going to use, gets assigned an IP address, and then the OS encapsulates IP packets into PPP frames and transmits these frames over the PPP link to their destination. If the connection is lost, then the process has to start all over again. This is the approach used by many current dongles, but in this thesis a new approach is proposed.

Check your progress 2

1. Wi-Fi Dongle comes with:
 - a. 3G technology
 - b. 4G technology
 - c. Both a and b
 - a. Neither a nor b

2.4 Connecting and configuring Wi-Fi Dongle with PC

A USB Wi-Fi adapter or dongle connects a computer or laptop to Wi-Fi network. If the computer is not having network card, then such type of device will allow you to connect to internet without installing network card in the computer. Also if your computer has outdated network card, you can also upgrade it without removing old card. In such case, you need to disable the integrated wireless network card in order to allow new card to install. Wireless networking lets you connect your computer to other devices on the same network or share an Internet connection. Nowadays the requirement of cables are not there, which on the other hand becomes convenient, as you can watch internet on laptop which can be carried to any place or network location and once connected the data can be shared among two or more computers in a network. Once the device is connected, you can share files, videos, printers, scanners and Internet connection across in network. If you own a small business, keeping employees connected is easy, and there are no costs involved in moving computers from one office to another should your business grow.

Connecting a dongle to desktop or laptop computer requires few simple steps which can be carried out by instructions as provided. Users can learn how to connect dongles to laptops with the click of a few buttons. For a laptop or computer that does not have integrated wi-fi or a wireless card, wi-fi dongles are an easy way to enable wireless functionality. Users may begin by plugging the wi-fi dongle into the USB port. Once the operating system reads it, add the installation CD and follow the steps that appear on the screen. In some cases, the computer requires a complete reboot. Once completed, a wi-fi icon will appear on the screen, showing a list of available wireless networks. Then, it's time to select the wireless network and start surfing.

- After plugging the dongle, you will see a pop message asking you to auto-install the device on your desktop or laptop computer.
- Now you need to click on Install button and wait for the completion of process.
- If you don't receive the auto message, in such case you need to go to My Computer and select the Wi-Fi device.
- On the Wi-Fi device, you have to double click in order to start the installation.
- After installing, the Wi-Fi device will create a shortcut icon on desktop, on which you have to double click in order to make the dongle run.

Check your progress 3

1. Wi-Fi Dongle:

- a. Requires software to installing
- b. Can be installed directly using latest operating system
- c. Needs USB port
- d. All of above

2.5 Let Us Sum Up

In this unit we have learnt that a dongle is a computer hardware which is connected to USB to provide internet services and works with software that is required to connect to internet. It is known that a Dongle is a USB Wi-Fi adapter which is a plug and play device that on affixing with desktop or laptop's can be connected to internet.

It is seen that a USB wireless adapter is a dongle which is made of plastic with digital circuit that connects device with internet and is also another form of broadband wireless adapter. It is noted that a dongle is connected to desktop or laptop computer which can be installed in simple steps and provides user with how to connect dongles to laptops with few buttons.

2.6 Answers for Check Your Progress

Check your progress 1

Answers: (1 -a)

Check your progress 2

Answers: (1 -c)

Check your progress 3

Answers: (1 -d)

2.7 Glossary

1. **ADSL** - It is a broadband for connecting internet that works on existing telephone line.
2. **PSTN** - It is Public Switched Telephone Network which is combination of interconnection which handle circuit switched voice communication.
3. **Dongle** - It is a portable Wi-Fi internet device which is connected with USB interface for internet.

2.8 Assignment

Explain the working of Wi-Fi Dongle.

2.9 Activities

Write steps to install dongle in laptop computer.

2.10 Case Study

Compile the details about hardware configuration of Wi-Fi Dongle.

2.11 Further Readings

1. An Introduction to Modern Electronic Media, Joseph Dominick, Barry Sherman, and Fritz Messere.
2. Introduction to Wi-Fi technology; Lawrence Harte.