

# A Comprehensive Review of Mobile WiFi Hotspot Technology

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**Abstract** - Internet and World Wide Web has become a trend in our culture and use of wireless technology to access the Internet is inevitable choice for the future. WiFi technology is being used to connect wirelessly to the Internet using mobile devices at home and from public hotspot locations. However, we lose the internet connectivity when we go out of its range. On the contrary, 3G MiFi (or Intelligent Mobile Hotspot) offers a continuous access to the Internet wirelessly wherever the respective cellular service is available. It provides more flexibility, available for connecting to internet, than Wi-Fi. MiFi is a small device that can be connected to a mobile phone (cellular) carrier and provide internet access for up to 5 devices. In this paper, we have discussed about the technology and its significant features, along with its technical details.

**Keywords** - MiFi, Wi-Fi, Internet, World Wide Web.

## I. INTRODUCTION

Long time ago when Web browsing required sitting in one place and using a computer plugged into a cable. Now, people expect to hop online whenever they want from wherever they want using wireless Internet connections. But it isn't always easy. Mobile devices lose their capabilities when the carrier's signal drops out; laptop users struggle to find a public Wi-Fi network that will work; and the Wi-Fi networks that are available get slowed down by overcrowding.

This problem can be solved by using wireless mobile hotspot technology (MiFi device). It works by connecting to a mobile broadband network and then acting as a wireless router it makes available the internet connection to a number of devices. The devices that want to connect to the MiFi device usually have to be within a close radius (within 10 meters). The name is a made from Mobile & WiFi – MiFi. The term MiFi is actually a trademarked name by the company Novatel Wireless, who developed MiFi and used the strap line "Intelligent Mobile Hotspots".

## II. ABOUT MIFI

Mobile hotspot device is a credit card sized device as shown in fig. 1 that is able to offer 4 hours of active use off a single charge. Up to 5 wireless enabled devices can connect to it to use the mobile broadband network that is available through the wireless connection shown in fig. 2. It works in much the same way as wireless routers in the home work but it does not require it to be plugged into an electrical socket or be

connected to the telephone line as it gets its connection from the 3G mobile broadband networks [1].



Fig.1: A Novatel MiFi 2372 "Intelligent Mobile Wi-Fi Hotspot

Intelligent Mobile Hotspots are integrated with application environment suitable for enterprise and consumer. They bring broadband connectivity ecosystem. Unlike other solutions that require router broadband external modem and is only valid as a provider of connections, but also making internet cloud personal than the Internet connection speed is easily shared with many users, as well as Wi-Fi devices, like laptops, cameras, gaming devices, and multimedia player. Product MiFi has brains, able to open platform that can host an advanced software applications and highly flexible to continue the evolution of mobile broadband [2, 3].



Fig.2: Up to 5 wireless enabled devices can connect to MiFi

Many of us have used WiFi technology to connect wirelessly to the Internet using mobile devices viz. laptops,

Smartphone's, iPads, iPhones, and PDAs at home and from public hotspot locations. However, these devices must stay within the range of a WiFi network; otherwise they will lose Internet connectivity. On the contrary, 3G MiFi (or Intelligent Mobile Hotspot) allows access to people surfing the Internet wirelessly anywhere that cellular service is available. Depending on the density and proximity of the remote site to cell towers, this could mean that more options for flexibility might be available for connecting than would be available using Wi-Fi [4].

MiFi automatically connects to Wireless Mobile Broadband service to give broadband Internet access to up to five Wi-Fi-enabled devices. You and your colleagues will be able to check email, access corporate intranets, download files, send pictures with a Wi-Fi-enabled camera, and access the Internet on any Wi-Fi-enabled device—even when you're nowhere near a traditional hotspot. The MiFi device is about the size of eight stacked credit cards and weighs just over 2 ounces, so it's ultra-portable.

### III. FEATURES OF MIFI

- High-speed connection, Enjoy typical download speeds of 600 Kbps to 1.4 Mbps and typical upload speeds of 500 to 800 Kbps.
- Sleek design, small enough to carry in your shirt pocket, it features an internal antenna, so there are no outer parts to break.
- On-board training and support, device comes loaded with VZAccess Manager and user guides for Windows® and Mac. ®, No CDs required.3
- On-board training and support, device comes loaded with VZAccess Manager and user guides for Windows® and Mac. ®, No CDs required.
- Plenty of standard features, these include auto-install, auto connectivity, Network Driver Interface Specification (NDIS) support, VPN capability, and a removable lithium-ion battery. You'll also get two-way text messaging when you connect MiFi to your notebook via USB.
- Total security, Keep would-be trespassers from using your connection with password protection, CDMA authentication and identification, dynamic Mobile IP (MIP) key update, common Wi-Fi security protocol support including WEP/WPA/WPA2, Mac Address filtering, Serial Peripheral Interface (SPI) firewall, VPN pass-through, and more [5].

### IV. WORKING OF MIFI

The MiFi device gets its connection from the mobile phone network and then makes this available as a wireless hotspot. Up to 5 devices can connect to the secure Wireless hotspot providing they are within the 10 m (30 Ft.) range of the MiFi device.

Fig. 3 shows the mesh network of MiFi [1].

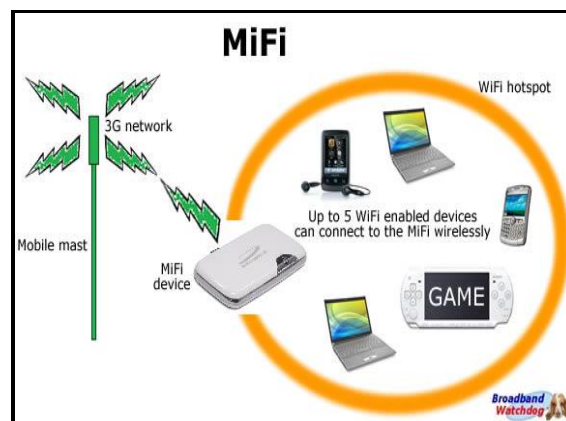


Fig.3: Mesh cloud of MiFi

Mobile wireless mesh system can be used to create a wireless internet cloud. Users with PC's, laptops, personal digital assistants, and other devices that are able to connect to the internet can operate within the parameter of the cloud. The cloud enables a direct connection from the device to the Internet. If multiple clouds are connected, much like lengths in a chain, users may access the Internet from any cloud. In a wireless mesh network topology, multiple mobile mesh nodes are deployed across a large area. Each node in the network acts as a wireless router connecting to each of the others. Even if one of the nodes breaks down, the remaining nodes will reconfigure themselves automatically and route the data to the final destination. This is why the Mesh network is considered reliable for data transmission [4].

### V. OPERATING SPEEDS

LTE bandwidth (700 MHz) you can get the broadband-like speed you require to work efficiently outside the home or office. You can connect to the Internet, corporate intranet, check your email and download attachments with typical download speeds of 5-12 Mbps. Mobile Broadband gives LTE bandwidth (700 MHz) you can get the broadband-like speed you require to work efficiently outside the home or office. You can connect to the Internet, corporate intranet, check your email and download attachments with typical download speeds of 5-12 Mbps. Mobile Broadband gives you the freedom to stay productive and connected whether you're on the road or in a meeting across town.

#### 4G Mobile Broadband with LTE

- Download: typical download speeds of 5-12 Mbps
- Upload: typical upload speeds of 2-5 Mbps

#### 3G Mobile Broadband with EVDO Rev. A (3G CDMA Technology)

- Download: typical download speeds of 600 kbps–1.4 Mbps.

- Upload: typical upload speeds of 500-800 kbps.
- **Wi-Fi 802.11b/g/n**
- 802.11b uses the 2.4 GHz frequency with a bandwidth of 11 Mbps
- 802.11g uses the 2.4 GHz frequency with a bandwidth of 54 Mbps.
- 802.11n uses the 2.4 GHz frequency with a bandwidth of 150 Mbps [2].

VI. CONNECTORS, INDICATORS AND BUTTONS ON MIFI

Fig. 4 and fig. 5 shows the Connectors, Buttons and Indicators on MiFi device.

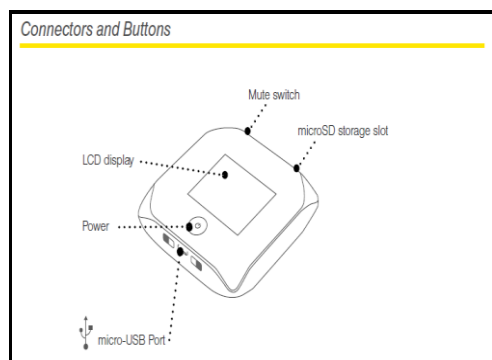


Fig.4: Connectors and Buttons

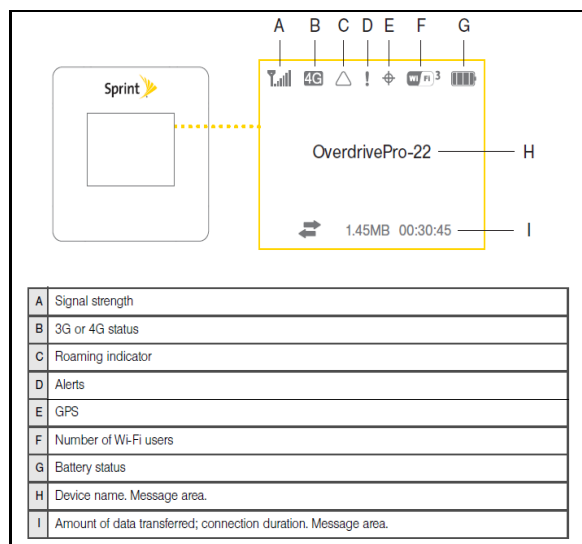


Fig.5: Indicators on MiFi [3]

LED changes its colour or ON/OFF for different status, so along with description table 1 shows LED Pattern.

Table 1: Description about LED Colour

LED Color	Status	Description
No light	Off, and the Power Button LED is also off	The device is powered off or otherwise is not getting power
No light	Off; the Power Button LED is pulsing GREEN	The device is in low-power Standby mode. This means the device is charging. While connected to a computer, but the device is not connected to the network.
GREEN	Solid	The device is powered on but is not transmitting or receiving data
	Slow blinking	The device is on and searching for a network, and does not have service
	Intermittent blinking	The device is transmitting or receiving data. The blink rate is proportional to the data speed.

Table 2: Power Button LED [6]

LED Color	Status	Description
No Light	Off	The device is powered off or otherwise is not getting power.
BLUE	Solid	The device is powered on and roaming.
GREEN	Solid	The device is powered on and fully charged.
	Pulsing	The device is in low-power Standby mode.
Red	Blinking	The battery is critically low.
Amber	Solid	The battery is charging.
	Pulsing	The device has an error.

VI. CONCLUSION

With the rapid progress in the past decade, everyone has the privilege to own a computer as well as a mobile phone. A wireless network connection is an inevitable choice to access the Internet in the future. Many of us have used WiFi technology to connect wirelessly to the Internet using mobile devices at home and from public hotspot locations. However, we lose the internet connectivity when we go out of its range. On the contrary, 3G/4G MiFi (or Intelligent Mobile Hotspot) offers a continuous access to the Internet wirelessly wherever the respective cellular service is available. It provides more flexibility, available for connecting to internet, than Wi-Fi. MiFi is a small device that can be connected to a mobile phone (cellular) carrier and provide internet access for up to 5 devices. In this paper we have discussed about the MiFi (Intelligent Mobile Hotspot) technology, its important features and technical details.

VII. REFERENCES

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