1. **Introduction**

Nowadays, mobile devices become a part of human’s life with on growing technology. Everyone has of one, or even two, mobile phones and, in some countries, the quantity of cellular telephones have surpassed the quantity of cabled lines. So every communication is through the mobile devices. Before, mobile devices have had restricted memory, constrained information correspondence abilities, and closed, proprietary operating systems. For these reasons, they have seemed almost insusceptible to file-sharing applications. However, with current memory-concentrated smart phones, we have connectivity options like GPRS, Bluetooth and Wi-Fi and running software platforms like Windows mobile and Symbian, shared (P2P) frameworks are prepared to colonize even the versatile domain [2].

As an overview of this paper, section 2 describes various file sharing technologies in mobile devices. Method used in P2P file sharing services is mentioned in section 3 where as conclusion is provided in section 4 and references include in section 5.

1. **Technologies**
   1. **Bluetooth Technology**

Phone users can share files like audio bits, images and videos through Bluetooth connectivity, which is known as standard wire replacement protocol. However to do this, those users are well known to each other and decide to transfer some file from one device to another. Also we have communication technologies like Wi-Fi and UMTS in current mobiles and use these features in permitting automatic exchange of files and data among devices by creating P2P network.

This paper proposes a Bluetooth connectivity technology P2PBluetooth, which is a mobile to mobile application that enables file sharing among mobile phones. Figure.1 represents macro-components of P2PBluetooth system. In this, ConnectionManager handles detecting new peers in proximity and determining when peers are disconnected through timeouts. P2PListener is a server, listens for incoming client connections. Whenever the system detects other devices or peers, one list is advertised which is managed by P2PPublisher. P2PDiscoveryService searches for contents available in other devices periodically. Those two should be hosting in P2PListener and this process is done by using protocol Service Discovery Protocol (SDP) which is included in Bluetooth protocol stack. In this inquiry process is as follows: Device inquiry is started followed by service inquiry (each detected device, hosts P2PListner is queried) and then retrieve public contents [2].



**Figure.1. Macro-components of P2PBluetooth [2].**

* 1. **Wi-Fi Technology**

As Bluetooth technologies have some limitations: communication is in limited range and data transfer rate between two Bluetooth devices is very low. So this paper proposes an alternative way is Wi-Fi (Wireless Fidelity). As in name mentioned, this technology is also an alternative to wired communications. As per IEEE 802.11 communication standards, Wi-Fi is commonly used in Wireless Local Area Networks [1]. We can achieve high speed in transmit and receive data by using Wi-Fi as it used radio technologies. Wi-Fi provides its users with the freedom of joining with the internet from wherever inside Wi-Fi hotspot without using wires. Through the Wi-Fi hotspot, the clients can even upgrade their home business, as accessing information through Wi-Fi is simple. Through this hotspot accessing wireless network is cheap.

* 1. **Bluetooth versus Wi-Fi**

Wi-Fi has advantages over Bluetooth in following scenarios: Bluetooth transfers data at very slow rate like 720kbps where as Wi-Fi does this at 11mbps. So, Bluetooth becomes very slow in transferring videos or large file compared to Wi-Fi. Another one is Bluetooth is a device to device connection unlike Wi-Fi, which is designed to link up entire network.



**Figure.2. Power consumption comparison [2].**

Though we have more advantages for Wi-Fi, the main drawback is power consumption. Wi-Fi deserves more power of device to transmit or receive data than Bluetooth. So for limited power devices like mobile phones Bluetooth is much usable than Wi-Fi. Figure 2 compares power consumption of Bluetooth technology versus Wi-Fi Technology.

* 1. **Peer to Peer Technology**

P2P network does not require a central server to transmit and receive files among each computer in network. Because each computer in network acts as both sender and receiver; allows shared access to various files such as video, audio and data in digital format [1]. This type of network is very useful in businesses. Also we can set up within home and over internet also. But this type of network requires all the devices in network should use same type of protocol or compatible one to connect to each other to access file and other resources in other devices.

In P2P architecture workloads are shared among peers and peers are equally privileged members in the application. Every device in a system is referred to as node. The owner of every device on a P2P system would set aside a bit of its resources such as processing power, disk storage, or network bandwidth to be made straightforwardly accessible to other system member, without the requirement for central coordination by servers or stable hosts. With this model, peers are suppliers and consumers of resources, rather than the conventional client server model where just the server send and customer receive.

1. **StegTorrent**

This paper proposes a new network steganographic method for BitTorrent (popular P2P file transfer protocol) is StegTorrent. BitTorrent is open source and has more efficiency to send and receive data. Because of these two reasons, BitTorrent is widely used in P2P device communication. In BitTorrent, resource is divided into various fragments. Peer does not require entire resource to share as it is able to download fragments simultaneously. Steganography includes techniques that install a secret message into the bearer of this message in such a way, to the point that the transporter alteration brought about by the installing of the steganogram should not be noticeable to anybody. It is critical to stress that, for an outsider eyewitness who is not mindful of the steganographic strategy, the trading of steganograms stays covered up. Figure 3 illustrates how the hidden data can be exchanged on peers by using StegTorrent [3].



**Figure.3. StegTorrent hidden data exchange scenario [3].**

From server side perspective, secret data bits are included based on order in which data packets are sent to receiving set of clients. For example data sent to two clients A and B. If data first received by A and the B then sending bit is 0 otherwise it interpreted as 1. From client side, under StegTorrent during downloading the resource, secret data receiver collects information from BitTorrent users. Order of packets depends on the value of timestamp\_microseconds from μTP protocol [3].

1. **Conclusion**

Cellular phones become very smart and we can call them now as smart phones with features other than voice communication like file sharing from one device to other device called P2P file sharing. To do this, smart phones have various technologies like Bluetooth and Wi-Fi. This paper discusses pros and cons of Bluetooth and Wi-Fi technologies and also proposes technologies like P2PBluetooth, Peer to Peer technology. To share secret data by using BitTorrent, this paper proposes a steganographic method which is called StegTorrent.

1. **References**

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