SPECTRAL EFFICIENCY LEARNING IN WIRELESS NETWORKS

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Abstract : Due to the technology evolution and the development of networks leads to intelligent buildings in communications. Wireless sensor networks communication gives uninterrupted access to information This provides in improving the reliability and efficiency of infrastructure systems. As related with other technologies wireless network ensure the interconnection and communication of multiple users on the shared channel. Wireless-enabled sensors and actuators, is also playing an important role in safety monitoring over power transmission and ensure production safety. Wireless network technology based on microelectromechanical systems (MEMS) has made remarkable progress in recent years. Be contingent on the application scenario, this technology ensure individual privacy rights and secure the systems from malicious attacks.

IndexTerms **- Communication, Wireless, Networks, Sensors and Actuators, MEMS.**

I. INTRODUCTION

Wireless networks do not normally operate in isolation. They are connected to one another or to the nodes. To connect this nodes some connecting devices can operate in different layers of the internet model. It is self configurable to keep the effort and costs involved in its maintenance at a realistic level. The Wireless networks systems flexibility is monitor independently with its configurable parameter in every node and its modification kept as possible at all times, even when the node is sleeping or idle state.

Wireless network protocols have a unique self-organizing capability. Another interesting feature of Wireless network is that it supports building performance and energy management with the sensor nodes to cooperate with each other. Sensor nodes have an in-built processor, using which raw data are processed before transmission with the help of routers and gateways. These features facilitate wide range of applications of Wireless network ranging from biomedical, environmental, military, event detection, vehicular, temperature, humidity, light, asphyxiating gases/smoke, occupancy, and energy consumption.

II. Wireless Network Technology

A large number of technologies have been developed to support wireless networking in different scenarios like a choke packet. The result of the concept of the Choke packet is that we're seeing wireless being integrated into an increasing number of places where it wasn't used before and send by node to the source to inform it of congestion. A certain types of computer hardware, portable devices like phones, PC and tablets feature built-in wireless radios. Wireless broadband routers power many home networks. Other kinds of policy is used to determine its efficiency by retransmission policy, window policy, discarding policy, admission policy, acknowledgement policy. Each policy equipment include external adapters and range extenders. Due to this policy changes in wireless network that provides communication services to a geographic area larger than a single urban area. The most common of all wireless networks is done through UDP, TCP and SCTP. Wireless telecommunication networks are generally implemented by radio communication by UDP(message oriented), TCP(byte oriented), SCTP(best features of UDP and TCP). This implementation takes place at the physical layer of the OSI model network structure with stream concept. Wireless Network maintains its architecture with its basic Bluetooth. This bluetooth contains two types of networks piconet and scatternet.

2.1. Piconets: The latest technology available in all smart phones is piconet and it also naming as a small net. This technology works depending upon the coverage of the distance between device and piconet. A Piconet can be of having eight stations, the first most is called Primary and the rest are called Secondary. The data traverse in Piconet through data packets.

2.2. Scatternet: As a result piconets combined to form a Scatternet. Like Piconet it holds two stations. The first station is used to receive messages and the next station is used to deliver messages. Any one station can be a member of piconet. Thus Piconet and Scatternet is merging process with one another.

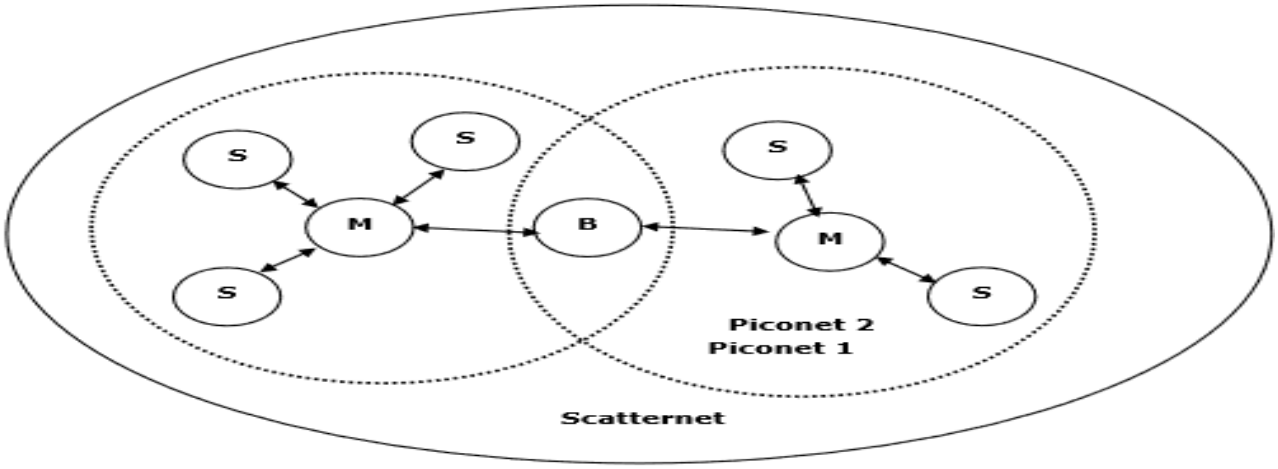

Figure 1. Piconets and Scatternet

The data in the packet are move through the different layers and they trapped through application layer, Profile data dictionary, L2CAP layer, Baseband layer and Radio layer. The packets needs to send a frame to a group of stations or to every station. The server creates copies of the received packets and sends a copy to a group of stations or to all stations. Stations use the source and destination addresses for initial connection of transferring packets. The source station can now use the virtual circuit and the corresponding identifier to send the packets or packets to the destination. The server can also deliver a unicast packets by sending its addresses to every station, but the destination addresses is unknown.

III. Wireless Networks – Satellite Networks

A satellite network is a combination of nodes containing packet of information, some of which are cells, that provides communication from one point on the earth to another as destination. Satellite networks are like type of networks in that they divide the planet into cells. It provide transmission capability to and from any location on earth. Orbits: An artificial satellites needs to have an orbit, the path in which it travels around the earth. The shapes of orbit disclosed are equatorial, inclined, or polar with its angle.

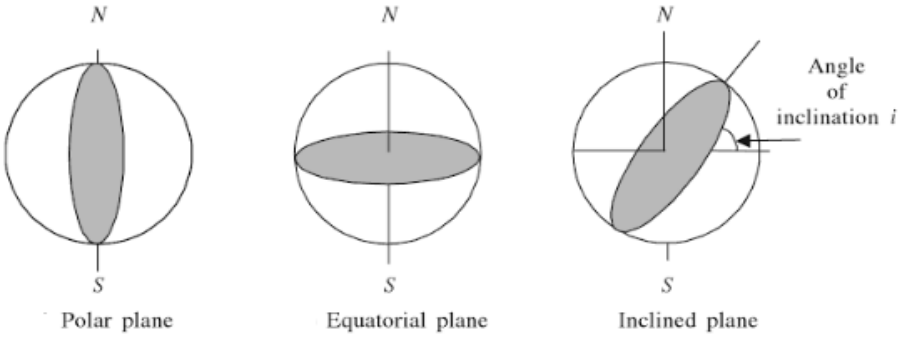

Figure 2. Orbits in different plane position

3.1 Three categories of Satellites

LEO: Has the advantage of low delay, and high safety but the disadvantage that from an observer's point of view on the earth, the satellite appears to move across the sky which is not able to determine its coverage.

MEO: An elliptical(rather than circular) orbit primarily used to provide communication at the north and south poles, as gravitation of attracting poles.

GEO: Has the advantage that the satellite remains at a fixed position which respect to a location on the earth's surface, but the disadvantage of being farther away of the station. Most of the time the nodes location faults.

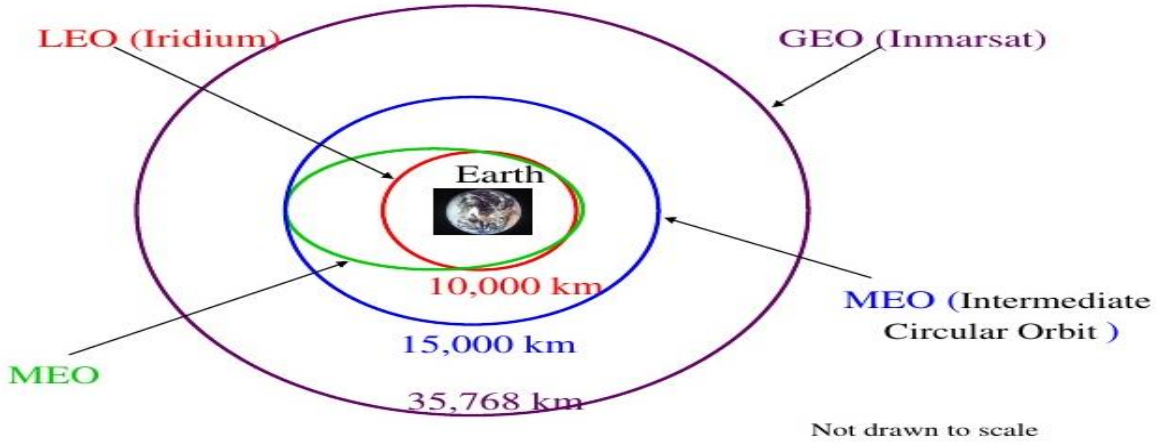

Figure 3. Categories of different satellites with its kilometers

High quality communication is done with the help of three categories of satellites are GEO, MEO, LEO. The below chart explains about the usage of satellite networks.

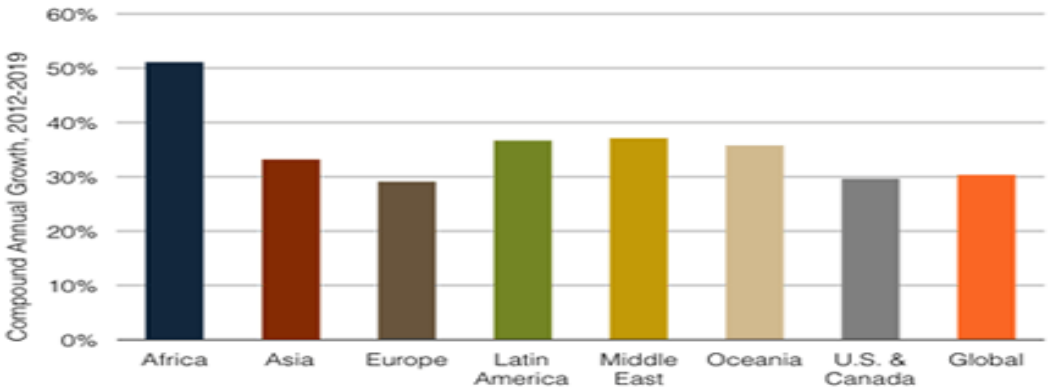

Figure 4. Orbit demand growth by region

Every satellite networks can inturn be divided into smaller networks. The ultimate responsibility of transferring packet is given through global authority of stations.

Forward link Frequency: 2000 to 2100 MHz Data rate: 1 Mb/s						
	GEO			LEO		
	Transmit antenna	Transmit power	EIRP	Receive antenna	G/T	Margin (coding gain of 9 dB)
Option 1	2.0 m	20 W	42 dBW	0.5 m	–12 db/°K	2 dB
Option 2	5.6 m	250 W	62 dBW	Wide-beam antenna –2 dBi	–32 dB/°K	2 dB
Return link Frequency: 2200 to 2300 MHz Data rate: 1 Mb/s						
	LEO			GEO		
	Transmit antenna	Transmit power	EIRP	Receive antenna	G/T	Margin (coding gain of 9 dB)
Option 1	0.5 m	20 W	30 dBW	2.0 m	1 dB/°K	2 dB
Option 2	Wide-beam antenna –2 dBi	250 W	21 dBW	5.6 m	9 dB/°K	2 dB
EIRP = effective isotropic radiated power; G/T = gain-to-noise temperature						

Table 1. comparison of satellite network options

IV.Satellite Networks Applications

The growth in satellite technology provide services to internet sectors like military, government, IT field, hospital and others. Telecommunications services is widely developed with the support of wireless networks. Data throughout the world is updated for every second as fast as with the technology of satellite networks. The oldest method of cable facility is diminishing slowly as the communication overload by DISH facility in satellite networks. The era of satellite networks is done by the down of land based communication services. Land based communication may be down or diminishing due to the natural disaster and emergencies situation.

The most important of Wireless (satellite) network applications we using are navigation, military, communication, weather, medical sector, earth observation and others. In navigation sector, GPS technology is used. With the help of GPS technology it travel to the polar regions also for finding ozone layer depletion. It tracks and transmit data with full accuracy with the help of GNSS technology. Communication is done by two technology of geostationary orbits and molniya orbits. In satellite network communication is mainly done with LEO. Example of communication we succeeded are telephony, television and radio. Weather condition are updated for every second with satellite imagery waves like visible, infrared, microwave. Data is collected with accuracy throughout earth surface which provides and quality of life. Some of the fields in earth observation are agriculture, forestry, geology, cartography, environment, defence security.

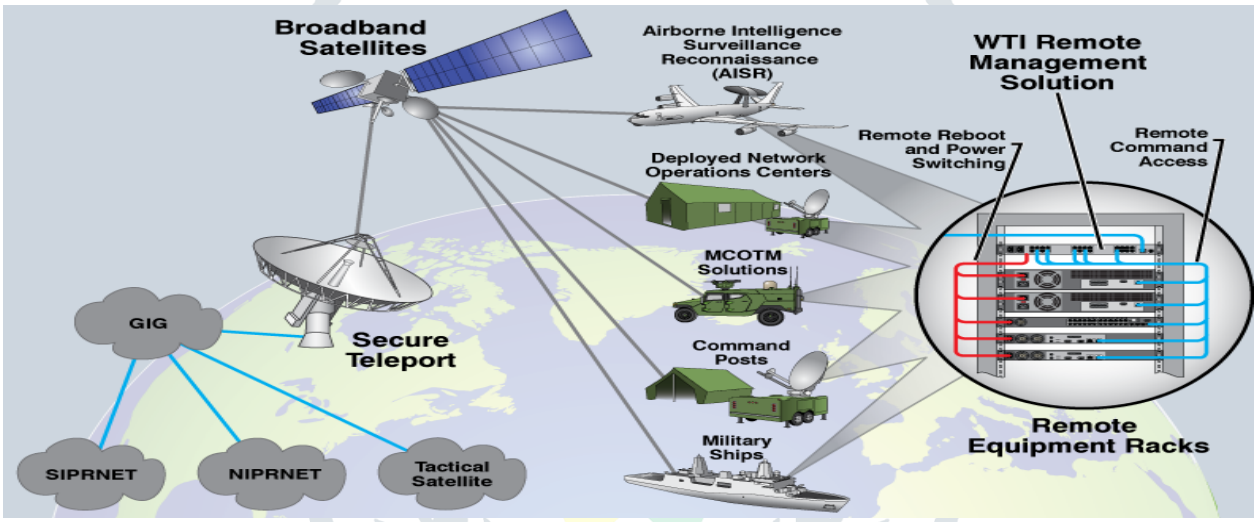

Figure 5. Satellite communication

V.CONCLUSION

The overview of the wireless technology is not much exclusive. And it is “POINT TO MULTIPOINT” communication method, so by naturally its characteristics will support in wide range. There is no need of mass amount of investment and also less pollution affected. The main advantage of this technology is, it away from human surface. While comparing with wired concept, the wireless technology is more efficient and fastest technology.

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