

Green Revolution with Green BTS via Optical Space Communication

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Abstract- Telecommunication technology has shown tremendous growth in their inventions from 1 Generation to 5 Generation. Moreover wirelessly drone communication will be a new technique which will change the perception of wireless telecommunication. Optical laser emitted drones will communicate with each other at certain level of our atmosphere layer. These drones will be made in respective to automatic alignment of their beam of light communication for high bit rate transmissions in rural and remote areas. This paper will represent how drones will lead the wireless telecom sector in upcoming 10 years.

Keywords- Optical communication, Drone, Wireless beam communication, specifications

I. INTRODUCTION

Aided by the developments in optical computing and sensing as well as the diminishment of maneuvers, unmanned aerial vehicles (UAVs) such as balloons, quadcopters, and gliders, have been receiving substantial courtesy in the investigation community. Undeniably, UAVs have turned into an essential element in numerous precarious applications such as border surveillance, disaster monitoring, traffic monitoring, remote sensing, and the transportation of goods, medicine, and first-aid. More recently, new possibilities for commercial applications and public service for UAVs have begun to emerge, with the potential to dramatically change the way in which we lead our daily lives. For instance, in 2013, Amazon announced a research and development initiative focused on its next-generation Prime Air delivery service. The goal of this service is to deliver packages into customers' hands in 30 minutes or less using small UAVs, each with a payload of several pounds. 2014 has been a pivotal year that has witnessed an unprecedented proliferation of personal drones, such as the Phantom and Inspire from DJI, AR Drone and Bebop Drone from Parrot, and IRIS Drone from 3D Robotics [1].

Approximately 40 percent of the world is connected to the internet. Of those who aren't, many are offline for one major reason: Connectivity is expensive. If you think about the traditional model of connectivity, it starts with a tower that propagates radio signals to people devices. To connect people this way, mobile operators have to build out an extensive

infrastructure requiring land rights, equipment, fiber/microwave, and access to power to run it all. Using this model, connecting people in remote or low-population-density areas can be financially challenging — there are fewer potential customers, and you have to build more infrastructures to reach them. To make the problem even more challenging, one in five people globally lives in extreme poverty, existing on \$1.25 per day or less. While tremendous progress has been made in connecting more than 90 percent of the world's population to 2G networks, getting to 100 percent using conventional approaches is unlikely to happen in the near term, given how unlikely it would be that operators would be able to recoup their infrastructure investments [2]. Moreover LTE and 5G [3] technologies has boomed the Telecommunication sector.

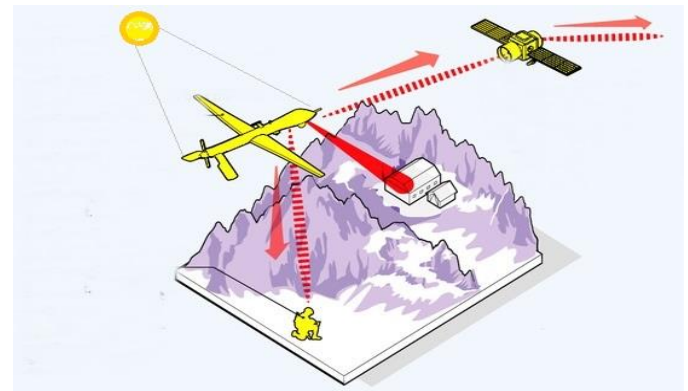


Fig.1: Drone communication

II. HOW DRONE WORKS

Drones are basically solar enable light weighted airplanes which resist in space for long time with their solar chargeable batteries from sun. These planes are designed to transmit wireless signal to ground for better communication. These drones provides high rate of optical transmission to ground station as well as to each other having a proper line of sight with optical beam transmitted by one of the drone. These drones rotate or resist in space in an elliptical or circular path.

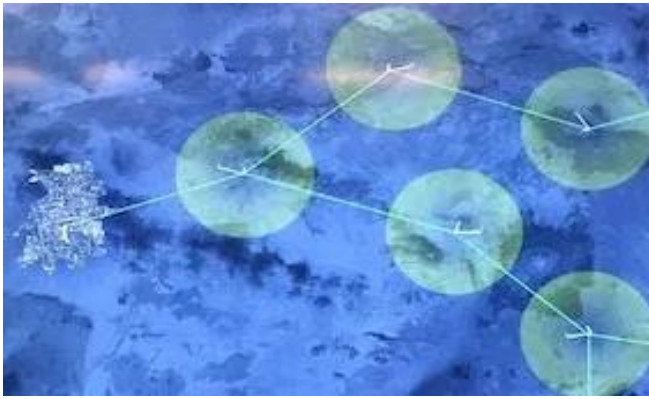


Fig.2: Drone communication wireless network



Fig.3: Drone

The drone is designed as transceiver airplane which can transmit and receive beam of light transmitted by one drone to another.

Facebook and Google have already revealed his Project Aquila and Project loon which will work on this technology. These skyrocketed companies have taken an initiative to take the wireless telecommunication at high rate and fastest wireless communication by introducing optical fiber communication in remote and rural areas. Facebook owner said that “Internet.org is a partnership between companies, non-profits and governments. No one company can do this work by itself, and Facebook will not deploy these technologies alone. We’re looking forward to working with our partners and operators worldwide over the coming months and years. Together we can develop new solutions to these important problems, and deliver on the promise of a connected world” [4].

III. GOOGLE PROJECT LOON

Whereas Google Project Loon described that Project Loon is a research and development project being developed by Google X with the mission of providing Internet access to rural and remote areas. The project uses high-altitude balloons placed in the stratosphere at an altitude of about 18 km (11 mi) to create an aerial wireless network with up to 4G-LTE speeds[5]. Project Loon is Google's pursuit to deploy a high-altitude balloon network operating in the stratosphere, at altitudes between 18 km and 25 km along with 5G technological evaluation parameters having optical communication in upcoming era [6-8]. Google asserts that this particular layer of the stratosphere is advantageous because of its relatively low wind speeds (e.g., wind speeds between 5 and 20 mph / 10 to 30 kmph) and minimal turbulence. Moreover, Google claims that it can model, with reasonable accuracy, the seasonal, longitudinal, and latitudinal variations in wind speeds within the 18–25 km stratospheric layer.

Given a reasonably accurate model of wind speeds within the 18–25 km band, Google claims that it can control the latitudinal and longitudinal position of high-altitude balloons by adjusting only the balloon's altitude. By adjusting the volume and density of the gas (e.g., helium, hydrogen, or another lighter-than-air compound) in the balloon, the balloon's variable buoyancy system is able to control the balloon's altitude [9,10].

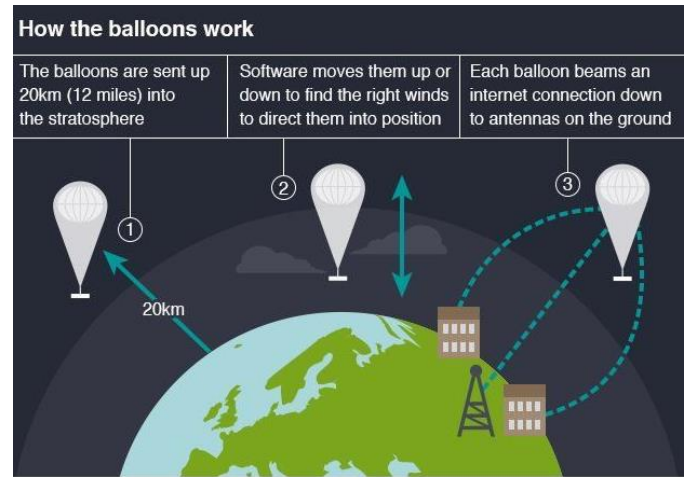


Fig.5: Google Project Loon

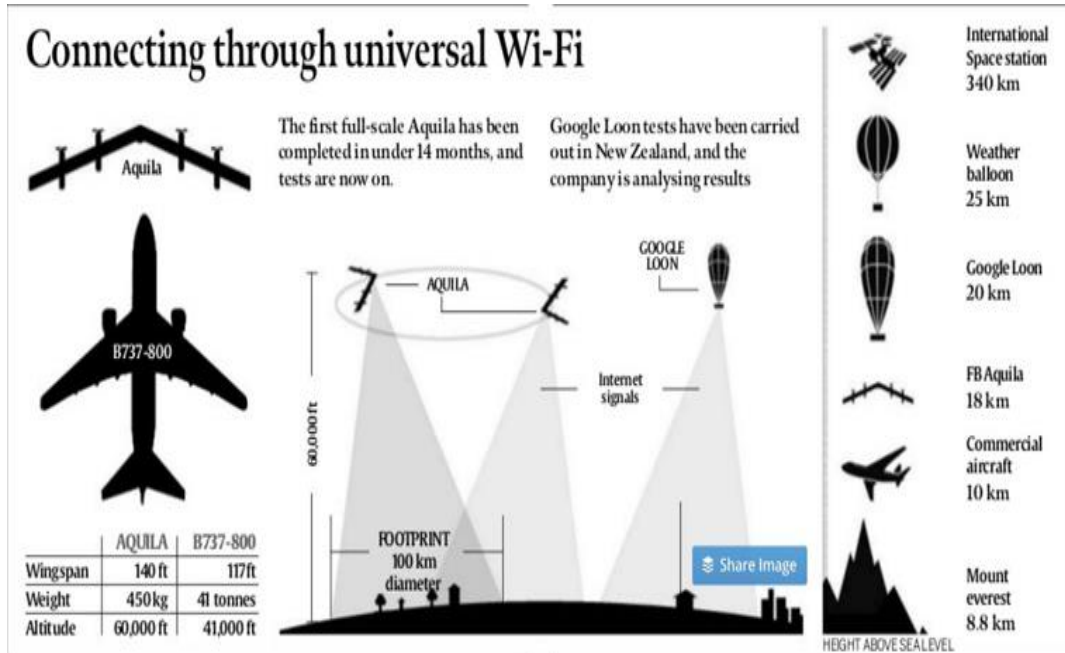


Figure 4. Drone communication specification

IV. APPLICATION

There is no interference as drones will fly in the air above the commercial airliners at the range of 60,000 to 90,000 feet. 2. FACEBOOK DRONE is an attempt to provide reliable and high speed connectivity to those areas without any existing internet infrastructure or is prohibitively expensive. 3. Drones are using free space optical communication technique so is immune to radio frequency interference or saturation. 4. This technique is using the renewable source of energy provided by the sun. [11] [12]

V. ADVANTAGES

Everyone specially peoples from the villages and remote areas without internet connectivity get the benefit of this high speed internet services, that would enhance the connectivity between peoples and they also get familiar with so many facilities which were previously limited to the developed areas only. These remote areas would get the opportunity to the development of their own. [13] Project like Loon can reduce the radioactive signal disasters to human’s life upto many extant.[14][15].

VI. CONCLUSION

With an aim of affordable internet access to each and everyone in the world irrespective of their location Facebook make it happen by using the advanced technology through

which the entire world can be connected together with the help of drones, satellites, mesh networks, radio and free space optics, and can bring the revolutionary change making internet easily accessible to everyone specially in rural areas.

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