Airborne Internet an Enhancement to Broadband Networks

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Abstract: Now we are in the world where people started exchanging or downloading huge amount of data through internet, for this we see workers laying so many wires underground and we see huge number of wires hung on electric poles to connect internet from ISPs (Internet Service Provider) to user's computer or to business centers because usage of internet has become common in each and every house.

In this paper we are discussing about a new technology that takes broadband into the air i.e. "airborne internet". The idea is to provide a high speed network connecting an aircraft and ground and also supports aircraft to aircraft communication . The main aim of airborne internet is to provide internet signals to the places where there is no chance to connect broadband cables or wires to the consumer's computer and to reduce the amount of time to transmit the data through internet. The airborne internet uses multi hop mesh topology for removing unwanted congestion in the network.

IndexTerms – **InternetServiceProvider, Broadband connection, internet, cables, wifi-router, airborne internet.**

I. INTRODUCTION

In the present era the usage of internet has become a part of our life. The people have become dependent on internet for doing any kinds of work like groceries, medicines, bill payments, clothing, etc. So internet is ruling the present day world. Here we made a study of the existing scenario of internet and its benefits and disadvantages.

The present day internet is mainly dependent on a grounded cable which doesn't work in certain situations in terms of breakage. Hence there is a need for internet which works better than broadband internet. In this paper we propose airborne internet an enhancement to broadband internet.

II. EXISTING SYSTEM

The existing system of network connectivity or connecting to internet is through land cables. Land based cables will transmit the data according to the diameter of the corresponding cable; they are limited physically in how much data they will deliver. In airborne internet there is no physical limitation of transmitting the data.

The existing internet services are provided by laying cables underground which needs manual effort for digging the land, but airborne internet is network in air. That means there is no requirement of laying wires underground.

We use aircrafts which are mobile objects i.e. it moves from one region to another region. Therefore mobile routing is used for maintaining the data channel connectivity. It also helps to avoid losing the network connectivity which is not supported by the existing internet services.

Wi-Fi (Wireless Fidelity) signal strength will be reduced when it passes by a concrete wall, celling, household items or metal obstruction. But in airborne internet there won't be any change in strength of signal. Directly client's systems will connect to the network by the antenna on top of their building.

New apps have come into the market where an outsider can hack the person's Wi-Fi details and use it whenever he wants. So here comes a security problem. But airborne internet won't encourage such type of activities.

The Wi-Fi router can cover only few meters of distance but to connect distance in tens of meters then additional access points need to be purchased and fixed on the walls which will increase the budget of a company.

The speed of a Wi-Fi router will have relatively low speed than internet in air i.e. airborne internet because a single internet connection is being shared by many users.

We have few drawbacks with Wi-Fi technology then a new concept comes into picture i.e. Li-Fi (Light Fidelity) where light spectrum (visible light) is used to transmit the information. But the downside is that light cannot penetrate through wall and without light, Li-Fi technology won't work. This light can be interrupted by sunlight at outdoors so Li-Fi technology doesn't make any favor to the public.

III. PROPOSED SYSTEM

Introduction of Airborne Internet:

Airborne Internet is a new form of internet. Here the consumers have to fix antennas on top of their homes or on business buildings to receive the signals from the network hub overhead. The networks will work in coordination with Internet Service Providers (ISPs), who will provide their high-capacity terminals for use by the network.

The network opts for aviation communication and navigation which is used by businesses, private internet users and government agencies like military. Here we may not go completely with wireless communication. This aircraft will be monitored and tracked by the air traffic control system.There would also be the capability to allow aircraft passengers to go 'on-line' to check their e-mail, send messages through internet and surf the web. The airborne network will use TCP/IP as the set of protocols for specifying network addresses and ensuring arrival of packets.
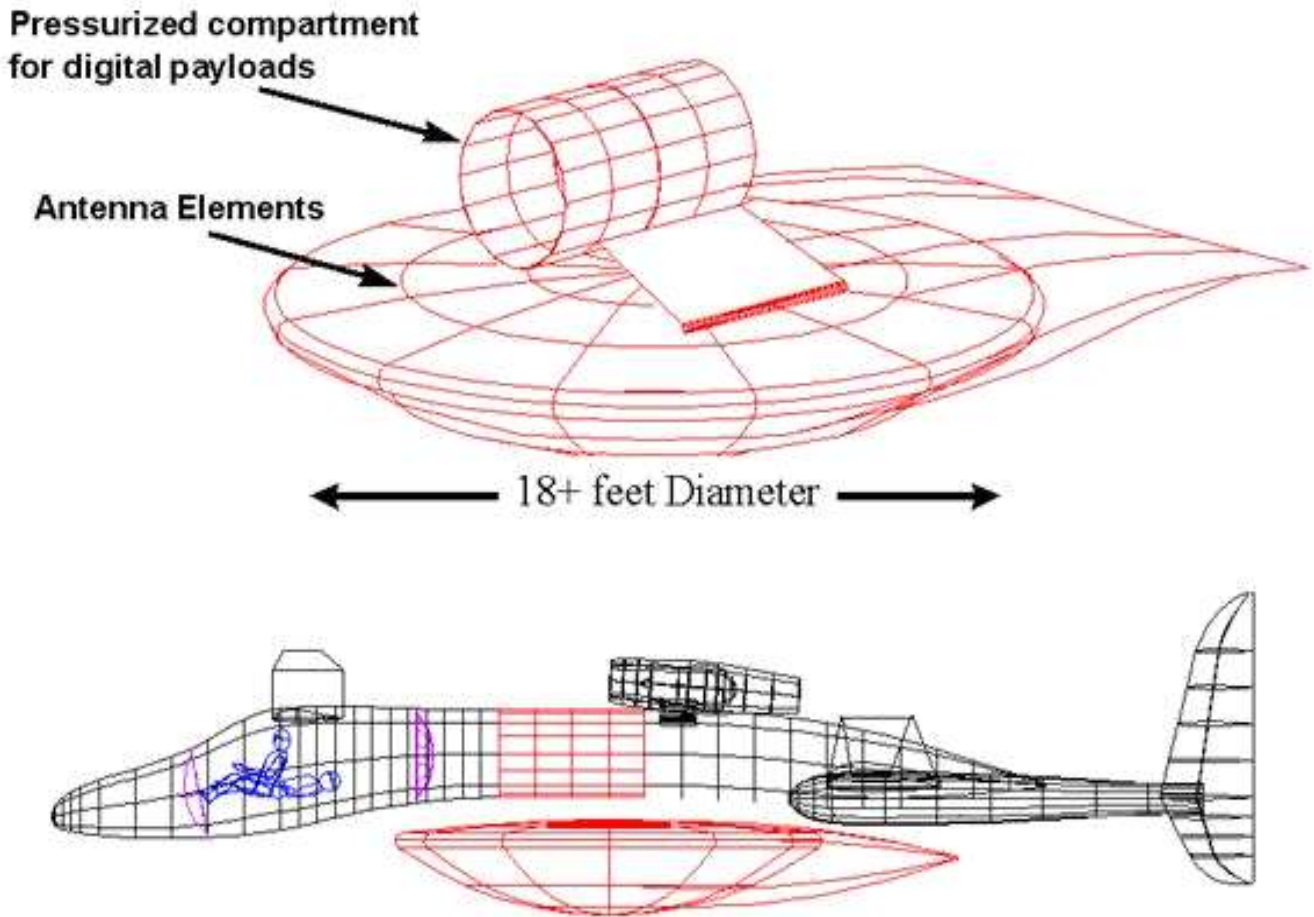

Figure 1: Structure diagram

The airborne internet is a network where we see each and every client's internet connection is connected to the aircraft's digital payload. In this scenario we get to know that the two aircrafts will have an interconnected digital data transfer for transferring information like weather forecast, turbulence, difference in air pressure, buoyancy, landing information and distance between two aircrafts. The above situations are considered as critical information and become more critical when the corresponding aircraft goes beyond the convectional surveillance radar range.
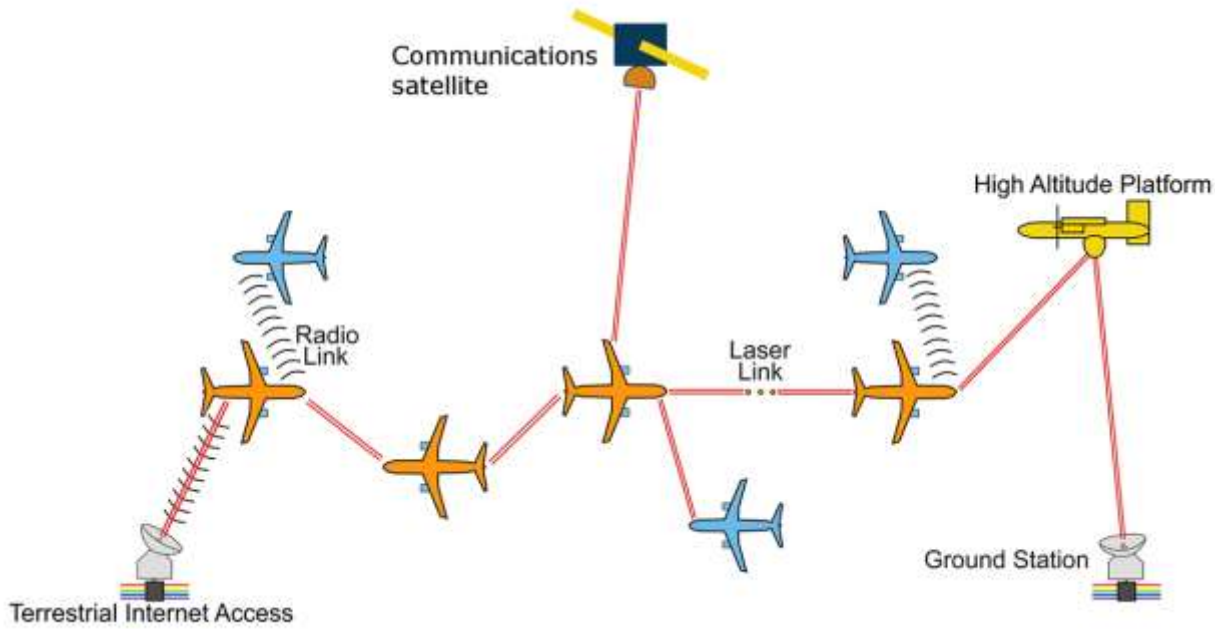
Figure 2: Satellite implementation of airborne internet system

IV. IMPLEMENTATION:

The aircraft which is used for the airborne internet is specially designed for the HALO network (High Altitude Long Operation) which will affix a communication payload pod under the aircraft's fuselage. This HALO aircraft will fly above the metropolitan cities in a circular orbit of 5 to 8 nautical miles diameter, i.e. it can approximately cover a city in 2000 yards. The affixed communication payload pod will connect to each and every node of the client's system. The HALO network will use a narrow beam antenna to form various blocks on the earth's surface where each block may cover a geographical area of 4 to 8 square miles. If suppose, we use a lensed antenna, the lens will diverge the beams in order to cover huge area on the earth's surface which is better than a narrow beam antenna.

This HALO aircraft has a capacity to fly at an altitude of 15,000 to 28,000 meters above the sea level. At this altitude we can feel free to fly an airborne aircraft from any unnatural weather conditions.
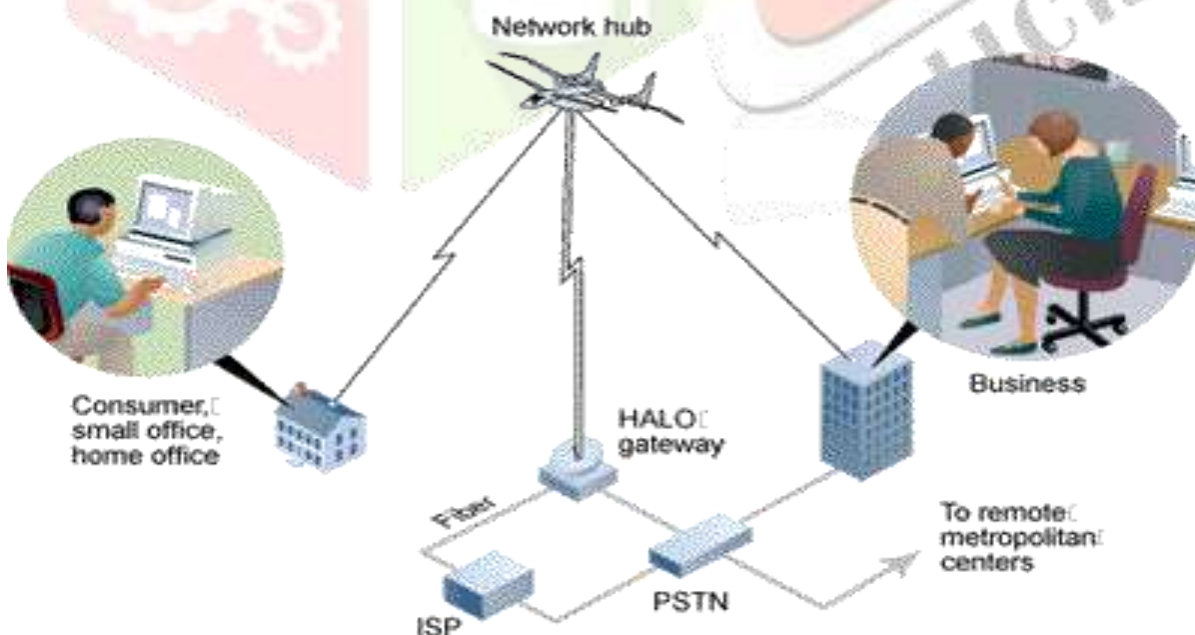

Figure 3: Demonstration of a HALO aircraft connection to client's computer

Advantages of Airborne Internet:

The antennas which are fixed on top of the building are less weighed antennas.

Generally people use Wi-Fi routers to connect internet to their gadgets, that means a single internet connection is being shared by multiple systems or gadgets which relatively slows down the speed of the network. But in airborne internet we have an option where each and every system or a gadget can connect to the airborne aircraft.

Satellites need to be launched into the space by investing huge amount of money and lot of hard work put by the scientists, but an airborne internet can be simply established by deploying an aircraft which is also a cost advantage. Even HALO is capable of providing high rate communications to users of multimedia also.

Airborne internet also provides a robust free, fast, reliable connectivity network.

V. CONCLUSION:

The key feature of airborne internet is it is a ubiquitous or also called as an Omni-present (found everywhere) multimedia service.

As the technology is getting advanced, the governments and commercial agencies need to move towards airborne internet for having internet services as a wireless communication. The airborne internet will make sure that the data transmission will not have any time delay and data traffic.

The bandwidth of a satellite and an airborne internet is almost the same but the arrival of data in airborne internet is relatively faster than a satellite because satellites orbit several miles above the earth.

The HALO network would like propose this latest technology to small and medium scale industries at a reasonable cost.

A survey revealed a fact that thousands of cities and towns are away from internet services, so few U.S companies would like to propose the airborne internet to each and every city on the earth.

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