International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 11 Issue: 04 | Apr 2024 www.irjet.net p-ISSN: 2395-0072

AIRBORNE INTERNET

Aishwarya N, Roopa, Sushma B

[1] *Asst.Professor (M.Sc), Dept of Computer Science, JSSCACS, Mysuru, Karnataka, India.*
[2]*Asst.Professor (MCA), Dept of Computer Science, JSSCACS, Mysuru, Karnataka, India.*
[3]*Asst.Professor (MCA), Dept of Computer Science, JSSCACS, Mysuru, Karnataka, India.*

ABSTRACT - *A notion called "airborne internet" applies computer network theory and ideas to the field of transportation. Enabling a multi-purpose, all-purpose data channel for individuals traveling is the aim in order to establish information connectivity. The idea is to give aircraft access to a high-speed, all-purpose digital network. By allowing the unification of numerous operations into a single data channel, it can do this and potentially save the FAA and aircraft operators a significant amount of money. One data channel can be used by many applications. The fact that it functions similarly to the actual internet gives it its name.*

Key Words: **Wi-Fi,Flight, floating on Air, modem, Internet, Satellite.**

1. INTRODUCTION

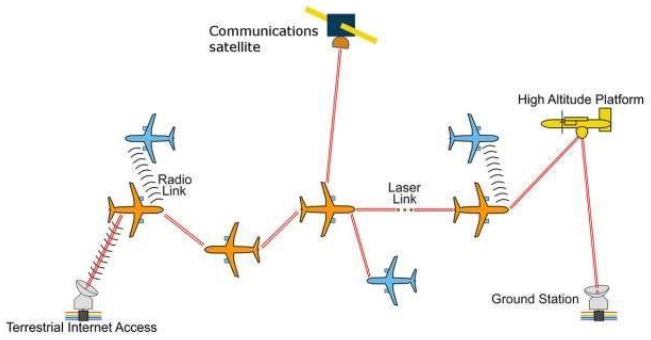
An envisioned network for use in aircraft communications, navigation, and surveillance is called the Airborne Internet (CNS).The airborne Internet, commonly referred to as AI, is a communication network that is intended to incorporate nodes, points of contact, or interactivity on various aircraft kinds.

The commercial Internet's technology is also used by the Airborne Internet, a peer-to-peer, private, secure, and dependable aircraft communications network. This implementation transfers the data that is transferred over this communication link between an airplane and a ground-based Internet access node. It offers access to an abundance of online data and resources while in the air. It is useful for a variety of tasks, including travel planning, reservations made while en route, and flight scheduling. It is helpful for aircraft-to-aircraft communications as well as for supplying weather and adjacent airspace environment information. Voice and video recording in the cockpit, in-flight video monitoring, and flight tracking/deviation monitoring are some of the security applications.

1.1 OBJECTICVES

There is a huge demand for broadband, high data rate service due to the growing demand for Internet services. It's anticipated that hundreds of millions of people will need Internet access globally very soon. The need for broadband services will increase due to the rise in electronic commerce and World Wide Web usage.

This idea, called the Airborne Internet, is being promoted with assistance from the Airborne Internet Consortium (AIC).



Satellite implementation of airborne internet system

1.2 SCOPE

Angel Technologies is developing an aerial Internet network dubbed High AltitudeLong Operation (HALO), which would employ light aircraft to fly overhead and offer businesses quicker data transfer than a T1 connection. Customers would have a connection similar to DSL. A solar-powered, unmanned aircraft that functions similarly to the HALO network is being developed by AeroVironment and NASA, while Sky Station International is preparing a project along these lines that will use blimps rather than airplanes.

2. EXISTING SYSTEM

At the moment, land cables are used for network or internet connectivity.The data transmitted by land-based cables is restricted in terms of physical capacity; the amount of data they can carry is determined by the cable's width. The physical limits on data transmission are absent from the aviation internet.

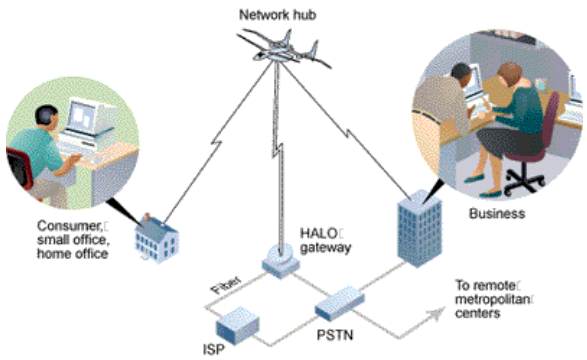
While airborne internet is a network in the air, current internet services are provided by installing cables underground, which requires labor-intensive earth excavation.

2.1 Disadvantages:

- The signal strength of Wi-Fi (Wireless Fidelity) will be weaker when it goes past a metal barrier, a concrete wall, or a celling.
- A company's budget will increase if extra access points need to be bought and mounted on the walls in order to connect tens of meters away from the Wi-Fi router, which can only cover a few meters.

3. PLANNED SYSTEM:

Our slow modems are being overloaded with the amount of data we need to send and receive these days, including images, videos, and audio files. In order to boost their bandwidth, a lot of Internet users are moving to cable modems and digital subscriber lines (DSLs). A novel service category is now under development that aims to elevate broadband to a higher level.



This figure illustrates how a high-speed wireless Internet connection will be made possible via the HALO Network.

By arranging airplanes in regular patterns over hundreds of cities, at least three companies intend to offer high-speed wireless Internet access. Angel Technologies is developing an aerial Internet network dubbed High AltitudeLong Operation (HALO), which would employ light aircraft to fly overhead and offer businesses quicker data transfer than a T1 connection. Customers would have a connection similar to DSL. A solar-powered, unmanned aircraft that functions similarly to the HALO network is being developed by AeroVironment and NASA, while Sky Station International is preparing a project along these lines that will use blimps rather than airplanes. We'll now examine the networks that are being developed, the aircraft, and the potential residential applications for consumers of this technology.

4.REQUIREMENTS

- It is not entirely wireless when using the Internet when in the air. All airborne Internet networks will have components located on the ground.
- It will be necessary for customers to install an antenna at their residence or place of business in order to receive signals from the network hub overhead.
- Additionally, existing Internet service providers (ISPs) will collaborate with the networks, lending their high-capacity terminals for network use.

5. WHY AIRBORNE INTERNET?

The creation of the Airborne Internet can be attributed to two key factors. They're :

- **Small Aircrafts Transportation System**
- **Need For a Higher Bandwidth**

6. IMPLEMENTATION SYSTEMS:

6.1 A HALO Overhead

Angel Technologies is using its HALO Network to create an aerial internet network. The Proteus plane, the focal point of this network, will lift wireless networking gear into the sky. Long wings and low wing loading are features of Scaled Composites' Proteus aircraft, which is intended for prolonged high-altitude flying. The entire plane's mass divided by the area of its wings is the wing loading. Up to 75 miles (120.7 km) in diameter, Proteus can cover ground while flying at altitudes of 9.5 and 11.4 miles (15.3 and 18.3 km).

The one-ton airborne network hub, at the center of Angel's Proteus aircraft, enables the aircraft to transmit data signals from ground stations to residences and places of business. The electronics for wireless connection and antenna array make up the AI network hub. In order to service thousands of customers, the antenna array generates hundreds of virtual cells—similar to cell phones—on the ground.

High-speed data signals from a ground station are reflected onto your PC via an 18-foot dish located below the aircraft. There will be three piloted Proteus aircraft assigned to each city in the HALO Network. Every aircraft will take off and fly for eight hours before being replaced by another. Once in the air, it will climb to a safe altitude above any inclement weather and commercial traffic before starting an eight-mile circuit around the city.

High-speed data signals are reflected from a base station to your PC via an 18-foot dish located below the aircraft. In the HALO Network, three piloted Proteus aircraft will be assigned to each city. After eight hours of flight, each plane will be replaced by another, which will take off and circle the city eight miles at a safe altitude above any inclement weather or commercial traffic.

6.2 Floating On Air

Sky place International refers to its blimps as "lighter-than-air platforms" and intends to place one of these airships over each city in the race to provide high-speed Internet connectivity from high altitudes. Wireless service would be available to an area of around 7,500 square miles (19,000 square km) from each station, which would fly at a height of 13 miles (21 km).

Sky Station Blimp	
Diameter	203 ft (62 m)
Length	515 ft (157 m)
Width	approx. 300 ft (91 m)
Power	Solar and fuel cells

6.3 NASA's Sub-space Plans:

Additionally, NASA is involved in AeroVironment's possible aerial Internet system.

The Helios prototype is made of carbon fiber, graphite epoxy, Kevlar, and Styrofoam, and it has a thin, translucent skin covering it all. To accommodate the continual bending that occurs during flight, the carbon fiber main pole that supports the wing is thicker at the top than the bottom.

7. KEY FEATURES

Below is a summary of the main characteristics of the Airborne Internet Network.

- Smooth, widely available multimedia services.
- Conformity to final user contexts
- Improved user connectivity throughout the world.
- Quickly deployable to potential locations.
- Trustworthy and safe information exchanges.
- Utilizing available spectrum efficiently is made possible by bandwidth on demand.
- It could result in financial savings for aircraft owners.

8. DIFFERENCE BETWEEN SATELLITE AND AI

- AI does not require a license for frequency bands.
- Can service hundred-thousand of broadband subscribers
- The range of single link delays is around 60 msec below the airplane and 200 msec at the signal edge.

	AI service	**Satellite**
Time delay	Small delay	Big delay
Frequency	8-38 GHz	4-6 GHz 9-13 GHz
Power	Low Power	High Power
Cost	Low Cost	High Cost

9. ADVANTAGES OF AIRBORNE INTERNET

- Small number of moving parts means low maintenance costs.
- High degrees of redundancy (for example, an airplane can lose several motors and still land safely; most failure modes don't call for a quick response from the ground operator)
- Apart from the time delay, the functioning of the airborne Internet will be similar to that of satellite-based Internet access. Satellite and aircraft Internet connectivity usually have the same bandwidth, however because aircraft Internet is lower in the atmosphere, data transmission times are faster. A few hundred miles above Earth is the orbit of a satellite. At a height of between 52,000 and 69,000 feet (15,849 and 21,031 meters), the aerial Internet aircraft will fly in a circle above the ground. The aircraft will be flying considerably above commercial air traffic at this level, untouched by bad weather.
- If network connectivity was available, people could use their time in travel for more productive activities.
- A fast digital network would be involved. Because it enables the consolidation of numerous tasks into a single data channel, it has the potential to save the FAA and aircraft operators a significant amount of money.

10. FUTURE ACTIVITIES

In order to create options for the Airborne Internet, evaluate the benefits and drawbacks of each option, and make a recommendation, we plan to keep using the above explained technique. The architecture will then be improved and documented for system developers to utilize in collaboration with other SATS organizations.

To further understand the architecture's key components' relevance to SATS, prototypes of these components will be assessed. Cost and performance estimates will be made. There will be a different security evaluation created.

11. CONCLUSION

For aviation services like traffic management and craft surveillance, among others, aircraft internet is incredibly useful. At extremely high altitudes, it enables web connectivity for travelers in aircraft. Dedicated ships stationed within the oceans to function as base stations (BSs) will be connected to the web via already-deployed underwater cables. Compared to the previously planned options, the projected resolution is better because it avoids using costly and slow satellite links.

Therefore, this aerial internet technology has many applications in the field of aviation services, such as weather updates, aircraft tracking, and air traffic control. It also gives passengers the chance to access the internet at extremely high altitudes, i.e., in aeroplanes, and other traditional services. Hence, creating a network in the air to establish connectivity is yet another new trend in our mobile era.

12. REFERENCE

[1] Neetu Gupta, Abhishek Aggarwal, "Airborne Internet — The Internet in the air", Volume 1, Issue 08 June 2017.

[2] Syed Junaid Nawaz, Noor M. Khan," Airborne

[3]www.airborneinternet.org

[4]airborneinternet.pbwiki.com