AIRBORNE INTERNET

P. Smruthi & Aleesha Kurian
Don Bosco College
Angadikadavu, Kannur

Introduction

- To support the NASA's Small Aircraft Transportation System.
- Provide interconnected digital data network between aircraft and the ground.
- Used in aviation, navigation, business, private internet users and government agencies.

What is an Airborne Internet

- It is a proposed network
- To support NASA
- To implement the small aircraft for public transportation
- Establishes a robust, reliable channel to the aircraft. Data transfer rate- megabits per second.
- Like internet, it also uses TCP/IP
- To track aircraft for air traffic control system.

- Two reasons for its development

  a) Small Aircraft Transportation System

  b) Need for a higher bandwidth

How the Airborne Internet will work

Fig: Airborne-Internet systems will require that an antenna be attached to the side of your house or work-place

Key Features

- Adaptation to end user environments.
- Enhanced user connectivity globally.
- Rapidly deployable to sites of opportunity.
- Secure and reliable information transactions.
- Bandwidth on demand provides efficient use of available spectrum.
- Helps to avoid the connectivity down time of people in transit.
- Helps to achieve a broader bandwidth.
- Has the potential to provide cost savings for aircraft

Comparative Study…..

GTA-m: Greedy Trajectory-Aware m copies) Routing for Airborne Internet

- Proposes a multicopy trajectory
- Focuses on use of ad-hoc, air-to-air communication
- Assumes no aircraft body blockage on radio

- It enhances network performances
- It improves the delay compared to DTN routing protocols
- Provides a highly mobility nodes

Security of airborne network dynamics and algorithms: A graph theoretic perspective

- Formulates security and robustness
- Both sensing and communication topology
- Provides security methods

- Framework has developed in three aspects
- To achieve protect the information flow
- Requires different modeling

A Smooth-Turn Mobility Model for Airborne Networks

- Introduce a novel mobility model
- Capture correlation across time and spatial coordinates
- Also capture random movements

Simulating Large-Scale Airborne Networks with ns-3

- Use ns-3 network simulator
- Provide high speed internet to passengers
- Evaluate effectiveness using OLSR to route network traffic

Evaluation of a Multihop Airborne IP Backbone with Heterogeneous Radio Technologies

- Test focused on high capacity radio system
- Provide stable airborne IP backbone

Airborne Network Evaluation: Challenges and High Fidelity Emulation Solution

- Identifies challenges in designing and evaluation
- Introduce a wireless network emulation

Airborne Network: A Cyber physica System Perspective

- Provides suitable mobility models
- Use RWP and RD models
- Requires security strategies

K.J.Kwak, Y.Sagduyu, J.Deng, J.Yackoski, Jason Li Intelligent Automation.

Conclusion

- New trend in mobile world
- Provides high capacity network backbone
- Allows passengers to access internet at high altitudes

References

- Xiaoping MA, H.X.TAN and A.C.Valera “Sense and Sense-abilities" Programme, Institute for Infocomm Research, Singapore
- S.Roy, J.A.Torres, M.Xue, C.Alex, Rahul Dhal, Chih-Wei Chen, Washington State University
- Yan Wan, K.Namuduri, Y.Zhou, Dayin He, Shengli Fu
- B. Newton , Jay Aikat, K. Jeffay, University of North Carolina at Chapel Hill
- B.N Cheng, Randy Charland, Paul Christensen, L.Veytser and James Wheeler MIT Lincoln Laboratory 244

- T. Spyropoulos, K. Psounis, and C. Raghavendra, Spray and Wait: an Efficient Routing Scheme for Intermittently
- A. Vahdat and D. Becker . Epidemic Routing for partially Connected Ad Hoc Networks
- Bishop, M., ``What is computer security?," IEEE Security and Privacy, vol. 1, no. 1, pp. 67-69.
- C. Bettstetter, H. Hartenstein, and X. P´erez-Costa, “Stochastic properties of the random waypoint mobility model
- J. Boudec and M. Vojnovic, “Perfect simulation and stationarity of a class of mobility models,”


Thank you!