



AIRBORNE INTERNET

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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



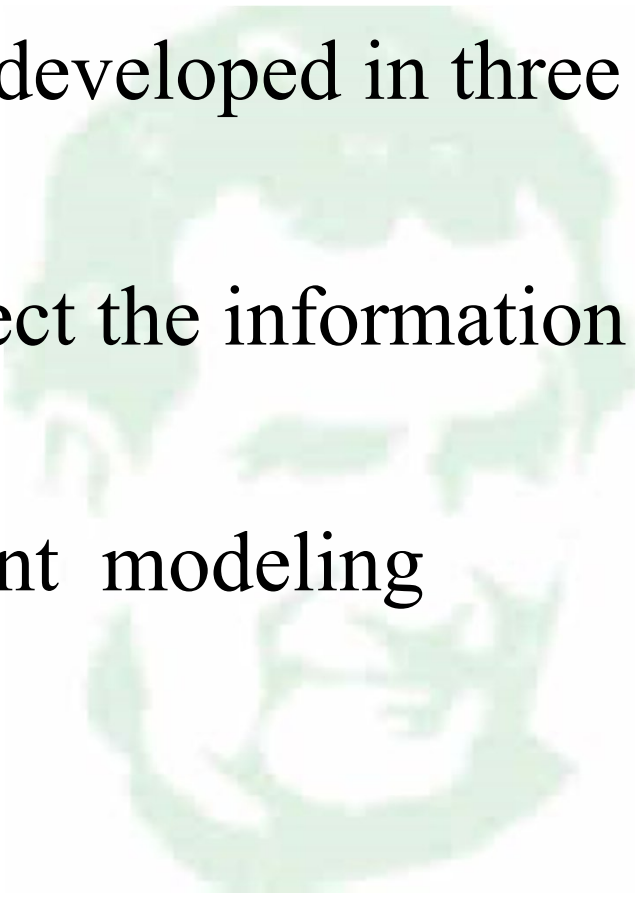
- Proposes a multicopy trajectory
- Focuses on use of ad-hoc, air-to-air communication
- Assumes no aircraft body blockage on radio

- 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

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- A faint, large-scale background image of a man's face, likely Don Bosco, is centered behind the text. The image is light green and serves as a subtle watermark.
- 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 physical 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!