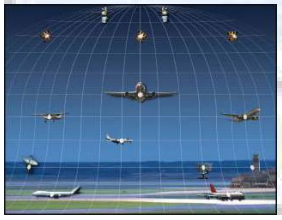
# SBT Chief Architect

Cal Ramos

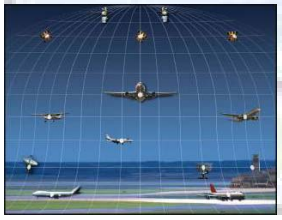


# SBT Chief Architect

1. External architectural and outreach interface
   - Foster awareness and collaboration
   - Promotes migration toward network-centric architectures
   - Focus of Activities:
     - *Establish of public-private partnerships*
     - *Airborne Internet Consortium*
     - *National Center for CNS Research (NCCR)*

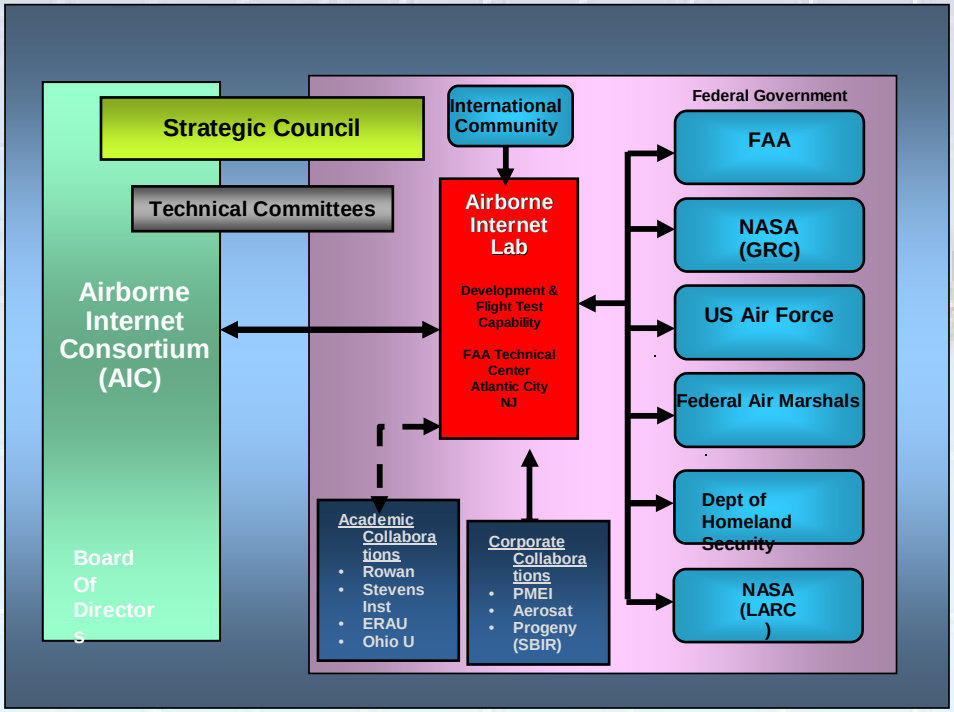
2. Promote systems architecture framework
   - Provides for solid requirements and technology infusion paths
   - Facilitates coordination & integration with external projects & organizations
   - Focus of Activities:
     - *High level roadmaps for business case development, certification, and commercialization (In-house and contracted studies)*

3. Lead technical coordination amongst subprojects
   - Provides for systems context of external drivers for capability development
   - Facilitate system level coordination and integration
   - Focus of Activities:
     - *Coordinates with PM/Deputy PM and Chief Engineer for project oversight*
     - *Maintain awareness of external technology, policy and standards groups (Industry Standards Working Groups etc.)*

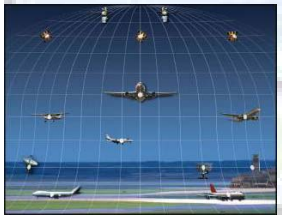


# Airborne Internet Consortium

## *Airborne Internet Lab*



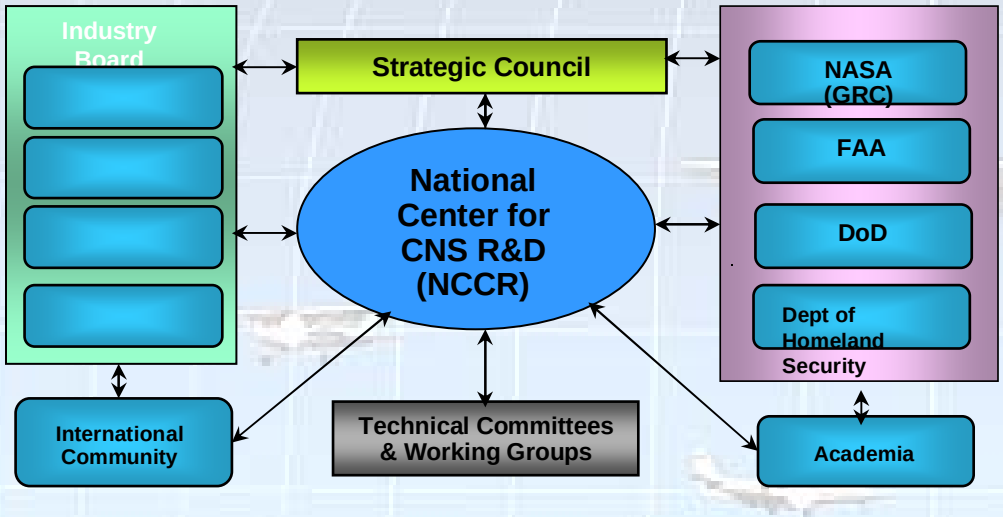

- Non-profit corporation - promote international adoption of open systems architecture, standards, and protocols that support Internet-based applications for aviation
- Initiative leverages mobile networking activities done at GRC through SATS
- Key development partner is FAA Tech Center Airborne Internet Project
  - Airborne Internet Lab
  - FAA TC Aircraft Fleet
- Participated in multiple planning and information sharing meetings
- Formal MOA signed with AIC
- GRC collaboration with AIC/FAA Tech Center in area of:
  - Secure Mobile Routing
  - Architecture Development
  - Technology Demonstrations
  - Airborne Internet Lab Coordination



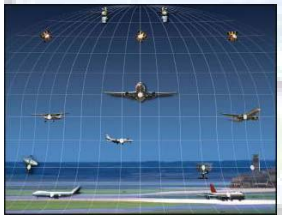
# National Center for CNS R&D (NCCR)

*Background and Goals*

## *Potential Governance Model*

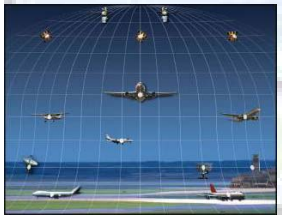



- FY05 Congressional Earmark
- National focal point to facilitate, leverage and integrate the resources, knowledge and capabilities of industry, government and academia to attack critical elements of CNS R&D needed to create the digital airspace infrastructure of the future.
- Provide critical leadership in advocating a national roadmap for CNS Research and Development.
- Shall foster the development of a next generation, scalable CNS infrastructure that incorporates interoperable standards, leverages available spectrum, promotes safety and security, and streamlines certification.
- Key NCCR Partner will be Ohio Aerospace Institute.
  - Concept of NCCR defined
  - Proposal under evaluation



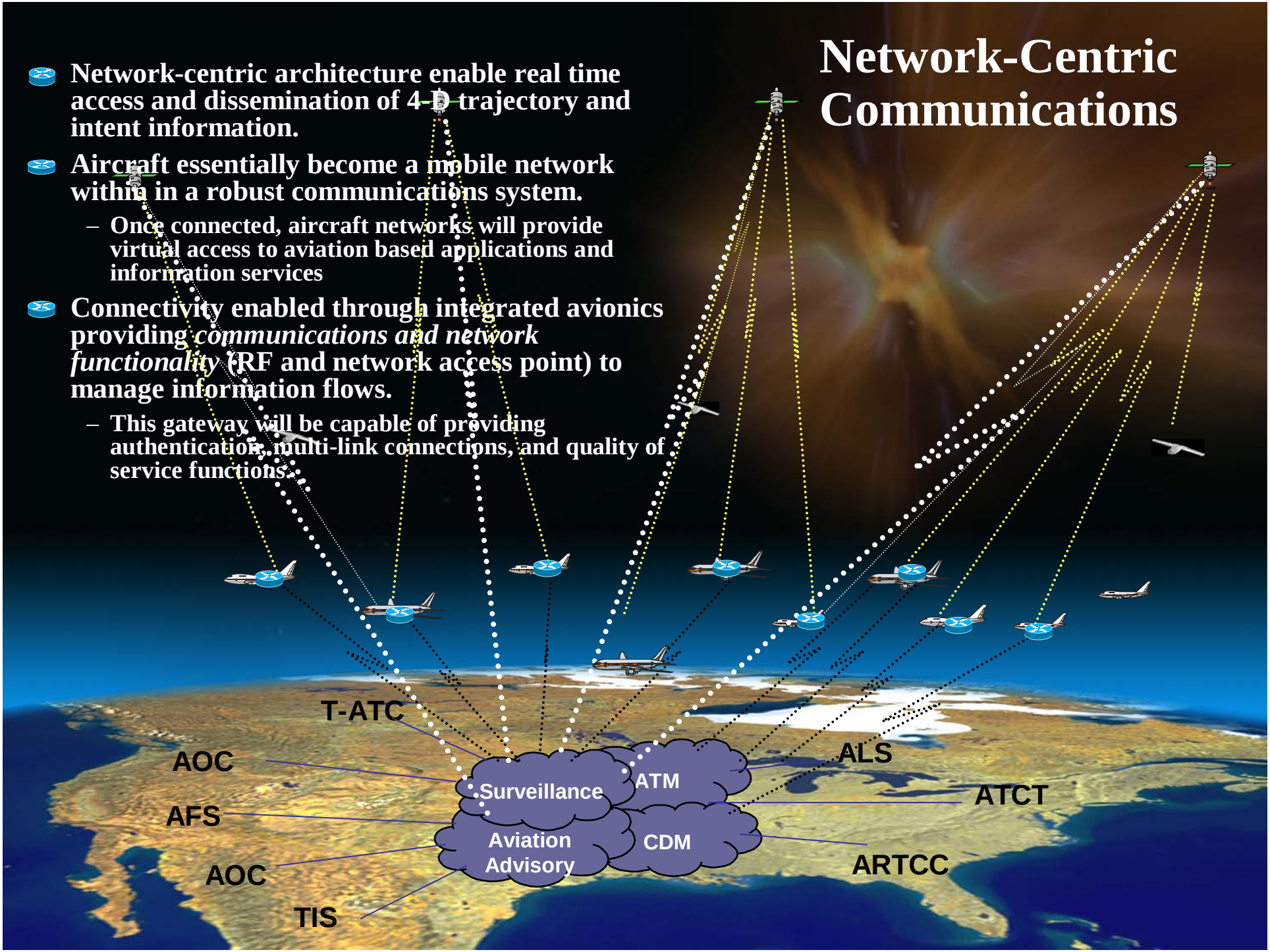
# Business Case Development Task

- *Contract Study with **CNS/AMA***
- ***Objective** is to conduct early assessment of technical, business and economic factors so that the research can be transitioned to industry for commercialization.*
  - *Business Case and Certification Report Completed*
- ***Future Concept of Operations Assumptions***
  - Recognition of need for Next Generation Air Transportation System (NGATS) to potentially support 3X greater air traffic capacity
  - Significant changes in the current concepts of operations will be needed to accommodate this demand while maintaining safety and security.
  - The changes needed to transform the NAS and reach global interoperability are centered on
    - > a shift toward more autonomous aircraft operations
    - > a significant improvement in situational awareness by all participants, and
    - > the need for significantly greater information exchange between the aircraft and the ground.



# Network-Centric Communications

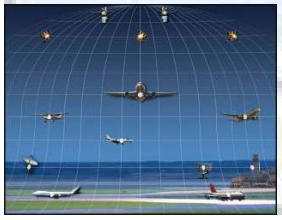
- Network-centric architecture enable real time access and dissemination of 4-D trajectory and intent information.
- Aircraft essentially become a mobile network within in a robust communications system.
  - Once connected, aircraft networks will provide virtual access to aviation based applications and information services
- Connectivity enabled through integrated avionics providing *communications and network functionality* (RF and network access point) to manage information flows.
  - This gateway will be capable of providing authentication, multi-link connections, and quality of service functions.



# Business Case Development Task

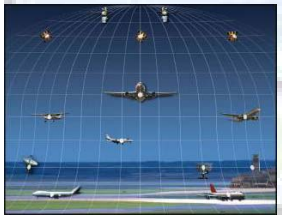
## *Technical Design Features*

- IPv6 based
- QoS functionality - mixing of information packets over a single radio links
- IPsec-based security, with security associations to permanent identities as opposed to an IP address
- Accommodation of mobile networks
- Capable of providing multicast services
- Scalable and extensible architecture



# Aviation Communications/Networking
## *Advocacy and Standards*

- **Industry Support Task** with **CNS** tp provide support for AEEC Committees and User Forums, RTCA Committees and Forums and related Industry bodies. Includes Industry forum participation, Meeting Minutes and Quarterly Reviews
  - **AEEC**
    - Aircraft Data Networks (ADN) Working Group
    - Data Link Systems (DLK) Subcommittee
    - Air Ground Communications System (AGCS) Subcommittee
    - Aircraft Information Security (SEC) Working Group
    - AEEC General Session
  - **RTCA**
    - RTCA SC 186 Automatic Dependent Surveillance - Broadcast (ADS-B)
    - RTCA SC 195 Flight Information Services Communications (FISC)
    - RTCA SC XXX Aeronautical Information Services (AIS) Data Link
    - RTCA Symposium
    - RTCA Forum
  - **ICAO**
    - Aeronautical Communications Panel (ACP) Working Group “N”
- **Participation in IETF Meetings** - focus on mobile networking standards development



# Chief Architect
## *Plans and Activities for FY06*

1. External architectural and outreach interface
   - *Coordinate with AIC to define technology demonstrations for FY06 and beyond*
   - *Establish/formalize National Center for CNS Research (NCCR).*

2. Systems architecture framework.
   - *Complete business case development and certification roadmaps.*
   - *Initiate and complete commercialization roadmap study*

*3. Continue standards advocacy initiatives.*
   - *Industry Groups (ICAO and AEEC)*
   - *IETF*