Headquarters U. S. Air Force

Integrity - Service - Excellence

US AWACS Airborne IP Networking – Information Assurance Challenges

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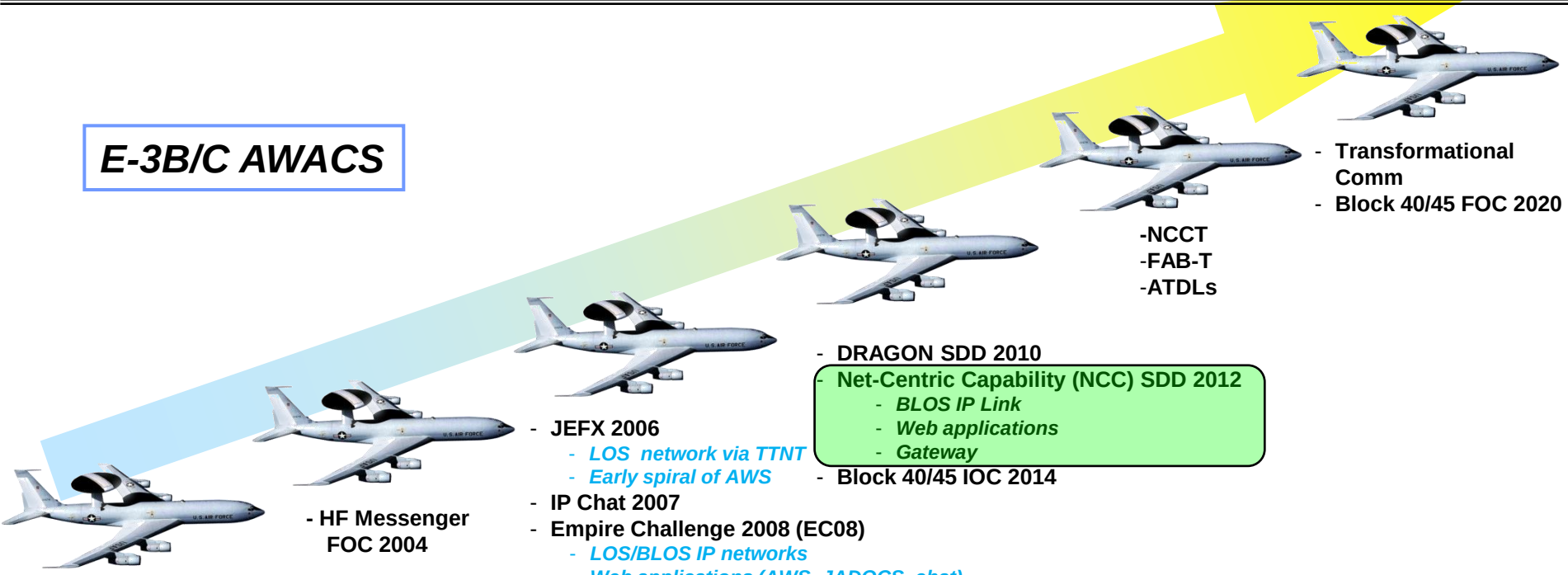
AWACS Net-Centric Roadmap

Pathway to Airborne IP Networking

2001-2005	2006-2010	2010-2015	2015-2020	2020->2035+

E-3B/C AWACS



- Block 30/35 FOC

- HF Messenger FOC 2004

- JEFX 2006
  - *LOS network via TTNT*
  - *Early spiral of AWS*
- IP Chat 2007
- Empire Challenge 2008 (EC08)
  - *LOS/BLOS IP networks*
  - *Web applications (AWS, JADOCS, chat)*
  - *Network performance enhancements*
- CWID 2009
  - *Airborne C2, US Agency, and Coalition interoperability via AWS*
  - *FAA air tracks web service*
- Transitional Networking Capability 2010
- LiveFly Exercise 2010 (TBD)

- DRAGON SDD 2010
- Net-Centric Capability (NCC) SDD 2012
  - *BLOS IP Link*
  - *Web applications*
  - *Gateway*
- Block 40/45 IOC 2014

-NCCT
-FAB-T
-ATDLs

- Transformational Comm
- Block 40/45 FOC 2020

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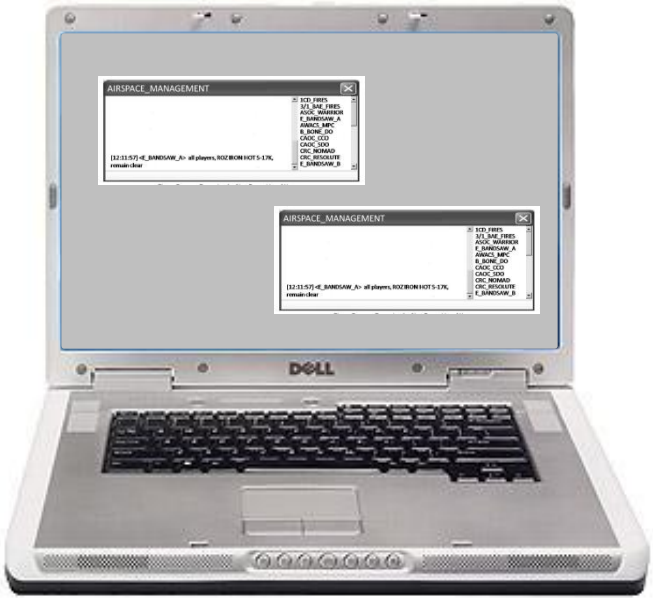
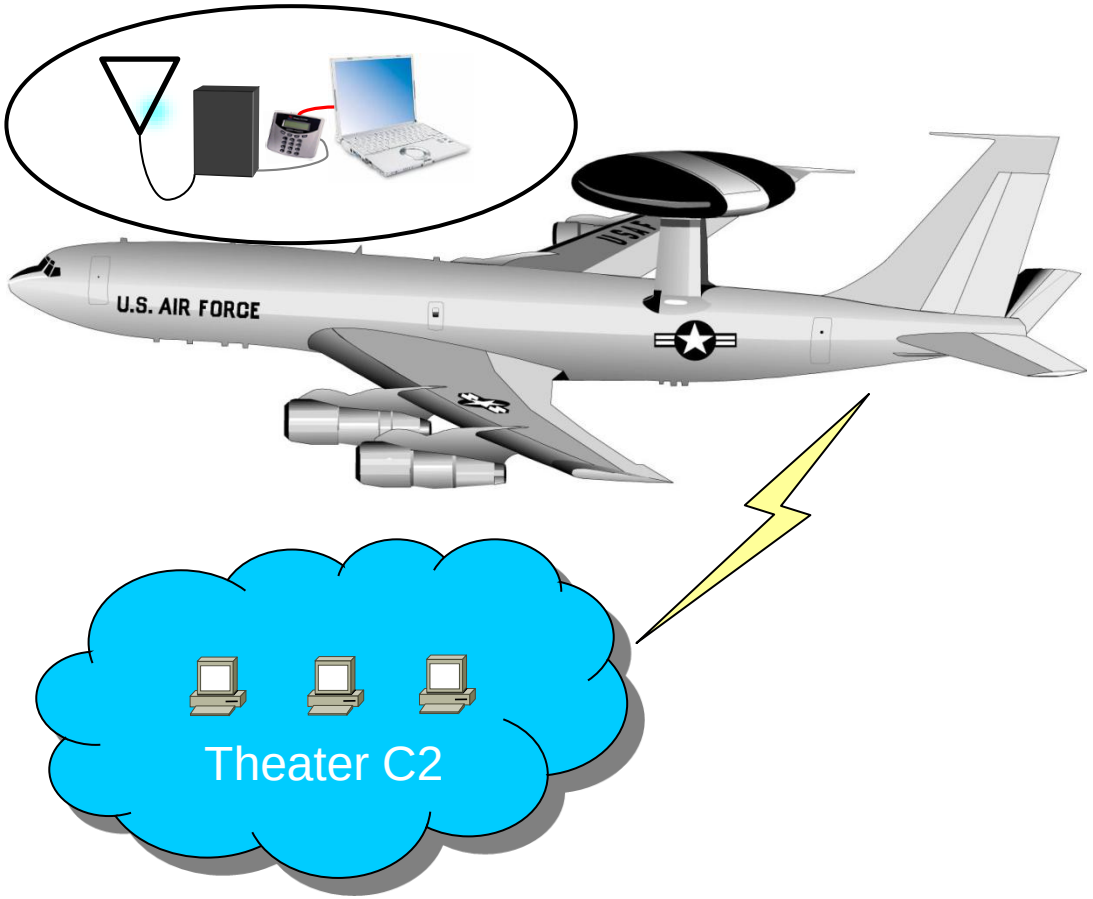
IP Chat on AWACS

- Rapid response to urgent theater need for Chat on AWACS
  - IP comm with CAOC, theater C2 nodes
- Roll-on/Strap-down kit





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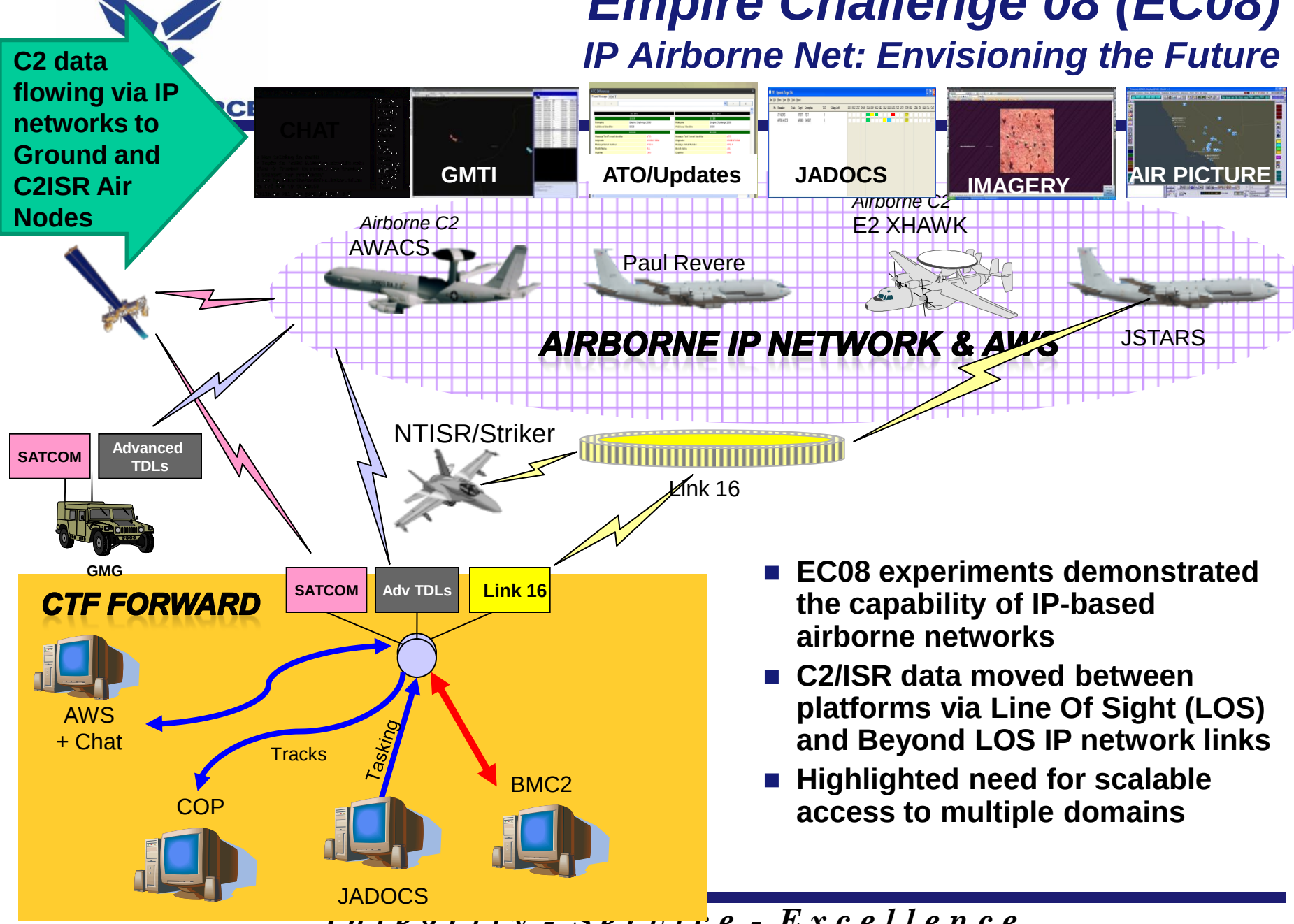
IP Chat on AWACS

- IP chat is vital in OIF/OEF - *"95% of all command and control info comes across chat" (AOR C2 Conference)*
- AWACS participates in a networked war with multiple US and coalition networks
- Need for scalable access to multiple domains exists now
  - "Brute force" approaches (single computer and comm link per classified network) hinder ops, place greater SA burden on crews

Empire Challenge 08 (EC08)

IP Airborne Net: Envisioning the Future



- EC08 experiments demonstrated the capability of IP-based airborne networks
- C2/ISR data moved between platforms via Line Of Sight (LOS) and Beyond LOS IP network links
- Highlighted need for scalable access to multiple domains

AWACS Commercial Air Tracks/C2 Web Services

Coalition Warrior Interoperability Demo (CWID) 2009

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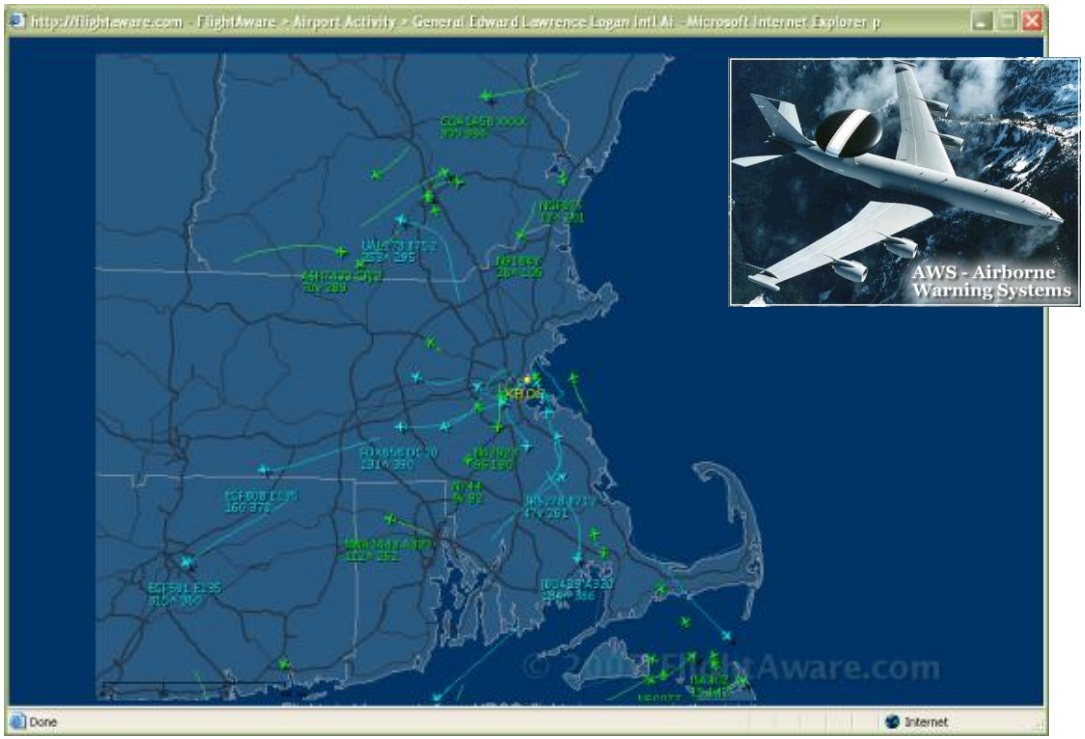
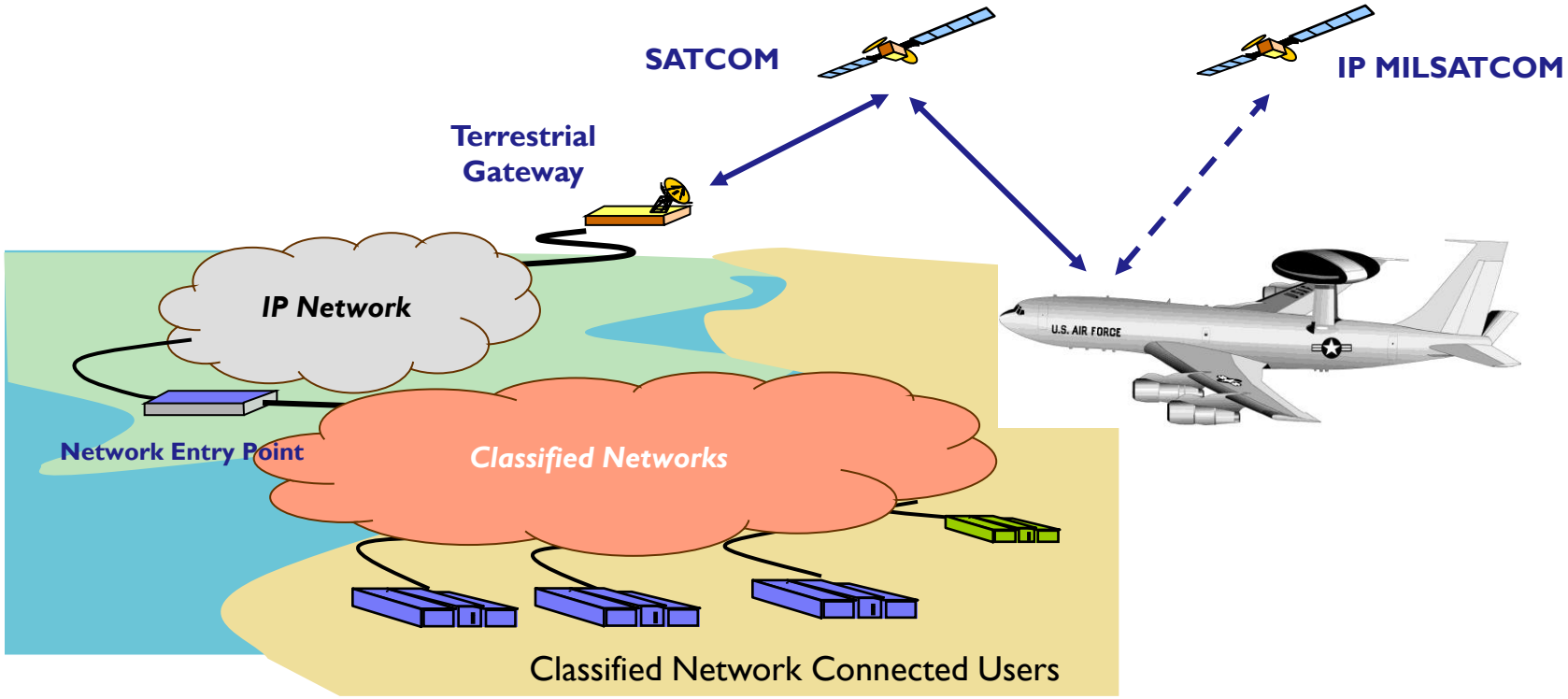
- **Incorporation of Federal Aviation Administration (FAA) surveillance and air traffic data into AWACS C2 mission**
- **Provides civil air tracks, flight plans, callsigns/ flight ID**
- **Gives AWACS operators insight into civil air picture**
  - **Homeland Defense**
  - **Civil missions (disaster relief, etc)**
- **Demonstrated during CWID09 sim event**



Cross-domain sharing of Chat traffic and simulated AWACS/FAA air tracks between classified and unclassified networks – AWACS mission area enabler

AWACS Net-Centric Capability (NCC) Program



- **Integrated Net-Centric Capability (NCC) for AWACS Block 40/45**
  - **Leverages SATCOM capability provide by avionics mods (threshold BLOS capability)**
  - **FAB-T Increment 2+ hardware and software (antenna, terminal, control) (objective BLOS capability)**
  - **Web applications (chat, e-mail, imagery, browser, Airborne Web Services)**
  - **Gateway between Link 16, new Situational Awareness Data Link (SADL), and IP comm**

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AWACS IA Challenges

From the operator perspective…

- **Network survivability is important now, will become critical**
  - ***Must be able to fight through a network attack***
- **Multi-level network security is essential**
  - ***Access to US platforms operating at multiple security levels***
  - ***Access to joint/coalition partner networks***
- **Mission crews are well-trained…but won't be IA professionals**
  - ***Airborne guard/MLS devices must work with minimum care and feeding***
  - ***Ops restrictions, dynamic and low bandwidth networks will make remote admin difficult or impossible***

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AWACS IA Challenges

From the systems engineering perspective…

- **COTS IA products may impose SWaP (space, weight and power) and performance requirements**
  - ***Small form-factor guards/MLS devices will decrease platform impact***
  - ***COTS network appliance performance may not support dynamic airborne environment***
- **Use of tactical edge LOS IP networks will make forward implementation of IA products essential**
  - ***Platforms may be required to execute missions via IP networks, with no reachback to ground connectivity***

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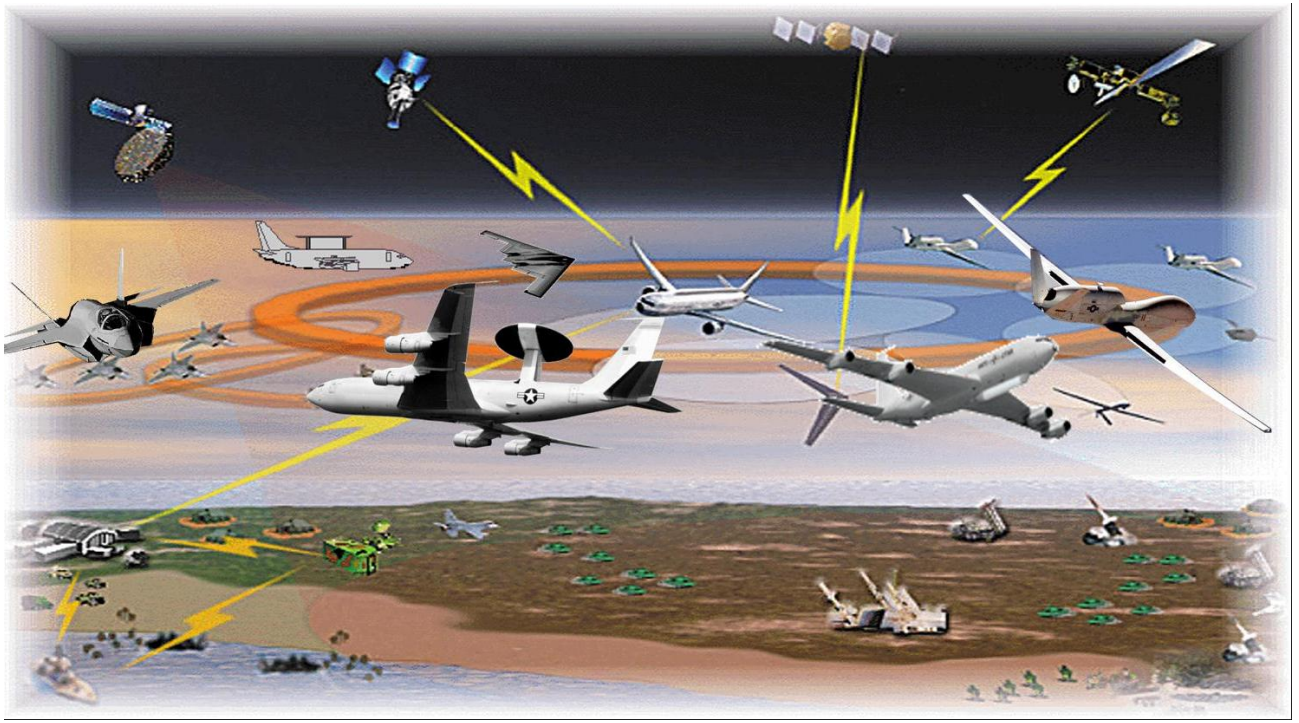
In Summary



- **Effective IA will protect AWACS ability to execute the forward C2 mission across IP-enabled networks – it's happening now in OIF/OEF**
- **IA can make or break the effectiveness of net-centric operations; collaboration between developers, implementers, and warfighters is absolutely necessary to ensure IA solutions that protect and enable network ops!**

- **Contact info –**

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