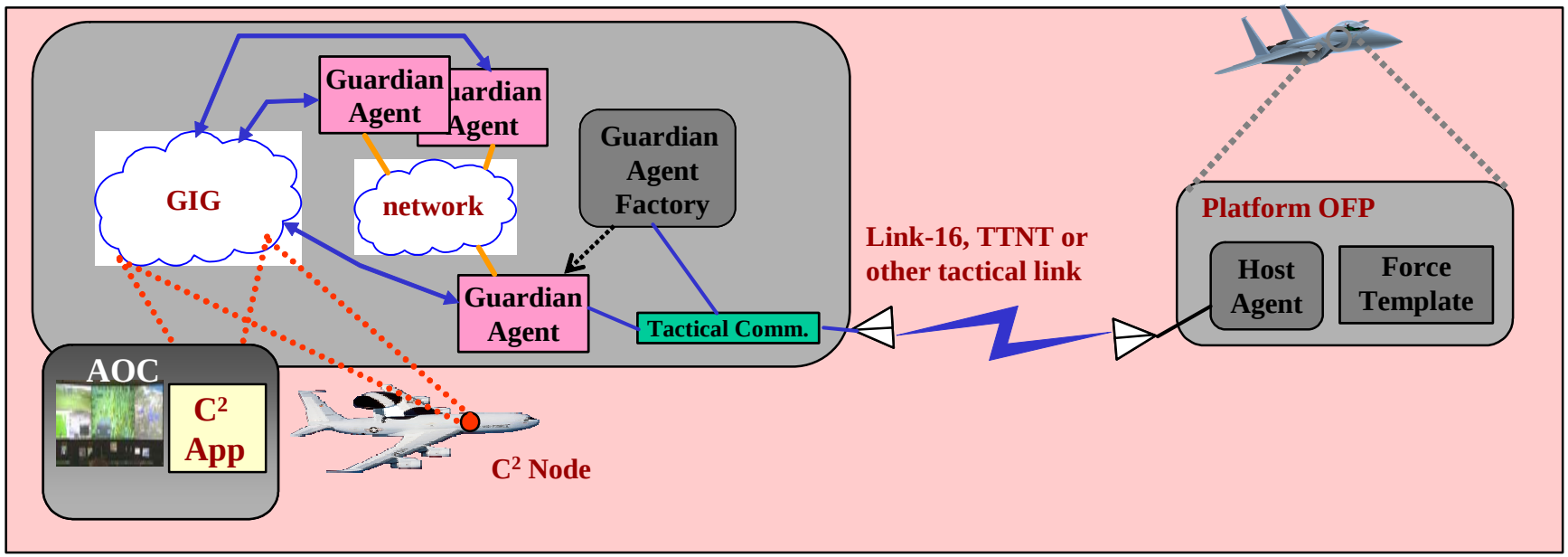
Enabling Interoperability in C2 Aircraft

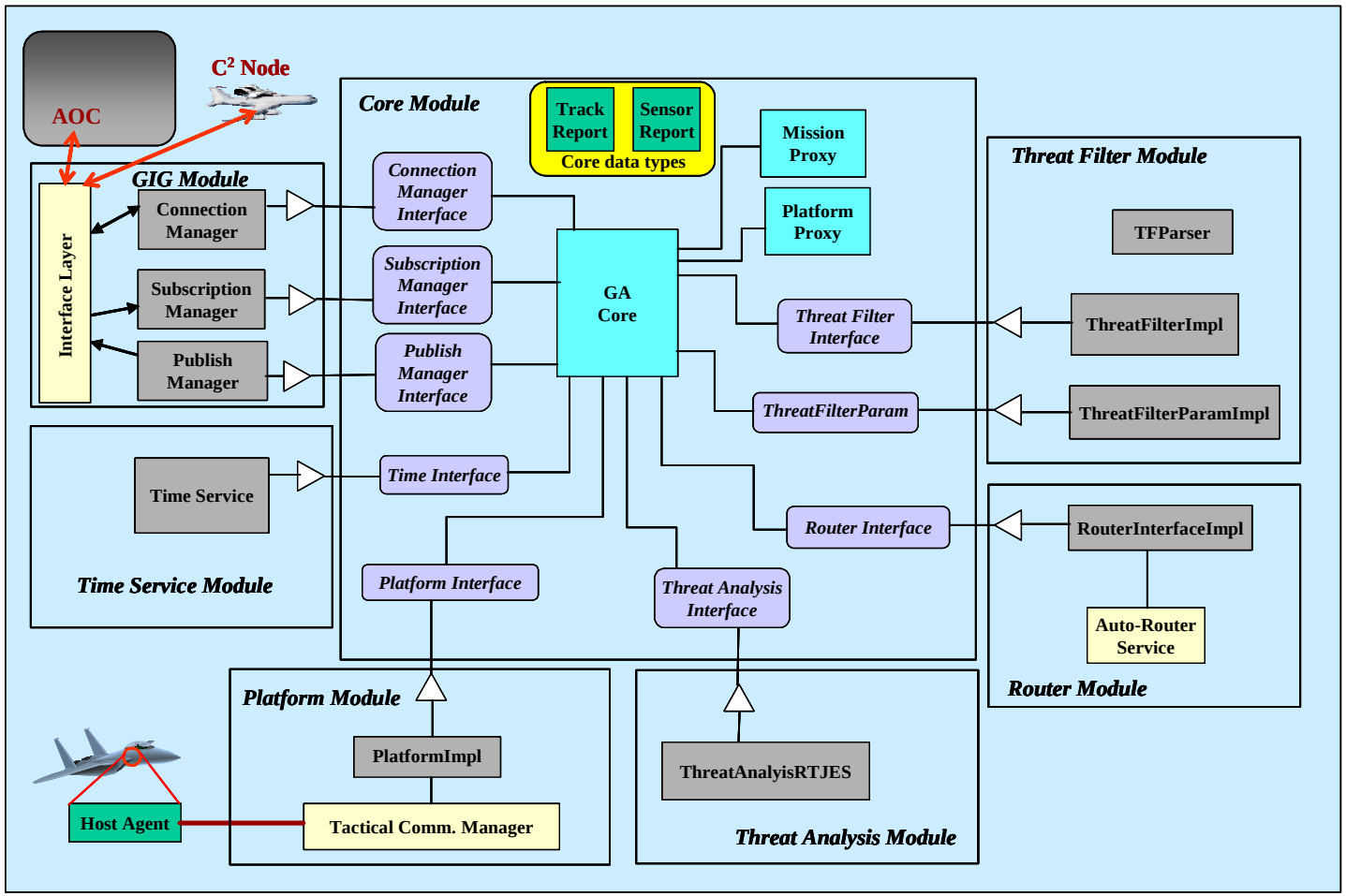
11th International
Command and Control Research and Technology Symposium
26-28 September 2006
De Vere University Arms, Cambridge, UK

Charles P. Satterthwaite
Embedded Information Systems Branch
(AFRL/IFTA)
Dr. David E. Corman
Boeing

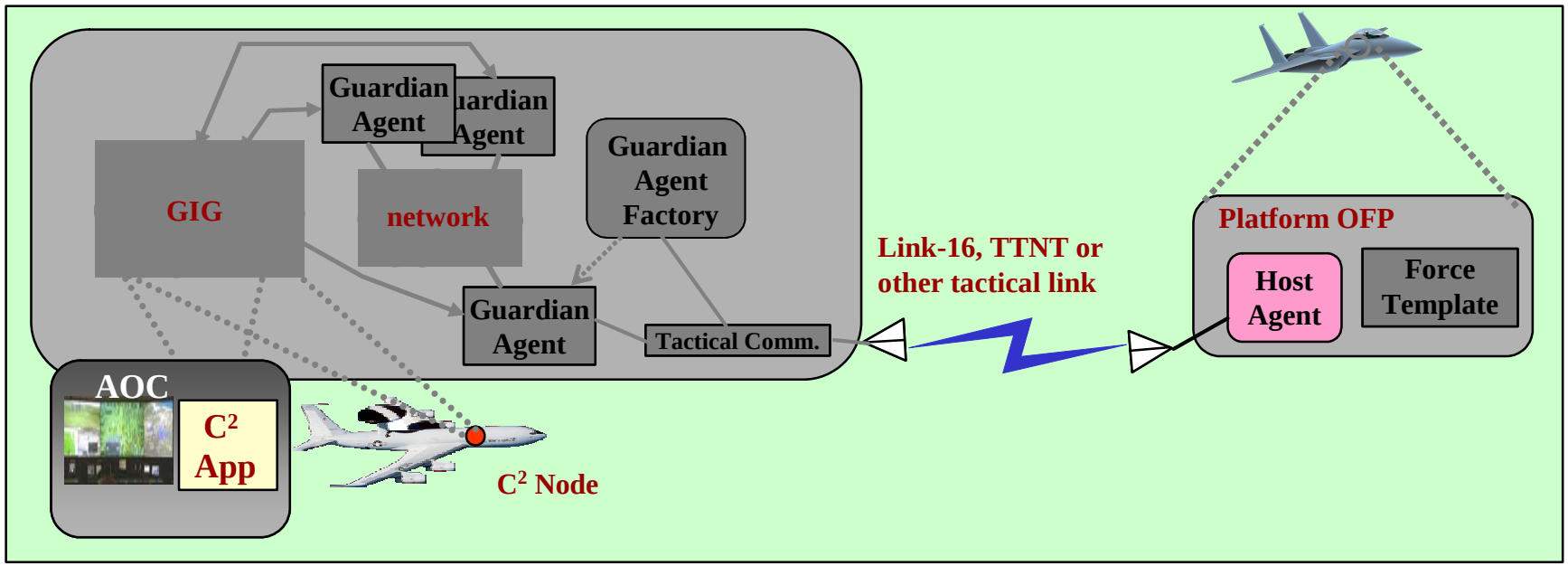
Guardian Agent



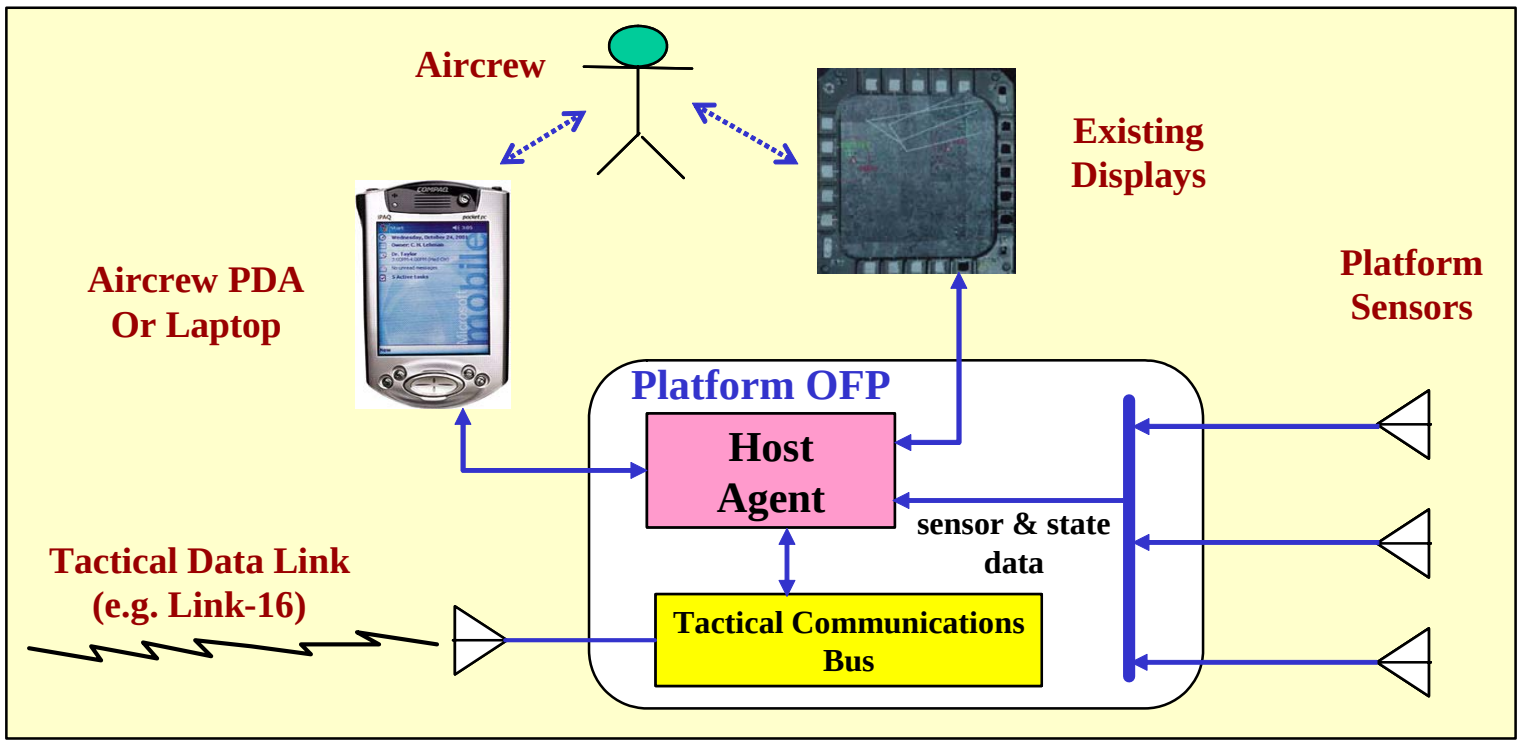
Modular Design of the Guardian Agent



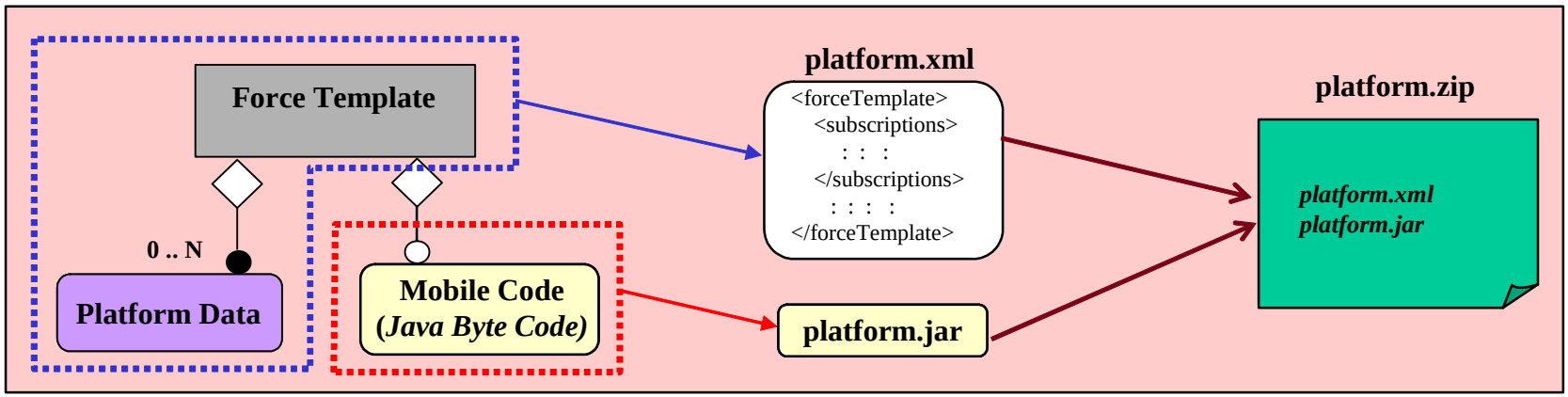
Host Agent


Guardian Agent
Guardian Agent
GIG
network
Guardian Agent Factory
Guardian Agent
Tactical Comm.
AOC
C² App
C² Node
Link-16, TTNT or other tactical link
Platform OFP
Host Agent
Force Template

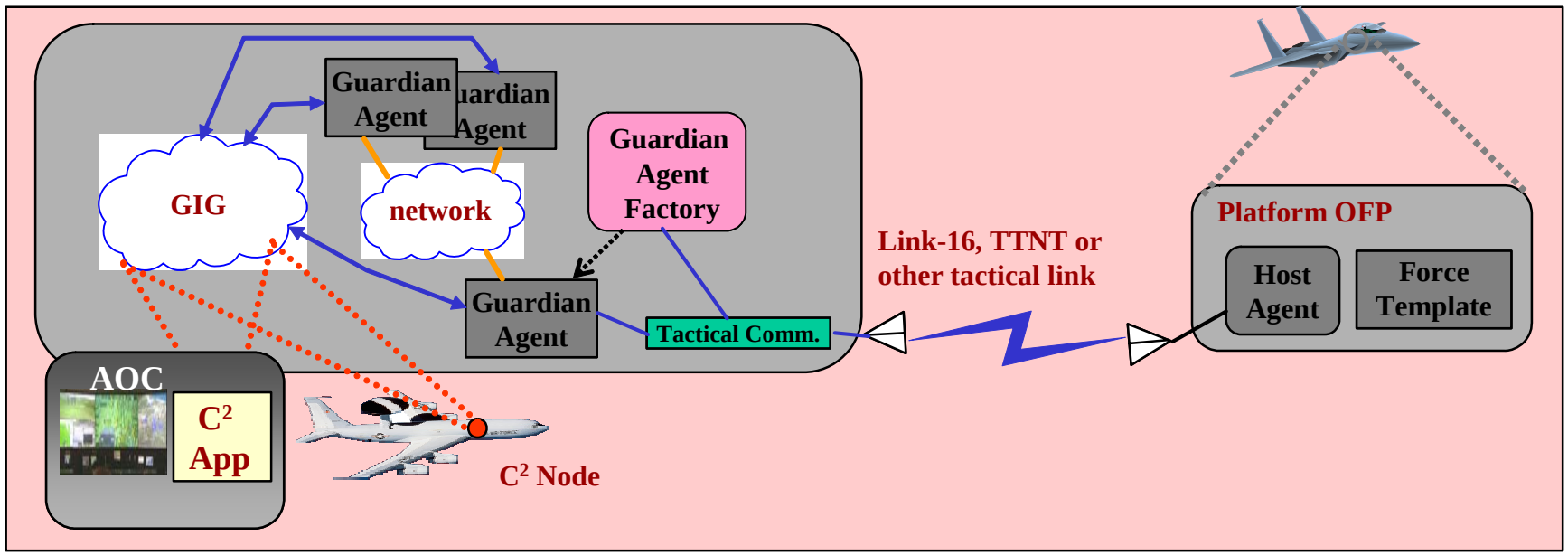
Aircrew Interface



Components of the Guardian Agent

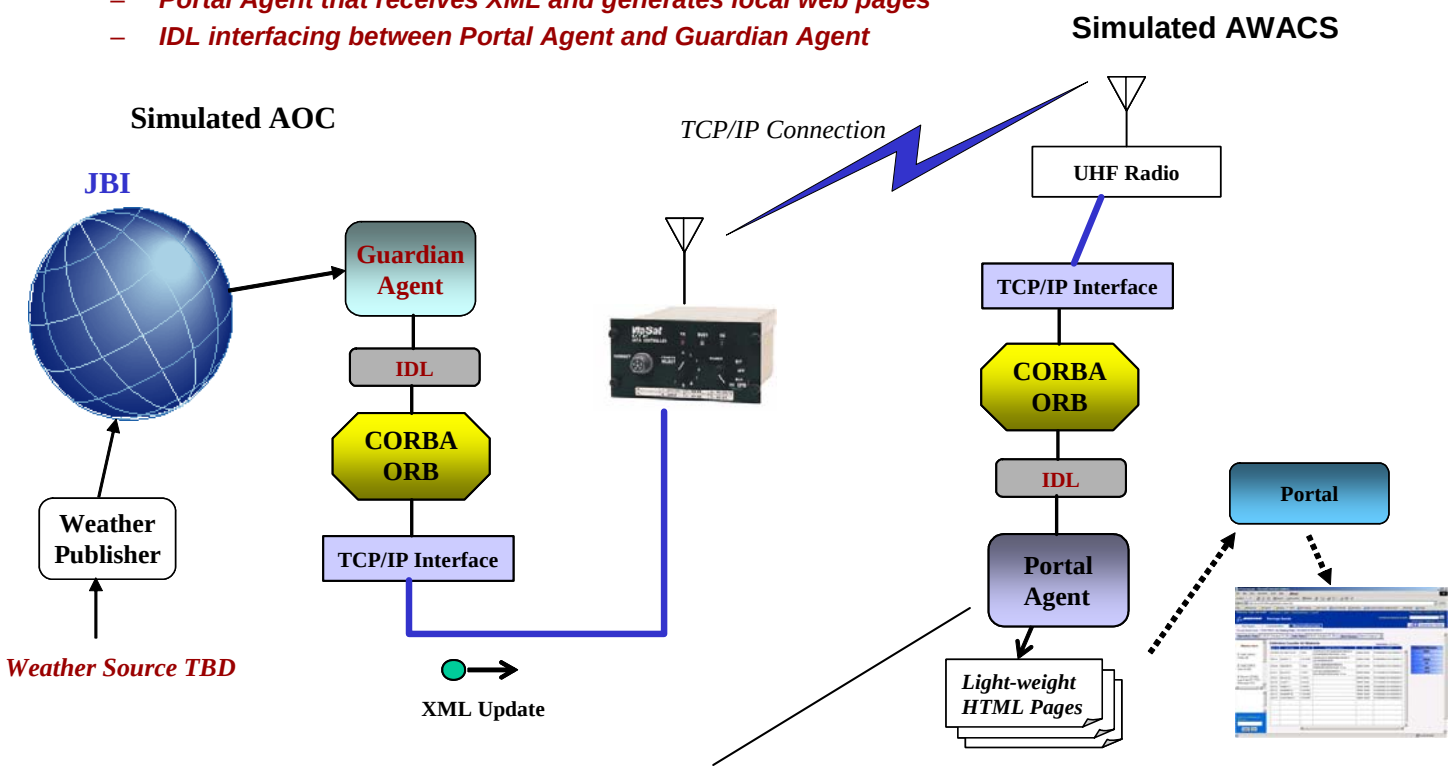


Guardian Agent Factory



Weather Service for C2 Aircraft

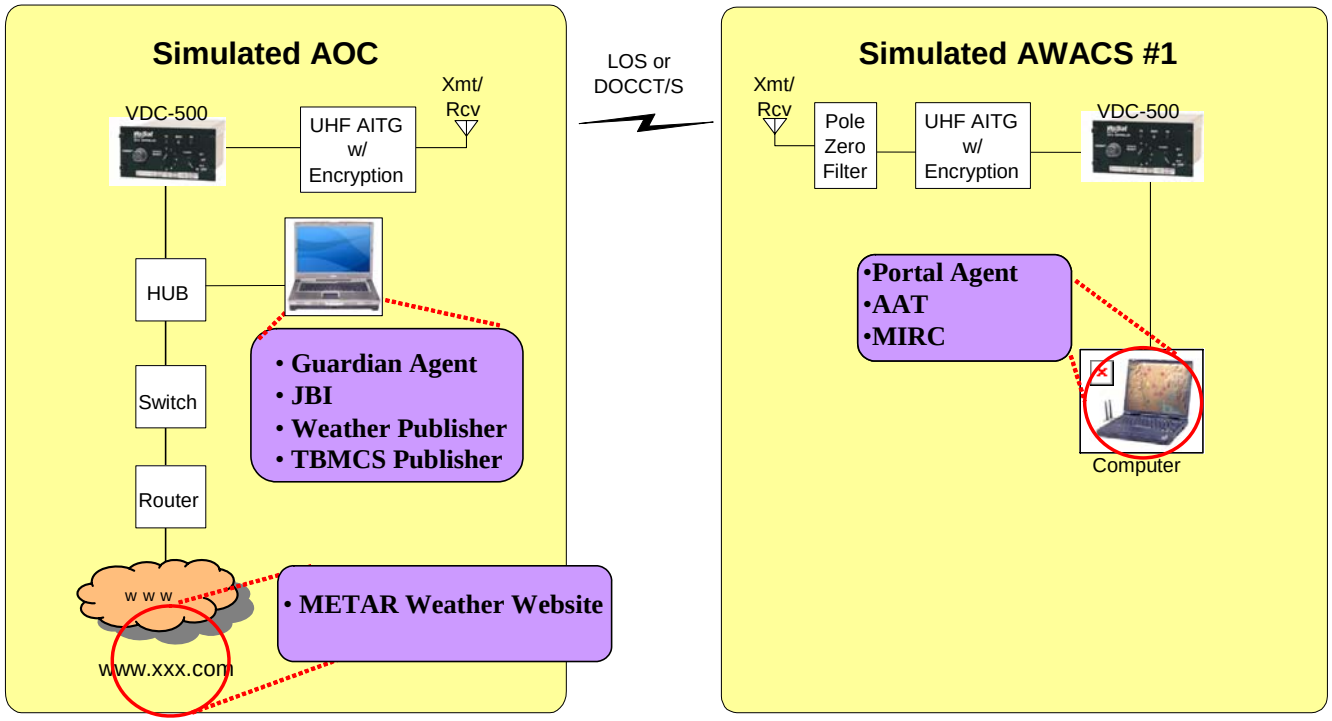
- **Integration uses:**
  - *CORBA ORB*
  - *Portal Agent that receives XML and generates local web pages*
  - *IDL interfacing between Portal Agent and Guardian Agent*



Portal Agent receives XML Update. The Portal Agent creates a new/updated web page

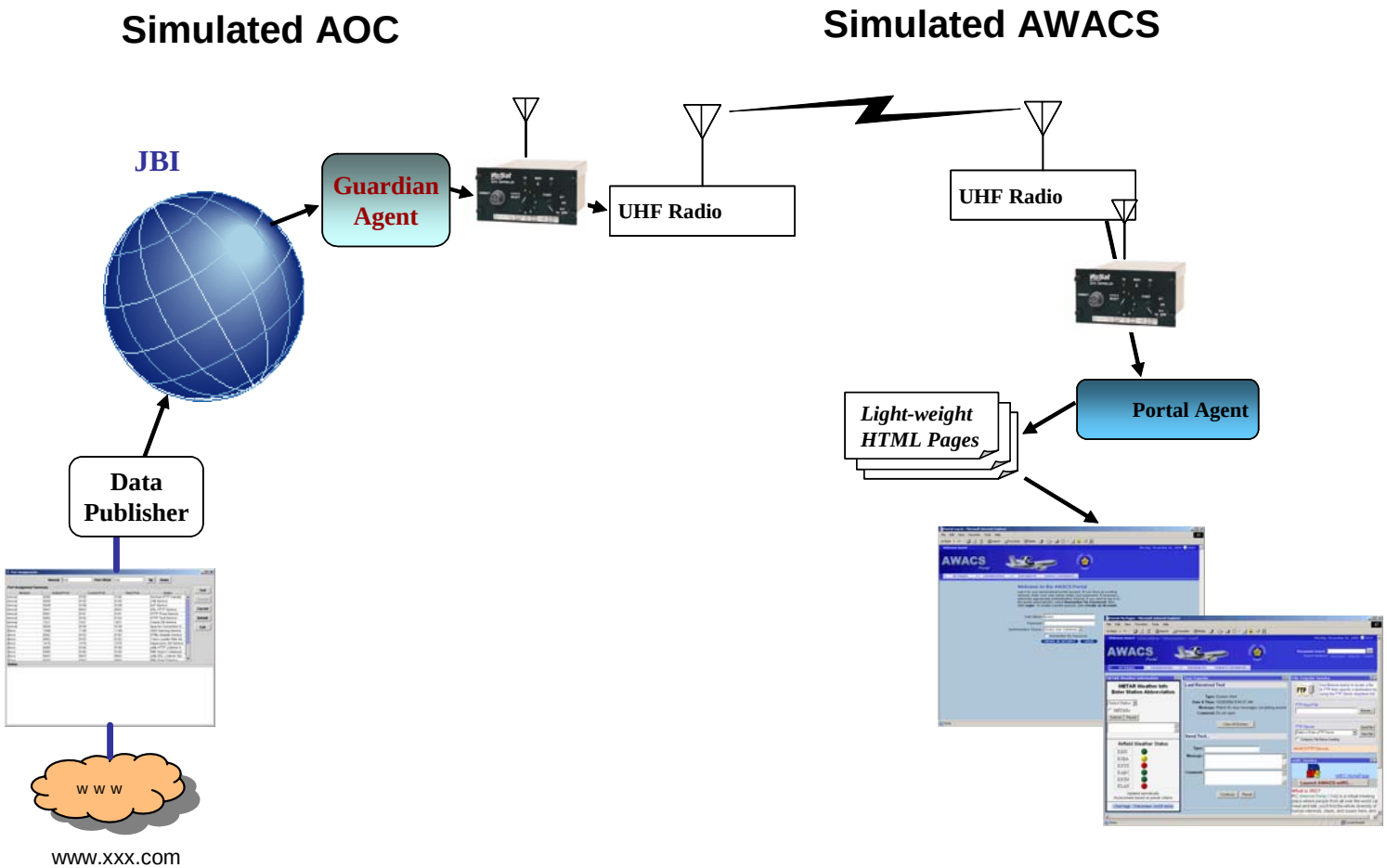
Boeing's Aircraft Integration Lab

Physical Block Diagram

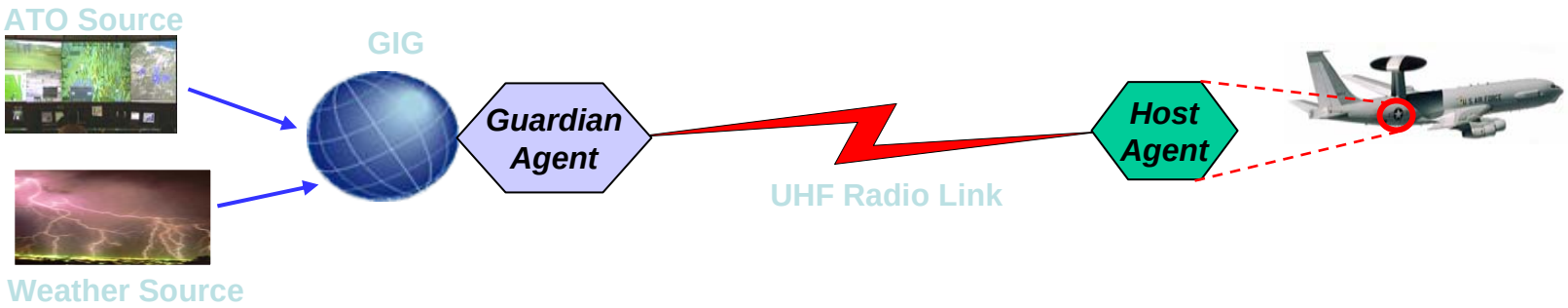


Aircraft Integration Lab

AOC for C2


Simulated AOC
Simulated AWACS
JBI
Guardian Agent
UHF Radio
UHF Radio
Light-weight HTML Pages
Portal Agent
Data Publisher
AWACS
AWACS
w w w
www.xxx.com

Technology Transition Activity
AWACS Integration

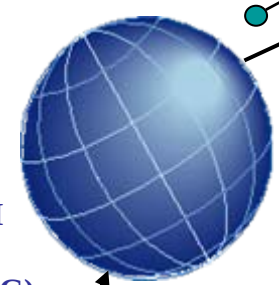


- Objective: Provide real-time weather updates and ATO updates to AWACS using IEIST technology
- Makes use of Internet Protocol (IP) link over UHF radio
- Allows the AWACS operator to subscribe and query weather data via Guardian Agent
- Applicable to AWACS 30/35 or 40/45 programs
- Host Agent implemented as a Web Portal Java applet

Weather Updates Via Subscription

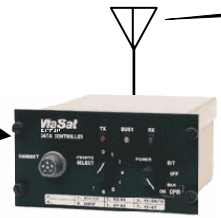
- **If a weather update is published by the weather server, the Guardian Agent forwards the report to the Host Agent applet on the AWACS**

AWACS Ground Station



AFRL JBI Ref. 1.1 (example GIG)

Guardian Agent



UHF radio

UHF radio

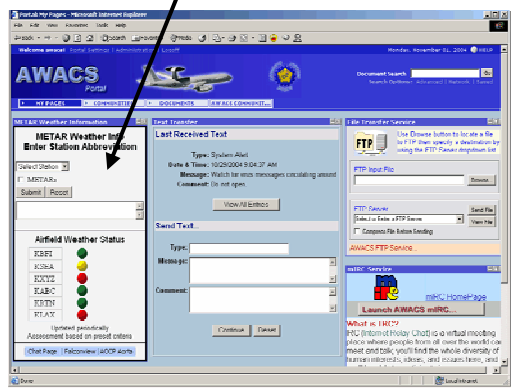
Host Agent Applet

Weather Publisher

Internet connection

http://weather.gov/xml

National Weather Service (NWS) Website



① Weather Publisher publishes new weather information using NWS data from Internet

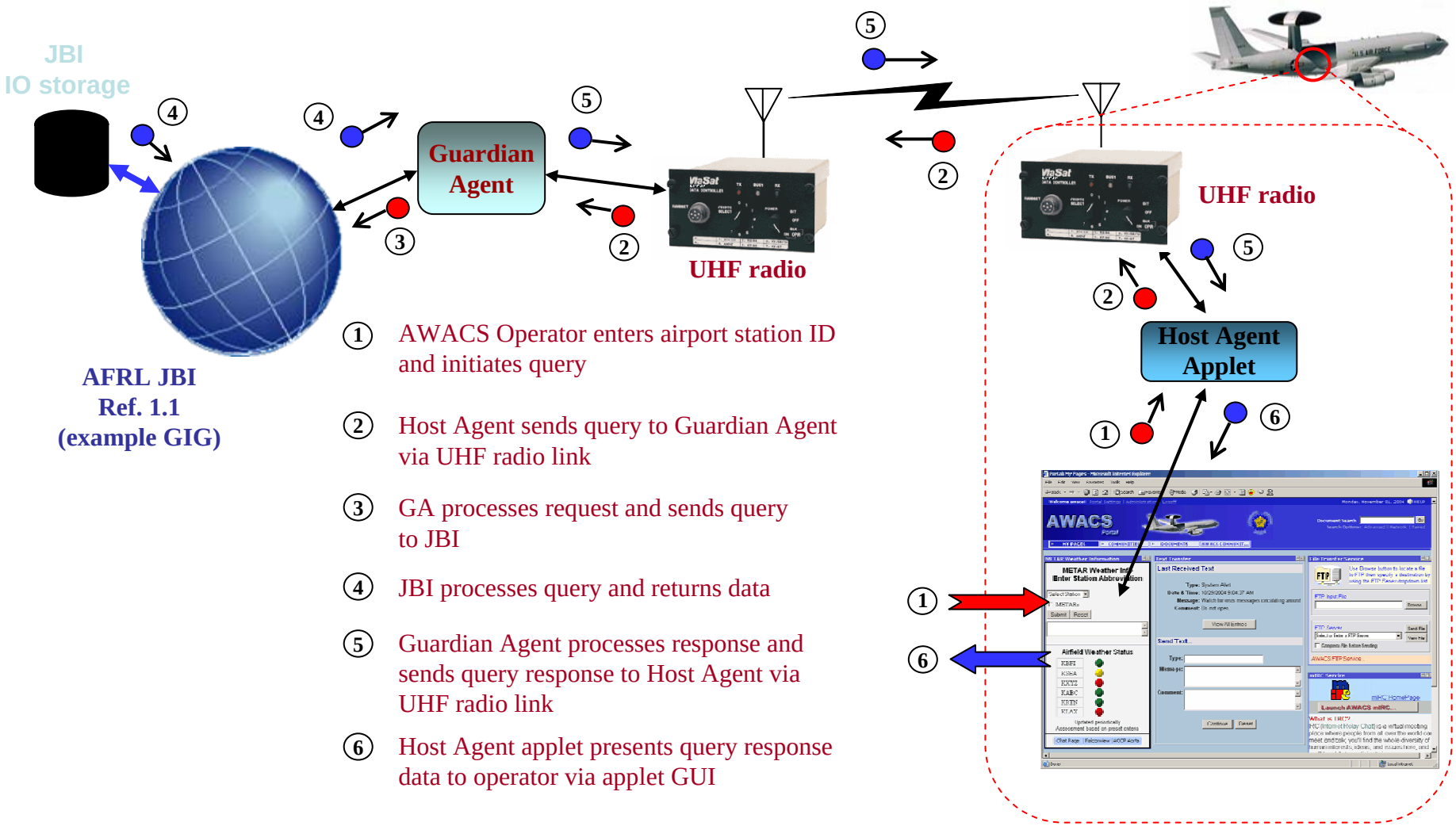
② GA receives weather update via subscription

③ GA processes data and sends Weather Updates to Host Agent via IP/UHF link

④ Data is transmitted to simulated AWACS

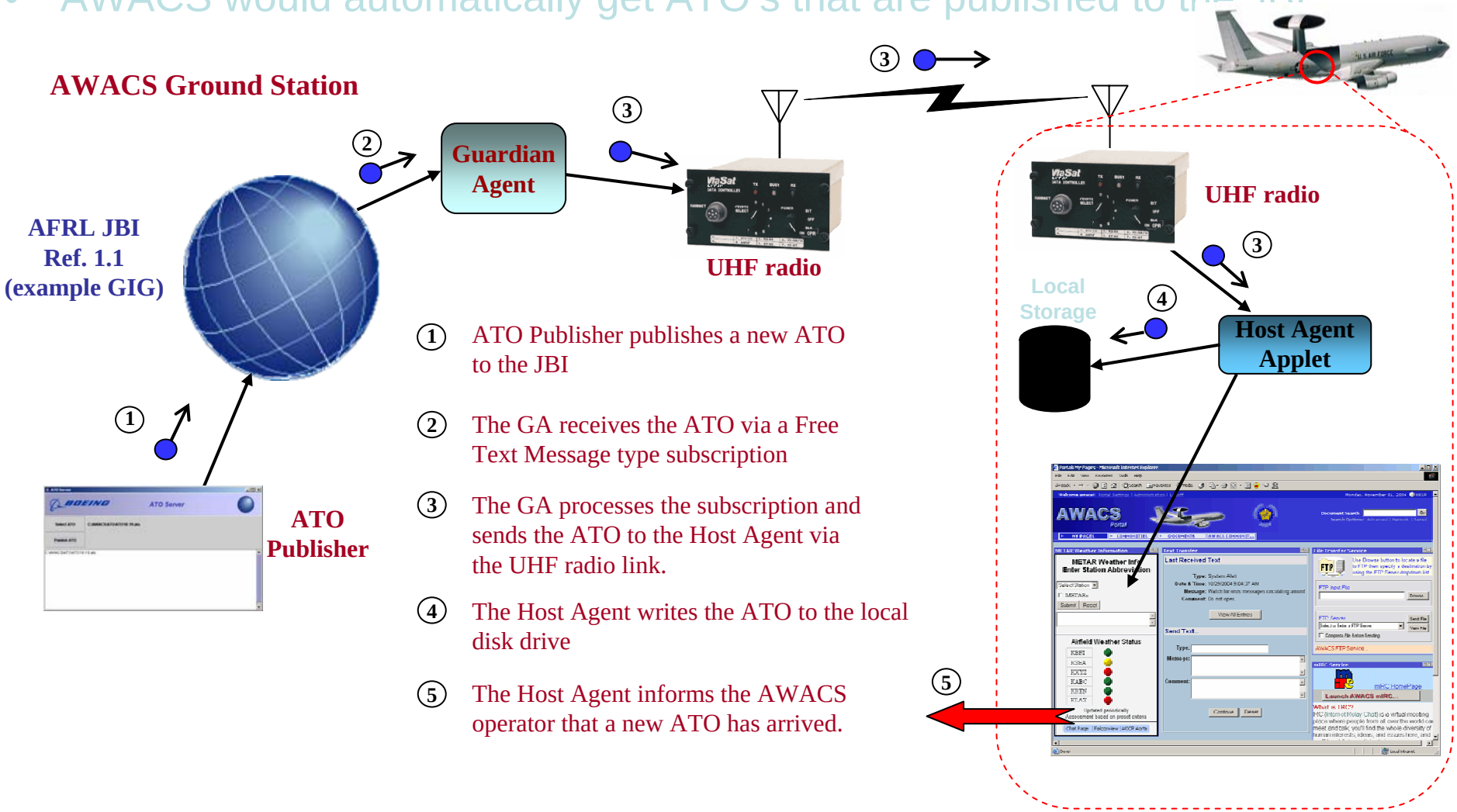
⑤ Host Agent Java Applet updates the Weather user interface.

Weather Query Option



ATO Updates Via Subscription

- AWACS would automatically get ATO's that are published to the JBI



1. ATO Publisher publishes a new ATO to the JBI
2. The GA receives the ATO via a Free Text Message type subscription
3. The GA processes the subscription and sends the ATO to the Host Agent via the UHF radio link.
4. The Host Agent writes the ATO to the local disk drive
5. The Host Agent informs the AWACS operator that a new ATO has arrived.

Summary

- The prominence of Net-centric Operations as a the modern warfighting philosophy requires connectivity and inter-operability for all the entities involved.
- The IEIST program has developed a set of technologies that:
  - enable legacy platforms to integrate with current and future GIG's
  - Technology that can have an operational impact on the Warfighter for increasing lethality and survivability
  - patentable technology

- Technology provides basis for a transitional product

- Technology is applicable to both manned and unmanned platforms.

- IEIST technology is well placed to support the warfighter in the growing importance of the Global Information Grid