Secure IP Networking for Enhanced and Dynamic Tactical Data Group

NOV 2019

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The evolution of Tactical Data Links

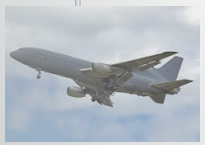
1999

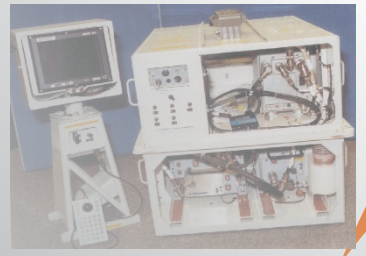
Ruggedized COTS

Lightweight Portable Extensible

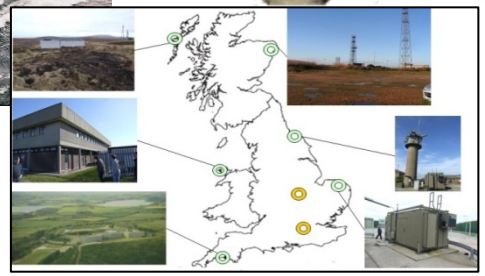
2019

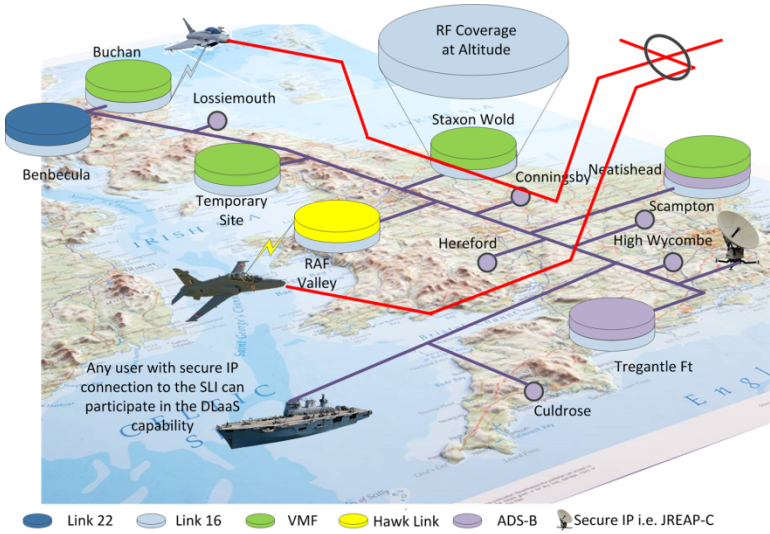
Networked Distributed Shared Multi Link Environment





Bespoke Engineering





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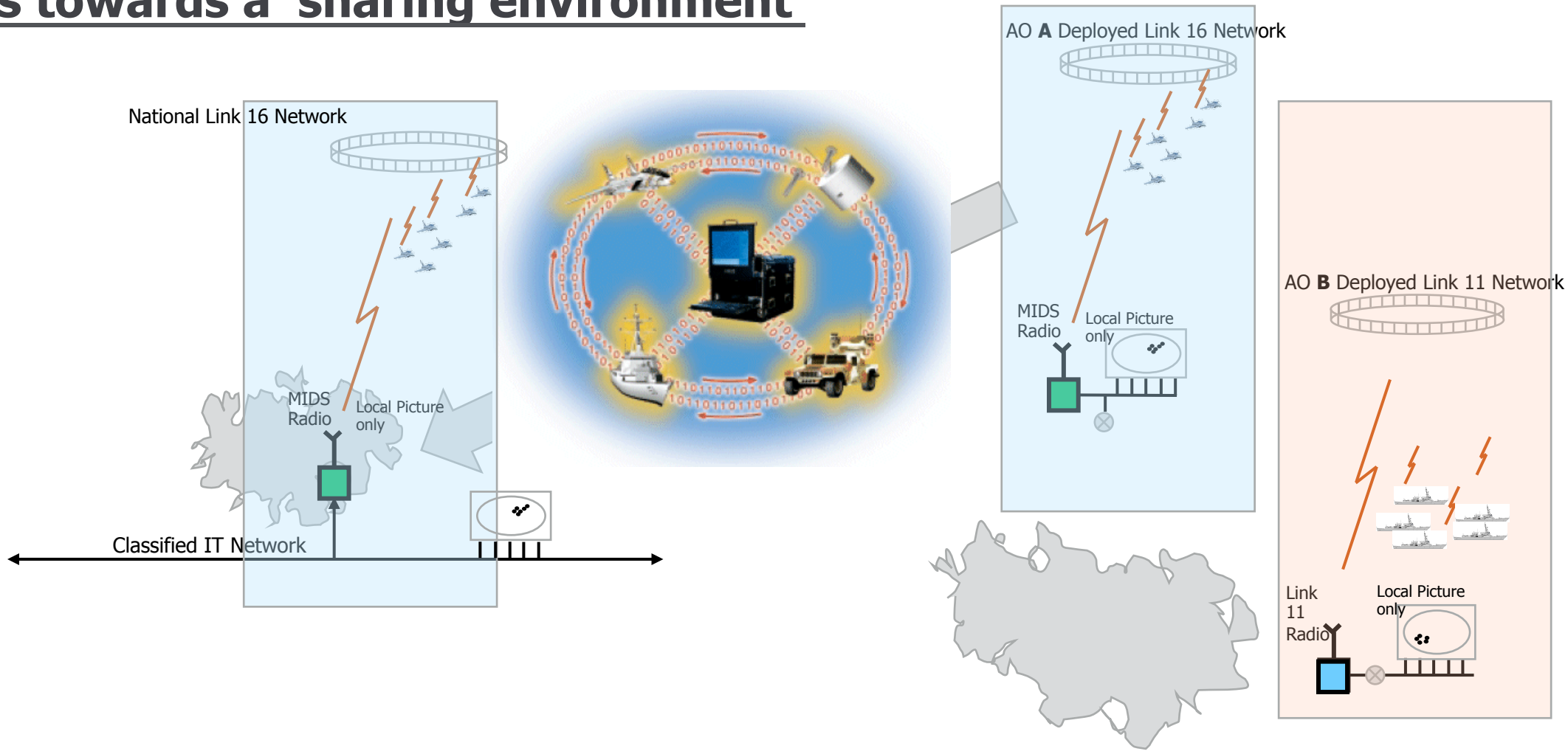
Tactical Data Integration and Dissemination

- Tactical Intelligence, Situation Awareness and Digital Command & Control is available to a multitude of users, in the operational and non-operational space
- Each data interface has its own physical characteristics, content and security constraints resulting in a series of isolated stove piped information exchanges.
- The utopian goal is a single defence wide information infrastructure providing a common tactical and intelligence network encompassing operational tactical data links (TDLs), intelligence and sensor data with distributed operators through a 'backboned' network capability.

Steps towards a 'sharing environment'



System of Systems - Requirement

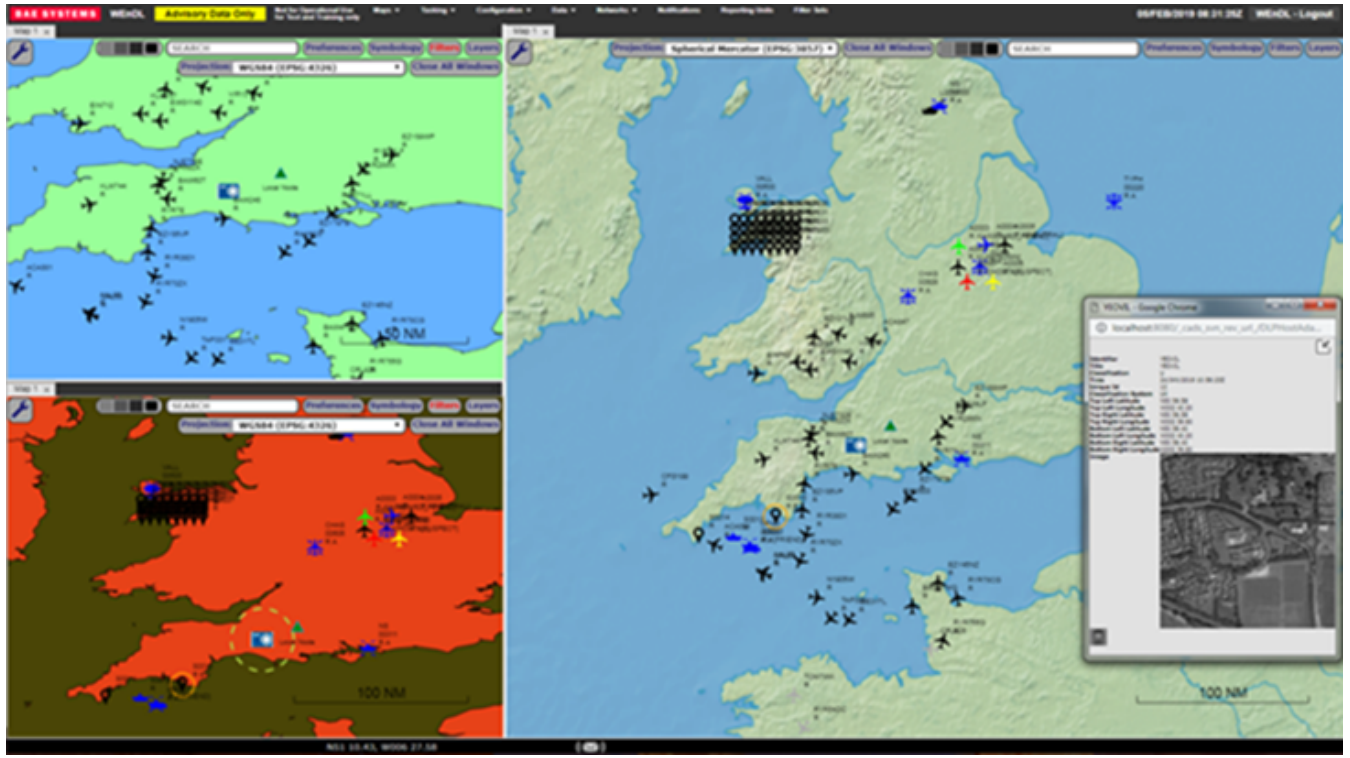
A system would comprise a set of components developed specifically to exploit, distribute and manage disparate sources of data, creating a unified Information Exchange across the whole of the battlespace. Such a system would comprise:

- Command and Control
- Situational Awareness
- The ability to exchange messages by voice
- Connectivity to IP only assets
- The ability to allow third parties to join the network
- Simulation/Synthetics

Capabilities
Situational Awareness

The systems will be a web served, geographically referenced view of the tactical data link and network sources to which it is connected.

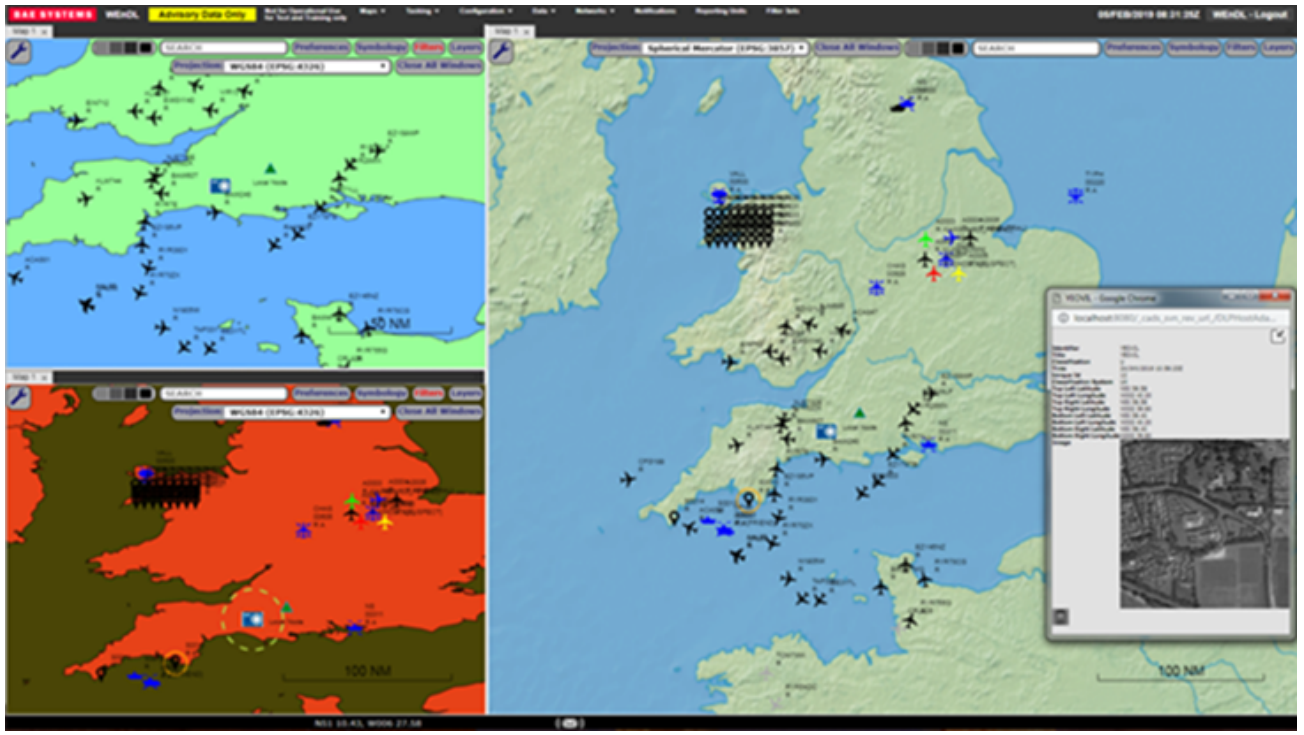
- This picture would be:
  - Accessible over the network using a standard web browser
  - Available to all network operators simultaneously (IP bandwidth permitting)
  - Filtered by user on a unique geographical area, hostility filter and map underlay to suit their own needs
  - Driven from the various Data sources which can be overlaid on the same display thereby allowing the build up of a composite multi source view.
  - Enhanced by the ingest of ATO and ACO electronic data



Capabilities
Command and Control

C2 would provide all of the capabilities of the Situational Awareness account but also includes the ability for authorised users to interact with the connected information sources.

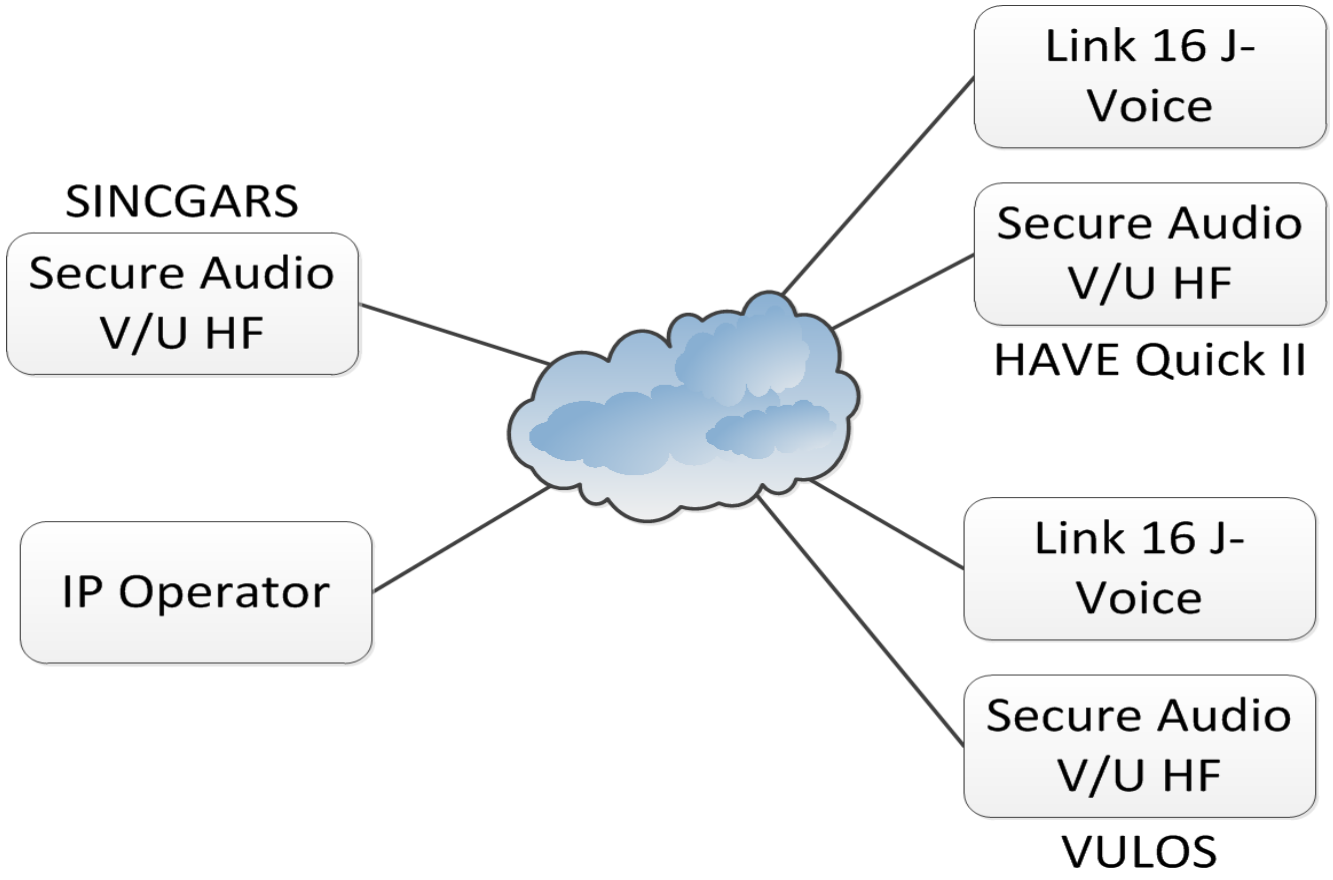
- The operator could:
- Create real or virtual entity's participating in any or all connected networks
- Send and receive
  - Text based messages
  - Data Link Voice and Secure Audio via the network
  - Command and Control messages
- Provide entity data to the networks (Blue Forces, Intel driven points of interest etc)
- Communicate from any authorised PC on the network using its web browser to any Data Link or other IP assets
- Setup forwarding rules between attached networks enabling same and dissimilar network transfer of information



Capabilities
Audio Exchange

Federation capabilities should operate with data and digitised voice. Resulting in the ability for Voice networks of different types to interact without a requirement for multiple radios

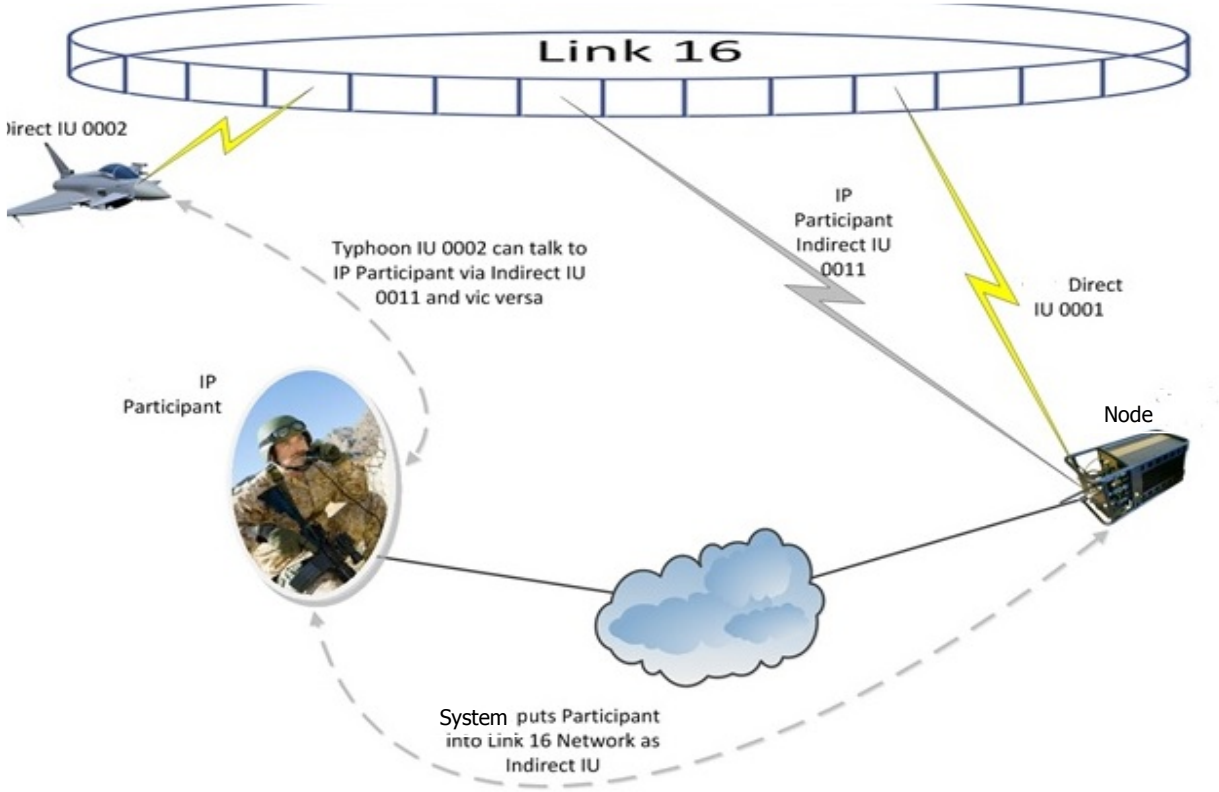
- Communications between Voice Networks of different types could take place
- System would digitise the voice interface to the native Radio Unit and exchange the digitised voice as Audio Over IP
- Point to point network communications would be enabled as are Point to Multi Point
- IP, Data Link and Audio Network Users would all able to benefit from this network
  - For example Have Quick II network users could communicate with SINCGARS network users without the need for bespoke tuned radios



Capabilities
Non Native Data Link Interface

The system should provide the capability for any connected user to become part of any connected network. An operator connected to the system via IP can be put into a Link 16 network as if they are a direct participant.

- The operator can:
  - Become an indirect Participant in the network
  - Communicate via Voice or Data directly with other network entities
  - Appear within the network at any geographic location
  - Carry out full C2 and SA account actions as if they were a native participant.
- Other Network Participants can:
  - See and interact with the Non native participant using native protocols
  - Treat the Non native participant as a native participant.



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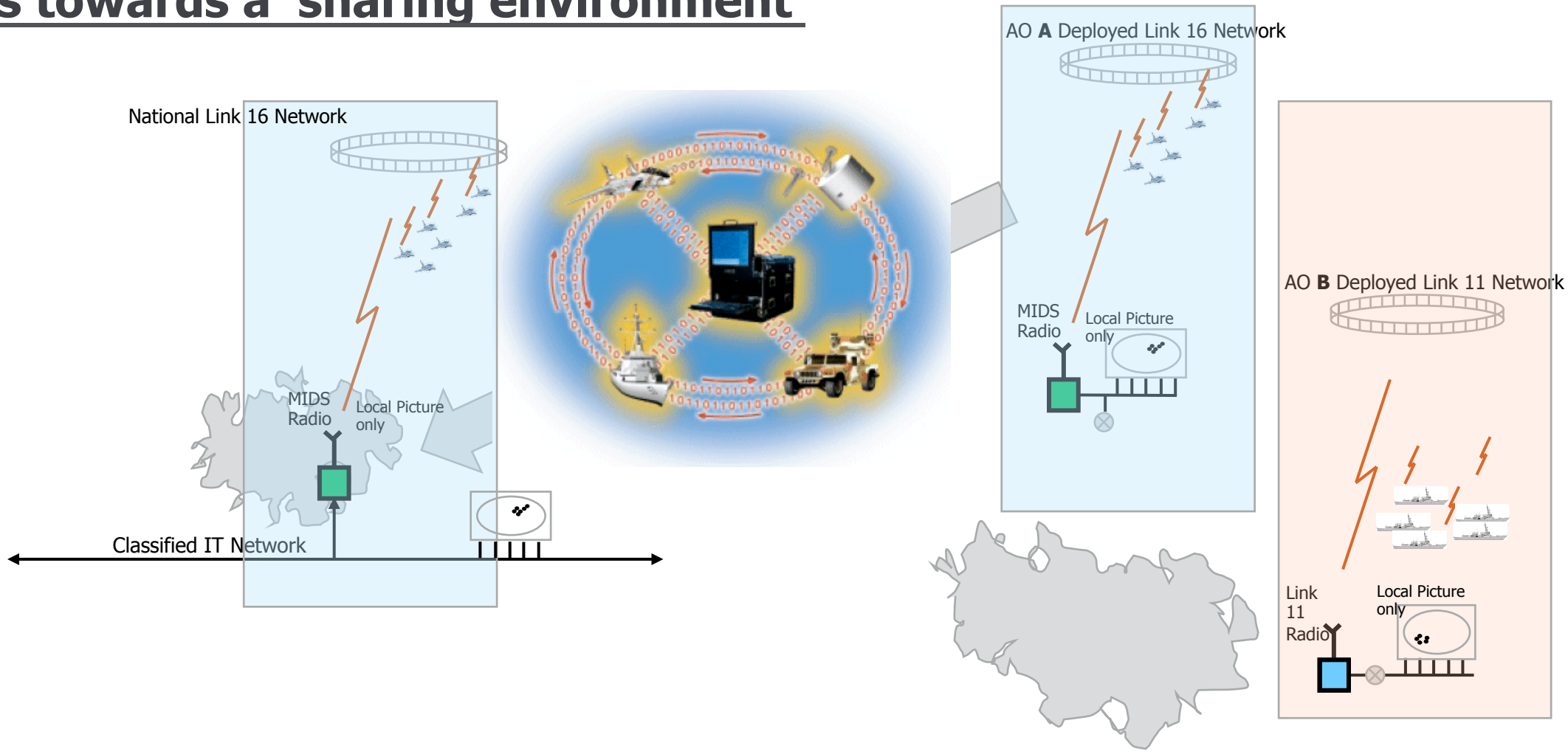
Capabilities
3RD Party Information Exchange

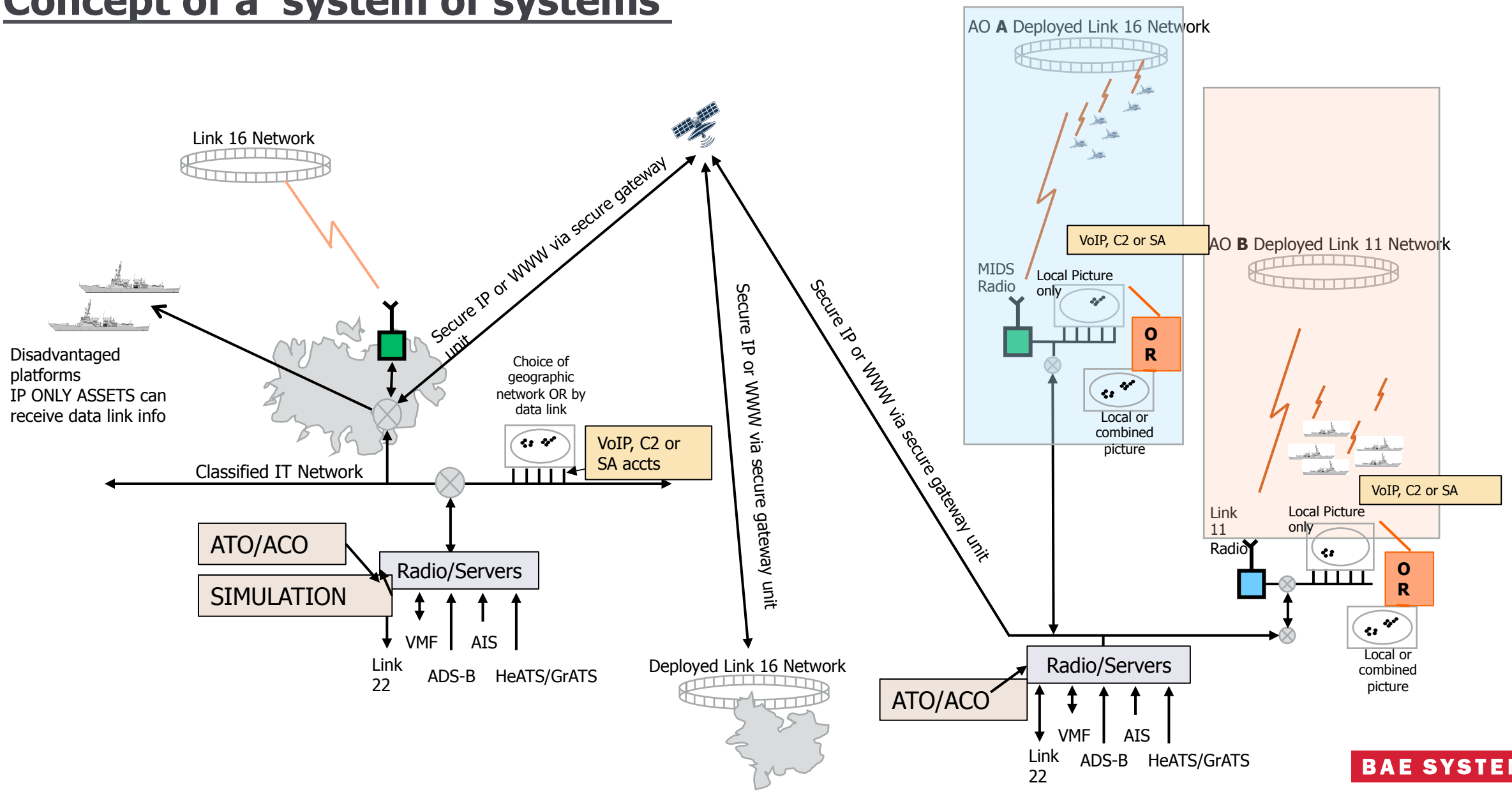
The system should have a C2 mode that provides all of the capabilities of the Situational Awareness account but also includes the ability for authorised users to interact with the connected information sources.

- In order to maximise the benefit from the system, it is important that the DataBase of TDL traffic and the ability to interact with the TDL participants is available to other applications and users of other secure networks.
- The system should support the exchange of data into and out of its DataBase via the implementation of an Open Standard interface which can be made available to authorised applications/ customers on an as required basis.
- As per the Local Operator accounts the concept of different levels of functionality is maintained on this interface. These levels are:
    - Subscriber or SA viewer only
    - Contributor or Command and Control Account

Steps towards a 'sharing environment'



Concept of a 'system of systems'



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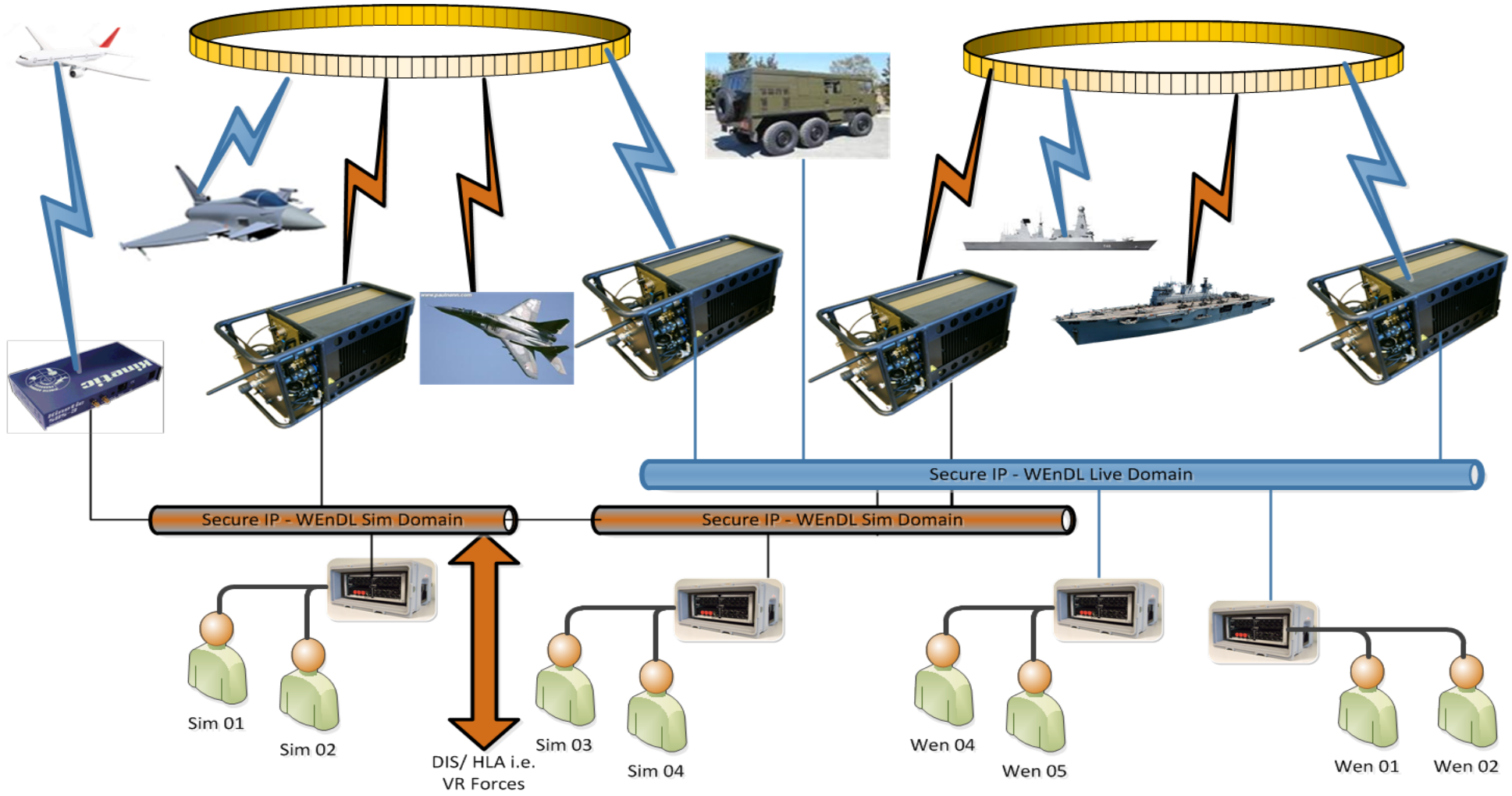
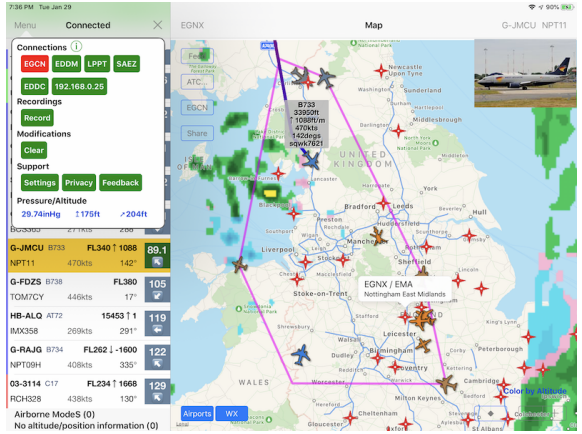
Simulation – perhaps a Live Virtual Construct?

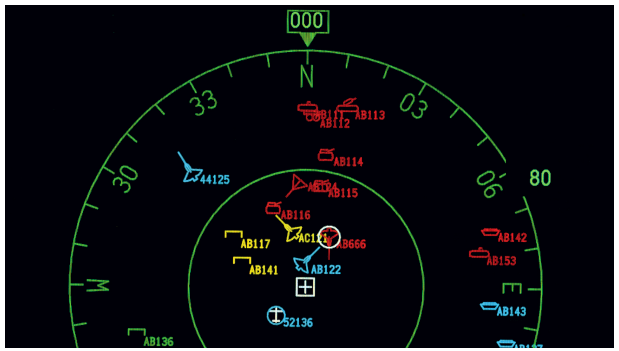


Operational Example
Enhancing FJ Situational Awareness of General Aviation Traffic

Creation of a low-cost system that uses existing satellite navigation and commercial aircraft data to improve airspace safety.

- Using the system military aircraft can now use vital information about nearby civil aircraft to aid pilot decision-making.
- Use of Automatic Dependent Surveillance—Broadcast (ADS–B) system as a means of passing civilian aircraft flight data via a tactical data link gateway enabling military aircraft to monitor general air traffic.
- ADS-B is a surveillance technology which tracks and broadcasts the location of aircraft using satellite navigation. The system can access the data transmitted from ADS-B, channel the relevant information in a simple format and make it available to military aircraft.





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