



Integration for Multi-Domain Integration of Systems

An Architecture to Connect Information Systems across Defence

DSTL/PUB158891

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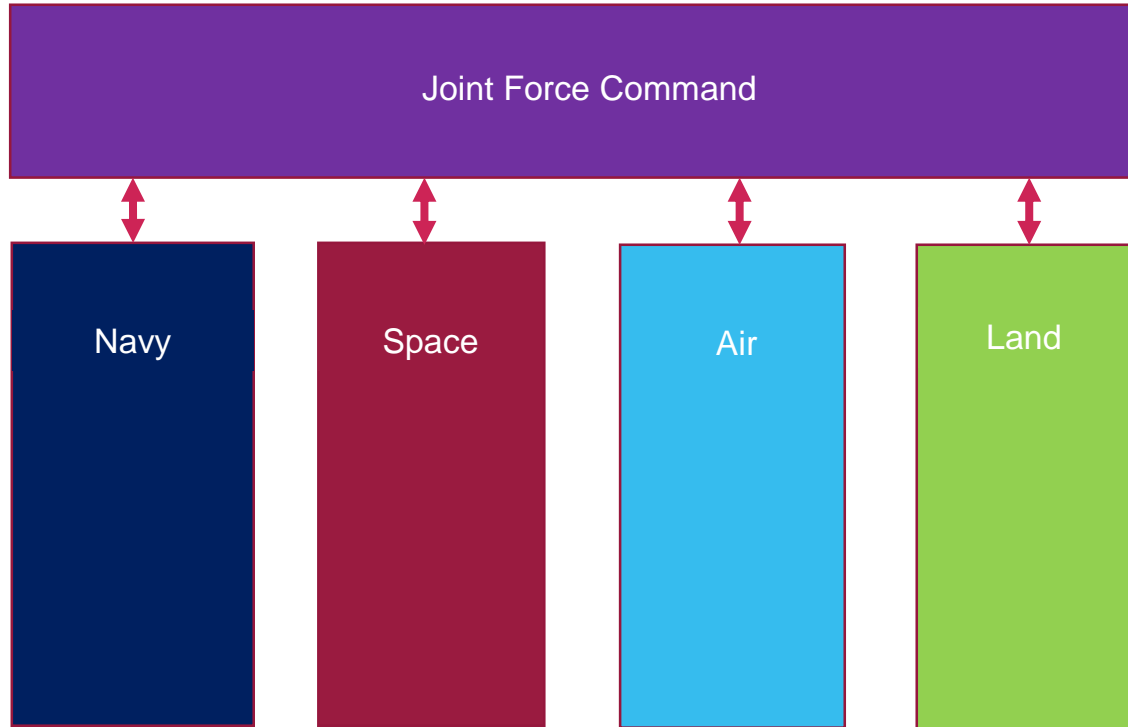
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If you don't know what's going on, you can't do the right thing about it

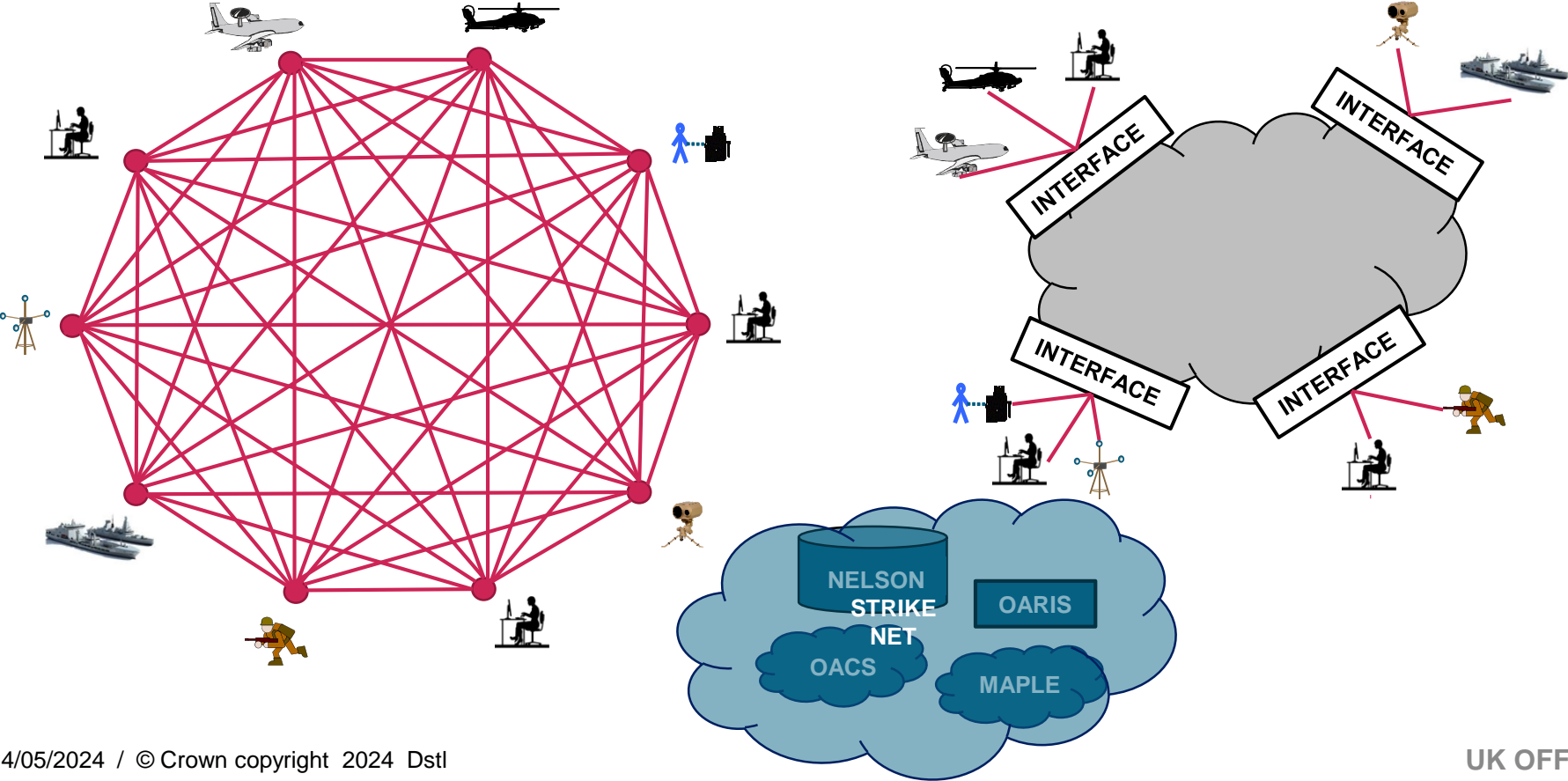


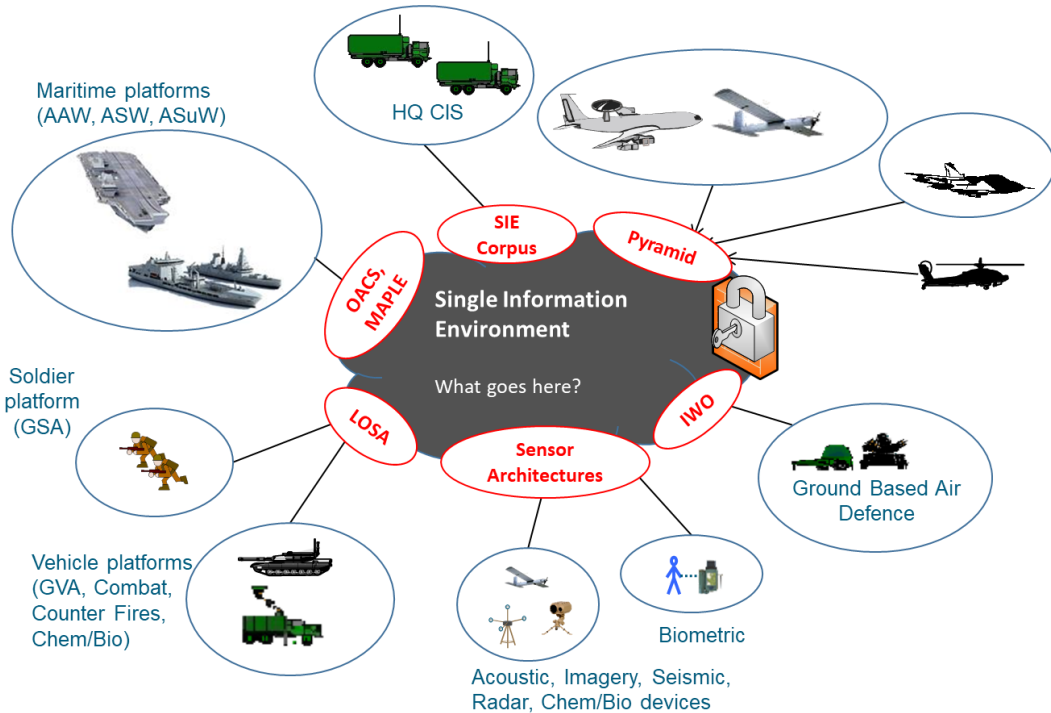
Cf. Internet lacking search engine and web addresses

Simplifications

- Bespoke links exist
- Intra-service information exchange not good either
- Problem multiplies with many nations

Modular Open Architecture Construct





Single Information Environment:

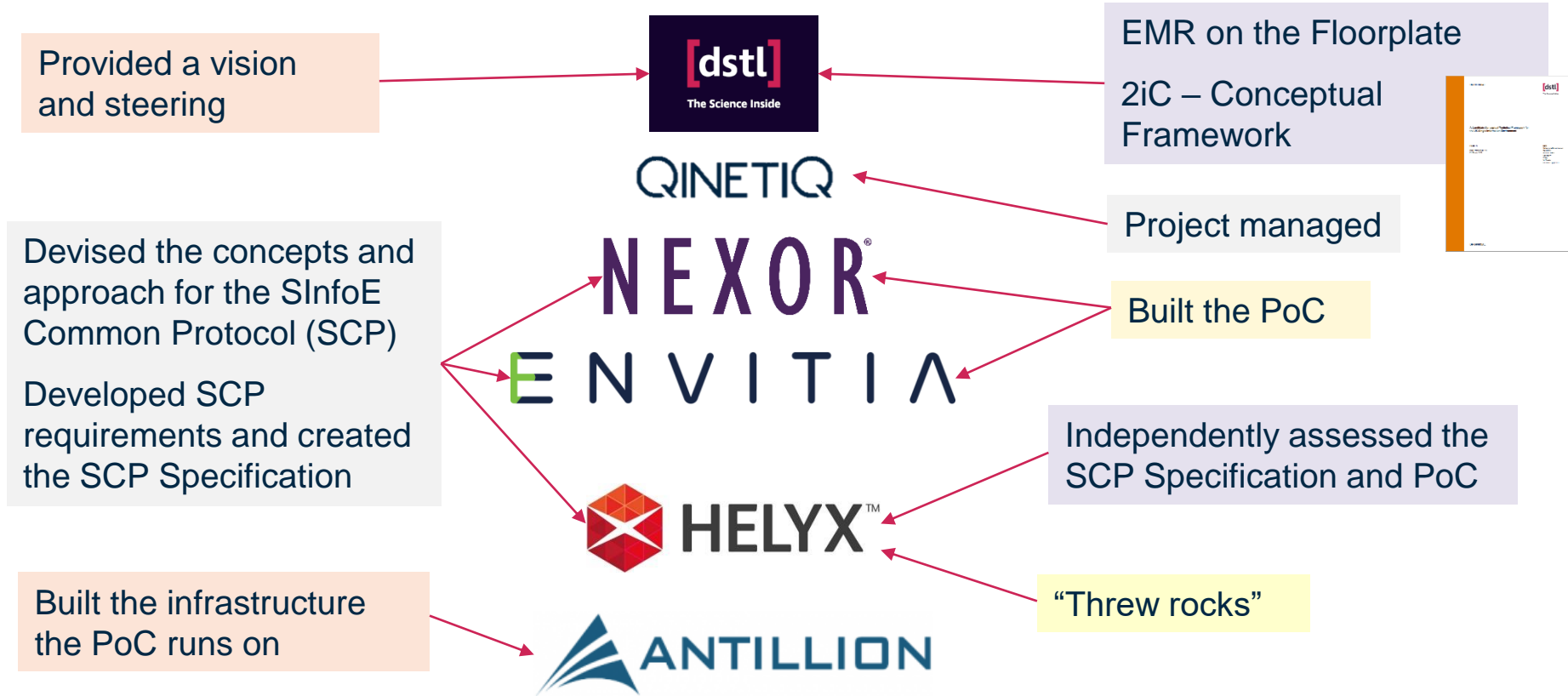
“Information flows freely from its point of origin to its point of need”

2017 Defence Information Strategy (now superseded by Digital Strategy for Defence)

Requirements for a Single Information Environment Architecture

Requirement	Intent
Scalable	Does not impose architectural constraints that limit the size of the SInfoE environment theoretically or practically.
DDIL Resilience	Is resilient to Denied, Degraded, Intermittent and Low bandwidth networks.
Agile	Able to quickly adapt to differing mission types, mission changes, organisations leaving or joining a mission, and changes to network characteristics
Assured	Demonstrably able to meet the confidentiality, integrity and availability need of a military environment
Interoperable	Able to interoperate in a Combined Joint, Intra-governmental, Inter-agency and Multinational (CJIIM) environment where many agencies and nations may be interconnected
Open	Able to interface with technologies from any vendor

The Team





Attached Systems



Service Provider



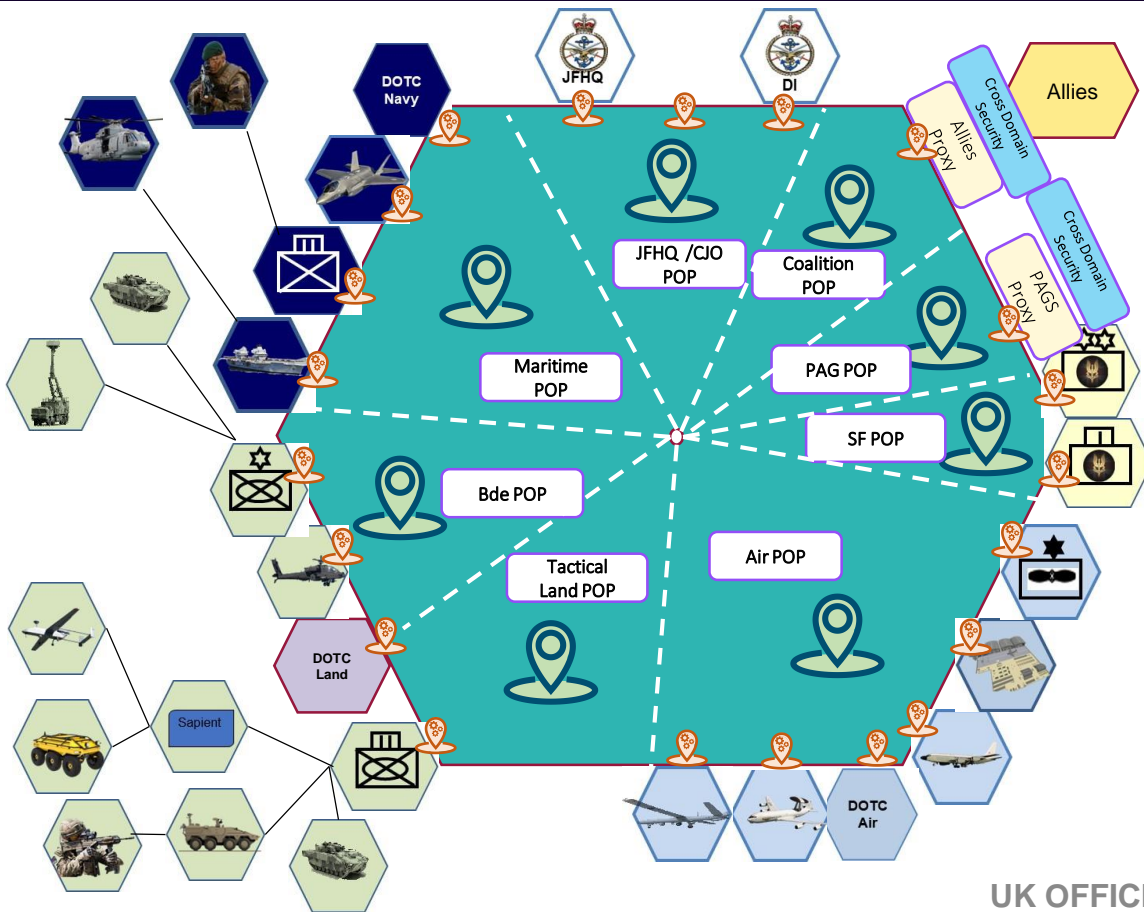
Point of Presence



Single Information Environment
Common Protocol (**SCP**)

The SInfoE Vision

- Flexible, Scalable, Agile. Evergreen
- Turn data into intelligence by making it visible and sharable
- Train as we fight – embed training simulations
- Simulation and Wargaming advancing C2 capability and practice





Exploitation through Multi-Domain Integrated Systems (MDIS)

and Single Information Environment (SInfoE) architecture's contribution to MDIS' Trial Acheron

The Multi-Domain Integrated Systems Game Changer Programme

- Mission: to provide investment choice for Multi-Domain Integrated Robotic & Autonomous Systems (MDI RAS) at Integrated Review 2025 (IR25), supported by evidence, standards and delivery pathways
- Led by DE&S Future Capability Innovation
- Funding from the Defence Innovation Unit
- 4-year programme running from April 2021 to March 2025
- Multiple Industry Participants

S&T Support to MDIS

- Funding from DE&S Future Capability Innovation
- Multiple projects within Dstl

■ ACHERON:

- Assesses Defence's All-Domain, integrated RAS capability potential
- Supports and aligns FLCs trials and contributes to Joint Exercises
- Identifies the level of C2 that can be achieved within a physical system solution

■ Collaborative Team

- All FLCs engaged and able to share information seamlessly across networks
- 7 industry partners providing RAS – writing their own Service Providers
- SInfoE provided by DSTL and Nexor, supported by Envitia
- Sierra Nevada Corporation Mission Systems UK providing Event Planning, Execution, and Physical Integration Support
- Eagle Eye Innovations providing Regulation and Safety support

■ SInfoE architecture – Integrating multiple systems for Acheron

ACHERON Scenario

Event: 1st – 31st July 2024

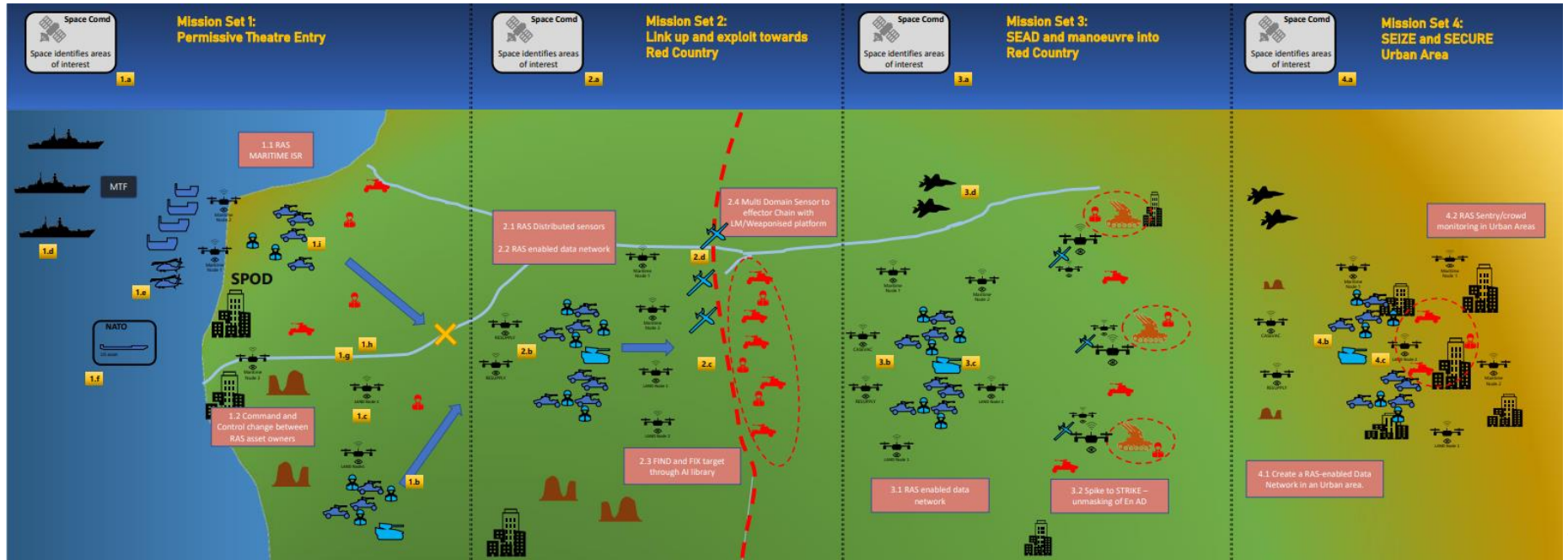
DV days: 11th and 12th July

Technical: 10th July

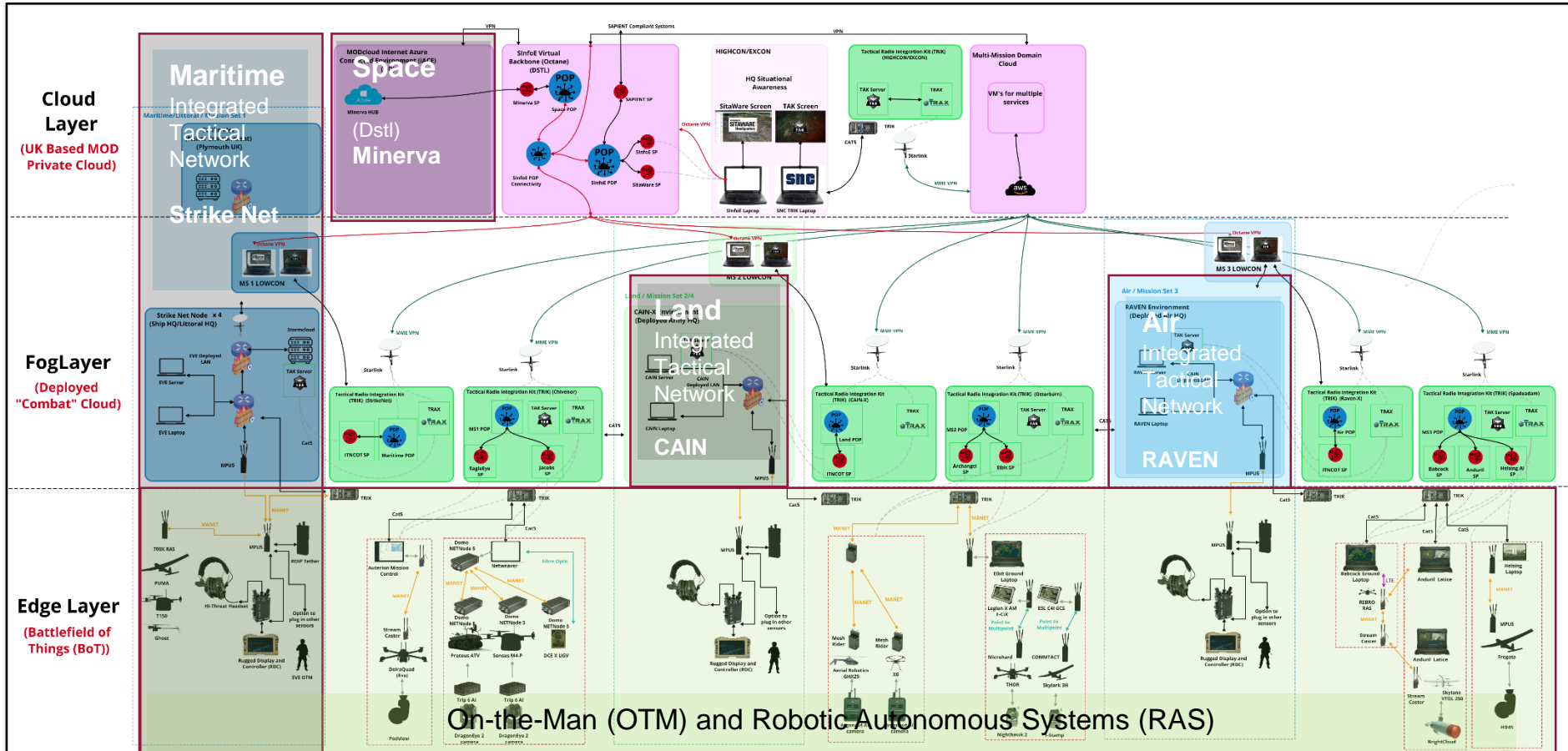
Point of Contact:

douglas.stock105@mod.gov.uk

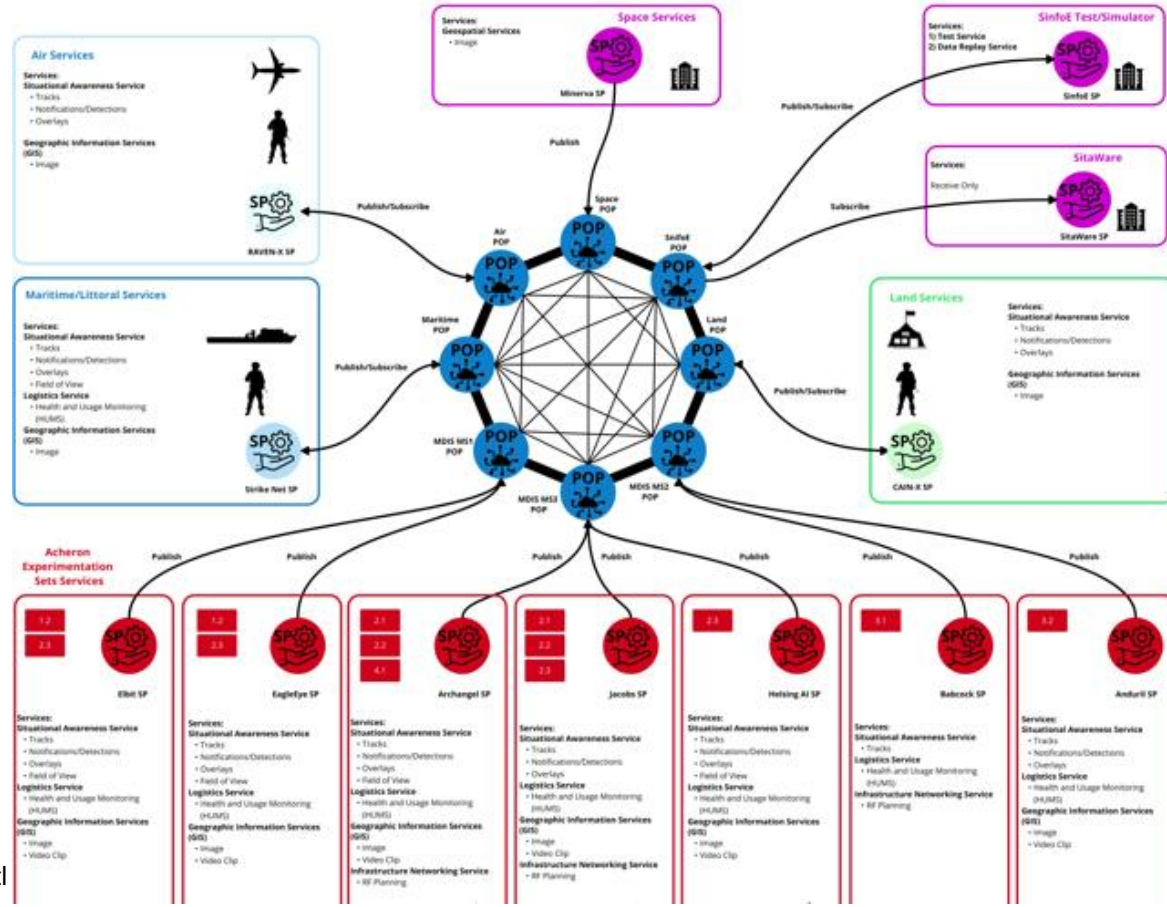
- Mission Set 1: Landing in Host Nation
- Mission Set 2: Penetrating Hostile Nation
- Mission Set 3: Suppression of Enemy Air Defences
- Mission Set 4: Urban Seize & Secure



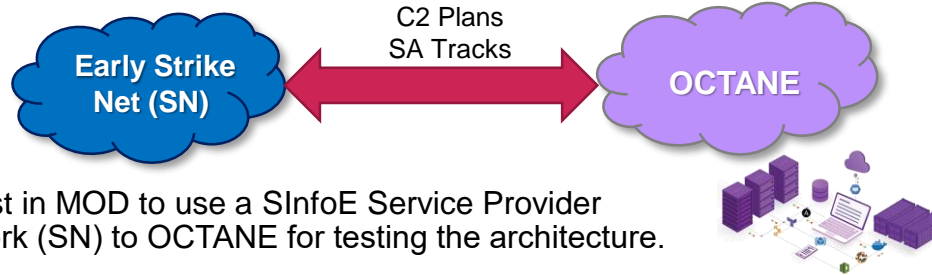
MDIS Configuration



Information-centric view of MDIS Capability



Strike Net REPMUS 23

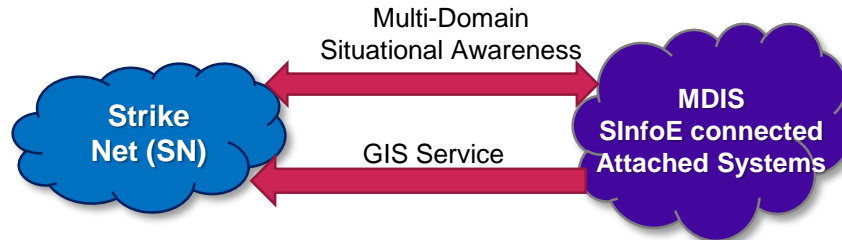


- Navy Develop were the very first in MOD to use a SInfoE Service Provider connecting Navy's Strike Network (SN) to OCTANE for testing the architecture.
- This was successfully achieved across two main services:
SA Tracks and Command and Control (C2) Plans services

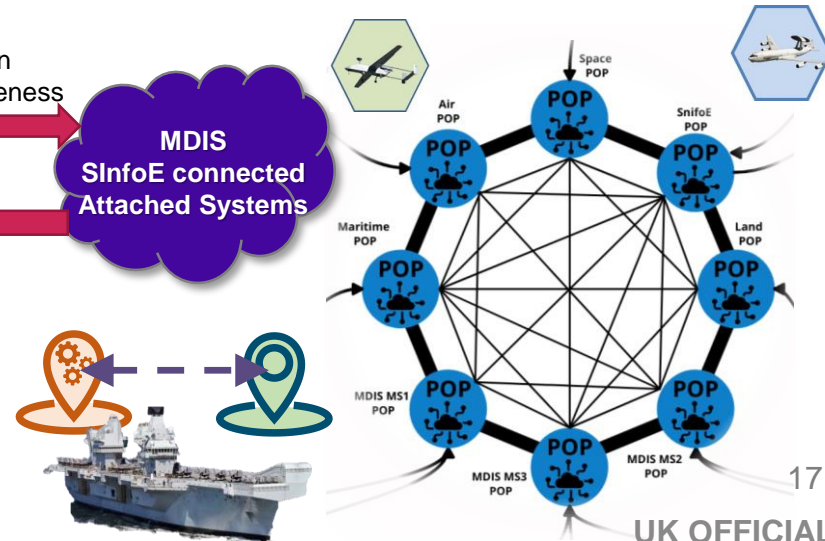
Open C5ISR Test ANd Evaluation (OCTANE) Environment

- Cloud Environment accredited for OS, Low barrier to entry
- Delivered under Communications and Networks Programme
- Supporting wider Portfolio: AI, MarSys, SR Projects and FLC

Strike Net & MDIS ACHERON



- Strike Net will be integrated to wider SInfoE to share and receive Situational Awareness services.
- Strike Net will be integrated to the Geographical Information Service (GIS) to task and receive satellite imagery from Minerva.



Strike Net:

- Strike Net's remit is wide, including the inter-platform networks, data standards and architecture for crewed/uncrewed integration and control in all aspects of maritime domain.
- StrikeNet and SInfoE are complementary capabilities with potential for future mutual benefit and convergence assisted by the Integrated Design Authority as the digital battlespace continues to transform.

SInfoE:

- Strike Net could use SInfoE's methods for search and discovery to access multi-domain services.
- Strike Net could use the SCP protocol including assurance mechanisms

SInfoE and Strike Net have the same goal to utilise NATO, MOD, Industry standards and Maritime data standards: within SCP schemas for SInfoE.

1. Improved operational effectiveness

- Faster and better-informed decision-making

2. Increased information exchange security

- Utilising Data Centric Security (DCS) supporting MOD UK StratCom efforts in Zero Trust Architecture (ZTA) and progressing Data Centric Interoperability

3. Increased agility

- Greater flexibility to changing circumstances, organisational structures and technology

4. Better collaboration

- More effective and strengthened partnerships with allies, partners, and other stakeholders

5. Increase Efficiency and Reduced Integration Costs

- Reducing duplication (burden-sharing) and complexity of systems and processes

6. Engineering Efficiency

- Each MOD system has to create one interface to the SInfoE, not multiple interfaces
- Integration done by attached system manufacturer rather than a systems integrator
- More likely to be a Cat C/D Project than Cat A

How has MDIS progressed SInfoE architecture?

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- Conduct R&D into those areas where the system resulting from ACHERON does not yet fulfil complete SInfoE architecture initial requirements
 - International/Intra-governmental/Inter-agency development and testing
 - Significant thought and experimentation on how best to assure the information within the SInfoE
 - Further develop resilience to Denied, Degraded, Intermittent and Low-Bandwidth environments

- Delivery
 - How best to leverage scarce MOD investment sources to complete development, and
 - Exploit effectively within MOD Equipment Programmes



Questions?

[dstl] The Science Inside

Discover more

