

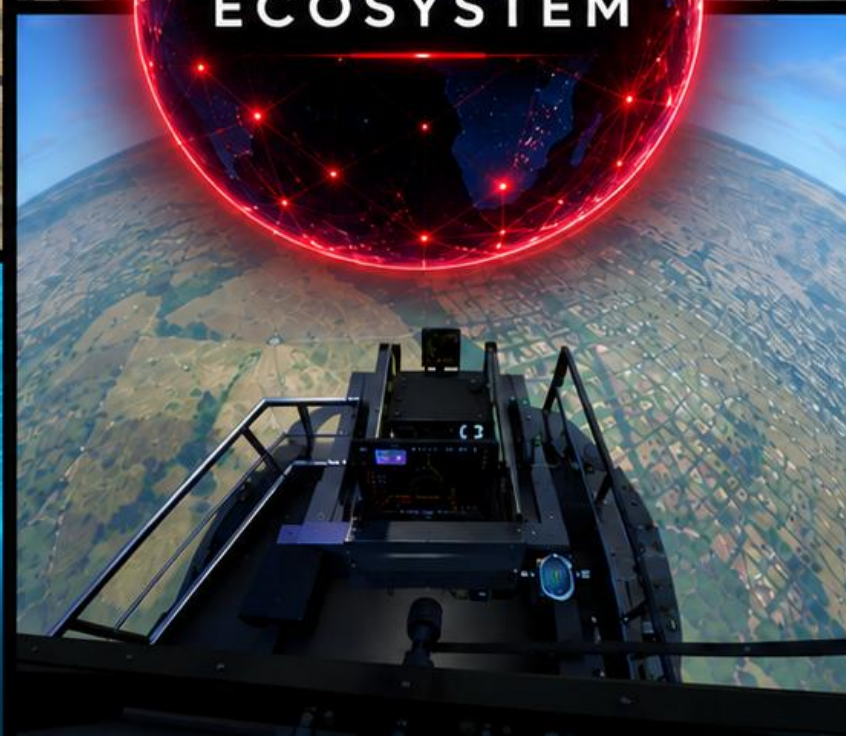
ANTYCI

CA²X² Forum 2026

What NATO's Future Means for Nations Today

See the future

 ST Engineering



Simulation Ecosystems and NATO's NexGen M&S



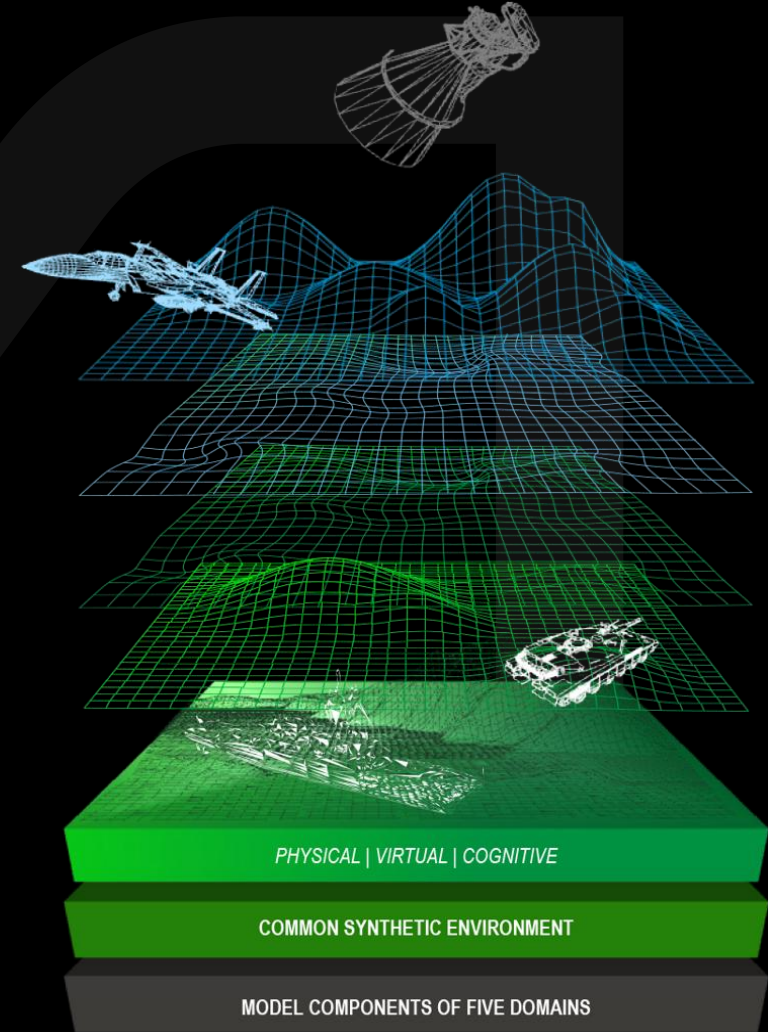
Multi-Domain Operations demand training across land, air, maritime, cyber, space *and* the cognitive/information dimensions



Nations hold capable simulation systems that were procured independently and don't easily connect



NATO's proposed answer: shift focus from standalone systems to integrated *simulation ecosystems*



Why the Old Model is Struggling



Legacy standards (DIS, HLA, FMN) were built for narrower, largely single-domain federation problems



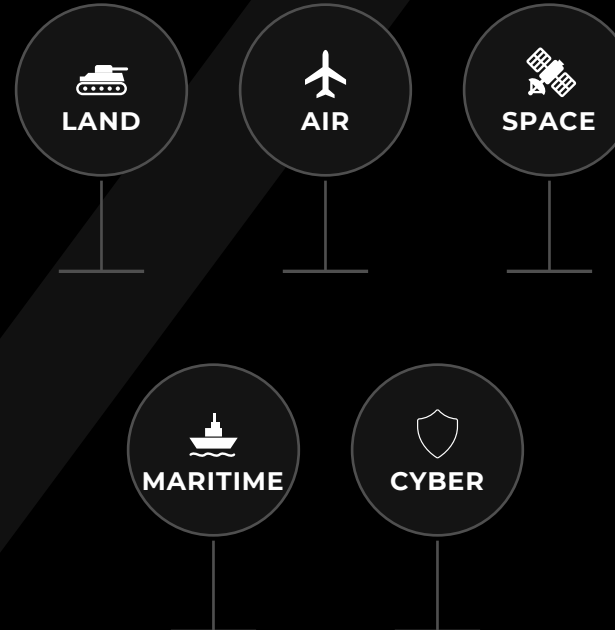
Today's requirement: multi-domain fidelity, AI-enabled behaviours, information/cognitive effects, distributed multinational play



Practitioners report most effort now goes into preparing and connecting systems, not delivering training itself

ISOLATED SYSTEMS

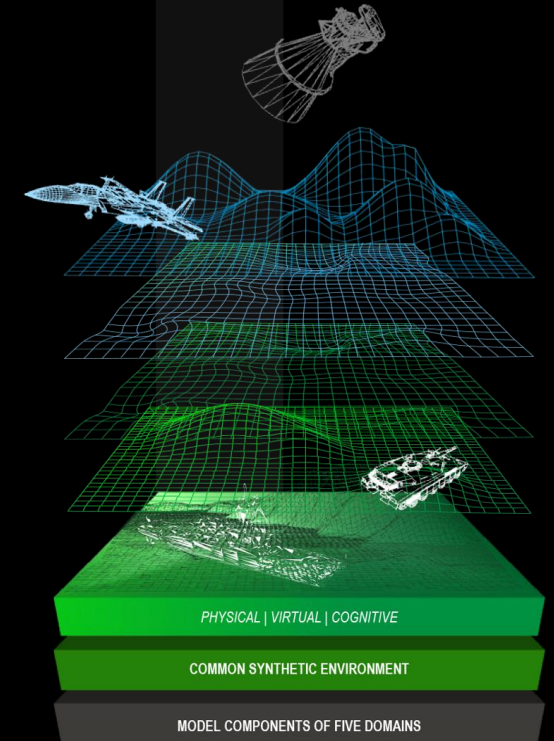
Repeated integration effort



NO SHARED LAYER

SHARED ECOSYSTEM

Connect once. Reuse.



ONE INTEGRATION FABRIC

From Systems to Ecosystems: A Definitional Shift



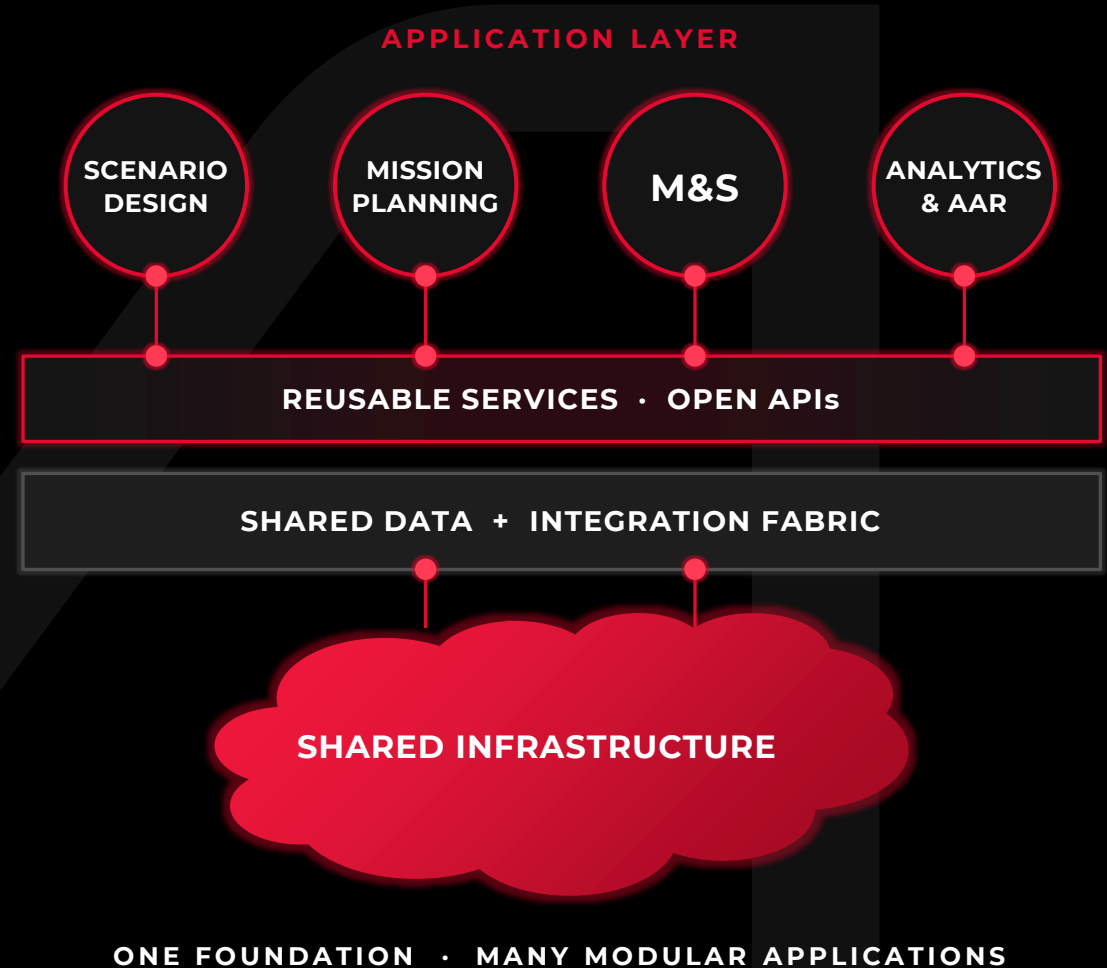
An ecosystem is open architecture + reusable services + shared data + modular insertion, not a product



Spans the full readiness continuum: scenario generation, planning, simulation, decision support, analytics, AAR

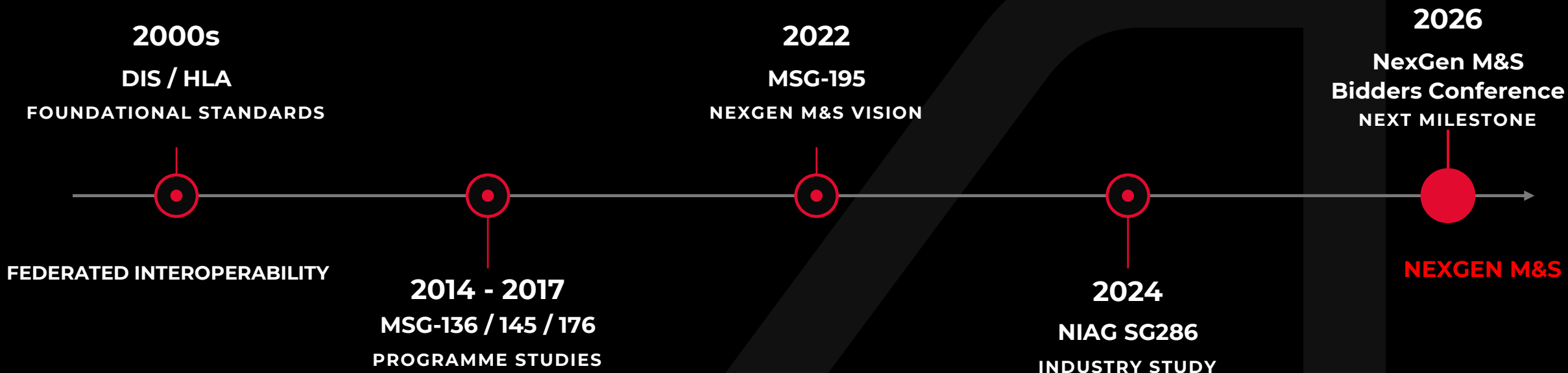


Cloud-computing analogy: shared infrastructure, many applications, one foundation



NATO's Journey Towards NexGen M&S

EVOLUTION TOWARDS A COMMON SYNTHETIC ENVIRONMENT



Foundations: DIS, HLA (IEEE 1516-2020) and Federated Mission Networking over two decades

NATO MSG studies (MSG – 136, 145, 176, 195) piloted service-oriented architectures and Modelling & Simulation as a service

NexGen M&S (2026 Bidders Conference) consolidates this into a single Common Synthetic Environment vision

What NATO Means by a Common Synthetic Environment



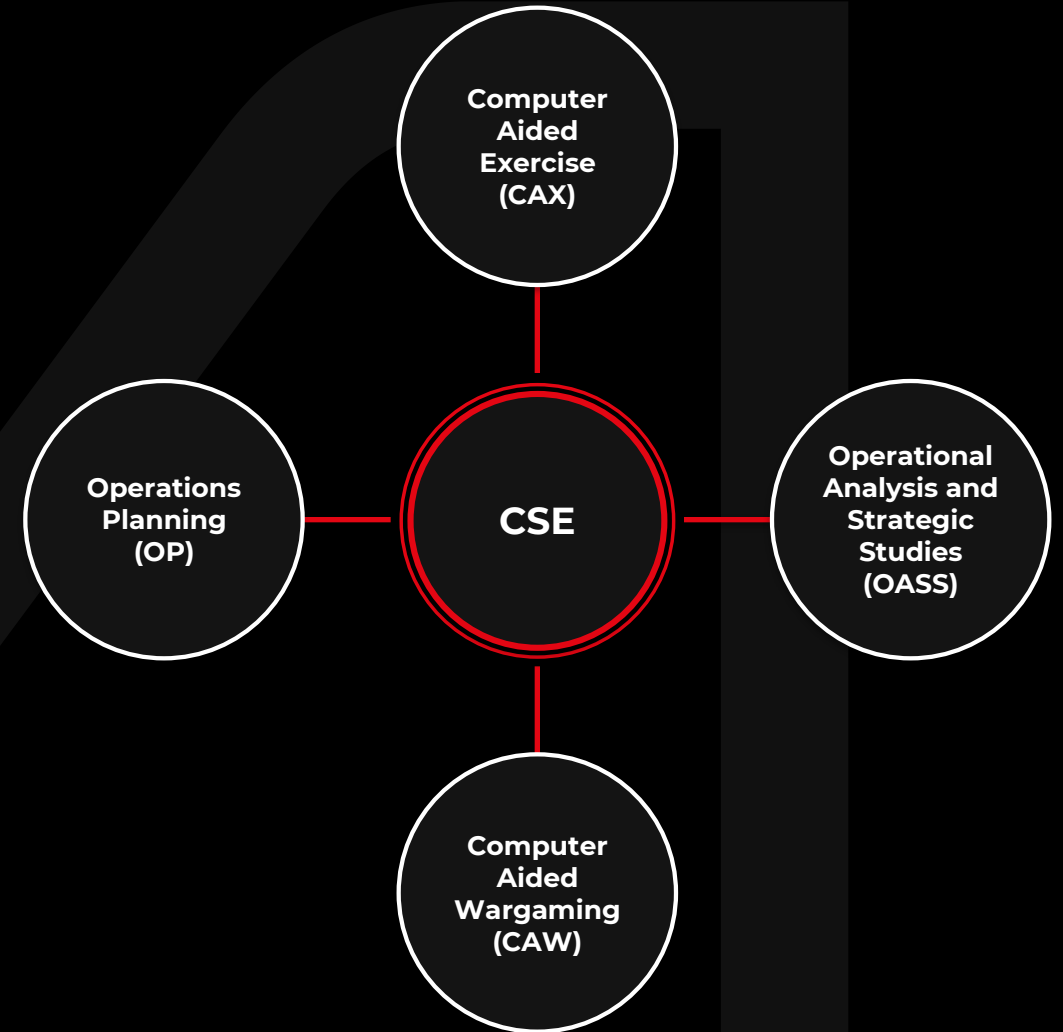
A shared foundation of terrain, ORBAT, behavioural models and data exchange — not a single software product



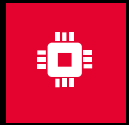
Enables reuse: one force structure can support analysis, wargaming, training and planning alike



Must accommodate tiered sensitivity, open source reference data through to nationally validated sovereign datasets



A Practical Ecosystem Architecture Example



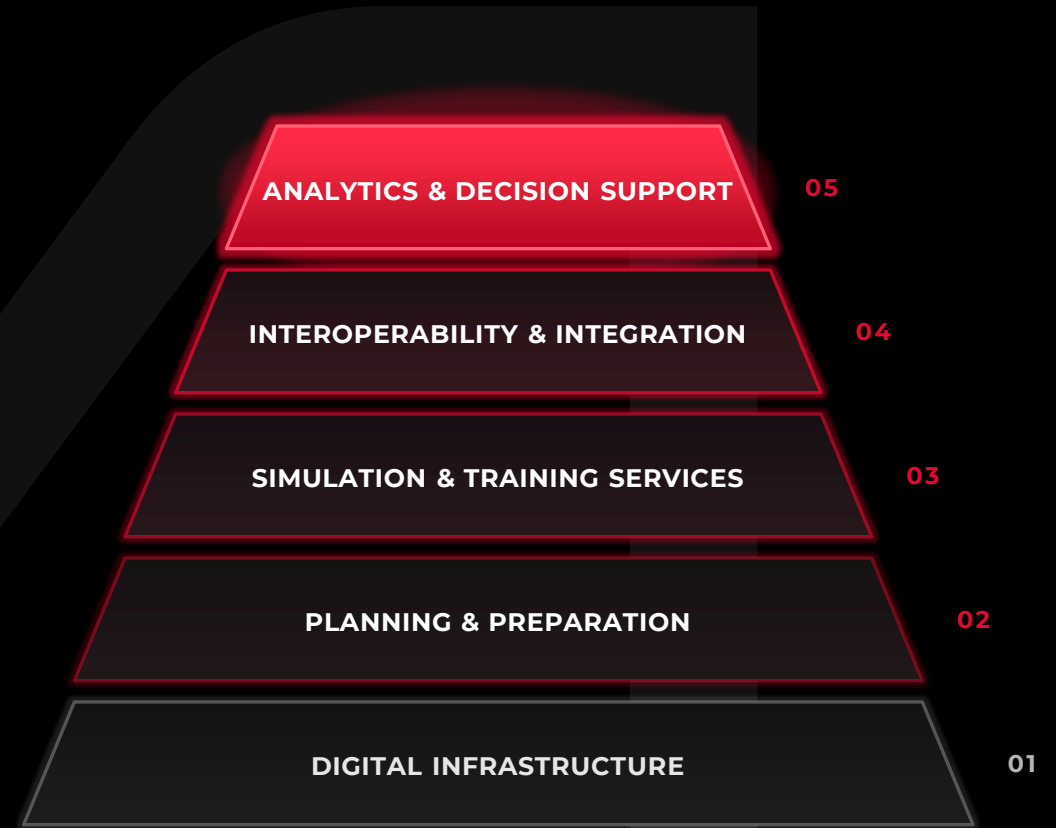
Five layers: Digital Infrastructure; Planning & Preparation; simulation & training services; interoperability & integration; analytics & decision support



AI-assisted services are targeted at scenario generation and analytics, to reduce manpower and specialist-time burden



Interoperability depends as much on API openness and data quality as on standards compliance



FOUNDATION • SERVICES • INSIGHT

Sovereignty and the Federation Model

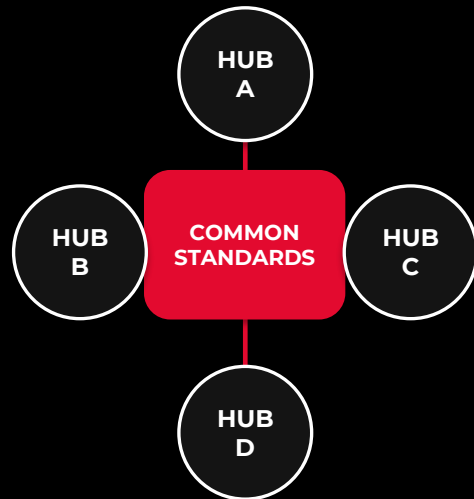
CENTRALISED SYSTEM



One architecture
for every nation

vs

FEDERATION MODEL



Sovereign national hubs
linked by common
standards



Nations will not converge on identical systems, nor should they be expected to



Real challenge is interoperability while preserving sovereign capability, industrial policy and procurement diversity



A federation of national ecosystems, bound by common standards, may be more realistic than one centralised NATO system

Case study 1: National Ecosystems and AI Services

NATIONAL PROGRAMMES ALREADY MOVING THIS WAY



MAK ONE

LS Core 2.0 (Australia)

Constructive, virtual and Command a Post Exercise (CPX) systems federated via shared terrain and scenario repositories



US Synthetic Training Environment

Pursuing AI-assisted scenario generation and information-environment simulation



Ambition, Not Yet Evidence

Both are illustrative of ambition and direction, not independently verified evidence of outcomes

Sources: Australian Army Simulation Wing, SimTecT 2021; Australian National Audit Office, Major Projects Report 2015–16 (JP 2072 Phase 3A); PEO STRI, Synthetic Training Environment Operational Overview, 2022. Programme descriptions, not independently audited outcome data.

Case Studies II: Interoperability as an Operational Enabler



RAF Gladiator: MOD-owned system (DE&S-operated) federating training devices from multiple suppliers — Boeing Defence UK as prime, MAK's VR Forces for computer-generated forces, additional plug-ins for comms and Link 16 — into one hub-and-spoke synthetic environment



Demonstrates integration of existing platform simulators (Typhoon, F-35, Rivet Joint, Joint Fires) into a shared environment, rather than replacing them

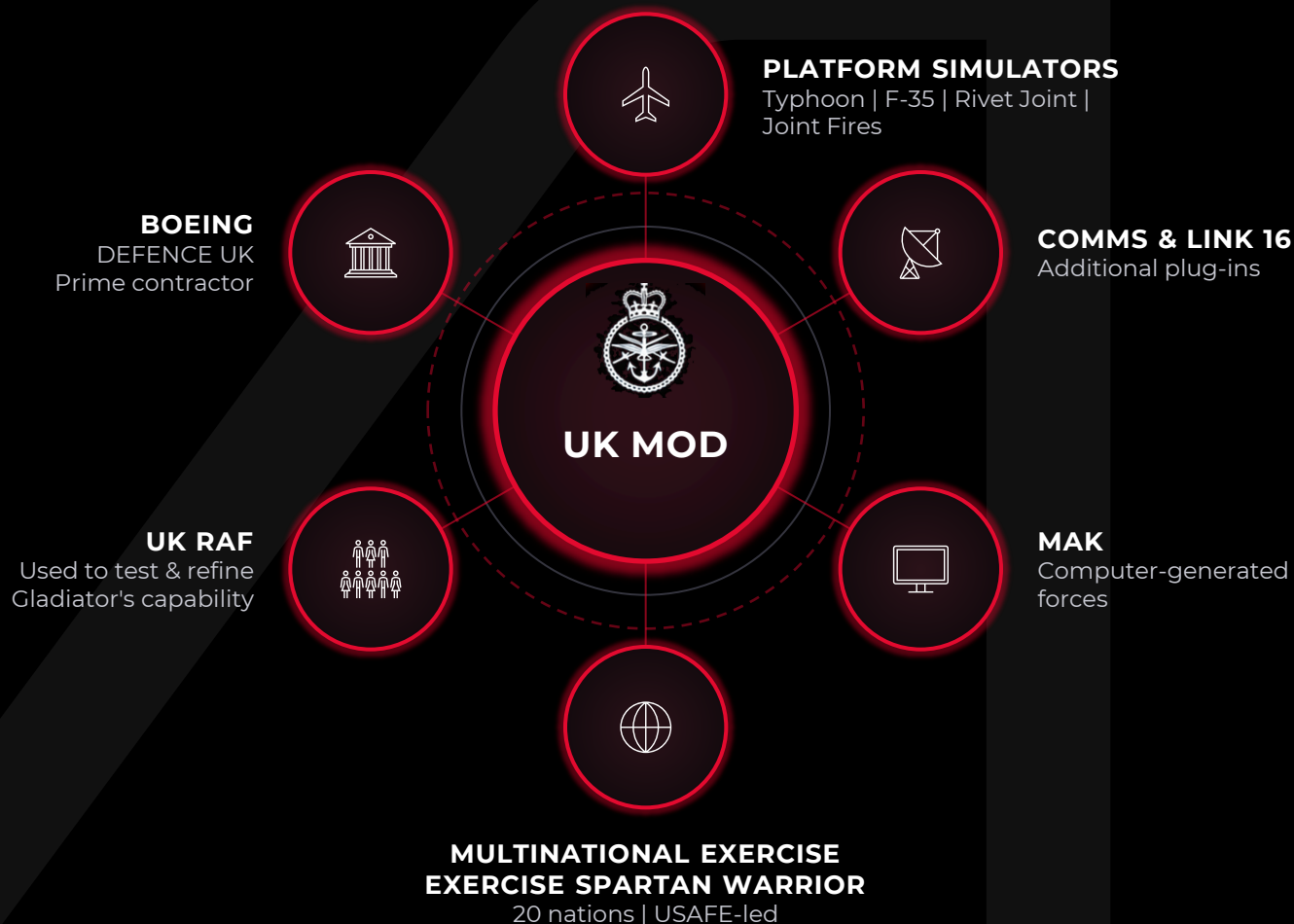


Used as a UK contributing node in the 20-nation, USAFE-led Exercise Spartan Warrior — genuine evidence of the federation model operating in a live multinational exercise, and used by the RAF itself to test and refine Gladiator's capability



RAF Gladiator: Federating Simulators, Strengthening Readiness

RAF Gladiator is a UK MOD-owned system (DE&S-operated) federating training devices from multiple suppliers.



Interoperability: Beyond Standards



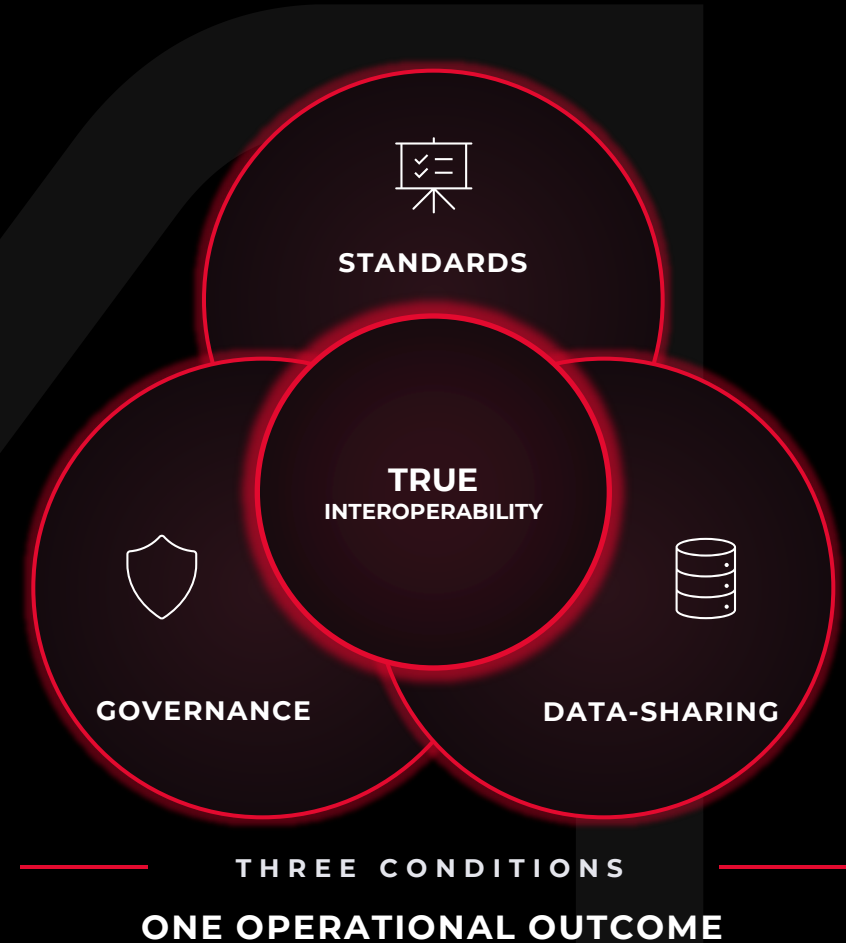
Standards compliance (HLA/DIS/FMN) is necessary but not sufficient, implementation and API openness vary widely



Interoperability is a governance, data-sharing and trust problem as much as a technical one



CWIX validates interoperability in practice, but cost and access barriers disadvantage SMEs and smaller nations



Conclusions and Questions for the Forum



future readiness depends on ecosystems, not standalone



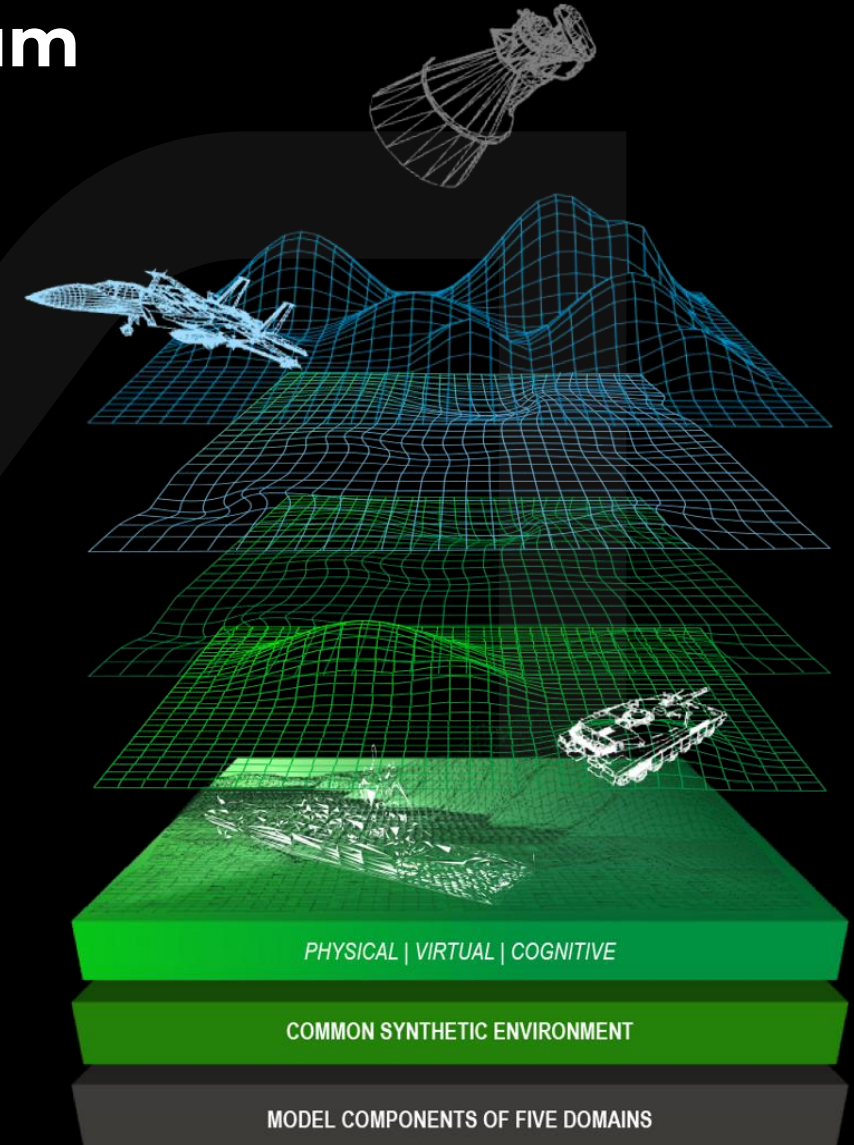
For nations the opportunity is to adopt ecosystem principles today



How do we transform decades of successful experimentation into enduring operational capability?



Who is responsible for maintaining ecosystem coherence at a national level?



Thank you



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