

TRAINING

(HU) Integrated European Joint Training and Simulation Centre (EUROSIM)

(Established in November 2019)

For Public Release

PROJECT DESCRIPTION

The EUROSIM concept intends to fulfil the capability goals providing solution to missing capability in the field of multinational joint training and military exercises. It will contribute to battalion-level training and above as well to raise the overall level of such trainings by exploiting and integrating existing but geographically spread training sites into a networked training system. The prearranged integrated system ensures the EU Member States' forces' concerted and harmonized training. The System can handle the structure of various service branches of the military and also integrates with systems of civil and non-military organizations (police, disaster relief, healthcare, cyber, NGO's, counterterrorism). The establishing of the technical conditions is the most important cornerstone of the project.

To have a real-time connection and communication between the dispersed simulation equipment, project members need to establish a protected, cloud-based network system based on the Modelling and Simulation as a Service (MSaaS) model of cloud computing, which is considered a very efficient approach for building next-generation simulation systems, which also provides a suitable digital environment for the application of Emerging and Disruptive Technologies (EDTs). EUROSIM MSaaS provides a framework that enables credible and effective M&S services available on-demand to a large number of users. The M&S Services are made available in an efficient and cost-effective way to provide the required level of agility to enable convenient and rapid integration of capabilities.

The technological architecture of the system is based on hybrid cloud technology formed from national, EU and NATO level clouds, in which integrated national, EU and NATO level Modelling and Simulation capabilities (infrastructures, software, platform and applications) are available through a digital platform (portal). The platform operates in standalone and federated mode as well.

- Standalone operation mode (national cloud): This level indicates a stand-alone MSaaS Capability as national cloud: for example, the MSaaS Capability resides on a national and restricted network. At this level the MSaaS Capability only provides services to the national organisations.
- Federated (allied) operation mode: At this level the MSaaS Capability has the ability to provide Simulation Services to and consume Simulation Services from another MSaaS Capability. The MSaaS Capability has the ability to participate in a federated or/and an allied framework for MSaaS environment.

For easier project management and EDA Cat.B support's request, the project was divided into two phases: Phase 1 and Phase 2. The first one includes all the preparatory work, notably market research, harmonisation of requirements, R&T activities and the development of strategic documents. The second one concentrates on the execution and the closing.



HU, FR, DE, PL, SI

EL, LT, LV, NL, PT,
ROIDEATION
INCUBATION
EXECUTION
CLOSING**Contribution to
the more binding
commitments**
Yes**Capability
Perspective****EU CDP priority**Future Soldier
System
Cohesive and
Well-Trained
Militaries**CARD references**

Soldier Systems

**Operational
Viewpoint****HICG**Common
Exercises &
Training**EDA support**

No

OBJECTIVES/PRODUCTS

The objective of the project is to establish a tactical Training and Simulation HUB, which, through decentralized governance, involving multinational training capacities could integrate tactical training and simulation sites in Europe into a real-time, networked, and connected system, and also integrates with the systems of civil and non-military organizations (police, disaster relief, healthcare, cyber, NGO's, counterterrorism). The EUROSIM HUB complex IT Central Infrastructure is based on a cloud service model: the role of edge computing is to distribute computation workload required for the simulation among the edge nodes and the central cloud, in order to maximize execution speed and minimize latency.

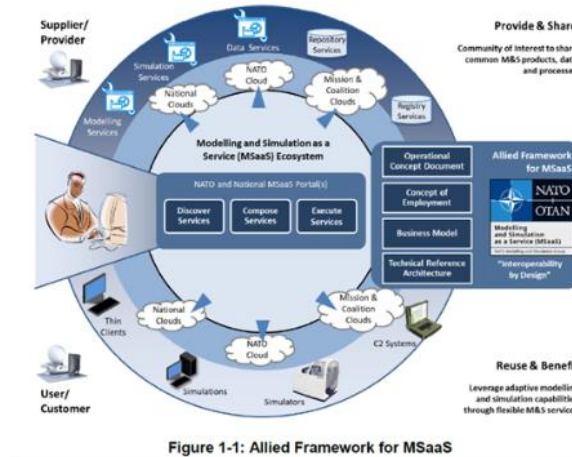
EUROSIM should be built as an open system based on the Modeling and Simulation as a Service (MSaaS) model to allow connection of all national hubs individually without having to rely on a central service (mesh-functionality). The EUROSIM MSaaS based on "Allied Framework for MS as a Service" (MSaaS) (NATO STANAG – Figure 1-1) ecosystem in the NATO coalition will be based on a federated approach of national and NATO services and service providers that are enabled by a common technical reference architecture, common processes and a common business model. EUROSIM MSaaS provides a framework that enables credible and effective MS services available on-demand to a large number of users. The M&S Services available in an efficient and cost-effective way to provide the required level of agility to enable convenient and rapid integration of capabilities. Cloud computing supports the four service models:

- Software as a Service (SaaS).
- Platform as a Service (PaaS).
- Infrastructure as a Service (IaaS).
- Training as a Service (TaaS).

The SaaS model allows the consumer to use the provider's applications running on a cloud infrastructure without the consumer needing to manage or control the underlying hardware and software infrastructure. The IaaS model allows the consumer to utilize processing, storage, networks and other fundamental computing resources, allowing the consumer to deploy and run arbitrary software. In the middle, the PaaS model allows the consumer to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider.

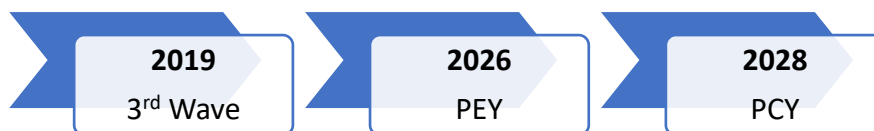
TaaS model is a training technology also based on the concept of Software as a Service that can be coupled with the MSaaS whereas MS is used to deliver a training. TaaS, in fact, is a specialisation of the MSaaS domain in the field of training that uses SaaS paradigm to deliver a new concept of training as service and no longer as a product. Therefore, from this perspective, the goal of MSaaS is to provide MS applications as a cloud-computing service model so that they are available on-demand, over the network, with the ability to charge per-use rather than needing to purchase entire M&S products. This approach reduces cost of ownership for the consumer (pay per use, no maintenance of local installations, less effort for deployment and maintenance).

The Cloud Model is composed of five essential characteristics, three service models and four deployment models: Characteristics: On-demand self-service; Broad network access; Resource pooling; Rapid elasticity; Measures service. Service Models: Software as a Service (SaaS); Platform as a Service (PaaS); Infrastructure as a Service (IaaS). Deployment Models: Private Cloud; Community Cloud; Public Cloud; Hybrid Cloud. The desire here is for MS to make effective use of existing cloud-computing service models. It focusses on how cloud-computing components, in particular the IaaS, PaaS, and SaaS models, can best be used in support of MS.



INDICATORS

Project Execution Year (PEY) and Project Completion Year (PCY):



DELIVERABLES ACHIEVED

- Common Requirements Concept and Initial Business Case / Model for M&S as a Service harmonization with NATO SANAGs and STO MSG technological reports.
- Harmonization with EU Modelling and Simulation Framework and NATO STANAGs.

CRITERIA FOR SUCCESS

- Project is implemented below the approved budget.
- Best value for money.

Implementation of the project may include the following:

- MSaaS implementation on EU (NATO) level.
- MSaaS implementations on national level.
- Mission-specific MSaaS implementations.
- MSaaS implementations on different security levels (e.g., EU and NATO Unclassified, EU and NATO Secret).

Doctrine:

- MSaaS is considered a modernization of existing M&S capability and technology. Although major doctrine changes are not expected, minor revisions or adaptations may be required.

Organization and Policy (How to organize EU/NATO M&S structures):

- The need for an EU/NATO Framework for M&S as a Service results from national policies like United Kingdom's Defence Information and Communications Technology Strategy, United States Department of Defence (DoD) Cloud Computing Policy, the Italian Ministry of Defence (MoD) NEC and NATO policies.
- Establishing the EU/NATO Framework for M&S as a Service requires installation of an MSaaS Governance Authority (as defined by AMSP-02 / STANREC 4794) and accompanying policies (e.g., a policy mandating the sharing of M&S resources).

- Establishment of national and EU/NATO “Simulation Centers by cloud migration” that have oversight of MSaaS activities.
- Adopting the EU/NATO Framework for M&S as a Service will influence procurement as M&S services may be acquired on a pay-per-use or share-principle and ownership is not necessarily transferred. This has impacts on the relationship between the provider (e.g., industry) and buying authorities.

Leadership (Chain of Command and Control and relationships in EU/NATO and nations according to MSaaS):

- To realize the full potential of MSaaS an enterprise approach is required where senior leaders approve the MSaaS concept and support the transformation activities.

Materials (All the hardware, software, equipment and systems related to MSaaS necessary to EU/NATO and nations to manage, to support and to develop M&S Services):

- The MSaaS concept requires establishment of a cloud infrastructure and appropriate infrastructure (e.g., network connections).
- Full adoption of MSaaS requires gradual transformation of existing M&S applications, data, etc. to comply with the MSaaS concept.
- Personnel (Availability of qualified people according to MSaaS needs).

Facilities (Data Centers, Training facilities and Battle Labs available to provide and to consume MSaaS services):

- Cloud infrastructure and appropriate data centers are required.
- Training facilities (e.g., simulator centers, classrooms) need to be equipped with appropriate infrastructure and need to be connected to simulation networks.

Interoperability (How to provide interoperable and accessible MSaaS services in EU/NATO and nations):

- The MSaaS concept promotes an open systems approach and strongly favors the adoption of open standards (for data formats, protocols, etc.). If required, existing proprietary solutions need to be replaced by open standards.
- To enable the MSaaS concept, sharing of M&S resources needs to be mandated.
- Exchange of classified information (either single-level or multi-level security) may require adaptation of security policies and alignment between EU/NATO and nations.
- Continuous and effective cooperation with other participating Member States’ implementing industries.