

NETN FOM

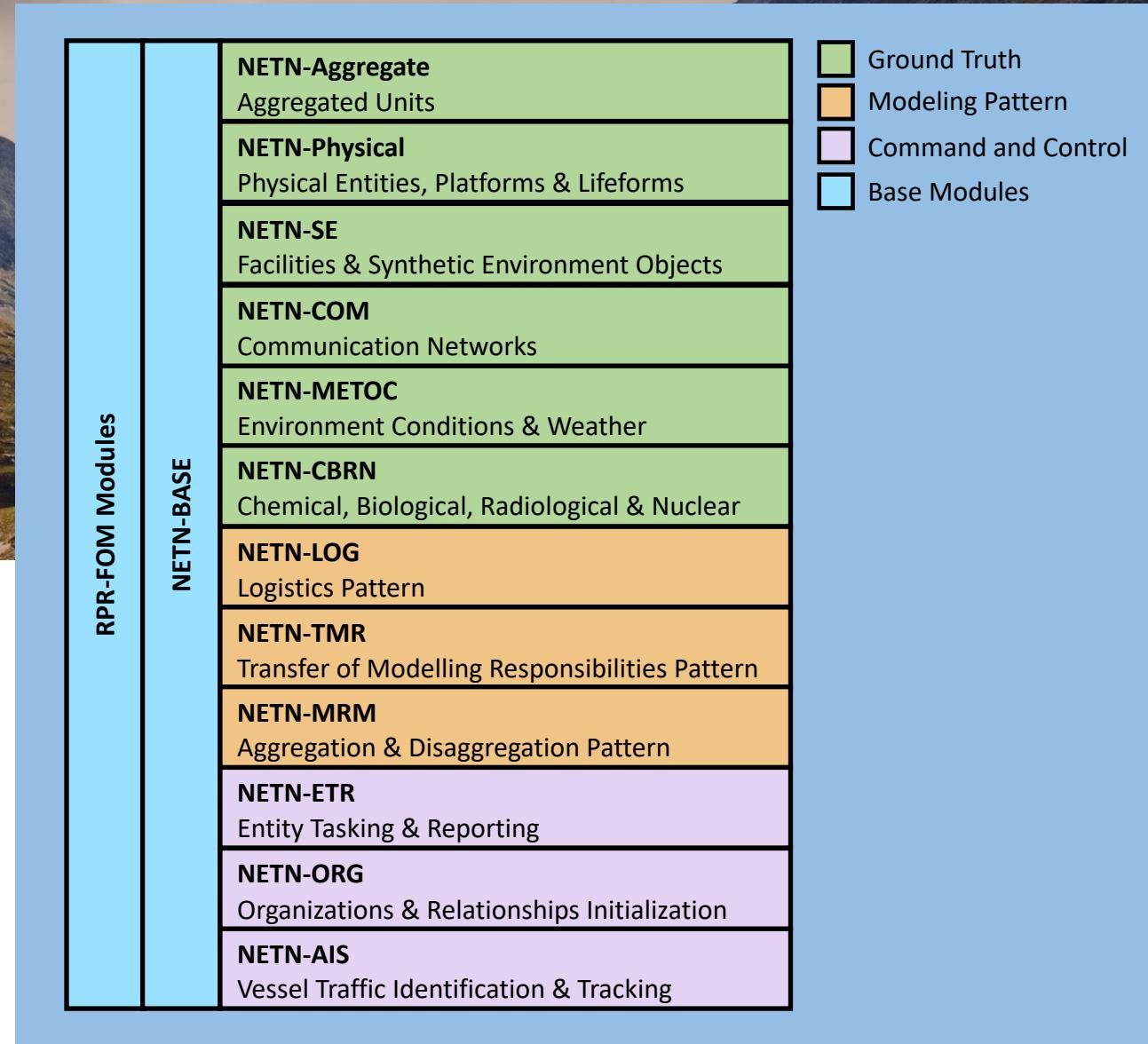
NATO Education and Training Network (NETN)
Federation Object Model (FOM)

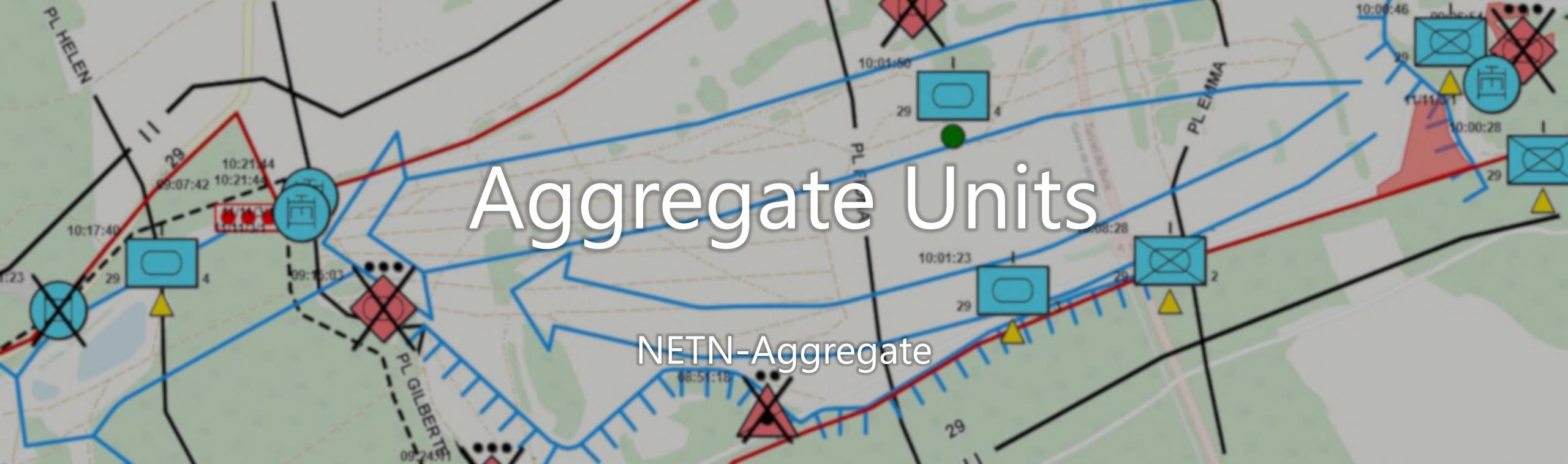
- NETN FOM is a modular **IEEE 1516** (NATO STANAG 4603) High-Level Architecture (**HLA**) Federation Object Model (FOM)
- NETN FOM is part of the **Allied Modelling and Simulation Publication AMSP-04** (NATO STANREC 4800)
- **NETN FOM v3.0** is Modular



NATO Modelling and Simulation Group
<https://www.sto.nato.int>

NETN FOM v3.0 Modules





Aggregate Units

NETN-Aggregate

- The **NETN Aggregate and Physical** FOM modules are extensions to the corresponding RPR-FOM v2.0 FOM modules for representing Ground Truth state of Aggregate Entities, Platforms, Equipment, Life Forms, Cultural Features and Environment Objects.
- UUID attribute based on MSDL/NETN-ORG are used to uniquely identify simulated entities in a scenario.

Physical Entities, Platforms & Lifeforms

NETN-Physical

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Facilities and Synthetic Environment

NETN-SE

Communication Networks

NETN-COM

Environment Conditions & Weather

NETN-METOC

- Representation of environment conditions associated with geographical locations, areas, simulated entities, and terrain features.
 - **Terrain Surface**
 - **Water Surface**
 - **Atmospheric Layers**
 - **Subsurface volumes of water**

Chemical, Biological, Radiological and Nuclear M&S

NETN-CBRN

- The **NETN Chemical, Biological, Radiological and Nuclear (CBRN)** module defines a standard way to distribute dispersion calculations and information about dispersion effects on entities and the environment.
 - **Source release & Hazard area**
 - **CBRN Detectors**
 - **CBRN Effects**
 - **Protective measures**



Organizational Relationships and Initialization

NETN-ORG

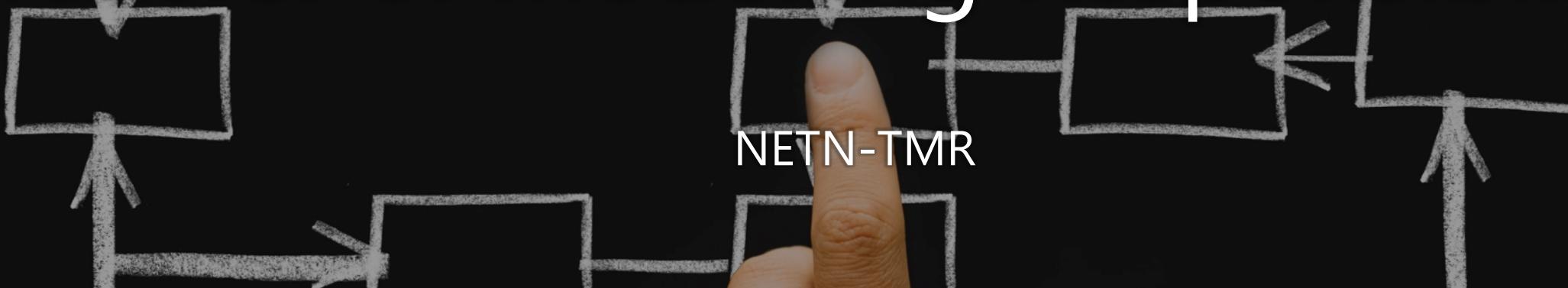
- The **NETN-ORG** FOM module provides a standard way of representing the state, organization and relationships of units at a given point in time. Used for (re-)initialization of scenarios and for distributing dynamic changes of organizational relationships.
 - **Dynamic Task Organisation**
 - **Force Relationships**
- Based on SISO-STD-007-2008: Military Scenario Definition Language (MSDL) with extensions.

Logistics Pattern

NETN-LOG

- The **NETN Logistics (LOG)** module defines patterns used by federated systems to negotiate and collectively simulate logistics operations involving resource **transfer, repairs** and **transport**.
 - Refuelling of aircraft at an airbase or in the air
 - Transport of supplies between facilities
 - Repair of damaged platforms in a facility or by unit
 - Transport of units, platforms, and humans by train, ship, or aircraft

Transfer of Modelling Responsibilities

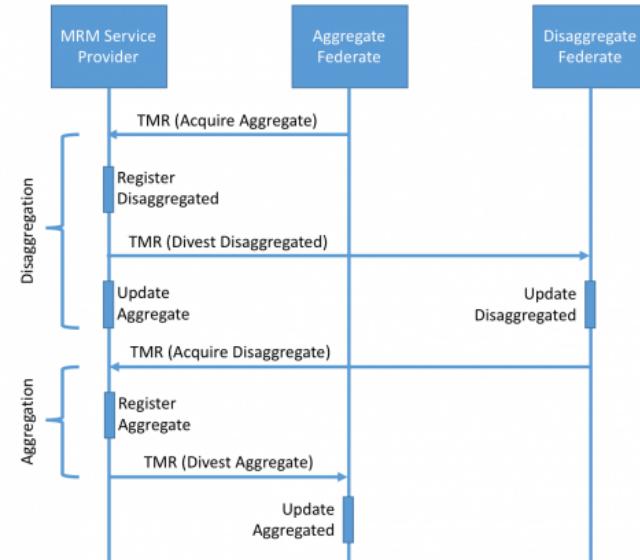


- The **NETN Transfer of Modelling Responsibility** (TMR) module is used to dynamically change which system is responsible for the simulation of a specific object in the synthetic environment.
 - Transfer from a Live to a Virtual or Constructive simulation
 - Transfer between Virtual and Constructive simulations
 - Transfer between hi- and low-fidelity models
 - Transfer to allow backup, maintenance or load-balancing
 - Transfer of certain attributes to functional models such as movement, damage assessment etc.

Aggregation & Disaggregation

NETN-MRM

The **NETN Multi-Resolution Modelling (MRM)** module provides a standard way to manage aggregation and disaggregation of simulated units and physical entities.

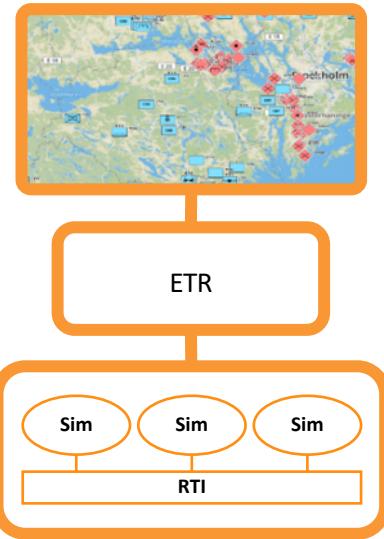


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Entity Tasking & Reporting

NETN-ETR

The **NETN Entity Tasking & Reporting (ETR)** module represent lower-level tasks suitable for providing simulation instructions to federates modelling individual units or platforms.



Vessel Identification and Data

NETN-AIS

- Simulation oriented representation of vessel traffic identification and data used by the international Automatic Identification System (AIS)
 - **Navigation Data** including position, speed, direction etc.
 - **Voyage Data** including destination, route, cargo etc.



NETN FOM

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- All NETN Modules are available on GitHub
 - <https://github.com/AMSP-04>



NETN FOM

Maintained

- All updates and versioning of this work is
 - coordinated by the NATO Modelling and Simulation Coordination Office (**MSCO**),
 - managed by the NATO Modelling and Simulation Group (**NMSG**) and
 - performed as NATO Science and Technology Organization (**STO**) technical activities
 - in support of the NMSG Modelling and Simulation Standards Subgroup (**MS3**).