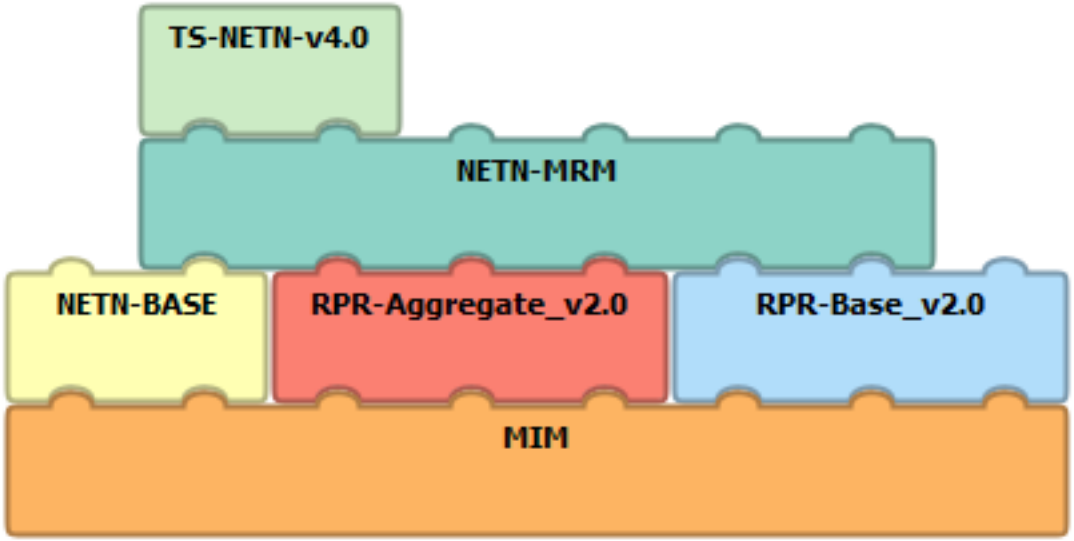
Project TS-NETN



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1. Module RPR-Base_v2.0

Information

Name:	SISO-STD-001.1-2015 - Real-time Platform Reference Base FOM Module
Type:	FOM
Version:	2.0
Modification Date:	2015-08-10
Security Classification:	Unclassified
Purpose:	The RPR FOM supports interoperability for real-time, platform oriented defense simulation.
Application Domain:	All domains
Description:	This module provides a common base for RPR based FOM Modules. It contains common datatypes and the BaseEntity and EmbeddedSystem object class definitions.
Use Limitation:	

Other:	

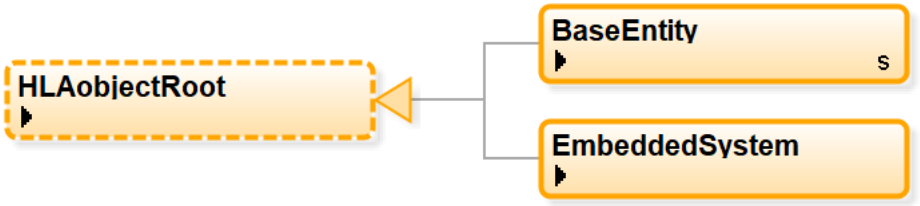
Primary author Point Of Contact

Name:	RPR FOM Product Development Group
Organization:	SISO - Simulation Interoperability Standards Organization
Telephone:	+1 (407) 882-1348
Email:	siso-help@sisostds.org

References

Dependency	Real-time Platform Reference Enumerations FOM Module
Text Document	Standard for Guidance, Rationale, and Interoperability Modalities for the Real-time Platform Reference Federation Object Model (RPR FOM) SISO-STD-001-2015 10 August 2015
Text Document	IEEE Standard for Distributed Interactive Simulation - Application Protocols IEEE Std 1278.1-1995 September 21, 1995
Text Document	IEEE Standard for Distributed Interactive Simulation - Application Protocols IEEE Std 1278.1a-1998 19 March 1998

1.1. Object Classes



1.1.1. **BaseEntity** RPRnoteBase1

Full Name: HLAobjectRoot.BaseEntity

Sharing: Subscribe

Semantics: *A base class of aggregate and discrete scenario domain participants. The BaseEntity class is characterized by being located at a particular location in space and independently movable, if capable of movement at all. It specifically excludes elements normally considered to be a component of another element. The BaseEntity class is intended to be a container for common attributes for entities of this type. Since it lacks sufficient class specific attributes that are required for simulation purposes, federates cannot publish objects of this class. Certain simulation management federates, e.g. viewers, may subscribe to this class. Simulation federates will normally subscribe to one of the subclasses, to gain the extra information required to properly simulate the entity.*

Attributes:

EntityType	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	EntityTypeStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Static	*NA*				
	Semantics					
	The category of the entity.					

EntityIdentifier	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	EntityIdentifierStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Static	*NA*				
	Semantics					
	The unique identifier for the entity instance.					
IsPartOf	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	IsPartOfStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Defines if the entity if a constituent part of another entity (denoted the host entity). If the entity is a constituent part of another entity then the HostEntityIdentifier shall be set to the EntityIdentifier of the host entity and the HostRTIObjectIdentifier shall be set to the RTI object instance ID of the host entity. If the entity is not a constituent part of another entity then the HostEntityIdentifier shall be set to 0.0.0 and the HostRTIObjectIdentifier shall be set to the empty string.					
Spatial	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	SpatialVariantStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change* RPRnoteBase10 RPRnoteBase11 RPRnoteBase12 RPRnoteBase13 RPRnoteBase14				
	Semantics					
	Spatial state stored in one variant record attribute.					
RelativeSpatial	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	SpatialVariantStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change* RPRnoteBase10 RPRnoteBase11 RPRnoteBase12 RPRnoteBase13 RPRnoteBase14				
	Semantics					
	Relative spatial state stored in one variant record attribute.					

HLAprivilegeToDeleteObject *Inherited from HLAobjectRoot in MIM*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	HLAtoken	PS	DA	TS	HLAreliable	
	Update type	**Update Condition**				
	Static	*NA*				
	Semantics					

1.1.2. **EmbeddedSystem**

Full Name: HLAobjectRoot.EmbeddedSystem
Sharing:
Semantics: *A base class used to associate components such as sensor and emitting systems with their parent entity object.*
Attributes:

EntityIdentifier	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	EntityIdentifierStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Static	*NA*				
	Semantics					
	The EntityIdentifier of the object which this embedded system is a part of.					
HostObjectIdentifier	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	RTIobjectId	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Static	*NA*				
	Semantics					
	The RTI object instance ID of the object of which this embedded system is part of.					
RelativePosition	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	RelativePositionStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The position of the embedded system, relative to the host object's position.					

HLAprivilegeToDeleteObject *Inherited from HLAobjectRoot in MIM*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	HLAtoken	PS	DA	TS	HLAreliable	
	Update type	**Update Condition**				
	Static	*NA*				
	Semantics					

1.2. Datatypes

1.2.1. Simple Datatypes

AccelerationMeterPerSecondSquaredFloat32

Representation: HLAfloat32BE
Units: meter per second squared (m/(s^2))
Resolution: NA
Accuracy: NA
Semantics: Linear acceleration vector composed of SI base units. Based on the Linear Acceleration Vector record as specified in IEEE 1278.1-1995 section 5.2.33b.

AngleDegreeFloat32

Representation: HLAfloat32BE
Units: degree (deg)
Resolution: NA
Accuracy: NA
Semantics: Angle, based on unit degree (of arc), unit symbol °.

AngleRadianFloat32

Representation: HLAfloat32BE
Units: radian (rad)
Resolution: NA
Accuracy: NA
Semantics: Angle, based on SI derived unit radian, unit symbol rad.

AngularVelocityRadianPerSecondFloat32

Representation: HLAfloat32BE
Units: radian per second (rad/s)
Resolution: NA
Accuracy: perfect

Semantics: Angular velocity vector composed of SI base units. Based on the Angular Velocity Vector record as specified in IEEE 1278.1-1995 section 5.2.2.

ClockTimeHourInteger32

Representation: HLAinteger32BE
Units: hour
Resolution: 1
Accuracy: perfect
Semantics: Time past on the clock in full hours since a specified point in time.

DepthMeterFloat32

Representation: HLAfloat32BE
Units: meter (m)
Resolution: NA
Accuracy: NA
Semantics: Depth, based on SI base unit meter, unit symbol m.

Float32

Representation: HLAfloat32BE
Units: NA
Resolution: NA
Accuracy: NA
Semantics: Single-precision floating point number.

Float64

Representation: HLAfloat64BE
Units: NA
Resolution: NA
Accuracy: NA
Semantics: Double-precision floating point number.

FrequencyHertzFloat32

Representation: HLAfloat32BE
Units: hertz (Hz)
Resolution: NA
Accuracy: NA
Semantics: Frequency, based on SI derived unit hertz, unit symbol Hz.

Integer16

Representation: HLAinteger16BE
Units: NA
Resolution: 1
Accuracy: perfect
Semantics: Integer in the range [-2^15, 2^15-1].

Integer32

Representation: HLAinteger32BE
Units: NA
Resolution: 1
Accuracy: perfect
Semantics: Integer in the range [-2^31, 2^31-1].

InterrogationsPerSecondFloat32

Representation: HLAfloat32BE
Units: interrogations/second
Resolution: NA
Accuracy: perfect
Semantics: Number of interrogations per second.

LengthMeterFloat32

Representation: HLAfloat32BE
Units: meter (m)
Resolution: NA
Accuracy: NA
Semantics: Length, based on SI base unit meter, unit symbol m.

MassKilogramFloat32

Representation: HLAfloat32BE
Units: kilogram (kg)
Resolution: NA
Accuracy: NA
Semantics: Mass, based on SI base unit kilogram, unit symbol kg.

MeterFloat32

Representation: HLAfloat32BE
Units: meter (m)
Resolution: NA
Accuracy: perfect
Semantics: Datatype based on SI base unit meter, unit symbol m.

MeterFloat64

Representation: HLAfloat64BE
Units: meter (m)
Resolution: NA
Accuracy: perfect
Semantics: Datatype based on SI base unit meter, unit symbol m.

Octet

Representation: HLAoctet
Units: NA

Resolution: 1
Accuracy: perfect
Semantics: Uninterpreted 8-bit value.

PercentFloat32

Representation: HLAfloat32BE
Units: percent (%)
Resolution: NA
Accuracy: NA
Semantics: Percentage

PercentUnsignedInteger32

Representation: RPRunsignedInteger32BE
Units: percent (%)
Resolution: 1
Accuracy: perfect
Semantics: Percentage

PowerRatioDecibelMilliwattFloat32

Representation: HLAfloat32BE
Units: decibel milliwatt (dBm)
Resolution: NA
Accuracy: perfect
Semantics: Power ratio in decibels (dB) of a measured power referenced to 1 milliwatt (mW).

RevolutionsPerMinuteInteger16

Representation: HLAinteger16BE
Units: revolutions per minute (RPM)
Resolution: 1
Accuracy: NA

Semantics: Frequency of rotation, expressed in revolutions per minute.

TemperatureDegreeCelsiusFloat32

Representation: HLAfloat32BE
Units: degree Celsius (C)
Resolution: NA
Accuracy: NA
Semantics: Temperature, based on SI derived unit degree Celsius, unit symbol °C.

TimeMicrosecondFloat32

Representation: HLAfloat32BE
Units: microsecond
Resolution: NA
Accuracy: NA
Semantics: Time, based on SI base unit second, expressed in microsecond, unit symbol s.

TimeMillisecondUnsignedInteger32

Representation: RPRunsignedInteger32BE
Units: millisecond (ms)
Resolution: NA
Accuracy: NA
Semantics: Time, based on SI base unit second, expressed in millisecond, unit symbol ms.

TimeSecondInteger32

Representation: HLAinteger32BE
Units: second (s)
Resolution: 1
Accuracy: perfect
Semantics: Time, based on SI base unit second, unit symbol s.

TimestampUnsignedInteger32

Representation:	RPRunsignedInteger32BE
Units:	3600/(2^31) second
Resolution:	1
Accuracy:	perfect
Semantics:	The time past the hour, scaled so that value 0 represents the start of the hour and value 2^31 - 1 represents one time unit before the start of the next hour, thereby resulting in each time unit representing exactly 3600/(2^31) s, which is approximately 1.67638063 microsecond.

UnsignedInteger16

Representation:	RPRunsignedInteger16BE
Units:	NA
Resolution:	1
Accuracy:	perfect
Semantics:	Integer in the range [0, 2^16-1].

UnsignedInteger32

Representation:	RPRunsignedInteger32BE
Units:	NA
Resolution:	1
Accuracy:	perfect
Semantics:	Integer in the range [0, 2^32-1].

UnsignedInteger64

Representation:	RPRunsignedInteger64BE
Units:	NA
Resolution:	1
Accuracy:	perfect
Semantics:	Integer in the range [0, 2^64-1].

UnsignedInteger8

Representation: RPRunsignedInteger8BE
Units: NA
Resolution: 1
Accuracy: perfect
Semantics: Integer in the range [0, 2^8-1].

VelocityMeterPerSecondFloat32

Representation: HLAfloat32BE
Units: meter per second (m/s)
Resolution: NA
Accuracy: perfect
Semantics: Speed/Velocity in meter per second.

WavelengthMicronFloat32

Representation: HLAfloat32BE
Units: micron
Resolution: NA
Accuracy: perfect
Semantics: Wavelength expressed in micrometer.

1.2.2. Array Datatypes

RPRUserDefinedTag

Element Type: HLAASCIIchar

Cardinality: [8..2147483647]

Encoding: RPRnullTerminatedArray

Semantics: *The array shall be at least 8 bytes (octets) in size, which shall contain the time according to the DIS time stamp field format (IEEE 1278.1-1995 section 5.2.31) converted into hexadecimal American Standard Code for Information Interchange (ASCII) character representation (0-9 and A-F), with leading zeros included. The ordering of the characters shall be in accordance with section 5.1.1 of IEEE 1278.1-1995, that is most significant octet first, with the most significant bits first (i.e. the character for bits 4-7 precedes the character for bits 0-3). This encoding is equivalent to the result of the 'C'-statement "sprintf(UserTag, "%08X", DIStimestamp)," where 'DIStimestamp' is represented in native format.*

More user-supplied information may be included, starting from the 9th character, as specified in the federation agreements.

ArticulatedParameterStructLengthlessArray

Element Type: ArticulatedParameterStruct

Cardinality: Dynamic

Encoding: RPRlengthlessArray

Semantics: *Dynamic array of ArticulatedParameterStruct elements, may also contain no elements. The array is encoded without array length, containing only the elements.*

ClockTimeStructLengthlessArray

Element Type: ClockTimeStruct

Cardinality: Dynamic

Encoding: RPRlengthlessArray

Semantics: *Dynamic array of ClockTimeStruct elements, may also contain no elements. The array is encoded without array length, containing only the elements.*

EntityTypeStructLengthlessArray

Element Type: EntityTypeStruct
Cardinality: Dynamic
Encoding: RPRlengthlessArray
Semantics: *Dynamic array of EntityTypeStruct elements, may also contain no elements. The array is encoded without array length, containing only the elements.*

Float32Array1Plus

Element Type: Float32
Cardinality: [1..2147483647]
Encoding: HLAvariableArray
Semantics: *Generic dynamic array of Float32 elements, containing at least one element.*

Integer16Array1Plus

Element Type: Integer16
Cardinality: [1..2147483647]
Encoding: HLAvariableArray
Semantics: *Generic dynamic array of Integer16 elements, containing at least one element.*

OctetArray

Element Type: Octet
Cardinality: Dynamic
Encoding: HLAvariableArray
Semantics: *Generic dynamic array of Octet elements, may also contain no elements.*

OctetArray1Plus

Element Type: Octet
Cardinality: [1..2147483647]
Encoding: HLAvariableArray
Semantics: *Generic dynamic array of Octet elements, containing at least one element.*

OctetArray2

Element Type: Octet
Cardinality: 2
Encoding: HLAfixedArray
Semantics: *Generic array of two Octet elements.*

OctetArray3

Element Type: Octet
Cardinality: 3
Encoding: HLAfixedArray
Semantics: *Generic array of three Octet elements.*

OctetArray4

Element Type: Octet
Cardinality: 4
Encoding: HLAfixedArray
Semantics: *Generic array of four Octet elements.*

OctetArray7

Element Type: Octet
Cardinality: 7
Encoding: HLAfixedArray
Semantics: *Generic array of seven Octet elements.*

OctetArray8

Element Type: Octet
Cardinality: 8
Encoding: HLAfixedArray
Semantics: *Generic array of eight Octet elements.*

OctetPadding32Array

Element Type: Octet
Cardinality: Dynamic
Encoding: RPRpaddingTo32Array
Semantics: *Generic dynamic array of meaningless Octet elements, to align the subsequent data structure to the next 32 bit octet boundary value (OBV). The array is encoded without array length, containing zero to three elements.*

OctetPadding64Array

Element Type: Octet
Cardinality: Dynamic
Encoding: RPRpaddingTo64Array
Semantics: *Generic dynamic array of meaningless Octet elements, to align the subsequent data structure to the next 64 bit octet boundary value (OBV). The array is encoded without array length, containing zero to seven elements.*

OrientationStructLengthlessArray

Element Type: OrientationStruct
Cardinality: Dynamic
Encoding: RPRlengthlessArray
Semantics: *Dynamic array of OrientationStruct elements, may also contain no elements. The array is encoded without array length, containing only the elements.*

UnsignedInteger16Array1Plus

Element Type: UnsignedInteger16
Cardinality: [1..2147483647]
Encoding: HLAvariableArray
Semantics: *Generic dynamic array of UnsignedInteger16 elements, containing at least one element.*

UnsignedInteger32LengthlessArray

Element Type: UnsignedInteger32
Cardinality: Dynamic
Encoding: RPRlengthlessArray

Semantics: *Generic dynamic array of UnsignedInteger32 elements, may also contain no elements. The array is encoded without array length, containing only the elements.*

UnsignedInteger64Array1Plus

Element Type: UnsignedInteger64
Cardinality: [1..2147483647]
Encoding: HLAvariableArray
Semantics: *Generic dynamic array of UnsignedInteger64 elements, containing at least one element.*

UnsignedInteger8LengthlessArray

Element Type: UnsignedInteger8
Cardinality: Dynamic
Encoding: RPRlengthlessArray
Semantics: *Generic dynamic array of UnsignedInteger8 elements, may also contain no elements. The array is encoded without array length, containing only the elements.*

WorldLocationStructLengthlessArray

Element Type: WorldLocationStruct
Cardinality: Dynamic
Encoding: RPRlengthlessArray
Semantics: *Dynamic array of WorldLocationStruct elements, may also contain no elements. The array is encoded without array length, containing only the elements.*

1.2.3. Fixed Record Datatypes

AccelerationVectorStruct

Encoding: HLAfixedRecord

Semantics: *The magnitude of the change in linear velocity over time.*

Name	Type	Semantic
XAcceleration	AccelerationMeterPerSecondSquaredFloat32	*Acceleration component along the X axis.*
YAcceleration	AccelerationMeterPerSecondSquaredFloat32	*Acceleration component along the Y axis.*
ZAcceleration	AccelerationMeterPerSecondSquaredFloat32	*Acceleration component along the Z axis.*

AngularVelocityVectorStruct

Encoding: HLAfixedRecord

Semantics: *The rate at which the orientation is changing over time, in body coordinates.*

Name	Type	Semantic
XAngularVelocity	AngularVelocityRadianPerSecondFloat32	*Acceleration component about the X axis.*
YAngularVelocity	AngularVelocityRadianPerSecondFloat32	*Acceleration component about the Y axis.*
ZAngularVelocity	AngularVelocityRadianPerSecondFloat32	*Acceleration component about the Z axis.*

ArticulatedParameterStruct

Encoding: HLAfixedRecord

Semantics: *Structure to specify a movable or attached part of an entity. Based on the Articulation Parameter record as specified in IEEE 1278.1-1995 section 5.2.5.*

Note that usage of this datatype for the PhyscialEntity object class attribute ArticulatedParametersArray and MunitionDetonation interaction class parameter ArticulatedPartData shall be in accordance with IEEE 1278.1-1995 Annex A.

Name	Type	Semantic
ArticulatedParameterChange	Octet	*Indicator of a change to the part. This field shall be set to zero for each exercise and sequentially incremented by one for each change in articulation parameters. In the case where all possible values are exhausted, the numbers shall be reused beginning at zero.*
PartAttachedTo	UnsignedInteger16	*Identification of the articulated part to which this articulation parameter is attached. This field shall contain the value zero if the articulated part is attached directly to the entity.*
ParameterValue	ParameterValueVariantStruct	*Details of the parameter: whether it is an articulated or an attached part, and its type and value.*

ArticulatedPartsStruct RPRnoteBase7

Encoding: HLAfixedRecord

Semantics: *Structure to represent the state of a movable part of an entity.*

Name	Type	Semantic
Class	ArticulatedPartsTypeEnum32	*The type class uniquely identifies a particular articulated part on a given entity type. Guidance for uniquely assigning type classes to an entity's articulated parts is given in section 4.8 of the enumeration document (SISO-REF-010).*
TypeMetric	ArticulatedTypeMetricEnum32	*The type metric uniquely identifies the transformation to be applied to the articulated part.*
Value	Float32	*Value of the transformation to be applied to the articulated part.*

AttachedPartsStruct

Encoding: HLAfixedRecord

Semantics: *Structure to represent removable parts that may be attached to an entity.*

Name	Type	Semantic
Station	StationEnum32	*Identification of the location (or station) to which the part is attached.*
StoreType	EntityTypeStruct	*The entity type of the attached part.*

ClockTimeStruct

Encoding: HLAfixedRecord

Semantics: *Specification of the point in time of an occurrence. Based on the Clock Time record as specified in IEEE 1278.1-1995 section 5.2.8.*

Name	Type	Semantic
Hours	ClockTimeHourInteger32	*The number of hours since 0000 hours, January 1, 1970 UTC.*
TimePastTheHour	TimestampUnsignedInteger32	*The time past the hour indicated in the Hours field.*

ConstituentPartRelationshipStruct

Encoding: HLAfixedRecord

Semantics: *The relationship of the constituent part object to its host object. Based on the Relationship record as specified in IEEE 1278.1a-1998 section 5.2.56.*

Name	Type	Semantic
Nature	ConstituentPartNatureEnum16	*The nature or purpose for the joining of the constituent part object to the host object.*
Position	ConstituentPartPositionEnum16	*The position of the constituent part object with respect to the host object.*

DimensionStruct

Encoding: HLAfixedRecord

Semantics: *Bounding box in X,Y,Z axis.*

Name	Type	Semantic
XAxisLength	MeterFloat32	*Length in meters along X axis.*
YAxisLength	MeterFloat32	*Length in meters along Y axis.*
ZAxisLength	MeterFloat32	*Length in meters along Z axis.*

EntityIdentifierStruct

Encoding: HLAfixedRecord

Semantics: *Unique, exercise-wide identification of the entity, or a symbolic group address referencing multiple entities or a simulation application. Based on the Entity Identifier record as specified in IEEE 1278.1-1995 section 5.2.14.*

Name	Type	Semantic
FederateIdentifier	FederateIdentifierStruct	*Simulation application (federate) identifier.*
EntityNumber	UnsignedInteger16	*Each entity in a given simulation application shall be given an entity identifier number unique to all other entities in that application. This identifier number is valid for the duration of the exercise; however, entity identifier numbers may be reused when all possible numbers have been exhausted. No entity shall have an entity identifier number of NO_ENTITY (0), ALL_ENTITIES (0xFFFF), or RQST_ASSIGN_ID (0xFFFE). The entity identifier number need not be registered or retained for future exercises. An entity identifier number equal to zero with valid site and application identification shall address a simulation application. An entity identifier number equal to ALL_ENTITIES shall mean all entities within the specified site and application. An entity identifier number equal to RQST_ASSIGN_ID allows the receiver of the CreateEntity interaction to define the entity identifier number of the new entity. The new entity will specify its entity identifier number in the Acknowledge interaction.*

EntityTypeStruct RPRnoteBase5

Encoding: HLAfixedRecord

Semantics: *Type of entity. Based on the Entity Type record as specified in IEEE 1278.1-1995 section 5.2.16.*

Name	Type	Semantic
EntityKind	Octet	*Kind of entity.*
Domain	Octet	*Domain in which the entity operates.*
CountryCode	UnsignedInteger16	*Country to which the design of the entity is attributed.*
Category	Octet	*Main category that describes the entity.*
Subcategory	Octet	*Subcategory to which an entity belongs based on the Category field.*
Specific	Octet	*Specific information about an entity based on the Subcategory field.*
Extra	Octet	*Extra information required to describe a particular entity.*

EventIdentifierStruct

Encoding: HLAfixedRecord

Semantics: *Identification of an event. Based on the Event Identifier record as specified in IEEE 1278.1-1995 section 5.2.18.*

Name	Type	Semantic
EventCount	UnsignedInteger16	*The event number. Uniquely assigned by the simulation application (federate) that initiates the sequence of events. It shall be set to one for each exercise and incremented by one for each event. In the case where all possible values are exhausted, the numbers may be reused beginning again at one.*
IssuingObjectIdentifier	RTIobjectId	*Identification of the object issuing the event.*

FederateIdentifierStruct

Encoding: HLAfixedRecord

Semantics: *Unique identification of the simulation application (federate) in an exercise, or a symbolic group address referencing multiple simulation applications. Based on the Simulation Address record as specified in IEEE 1278.1-1995 section 5.2.14.1.*

Name	Type	Semantic
SiteID	UnsignedInteger16	*Each site shall be assigned a unique site identification. No individual site shall be assigned an identification number containing NO_SITE (0) or ALL_SITES (0xFFFF). An identification number equal to ALL_SITES (0xFFFF) shall mean all sites; this may be used to initialize or start all sites. The mechanism by which Site Identification numbers are assigned is part of federation agreements.*
ApplicationID	UnsignedInteger16	*Each simulation application (federate) at a site shall be assigned an identification number unique within that site. No simulation application shall be assigned an identification number containing NO_APPLIC (0) or ALL_APPLIC (0xFFFF). An application identification number equal to ALL_APPLIC (0xFFFF) shall mean all applications; this may be used to start all applications within a site. One or more simulation applications may reside in a single host computer. The mechanism by which application identification numbers are assigned is part of federation agreements.*

IsPartOfStruct

Encoding: HLAfixedRecord

Semantics: *Defines the spatial relationship between two objects.*

Name	Type	Semantic
HostEntityIdentifier	EntityIdentifierStruct	*The identifier of the entity of which the object is a constituent part.*
HostRTIObjectIdentifier	RTIobjectId	*The RTI instance identifier of the object of which this object is a constituent part.*
Relationship	ConstituentPartRelationshipStruct	*The relationship of the constituent part object to its host object.*
NamedLocation	NamedLocationStruct	*The discrete positional relationship of the constituent part object with respect to its host object.*

LinearSegmentStruct RPRnoteBase20

Encoding: HLAfixedRecord

Semantics: *Specifies linear object segment characteristics.*

Name	Type	Semantic
SegmentNumber	UnsignedInteger32	*Identifies the individual segment.*
PercentComplete	PercentUnsignedInteger32	*Specifies the percent completion of the segment.*
Location	WorldLocationStruct	*Specifies the location of the segment.*
Orientation	OrientationStruct	*Specifies the orientation of the segment.*
Length	UnsignedInteger16	*Specifies the length of the segment, in meters, extending in the positive X direction.*
Width	UnsignedInteger16	*Specifies the total width of the segment, in meters; one-half of the width shall extend in the positive Y direction, and one-half of the width shall extend in the negative Y direction.*
Height	UnsignedInteger16	*Specifies the height of the segment, in meters, above ground.*
Depth	UnsignedInteger16	*Specifies the depth of the segment, in meters, below ground level.*
DamagedState	DamageStatusEnum32	*Specifies the damaged appearance of the segment.*
Deactivated	RPRboolean	*Specifies whether or not the segment has been deactivated (it has ceased to exist in the synthetic environment).*
Flaming	RPRboolean	*Specifies whether or not the segment is aflame.*
ObjectPreDistributed	RPRboolean	*Specifies whether or not the segment was created before the start of the exercise.*

Name	Type	Semantic
Smoking	RPRboolean	*Specifies whether or not the segment is smoking (creating a smoke plume).*

NamedLocationStruct

Encoding: HLAfixedRecord

Semantics: *The discrete positional relationship of the constituent part object with respect to its host object. Based on the specifications in IEEE 1278.1a-1998 of the IsPartOf PDU 'Location of Part' (paragraph 5.3.9.4e) and 'Named Location' (paragraph 5.3.9.4f) fields.*

Name	Type	Semantic
StationNumber	Integer16	*The number of the particular station at which the constituent part is attached.*
StationName	StationNameLocationVariantStruct	*The name of the station where the constituent part is located.*

OrientationStruct

Encoding: HLAfixedRecord

Semantics: *The orientation of an object in the world coordinate system, as specified in IEEE Std 1278.1-1995 section 1.3.2.*

Name	Type	Semantic
Psi	AngleRadianFloat32	*Rotation about the Z axis.*
Theta	AngleRadianFloat32	*Rotation about the Y axis.*
Phi	AngleRadianFloat32	*Rotation about the X axis.*

RelativePositionStruct

Encoding: HLAfixedRecord

Semantics: *Relative position in right-handed Cartesian coordinates.*

Name	Type	Semantic
BodyXDistance	MeterFloat32	*The distance from the reference location along the X axis.*
BodyYDistance	MeterFloat32	*The distance from the reference location along the Y axis.*
BodyZDistance	MeterFloat32	*The distance from the reference location along the Z axis.*

RelativeRangeBearingStruct

Encoding: HLAfixedRecord

Semantics: *Relative position in polar coordinates.*

Name	Type	Semantic
Range	LengthMeterFloat32	*The range from the reference location.*
Bearing	AngleRadianFloat32	*The bearing from the reference location.*

SpatialFPStruct RPRnoteBase15

Encoding: HLAfixedRecord

Semantics: *Spatial structure for Dead Reckoning Algorithm FPW (2) and FPB (6).*

Name	Type	Semantic
WorldLocation	WorldLocationStruct	*Location of the object.*
IsFrozen RPRnoteBase19	RPRboolean	*Whether the object is frozen or not.*
Orientation	OrientationStruct	*The angles of rotation around the coordinate axes between the object's attitude and the reference coordinate system axes (calculated as the Tait-Bryan Euler angles specifying the successive rotations needed to transform from the world coordinate system to the entity coordinate system).*
VelocityVector	VelocityVectorStruct	*The rate at which an object's position is changing over time.*

SpatialFVStruct RPRnoteBase15

Encoding: HLAfixedRecord

Semantics: *Spatial structure for Dead Reckoning Algorithm FVW (5) and RVB (9).*

Name	Type	Semantic
WorldLocation	WorldLocationStruct	*Location of the object.*
IsFrozen RPRnoteBase19	RPRboolean	*Whether the object is frozen or not.*
Orientation	OrientationStruct	*The angles of rotation around the coordinate axes between the object's attitude and the reference coordinate system axes (calculated as the Tait-Bryan Euler angles specifying the successive rotations needed to transform from the world coordinate system to the entity coordinate system).*

Name	Type	Semantic
VelocityVector	VelocityVectorStruct	*The rate at which an object's position is changing over time.*
AccelerationVector	AccelerationVectorStruct	*The magnitude of the change in linear velocity of an object over time.*

SpatialRPStruct RPRnoteBase15

Encoding: HLAfixedRecord

Semantics: *Spatial structure for Dead Reckoning Algorithm RPW (3) and RPB (7).*

Name	Type	Semantic
WorldLocation	WorldLocationStruct	*Location of the object.*
IsFrozen RPRnoteBase19	RPRboolean	*Whether the object is frozen or not.*
Orientation	OrientationStruct	*The angles of rotation around the coordinate axes between the object's attitude and the reference coordinate system axes (calculated as the Tait-Bryan Euler angles specifying the successive rotations needed to transform from the world coordinate system to the entity coordinate system).*
VelocityVector	VelocityVectorStruct	*The rate at which an object's position is changing over time.*
AngularVelocity	AngularVelocityVectorStruct	*The rate at which an object's orientation is changing over time.*

SpatialRVStruct RPRnoteBase15

Encoding: HLAfixedRecord

Semantics: *Spatial structure for Dead Reckoning Algorithm RVW (4) and RVB (8).*

Name	Type	Semantic
WorldLocation	WorldLocationStruct	*Location of the object.*
IsFrozen RPRnoteBase19	RPRboolean	*Whether the object is frozen or not.*
Orientation	OrientationStruct	*The angles of rotation around the coordinate axes between the object's attitude and the reference coordinate system axes (calculated as the Tait-Bryan Euler angles specifying the successive rotations needed to transform from the world coordinate system to the entity coordinate system).*
VelocityVector	VelocityVectorStruct	*The rate at which an object's position is changing over time.*

Name	Type	Semantic
AccelerationVector	AccelerationVectorStruct	*The magnitude of the change in linear velocity of an object over time.*
AngularVelocity	AngularVelocityVectorStruct	*The rate at which an object's orientation is changing over time.*

SpatialStaticStruct RPRnoteBase15

Encoding: HLAfixedRecord

Semantics: *Spatial structure for Dead Reckoning Algorithm Static (1).*

Name	Type	Semantic
WorldLocation	WorldLocationStruct	*Location of the object.*
IsFrozen RPRnoteBase19	RPRboolean	*Whether the object is frozen or not.*
Orientation	OrientationStruct	*The angles of rotation around the coordinate axes between the object's attitude and the reference coordinate system axes (calculated as the Tait-Bryan Euler angles specifying the successive rotations needed to transform from the world coordinate system to the entity coordinate system).*

VariableDatumStruct RPRnoteBase16 RPRnoteBase17

Encoding: HLAfixedRecord

Semantics: *These fields shall specify the types of variable datum, their length, and their value.*

Name	Type	Semantic
DatumID	DatumIdentifierEnum32	*The fixed datum id represented by a 32-bit enumeration*
DatumLength	UnsignedInteger32	*This field shall specify the length of the variable datum in bits.*
DatumValue	UnsignedInteger64Array1Plus	*Value of the variable datum defined by the Variable Datum ID and Variable Datum length. This field shall be padded at the end to make the length a multiple of 64-bits.*

VelocityVectorStruct

Encoding: HLAfixedRecord

Semantics: *The rate at which the position is changing over time.*

Name	Type	Semantic
XVelocity	VelocityMeterPerSecondFloat32	*Velocity component along the X axis.*
YVelocity	VelocityMeterPerSecondFloat32	*Velocity component along the Y axis.*
ZVelocity	VelocityMeterPerSecondFloat32	*Velocity component along the Z axis.*

WorldLocationStruct

Encoding: HLAfixedRecord

Semantics: *The location of an object in the world coordinate system, as specified in IEEE Std 1278.1-1995 section 1.3.2.*

Name	Type	Semantic
X	MeterFloat64	*Distance from the origin along the X axis.*
Y	MeterFloat64	*Distance from the origin along the Y axis.*
Z	MeterFloat64	*Distance from the origin along the Z axis.*

1.2.4. Variant Record Datatypes

ParameterValueVariantStruct

Encoding: HLAvariantRecord
Discriminant name: ArticulatedParameterType
Discriminant type: ParameterTypeEnum32
Semantics: *Variant record specifying the type of articulation parameter (articulated or attached part), and its type and value.*

Name	Enumerator	Type	Semantics
ArticulatedParts	ArticulatedPart	ArticulatedPartsStruct	*Alternative for an articulated part.*
AttachedParts	AttachedPart	AttachedPartsStruct	*Alternative for an attached part.*

SpatialVariantStruct

Encoding: HLAvariantRecord
Discriminant name: DeadReckoningAlgorithm
Discriminant type: DeadReckoningAlgorithmEnum8
Semantics: *Variant Record for a single spatial attribute.*

Name	Enumerator	Type	Semantics
SpatialStatic	Static	SpatialStaticStruct	*Variant for representing a static object.*
SpatialFPW	DRM_FPW	SpatialFPStruct	*Variant for representing an object with a constant velocity (or low acceleration) linear motion in world coordinates.*
SpatialRPW	DRM_RPW	SpatialRPStruct	*Variant for representing an object with a constant velocity (or low acceleration) linear motion, including rotation information, in world coordinates.*
SpatialRVW	DRM_RVW	SpatialRVStruct	*Variant for representing an object with high speed or maneuvering at any speed, including rotation information, in world coordinates.*
SpatialFVW	DRM_FVW	SpatialFVStruct	*Variant for representing an object with high speed or maneuvering at any speed in world coordinates.*

Name	Enumerator	Type	Semantics
SpatialFPB	DRM_FPB	SpatialFPStruct	*Variant for representing an object with a constant velocity (or low acceleration) linear motion in body axis coordinates.*
SpatialRPB	DRM_RPB	SpatialRPStruct	*Variant for representing an object with a constant velocity (or low acceleration) linear motion, including rotation information, in body axis coordinates.*
SpatialRVB	DRM_RVB	SpatialRVStruct	*Variant for representing an object with high speed or maneuvering at any speed, including rotation information, in body axis coordinates.*
SpatialFVB	DRM_FVB	SpatialFVStruct	*Variant for representing an object with high speed or maneuvering at any speed in body axis coordinates.*

StationNameLocationVariantStruct RPRnoteBase6

Encoding: HLAvariantRecord
Discriminant name: StationName
Discriminant type: ConstituentPartStationNameEnum16
Semantics: *The station name at which the constituent part is located. In case of 'On Station', the alternative specifies its location relative to the host object.*

Name	Enumerator	Type	Semantics
RelativeLocation	OnStationXYZ	RelativePositionStruct	*The location of the constituent part object relative to the host object entity coordinate system.*
RelativeRangeAndBearing	OnStationRangeBearing	RelativeRangeBearingStruct	*The location of the constituent part object relative to the host object in polar coordinates.*

1.3. User Supplied Tags

Update/Reflect

Datatype: RPRUserDefinedTag

Semantics: *User-supplied tag provided with each update/reflect of object instance attribute values. Contains at least the DIS timestamp in the first 8 characters.*

Send/Receive

Datatype: RPRUserDefinedTag

Semantics: *User-supplied tag provided with each send/receive of an interaction. Contains at least the DIS timestamp in the first 8 characters.*

Delete/Remove

Datatype: NA

Semantics: *NA*

Divestiture Request

Datatype: NA

Semantics: *NA*

Divestiture Completion

Datatype: NA

Semantics: *NA*

Acquisition Request

Datatype: NA

Semantics: *NA*

Request Update

Datatype: NA

Semantics: *NA*

1.4. Notes

RPRnoteBase1

Semantics: *Federates shall send the time at which the data is valid in the user defined tag with every attribute values update and interaction. The time shall be in the first 8 bytes (octets) of the user defined tag, using the DIS timestamp field format (see section 5.2.31 of IEEE 1278.1-1995) converted into hexadecimal ASCII character representation (0-9 and A-F). The ordering of the characters shall be in accordance with section 5.1.1 of IEEE 1278.1-1995, that is most significant octet first, with the most significant bits first (i.e. the character for bits 4-7 precedes the character for bits 0-3).*

All federates shall transmit this field, even if they do not use it themselves, so that other federates can use its value to compensate for network transport delays.

RPRnoteBase2

Semantics: *Not optional*

RPRnoteBase3

Semantics: *Default value: all zeros*

RPRnoteBase4

Semantics: *This must reference a valid Object instance.*

RPRnoteBase5

Semantics: *All fields in the entity type struct are enumerations. The values for the individual fields are to be derived from the federation agreements, which could refer to SISO-REF-010. The values used in this structure should comply with the requirements specified in section 5.2.16 of IEEE 1278.1-1995 (for platform and environmental entities) and section 5.2.39 of IEEE 1278.1a-1998 (for aggregate entities).*

RPRnoteBase6

Semantics: *This note applies when this datatype is used within the BaseEntity.IsPartOf attribute.*
The following StationName enumerations - On station RNG/BRG (15) and On station - x,y,z (16), are optional to transmit along with associated RelativeLocation or RelativeRangeAndBearing information. If these enumeration values (15) and (16) are received, they shall be ignored. The RelativeSpatial attribute shall be used in all cases. (Note: Although the RelativeLocation field uses the same WorldLocation contained in the RelativeSpatial attribute, in both these cases, the values do not represent a location in world coordinates, but, rather, the relative location of a part entity to the host entity in the referenced entity coordinate system. The RelativeRangeAndBearing field does not provide full relative spatial data and, therefore, cannot be substituted for the RelativeSpatial attribute.)

RPRnoteBase7

Semantics: *The units of the Value field depends on the value of the TypeMetric field. The units are defined in section A.2.1.4 of IEEE 1278.1-1995.*

RPRnoteBase8

Semantics: *The TSPI_Change condition shall be evaluated as follows: The owner of a base entity object shall maintain two state models of the object in support of the dead reckoning process. One model shall be the internal model used by the simulation application to represent that object. The other shall be a dead reckoning model of the object. Certain thresholds shall be established as criteria for determining if the object's actual TSPI data has varied by an allowable amount from the dead reckoned TSPI data. TSPI_Change is TRUE when either:*
a) the objects actual position differs from the dead reckoned position by more than DRA_POS_THRSH_DFLT
b) the objects actual orientation differs from the dead reckoned orientation by more than DRA_ORIENT_THRSH_DFLT
See section 5.1.4 of IEEE 1278.1-1995 for the value of these symbolic constants.

RPRnoteBase9

Semantics: *The values of the default update conditions are as follows:*
DRA_POS_EPSILON_DFLT 0.001 m
DRA_ORIENT_EPSILON_DFLT 0.00001 rad
DRA_VEL_EPSILON_DFLT 0.001 m/s
DRA_ACCEL_EPSILON_DFLT 0.001 m/s/s
DRA_ANG_VEL_EPSILON_DFLT 0.00001 rad/s

RPRnoteBase10

Semantics: *The update condition for the WorldLocation field is TRUE when TSPI_Change is TRUE and the actual position differs from the last transmitted position by more than a threshold value in any direction.*
The default threshold shall be DRA_POS_EPSILSON_DFLT. RPRnoteBase8 RPRnoteBase9

RPRnoteBase11

Semantics: *The update condition for the Orientation field is TRUE when TSPI_Change is TRUE and the actual orientation differs from the last transmitted orientation by more than a threshold value in any orientation.*
The default threshold shall be DRA_ORIENT_EPSILON_DFLT. RPRnoteBase8 RPRnoteBase9

RPRnoteBase12

Semantics: *In case Dead Reckoning Algorithm FPW (2), RPW (3), RVW (4), FVW (5), FPB (6), RPB (7), RVB (8), or RVB (9) is used, the update condition for the VelocityVector field is TRUE when TSPI_Change is TRUE and the actual velocity differs from the last transmitted velocity by more than a threshold value in any direction.*
The default threshold shall be DRA_VEL_EPSILON_DFLT. RPRnoteBase8 RPRnoteBase9

RPRnoteBase13

Semantics: *In case Dead Reckoning Algorithm RVW (4), FVW (5), RVB (8), or RVB (9) is used, the update condition for the AccelerationVector field is TRUE when TSPI_Change is TRUE and the actual acceleration differs from the last transmitted acceleration by more than a threshold value in any direction.*
The default threshold shall be DRA_ACCEL_EPSILON_DFLT. RPRnoteBase8 RPRnoteBase9

RPRnoteBase14

Semantics: *In case Dead Reckoning Algorithm RPW (3), RVW (4), RPB (7), or RVB (8) is used, the update condition for the VelocityVector field is TRUE when TSPI_Change is TRUE and the actual angular velocity differs from the last transmitted angular velocity by more than a threshold value in any direction.*
The default threshold shall be DRA_ANG_VEL_EPSILON_DFLT. RPRnoteBase8 RPRnoteBase9

RPRnoteBase15

Semantics: *Frozen entities should not be dead-reckoned, i.e. should be displayed as fixed at the current location even if non-zero velocity, acceleration or rotation data received from the frozen entity.*

RPRnoteBase16

Semantics: *The DatumLength equals the length in bits of the DatumValue only. The total size of a VariableDatumStruct record must account for the padding length.*

RPRnoteBase17

Semantics: *The type of the DatumValue field is determined by the value of the DatumID field. The types and associated units, etc., for each of the DatumID enumeration values are to be derived from the federation agreements, which could refer to SISO-REF-010. The DatumValue element type is defined as a UnsignedInteger64 (64 bits) to ensure the correct byte alignment for types that include 64-bit elements.*

RPRnoteBase18

Semantics: *If the entity is a constituent part of another entity (denoted by the IsPartOf attribute being set appropriately) then the Spatial attribute may be ignored by a receiving federate. Instead, the receiving federate can calculate spatial attribute values by adding the offsets provided in the RelativeSpatial attribute to the values provided in the host entity's Spatial attribute. Even if a federate is updating RelativeSpatial, it should still update Spatial for the benefit of federates who do not subscribe to the optional RelativeSpatial and IsPartOf attributes.*

RPRnoteBase19

Semantics: *If the entity is a constituent part of another entity (denoted by the IsPartOf attribute being set appropriately) then the IsFrozen attribute is no longer updated. The frozen status of the entity is the same as the frozen status of the host entity.*

RPRnoteBase20

Semantics: *Damaged appearance for environment objects has values 0: no damage, 1: damaged and 2: destroyed, with respect to the DIS standard as defined in SISO-REF-010 (section 12.1.2.1) ; this has to be taken into account when setting up a DIS-HLA gateway (SDEM mapping and filtering)*

2. Module NETN-BASE

Information

Name:	NETN-BASE
Type:	FOM
Version:	2.0
Modification Date:	2020-09-05
Security Classification:	Not Classified
Purpose:	
Application Domain:	Training
Description:	Base module for NETN FOM modules. Mainly datatypes for use in other NETN FOM modules
Use Limitation:	
Other:	

Release authority Point Of Contact

Name:	NATO Modelling and Simulation Group
Organization:	NATO Science and Technology Organization
Telephone:	
Email:	msg@cso.nato.int

Primary author Point Of Contact

Name:	MSG-163 Evolution of NATO Standards for Federated Simulation
Organization:	NATO Modelling and Simulation Group
Telephone:	
Email:	msg@cso.nato.int

Primary author Point Of Contact

Name:	MSG-134 NATO Distributed Simulation Architecture & Design, Compliance Testing and Certification
Organization:	NATO Modelling and Simulation Group
Telephone:	
Email:	msg@cso.nato.int

Primary author Point Of Contact

Name:	MSG-106 Enhanced CAX Architecture, Desing and Methodology
Organization:	NATO Modelling and Simulation Group
Telephone:	
Email:	msg@cso.nato.int

References

Dependency	RPR-Base

Use History

v1.0.2 - Initial version developed by MSG-106 and MSG-134. Release included in NETN-FOM v2.0
v2.0.0 - Updated version developed by MSG-163. Release included in NETN-FOM v3.0

2.1. Datatypes

2.1.1. Simple Datatypes

EpochTimeSecInt64

Representation: HLAinteger64BE
Units: Second
Resolution: 1
Accuracy: NA
Semantics: The number of seconds since 1 Jan 1970 (wallclock time) or since the start of the simulation (logical time).

QuantityFloat32

Representation: HLAfloat32BE
Units: NA
Resolution: NA
Accuracy: NA
Semantics: A generic floating-point quantity.

QuantityFloat64

Representation: HLAfloat64BE
Units: NA
Resolution: NA
Accuracy: NA
Semantics: A generic floating-point quantity.

QuantityInt32

Representation: HLAinteger32BE
Units: NA
Resolution: NA
Accuracy: NA

Semantics: A generic discrete quantity.

DirectionDegreesFloat32

Representation: HLAfloat32BE
Units: Degree
Resolution: NA
Accuracy: NA
Semantics: Compass direction measured clockwise relative to true north. Calculate values outside the range [0, 360) as modulo 360.

LatLongDegreesFloat64

Representation: HLAfloat64BE
Units: Degree
Resolution: NA
Accuracy: NA
Semantics: Represents a measure of either latitude or longitude in decimal degrees of arc.

MassDensityFloat32

Representation: HLAfloat32BE
Units: kg/m3
Resolution: NA
Accuracy: NA
Semantics: Density of substance measured as kg per cubic meter.

PercentFloat64

Representation: HLAfloat64BE
Units: Percent
Resolution: NA
Accuracy: NA
Semantics: A generic measure of percentage (0-100).

TimeSecInt32

Representation:	HLAinteger32BE
Units:	Second
Resolution:	NA
Accuracy:	NA
Semantics:	A generic time interval in seconds.

AltitudeMeterFloat64

Representation:	HLAfloat64BE
Units:	Meter
Resolution:	NA
Accuracy:	NA
Semantics:	Generic representation of altitude defined by the context of use, i.e. height Above Mean Sea Level, height Above Ground Level.

MassConcentrationFloat32

Representation:	HLAfloat32BE
Units:	kg/m3
Resolution:	NA
Accuracy:	NA
Semantics:	Concentration of a substance measured as kg/m3.

2.1.2. Enumerated Datatypes

ActiveStatusEnum8

Representation: HLAoctet

Semantics: *A state which indicates the status of an object concerning its participation in the simulation. An object in an inactive state is not simulated and does not interact with other objects.*

Enumerator	Value
Other	0
Active	1
Inactive	2

AggregateMissionEnum16

Representation: HLAinteger16BE

Semantics: *Representation of the general class or nature of activity related to a unit's mission. Enumerations are based on JC3IEDM action-event-category-code.*

Enumerator	Value
Abdication	1
Accident	2
AccidentAircraftGround	3
Accident_Mine	4
Accident_Traffic	5
Accident_Weapon	6
Accident_Workplace	7
Advancing	8
AerialEngagement	9
AerialShootDown	10
AirAssault	11
AirborneAssault	12
AircraftCrash	13

Enumerator	Value
AircraftLanding	14
AircraftLaunchActivity	15
AircraftLoss	16
AirspaceViolation	17
AlertCancellation	18
Ambush	19
AmphibiousOperation	20
ArmsProduction	21
ArmsTrade	22
Arresting_Legal	23
ArrestingOrObstructing	24
Arson	25
ArtilleryFire	26
Assassination	27
Assembling	28
AssistingACriminal	29
AtmosphericPollution	30
Attack_Deliberate	31
Attack_Diversion	32
Attack_Electronic	33
Attack_Hasty	34
Attack_Main	35
Attack_NotOtherwiseSpecified	36
Attack_Supporting	37
AttemptedMurder	38
AttemptedRape	39
AttemptedRobbery	40

Enumerator	Value
AttemptedSuicide	41
Avoiding	42
BellyLanding	43
Blocking	44
Bombing	45
Bombing_Accidental	46
Bombing_Deliberate	47
BoobyTrapDiscovery	48
BorderCrossing_Escorted	49
BorderCrossing_Forced	50
BorderCrossing_Illegal	51
BorderCrossing_Not-Planned	52
BorderCrossing_Planned	53
BorderCrossing_Surveilled	54
BorderIncursion	55
BorderRaid	56
Breaching	57
Build-Up	58
BurnedOutObject	59
Bypass	60
Canalise	61
Capture	62
CarrierLaunch	63
CarrierRecovery	64
CBRN-EVENT	65
CeremonyOrParade	66
CivilDemonstration_Illegal	67

Enumerator	Value
CivilDemonstration_Legal	68
CivilDisobedience	69
CivilUnrest	70
CivilWar	71
Clearing_Air	72
Clearing_LandCombat	73
Clearing_Obstacle	74
Clearing_RadioNet	75
CodewordExecution	76
Collision_Mid-Air	77
Collision_Obstacle	78
CommunicationsActivation	79
CommunicationsDeactivation	80
CommunicationsDisruption	81
CommunicationsInterception	82
CommunicationsOutage	83
CommunicationsRestoration	84
ConductingConference	85
ConductingForwardPassageOfLines	86
ConductingMediaInterview	87
ConductingPreparatoryFire	88
ConductingRearwardPassageOfLines	89
ConductingRecreationalActivities	90
ConductingRoadService	91
ConductingSocialEvents	92
ConductingSportingEvents	93
Confiscation	94

Enumerator	Value
ConsolidatingOfAPosition	95
Constructing	96
Containing	97
Cooperating	98
CounterAttack	99
CounterAttackByFire	100
Counter-BatteryFire	101
CoupDetat	102
Covering	103
CrimeAgainstHumanity	104
CriminalIncident	105
Crossing	106
Dazzle	107
Death_NaturalCauses	108
DeathOfChiefOfState	109
DeathOfSpiritualLeader	110
Deception	111
Deception_Electronic	112
Defeat	113
Defending	114
Deflecting	115
Delaying	116
Demolition	117
Demonstration	118
Denying	119
Deploying	120
Destroying	121

Enumerator	Value
Disease	122
Disengaging	123
Disrupting	124
Distributing	125
Diversion	126
Drive-ByShooting	127
Drought	128
DrugConsumption_Illegal	129
DrugDistribution_Illegal	130
DrugManufacturing_Illegal	131
DrugOperation	132
DrugStorage	133
DrugTransportation	134
EarlyWarningAlert	135
Earthquake	136
ElectionAssociatedViolence	137
ElectronicEmission	138
ElectronicWarfare	139
EnemyContact	140
Engaging	141
Enveloping	142
Epidemic	143
EquipmentFailure	144
Escaping	145
Escorting	146
Evacuating	147
Execution	148

Enumerator	Value
Exploitation	149
Explosion	150
Famine	151
Fire	152
Firefighting	153
Fix	154
Fix_Acoustic	155
Fix_Electromagnetic	156
Fix_Electro-Optical	157
Flood	158
FollowingAndAssuming	159
FollowingAndSupporting	160
ForcedLanding	161
FriendlyFire	162
GeneratingChemicalSmoke	163
Genocide	164
GovernmentalCollapse	165
Guarding	166
Gunnery_Air-To-Air	167
Harassing	168
Hiding	169
Hijacking_Boat	170
Hijacking_LandVehicle	171
Hijacking_NotOtherwiseSpecified	172
Hijacking_Plane	173
Hold_Defensive	174
Hold_Offensive	175

Enumerator	Value
HostageTaking	176
HumanRightsViolation	177
Hunting	178
Identifying	179
Illumination	180
IndirectFire	181
IndiscriminateShooting	182
IndustrialEspionageIncident	183
Infiltration	184
Interception	185
Interdiction	186
Intimidation	187
Invasion	188
Isolation	189
IssuingMediaArticle	190
IssuingMediaDocumentary	191
IssuingPressRelease	192
Jamming	193
Kidnapping	194
LabourStrike	195
Leaguer	196
LetterBombExplosion	197
LetterBombIncident	198
LocalElection	199
Locating	200
Looting	201
Maintaining	202

Enumerator	Value
Marking	203
MartialLawImplementation	204
MassingOfForces	205
MassiveDeportationOrBanishment	206
MedicalEvacuation	207
MilitaryMobilisation	208
Mine-Laying	209
MissingIndividual	210
MissionStaging	211
MortarFire	212
Moving	213
Murder	214
MutualAssistancePactAgreement	215
NationalElection	216
NationalHoliday	217
NationalStateOfEmergency	218
NaturalDisaster	219
NavalGunFire	220
NavalPlatformFlightOperations	221
NetworkSeizure	222
Neutralize_Chemical	223
Neutralize_Combat	224
Neutralize_Explosive	225
Obscure	226
Observing	227
Occupying	228
Oceans_SeasOrWaterPollution	229

Enumerator	Value
OffensiveOrCounteroffensive	230
OrganisedCrime	231
OutbreakOfRacialOrTribalOrEthnicWarfare	232
Patrolling	233
PeaceConference	234
PeaceTreatyAgreement	235
Penetrating	236
Pestilence	237
PetroleumProductSpills	238
Picketing	239
Poisoning	240
PoliticalDemonstration	241
PoliticalExecution	242
POWReturn	243
PrisonerExchange	244
Procuring	245
Protection_Electronic	246
ProvidingAccommodation	247
ProvidingAgriculturalSupport	248
ProvidingBedding	249
ProvidingCamps	250
ProvidingConstructionServices	251
ProvidingDecontaminationServices	252
ProvidingEducationServices	253
ProvidingHealthcareServices	254
ProvidingHostNationSupport	255
ProvidingInfrastructure	256

Enumerator	Value
ProvidingLaundryServices	257
ProvidingRepairServices	258
ProvidingSecurityServices	259
ProvidingShelter	260
ProvidingStorageServices	261
ProvidingTranshipmentServices	262
Proxy-Bombing	263
PsychologicalOperation	264
PublishingMediaArticle	265
PublishingMediaDocumentary	266
PublishingPressRelease	267
Pursuing	268
Rape	269
Reconnaissance	270
ReconnaissanceInForce	271
Reconstituting	272
Recovering	273
Recuperating	274
Redeployment	275
RefugeeMovement	276
Reinforcing	277
ReliefInPlace	278
ReligiousDemonstration	279
ReligiousViolence	280
ReligiousWarfare	281
Rendezvous	282
Reorganising	283

Enumerator	Value
Repairing	284
Resting	285
Resupplying	286
Retain	287
Retire	288
Revolution	289
Riot	290
Robbery	291
RocketFire	292
Sabotage	293
Screening	294
SecessionOfPortionOfCountry	295
Securing	296
SecurityCompromise	297
SecurityViolation	298
Seizing	299
ServingAsABreakoutForce	300
ServingAsABridgeheadForce	301
ServingAsAFlankGuard	302
ServingAsAMainBody	303
ServingAsAnAdvanceGuard	304
ServingAsAnIn-PlaceForce	305
ServingAsARearGuard	306
ServingAsAReserve	307
SettingUp	308
Shooting	309
SniperAttack	310

Enumerator	Value
SpaceAccident	311
Spying	312
StateOfWar	313
Strafing_Aerial	314
Strike	315
Suicide	316
Supporting	317
Suppressing	318
Surrender	319
Surveillance_Electronic	320
SuspensionOfHostilities	321
Terrorism	322
Threaten	323
Torture	324
Transporting	325
Traversing	326
TreatyViolation	327
Troublemaking_Agitating	328
Troublemaking_Bullying	329
Troublemaking_Harassing	330
Troublemaking_Hooliganism	331
Troublemaking_Inciting	332
Troublemaking_Intimidating	333
Turning	334
UnexplodedOrdnanceDiscovery	335
VandalismOrRapeOrLootOrRansackOrPlunderOrSack	336
Verifying	337

Enumerator	Value
VesselSinking	338
VolcanicEruption	339
WarOrCrisisAlert	340
WarOrMilitaryConference	341
WarCrime	342
WeaponFiring	343
Withdrawal	344
WithdrawalUnderPressure	345
Witnessing	346
NotOtherwiseSpecified	347
Other	0

DamageStatusEnhancedEnum32

Representation: HLAinteger32BE

Semantics: *The damage status of an object.*

Enumerator	Value
NoDamage	0
SlightDamage	1
ModerateDamage	2
SignificantDamage	3
Destroyed	4

CancellationReasonEnum32

Representation: HLAinteger32BE

Semantics: *Describes the reason for a cancellation.*

Enumerator	Value
Other	0
TimeOut	1

PointTypeEnum32

Representation: HLAinteger32BE
Semantics: *Specifies if a point is defined by a location or by reference to a point object in the federation.*

Enumerator	Value
Location	0
UuidReference	1

PathTypeEnum32

Representation: HLAinteger32BE
Semantics: *Specifies if a path is defined by waypoints or by reference to a path object in the federation.*

Enumerator	Value
Waypoints	0
UuidReference	1

GeoLocationTypeEnum32

Representation: HLAinteger32BE
Semantics: *Specifies different ways to reference geographical locations.*

Enumerator	Value
Point	1
Circle	2
Polygon	3
Quadrangle	4
Path	5
NETN_UUID	6
RPR_Entity	7
NameReference	8

AltitudeTypeEnum8

Representation: HLAoctet
Semantics: *The reference for altitude. AMSL = Above Mean Sea Level or AGL = Above Ground Level.*

Enumerator	Value
AMSL	1
AGL	2

EchelonEnum32

Representation: HLAinteger32BE
Semantics: *The echelon level of a unit.*

Enumerator	Value
NONE	0
TEAM	1
CREW	2
SQUAD	3
SECTION	4
PLATOON	5
DETACHMENT	6
COMPANY	7
BATTERY	8
TROOP	9
BATTALION	10
SQUADRON	11
REGIMENT	12
GROUP	13
BRIGADE	14
DIVISION	15
CORPS	16
ARMY	17

Enumerator	Value
ARMYGROUP	18
FRONT	19
REGION	20

2.1.3. Array Datatypes

Callsign

Element Type: HLAunicodeChar
Cardinality: Dynamic
Encoding: HLAvariableArray
Semantics: *Identifier for a simulated entity. Callsigns should be unique in the context in which they are used but are not required to be globally unique.*

TransactionId

Element Type: HLAbyte
Cardinality: 16
Encoding: HLAfixedArray
Semantics: *Unique identifier for a transaction. Encoded according to RFC 4122, section 4.1.2 using 16 bytes. Also referred to as Variant 1 or RFC 4122/DCE 1.1 UUIDs.*

UuidArrayOfHLAbyte16

Element Type: HLAbyte
Cardinality: 16
Encoding: HLAfixedArray
Semantics: *Deprecated.*

UUIDs are exchanged as a byte array and are encoded according to RFC

4122, section 4.1.2 using 16 bytes. Also referred to as Variant 1 or RFC 4122/DCE 1.1 UUIDs.

For example, 00112233-4455-8877-6699-aabbccddeeff is encoded as the bytes 00 11 22 33 44 55 88 77 66 99 aa bb cc dd ee ff.

ArrayOfUuid

Element Type: UuidArrayOfHLAbyte16
Cardinality: Dynamic

Encoding: HLAvariableArray
Semantics: *Deprecated. Array of Unique Identifiers expressed as UUIDs.*

NETN_ArrayOfSupplyStruct

Element Type: NETN_SupplyStruct
Cardinality: Dynamic
Encoding: HLAvariableArray
Semantics: *A set of supply descriptions.*

FederateName

Element Type: HLAunicodeChar
Cardinality: Dynamic
Encoding: HLAvariableArray
Semantics: *The unique name of a federate participating in an HLA federation.*

GeodeticPath

Element Type: GeodeticLocation
Cardinality: [2..2147483647]
Encoding: HLAvariableArray
Semantics: *A sequence of geodetic locations defining a path where each segment is a great circle between locations.*

GeodeticPolygon

Element Type: GeodeticLocation
Cardinality: [3..2147483647]
Encoding: HLAvariableArray
Semantics: *A sequence of geodetic locations defining a geographical area bounded by a closed path where the first and last locations in the sequence are connected. Each point is a geodetic coordinate in WGS84 on the earth surface, and each segment is a great circle between locations.*

ArrayOfWorldLocationStruct

Element Type: WorldLocationStruct
Cardinality: Dynamic
Encoding: HLAvariableArray
Semantics: *A polygonal chain (path) expressed as a sequence of geocentric points.*

ArrayOfStringType

Element Type: HLAunicodeString
Cardinality: Dynamic
Encoding: HLAvariableArray
Semantics: *A generic representation of a set of strings.*

UUID

Element Type: HLAbyte
Cardinality: 16
Encoding: HLAfixedArray
Semantics: *4122, section 4.1.2 using 16 bytes. Also referred to as Variant 1 or RFC 4122/DCE 1.1 UUIDs.*

For example, 00112233-4455-8877-6699-aabbccddeeff is encoded as the bytes 00 11 22 33 44 55 88 77 66 99 aa bb cc dd ee ff.

Text64

Element Type: HLAunicodeChar
Cardinality: [0..64]
Encoding: HLAvariableArray
Semantics: *Text of max length 64 characters.*

ArrayOfText64

Element Type: Text64
Cardinality: Dynamic
Encoding: HLAvariableArray
Semantics: *A set of names of max length 64 unicode characters.*

SymbolIdentifier

Element Type: HLAunicodeChar
Cardinality: Dynamic
Encoding: HLAvariableArray
Semantics: *A symbol identifier is represented as a string. The symbol standard used is indicated using an URI notation (uri:xxxxxxxxxx). The following uri should be used for common symbology standards app6b, app6b, app6c, app6c, 2525b, 2525c, 2525d. If not provided the symbol standard used is undefined.*

2.1.4. Fixed Record Datatypes

NETN_SupplyStruct

Encoding: HLAfixedRecord

Semantics: *Description of supply. Same encoding as RPR2 SupplyStruct.*

Name	Type	Semantic
SupplyType	EntityTypeStruct	*The type of supply (as described in the Bit Encoded Values for Use with Protocols for Distributed Interactive Simulation Applications)*
Quantity	QuantityFloat32	*The number of units of the supply type. The unit measure depends on the supply type and shall use the SI units of measurement used for such supplies.*

GeodeticCircle

Encoding: HLAfixedRecord

Semantics: *A geodetic point and radius specifying a circle on the surface of the earth WGS84 where the radius is a great circle distance on the surface.*

Name	Type	Semantic
CenterPoint	GeodeticLocation	*The center of the circular area. Lat, Long on WGS84.*
Radius	MeterFloat32	*The radius of the circular area.*

GeodeticLocation

Encoding: HLAfixedRecord

Semantics: *A geodetic point, specified by latitude and longitude, with unspecified altitude. WGS84*

Name	Type	Semantic
Latitude	LatLongDegreesFloat64	*The latitude in degrees.*
Longitude	LatLongDegreesFloat64	*The longitude in degrees.*

GeodeticQuadrangle

Encoding: HLAfixedRecord
Semantics: *A latitude-longitude quadrangle is a region bounded by two meridians and two parallels.*

Name	Type	Semantic
Point1	GeodeticLocation	*Lat, Long on WGS84*
Point2	GeodeticLocation	*Lat, Long on WGS84*

GeodeticPoint

Encoding: HLAfixedRecord
Semantics: *A geodetic point, specified by latitude, longitude and altitude.*

Name	Type	Semantic
Latitude	LatLongDegreesFloat64	*The latitude in degrees.*
Longitude	LatLongDegreesFloat64	*The longitude in degrees.*
Altitude	AltitudeMeterFloat64	*Height Above Mean Sea Level*

2.1.5. Variant Record Datatypes

AreaVariantStruct

Encoding: HLAvariantRecord
Discriminant name: AreaType
Discriminant type: GeoLocationTypeEnum32
Semantics: *Description of an area relative to the earth's surface.*

Name	Enumerator	Type	Semantics
GeodeticPolygon	Polygon	GeodeticPolygon	*A sequence of geodetic locations defining a geographical area bounded by a closed path where the first and last locations in the sequence are connected. Each point is a geodetic coordinate in WGS84 on the earth surface, and each segment is a great circle between locations.*
GeodeticCircle	Circle	GeodeticCircle	*A geodetic point and radius specifying a circle on the surface of the earth WGS84 where the radius is a great circle distance on the surface.*
GeodeticQuadrangle	Quadrangle	GeodeticQuadrangle	*A latitude-longitude quadrangle is a region bounded by two meridians and two parallels.*

PathVariantStruct

Encoding: HLAvariantRecord
Discriminant name: PathType
Discriminant type: PathTypeEnum32
Semantics: *Defines a path, either as a polygonal chain of waypoints or a UUID that refers to a path object in the federation.*

Name	Enumerator	Type	Semantics
Waypoints	Waypoints	ArrayOfWorldLocationStruct	*The path defined by waypoints, not necessarily registered in the federation execution as a NETN_GeoObject.Path.* *The array can be empty (size=0).*

Name	Enumerator	Type	Semantics
UUID	UuidReference	UuidArrayOfHLAbyte16	*A UUID that referes to a NETN_GeoObject.Path that is registred iin the federation execution.*

PointVariantStruct

Encoding: HLAvariantRecord
Discriminant name: PointType
Discriminant type: PointTypeEnum32
Semantics: *Defines the point, either a Location or a UUID reference to a point object in the federation.*

Name	Enumerator	Type	Semantics
Location	Location	WorldLocationStruct	*The geocentric location.*
UUID	UuidReference	UuidArrayOfHLAbyte16	*A UUID that refers to a NETN_GeoObject.Point.*

3. Module TS-NETN-v4.0

Information

Name:	New Module
Type:	SOM
Version:	1.0
Modification Date:	-
Security Classification:	unclassified
Purpose:	
Application Domain:	
Description:	Description of New Module
Use Limitation:	
Other:	

Dependencies

RPR-Base_v2.0
NETN-BASE
NETN-MRM
RPR-Aggregate_v2.0

3.2. Switches

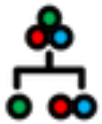
Auto Provide	Enabled
Convey Region Designator Sets	Disabled
Convey Producing Federate	Disabled
Attribute Scope Advisory	Disabled
Attribute Relevance Advisory	Disabled
Object Class Relevance Advisory	Disabled
Interaction Relevance Advisory	Disabled
Service Reporting	Disabled
Exception Reporting	Disabled
Delay Subscription Evaluation	Disabled
Automatic Resign Action	CancelThenDeleteThenDivest

3.3. Service Utilization

Federation Management

Create Federation Execution
Destroy Federation Execution
Join Federation Execution
Resign Federation Execution

4. Module NETN-MRM



Information

Name:	NATO Education and Training Network (NETN) Multi-Resolution Modelling (MRM) Module
Type:	FOM
Version:	2.0
Modification Date:	2020-09-02
Security Classification:	Not Classified
Purpose:	The purpose of NETN-MRM is to support federations where models are represented at multiple levels of resolution and where the level of resolution can change dynamically during a simulation.
Application Domain:	
Description:	The MRM FOM module specifies interaction classes necessary to enable federation multi-resolution modeling.
Use Limitation:	NETN-MRM covers the following cases: * Aggregation of subunits and/or physical entities * Disaggregation of unit into subunits and/or physical entities * Division of simulated unit into specific parts - resources divided and all entities simulated * Merge of previously divided parts with simulated unit. * Activate and Inactivate aggregate units' representation in the simulation
Other:	

Release authority Point Of Contact

Name:	NATO Modelling and Simulation Group
Organization:	NATO Science and Technology Organization

Telephone:	
Email:	msg@cso.nato.int

Primary author Point Of Contact

Name:	MSG-163 Evolution of NATO Standards for Federated Simulation
Organization:	NATO Modelling and Simulation Group
Telephone:	
Email:	msg@cso.nato.int

Primary author Point Of Contact

Name:	MSG-134 NATO Distributed Simulation Architecture & Design, Compliance Testing and Certification
Organization:	NATO Modelling and Simulation Group
Telephone:	
Email:	msg@cso.nato.int

Primary author Point Of Contact

Name:	MSG-106 Enhanced CAX Architecture, Desing and Methodology
Organization:	NATO Modelling and Simulation Group
Telephone:	
Email:	msg@cso.nato.int

References

Dependency	NETN-BASE
Dependency	RPR-Aggregate

Use History

v1.1.1 - Initial version of NETN-MRM FOM Module released as part of NETN-FOM v2.0.
v2.0.0 - Updated version by MSG-163 to be part of NETN-FOM v3.0.

Dependencies

NETN-BASE
RPR-Aggregate_v2.0

RPR-Base_v2.0

4.1. Object Classes

4.1.1. NETN_Aggregate

Full Name: HLAobjectRoot.BaseEntity.AggregateEntity.NETN_Aggregate
Sharing: Publish/Subscribe
Semantics: *Aggregate extensions for NETN*
Attributes:

UniqueId	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	UuidArrayOfHLAbyte16	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Static	*NA*				
	Semantics					
	Required. A unique identifier for the object. The Universally Unique Identifier (UUID) is either generated or defined as part of scenario initialization, e.g. using NETN-ORG MSDL data. The unique identifier can serve dual purposes. It is a unique identification of the NETN_Aggregate object instance but can also be a reference to a NETN-ORG unit element with the same unique identifier.					
Status	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	ActiveStatusEnum8	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Required. Indicate if this aggregate unit currently is being simulated or not. E.g. units mounted or embarked on transports can be set to inactive. During an inactive state, the attribute values may not reflect an accurate, current value. Therefore, any subscribing federate can ignore inactive units. An inactive instance may have its instance attributes updated by a federate but reflected updates shall be ignored by receiving federates. All attributes must be updated to represent the current status of the instance before setting the status to active.					

SubunitList	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	ArrayOfUuid	PS	DA	RO	HLAreliable	
	Update type	**Update Condition**				
	Not applicable	*NA*				
	Semantics					
	Optional. Reference to disaggregated representations of subsets of the aggregate unit when registered in the federation. Each element should refer to an existing NETN_Aggregate object in the federation. If not published, disaggregation is not supported.					
ParentUnit	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	UuidArrayOfHLAbyte16	PS	DA	RO	HLAreliable	
	Update type	**Update Condition**				
	Not applicable	*NA*				
	Semantics					
	Optional. Reference to parent aggregate entity. If not published, aggregation is not supported. The default value is 0000000000000000 (no parent unit).					
DividedUnitList	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	ArrayOfUuid	PS	DA	RO	HLAreliable	
	Update type	**Update Condition**				
	Not applicable	*NA*				
	Semantics					
	Optional. Reference to other aggregate or physical entities divided from the aggregate unit to represent specific subsets of holdings. If not published, a division is not supported.					
SourceUnit	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	UuidArrayOfHLAbyte16	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. Reference to an active NETN_Aggregate instance, the source of a NETN-MRM division. If not published, merging is not supported. The default value is 0000000000000000 representing no source unit.					

EmbeddedUnitList	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	ArrayOfUuid	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. Reference to units or platforms embarked on and transported by this unit. If not published, transport of embedded units not supported.					
HigherHeadquarters	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	UuidArrayOfHLAbyte16	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. A reference to an entity representing the aggregate unit's superior or headquarters from which orders are given and to which reports are sent. The highest level unit or headquarters will publish 0000000000000000 as its HigherHeadquarters value. The referenced entity may or may not be registered in the federation as a NETN_Aggregate and/or NETN-ORG unit. If not published, the aggregate does not have a superior unit or headquarter. The default value is 0000000000000000 (no higher headquarters).					
Mounted	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	PercentFloat64	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. The percentage of aggregate personnel travelling on or in their organic transport. Default 100% - all personnel mounted.					
SymbolId	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	SymbolIdentifier	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On Change*				
	Semantics					
	Optional. A symbol identifier represented as a string.					

Callsign	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	HLAunicodeString	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Static	*N/A*				
	Semantics					
	Required. A callsign used to address the unit. Callsigns should be unique in the context in which they are used but not required to be globally unique.					
Echelon	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	EchelonEnum32	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Static	*N/A*				
	Semantics					
	Optional. The size of the unit (level of command).					
EntityList	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	ArrayOfEntityStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. This attribute provides data on all entities comprising the aggregate. Entities include equipment, e.g. platforms, weapons, sensors and lifeforms such as personnel. Each entity contains key status attributes and subunit allocation information. If not provided the status and allocation of entities is not modelled on an entity level.					
SuppliesStatus	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	NETN_ArrayOfSupplyStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. The type and quantities of supplies available (on hand) to the unit. If not provided, the amount of available supplies is undefined.					
EquipmentStatus	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	ArrayOfResourceStatus	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. This summarizes the health status of the equipment comprising the aggregate. If not provided, the status of equipment is undefined.					

PersonnelStatus	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	ArrayOfResourceStatus	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. This summarizes the health status of personnel comprising the aggregate. If not provided, the status of personnel is undefined.					
VisualSignature	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	VisualSignatureStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Describes the unit's susceptibility to electro-optical detection.					
HUMINTSignature	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	HUMINTSignatureStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Describes the unit's susceptibility to human intelligence (HUMINT), i.e. information collected and provided by human sources.					
ElectronicSignature	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	ElectronicSignatureStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Describes the aggregate's susceptibility to electronic detection both as a summary value and by identifying aggregate sensors together with their operational status.					
CombatValue	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	PercentFloat64	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. A summary value (in per cent) of unit effectiveness based on the level of training, leadership, morale, personnel and equipment operational status, etc. The default value is 100%.					

CoverStatus	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	PercentFloat64	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. Describes the unit's protection from the effects of weapons fire. Default is 0% - Fully affected by weapon fire.					
CaptureStatus	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	CaptureStatusEnum8	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The status of an aggregate with respect to its control or influence over its own activities.					
Mission	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	MissionStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The operational task the aggregate has been ordered to perform.					
Activity	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	AggregateMissionEnum16	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. The current activity of the platform. The value is based on the Joint Consultation, Command and Control Information Exchange Data Model (JC3IEDM) action-event-category-code. The JC3IEDM is a fully documented standard [NATO STANAG 5525] for an information exchange data model for the sharing of C2 information. Default is 0 (Other activity).					
Route	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	PathVariantStruct	PS	DA	RO	HLAreliable	
	Update type	**Update Condition**				
	Conditional	*When Changed*				
	Semantics					
	Optional. The current path of movement.					

Destination	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	PointVariantStruct	PS	DA	RO	HLAreliable	
	Update type	**Update Condition**				
	Conditional	*When Changed*				
	Semantics					
	Optional. The current destination of movement.					
WeaponsControlOrder	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	WeaponControlOrderEnum8	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Optional. Describes current Weapon Control Order Free, Tight, or Hold. Default is 0 - Other.					
AggregateMarking *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	AggregateMarkingStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	A unique marking or combination of characters used to distinguish the aggregate from other aggregates.					
AggregateState *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	AggregateStateEnum8	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	An indicator of the extent of association of objects form an operating group.					
Dimensions *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	DimensionStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*AggSizeChange*				
	Semantics					
	The size of the area covered by the units in the aggregate.					

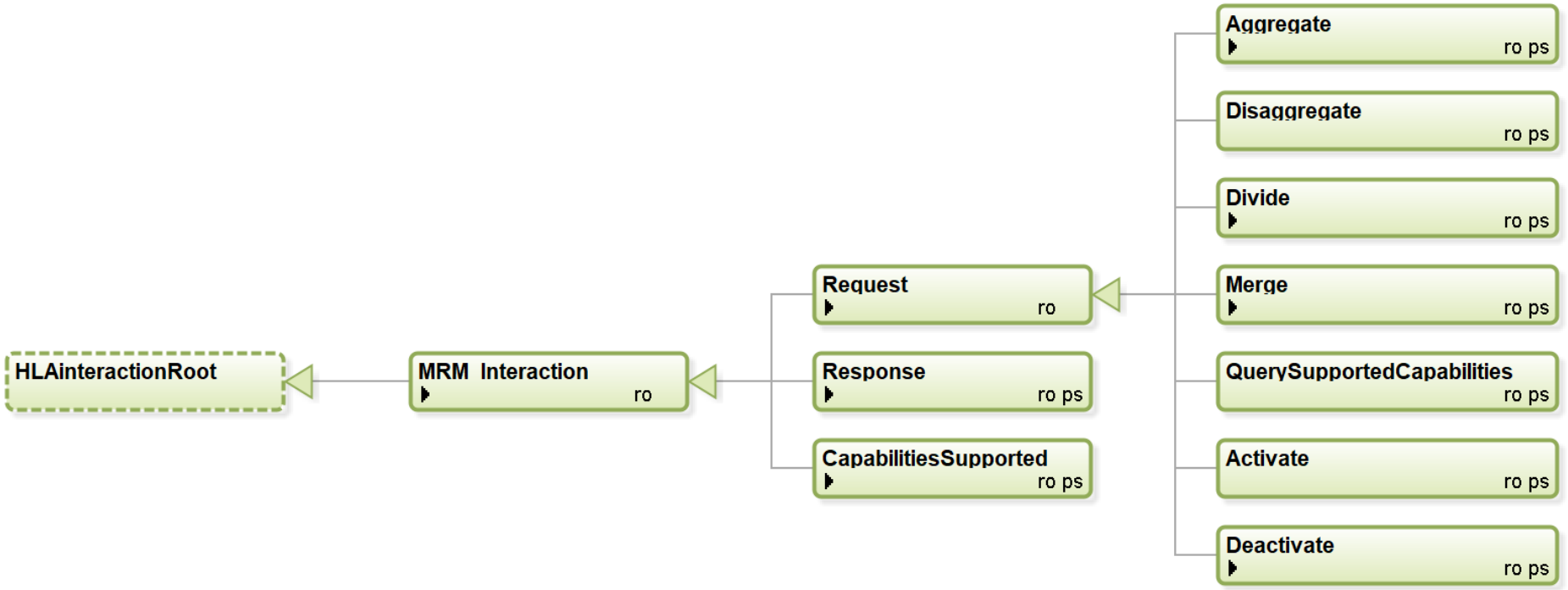
EntityIdentifiers *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	RTIobjectIdArray	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The identification of entities that are contained within the aggregate.					
ForceIdentifier *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	ForceIdentifierEnum8	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The identification of the force that the aggregate belongs to.					
Formation *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	FormationEnum32	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The category of positional arrangement of the entities within the aggregate.					
NumberOfSilentEntities *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	Integer16	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The number of elements in the SilentEntities list.					
NumberOfVariableDatums *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	UnsignedInteger32	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The number of records in the VariableDatums structure.					

SilentAggregates *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	SilentAggregateStructLengthlessArray	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The numbers and types, of silent aggregates contained in the aggregate. Silent aggregates are sub-aggregates that are in the aggregate, but that are not separately represented in the virtual world.					
SilentEntities *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	SilentEntityStructLengthlessArray	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The numbers and types, of silent entities in the aggregate. Silent entities are entities that are in the aggregate, but that are not separately represented in the virtual world.					
SubAggregateIdentifiers *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	RTIobjectIdArray	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The identifications of aggregates represented in the virtual world that are contained in the aggregate.					
VariableDatums *Inherited from AggregateEntity in RPR-Aggregate_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	VariableDatumStructLengthlessArray	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Extra data that describes the aggregate.					

EntityType *Inherited from BaseEntity in RPR-Base_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	EntityTypeStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Static	*NA*				
	Semantics					
	The category of the entity.					
EntityIdentifier *Inherited from BaseEntity in RPR-Base_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	EntityIdentifierStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Static	*NA*				
	Semantics					
	The unique identifier for the entity instance.					
IsPartOf *Inherited from BaseEntity in RPR-Base_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	IsPartOfStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Defines if the entity if a constituent part of another entity (denoted the host entity). If the entity is a constituent part of another entity then the HostEntityIdentifier shall be set to the EntityIdentifier of the host entity and the HostRTIObjectIdentifier shall be set to the RTI object instance ID of the host entity. If the entity is not a constituent part of another entity then the HostEntityIdentifier shall be set to 0.0.0 and the HostRTIObjectIdentifier shall be set to the empty string.					
Spatial *Inherited from BaseEntity in RPR-Base_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	SpatialVariantStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change* RPRnoteBase10 RPRnoteBase11 RPRnoteBase12 RPRnoteBase13 RPRnoteBase14				
	Semantics					
	Spatial state stored in one variant record attribute.					

RelativeSpatial *Inherited from BaseEntity in RPR-Base_v2.0*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	SpatialVariantStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change* RPRnoteBase10 RPRnoteBase11 RPRnoteBase12 RPRnoteBase13 RPRnoteBase14				
	Semantics					
	Relative spatial state stored in one variant record attribute.					
HLAprivilegeToDeleteObject *Inherited from HLAobjectRoot in MIM*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	HLAtoken	PS	DA	TS	HLAreliable	
	Update type	**Update Condition**				
	Static	*NA*				
	Semantics					

4.2. Interaction Classes



4.2.1. **HLAinteractionRoot**

Full Name: HLAinteractionRoot
Sharing:
Transportation type: HLAreliable
Order: Receive
Dimensions:
Semantics:
Parameters: -

4.2.2. **MRM_Interaction**

Full Name: HLAinteractionRoot.MRM_Interaction
Sharing:
Transportation type: HLAreliable
Order: Receive
Dimensions:
Semantics: *Base class for all MRM interactions.*
Parameters:

Name	Datatype	Semantics
EventId	TransactionId	*Unique identifier for all MRM interactions belonging to the same request/respons event.*

4.2.3. **Request**

Full Name: HLAinteractionRoot.MRM_Interaction.Request
Sharing:
Transportation type: HLAreliable
Order: Receive
Dimensions:
Semantics: *A base class for all MRM Request events.*
Parameters:

Name	Datatype	Semantics
Federate	FederateName	*Required. Intended federate responsible for performing the requested action. Sending federate should ensure that receiving federate can perform requested action. If not able to perform, a response interaction indicating failure should be returned.*
AggregateUnit	UuidArrayOfHLAbyte16	*Required for all requests except QuerySupportedCapabilities. Unique identifier for the NETN_Aggregate for which this request is related to.*
EventId *Inherited from MRM_Interaction in NETN-MRM*	TransactionId	*Unique identifier for all MRM interactions belonging to the same request/respons event.*

4.2.4. **Aggregate**

Full Name: HLAinteractionRoot.MRM_Interaction.Request.Aggregate
Sharing: Publish/Subscribe

Transportation type: HLAreliable
Order: Receive
Dimensions:
Semantics: *Instruction to the AggregateFederate to perform aggregation of the specified AggregateUnit's parts.*
Parameters:

Name	Datatype	Semantics
RemoveSubunits	HLAboolean	*Optional. Indicates if the disaggregate subunits (represented as aggregates in the federation) should be deleted from the federation execution. Default is TRUE - all subunits should be deleted. If FALSE all disaggregate subunits shall be set to inactive.*
Federate *Inherited from Request in NETN-MRM*	FederateName	*Required. Intended federate responsible for performing the requested action. Sending federate should ensure that receiving federate can perform requested action. If not able to perform, a response interaction indicating failure should be returned.*
AggregateUnit *Inherited from Request in NETN-MRM*	UuidArrayOfHLAbyte16	*Required for all requests except QuerySupportedCapabilities. Unique identifier for the NETN_Aggregate for which this request is related to.*
EventId *Inherited from MRM_Interaction in NETN-MRM*	TransactionId	*Unique identifier for all MRM interactions belonging to the same request/respons event.*

4.2.5. **Disaggregate**

Full Name: HLAinteractionRoot.MRM_Interaction.Request.Disaggregate
Sharing: Publish/Subscribe
Transportation type: HLAreliable
Order: Receive
Dimensions:
Semantics: *Instruction to perform a full disaggregation of a AggregatedUnit. All subunits and platforms will be registered in the federation.*
Parameters:

Name	Datatype	Semantics
Federate *Inherited from Request in NETN-MRM*	FederateName	*Required. Intended federate responsible for performing the requested action. Sending federate should ensure that receiving federate can perform requested action. If not able to perform, a response interaction indicating failure should be returned.*
AggregateUnit *Inherited from Request in NETN-MRM*	UuidArrayOfHLAbyte16	*Required for all requests except QuerySupportedCapabilities. Unique identifier for the NETN_Aggregate for which this request is related to.*

Name	Datatype	Semantics
EventId *Inherited from MRM_Interaction in NETN-MRM*	TransactionId	*Unique identifier for all MRM interactions belonging to the same request/respons event.*

4.2.6. **Divide**

Full Name: HLAinteractionRoot.MRM_Interaction.Request.Divide
Sharing: Publish/Subscribe
Transportation type: HLAreliable
Order: Receive
Dimensions:
Semantics: *Instruction to divide the simulated AggregateUnit into multiple simulated object. The resouces are divided among the simulated entities. After successful division two simulated entities represent the entire Unit. 1) The original AggregateUnit and 2) the divided unit or platform. Both these entities are simulated until merged.*

Parameters:

Name	Datatype	Semantics
Equipment	ArrayOfResourceStatus	*Optional. Amount of equipment of different type and health status to be divided.*
Personnel	ArrayOfResourceStatus	*Optional. Amount of personnel of different type and health status to be divided.*
Supplies	NETN_ArrayOfSupplyStruct	*Optional. Amount of supplies to divide.*
RegisterPhysicalEntities	HLAboolean	*Optional. If true all Equipment of type Platform and Lifeform are published as individual objects in the federation.*
Federate *Inherited from Request in NETN-MRM*	FederateName	*Required. Intended federate responsible for performing the requested action. Sending federate should ensure that receiving federate can perform requested action. If not able to perform, a response interaction indicating failure should be returned.*
AggregateUnit *Inherited from Request in NETN-MRM*	UuidArrayOfHLAbyte16	*Required for all requests except QuerySupportedCapabilities. Unique identifier for the NETN_Aggregate for which this request is related to.*
EventId *Inherited from MRM_Interaction in NETN-MRM*	TransactionId	*Unique identifier for all MRM interactions belonging to the same request/respons event.*

4.2.7. **Merge**

Full Name: HLAinteractionRoot.MRM_Interaction.Request.Merge
Sharing: Publish/Subscribe
Transportation type: HLAreliable

Order: Receive

Dimensions:

Semantics: *Instruction to merg the simulated AggregateUnit with the selected divided parts. After successful merge the divided parts are removed from the federation and their resources are combined with the AggregatedUnit.*

Parameters:

Name	Datatype	Semantics
Subunits	ArrayOfUuid	*Required. A set of unique identifiers of subelements of the AggregateUnit. These can be any subunit and/or equipment defined at a subunit on any level.*
Federate *Inherited from Request in NETN-MRM*	FederateName	*Required. Intended federate responsible for performing the requested action. Sending federate should ensure that receiving federate can perform requested action. If not able to perform, a response interaction indicating failure should be returned.*
AggregateUnit *Inherited from Request in NETN-MRM*	UuidArrayOfHLAbyte16	*Required for all requests except QuerySupportedCapabilities. Unique identifier for the NETN_Aggregate for which this request is related to.*
EventId *Inherited from MRM_Interaction in NETN-MRM*	TransactionId	*Unique identifier for all MRM interactions belonging to the same request/respons event.*

4.2.8. **QuerySupportedCapabilities**

Full Name: HLAinteractionRoot.MRM_Interaction.Request.QuerySupportedCapabilities

Sharing: Publish/Subscribe

Transportation type: HLAreliable

Order: Receive

Dimensions:

Semantics: *A request to query the capabilities of a specified federation to provide support for MRM events. The queried federate shall respond with a CapabilitiesSupported interaction.*

Parameters:

Name	Datatype	Semantics
Federate *Inherited from Request in NETN-MRM*	FederateName	*Required. Intended federate responsible for performing the requested action. Sending federate should ensure that receiving federate can perform requested action. If not able to perform, a response interaction indicating failure should be returned.*
AggregateUnit *Inherited from Request in NETN-MRM*	UuidArrayOfHLAbyte16	*Required for all requests except QuerySupportedCapabilities. Unique identifier for the NETN_Aggregate for which this request is related to.*

Name	Datatype	Semantics
EventId *Inherited from MRM_Interaction in NETN-MRM*	TransactionId	*Unique identifier for all MRM interactions belonging to the same request/respons event.*

4.2.9. **Activate**

Full Name: HLAinteractionRoot.MRM_Interaction.Request.Activate
Sharing: Publish/Subscribe
Transportation type: HLAreliable
Order: Receive
Dimensions:
Semantics: *Request federate to change of status of AggregateUnit to Active. If required the unit will be registered in the federation.*
Parameters:

Name	Datatype	Semantics
Federate *Inherited from Request in NETN-MRM*	FederateName	*Required. Intended federate responsible for performing the requested action. Sending federate should ensure that receiving federate can perform requested action. If not able to perform, a response interaction indicating failure should be returned.*
AggregateUnit *Inherited from Request in NETN-MRM*	UuidArrayOfHLAbyte16	*Required for all requests except QuerySupportedCapabilities. Unique identifier for the NETN_Aggregate for which this request is related to.*
EventId *Inherited from MRM_Interaction in NETN-MRM*	TransactionId	*Unique identifier for all MRM interactions belonging to the same request/respons event.*

4.2.10. **Deactivate**

Full Name: HLAinteractionRoot.MRM_Interaction.Request.Deactivate
Sharing: Publish/Subscribe
Transportation type: HLAreliable
Order: Receive
Dimensions:
Semantics: *Request change of status of AggregateUnit to Inactive and if indicated remove it from the federation.*
Parameters:

Name	Datatype	Semantics
RemoveUnit	HLAboolean	*Optional. Indicates if the Aggregate Unit shall be removed as an object instance in the federation. Default = FALSE - keep object instance in federation.*
Federate *Inherited from Request in NETN-MRM*	FederateName	*Required. Intended federate responsible for performing the requested action. Sending federate should ensure that receiving federate can perform requested action. If not able to perform, a response interaction indicating failure should be returned.*
AggregateUnit *Inherited from Request in NETN-MRM*	UuidArrayOfHLAbyte16	*Required for all requests except QuerySupportedCapabilities. Unique identifier for the NETN_Aggregate for which this request is related to.*
EventId *Inherited from MRM_Interaction in NETN-MRM*	TransactionId	*Unique identifier for all MRM interactions belonging to the same request/respons event.*

4.2.11. **Response**

Full Name: HLAinteractionRoot.MRM_Interaction.Response
Sharing: Publish/Subscribe
Transportation type: HLAreliable
Order: Receive
Dimensions:
Semantics: *A response from the receiving federate indicating ability to comply with request.*
Parameters:

Name	Datatype	Semantics
Status	HLAboolean	*Required. Specifies the result of the request action. TRUE indicates success.*
EventId *Inherited from MRM_Interaction in NETN-MRM*	TransactionId	*Unique identifier for all MRM interactions belonging to the same request/respons event.*

4.2.12. **CapabilitiesSupported**

Full Name: HLAinteractionRoot.MRM_Interaction.CapabilitiesSupported
Sharing: Publish/Subscribe
Transportation type: HLAreliable
Order: Receive
Dimensions:

Semantics: *An interaction sent in respons to a QuerySupportedCapabilities request. The respons include a list of names of the supported capabilities for the Aggregate unit specified in the query. The names are one or more of "Aggregate", "Disaggregate", "Divide", "Merge", "Activate" and "Inactivate".*

Parameters:

Name	Datatype	Semantics
CapabilityNames	ArrayOfStringType	*Required. A list of names of the supported capabilities for the Aggregate entity specified in the query. The names are one or more of "Aggregate", "Disaggregate", "Divide", "Merge", "Activate" and "Inactivate".*
EventId *Inherited from MRM_Interaction in NETN-MRM*	TransactionId	*Unique identifier for all MRM interactions belonging to the same request/respons event.*

4.3. Datatypes

4.3.1. Simple Datatypes

RangeFloat32

Representation:	HLAfloat32BE
Units:	meters
Resolution:	NA
Accuracy:	perfect
Semantics:	Range of sensor

4.3.2. Enumerated Datatypes

WeaponControlOrderEnum8

Representation: HLAoctet

Semantics: *The enumerations for weapon control*

Enumerator	Value
WeaponsFree	1
WeaponsHold	3
Other	0
WeaponsTight	2

CaptureStatusEnum8

Representation: HLAoctet

Semantics: *The status of a person or unit with respect to their control or influence over their own activities. Default: 1 - Not Captured.*

Enumerator	Value
Not-Captured	1
Captured	2
AttemptingSurrender	3
Other	0

EntityCategoryEnum32

Representation: RPRunsignedInteger32BE

Semantics: *Category of entity*

Enumerator	Value
Invalid	0
EquipmentEntity	1
PersonnelEntity	2

Enumerator	Value
EmitterEntity	3
RadioEntity	4

ConcealmentEnum32

Representation: RPRunsignedInteger32BE

Semantics: *The reason for the objects concealment*

Enumerator	Value
Invalid	0
InOpen	1
MountedInternally	2
MountedExternally	3
UnderNet	4
UnderGround	5
InsideStructure	6
FightingPositionCovered	7
FightingPositionUncovered	8

SensorStateEnum32

Representation: RPRunsignedInteger32BE

Semantics: *The emission states of aggregate sensors*

Enumerator	Value
OnButNotEmitting	2
Off	1
Other	0
OnAndEmitting	3

4.3.3. Array Datatypes

ArrayOfResourceStatus

Element Type: ResourceStatusNumberStruct
Cardinality: [1..2147483647]
Encoding: HLAvariableArray
Semantics: *The array of health states for a named resource.*

ArrayOfEntityStruct

Element Type: EntityStruct
Cardinality: [1..2147483647]
Encoding: HLAvariableArray
Semantics: *Data for one or more entities that comprise an entity list.*

ArrayOfSensorStruct

Element Type: SensorStruct
Cardinality: [1..2147483647]
Encoding: HLAvariableArray
Semantics: *Array with definitio0ns of sensors, 1+ cardinality*

4.3.4. Fixed Record Datatypes

VisualSignatureStruct

Encoding: HLAfixedRecord

Semantics: *Specifies the visual structure*

Name	Type	Semantic
DVOSignaturePercent	PercentUnsignedInteger32	*A summary percentage of an aggregates susceptibility to detection by direct view optics, i.e. the human eye, binoculars, or telescopes. A unit with zero percent signature would be concealed from DVO detection.*
I2SignaturePercent	PercentUnsignedInteger32	*A summary percentage of an aggregates susceptibility to detection by Image Intensifying sensors. A unit with zero percent signature would be invisible to image intensifiers (I2).*
ThermalSignaturePercent	PercentUnsignedInteger32	*A summary percentage of an aggregates susceptibility to detection by thermal sensors. A unit with zero percent signature would be invisible to thermal sensors.*

MissionStruct

Encoding: HLAfixedRecord

Semantics: *The operational task the aggregate has been ordered to perform, the time the mission was assigned, and the estimated completion time.*

Name	Type	Semantic
StartTime	EpochTimeSecInt64	*An optional field providing the mission start time*
EndTime	EpochTimeSecInt64	*An optional field providing the mission estimated end time*
MissionEnum	AggregateMissionEnum16	*The mission assigned to the aggregate*

HUMINTSignatureStruct

Encoding: HLAfixedRecord

Semantics: *Describes the unit's susceptibility to human intelligence (HUMINT), i.e. information collected and provided by human sources.*

Name	Type	Semantic
HUMINTSignaturePercent	PercentUnsignedInteger32	*A summary percentage of an aggregates susceptibility to detection by human intelligence collectors. Zero percent signature means an aggregate is impervious to HUMINT.*

ElectronicSignatureStruct

Encoding: HLAfixedRecord

Semantics: *A summary percentage of an aggregates susceptibility to detection of its electronic emissions. Zero percent means that the aggregate has no electronic emissions.*

Name	Type	Semantic
ElectronicSignaturePercent	PercentUnsignedInteger32	*A summary percentage of an aggregates susceptibility to detection of its electronic emissions. Zero percent means that the aggregate has no electronic emissions.*
SensorArray	ArrayOfSensorStruct	*A list of sensors owned by the aggregate together with their respective operational status and range*

ResourceStatusNumberStruct

Encoding: HLAfixedRecord

Semantics: *The name of a resource and the number of instances of that resource by health status.*

Name	Type	Semantic
NumberHealthyOrIntact	QuantityFloat64	*The number of healthy or intact resources*
NumberSlightlyDamaged	QuantityFloat64	*The number of slightly damaged resources*
NumberModeratelyDamaged	QuantityFloat64	*The number of moderately damaged resources*
NumberSignificantlyDamaged	QuantityFloat64	*The number of significantly damaged resources*
NumberDestroyed	QuantityFloat64	*The number of destroyed or consumed resources*
ResourceName	HLAunicodeString	*The name of the resource*
ResourceType	EntityTypeStruct	*The type of the resource (as described in the Bit Encoded Values for Use with Protocols for Distributed Interactive Simulation Applications)*

EntityStruct

Encoding: HLAfixedRecord
Semantics: *An entity represented to the federation as part of the aggregate object which owns it.*

Name	Type	Semantic
Callsign	HLAunicodeString	*The unique identifier of the object.*
EntityCategory	EntityCategoryEnum32	*Indicates whether the entity is equipment, person, emitter, etc.*
EntityStatus	DamageStatusEnhancedEnum32	*The damage state of the entity.*
IsDistinctObject	RPRboolean	*A BaseEntity object has been created to represent this entity (true) or not (false). Default is false.*
IsUnavailable	RPRboolean	*This entity is in use by another object (true) or not (false). Default is false.*
Facing	DirectionDegreesFloat32	*Direction is measured in degrees clockwise from orientation of unit. Default is 0.*
Concealment	ConcealmentEnum32	*Indicates whether the entity is concealed and, if so, how*
OffsetLocation	RelativePositionStruct	*The entity location given as an offset from the location of the aggregate unit in meters.*
UnitAllocation	UuidArrayOfHLAbyte16	*Reference to unit by UUID to which this entity is allocated as a resource. Unit may or may not be represented in the federation as a NETN_Aggregate and/or NETN-ORG Unit object.*

SensorStruct

Encoding: HLAfixedRecord
Semantics: *Defines a sensor,operational status, damage status, coverage and ID*

Name	Type	Semantic
SensorStateEnum	SensorStateEnum32	*The operational status of the sensor*
SensorDamageState	DamageStatusEnum32	*The damage status of the sensor*
SensorCoverage	RangeFloat32	*The maximum range of the sensor*
SensorID	HLAunicodeString	*A sensor owned by the aggregate*

5. Module RPR-Aggregate_v2.0

Information

Name:	SISO-STD-001.1-2015 - Real-time Platform Reference Aggregate FOM Module
Type:	FOM
Version:	2.0
Modification Date:	2015-08-10
Security Classification:	Unclassified
Purpose:	The RPR FOM supports interoperability for real-time, platform oriented defense simulation.
Application Domain:	All domains
Description:	This module provides the object class definition for representing aggregates of entities.
Use Limitation:	

Other:	

Primary author Point Of Contact

Name:	RPR FOM Product Development Group
Organization:	SISO - Simulation Interoperability Standards Organization
Telephone:	+1 (407) 882-1348
Email:	siso-help@sisostds.org

References

Dependency	Real-time Platform Reference Base FOM Module
Text Document	Standard for Guidance, Rationale, and Interoperability Modalities for the Real-time Platform Reference Federation Object Model (RPR FOM) SISO-STD-001-2015 10 August 2015
Text Document	IEEE Standard for Distributed Interactive Simulation - Application Protocols IEEE Std 1278.1-1995 September 21, 1995
Text Document	IEEE Standard for Distributed Interactive Simulation - Application Protocols IEEE Std 1278.1a-1998 19 March 1998

5.1. Object Classes

5.1.1. **AggregateEntity**

Full Name: HLAobjectRoot.BaseEntity.AggregateEntity

Sharing: Publish/Subscribe

Semantics: *A group of one or more separate objects that operate together as part of an organization. These objects may be discrete, may be other aggregate objects, or may be a mixture of both.*

Attributes:

AggregateMarking	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	AggregateMarkingStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	A unique marking or combination of characters used to distinguish the aggregate from other aggregates.					
AggregateState	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	AggregateStateEnum8	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	An indicator of the extent of association of objects form an operating group.					

Dimensions	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	DimensionStruct	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*AggSizeChange*				
	Semantics					
	The size of the area covered by the units in the aggregate.					
EntityIdentifiers	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	RTIobjectIdArray	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The identification of entities that are contained within the aggregate.					
ForceIdentifier	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	ForceIdentifierEnum8	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The identification of the force that the aggregate belongs to.					
Formation	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	FormationEnum32	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The category of positional arrangement of the entities within the aggregate.					
NumberOfSilentEntities	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	Integer16	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The number of elements in the SilentEntities list.					

NumberOfVariableDatums	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	UnsignedInteger32	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The number of records in the VariableDatums structure.					
SilentAggregates	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	SilentAggregateStructLengthlessArray	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The numbers and types, of silent aggregates contained in the aggregate. Silent aggregates are sub-aggregates that are in the aggregate, but that are not separately represented in the virtual world.					
SilentEntities	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	SilentEntityStructLengthlessArray	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The numbers and types, of silent entities in the aggregate. Silent entities are entities that are in the aggregate, but that are not separately represented in the virtual world.					
SubAggregateIdentifiers	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	RTIobjectIdArray	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	The identifications of aggregates represented in the virtual world that are contained in the aggregate.					

VariableDatums	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	VariableDatumStructLengthlessArray	PS	DA	RO	HLAbestEffort	
	Update type	**Update Condition**				
	Conditional	*On change*				
	Semantics					
	Extra data that describes the aggregate.					
HLAprivilegeToDeleteObject *Inherited from HLAobjectRoot in MIM*	**Datatype**	**Sharing**	**Ownership**	**Order**	**Transportation**	**Dimensions**
	HLAtoken	PS	DA	TS	HLAreliable	
	Update type	**Update Condition**				
	Static	*NA*				
	Semantics					

5.2. Datatypes

5.2.1. Array Datatypes

MarkingArray31

Element Type: Octet
Cardinality: 31
Encoding: HLAfixedArray
Semantics: *String of characters represented by a 31 element character string.*

SilentAggregateStructLengthlessArray

Element Type: SilentAggregateStruct
Cardinality: Dynamic
Encoding: RPRlengthlessArray
Semantics: *Set of silent aggregates (aggregates not registered in the federation).*

SilentEntityStructLengthlessArray

Element Type: SilentEntityStruct
Cardinality: Dynamic
Encoding: RPRlengthlessArray
Semantics: *A set of silent entities (entities not registered in the federation).*

VariableDatumStructLengthlessArray

Element Type: VariableDatumStruct
Cardinality: Dynamic
Encoding: RPRlengthlessArray
Semantics: *Set of additional data associated with an aggregate.*

5.2.2. Fixed Record Datatypes

AggregateMarkingStruct RPRnoteAggregate5

Encoding: HLAfixedRecord

Semantics: *Unique marking associated with an aggregate.*

Name	Type	Semantic
MarkingEncodingType	MarkingEncodingEnum8	*The type of marking.*
MarkingData	MarkingArray31	*The marking itself.*

SilentAggregateStruct

Encoding: HLAfixedRecord

Semantics: *These fields contain information about subaggregates not registered in the federation.*

Name	Type	Semantic
AggregateType	EntityTypeStruct	*This field shall specify the aggregates common to this system list.*
NumberOfAggregatesOfThisType	UnsignedInteger16	*This field shall specify the number of aggregates that have the type specified in AggregateType field.*

SilentEntityStruct

Encoding: HLAfixedRecord

Semantics: *These fields contain information about entities not registered in the federation.*

Name	Type	Semantic
NumberOfEntitiesOfThisType	UnsignedInteger16	*This field shall specify the number of entities that have the type specified in the field EntityType.*

Name	Type	Semantic
NumberOfAppearanceRecords	UnsignedInteger16	*This field shall specify the number of Entity Appearance records that follow. This number shall be between zero and the number of entities of this type. Simulation applications representing the aggregate that do not model entity appearances shall set this field to zero. Simulation applications representing the aggregate that model entity appearances shall set this field to the number of entity appearances that deviate from the default appearance. Other simulations can safely assume that any entity appearances not specified are default appearances.*
EntityType	EntityTypeStruct	*This field shall specify the entity types common to the entities in this system list.*
EntityAppearance RPRnoteAggregate6 RPRnoteAggregate7	UnsignedInteger32LengthlessArray	*This field shall specify the entity appearances of entities in the aggregate that deviate from the default. The length of the array is defined in the NumberOfAppearanceRecords field.*

5.3. Notes

RPRnoteAggregate1

Semantics: *Default value: empty*

RPRnoteAggregate2

Semantics: *Not optional*

RPRnoteAggregate3

Semantics: *Default value: Other*

RPRnoteAggregate4

Semantics: *Default value: zero*

RPRnoteAggregate5

Semantics: *The units and semantics for the MarkingData array elements are specified by the value of the MarkingEncodingType.*

RPRnoteAggregate6

Semantics: *The interpretation of the 32 bits defining the entity appearance is to be derived from the federation agreements, which could refer to the entity appearance record as defined in SISO-REF-010. The reason that this has not been split out into separate fields (as has been done for the subclasses of BaseEntity) is the difficulty of providing an efficient manner of defining an array of such appearance fields.*

RPRnoteAggregate7

Semantics: *RPRlengthlessArrayLength=NumberOfAppearanceRecords*