OneArc

Enhancing Distributed Simulation to C2 interoperability using NETN v4.

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Introduction

- NETN 4 Developer and integrator
- Task group developing NETN 4
- Developed NETN 4 connections from scratch
- Updating from RPR2 and NETN 3 to NETN 4
- Based on experiences from SweAF exercises.

Background to problem

- C2 exercises with multiple simulators and C2 systems
  - How do we transfer information between the systems?
  - How to streamline the integration as much as possible?
  - How to we decrease the exercise overhead?

Transfer information between systems

- HLA and NETN 4
- Standardized communication interface
- Standardised object model that covers the base need
  - Can be extended to cover special use cases for systems

Why NETN 4?

- Its HLA4 and modular
- Both Ground Truth and Perceived truth in same environment
  - Or in separate depending on the need and design
- Send basic tasks between systems
- Possible to change responsible system during runtime
- Possible to change one model without having a new system

NETN4 Observation reports

- Basic requirements for sending a report
  - 5 required parameters
- Multiple more fields to include more information about the report

Name: ObservationReport

Transportation: HLAreliable

Sharing: Publish, Subscribe

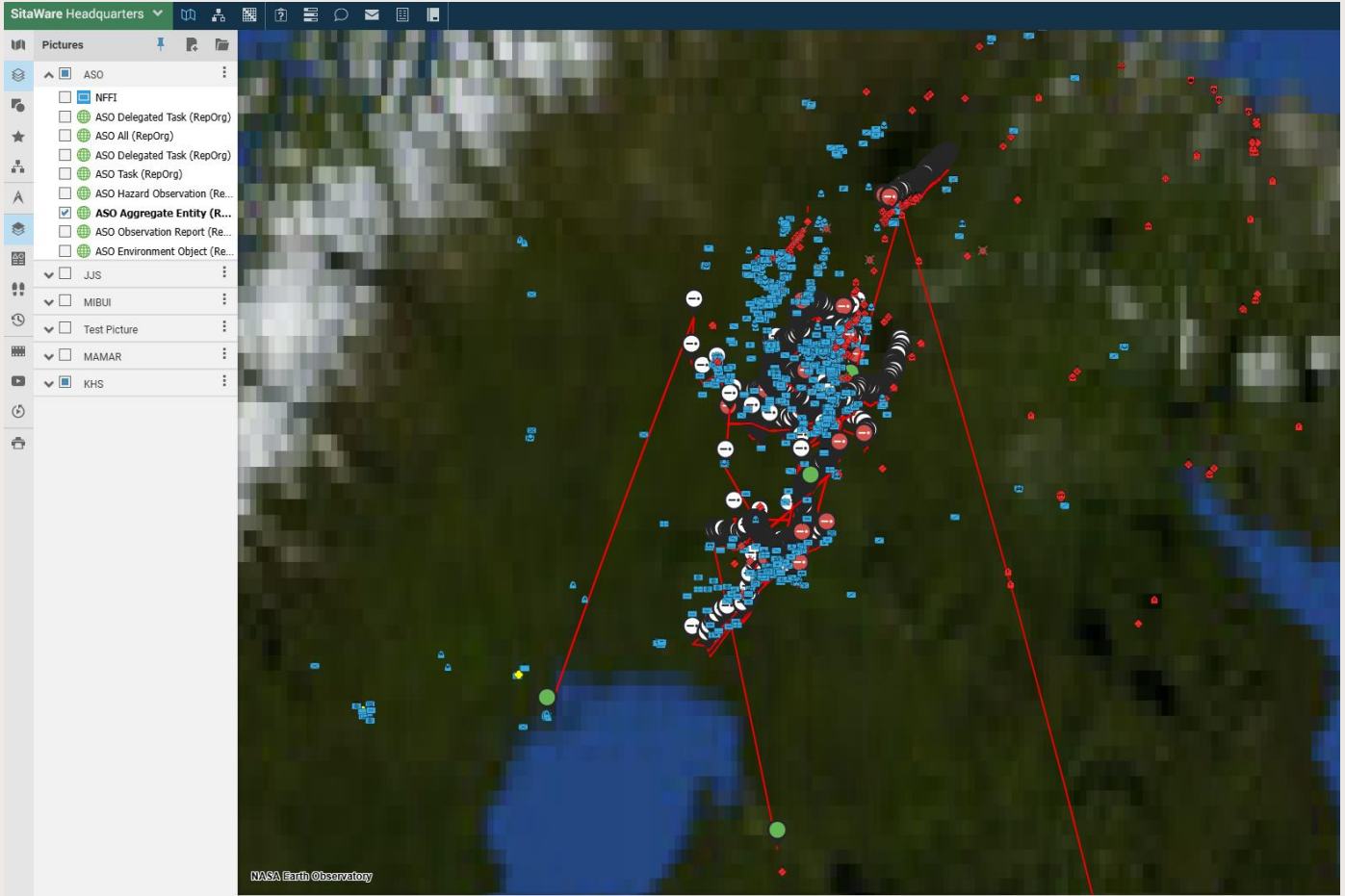
Parameters:

Name	Datatype	Semantics	Source
ObservedEntity	UUID	Required: The unique identifier ...	ObservationReport
ObservationTime	EpochTime	Required: The time when the ob...	ObservationReport
IdentificationLevel	IdentificationLevelEnum8	Optional. The identification leve...	ObservationReport
ConfidenceLevel	Float64	Optional:	ObservationReport
SensorType	EntityTypeStruct	Optional: The type of sensor tha...	ObservationReport
UncertaintyInterval	Float64	Optional	ObservationReport
Activity	AggregateMissionEnum16	Optional: The current activity of...	ObservationReport
Health	PercentFloat32	Optional: Observed strength of ...	ObservationReport
Location	LocationStruct	Optional: Observed location wh...	ObservationReport
Heading	DirectionDegreesFloat32	Optional: Observed heading of ...	ObservationReport
Speed	VelocityMeterPerSecondFloat32	Optional: Observed speed of th...	ObservationReport
HostilityStatus	HostilityStatusCodeEnum32	Optional: Perceived hostility of t...	ObservationReport
Marking	HLAunicodeString	Optional: Observed marking on ...	ObservationReport
Name	HLAunicodeString	Optional: Perceived name of th...	ObservationReport
Side	UUID	Optional: Perceived force identi...	ObservationReport
Equipment	ArrayOfObservedEquipment	Optional: Observed supplies an...	ObservationReport
Symbol	SymbolIdentifier	Optional: Symbol identifier for t...	ObservationReport
ReportId	UUID	Required: Unique identifier for t...	ETR_Report
ReportingEntity	UUID	Required: The entity sending th...	ETR_Report
Receiver	UUID	Optional: The indended receiver...	ETR_Report
TimeStamp	EpochTime	Required: The time when the re...	ETR_Report
Comments	HLAunicodeString	Optional. Any additional comm...	ETR_Report
UniqueId	UUID	Optional: A unique identifier for...	HLAinteractionRoot
SendTime	EpochTime	Optional: Scenario time when t...	HLAinteractionRoot

How does it work in practice?

- Multiple Simulators
  - Each simulator can calculate their own reports or one shared sensor module
- C2 system shall consume all reports
  - Simulators can consume if it is relevant
- Option to change sensor modules based on needs and design

Ground truth



Perceived truth

The future – Transferring data from C2 to Sim

- Tactical graphics
  - Custom FOM to transfer Tactical graphics in the federation
- Transfer orders directly from C2 systems to Simulation
  - Utilize the tactical graphics data for routes and similar

Questions?