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# RPR v2 - Object Class - Aircraft

## Test Purpose

The test shall verify that the System under Test (SuT) has implemented the GRIM RPR v2 requirements for the RPR v2 object class BaseEntity.PhysicalEntity.Platform.Aircraft. The requirements in GRIM is found in [Ref 1], chapter 7.6.1, Object Classes. The test shall verify that attributes (required and optional) stated in the Conformance Statement are managed correct.

The test case also includes requirements for the three levels of capability at the RPR v2 Aircraft Badge.

## Overview

[Ref 1], chapter 7.6.1.3: “This object class provides an attributeless subclass of Platform used to support DM filtering. It is equivalent to the DIS Air domain in that it represents platform entities such as airplanes, balloons, etc. that operate mainly in the air, but that include some limited land operations. This object class is publishable because it qualifies as a leaf node of the RPR FOM.”

## Conformance Statement

The owner of the SuT shall submit a Conformance Statement for the SuT, it will identify the required scope of correct managed attributes in the Test Protocol column for Publishing and Subscribing of class attributes.

## Test Environment

The SuT shall execute in the IVCT framework. The framework will listen to provided data from the SuT and stimulate the SuT with data to consume according to the Conformance Statement.

## The Scope of the Tests

The main purpose of these tests is to verify that the requirements and guidance in GRIM for RPR v2 is considered. The tests are not designed for checking that e.g. realistic flight models are used by the SuT.

### Declaration Tests

A provider of a class attribute shall publish the class attribute and a consumer shall subscribe to the class attribute.

### Syntax Tests

The tests checks that correct encoding and decoding are used when sending and receiving instance attribute updates.

### Semantic Tests

The semantic correctness of the attribute values is checked when applicable, e.g. an Aircraft shall have a position that is within the scenario boundary. A destroyed aircraft shall not be flying. A normally flying aircraft shall have the instance attribute PowerPlantOn set to *True*.

## Provider Requirements

To verify that provided attributes are used in a correct manner shall the SuT owner provide a scenario that verifies:

* That GRIM RPR v2 required attributes are listed in the conformance statement, are published, used with correct encoding and that attribute values are correct in a semantic aspect. The Spatial attribute shall either when the entity is moving be updated with a time interval or using dead-reckoning and update the attribute when a field value in the Spatial attribute has exceeded a specified threshold.
* That RPR2 GRIM optional attributes listed in the conformance statement are published, used with correct encoding and that attribute values are correct in a semantic aspect.

## Consumer Requirements

To verify that consumed attributes are used in a correct manner shall the IVCT framework provide a scenario that verifies:

* That GRIM RPR v2 required attributes are listed in the conformance statement, are subscribed, correct decoded and that attribute values are correct managed in a semantic view. The Spatial attribute field values for dead-reckoning shall be used to calculate position, orientation and velocity when any of these parameters are needed by the consumer.
* That GRIM RPR v2 optional attributes that are listed in the conformance statement are subscribed, correct decoded and that attribute values are correct managed in a semantic view.

# RPR v2 Aircraft Badge Requirements

## Bronze Badge:

The listed attributes for this badge are the normally required attributes in a federation to get a basic level of interoperability. All required attributes shall be correct managed by a provider and/or a consumer.

When an entity is moving, a provider shall for the attribute Spatial provide updates at a specified rate or use dead-reckoning when updating the attribute.

## Silver Badge:

The listed attributes for this badge are required to manage the viewing of the platform. All required attributes shall be correct managed by a provider and/or a consumer.

A provider shall for the attribute Spatial manage Dead-Reckoning algorithm Static, and at least one of the two algorithms that uses position, orientation and velocity when the entity is moving, threshold values shall be used to reduce the number of updates.

A consumer shall at least use position, orientation and velocity data in the Spatial attribute together with the timestamp at the latest update to calculate a current position, orientation and velocity at an entity.

## Gold Badge:

The listed attributes for this badge are required for manage extended viewing and sensor computation of the platform. All required attributes shall be correct managed by a provider and/or a consumer.

A provider shall manage the attribute Spatial Dead-Reckoning algorithm Static, andfor a moving entity the algorithms that uses position, orientation, velocity and acceleration and angular velocity when these parameters are changed, threshold values shall be used to reduce the number of updates.

A consumer shall use all of the provided data in the Spatial attribute together with the timestamp at the latest update to calculate a current position, an orientation and a velocity at an entity.

# References

[Ref 1] SISO-STD-001-2015, Standard for Guidance, Rationale, and Interoperability Modalities for the Real-time Platform Reference Federation Object Model, Version 2.0, 10 August 2015.