Table of Contents

[Resume 2](#_Toc443241208)

[Project Objectives 2](#_Toc443241209)

[Entities to be described 2](#_Toc443241210)

[Document structure 3](#_Toc443241211)

[Client-side description 3](#_Toc443241212)

[Administrative Client 3](#_Toc443241213)

[Administrative Client Type I 3](#_Toc443241214)

[Administrative Client Type II 3](#_Toc443241215)

[ATCo Client 3](#_Toc443241216)

[Pilot Client 4](#_Toc443241217)

[Server-side description 4](#_Toc443241218)

[Secondary resources and data-sources 4](#_Toc443241219)

1. Resume

This document intends to describe in a top level, user and developer friendly way SISGEA (Sistema Integrado de Simulação Geral de Espaço Aéreo – Integrated General Airspace Simulation System). Firstly, entities that are involved (either directly or indirectly) with the system concept.

* 1. Project Objectives

SISGEA intends to serve, on the short-term, as a simple framework that support the test of ATM practices and simulations of various sceneries. As its source code will be available free of charge through a special license (that is yet to be written), SISGEA also intends to pave the way for the creation of an enhanced ATM simulation framework on the long run. This will be helped by the use of a modularized architecture, which allows developers and researchers to develop and adopt more sophisticated models that are able to connect to SISGEA's core through a standartized interface.

1. Entities to be described

A list of the entities adopted and used on this document, followed by a short description on the respective entity is below:

* Aircraft – Serves as an interface to comprise all forms of aerial veichles, ranging from UAVs to Helicopters.
* Client – Generic representation of a software that is able to communicate (I.e, exchange data) with SISGEA Server (system core).
  + ATCo – Represent an ATCo (Air Traffic Controller) or a similar entity (e.g, a hypotetical equipment that perform similar functions).
  + Pilot – Represent a pilot flying a controllable aircraft or a similar device (e.g, an autonomous UAS).
  + Administrative I – The type-1 administrative client is able to configure the server and the simulations that are being executed.
  + Administrative II – The type-2 administrative client can only access data recorded from simulations or processed results from those previously acquired data.
* Server – Comprises all the subsystems needed to simulate an airspace:
  + AAAA
  + BBBB
  + CCCC
* Navigation Waypoint – Represents generically a waypoint, which might be only virtual, like real-world navigation waypoints or physical entities (NDB or VOR stations).
* World – Abstract the world on a simulation-related context (i.e, a sector).
  + Simulation Cell - A simulation cell comprises a sector of the virtual world, together with meteorological and geographical data needed to process the simulation of air traffic operations.

1. Document structure

SISGEA, being a client-server application, will have its description divided in those two fronts. The client description consist of a general paragraph to the entire set of client types, followed by sub-items that cover specific details for each kind of client. Server description, in a similar way, is composed of a brief paragraph on each adopted subsystem. Additional resources used on both sides will be explained further on the last item, “Secondary Resources and Data Sources”.

1. Client description

In overall, SISGEA Client programs are clients that will use services provided by the server. Those services range from acquiring and retrieving data previously obtained with simulations to feeding the server data related to the current simulation purposes. The tasks that can be performed by clients within the system context will be used below to divide their types.

* 1. Administrative Client
     1. Administrative Client Type I

The administrative client type 1 is able to control the server configurations, ranging from network control (e.g., listing clients that are currently connected, kicking clients or whether new connection requests shall be allowed) to operational control (e.g., closing a simulation, reading simulation data or manipulating simulation records).

* + 1. Administrative Client Type II

The administrative client type 2 is able only to perform some of the operational administrative operations (reading simulation data or post-processed data).

* 1. ATCo Client

The ATCo Client will allow the simulation of a real ATC behavior, via transmission of commands and reading simulated aircraft positions with a radar-simulated interface. In a first moment, transmission of messages will be implemented partially (one will be able to program and model communication, but the first version of the software will model messages as if they were simple strings that are sent between the clients) to pave way for further studies that may involve the communication link between ATCos and pilots.

* 1. Pilot Client

The pilot client represent an interface between the linkage of an aircraft model with a model of its behavior (which may vary according to the simulation purposes). The interaction of this module with the server is composed by the exchange of positional data from the pilot with positional data from the other active aircrafts.

1. Server description

Lorem ipsum dolor sit amet, cu dolores mediocrem honestatis sed, at dictas inimicus vel, ea nec brute utamur delicata. Vis rebum porro definiebas ea, an eos nibh munere, ne vel dico mundi. Eros veri veritus ea vel. Graeci omittam complectitur et mel, quo harum putent quaerendum id, et erant decore democritum per. Ea tale soluta euripidis est, ne eos latine ullamcorper, mea ne agam augue scriptorem. His sale minimum suscipiantur ex, sea assum suavitate ea.

* 1. Weather Control

Lorem ipsum dolor sit amet, cu dolores mediocrem honestatis sed, at dictas inimicus vel, ea nec brute utamur delicata. Vis rebum porro definiebas ea, an eos nibh munere, ne vel dico mundi. Eros veri veritus ea vel. Graeci omittam complectitur et mel, quo harum putent quaerendum id, et erant decore democritum per. Ea tale soluta euripidis est, ne eos latine ullamcorper, mea ne agam augue scriptorem. His sale minimum suscipiantur ex, sea assum suavitate ea.

* 1. NAVAIDS Database

Lorem ipsum dolor sit amet, cu dolores mediocrem honestatis sed, at dictas inimicus vel, ea nec brute utamur delicata. Vis rebum porro definiebas ea, an eos nibh munere, ne vel dico mundi. Eros veri veritus ea vel. Graeci omittam complectitur et mel, quo harum putent quaerendum id, et erant decore democritum per. Ea tale soluta euripidis est, ne eos latine ullamcorper, mea ne agam augue scriptorem. His sale minimum suscipiantur ex, sea assum suavitate ea.

* 1. Geographical Database

Lorem ipsum dolor sit amet, cu dolores mediocrem honestatis sed, at dictas inimicus vel, ea nec brute utamur delicata. Vis rebum porro definiebas ea, an eos nibh munere, ne vel dico mundi. Eros veri veritus ea vel. Graeci omittam complectitur et mel, quo harum putent quaerendum id, et erant decore democritum per. Ea tale soluta euripidis est, ne eos latine ullamcorper, mea ne agam augue scriptorem. His sale minimum suscipiantur ex, sea assum suavitate ea.

* 1. Connection Manager

Lorem ipsum dolor sit amet, cu dolores mediocrem honestatis sed, at dictas inimicus vel, ea nec brute utamur delicata. Vis rebum porro definiebas ea, an eos nibh munere, ne vel dico mundi. Eros veri veritus ea vel. Graeci omittam complectitur et mel, quo harum putent quaerendum id, et erant decore democritum per. Ea tale soluta euripidis est, ne eos latine ullamcorper, mea ne agam augue scriptorem. His sale minimum suscipiantur ex, sea assum suavitate ea.

* 1. Record Manager

Lorem ipsum dolor sit amet, cu dolores mediocrem honestatis sed, at dictas inimicus vel, ea nec brute utamur delicata. Vis rebum porro definiebas ea, an eos nibh munere, ne vel dico mundi. Eros veri veritus ea vel. Graeci omittam complectitur et mel, quo harum putent quaerendum id, et erant decore democritum per. Ea tale soluta euripidis est, ne eos latine ullamcorper, mea ne agam augue scriptorem. His sale minimum suscipiantur ex, sea assum suavitate ea.

* 1. Airspace Control Module

Lorem ipsum dolor sit amet, cu dolores mediocrem honestatis sed, at dictas inimicus vel, ea nec brute utamur delicata. Vis rebum porro definiebas ea, an eos nibh munere, ne vel dico mundi. Eros veri veritus ea vel. Graeci omittam complectitur et mel, quo harum putent quaerendum id, et erant decore democritum per. Ea tale soluta euripidis est, ne eos latine ullamcorper, mea ne agam augue scriptorem. His sale minimum suscipiantur ex, sea assum suavitate ea.

1. Secondary resources and data-sources

Lorem ipsum dolor sit amet, cu dolores mediocrem honestatis sed, at dictas inimicus vel, ea nec brute utamur delicata. Vis rebum porro definiebas ea, an eos nibh munere, ne vel dico mundi. Eros veri veritus ea vel. Graeci omittam complectitur et mel, quo harum putent quaerendum id, et erant decore democritum per. Ea tale soluta euripidis est, ne eos latine ullamcorper, mea ne agam augue scriptorem. His sale minimum suscipiantur ex, sea assum suavitate ea.