Action for the Dissemination and Adoption of the MARTE and related Standards for component based middleware

Designing ARINC 653 Application with MARTE

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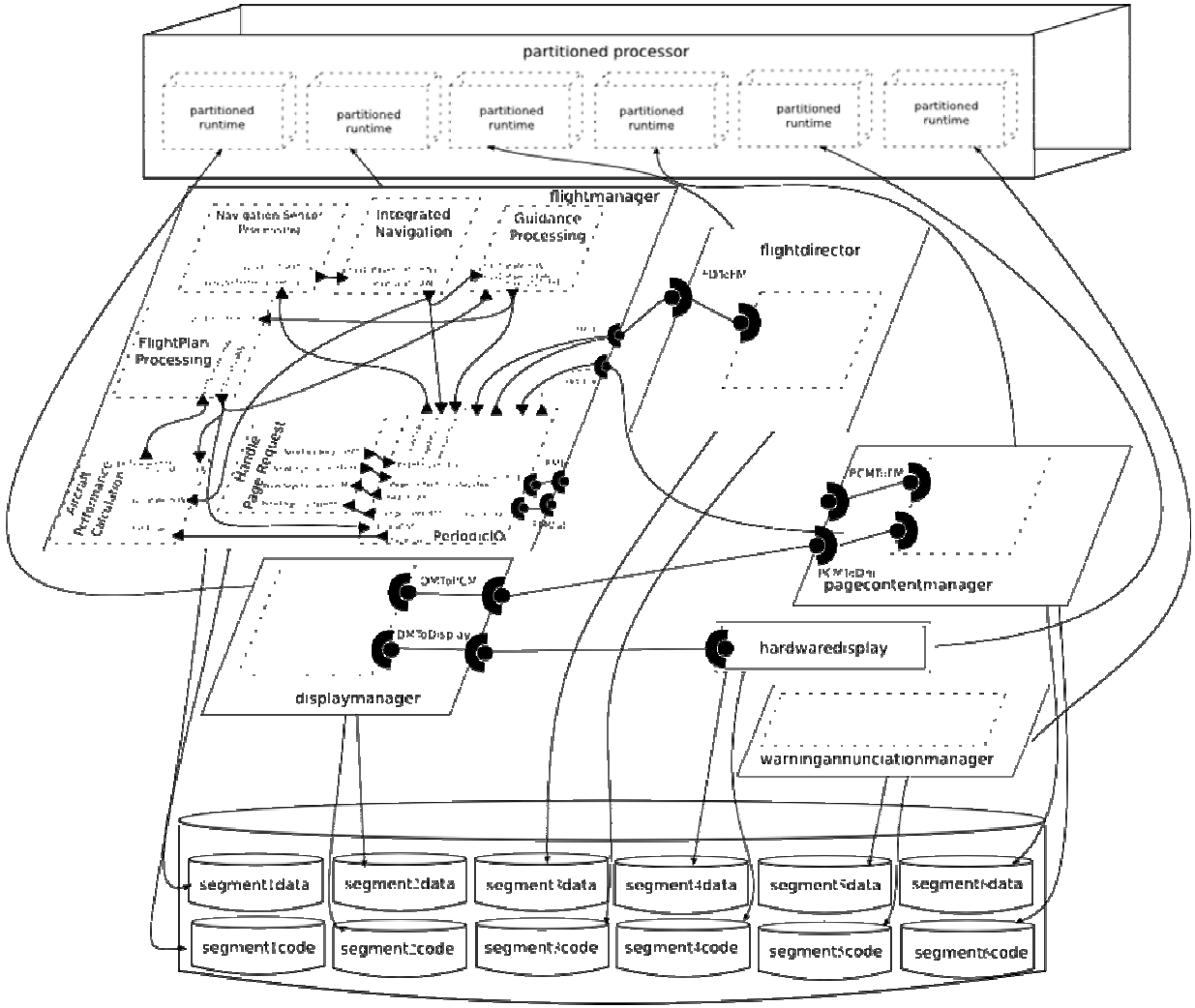
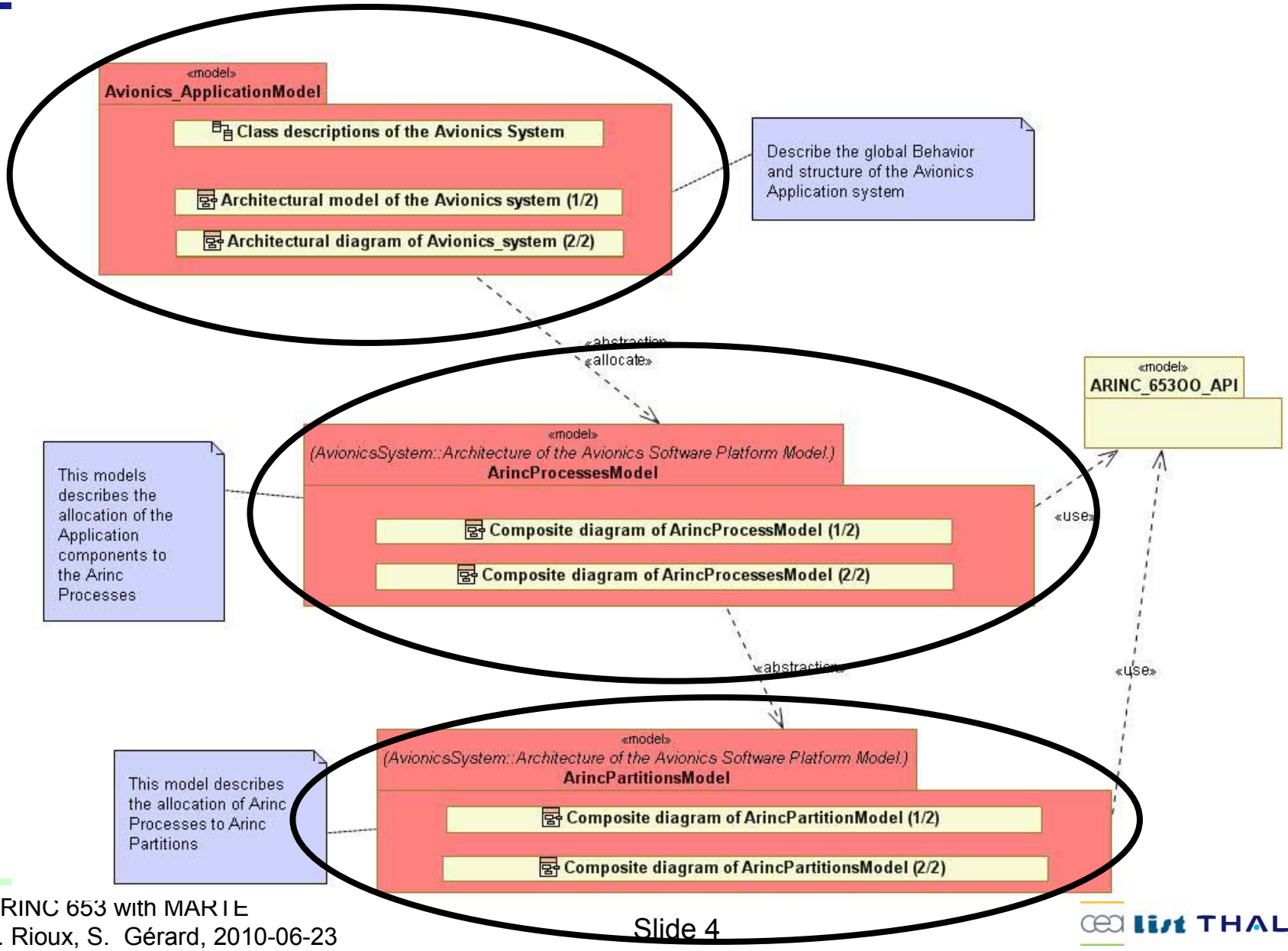
Objectives

- **Explain how to use MARTE to design an ARINC 653 application**
  - Provide a user guideline.
  - Provide a basic example.
- **Assess:**
  - Capacities of MARTE for modeling designs of ARINC 653 applications.
  - Capacities of MARTE to support scheduling analysis (RMA) on MARTE models of ARINC 653 applications.
  - Possibility to generate ARINC 653 configuration file from MARTE models of ARINC 653 applications.
- **Improve MARTE profile if required**

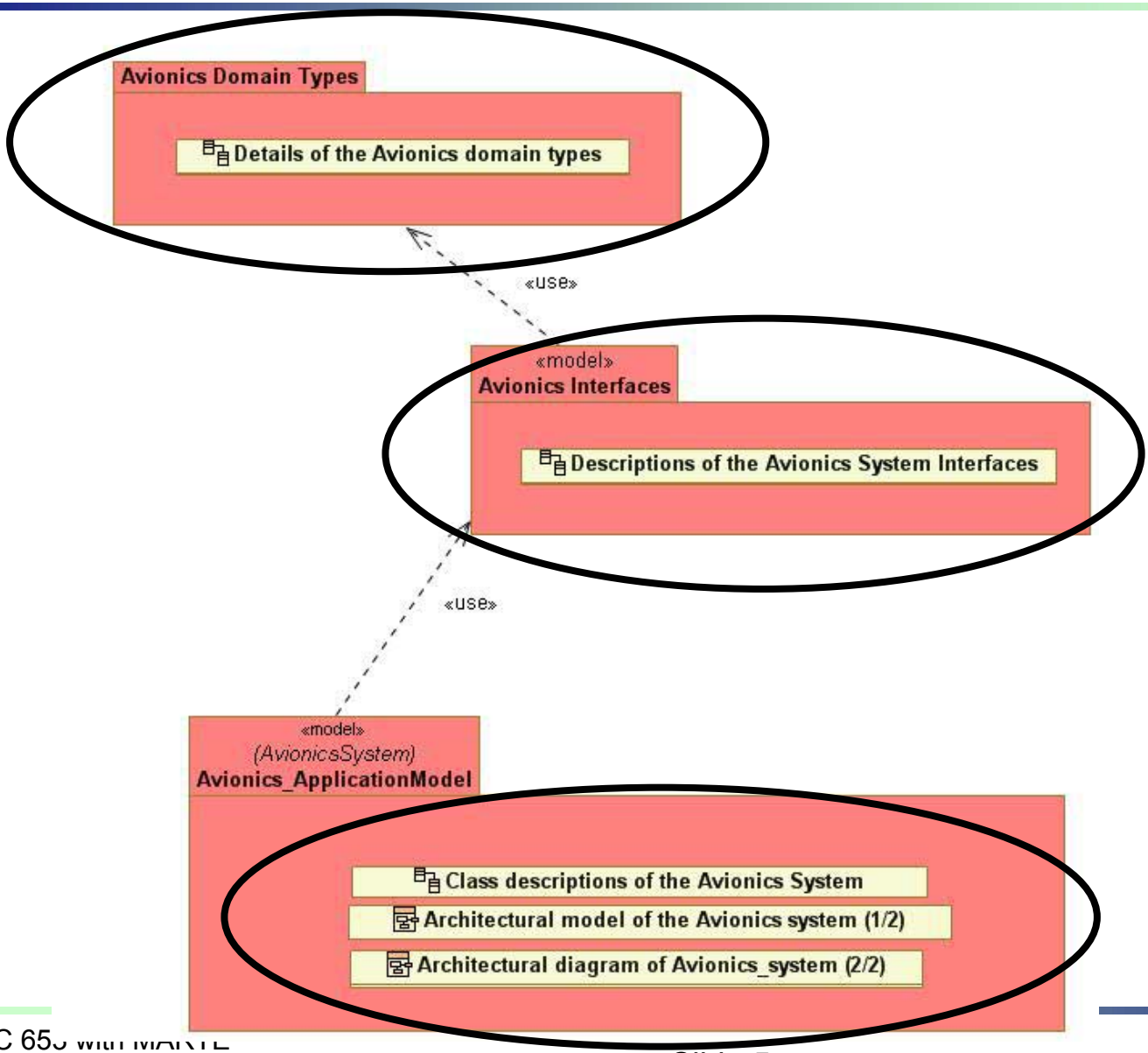
ARINC 653 Application: Avionics Flight Manager



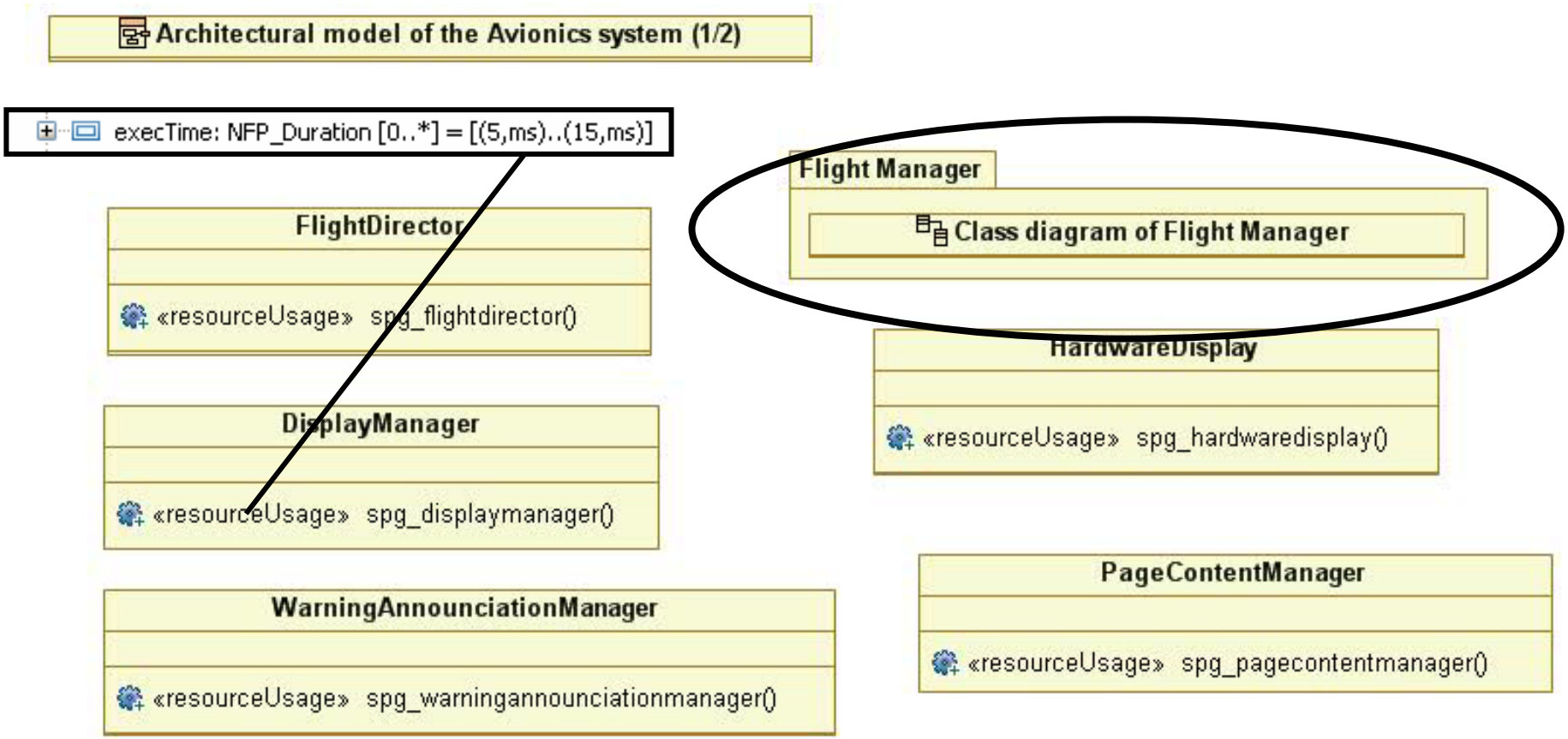
Process Development



Modeling the application



Class diagram of Avionics functions



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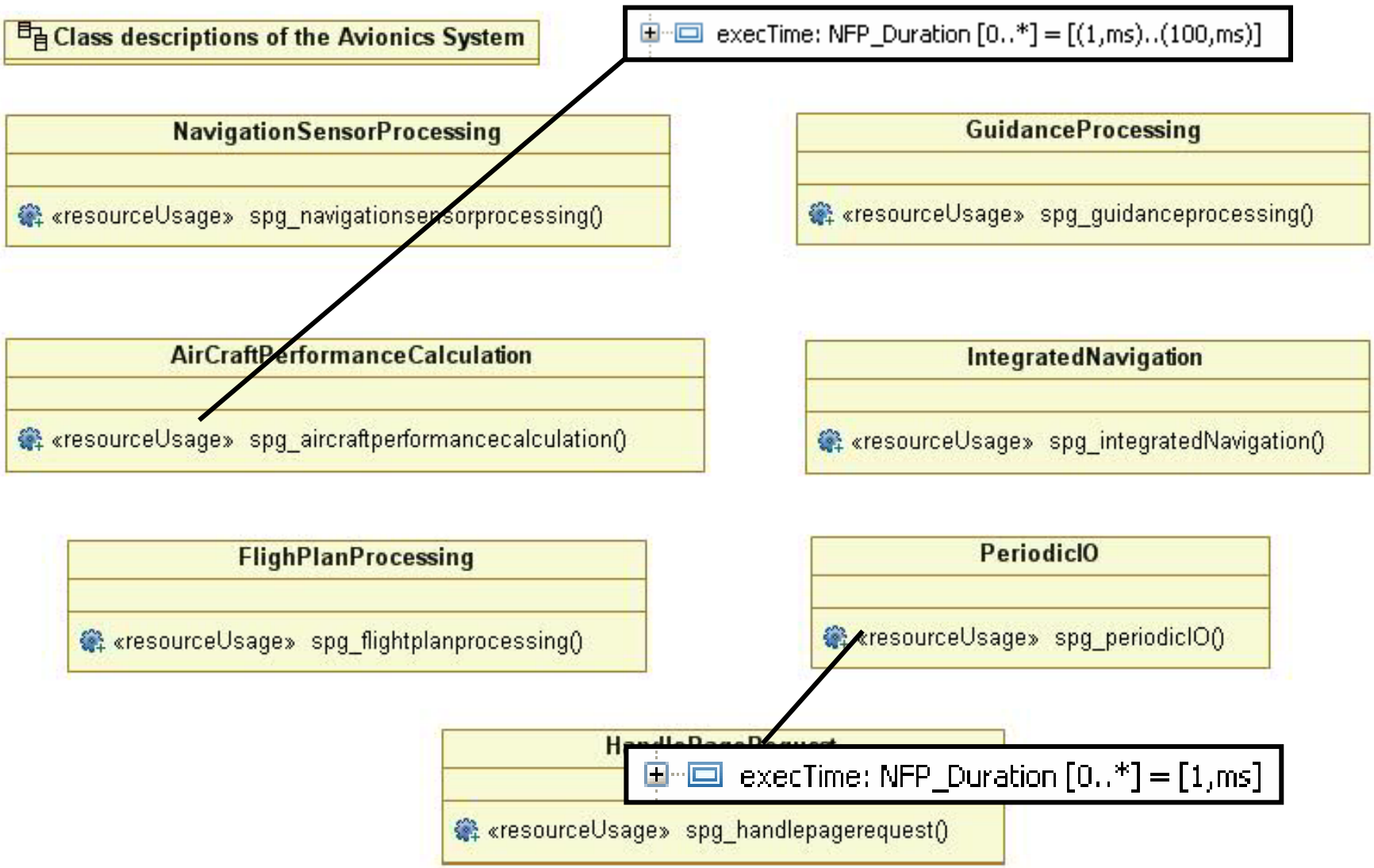
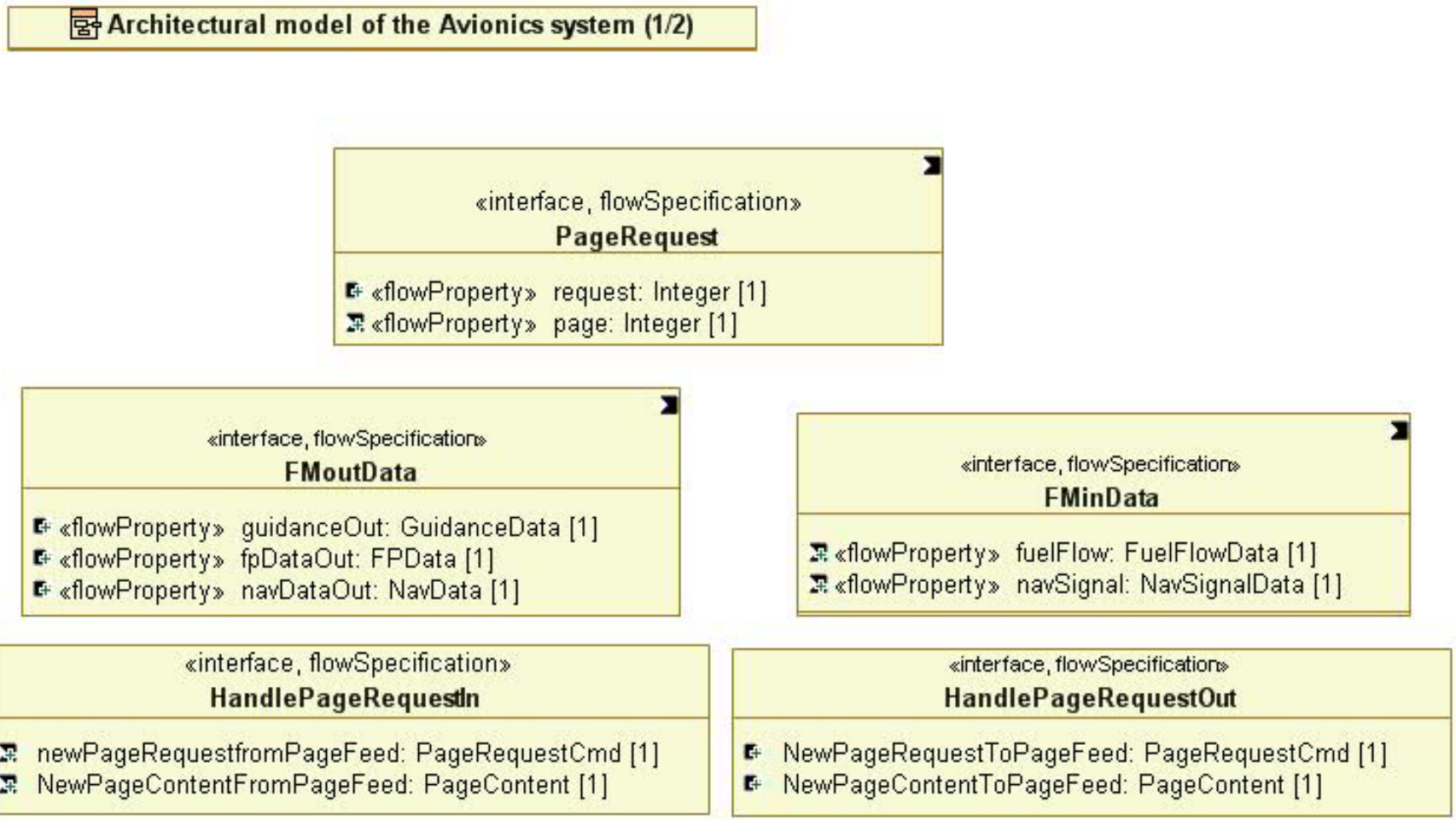


Application Behavior description

- Use State-machine to describe behaviors inside differents avionics functions and sub-functions
- Use sequence diagrams to model interactions/uses-cases of differents avionics functions and sub-functions.
- Use activity diagrams to model the detail internal behavior of operations inside the avionics functions and sub-functions.
- Actions can be used to describe the detail behavior of its operation inside avionics functions and sub-functions.

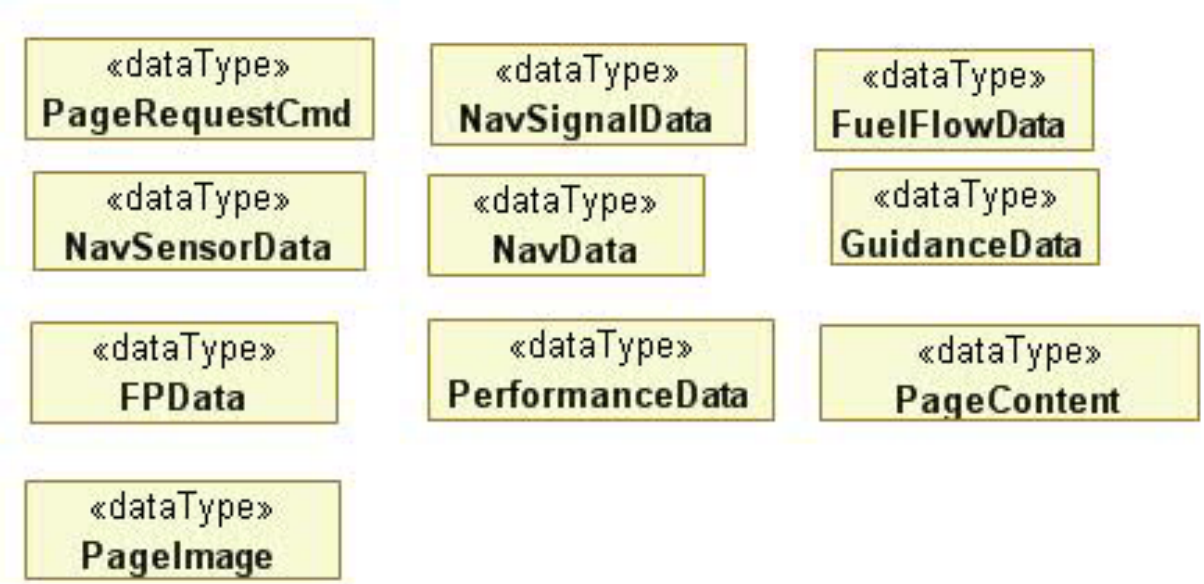
Interfaces definition

- **During designing the application:**
  - **Identify the interfaces**

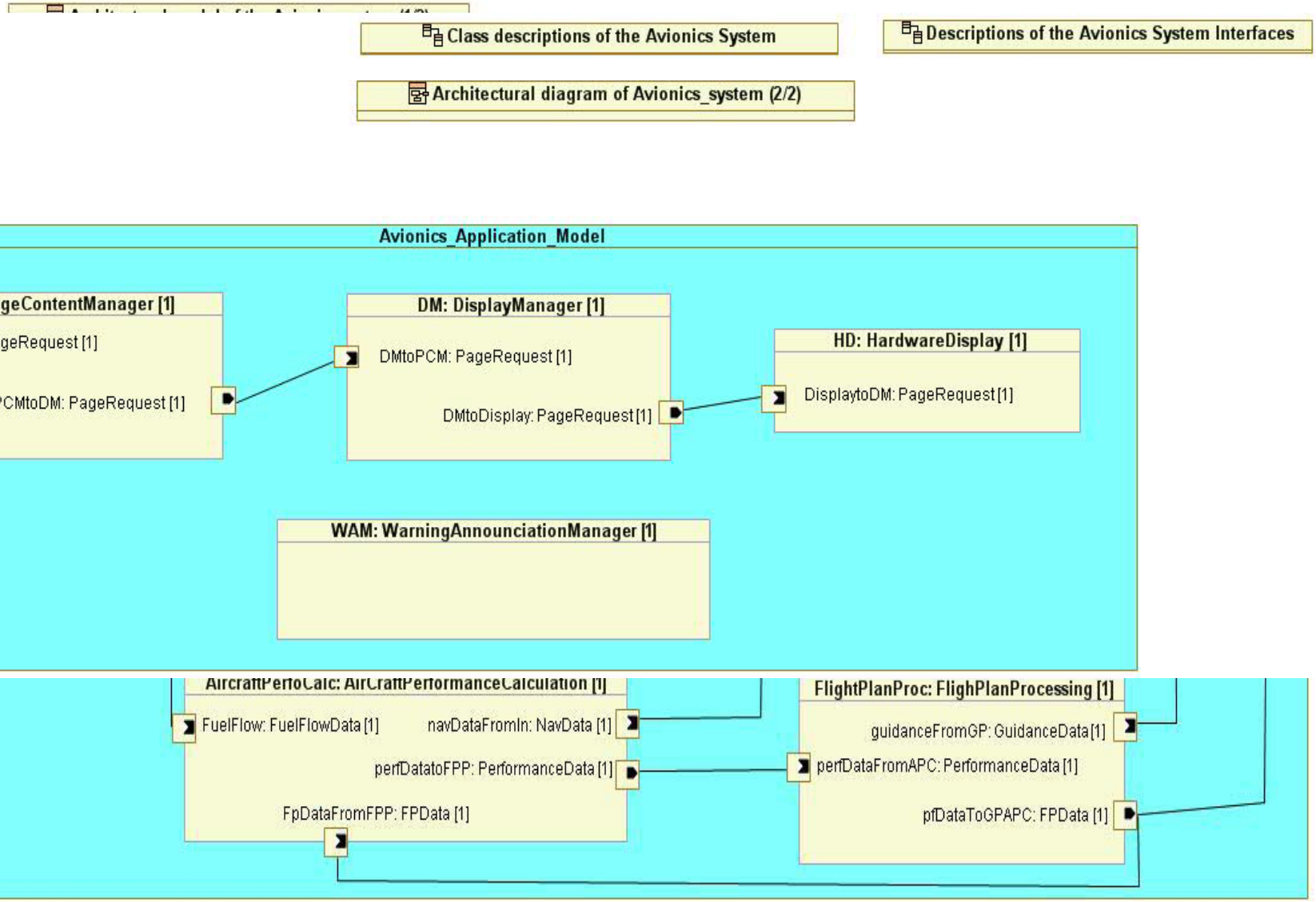


DataTypes definition

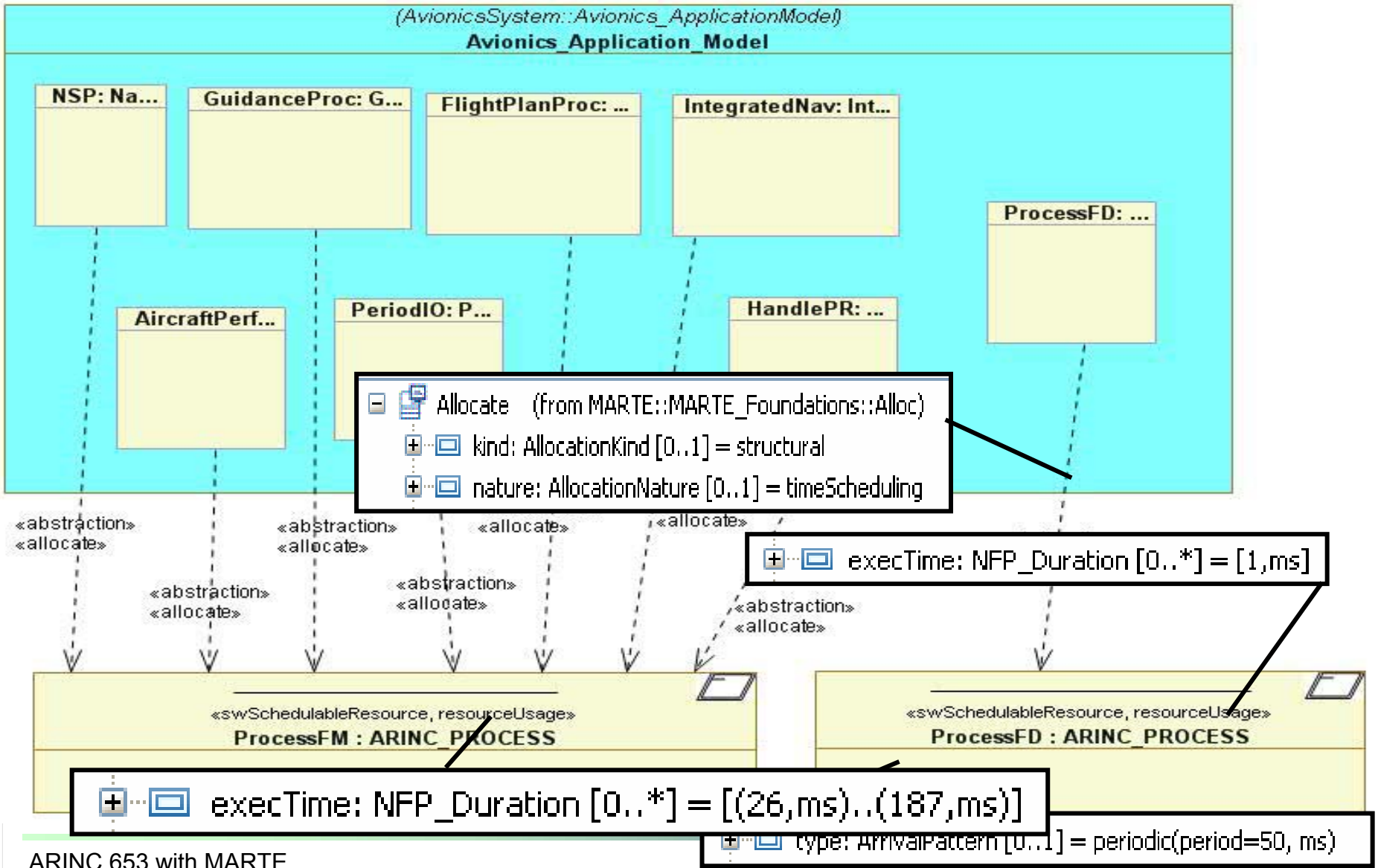
- **During designing and interfaces definition**
  - **Identify domain types « datatype »**



Component architecture



Allocate Functions on ARINC Process



Allocate Process to Partition