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Simulating Uninhabited Combat Aircraft in Hostile Environments

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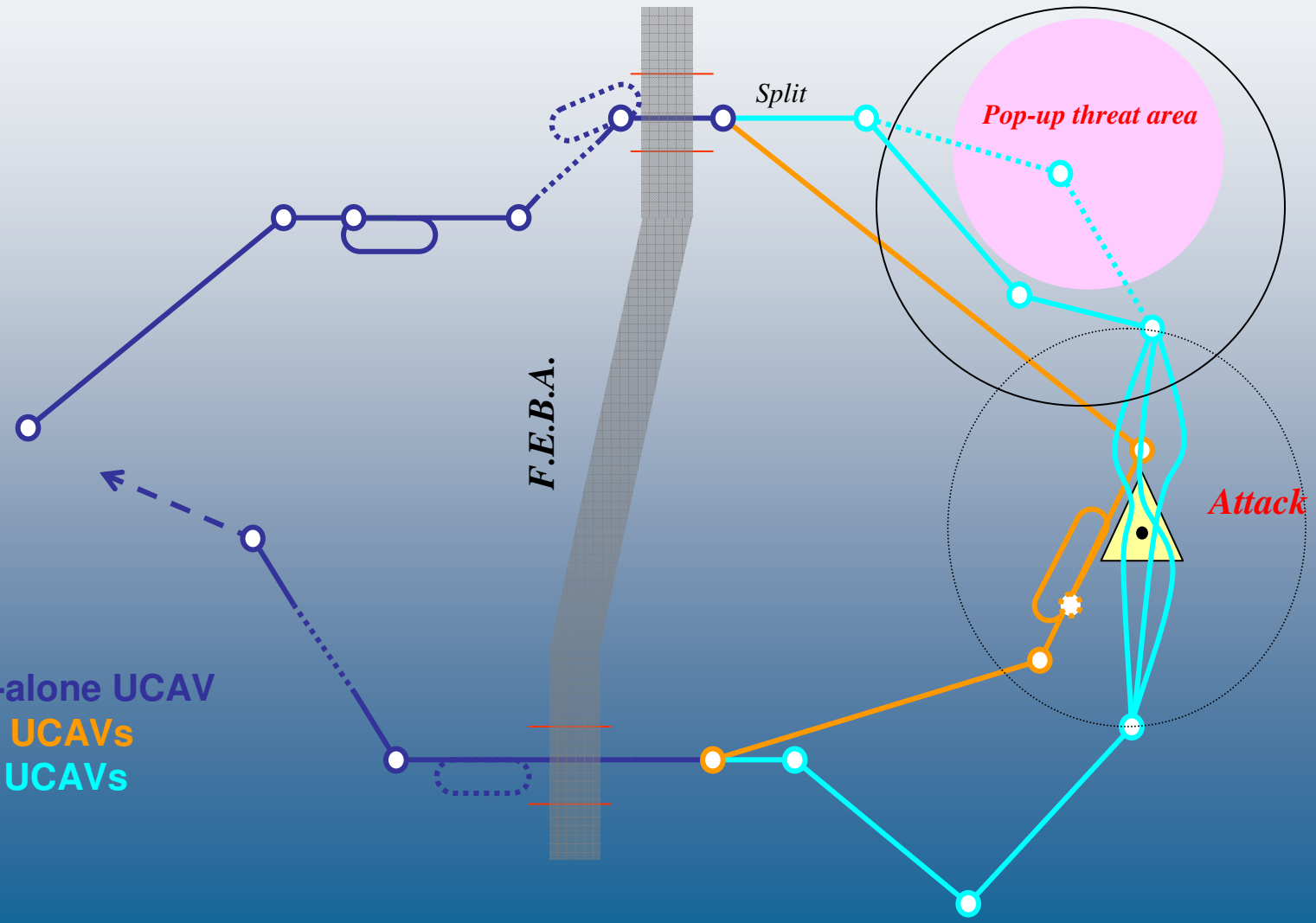
Motivation

- Less dangerous situations for pilots.
- Cutting-down aircraft cost.
- Uninhabited Combat Aircraft Vehicles (UCAVs) have been studied for 25 years.
- French initiative over the last years, funded by the D.G.A. (the French ARPA).

Mission

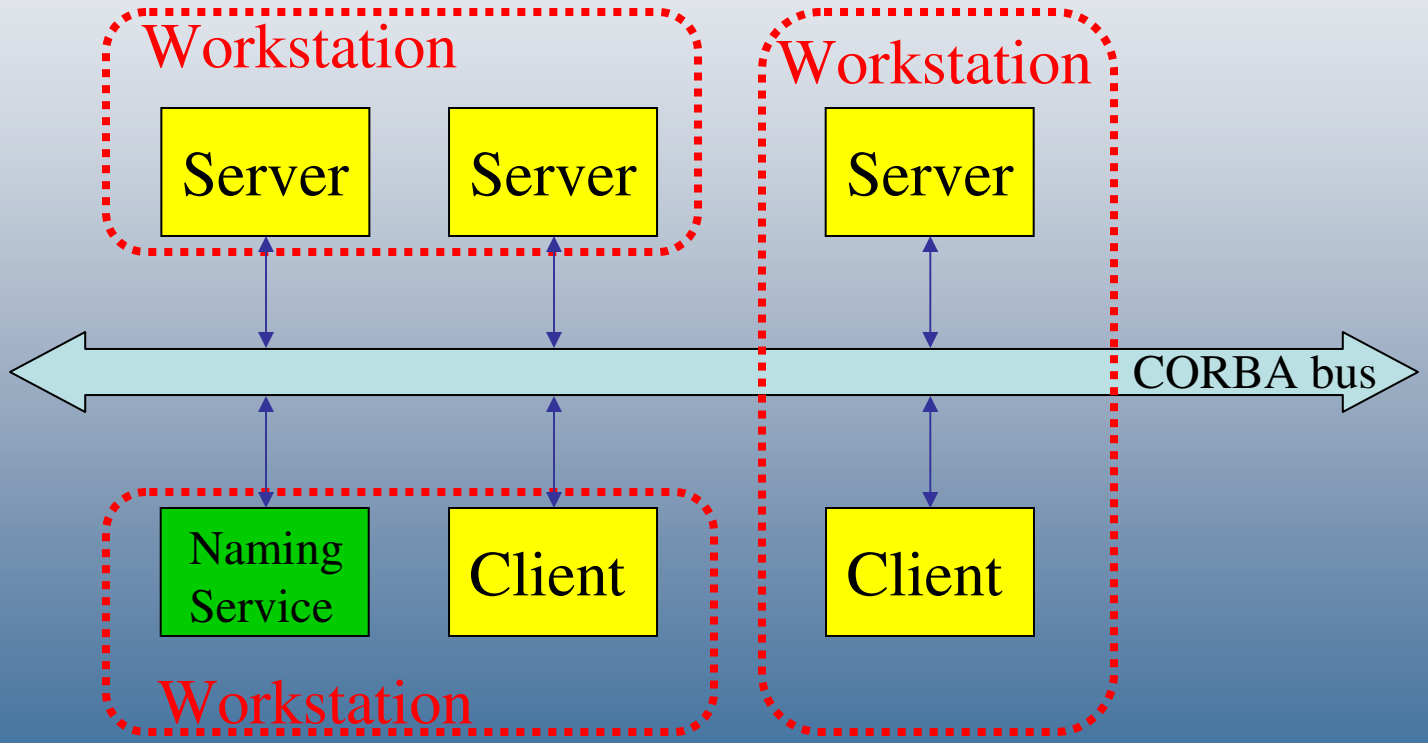


- Stand-alone UCAV
- Recce UCAVs
- Strike UCAVs

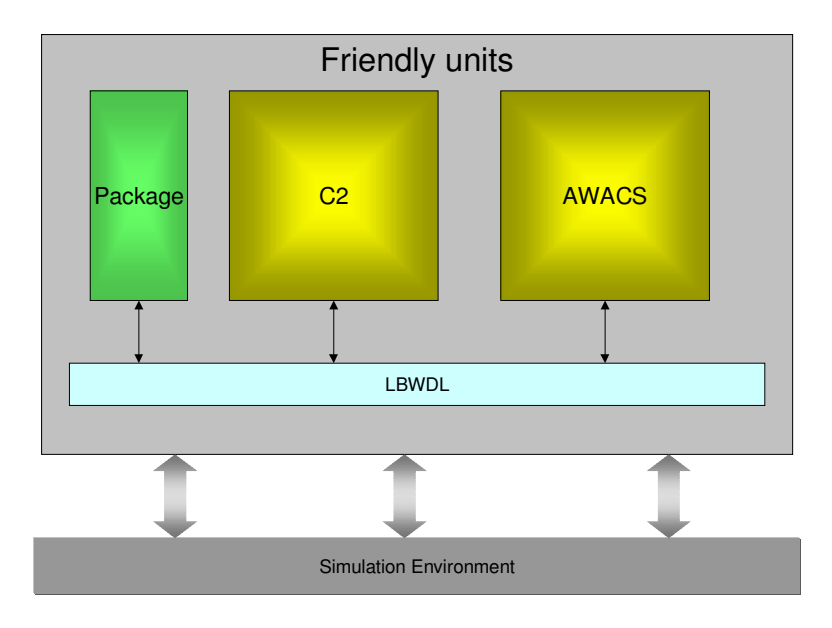
Goals

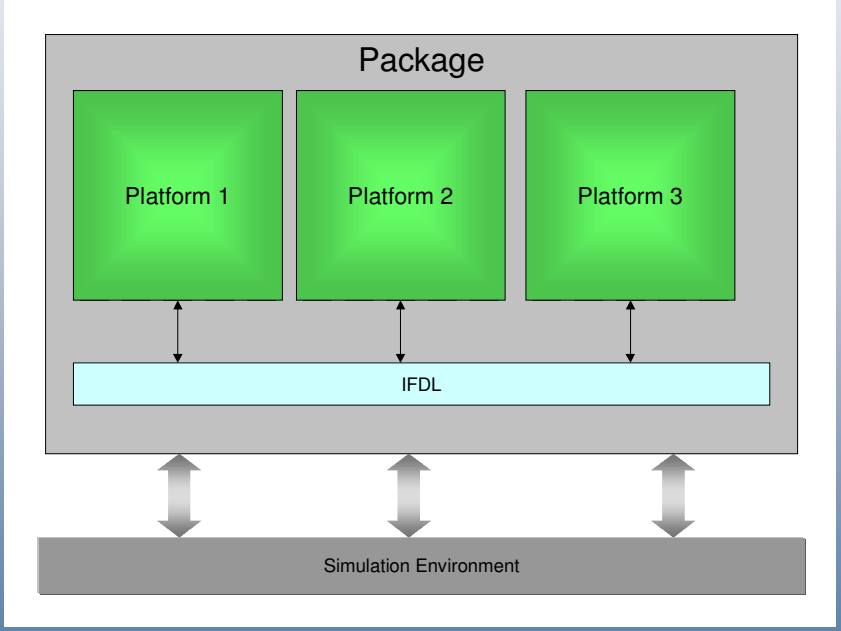
- Simulation of the ground and air environment.
- Pseudo real-time, distributed.
- Reasoning under time stress.
- Collaboration among UCAVs.

Simulation environment : Athéna

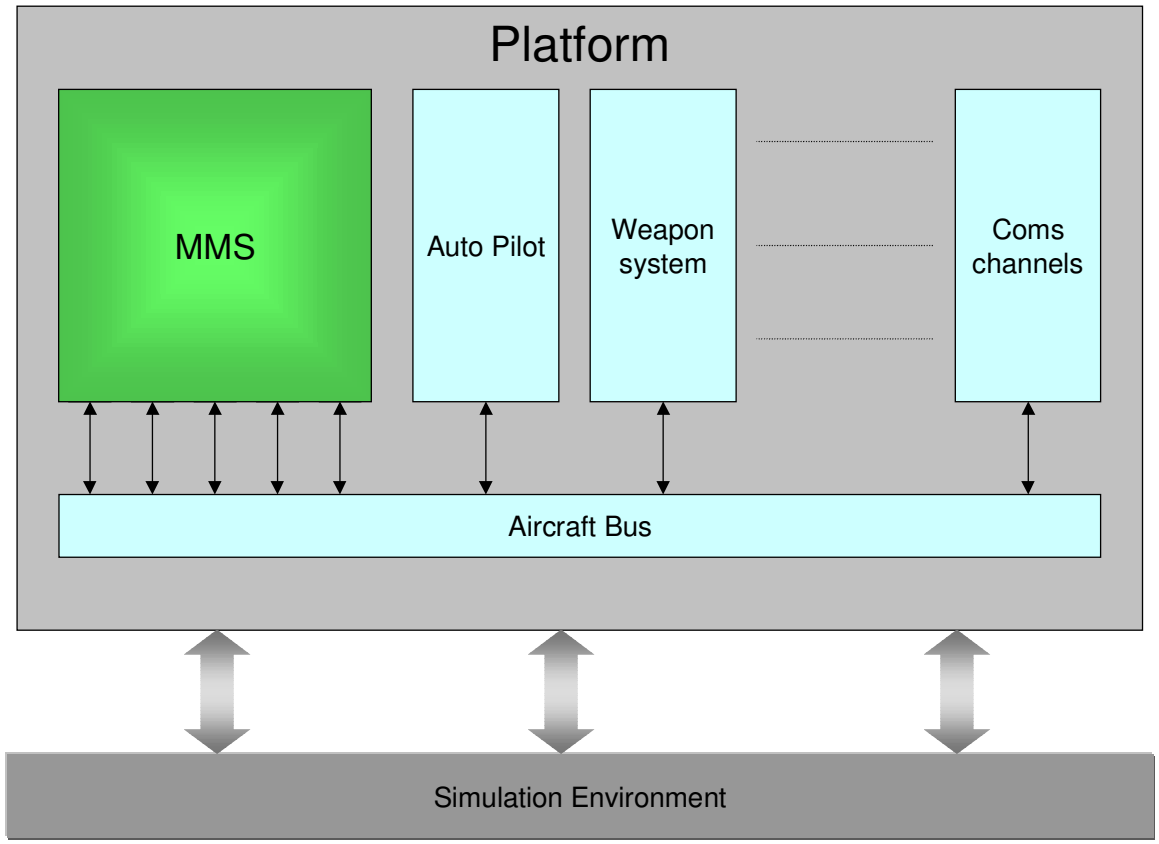


Objects and package models

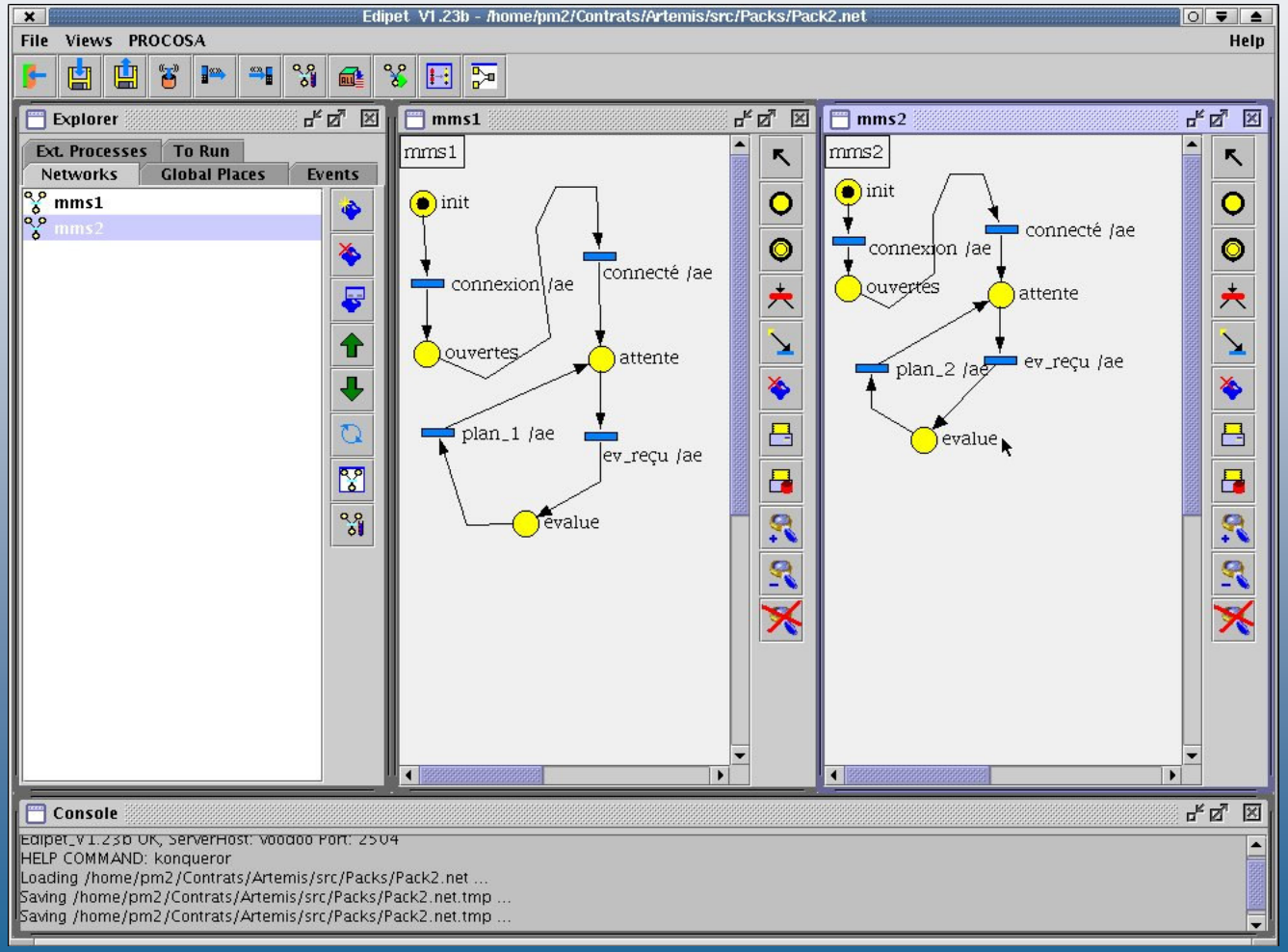




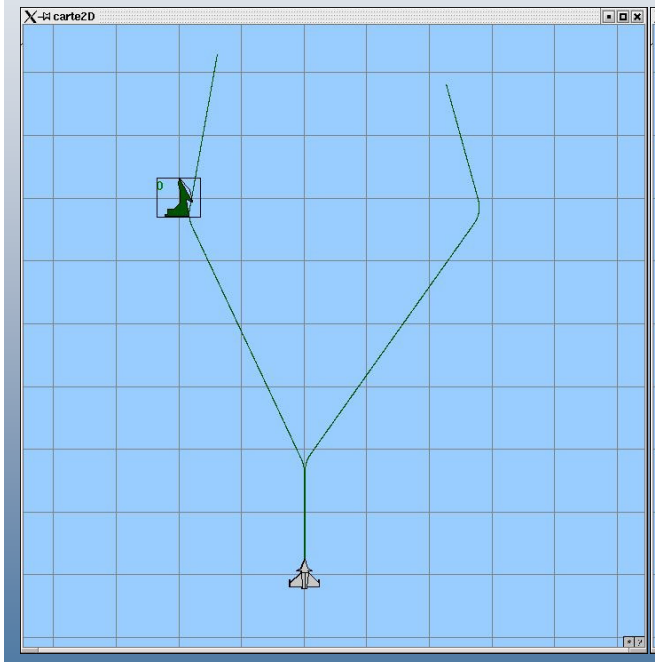
Aircraft model



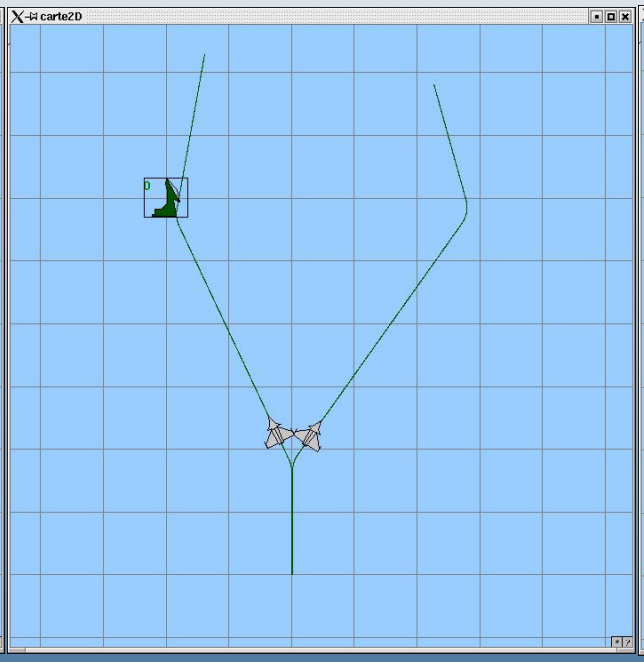
M.M.S. model : Petri nets



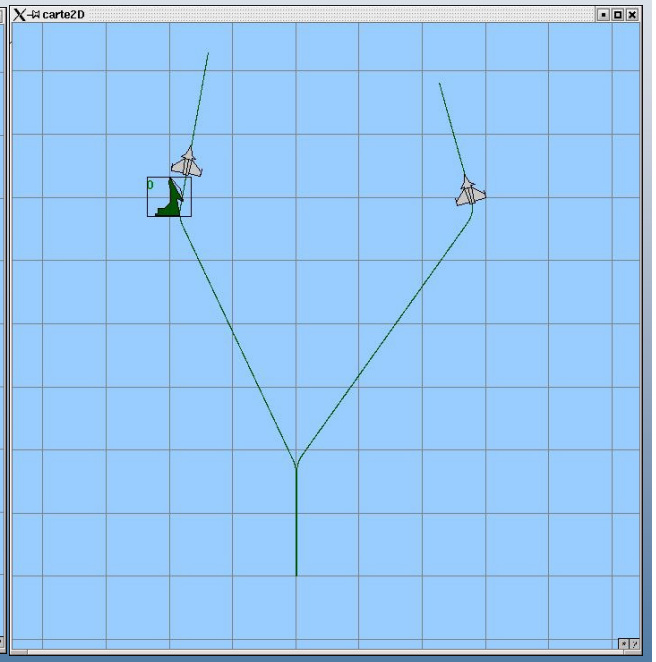
Experiments



(1) Take-off



(2) Pop-up threat detection



(3) Intermediate attack

Conclusion

- Work in progress (end in April 2006).
  - Simulation from end to end of the main components using Petri nets.
  - Early experimental results exhibit encouraging MMS behavior.
- Open issues :
  - “Anytime” algorithms for reasoning under time stress.
  - Conjecture elaboration for collaboration.
  - High Level Architecture (HLA) for pseudo real-time simulation.
- Future project : porting the models on 3 small real aircraft.