Avionics Domain
KARYON Project Results
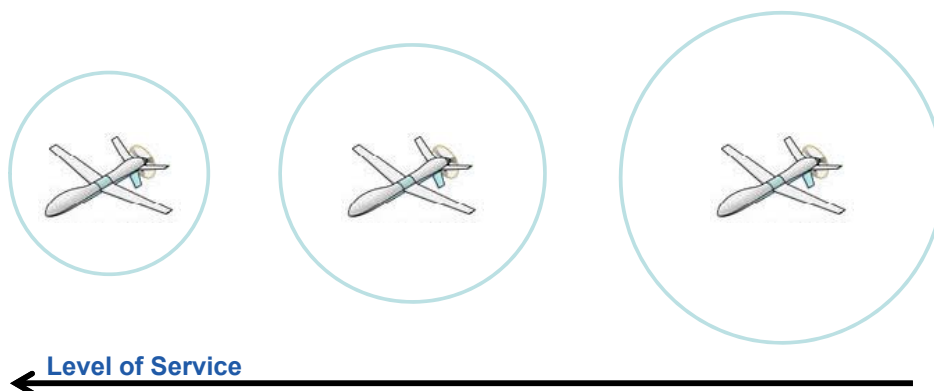
11/10/2014

AGENDA

- Scenario Description
- Safety Kernel Components Architecture
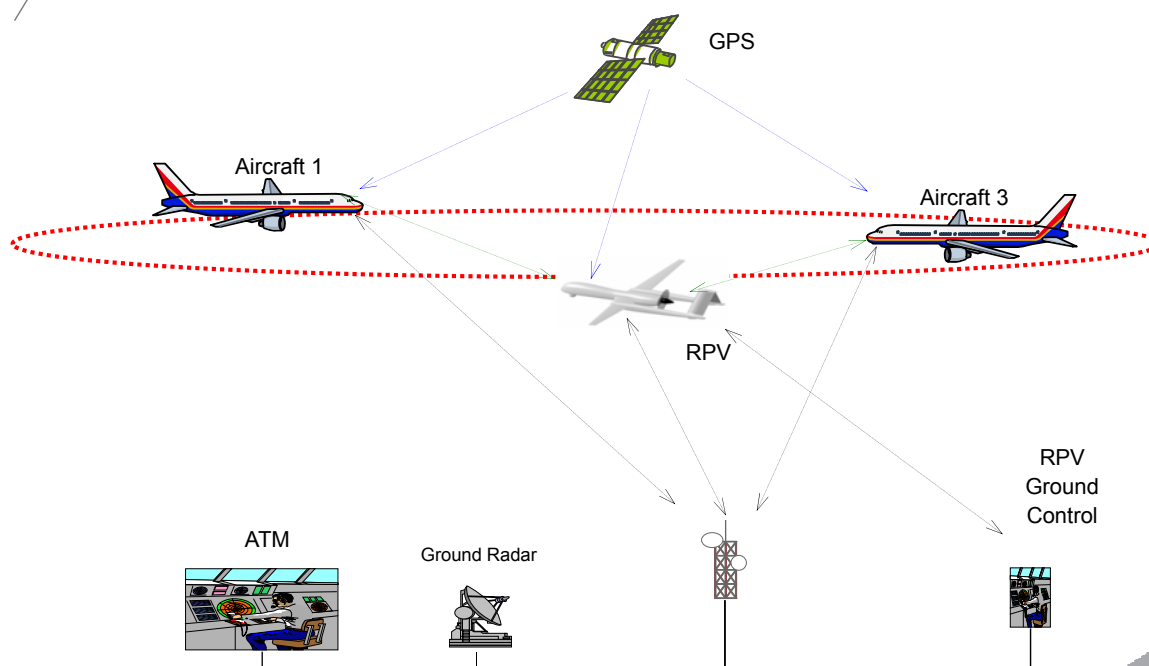- Test Environment
- Demonstrations

SCENARIO DESCRIPTION

- Demonstrate KARYON functionalities in an aeronautical application and how it may improve the usage of local airspace without compromising flight safety.
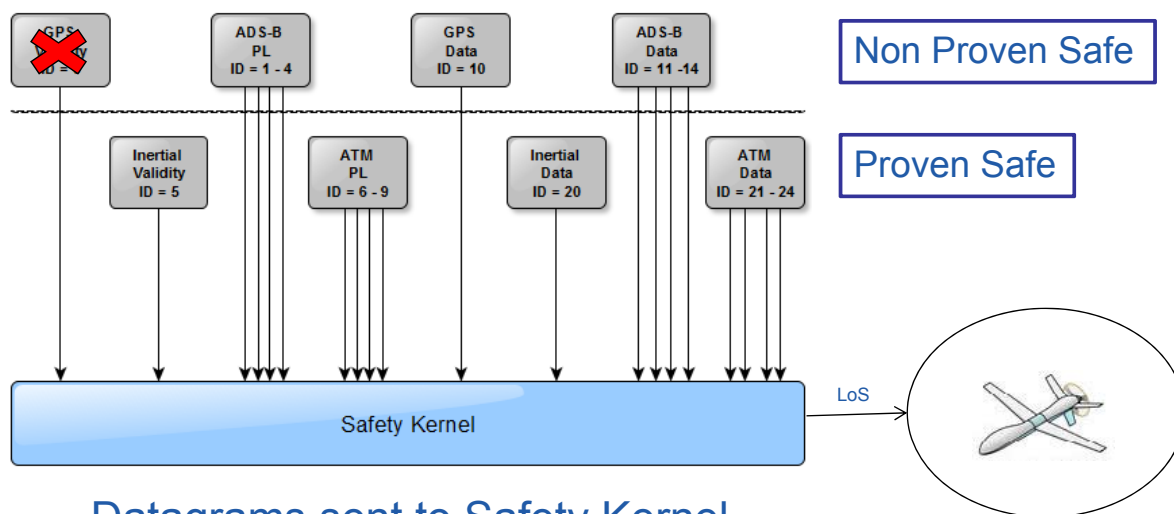

Level of Service

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SCENARIO DESCRIPTION

GPS

Aircraft 1

Aircraft 3

RPV

RPV Ground Control

ATM

Ground Radar

EMBRAER

SAFETY KERNEL COMPONENTS ARCHITECTURE

| Non Proven Safe |
| Proven Safe |

GPS (Safety) — ✗
ADS-B PL ID = 1 - 4
GPS Data ID = 10
ADS-B Data ID = 11 -14

Inertial Validity ID = 5
ATM PL ID = 6 - 9
Inertial Data ID = 20
ATM Data ID = 21 - 24

Safety Kernel

LoS
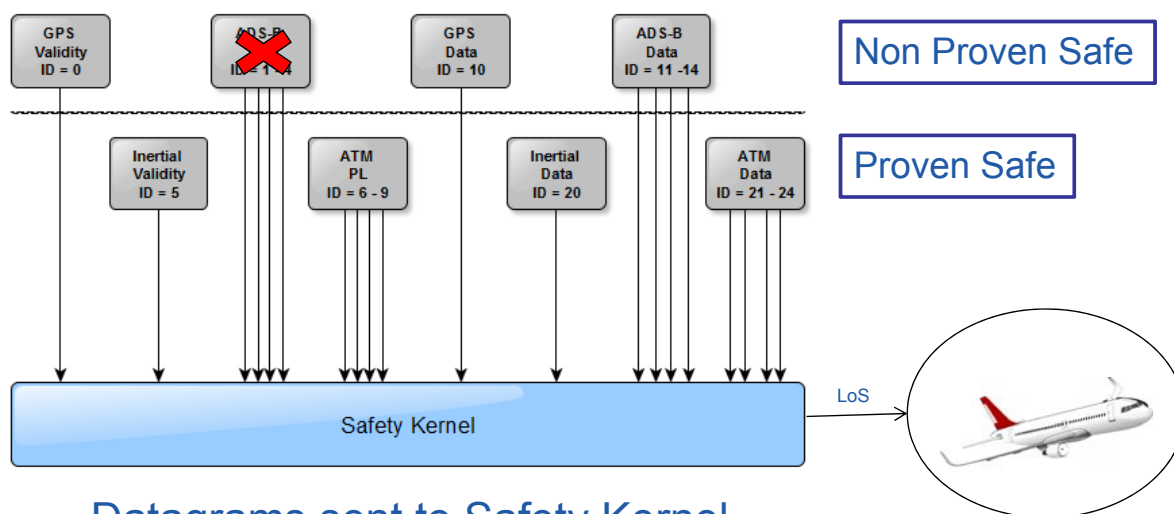
Datagrams sent to Safety Kernel

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EMBRAER
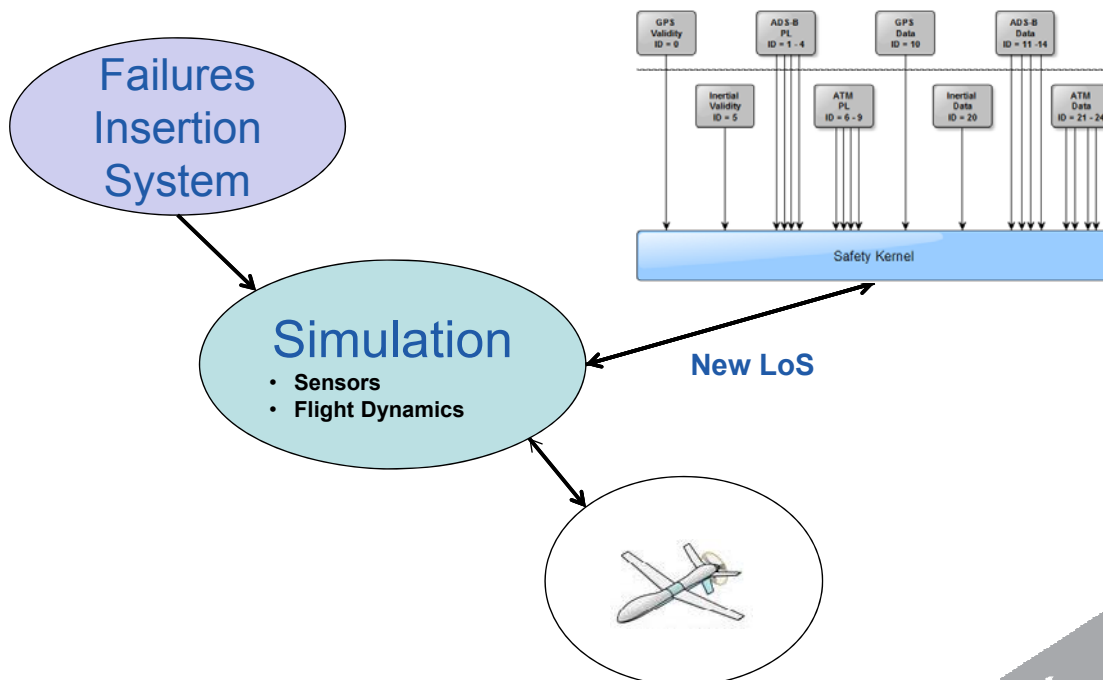

SAFETY KERNEL COMPONENTS ARCHITECTURE

| Non Proven Safe |
| Proven Safe |

GPS Validity ID = 0
ADS-B PL ID = 1 - 4 — ✗
GPS Data ID = 10
ADS-B Data ID = 11 -14

Inertial Validity ID = 5
ATM PL ID = 6 - 9
Inertial Data ID = 20
ATM Data ID = 21 - 24

Safety Kernel

LoS

Datagrams sent to Safety Kernel

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TEST ENVIRONMENT

DEMONSTRATIONS

1. No failure insertion. Level of Service = 2;

2. GPS PDOP = 5. Level of Service = 1.

Validity Signal	Description
1-2	Good reliability and better precision. All safety requirements are met.
2-5	Uncertainties start to have some impact on navigation. Additional measures must be taken so that flight safety is not compromised.
5-10	Poor information quality and potential threat to safety. Signals must be used carefully.
10-20	Displacement information only an estimation. Worst quality signal.

Physical interpretation of GPS validity signals

- The level of serviced calculated by the Safety Kernel becomes worse the higher the validity value.