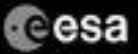


ADCSS 2015



Earth observation and Microsat

THE EUROPEAN SPACE AGENCY
Satellite Communications and Satellite Navigation Systems

Human Spaceflight and Space Laboratories

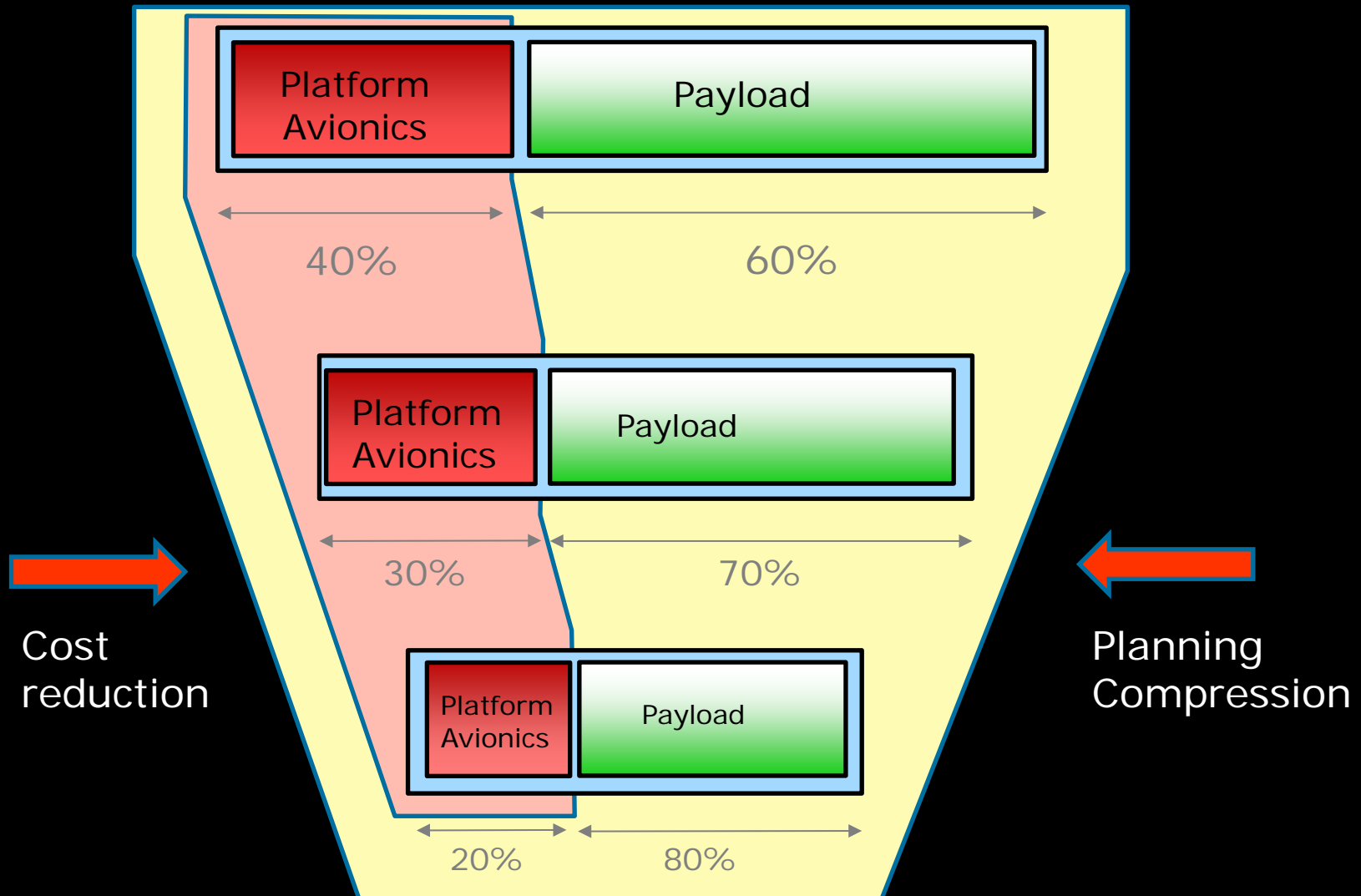
Launchers

Exploration of the Solar System and Deep Space

- Ph. ARMBRUSTER - Head of Data Systems
- A. BENOIT - Head of Control Systems
- K. HJORTNAES - Head of Software Systems

ESA/ESTEC – 20-22/10/2015

Main Challenge

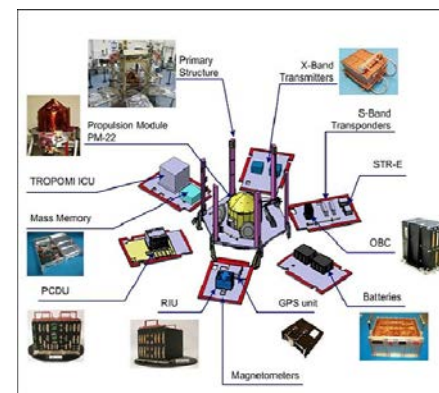


How ?

✓ Recurrence – reusing existing “flexible” designs

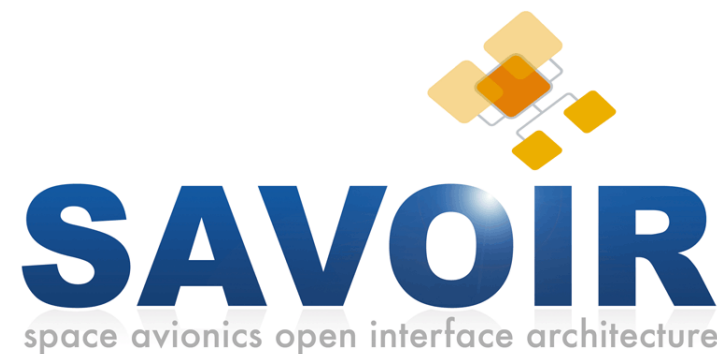
✓ Through generic platforms ?

- Astrobus, Spacebus, small GEO, Alphasat, Neosat

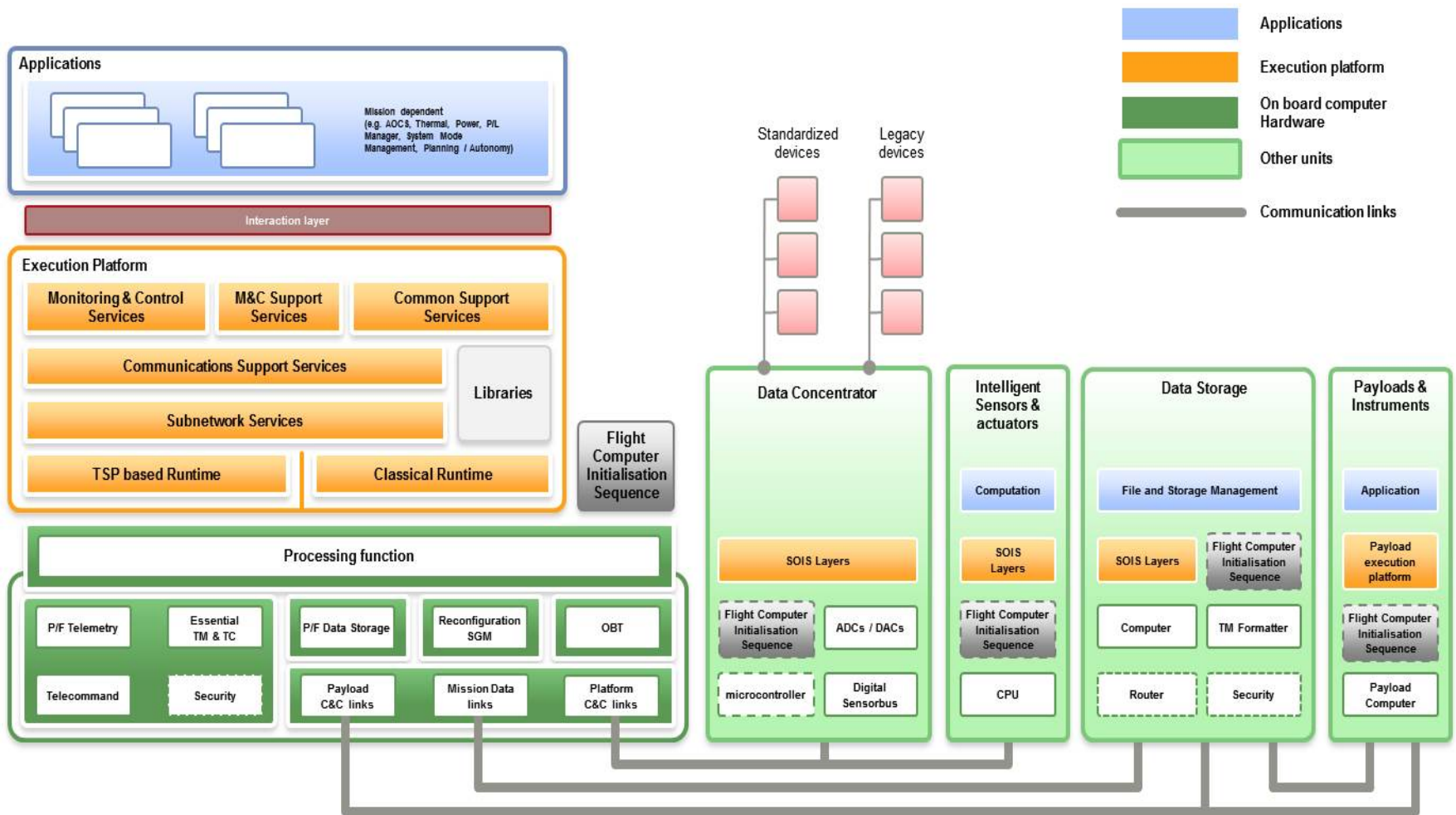


✓ Via “more standardized” Avionics

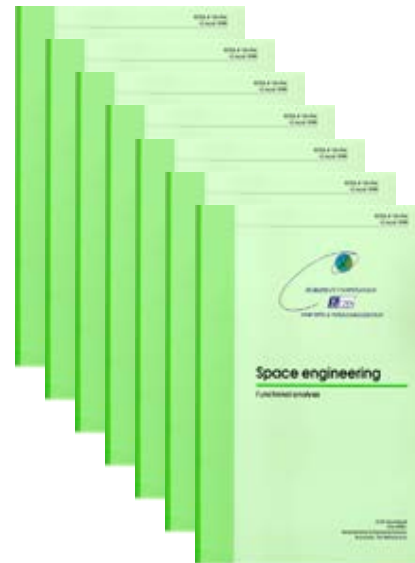
- **S**pace
- **A**Vionics
- **O**pen - **I**nterfaces
- **A**Rchitecture



SAVOIR : Reference Architecture



SAVOIR : Standardised Interfaces, Services and Protocols



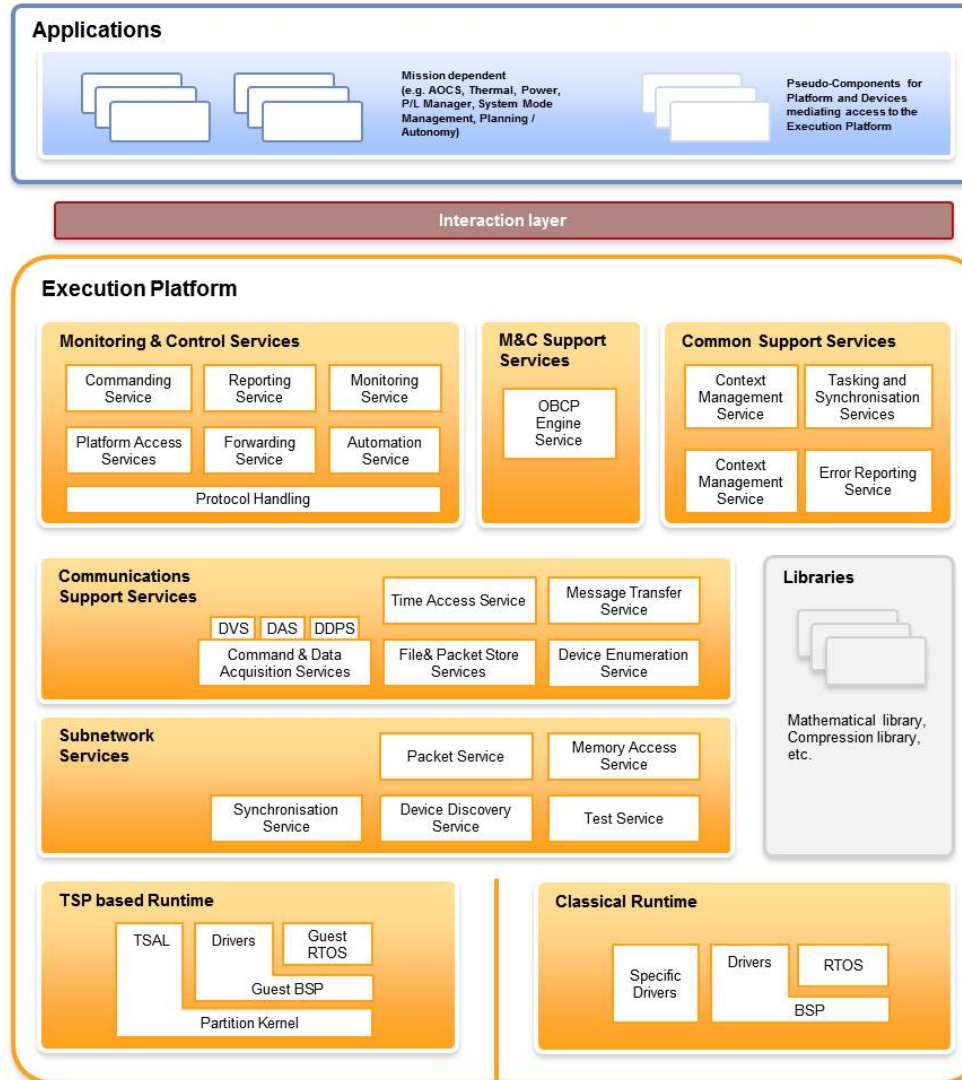
New interfaces:

- Sensor buses
- PowerLinks
- SPI

Enhanced Networks:

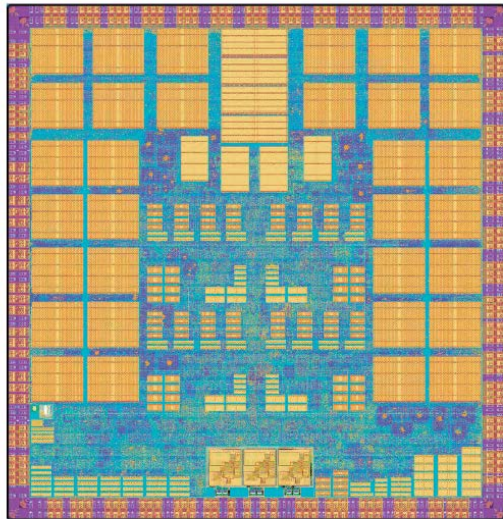
- Time Triggered Ethernet
- SpaceWire-D
- SpaceFibre

SAVOIR : Software Architecture



SAVOIR : Building blocks

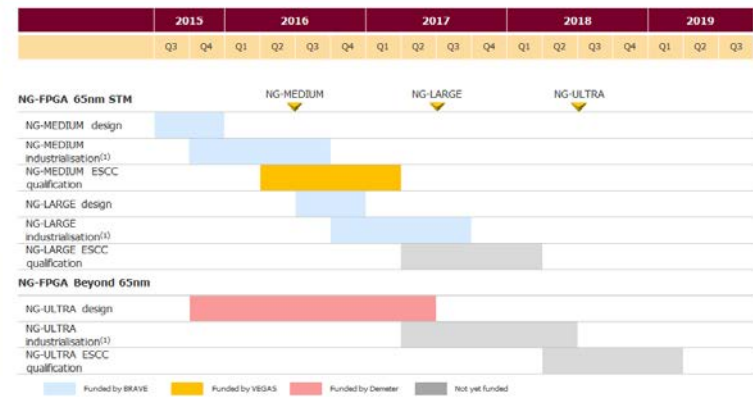
ESA's Next Generation Microprocessor



GR740 Quad-Core LEON4FT - Available in 2016

www.gaisler.com/GR740

BRAVE FPGA Rad-Hard FPGA Roadmap and Funding



Is it enough ?



Probably not ... We have to get a step further !

- Generic specifications for recurrent units (OBCs, RTUs, Mass Memories)
- Standardization of interfaces within units ?
- Modular and scalable electronic equipment ?
- More COTS ?
- Adaptive systems : SW defined Avionics ?

An other challenge !

ESA Workshop on

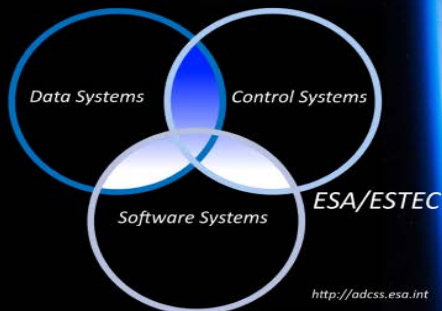
Avionics

Data

Control

Software

Systems



- Going more cross sectorial !
 - Avionics englobes many disciplines
 - Data Handling, electronics, IP Cores
 - Control Algorithms, sensors, actuators
 - FDIR
 - Software
 - Could power distribution could benefit from a similar approach ?

With special thanks for

J.L. Terraillon, SAG co-chairman

SAG members

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Davide Oddenino together with the organisation team : D. Oddenino, F. Guettache, M. Daniel, K. Gerlo and A. Isaeva

Welcome to ADCSS 2015 !