Development Club Presentation

SmartNode

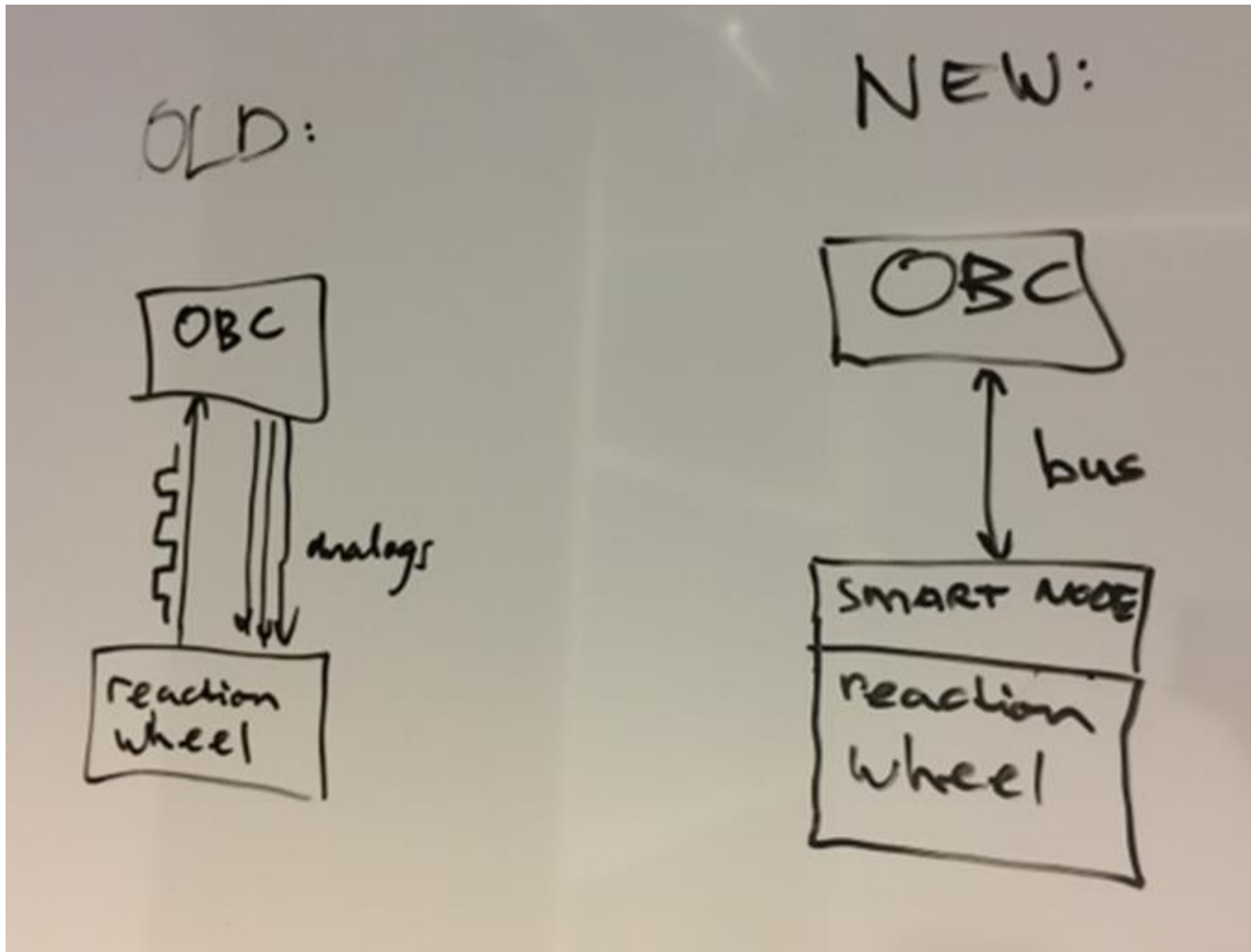Marc Neefs – m.neefs@airbusds.nl

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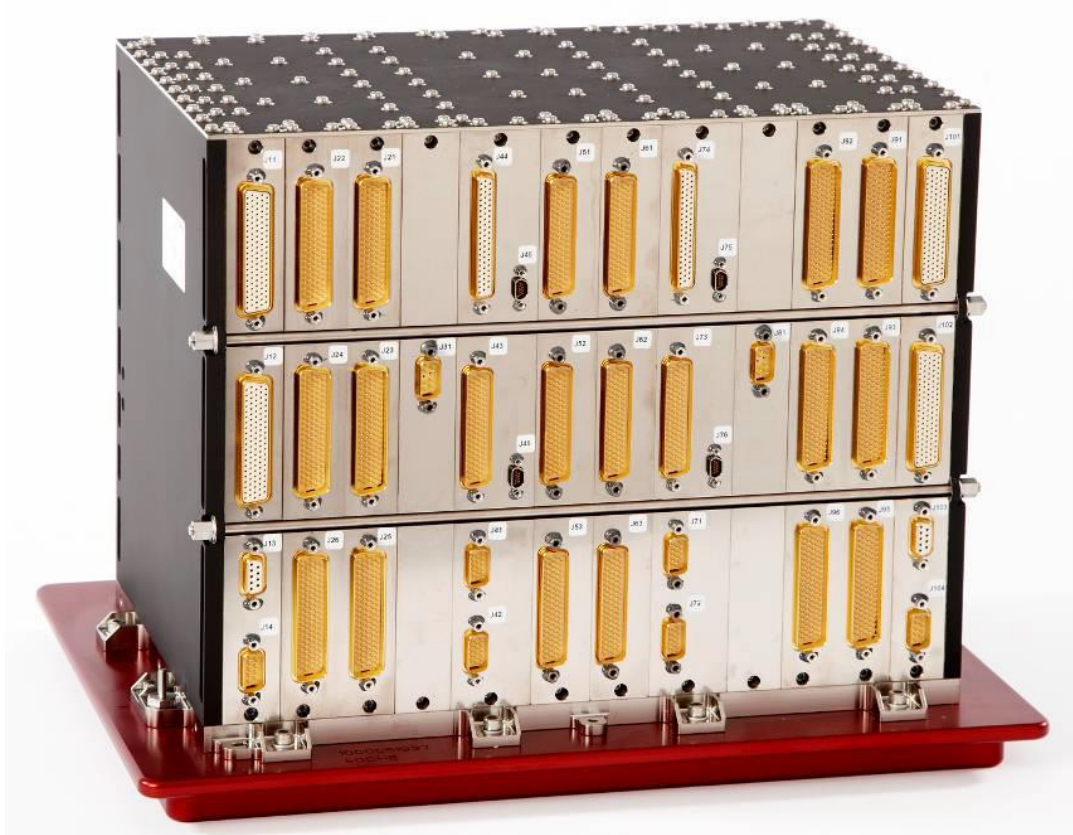
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What is the problem

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What is the SmartNode?

SmartNode
Adds the intelligence needed for Plug and Play Spacecraft

Hardware – software box
- Adapt existing units for new platforms
- Enabler for new subsystems

Recurring product
- One node fits most
- Offer service for specials

Emerging market:
opportunity's for new product

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SmartNode commercial perspective

Average platform > 10 nodes;

Potential market: # satellites x 10

Upcoming commercial constellations (Google, Virgin, Oneweb, Space-X)

Commercial benefits prime perspective

- Harness complexity / weight
- recurring AIT cost reduction
- Supplier independency / flexibility

Commercial benefits subsystem supplier perspective

- Opens new space business market
- Product becomes plug & play / more attractive / better to maintain
- Time to market, SN is much cheaper then own DDV & Qualification
 Stick to their core business mechanical – optical

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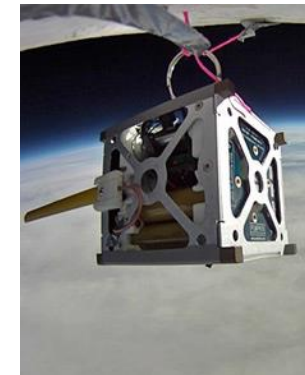
Technical feasibility

Similar concepts are now mainstream in automotive improving

- Cost effectiveness
- Reliability (harness, self diagnostics)
- Supplier independence

RAD hard FPGA technologies are available to introduce in space (mircosemi,/Xilinx) without ITAR constraints. Possible use of radiation hardened commercial components for SN?
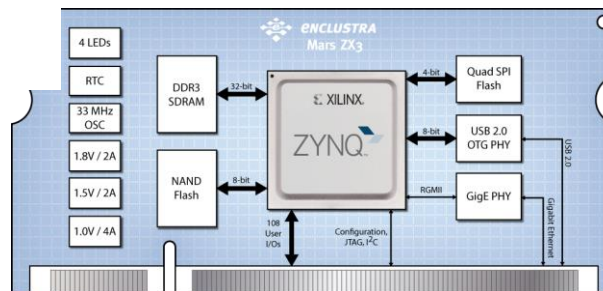
Constraints and challenges

Important constrains for our application
- High reliability in harsh environment
- configurability
- low power consumption.
- real time behaviour of the constellation of nodes

Questions for the DevClub:
1. How to achieve flexibility in the electrical interfaces to be configurable by the SN (Analog, Pulse, Current, serial interfaces)
2. What technology should be used for the interconnecting network and provide power to the individual nodes
3. What mechanical solution can be chosen to allow distribution of the nodes in a harsh space environment.
4. How reliability and redundancy could be implemented in the smart node.

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