

A common ADHA architecture and the used standards

RUAG Space & Airbus Space and Defence & Thales Alenia Space
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AIRBUS

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ADHA – Presentation

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ADHA – Presentation

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Background

What is ADHA?

ADHA stands for Advanced Data Handling Architecture.

ADHA is an ESA funded study performed in parallel (and partly in co-engineering) by two main consortiums of space born electronics manufacturers. These are Airbus Defense and Space in association with RUAG and Thales Alenia Space.

Background

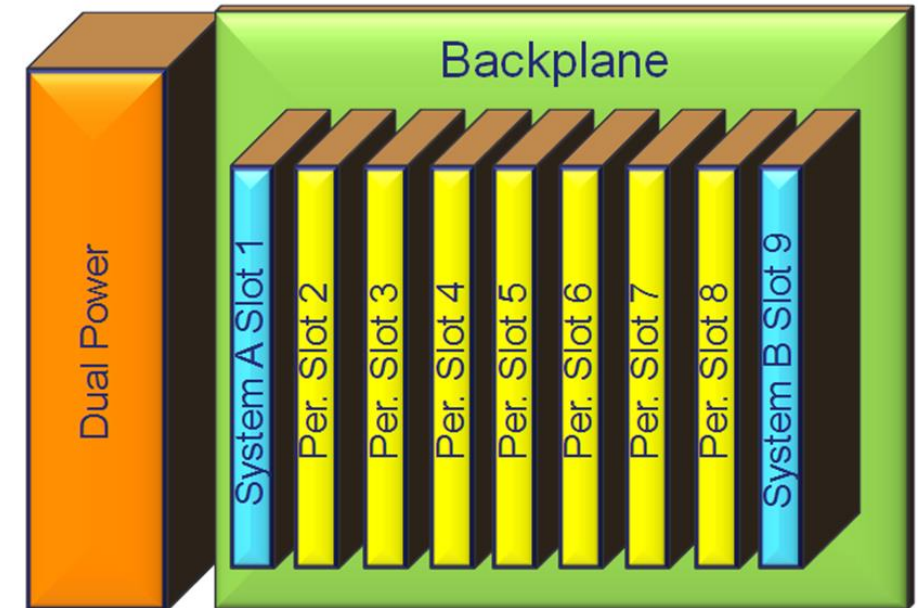
ADHA Objectives

The main objective of the Advanced Data Handling Architecture (ADHA) concept is to establish a versatile, compact, modular and scalable Data Handling System architecture using standardised building blocks on interface, module and unit level and processes for design, models and MAIT.

ADHA Architecture Description

ADHA Architecture Concept

- **Standard Modules:**
 - OBC, SSMM, IO modules, GNSS RE and Power Module
- **Redundancy:**
 - Redundant Modules
 - Redundant Power
 - Redundant Links
- **Standard Backplane:**
 - Based on cPCI Serial Space backplane
 - Form factor (6U)
- **Centralised Processing:**
 - Multi-core processor & Time and Space Partitioning
- **Housing:**
 - Rack concept with standard modules

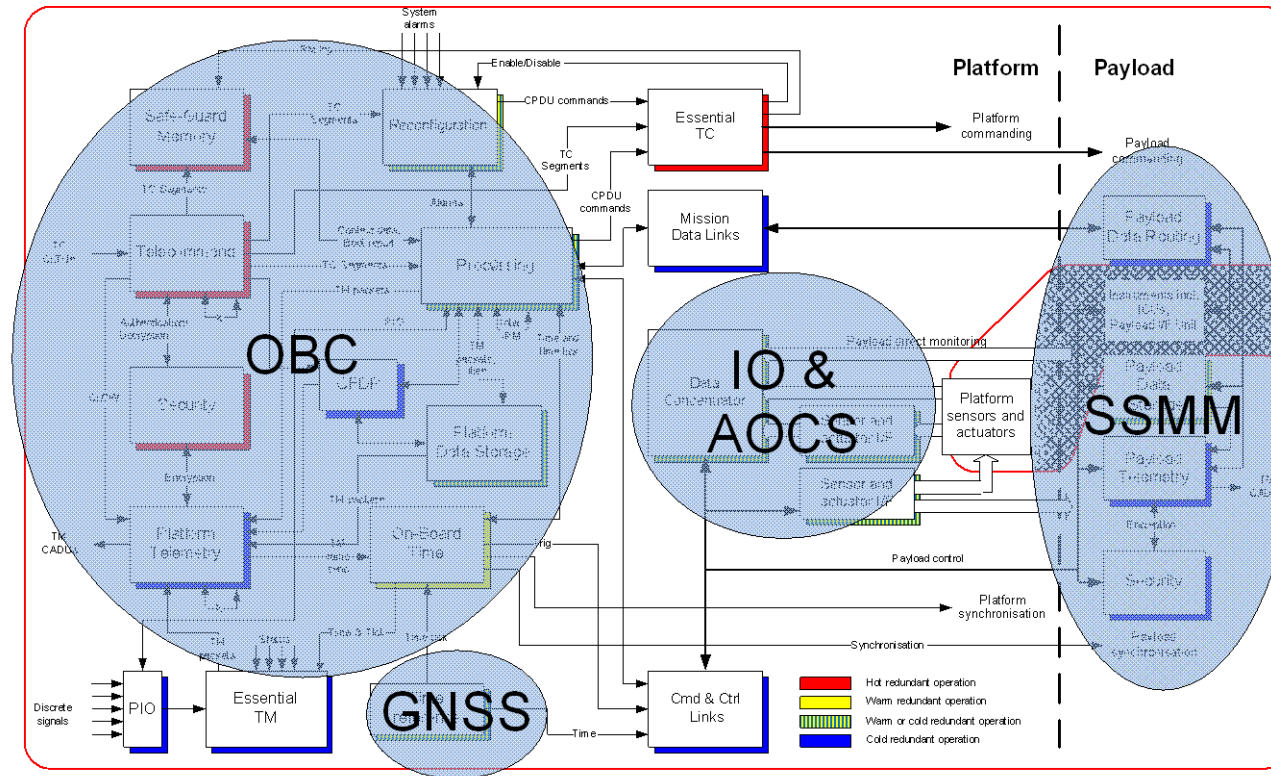


ADHA Modules

ADHA Architecture

SAVOIR (Units go Modules)

With ADHA the partitioning of the SAVOIR functions has changed from what classically used to be defined as units to now be defined as modules instead.



ADHA Architecture

ADHA Modules

The following module specifications have been established:

- ADHA OBC Module Specification
- ADHA SSMM Module Specification
- ADHA GNSS RE Module Specification
- ADHA I/O Modules Specification
- ADHA Power Module Specification

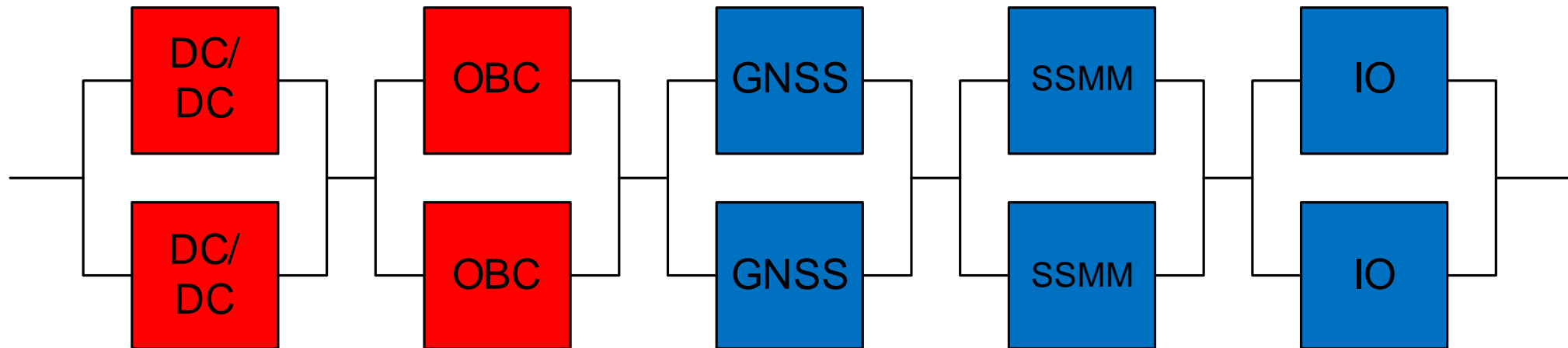
ADHA Redundancy

ADHA Architecture

Redundancy concept

Redundant DC/DC boards

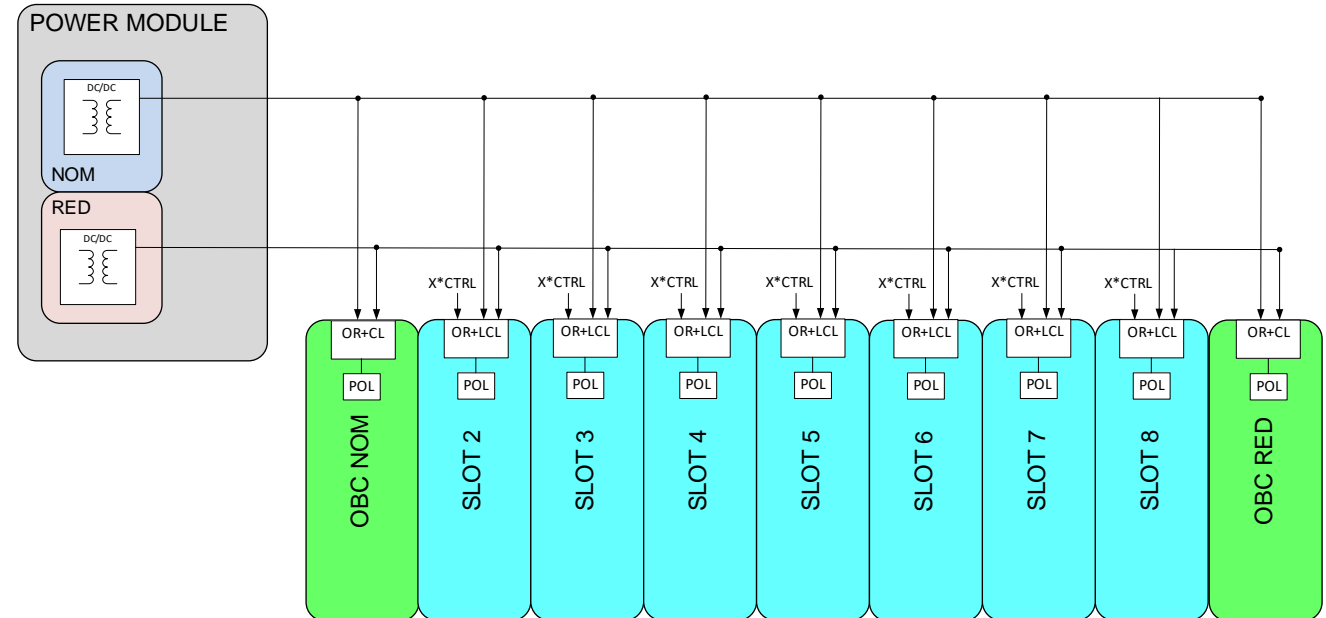
Redundant boards, cross-strapped with redundant Command & Control links



ADHA Architecture

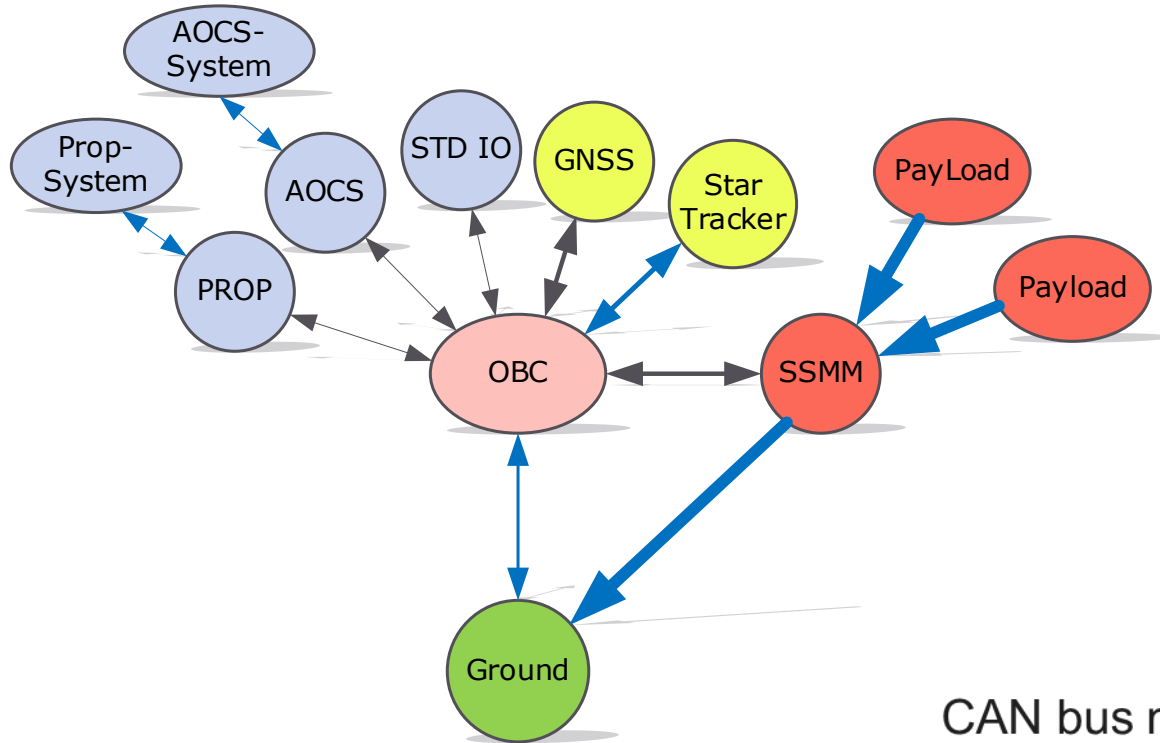
Redundant Power

- Redundant power chains (Nom & Red)
- Redundant power lines (+12V, +28V, +5V)
- System slots automatically powered
- Peripheral slots switched ON by system slot
- POL used on all boards for local voltages

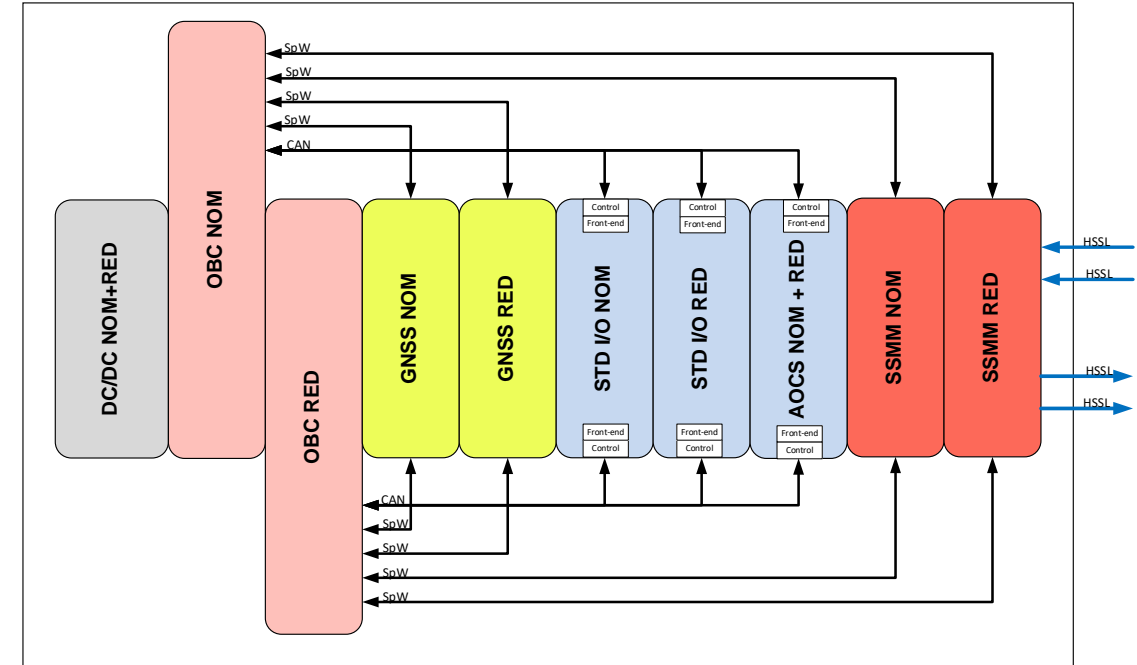


ADHA Architecture

Communication Links / Buses



CAN bus multi drop
SpW dual star
HSSL links



ADHA Backplane

ADHA Architecture

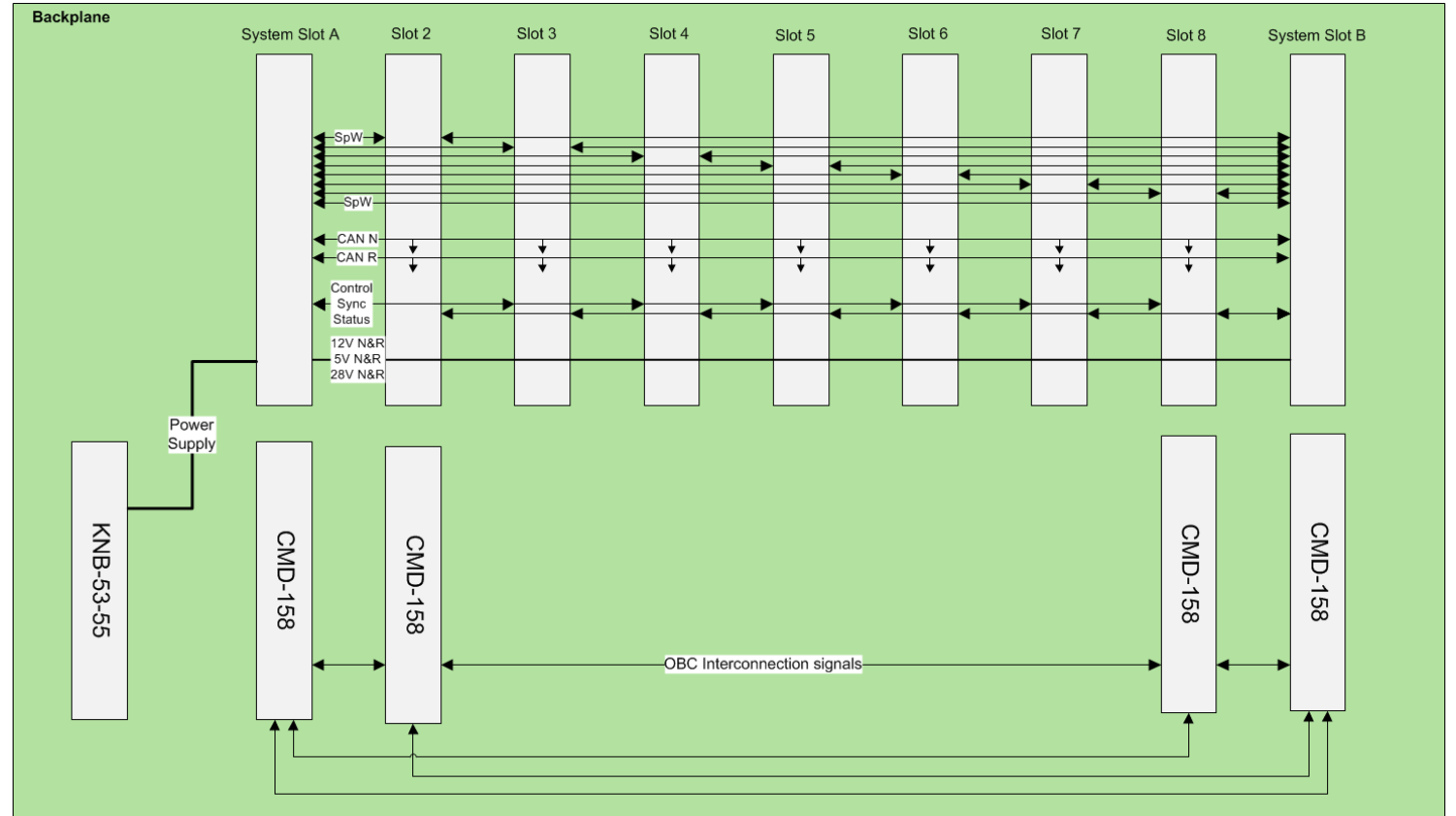
Backplane

- Based on cPCI Serial Space Standard, CPCI-S.1 R1.0
- Added new power lines (in P0) to make the power bus redundant (added red 12V, red 5V, nom 28V and red 28V)
- Moved control signals (PSON, RST) and status signal (WAKE) from utility connector to system slot (in P0).
- Added PPS signal (in P0) to allow PPS signals to be routed from peripheral slot to system slot.
- Added 3 sync signals from system slot to all peripheral slots by making use of USB signals (in P1).
- Utility connector is removed since not used.

ADHA Architecture

ADHA Backplane

- A 6U-monolithic-hybrid backplane is intended for the ADHA Rack.
- The upper part of the backplane is compliant to the cPCI Serial Space standard. The lower part contains a user defined backplane.
- Lower part contains a connector to the Power module and four connectors for the inter connections (x-strapp) between the OBC modules.

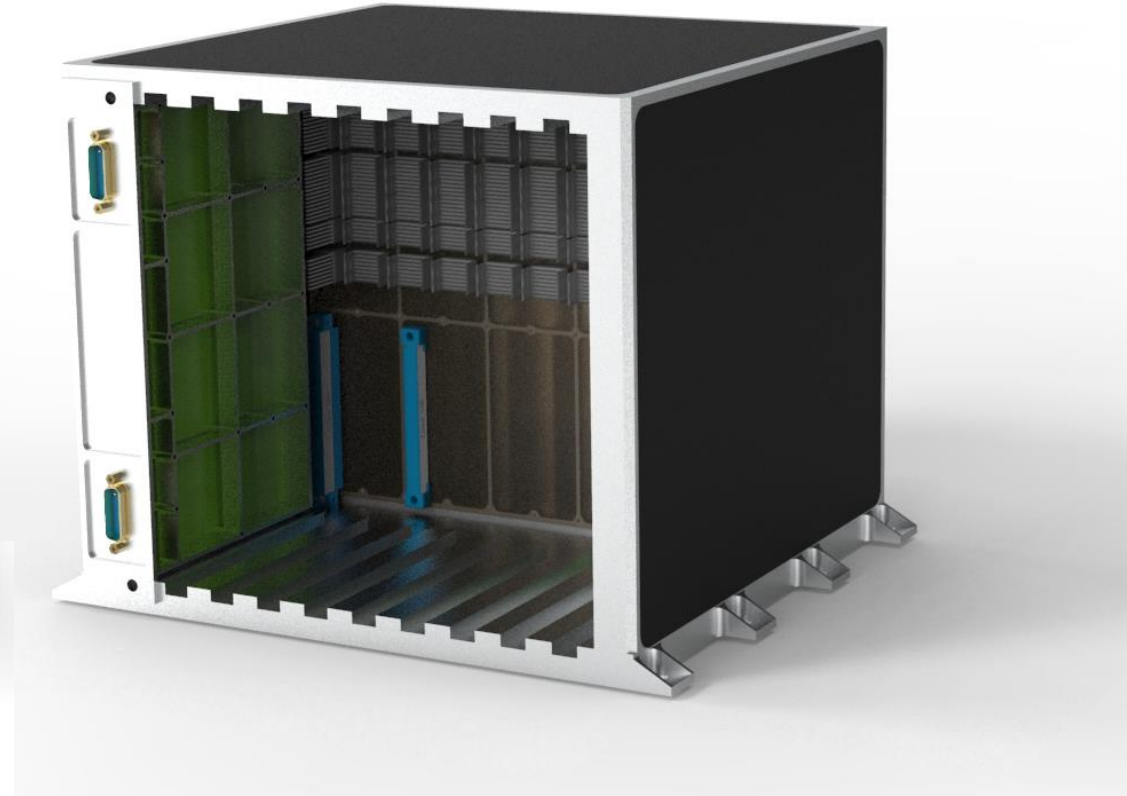
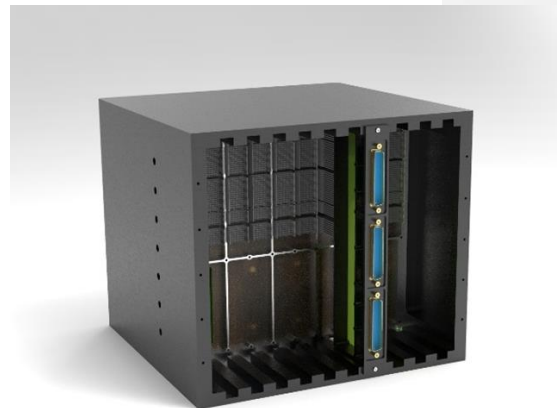


Centralised Processing

ADHA Housing

ADHA Architecture Housing

- Racked concept
- Power module (with redundant DC/DC)
- 1 power slot, 2 system slots and 7 peripheral slots
- cPCI Serial Space based Backplane
- Rack supports rear boards



ADHA Architecture

ADHA Module

- 6U Frame
- Backplane connectors
- External connectors
- Wedge-lock



ADHA Platform Controller

