FAM Science

PnP framework implementation using RMAP

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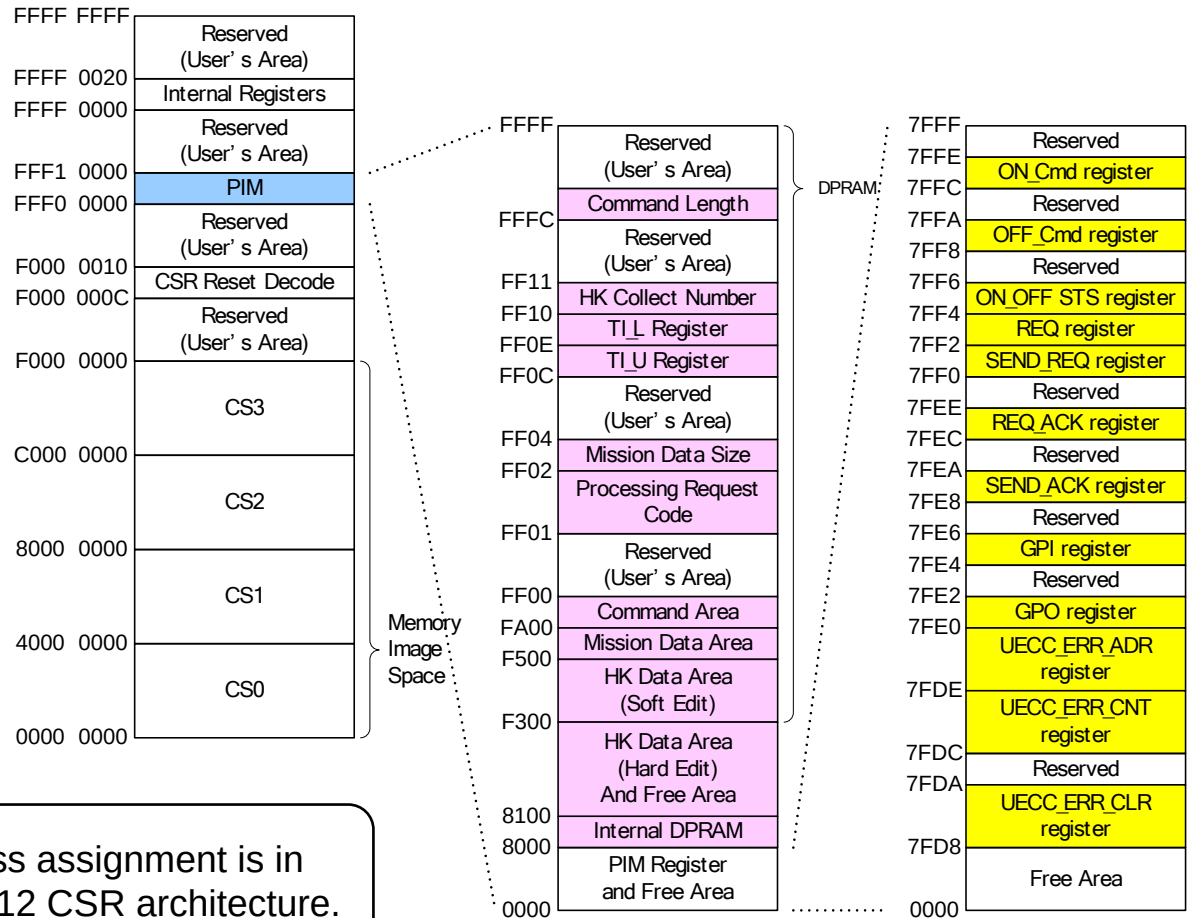
Common communication scheme using common memory mapping over RMAP

- **Background**
  - In Japan, we have been using a common communication method for house keeping data collection, command transfer, etc.
- **PIM (Peripheral Interface Module) protocol for Japanese scientific satellites has similar mechanism to RMAP.**
  - It is a sort of remote register access method based on "common memory mapping".
- **PIM on RMAP**
  - PIM protocol can be implemented on SpaceWire by replacing its physical layer and the lower part of the data-link layer with SpaceWire and RMAP.
  - We would like to propose PIM like standard memory mapping which is consistent with PnP framework.
- **Consideration for implementing Plug and Play characteristics and SpaceWire-RT requirement**
  - Priority and channel configuration are specified.
  - Common telemetry and command registers in PIM protocol are mapped.
  - Plug & Play characteristics are related to the reserved address space.
  - IEEE1212-2001 CSR architecture is a reference.

Memory Mapping for Japanese scientific satellites

- **Memory mapping which is consistent with PnP framework over RMAP.**



Network wide address assignment is in reference to IEEE1212 CSR architecture.

Summary

- **“Plug”gable characteristics is realized using RMAP.**
  - Japanese scientific satellites technology is inherited smoothly using “common memory mapping”
- **“Play” scheme is provided with middleware.**
  - SpaceWire-RT consideration is taken into account using telemetry and command protocol.
  - Those protocol is delivered as middleware in addition to documents