Redundancy Implementation using RMAP

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Redundant SpW port

- **Redundancy is required for Space Wire implementation on satellite bus systems.**
- **PHY level redundancy should be transparent to user as mentioned by NASA (MAPLD 2006 and SpW WG Jan. 2007).**
  - Connection and Disconnection are needed for switch over

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┌──────┐
│ PHY  │╲
└──────┘  ╲  ┌────────┐   ┌────────┐
           ┤ CODEC  ├───┤ RMAP   ├──│
┌──────┐  ╱  └────────┘   └────────┘
│ PHY  │╱
└──────┘
```
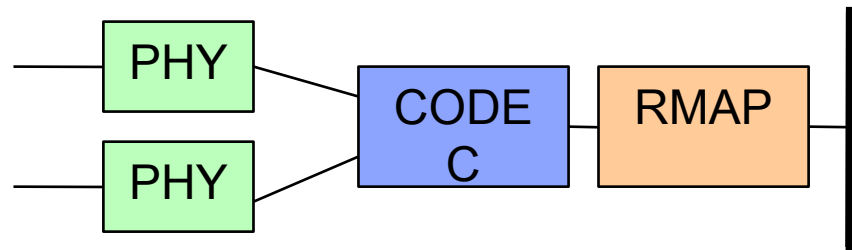
- **There is another possibility in "redundancy" for RMAP.**
  - One RMAP IP is shared among 2 ports.
  - Those are kept being connected.

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┌──────┐   ┌────────┐
│ PHY  ├───┤ CODEC  │╲
└──────┘   └────────┘  ╲  ┌────────┐
                          ┤ RMAP   ├──│
┌──────┐   ┌────────┐  ╱  └────────┘
│ PHY  ├───┤ CODEC  │╱
└──────┘   └────────┘
```
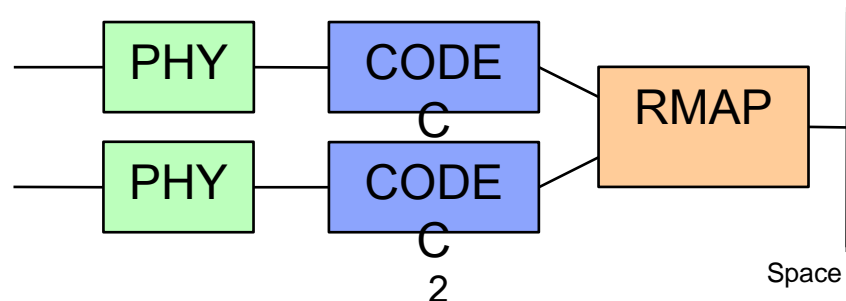
Use case of redundant CODEC for single RMAP logic

- ❑ **RMAP replay is returned through the port which RMAP command is received.**
    - – Step 1: accept receive request from PHY
    - – Step 2: connect the receiving I/F and sending I/F, which accept receiving request into RMAP CODEC
        - • RMAP CODEC is connected until the completion of the transaction (including reply).
    - – Step 3: disconnect receiving I/F upon the completion of data receiving (EOP/EEP).
    - – Step 4: disconnect sending I/F upon the completion of data sending (EOP).
        - • This step is replaced with the completion of receiving data without reply.
    - – Step 5: return to Step 1.

- ❑ **RMAP based redundancy is implemented on our satellite bus system, and it is another possible implementation accommodating transparency for users.**
    - – RMAP specification encompasses the redundancy mechanism used for conventional scientific satellite bus system in Japan.