



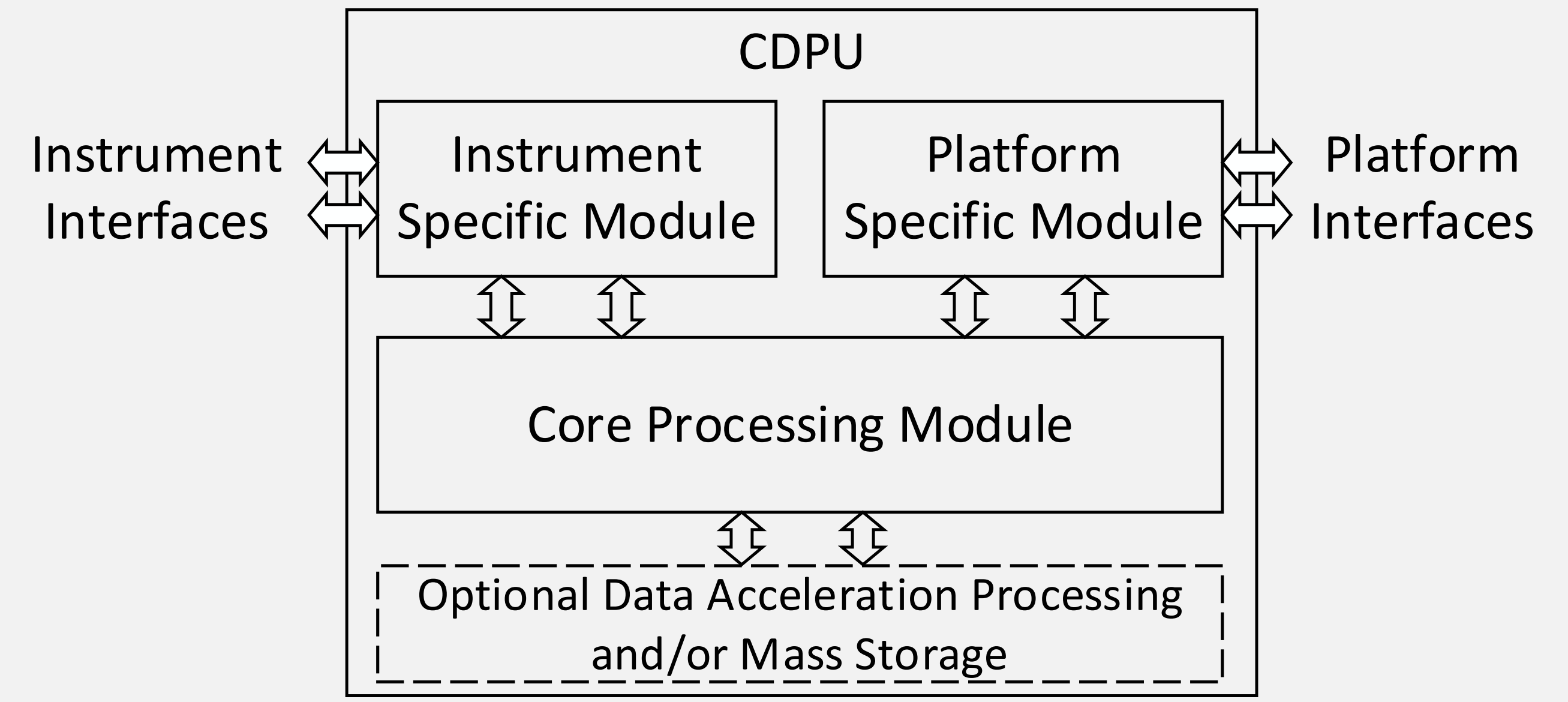
Instrument Control & Data Processing for high-reliable 'New Space' instruments



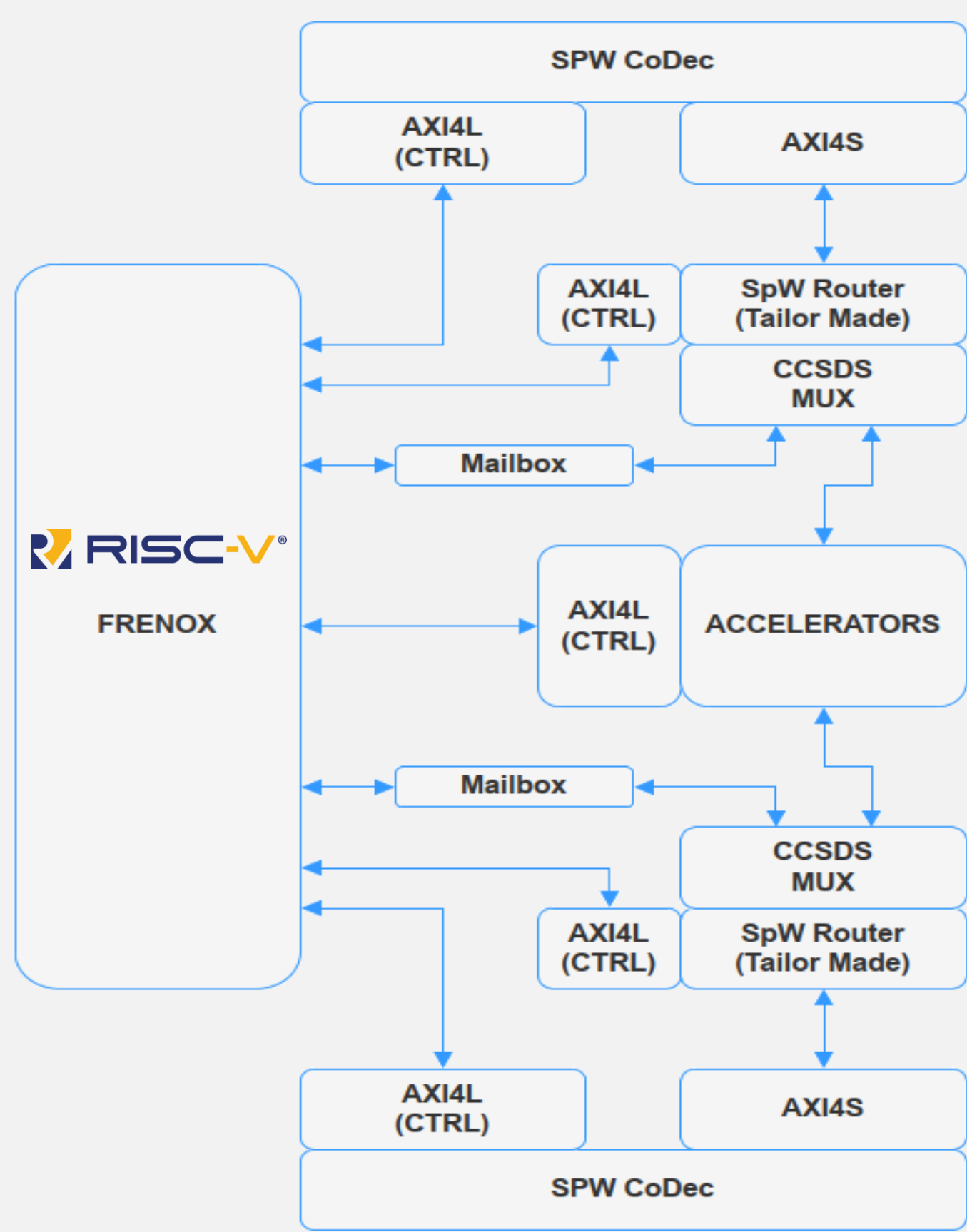
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The **Control & Data Processing Unit (CDPU)** offers flexibility and reduced Time-to-Orbit for compact SmallSat instruments

- Flexibility at design-time
- In-orbit reconfigurability
- In-orbit edge computing (image processing, encryption, instrument autonomy)
- >5 years in-orbit life-time (LEO)

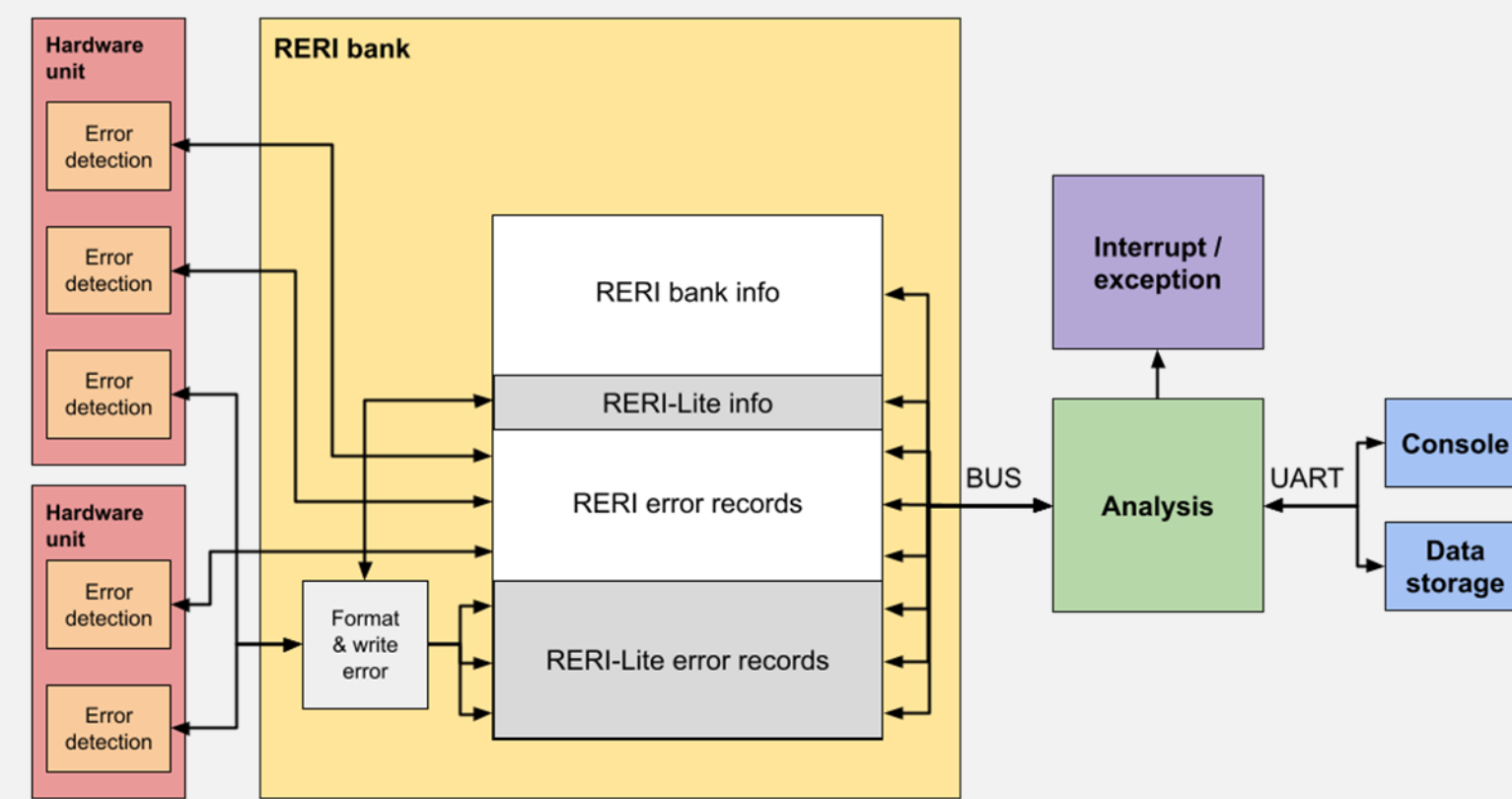


Trade-off: COTS | Rad.-tolerant | Rad.-hardened



CDPU base-line design:

- **FreNox RISC-V IP (RV32IMA)**
- SpW interface IP
- SpFi interface IP
- AXI interconnect infrastructure
- Accelerator support



High-Reliability & High-Security features:

- Lockstep
- Error Detection and Correction
- Lightweight checkers (Hardware Trojans & SEE)
- RERI (RAS Error-record Register Interface) / FDIR handling
- PQC encryption & authentication
- Secure boot & reconfiguration

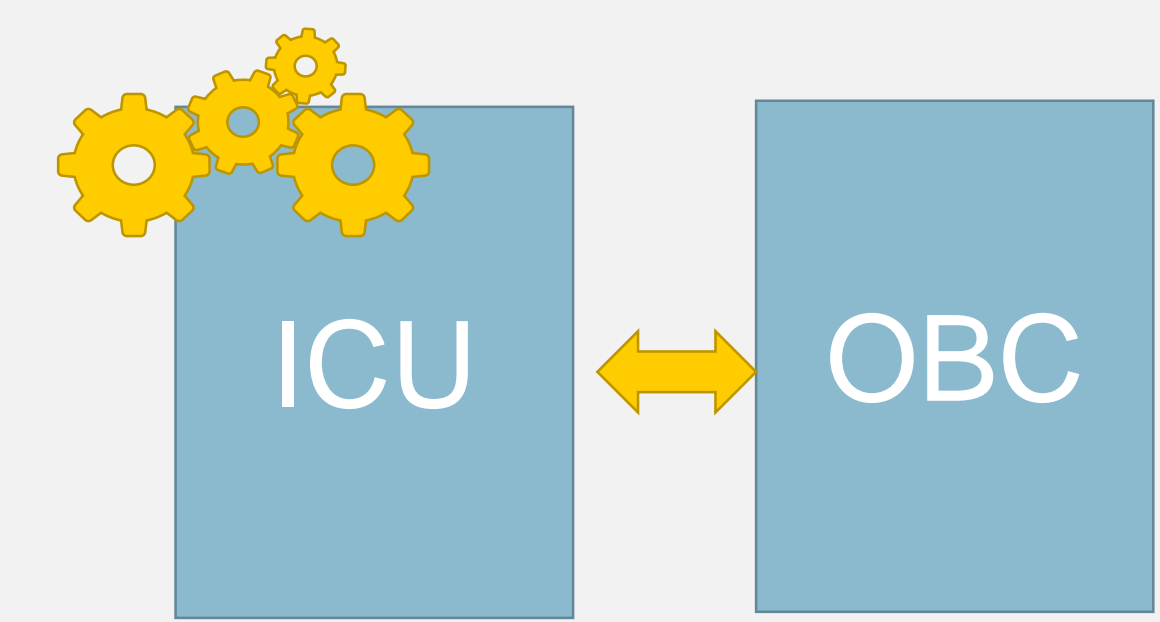
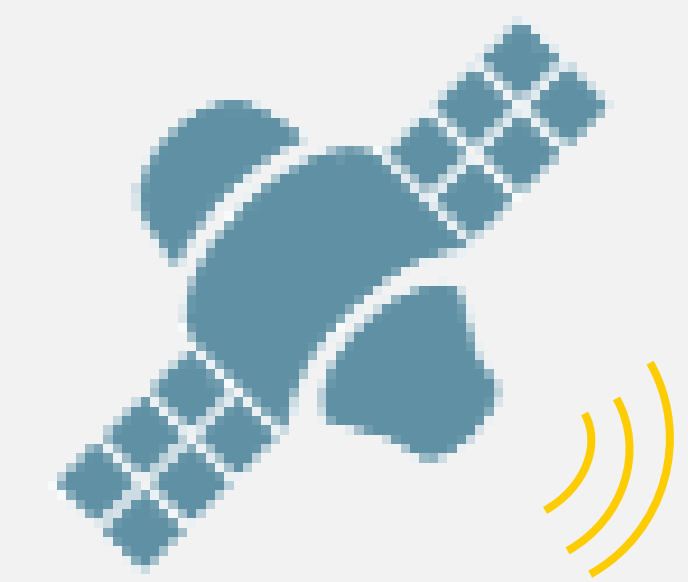


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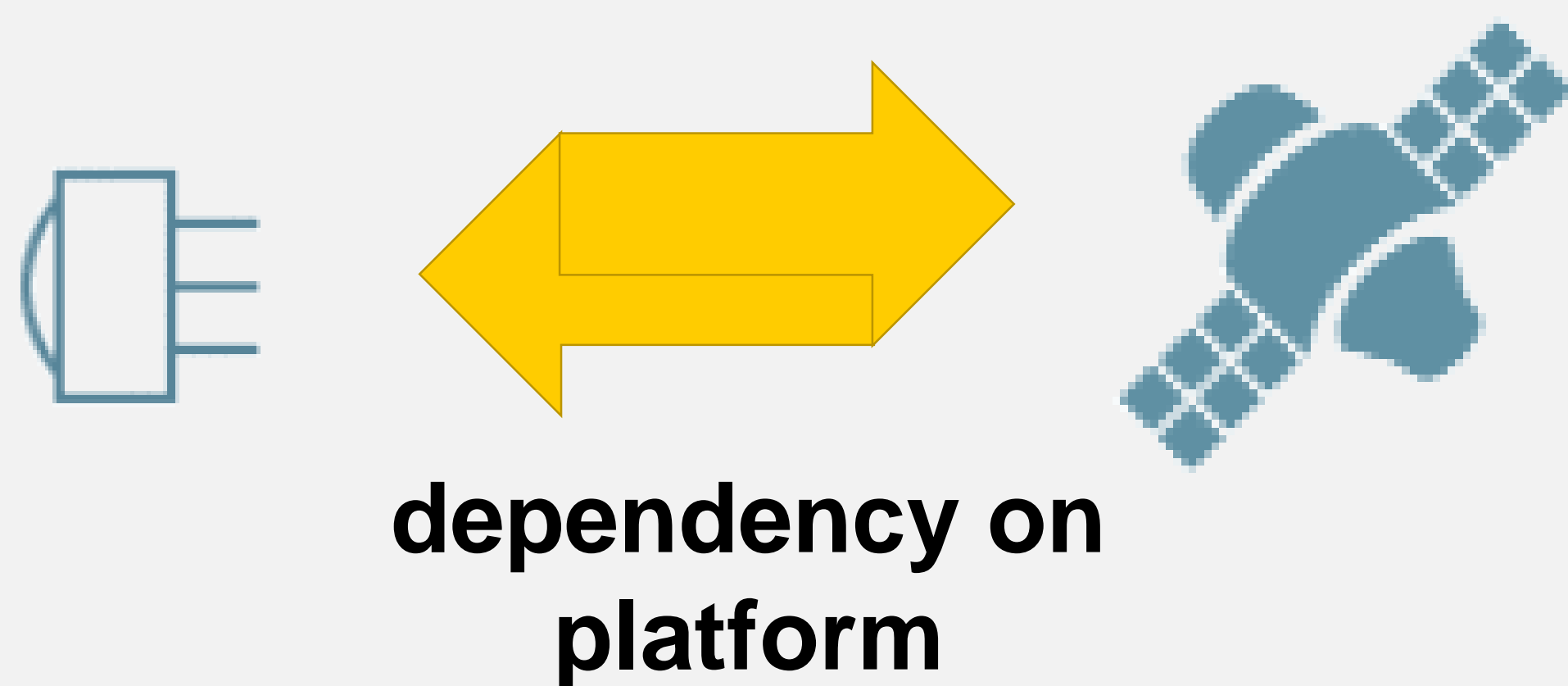
Protect. Renew. Empower.

data rate | bandwidth | latency

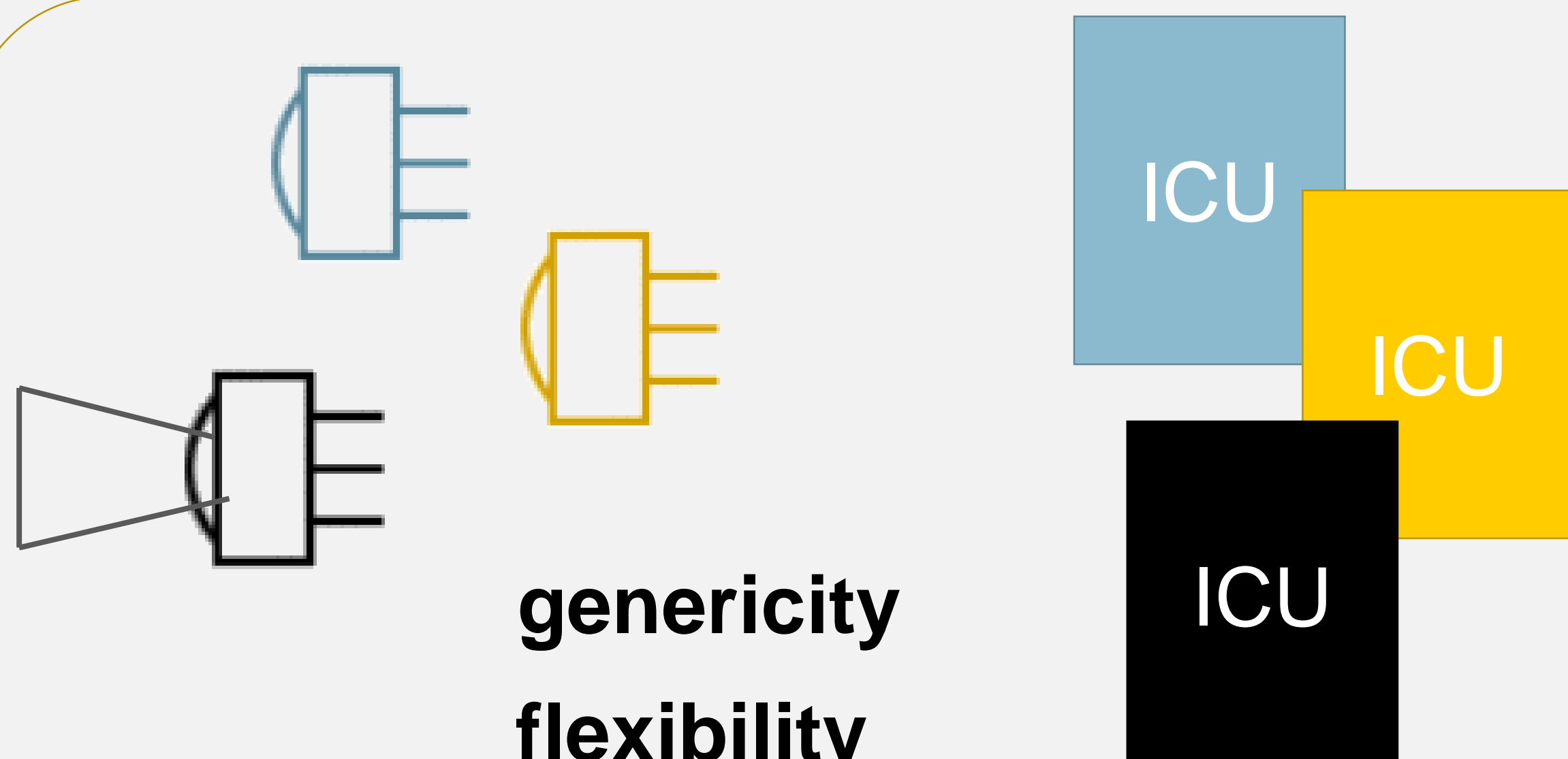


edge processing

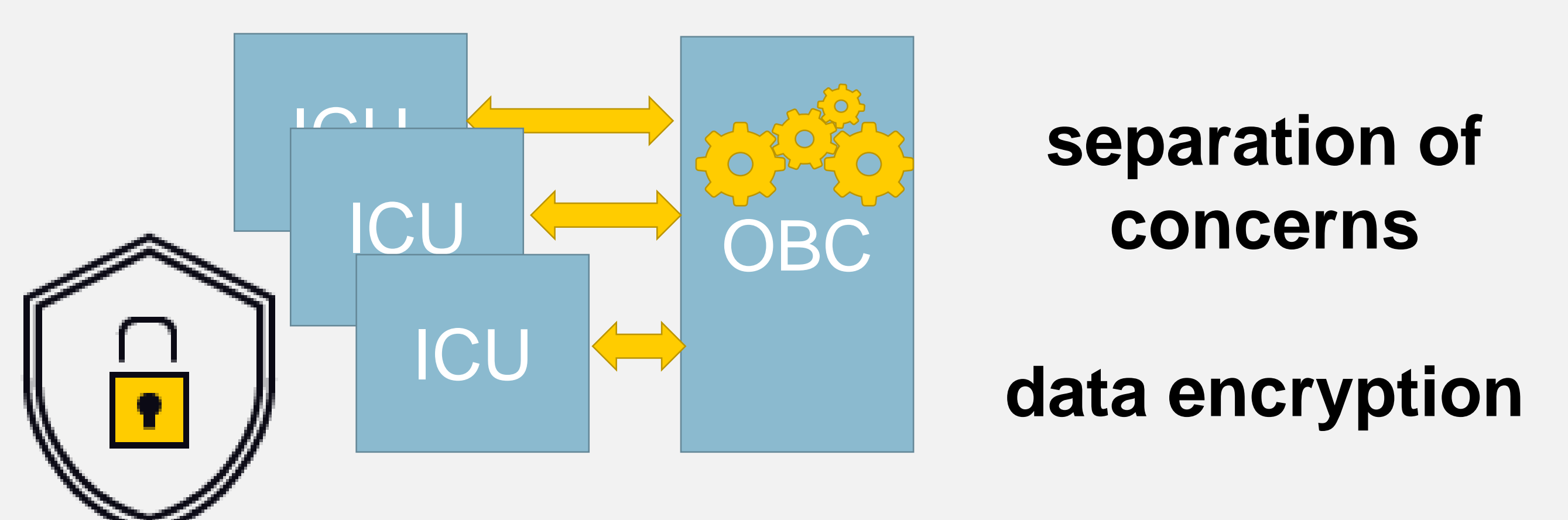
Challenges to address for 'New Space' SmallSat



dependency on platform



genericity flexibility



separation of concerns
data encryption



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