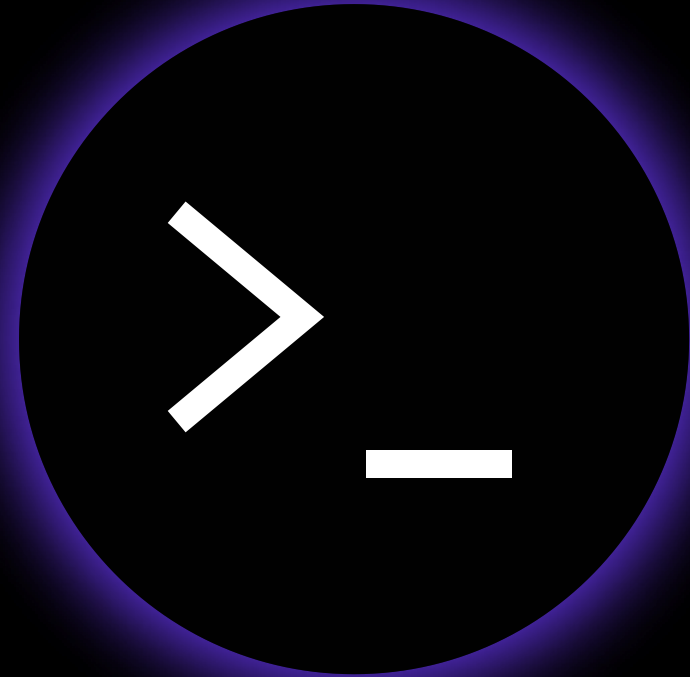


RC64

Space Manycore enabled by SpaceWire & SpaceFibre



October 2022



Ramon.Space

Ran Ginosar

Space Computing Systems

Any orbit, deep Space, 20-30 years lifetime

70 engineers, Israel and USA

18 years of government funding

3 years privately funded

Heritage: CAES GR712RC, multiple deep Space missions

Prof. ECE, Technion—Israel

Founder & President,

Ramon.Space

(prev. Ramon Chips)

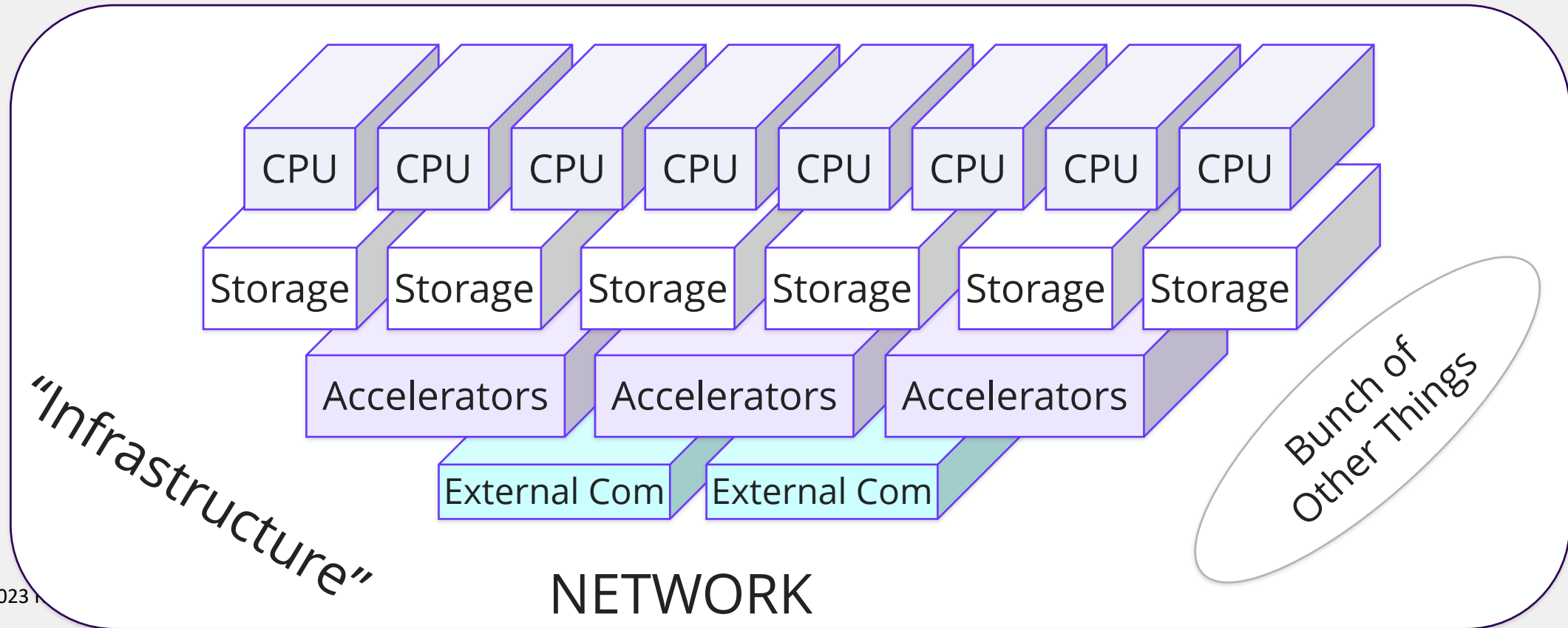


Goal: Data Center in Space – DCiS™



User Application Containers

System Software: OS, Cloud, Docker



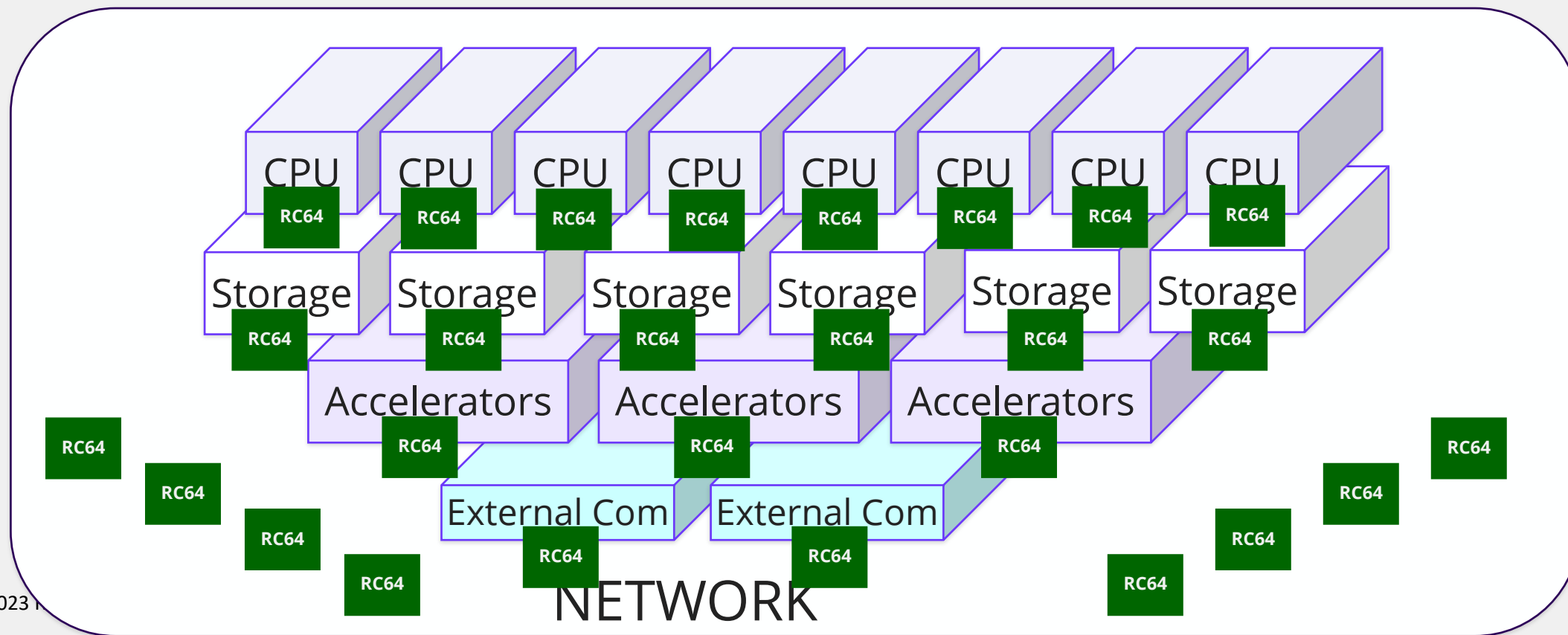


DCiS™ based on RC64 “Infrastructure SoC”

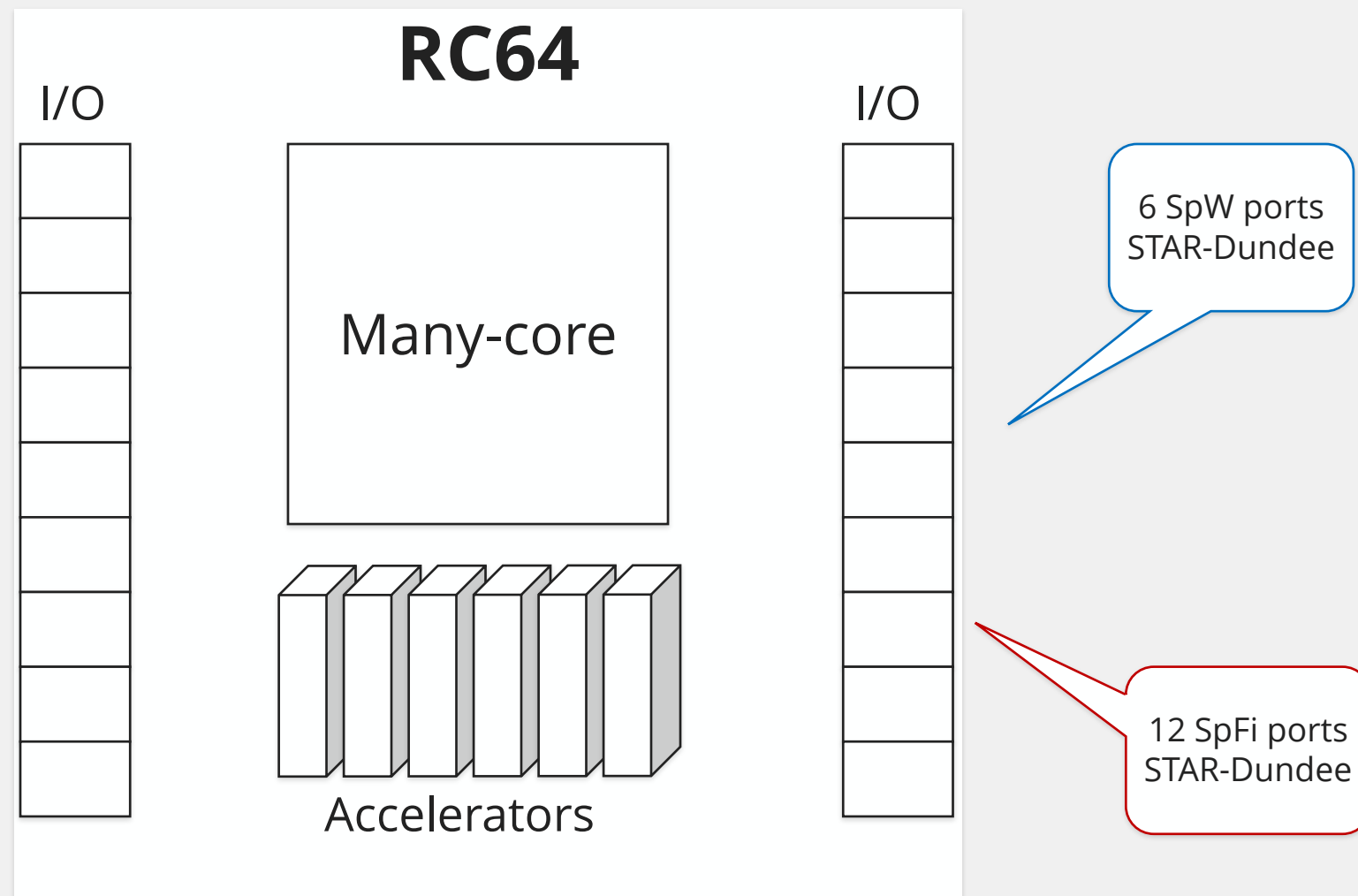


User Application Containers

System Software: OS, Cloud, Docker



>_ RC64—more than a DSP, it is an “Infrastructure SoC”

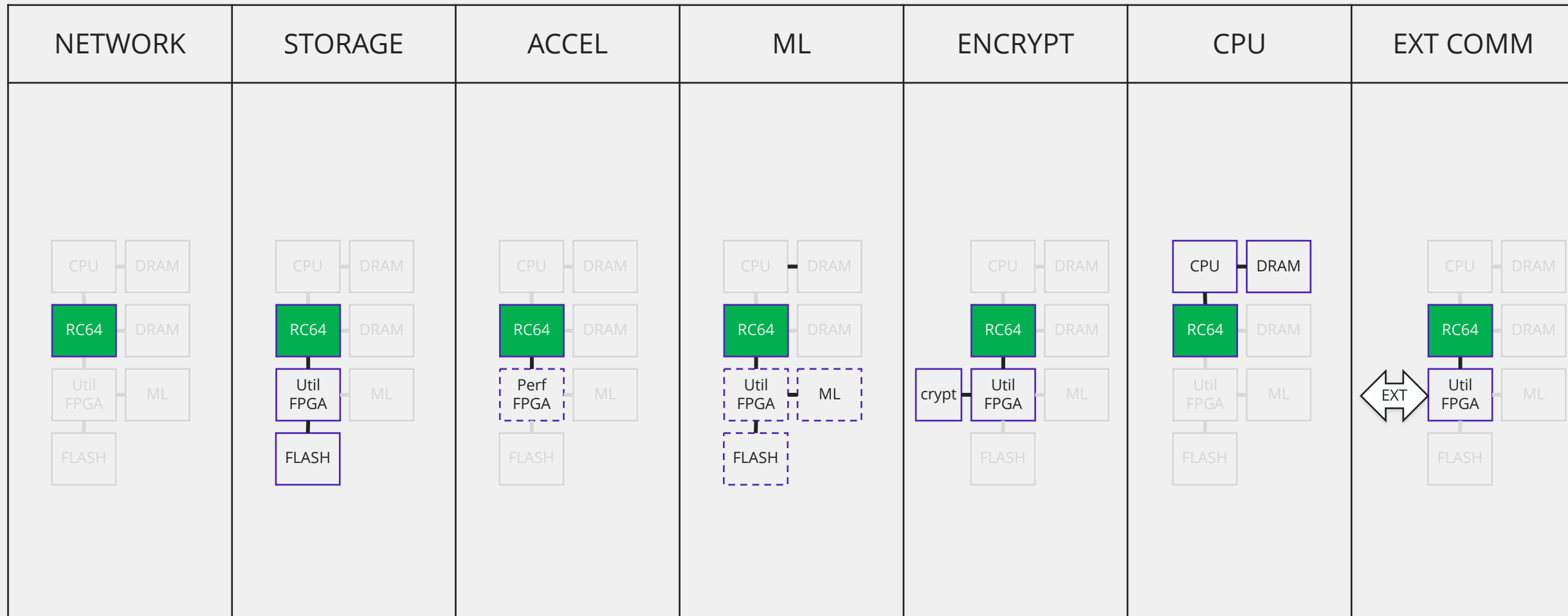


>_ Following DPUs in terrestrial data centers

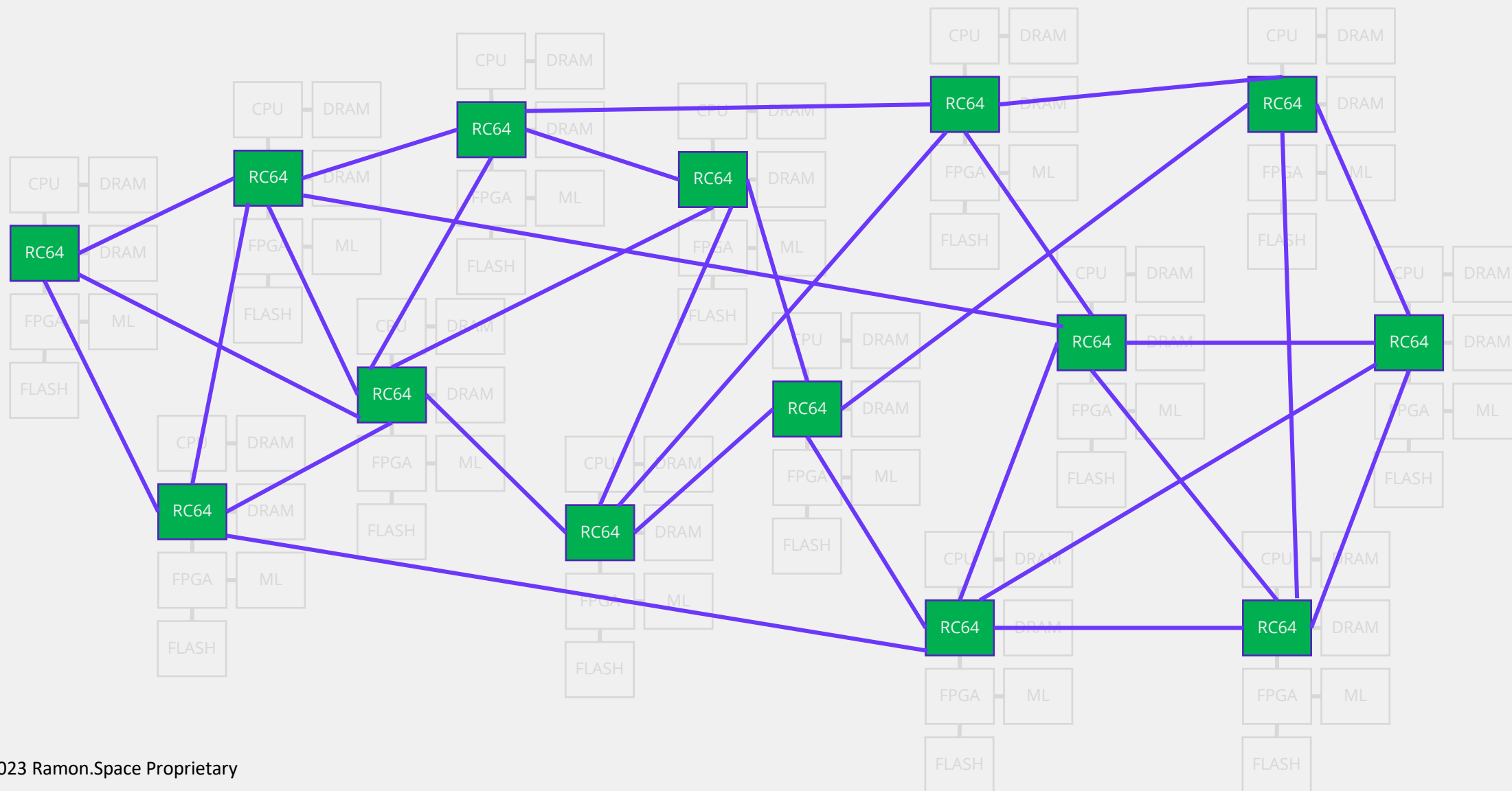
- Annapurna Labs/AWS Graviton3
- Nvidia-Mellanox BlueField-3 DPU
- Fungible F1 DPU
- AMD Pensando DPU
- AMD-Xilinx Alveo
- Broadcom Stingray DPU
- Marvell Octeon DPU



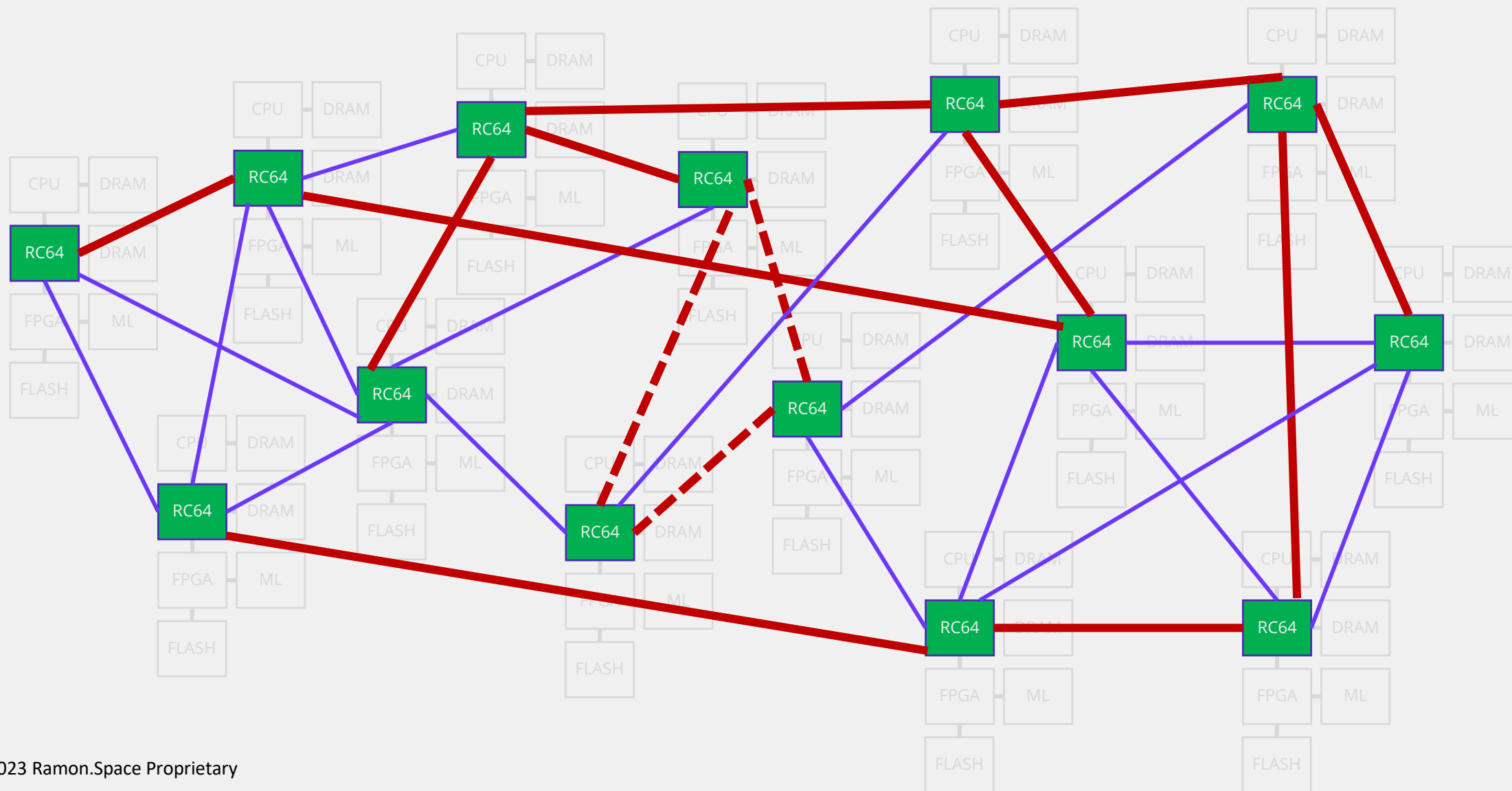
>_ RC64-based DCiS™ Building Blocks



>_ RC64-based DCiS™ Network

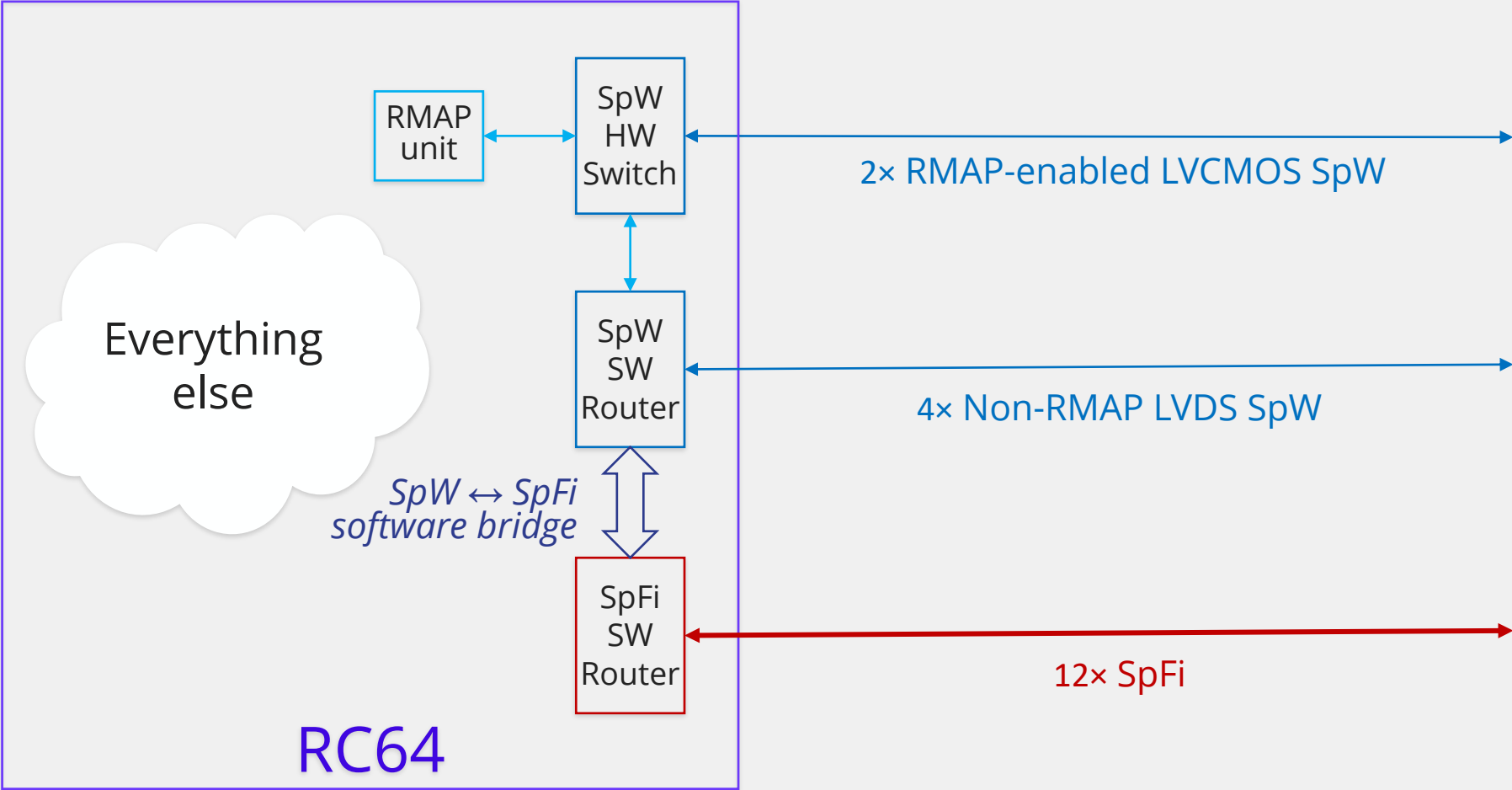


>_ RC64-based DCiS™ Network: Software Routing





RC64 Dual Network: SpW & SpFi

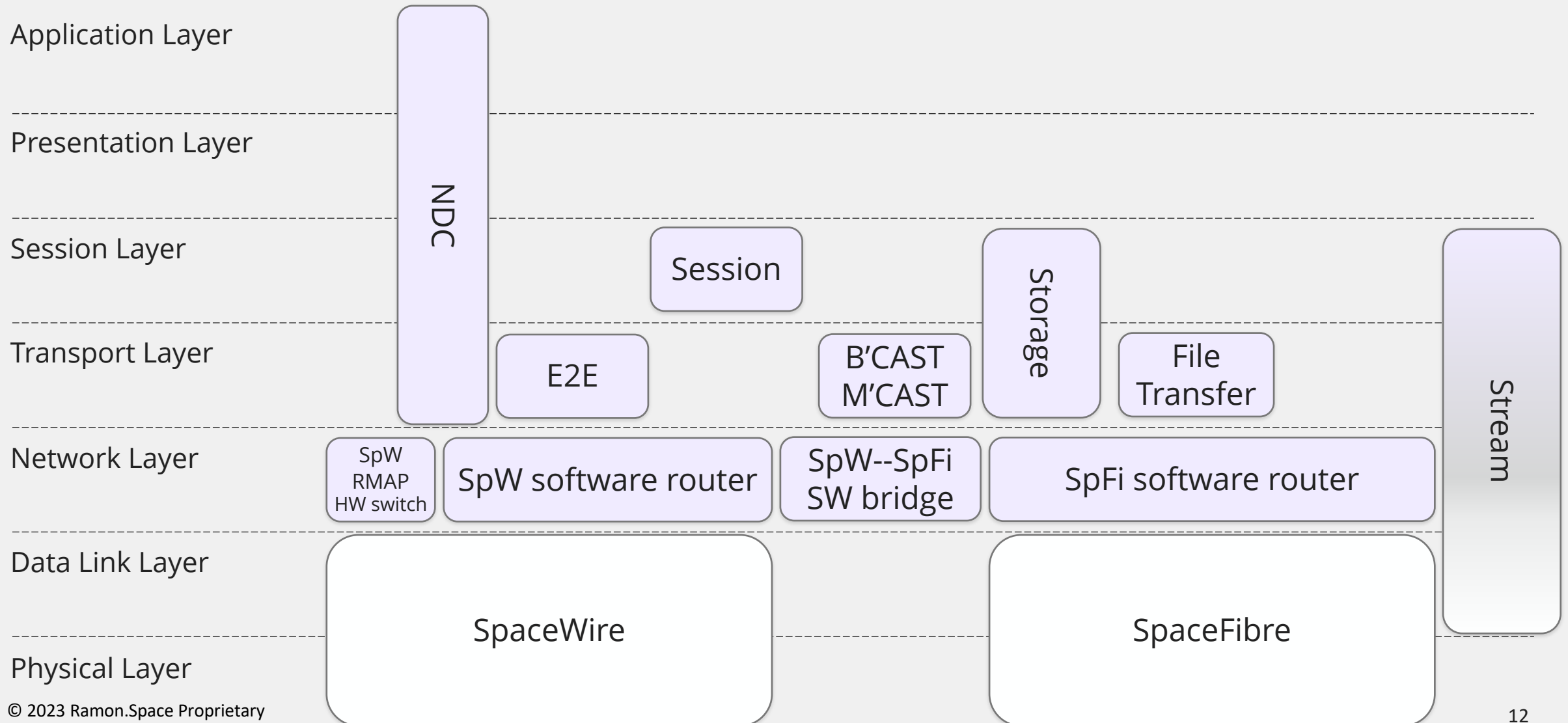


>_ DCiS™ Networking Principles

- Flexible: Software, no hardware
- Over-provisioning—less than 30% utilization, >2× redundancies
- Simple—no multi-lane, a few virtual channels; QoS by SW
- Adhere to standards—inter-operable with FPGA, etc.
- Adhere to layer separation—no mix of functionalities across layers
- Upgradeable--each layer is upgradable independent of other layers

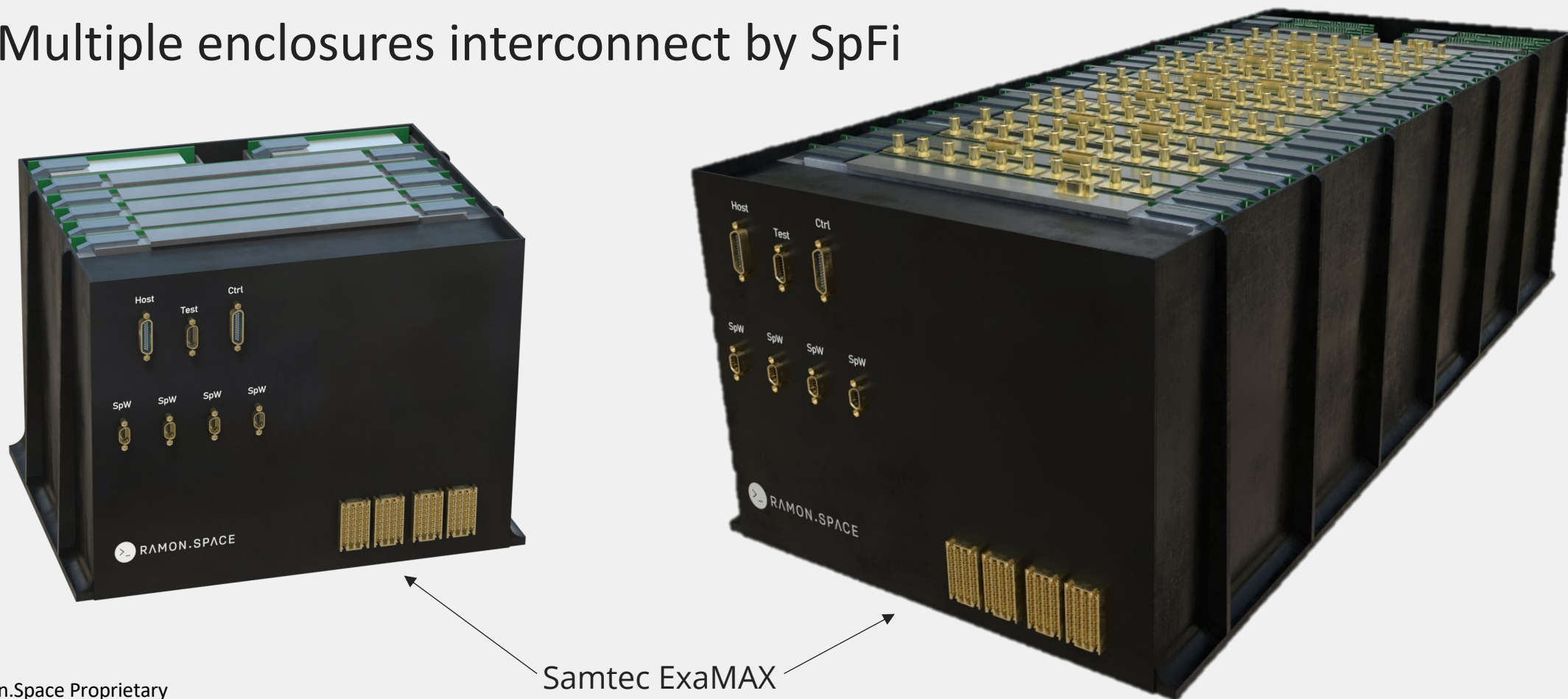


DCiS™ Networking Layers



>_ DCiS™: from Edge Compute to Small-Data-Centers

- 6U-220 VPX cards & enclosures
- Multiple enclosures interconnect by SpFi





Lessons Learned

- SpW & SpFi provide excellent basis for DATA CENTER networking
 - Reasonable HW & SW effort and expertise
 - High reliability
 - Low cost
 - Power efficient
 - High flexibility
- Is this future proof?
- SpFi should upgrade from 8b/10b to either 64b/67b or 128b/130b
 - To complement 28/32 Gbps & 56 Gbps SERDES in NEXT-GEN

Thank you

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