NICA: An Infrastructure for Inline Acceleration of Network Applications

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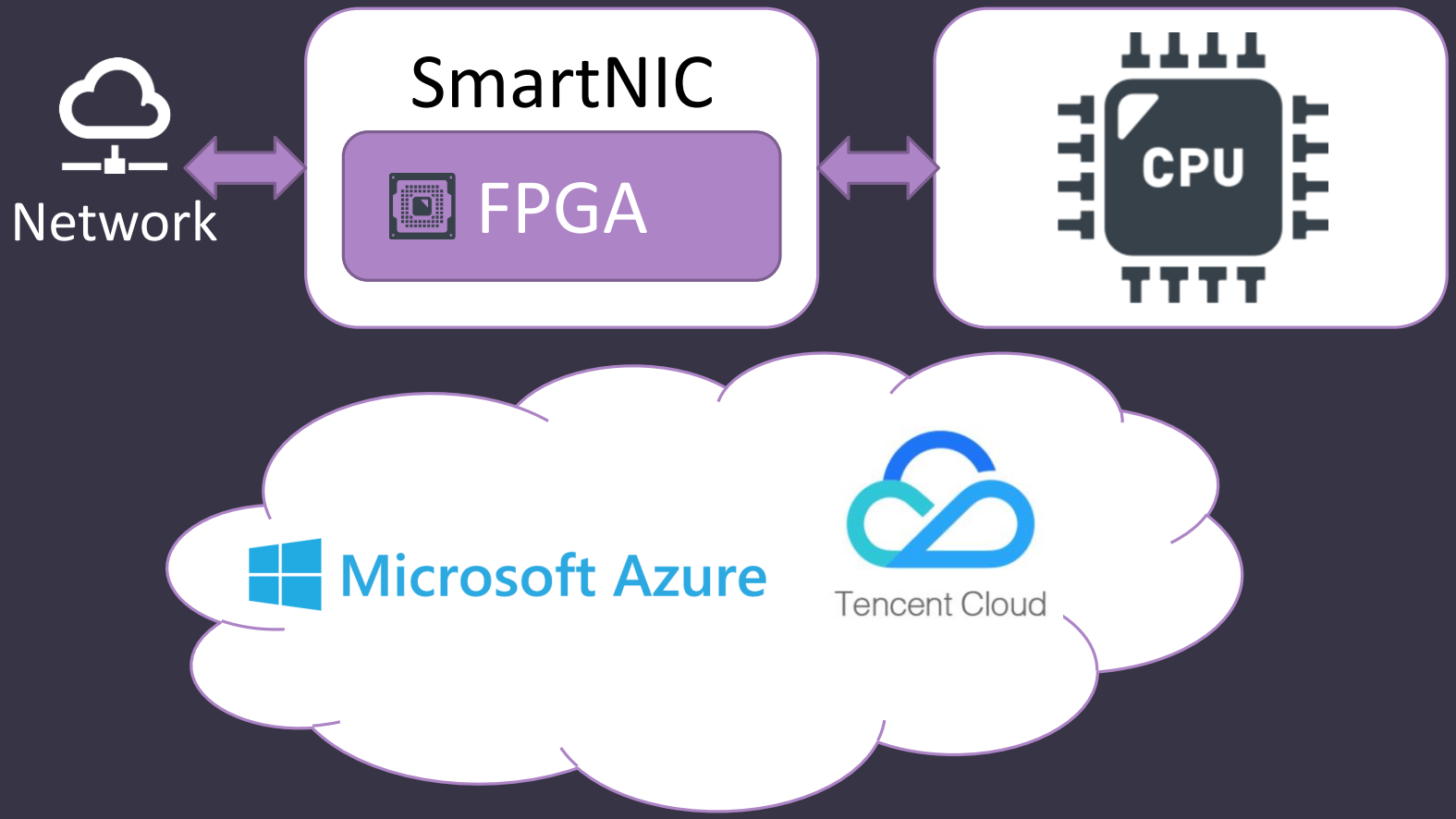
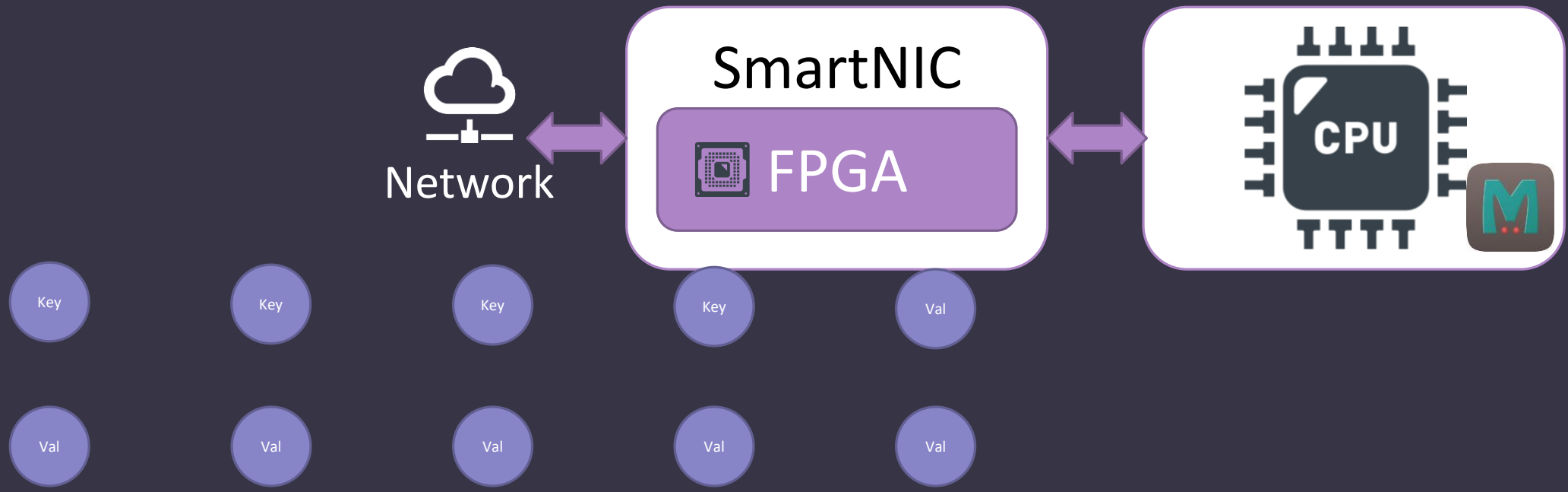
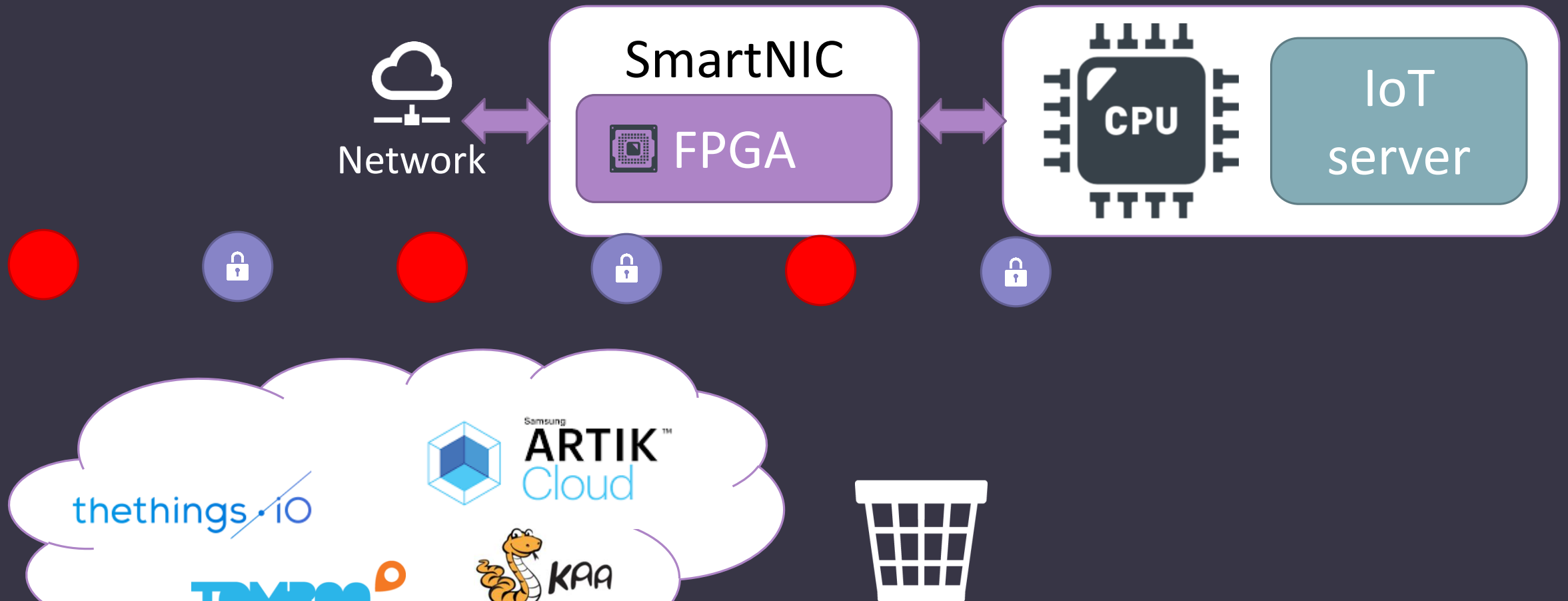
FPGA-based SmartNICs



A key-value store cache



CoAP cryptographic authentication

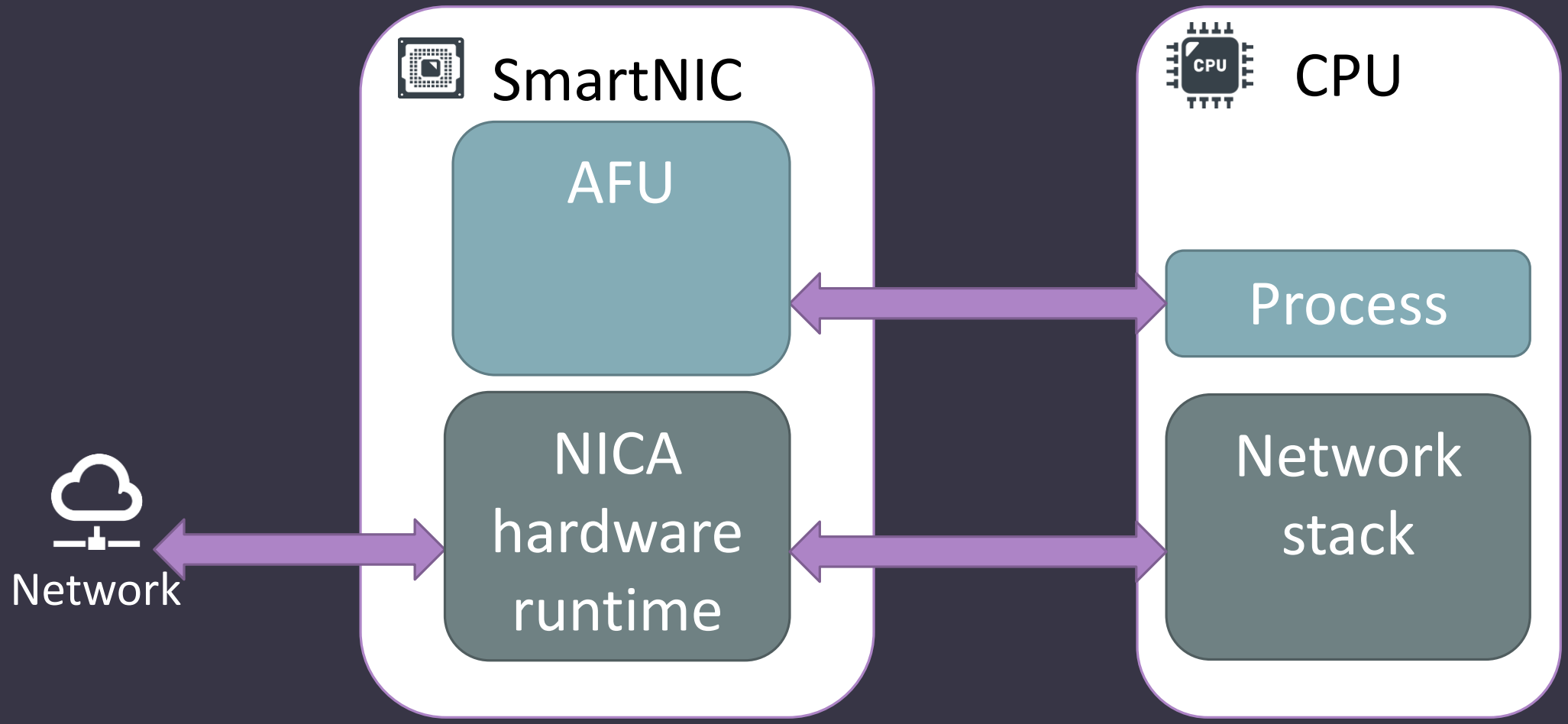


Challenges for cloud inline accelerators

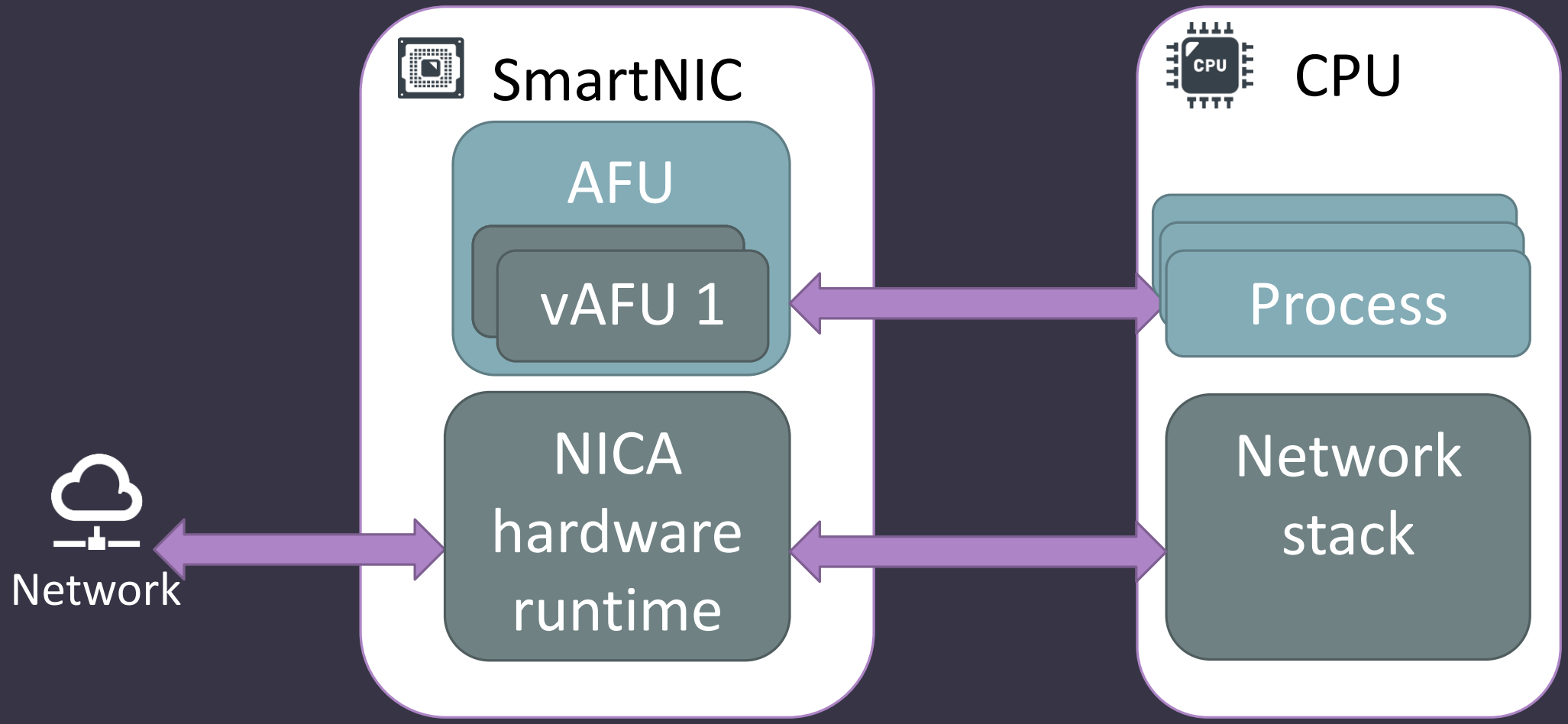
- No operating system abstractions
- No virtualization support:
  - performance & state isolation

The NICA infrastructure fulfills these requirements

NICA operating system abstractions



NICA virtualization



NICA key-value store cache results

- FPGA processes hits at 40 Mtps, 21× faster than a 6-core CPU
- Linear scaling with #VMs
- Host integration: 107 lines of code

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Thursday, July 11, 2019, 11:15 am, Track I