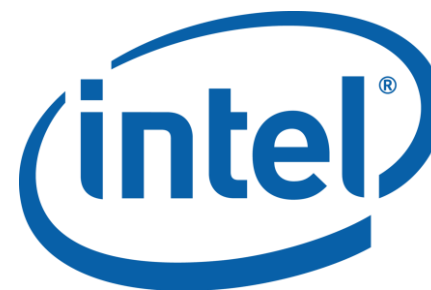


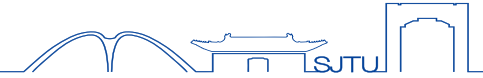
QZFS: QAT Accelerated Compression in File System for Application Agnostic and Cost Efficient Data Storage

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Background



**High-speed
Storage I/O**



NVMe SSDs

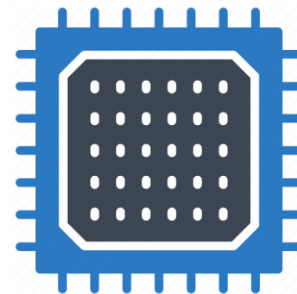
**Space efficiency
for lower TCO**



*High-performance
Computing (HPC)*



**Offloading to
free up CPU**

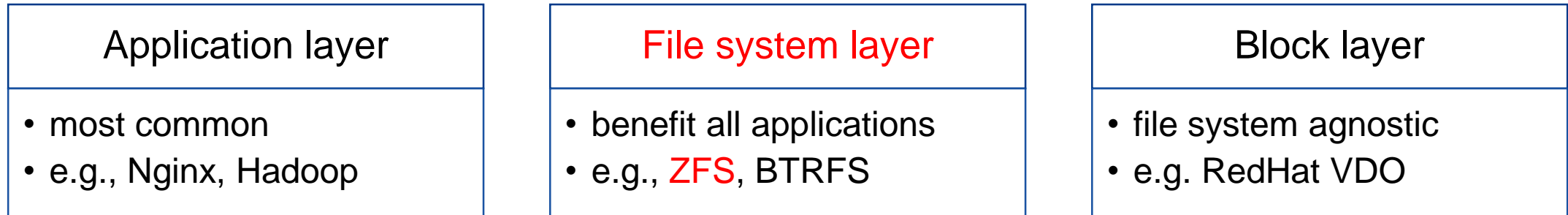


Accelerators (GPU, FPGA, ASIC)

Data Compression Acceleration



Compression in different system layers



Our work: ASIC-based compression offloading



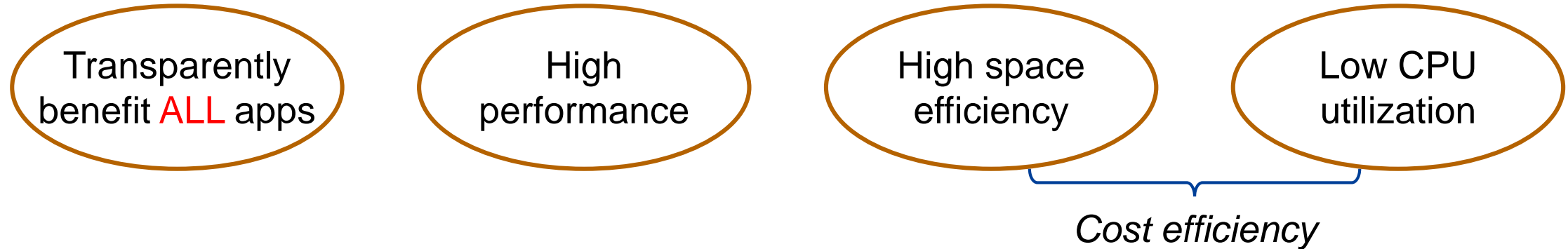
- Modern ASIC for cryptography and compression
- Type: PCIe adapter, chipset, SOC
- Performance: up to **100Gbps**
- Price: low to **\$32** after put into chipset

Intel® QuickAssist Technology (QAT)

QZFS (QAT-Accelerated ZFS)



▪ Features



▪ Design highlights

- Seamless integration of QAT-accelerated *gzip*
- **Vectored I/O** for data reconstruction (memory zero copy)
- **HW/SW switch** that considers *offload cost*
- **Compressibility-dependent** offloading to save QAT resources
- **ASYNC offload framework** (maybe in future): further performance enhancement

ATC '19, Renton, WA, USA

3:20 PM, Track I (Filesystems)

on July 10th