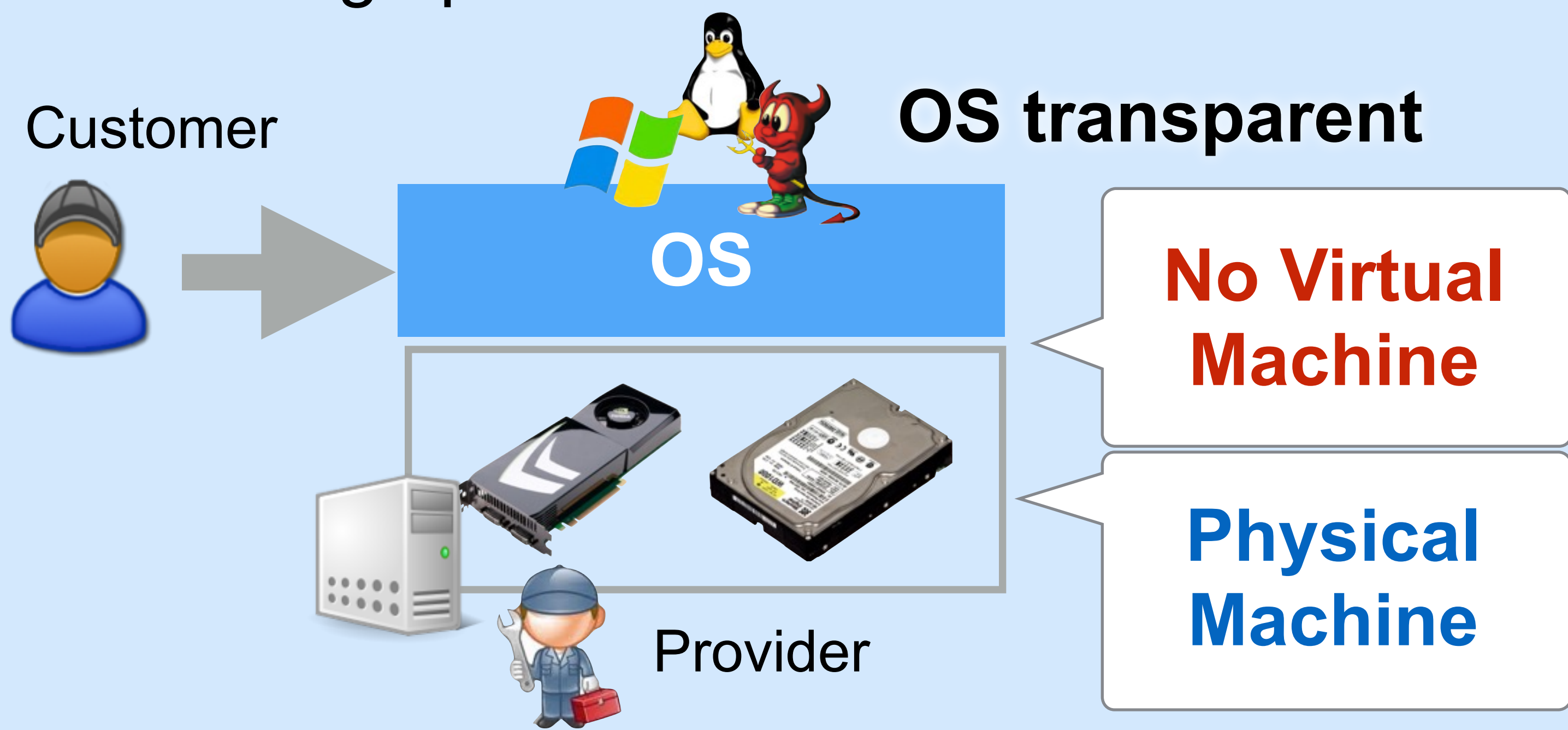


Improving Agility and Elasticity in Bare-metal Clouds

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 †University of Tsukuba, ‡The University of Tokyo

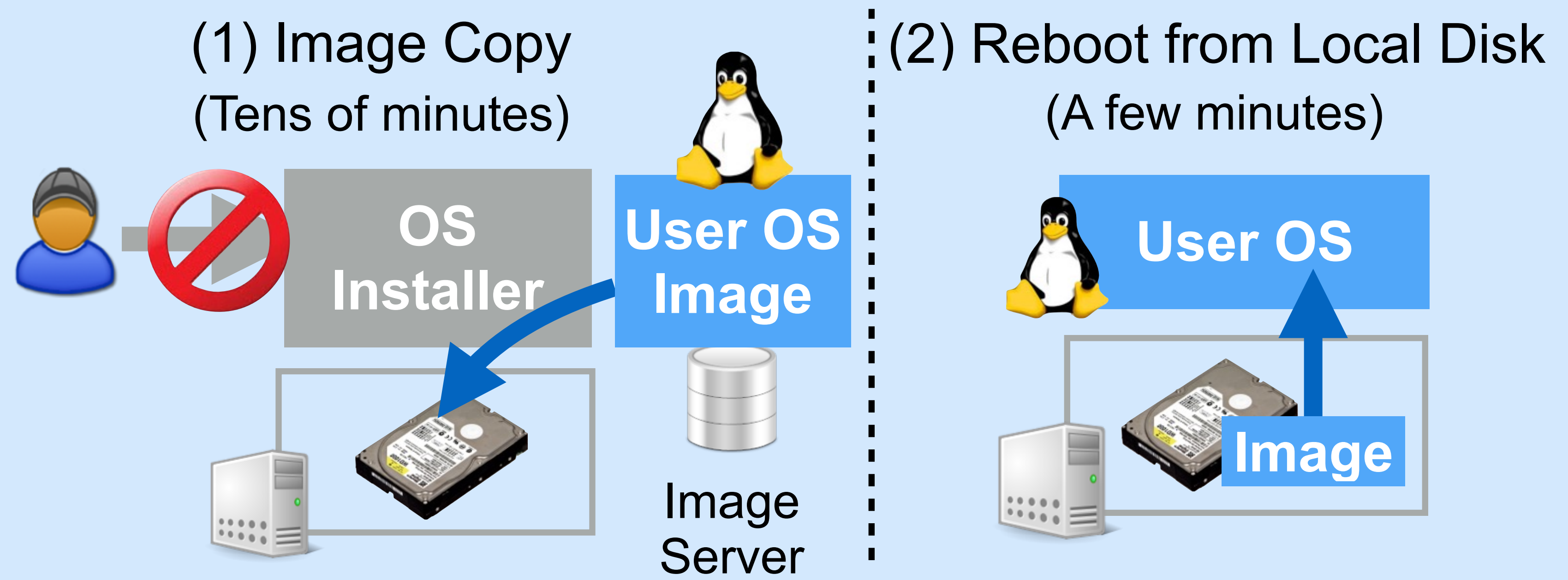
Bare-metal Clouds

An IaaS for high performance and device functionality



OS Deployment Problem

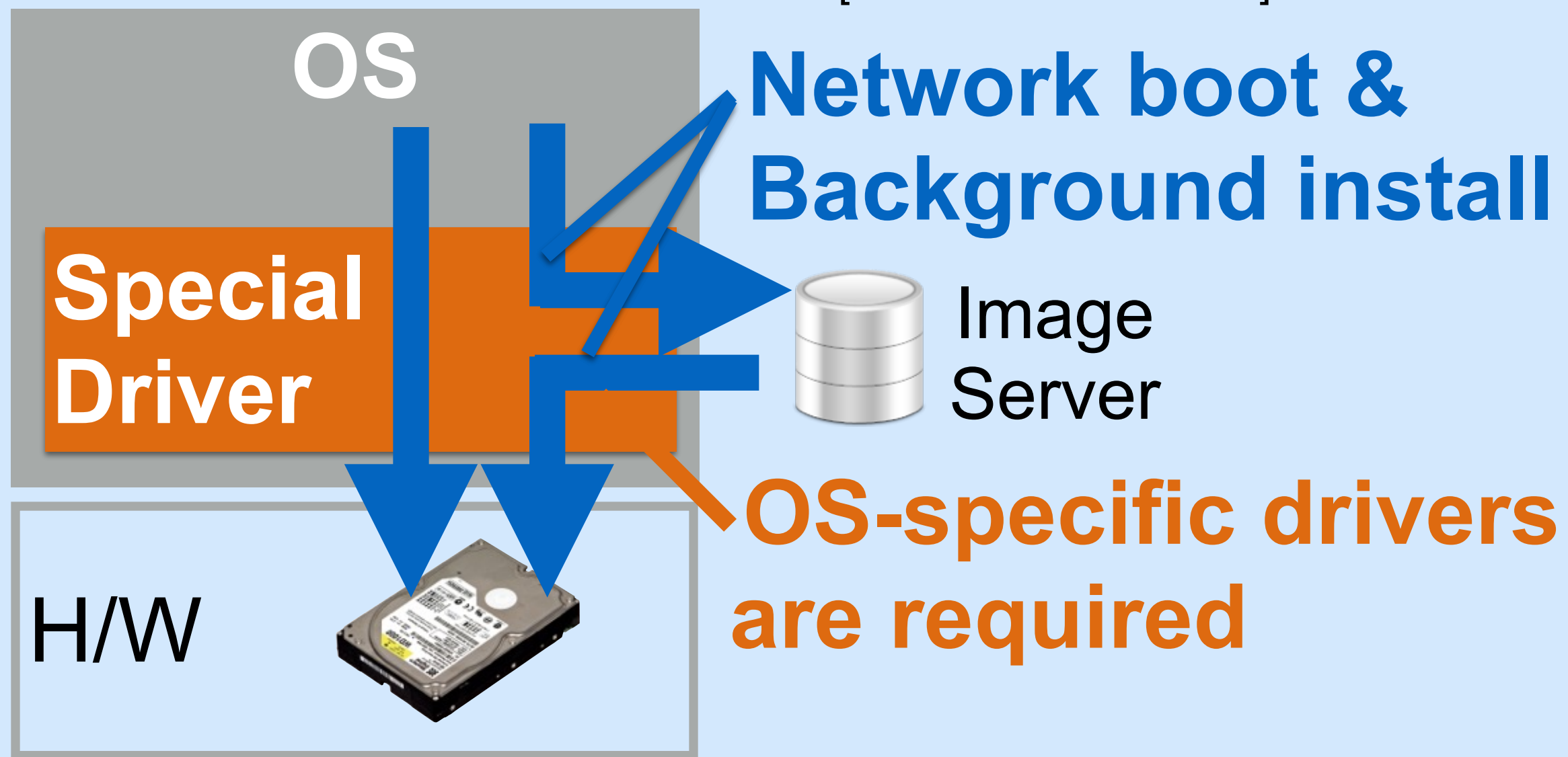
Long wait time sacrifices agility and elasticity



Existing Solutions

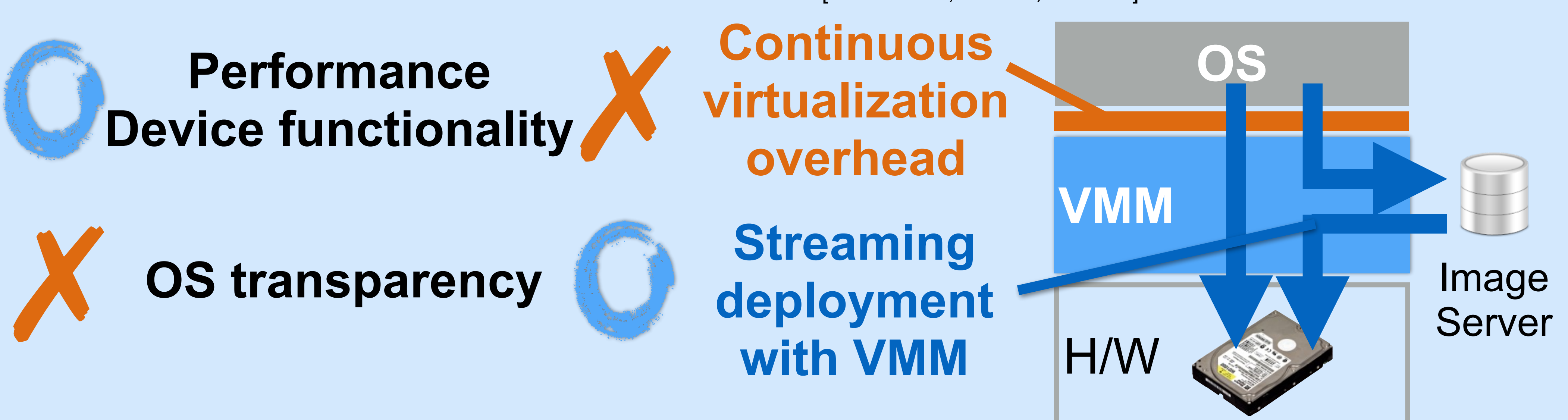
(1) OS Streaming Deployment

[Clerc et al. IPCCC'10]



(2) Conventional VMMs

[VMware'01, Xen'03, KVM'07]

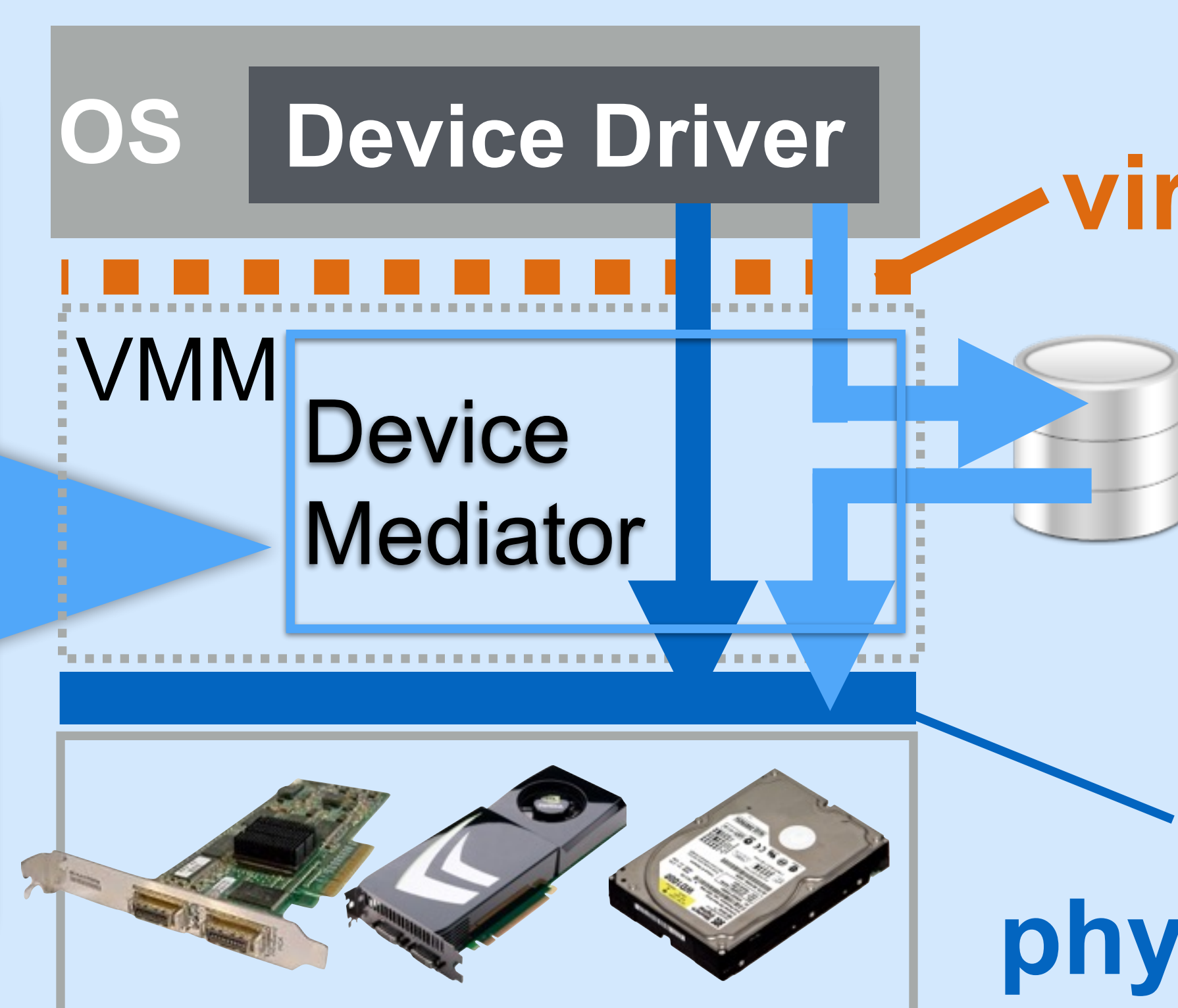


OS Deployment with a Special-purpose VMM

(1) Streaming deployment with VMM

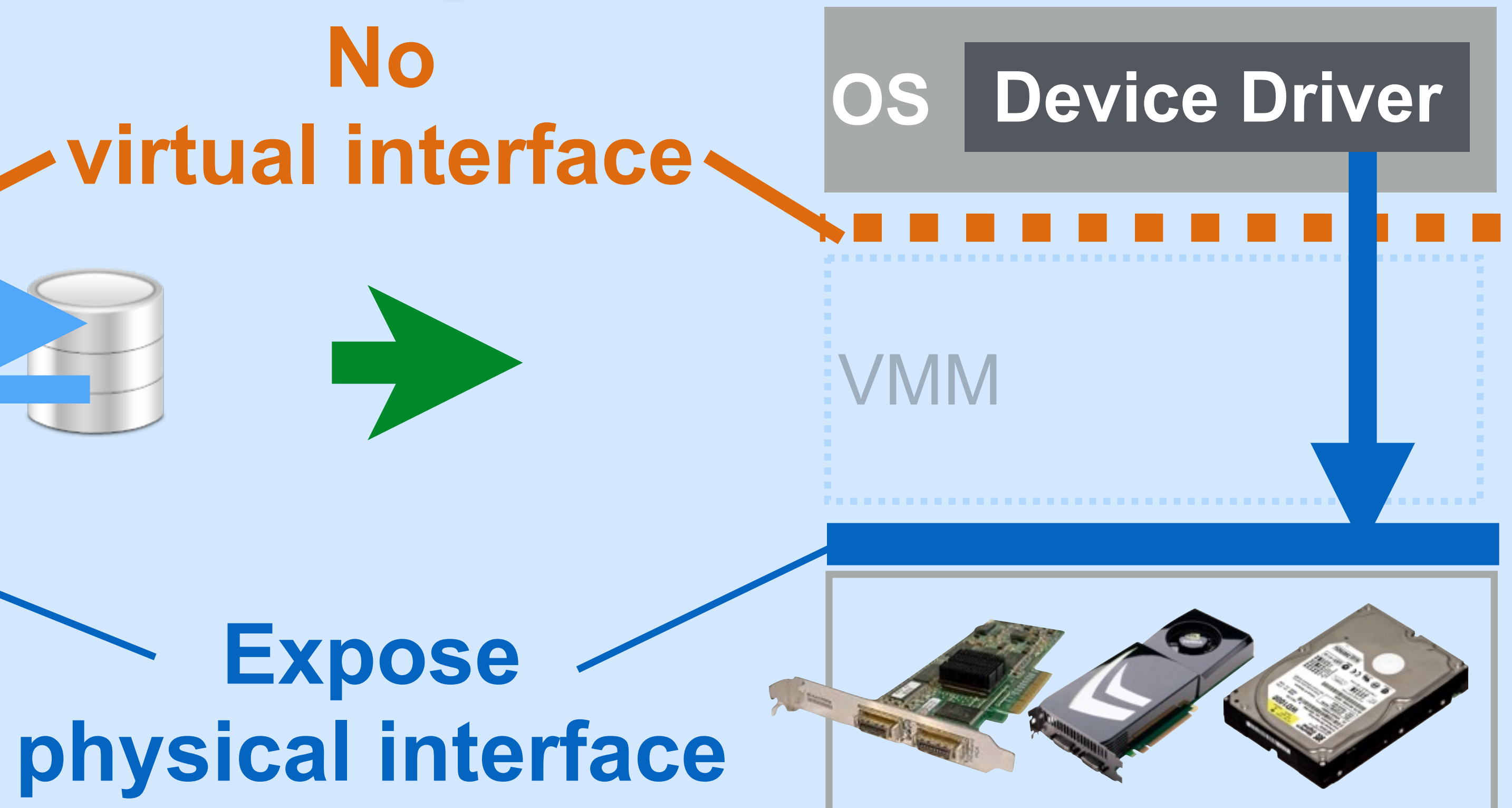
OS transparency

- Device-interface-level I/O mediation
- (1) I/O interpretation to understand I/O context
- (2) I/O redirection to perform network booting
- (3) I/O multiplexing to perform background install



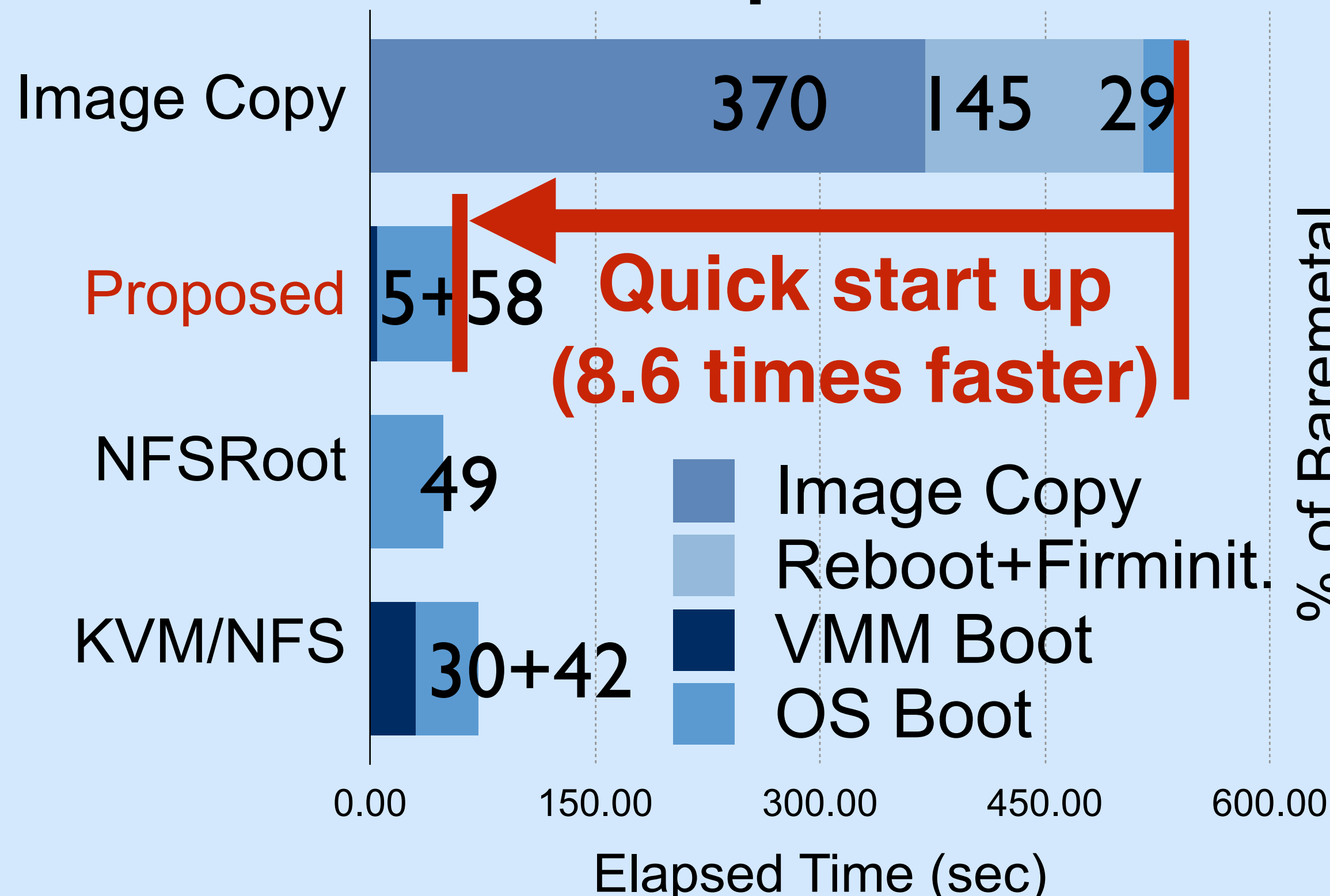
(2) Seamless de-virtualization

Performance / Device functionality

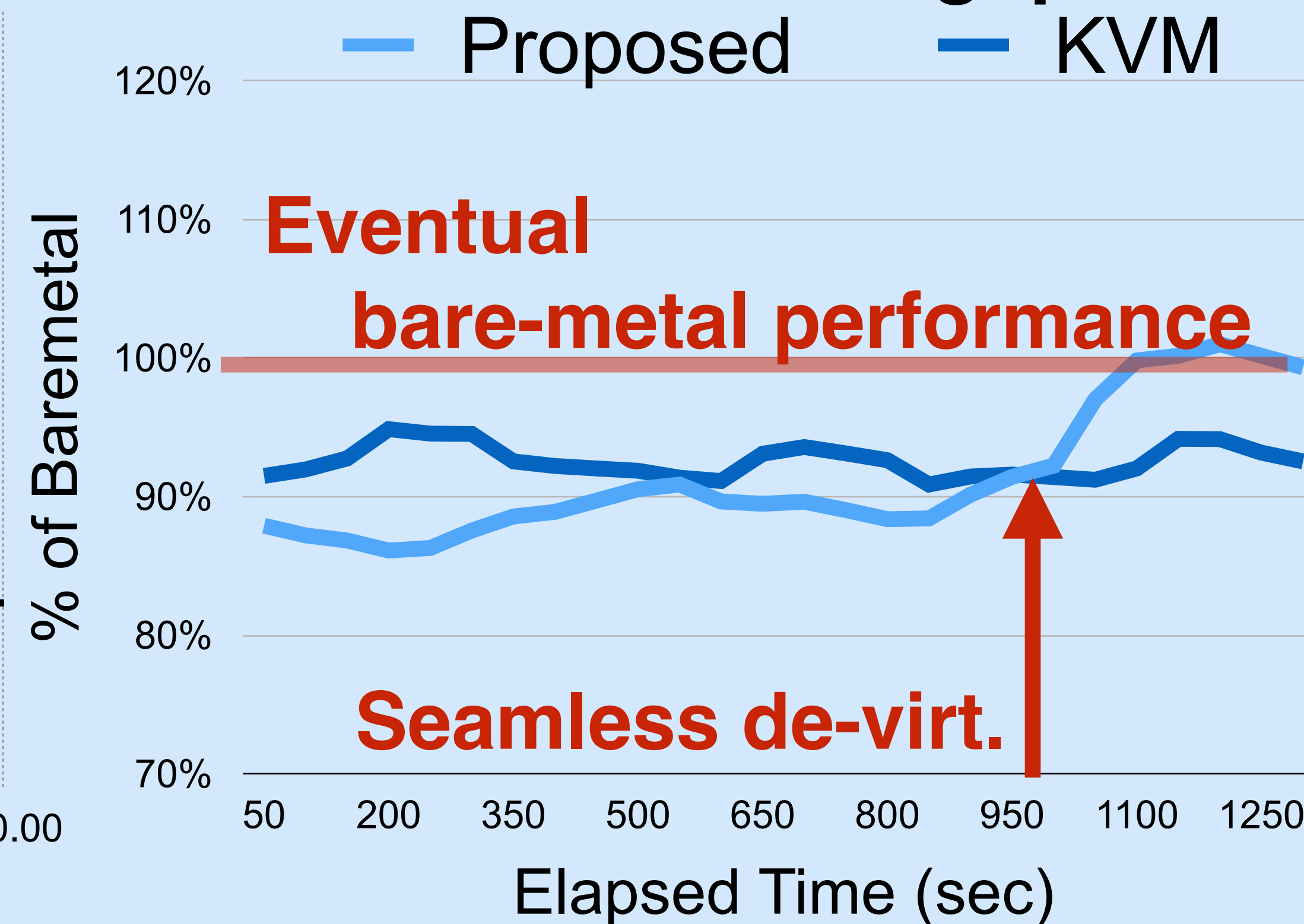


Evaluation (Deploying 32GB Linux image)

OS-startup Time



Cassandra Throughput



MPICH Latency (10-nodes cluster)

