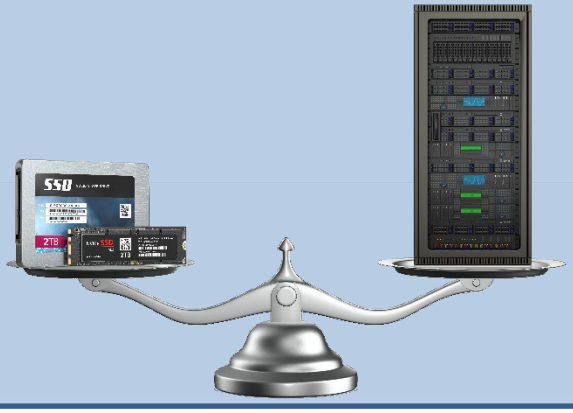
Balancing Servers and SSDs



One of the questions facing datacenter system and application architects is, “Are SSDs too big for servers?” SSDs have continued to double in capacity every year and a half to two years. Server performance has essentially plateaued. Five years ago, 4-5 SSDs were necessary to support a single server’s workload. Today, a single SSD could support the storage needs of most server workloads. However, having a single SSD in a server makes it a single point of failure. And sharing a few direct-attach drives across several servers can cause data management issues and backup complexity. Centralized storage arrays can eliminate these issues but are extremely expensive.

So, how can datacenter systems and application architects rebalance the relationship between server needs and storage capacity for typical enterprise workloads? Balancing the relationship between servers and SSDs is critical to datacenter cost, operational efficiency, and performance. Purchasing an extra drive for every server drives up CAPEX costs, while complex data management and/or backup schemes increase OPEX costs.

IT vendors take different positions are how to address these issues, such as:

1) Networked SSDs, which are accessible remotely over Ethernet;
2) Scale-out flash storage (SOFS) software, where a group of direct-attach SSDs looks like one large shared namespace on an NVMe over Fabric (NVMe-oF) network;
3) Smart storage/computational storage, where processing is handled in the SSD itself.

Today, SOFS software (which is an outgrowth of software-defined storage) is leading the pack to solving this problem, with offerings from several vendors and roughly 3 years of production deployments under its belt. Smart storage/computational storage is having some luck in

embedded applications, and for features such as encryption and compression, but is still looking for widespread adoption with “big data applications” in the datacenter (big software companies don’t like recoding their applications). Networked SSDs have just seen the light of day and could prove an interesting (and lower-cost) alternative to storage arrays but we will have to wait a few years on this technology.

One thing is certain – the footprint of large storage arrays continues to shrink.

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