



Consistent

High Performance

Secure & Private

End-Customer Managed

Enterprise-Class

Charge Hourly

Zadara™ Storage

VPSA™

**Virtual Private
Storage Array™**

Enterprise Storage... *as a Service*

PURE OPEX • FULLY MANAGED • 100% UPTIME SLA

Enterprise
Storage

+

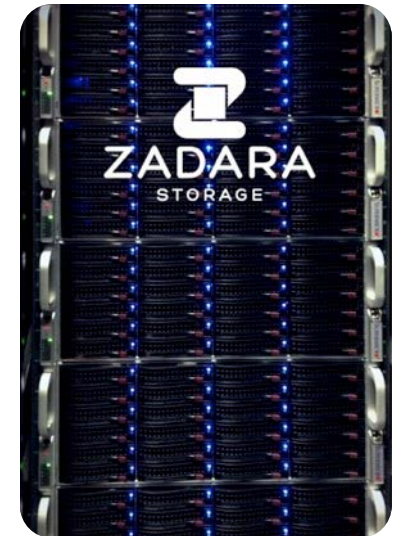
as a Service

=

ZADARA
STORAGE

- **You get to define:**
 - Controller performance
 - Cache amount
 - Drive types
 - RAID types
 - I/Os for databases
 - Low latency for OLTP apps
- **With support for:**
 - Block + file access
 - High Availability, BC, DR
 - Clusters

- **With the benefits of:**
 - 100% OpEx
 - Elastic in all directions
 - Easily modified
 - Multi-tenant environment, Single-tenant experience
 - Performance isolation
 - No up-front costs
 - **Short Commitments:**
 - 1 hour Cloud / Co-lo
 - 6 month On-premise

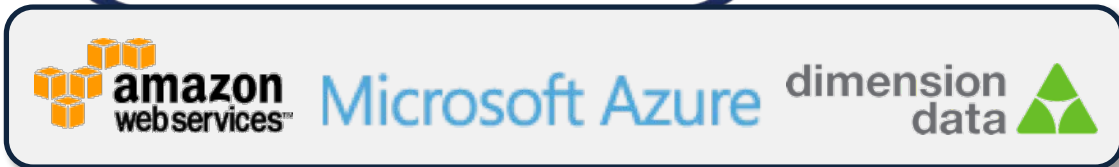
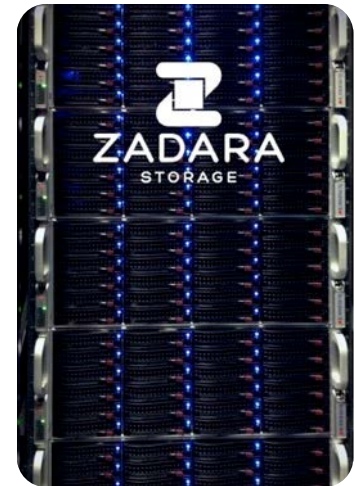
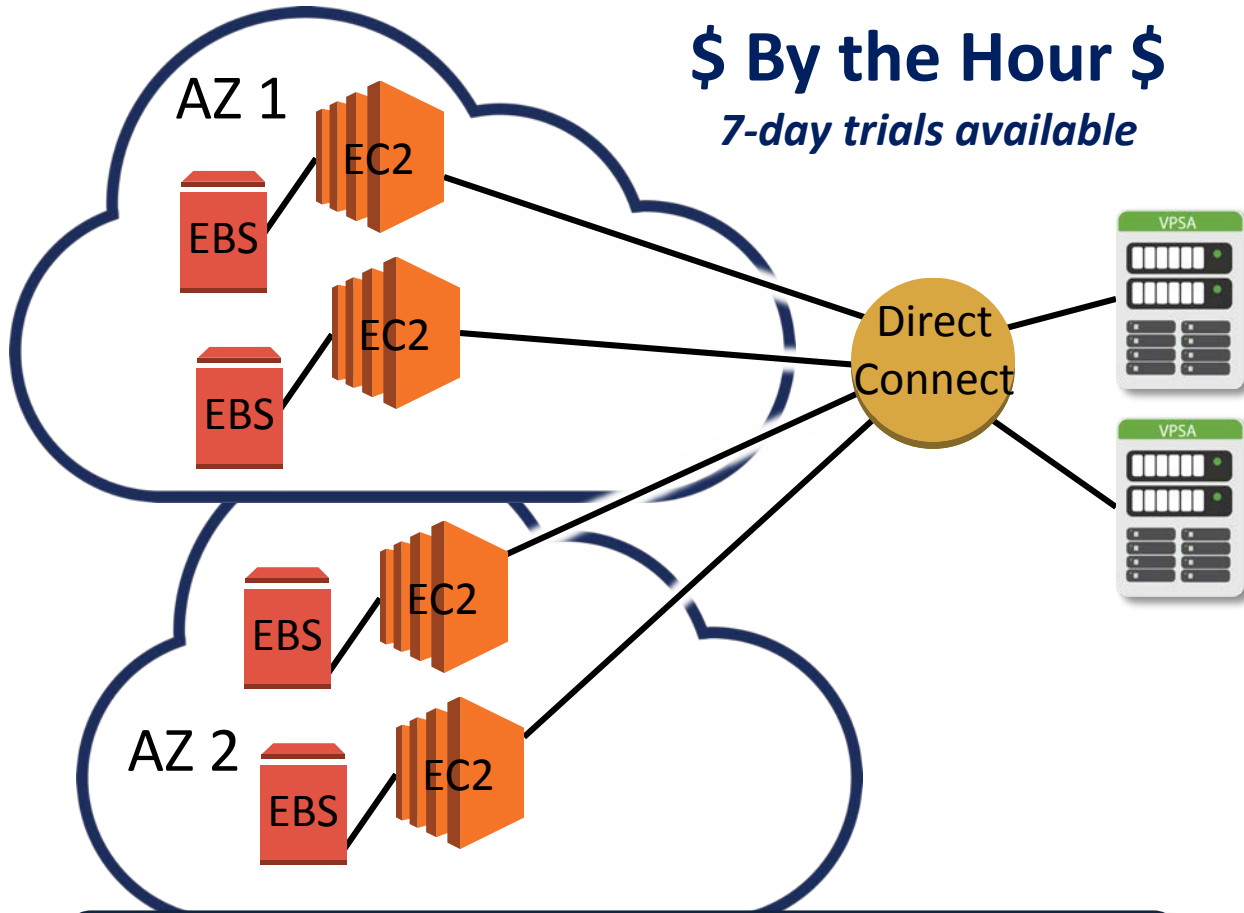


ZADARA
STORAGE

VPSA Public Cloud Option

\$ By the Hour \$
7-day trials available

Zadara Storage
Cloud Rack



Advantages

In the Cloud

- More Performance
- More Protocols
- More Features
- Higher QoS
- Better SLA
- Dedicated HW (on-demand)
- Sophisticated Networking

On Premises

- OpEx Model
- Lower TCO (~50%)
- No purchase, \$0 down
- Remotely managed
- Replicates to the cloud
- Performance isolation
- Metering (chargeback)
- Exabyte-scale

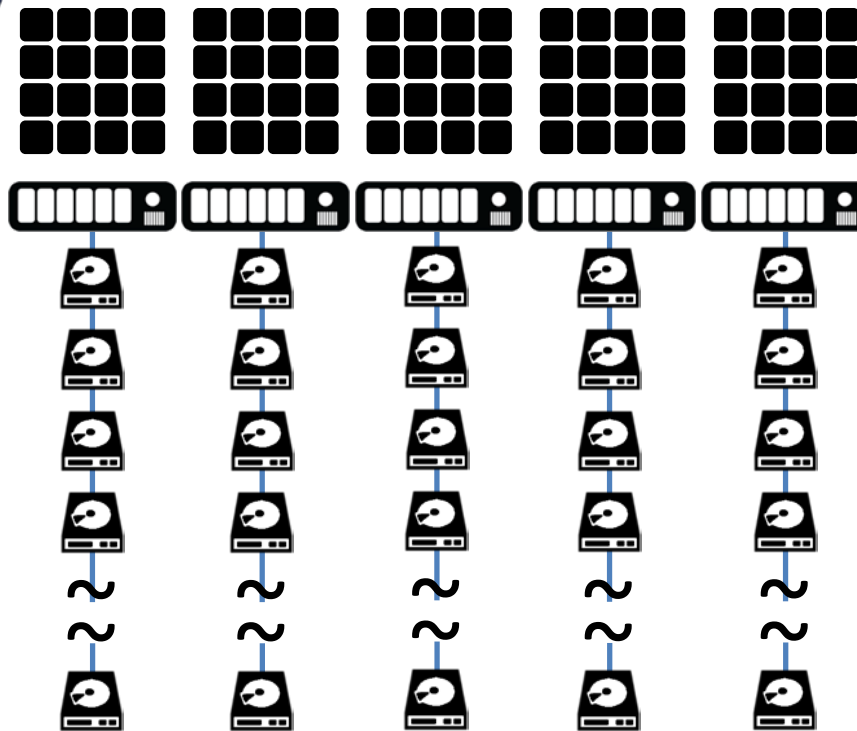
Zadara-AWS-Azure Value-Add

	AWS EBS / EFS PIOPS EBS	Azure Page Blob Azure Files	AWS/Azure + Zadara VPSA
Max Volume Size	16TB Very Large? (File)	1TB (Block) 5TB (File)	100TB
File Storage	NFS only (Preview)	SMB only (Preview)	Yes, NFS+SMB
Encryption at Rest + User Owns Keys	AWS Owns Keys	No	Yes
Clusters/Sharing	No	No	Yes
High IOPS	Up to 20K	Up to 5K (in beta)	Yes
SSD Option	Yes	Yes (Limited VM types)	Yes
Instant Snapshots	No	No	Yes
Remote Replication	No	No	Yes

Zadara Storage Cloud

Hybrid Storage Using Standard Components:

- X86 Servers
 - Drives: SSD/SAS/SATA
 - Dual 10/40GbE Switching
 - Openstack, Ubuntu, KVM

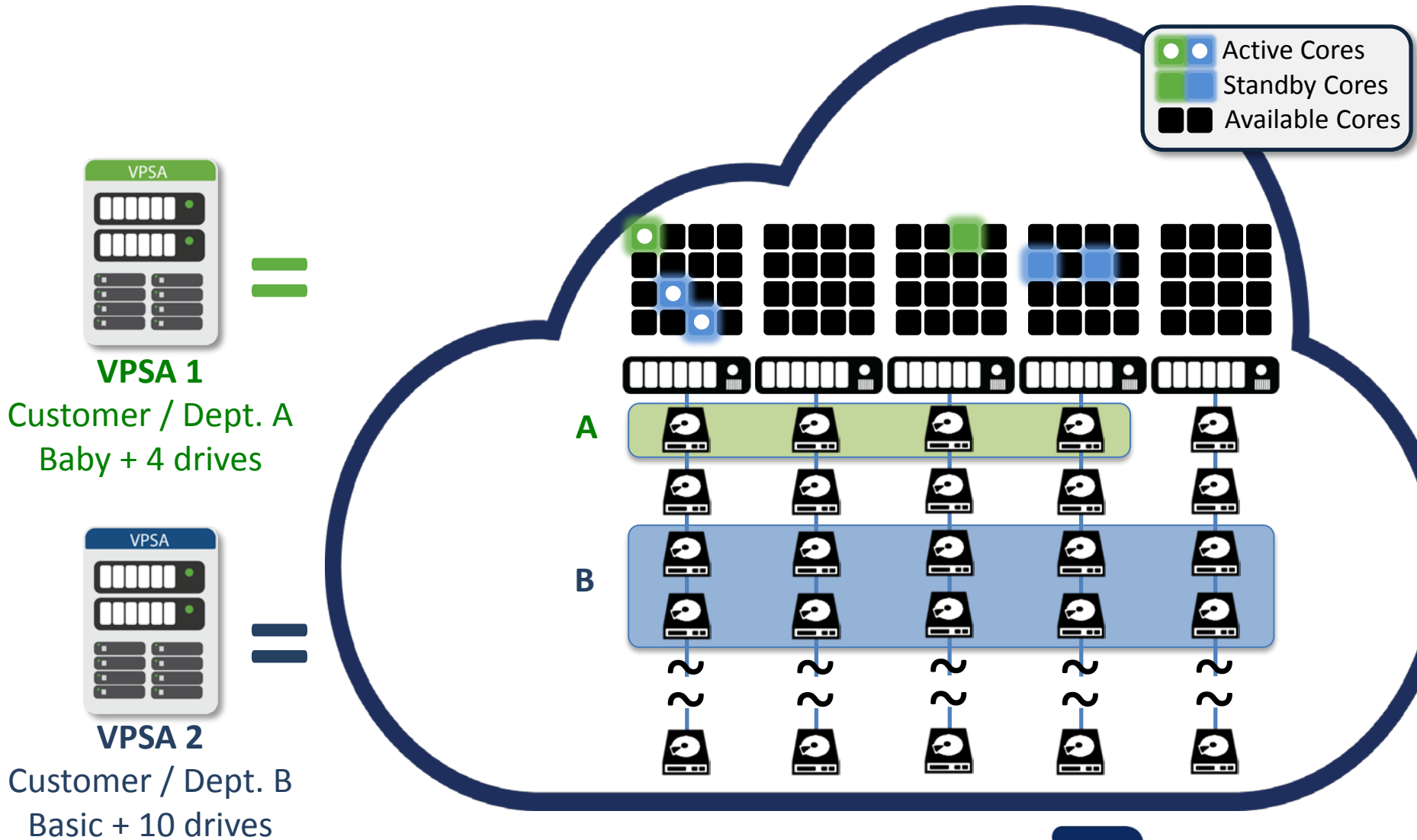


Cores

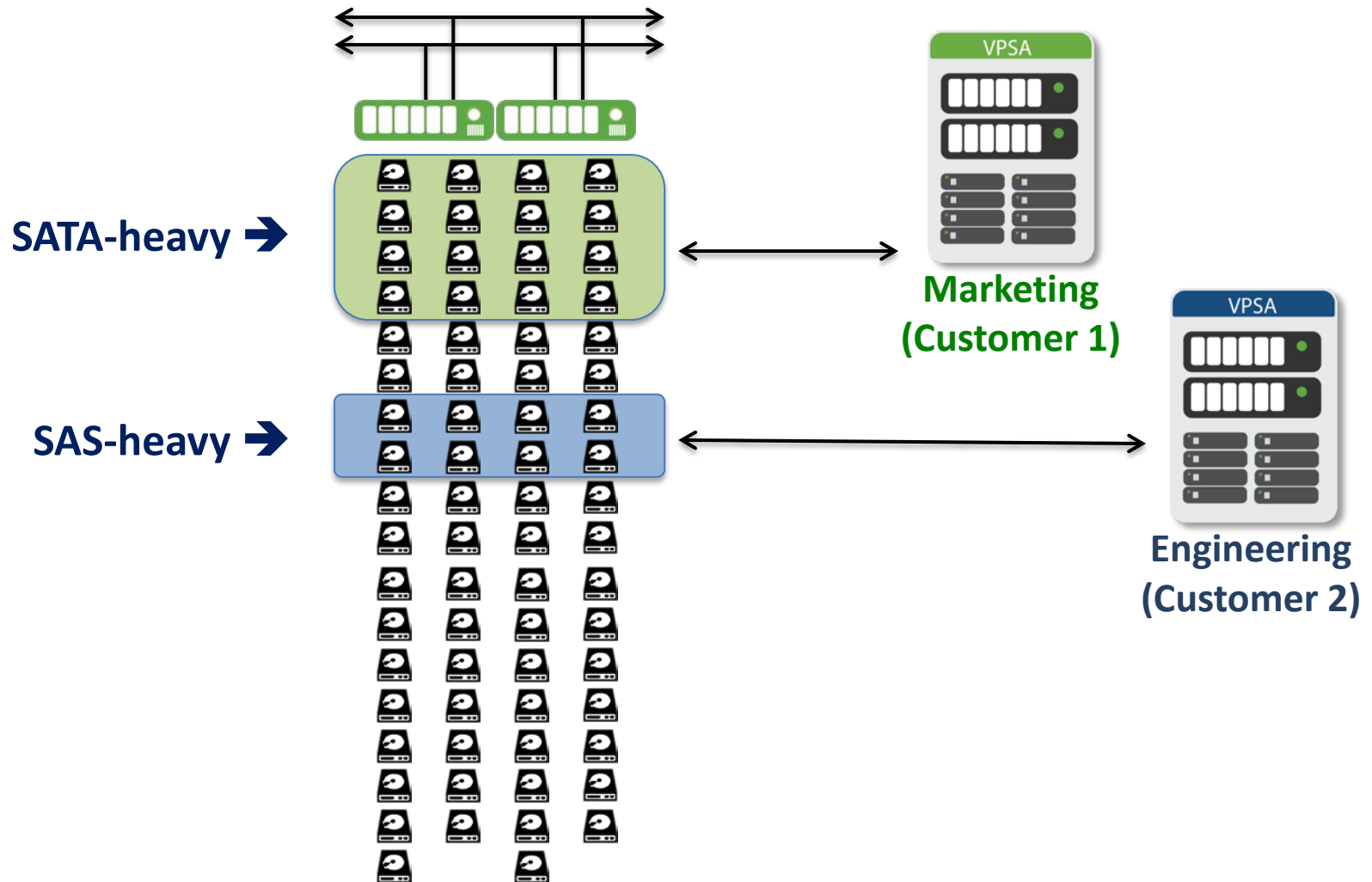
Storage Nodes

Drives

What Does my VPSA™ Look Like?

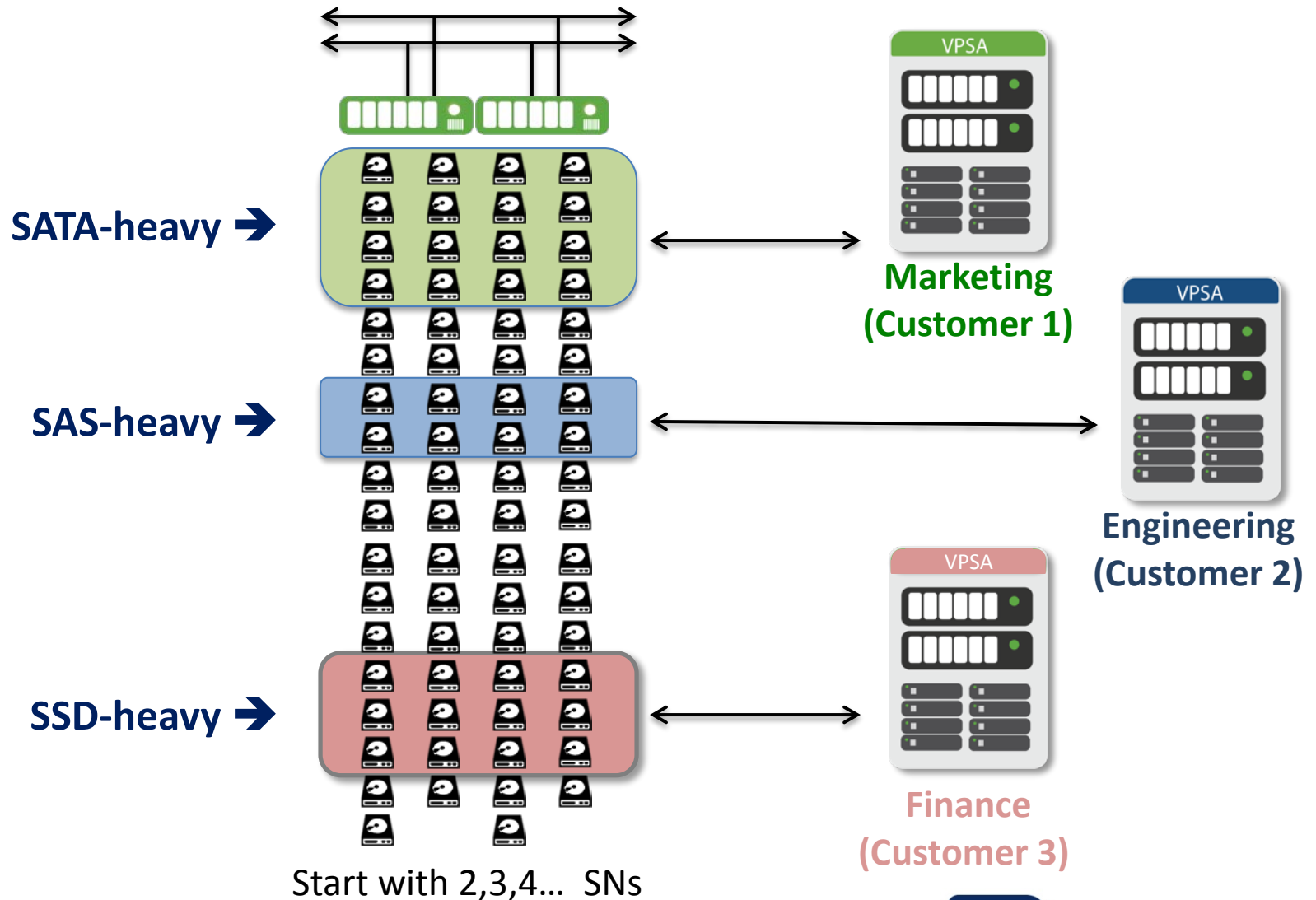


Create (and Pay For) Only What You Need

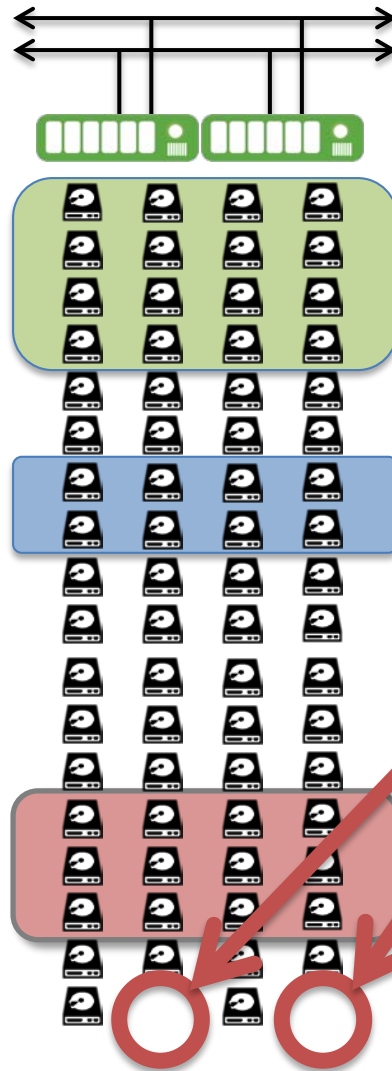


Start with 2,3,4... SNs

Create (and Pay For) Only What You Need



SSDs Front all Magnetic Media



SSDs for
Caching

SSD Cache Capabilities

- **Used for:**
 - both reads and writes,
 - both data and metadata
- **Distributed:** a single VPSA can combine partitions from many different SNs into a single cache entity
- **Protected:** no single failure point, incl. total SN failure
- **Elastic:** can grow and shrink instantly, dynamically, on the fly and with no service interruption. Allows each tenant to dial in her ideal price/performance point
- **Utilizes RDMA** over Ethernet (iSER) for lowest possible network latency in a distributed cache architecture

Why Magnetic Media?

- (a.k.a. We're at the Flash Memory Summit; aren't we here because disk drives are dead?)
- Large, low-RPM disk drives are still far cheaper than flash media, and still rapidly cost-reducing
- 6TB drives are widely available, and are going to 8, 10, ...
- These drives cost around \$0.03, an order of magnitude less than SSDs (and the cost is dropping almost as quickly)
- They still have great sequential performance (better than some of the SSDs we've tested)

From EMC via ExtremeTech

Flash vs HDD : Industry Cost Trends

MLC 8X More Expensive Than Performance HDD Through 2016



**This Ratio
Hasn't Changed**

EMC²

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SSD + HDD = Cost & Performance

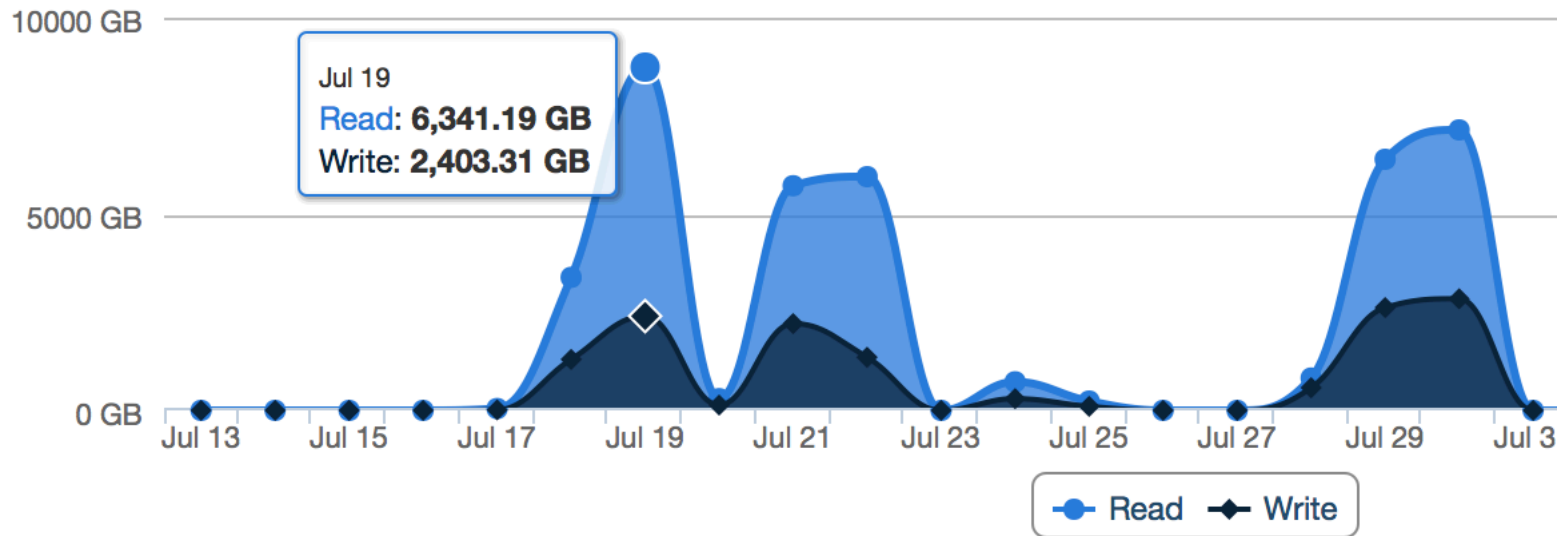
- A popular configuration among our customers is large (5-6TB drives) with SSD caching
- The reason is obvious: if the data fits in cache, one gets SSD performance at a SATA price
- Given that our cache is elastic, it's easy to find the right cache size (and change it on the fly)
- (One can't make a mistake – switch from HDD to SSD and back anytime, non-disruptively)

Real-World Example

- A certain Ivy League university...
- NAS (file) workload

Drives

Type	Count
SATA 4656GB 7200RPM	40
SSD CACHE DRIVES Cache	22





THANK YOU



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