



# *Designing High-Performance AFAs for SMEs*

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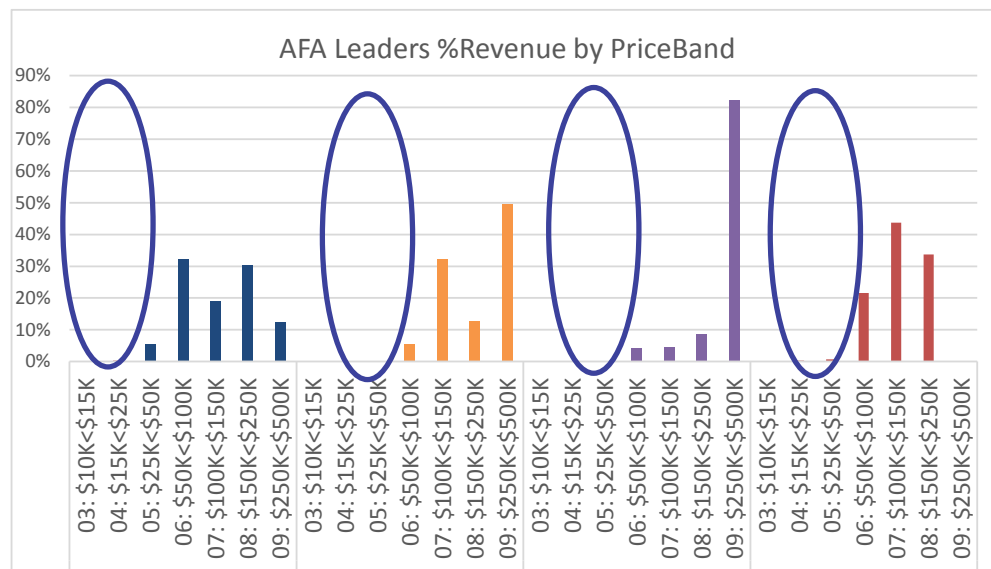
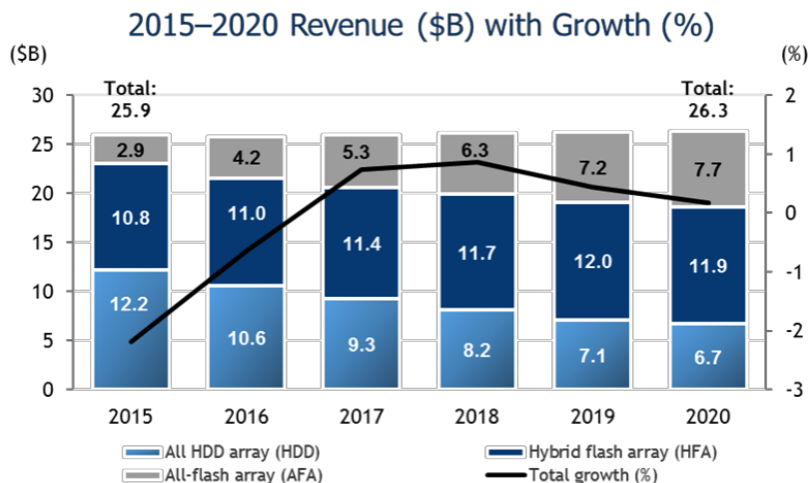


## AFAs for the SME Market

- Flash-based storage is growing very fast
  - AFA products have strong adoption in the \$100K to \$500K price range
  - Cost of NAND-flash continues to decrease
- Customer demand in SMEs is growing for AFA products (**targeting < \$100K**)
  - Must support mission-critical workloads
  - For example: 500K IOPS / 50TB for <\$50K would be ideal for SMEs
- Seagate Systems is developing products to address this challenge
  - Investing in purpose-built software and hardware controller architectures



# Enterprise AFA Growth

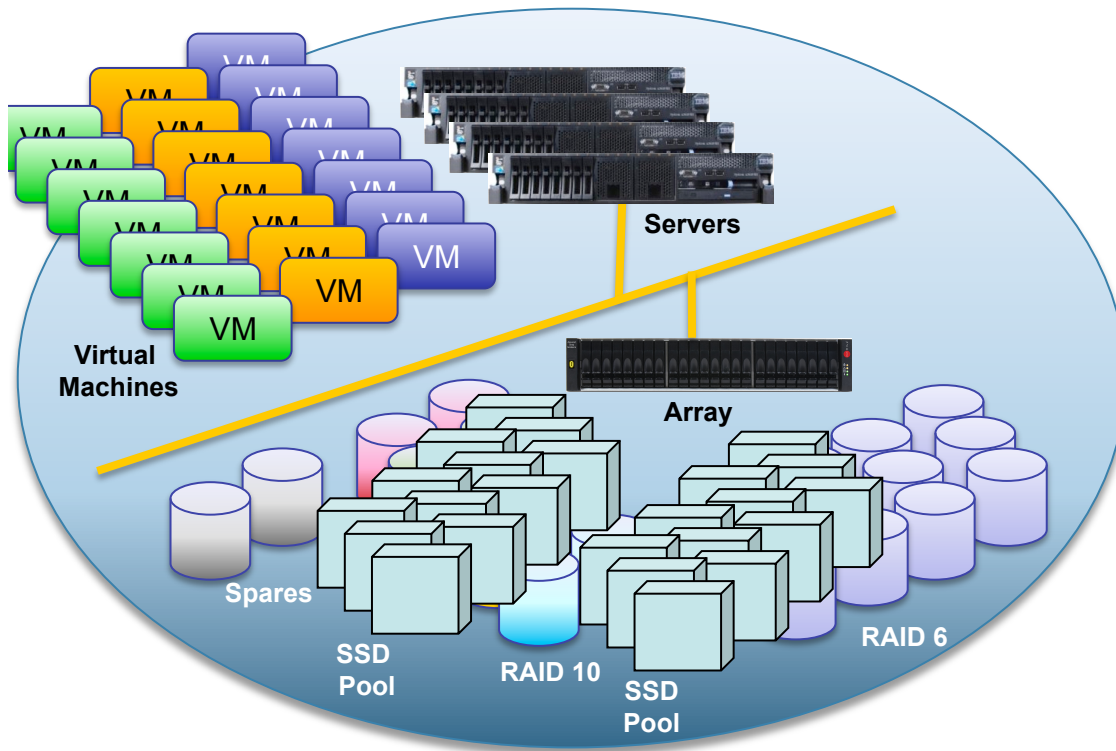


Selected Segment Growth Rate		Total Market CAGR 0.3%
▼	All HDD array CAGR -11.2%	
▲	Hybrid flash array CAGR 1.9%	
▲	All-flash array CAGR 21.4%	

- HDDs continue to play a critical role in this market
- High growth in AFAs will continue
- Current AFA Market-Leading products are sold between \$100K and \$500K



# AFA Architecture Benefits for SMEs



IOPS are becoming a concern:

- 2K to 5K IOPS per array
- Difficult Provisioning
- Applications slow down at peak times

AFA avoids common issues:

- Simple provisioning
- >100K IOPS per array
- More VMs
- Applications have consistent QoS during peak times



# Seagate AFA Controller Design

- Storage Companion ASIC
  - Enables low-cost CPU subsystem
  - Data path performance optimizations
  - Fast write data protection with super-caps
  - Erasure-coding computations
  - Embedded management processor (ARM)
- RealStor OS Software
  - Proprietary Kernel for high-performance and protected data-path
  - RealStream – optimizes stream ingest
  - Rich data services - thin provisioning, snaps and replication
  - Distributed Erasure Coding
  - Data reduction – dedupe and compression

Seagate is investing in purpose-built AFA controller ASICs and software to deliver high IOPS / low-latency in lower Price Bands



## Summary

- Market dynamics are shifting – creating expansion of flash use-models
- IT budgets continue to be tight
- Server virtualization complements the performance increases in flash-based storage

Stay-tuned for compelling solutions from Seagate Systems...



**Thank you!**