

# The Business Case for VAAI

March 2011

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**Mark Bowker, Senior Analyst, Enterprise Strategy Group**

## The Business Case for VAAI

As virtualization becomes more pervasive across the data center, the tight integration between servers and storage becomes increasingly important -- and VAAI support will be key. This webcast will provide a comprehensive look at VAAI, showing you how its technical benefits can translate into business advantages within your organization.

By attending this webcast, you'll:

- Learn how VAAI can help you optimize and simplify your vSphere environments.
- See how VAAI technical benefits can translate into tangible business benefits.
- Discover how VAAI-supported storage systems can enable datacenter transformation.

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- Objectives and Overview
  - What Is Integration?
  - What Are the Key Features of VAAI and the Benefits?
- VAAI: More than the Just a Checkbox
  - VAAI – Why This Matters?
- Hitachi Support for VAAI: Solutions Overview
  - The Power of Server and Storage Virtualization
- Summary and Resources
- Q & A

## Overview

As virtualization becomes more pervasive across the datacenter and organizations look to virtualize more mission-critical applications, the tight integration between servers and storage will be **requisite**.

This webcast provides a comprehensive look at the important role VAAI will play in datacenters – as both an enabler of virtualization and a foundation for cloud environments.

## Learning Objectives

1. Understand the key role VAAI will play in VMware environments today to optimize and simplify these environments as the critical role it will play in supporting large-scale virtualized production environments.
2. Understand the key technical benefits of VAAI and how they can translate into tangible business benefits.
3. Learn how VAAI-supported storage systems can enable datacenter transformation.

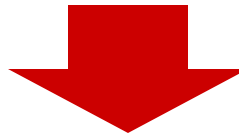
## Definitions:

“Integration is the ‘cooperation’ between VMware vSphere OS and application services and infrastructure systems in sharing the workload that is required for datacenter transformation.”

“VAAI is all about the integration between ESX hosts and storage, which allows for critical processing to be done at the storage level. It also provides customers with access to key storage functionality.”

## IT Benefits

- Improved VM performance
- Improved cloning and vMotion
- Faster provisioning of VMs and increased VM density
- Improved storage utilization and storage performance



## Business Benefits

- Lower storage infrastructure costs per VM
  - Improved business productivity
  - Lower OPEX and CAPEX costs

The **Customer Benefit** depends on the **scalability** and **performance** of the storage environment, and **storage virtualization** support is key.

## CAPEX benefits

- More VMs on fewer arrays
- Extend VAAI benefits to older non-VAAI-enabled storage arrays
- Consolidate VMs to a single SAN using storage virtualization
- Reclaim/repurpose disk capacity/storage systems

## OPEX benefits

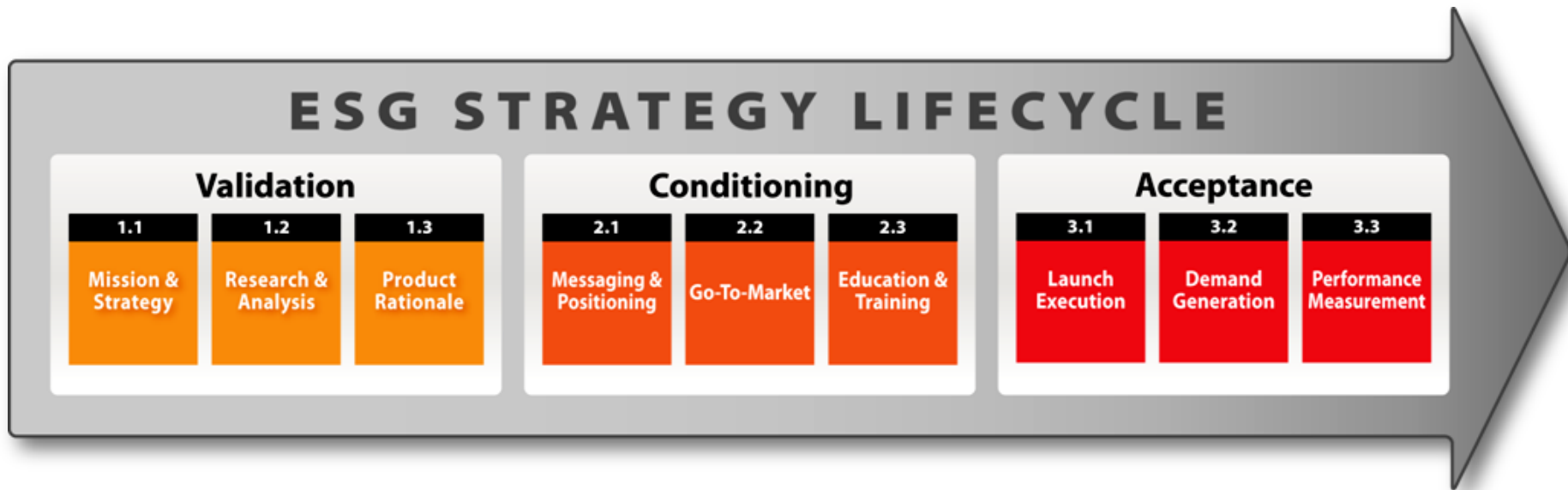
- Simplify and speed up VM provisioning (e.g., in VDI and large environments)
  - Provisioning to one SAN (via storage virtualization) is easier
  - No need to “survey” multiple arrays to find available disk space
  - Hardware thin provisioning of VMs
- Perform more cost-effective migrations for future platform refreshes
  - Storage virtualization is more cost-effective than storage vMotions
- Simplify ongoing performance optimization
  - Move volumes within the array (external to internal, SATA to SAS/flash, etc.) vs. doing the movement using VAAI



# VAAI: More Than an Integration Checkbox

# Introduction

- Mark Bowker, Senior Analyst



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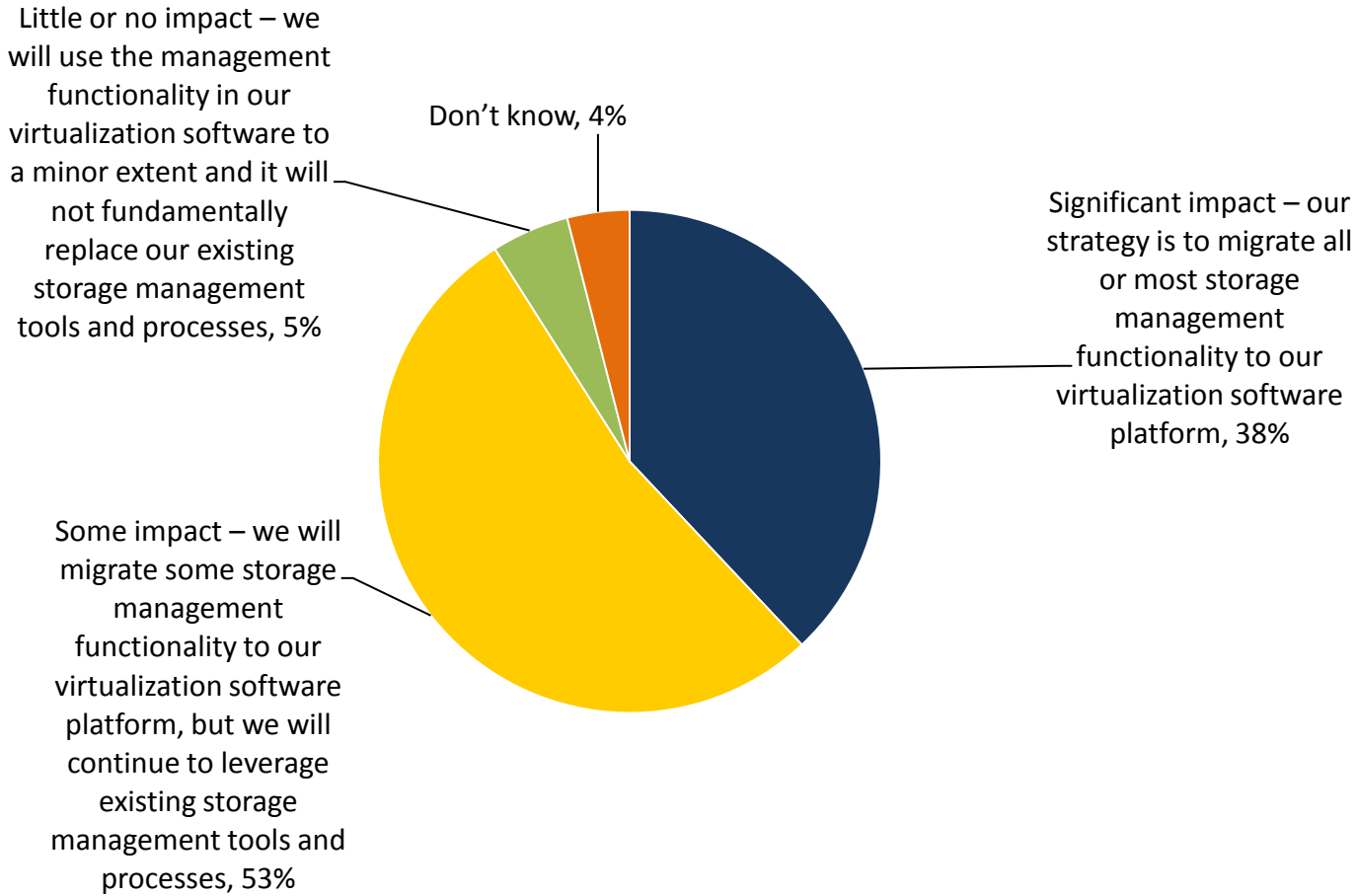
Rochaverá Corporate Towers  
Av. das Nações Unidas, 14.171  
15º Andar  
São Paulo - SP - 04794-000 - Brasil

# Agenda

- Business Drivers for VAAI
- Server Virtualization Market Analysis
- VAAI – Why This Matters
- Summary

# How Virtualization Is Impacting Storage Management Processes/Tools

**Which of the following best describes how virtualization technology is impacting your organization's storage management processes and tools?  
(Percent of respondents, N=190)**



## Write Same/Zero (Block Zeroing)

Eliminates redundant and repetitive write commands, which means less I/O for common tasks.

Benefit: Speeds provisioning of new VMs; key to supporting large-scale VMware or VDI deployments

## Full Copy (Xcopy)

Leverages storage array's ability to mass copy, snapshot and move blocks via SCSI commands.

Benefit: Speeds up cloning and storage vMotion; allows for faster copies of VMs

## Hardware-Assisted Locking

Stop locking LUNs; start locking blocks only.  
Offloads SCSI commands to storage array.

Benefit: Removes SCSI Reservation conflicts; enables faster locking; improves VM density performance

# VAAI – VMware APIs for Array Integration

## Offloads I/O Intensive Operations

- Technology improvement:
  - Simplify and speed storage provisioning
  - Create tighter integration
  - Increase agility
  - Improve performance
- Business value
  - Reduced CAPEX & OPEX
  - Ensure maximum value of your VMware environments
  - Lower infrastructure cost per VM
  - Deliver reliable IT services

Hitachi Extends VSP feature plus VAAI  
benefits to heterogeneous storage arrays

# Shifting Processing to the Storage Architecture

- Releases servers back to what they were designed for
  - Improved optimization, efficiency and ROI
  - Higher density
- Automating functions releases administrators
  - Maintain business-focused tasks
- Improved IT process
  - VAAI can help change management paradigm
- VAAI reduces risk by moving tasks that were performed manually
  - Susceptible to human error
  - Automated management

# State of Virtualization

Server virtualization is becoming ubiquitous

- However, market immaturity reflected by 58% of organizations having virtualized less than 1/3 of servers.

IT-owned workloads dominate

- 59% have not virtualized any mission critical applications.
- 58% less than 30% “virtualized”

Users are reaping benefits

- Reduced capital and operations costs, reduced floor space, improved provisioning time, etc.

There will be significant market maturity in the next 24 months

- Lots of expected growth, hurdles still to overcome.

# Accelerating Success

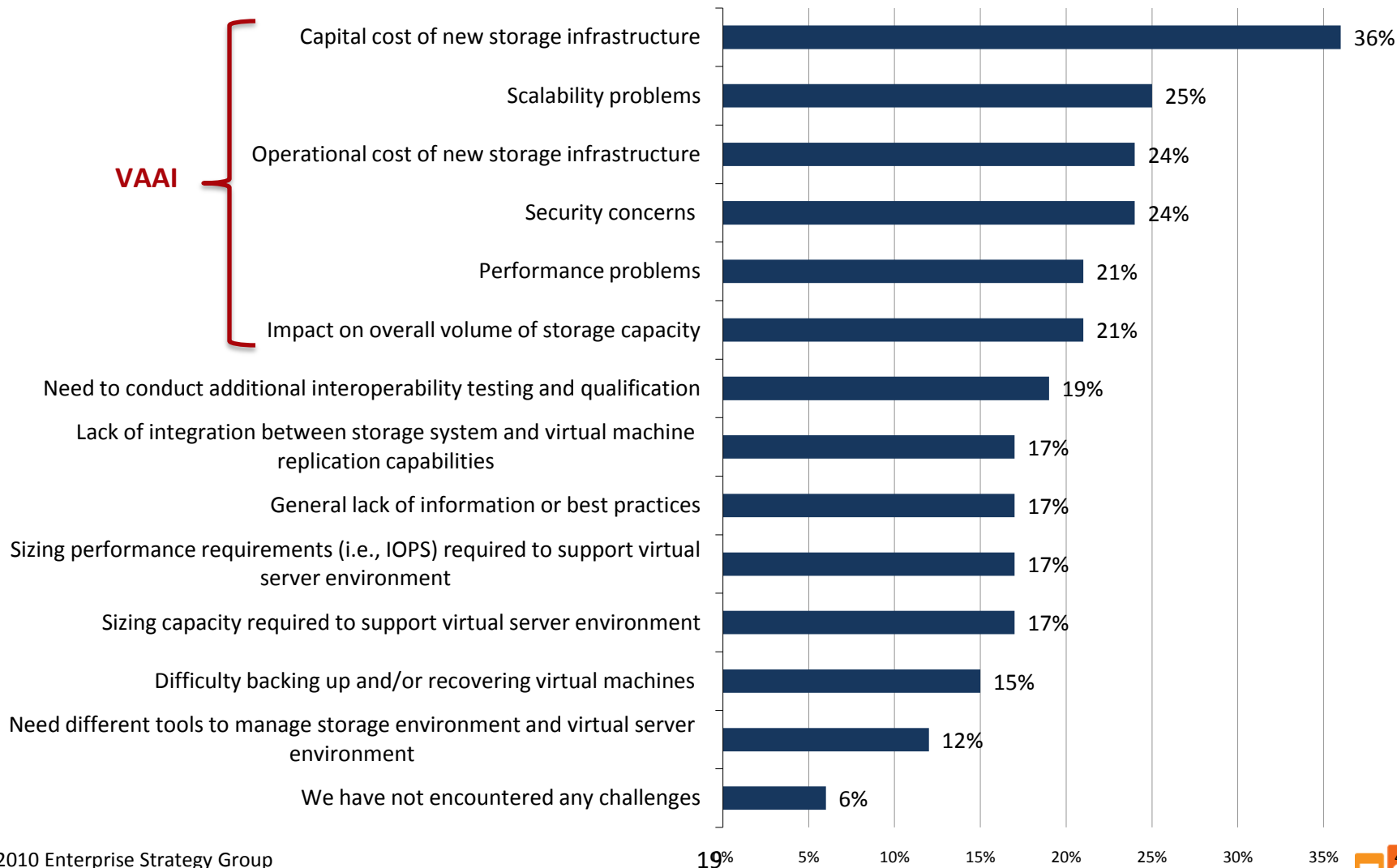
- Performance tops the factors preventing expansion
- Clear signs that customers plan to massively grow virtualization deployments over next 2 years
  - 48% expect to have more than 40% of servers virtualized
  - Want to leverage it in mission critical, production workloads
- Purse strings loosening in 2011, particularly for leading-edge consumers
  - Still, efficiency is key
  - Customers look more for business process improvement and ROI
- Virtualization remains key spending priority – the top one!
- Storage optimization key to expanding server virtualization
  - Two key factors: VAAI and Enterprise-class storage



# VAAI – Why This Matters

# Storage-Specific Challenges Related to Server Virtualization Environment

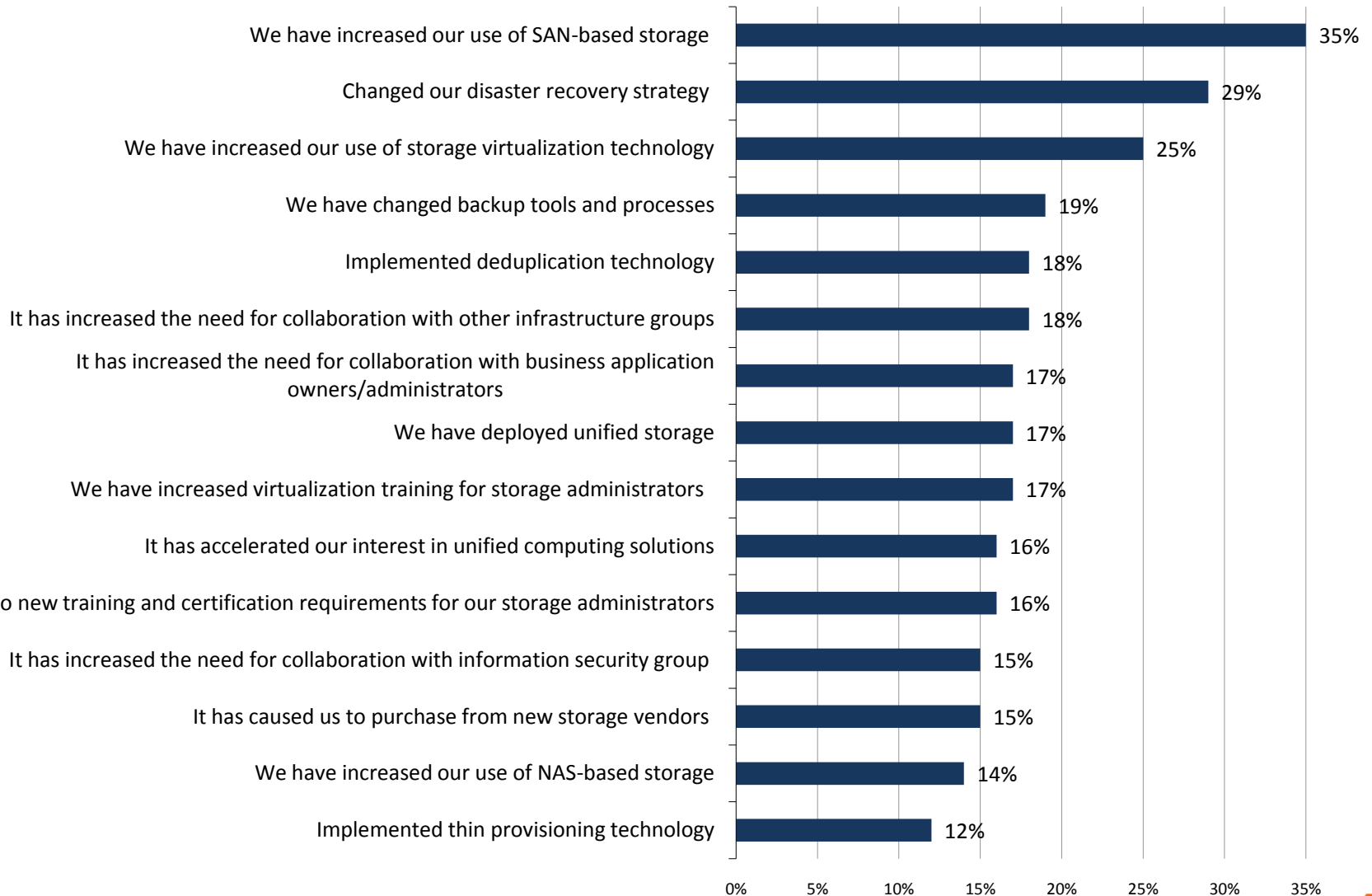
From a storage infrastructure perspective, which of the following would you consider to be significant challenges related to your organization's server virtualization usage? (Percent of respondents, N=190, multiple responses accepted)



# Impact of Server Virtualization on Storage Infrastructure/Processes

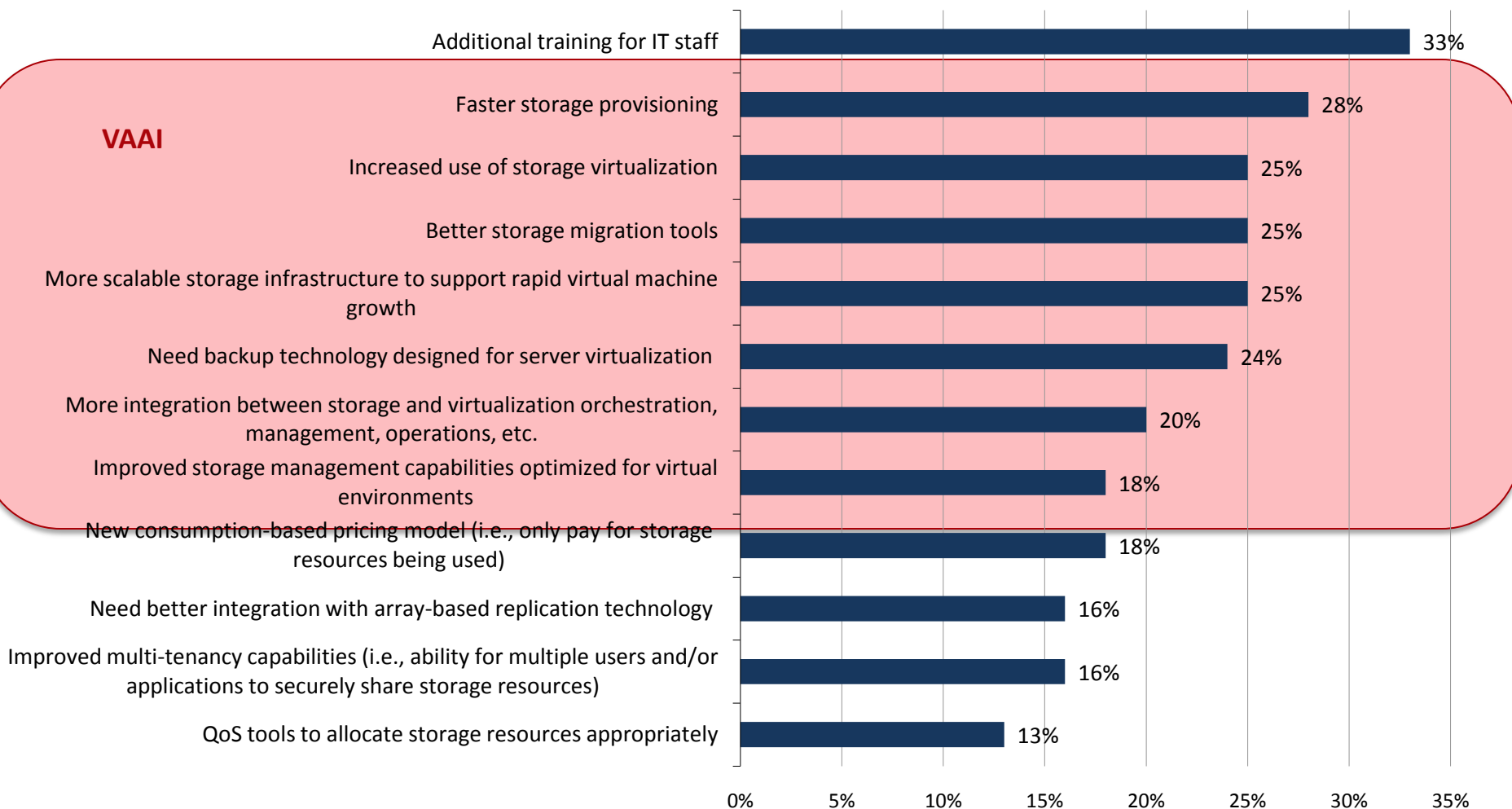
How has the use of server virtualization technology impacted your organization's storage infrastructure and/or processes? (Percent of respondents, N=190, multiple responses accepted)

VAAI



# Storage-Specific Factors That Would Enable More Widespread Usage of Server Virtualization

From a storage infrastructure perspective, which of the following developments need to take place in order to enable more widespread server virtualization usage? (Percent of respondents, N=190, multiple responses accepted)



# VAAI – Solving some of the top virtualization challenges

# Scaling

- Challenge
  - Mobility, redistributing workloads and dynamic load balancing
  - Resource contentions – LUN locking
- VAAI
  - Offloads lock management from the host to the storage array
- Why this matters?
  - Increases I/O performance and scalability
  - Free up server resources
  - Improved VM density
  - Streamlined change management

# Provisioning

- Challenge
  - Stalled common tasks such as storage vMotion, cloning, and VM creation from templates
  - Migrating a 100 GB VM can take 1/2 hour to 2 1/2 hours
- VAAI
  - Full copy API leverages native array copy capability
- Why this matters?
  - Dramatically reducing the load on:
    - Server – ESX host
    - Storage array
    - Network
  - Improved business productivity

# Hitachi Dynamic Provisioning

## Why This Matters

ESG has found that performance, scalability, complexity, and cost were consistently among the top storage challenges reported by IT professionals and managers.[4] A major challenge with both direct attached storage and midrange storage systems in Exchange environments has been the administrative effort required to manage scalability and performance. With traditional midrange storage systems, administrators must carefully map servers to resources to avoid bottlenecks and balance the load evenly. With DAS, administrators are limited by the number of drives that can be attached to a single server, which can be a very inefficient use of powerful server resources.

With architectural enhancements, enterprise class Wide Striping, and load balancing technology, ESG Lab has verified that the Hitachi Adaptable Modular Storage 2000 family can cost-effectively provide easy-to-configure storage for mission-critical applications with excellent performance. ESG Lab validated that the Adaptable Modular Storage 2000 family was able to stripe data across a large number of disk drives while efficiently allocating capacity using HDP. This improved performance significantly while reducing administrative effort. In combination with active-active load balancing, HDP significantly reduced performance management tasks.

ESG Lab Review: Hitachi Adaptable Modular Storage with Microsoft Exchange Server 2010, January 2011

<http://www.enterprisestrategygroup.com/2011/01/esg-lab-review-hitachi-adaptable-modular-storage-with-microsoft-exchange-server-2010/>

# Business benefits of scale-up vs. scale-out

- Customers try to scale by adding more and bigger servers
  - Target new applications without risking performance degradation
  - Improve density and increase scale of deployments
- VAAI-enabled arrays offload tasks from hosts to storage
  - Results in servers function effectively
  - Leverage existing investments
  - Assign tasks to most efficient processing

- System features matter – VAAI is not just a checkbox
  - Symmetric controller architecture
  - Pre-fetch algorithms
  - Hitachi Dynamic Provisioning
  - Hitachi Dynamic Tiering
- Hitachi Adaptable Modular Storage (AMS)
- Hitachi Virtual Storage Platform (VSP)
  - Full VMware VAAI support for heterogeneous storage
  - VAAI benefits without having to migrate storage platforms
  - Immediate opportunity to reclaim / repurpose disk, storage arrays
  - Consolidation

Consistent utilization across servers, network, and storage

# Designing for success

- Architecture, design and proven history
  - Excellent for database workloads also let these arrays make the most of VAAI functionality
  - Enables higher data center efficiency
- More spindles
  - Simplify storage VMotion, load balancing and provisioning
  - Confidently migrate next tier of applications
- Retain a single point of management
  - Organizational alignment
- Already invested?
  - Cost-effective solution, leverage its full capabilities and scale virtualization deployments

**Availability, performance and reliability**

# Summary

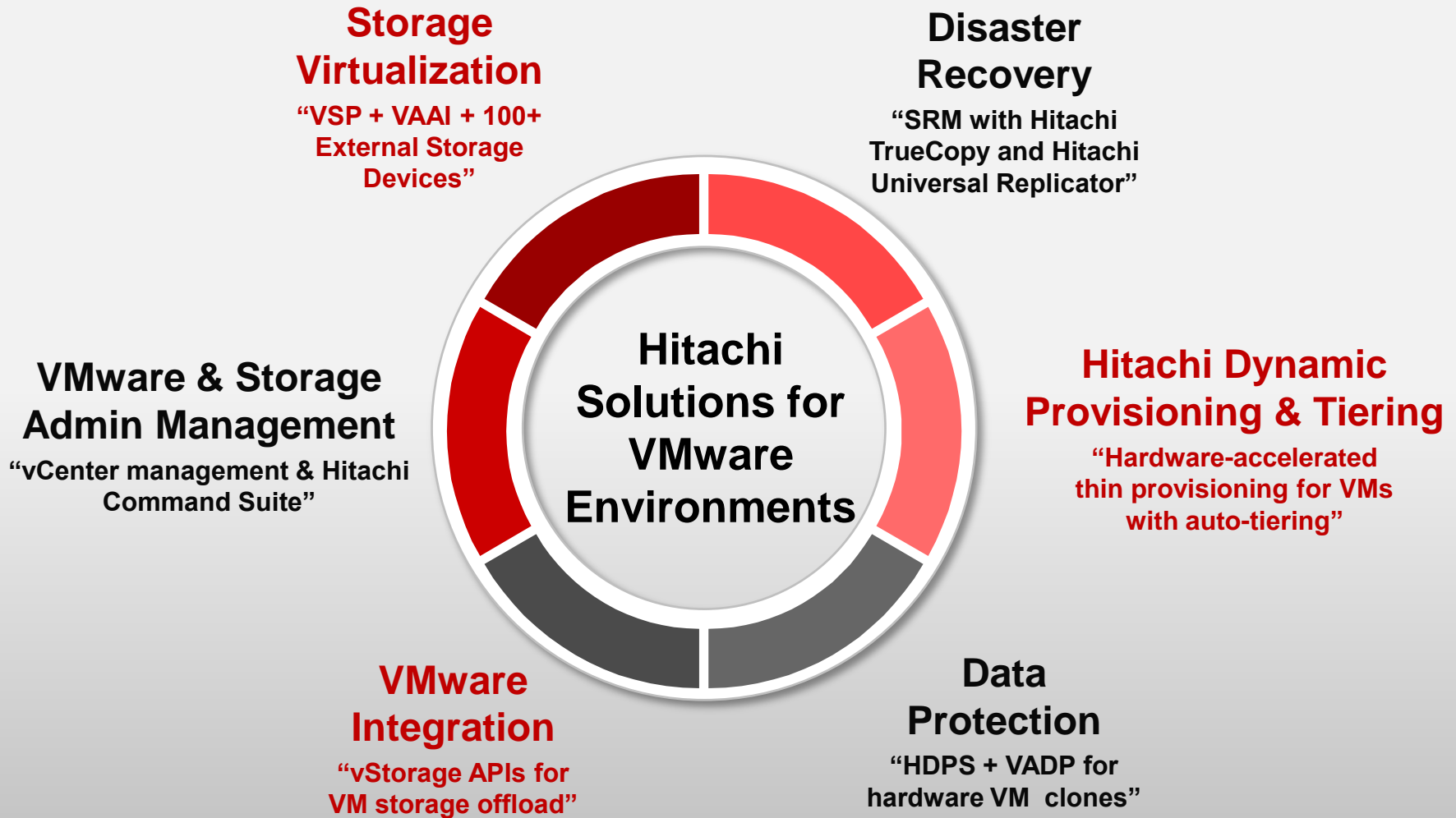
- VAAI increases operational benefit of VMware
  - Simplifies tasks
  - Returns server to function it was designed for
  - Leverages array intelligence and processing power
  - Reduces risk
- VAAI plus AMS & VSP enterprise-class architecture
  - Accelerates virtualization deployments
  - Leads to service catalog approach
  - Enables cloud computing/IT-as-a-service
  - Makes capacity planning easier, enables extensive VM scaling, on boards mission critical applications
  - Returns better consolidation and ROI

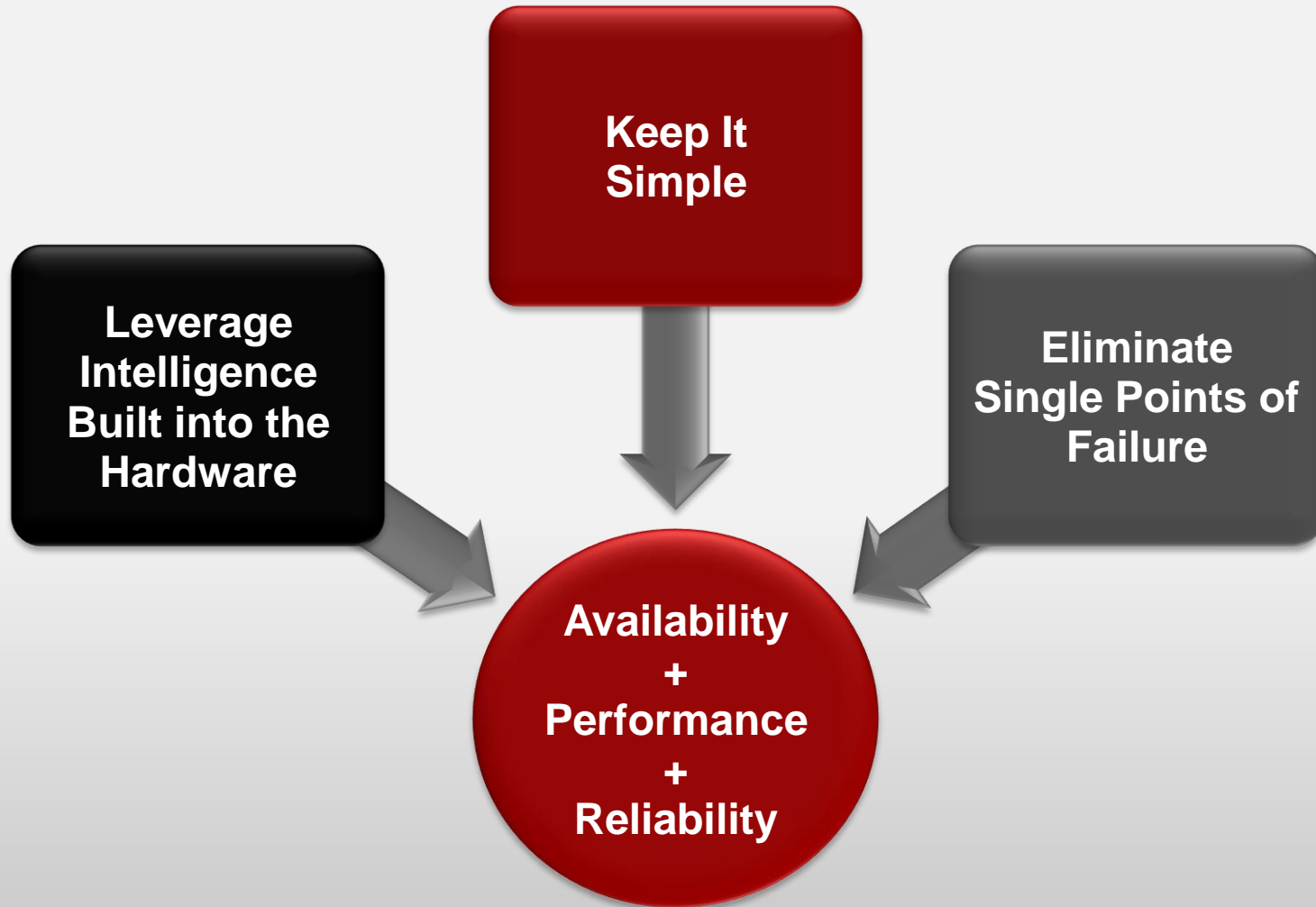
Think optimization to help accelerate and scale virtualization investments and business value



# Hitachi Support for VAAI Solutions Overview

## “The Infrastructure to Virtualize all Data Center Applications”



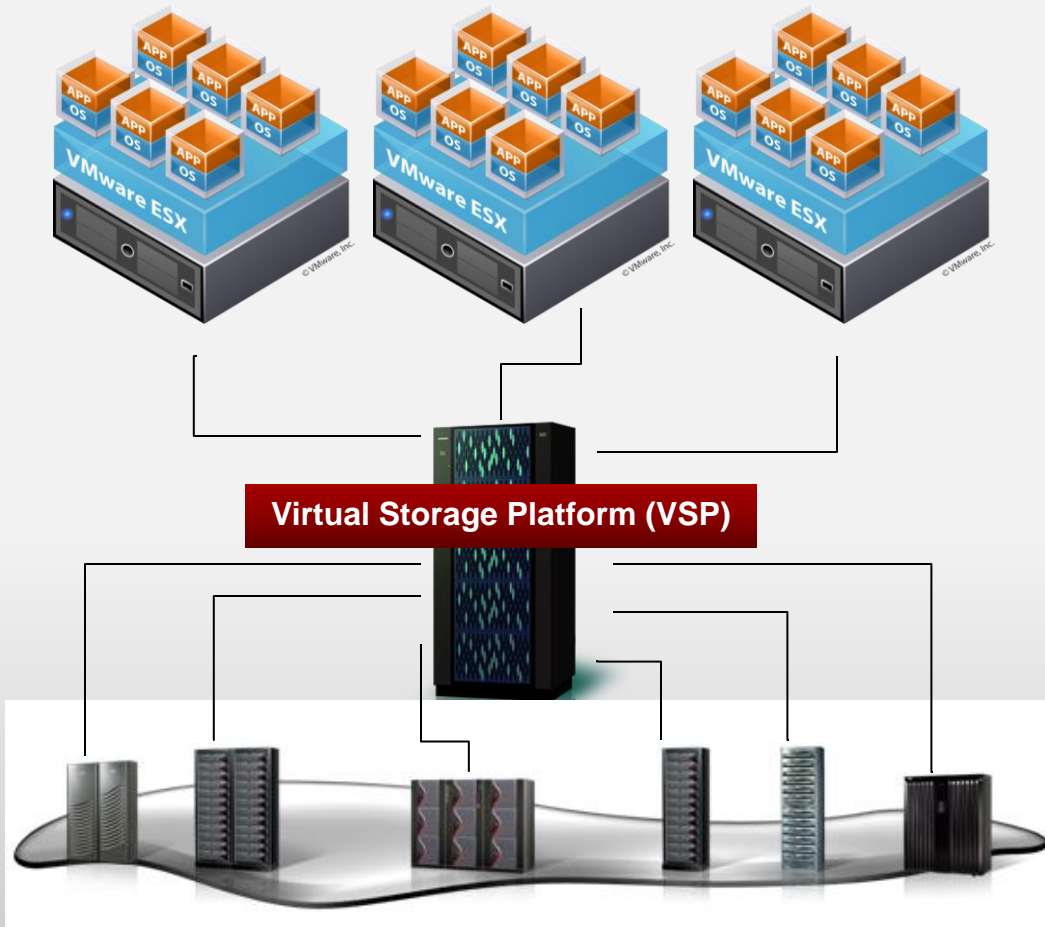


**“Tier-One applications require an *enterprise* storage capability.”**

- Hitachi Adaptable Modular Series 2000
  - Announced at VMware launch in July 2009
  - Hitachi Value-Add
    - Hitachi Symmetric Active-Active Load Balancing Controllers
    - Hitachi Dynamic Provisioning
- Hitachi Virtual Storage Platform
  - Announced Feb 2010
    - Includes support for Hitachi storage arrays plus 100+ arrays listed on the VSP storage virtualization matrix
  - Hitachi Value-Add
    - Load-balanced/SVD
    - Hitachi Dynamic Provisioning
    - Hitachi Dynamic Tiering
    - 3D scaling architecture



The Power of Server and Storage Virtualization...



- **VAAI Inheritance**
- Approximately 100+ arrays certified for SVD back-end connectivity.
- More than 20,000 Hitachi storage systems shipped with virtualization enabled.

Storage virtualization just got a lot more relevant.  
**Discover the Hitachi difference.**

## Overview:

- Hitachi system-based storage virtualization enables servers and storage to be managed as a single shared resource, or common pool.

## What It Does:

- Reduces the number of “touch points” – one management software, one replication software, etc.
- Enables existing external heterogeneous storage to be leveraged for ESX clustering

## Why This Matters:

- Improves scale and efficiency at the storage and server level
- Investment protection, simplicity and improved ROI
  - No “ripping and replacing” to take advantage of VAAI
  - No painful migrations due to our storage virtualization approach
  - High performance and flexibility for existing VMware storage environments and proven reliability for running critical business apps

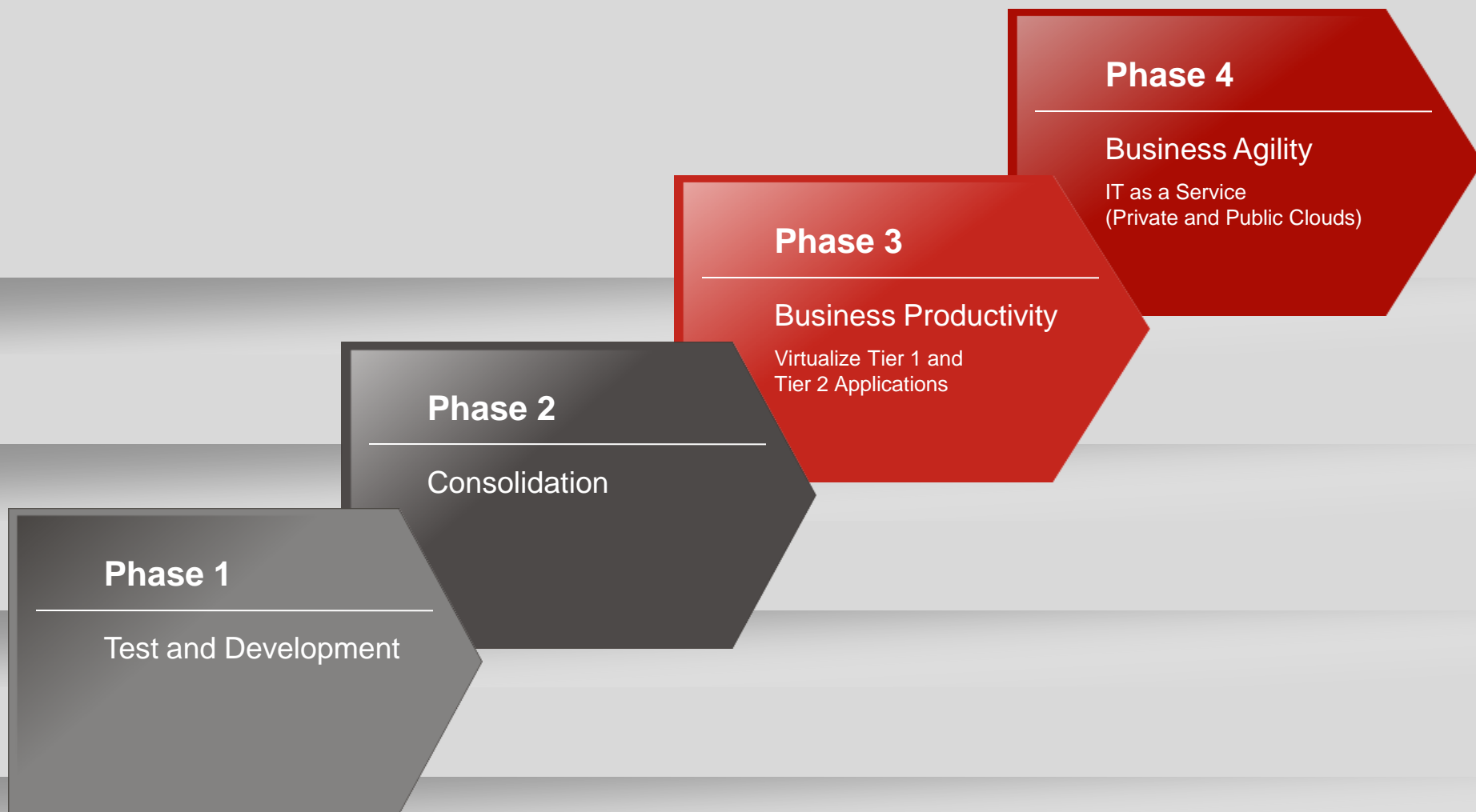
- Investment protection, simplicity and improved ROI
  - No “ripping and replacing” to take advantage of VAAI
  - No painful migrations due to our storage virtualization approach
  - Just raw performance and flexibility *for existing VMware storage environment*
- Lower OPEX and CAPEX costs
  - Achieve the highest performance and VM density for virtualized applications in production environments
  - Automate and consolidate tiered storage assets while ensuring the highest levels of reliability, performance and availability
  - Simplify management, DR and backups to one solution

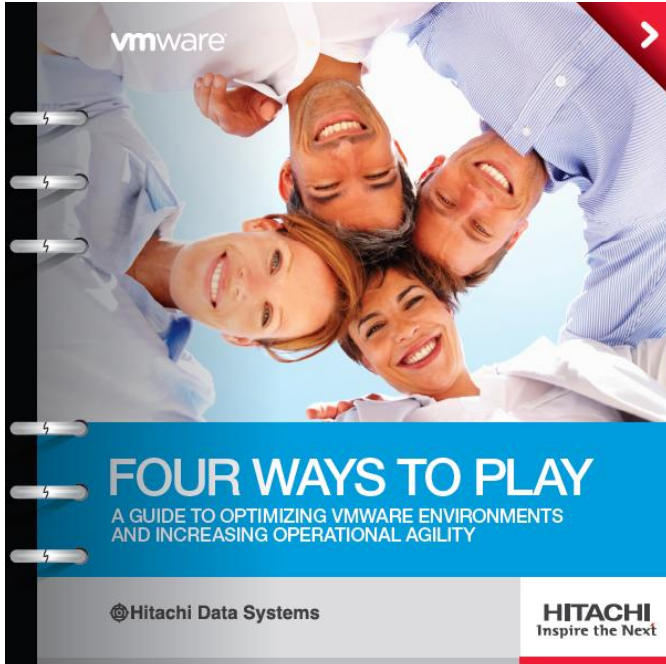


# Summary and Resources To Help You Dig Deeper

- What's really happening as the maturity of server virtualization increases?
  - VMware infrastructure is no longer a “box dropping” for storage vendors
  - VMware now needs enterprise-class storage with integration
    - vStorage APIs eliminate previous limitations with VMFS and Block Storage
    - NFS is now no longer suitable for large VMware environments
  - Organizations require 100% guarantee for NO DOWNTIME
    - Tier-one and tier-two applications demand it!
    - Storage feature set, track-record become increasingly important
  - Organizations need to address the increasingly complex setups that have grown over the years:
    - Many datastores on different RAID groups and arrays
    - Clones & backup issues
    - Single points of failure for ESX hosts running large amounts of VMs
    - Inability to vMotion VMs around in this infrastructure
    - Lack of, or limited, disaster recovery

It's time to **re-think** the **role of storage and storage virtualization** in enabling datacenter transformation.





## Also, check out the following:

On-Demand Hitachi WebTechs at  
<https://hdschannel.webex.com>:

- [Enabling the Virtual Data Center](#)
- [How to Optimize Storage Environments for vSphere 4.1](#)
- The Six Points of Integration (that Matter) – **coming in March**

➤ <http://www.hds.com/go/eguide>

	<b>Portfolio Delivered</b>
<b>Adapters</b>	<p><b>Adapters on <a href="http://www.vmware.com">www.vmware.com</a></b> Hitachi Storage Replication Adapter (SRA) for VMware vCenter Site Recovery Manager (SRA) Hitachi NAS Storage Replication Adapter for VMware vCenter Site Recovery Manager (Initial Release)</p>
<b>Prescriptive</b>	<p><b>Best Practices:</b> <a href="#">Optimizing the Hitachi Virtual Storage Platform in vSphere Environments</a> <a href="#">Optimizing the Hitachi Universal Storage Platform® Family in VMware Environments Best Practices Guide</a> <b>NEW</b> <a href="#">Optimizing the Hitachi Adaptable Modular Storage 2000 Family in vSphere 4 Environments</a> <a href="#">Advantages of Using VMware VAAI with the Hitachi Adaptable Modular Storage 2000 Family Lab Validation Report</a> <a href="#">Managing Tiers of Hitachi Storage in vSphere Environments(ZIP, 5.69MB)</a> <a href="#">Using VMware vSphere 4 with Hitachi Dynamic Provisioning Software on the Hitachi Adaptable Modular Storage 2000 Family</a> <a href="#">Advantages of Hitachi Adaptable Modular Storage 2000 Family Symmetric Active-active Controllers in vSphere 4 Environments</a> <a href="#">Planning for Microsoft® Exchange Server 2007 Deployments on the Hitachi Adaptable Modular Storage 2000 Family</a> <a href="#">Virtualizing Microsoft® Office SharePoint® Server 2007 with VMware vSphere 4 on the Hitachi Adaptable Modular Storage 2000 Family Reference Architecture Guide</a> <a href="#">Virtualizing Microsoft® Office SharePoint® Server 2007 with VMware vSphere 4 on the Hitachi Adaptable Modular Storage 2000 Family Implementation Guide</a></p> <p><b>White Papers:</b> <a href="#">Top 5 Business Reasons Organizations use Hitachi Modular Storage in Virtualized Server Environments</a> <a href="#">Top 5 Business Reasons to use Hitachi Enterprise Storage in Virtualized Server Environments</a> <a href="#">Deploying the Hitachi NAS Platform in VMware vSphere Environments Using the Hitachi Adaptable Modular Storage 2000 Family</a> <a href="#">Protecting Virtual Machines Using Hitachi Data Protection Suite and Hitachi VSS Hardware Provider</a> <a href="#">Hitachi and Brocade Disaster Recovery Solutions for VMware Environments</a> <a href="#">Optimizing Operational Efficiency and Resiliency in VMware Environments with Hitachi Data Systems Solutions</a></p> <p><b>Technical Resources:</b> <a href="#">VMware Storage Replicator Adapter Implementation Guide for Hitachi NAS</a> <a href="#">VMware vCenter Site Recovery Manager Deployment Guide</a></p>



**Questions or Comments?**

## March

- ***How to Deliver Efficient IT to Remote and Cloud Users***, March 16, 2011 at 9am PT, 12pm ET
- ***The Six Points of VMware Integration***, March 23, 2011 at 9am PT, 12pm ET
- ***Snapshot-based Backup and Data Protection***, March 30, 2011 at 9am PT, 12pm ET

Please check [www.hds.com/webtech](http://www.hds.com/webtech) for:

- Link to the recording, the presentation and Q&A (available next week)
- Schedule and registration for upcoming WebTech sessions

Thank you!