Abacus Virtualization Proposal

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Abacus Inc.

Abacus Inc. is a major American multinational retailer with headquarters in Dallas, Texas that specializes in selling clothing, home products and food products. Abacus Inc. was founded in 2001 by Adam Zampa and Nathan Coulter-Nile in Kingsville. Initially, Abacus Inc. started with a small number of employees but has expanded considerably over the decade and grown from 23 employees in 2001 to over 1700 employees in 2015 and more than 2000 at the start of 2019. Abacus Inc. currently has 120 stores across the United States including 615 that only sell food products.

Abacus Inc.
UK'S #1 ONLINE RETAILER

Type : Public Company	**Number of locations :** 40
Industry : Retail	**Number of Employees :** 2000-2200
Founded : 2001	**Key people :** Alan Tan(CIO)
Headquarters : Dallas	

[1] https://www.wix.com/createlogo6/logo-maker?utm_source=google&utm_medium=cpc&utm_campaign=1633733508%5E59733545462&experiment_id=company%20logo%20maker%5Ee%5E31295 987 6074%5E&gclid=CjwKCAjw2uf2BRBpEiwA31VZj_AsNSB9gHUjsUFBaemSCBCzkMQ-3_I-zHt2Zu7f0NzYPaPGraJ0rhoCgu4QAvD_BwE

Abacus Inc. IT infrastructure (HP 9000 rp7400)

Overview of Abacus's current on-premise hardware, software and network IT infrastructure

Processor	PA-RISC 8700 processors, 750MHz cpu with 2.25MB integrated cache
Memory	Memory carrier - Has eight DIMM slots - N4000 memory carrier - Plugs into the system processor board
Internal disk drives	73GB 'hot plug' Ultra160 SCA LVD SCSI hard drive - 10000 RPM, low profile
PC I/O Cards	PCI-X Dual Channel 2Gb Fibre Channel HBA
Power supplies - UPS	PowerTrust II-MR Uninterruptible Power Supply - 4.5KVA, 4000 watt, 240VAC
Serial multiplexer products	64 port multiplexer card
Interface adapters	10Base-T/100Base-TX PCI LAN adapter - Has AUI, BNC, and RJ-45 connectors
Wide Area Network (WAN) Adapters	4 port X.25/frame relay adapter card

[1] https://www.openpa.net/systems/hp_n4000-rp7400.html

Practical Applications In The Retail Environment

An organization that has, for example, determined that introducing digital signage will improve customer satisfaction and speed up a company's ability to change and roll out new offerings, then this particular task will either become very easy or quite complicated, depending on the technical infrastructure. If an organization's setup has yet to go virtual, its IT managers must not only install the new digital signs, but also buy and install new computers and servers to run them.

Hence, virtualization can be a game-changer for retail environments. For those companies that have deployed virtual solutions

For large home improvement retailers and supermarket chains, creating a virtual storage structure allows the merchant to provide more efficient and reliable services for customers and streamline processes for staff, among other things.

[1] https://retailtouchpoints.com/features/executive-viewpoints/store-age-virtualization-how-retailers-can-gain-an-edge-with-it-operations

IT Challenges Facing Retail Industry

The challenges plaguing IT managers of retail stores range from limited or no IT staff on-site to lack of budget allocation. Retailers have a need to introduce the latest technologies into their company infrastructure in order to stay competitive — such as POS systems collecting customer data, digital signage, and in-store ordering systems to reduce customer wait times.

To fully utilize the valuable insights that information from these systems can provide, the data must be processed and analyzed locally. Cloud storage options offer many benefits for users, but for those organizations requiring real-time data processing, cloud storage and corporate data centers typically have become too slow, costly and tedious to administer.

Compounding these challenges is the fact that consequences such as downtime or lost information is a serious issue for retail environments. Any glitch or system failure results in lost sales and the possibility of lost customers, as consumers are no longer willing to put their faith in a store that is unprepared and wastes their time.

[1] https://etaileast.wbresearch.com/blog/five-key-challenges-for-retailers-how-to-solve-them

Problem Statement

Abacus Inc. looked at increasing capacity on existing systems through to complete reform of the data storage infrastructure. With long-term business simplification in mind,
Abacus Inc. wanted to reduce complexity, increase total capacity and performance, and cut both device acquisition costs and operational costs.

For standardization of virtual machines all our company we have narrowed down our choices to two leading Virtualization software VMware vSphere & Microsoft Hyper-V. Further by analyzing the features, cost structure and the security measurements of both we can decide the best-fit for our company according to the current infrastructure.

Key Requirements

- Virtualization solution should be selected depending upon our key requirements for getting the best business solution

Reduce Cost: CapEx, OpEx

Data center virtualization: Consolidation, Agility
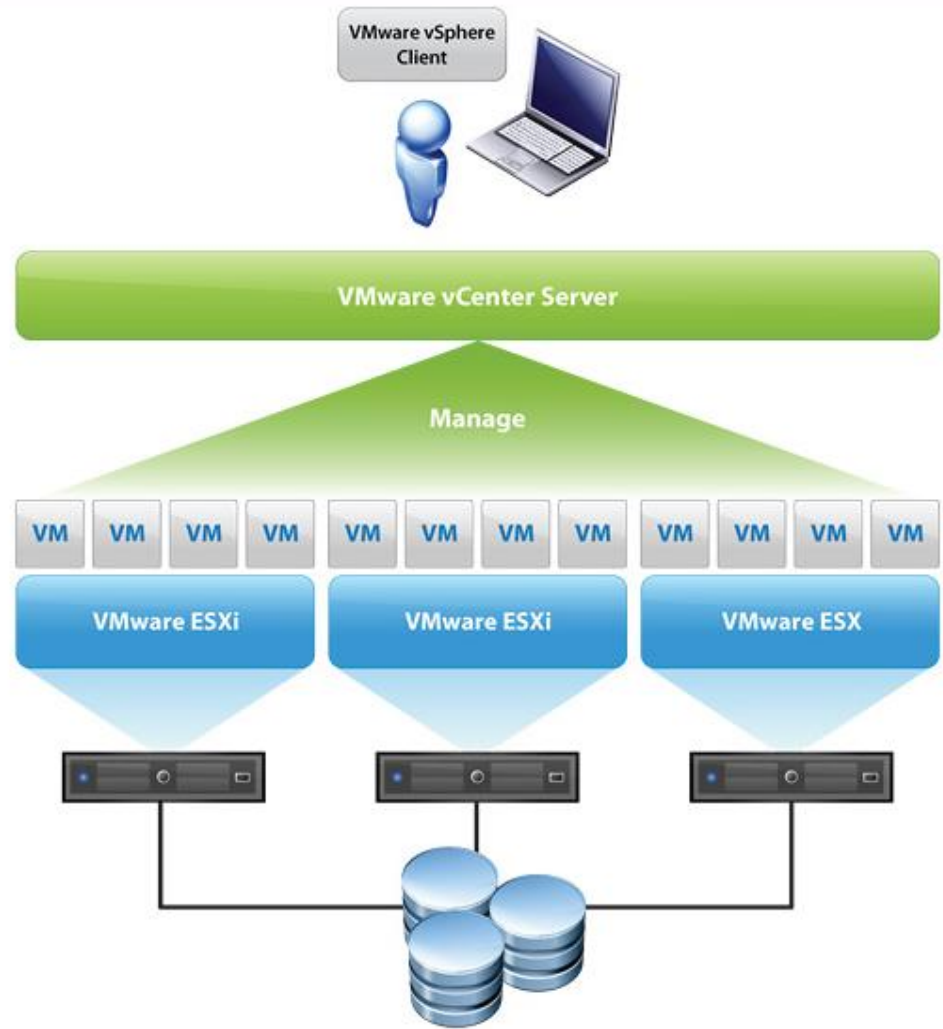
Flexibility : Easy to Configure, Less Maintenace
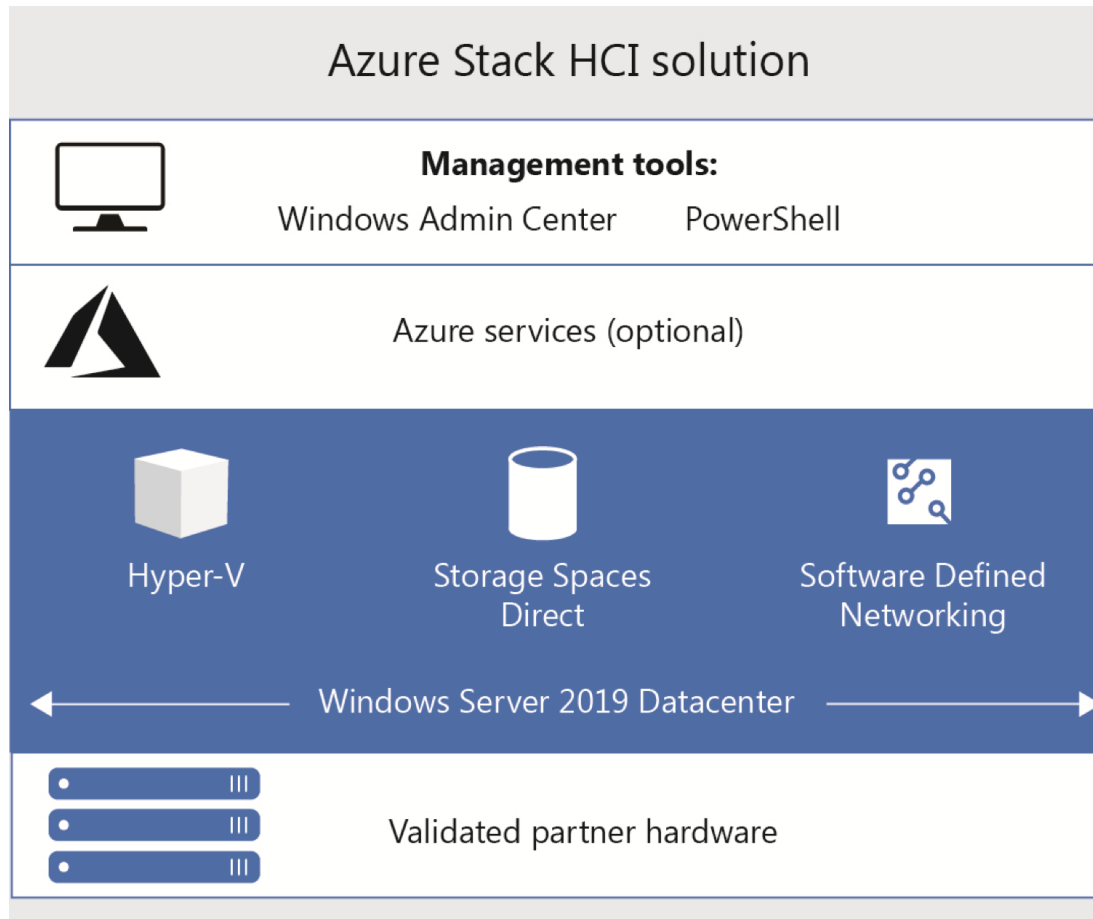
Security: Data Recovery, Data Backup

Comparison between VMware vSphere 6.7 & Microsoft Hyper-V 2019

Landscape for VMware vSphere

[1] https://docs.vmware.com/en/VMware-vSphere/index.html

Landscape for Azure Stack HCI

Azure Stack HCI solution

Management tools:
Windows Admin Center · PowerShell

Azure services (optional)

Hyper-V · Storage Spaces Direct · Software Defined Networking

Windows Server 2019 Datacenter

Validated partner hardware

[1] https://azure.microsoft.com/mediahandler/files/resourcefiles/azure-stack-hci-use-cases-and-scenarios/MSFT-AzureStackHCIBoM-UseCases-WP-Final.pdf

Feature Comparison

System	Resource	Microsoft Hyper-V 2019	VMware vSphere 6.7		
			Free Hypervisor	Essential Plus	Enterprise Plus
Host	Logical Processors	512	768	768	768
	Physical Memory	24 TB	4 TB?	4 TB?	16 TB
	Virtual CPUs per Host	2048	4096	4096	4096
	VM per Host	1024	1024	1024	1024
	Nested Hypervisor	Yes (only some OSes)	Yes	Yes	Yes
VM	Virtual CPUs per VM	240 for Generation2 64 for Generation1	8	128	128
	Memory per VM	12 TB for Generation2 1 TB for Generation1	6128 GB	6128 GB	6128 GB
	Maximum Virtual Disk	64 TB for VHDX format 2040 GB for VHD format	62 TB	62 TB	62 TB
	Number of disks	256 (SCSI)	256 (SCSI)	256 (SCSI)	256 (SCSI)
Cluster	Maximum Nodes	64	N/A	64	64
	Maximum VMs	8000	N/A	8000	8000

Advantages: VMware vSphere & Microsoft Hyper-V

VMware Advantages

- No operating system is necessary for controlling the management components

- Excellent vendor support

- Available AWS apps

- No security patches necessary for Controlling Layer components

- Out-of-the-box governance feature set

Hyper-V Advantages:

- Minimal device driver management

- New server roles are easy to install

- High resilience to corrupt external code

- Readily scalable services

- A wide range of compatible devices

- Shorter initialization time

- Zero downtime to perform maintenance or apply security updates

[1] https://www.acronis.com/en-us/articles/hyper-v-vs-vmware-vsphere/

Disadvantages: VMware vSphere & Microsoft Hyper-V

VMware Disadvantages

- Incompatibility with hardware that VMware doesn't support

- Steep learning curve

- Trial software missing some functionality

- Complex device drivers will slow the initialization time

- Corrupt external code may slow initialization or hang a server

Hyper-V Disadvantages:

- A crash of the primary OS will crash all VMs

- Frequent OS and security updates translate into more overhead

- OS must be installed in order for the Hypervisor Layer to operate

- Lack of support for service templates

[1] https://www.acronis.com/en-us/articles/hyper-v-vs-vmware-vsphere/

Cost Comparisons (vSphere vs Hyper-V)

	Hyper-V 2019 Datacenter Edition	vSphere-6 Enterprise plus edition
Host	3	3
Per-host cores/CPU	16	16
Maximum Memory per host	24 TB	16TB
Auto deploy	No	Yes
Host profiles	No	Yes
Guest OS Licensing	Yes	No
Fault Tolerance	No	Yes
Price USD	$18,000	$23,000

Customers using vSphere & Hyper-V

- Use-cases of retail companies using vSphere & Hyper-V

Leading Retail Companies using VMware vSphere:
COOP, Amazon, Alfamart

Leading Retail Companies using Microsoft Hyper-V:
Fabletics, Marks & Spencers, Natuzzi

Recommendation: Azure stack HCI

Run workloads from branch office to edge

Supports large-scale virtual desktop implementations

Protection with Azure Site Recovery

Applied trusted Enterprise Virtualization

Windows Admin Center for HCI

[1]_cloudblogs.microsoft.com/windowsserver/2019/06/06/25-reasons-to-choose-azure-stack-hci/

TCO calculation using Azure stack HCI

To get an approximation for our cost structure we performed TCO comparison for 200 VM's with basic hardware integration we require on both VMware & Microsoft Azure .

Results : The 1-year TCO of Azure Stack is $139,003, 20% lower than vSphere Enterprise Plus

Virtual Machines

REGION:	OPERATING SYSTEM:	TYPE:	TIER:
West US	Windows	(OS Only)	Standard

INSTANCE:

D2 v3: 2 Cores(s), 8 GB RAM, 50 GB Temporary storage, $0.1713/hour

VIRTUAL MACHINES

200

Compute (D2 v3)

○ Pay as you go
● 1 year reserved (~62% discount)
○ 3 year reserved (~76% discount)

COMPUTE PAYMENT OPTIONS:

Upfront

$11,583.64
Average per month
($139,003.68 charged upfront)

OS (Windows)

● License included
○ Azure Hybrid Benefit

$13,432.00
Average per month
($0.00 charged upfront)

= $25,015.64
Average per month
($139,003.68 charged upfront)

Azure Stack HCI for Abacus Inc.

- Minimized risk, great security

- Simpler Price module

- Flexibility to Azure cloud

- Board range of hardware partners

- Here, according to our requirements and budget we think migrating to stack would be a better option for us. It will not only solve our current problems but will so make the could migration journey easier in future.

Virtualization Business benefits & Implementation Strategy

Key Challenges for Virtualization:

- Build cost effective and dynamic infrastructure that helps gain deeper insights on resource utilisation
- Effectively manage and optimise the existing IT resources
- Scalable infrastructure to meet long-term IT goals
- Reduce operational and capital costs while bringing in IT efficiency

Expected Business Benefits :

70% reduction in datacentre footprint achieved through physical server consolidation

Realize implementation has enabled the company to manage the virtual resources better and gain insights of resource utilisation to meet scalability requirements of applications

Proactive management of performance, availability and capacity resulting in better agility and infrastructure modernization

Increased productivity through better mobilisation of workforce and reduced desktop management costs
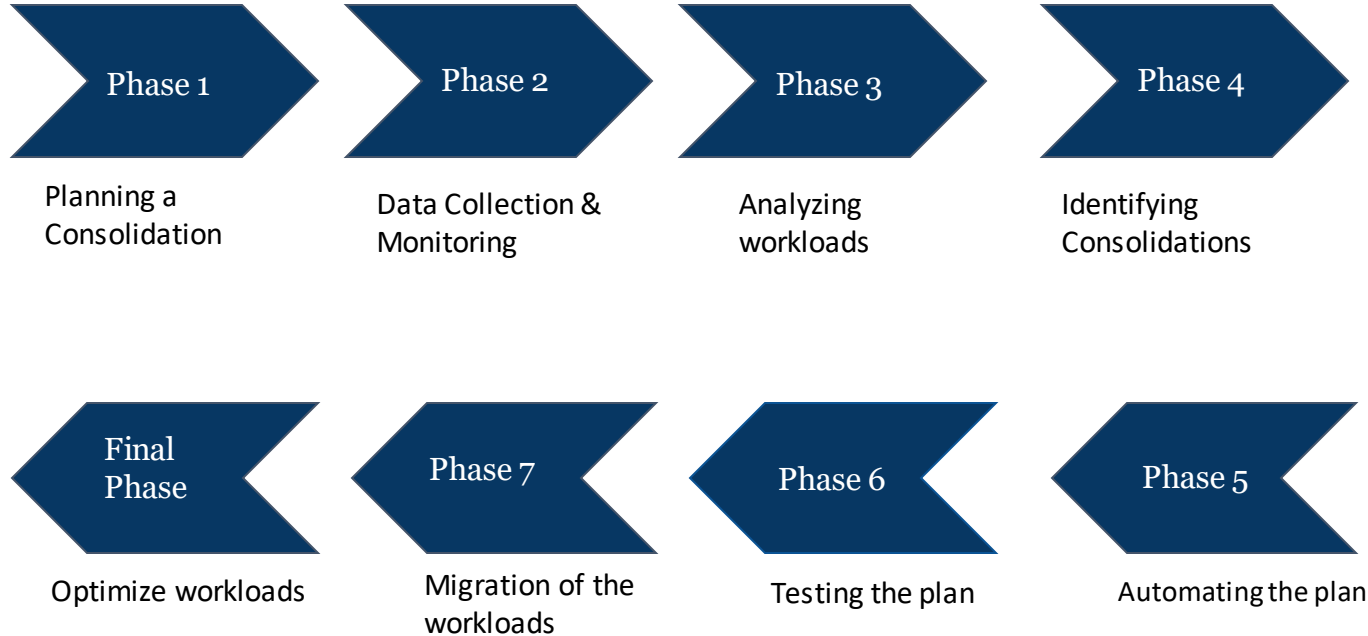
Better resource optimisation through smart provisioning of infrastructure and application resources across development, test, QA and production environments

Operational efficiencies to drive greater resource utilisation, with reduction in Capex by 50% and Opex going down by 30%

Virtualization Implementation Strategy

- There are certain phases that must be achieved for a successful consolidation

Phase 1

Planning a Consolidation

Phase 2

Data Collection & Monitoring

Phase 3

Analyzing workloads

Phase 4

Identifying Consolidations

Final Phase

Optimize workloads

Phase 7

Migration of the workloads

Phase 6

Testing the plan

Phase 5

Automating the plan

Future Plans:
Abacus's Transition to Cloud

Future Plans -The Cloud as Catalyst for Retail

Microsoft Hyper-V was instrumental in supporting Abacus's digital transformation. Leveraging the company's past investments in Azure and Hyper-V helped the firm minimize costs and accelerate migration.

- Data virtualization enables a unified, real-time view of products, inventory availability, color and size options and will allow Abacus Inc. to easily integrate its existing workloads on to Azure.
- Quality control is a challenge for retailers because of the sheer number of pass-offs and locations products make on their way from the manufacturer to the customer's hands.
- By completely moving to a cloud platform based on Azure, Abacus Inc. can streamline platform administration and expand IT capabilities in order to gain full visibility into all necessary background data for prioritizing and fixing quality control issues.

Why Microsoft Azure?

- By replacing on-premises infrastructure with Azure, our company is looking to take advantage of all the new capabilities of the cloud. It's the digital transformation that customers are going through right now that is a key driver of Azure adoption.

Benefit from business agility Azure provides

Take advantage of the new trends around machine learning to better leverage the data

Benefits at the Infrastructure level of just able to scale up and scale down when needed

Microsoft Azure

Microsoft Suite of Retail-Focused Third Party Apps

Neal Analytics SKU assortment optimization, which promises a new way to ensure the right products are on the right shelves in every store.

Flintfox RMx, on the other hand, is all about pricing. Described as a hyper-performing price engine, RMx can provide sub-millisecond response to price changes, helping retailers to tightly control pricing strategy and promotions.

AFS Technologies provides an app to help in-store staff comply with store promotions, improve shelf performance and optimize retail operations.

Azure users can also integrate apps with **Dynamics 365**. These include Scaptify (which connects Dynamics Business Central with Shopify), HR Plus, Stock Management, Maplytics™ and Trial.

Retail Companies Using Microsoft Azure

- Leading Retail Companies that are using Azure are :

- Arca Continental, ASOS, Deschutes Brewery, Pandora, Coca Cola, Asics, Loreal, Kroger, Marks & Spencer and Walmart.

Conclusion

Towards the end, we want to shed light on the some of the reasons that made us choose Microsoft Hyper-V instead of VMware for Abacus Inc.

- With the help of Hyper-V it will be possible to migrate VMs across different virtual subnets

- Ensures that a live migrate VM's location is updated and synchronized among hosts that have ongoing communication with the migrated VM. Can run multiple virtual networks on a physical network with overlapping IP addresses

- VMs can be moved to different virtual subnets or premises without requiring a change to the network topology.

To conclude, this implementation of improving the IT infrastructure will not only improve Abacus's scalability, reduce capital expenditure, improve security and the ability to focus on the core business are just some of the benefits but also help our workforce to increase their efficiency aiding us reach our business goals.

Thank you