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 Microsoft Dynamics

**Sunny
Delight**
Beverages Co.

AXUG
DYNAMICS AX USER GROUP


Targus

OneNeck provides a **comprehensive, flexible** suite of outsourcing solutions designed specifically for mid-market companies

- Founded in 1997
- Supports over 50 customers at over 850 sites worldwide
- 99% Contract Renewal Rate exceeding the industry average of 85%
- Primary data center/support center operations in Phoenix and Houston
- 100% US based operations and employees
- Diverse staff of Dynamics AX certified professionals
- Average of 99.9% systems availability
- Supports multi-site deployments for two of the largest hosted Dynamics AX environments in North America
- Ranked #1 ERP Outsourcing Vendor by the Black Book of Outsourcing

Disaster Recovery and Virtualization

Introduction and Case Study

Making your business disaster ready with virtual infrastructure

Paul Zalewski

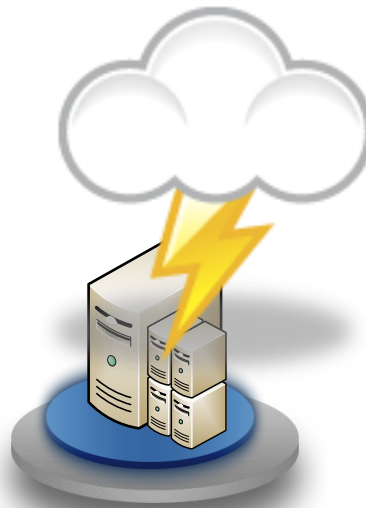
OneNeck IT Services

Mike Kennedy

Sunny Delight Beverages Company

- Topics
 - ✓ Business Continuity and Disaster Recovery Planning
 - ✓ Virtualization Overview
 - Virtualization Basics
 - Virtual Solutions
 - Virtualization Advanced Features
 - Consolidation through Virtualization Process
 - Virtualization Overview Summary
 - ✓ Sunny Delight Case Study
 - Company Profile
 - Infrastructure and Application Profile
 - Initial Disaster Recovery Solution Analysis
 - Revised Disaster Recovery Solution Analysis – Extensive Virtualization
 - Recovery Strategy
 - Summary
 - ✓ Questions and Discussion

Business Continuity and Disaster Recovery Planning



- The Need for Business Continuity and Disaster Recovery Planning
 - ✓ Business Continuity Planning and Disaster Recovery solutions are required for most businesses today
 - Compliancy Regulations
 - Accepted Business Practice
 - ✓ Industry experts state that between 60 and 90% of companies that don't have a proactive disaster plan find themselves out of business within 24 months of a major disaster.

- Business Impact Analysis Considerations
 - ✓ Application Criticality Assessment – in order to develop an effective strategy, the enterprise must evaluate their IT applications and assess how critical the application is to the business operation, and then prioritize the recovery plan based upon criticality.
 - ✓ Recovery Time and Point Objectives – the analysis should establish:
 - The Recovery Time Objective – the maximum time the enterprise can be without the application.
 - The Recovery Point Objective – the maximum amount of data loss that can be tolerated.
 - ✓ Risk Probability – the assessment should consider the probability of specific outages, the strategy should address minor, major, and catastrophic interrupts. Fault tolerant and High Availability solutions address local interrupts; Disaster declarations and offsite recovery solutions address catastrophic events.

- Common Alternate Site Recovery Strategies
 - ✓ Continuous Availability – An architecture where the workloads are load balanced over several – often geographically distributed – platforms, each provisioned to have spare capacity. When one of the platforms fails, the workload is distributed over the remaining platforms.
 - ✓ On-Line and Near-Line – An architecture with an available failover site, which is equipped with power, cooling, network, and security. Sufficient infrastructure is available to recover systems in the event of a primary facility outage. The data, application, and system information is replicated to the failover site either by using data replication methods or by shipping backup media.
 - ✓ Cold Site Recovery – An architecture with an available failover site which is equipped with power, cooling, network, and security. Recovery equipment is made available in the event of a disaster, systems are restored from offsite backups from the primary facility.

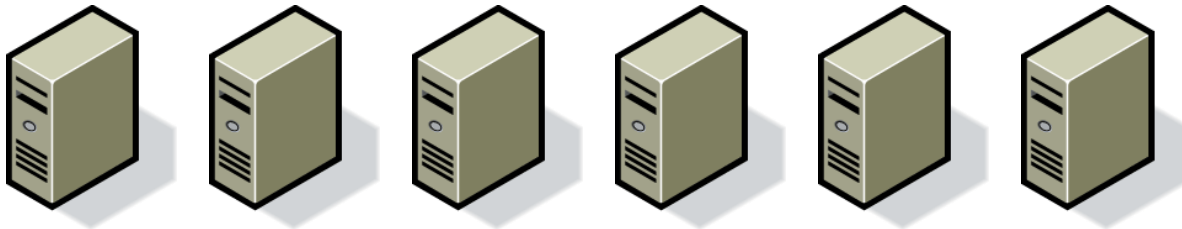
- Recovery Considerations

- ✓ Implementation of a reliable recovery strategy with fast time to recovery is expensive largely because it involves maintaining recovery Infrastructure that mirrors the primary infrastructure. Upgrades to the primary infrastructure must be applied in parallel to the recovery infrastructure, adding to the cost, hence many companies forgo the effort.
- ✓ An acceptable recovery strategy represents a fine line between the cost of implementing the strategy and the impact and likelihood of the potential outage. The more cost effective approaches allow the enterprise to deploy a recovery strategy with wider application coverage, providing maximum uninterrupted coverage
- ✓ Virtual Infrastructure makes business continuity and disaster recovery commercially/economically feasible for mid-sized enterprises and provides coverage beyond only the most critical applications.

Virtualization Basics



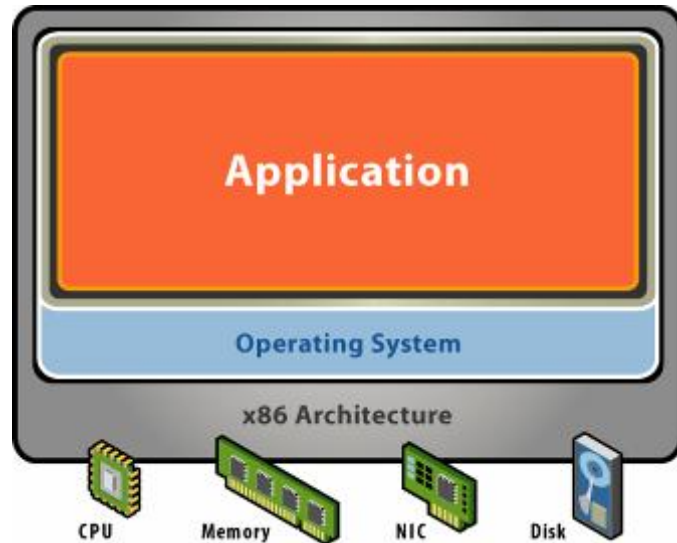
- Common Practice - “Commodity-based” server deployment methodology
 - ✓ Individual services/applications are hosted on standard configuration ‘commodity’ servers.
 - ✓ Provides for manageability through standardization and isolation.
 - ✓ Leads to the proliferation of windows-based servers.
 - ✓ Intentionally segregated and/or isolated services and applications on dedicated servers to avoid the contention and conflicts that could arise between the services and applications running on a single windows server.
 - ✓ Can lead to an infrastructure of generally under-utilized servers.



- Consolidation through Virtualization
 - ✓ The **core concept** of consolidation through virtualization is technology that enables the **partitioning of a physical server** - the ability to allow multiple independent operating systems to run on the same hardware at the same time.
 - ✓ The emergence of 64-bit hardware and virtualization technologies into the IT mainstream provides today's enterprises with an opportunity for significant infrastructure optimization and lower costs by allowing the consolidation of the server environment.
 - ✓ The leading virtualization technology providers (Microsoft and VMware) are hardware manufacture independent and provide solutions for 32-bit and 64-bit hardware solutions, although the performance and scalability of the 64-bit hardware solutions are recommended.

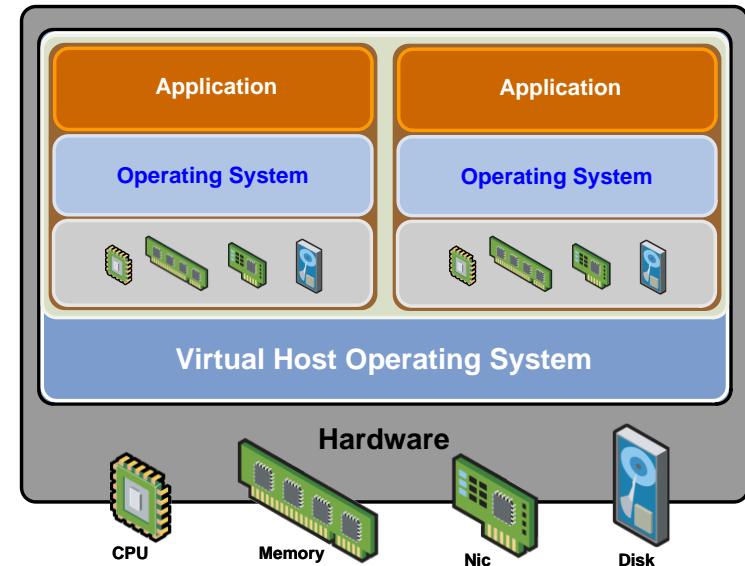
- Architecture Comparison

Dedicated



Single OS image per machine
Software and hardware tightly coupled
Running multiple applications on same machine often creates conflict
Underutilized, inflexible, costly infrastructure

Virtual



Break dependencies between OS and hardware

Manage OS and application as single unit by **encapsulating** them into VMs

Strong fault and security **isolation**

VMs are **hardware-independent**: they can be provisioned anywhere

- Key Features of Virtualization

Partitioning



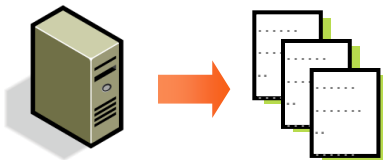
Run multiple virtual machines simultaneously on a single physical server

Isolation



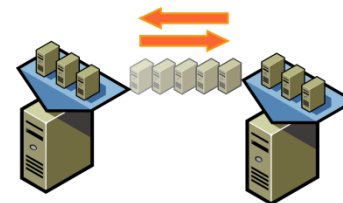
Each virtual machine is isolated from other virtual machines on the same server

Encapsulation



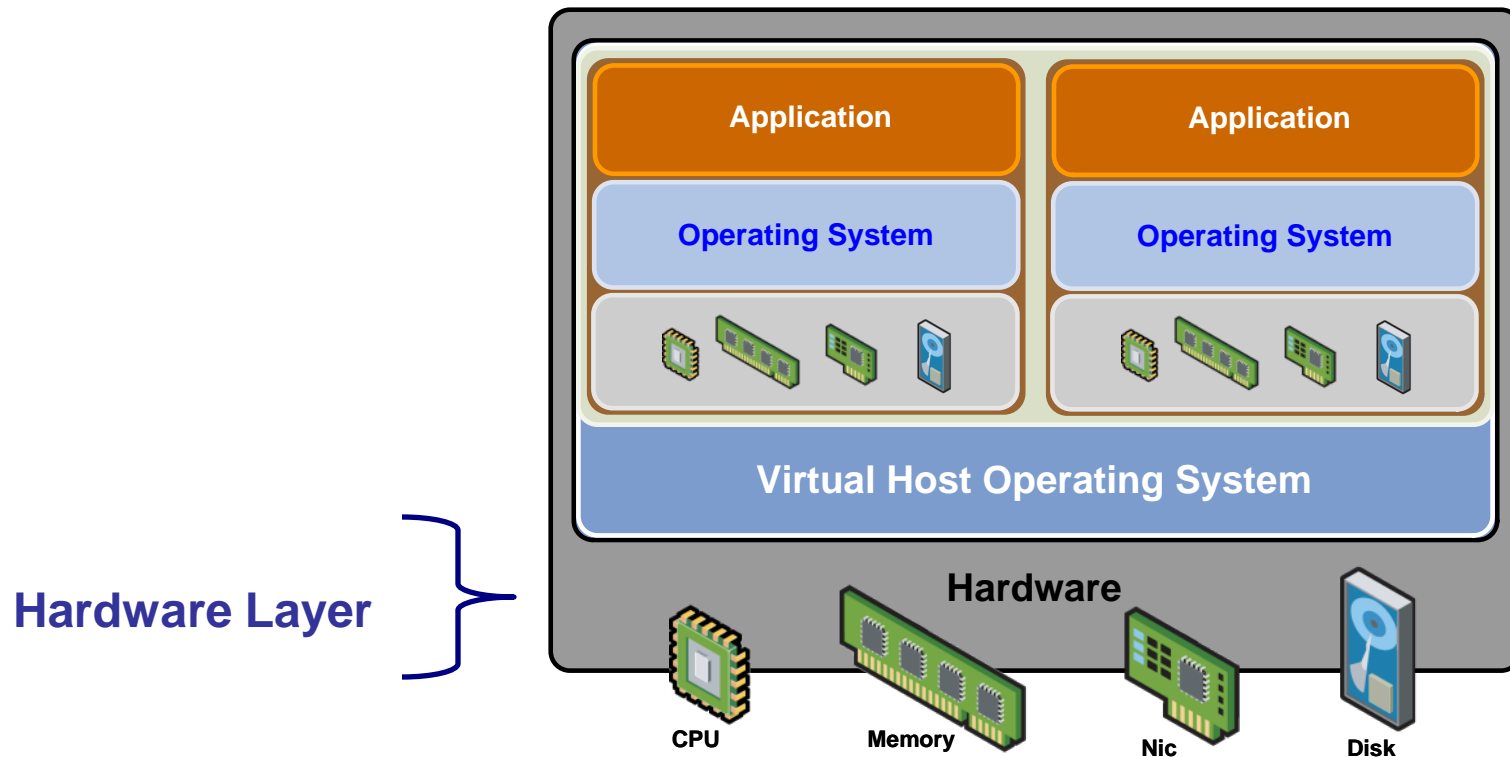
Virtual machines encapsulate entire systems (hardware configuration, operating system, apps) in files

Hardware Independence

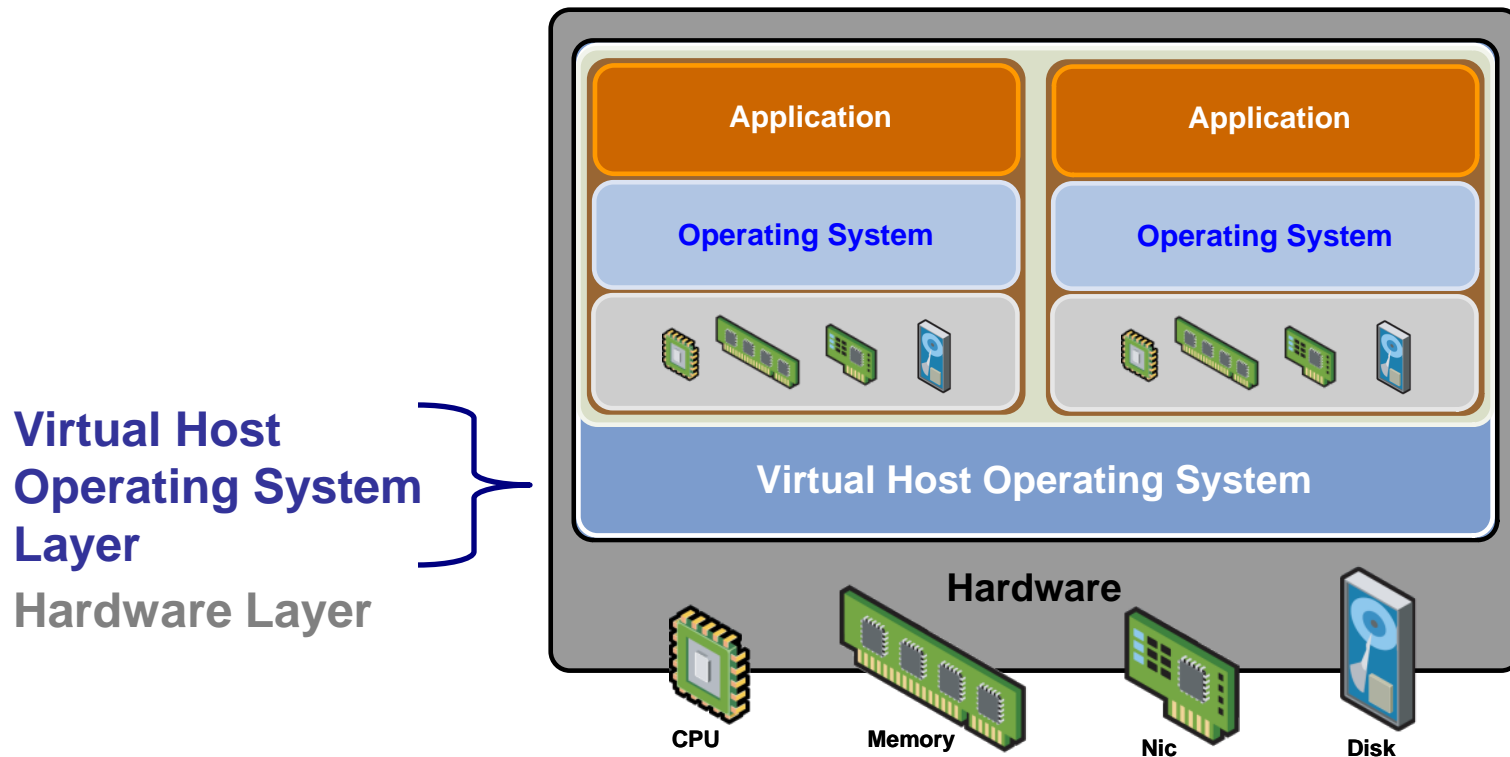


Run a virtual machine on any server without modification

- Virtualization Architecture Layers
 - ✓ **Hardware** layer consisting of processors, memory, interface adapters and disk.



- Virtualization Architecture Layers
 - ✓ **Virtual Host Operating System** layer manages the core hardware layer and the Virtual Machine layer

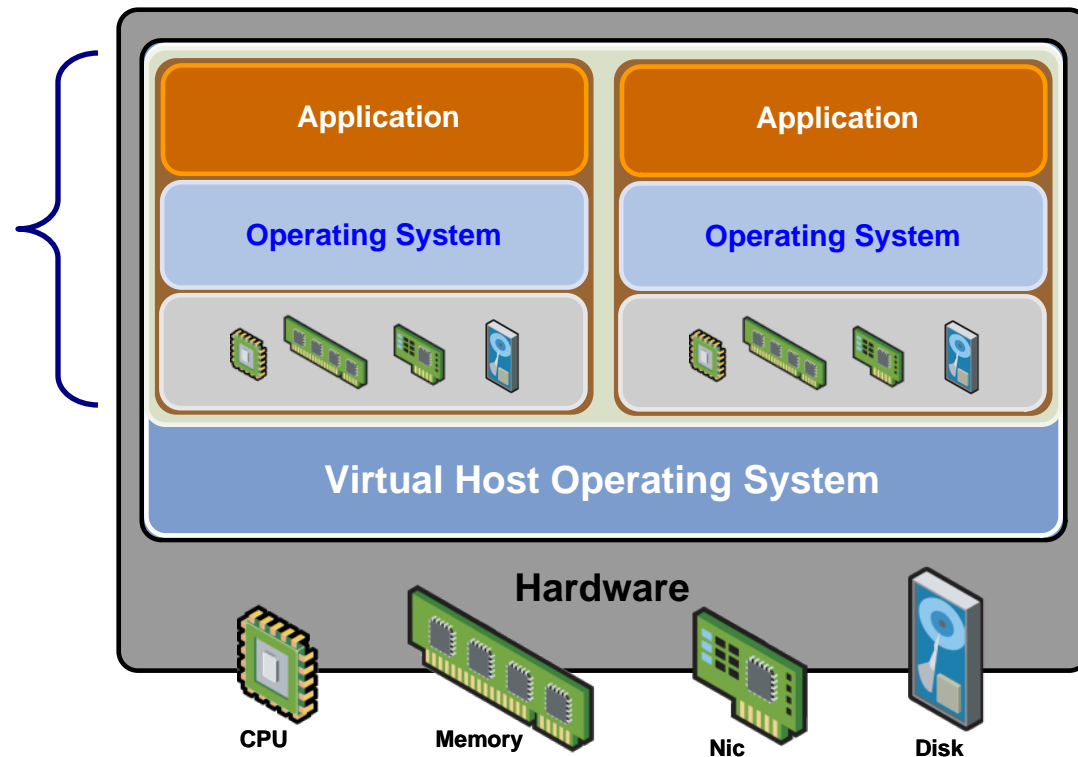


- Virtualization Architecture Layers
 - ✓ **VM (Virtual Machine)** layer consisting of allocated CPU, memory, interfaces, and disk, running an independent operating system, providing for an operating environment for one or more services and/or applications.

Virtual Machine
(VM) Layer

Virtual Host
Operating System
Layer

Hardware Layer

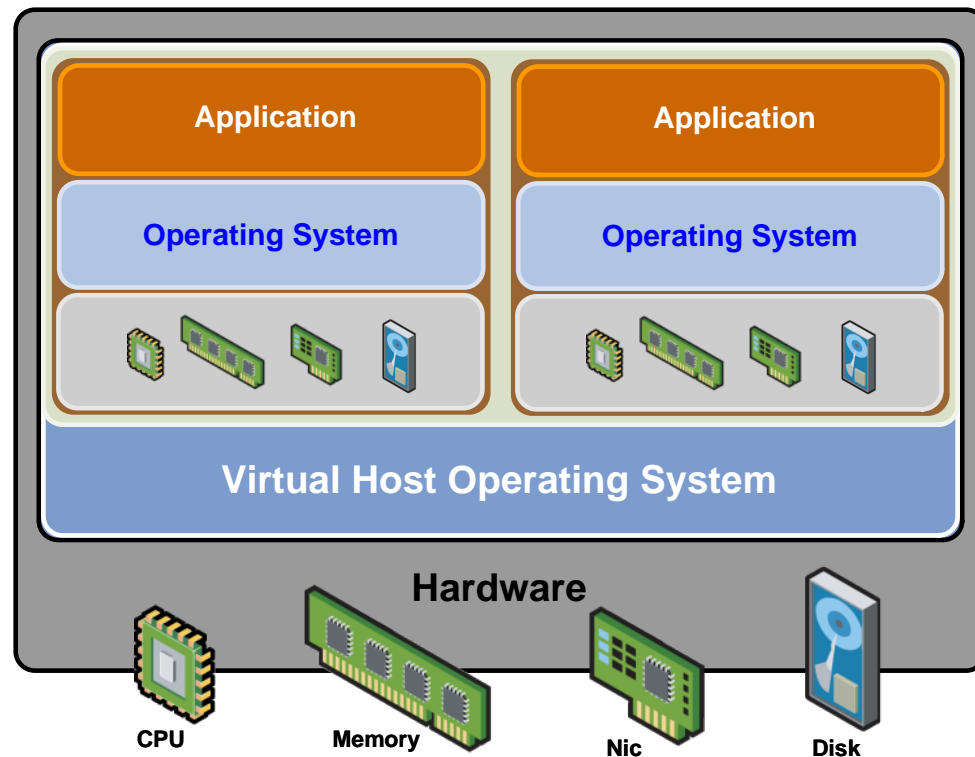


- Virtualization Architecture Layers
 - ✓ This illustration depicts a two Virtual Machine (VM) environment, although the virtual environments are highly scalable, limited only by the resources available from the core physical server.

Virtual Machine
(VM) Layer

Virtual Host
Operating System
Layer

Hardware Layer



- Operating System Architecture Compatibility and Resources
 - ✓ Generally, a VM can run any (Windows or Linux) operating system compatible with the core Virtual Host Operating System; **a 32-bit Virtual Host Operating System can only provide for 32-bit VM operating systems; a 64-bit Virtual Host Operating System can provide for 32-bit and 64-bit VM operating systems**, which is a primary consideration for 64-bit hardware and Virtual Host Operating Systems.
 - The “Virtual Extensions” are only available with the 64-bit processors; 64-bit processors with virtual extensions are required for effective server virtualization.
 - ✓ **There are limitations to the amount of resources that can be allocated** to a single VM; *4 CPU's and 16gb memory*, however, the primary virtualization solution providers will be addressing these limitations in future product releases.
 - The resource limitations dictate the type of system/application environments that are suitable for virtualization.

Virtual Solutions



- Vendor Solutions

- ✓ VMware

- Infrastructure 3 – Integrated Host product with extended functionality

- ESX Server 3
 - Virtual Center
 - VMotion
 - Resource Pools
 - DRS
 - HA

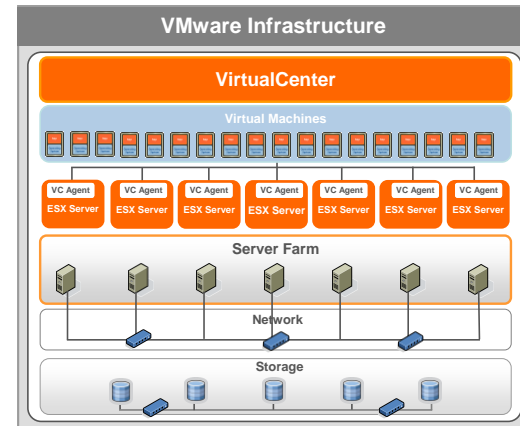
- VMware Server

- Host OS product with basic functionality
 - Formerly VMware GSX Server

- ✓ Microsoft

- Microsoft Virtual Server / Windows Server Virtualization

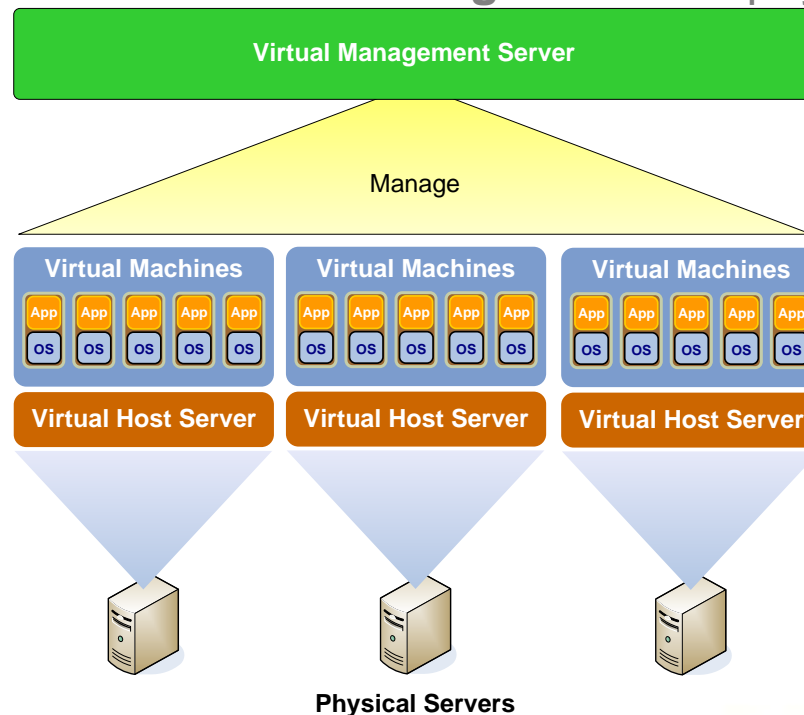
- ✓ Others, such as Citrix/XenSource



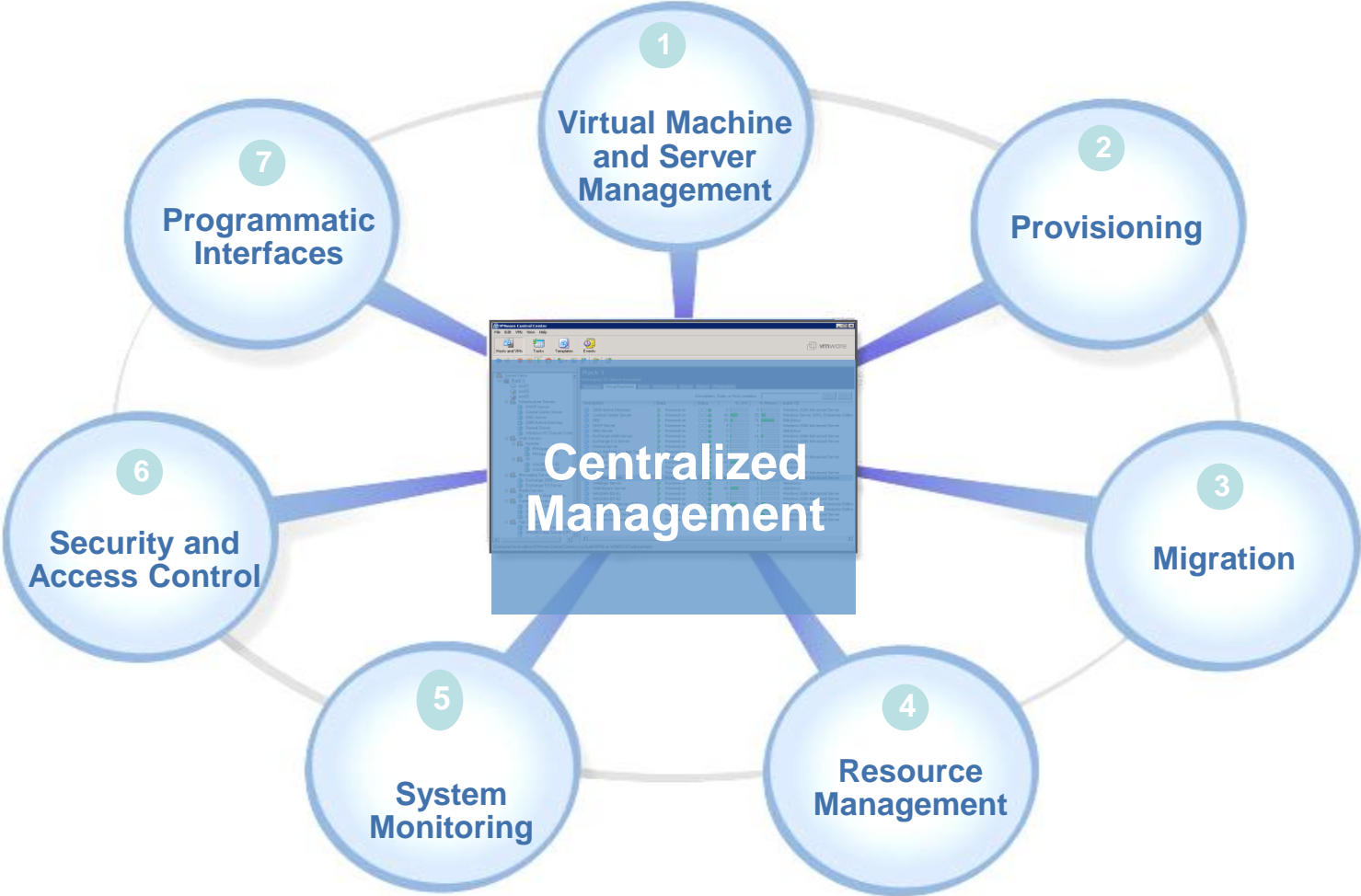
Virtualization Advanced Features



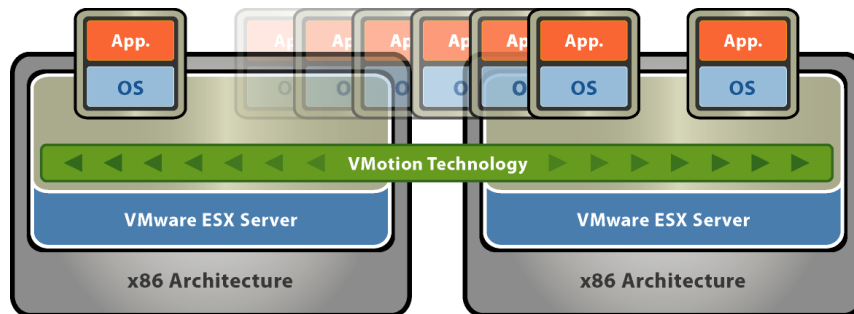
- Central Management - Expanded Virtual Server Environment
 - ✓ This illustration depicts three physical virtual host servers, each is running multiple Virtual Machines. Included is a **management layer** which provides for managing the Virtual machines across the physical servers
 - ✓ The virtual server management layer provides for administration of the virtual server 'farm' environment, including **server provisioning, capacity management and load balancing** across the physical servers.



- Central Management – Key Functionality (Virtual Center)



- VMotion



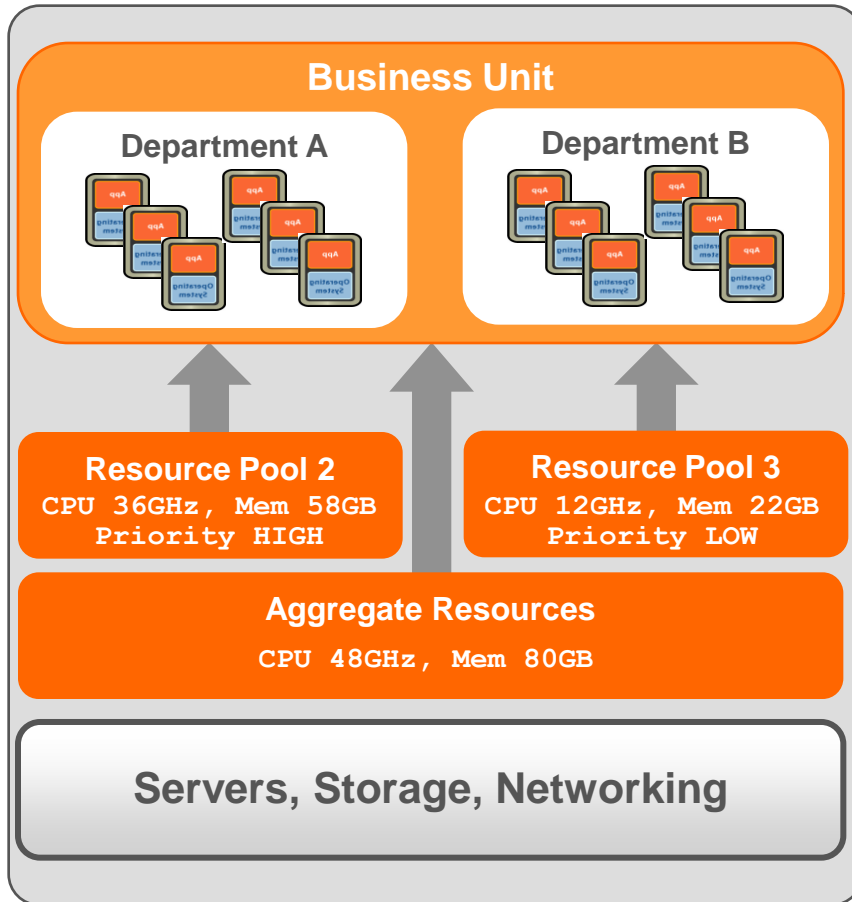
What is it?

- Live migration of virtual machines with VMware VMotion

Environment Impact

- Zero downtime maintenance
- Continuous service availability
- Requires External Disk

- Resource Pools



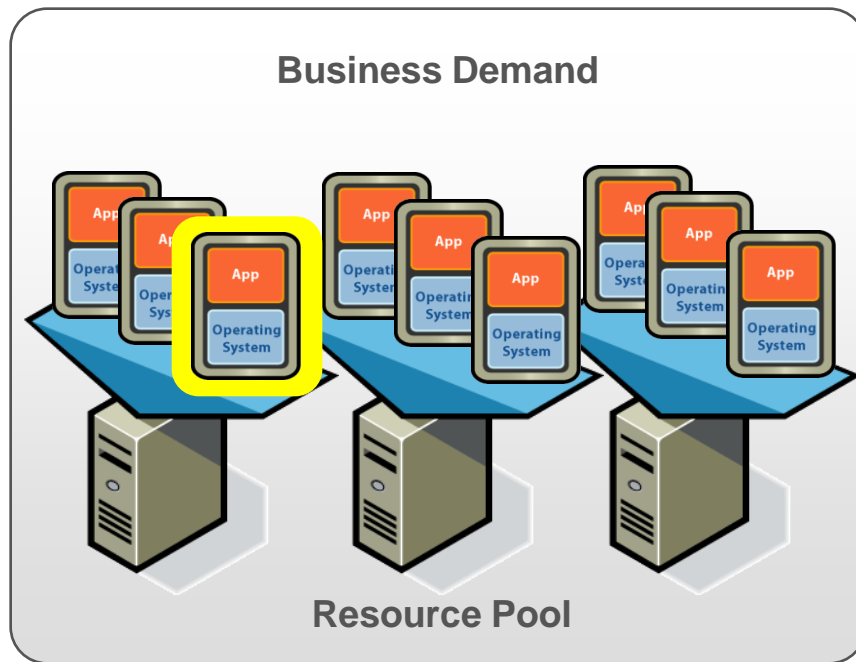
What is it?

- Aggregate collections of disparate hardware resources enabling enterprise resource management

Environment Impact

- Failed server means fewer resources, not a failed application
- Enables high availability across the infrastructure
- Dedicated (virtual) infrastructure for each business unit; central IT retains control over hardware
- Delegation of resource and virtual machine management down to the business unit

- DRS – Dynamic and intelligent allocation of hardware resources



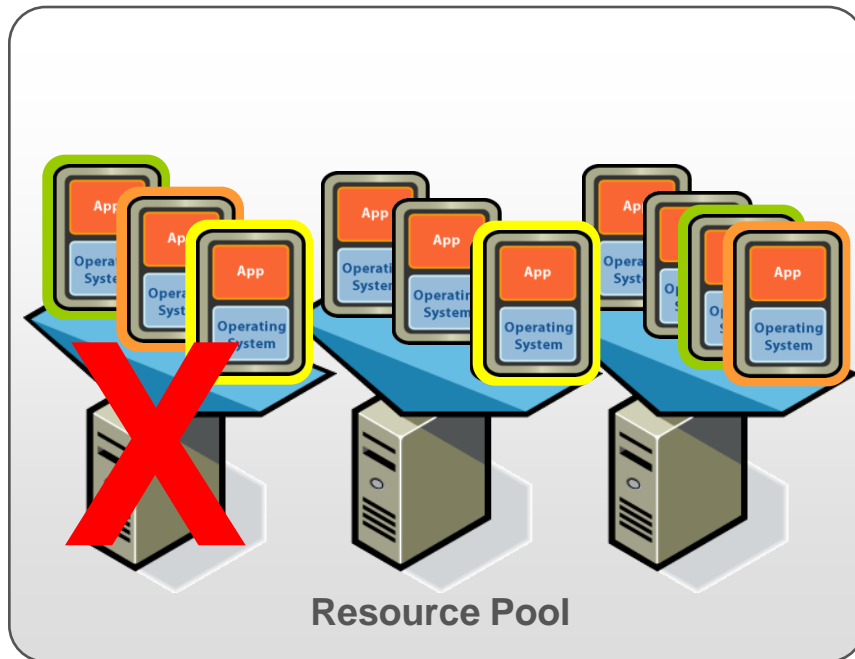
What is it?

- Dynamic balancing of computing resources across resource pools
- Intelligent resource allocation based on pre-defined rules

Environment Impact

- Align IT resources with business priorities
- Operational simplicity; dramatically increase system administrator productivity
- Add hardware dynamically to avoid over-provisioning to peak load
- Automate hardware maintenance
- On, Off, or Automatic

- HA – High Availability



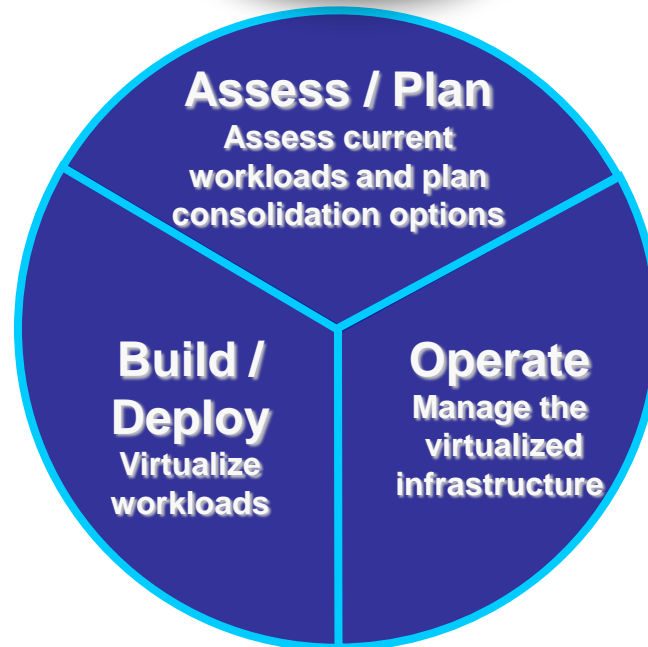
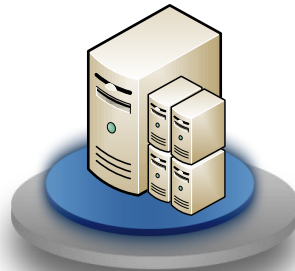
What is it?

- Automatic restart of virtual machines in case of server failure

Environment Impact

- Cost effective high availability for all applications
- No need for dedicated stand-by hardware
- None of the cost and complexity of clustering

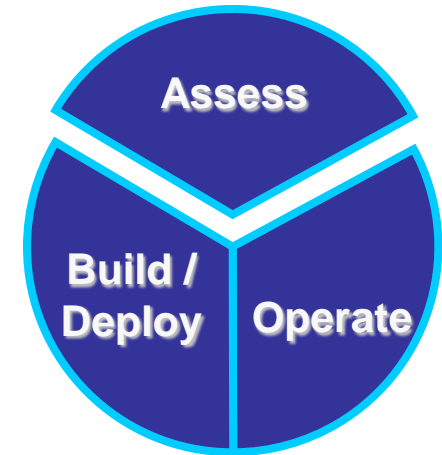
Consolidation through Virtualization Process Overview

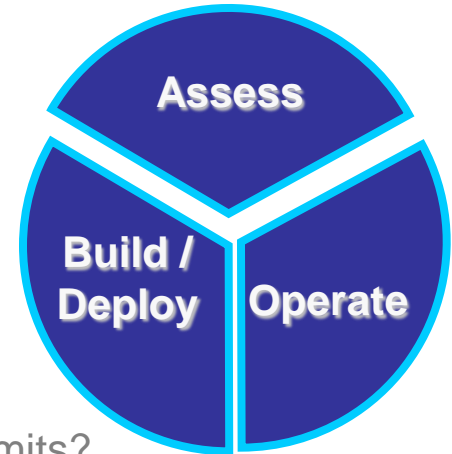


- Assess
Existing hardware and software deployed

- ✓ What is the current
Hardware/Software inventory?

- OS and version
- CPU speed and quantity
- Memory size
- NIC speed and quantity
- Disk space used and capacity
- Applications installed
- Service packs and patch levels
- Connected devices





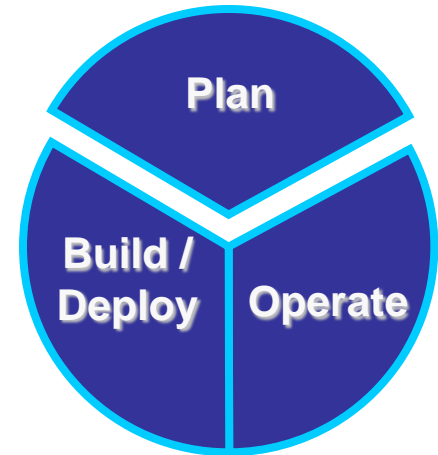
- Assess

Existing workload requirements

- ✓ What are the current

Workload Characteristics?

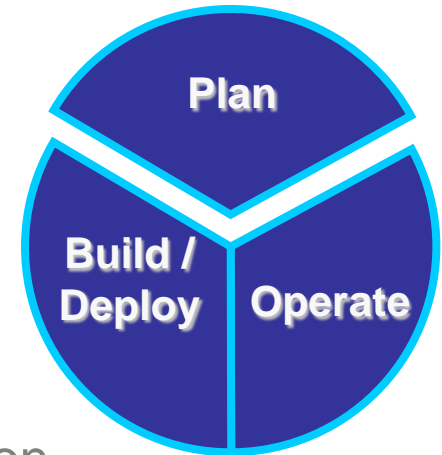
- CPU utilization: Average and peak usage?
- CPU scaling: Will workload need to scale beyond limits?
- Network: What is the saturation level produced by workload?
- Memory: What is the average & peak memory usage of the workload?
- Storage: What is the average read/write usage? Is shared storage required?
- **Support: Is the application supported within a virtualized environment?**
- Isolation: Does the workload need to be isolated from other workloads?



- Plan

Identifying Candidates for Virtualization

- ✓ Compile inventory
 - Obtain Hardware/Software inventory
 - Obtain performance information
- ✓ Eliminate appropriate candidates
 - Analyze computing resource requirements
 - Systems exceed CPU/Memory limits?
 - Large Exchange or DB Server environments?
 - Special hardware requirements
 - USB, hardware dongles, unique adapters
 - Applications unsupported in virtual environment
 - Review vendor support positions
 - Review user group anecdotal experiences

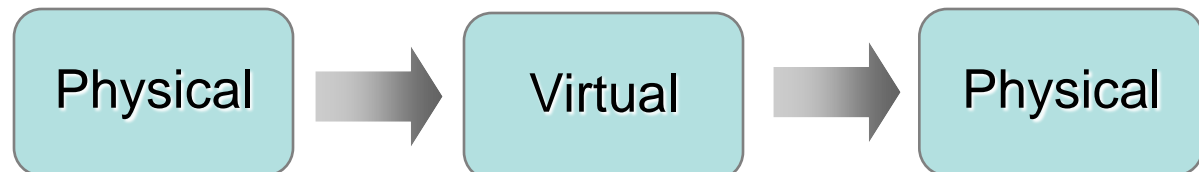
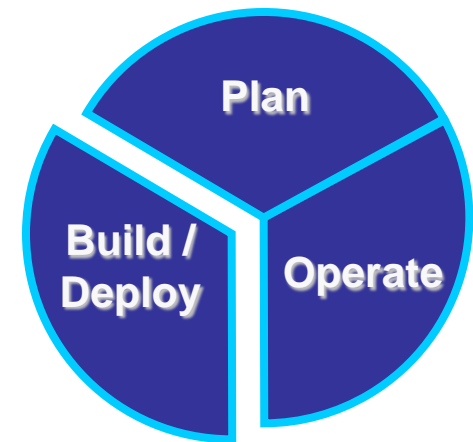


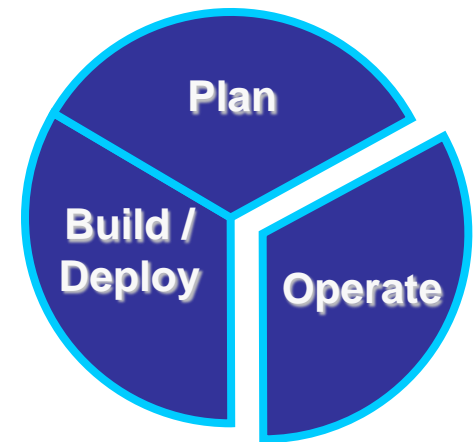
- Plan
 - Identify Host Configurations based on Net Computing Resource Requirements**
 - ✓ Accumulate computing resource requirements
 - ✓ Determine single or multiple host configuration
 - ✓ For multiple host configurations
 - Plan for attached shared storage
 - Balance workload across hosts
 - Plan for failover capacity
 - ✓ Configure hosts systems based on resource requirements

- Build / Deploy Process

Server Virtualization Considerations

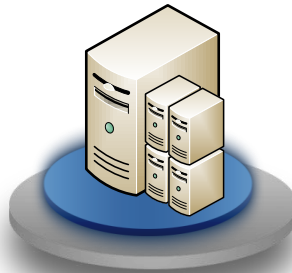
- ✓ Analyze downtime requirements
- ✓ Assess system dependencies
- ✓ Assess Physical to Virtual migration strategy
 - Build vs migrate
- ✓ Leverage tools – P2V – V2P
 - Automated Deployment Services (Windows)
 - Automated Provisioning inherent in solution
 - 3rd Party Tools
 - PlateSpin PowerConvert
- ✓ Leverage Standard processes
 - Utilize pre-built library of VMs to reduce provisioning time
- ✓ Develop Phased plan with fallback contingency
 - Reserve physical servers for pre-defined time





- Operate
Considerations
 - ✓ Management generally the same as physical server systems
 - ✓ Patch Management Processes
 - Patching virtual machines
 - Patching the host machine
 - ✓ Backup Processes
 - VM Backups
 - Native backups
 - Single file restores
 - Host Backups
 - VHD/VKD image backups
 - System state considerations
 - ✓ Administrator Console Management
 - Features/Functions vary depending on solution
 - Advanced Features
 - High Availability Failover
 - Automated Load Balancing

Virtualization Overview Summary



- **Virtual Server Use Cases**



Server Consolidation and Containment - Eliminate server sprawl by deploying systems into virtual machines.



Infrastructure Provisioning - Reduce the time for provisioning new infrastructure to minutes with sophisticated automation capabilities.



Legacy Application Re-hosting - Migrate legacy operating systems and software applications to virtual machines running on new hardware for better reliability



Test and Development - Rapidly provision and re-provision test and development servers; store libraries of pre-configured test machines.



Business Continuity - Reduce the cost and complexity of business continuity by encapsulating entire systems into files that can be replicated and restored onto any target server.

- Server Virtualization Benefits - *Based on their inherent partitioning, isolation, and encapsulation, virtual machines offer many advantages over physical servers. The advantages are significant; Virtual Machines:*
 - ✓ **Run on industry standard hardware** (X86 and X64).
 - ✓ **Have full access to physical resources** such as CPU, memory, disk, networking, and peripherals, allowing them to run any software application in a virtual machine.
 - ✓ **Are completely isolated**, providing secure processing, networking, and data storage.
 - ✓ **Can run concurrently with other virtual machines** for optimal hardware utilization.
 - ✓ **Are encapsulated in software files so that they can be provisioned, backed up, or restored with the ease of a file copy** (VHD/VDK).
 - ✓ **Are portable, so full systems, including virtual hardware, operating systems, and fully configured applications can be easily moved** from one physical server to another, in some instances, even while running.

- Server Virtualization Benefits - Continued:
 - ✓ Can incorporate **distributed resource management and high-availability capabilities** that provide better service levels to software applications than static physical infrastructure.
 - ✓ Can be **built and distributed as plug-and-play virtual appliances** that contain the entire stack of virtual hardware, operating systems, and fully configured software applications for rapid deployment.
- Virtualization:
 - ✓ Provides a **path for infrastructure technology refresh** of the enterprise's core hardware and software infrastructure (32-bit to 64-bit)..
 - ✓ Provides a **path for server consolidation** within the enterprise's core hardware infrastructure.
 - ✓ Enables the deployment of a cost-effective **disaster recovery solution** by leveraging the key features of the virtual machine environment.

Sunny Delight Case Study



Sunny Delight Case Study



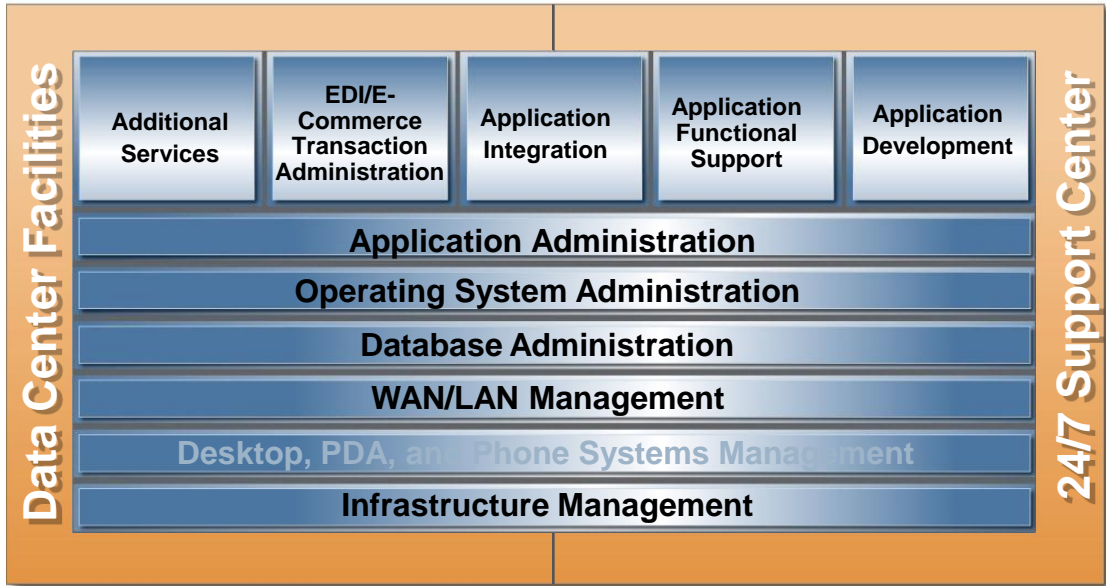
- Company Profile
 - ✓ Leading producer of juiced-based drinks in North America and Western Europe
 - ✓ Formed from brands acquired from Procter & Gamble in 2004
 - ✓ Eight U.S. and European locations with multiple remote Distribution Centers
 - ✓ Worldwide headquarters located in Cincinnati, Ohio
European headquarters located in Barcelona, Spain

Mike Kennedy



DIRECTOR, GLOBAL INFORMATION TECHNOLOGY SOLUTIONS

“Sunny Delight recently implemented Microsoft’s Axapta (Dynamics AX) application with the help of OneNeck. We were most impressed with their ability to deliver SunnyD’s infrastructure and ERP environments in our highly complex and fast paced implementation model. OneNeck continues to demonstrate a commitment to the success of our business by providing us with flexible implementation and support models.”



OneNeck Provided Services

- Enterprise Application Profile
 - ✓ 520 Users
 - ✓ Global ERP – Microsoft Dynamics AX
 - ✓ Supply Chain Management – Prescient
 - ✓ Warehouse Management - DLX
 - ✓ Reporting - Targit
 - ✓ HR, Payroll and Expense Management - ADP
 - ✓ Messaging - Microsoft Exchange, OWA, Blackberry
 - ✓ Enterprise Information Collaboration – SharePoint
 - ✓ Integration Layer – Connectivity Studio

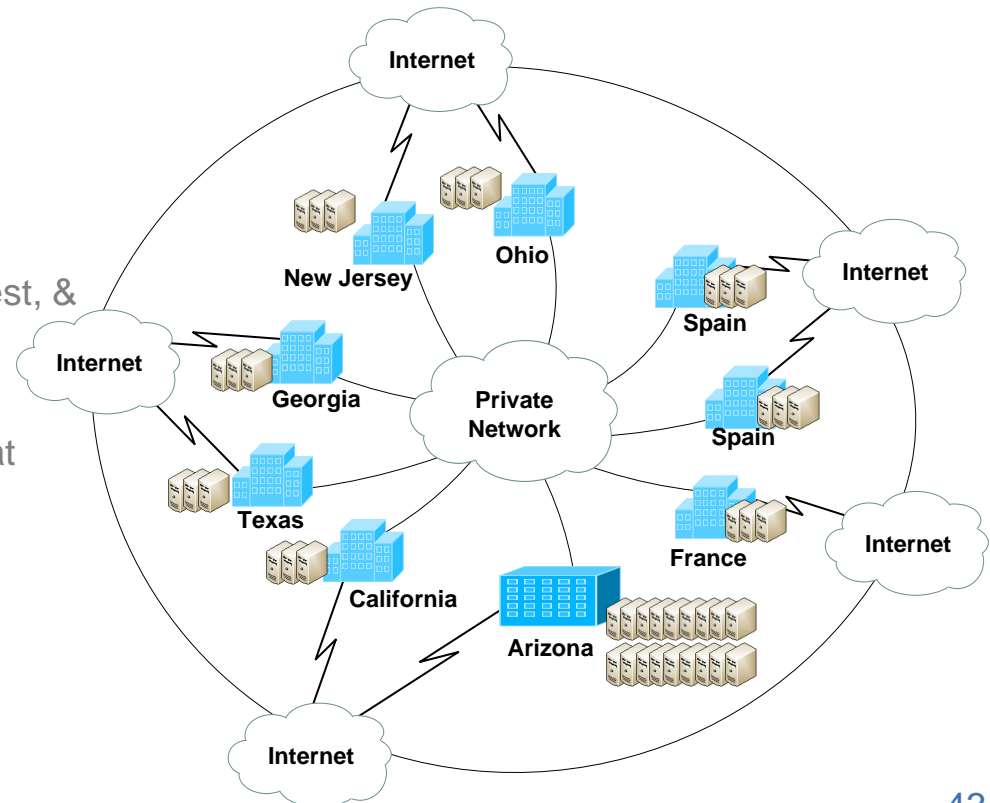
- Infrastructure Profile

- ✓ Wide Area Network (WAN) Infrastructure

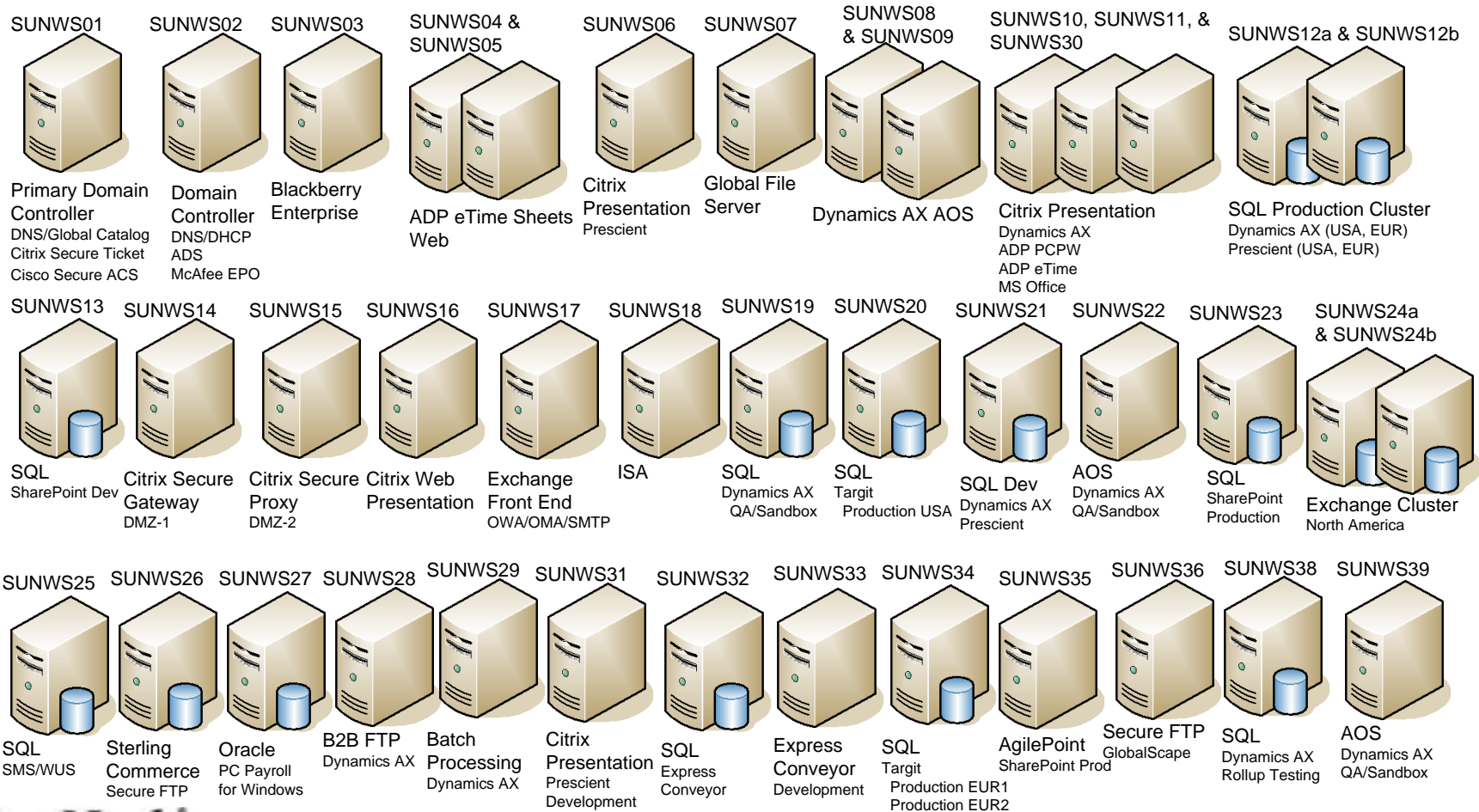
- Private Network (frame based replaced by meshed MPLS)
 - Internet (VPN) backup

- ✓ Server Infrastructure

- Data Center (Arizona)
 - 40 Windows Servers
 - Enterprise Applications, Production, Development, Test, & QA
 - Sunny Delight Facilities
 - 2-3 Local Windows Servers at each of 8 sites
 - Active Directory, File & Print, Utility, Local Applications, & Backup



- Pre-Virtualization Data Center Servers



- Disaster Recovery Initiative
 - ✓ Disaster Recovery Assessment initiated early 2006
 - ✓ Assessment Included:
 - Application Business Impact Analysis
 - Application Critical Time Frame Analysis
 - Disaster Recovery Minimum Configuration
 - Disaster Recovery Solution Options
 - Cold Site (DR Subscription)
 - Hot Site
 - Hot Site with Data Replication
 - Redundant Sites (Bi-directional failover)
 - Solution Estimated Cost Summary

- Application Business Impact Summary

Application/Service	1-2 Days	3-5 Days	5+ Days	Category
Internet Access / Inter-Facility Network (WAN)	Critical Impact			Essential
Windows Active Directory / Local Area Network (LAN) infrastructure	Critical Impact			Essential
DynamicsAX-PROD-USA	Critical Impact			Essential
DynamicsAX-PROD-EUR	Critical Impact			Essential
ADP Payroll/E-Time/E-Timesheets	Critical Impact			Essential
E-mail – USA and Europe	Critical Impact			Essential
Prescient Prod USA	Moderate Impact	Critical Impact		Essential
Prescient Prod Europe	Moderate Impact	Critical Impact		Essential
Xpress Conveyor	Moderate Impact	Critical Impact		Essential
BES – Blackberry Enterprise Server	Moderate Impact	Critical Impact		Essential
Targit – USA	Moderate Impact	Critical Impact		Essential
Targit – Europe	Moderate Impact	Critical Impact		Essential
Sharepoint	Moderate Impact	Critical Impact		Essential
DynamicsAX-DEV-USA	Minimal Impact	Minimal Impact	Moderate Impact	Delayed
DynamicsAX-QA-USA	Minimal Impact	Minimal Impact	Moderate Impact	Delayed
DynamicsAX-SANDBOX-USA	Minimal Impact	Minimal Impact	Moderate Impact	Delayed
DynamicsAX-DEV-EUR	Minimal Impact	Minimal Impact	Moderate Impact	Delayed
DynamicsAX-QA-EUR	Minimal Impact	Minimal Impact	Moderate Impact	Delayed
DynamicsAX-SANDBOX-EUR	Minimal Impact	Minimal Impact	Moderate Impact	Delayed
DynamicsAX Dev/QA/Sandbox	Minimal Impact	Minimal Impact	Moderate Impact	Delayed
Targit Test Server	Minimal Impact	Minimal Impact	Moderate Impact	Delayed
Prescient Dev/Training	Minimal Impact	Minimal Impact	Moderate Impact	Delayed
AC Nielsen Nitro	Minimal Impact	Minimal Impact	Minimal Impact	Suspended

- Application Critical Time Frame Summary

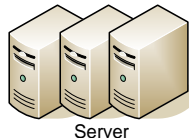
Application/Service	Criticality	Critical Time Frame
Internet Access / Inter-Facility Network (WAN)	1	2 Days
Windows Active Directory / Local Area Network (LAN) infrastructure	1	2 Days
DynamicsAX-PROD-USA	1	2 Days
DynamicsAX-PROD-EUR	1	2 Days
ADP Payroll/E-Time/E-Timesheets	1	2 Days
E-mail – USA and Europe	1	2 Days
Prescient Prod USA	2	5 Days
Prescient Prod Europe	2	5 Days
Xpress Conveyor	2	5 Days
BES – Blackberry Enterprise Server	2	5 Days
Targit – USA	3	5 Days
Targit – Europe	3	5 Days
Sharepoint	3	5 Days
DynamicsAX-DEV-USA	4	5+ Days
DynamicsAX-QA-USA	4	5+ Days
DynamicsAX-SANDBOX-USA	4	5+ Days
DynamicsAX-DEV-EUR	4	5+ Days
DynamicsAX-QA-EUR	4	5+ Days
DynamicsAX-SANDBOX-EUR	4	5+ Days
DynamicsAX Dev/QA/Sandbox	4	5+ Days
Targit Test Server	4	5+ Days
Prescient Dev/Training	4	5+ Days

- Minimum Configuration



SUNWS01

Active Directory
DHCP, DNS, GC
Citrix Secure Ticket Auth
Certificate Server
Cisco ACS Server



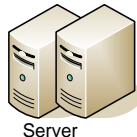
SUNWS10, 11 and 30

Citrix Farm – Axapta Clients



SUNWS06

Citrix Farm – Prescient Client



SUNWS08 and 09

AOS Cluster



SUNWS12a

Production Databases
Dynamics AX
PROD_USA
PROD_EUR1
PROD_EUR2
Prescient
PROD_USA
PROD_EUR



SUNDR02

ISA 2000 (SUNWS18)
Exchange OWA/OMA (SUNWS17)
eTime Sheets Web (SUNWS04)
GlobalScape Public FTP (SUNWS36)



SUNWS03

Blackberry BES



SUNWS24a

Exchange Backend



SUNWS23

Sharepoint

SUNWS35

Agilepoint



SUNWS07

File Server
S: Drive
TS Profiles
eTime DB (file)



SUNWS32

Xpress Conveyor



SUNDR01

Citrix SGA (SUNWS14)
Citrix Sec Proxy (SUNWS15)
Citrix Web Pres (SUNWS16)



SUNDR03

Virtual Host



SUNWS20

Target – PROD USA
App and Database



SUNWS34

Target – PROD EUR
App and Database



SUNDR04

Virtual Host



SUNWS26

eTime Sheets Database
Citrix Farm Database
Sterling Commerce FTP



SUNWS27

ADP Oracle DB



SUNWS28

B2B FTP



SUNWS29

Axapta Batch



SUNBAK

Netbackup



- Initial DR Assessment Estimated Solution Cost Summary

Solution/Cost Component	Monthly Recurring	Annual Recurring	One Time Cost Services	Solution Cost (36 Month)	Solution Cost (60 Month)
Cold Site w/Subscription					
Subscription Service	xxx			xxx	xxx
Detailed design/plan and solution development			xxx	xxx	xxx
Ongoing DR solution maintenance	xxx				
Annual Testing		xxx		xxx	xxx
Other Solutions					
Co-Location facility w/1.5MB Internet	xxx			xxx	xxx
Infrastructure (equipment)				xxx	xxx
Software Costs				xxx	xxx
Detailed design/plan and solution development			xxx	xxx	xxx
Solution Setup			xxx	xxx	xxx
Ongoing Maintenance	xxx				
Annual Testing		xxx		xxx	xxx

Solution Cost Ranks

Cold Site w/Subscription Cost Rank	5.58	7.72
Hot Site Cost Rank	6.79	8.78
Hot Site w/Data Replication Cost Rank	7.57	9.57
Redundant Site w/Data Replication Cost Rank	8.02	10.08

- Disaster Recovery Initiative Revision – Virtual Deployment
 - ✓ Initial Assessment Observations:
 - Solution Recovery Time did not completely meet expectations
 - Solution costs did not meet budget objectives
 - Solution did not address current environment technology refresh
 - ✓ Revised Assessment initiated mid 2006
 - Provide solution alternatives by leveraging consolidation through virtualization
 - ✓ Assessment Revision Included:
 - Proposed Production and DR Virtual configurations
 - Virtualization Deployment approach
 - Disaster Recovery Solution Options
 - Core Infrastructure Virtual Consolidation
 - Cold Site (DR Subscription)
 - Co-Location Warm Site
 - Sunny Delight Existing facility Warm Site
 - Solution Cost Summary

- Virtual Assess/Plan Process
 - ✓ Utilization Assessment and Grouping

Server	Total Memory	Average Memory Utilization	Peak Memory Utilization	Average CPU Utilization	Peak CPU Utilization
VSHOST1					
SUNWS02	2	60.56	67.71	0.91	9.61
SUNWS03	2	48.83	75.35	0.76	6
SUNWS07	2	26.95	29.35	0.57	20.83
SUNWS08	4	23.21	34.96	1.98	8.57
SUNWS10	4	28.5	63.92	2.63	51.04
SUNWS14	2	27.43	31.16	0.39	15.6
SUNWS17	2	63.76	91.09	1.31	10.65
SUNWS26	2	92.6	94.09	1.65	7.99
SUNWS29	4	27.96	78.48	3.98	37.66
SUNWS34	4	91.87	95.94	7.58	51.21
SUNWS35	2	30.96	32.93	0.36	5.81
Total/Average	30	47.51	63.18	2.01	20.45

- Virtual Assess/Plan Process
 - ✓ OS & Application Assessment and Grouping

Server	OS	Apps	Function
VSHost1			
SUNWS02	W2k3 Ent	AD, DNS, DHCP, ADS, McAfee	Active Directory Server
SUNWS03	W2k3	Blackberry Enterprise Server	Blackberry Server
SUNWS07	W2k3		File/Print Server
SUNWS08	W2k3	Axapta AOS Server	Axapta Prod AOS Metaframe Server 1
SUNWS10	W2k3	Office, Axapta, ADP (all)	Citrix Presentation Server
SUNWS14	W2k3	Citrix Secure Gateway Service Citrix Web Presentor	Citrix Secure Gateway(DMZ 1) Citrix SG Proxy(DMZ 2) Citrix Web Presentation Server
SUNWS17	W2k3	Exchange 2003	Exchange Outlook Web
SUNWS26	W2k3	MS-SQL	ADP SQL Database Server, Citrix Farm DB Server
SUNWS29	W2k3	Axapta Client	Axapta Client (Batch Server)
SUNWS34	W2k3	MS-SQL, Targit	Targit Production Europe
SUNWS35	W2k3	AgilePoint	AgilePoint Server

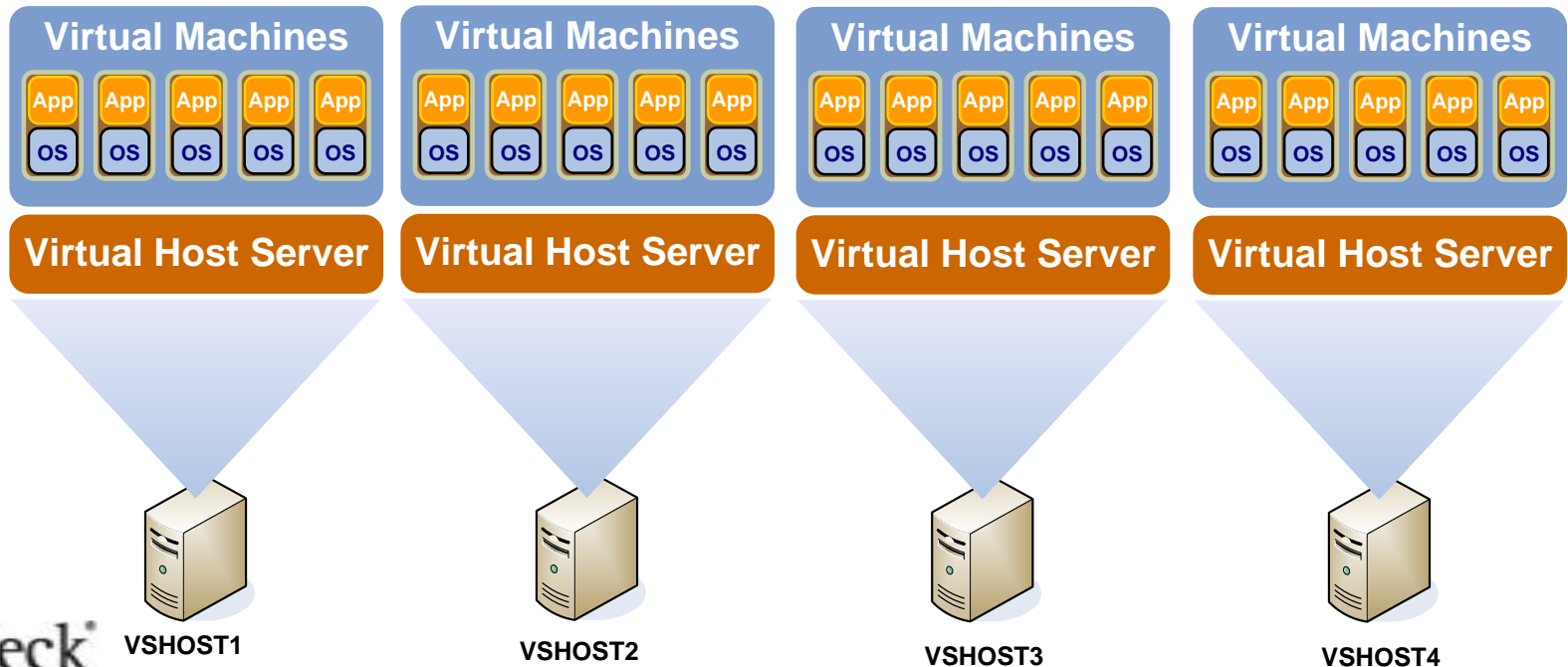
- Virtual Configuration – Production Environment

SUNWS02
SUNWS03
SUNWS07
SUNWS08
SUNWS10
SUNWS14
SUNWS17
SUNWS26
SUNWS29

SUNWS04
SUNWS09
SUNWS11
SUNWS18
SUNWS20
SUNWS23
SUNWS25
SUNWS27
SUNWS28

SUNWS13
SUNWS19
SUNWS21
SUNWS22
SUNWS33
SUNWS37
SUNWS38
SUNWS39
SUNWS31

SUNWS30
SUNWS32
SUNWS06
SUNWS24
SUNWS12
SUNWS34
SUNWS35



- Virtual Configuration – DR Environment

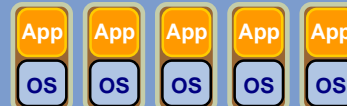
SUNWS02
 SUNWS03
 SUNWS04
 SUNWS07
 SUNWS08
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 SUNWS10
 SUNWS11
 SUNWS14
 SUNWS18
 SUNWS24

SUNWS20
 SUNWS23
 SUNWS26
 SUNWS27
 SUNWS28
 SUNWS29
 SUNWS32
 SUNWS34
 SUNWS35
 SUNWS06
 SUNWS12

Virtual Machines



Virtual Machines



Virtual Host Server

Virtual Host Server

Backup & Restore



SUNDR01



VSHOST1



VSHOST2

- Revised DR Assessment Estimated Solution Cost Summary

Solution/Cost Component	Monthly Recurring	Annual Recurring	One Time Cost Services	Solution Cost (36 Month)	Solution Cost (60 Month)
Production Consolidation w/Virtualization					
Infrastructure (hardware)				xxx	xxx
Software Costs				xxx	xxx
Detailed design/plan and solution development			xxx		
Solution Setup			xxx		
Cold Site w/Subscription					
Subscription Service	xxx			xxx	xxx
Detailed design/plan and solution development			xxx	xxx	xxx
Ongoing DR solution maintenance	xxx				
Annual Testing		xxx		xxx	xxx
Other Solutions					
Co-Lo Facility w/1.5MB Internet	xxx			xxx	xxx
Infrastructure (equipment)				xxx	xxx
Software Costs				xxx	xxx
Detailed design/plan and solution development			xxx	xxx	xxx
Solution Setup			xxx	xxx	xxx
Ongoing Maintenance	xxx				
Annual Testing		xxx		xxx	xxx

Solution Cost Ranks

Prod Consolidation w/Virtualization Cost Rank	1.56	1.90
Cold Site Subscription DR Cost Rank	5.64	7.52
Co-Location Warm Site DR Cost Rank	4.58	5.88
Sunny Delight Warm Site (Ohio) DR Cost Rank	3.31	4.02

- Cost Summary Comparison

Solution Cost Ranks

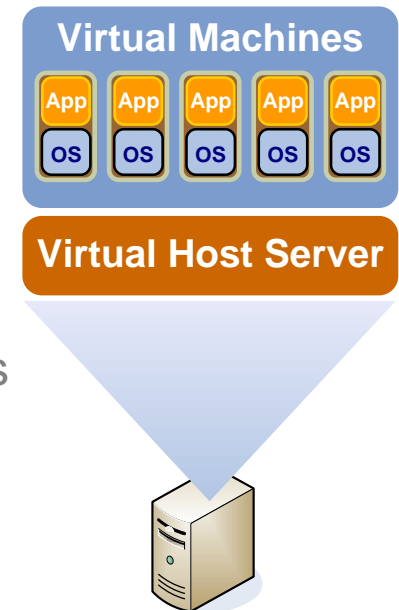
Production Consolidation w/Virtualization Cost Rank	1.56	1.90
Cold Site Subscription DR Cost Rank	5.64	7.52
Co-Location Warm Site DR Cost Rank	4.58	5.88
Sunny Delight Warm Site (Ohio) DR Cost Rank	3.31	4.02

Selected Options Accumulated Cost Rank	4.87	5.92
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Original DR Proposal Cost Ranks

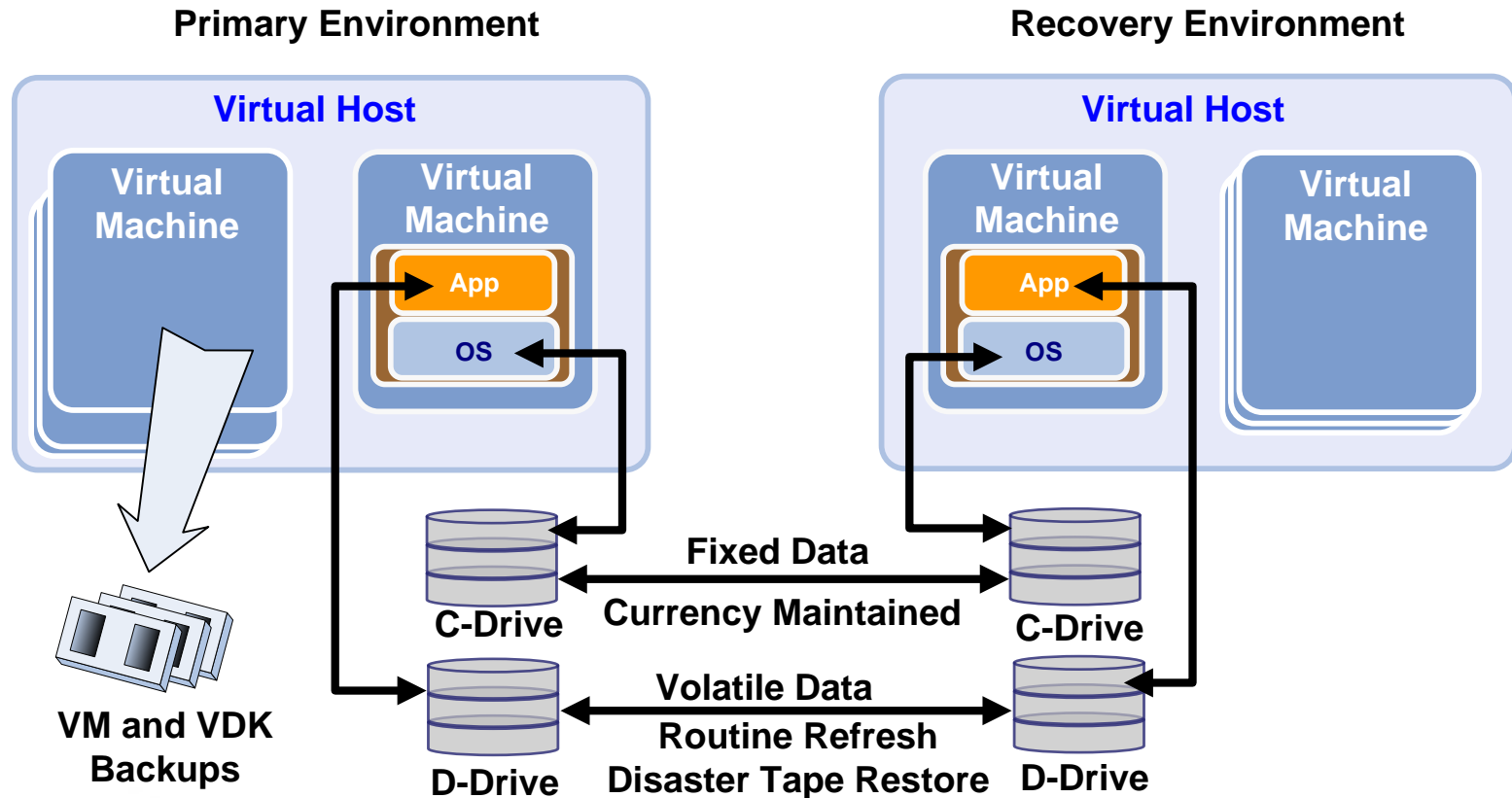
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Hot Site Cost Rank	6.79	8.78
Hot Site w/Data Replication Cost Rank	7.57	9.57
Redundant Site w/Data Replication Cost Rank	8.02	10.08

- Virtual Deploy Process
 - ✓ Established Virtual Environment Infrastructure
 - Servers, Network, SAN-Attached disk
 - Performed initial validation/verification testing
 - ✓ Performed Phased Migration of Production Environment
 - Determined migration approach based on case-by-case basis
 - Physical-to-Virtual (P-V) utilized native tools and PlateSpin
 - System Builds
 - Reserved physical hardware for fallback
 - Completed in 2-3 months
 - Minimal User Impact
 - ✓ Deployed Disaster Recovery Environment
 - Utilized VDK images to build most Virtual Machines

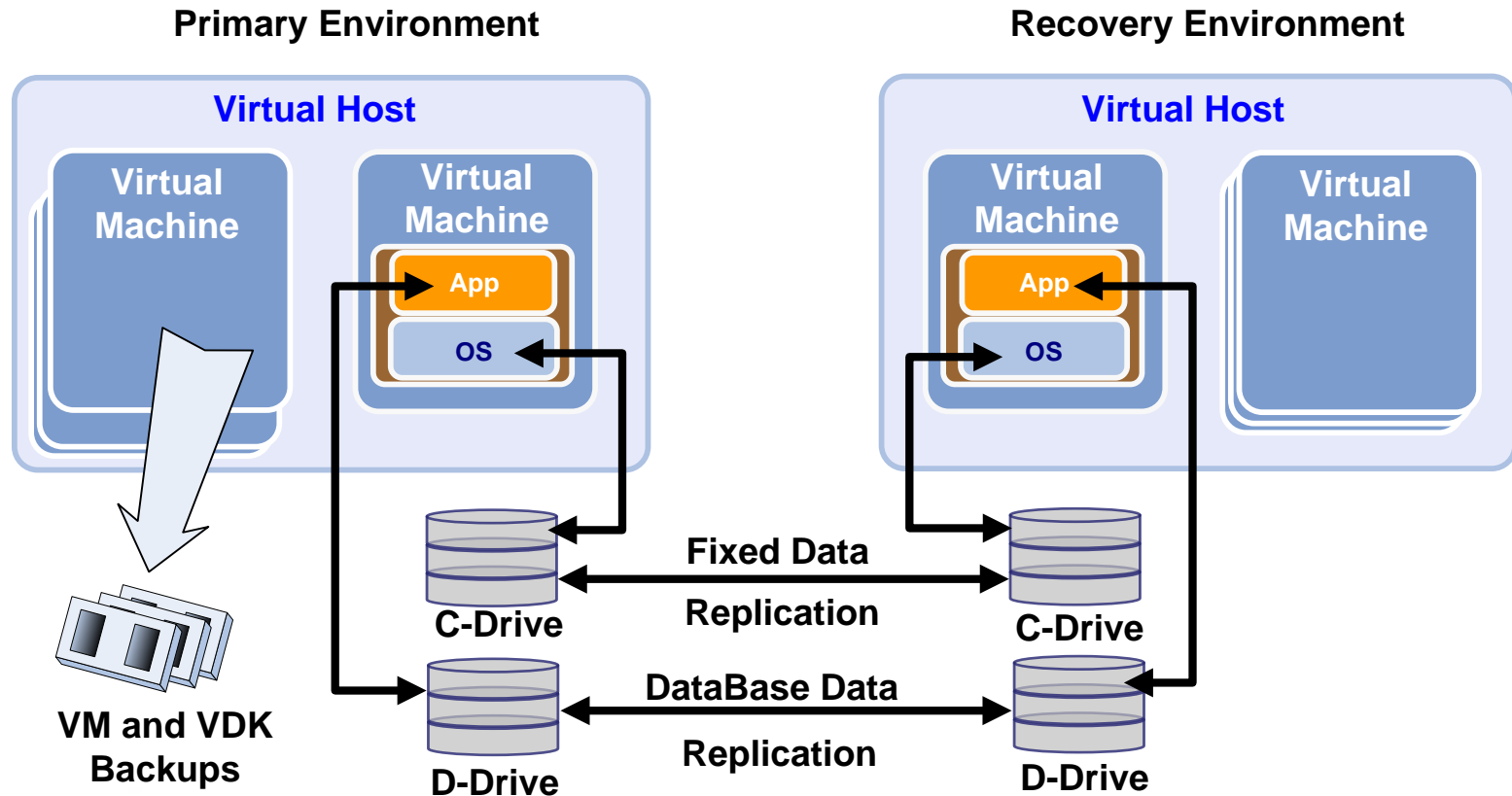


VSHOST1

- Recovery Strategy – Initial Deployment
 - ✓ Maintain VM Currency at the Recovery Center
 - ✓ Restore Volatile Data during recovery



- Recovery Strategy - Potential Future Deployment
 - ✓ Maintain VM Currency at the Recovery Center through replication
 - ✓ Maintain DB currency at the Recovery Center through replication



- Summary
 - ✓ Virtualization enabled the deployment of a cost-effective disaster recovery solution meeting the Sunny Delight recovery time and point objectives by leveraging the advantages of the virtual machine environment.
 - ✓ Virtualization provided for the deployment of a disaster recovery solution at minimal cost when compared with alternate solutions.
 - ✓ Virtualization provided a path for infrastructure technology refresh of Sunny Delight's core hardware infrastructure.
 - ✓ Sunny Delight was able to perform a technology refresh on their primary infrastructure and deploy a disaster recovery solution for less than the cost of a number of the alternate disaster recovery solutions.
 - ✓ Virtualization provided a path for server consolidation within Sunny Delight's core hardware infrastructure.
 - Consolidated from 40 to 4 physical virtual host servers.
 - Leveraged Virtual Advanced features to reduce server count.
 - ✓ Virtualization provided a migration path for infrastructure technology refresh of Sunny Delight's core OS software (32-bit to 64-bit).
 - ✓ Sunny Delight has realized additional benefits from the virtual machine environment, including increased high availability and rapid provisioning.

Questions?

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