vmware®

Server Consolidation and Containment with Virtual Infrastructure and BlueArc

Computing Challenges Today

To meet the constant demand to deploy, maintain and grow a broad array of services and applications, IT organizations must continually add new servers. However, as a consequence of purchasing more and more servers, organizations face a growing server sprawl presenting challenges that include:

- **Rising Costs.** In addition to the expense of adding new hardware, organizations pay more for power, cooling, network infrastructure, storage infrastructure, server administration, data center upgrades and new data centers.

- **Poor return on investment.** The common practice of dedicating a single server to each x86 application and sizing it for peak loads has led to severe underutilization of server assets in most data centers.

- **Decreasing manageability.** Managing servers becomes increasingly difficult as the number of servers grows and the number of applications continue to multiply.

- **Reduced efficiency.** As server sprawl increases, IT organizations are forced to spend more time on reactive tasks such as server provisioning, configuration, monitoring and maintenance.

Consolidating and Containing Servers

VMware® Infrastructure meets the challenges of server sprawl and underutilization by reducing hardware and operating costs by as much as 50%. A virtual infrastructure also simplifies server deployment and automates resource management to optimize capacity and infrastructure management.

VMware virtualization technology makes it possible to package a complete x86 server into a portable virtual machine package. Multiple virtual machines can then run simultaneously and independently on a single x86 server with consolidation ratios often exceeding five virtual machines per host processor.

Benefits of Server Consolidation and Containment

More than 100,000 customers—including 100% of the Fortune 100—rely on VMware virtualization solutions and realize benefits such as:

- **Dramatically lower costs.** IT organizations can reduce hardware and operating costs by as much as 50% from implementing a VMware server consolidation solution. Fewer servers also means lower costs for administration, power, cooling and data center infrastructure.

- **Boosted utilization and availability.** VMware Infrastructure aggregates x86 server resources into pools that can reliably
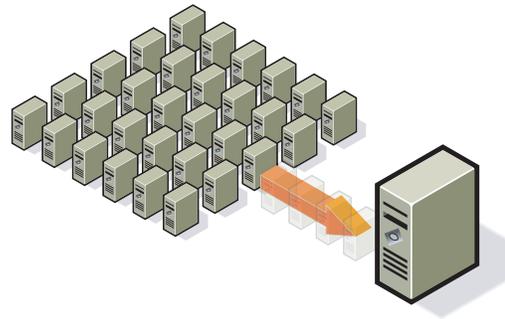
support CPU utilization exceeding 80% with the continuous load balancing provided by VMware DRS. If a physical server goes down, all the virtual machines on that hardware will migrate automatically and restart upon another physical server within the resource pool, via VMware High Availability (HA).

- **Improved manageability and reliability.** VMware Infrastructure reduces data center complexity by reducing the number of servers that IT organizations need to manage. Meanwhile, the VMware hypervisor sets the standard for reliability. Instances of ESX Server have been running in production customer environments for more than three years without a second of downtime.

- **Simplified server provisioning and workload deployment.** IT departments can reduce the time it takes to provision new servers by 50-70%. Virtual machines are as easy to copy as software files and are hardware independent, so deploying new workloads takes minutes instead of days.

- **Increased IT efficiency.** A VMware solution streamlines and eliminates common administrative tasks enabling IT organizations to manage a growing server environment with existing resources.

- **Improved ability to handle future growth.** Because a VMware solution eliminates the need to dedicate a physical server to each workload (or server application), organizations can more effectively monitor growth in relation to utilized capacity.

Learn More

To learn more about VMware solutions and products, visit http://www.vmware.com or call 1-877-4VMWARE.

BLUEARC ®

Optimize and Simplify VMware Storage Infrastructure with BlueArc NAS NFS Systems

BlueArc Corporation
www.bluearc.com

Partner Overview
BlueArc is the leading provider of high performance NFS network storage systems to enterprise markets, as well as data-intensive markets.

Key Business Needs
IT environments looking to achieve new efficiencies through the following infrastructure approaches: server virtualization with VMware, server consolidation, business continuity with VMware® VMotion™, scalable & high performance VMware environments.

Key Business Benefits
The simplicity of a virtualized shared storage resource like BlueArc parallels the VMware approach to a shared server using VMware ESX® and VMware vSphere™. When the two are used in tandem, the combination provides powerful economic advantages & operational flexibility. This ensures resources are efficient at all levels of IT infrastructure from application to storage.

Business Results
BlueArc enables companies to expand the ways they explore, discover, research, create, process and innovate in data-intensive environments. BlueArc products replace complex and performance-limited products with high performance, scalable and easy to use systems capable of handling the most data intensive applications and environments.

VMware & BlueArc
The scalable, easy to implement, operate, and manage BlueArc NAS creates the perfect tandem for VMware environments.

Products
BlueArc Mercury and Titan NAS systems are verified through VMware testing for the following VMware connectivity options:

- VMware with NAS-based NFS
- VMware ESX, VMware vSphere 4, VMware Infrastructure 3 & 4, VMware HA, DRS, SRM, VMotion, Storage VMotion

Partner Products
- BlueArc Mercury and Titan NAS Systems and Software

VMware Storage Challenges Today

VMware has fundamentally changed the very nature of server deployment, provisioning, and operations making it incredibly simple, easy, and amazingly fast. Add VMware's exceptional increase in application availability and the result is a paradigm shifting technology. Change historically brings with it unintended consequences. The success of VMware has put unprecedented pressure on storage systems; challenging their management in ways that were not anticipated.

- **Individual Virtual Machine SAN Storage QoS.** VMware ESX® & VMware vSphere™ virtualizes storage LUNs so they can be sliced, diced, and shared. But, when multiple virtual machines are sharing the same LUN or LUNs, those LUNs cannot discriminate among them. This means individual virtual machines may experience queuing, variable storage response times, and even storage timeouts if another LUN is storage I/O intensive.

- **Complex SAN datastore provisioning.** SAN storage provisioning has many more steps than VMware server provisioning and has no "golden image" equivalent. There are far more manually intensive steps then most VMware admins are used to or comfortable with.
  - Set up LUN
  - Set up of RAID set for the LUN
  - Assign LUN to VMFS data store
  - Virtualize LUN
  - Assign virtual LUN(s) to each VM
  - Thin provision each virtual LUN
  - Set up FC or iSCSI multi-pathing
  - Set up FC zones, hard zones, & overlapping zones
  - Set up a duplicate SAN & zones for load balancing & change management
  - Use storage

- **Difficult Virtual Machine storage LUN scaling.** Scaling the capacity of the assigned storage LUNs requires either scheduled virtual machine downtime, or storage system virtualized storage LUNs. This creates multiple layers of LUN virtualization that makes performance troubleshooting an extensively time consuming exercise at best or incredibly frustrating at worst.

- **Disappointing performance.** SAN storage LUN performance is best with sequential I/O and throughput. Random I/O is its weakest performance. Unfortunately, random I/O is what multiple virtual machines provide to SAN storage LUNs.

BlueArc's Inimitable Solution

BlueArc NAS systems are known for their scalability and are globally recognized as the industry leader in NFS performance storage. And BlueArc NAS systems are the only ones that keep running at maximum performance even after system object management limits have been met so your virtualized applications never slow down. But BlueArc NAS systems go far beyond just high performance to solve the storage challenges in VMware environments.

- **Eliminate Virtual Machine Storage QoS issues.** VMware's storage virtualization layer has NFS built-in. NFS becomes the datastore thus eliminating the requirement to setup, implement, or operate VMFS datastores. BlueArc's NFS storage views each virtual machine individually and can prioritize them based on policy or configuration to better match the I/O load.

- **Drastically simplifies datastore provisioning.** BlueArc NFS system storage provisioning is as easy or easier than even VMware server provisioning which is self-evident by examining the steps:
  - Set up NFS datastore on BlueArc NAS
  - Assign to VMware vCenter™
  - Set up trunking (if necessary) on server and switch
  - Use storage

- **Makes scaling painless.** BlueArc's NFS systems scale into the petabytes and doing so is incredibly easy with no virtual machine disruptions or downtime.
  - Increase the capacity on BlueArc NFS side
  - Refresh virtual machine storage
  - Use newly provisioned storage

- **Jaw-dropping performance.** In general, NFS NAS is optimized for random I/O performance, which matches the I/O characteristics of multiple virtual machines. BlueArc NFS is uniquely embedded in silicon as part of BlueArc's SiliconFS, making the performance of NFS random I/O unmatched.

- **Transparent storage tiering.** BlueArc provides automated and transparent storage tiering to help reduce rack space, data center floor space, and power and cooling consumption. And because there is no need to restart applications after data has been moved to a different tier, there is no downtime.

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