VMware DRS

Dynamic balancing and allocation of resources for virtual machines

AT A GLANCE

VMware® Distributed Resource Scheduler (DRS) dynamically allocates and balances computing capacity across a collection of hardware resources aggregated into logical resource pools. VMware DRS continuously monitors utilization across resource pools and intelligently allocates available resources among the virtual machines based on pre-defined rules that reflect business needs and changing priorities. When a virtual machine experiences an increased load, VMware DRS automatically allocates additional resources by redistributing virtual machines among the physical servers in the resource pool.

BENEFITS

• Prioritize resources to the highest value applications in order to align resources with business goals.

• Optimize hardware utilization automatically and continuously to respond to changing conditions.

• Provide dedicated (virtual) infrastructure to business units while giving central IT complete control over hardware.

• Conduct zero-downtime server maintenance.

• Minimize power consumption in the datacenter with Distributed Power Management (experimental)

Resource Pool

Physical Servers

Figure 1: VMware DRS automatically and intelligently balances resources among virtual machines.

What is VMware DRS?

VMware® Distributed Resource Scheduler (DRS) dynamically allocates and balances computing capacity across a collection of hardware resources aggregated into logical resource pools. VMware DRS continuously monitors utilization across resource pools and intelligently allocates available resources among the virtual machines based on pre-defined rules that reflect business needs and changing priorities. When a virtual machine experiences an increased load, VMware DRS automatically allocates additional resources by redistributing virtual machines among the physical servers in the resource pool. VMware DRS allows IT organizations to:

• Prioritize resources to the highest value applications in order to align resources with business goals.

• Optimize hardware utilization automatically and continuously to respond to changing conditions.

• Provide dedicated (virtual) infrastructure to business units while giving central IT complete control over hardware.

• Conduct zero-downtime server maintenance

New – VMware Distributed Power Management or DPM (experimental) continuously monitors resource requirements in a DRS cluster. When resource requirements of the cluster decrease, it consolidates workloads to reduce power consumption by the cluster. When resource requirements of workloads increase, DPM brings powered-down hosts back online to ensure service levels are met.

Distributed Power Management allows IT organizations to:

• Cut power and cooling costs in the datacenter

• Automate management of energy efficiency in the datacenter.

How Does VMware DRS work?

VMware DRS dynamically allocates and balances computing capacity across collections of hardware resources aggregated into logical resource pools. VMware DRS continuously monitors utilization across the resource pools and intelligently allocates available resources among virtual machines.

VMware DRS allows users to define the rules and policies that decide how virtual machines share resources and how these resources are prioritized among multiple virtual machines. When
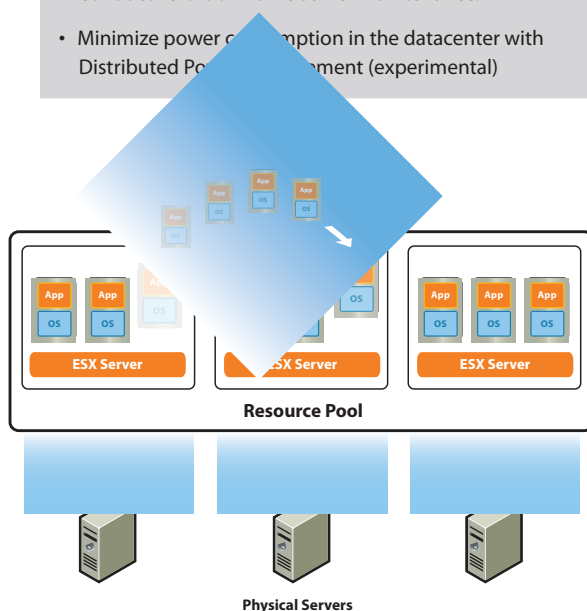
a virtual machine experiences increased load, VMware DRS first evaluates its priority against the established resource allocation rules and policies, and if justified, allocates additional resources. Resources are allocated to the virtual machine by either migrating it to another server with more available resources or by making more "space" for it on the same server by migrating other virtual machines to different servers.. The live migration of virtual machines to different physical servers is executed completely transparent to end-users through VMware VMotion.

VMware DRS can be configured to operate in either automatic or manual mode. In automatic mode, DRS determines the best possible distribution of virtual machines among different physical servers and automatically migrates virtual machines to the most appropriate physical servers. In manual mode, VMware DRS provides a recommendation for optimal placement of virtual machines, and leaves it to the system administrator to decide whether to make the change.

Flexible hierarchical organization of resource pools allows administrators to match available IT resources to the needs of the business organization. Individual business units can receive dedicated IT resources while still benefiting from the efficiency of resource pooling. Robust access privileges make it possible to delegate routine infrastructure tasks for a business unit resource pool to a business unit system administrator.

New –Distributed Power Management (experimental)

Distributed Power Management is a new module within DRS which makes recommendations or decisions to power off or power on hosts to save energy. These recommendations are based on virtual machine resource demand, host resource capacity and user-defined reserve resource capacity. Depending on whether you choose automatic or manual mode for DPM, it will put hosts in standby mode or recommend it if total resource demand plus user-defined reserve capacity is less than the total available host resource capacity in the cluster.

When resource demand in the cluster increases, DPM will bring hosts back online so virtual machines can utilize their capacity. DPM uses wake on lan to bring hosts back online.

How Is VMware DRS Used in the Enterprise?

- **Align IT resources with business priorities.** Define rules and policies to decide how resources should be prioritized among virtual machines. VMware DRS dynamically and intelligently allocates IT resources to the highest priority virtual machines to ensure optimal alignment between business and IT.

- **Guarantee IT autonomy and service levels to business organizations.** Provide dedicated IT infrastructure to business units while still profiting from higher hardware utilization through resource pooling.

- **Dramatically increase system administrator productivity.** Enable a single system administrator to monitor and effectively manage a large pool of infrastructure resources.

- **Automate hardware maintenance.** Place a physical server in maintenance mode and VMware DRS will automatically migrate all virtual machines to other physical servers, allowing server maintenance with zero downtime.

- **Easily add and deploy new capacity.** Add new physical servers to a resource pool and VMware DRS will automatically take advantage of the additional capacity by redistributing virtual machines among the servers.

- **NEW: Reduce power consumption in the datacenter.** Consolidate workloads during off-peak hours and power off hosts to make datacenters more energy efficient.

Key features of VMware DRS

- **Resource pools with VMware DRS.** Aggregate disparate hardware resources into unified logical resource pools. With VMware DRS, resource pools are automatically and intelligently optimized to ensure that IT resource allocation matches business priorities while maximizing hardware utilization.

- **Abstraction of resources from hardware.** Manage resources independently of the physical servers that contribute the resources.

- **Flexible hierarchical organization.** Organize resource pools hierarchically to match available IT resources to the business organization. VMware DRS ensures that resource utilization is maximized while business units retain control and autonomy of their infrastructure. Resource pools can be flexibly added, removed, or reorganized as business needs or organization change.

- **Isolation between resource pools.** Make allocation changes within a resource pool without impacting other unrelated resource pools. For example, any allocation changes in the resource pool dedicated to a given business unit do not impact other resource pools.

- **Access control and delegation.** Secure resource allocation at different levels in the company while eliminating bottlenecks. Virtual machine creation and maintenance for a business unit can be delegated to a business unit system administrator thus eliminating reliance on central IT for every routine operation.

- **Management of sets of virtual machines running a distributed application.** Optimize the service level of distributed applications by controlling the aggregate allocation of resources for the entire set of virtual machines running the distributed application.

- **Manual and automatic mode.** VMware DRS collects resource usage information from servers and virtual machines, and then generates recommendations to optimize virtual machine allocation. These recommendations can be executed automatically or manually.

- **Initial placement.** When a virtual machine is first powered on, VMware DRS either automatically places the virtual machine on the most appropriate physical server or makes a recommendation.

- **Continuous optimization.** VMware DRS continuously optimizes resource allocations based on defined resource allocation rules and resource utilization. The resource allocation changes can be automatically executed by performing live migration of virtual machines through VMotion. Alternatively, in manual mode, VMware DRS provides execution recommendations for system administrators.

- **Maintenance mode for servers.** Perform maintenance on physical servers without disruption to virtual machines and end users. When a physical server is placed in maintenance mode, VMware DRS identifies alternative servers where the virtual machines can run. Based on automation mode settings, the virtual machines are either automatically moved to use the alternative servers, or the system administrator performs the move manually using the VMware DRS recommendations as a guideline.

- **Affinity rules.** Create rules that govern the allocation of virtual machines to physical servers. For example, certain virtual machines can always run on the same server for performance reasons. Alternatively, specified virtual machines can always run on different servers for increased availability.

- *New* – **Power Management.** Reduce energy consumption in the datacenter by using Distributed Power Management (experimental) to consolidate workloads and power off power consuming servers. DPM can be configured to make recommendations for power on or power off based on user-defined period of resource load history. For example, power off decisions can be based on 1-2 hours worth of resource load history and power on decisions can be based on 5- 15 minute resource load history.

How Can I Purchase VMware DRS?

- VMware DRS is included VMware Infrastructure 3 Enterprise.

For more information on how to purchase, refer to the "How to buy" page http://www.vmware.com/products/vi/buy.html

Product Specifications and System Requirements

VMware DRS requires ESX Server, VirtualCenter Management Server, and VMotion.

For detailed product specifications and system requirements refer to the System Requirements chapter in the VMware Infrastructure Installation and Upgrade Guide and the Resource Management Guide located at http://www.vmware.com/support/pubs/vi_pubs.html.

"The 'set it and forget it' automation aspect of VMware HA and DRS will enable us to automatically allocate resources as needed, whenever needed, all without our intervention."
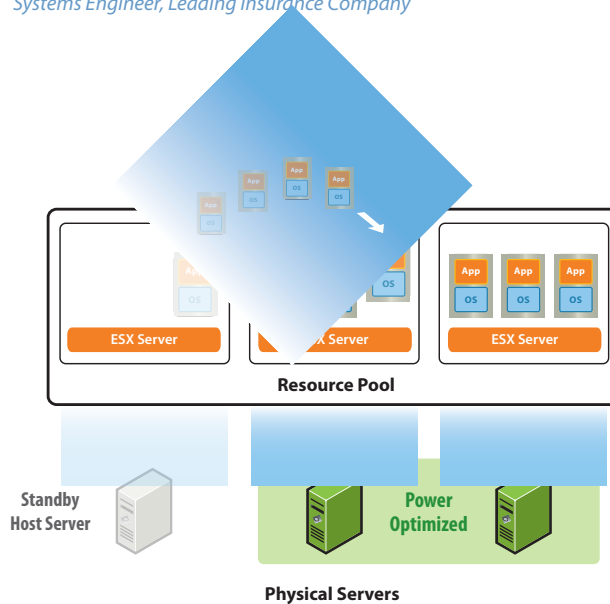
Systems Engineer, Leading Insurance Company

Figure 2: Distributed Power Managemant automates energy efficiency for a green data center.

For more information on Virtualization Performance, you can reach us at:
Website: www.virtualizationperformance.com
Sales: (866) 496-4560
Tel: (813) 805-8750
Fax: (813) 436-5301