RED HAT® CLOUDFORMS™

CLOUD RESOURCE MANAGEMENT THE RIGHT WAY

TECHNOLOGY BRIEF

HOW TO EFFECTIVELY OPTIMIZE VIRTUAL INFRASTRUCTURE AND PRIVATE AND HYBRID CLOUD RESOURCES

INTRODUCTION: CAPACITY PLANNING AND RESOURCE MANAGEMENT

Enterprise IT infrastructures are being transformed into dynamic, virtual infrastructures to enable increased agility, lower costs, and higher service levels. However, while these new shared infrastructures combine virtualization, resource aggregation, logical allocation, dynamic workload relocation, and settings reconfiguration, they also introduce significant complexities to resource management and capacity planning.

And while resource utilization data in a virtual infrastructure can be obtained using new, virtual-aware techniques, this data alone is insufficient to manage, optimize, and plan the virtual infrastructure. Unfortunately, many IT management tools and approaches were never designed for these new environments and many traditional tools cannot keep up with the real-time changes that occur in virtual environments. To manage and control virtual environments you need new management tools and approaches.

In addition, this quantitative capacity and utilization data lacks the qualitative information necessary to answer complex questions like:

- Why is server utilization increasing? What changes were responsible for the increase in demand or decrease in capacity? Were VMs added? Did hardware change?

- Why is SAN utilization dramatically increasing? Which users or groups are responsible for the increase? What is on the SAN and who owns it?

- How many more VMs can the infrastructure support? How many VMs are being retired? How many VMs are under-utilizing their resource reservations?

- Why are some VMs performing well and others poorly when they were all derived from the same source? What's different? When did the changes happen?

Performance and utilization data alone cannot provide answers to questions like these. Instead, you need qualitative information that enables:

- Resource utilization data to be correlated with virtual configuration information, VM life cycle tracking, and infrastructure events.

- An understanding of when VMs will be added and retired so that you can plan for future capacity.

- Storage capacity management, eliminating unregistered VMs, managing disk allocation, and managing free space within the VMs.

- Storage utilization, insight into the disk I/O, and optimized access to VMs

CLOUDFORMS DELIVERS:

- Rapid time-to-value

- Utilization tracking and trending for: clusters, resource pools, storage, hosts, and VMs

- Reasons for utilization changes (utilization data correlated with configuration information)

- Trending information that predicts when capacity will be exceeded

- Storage usage information

CLOUDFORMS ANSWERS:

- Where do I have excess capacity?

- Where is utilization high, low, and expected?

- When will I need to add additional capacity?

- What was the impact of VM configuration changes?

- How are VM snapshots affecting capacity and utilization?

- Why is response time increasing if the underlying virtual resources supporting the service haven't changed?

TECHNOLOGY

CloudForms, Red Hat's comprehensive Infrastructure-as-a-Service (IaaS) Cloud Management offering, enables IT administrators and managers to optimize their virtual infrastructures with advanced capacity planning and sophisticated resource management capabilities. By combining extensive configuration information and operational event data with utilization and performance statistics, CloudForms uniquely addresses both the quantitative and the qualitative management requirements enterprises need to get the most out of their infrastructure investments with the lowest management costs.

FEATURES AND CAPABILITIES

CloudForms captures infrastructure utilization and performance metrics and dynamically calculates capacity. This information is uniquely correlated with extensive configuration and operational data, providing a comprehensive view of the virtual infrastructure. This configuration information includes: classifications, applications, patches, virtual hardware, drift, baselining, VM events, relationship and dependency mapping, and infrastructure changes.

CloudForms enables continuous visibility and deep insight into a virtual infrastructures, providing a clear picture of what is driving both growth and change in resource utilization. It enables organizations to:

- Track cluster, resource pool, VM and host utilization, project growth.

- Identify VM resource consumption.

- Identify and limit resource consumption by category.

- Determine what changes within the virtual infrastructure are responsible for resource usage.

- Identify bottlenecks where VMs are active but no resources are available.

CloudForms enables real-time control and policy-based automation of virtual machines and infrastructures. With CloudForms, policies can be created and enforced to control and limit resource usage based on service level, life cycle stage, line of business, location, group, or user. These policies help enterprises manage and automate their virtual infrastructures and maximize their resource and storage investment.

Deep insight into the capacity and utilization of the virtual infrastructure, combined with the ability to enforce IT policies based on VMs and virtual infrastructure events, enables you to:

- Automatically retire VMs that have not been used recently, freeing up valuable resources for other VMs.

- Automatically limit resource allocation based on policies.

- Detect over-reserved memory and CPU for reclamation.

CloudForms collects and tracks capacity, utilization, and performance metrics including:

- Clusters
- Resource pools
- Hosts
- Virtual machines
- Appliances
- Virtual networks
- CPU capacity, reservations, and utilization
- Memory capacity, reservations, and utilization
- CPU-ready wait times
- Network I/O
- Disk I/O

CloudForms offers policy-based control and is automated across:

- VM configuration and operation events (e.g., VM start, stop, and migrate)
- Virtual infrastructure (VI) configuration and operation events (e.g., connect or disconnect host, place host in maintenance mode, or re-boot)
- On-demand and scheduled VI and VM management tasks

Storage utilization information that is combined with state analysis of VMs, virtual appliances, VM snapshots, and configuration files, and correlated with configuration information (e.g., classification, VM events, relationship, and dependency mapping) and infrastructure changes enables you to:

- Track storage utilization by resource type.
- Track VM disk usage and detect wasteful over-allocation or dangerous under-allocation that will create operational problems.
- Identify and analyze unregistered VMs for removal, remediation, and quarantine.
- Identify LUNs with heavy I/O activity.

Pro-active management of storage through IT policies, allows you to:

- Automatically age and retire VMs to reduce storage costs.
- Automatically delete or dismiss snapshots to reclaim space.
- Enforce allocation of storage quotas to assure cost of service.
- Migrate VMs to appropriate storage location to balance LUN I/O.

TRACK VM USAGES AND DETECT WASTEFUL OVER ALLOCATION OR DANGEROUS UNDER ALLOCATION THAT WILL CREATE OPERATIONAL PROBLEMS
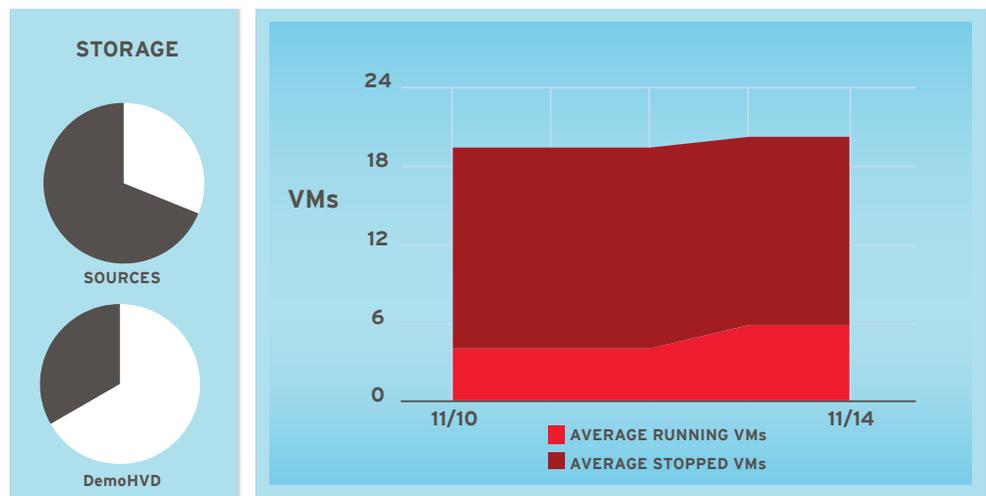
CloudForms collects and tracks storage capacity and utilization information including:

- LUNs, VMs, virtual appliances, snapshots, VMDKs, VHDs
- Discovery of "virtual debris" consuming valuable storage, including orphaned VMDKs and snapshots
- Intra-VM analysis, including disk configurations, partition information, file system type, space allocation, free space

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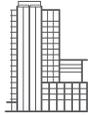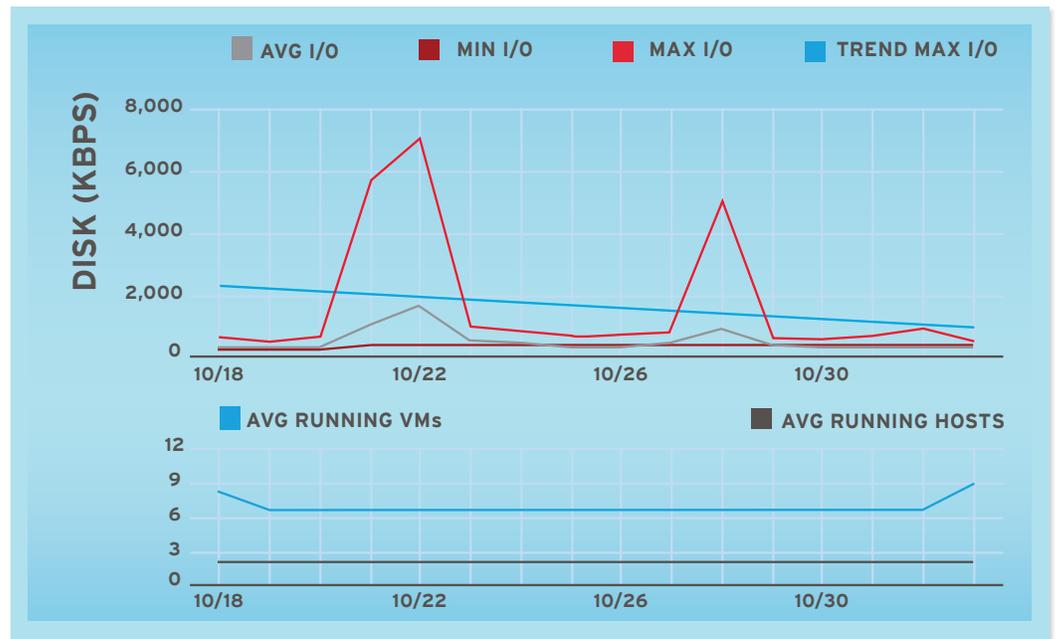
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ABOUT RED HAT

Red Hat is the world's lead-ing provider of open source solutions, using a community-powered approach to provide reliable and high-performing cloud, virtualization, storage, Linux, and middleware tech-nologies. Red Hat also offers award-winning support, train-ing, and consulting services. Red Hat is an S&P company with more than 70 offices span-ning the globe, empowering its customers' businesses.

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UNDERSTAND STORAGE UTILIZATION AT A GLANCE

Disks (3)	✓
⊞ #0	✓
⊟ #1	✓
Location	0:0
Device Name	disk
Filename	{Demo} SQL2005-3/SQL2005-
Present	true
Start Connected	true
Size	4,294,967,296 bytes
Unallocated Space	9628672
Allocated Space	4285338624
Size On Disk	
⊞ #2	✓

Volumes (2)	✓	▲
⊞	✓	✓
⊟ C:	✓	▲
Type	physical	physical
File System	NFTS	NFTS
Size	4,285,338,624 bytes	4,285,338,624 bytes
Free Space	675,086,336 bytes	675,086,336 bytes
Used Space	3,610,252,288 bytes	3,610,293,248 bytes

TRACK STORAGE UTILIZATION PER TYPE

SUMMARY

CloudForms provides IT decision makers and administrators with the insight, control, and auto-mation necessary to optimize resources, understand utilization, and plan for the future capacity needs of their virtual infrastructures.