

## VM Optimization: Find the Balance

Your guide to right-sizing and waste-finding in the virtual environment.



### INTRODUCTION

Everything in life seems to be about finding that sweet spot where everything hangs in perfect balance. Your virtual environment is no different. In this case, it's all about capacity lifecycle management, which can be broken down into four phases:

- **Capacity planning.** Forecasting your long-term resource requirements is critical so you can plan, budget and procure what is needed over time.
- **Capacity allocation.** When business units within your organization come to you and ask for IT help, your job is to create virtual machines (VMs) and assign resources, such as CPUs, RAM and storage, to handle specific tasks. Without a good capacity allocation process — and experience with those specific tasks — your team has no way to arbitrate requests and simply has to assign the resources as requested.
- **Capacity optimization.** Once a VM has been set up to run a particular workload, it's important to periodically review how the allocated resources are actually being used. Does the VM have the appropriate amount of CPU, memory and disk space? Or are

there wasted resources in this particular environment? This review process is called “right-sizing” the environment and is key to realizing the promise of virtualization — plus it can help you save on capital and operational costs.

- **Capacity maintenance.** Even when you think you have optimized your virtual environments, things can get out of sync over time. You may have an increase in the number of users accessing the environment. The size of the database may grow, so you probably have to add more resources in terms of CPU or memory. That's why ongoing capacity maintenance is important.

This white paper dives deeper into the optimization phase of capacity lifecycle management and explores various options for getting the best performance from your virtual environments.

### THE NITTY-GRITTY OF OPTIMIZATION

Part of the system administrator's role is, obviously, to assist business units and teams by setting up IT resources to get work done. But it's not always possible to gauge the true needs from a request. The business strategist may communicate the need quite clearly from his or her team's point of view, but translating

that into IT resources can be a challenge, especially in terms of how much virtual space to allocate. Virtualization technologies have not been around all that long, so you don't always have a precedent to draw from.

Achieving optimal resource allocation requires deep knowledge on both the business and IT sides of the fence, but it also requires keeping tabs on the virtual environment over time and tracking how resources are being used. The optimization process includes taking steps to right-size each VM in terms of CPU, memory and disk space, as well as finding waste, such as excess storage or VMs that are not doing any work, and reclaiming those resources for other purposes.

Here are a few key areas to pay careful attention to, and related questions to ask, when working on capacity optimization:

- **VM density.** How many VMs do you have per host?
- **Disk space.** How much has been allocated, and is it being utilized or is it sitting idle?
- **Zombie VMs.** Are there VMs running that aren't being used at all?
- **Service level.** Are you taking a proactive approach to meeting your service-level objectives (SLOs) or service-level agreement (SLA) with each customer? Does your sluggish system or poorly allocated resources get in the way?
- **Resource utilization.** Do you track how the business units use the resources you give them? How do you plan for the future?

Let's walk through each of these areas.

### VM DENSITY

VM density is the number of VMs divided by the number of hosts and servers you have. Why is this important? VM density reflects how effectively you are using your virtualized environment. Obviously, the fewer servers you have, the less money you have to spend on the servers, so from the standpoint of capital expenditures and operations, it's critical to find the balance — and that ratio can be difficult when it comes to meeting all of your organization's business needs.

But truly finding this balance is what realizes the promise of virtualization. Prior to virtualization, everything existed in the physical environment. Admins always had to leave enough just-in-case resources available because the physical environment wasn't fluid. Often, these excess resources were never actually used. The fluidity of virtualization, on the other hand, enables you to run a high-density environment, so that you are actually using all the resources you've allocated.

It's important to get VM density right. Too few VMs will result in bad user experiences. Too many VMs will result in not utilizing all the available resources.

### DISK SPACE

Keeping track of how your disk space is being used is also important. Over-allocated virtual files, abandoned templates, powered-off VMs and other culprits all create unused disk space. Why does this matter? While disk space is not as expensive as it used to be, managing terabytes of storage can be burdensome. Also, if you can reclaim some of your unused storage, you can reduce capital expenditures, and that's always a good thing.

### ZOMBIE VMs

Sometimes when a project wraps up, customers don't always follow up with IT to let the admin know that they no longer need the resources. So there will be these zombie VMs languishing in the virtual environment. VMs consume resources even when they aren't doing any work. Over time, the power required to run them and the memory allocated adds up, as does the allocated storage. A critical part of capacity optimization is reviewing all of your VMs and identifying any that are no longer in service, then either reallocating or eliminating those resources.

### SERVICE LEVEL

Providing the best possible service to your customers means being proactive and anticipating problems before they actually happen. Taking care of the business and running an efficient IT environment are required for meeting today's standard for an acceptable SLA. Automating day-to-day tasks and creating an alert system for when things

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get off track go a long way toward keeping customers happy. And that's really important for an IT organization these days. In addition, finding the right balance between the number of VMs within your environment and the number of administrators on your team can help you meet your SLOs and SLAs much more easily. Virtualization tools can help streamline your optimization processes regardless of the size of your team.

## RESOURCE UTILIZATION

It's critical to review your virtual environment to ensure that you have the right amount of resources allocated toward each VM. If you allocate too many resources, just to be safe, you will have excess capacity that is wasted or that could be used to create new VMs — because you will always get new requests to run additional workloads. If you don't allocate enough resources, your systems will get bogged down. But if you're efficiently using your resources for your current virtual landscape, you will not need to purchase additional servers and other resources as often.

## CONCLUSION

These five areas provide key opportunities for capacity optimization. The right virtualization tools can help you find the ongoing balance your organization needs to right-size all of your VMs with the appropriate amount of CPU, memory and disk space; find wasted resources and reallocate them toward more strategic purposes; troubleshoot performance bottlenecks; and pinpoint up-to-the-day resource utilization to help with capacity planning. From there, being able to calculate costs associated with running a VM for a particular workload and then sharing reports with each business unit underscores your team's value to the organization's overall bottom line.

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