

The virtualization solution



its manageability benefits for your business

Managing a company's servers can be a source of headaches. As your business grows, and as you buy or lease new servers to run the applications that support this growth, the headaches can increase. You have more machines to maintain, upgrade, and fix when problems arise. Wouldn't it be great if you could increase your server technology without adding to maintenance time so you could concentrate on your core business issues? Server virtualization allows you to take a large step in that direction.

Virtualization greatly simplifies the management of your server infrastructure. This is especially useful for a small company who can't dedicate multiple employees to server management. In the following pages, we explore how virtualization benefits the management of your company's server infrastructure, and discuss specific advantages the Dell 2-2-1 solution and Microsoft System Center Essentials 2010 provide in this context.

After you read this paper and understand better how virtualization can simplify server management, you can learn more by exploring the other reports in this series. The Benefits video and study are especially helpful places to start. To view them, just click the different report tabs at the top of this page.

MANAGING YOUR COMPANY'S SERVERS

In today's dynamic business environment, information must be available when you need it. Any disruption in availability is costly—in terms of money, lost opportunities, or both. Like any machine, servers need routine maintenance in order to operate reliably around the clock, year after year. Effective server management anticipates and responds quickly to changing business needs, keeps servers optimized and operational at all times, and ensures that important data is always accessible.

What is involved in managing a server infrastructure? While many management tasks are necessary in both virtualized and non-virtualized (physical) server environments, they become considerably easier after virtualization, when you have replaced the physical servers running separate applications with one or two physical servers running virtual machines (VMs).

Maintenance activities fall into two categories: those related to hardware, including physical servers, storage, and network; and those related to software, particularly the operating system (OS) and applications. Each group includes tasks related to periodic maintenance, deployment, and repair. Let's examine these tasks.

IT staff must regularly maintain hardware—carrying out tasks such as cleaning vents and fans, running hardware diagnostics, and addressing problems by replacing any components that have failed or are likely to fail soon. They also deploy new servers, which includes purchasing or leasing the servers, installing them, configuring and testing them, and loading OS and application software onto them.

On the software side, IT staff must keep servers up to date by applying updates and patches. Maintaining software also includes managing applications—installing them, deploying them, and granting access to users. When software fails, maintenance tasks can include restoring data from backups and bringing the system back to an operational state.

Figure 1 breaks down the common tasks IT staff must perform in both a traditional physical environment and in a virtualized one. With fewer physical servers hosting all of your VMs, there is much less repetition of steps, making the process considerably easier!

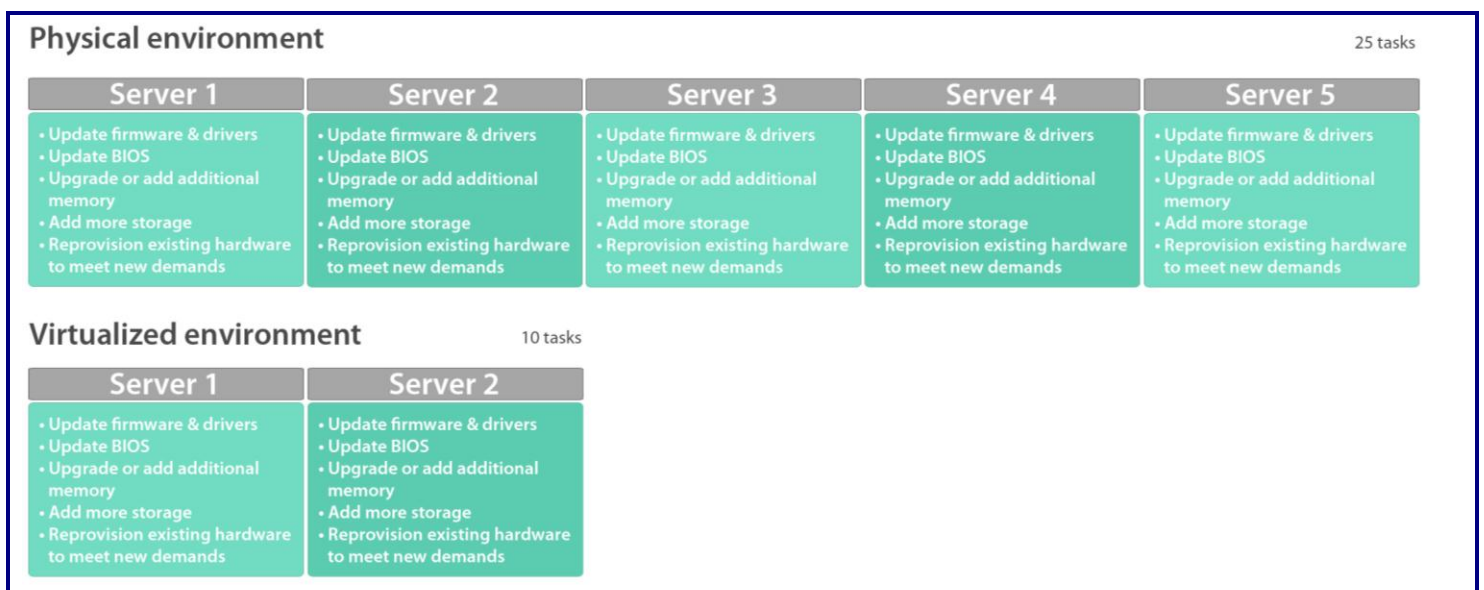


Figure 1: Virtualizing greatly reduces management tasks compared to a traditional physical server environment.

Virtualization minimizes maintenance for hardware because it reduces the amount of hardware to maintain. This minimizes the physical tasks (e.g., adding a disk, changing disk space, or swapping a device for another) that are time consuming, error prone, and that require physical access to the server. In the virtual machines themselves, you can accomplish these tasks with just a few clicks of the mouse. Virtualization allows you to move and reassign hardware resources to virtual machines in an extremely simple and flexible manner.

HOW VIRTUALIZATION SIMPLIFIES SERVER MANAGEMENT

The routine tasks your IT employee performs consume less overall effort and time in a virtualized environment. And, as your business and data needs grow, virtualization provides the easily managed flexibility to respond to your needs: no longer must you purchase and set up a new physical server for each new business application you require. Furthermore, the day-to-day management of VMs is much simpler than that of physical servers, leaving more time for your IT staff to concentrate on improvement and innovation of your IT infrastructure.

Dell understands the impact of virtualization for small businesses. In collaboration with Microsoft, Dell has created a set of virtualization solutions to help companies like yours reap the cost and efficiency benefits virtualization brings. Dell 2-2-1 solutions based on Microsoft® Windows Server® 2008 R2 Service Pack 1 with Hyper-V™ and System Center Essentials 2010 provide an excellent balance among reliability, efficiency, and cost, while greatly simplifying server, storage, and data management.

The Dell 2-2-1 solution is a high availability (HA) solution¹ consisting of two Dell PowerEdge™ R410 servers and two Dell PowerConnect™ 5524 network switches, which all connect to a Dell PowerVault™ MD3200i storage array. As the term high availability implies, the redundant configuration of two servers, two switches, and storage array (redundant because it has multiple power supplies and can run with failed drives) will continue to run if any single component fails. Figure 2 illustrates this configuration.

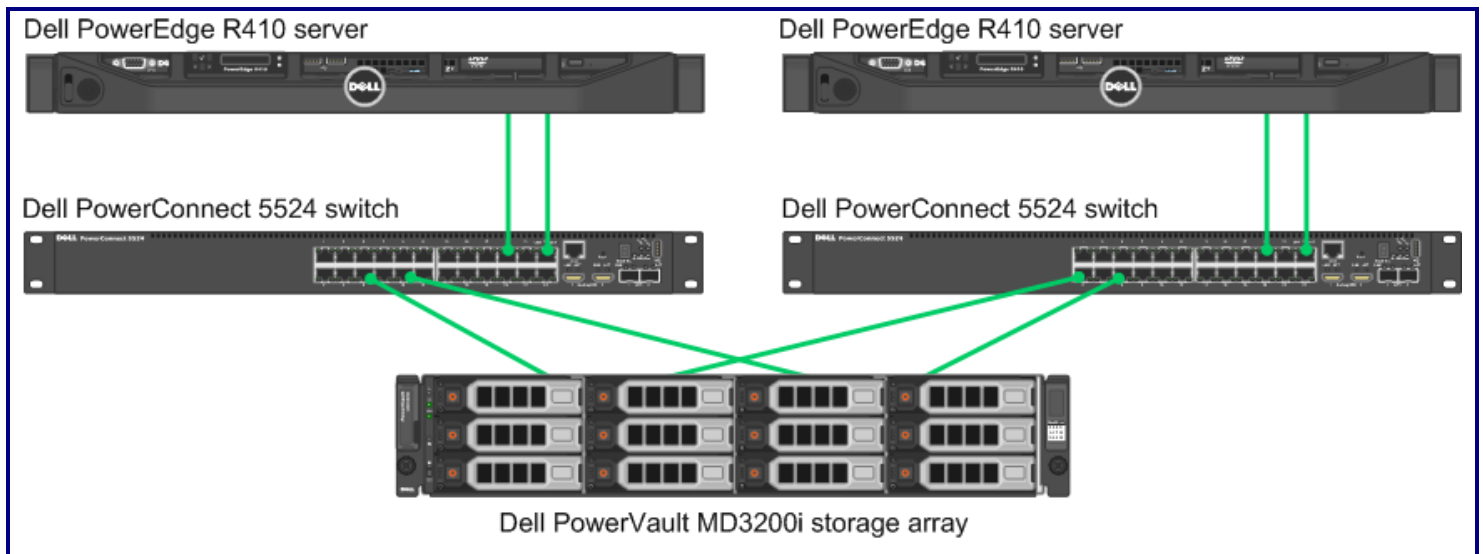


Figure 2: The Dell 2-2-1 solution.

¹ See the Benefits of Virtualization white paper for an explanation of HA solutions.

Below, we describe some of the more significant ways the Dell 2-2-1 solution simplifies managing your server installation.

Manage your servers from a single location

The more physical servers you have, the more complicated managing and maintaining them becomes. With virtualization, you centralize server management, so that you can easily maintain, control, and configure your servers from a single location. The Dell 2-2-1 solution includes centralized management options that allow you or your employees to automate numerous aspects of your server environment. You can automate power management, balance workloads on your various virtual machines, convert a physical server into a virtual machine, provision new servers, and migrate VMs from a failed server to an active one.

The Dell 2-2-1 solution can include Microsoft products that further centralize server management, such as Microsoft System Center Essentials 2010. As Figure 3 demonstrates, management solutions such as System Center Essentials can act like a universal remote control to easily manage both physical and virtual servers from a single location. Dell also provides “embedded management” on its PowerEdge R410 servers. This means that all the management tools an IT employee needs are on the server, so there is no need for disks, which can be lost or scratched. These embedded management tools span all stages of management: installing, configuring, monitoring, updating, repurposing, and deactivating a server or servers.

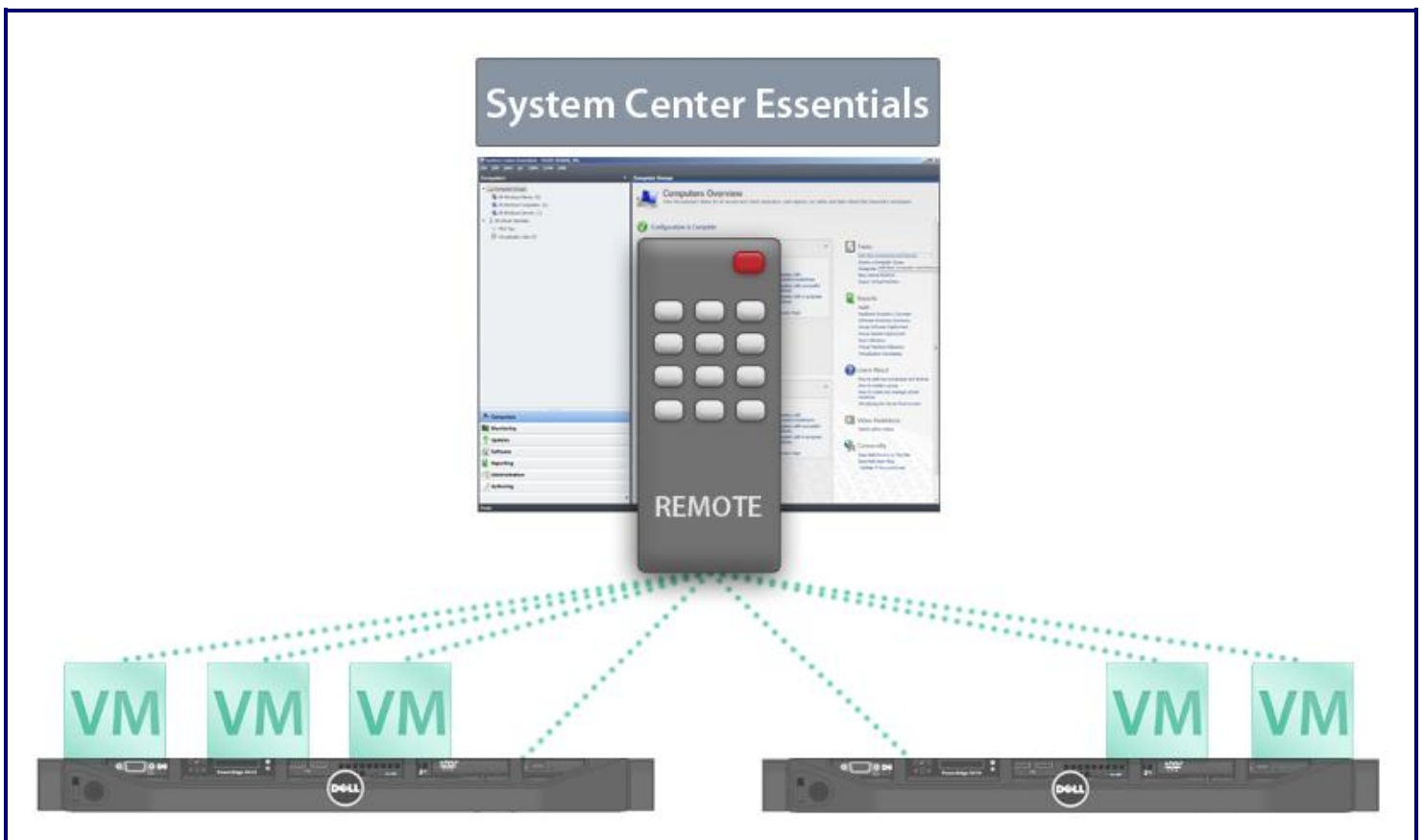


Figure 3: The management server, with Microsoft System Center Essentials, lets you manage your servers and VMs easily from a single location.

Maintain a flexible IT environment

Traditional server environments make it difficult to be flexible – something as simple as adding a new application could require provisioning a new server and all that comes along with it. With the Dell 2-2-1 solution, you can easily create, activate, or decommission your virtual machines at any point. Your IT environment suddenly becomes extremely flexible! Your only constraints are how many virtual machines are running simultaneously and how much of the physical server resources they are using. As long as sufficient resources for a specific virtual machine are available, you can start the VM and begin using it. Contrast this with an installation of physical servers, where bringing new servers into operation is not only costly, but also add time-consuming physical configurations that are prone to error.

Avoid unpleasant surprises

Virtualization minimizes your risk of unexpected server issues, such as when a new application you are testing fails and affects your IT operation. In a virtualized environment, such as the Dell 2-2-1 solution, you can test new applications on a VM before deploying them, without affecting the environment. If the application crashes the VM, you can restart the VM through a few clicks of the mouse. Your VM is effectively isolated from other VMs and from critical system components so it cannot affect any critical data in other systems. More importantly, you need not assign and set up a physical server to do your testing. Because tasks such as these do not interfere with your day-to-day operation, your IT environment becomes more stable. Testing an application consumes only the unused processing power of your physical host server, which is usually plentiful. The stable nature of an HA solution means that in most cases, you can quickly generate a new VM to handle unexpected tasks, such as running data recovery tools on the shared storage.

Figure 4 shows how a virtualized environment lets you avoid unpleasant surprises, and how it is highly flexible.

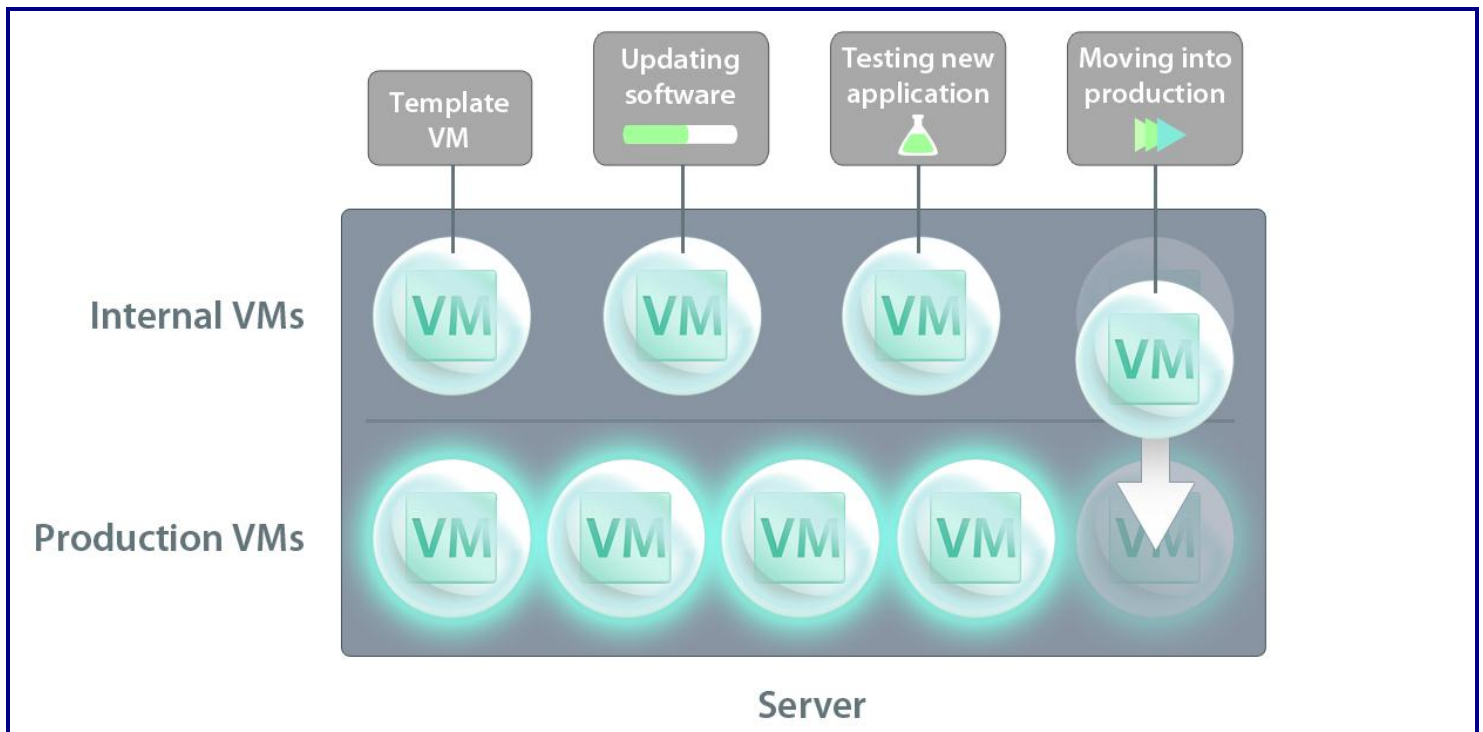


Figure 4: In a virtualized environment, each VM operates without affecting the others, giving you flexibility to meet all your needs while allowing you to avoid crashes and downtime.

Anticipate your changing business needs

Part of effective management is coping with inevitable change while preparing for the future. Virtualization makes it much easier to change your server infrastructure in response to new business needs. This might take the form of reallocating resources within your current server infrastructure. The Dell 2-2-1 solution lets you test, deploy, and launch new applications or virtual servers in a matter of hours, not weeks. You can change server resources as needed—increasing or decreasing virtual disk drive sizes, creating new virtual drives, connecting or disconnecting virtual resources (e.g., a printer) to a server, assigning or removing virtual resources to or from any VM. You can also migrate active VMs from one physical server to another, add or remove storage from an active VM with no interruption of service, and reallocate memory between virtual servers or enable Dynamic Memory, an added feature of Service Pack 1 in Windows Server 2008 R2 that automatically directs more memory to the virtual server that most requires it at any given time. Having these options and more makes it easy to confidently consolidate more VMs to a single physical host server and to roll out new servers as you need them.

Easily upgrade, update, and repair

Because a virtualized server environment lets you easily move virtual servers onto whatever physical host server you choose, you avoid being locked into aging hardware, as often happens with a traditional physical server setup. With the Dell 2-2-1 solution, you can easily move your VMs and virtualized servers onto newer hardware as necessary to get better performance and to accommodate business growth. The Dell solution provides you with a wide choice of upgrades and hardware components, largely because Dell builds its solutions with open standards and integration in mind. Dell 2-2-1 solutions are compatible with some of the top virtualization products from Symantec™, Microsoft, and other leading companies. Updates and repairs on Dell 2-2-1 solutions are also easy. In part, less hardware means fewer computers or servers that can fail and require updates or repairs. The automated update capabilities in Microsoft System Center Essentials, handle the updating on your virtual servers, making updates a breeze.

Keep data available 24/7

Businesses depend heavily on prompt around-the-clock access to their critical data. IT failures can be extremely costly. Fortunately, the highly redundant HA nature of Dell 2-2-1 solutions makes total hardware failures unlikely. In addition, if an application fails and causes its virtual machine to crash, the failure does not directly affect other virtual machines or servers. The risk of data unavailability is contained in HA virtualized settings. Windows Server 2008 R2 with Hyper-V helps your server network attain high availability with failover clustering, where a server that malfunctions “fails over” to another server. This process occurs immediately after the malfunctioning server goes offline, enabling the failover process to occur with very little application downtime. A high availability infrastructure is easier to manage, because it keeps your data up and running on its own at any time of day, with no immediate intervention needed from your IT staff.

Storage in a virtualized environment

The final piece to the Dell 2-2-1 solution is network storage, such as the Dell PowerVault MD3200i, a necessity for any company that wants to maximize the potential of virtual machines and be able to move them flexibly from one server to another. Using traditional direct-access storage limits the server locations to which your VMs can move. Network storage ensures that data is accessible from any host server on that network. Fully virtualizing the

infrastructure from servers to storage and network, as the Dell 2-2-1 solution does, lets you maximize the flexibility of managing your IT resources.

CONCLUSION

Virtualization greatly simplifies how your company manages its IT infrastructure, saving IT management time and increasing productivity through streamlining and automation. The result is improved service to your company and clients, all while reducing operating costs and capital expenditures.

Dell designed its 2-2-1 solutions with small businesses in mind. Dell 2-2-1 solutions ensure maximum return on your IT investment, minimize the risks to you and your IT team, and provide an easy growth path that helps your business cope with an ever-changing business environment.

To learn more about other aspects of server virtualization using the Dell 2-2-1 solutions, please see our additional papers and video.

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