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The road to virtualization now has a high speed lane.



Principles of InfraStruXure® High Density-Ready Architecture...

- 1 Rack enclosures that are HD-Ready
- 2 Metered PDUs at the rack level
- 3 Temperature monitoring in the racks
- 4 Centralized monitoring software (not shown)
- 5 Operations software with predictive capacity management (not shown)
- 6 Efficient InRow® cooling technology
- 7 UPS power that is flexible and scalable

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Letter from the Editor

IT: The Business of “Yes”

by Greg Shields

This weekend, I spent half a day on the phone with my cellular service provider attempting to convince them that I was an unhappy customer. This hours-long event was the culmination of multiple days of other phone calls and even a few trips to their service center (which I must ask, why must they always be on the other side of town—no matter where you live!). All this effort simply to tell this service provider that the cell phone I had purchased barely a year ago simply didn’t perform its stated functions.

In not so many words, I found myself repeatedly being told, “no.” “No,” you shouldn’t be experiencing these problems. “No,” we cannot simply send you a new phone. “No,” we don’t show any issues on this side. Hours upon hours of being treated like an ignorant and selfish child by a company I am required to contractually pay hundreds of dollars to each month with no capacity for bailing out.

In wading through the eighth, “Yes, I have tried rebooting the phone” question, I got thinking a little about we in the IT world today. Although some of us find ourselves working jobs in the intentionally-labyrinthine cellular service technical support field—I feel for you!—others of us are IT professionals in business and organizations elsewhere where our daily answer is “yes!” Our job is to keep the network running, get those applications installed, and even occasionally spend the night ensuring that our business continues to be a business. While some of us sometimes grow that thick skin around what we consider “our” IT environments, we still do so for the betterment of our customers. Those customers are the businesses we work for.

With the economic situation of late and the loads of workforce reductions, 2009 has really become the start of a whole new world. In that world, we in IT must be in the business of “yes” if we are to survive in our jobs and keep our businesses afloat. That’s why publications like this one are here, and we thank you once again for coming back month after month to hear our story.

If you’ve got a story about a fantastic “yes” that’s saved your life, your job, or your business, I’d love to hear it. Drop me a line at gshields@realtimepublishers.net if you want to share. Until then, good luck out there, and keep finding ways to say “yes!” ♦

Answers from the Experts

Your Windows Server Core Questions and Myths Addressed

by Don Jones

Q: I've heard that Server Core can't run antivirus software or management agents. Is that true?

A: Categorically NO. Although it's true that Server Core comes equipped with only certain predefined roles—domain controller, file server, Web server, and so forth—that doesn't preclude the installation of other software. The trick is that

other software can't depend upon any Windows components that Server Core doesn't have. For the most part, background services that don't rely on the .NET Framework and don't have more than a very basic GUI are fine—and that includes antivirus software from most of the major manufacturers (Symantec being a notable exception last time I checked) as well as management agents from major vendors (such as IBM's Tivoli

agent). Some applications may support missing features—like Notification Area icons—but if they fail gracefully (for example, don't explode) when such features aren't present, they'll be fine. It's a little annoying that Microsoft hasn't introduced a "Made for Server Core" or "Works with Server Core" logo program—you'd think they'd be all over that.



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Q: Is it possible to run Server Core and Hyper-V as a kind of smaller-footprint hypervisor?

A: Definitely—it's called "Windows Hyper-V Server" and Microsoft will let you use it for free. It's sort of their competition to VMware's free ESXi offering, although nothing competes with ESXi's sub-50MB footprint (for the free, embedded version). But Windows Hyper-V Server is basically a Server Core installation with only the Hyper-V role available. The difference between that and a paid-for copy of Server Core running Hyper-V is in licensing: A paid license of Windows Server 2008 includes licenses for a certain number of Windows virtual machines; in the case of Datacenter Edition, for example, it's unlimited Windows virtual machines. The free "Hyper-V Server" only covers the host license; you'll still have to pay for any Windows licenses for your virtual machines.

Q: Will Windows PowerShell ever run on Server Core?

A: Yes. Soon. As soon as Win2008 shipped and people started asking this question, I explained that the problem wasn't PowerShell, it was the .NET Framework. PowerShell only relies on a tiny subset of the Framework,

but the Framework is kind of an all-or-nothing deal (at least if you want to be able to call Microsoft for support; there are unsupported hacks that get PowerShell running today). I said that Microsoft simply needed to modularize the Framework so that a subset of it was available for installation on Server Core. I said that Microsoft was doubtless working on it. I was right: Windows Server 2008 R2 will offer enough of the Framework to support Windows PowerShell v2 (and will ship with that version) as well as ASP.NET-based Web sites (which was a conspicuously-missing feature in the original Server Core release). Estimates by the pundits range from mid-2009 to early-2010 on an R2 release; Microsoft hasn't weighed in on an official date (and I'm not pressing them—I'd rather it be *right* than *fast*).

Q: If I use Server Core to set up a domain controller, what features will I be missing?

A: None. Server Core's domain controller row is the full kit, including read-only domain controllers, AD-integrated DNS (if you install the DNS role, too), and so forth. Even FRS and whatnot are supported so that Group Policy will work. I've long held that branch office servers—which are often

little more than domain controllers with file and print services, DHCP, and DNS added—are the perfect use case for Server Core. Server Core's lower patch rate (less than 50%, currently, of the full Windows code base) means those servers will require less overall maintenance and attention—exactly what you want from a branch office machine. Server Core also has a somewhat lower memory footprint and a lower disk footprint, so you can rely on somewhat smaller servers. I've seen Server Core running a 10,000-object domain controller, in production, on a virtual machine that was allocated less than 512MB of RAM. Imaging it running on a nicely-equipped dual-core 64-bit machine with a few gigs of RAM under the hood!

Do you have a question? Visit concentratedtech.com and click "Contact" in the menu bar to submit a question to Don. ♦

Don Jones is a co-founder of Concentrated Technology. Join him and cohort Greg Shields for intense Win2008 and Windows PowerShell training—visit ConcentratedTech.com/class for more details. Ask Don a question by visiting ConcentratedTech.com and using the "Contact" page.

Product Review

Super Flexible File Synchronizer

by Eric Schmidt

With laptops outpacing desktops in sales, there is a constant need to make sure the data is backed up. Be it music, pictures, or documents, there is always a need to make sure there is more than one copy. With hard drives getting larger, storage media such as CDs, DVDs, and even Blu-Ray have not been able to keep up. Enter the era of hard drive backups. External drives can easily handle the entire contents of the average laptop drive with room to spare. The next challenge is remembering to make copies of files before disaster strikes. Obviously, this activity can be accomplished with utilities such as robocopy, but that's a command-line utility and to automate it requires creating a batch file and scheduled task. This is where a utility called Super Flexible File Synchronizer <http://www.superflexible.com> can help. This handy application can handle a variety of file synchronization tasks. Everything from backups to the replication of data between a server and laptop to synchronizing files with an FTP server.

The latest release is full of features and offers the ability to synchronize complete folder and file structures including locked files. For backup purposes, it also offers the ability to encrypt, compress, and zip files in order to save space (Professional version only). The built-in task scheduler makes the activity automated so that it won't be forgotten. Figure 1 is a screenshot of the window to build a synchronization profile. The bottom half of the window shows the standard scheduling options. Take special note of the additional tabs that extend the scheduling ability to support a wide range of needs.

Taking synchronization even further, Super Flexible File Synchronizer also has a feature called SmartTracking, which is a database of the files that were synchronized. With a database record of what has been synchronized, it is then very easy to identify files that have been deleted.

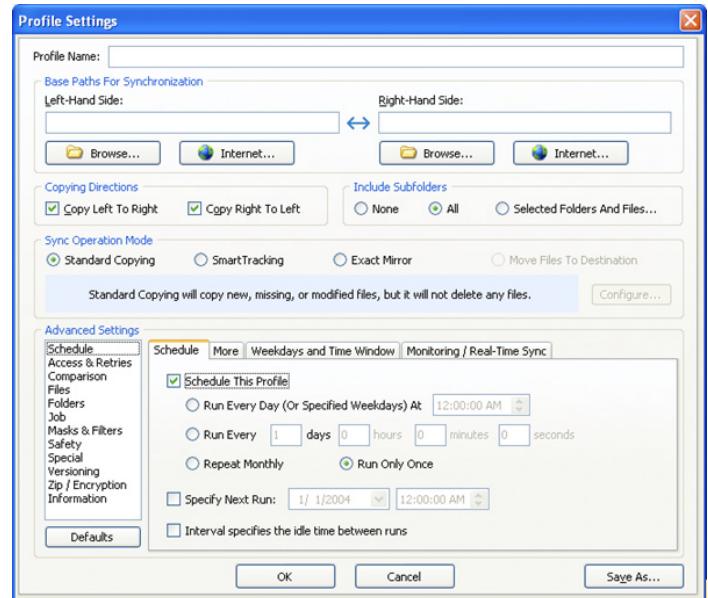


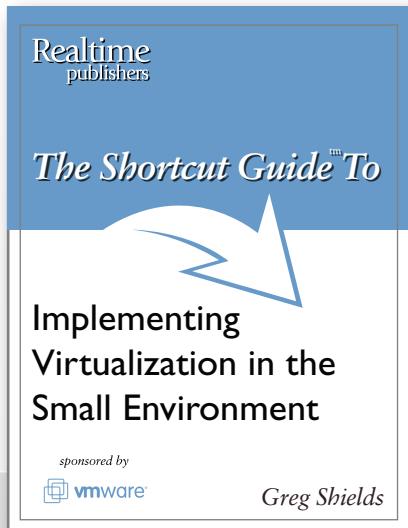
Figure 1: Profile settings with scheduling options.

Of course, Super Flexible File Synchronizer can do much more than provide the ability to back up files. It also contains a version-tracking feature. Although it's obvious that version tracking can enable quick rollback of documents and presentations, one big benefit is for script kitties. Having the ability to automatically save multiple versions of a script makes it very simple to go back and recover changes that were made that didn't work out so well.

To improve speed, Super Flexible File Synchronizer can also be configured to make partial changes to files. In situations in which files are very large, this could be a huge time saver. One example is OS images that are used to build workstations and servers. In large companies, the image may need to be copied to multiple locations over WAN links. By having the ability to copy only delta changes in the image file, Super Flexible File Synchronizer can make more efficient use of bandwidth.

With current versions for both Mac and Windows and a 2004 version for Linux (update coming in 2009), Super Flexible File Synchronizer is an application that lives up to its name. ♦

Eric Schmidt works as Enterprise Microsoft Security Technologist, with Honors, for Raytheon Company and has worked in Information Technology for 13 years. Eric has a Masters degree in Computer Information Technology and has developed extensive experience in systems administration, engineering, and architecture specializing in Microsoft Active Directory and Systems Management. Eric has been well recognized throughout his career for his contributions to designing and implementing enterprise-wide solutions using Microsoft Windows-based technologies.



Authored by **Greg Shields**

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Why Consider Essential Business Server 2008 as the Core for Mid-Sized IT?

by Eric Beehler

Mid-sized businesses will likely find this story familiar. You have one or two people that serve as the IT Help desk, server administrators, network administrators, the technology acquisitions specialists, and Chief Information Officer (CIO). A mid-sized business, one with approximately 50 to 300 users, has a small IT department with people who do it all and are expected to know it all. They also are victims of outages and immediate issues, aka firefighting, more often than their enterprise counterparts. When there is any IT-related issue, it cannot be spread around to colleagues to help. The IT professional in this kind of environment is limited in what they can hand off to another individual. In fact, they have to be the expert on all IT, not just for servers or desktops. They need to know how to keep the projector in the conference room running, configure the router, and know how to fix the copy machine.

Microsoft recognized there was a problem here. In a business this size, the IT budget is usually centered on essentials. Whereas an enterprise admin can expect to have resources such as deployment tools, incident monitoring software, and an employee or partner to help with issues such as licensing, such is not the case for mid-size IT. If you are lucky, you will get computers that run the same operating system (OS) and users who bother to turn on Windows Update. It is in this arena where the right tools with a clean interface and an easy, straight forward approach can assist in reducing the headache of the firefight. Microsoft took a similar approach several years ago to help sole proprietors with Small Business Server, and they wanted to extend that concept to the next level.

Helps Integrate the Servers into an Existing Environment

Unlike the Small Business Server, where things needed to be kept as simple as possible, Microsoft recognized that a one-size solution would not likely work in the mid-sized business. They determined that flexibility would need to be layered on top of what was built to help the small business manage complex products. Where Small Business Server would assume a new, clean, green field environment, the mid-sized business already has an IT infrastructure that needs to stay up and running. The Essential Business Server solution needs to allow for those requirements and must fit into the existing infrastructure where a network is already active and servers already exist.

To this end, there is the preparation and planning wizard, which gathers information on your existing network and asks pertinent questions. This software runs from a PC that is part of the planning process, long before a single target server is booted. This will cover the environment in which these servers will need to coexist. For example, will you be using the Security Server as the only firewall on the network? Or will you keep your existing firewall? Will you need to migrate the DHCP server? How many subnets will you be supporting?

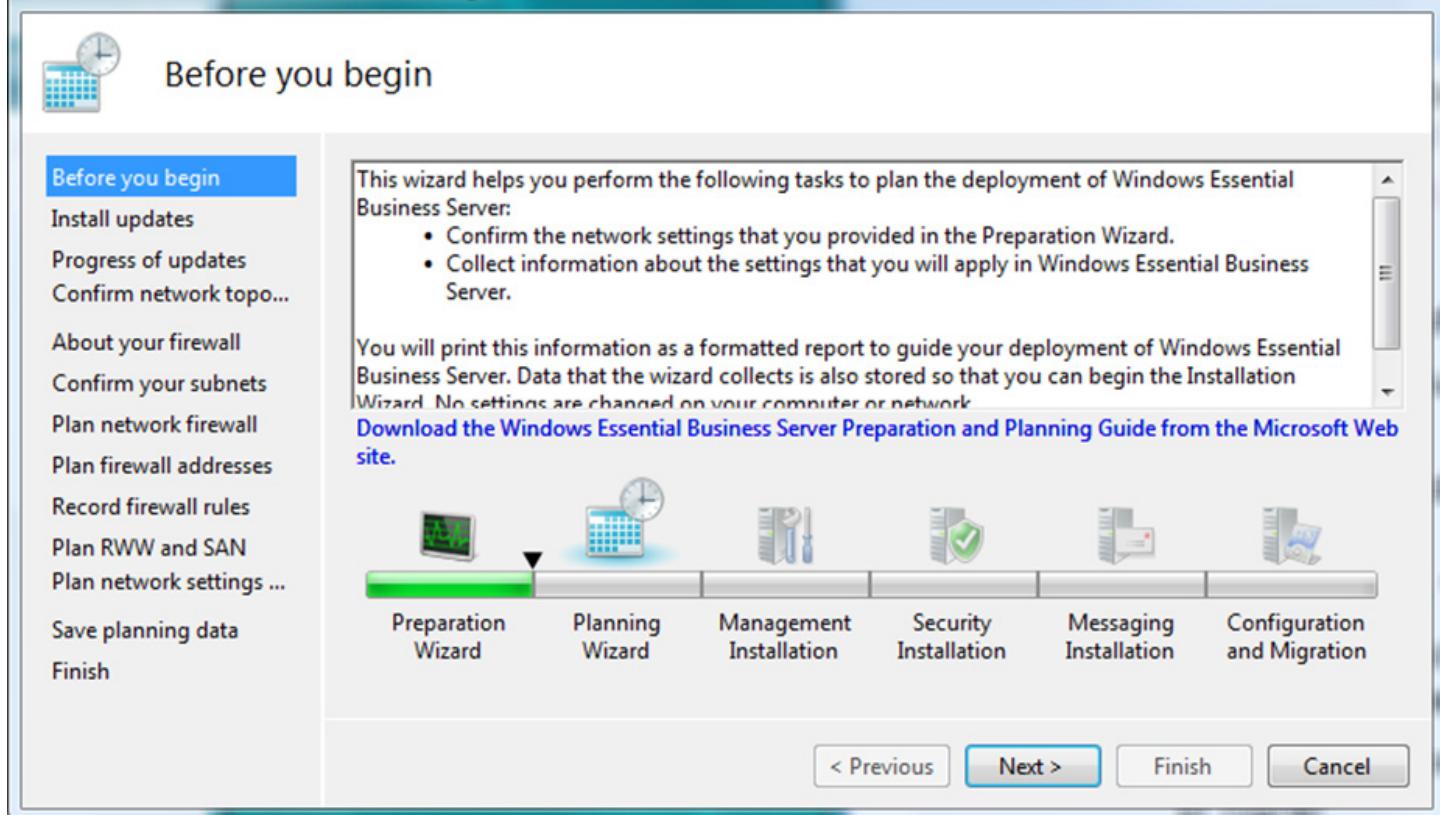


Figure 1: The planning and preparation wizard.

Essential Business Server 2008 Standard Edition installs onto three servers; Premium Edition adds a SQL Server. The primary three servers run the 64-bit edition of the Windows Server 2008 OS with a specific role and software setup for each server. The first server installed is the Management Server, which holds the core Active Directory (AD) controller, DNS Server, DHCP, and System Center Essentials. The next server installation is the Security Server, giving you solid protection with Forefront Threat Management Gateway (TMG), and the Exchange front-end as well as the Remote Web Workplace. Then there is the Messaging Server, which gives you Exchange Server 2007 with the added redundancy of an additional domain controller, DNS server, and/or DHCP server. The optional fourth server is SQL Server, available with the Premium Edition. Not only does this wrap the best server software Microsoft has to offer an infrastructure into one package, it also simplifies and discounts licensing for these products on the server and the client.

Simplifies Installation of Complex Products

One challenge for the mid-size IT person is getting a grasp on so many complicated products. Getting a handle on Exchange alone can be a daunting task. Add to that the specifics of installing a firewall product such as ForeFront TMG, and the task quickly becomes daunting. The installation process wraps all of these products into a simplified installation wizard. It will integrate the discovery with the answers given during the planning and preparation phase, then integrate them into the installation phase. Now don't be fooled, there are plenty of decisions to make during the installation, but the key configuration options for these products are put up front so that the environment can be up and running quickly. An example is Forefront TMG, where a default set of firewall rules is applied so that users can access the Internet immediately after installation. This rule set allows for Web surfing, Outlook Web Access (OWA), email, and other basic pieces of Essential Business Server to function immediately. This kind of installation process can dramatically reduce the headaches for an IT admin that is not intimately familiar with every application but understands the functions provided. This also means the required downtime is greatly reduced from the time it would have taken to install these products individually.

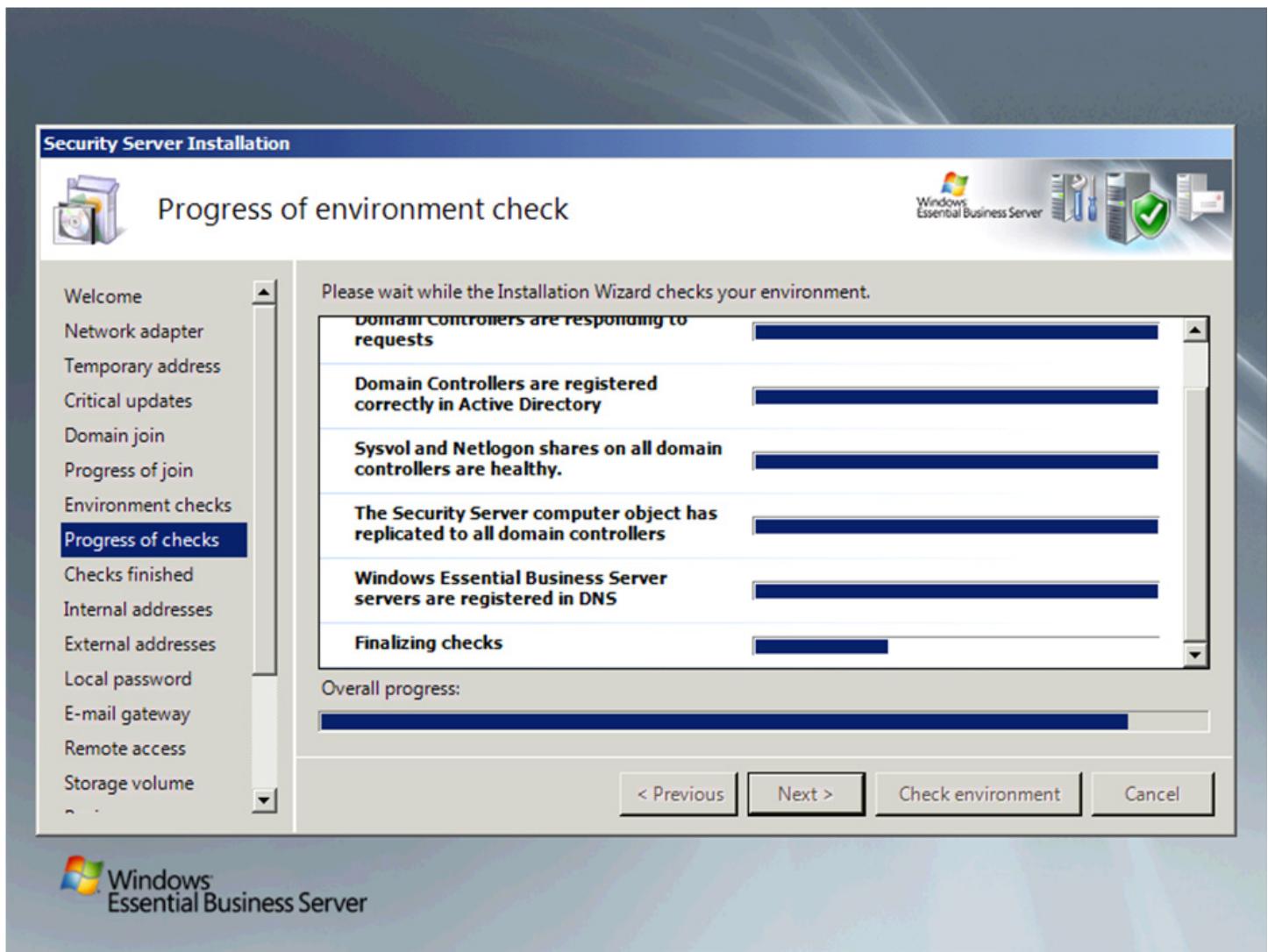


Figure 2: The Essential Business Server installation wizard.

After installation, everything has a basic configuration, but how do you go about touching the pieces of the applications that will likely require tweaks to make the infrastructure fully functional? The Post Installation and Migrations Tasks application opens immediately on the Management Server, providing a thorough checklist of tasks that should be reviewed and easy links to the utilities required to complete those tasks. In fact, those utilities will open on the Management Server via a RemoteApp session so that you don't have to jump between servers. You will also get links to the appropriate TechNet articles to help guide you through the processes. Once done with a task, just check it off, and move on. You are not forced to complete a task if it isn't necessary, as it would be with the rigidity of a wizard interface. If you need to you complete the task of entering additional firewall rules, you will be linked to the Forefront TMG console and provided a link to the associated article on configuration. If you don't need to complete the task, just mark it as complete and move on. You get the flexibility of using the true console application and the freedom to make your own settings.

Configuration and Migration Tasks

Guided Configuration and Migration Tasks

The configuration and migration checklist guides you through the final configuration steps of the Windows Essential Business Server servers and the migration of your existing data. Completing these tasks is highly recommended to enable all of your product features.

[Windows Essential Business Server Web Site](#)

[Add-in Catalog Web site](#)

#	Task	Status
1	Install the Management Server	Finished
2	Install the Security Server	Finished
3	Install the Messaging Server	Finished
4	Configure subnets	To do
5	Configure site-to-site VPN	To do
6	Configure firewall rules	To do
7	Configure SAN storage	To do
8	Migrate DNS	To do
9	Migrate DHCP	Requires task 8
10	Configure management tools	To do
11	Activate the servers	To do
12	Configure DNS Sender ID	To do
13	Configure DNS for RWW	To do
14	Configure certificate settings for RWW	To do
15	Migrate the Exchange Server mailboxes	Requires task 8
16	Move the user scripts and profiles	Requires task 8
17	Discover computers and devices	Requires task 8
18	Configure software update rules	Requires task 8
19	Move Active Directory roles	To do
20	Configure SharePoint Services	To do
21	Install client access licenses	Requires task...
22	Assign client access licenses	Requires task...
23	Finish configuration	

Configure subnets

Configure network settings for subnets in the network
Less than 15 minutes to complete

The Installation Wizard configured the network settings for the subnets in which Windows Essential Business Server is deployed. If you have additional subnets in your network, add the IP address ranges to the internal network definition in Forefront Threat Management Gateway (TMG).

- Follow the instructions in this article on the Technet website:
<http://go.microsoft.com/fwlink/?linkid=121235>
- After you finish this task, mark it as complete.
 [Mark task as finished](#) [move to next task](#)

Figure 3: The Guided Configuration and Migration Tasks checklist.

Manages the Mundane

Day-to-day duties can cause an administrator to lose sight of the environment. Let's take a user account for example. To get a new user up and running, you would have to create an account, create an Exchange mailbox, reconcile your licenses, and get that user access to the proper security groups. Will you remember all those tasks? It's more likely that you would forget a step, causing you to take time to reconcile licensing or field a call that the user doesn't have proper access. That may be an example with few consequences, but what about keeping tabs on security patching, uptime of your Exchange mail, or key Internet services? These are fires waiting to happen, and when the network has been attacked due to a vulnerability that should have been patched or Exchange dropped mail all weekend because of unexpected but undetected downtime, you may be in for more than just a short lunch hour. Essential Business Server provides you with the Administration Console.

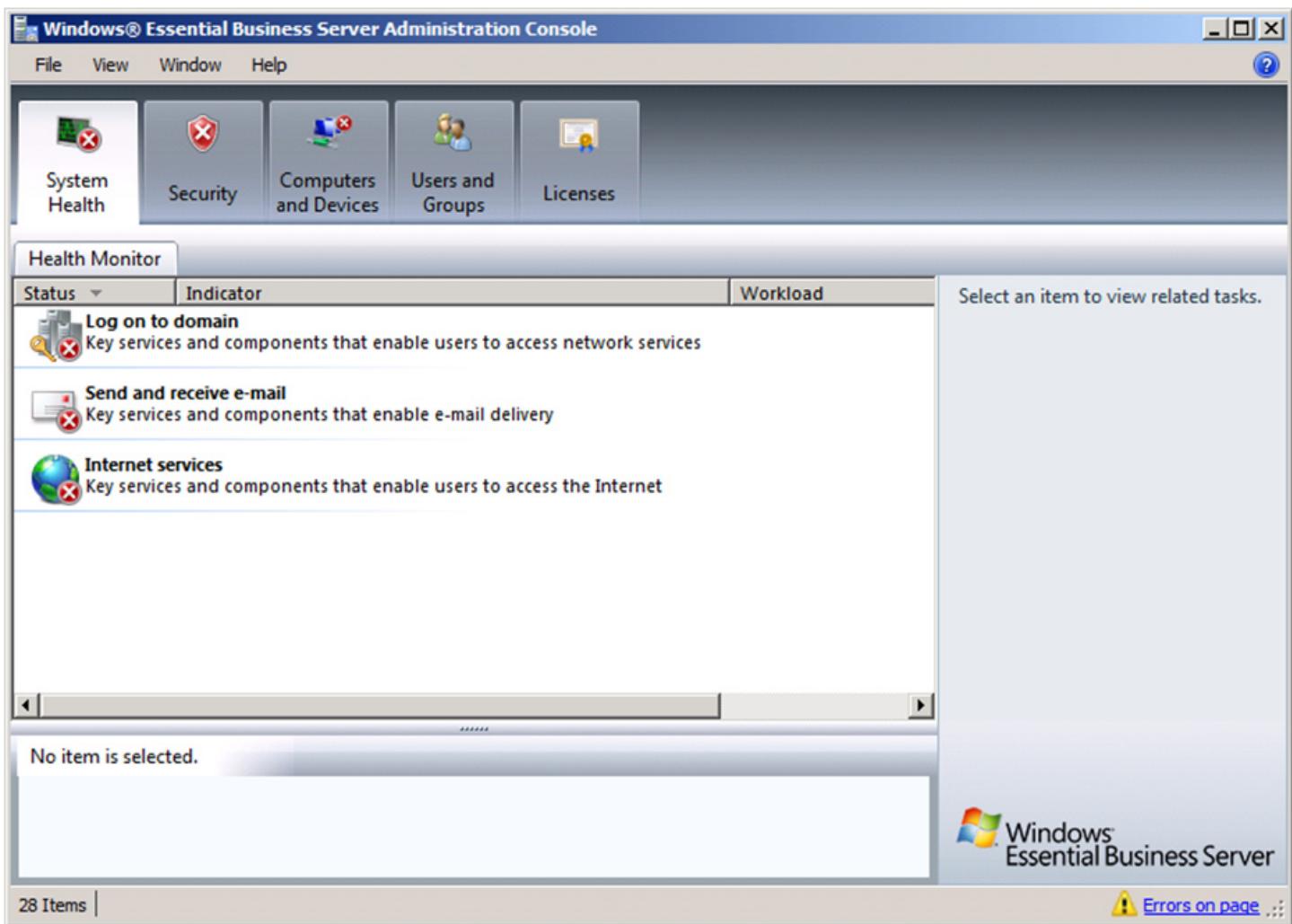


Figure 4: The Administration Console dashboard.

The Administration Console is the dashboard for the environment as well as the launching point for the most common daily administrative tasks. As Figure 4 shows, there are several problems in this environment that need to be addressed. The console will link to a full description of the issue that was collected by System Center Essentials and link to related applications that can help troubleshoot further. For example, in the case that anti-malware settings have been disabled, there will be a link to return the server to its default anti-malware settings automatically. This interface helps track problems, possibly find problems before users are even aware they exist, and even fix them or at least link you to the correct tools to troubleshoot further.

There are several wizards that will guide the administrator through tasks. Take the New User Account wizard as an example, which will check to make sure you have a Client Access License, set the password, assign groups, create a mailbox on Exchange, and set redirection for the user's Documents folder. Other examples include managing patches, deploying new software packages, and setting email alerts. There are also wizards for server functions such as changing an IP address of one of the core servers and another to update SSL certificates. This wizard approach to some of the mundane tasks may seem overly simplistic, but think about how much time is wasted on support calls with new users, dealing with software settings from unmanaged software installations, and performing audits of licenses because documentation wasn't kept up to date. Forced standardization of these processes saves time and money, both of which a small IT staff doesn't have.

Add-ins also extends the functionality of the Administration Console. Various products are offering add-ins to add their functionality to the overall management of Essential Business Server. The Microsoft Dynamics products, SharePoint, and SQL Server are some Microsoft examples. Third-parties such as Symantec with Backup Exec and Trend Micro with their antivirus solutions have also made add-ins available. The list of add-ins is actually fairly long and it is encouraging to see these vendors take the management approach of the Administration Console seriously.

How Cheap Is Cheap?

In the small IT department, the administrators are often asked to justify investment in technology. Here is where Essential Business Server makes sense, even without the integration and added management. A quick price comparison yields the true on-the-spot savings. When taken separately, the current street cost of four copies of Windows Server 2008, Exchange 2007, Forefront TMG, and System Center Essentials with five CALs comes to \$7799. Add SQL Server Standard 2008 to the mix and now you're up to \$10,213. To purchase Essential Business Server 2008 standard, you will pay \$5472. The price goes to \$7163 for the Premium edition that includes SQL Server. The savings continue to track when considering additional CALs where the standard alone products including SQL Server would add up to \$274 compared to \$195 for the Essential Business Server Premium CAL.



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The Choice You Have To Make

The points have been made as to why Essential Business Server is a compelling choice for mid-sized businesses. Companies will see favorable pricing and the IT department can realize easier management and a default installation that is based on best practices and is up and running right after installation. The downside is that you may need a more complex environment that includes additional child domains and additional clients beyond the 300 CAL limit, which means you will have to migrate to the full version of these separate products anyway or may find yourself with other third-party solutions provided by Essential Business Server that are already paid for. Those are considerations for any IT organization, but for most mid-sized businesses relying on Microsoft products with small IT staff, Essential Business Server is going to provide management capabilities they have likely never had, centralized management of their environment, and easier deployment. If a mid-sized company is considering an upgrade to their technology infrastructure, Essential Business Server deserves to be high on the list of consideration. ♦

Eric Beehler has been working in the IT industry since the mid-90's and was playing with computer technology well before that. His experience includes more than 9 years with HP's Managed Services division, working with Fortune 500 companies to deliver network and server solutions. His most recent experience is in the insurance industry, working on highly available solutions and disaster recovery. He has been deeply involved in delivering data management and implementing a variety of storage and backup solutions to insure Sarbanes-Oxley compliance for terabytes of data in multiple nationwide locations. He holds certifications from CompTIA (A+, N+, Server+) and Microsoft (MCITP: Enterprise Support Technician and Consumer Support Technician, MCTS: Windows Vista Configuration, MCDBA SQL Server 2000, MCSE+I Windows NT 4.0, MCSE Windows 2000, and MCSE Windows 2003). He also holds a Master's degree in Business Administration from the University of Colorado at Colorado Springs. He co-authored [MCITP: Microsoft Windows Vista Desktop Support Enterprise Study Guide](#) (Sybex/Wiley Publishing) and the upcoming [Essential Business Server 2008 Unleashed](#) (Sams), authored several white papers, and co-hosts "CS Techcast," the podcast for IT professionals. He provides consulting and training through his co-ownership in Consortio Services, LLC.

The Deep Dive

Top Tips for Managing Your Hyper-V Cluster

by Greg Shields

Last month, I showed you the intricate steps necessary to implement high-availability with Microsoft's Hyper-V. This new virtualization technology relies on Windows Failover Clustering as the backbone for its failover capabilities from one host to another. Because of this reliance, if you want production-worthy Hyper-V as your virtualization platform of choice, Windows clustering is another new technology you must come to know.

Windows clustering has been around for a long time, with roots beginning back in the early days of the Windows Server operating system (OS). Yet because of early missteps in its overall capability of actually creating trustworthy high availability out of your network services, many organizations have elected over the years to simply not use it. Without clusters in place, many admins just don't have the experience they need to do it well.

I wrote last month's article to give you the step-by-step of how to set up your cluster. Really, the information there is the hard part. Once your cluster is up and available, managing it is relatively easy if you start on the right foot. So with this in mind, let's talk about nine of the top tips you need to know if you want to best manage your Hyper-V cluster now that you've got it operational.

Tip #1: Always Use Teamed Network Cards

Network conditions irregularly involve the sporadic outage of network connections. From time to time, these short network outages can be perceived by a cluster as grounds for a failover event. Lacking the right number of network cards and the right amount of teaming on those cards can sometimes even lead to a cluster failure, particularly in the case of connections to quorum drives. When creating and working with your cluster, always use teamed network cards for production network, quorum, and iSCSI SAN connections to prevent single network card outages from impacting your overall cluster uptime.

Tip #2: Use Even Numbers of Nodes

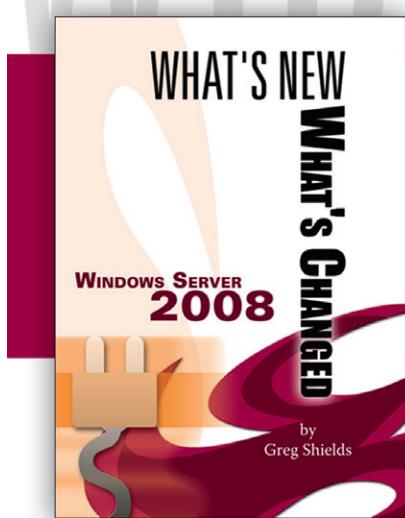
Clusters with even numbers of nodes by default will use the *Node & Disk Majority* quorum model, which requires each node to share access to the same shared disk. An alternate model used by default in clusters with odd numbers of nodes, the *Node Majority* quorum model requires that each cluster node have access to its own individual disk. If you plan to use the *Node Majority* model, you will need to add your own 3rd party replication mechanism between these disks, which adds another layer of complexity to your clustering environment. As such, if you plan for expansion of your environment, always do so in pairs and/or with the *Node & Disk Majority* to keep things simple.

Tip #3: Windows Server 2008 Really Requires One Virtual Machine Per LUN

In the initial release of Windows Server 2008, your highly-available Hyper-V environment must be architected such that each virtual machine resides exclusively in its own LUN. This is the case due to the way Windows Failover Clustering deals with its cluster resources. Thus, when creating virtual machines for your Hyper-V cluster, always install and manage only a single virtual machine per LUN.

Tip #4: Set the Automatic Start Option for Each Virtual Machine to Nothing in Hyper-V Manager

Hyper-V can operate in one of two configurations, either atop a single virtual host or within a cluster. As such, you'll find that some of the configurations within the Hyper-V Manager console are not the same once you've moved to high-availability. This is the case involved with this tip. Once you have configured a Hyper-V virtual machine to be highly available, the start actions associated with that virtual machine are then handled by the rules of the cluster. It can be possible to configure rules within the Hyper-V manager that may conflict with those set on the cluster itself. Cluster-based rules can handle a much larger set of potential problems—such as loss of individual cluster resources as opposed to just the loss of a host—than within the Hyper-V Manager. So, always define your failover rules within Failover Cluster Manager when possible.



Microsoft has released its next server operating system – Windows Server 2008 – and you need to know more about it. But you don't need the basics. You already know Windows 2003. You just need to know what's new and what's changed in Windows Server 2008. Read-Only Domain Controllers, the Group Policy Central Store, Terminal Server RemoteApps, Fine-Grained Password Policies. This quick and entertaining guide, written by Windows insider Greg Shields does just that. Focusing on the new technologies for installing, managing, and securing Windows Server 2008, you'll quickly ramp up your skills. Save yourself some time and money by skipping the basics and using your existing skills to master Microsoft's new server O/S.

Automate server installations * More effectively manage servers through Server Manager * Gain insight with Reliability and Performance Monitor * Implement powerful new Group Policy * Reduce your attack surface with Server Core * Complete better Active Directory backups * Deploy apps using Terminal Services * Secure your servers with the new Windows Firewall

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http://www.sapienpress.com/Windows_Server_08.asp

by Greg Shields

Tip #5: Use Predefined and Structured Naming Conventions for all Resources

You'll find that the move to high-availability with Windows Failover Clustering involves the creation of a large amount of additional resources to manage. Windows Failover Clustering itself can be a complex addition to an environment from the standpoint of simply keeping track of those resources. As such, before ever creating your cluster, make sure that you predefine and use a standardized naming convention for all resources. This includes network resources, storage elements, virtual machines and their cluster naming conventions, and any LUNs attached into the cluster itself. As some resources can be assigned multiple names in multiple locations—an iSCSI LUN can be named in multiple places and can have different names based on which service is using it, this action will save you headache and troubleshooting time down the road.

Tip #6: Be Aware of and Plan Accordingly for the Outage Timing Required for a Quick Migration

The process of Quick Migrating a virtual machine from one host to another with Hyper-V takes time. Unlike VMware's Live Migration—which usually completes with the loss of only a single ping packet—Quick Migrations in Microsoft's first release of Hyper-V require a bit more time. The unfortunate fact is that this amount of time is often much longer than the amount of retry time configured on clients for various network tasks. If Windows clients are configured for a 5-second interval for TCP connection aborts, and a Quick Migration requires 8 seconds to complete, it is likely that some users will see a short outage while you complete your migration. The time required to complete a Quick Migration in Hyper-V is dependent on two factors. First, the quality of the network connection between the two servers participating in the migration. Second is the amount of RAM assigned to the virtual machine. Table I shows the amount of time related to assigned RAM for Hyper-V virtual machines. You should be aware of this timing and plan your migrations appropriately.

Virtual Machine Memory	Downtime to Complete a Quick Migration
512MB	8 seconds
1GB	16 seconds
2GB	32 seconds
4GB	1 minute, 4 seconds
8GB	2 minutes, 8 seconds

Tip #7: Manage Your Failover Properties

Failover and the rules that define failover can also be a point of complexity within a Windows Failover Clustering environment. As you'll see when you look through the properties of your cluster, there are a number of factors that can impact where virtual machines fail over when problems occur. These issues grow geometrically more complex as the number of nodes in your cluster increases. You should consider selecting a preferred host for each virtual machine within the General tab of its properties. You should also think carefully about how and if you want to select any failback options. Conditions can occur on Windows Failover Clusters where similar conditions may occur on multiple servers, forcing a repeated failover/failback situation—commonly called a “bounce”. Bounces are bad, and can sometimes result in the complete failure of a cluster resource. Thus, the default setting for failback is to keep it disabled, which may be a good choice for your virtual machines. Setting additional nodes which are preferred for your virtual machine—particularly in the case of clusters that have more than two nodes—also helps you ensure that your virtual machines failover to the right nodes when problems occur.

Tip #8: Consider Using System Center Virtual Machine Manager to Ease Many Management Complexities

As you've probably concluded in reading this article, there are simply a lot of settings that get added when moving Hyper-V to high-availability. These settings arrive in multiple locations and can even in some cases conflict with each other. Microsoft provides its management toolset System Center Virtual Machine Manager (SCVMM) as a solution for consolidating much of your management needs under a single banner. You can think of SCVMM as Microsoft's equivalent to VMware's VirtualCenter (e.g., running one or two virtual hosts often doesn't require this add-on cost); however, the increasing complexity and requirements of larger environments eventually mandate it. If your environment grows much past two Hyper-V hosts, consider the purchase of SCVMM as a way to aggregate your management into a single location and further improve your uptime.

Tip #9: Upgrade to Server 2008 R2 as Soon as Operationally Feasible

Lastly, if you're considering a move to Hyper-V or are already well within one, its upgrades and improvements with Windows Server 2008 R2 are well worth the wait. R2 adds cluster-aware disk resources to your cluster, eliminating the one-VM-per-LUN requirement and improving intra-cluster communication in regards to VM ownership. R2 also replaces the early Quick Migration with the new Live Migration, reducing migration time to an amount that is reportedly equivalent to VMware's VMotion. Windows Server 2008 R2 is reported to be out later this year or early next year at the very latest. SCVMM itself is also getting new and very useful features with its next release, which is now in beta. For those who haven't yet started their jump to Hyper-V, a slight delay in making the move may prove fruitful in your overall experience. ♦

Greg Shields, MCSE: Security, CCEA, is an independent author, speaker, and consultant, based in Denver, Colorado. With more than 10 years of experience in information technology, Greg has developed extensive experience in systems administration, engineering, and architecture. Greg is a contributing editor for both Redmond magazine and MCPmag.com, authoring two regular columns along with numerous feature articles, webcasts, and white papers. He is also the resident editor for Realtime Publishers' Windows Server Community at www.realtime-windowsserver.com.

Practical PowerShell

Performance Peeking

by Jeffery Hicks

You can download a zip file with all these scripts from http://www.realtime-windowsserver.com/code/v2n4_Practical_PowerShell.zip.

A few columns ago, I showed how to use PowerShell to gather performance data. After thinking about it further, I realized this is just the task that would benefit from a graphical interface. Sure, there are plenty of graphical performance monitoring tools, but if you could make your own, you would have greater control over the feature set. This month, I have a script called `PerformancePeeker.ps1` that creates a Windows form to display performance information for a set of user-selected instances and counters.

Creating a Windows form script by hand is very tedious and next to impossible for anything but a very simple form. Fortunately, I have the free PrimalForms tool from SAPIEN Technologies, which you can download from PrimalTools.com. PrimalForms provides a graphical form builder. Drag controls to a form and arrange. When ready, export the form to a script, add your PowerShell code to tie everything together, and you're done. I've included the source form file along with the script in the zip file you can download from [Realtime Publishers](#).

I'm not going to show the entire script here, as most of the form and object generating code is of little value. Instead, let me walk you through what happens in the form and show you the corresponding script block that makes it happen. First, Figure 1 illustrates the type of form the script is creating.

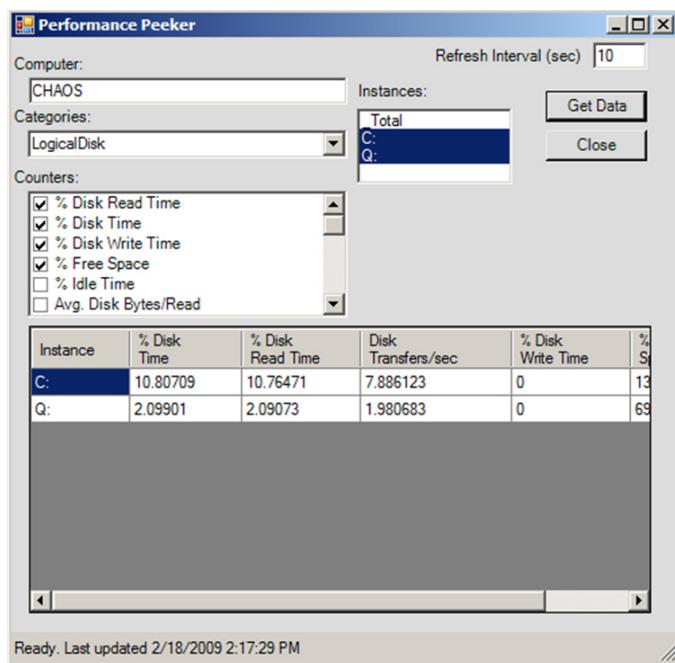


Figure 1: Performance Peeker.

When you first launch the script, the `computername` field is set to use `$env:computername`, which returns the `%COMPUTERNAME%` value. When the form is first shown, the `GetCategories` script block is executed.

```
$GetCategories=
{
    $comboCategories.Items.Clear()
    $chkCounters.Items.Clear()
    $listInstances.Items.clear()
    $dataGridView1.DataSource=$null
    $rtbHelp.Clear()

    $statusBar1.text=(“Getting performance categories from {0}” -f $txtComputername.Text)

    $form1.Refresh()
    $script:categories=[System.Diagnostics.PerformanceCounterCategory]::GetCategories($tx
tComputername.Text)
    $script:categories | foreach {
        $statusBar1.text=(“Getting performance categories from {0} [{1}]” -f
$txtComputername.Text,$_.Categoryname)
        $comboCategories.Items.Add($_.CategoryName)
    }

    $txtComputername.text=($txtComputername.Text).ToUpper()
    $statusBar1.Text=“Ready”
} #end GetCategories scriptblock
```

The main work is calling the `GetCategories()` method for the `System.Diagnostics.PerformanceCounterCategory` class, specifying the `computername` as a parameter. I'm purposely creating the `$categories` variable in the script scope because I want this variable to persist after the script block finishes. This variable is piped to `ForEach`, which adds each category name to the `Categories` combo box.

```
$script:categories | foreach {
    $statusBar1.text=(“Getting performance categories from {0} [{1}]” -f
$txtComputername.Text,$_.Categoryname)
    $comboCategories.Items.Add($_.CategoryName)
}
```

There is status bar text that informs you of the progress, but this happens so quickly you'll probably never see it. Once the categories are loaded, the assumption is that you will select one from the combo box. If you move your mouse over the category, you should get tool tip help for that category.

```

$ShowCategoryHelp=
{
    if ($comboCategories.SelectedItem -notmatch "Select a performance category") {
        $text=($script:categories | where {
            $_.Categoryname -eq $comboCategories.SelectedItem} |
            select CategoryHelp).CategoryHelp | Out-String
        $tooltip1.SetToolTip($comboCategories,"Performance Categories")
        $tooltip1.Show($text,$comboCategories,5000)
    }
}#end ShowCategoryHelp scriptblock

```

This is where \$script:categories comes back to help. The script block finds the corresponding category in \$script:categories and retrieves the CategoryHelp property. This value, converted to a string, is set as the tool tip's text. You may have to move your mouse over, out, and back again to get the tip to display.

When you select a different performance category, PowerShell executes the GetCounters script block.

```

$GetCounters=
{
    $chkCounters.Items.Clear()
    $listInstances.Items.clear()
    $rtbHelp.Clear()

    $statusBar1.Text="Getting {0} instances from {1}" -f $comboCategories.
    SelectedItem,$txtComputername.Text
    $form1.refresh()

    $perfcategory = New-Object System.Diagnostics.PerformanceCounterCategory($comboCatego
    ries.SelectedItem,$txtComputername.Text)
    $instances=$perfcategory.GetInstanceNames()
    if ($instances.count -eq 0) {
        $listInstances.Items.Add("Single Instance")
    }
    else {
        #add each instance to the drop down
        $instances | foreach {
            $listInstances.Items.Add($_)
        }
    }

    $listInstances.SelectedIndex=0

    $statusBar1.Text="Getting {0} counters from {1}" -f $comboCategories.

```

```

SelectedItem,$txtComputername.Text)
$script:counters=$perfcategory.getcounters($instances[0])
$Script:counters | foreach {
    $chkCounters.Items.add($_.Countername)
}

$txtRefresh.Enabled=$True
$statusBar1.Text="Ready"

} #End GetCounters scriptblock

```

This code block serves two purposes. First, in order to retrieve performance counters for a given category, you need to have an instance of a given category. To accomplish that, I first need a `PerformanceCounterCategory` object for the selected category.

```

$perfcategory = New-Object
System.Diagnostics.PerformanceCounterCategory($comboCategories
.SelectedItem,$txtComputername.Text)

```

Now I can call the `GetInstanceNames()` method and save the results to a variable.

```
$instances=$perfcategory.GetInstanceNames()
```

Some performance categories don't have instances, in which case, `$instances` will have a count of 0. If that is the case, an item is added to the `Instances` list control that says "Single Instance."

```

if ($instances.count -eq 0) {
    $listInstances.Items.Add("Single Instance")
}

```

Otherwise, each instance is enumerated and added to the list control.

```

$instances | foreach {
    $listInstances.Items.Add($_)
}

```

To get the counters, I call the `GetCounters()` method specifying the first instance in `$instances`.

```
$script:counters=$perfcategory.getcounters($instances[0])
```

Even if the category is a single instance type, this will still retrieve counters and store them in `$counters`. Again, notice I'm specifying the script scope for this variable. Each counter is then added to the counter `CheckBox` control.

```

$Script:counters | foreach {
    $chkCounters.Items.add($_.Countername)
}

```

At this point, you should begin selecting the counters you want to monitor. You need to check the box next to each counter to include it. Simply selecting a counter will also display information about that counter in a text box to the right of the counter list. Whenever you select an item, the \$ShowCounterHelp script block is fired.

```
$ShowCounterHelp=
{
    $SelectedCounter=$chkCounters.SelectedItem
    $counterHelp=($Script:counters | where {$_.countername -match $SelectedCounter}).CounterHelp
    $rtbHelp.Text=$counterHelp
} #end ShowCounterHelp scriptblock
```

This script block searches the \$script:counters variable for the corresponding selected counter and retrieves the CounterHelp property. This property is displayed in a RichTextBox control. I could have used the ToolTip object again, but some of the help for different counters can be long and I didn't think it would be very user friendly.

Once you've selected a category, counters, and one or more instances (simply click each one to add it), click the Get Data button. The GetData script block is associated with this control.

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```

$GetData=
{
    #stop the timer while data is refreshed
    $timer1.stop()

    #clear some entries
    $rtbHelp.Clear()
    $counterNames=@()
    $chkCounters.CheckedItems | foreach {
        $counterNames+= $_.ToString()
    }
    if ($counterNames.count -eq 0) {
        $statusBar1.text="Oops. You forgot to select some counters."
        return
    }

    $statusBar1.Text="Getting performance data..please wait"
    $form1.Refresh()

    [string]$computername=$txtComputername.text
    [string]$category=$comboCategories.SelectedItem

    $instances=$listInstances.SelectedItems

    #create an array to hold perf data
    $griddata=@()

    #get perfdta
    foreach ($instance in $instances) {
        #get a custom perf data object for each instance
        $perfData=New-PerfDataObject $computername $category $instance $counterNames
        $perfData | foreach {
            $griddata+= $_
        }
    }
    #create an array object
    $array= New-Object System.Collections.ArrayList

    #add the griddata to the array object
    $array.AddRange($griddata)
}

```

```

#set the datasource to the array
$DataGridView1.DataSource = $array

#set the timer interval
$interval=$txtRefresh.Text -as [int]
#interval must be in milliseconds
$timer1.Interval = ($interval * 1000) #1 second time interval
#start the timer
$timer1.Start()

$statusBar1.text=(“Ready. Last updated {0}” -f (Get-Date))
} #end Get-Data script block

```

The script block clears some items and verifies that you have selected some counters, otherwise the script block will end.

```

$chkCounters.CheckedItems | foreach {
    $counterNames+=$_.ToString()
}
if ($counterNames.count -eq 0) {
    $statusBar1.text="Oops. You forgot to select some counters."
    return
}

```

The script block gets some information from the form.

```

[string]$computername=$txtComputername.text
[string]$category=$comboCategories.SelectedItem
$instance=$listInstances.SelectedItems

```

I create an empty array object. This will hold all the performance data objects I'm going to create. Later, this object will be used as the source for the DataGridView control.

```

#create an array to hold perf data
$griddata=@()

```

Each instance is enumerated and passed with other information to the New-PerfDataObject function.

```

foreach ($instance in $instances) {
    #get a custom perf data object for each instance
    $perfData=New-PerfDataObject $computername $category $instance $counterNames
}

```

This function will return a custom object with performance counter values for each instance. Each returned object is added to my temporary array.

```
$perfData | foreach {  
    $griddata+=$_  
}
```

Let's take a look at this function.

```
Function New-PerfDataObject {  
    Param([string]$computername,  
          [string]$category,  
          [string]$instance,  
          [array]$counters  
    )  
  
    #If single instance then use category name  
    If ($instance -eq "Single Instance") {  
        $instancename=$category  
        $instance=$Null  
    }  
    else {  
        $instancename=$instance  
    }  
    #create empty object  
    $obj = New-Object PSObject  
    $obj | Add-Member NoteProperty -name "Instance" -value $instancename  
  
    $collected=@{ }  
    #get counters and data  
    #the first time through counters have 0 value.  
    #go through twice to get some values  
    for ($i=0;$i -lt 2;$i++) {  
        foreach ($counter in $counters) {  
            If (-not $collected[$counter]) {  
                $collected[$counter]=New-Object System.Diagnostics.PerformanceCounter $category,  
                $counter,$instance,$computername  
            }  
        }  
    }  
}
```

```

        foreach ($counter in $collected.keys) {
            $perfcounter=$collected.item($counter)
            $perfcounter.NextValue() | Out-Null
        }
    }

    foreach ($counter in $collected.keys) {
        #create a property for each counter and
        #add it to the object
        $perfcounter=$collected.item($counter)
        $obj | Add-Member NoteProperty -name $counter -value $perfCounter.NextValue()
    }

    #write the performance data object to the pipeline
    write $obj
}

} # end NewPerfDataObject function

```

The function will return a custom object with properties for the instance name and each counter. If the performance category is of the single instance type, I'll use the category name as the instance name.

```

#If single instance then use category name
If ($instance -eq "Single Instance") {
    $instancename=$category
    $instance=$Null
}
else {
    $instancename=$instance
}
#create empty object
$obj = New-Object PSObject
$obj | Add-Member NoteProperty -name "Instance" -value $instancename

```

Now comes the tricky part, which needs an associative array, also known as a hash table.

```
$collected=@{ }
```

To retrieve performance counter values, I need a PerformanceCounter object.

```

New-Object System.Diagnostics.PerformanceCounter
$category,$counter,$instance,$computername

```

This object has a **NextValue()** method, which will return a data sample. However, you won't get any real data the first time you call this method. You need to call it twice to capture anything. Therefore, I'm using a **For** construct to loop through a block of code twice.

```
for ($i=0;$i -lt 2;$i++) {
    foreach ($counter in $counters) {
```

I've passed an array of counters, so each counter is processed using **ForEach**. Each counter is added to the hash table as a key if it doesn't already exist. The corresponding value is the performance counter object for that counter.

```
If (-not $collected[$counter]) {
    $collected[$counter]=New-Object System.Diagnostics.PerformanceCounter $category,
    $counter,$instance,$computername
}
```

Once I've built the hash table, I'll enumerate it once, calling the **NextValue()** method, which I discard by piping to **Out-Null**.

```
foreach ($counter in $collected.keys) {
    $perfcounter=$collected.item($counter)
    $perfcounter.NextValue() | Out-Null
}
```

Now I'll repeat the process, except this time, I'll add the counter as an object property and use **NextValue()** to retrieve the property's value.

```
foreach ($counter in $collected.keys) {
    #create a property for each counter and
    #add it to the object
    $perfcounter=$collected.item($counter)
    $obj | Add-Member NoteProperty -name $counter -value $perfCounter.NextValue()
}
```

All that remains is to write the object to the pipeline, which passes it back to the **GetData** script block.

```
write $obj
```

After I've retrieved all the performance data and saved it to **\$griddata**, I create an **ArrayList** object and add **\$griddata**.

```
$array= New-Object System.Collections.ArrayList

#add the griddata to the array object
$array.AddRange($griddata)
```

The `ArrayList` object becomes the source for the `DataGridView`.

```
$DataGridView1.DataSource = $array
```

At this point, the data should be presented in the form. The script block ends by starting the `Timer` control.

```
$interval=$txtRefresh.Text -as [int]
#interval must be in milliseconds
$timer1.Interval = ($interval * 1000) #1 second time interval
#start the timer
$timer1.Start()
```

The control on the form lets you specify a refresh interval in seconds. The `Timer` control ticks in milliseconds, so the `Interval` property is calculated accordingly. When the timer expires, the `GetData` script block is executed as defined in the form section of the script.

```
$timer1.add_Tick($GetData)
```

Before we leave, a few caveats. This script is intended as a broad and general performance monitoring tool. Some performance values may need a little “interpreting.” For example, counters that are related to a processor may return a value that needs to be divided by the total number of processors. Also, some counters return very large values, which are expressed in scientific notation.

I hope it goes without saying to select a refresh interval that is short enough to be meaningful but not so short that you can’t get all the data before the next refresh. Finally, you need administrative rights on any remote computer for most of this to work. There’s no easy way to pass alternate credentials, but I’ve found that even a mapped drive using alternate credentials will provide the necessary secure connection.

I’m sure you’ll recognize a number of areas for improvement and enhancements. I hope you tackle them. Feel free to use the forums at ScriptingAnswers.com if you need any assistance. ♦

*Jeffery Hicks (MCSE, MCSA, MCT) is a Microsoft PowerShell MVP and Scripting Guru for SAPIEN Technologies. Jeff is a 17 year IT veteran specializing in administrative scripting and automation. Jeff is an active blogger, author, trainer and conference presenter. His latest book is *Managing Active Directory with Windows PowerShell: TFM* (SAPIEN Press). Follow Jeff at Twitter.com/JeffHicks and blog.sapient.com. You can contact Jeff at jhicks@sapien.com.*

Exclusively Exchange

Exchange 14 Cool Tidbits

by J. Peter Bruzzese

It's hard to believe that we are talking about the next release of Exchange, but Exchange 2007 is coming up on the next Service Pack, SP2, and development began on Exchange 14 almost immediately after they green-lighted 2007.

Allow me to put your mind at ease. Exchange 14 is not looking to revise our world yet again with a complete overhaul of the consoles; the Exchange Management Console (EMC) and Shell are working just fine. In fact, much of the initial information we have regarding Exchange 14 is less about the administrative side and more about how users will be pleased with the changes being made on the Outlook Web Access (OWA) side. In order to accomplish the changes, a redesign was needed.

A Redesign from The Ground Up

Videos have been released by the Microsoft Exchange Team (<http://msexchangeteam.com>) that focus on what the future holds. In the first video, featuring Exchange Program Manager KC Lemson and Exchange Labs Program Manager Jim Lucey, we learn a lot about the underlying motive behind the changes.



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The redesign from the ground up of Exchange 14 is based on a memo from Ray Ozzie dated October 28, 2005, where Ozzie outlined the challenges Microsoft faces in pursuing supported services and software through its official Live services. An on-premise Exchange solution is still a key element to environments, but now Microsoft is focusing on deploying it as a service. To truly see how Exchange performs in the cloud, Microsoft had to go outside of its traditional dog-food testing environment (which is simply the testing process in-house) because even at 100,000 users, Microsoft doesn't have enough people to test cloud services. So the company developed Exchange Labs (recently renamed to Outlook Live), which is a way for testing Exchange 14 in a high-scale multitenant environment. Exchange Labs has 3.5 million student mailboxes (students, faculty, staff, and alumni) within 1500 organizations worldwide, which is an impressive demonstration of its ability to scale out.

Cross-Platform Browser Support (and More)

After the first video, there were a ton of comments, many of which centered in on the request for the Exchange Team to provide multi-browser support. Exchange does support OWA for cross-platform support but typically the support in Safari and Firefox is for "OWA Light," which doesn't provide all the rich features you typically see with Internet Explorer.

So, the follow-up video posted on the site (as well as on TechNet Edge—<http://edge.technet.com>) helped to demonstrate the following great new features we can look forward to with OWA. In the second video, KC Lemson returns with Ian Hameroff (Senior Technical Product Manager) and shows us the following:

- ▶ Premium OWA for Internet Explorer, Safari, and FireFox
- ▶ The introduction in OWA of a new conversation view that allows the stacking of mail under the same thread for easier discussion tracking through the day/week/month; the idea is to cut down on clutter and increase productivity
- ▶ IM will be integrated within the OWA interface (which will also integrate 'presence' into the interface)

What Are the Masses Requesting?

Based on the responses to these great videos coming from the Exchange Team (and you can expect future ones, no doubt), we can gauge the needs of folks in the Exchange world a bit. For example, one comment asked 'Where is the support for Opera and others?"

Others requested these same features be added directly to the next release of Outlook (which would make sense), but some were saying "OWA is probably going to become the preferred client unless people update their Outlook in the process of updating their Exchange Server.) Now that would be an interesting switch—using OWA internally because the features outweigh what you can do with your existing Outlook and you don't have the ability (funding/approval) to upgrade to the newest flavor of Outlook.

One comment regarding improving OWA was that "OWA still does not have the capability of multiple tabs within the same frame window. Having another window open when opening/composing a message is aesthetically inefficient and sooooo yesterday!"

There is a lot of talk on the wire about the eventual demise of Public Folders and a moving over to SharePoint. The Exchange Team has reported on this future certainty for quite some time and the admins are taking sides on the issue (although the Exchange Team has said "Microsoft will continue to support Public Folders in the next major release of Exchange Server, after Exchange 2007" so there really is nothing to worry about). So, one worried person said "Please keep the Public Folders in. They are a great way to share emails in project groups or amongst different departments. Just make a Public Folder and start to share. No extra software (and thus licenses) needed." However, a Public Folder-hater said "Please kill Public Folders. They are the worst invention for any large enterprise. I do want some stripped down version of a mailbox for shared email addresses, though (and third-party vendors not to charge for it as a mailbox). Maybe just an inbox and deleted items? That would be perfect for department email address needs. I also want to see expanded retention folders with way more options to file things away. Maybe an area for each user with a retention time on it?"

We Want More Information!

The desire for more information is the biggest comment coming from the Exchange world. It's a product that is well loved by those of use that work with it, and we are excited to see it being developed further. No doubt as we get closer and closer to the release date, we will see more information coming from our friends on the Exchange Team. ♦

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