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in Realtime

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Letter from the Editor

The Commoditization of Virtualization

by Greg Shields

Last month's firing of Diane Greene, the now-former CEO of VMware, should strike directly at the heart of many a virtualization administrator. Diane was well known and well respected among IT professionals for her work in maintaining VMware's early preeminence within the industry. But times change and so do first-mover advantages. Even with its rock-solid product and deeply supportive fan base, VMware's solidly entrenched product lines are now seeing their first real test of competition. The most obvious of these is Microsoft's new Hyper-V virtualization platform, but others exist with longer histories of service.

I won't argue the benefits of one virtualization solution over another in a feature-by-feature war. Today, VMware's Virtual Infrastructure beats all the rest when it comes to capabilities. But it also beats the rest when it comes to price. I think Charles Babcock put it best in the July 14th issue of *Information Week* when he wrote:

What, for example, will VMware do with a pricing schedule that shows an ESX hypervisor at \$495 per dual-core processor, \$995 for a small-business package, \$2,995 for a high-availability offering, and \$5,750 for an enterprise-class Virtual Infrastructure 3 package? 'With no competition, you can get away with that,' said Gartner analyst Thomas Bittman. 'Now, VMware has seven solid competitors. Regardless of whether Diane left, VMware needed to address pricing.'

True enough. VMware's product is excellent, but alternative solutions that provide varying percentages of its capabilities are slowly encroaching on its market share. With rare exception, those solutions arrive with a lower price point.

The other market force to consider is related to the environments that have already virtualized in comparison with those that have yet to make the jump. With many larger environments already having a toe in virtualization's pond, the smaller environments are where the next battleground is due to be fought. These smaller environments tend to have less available capital on-hand. Their "just-make-it-work" approach to data center management makes them more apt to select less expensive and therefore less feature-rich solutions.

So where am I going with all this talk of economics? I fully expect with the current market situation approaching a commodity status, the next strategic step I see is for prices to fall. Keep an eye on our Windows Server community at <http://www.realtime-windowsserver.com> for all the up-to-the-second information as it crosses my desk. ♦

Answers from the Experts

Should You Be Using Windows 2008 Read-Only Domain Controllers?

by Don Jones

Q: Jeff asks, “Should I be using Win2008 Read-Only Domain Controllers in my environment?”

A: The answer: A definite “Maybe.” Read-Only Domain Controllers (RODCs) are one of Win2008’s new features targeted primarily at branch offices—that is, at locations within a distributed organization where there are few or no IT personnel, and where the server itself may not be as

physically secure as you would like.

As the name implies, an RODC contains a read-only copy of the domain, making it good for authenticating logon requests but requiring a connection to a full DC in order to make changes such as password resets. RODCs also support read-only DNS, providing branch offices with local DNS lookups—again, useful if the connectivity to the branch office isn’t fast or completely reliable. Interestingly, the RODC continues to

replicate files via FRS or DFS-R—but as with AD itself, this replication is incoming-only.

The read-only part of an RODC helps ensure that a physically-compromised branch office DC can’t be used to corrupt the forest; changes to an RODC are not replicated to the rest of the domain. Because applications still need to be able to make changes to AD, the RODC will provide a referral to a full DC when changes need to be made.

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RODCs don't actually store AD passwords (you can filter other attributes, too, but by default, everything else in AD is stored on an RODC), so if an RODC is physically compromised, there aren't any passwords to work with, encrypted or otherwise. Instead, authentication is proxied by the RODC, meaning the RODC contacts a real DC to authenticate users—and then caches that credential in-memory (you have to explicitly configure this caching behavior) to speed future authentication requests.

One very cool feature is that the RODC's local Administrator account can be assigned to an on-site user at the branch office without granting

that person any permissions in AD itself. This allows the local person to do local maintenance, such as running backups or installing device drivers, while maintaining the security of AD.

The small-footprint Server Core installation of Win2008 supports RODCs; because Server Core is anticipated to be somewhat lower-maintenance than the full Win2008 install, Server Core might also be a good choice for these branch offices. Other good Win2008 features to use on a branch office server are BitLocker and Trusted Platform Module (TPM), both of which help further secure the DC's data in the event the server (or its hard drive) is physically stolen.

Do you have an IT question you'd like Don to answer? Send it to answers@realtimepublishers.com for consideration! ♦

Don Jones is a co-founder of Concentrated Technology (www.concentratedtech.com), helping to deliver IT knowledge in less time using innovative content techniques. He also serves as CTO and Series Editor for Realtime Publishers. Don is the author of more than 30 IT books, including Windows PowerShell: TFM; VBScript, WMI, and ADSI Unleashed; Managing Windows with VBScript and WMI; and many more. He is a multiple-year recipient of Microsoft's "Most Valuable Professional" (MVP) Award with a specialization in Windows PowerShell.

Product Review

GoToMyPC

by Don Jones

If you're not at least familiar with the GoToMyPC product family (which includes GoToMeeting and other related products), you must have been living under a rock for the past few years—extensive radio advertising campaigns have raised awareness on this product big-time. But how suitable is it for enterprise use? A few years back, the company was purchased by Citrix and GoToMyPC is now offered by “Citrix Online;” Citrix certainly “gets” the enterprise, so I wanted to see how the latest GoToMyPC (GTMP) offering is working out.

The overall concept for GTMP is simple: You install a client application on your computer, which runs in the background. It maintains a connection with the GTMP servers over an HTTP port. You then use the GTMP Web site to securely log into your computer for Remote Desktop-esque access to your PC. Unlike Remote Desktop, which taps into Windows' native multi-user capabilities, GTMP is more like the popular (and free) VNC software in that it is essentially sending a snapshot of your PC screen across the Web. You'll start with a “zoomed out” view of your desktop, allowing you to see everything but maybe not read it. If your PC is using a high screen resolution but the remote computer you're using can't match it, you may not be able to read what's on your PC's screen very well. But you can zoom in and see everything 100%, and then scroll around your desktop as needed—basically, a good compromise. GTMP also provides file-transfer capabilities for moving files between your PC and whatever remote computer you're on.

The technology works well; the experience is snappy and as responsive as you would expect for this type of technology. It's super easy to set up, very secure (in addition to a username and password, you can create a list of single-use login PINs to carry around with you, making it harder for someone to get into your machine without your permission), and works exactly as advertised. What I'm more interested in is its enterprise suitability.

What It Ain't

GTMP is *not* a remote-support product; Citrix markets GoToAssist for that exact purpose. Although the two share underlying technologies, the interfaces are completely different. Having GTMP on a user's machine does not necessarily make a great remote-support experience. In fact, GTMP can be configured to blank the PC's screen when someone's using it remotely, which is good for both protecting privacy and preventing the freak-out that occurs when someone sees a desktop operating under remote control; it's not so good for remote support scenarios. There is a way to invite guests to the machine—a la Messenger's Remote Assistance—but it's still sub-optimal. If you need remote support, look into GoToAssist.

Enterprise Concerns

The main barriers to enterprise adoption of GoToMyPC—that is, getting permission for users to install it—revolve around a few key, and fairly obvious, concerns:

- ▶ **Security:** We're letting people into the enterprise remotely. Is this safe?
- ▶ **Data protection:** We're potentially letting people copy data out of the enterprise to remote machines—good idea? This is an especial concern for companies dealing with compliance issues and sensitive data. Unless VPN-style remote access, where you can confine remote users to a portion of your network that doesn't contain sensitive data, GTMP is utilizing a fully trusted desktop machine that's on the office intranet.
- ▶ **Control:** How well can we monitor and manage this product within the enterprise?

From the security perspective, Citrix is doing all that humankind could do. Access requires an email address and two passwords, which are required to be strong passwords. You can optionally create one-time passwords to provide further protection. Note that the authentication is handled both by the GTMP Web site and your local GTMP client, so there's no way to tie it into a broader enterprise authentication scheme. That means smart cards, RADUIS, SecurID, and other advanced authentication schemes are out of the question. The entire data stream is encrypted with 128-bit AES, so it's about as safe as it could possibly be from interception. However, none of these features can overcome a paranoid Security Officer or extremely strict and inflexible company policies; there are certainly instances where GTMP might not meet company requirements for security and so won't be allowed. Citrix offers the GoToMyPC Authorization Management Service, something you can get for free from Citrix whether anyone in your company is using GTMP or not. This allows you to prevent users from using GTMP if desired; corporate customers get this service also. You can also simply block access to poll.gotomypc.com at your firewall and you'll block everyone from using the service.

The data protection issue is a bigger concern. I couldn't find a way to allow the GTMP remoting while at the same time blocking file transfer; that means you're opening up a potential means for sensitive data to leave a secured desktop machine and reside on a remote machine—potentially even one not owned by the company. I can see that being one of the biggest concerns some companies might have about allowing this product in their environment, simply due to legal concerns for compliance requirements such as HIPPA, GLBA, SOX, PCI DSS, and so forth. It would be nice if the GTMP client read some Group Policy-controlled registry keys to determine if (a) the client was allowed to run, (b) what various options are configured to be, and (c) whether or not file transfers were allowed. This would provide some enterprise warm-and-fuzzy, not to mention centralized, internal controls over the use of the product.

And that lack of internal control over GTMP is probably the biggest hurdle the product has in the more secure-and-paranoid enterprise. The free Corporate Authorization Management Service allows you to designate which users may use GTMP: You can block the use of personal accounts and designate that only corporate accounts—those purchased by your company—can be used. Blocking is handled based on your company's IP addresses; you set it up so that only corporate accounts can be used for connections originating from your network. If you have a lot of public-facing IP addresses—say, from a lot of office locations—this will be a pain to set up initially. Again, if the client could be configured via Group Policy, it'd give you more flexibility and control without having to contact Citrix.

The Mac Connection

While you can use the Web end of GTMP on a Mac to access a Windows PC, the GTMP client doesn't run on a Mac, so you can't use it to remotely access a Mac. Apple's MobileMeservice, combined with OS X 10.5 or later, offers a built-in "Back to my Mac" feature which is analogous to GoToMyPC.

Conclusion

GTMP is a well-designed solution that does exactly what it advertises. Citrix doesn't include the security and control features that some companies will require, but they do provide a means to ensure the service can't be used by unauthorized users. If you can overcome any objections about the potential to transfer files off-network, then GTMP is a great way to provide users with remote access to their office PCs. I don't feel it's as robust, performance-wise, as Remote Desktop, but it's definitely easier to set up and maintain, and much easier to use in a broader variety of situations because it uses HTTP connections rather than a completely different protocol (RDP). ♦

SQL Server 2008

by Richard Siddaway

Microsoft's SQL Server will have almost 20 years of history behind it when it ships this year. Over those years, it has evolved into a comprehensive database platform used in many organizations both directly to support applications and indirectly through Microsoft products such as SharePoint. At the time of writing, the latest version, SQL Server 2008, is at Release Candidate (RC) 0 stage. It is feature complete and is the version upon which this article is based. Please be aware that there is a possibility that some features may change in the final version. SQL Server 2008 RC0 can be downloaded from <http://www.microsoft.com/sqlserver/2008/en/us/try-it.aspx>.

There is a raft of new features in SQL Server 2008, as with any new release of a major product. I will outline the major changes in this article but will concentrate on those new features that affect the administration of SQL Server 2008. I will also cover some of the reasons I believe that businesses should consider upgrading to SQL Server 2008.

Each new release of SQL Server brings more functionality or enhancements for existing functionality. Among the new features of SQL Server 2008:

- Data encryption
- Auditing
- Database mirroring improvements
- Resource governance
- Query plan lock down
- Data compression
- Policy-based management
- Introduction of LINQ and ADO.NET object services
- New data types
- Geographic data
- Backup compression
- Partitioned table enhancements
- TSQL enhancements, notably MERGE statement and grouping sets
- Reporting Services improvements
- PowerShell integration with SQL Server
- Web edition

A complete list of new features with links to further information can be found at <http://www.microsoft.com/sqlserver/2008/en/us/overview.aspx>.

Even the partial list presented gives too much to cover in a single article. As previously mentioned, I will concentrate on the features that have an impact on administration or the implementation of SQL Server 2008. In terms of things that will affect the administration of SQL Server, the ability to set management policies and the resource governor will potentially have the largest impact.

Policy-Based Management

Many organizations have multiple instances of SQL Server in their environment. From an administrator's viewpoint, those instances of SQL Server should be configured in an identical manner. It is much easier to ensure that the correct settings

are applied from an administrative and security standpoint if the configurations are identical. If there are a handful of servers, it is possible to perform this task via manual checks, but as the number of servers increases, it becomes increasingly difficult and time consuming to perform these checks and will eventually become impossible. SQL Server 2008 introduces management policies that are known as the Declarative Management Framework in the documentation. With management policies, it is possible to ensure that all your servers are configured correctly and to be notified when a configuration item is in violation of the policy. It is also possible to force compliance with the policy.

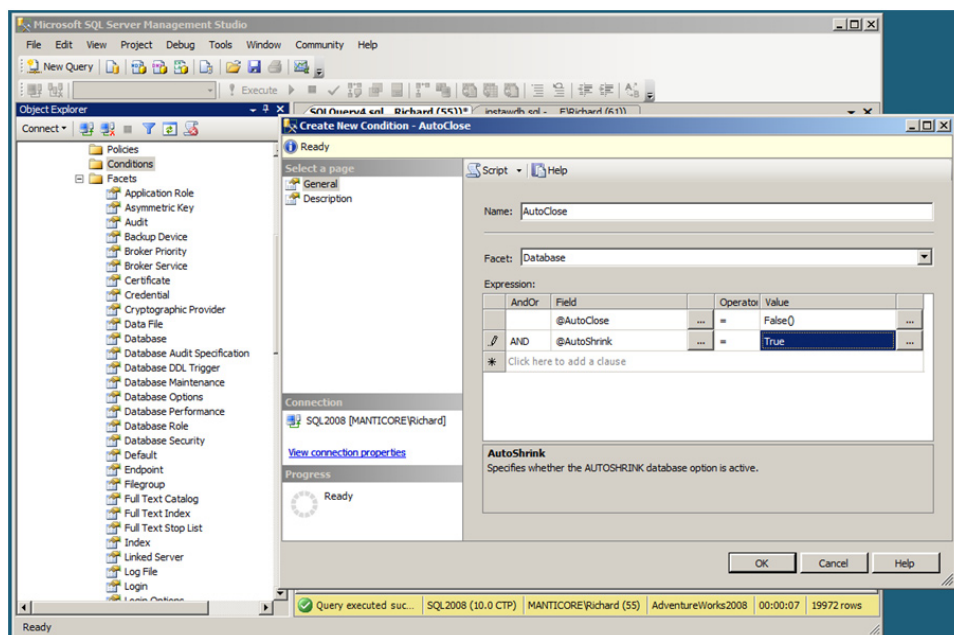


Figure 1. Creating a condition.

Some examples of policies include:

- ▶ Setting Authentication Mode to be Windows Authentication
- ▶ Set the database recovery model
- ▶ Ensure AUTO_CLOSE is set to OFF

A policy consists of one or more conditions that test the state of a particular property. The properties are grouped into facets. As an example to be used throughout this section, consider the fact that databases can be configured to automatically close down when the last user logs off from the database. This is normally considered to be against best practice given the overhead needed to bring the database back online when a user connects to the database.

To create a new policy, start by opening SQL Server Management Studio, then navigate to the Management node, and select Policy Management. This exposes a further three nodes: Policies, Conditions, and Facets. On a new instance of SQL Server 2008, there will not be any Policies or Conditions defined. Under the Facet node, you will see a long list of options. Each facet is a grouping of related properties. As an example, the database facet contains the properties of the database object. If you compare the properties list in the facets with those available by right-clicking an object and selecting properties, you will see the relationship.

The first step is to create a new condition. Right-click Conditions, and select New Condition. Supply a name and select the facet to be used—in this case, the Database facet. Then select the field(s), operators, and values that the condition should test against. In this case, we want both conditions to be set to false. An example is shown in Figure 1. An optional description can be added to the condition.

The next step is to create the actual policy. Right-click Policies, and select New Policy. Supply a name, and select a Condition from the drop-down list. The policy can be configured to run on demand or on schedule. In this case, we will use On demand as shown in Figure 2.

To test the new policy, we will use the AdventureWorks2008 sample database that can be downloaded from <http://www.codeplex.com/MSFTDBProdSamples/Release/ProjectReleases.aspx?ReleaseId=16040>.

One issue I had in the script was that the path to find the data to load into the database wasn't quite right. The line should be

```
SET @data_path = 'C:\
Program Files\Microsoft
SQL Server\100\Tools\
Samples\AdventureWorks
2008 OLTP\';
```

Having created the database, open the properties, and set AUTO_CLOSE to True. Right-click the CloseShrink policy that we have just created, and select Evaluate. Figure 3 shows the results of evaluating the policy. The AdventureWorks2008 database clearly is violating the policy. To correct this, select the check box by the database(s) that are violating the policy, and click Apply. After a warning message to confirm application, the policy is applied to the database, and the correct setting is applied.

This feature allows you to create policies that can be used to standardize the configuration of the server and the databases. Policies can also be created that control the naming conventions used for database objects. Care must be taken with this option if you are using third-party applications whose databases will not comply with your convention.

The real power of this feature comes with the fact that policies can be configured on one server and pushed out to be applied to a group of servers. Using the Registered Servers option from the View menu in SQL Server Management Studio, it is possible to create groups of servers and designate them Central Management Servers. Note that a Central Management Server cannot be a member of a server group that it manages. The policies that are created on the Central Management Server can then be applied to the whole group of servers, thus ensuring that configurations are standardized across the SQL Server estate and that reports can be generated proving compliance. If you would like to actually try this feature, a TechNet virtual lab is available at <http://msevents.microsoft.com/CUI/WebCastEventDetails.aspx?EventID=1032357626&EventCategory=3&culture=en-US&CountryCode=US>.

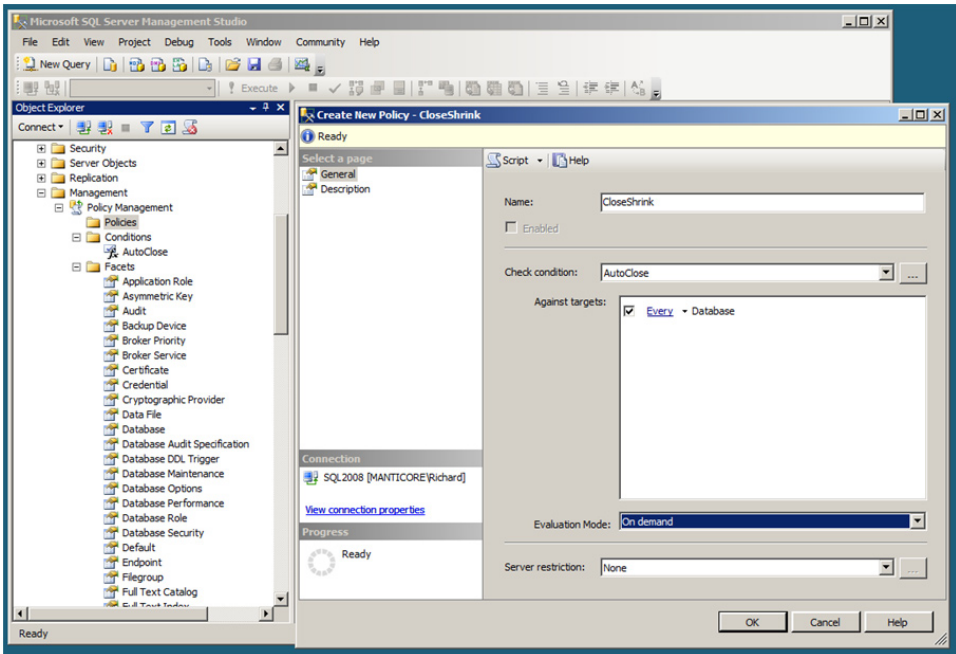


Figure 2. Creating a policy.

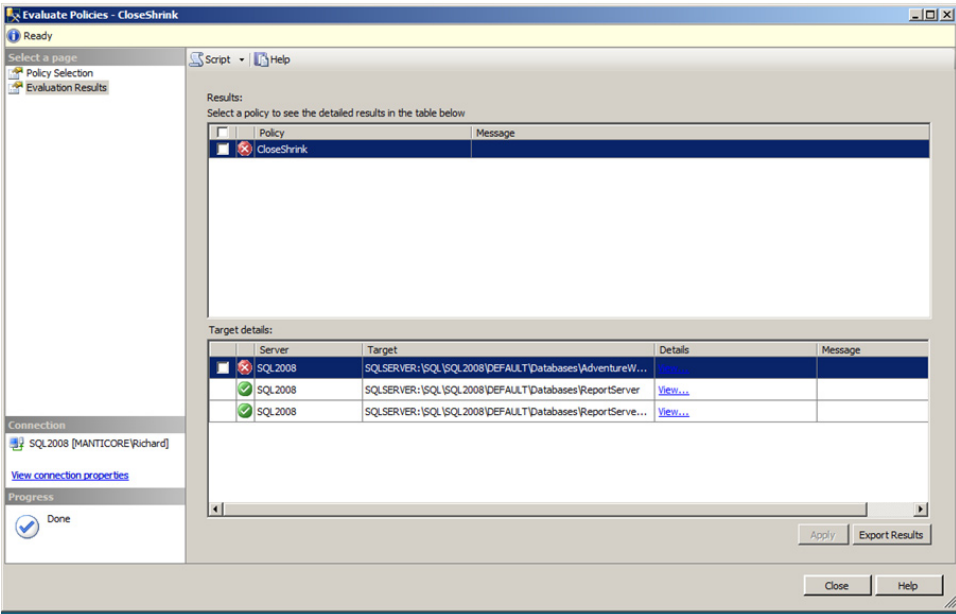


Figure 3. An evaluated policy.

The policies that are available through the DMF are those policies previously available through the SQL Server Best Practice Analyzer. By making the best practice policies available in this manner, SQL Server best practice can be applied proactively and enforced across the SQL Server estate with a minimum of administrative effort.

Resource Governance

Most DBAs have experienced the nightmare scenario of all the users suddenly complaining about the database server being really slow. When you investigate what is causing the problem, you discover that a user has submitted a query that is so badly written that it just sits there consuming any and all resources, especially CPU and memory, to which it can get access. This can lead to the server processor and memory usage being “maxed out” by a single query.

The concept of a single application per server is slowly disappearing as organizations realize that consolidating workloads onto a smaller number of servers means those servers are being used more efficiently. There is also a cost savings involved as expenditure on hardware, software licenses, power, air conditioning, and so on is reduced. Consolidating workloads in this manner adds a task into the administrator’s schedule in that management of the workloads is now required. Workloads consolidated onto a single server will have different requirements and will require management to avoid contention for CPU and memory resources causing performance degradation.

On a busy server, not all workloads are equal. In many cases there is a need to give one workload a priority over other workloads. The Resource Governor can be used to solve, or alleviate, these problems. It performs a number of tasks:

- ▶ Route workloads to specific resource groups
- ▶ Monitor resource usage at the workload level
- ▶ Set limits on resources, i.e. CPU and memory usage
- ▶ Set priorities for workloads

The resource limits can be changed dynamically.

There are a number of constraints on the Resource Governor. It only works for the database engine across the local instance of SQL Server. There is no resource combination across instances. Other components, such as Analysis Services and Reporting Services, are not supported. Very short queries will not be included in the workload management.

The Resource Governor, like a lot of SQL Server functionality, can be managed from SQL Server Management Studio or from TSQL.

Reporting Services

One major change to Reporting Services is that the dependency on IIS has been removed. In previous versions of Reporting Services, IIS was used to provide a Web front end to Reporting Services. IIS and SQL Server are both resource-hungry applications, especially for memory. This could lead to the situation where IIS and SQL Server are competing for memory if Reporting Services was on the same physical server as the databases being reported from. The only remedy for this was to move the Reporting Services onto another physical server, which adds extra license and hardware costs to the implementation.

SQL Server 2008, instead of using IIS, utilizes the operating system (OS) HTTP.SYS capabilities. In addition, the report server has an HTTP listener that directly accepts requests. HTTP requests are directly logged by the report server in a similar manner to the logs created by IIS. ASP.NET is hosted within Reporting Services via the CLR capability of SQL Server. Authentication also moves out of IIS and into the Reporting Server. Memory management for Reporting Services has been improved with the ability to set thresholds for memory usage during report processing.

Report creation has also been enhanced with the table, matrix, and list items combined into a new Tablix data region. The Tablix has a flexible grid layout so that columns and rows can be grouped as required to give the correct layout for the report. Groups of rows or columns can be nested. A new version of Report Designer incorporates working with the Tablix area.

Windows PowerShell

Windows PowerShell is Microsoft's future automation engine. The most visible application of the engine is in the PowerShell command-line console and scripting language. Exchange Server 2007 was the first major product to incorporate PowerShell support. SQL Server 2008 will also incorporate PowerShell support, though in a different way to Exchange.

The SQL Server team has provided PowerShell support by creating a provider. A provider exposes a data store in the same manner as the file system (that is, it can be accessed as if it was another drive on your system). PowerShell includes providers for the file system, registry, and the certificate store, among others. The SQL Server provider exposes the Server Management Objects (SMO) hierarchy and the policy management objects as if they were the file system.

You can use standard file system navigation commands such as `cd` and `dir` to work through the provider. It is possible to work interactively with the server object or databases or any other SQL Server administrative object. If you can see it in SQL Server Management Studio, you should be able to work with it in PowerShell. One nice touch is the ability to right-click on an object in the Management Studio and open PowerShell at that point in the object hierarchy.

Most Microsoft products that have implemented PowerShell support allow the addition of their functionality into the standard PowerShell console. If you are using the console shortcut that is installed by the product, you can add functionality. This allows you to create a PowerShell-based administrative console that supplies you with the tools you need to work. The PowerShell console supplied by SQL Server is closed (that is, it is not possible to add extra functionality). In fact, the commands that allow you to work with PowerShell snap-ins to manage the extra functionality have been removed.

One thing you cannot do in the SQL Server PowerShell provider is create a new object via the standard `New-Item` cmdlet. You need to revert to scripting or the Management Studio to do so.

For the IT generalist in a small to medium-sized organization, the introduction of PowerShell will be of immense benefit. The same toolset can be used to administer Windows, Exchange, SQL Server, IIS, Active Directory (AD), and a number of other Microsoft and third-party products. As the introduction of the MMC unified GUI-based administration, PowerShell will provide the same level of unification at the command line and in scripts.

Data Encryption

The ability to encrypt individual columns of data was introduced in SQL Server 2005. SQL Server 2008 builds on the encryption capabilities by introducing Transparent Data Encryption (TDE), which encrypts the whole database and the log files. Encryption and decryption are performed in real time by the database engine based on a certificate-protected Database Encryption Key (DEK). AES and 3DES can be used as encryption algorithms.

The encryption and decryption is transparent to applications, as it is managed by the database engine. One thing to be aware of is that the data is only encrypted in the database and log files. It is not encrypted in transit between the database server and a client application.

When a database with TDE is backed up, the backup file is also encrypted using the DEK. The DEK must be available for a restore to occur. As well as a backup plan for the data, it is now necessary to back up the certificates protecting the encryption keys.

New Data Types

A number of new data types are introduced with SQL Server 2008. Previous versions of SQL Server have used a DateTime data type that combines time and date information. This has led to unnecessary storage and programming overhead if only the date or the time is required. SQL Server 2008 introduces four new data types for storing date and time information:

- ▶ Time—Stores only time data to an accuracy of 100 nanoseconds, requiring 3 to 5 bytes
- ▶ Date—Stores only the date portion, requiring 3 bytes
- ▶ Datetime2—Stores date and time information to an accuracy of 100 nanoseconds, requiring 6 to 8 bytes; the original datetime data type stores time and date information to an accuracy of 0.00333 seconds, requiring 8 bytes, while smalldatetime has an accuracy of 1 minute and requires 4 bytes
- ▶ Datetimeoffset—Stores a date and time together with a time zone offset; it has an accuracy of 100 nanoseconds and requires 8 to 10 bytes

Documents, and other unstructured data, can be stored within the file system and accessed through the database by using the FILESTREAM storage option. SQL Server 2008 utilizes an NTFS file system to store varbinary(max) binary large objects (BLOBs). T-SQL can perform actions on FILESTREAM data such as insert, update, query, and backup. Streaming access is provided via the Win32 file system interfaces. The NT system cache is used for file data rather than the SQL Server buffer pool, reducing the impact on SQL Server performance.

FILESTREAM storage should be used instead of database storage when:

- ▶ Objects' average size is greater than 1MB
- ▶ Fast read access is required

It is not possible to encrypt FILESTREAM data.

Hierarchical data has traditionally been awkward to manage using a relational model. A common example of hierarchical data is organizational structure. SQL Server 2008 introduces a hierarchyid data type to manage this situation. The hierarchyid data type represents values as a position in a tree. A number of methods are available for working with hierarchical data:

- ▶ GetAncestor()
- ▶ GetDescendant()
- ▶ Read()
- ▶ Write()
- ▶ GetLevel()

Hierarchical data is accessible through T-SQL and .NET managed code.

Spatial data types are now supported in SQL Server 2008. The geometry data type supports planar (that is, flat earth) data, whereas the geography data type stores ellipsoidal (that is, round earth) data including GPS latitude and longitude values. The spatial data can be issued as points, linestrings, and polygons.

Web Edition

Microsoft has introduced another edition to the lineup for SQL Server 2008. The Web edition is seen as a low-cost option for Web hosts and Web sites. This edition has a feature set optimised for Web use including:

- ▶ Support for up to 16 instances
- ▶ Log shipping
- ▶ Replication subscriber

- Policy-based management
- Management tools
- SQL Server 2008 new data types
- Report server

The full list of the features supported by the different versions of SQL Server 2008 can be found at [http://technet.microsoft.com/en-us/library/cc645993\(SQL.100\).aspx](http://technet.microsoft.com/en-us/library/cc645993(SQL.100).aspx).

Why Upgrade?

Upgrading database servers, and migrating between versions of SQL Server, is a task that organizations will not undertake just because there is a new release of SQL Server available. What is there in SQL Server 2008 that will make organizations want to upgrade? As with any new product, the reasons for upgrading will vary between organizations. The driving forces that will cause organizations to upgrade:

- New features that enable businesses to create applications to enhance their revenue stream
- Increased manageability
- Increased security
- Increased scalability

The new data types, with the spatial data being one of the headline items, may be one of the drivers behind new applications. The ability to add spatial data to applications enhances their usability and is a growth area. The changes to the indexing functionality to accommodate the spatial data ensure that it can be speedily accessed.

Increased manageability reduces the costs of administration. The prime mover in this aspect is the policy-based administration. Administrators are now able to configure a policy on a central server, push that policy out across the SQL Server estate, and report on the status of the configuration, providing a welcome boost to administration capability. Thus, administrators can easily prove the configuration of their servers conforms to best practice and the policies can be used to enforce that conformity.

The ability to govern the resources used by queries enables the DBA to apply a more granular level of control to the way the server operates, which will improve the throughput of the server. Increased scalability and security all add up to a platform better positioned to meet your organization's needs through aspects such as data compression, backup compression, enhancements to the encryption capabilities, and the enhanced auditing features.

Summary

In this article, I have concentrated on those aspects most pertinent to the DBA, but there are other enhancements in SQL Server 2008 that make the product more compelling: The changes in Transact-SQL with grouping sets, the ability to capture changed data, and the merge statement improve the programmability of SQL Server 2008. Changes to the Analysis Services and Reporting Services features give better analytical and reporting capabilities. Data mining integration with Microsoft Office 2007 provide an increased level of access to this functionality.

The question organizations will be asking is "Does this add up to a compelling case for upgrade?" In all of this, one aspect to remember is that if you are running third-party applications, the vendor may not immediately support SQL Server 2008. Thus, the answer to that question is very much dependent on the organization's requirements. Those businesses with many SQL Server instances will find the policy-based management to be a huge step forward. The Resource Governor will be of benefit to DBAs in preventing a rogue query from taking over the server.

It may be thought that if Microsoft is planning to shrink the time between releases, it is possible to skip a version. If your organization is running SQL Server 2000 or earlier, check on the Microsoft life cycle information at <http://support.microsoft.com/gp/lifeselectserv> and plan your upgrade path accordingly.

This article provides a very brief overview of some of the new features in SQL Server 2008. It is not possible in the confines of a single article to do justice to all the new features. From an administrator's perspective, there are a number of new and very useful features in SQL Server 2008. The trick, as with all new technology, is ensuring it is used and that the new version is not treated as just another instance of older versions of the product. ♦

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The Deep Dive

Should You Use Access-Based Enumeration?

by Greg Shields

It's like hiding files and folders but without setting the "hidden" bit. Access-Based Enumeration (ABE) has been around since the release of Service Pack 1 (SP1) for Windows Server 2003, yet many environments may not have implemented it. In many environments, there are a few good reasons why they have not.

ABE effectively changes the way in which files and folders are made available to users by hiding those that a user does not have access to. If a user does not have some form of access—minimally, the NTFS Read attribute—for a file or folder, that object is not presented to the user. Once enabled, when users navigate through a file share either through the GUI or via the command prompt, they won't see any folders for which they have no access.

Sounds like a fantastic technology! By implementing ABE on your file shares, you very quickly add a layer of security that prevents prying eyes from peeping through your folder structure. This can be a very good thing because of the way that many users name files. Although permissions prevent invalid users from opening files to view their contents, often the name of the file is all that is necessary to scrub a little bit of inappropriate information. Think about some of the folders in your shared folders:

Reasons to Fire John Doe.doc
Employee Raises (Not to Release until 11-2).xls
Project X Schematic - Unreported Widget Failure.vsd

Even with the contents of these potentially highly sensitive documents being made unavailable to users through the standard permissions model, their naming and other file characteristics can still provide clues to the nosy user. Enabling ABE on such a folder effectively hides these sensitive documents from inappropriate eyes.

However, enabling ABE can also be a pain point for an organization. One operational way used by many well-meaning users to locate folders to which they rightfully

need access is through simple browsing. If you're the HR Director and you see a critical subfolder that discusses a potential issue, you likely want and legitimately need access to that folder to determine its contents. Lack of knowledge of its existence can be a limiting factor towards getting your job done.

Implementing ABE in Server 2003

ABE is implemented on a per-share basis, and although it is enabled with the installation of Windows Server 2003 SP1, a separate download is required to display the necessary management interfaces. First, navigate to <http://www.microsoft.com/downloads/details.aspx?FamilyId=04A563D9-78D9-4342-A485-B030AC442084&displaylang=en> and download the correct package for your processor class. Once installed, right-click a shared folder, and select Properties. Then select on the Access-based Enumeration tab to see a screen similar to Figure 1. The top check box enables ABE for this shared folder only, while the bottom box enables it for all the shared folders on the server.

Also available is a command-line tool called `abecmd.exe`, which can accomplish the same tasks as seen in the GUI. To use this command to enable ABE on the share, use the following syntax:

```
abecmd.exe /enable /server {serverName}
{shareName}
```

To enable ABE for all shares on a particular server, use the syntax:

```
abecmd.exe /enable /server {serverName} /
all
```


Remember that ABE only works when files are viewed through the shares where ABE is enabled. Navigating to files through other means will render files visible again.

Implementing ABE in Server 2008

Shares with Windows Server 2008 can be created in one of two ways. The way most familiar to experienced Windows admins is to right-click a folder of interest, choose Properties, and click the Advanced Sharing button. This enables the level of granularity associated with sharing similar to what many are used to seeing in Windows Server 2003. However, this mechanism does not expose the necessary options for ABE.

To create a share with ABE enabled, first ensure that the File Services Role is installed on the server. This can either be done by creating a share using the previous steps or by installing the role directly through Server Manager. Once installed, open Server Manager and right-click Share and Storage Management under File Services, then select Provision Share. The resulting Provision a Shared Folder Wizard brings together many of the previously separated

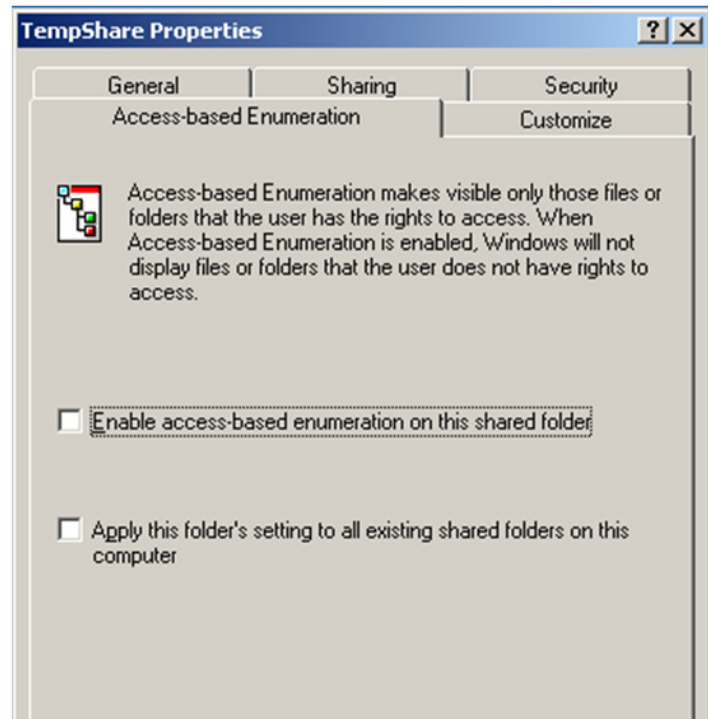


Figure 1: The GUI exposure for ABE is not made available automatically with the installation of SPI. Once the separate download is required, ABE can be enabled for specific shares or an entire server.



WHAT'S NEW



WHAT'S NEW
WHAT'S CHANGED
WINDOWS SERVER 2008
by Greg Shields

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

Greg Shields

actions commonly associated with creating new shares, such as setting permissions, exposed protocols, user limits, and offline settings. Under SMB Settings, click Advanced, and in the resulting screen similar to Figure 2, select the *Enable access-based enumeration* check box.

Enable ABE When Appropriate

There are some very important scenarios where ABE can assist with further securing a folder structure against prying eyes. But your environment needs to counter this benefit against the added difficulty users will have in finding files and folders to which they may need access. One alternative solution is to use ABE for highly sensitive folders only, where the naming of files within those folders may impart inappropriate information to the browser. In any case, informing users of the new functionality prior to making any changes is critical to keeping Help desk calls down. ♦

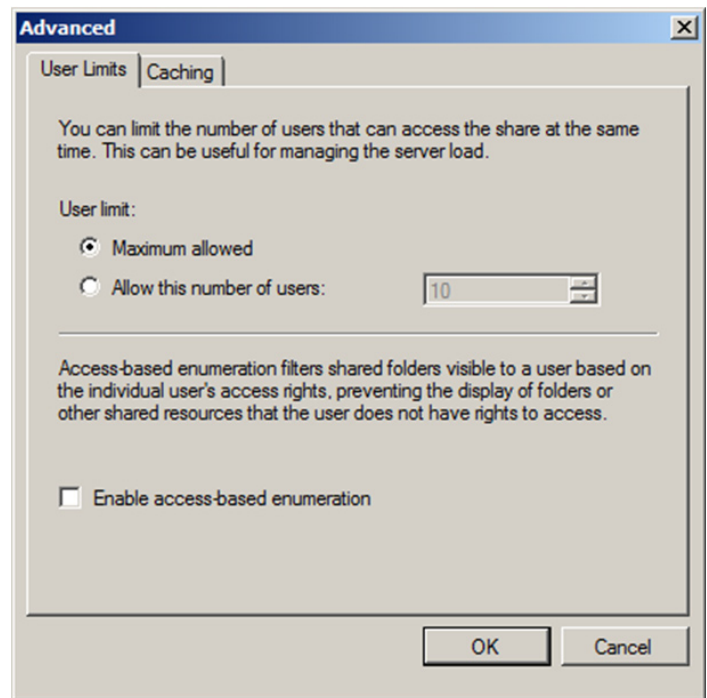


Figure 2: The ABE toggle switch in Server 2008 is slightly more buried within the Provision a Shared Folder Wizard.

Practical PowerShell

Who's Your Owner?

by Jeffery Hicks

In PowerShell, the `Get-ChildItem` cmdlet does a great job returning file information. However, one piece of potentially useful information it doesn't report is the file owner. Wouldn't it be useful to manage files based on ownership? How many files does Jack own and how much space is he using? You can accomplish this very easily with PowerShell. First, you'll need the following `Get-OwnerReport.ps1` script, which you can download from Realtime site.

You can download the following code from http://www.realtime-windowsserver.com/code/vln8_Practical_PowerShell.zip

```
#Get-OwnerReport.ps1
Param([string]$path=$env:Temp,[switch]$recurse,[switch]$force)

#verify the path is reachable
if (-Not (Test-Path $path)) {
    Write-Warning "Failed to find $path"
    Return
}

#create a get-childitem script block that corresponds
#to the passed values of -recurse and -force

$cmd="Get-ChildItem $path"

if ($recurse) {
    $cmd=$cmd + " -recurse"
}

if ($force) {
    $cmd=$cmd + " -force"
}

&$ExecutionContext.InvokeCommand.NewScriptBlock($cmd) |
where {-not $_.PSIsContainer} | foreach {
    $_ | Add-Member -MemberType "NoteProperty" -name "Owner" `
-value (Get-Acl $_.fullname).Owner
    $_ | Add-Member -MemberType "AliasProperty" -name "Size" `
-value Length -passthru
}
```

Listing 1: Get-OwnerReport.ps1.

You can run this as a standalone script, no functions to load in your profile or anything. The script can take run time parameters:

```
Param([string]$path=$env:Temp,[switch]$recurse,[switch]$force)
```

You'll need to pass it a folder path. The default is the %TEMP% environmental variable. Optionally, you can also use `-recurse` to search subfolders and `-force` to include hidden files. The script uses the `Test-Path` cmdlet to validate the specified path:

```
if (-Not (Test-Path $path)) {  
    Write-Warning "Failed to find $path"  
    Return  
}
```

If it can't be verified, an error message is displayed and the script ends. Assuming all goes well, a `Get-ChildItem` expression is constructed based on any optional parameters that might have been passed:

```
$cmd="Get-ChildItem $path"  
  
if ($recurse) {  
    $cmd=$cmd + " -recurse"  
}  
  
if ($force) {  
    $cmd=$cmd + " -force"  
}
```

This constructed expression is executed using the built-in `$ExecutionContext` variable:
&\$ExecutionContext.InvokeCommand.NewScriptBlock(\$cmd)

The `$ExecutionContext.InvokeCommand.NewScriptBlock($cmd)` returns the constructed `Get-ChildItem` expression. Using the ampersand (&) instructs PowerShell to carry out the expression. The resulting objects are next piped to `Where-Object` to filter out directories:

```
where {-not $_.PSIsContainer }
```

Each file object is then passed to `ForEach-Object`, which takes the current object and pipes it to `Add-Member`:

```
foreach {  
    $_ | Add-Member -MemberType "NoteProperty" -name "Owner" `  
    -value (Get-Acl $_.fullname).Owner  
}
```

Each file object gets a new `NoteProperty` called `Owner`. The value is the result of executing `(Get-Acl $_.fullname).Owner`. I also add an alias property called `Size` so that you can use that instead of `Length`.

```
$_ | Add-Member -MemberType "AliasProperty" -name "Size" `  
-value Length -passthru
```

Administrators never think of a file's length. We think about its size, so my custom property is more for convenience. Notice I used `-passthru`. This is to force Add-Member to write the object to pipeline. Every file object gets these properties as the object is written to the pipeline.

If you simply run the script, you'll get the default file listing from `Get-ChildItem` and think you've done something wrong because you don't see the `Owner` property. It's there. Remember, the object coming out of the pipeline is a file object, and PowerShell has a default view for that object type that doesn't include the new `Owner` property. You'll have to explicitly ask PowerShell to display it. Here are some examples.

```
PS C:\> c:\scripts\Get-OwnerReport c:\test -recurse |
>> sort Owner | select FullName,Owner,Size
>>
```

C:\test\logs\ex050202.log	BUILTIN\Administrators	34
C:\test\logs\ex050119.log	BUILTIN\Administrators	34
C:\test\logs\ex050105.log	BUILTIN\Administrators	34
C:\test\printme.vbs	BUILTIN\Administrators	63
C:\test\prhcal.csv	BUILTIN\Administrators	737
C:\test\PowerShell Commands.doc	BUILTIN\Administrators	2212
C:\test\processes.xml	BUILTIN\Administrators	88811
...		
C:\test\femalenames.jdh	PUCK\daisy	68636
C:\test\servers.jdh	PUCK\daisy	21
C:\test\test-debug.ps1	PUCK\Jeff	2307
C:\test\list.txt	PUCK\Jeff	86

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I've truncated the output just to give you a sample of what to expect. Of course, since everything coming out of PowerShell is an object, I can easily find out how many files belong to each owner:

```
PS C:\> c:\scripts\Get-OwnerReport c:\test -recurse |
>> sort Owner | group Owner | Select Count,Name
>>

Count Name
-----
891 BUILTIN\Administrators
33 PUCK\daisy
4 PUCK\Jeff
```

Let's take reporting a step further and pass the file objects to the Measure-Object cmdlet to return file size statistics:

```
PS C:\> c:\scripts\Get-OwnerReport c:\test -recurse |
>> group Owner | foreach {
>> $owner=$_name
>> $_group | measure-object size -sum -minimum -maximum |
>> select @{name="Owner";Expression={$owner}},Count,`
>> @{name="Total(MB)";Expression={$_.Sum/1MB -as [int]}},`
>> @{name="Smallest(KB)";Expression={$_.Minimum/1KB -as [int]}},`
>> @{name="Largest(KB)";Expression={$_.Maximum/1KB -as [int]}}
>> }
>>

Owner      : BUILTIN\Administrators
Count      : 890
Total(MB)   : 125
Smallest(KB) : 0
Largest(KB) : 30305

Owner      : PUCK\daisy
Count      : 33
Total(MB)   : 2
Smallest(KB) : 0
Largest(KB) : 1532

Owner      : PUCK\Jeff
Count      : 4
Total(MB)   : 0
Smallest(KB) : 0
Largest(KB) : 2
```

I use an associative array with Select-Object to define calculated properties to make the output a bit more reader-friendly.

If you are going to be reporting on a large folder structure, I recommend you save the results to a variable:

```
PS C:\> $data=c:\scripts\posh\Get-OwnerReport c:\test -recurse
```

You can then slice and dice the data anyway you want without having to re-run a long process. For example, I can use this expression to see all non-Administrator owned files:

```
$data | where {$_.owner -notmatch "Administrators"} |  
sort owner,size |Select fullname,size,owner
```

I'll let you try it on your own to see the output. Reporting gets even better if you have PowerGadgets because you can pipe to the Out-Chart cmdlet. The following code will create a bar chart (see Figure 1):

```
$data | group Owner| foreach {  
$owner=$_.name  
$_.group | measure-object size -sum -maximum |  
select @{name="Owner";Expression={$owner}},`  
Count,Sum,Maximum  
} | Sort Count | Out-Chart -Values Maximum,Sum -Label Owner -title "C:\TEST"
```

Or perhaps you'd prefer a pie chart that shows the number of files per owner:

```
$data | group Owner | foreach {  
$owner=$_.name  
$_.group | Measure-Object |  
select @{name="Owner";Expression={$owner}},Count  
} | Out-Chart -gallery Pie -Values Count -Label Owner -title "C:\TEST"
```

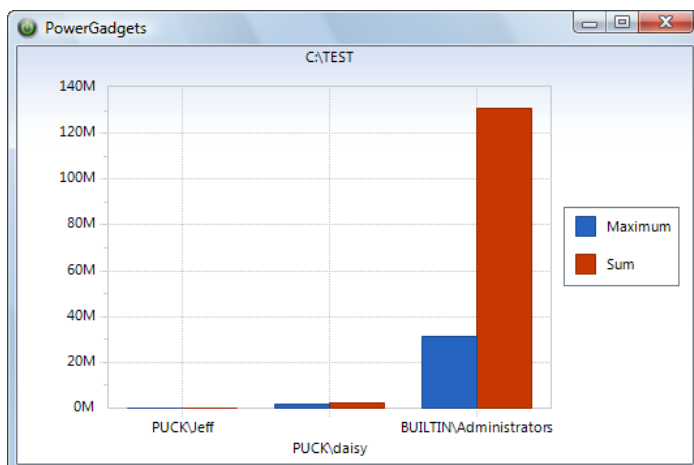


Figure 1: A file ownership chart.

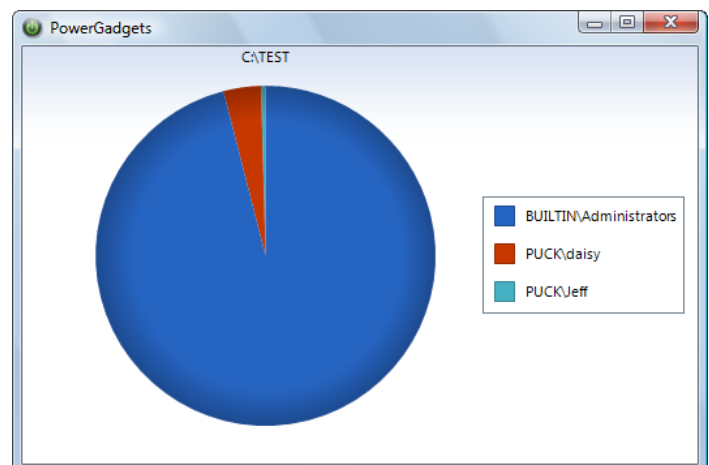


Figure 2: Number of files owned per user.

My test platform doesn't have a great variety of users, but I hope you get the picture.

I hope you see that the script is merely tweaking objects with a bit more information and that the script in many ways behaves like a cmdlet. You can export data to a CSV file, save it to a file, print it, or create an HTML report. You can do additional filtering or reporting by size, extension, or date in combination with the file owner as well, but I'll leave those projects to you. Remember, if you need assistance with those or any other PowerShell projects, please feel free to use the PowerShell forum at ScriptingAnswers.com. ♦

Jeffery Hicks, MCSE, MCSA, MCT, and Microsoft PowerShell MVP, is a Scripting Guru for SAPIEN Technologies. Jeff is a 16-year IT veteran. He has co-authored and authored several books, courseware, and training videos on administrative scripting and automation. His latest book is WSH and VBScript Core: TFM (SAPIEN Press 2007). You can contact him at jhicks@sapien.com.

Exclusively Exchange

The Top 10 PowerShell Tips, Tricks, and Tools for Exchange

by J. Peter Bruzzese

PowerShell! People, it doesn't get any cooler than this. It's not just that Windows is receiving a new command-line application to play with—something that finally says “I'm not DOS.” Even the old command prompt, which really was no longer DOS, still feels like DOS, doesn't it? But PowerShell doesn't even feel like it. You install it (or enable it if you are working with a server running 2008, being that it is included), open it up, and it's blue! OK, there are other cool aspects to it, and it does resemble every other CLI ever created (being that there is only so much you can do with a CLI), but the actual commands it can run, called cmdlets! And the power of pipelining those commands and pulling information from one command over to others and manipulating that information to accomplish tasks—all in one line!

Now here is where it gets even cooler: Exchange 2007 can be completely handled through PowerShell. The Exchange Management Shell (EMS) actually provides more control for you than the Exchange Management Console (EMC).

Exchange 2007 RTM reports indicated that the EMC could perform roughly 80 percent of the functions with the other 20 percent going to only the EMS. Since the release of SPI, that has changed, as functionality is restored for several features back over to the EMC (for example, Public Folder settings).

The Top 10 (Drum Roll Please!)

So what are the top 10 PowerShell tips, tricks, and tools you need to know to help you get started and moving forward with PowerShell? In Letterman fashion, we'll work backward from 10.

10. Using Ctrl+C when working with EMC wizards and interfaces to copy the underlying PowerShell commands being used. You can paste these commands somewhere else and study their syntax or do research further on how they are used. They can also serve as the basis for scripting the work you are doing through the GUI.

9. Do you like to work in PowerShell directly rather than EMS? You might have noticed that the Exchange commands won't work. That is because PowerShell is extended through the use of snap-ins. You need to load up the Exchange snap-in if you want it to work in the standard PowerShell. To do so, open PowerShell, and type

```
add-pssnapin *exchange*
```

Or if you want an even faster method, just hit Start, and in the Instant Search type

```
exshell.psc1
```

8. Getting help is an important aspect to working with PowerShell. How does one go about getting assistance with cmdlets? Well, if you type

```
get-help
```

you are taken to the help file. Type

```
get-excommand
```

to show you all the Exchange-oriented commands. If you know the beginning of your cmdlets (that is, get, test, update, set, new, remove, and so forth), you can type the beginning of the command, then hit the Tab key, and the rest of the cmdlet will be filled in. Keep hitting the tab key to take you to the next one in the list alphabetically until you find what you are looking for.

7. Sometimes we want to pipe the results we are seeing over to another format, like HTML for easier viewing or to be able to send to others. Brien Posey (MVP) recently wrote about this ability in PowerShell and used the command:

```
Get-MailboxStatistics | Select DisplayName, ItemCount | Sort ItemCount | ConvertTo-HTML  
-Property DisplayName, ItemCount >C:\temp\items.htm
```

This command will first get the Exchange mailbox statistics and then pipe them over to the command, which will only pull from it the Display Name and Item Count. That data is then piped into a sort command, which will sort based upon item count. Then we actually convert the whole thing to an HTML file that can be opened or sent to others.


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Over the past 15 years, Peter has worked with Goldman Sachs, CommVault Systems, and Microsoft, to name a few. He holds the following certifications: from Microsoft, MCSA 2000/2003, MCSE NT/2000/2003, and MCT with MODL; from Novell, CNA; from Cisco, CCNA; from CIW, CIW Master and CIW Certified Instructor; from CompTia, A+, Network+, and iNET+. Most recently, Peter has become a Microsoft Certified IT Professional: Enterprise Messaging Administrator (MCITP: Enterprise Messaging Administrator).



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6. What if you could know the result of a command before you execute it? That would save you a lot of frustration with committing to something before you know the damage right? The `whatif` parameter allows you to see the actions of a command before you execute it. To use it, simply append

```
-whatif
```

to the end of your command and see the results that may occur. This parameter won't work with every single command. At times, instead, you might want to use another parameter called

```
-validate
```

This will help you to ensure you are ready when executing a more complex string of commands.

5. Here is a tip you can see if you run the EMS (the shell displays tips with each startup). It relates to users asking for their passwords they've forgotten for their mobile device synchronization:

```
Get-activesyncdevicestatistics -ShowRecoveryPassword
```

4. Ringo said it best. "Get by with a little help from my friends." Literally, that appears to be true if you take advantage of a tool advertized by a friend of mine who is also another eJournal author, Don Jones. There is a Windows PowerShell Help Tool that you can find at http://www.primalscript.com/Free_Tools/index.asp. There is also a tool called SAPIEN PowerShell Extensions (PshX-SAPIEN) v1.2 that you can enhance PowerShell a bit for you.

3. The `Test` cmdlets are so important that MOMs extension pack utilizes them too. For example,

```
Test-ServiceHealth
```

will tell you which services should be running for the roles deployed on that server. If you want to check which services should be running, and if they aren't, start them up, type

```
Test-ServiceHealth | Select-Object -Expand ServicesNotRunning | Start-Service
```

You might also want to try some of the other `Test` cmdlets such as

```
Test-SystemHealth
```

or

```
Test-MapiConnectivity
```

For a full list of `Test` cmdlets type

```
help test
```

2. This one almost made it to number 1. It was a close race. To have the Hub Transport sync up with an Edge Transport Server, you need to perform an EdgeSync synchronization process in, you guessed it, the EMS. To start, on the Edge Transport Server, you need to create the subscription file by typing

```
New-Edgesubscription -file "c:\edgesub.xml"
```

Then, on the Hub Transport server you want to sync, copy the xml file over and open you EMC under Organization, Hub Transport, Edge Subscriptions. Next, run the New Edge Subscription wizard from the Actions pane.

1. One of the questions that comes my way the most when speaking at conferences about Exchange is "How do I turn on anti-spam agents on the Hub Transport Server?" Excellent question. If you have a smaller environment or simply have decided not to use an Edge Transport Server in your environment (which has the anti-spam agents automatically turned on), you need to type the following to enable the necessary features for you to configure

```
install-antispamagents.ps1
```

Exchange Management Shell: TFM is a great book that offers all the EMS ins and outs. This book "provides the answers in a 'cookbook' format that focuses on real-world Exchange Server 2007 management tasks, and how to accomplish them in Windows PowerShell." I've gotten through 80 pages of it so far, and it's just what an EMS newbie needs.

Conclusion

We've just scratched the surface here. There are logically different levels of PowerShell or EMS knowledge, and this was a primer. Down the road, we will revisit this topic from the Advanced Exchange Guru point of view. You'll then see the real power behind PowerShell. For now, try out the tips, tools, and tricks provided to take your first step into the new CLI. 💎

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