

EXPLORING SQLPS

The SQL Server Powershell Module In Depth





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What is SQLPS?

The Provider

Cmdlets/Functions

Practical Use

```
$trns = Get-ChildItem $dir -recurse | Where-Object {$_.name -like "*.trn"} | sort-object LastWriteTime
}
else{
    $full = Get-ChildItem $dir | Where-Object {$_.name -like "*.bak"} | Sort-Object LastWriteTime -desc | Select-Object -first 1
    $diff = Get-ChildItem $dir | Where-Object {$_.name -like "*.dff"} | sort-object LastWriteTime -desc | select-object -first 1
    $trns = Get-ChildItem $dir | Where-Object {$_.name -like "*.trn"} | sort-object LastWriteTime
}

#initialize and process full backup
$outputfile = Join-Path -Path $outputdir -ChildPath "restore_$database.sql"
$restore = Get-RestoreObject $database $full
$shfull = Get-Header $restore $smosrv
if($database.Length -eq 0)
{
    $database = $shfull.DatabaseName
    $restore.Database=$database
}

$LSNCheck = $shfull.CheckpointLSN
$files = $restore.ReadFileList($smosrv)
foreach($file in $files){
    $pfile = $file.PhysicalName
    if($newdata.Length -gt 0 -and $file.Type -eq "D"){
        $pfile=$newdata + $pfile.Substring($pfile.LastIndexOf("\"))
    }

    if($newdata.Length -gt 0 -and $file.Type -eq "L"){
        $pfile=$newlog + $pfile.Substring($pfile.LastIndexOf("\"))
    }

    $newfile = New-Object("Microsoft.SqlServer.Management.Smo.RelocateFile") ($file.LogicalName,$pfile)
    $restore.RelocateFiles.Add($newfile) | out-null
}

$ssqlout += "/******"
$ssqlout += "Restore Database Script Generated $(Get-Date)"
$ssqlout += "Database: "+$database
$ssqlout += "*****/"
$ssqlout += "--FULL RESTORE"
If($owner){$ssqlout += "EXECUTE AS LOGIN = '$owner';"}
$ssqlout += $restore.Script($smosrv)

#process differential backups
if($diff -ne $null){
    $restore = Get-RestoreObject $database $diff
    $hdiff = Get-Header $restore $smosrv

    if($hdiff.DatabaseBackupLSN -eq $LSNCheck){
        $ssqlout += "--DIFF RESTORE"
        $ssqlout += $restore.Script($smosrv)
        $LSNCheck = $hdiff.LastLSN
    }
    else{
        . . . . .
    }
}
```

Don't focus on the code,
focus on the concepts.

Ask questions!

In the beginning...

UPSEARCH



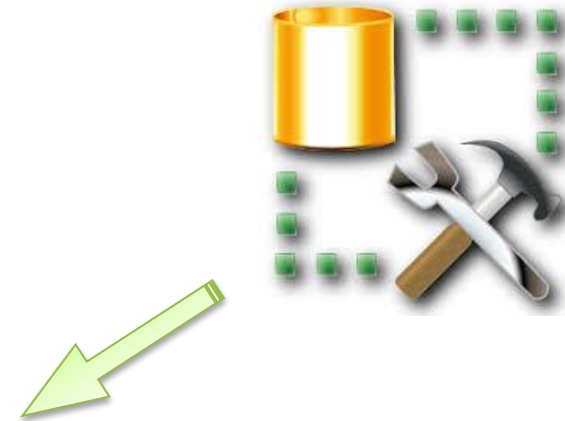
SQLPS

- Powershell module for SQL Server
- Includes cmdlets and the provider
- SQL Server 2012 or greater
- Powershell 2.0 or greater

`Import-Module SQLPS`



- Not installed specifically
 - Included anytime you install ANY SQL Server component
 - Installation Path:
C:\Program Files (x86)
 \Microsoft SQL Server
 120\Tools\PowerShell\Modules
-



.Net Library
requires .Net 2.0

SMO ASSEMBLIES	
Microsoft.SqlServer.Management.Common	Microsoft.SqlServer.SqlEnum
Microsoft.SqlServer.Smo	Microsoft.SqlServer.RegSvrEnum
Microsoft.SqlServer.Dmf	Microsoft.SqlServer.WmiEnum
Microsoft.SqlServer.Instapi	Microsoft.SqlServer.ServiceBrokerEnum
Microsoft.SqlServer.SqlWmiManagement	Microsoft.SqlServer.ConnectionInfoExtended
Microsoft.SqlServer.ConnectionInfo	Microsoft.SqlServer.Management.Collector
Microsoft.SqlServer.SmoExtended	Microsoft.SqlServer.Management.CollectorEnum
Microsoft.SqlServer.SqlTDiagM	Microsoft.SqlServer.Management.Dac
Microsoft.SqlServer.SString	Microsoft.SqlServer.Management.DacEnum
Microsoft.SqlServer.Management.RegisteredServers	Microsoft.SqlServer.Management.Utility
Microsoft.SqlServer.Management.Sdk.Sfc	

PhotoExtremist.com

DEMO!





Name	Provider	Root	CurrentLocation
----	-----	----	-----
A	Microsoft.PowerShell.Core\FileSystem	A:\	
Alias	Microsoft.PowerShell.Core\Alias		
C	Microsoft.PowerShell.Core\FileSystem	C:\	Users\Administrator
Cert	Microsoft.PowerShell.Security\Certificate	\	
D	Microsoft.PowerShell.Core\FileSystem	D:\	
Env	Microsoft.PowerShell.Core\Environment		
Function	Microsoft.PowerShell.Core\Function		
HKCU	Microsoft.PowerShell.Core\Registry	HKEY_CURRENT_USER	
HKLM	Microsoft.PowerShell.Core\Registry	HKEY_LOCAL_MACHINE	
Variable	Microsoft.PowerShell.Core\Variable		
WSMan	Microsoft.WSMan.Management\WSMan		

Windows Components as Drives

Get-PSDrive

Explore/Use like a FileSystem

Windows PowerShell

PS SQLSERVER:\> dir

Name	Root	Description
----	----	-----
DAC	SQLSERVER:\DAC	SQL Server Data-Tier Application Component
DataCollection	SQLSERVER:\DataCollection	SQL Server Data Collection
SQLPolicy	SQLSERVER:\SQLPolicy	SQL Server Policy Management
Utility	SQLSERVER:\Utility	SQL Server Utility
SQLRegistration	SQLSERVER:\SQLRegistration	SQL Server Registrations
SQL	SQLSERVER:\SQL	SQL Server Database Engine
SSIS	SQLSERVER:\SSIS	SQL Server Integration Services
XEvent	SQLSERVER:\XEvent	SQL Server Extended Events
DatabaseXEvent	SQLSERVER:\DatabaseXEvent	SQL Server Extended Events
SQLAS	SQLSERVER:\SQLAS	SQL Server Analysis Services

PS SQLSERVER:\sql\localhost\default



Provider

Folder

Host/Server

Instance

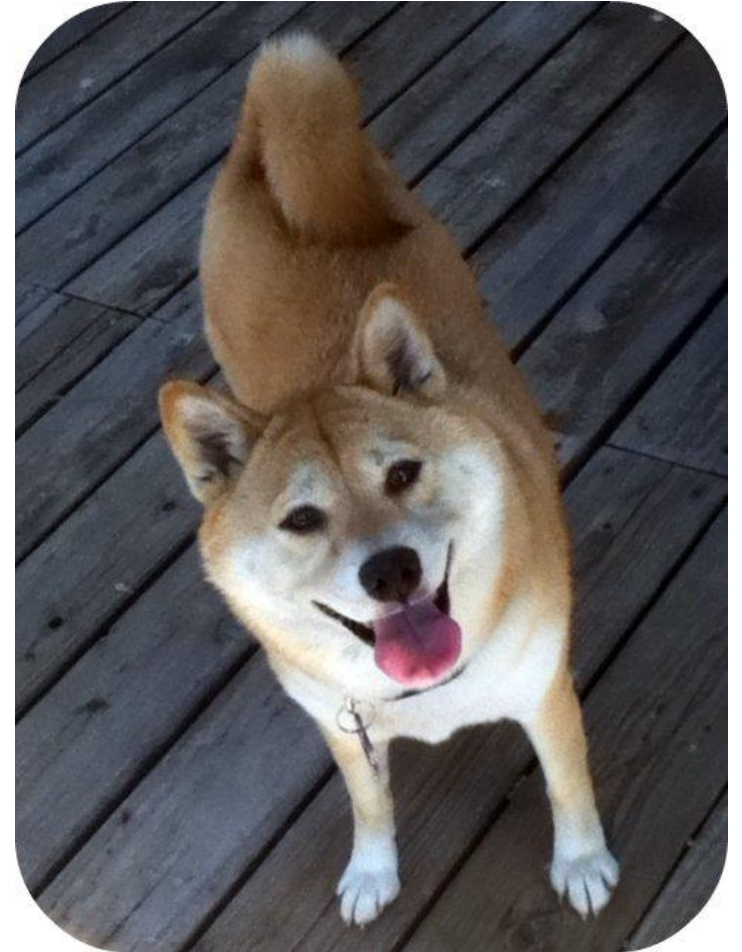
DEMO!



Timeouts!

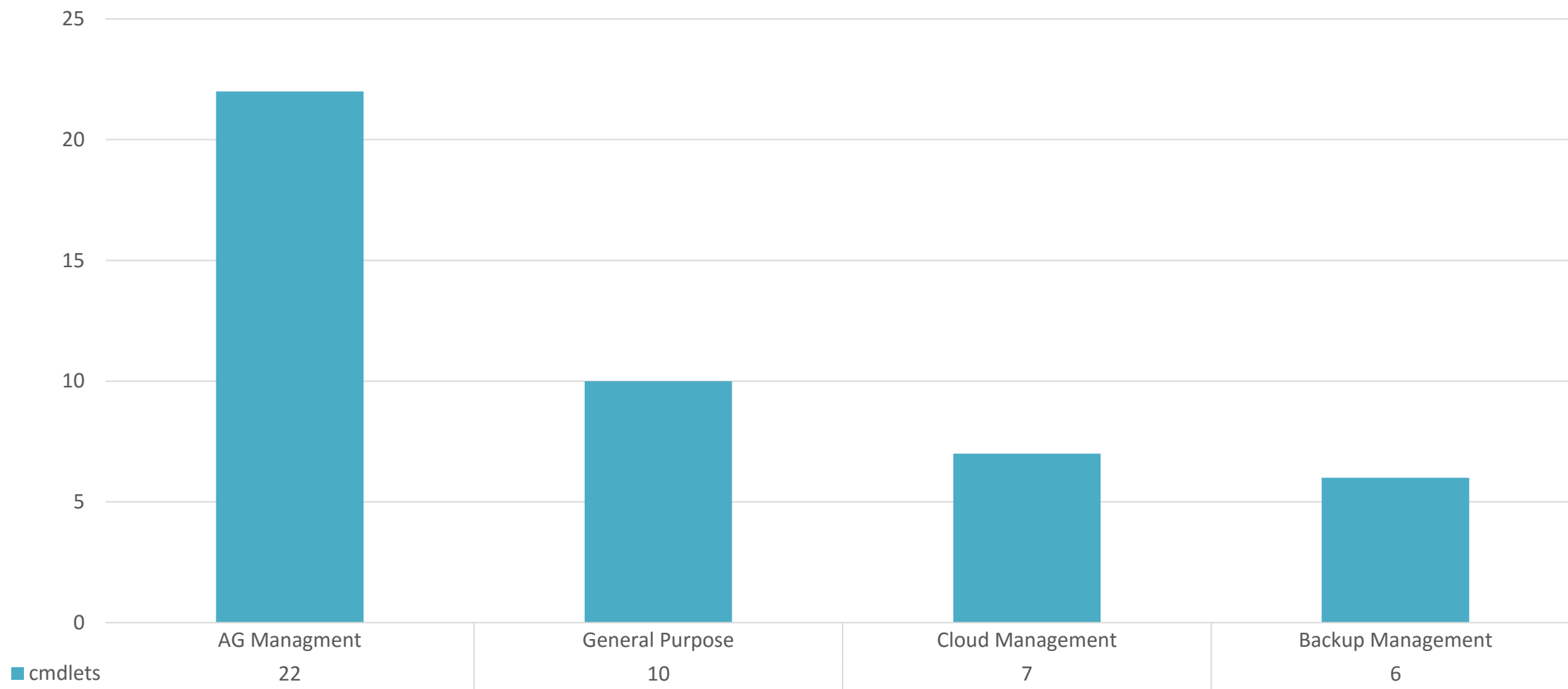
Tab completion and Intellisense

Contextual behavior



Verb-Noun

45 cmdlets total



Convert-UrnToPath

Decode-SqlName

Encode-SqlName

Get-SqlCredential

Get-SqlDatabase


Invoke-PolicyEvaluation

Invoke-Sqlcmd


New-SqlCredential

Remove-SqlCredential


Set-SqlCredential



Do not match Powershell
naming standards



Useful for checking Policy
Based Management



“Replacement” for sqlcmd,
heavily used

Backup-SqlDatabase

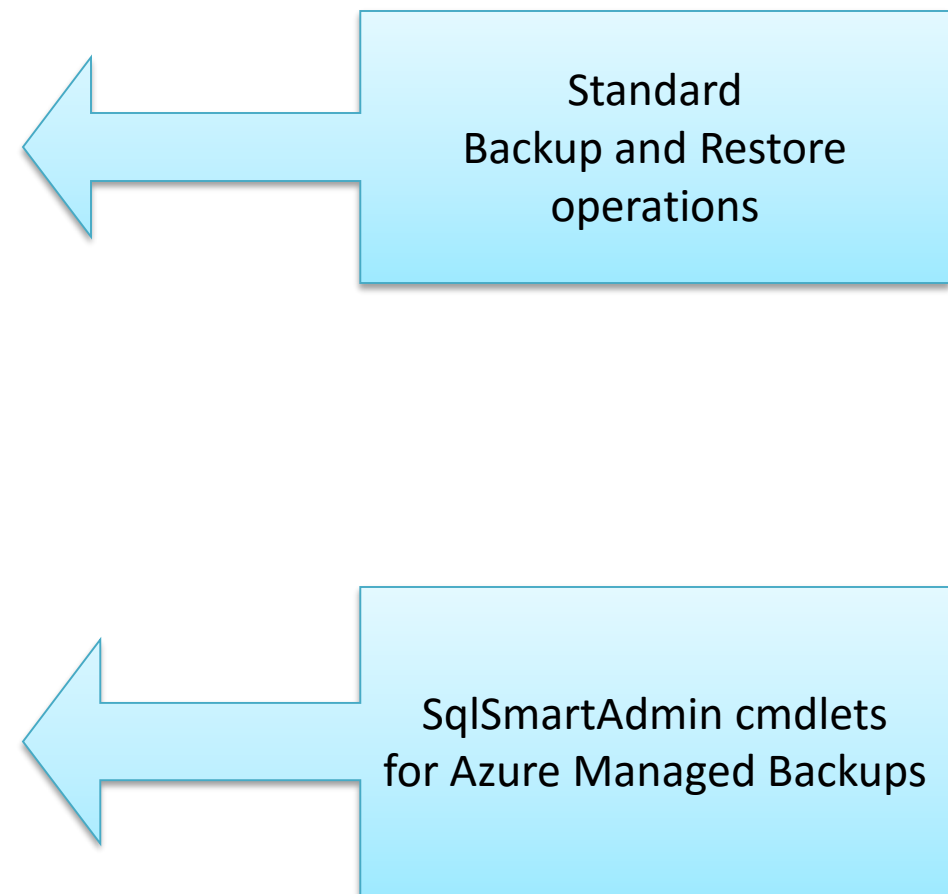
Restore-SqlDatabase

New-SqlBackupEncryptionOption

Get-SqlSmartAdmin

Set-SqlSmartAdmin

Test-SqlSmartAdmin



Standard
Backup and Restore
operations

SqlSmartAdmin cmdlets
for Azure Managed Backups

Add-SqlFirewallRule

Remove-SqlFirewallRule

Get-SqlInstance

Set-SqlAuthenticationMode

Set-SqlNetworkConfiguration

Start-SqlInstance

Stop-SqlInstance

These cmdlets all require the
Cloud Adapter Service

Careful, this doesn't return
what you think it does...

These do the same as Start-
Service and Stop-Service

Add-SqlAvailabilityDatabase	Remove-SqlAvailabilityReplica
Add-SqlAvailabilityGroupListenerStaticIp	Resume-SqlAvailabilityDatabase
Disable-SqlAlwaysOn	Set-SqlAvailabilityGroup
Enable-SqlAlwaysOn	Set-SqlAvailabilityGroupListener
Join-SqlAvailabilityGroup	Set-SqlAvailabilityReplica
New-SqlAvailabilityGroup	Set-SqlHADREndpoint
New-SqlAvailabilityGroupListener	Suspend-SqlAvailabilityDatabase
New-SqlAvailabilityReplica	Switch-SqlAvailabilityGroup
New-SqlHADREndpoint	Test-SqlAvailabilityGroup
Remove-SqlAvailabilityDatabase	Test-SqlAvailabilityReplica
Remove-SqlAvailabilityGroup	Test-SqlDatabaseReplicaState

Advanced Topic

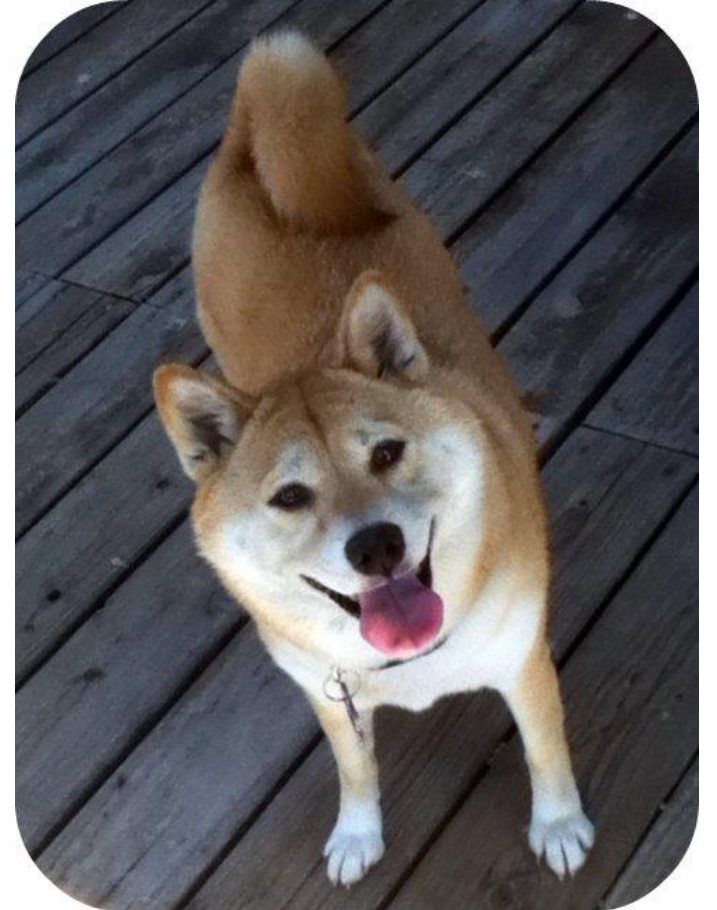
DEMO!



Poorly Documented

Unexpected behavior

Lack of support



So now what?

UPSEARCH

WHAT'S
NEXT?

DEMO!



- ✓ What is the SQLPS Module?
- ✓ How do we use it?
- ✓ The Provider, what is that all about?
- ✓ What kind of cmdlets (functions) are there?
- ✓ How do I use this darn thing, anyway?





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<https://upsearch.com/connect-with-us/>



<https://github.com/MikeFal>