dbatools

The PowerShell way to interact with SQL Server
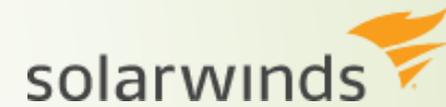
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SQLGrease

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- 20+ Years working with SQL Server
  - Development work since 7.0
  - Administration going back to 6.5
  - Fascinated with SQL internals

www.TF3604.com/dbatools

Agenda

- What is dbatools?
- Getting started / installing dbatools
- System compatibility
- Categories of commands
- Some basic commands

What is dbatools?

- PowerShell-based set of commands to manage SQL Server
- Community-produced
- Open-source, free to use
- Widely adopted
- In preview for many years, stable release in 2019
- Presently has 650+ commands
- Uses SMO behind the scenes

What can I do with dbatools?

- Read/write data
- Find SQL Server instances on the network
- Manage most server and database-level objects
- Do backup and restore operations
- Install and/or update SQL instances
- Migrate databases or entire instances
- Manage SQL Agent
- Install other community tools onto SQL instances
- Automate, automate, automate

Installing dbatools

```
Install-Module dbatools;


Install-Module : Administrator rights are required to install modules in
'C:\Program Files\WindowsPowerShell\Modules'. Log on to the computer with an
account that has Administrator rights, and then
```

try again, or install 'C:\Users\hansen\Documents\WindowsPowerShell\Modules' by adding "-Scope CurrentUser" to your command. You can also try running the Windows PowerShell session with elevated

rights (Run as Administrator).

At line:1 char:1

+ Install-Module dbatools;

+ ~~~~~~~~~~~~~~~~~~~~~~~~

   + CategoryInfo   : InvalidArgument: (:) [Install-Module], ArgumentException

   + FullyQualifiedErrorId : InstallModuleNeedsCurrentUserScopeParameterForNonAdminUser,Install-Module

Installing dbatools

Install-Module dbatools;

NuGet provider is required to continue

PowerShellGet requires NuGet provider version '2.8.5.201' or newer to interact with NuGet-based repositories. The NuGet provider must be available in 'C:\Program

Files\PackageManagement\ProviderAssemblies' or 'C:\Users\hansen\AppData\Local\PackageManagement\ProviderAssemblies'. You can also install the NuGet provider by running

'Install-PackageProvider -Name NuGet -MinimumVersion 2.8.5.201 -Force'. Do you want PowerShellGet to install and import the NuGet provider now?

[Y] Yes [N] No [S] Suspend [?] Help (default is "Y"):

Installing dbatools

Untrusted repository

You are installing the modules from an untrusted repository. If you trust this repository, change its InstallationPolicy value by running the Set-PSRepository cmdlet. Are you sure you want to install the modules from 'PSGallery'?

[Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help (default is "N"):

System compatibility

- Nearly 100% of dbatools commands will work for
  - SQL Server 2012 or later, running on modern Windows Server OS
  - Windows 7 or later, or Windows Server 2008 R2 or later for client
- But will work with decreased amount of functionality for
  - SQL Server versions back to SQL Server 2000
  - Azure versions of SQL Server
  - SQL Server on Linux / containers
  - macOS and Linus workstations

Categories of Commands (1/2)

- Availability Groups
- Backup and Restore – Database
- Backup and Restore – Certificates
- Certificates and Encryption
- Community Tools
- Connections
- Connection Strings
- Databases
- Data Masking
- dbatools Computer Management
- dbatools Configuration
- dbatools Support tools
- dbatools update watcher

- DBCC
- Diagnostics and Performance
- Detach and Attach
- Endpoints
- Export
- File System and Storage
- FileStream
- Lookup (Find)
- General
- Linked Servers
- Log Shipping
- Login and User Management
- Mail and Logging

Source: https://dbatools.io/commands/

Categories of Commands (2/2)

- Max Memory
- Migration
- Mirroring
- Network and Firewall
- Policy-Based Management
- Registered Servers
- Replication
- Resource Governor
- Security and Encryption
- Server Management
- Service Principal Names (SPNs)
- Services
- Data Generation

- Snapshots
- sp_configure
- SQL Agent
- SQL Client Configuration
- SQL Management Objects
- System startup
- tempdb
- Traces, Profiler and Extended Events
- Utilities
- Windows Server Failover Cluster
- Table Data

Source: https://dbatools.io/commands/

Instance migrations

```
Start-DbaMigration -Source sqlsrc\sql2016 `
-Destination sqldest\sql2022
-BackupRestore -SharedPath "\\ali\temp";
```

- User databases (mostly)
- Logins
- DB mail objects
- Agent objects
- Linked servers
- CMS groups/servers
- Configurations
- User objects in sys databases

- System triggers
- System backup devices
- Audits / Server audit specs.
- Endpoints / Extended events
- Policy management objects
- Resource governor objects
- Data collector sets
- Startup procedures

Instance migrations

```
Copy-DbaDatabase -Source sqlsrc\sql2016
-Destination sqldest\sql2022
-Database CorpDB
-BackupRestore -SharedPath "\\ali\temp";
```

- Very useful command

- Many, many other "migration" commands

Community tools

- Install commonly-used community tools on multiple target servers at once
  - Ola Hallengren Maintenance Solution
  - WhoIsActive
  - Dr. DMV Diagnostic Queries
  - First Responder Kit
  - And others
- Has commands to interacts with community tools

Enumerating instances

```
Find-DbaInstance -ComputerName ali3 -ScanType Browser;


Find-DbaInstance –DiscoveryType Domain;
```

Getting data in and out of SQL Server

```
$customers = Invoke-DbaQuery -SqlInstance $ali3
-SqlCredential sqlsaturday -Database CorpDB
-Query "select top (100) * from CorpDB.dbo.Customer;";


Write-DbaDataTable -SqlInstance $ali3 -Database "tempdb"
-InputObject $customers -AutoCreateTable -Table "customer";
```

Inventorying SQL Servers

```
Get-DbaDatabase -SqlInstance $ali3 |
Write-DbaDataTable -SqlInstance $ali3 -Database "tempdb" `
-AutoCreateTable -Table "databases";
```

- Do similar with
  - Disk usage
  - Jobs
  - Backup info
  - Configurations
  - Logins
  - Etc.

Summary

- This is just the tip of the iceberg
- dbatools is a rich library of commands to
  - Obtain large amounts of information about your SQL estate
  - Manage your SQL Servers in many ways
  - Operate on many instances with a single command
  - Many other tasks limited only by your imagination

Thank You

- This presentation and supporting materials can be found at www.tf3604.com/dbatools.

  - Slide deck

  - Scripts

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