

Surviving SQL Server

Guidance for new or accidental DBAs

Jeff Iannucci

Download all slides and scripts



<https://github.com/desertdba/Presentations>

Congratulations! You're the DBA.



A close-up photograph of a ginger cat's back and head. The cat has dense, orange-red fur with darker stripes. Its ears are perked up, and its tail is visible on the left. The background is a plain, light color.

Mistakes were made

Three keys for any DBA

- Discovery
- Recovery
- Security





What

about

performance

?

Default Blame Acceptor





Database's

Best

Advocate

Too much?



Discovery



These databases
are all your
responsibility



Find all the SQL Server instances



<https://dbatools.io/>

```
PS C:\> Find-DbaInstance -DiscoveryType All
```

PowerShell...?

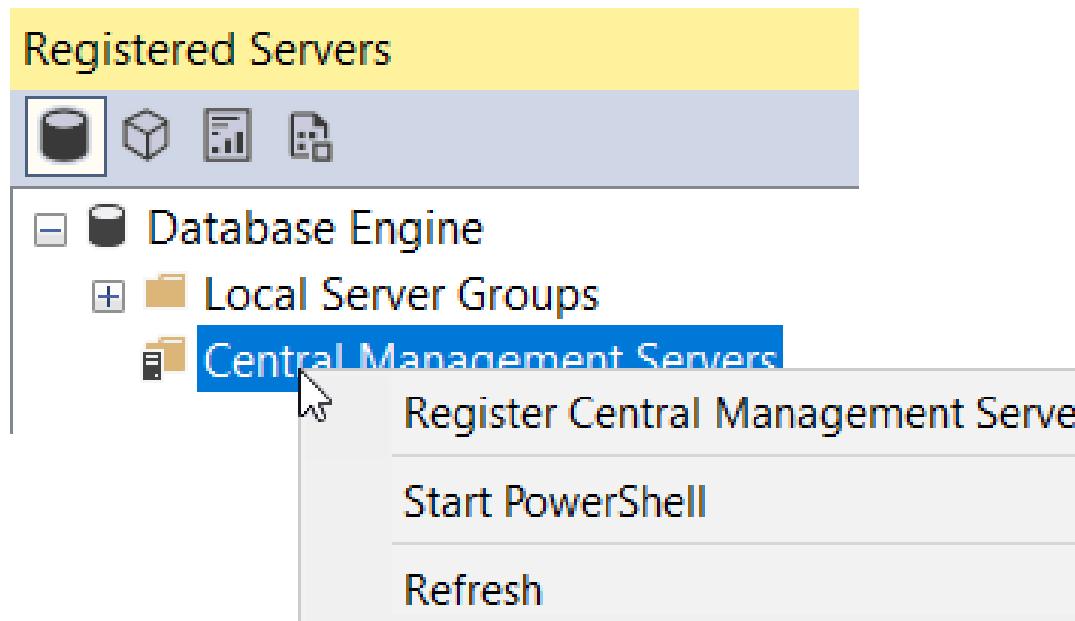
You

Make a
spreadsheet
**...or even a
database!**



Make a Central Management Server (CMS)

Registered Servers



- Database Engine
- Local Server Groups
- Central Management Servers

Register Central Management Server

Start PowerShell

Refresh

New Server Registration

General Connection Properties Always Encrypted Additional Connection Para

Login

Type the server name, or choose it from the drop-down list.

Server type: Database Engine

Server name: YeOldServer

Authentication: Windows Authentication

User name: BRADLEY\jeff_

Password:

Remember password

Registered server

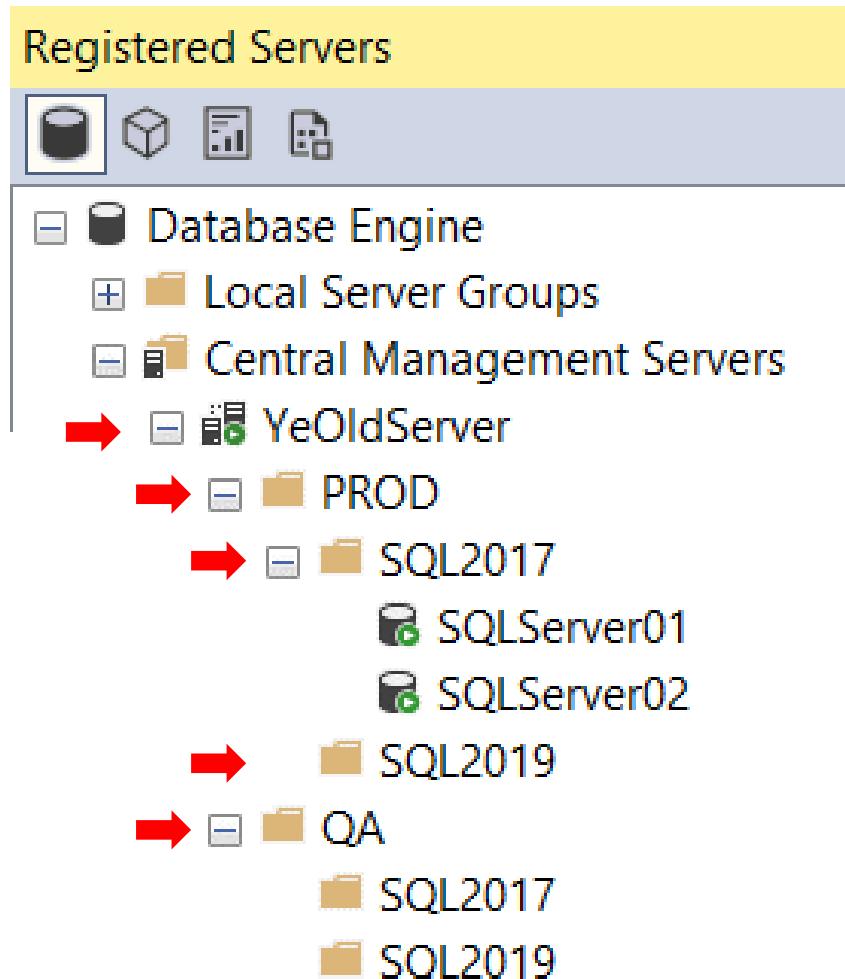
You can replace the registered server name with a new name and optional server description.

Registered server name: YeOldServer

Registered server description:

Test Save Cancel Help

Make a Central Management Server



Register the CMS

Organize by environment

Organize by version

SELECT @@VERSION

What is the version? (2019, 2017,...2000?)

What is the edition? (Enterprise, Standard, etc)

Are these virtual? (...HYPERVISOR...)

What is the current patch level?

<https://sqlserverupdates.com/>

Find out about your SQL Server instances

CPU and memory?

Data and log files?

Availability groups?

Any recent problems in the error log?

Failing jobs?

SQL Server Diagnostic Queries



<https://glennsqlperformance.com/resources/>

What you
find may
shock you



Start monitoring



What monitoring software?

A close-up photograph of a white dog's face, looking slightly to the left. The dog has dark eyes and a black nose. The background is dark.

Use sp_WholisActive

Monitoring using sp_WhoIsActive



https://github.com/amachanic/sp_whoisactive

http://whoisactive.com/docs/25_capturing/

Monitoring using sp_WhoIsActive



<https://app.pluralsight.com/library/courses/troubleshooting-sql-server-performance-spwholsactive/>

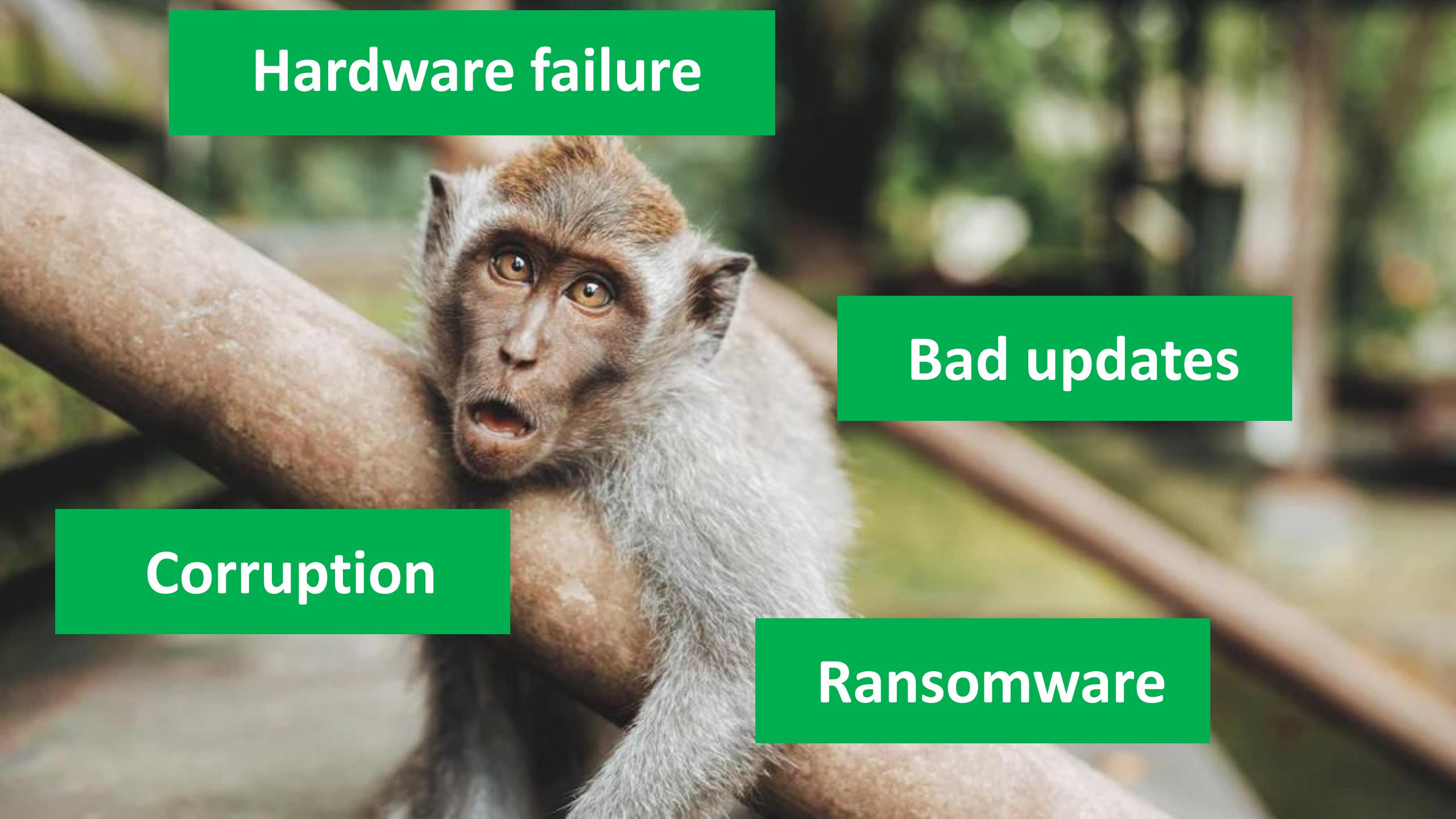
Recovery



Gratuitous quote from my employer



“If you aren’t planning for failure, you aren’t planning for success.” – Mike Walsh



Hardware failure

Corruption

Ransomware

Bad updates



Oops...?

You need
restorable
copies



Backup your databases



<https://ola.hallengren.com/>

Native backups

Full – all data pages

Diff – changed data pages

Log – transaction log

Can use multiple files

Can use backup compression



Backup compression

Includes Full, Differential, and Log backups

-  FULL.bak
-  DIFF.bak
-  TLOG.trn

- 233,600 KB
- 23,680 KB
- 246,076 KB

-  FULL_COMPRESS.bak
-  DIFF_COMPRESS.bak
-  TLOG_COMPRESS.trn

- 53,156 KB
- 3,732 KB
- 84,384 KB

```
EXEC sp_configure 'backup compression default', 1 ;
RECONFIGURE;
GO
```

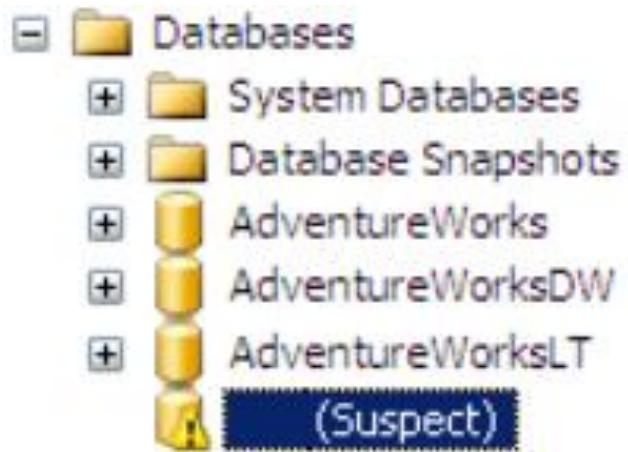
**Do you trust your
systems
administrators...**

...as DBAs?



Out of sync

If database and log files are backed up even a split second apart...



Other backup software

How frequent are backups?

Log backups?

System database backups?

Who does the restore?

Have you tested restoring?





Have you
tested
restoring?

**RANSOMWARE
IS IN YOUR
FUTURE**





Copy backups
offsite!

A photograph of a monkey with grey fur, sitting on a dark wooden railing. It is resting its chin on its hand and looking directly at the camera with a contemplative expression. The background is a blurred green forest.

Corruption

What objects are corrupted?

How much data is corrupted?

How to check for corruption?

Integrity checks



<https://ola.hallengren.com/>

Look for corruption/consistency problems

Daily for system databases

Weekly for user databases

Make sure tempdb is big enough

Set Page Verify to CHECKSUM

Set Page Verify to CHECKSUM

Database Properties - AdventureWorks2019

Select a page

- General
- Files
- Filegroups
- Options**
- Change Tracking
- Permissions
- Extended Properties
- Mirroring
- Transaction Log Shipping
- Query Store

Connection

Server: BRADLEY\SQL2019
Connection: BRADLEY\jeff_

[View connection properties](#)

Progress

Ready

Script ▾ [Help](#)

Collation: SQL_Latin1_General_CI_AS

Recovery model: Simple

Compatibility level: SQL Server 2019 (150)

Containment type: None

Other options:

| Concatenate Null Yields Null | True |
|---|--------------------------------------|
| Cross-database Ownership Chaining Enabled | False |
| Date Correlation Optimization Enabled | False |
| Delayed Durability | Disabled |
| Is Read Committed Snapshot On | False |
| Numeric Round-Abort | False |
| Parameterization | Simple |
| Quoted Identifiers Enabled | True |
| Recursive Triggers Enabled | False |
| Trustworthy | False |
| VarDecimal Storage Format Enabled | True |
| Recovery | |
| Page Verify | CHECKSUM |
| Target Recovery Time (Seconds) | 60 |
| Service Broker | |
| Broker Enabled | False |
| Honor Broker Priority | False |
| Service Broker Identifier | 470e976f-41ee-49b1-87f0-7bcf5ada2ab4 |
| State | |
| Database Read-Only | False |
| Auto Close | |

OK Cancel

The screenshot shows the 'Database Properties' dialog box for the 'AdventureWorks2019' database. The 'Options' tab is selected. In the 'Other options' section, the 'Recovery' settings are highlighted with a red box. The 'Page Verify' setting is set to 'CHECKSUM'. The 'OK' button at the bottom right is also highlighted with a red box.

Look for corruption/consistency problems

Daily for system databases

Weekly for user databases

Make sure tempdb is big enough

Set Page Verify to CHECKSUM

Enable alerts for 823, 824, 825 errors

Enable alerts for corruption (and more)



<https://www.brentozar.com/blitz/configure-sql-server-alerts/>

Check backups with sp_CheckBackup



https://github.com/Straight-Path-Solutions/sp_CheckBackup

A close-up photograph of a lion's head and upper body, resting in a field of tall, dry, golden-brown grass. The lion has a full, light brown mane. The background is blurred, showing more of the savanna landscape. A solid black rectangular box is positioned in the upper right area of the image, containing the word "Security" in a bold, yellow, sans-serif font.

Security



Villains



...and Clowns

Check permissions

Who is in sysadmin?

Who has CONTROL SERVER?

Who is in securityadmin?

Who is in local Administrators?

Who owns databases?



Check backups with sp_CheckSecurity



https://github.com/Straight-Path-Solutions/sp_CheckSecurity

Disable ‘sa’

‘sa’ can still own databases

‘sa’ can still own jobs

Prevents connections



Enable the remote “DAC”

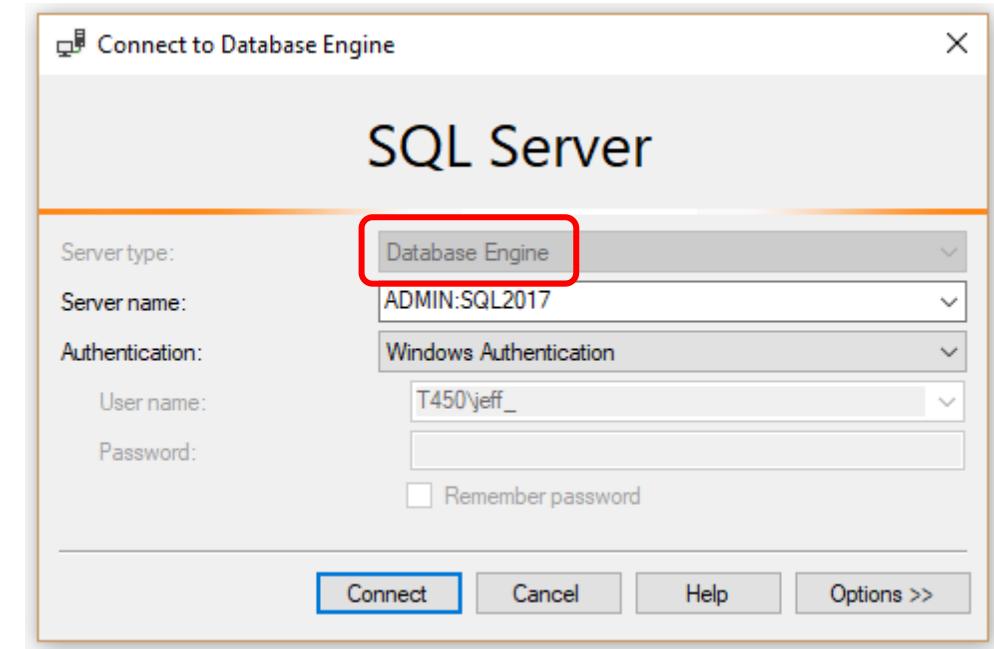
How to check

```
SELECT value_in_use  
FROM sys.configurations  
WHERE [name] = 'remote admin connections';
```

How to enable

```
sp_configure 'remote admin connections', 1;  
RECONFIGURE  
GO
```

How to use it



Enable the remote “DAC”

Important: DAC is like the Highlander...



...so don't use DAC for routine tasks

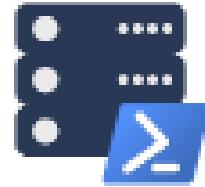
Review SQL Server Services



dbatools

```
PS C:\> Get-DbaService -ComputerName sqlserver2014a
```

Check for encryption



dbatools

```
PS C:\> Get-DbaDbEncryption -SqlInstance DEV01
```



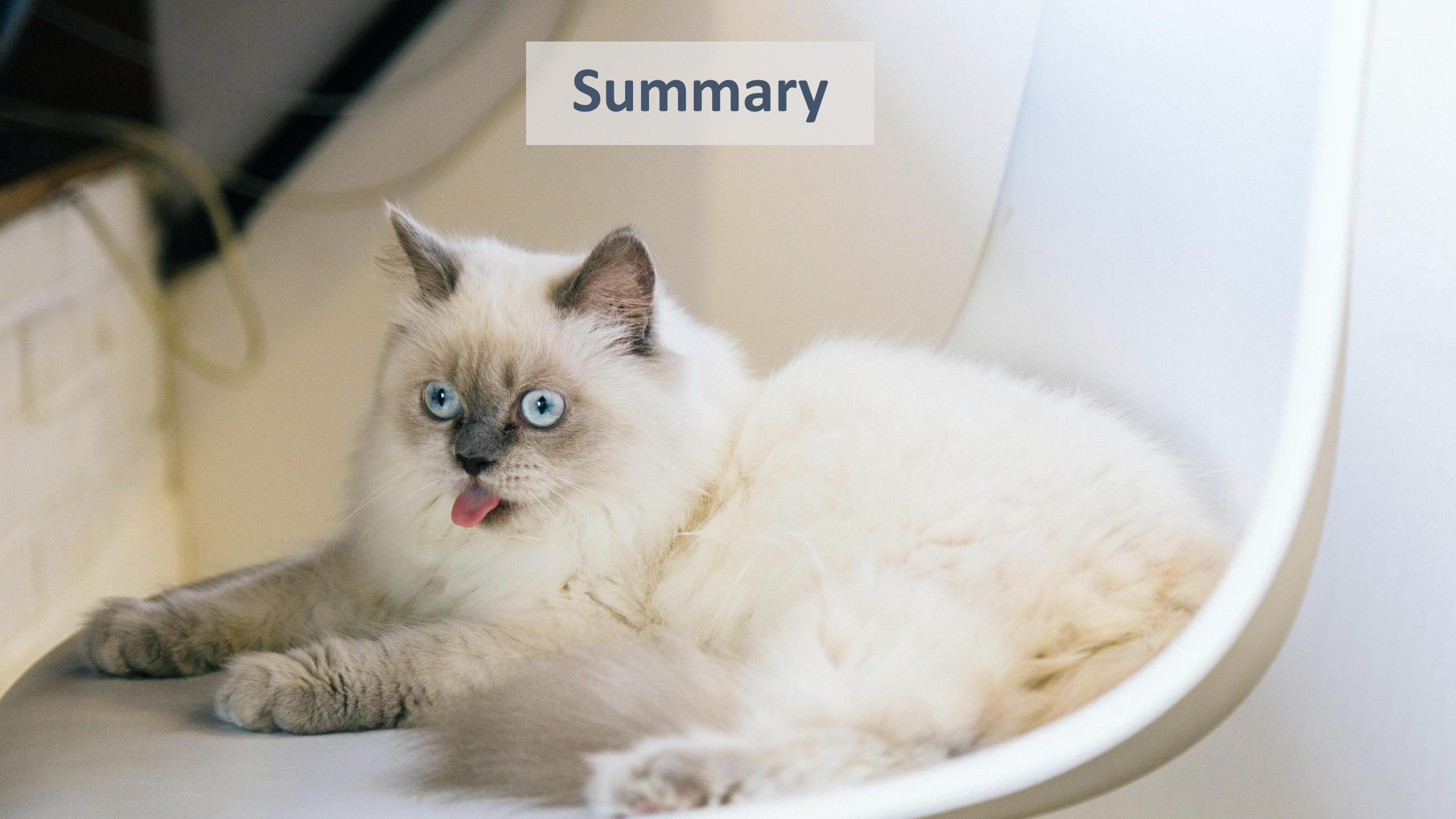
Copy certificates
and keys offsite!

Check for cumulative updates

<https://sqlserverupdates.com>

| Cumulative Update | Release Date | Build | Support Ends |
|------------------------------|--------------|--------------|--------------|
| CU18 | 2019/12/09 | 14.0.3257.3 | 2027/10/12 |
| CU17 | 2019/10/08 | 14.0.3238.1 | 2027/10/12 |
| CU16 | 2019/08/01 | 14.0.3223.3 | 2027/10/12 |
| Security update | 2019/07/09 | 14.0.3192.2 | 2027/10/12 |
| Hotfix | 2019/06/21 | 14.0.3164.1 | 2027/10/12 |
| CU15 | 2019/05/24 | 14.0.3162.1 | 2027/10/12 |
| SSAS GDR | 2019/05/14 | | 2027/10/12 |
| CU14 | 2019/03/25 | 14.0.3076.1 | 2027/10/12 |
| Hotfix | 2019/01/07 | 14.0.3049.1 | 2027/10/12 |
| CU13 | 2018/12/18 | 14.0.3048.4 | 2027/10/12 |
| CU12 | 2018/10/24 | 14.0.3045.24 | 2027/10/12 |
| CU11 | 2018/09/20 | 14.0.3038.14 | 2027/10/12 |
| CU10 | 2018/08/27 | 14.0.3037.1 | 2027/10/12 |
| GDR2 (security patch to CU9) | 2018/08/14 | 14.0.3035.2 | 2027/10/12 |
| CU9 | 2018/07/18 | 14.0.3030.27 | 2027/10/12 |

Summary



Download and install

dbatools PowerShell module

Ozar's First Responders Kit

Who Is Active

Ola Hallengren's scripts

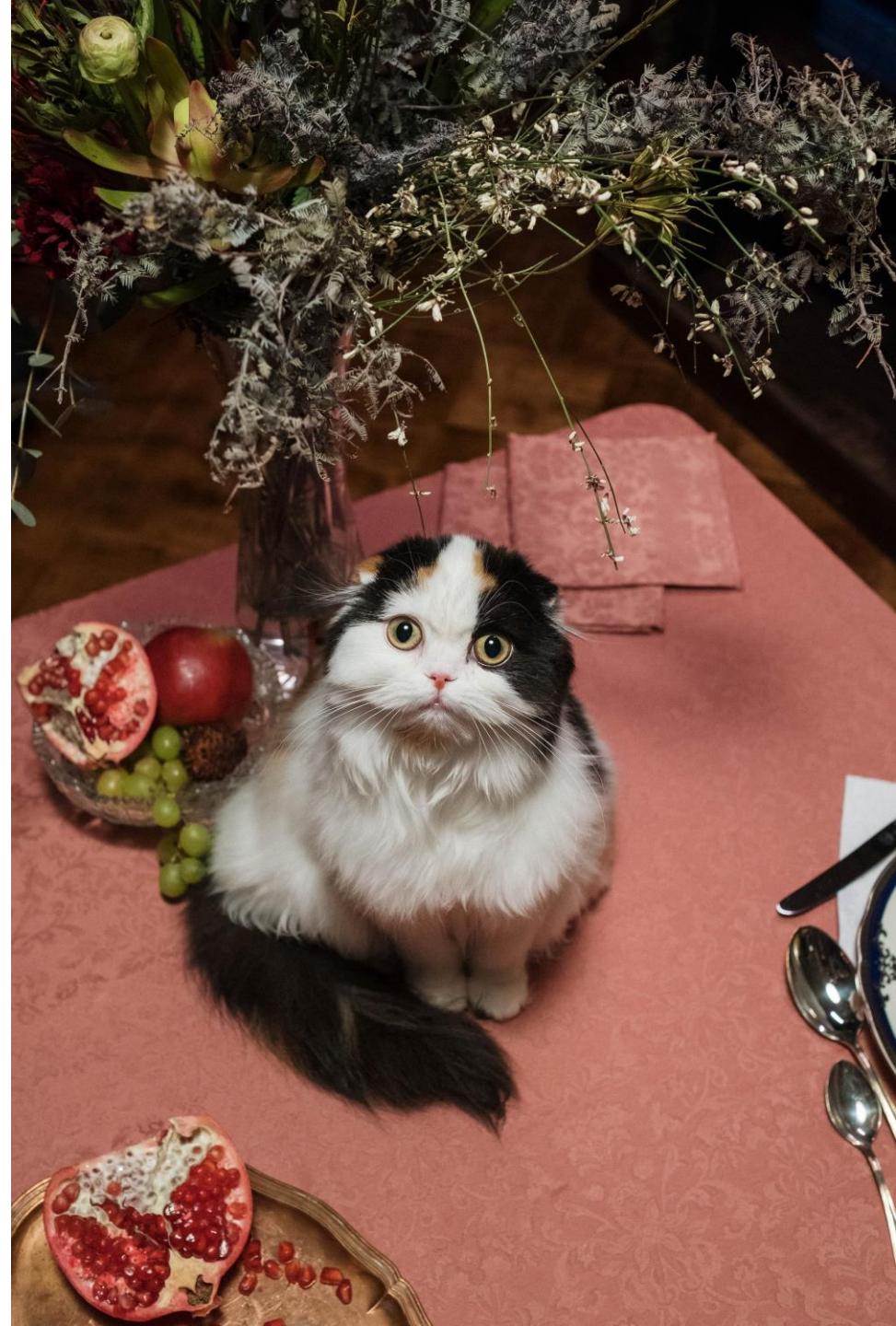
Glenn Berry's diagnostic queries



Download and install

sp_CheckBackup

sp_CheckSecurity



Learn all you can
about all your
puppies!



Get help

<https://sqlcommunity.slack.com>

#SQLHelp

Twitter...?

LinkedIn

<https://dba.stackexchange.com>





Copy backups
offsite!



...and test
restoring
backups!

Performance?



Thank you!



github.com/desertdba/Presentations



desertdba.com



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