



# Managing SQL Server at scale

# Jess Pomfret

She/Her

I'm a data platform architect with a passion for automation, proper football, and fitness. I enjoy contributing to open-source software and I'm a maintainer for dbatools. I also blog about PowerShell, SQL Server and a few random topics at [JessPomfret.com](http://JessPomfret.com).

DATA MASTERMINDS

DATA PLATFORM ENGINEER

MICROSOFT MVP

CLOUD AND DATA CENTER MANAGEMENT 2020 - 2022

INTERESTS

AUTOMATION, PROPER FOOTBALL AND FITNESS

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Learn  
**dbatools**  
IN A MONTH OF LUNCHES

AUTOMATING SQL SERVER TASKS WITH POWERSHELL COMMANDS



CHRISSEY LEMAIRE • ROB SEWELL

JESS POMFRET • CLÁUDIO SILVA

FOREWORD BY ANNA HOFFMAN

MANNING

# Rob Sewell

He/Him

I was a SQL Server DBA with a passion for Powershell, Azure, Automation, and SQL (PaaS geddit?) (And a sense of humour (and a habit for writing inside braces)). Now I just help other people with those (not the braces bit).

SEWELLS CONSULTING LTD

BEARD TWIZZLER

MICROSOFT MVP

DATA PLATFORM 2020 - 2022

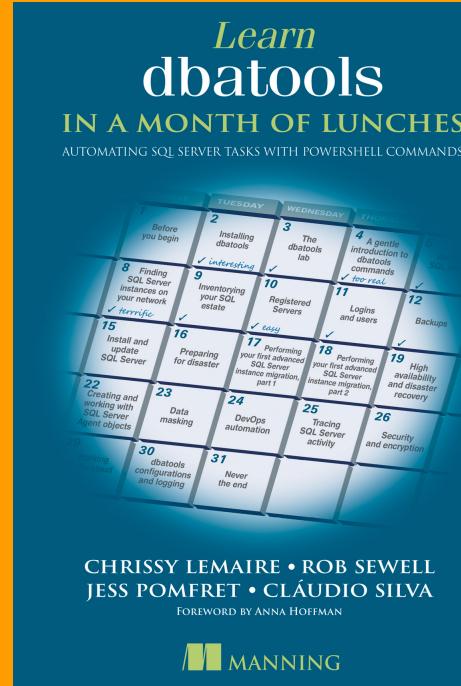
CLOUD AND DATA CENTER MANAGEMENT 2017 - 2022

INTERESTS

CYCLING, AUTOMATION, COMMUNITY



[ROBSEWELL.COM](http://ROBSEWELL.COM)

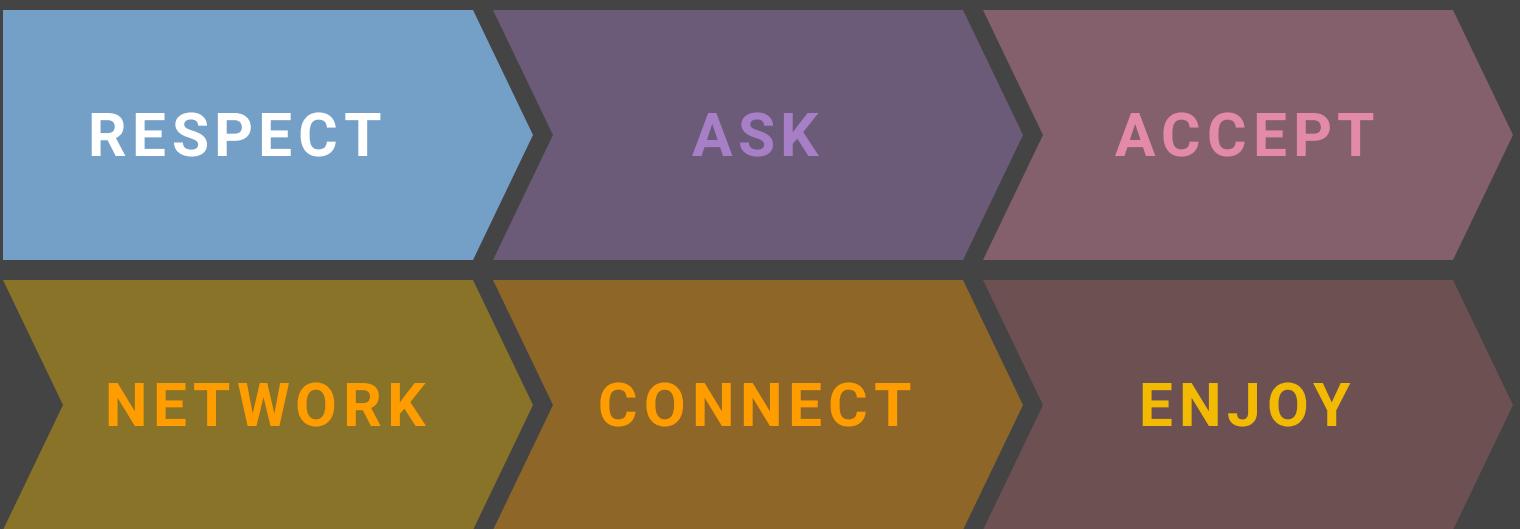


# What

WILL WE DO TODAY?



**Take phone  
calls outside.**  
**Don't talk over  
each other.**

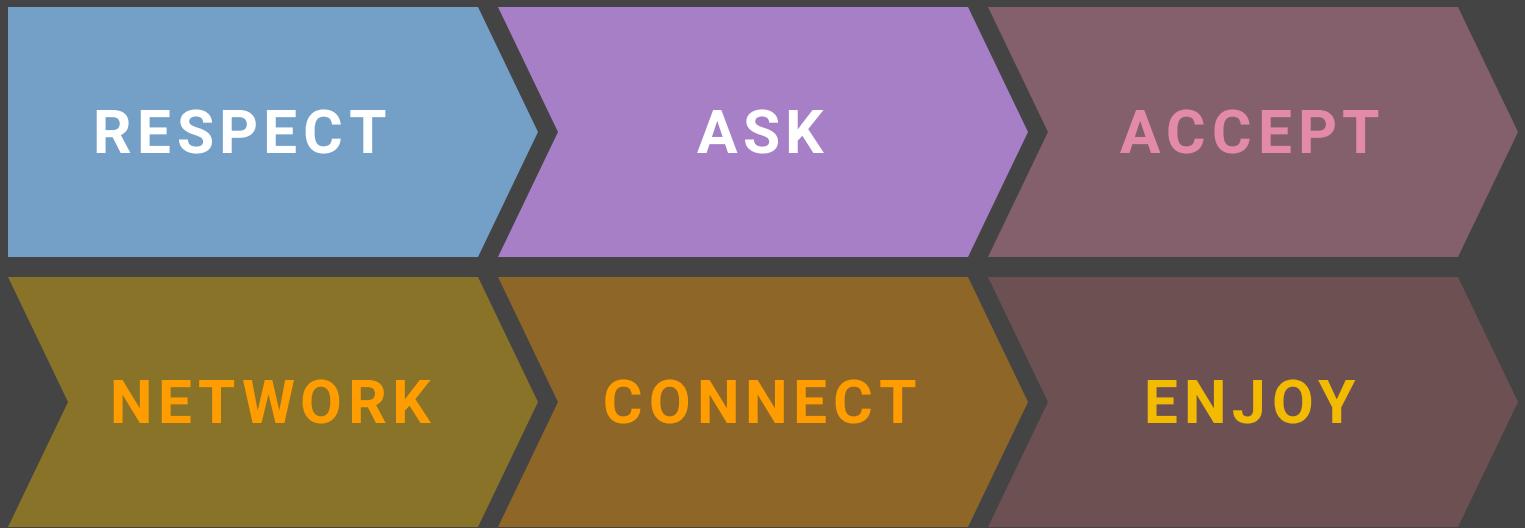


# What

WILL WE DO TODAY?



Don't wait  
until next  
week and  
think I wish I  
had asked that!

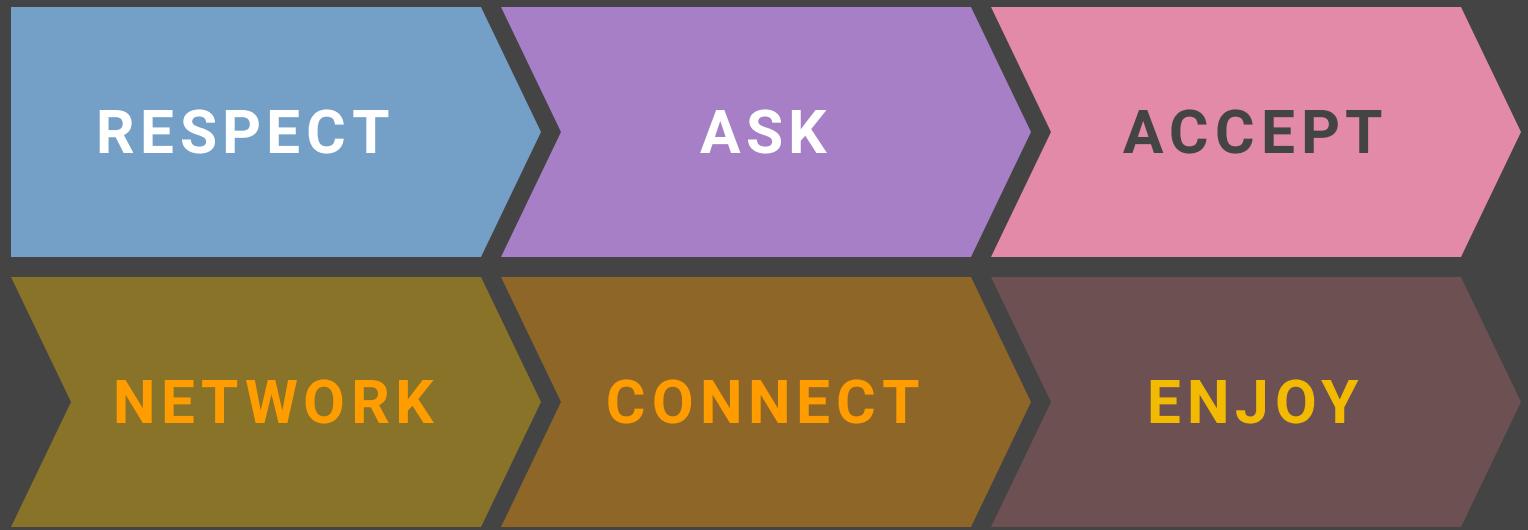


# What

WILL WE DO TODAY?



Others may  
have different  
beliefs. Thats  
ok.



# What

WILL WE DO TODAY?



Don't miss out  
on the chance  
to **network**

# What

WILL WE DO TODAY?



with all the  
other  
**wonderful**  
**people**  
alongside you.

# What

WILL WE DO TODAY?



Today is not  
just about  
learning **but**  
also about  
enjoyment

# Be Kind

WILL WE DO TODAY?



Take phone calls outside.  
**Don't talk over each other.**

**Don't wait until next week and think I wish I had asked that!**

Others may have **different beliefs. Thats ok.**



Don't miss out on the chance to **network**

with all the other **wonderful people** alongside you.

Today is not just about learning **but also about enjoyment**

# The Plan

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Every good project begins with a plan, and  
this is ours for today



LOCATION  
LOCATION  
LOCATION



LUNCH



THE NEXT THING



THING



COFFEE



BREAK



MORE THING



LAST THING

Let's  
Start with



A  
Pole

## Meet the audience

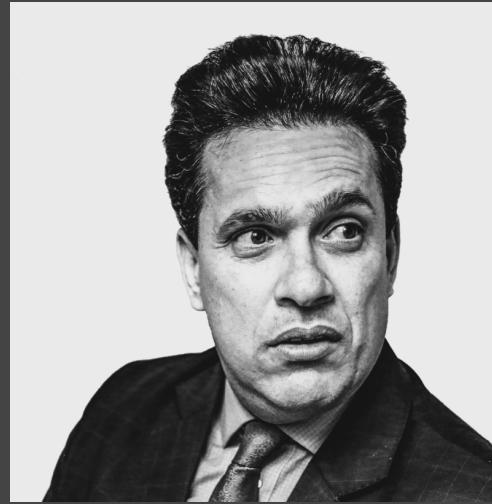
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Who are you?

We can't do this  
individually



DBA



CLOUD PLATFORM



INFRASTRUCTURE



POWERSHELL



AUTOMATION



CHARLOTTE LAM

## Meet the audience

---

Who are you?

We can't do this  
individually



DBA



CLOUD PLATFORM



INFRASTRUCTURE



POWERSHELL



AUTOMATION



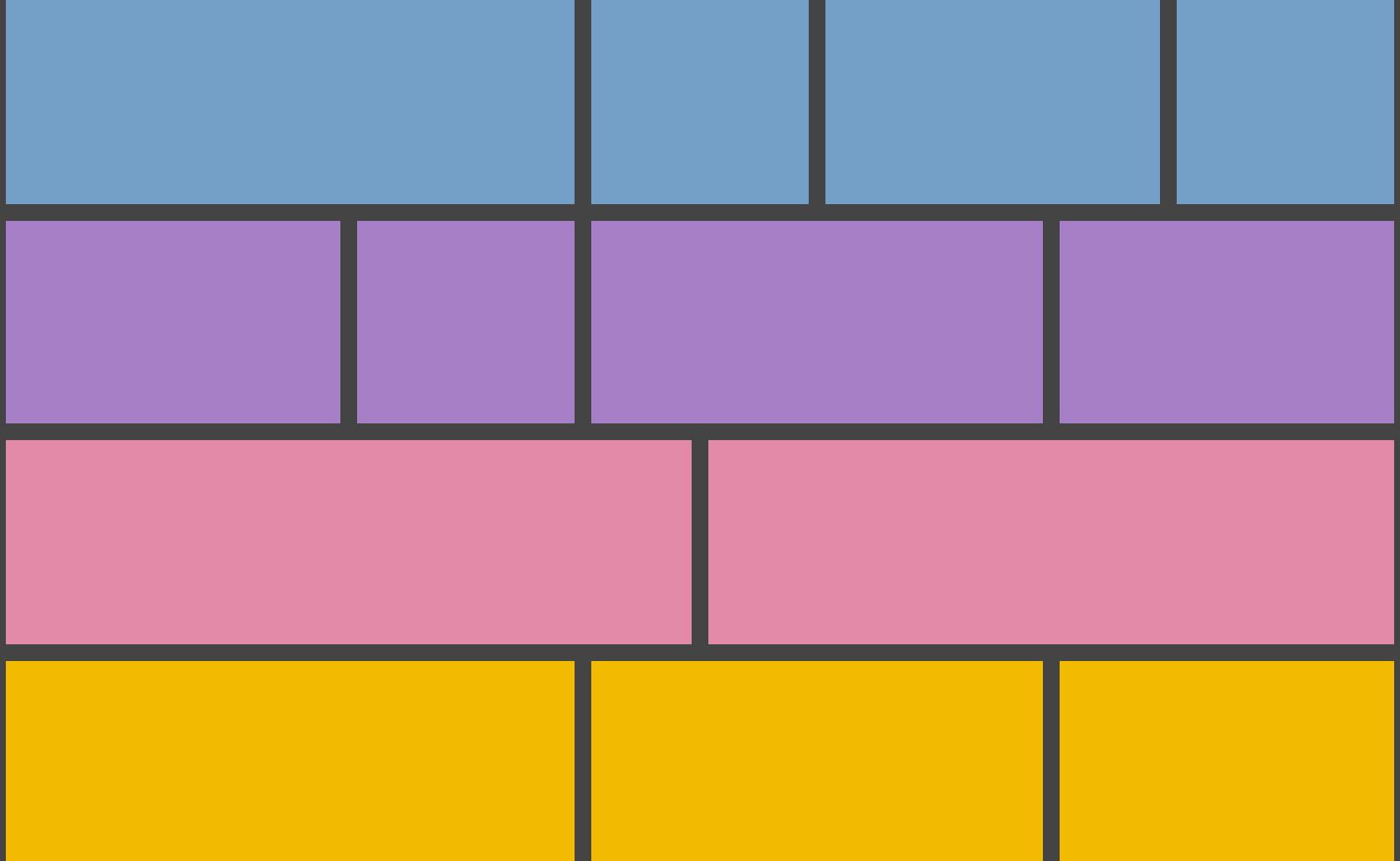
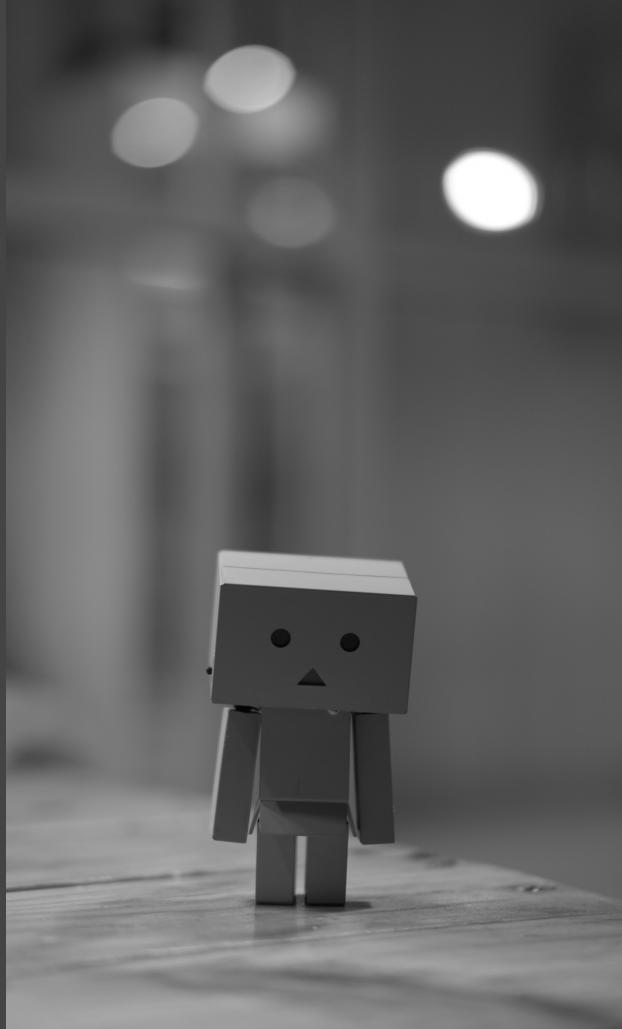
DOES EVERYTHING

# Location Location Location



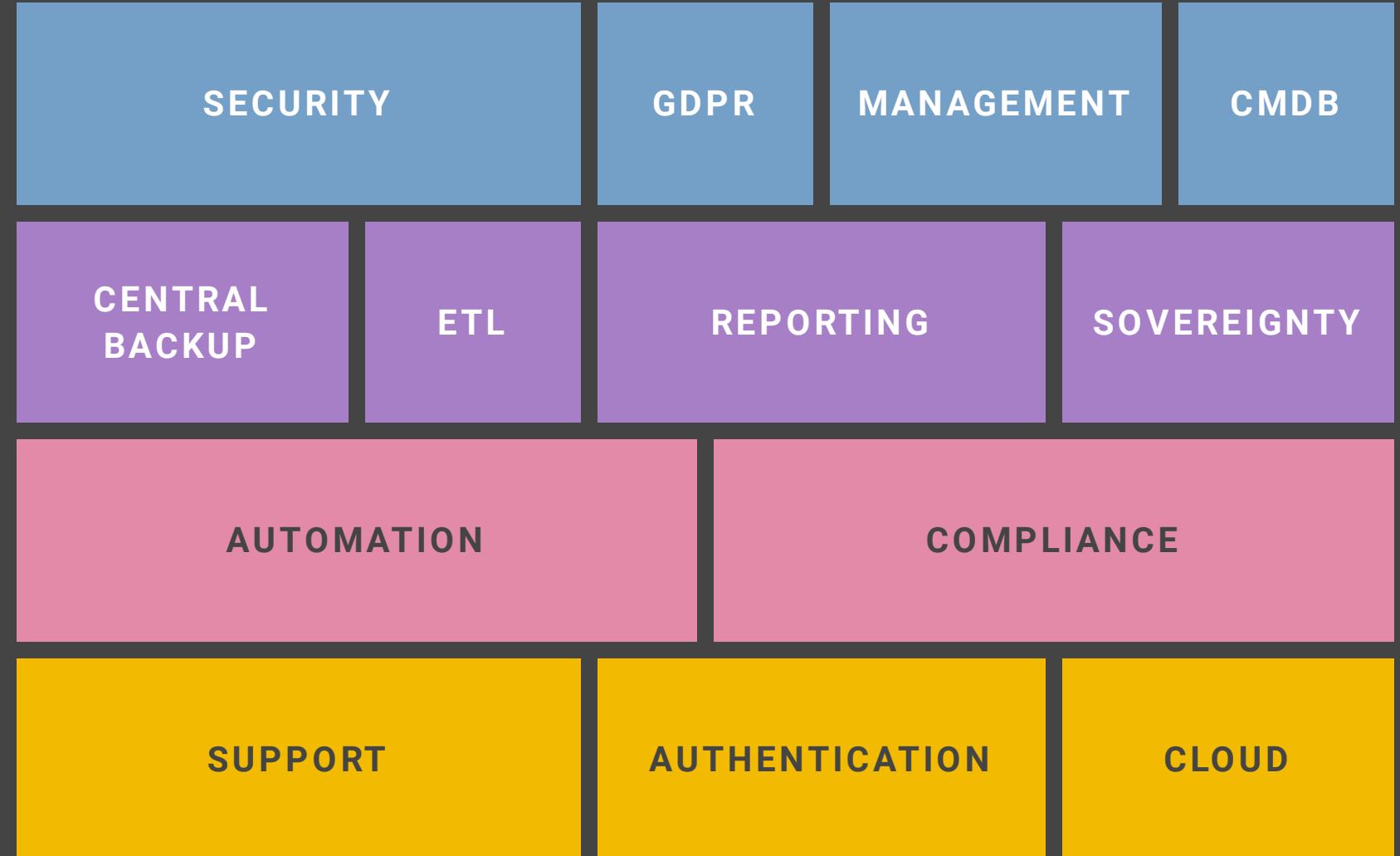
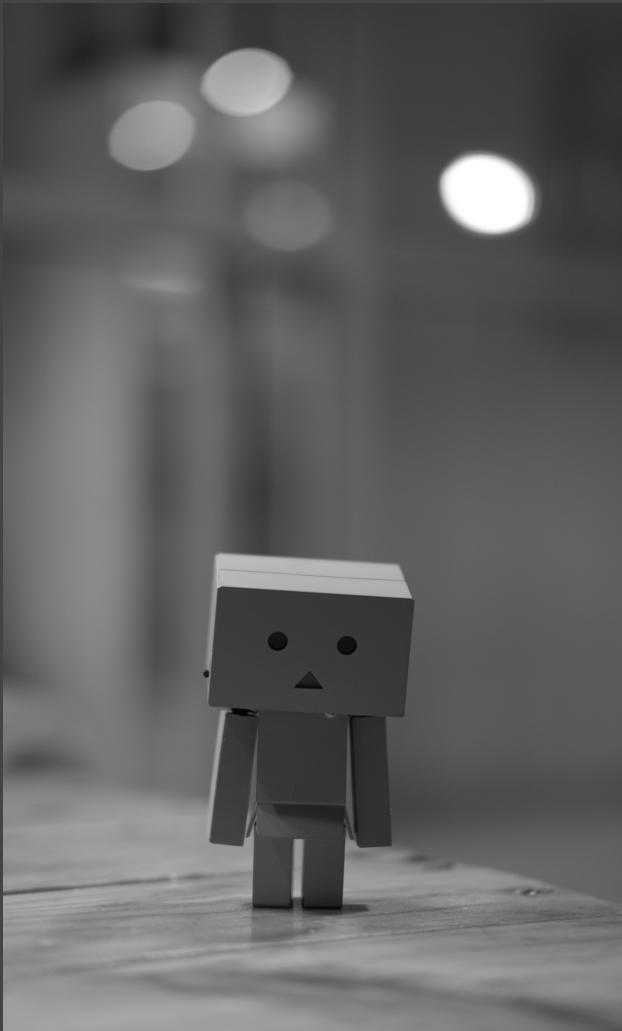
# Why do we need to know where all our instances are?

---



# Why do we need to know where all our instances are?

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“What about Bob's  
database ?”



JESS POMFRET

A large, rectangular portrait of a young man with short brown hair, smiling broadly. He is wearing a dark blue zip-up hoodie. The background is a plain, light-colored wall.

[BOBPUSATERI.COM/ABOUT-  
BOB](http://BOBPUSATERI.COM/ABOUT-BOB)

# How can we find them?



# SQL Instance Locators

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Finding all the SQL instances on an estate is a crucial step for all administration teams but is also important when combining teams due to departmental re-organisations or company mergers and acquisitions



**MICROSOFT ASSESSMENT AND PLANNING  
(MAP) TOOLKIT FOR SQL SERVER**

Lansweeper

**LANSWEEPER**



**DOCUMENTATION**



**AZURE MIGRATE**



**ROLL YOUR OWN**

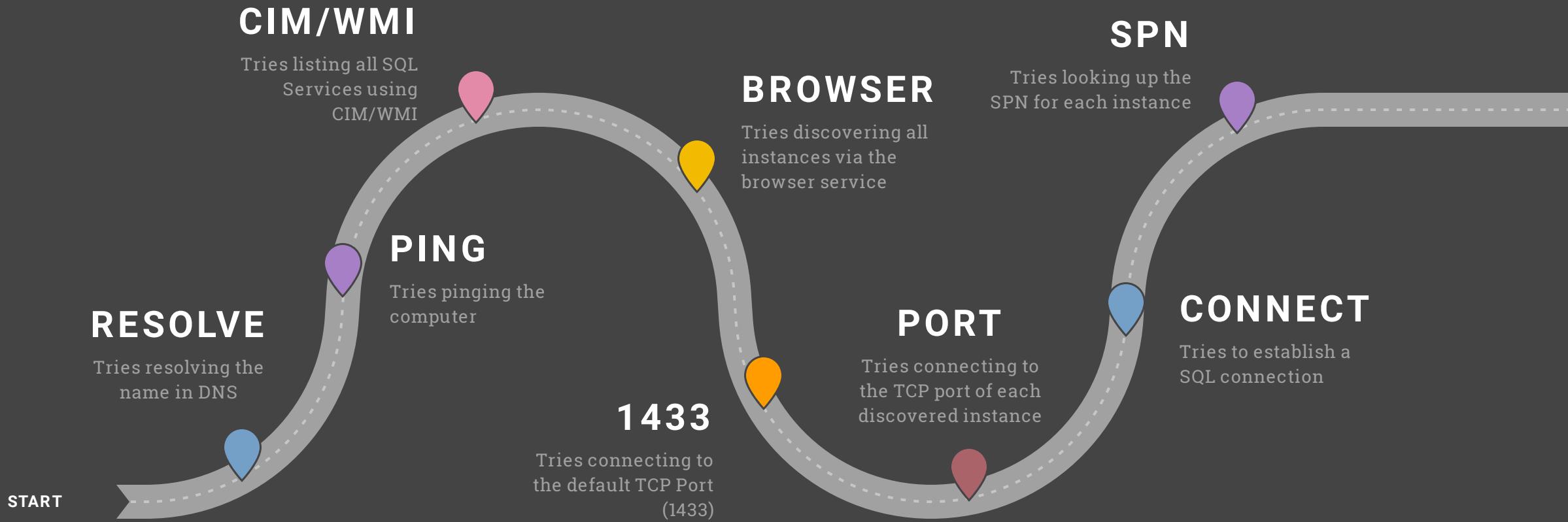


**DBATOOLS**

DBATOOLS

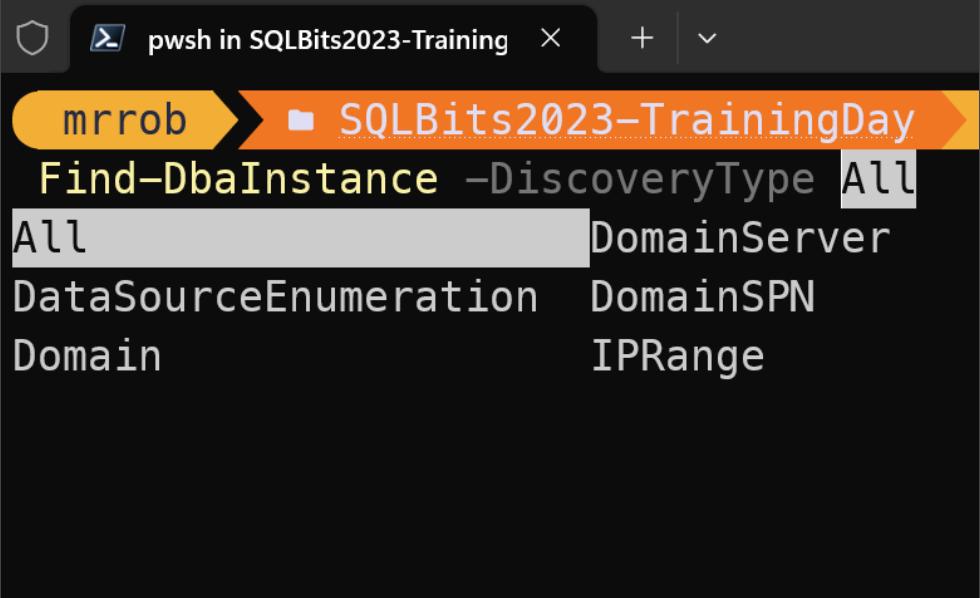
# Find-DbaInstance





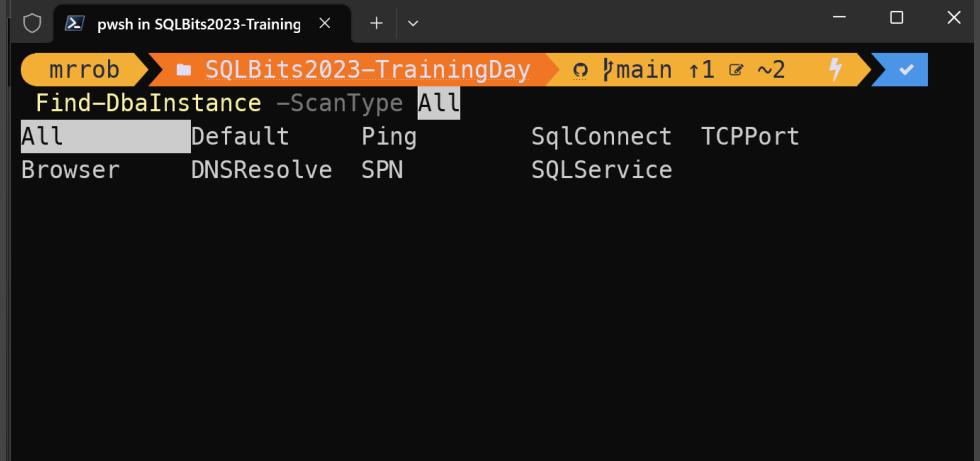
# Find-DbaInstance

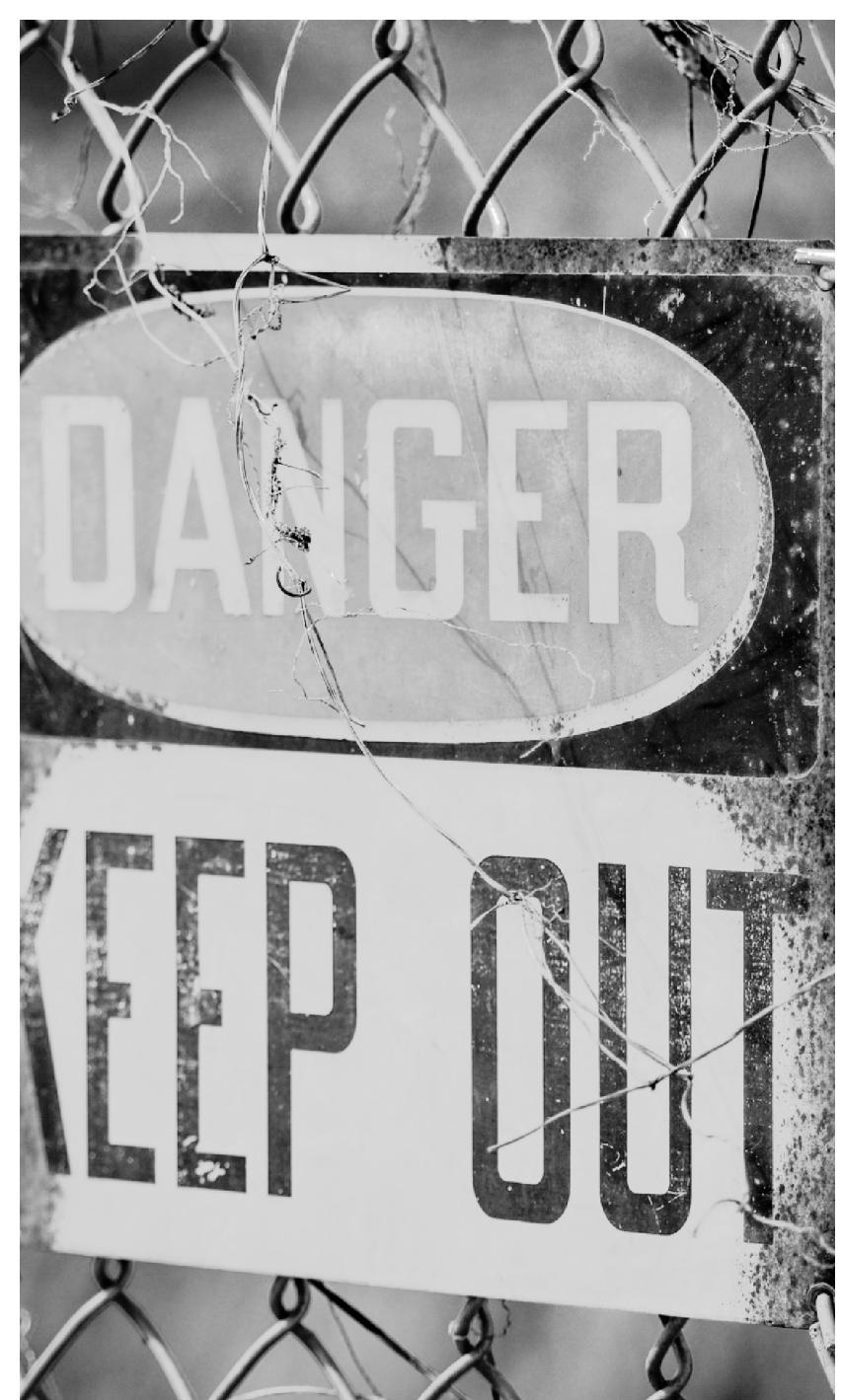
## Discovery Type

<b>IPRANGE</b> uses a range of IP Addresses and simply passes them on to be tested. Uses subnet of network adapters	<b>DOMAIN</b> Connects to Active Directory to look up all computers with registered SQL Instances. Not all instances need to be registered properly, so <u>this is not 100% reliable.</u>	<b>DATASOURCE ENUMERATION</b> Uses the default UDP Broadcast based instance enumeration used by SSMS to detect instances.	 <pre>mrrob ➤ pwsh in SQLBits2023-Training ✘ +   ▾ mrrob ➤ Find-DbaInstance -DiscoveryType All All                               DomainServer DataSourceEnumeration   DomainSPN Domain                           IPRange</pre>
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# Find-DbaInstance

## Scan Type

<b>SQLSERVICE</b> Tries listing all SQL Services using CIM/WMI. detects instances. guarantees high confidence	<b>PING</b> Tries pinging the computer. Failure does NOT terminate scans.	<b>DNSRESOLVE</b> Tries resolving the computer name in DNS	 A screenshot of a PowerShell window titled "pwsh in SQLBits2023-Training". The command "Find-DbaInstance -ScanType All" is run. The output shows the following table: <table border="1"><thead><tr><th>Scan Type</th><th>Description</th></tr></thead><tbody><tr><td>All</td><td>Default</td></tr><tr><td>Browser</td><td>DNSResolve</td></tr><tr><td>TCPPort</td><td>SPN</td></tr><tr><td>SQLService</td><td>SQLConnect</td></tr></tbody></table>	Scan Type	Description	All	Default	Browser	DNSResolve	TCPPort	SPN	SQLService	SQLConnect
Scan Type	Description												
All	Default												
Browser	DNSResolve												
TCPPort	SPN												
SQLService	SQLConnect												
<b>BROWSER</b> Tries discovering all instances via the browser service. detects instances.	<b>TCPPORT</b> Tries connecting to the TCP Ports. By default, port 1433 is used. This scan detects instances.	<b>SPN</b> Tries looking up the Service Principal Names for each instance											



TALK  
to your  
SECURITY TEAM



ComputerName	InstanceName	SqlInstance	Port	Availability	Confidence	ScanType
Jess2016.jessandbeard.local	MSSQLSERVER	Jess2016.jessandbeard.local	0	Unavailable	High	SqlServ...
Jess2019.jessandbeard.local	SSRS	Jess2019.jessandbeard.local\SSRS	0	Unknown	High	SqlServ...
Jess2019.jessandbeard.local	MSSQLSERVER	Jess2019.jessandbeard.local	0	Unavailable	High	SqlServ...
Jess2017.jessandbeard.local	SSRS	Jess2017.jessandbeard.local\SSRS	0	Unknown	High	SqlServ...
Jess2017.jessandbeard.local	MSSQLSERVER	Jess2017.jessandbeard.local	0	Available	High	SqlServ...
Beard2019AG2.jessandbeard.local	SSRS	Beard2019AG2.jessandbeard.local\SSRS	0	Unknown	High	SqlServ...
Beard2019AG2.jessandbeard.local	MSSQLSERVER	Beard2019AG2.jessandbeard.local	0	Available	High	SqlServ...
Beard2019AG3.jessandbeard.local	SSRS	Beard2019AG3.jessandbeard.local\SSRS	0	Unknown	High	SqlServ...
Beard2019AG3.jessandbeard.local	MSSQLSERVER	Beard2019AG3.jessandbeard.local	0	Available	High	SqlServ...
Beard2019AG1.jessandbeard.local	SSRS	Beard2019AG1.jessandbeard.local\SSRS	0	Unknown	High	SqlServ...
Beard2019AG1.jessandbeard.local	MSSQLSERVER	Beard2019AG1.jessandbeard.local	0	Available	High	SqlServ...
Beard2019AG4.jessandbeard.local	SSRS	Beard2019AG4.jessandbeard.local\SSRS	0	Unknown	High	SqlServ...
Beard2019AG4.jessandbeard.local	MSSQLSERVER	Beard2019AG4.jessandbeard.local	0	Available	High	SqlServ...
Duck.jessandbeard.local	SSRS	Duck.jessandbeard.local\SSRS	0	Unknown	High	SqlServ...
Duck.jessandbeard.local	MSSQLSERVER	Duck.jessandbeard.local	0	Available	High	SqlServ...
Laolith.jessandbeard.local	MSSQLSERVER	Laolith.jessandbeard.local	0	Available	High	SqlServ...
Ninereeds.jessandbeard.local	MSSQLSERVER	Ninereeds.jessandbeard.local	0	Available	High	SqlServ...
Errol.jessandbeard.local	MSSQLSERVER	Errol.jessandbeard.local	0	Available	High	SqlServ...
TheLibrarian.jessandbeard.local	MSSQLSERVER	TheLibrarian.jessandbeard.local	0	Available	High	SqlServ...
Daffy.jessandbeard.local	MSSQLSERVER	Daffy.jessandbeard.local	0	Available	High	SqlServ...

09:39:20 CPU: 29% | RAM: 5/16GB 12m 47s 474ms  
home heart

# 12 MINUTES

## DOMAIN SERVER

## SQL SERVICES

```
└ # $SQLInstances = $AdComputerNames | Find-DbaInstance
```

```
theboss ~  
# $SQLInstances
```

⌚ 20m 12.354s ⏱ 09:47:45

ComputerName	InstanceName	SqlInstance	Port	Availability	Confidence	ScanTypes
Jess2016	MSSQLSERVER	Jess2016	0	Unavailable	High	Default
Jess2019	SSRS	Jess2019\SSRS	0	Unknown	High	Default
Jess2019	MSSQLSERVER	Jess2019	0	Unavailable	High	Default
Jess2017	SSRS	Jess2017\SSRS	0	Unknown	High	Default
Jess2017	MSSQLSERVER	Jess2017	0	Available	High	Default
Beard2019AG2	SSRS	Beard2019AG2\SSRS	0	Unknown	High	Default
Beard2019AG2	MSSQLSERVER	Beard2019AG2	0	Available	High	Default
Beard2019AG3	SSRS	Beard2019AG3\SSRS	0	Unknown	High	Default
Beard2019AG3	MSSQLSERVER	Beard2019AG3	0	Available	High	Default
Beard2019AG1	SSRS	Beard2019AG1\SSRS	0	Unknown	High	Default
Beard2019AG1	MSSQLSERVER	Beard2019AG1	0	Available	High	Default
Beard2019AG4	SSRS	Beard2019AG4\SSRS	0	Unknown	High	Default
Beard2019AG4	MSSQLSERVER	Beard2019AG4	0	Available	High	Default
Duck	SSRS	Duck\SSRS	0	Unknown	High	Default
Duck	MSSQLSERVER	Duck	0	Available	High	Default
Laolith	MSSQLSERVER	Laolith	0	Available	High	Default
Ninereeds	MSSQLSERVER	Ninereeds	0	Available	High	Default
Errol	MSSQLSERVER	Errol	0	Available	High	Default
TheLibrarian	MSSQLSERVER	TheLibrarian	0	Available	High	Default
Daffy	MSSQLSERVER	Daffy	0	Available	High	Default
Rincewind	MSSQLSERVER	Rincewind	0	Available	High	Default
dragonlist		dragonlist	1433	Unknown	Medium	Default

20 MINUTES  
Default

⌚ 09:25:44 816ms

```
Find-DbaInstance -DiscoveryType DomainServer -DomainController jessdc1
```

ComputerName	InstanceName	SqlInstance	Port	Availability	Confidence	ScanTypes
ss2016.jessandbeard.local	MSSQLSERVER	Jess2016.jessandbeard.local	0	Unavailable	High	Default
ss2019.jessandbeard.local	SSRS	Jess2019.jessandbeard.local\SSRS	0	Unknown	High	Default
ss2019.jessandbeard.local	MSSQLSERVER	Jess2019.jessandbeard.local	0	Unavailable	High	Default
ss2017.jessandbeard.local	SSRS	Jess2017.jessandbeard.local\SSRS	0	Unknown	High	Default
ss2017.jessandbeard.local	MSSQLSERVER	Jess2017.jessandbeard.local	0	Available	High	Default
ard2019AG2.jessandbeard.local	SSRS	Beard2019AG2.jessandbeard.local\SSRS	0	Unknown	High	Default
ard2019AG2.jessandbeard.local	MSSQLSERVER	Beard2019AG2.jessandbeard.local	0	Available	High	Default
ard2019AG3.jessandbeard.local	SSRS	Beard2019AG3.jessandbeard.local\SSRS	0	Unknown	High	Default
ard2019AG3.jessandbeard.local	MSSQLSERVER	Beard2019AG3.jessandbeard.local	0	Available	High	Default
ard2019AG1.jessandbeard.local	SSRS	Beard2019AG1.jessandbeard.local\SSRS	0	Unknown	High	Default
ard2019AG1.jessandbeard.local	MSSQLSERVER	Beard2019AG1.jessandbeard.local	0	Available	High	Default
ard2019AG4.jessandbeard.local	SSRS	Beard2019AG4.jessandbeard.local\SSRS	0	Unknown	High	Default
ard2019AG4.jessandbeard.local	MSSQLSERVER	Beard2019AG4.jessandbeard.local	0	Available	High	Default
ck.jessandbeard.local	SSRS	Duck.jessandbeard.local\SSRS	0	Unknown	High	Default
ck.jessandbeard.local	MSSQLSERVER	Duck.jessandbeard.local	0	Available	High	Default
olith.jessandbeard.local	MSSQLSERVER	Laolith.jessandbeard.local	0	Available	High	Default
nereeds.jessandbeard.local	MSSQLSERVER	Ninereeds.jessandbeard.local	0	Available	High	Default
rol.jessandbeard.local	MSSQLSERVER	Errol.jessandbeard.local	0	Available	High	Default
eLibrarian.jessandbeard.local	MSSQLSERVER	TheLibrarian.jessandbeard.local	0	Available	High	Default
ffy.jessandbeard.local		Daffy.jessandbeard.local	1433	Unknown	Medium	Default

⌚ 09:39:36 813m 46.096s

# 14 MINUTES

Domain Server Default



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# Demo



# Update and Patch





# Migrating the Giant Database

Explaining more complex migration scenarios, pre-staging full backups, log shipping & cutover.

## Migration options

with dbatools

	Tiny & Non-Critical	Somewhere in the middle	Massive & Mission Critical
Backup\Restore			
Attach\Detach			
Full Backup + Diff\Log Backups			
Log Shipping			

# Moving to the cloud

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"THE TROUBLE WITH NOT HAVING A GOAL IS THAT YOU CAN SPEND YOUR LIFE RUNNING UP AND DOWN THE FIELD AND NEVER SCORE." BILL COPELAND

# Availability Groups



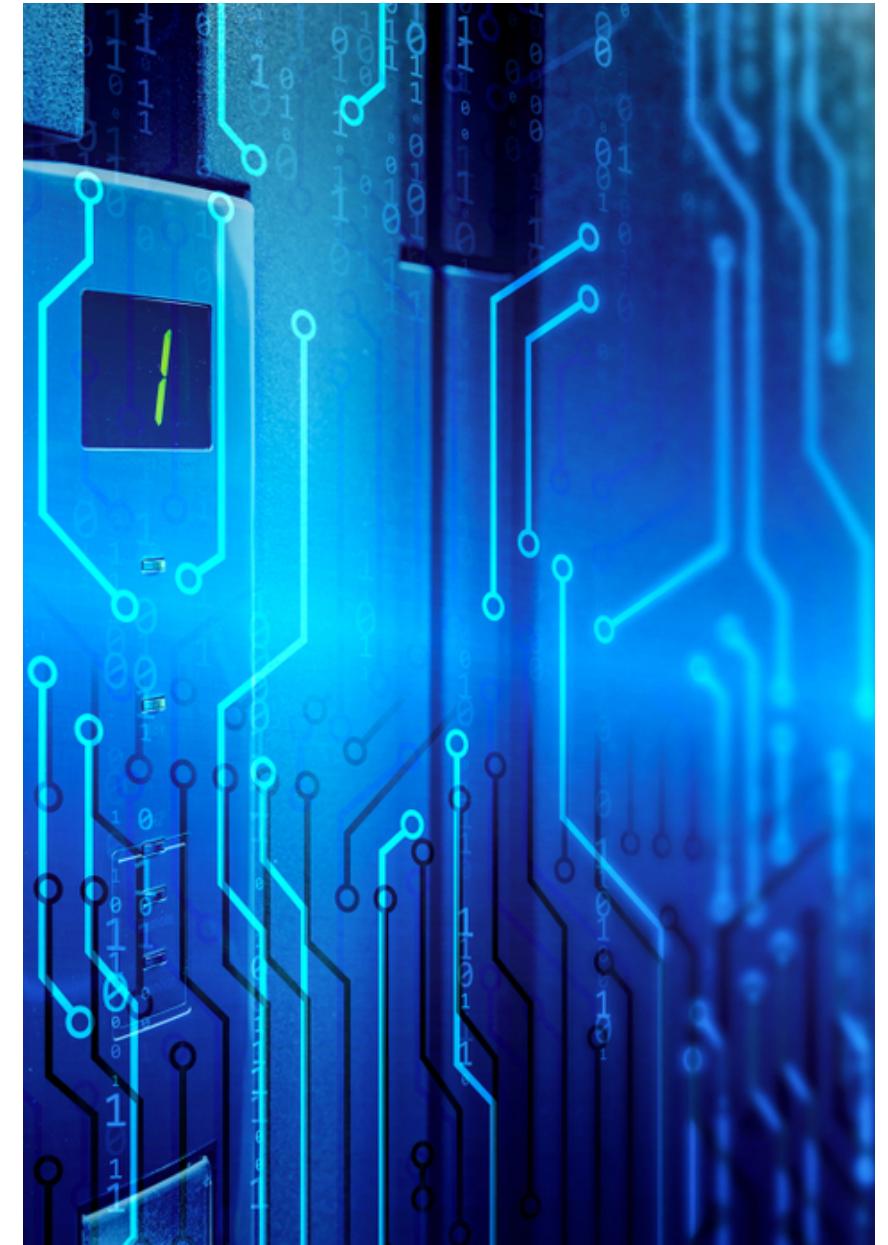
# A Comparison of High Availability and Disaster Recovery

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High Availability	Disaster Recovery
Ensures system is always available	Ensures system can be recovered after a disaster
Provides redundancy and failover	Provides backup and restore
Synchronous Availability Group with low latency	Asynchronous Availability Node in a different geography

# The Importance of High Availability

High availability is an important factor for businesses to consider when designing their IT infrastructure. Ensuring that systems are always available and running optimally can help to reduce downtime and improve customer satisfaction.



# The Benefits of Highly Available Database Systems

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## HIGHLY AVAILABLE DATABASES ARE ESSENTIAL FOR BUSINESSES

They ensure that data is always accessible and secure, even in the event of a system failure or outage



## HIGHLY AVAILABLE DATABASES PROVIDE SCALABILITY AND FLEXIBILITY

They can be easily scaled up or down to meet changing business needs



## HIGHLY AVAILABLE DATABASES REDUCE DOWNTIME

They minimize the impact of system outages and ensure that data is always available

**HIGHLY AVAILABLE DATABASES ARE ESSENTIAL FOR BUSINESSES,  
PROVIDING SCALABILITY, FLEXIBILITY, AND REDUCED DOWNTIME.**

# Thank you!

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ROB SEWELL

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FEEDBACK

<https://sqlb.it/?9188>

old\archive slides  
go no further...

Hi Rob - I moved all the slides that were notes or I  
didn't think were needed after this point... feel free  
to grab them back if you disagree



# Planning Out Upgrade/Migration

Talk about the non-technical aspects of planning such as downtime, tests, repointing applications, and understanding the impact for migrating to new instance.

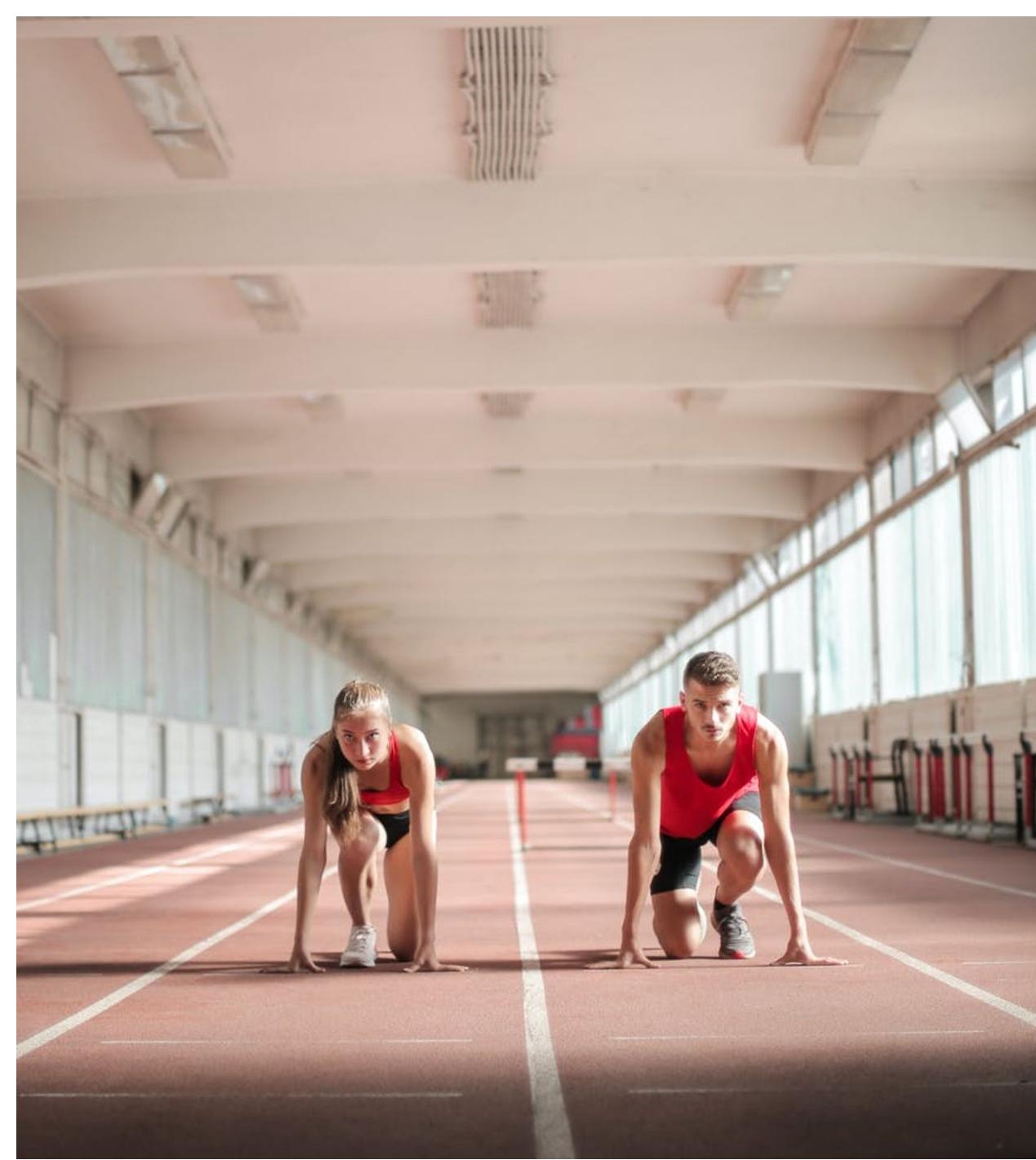
shutdown the primary AG VM from phone while  
demoing and then yell DISASTER HAS STRUCK -  
THERE BE DRAGONS IN THE DATACENTER





duplication, parallel,





COMPANY MISSION

**FASTER**