



# It's Under Control, But Is It Under Source Control?

**Drew Skwiers-Koballa**

He/him

Microsoft

[Aka.ms/sql-source-control](https://aka.ms/sql-source-control)



# Microsoft SQL at PASS Data Community Summit

Thursday

## Breakfast with the Microsoft Data Leadership Team

Hosted by Bob Ward

6:45AM

## SQL Server on Azure VM – Configuring for Price-Performance

Pam Lahoud

10:15AM

## Containerize with Ease with Cross-Platform SQL Server AGs

Amit Khandelwal

10:15AM

## Demo Party: Azure SQL Managed Instance in action

Mladen Andzic and Vladimir Ivanovic

10:15AM at Ecostage

## Developing with Databases: what are the pain points?

Davide Mauri

Birds of a Feather - Lunch

## SQL Database and Fabric – Better Together!

Muazma Zahid, Idris Motiwala and Jes Schultz

1:15PM at Ecostage

## Seamless Discover, assess and modernize to Azure SQL

Sudhir Raparla and Ravinder Singh

1:30PM

## From ground to cloud with SQL Server 2022

Ajay Jagannathan and Perry Skountrianos

3:15PM

## Exploring what's new in Azure SQL Managed Instance

Borko Novakovic and Vladimir Ivanovic

3:15PM

## Making the SQL Query Processor Work for You

Kate Smith and Derek Wilson

4:45PM

## Improve Your Hybrid SQL Server Observability with Azure Arc

Dhananjay Mahajan and Lance Wright

4:45PM

## What's new in SQL Tools and Experiences

Erin Stellato, Drew Skwiers-Koballa, Anna Hoffman

4:45PM

## HADR on SQL Server on Azure VMs: Everything you need to know

Pam Lahoud, Taryn Pratt

4:45PM

Friday

## From Startups to the Enterprise: Beyond RDBMS with Azure SQL

Bob Ward, Sanjay Mishra, Muazma Zahid and Davide Mauri

10:15AM

## So you want to be an MVP?

Rie Merritt, Birds of a Feather – Lunch

## What you should know about Always On availability groups

Bob Ward

1:30PM

## Data Encryption & Integrity: Innovations in Azure SQL

Pieter Vanhove

1:30PM

## Everything you need to know about Data Virtualization in SQL

Hugo Queiroz

3:15PM

## Unleashing the power of access control of the SQL engine

Andreas Wolter

3:15PM

## Accelerate your Oracle Modernization journey to Azure SQL

Neel Ball, Kuldeep Chauhan, Harmeet Singh

3:15PM



Wednesday

## Keynote: Shireesh Thota, Microsoft CVP Azure Data

## Hidden Gems in SQL Server 2022

Bob Ward and Ajay Jagannathan

10:15AM

## What's new in Azure SQL and SQL Server, Data Exposed Live

Anna Hoffman and SQL Product Group friends

10:15AM

## It's under control, but is it under source control?

Drew Skwiers-Koballa

11:00AM at Ecostage

## Query Store

Erin Stellato

Birds of a Feather - Lunch

## Optimize price-performance using Azure SQL DB Hyperscale

Arvind Shyamsundar and Aditya Badramraju

1:30PM

## Modernize apps with Azure SQL MI and unlock cloud benefits

Borko Novakovic and Mladen Andzic

4:45PM

## Manage, secure & govern SQL estate with Azure Arc

Raj Pochiraju and Dinakar Nethi

4:45PM

## More for less: Cost optimizing your Azure SQL Database

Abdul Sathar Sait and Nils Pohlmann

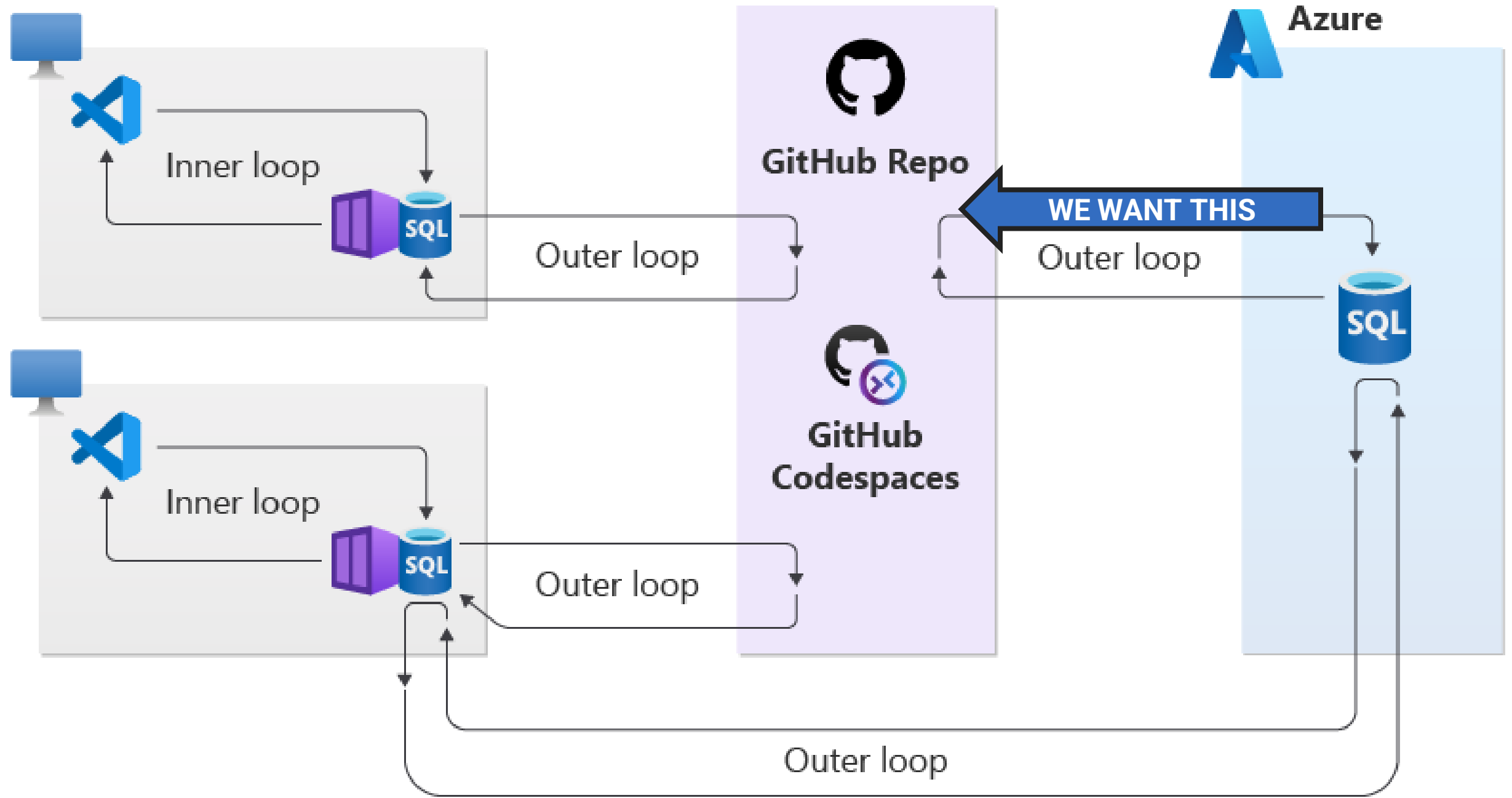
4:45PM

*Fill out our survey  
for a chance to win a  
mentoring session  
with the Partner  
Director of SQL,  
Sanjay Mishra  
[aka.ms/sqlsurvey](https://aka.ms/sqlsurvey)*



# What this session is and isn't about

- Is Not – advanced git, advanced deployments, database development practices/dogma
- Is –
  - Getting a real database into source control
  - What to do with it in source control
  - Stepping into DevOps 1 inch at a time

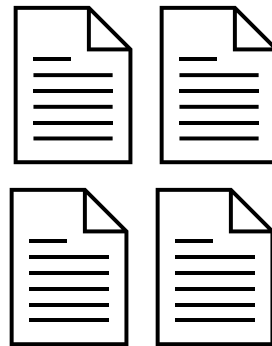


# Yes, SQL projects, but...

- Objects (tables, stored procedures, functions) are validated as a complete model
  - Do all the references match?
  - Does the specified engine version have that capability?
- ~~• \*Pre/post deployment scripts add additional actions before/after model is applied, eg:~~
  - ~~• Insert static data~~
  - ~~• Add users~~
- ~~• Advanced capabilities: variable evaluation at deployment (SQLCMD), dependent/nested projects~~

# Automating database objects to files

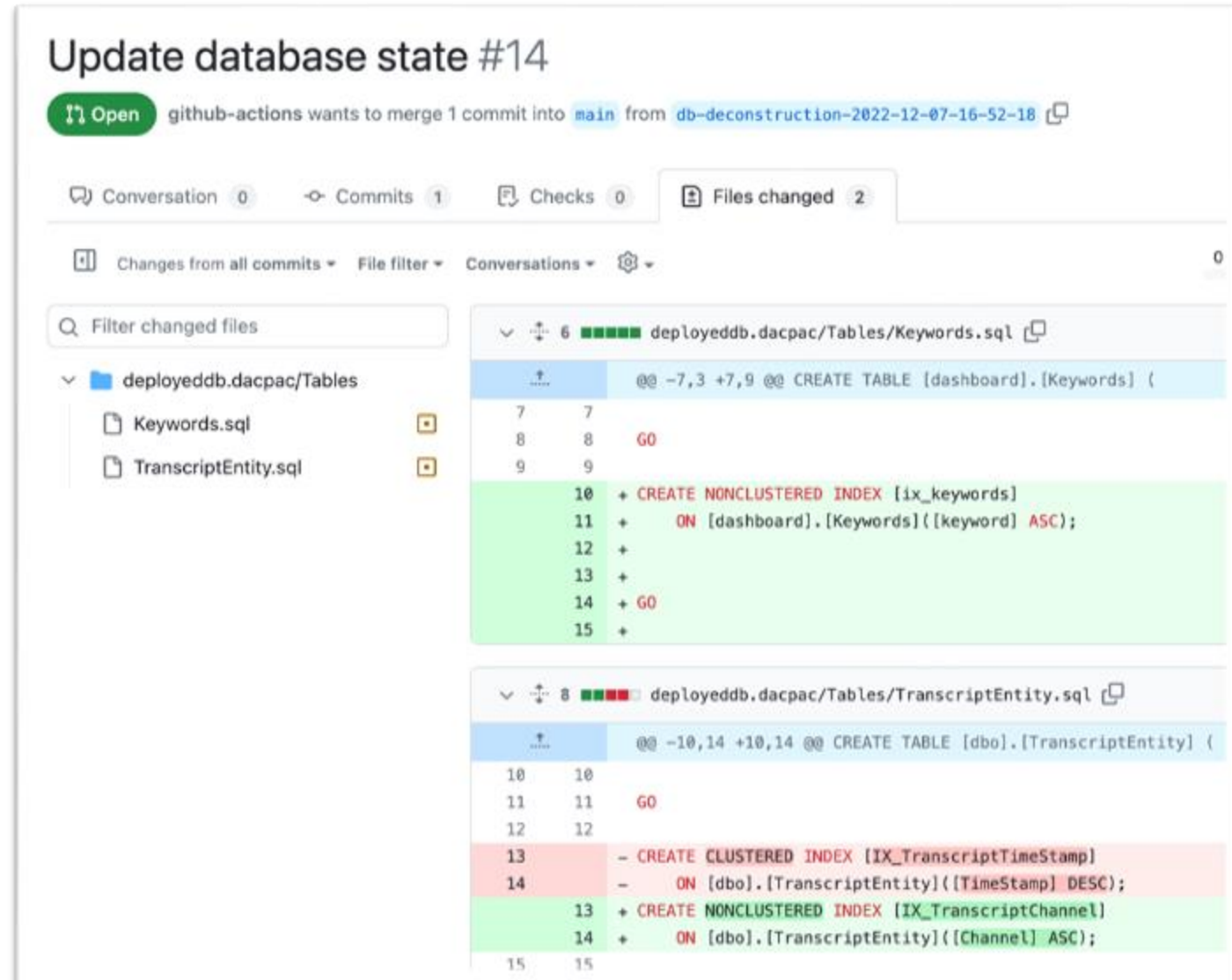
SqlPackage extract  
with *ExtractTarget* set  
to ObjectType,  
Schema, etc.



```
→ extractobjects sqlpackage /a:extract /ssn:localhost /sdn:AdventureWorks /su:sa  
/sp:Passw0rd /stsc:true /tf:AdventureWorks /p:ExtractTarget=ObjectType  
Connecting to database 'AdventureWorks' on server 'localhost'.  
Extracting schema  
Extracting schema from database  
Resolving references in schema model  
Exporting database objects  
Validating schema model for data package  
Validating schema  
Successfully extracted database and saved it to file '/Users/Shared/CodeRepos/Samp  
leSandbox/extractobjects/AdventureWorks'.  
Changes to connection setting default values were incorporated in a recent release  
. More information is available at https://aka.ms/dacfx-connection  
Time elapsed 0:00:07.76  
→ extractobjects cd AdventureWorks/Tables  
→ Tables ls  
Address.sql  
BuildVersion.sql  
Customer.sql  
CustomerAddress.sql  
ErrorLog.sql  
Product.sql  
ProductCategory.sql  
ProductDescription.sql  
ProductModel.sql  
ProductModelProductDescription.sql  
SalesOrderDetail.sql  
SalesOrderHeader.sql  
→ Tables
```

# Database change PRs

- ✓ Remove existing \*.sql files
- ✓ Run SqlPackage to generate files
- ✓ git status
- ✓ If changes
  - ✓ Add and commit files
  - ✓ Open PR




Manually triggered 11 hours ago

 dzsquared **Drew Skwiers-Koballa** FTE  a4de0d0

Status	Total duration	Billable time	Artifacts
Success	43s	1m	–

check-db.yml

on: workflow\_dispatch

 validate-db 33s



validate-db summary



 New pull request <https://github.com/dzsquared/planning-www/pull/13>

Job summary generated at run-time



# It CAN be done

- Whether manual or automated, your database can become code
- **Benefit** – history of objects in your database
  - When did that index get added?
  - Which tables have a column with type *text*?
  - The stored proc isn't returning results as expected, did it change?

# YourDatabase.sqlproj

```
<?xml version="1.0" encoding="utf-8"?>
<Project DefaultTargets="Build">
  <Sdk Name="Microsoft.Build.Sql" Version="0.1.14-preview" />
  <PropertyGroup>
    <Name>reactions</Name>
    <DSP>Microsoft.Data.Tools.Schema.Sql.Sql160DatabaseSchemaProvider</DSP>
    <ModelCollation>1033, CI</ModelCollation>
  </PropertyGroup>
</Project>
```

# Lightweight development environments

- Pile of \*.sql files becomes a SQL project
- SQL project becomes a dacpac
- Dacpacs deploy just about anywhere

```
dotnet new sqlproj -n AdventureWorks  
dotnet build  
sqlpackage /a:publish /sf:"bin/Debug/AdventureWorks.dacpac"  
           /tcs:{yourconnectionstring}
```

# Do we go further? At the right time:

- Unit tests
- Code analysis
- Development environments
- Change reviews

# Unit testing

- Add tests without interrupting existing dev processes
- Run ad-hoc or on automation

# Thank you

## Keep things under control!

**Drew Skwiers-Koballa**

[drskwier@microsoft.com](mailto:drskwier@microsoft.com)

[Aka.ms/sql-source-control](https://aka.ms/sql-source-control)

[Aka.ms/sqlsurvey](https://aka.ms/sqlsurvey)



PASS  
Data Community  
SUMMIT  
2023

# Session evaluation

Your feedback is important to us



**Evaluate this session at:**

[www.PASSDataCommunitySummit.com/evaluation](http://www.PASSDataCommunitySummit.com/evaluation)

