What is DevOps for Databases (SQL)?

Ian Pike
Cloud Solution Architect (Data & AI)
Customer Success Unit, Microsoft UK

Twitter: @ianpike
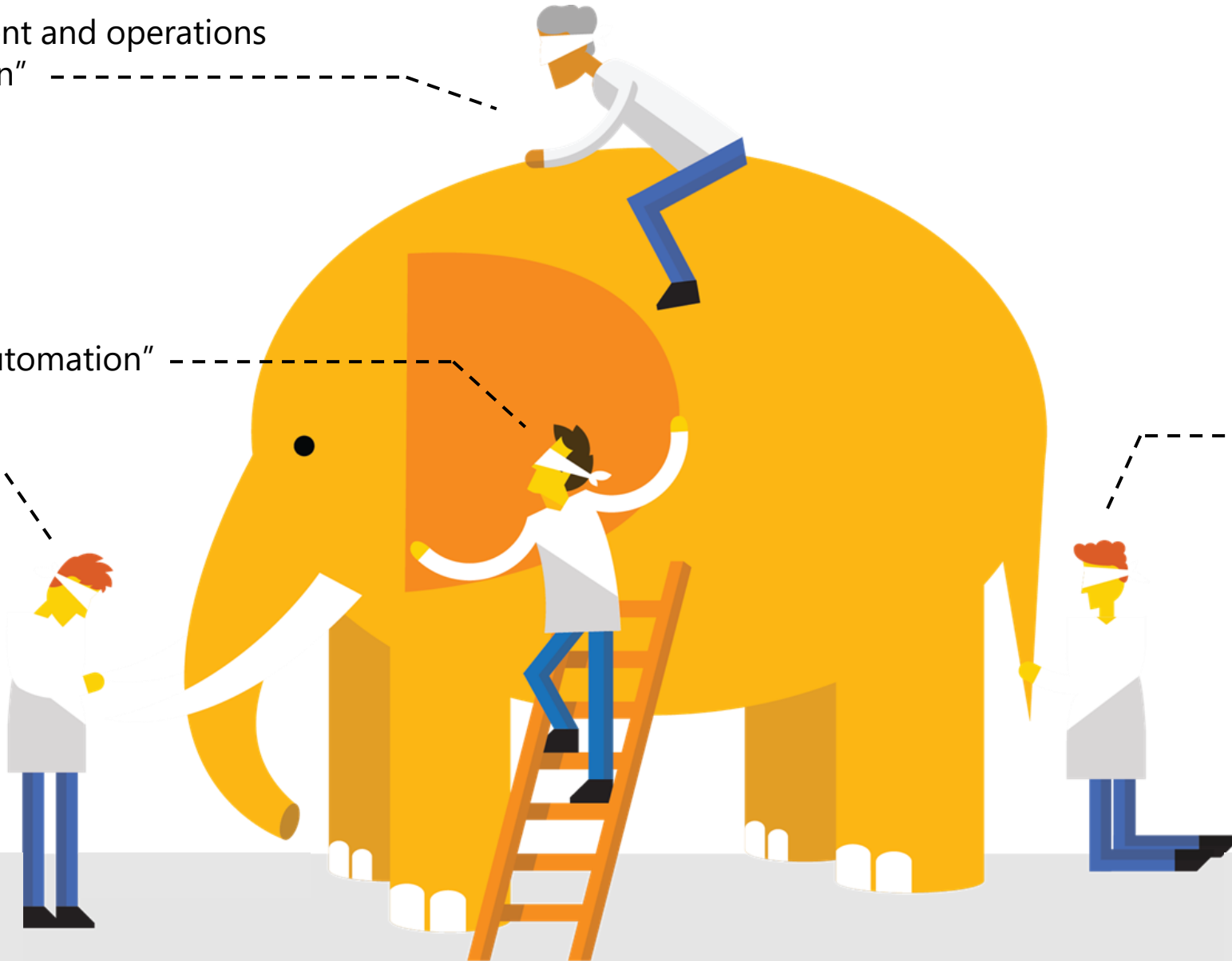https://www.linkedin.com/in/ipike/

What is DevOps?

What is DevOps?

"Development and operations collaboration"

"Automation"
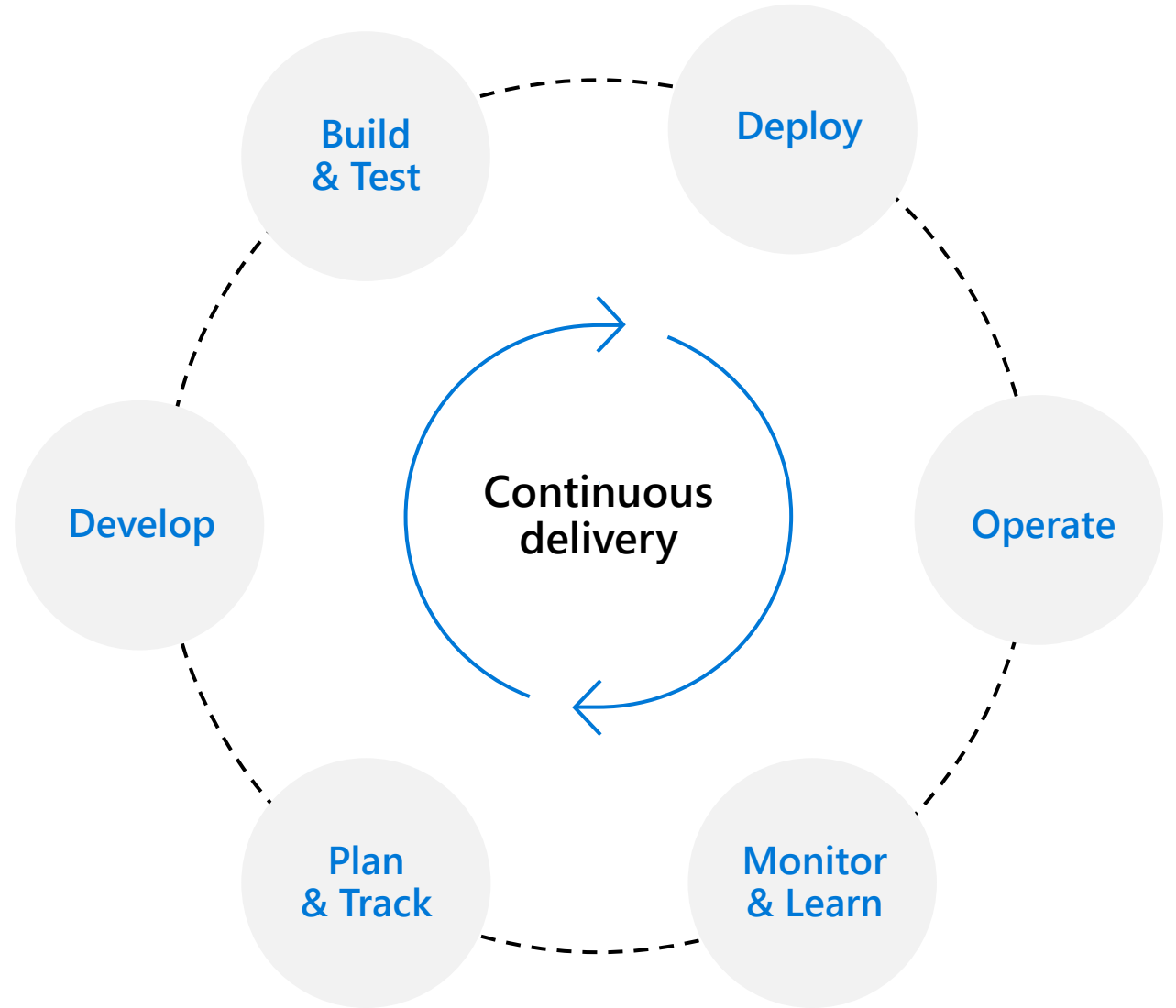
"A job title"

"Faster and smaller releases"

What is DevOps?

People. Process. Products.

" DevOps is the union of **people**, **process**, and **technology** to enable continuous delivery of value to your end users. **"**

Build
& Test

Deploy

Develop

Continuous
delivery

Operate

Plan
& Track

Monitor
& Learn

What do I need to implement DevOps?

DevOps brings together people, processes, and tools, automating software delivery to provide continuous value to your users. Using Azure DevOps, you can deliver software faster and more reliably - no matter how big your IT department or what tools you're using.
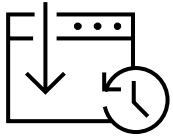
Continuous integration (CI)

Improve software development quality and speed.

When you use Azure Pipelines or Jenkins to build apps in the cloud and deploy to Azure, each time you commit code, it's automatically built and tested and bugs are detected faster.
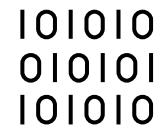
Continuous delivery (CD)

Ensures that code and infrastructure are always in a production-deployable state.

By combining continuous integration and infrastructure as code (IaC), you'll achieve identical deployments and the confidence to deploy to production at any time.
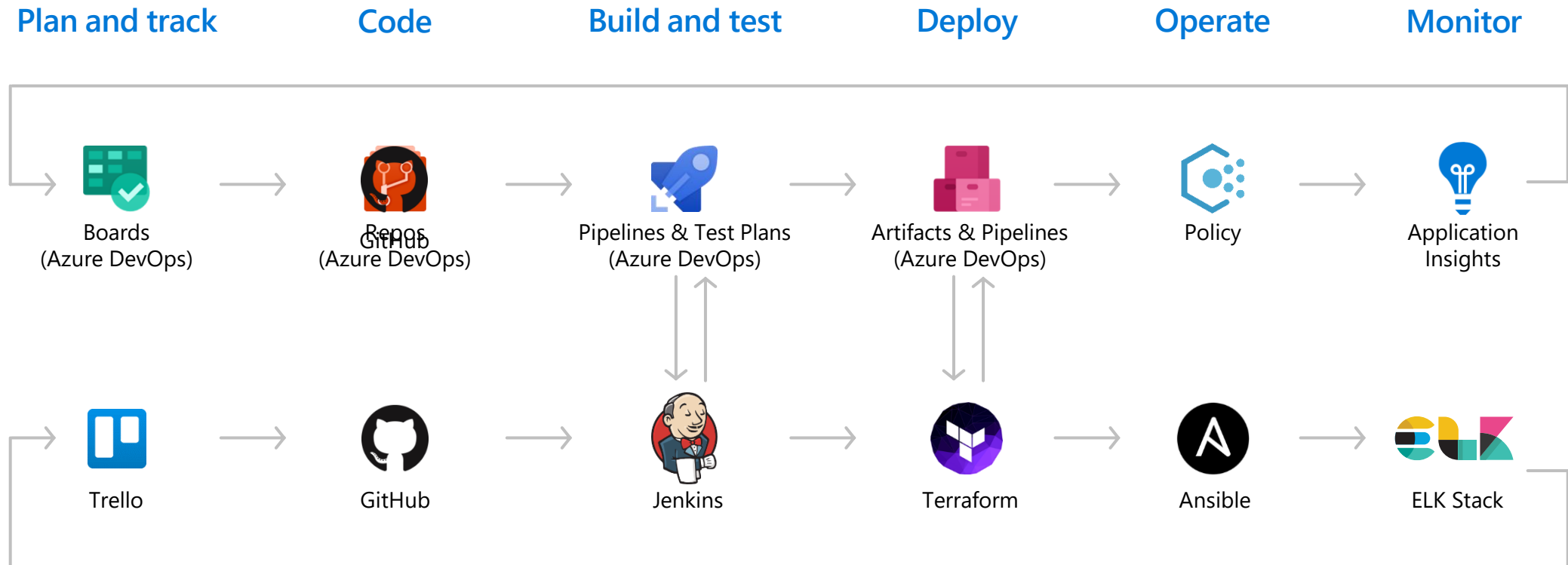
Continuous deployment with CI/CD

With continuous deployment, you can automate the entire process from code commit to production if your CI/CD tests are successful.

Using CI/CD practices, paired with monitoring tools, you'll be able to safely deliver features to your customers as soon as they're ready.

DevOps on Azure framework

Plan and track	Code	Build and test	Deploy	Operate	Monitor

Boards
(Azure DevOps)

Repos
(Azure DevOps)

Pipelines & Test Plans
(Azure DevOps)

Artifacts & Pipelines
(Azure DevOps)

Policy

Application
Insights

Trello

GitHub

Jenkins

Terraform

Ansible

ELK Stack

Azure DevOps

Azure Boards

———

Plan, track, and discuss work across teams, deliver value to your users faster.

Azure Repos

———

Unlimited cloud-hosted private Git repos. Collaborative pull requests, advanced file management, and more.

Azure Pipelines

———

CI/CD that works with any language, platform, and cloud. Connect to GitHub or any Git provider and deploy continuously to any cloud.

Azure Test Plans

———

The test management and exploratory testing toolkit that lets you ship with confidence.

Azure Artifacts

———

Create, host, and share packages. Easily add artifacts to CI/CD pipelines.

Azure

Azure

Azure DevOps

Better together

Azure Boards	Azure Repos	Azure Pipelines	Azure Test Plans	Azure Artifacts
Fully Integrated with end to end traceability	Scalable to any team and project size	Highly available, multi region, hybrid cloud & on-prem	Customer support	Consistent admin and access control

An end-to-end solution for organizations looking for an enterprise-grade toolchain
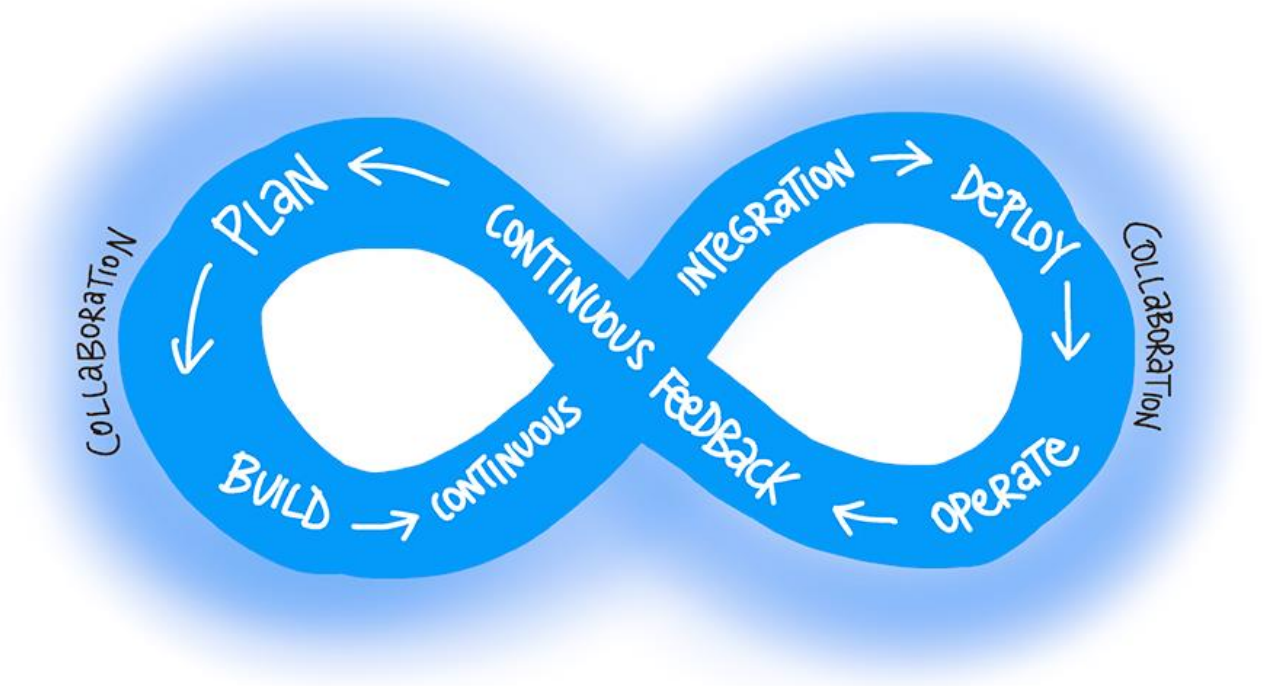
Azure

What is DevOps for Databases (SQL)?

What is DevOps for Databases (SQL)?

So many ways or different topics?

Is it

- DevOps for Data

- Devops for Databases or SQL

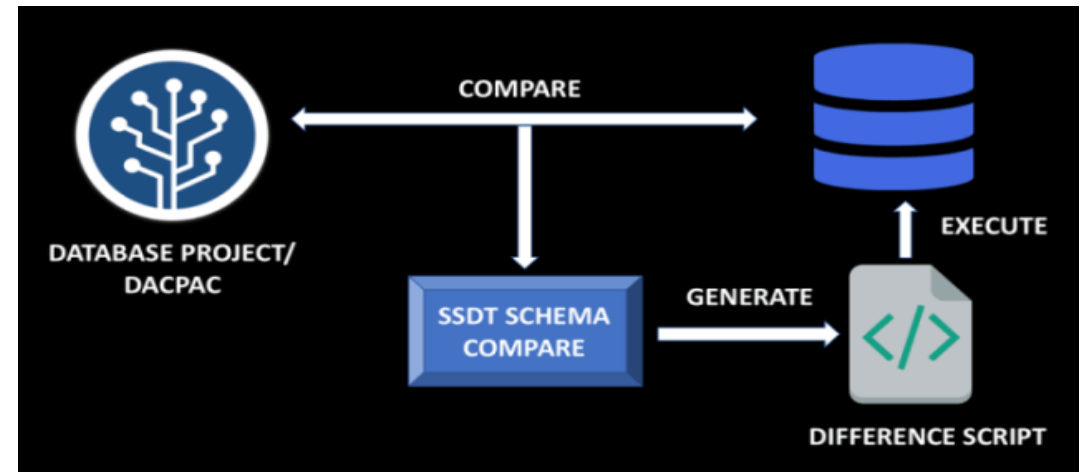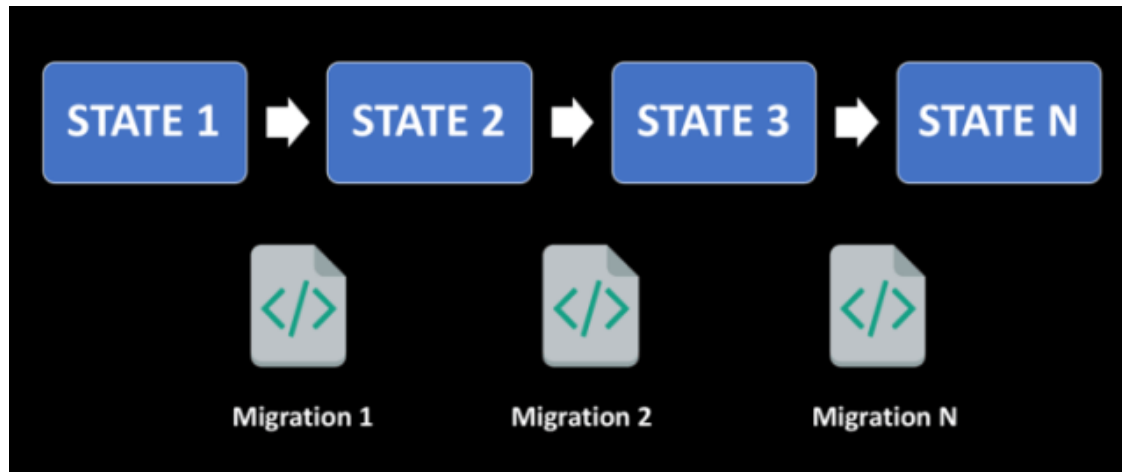- Data DevOps

- DataOps

- MLOps

What is DevOps for Databases (SQL)?

Two types of database deployment

State   Vs   Model

What is DevOps for Databases (SQL)?

What is SSDT? (SQL Server Data Tools)

- Part of Visual Studio – Check versions

    - Extension in VS2019

    - Separate Shell/Add-in for VS2017

- Two favours:

    - Database Projects (Schema)

    - BI Tools (SSIS/SSAS/SSRS)

What is DevOps for Databases (SQL)?

What is SSDT? (SQL Server Data Tools)

- Database Projects allow:

    - Deployment of Schema using DACPACs

    - Schema Compare

    - Data Compare

    - Offline development of model

    - Intellisense

    - Source Control integration - DevOps

Azure

What is DevOps for Databases (SQL)?

What is the difference between build objects?

There are two types:

- DACPACS – Schema only

- BACPACs – Objects plus Data

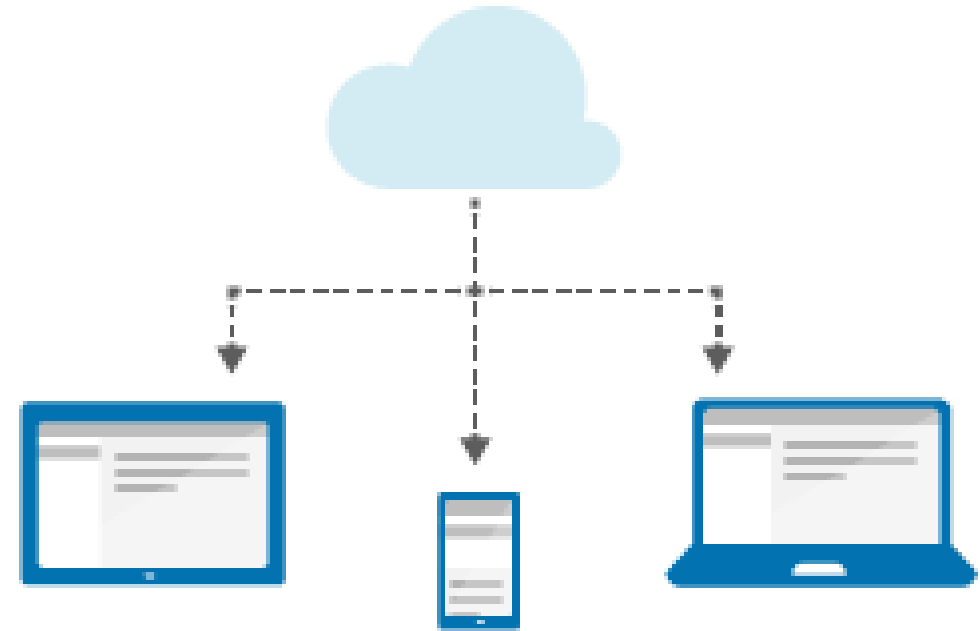This is deployed using SQLPackage.exe

https://docs.microsoft.com/en-us/sql/tools/sqlpackage?view=sql-server-ver15

What is DevOps for Databases (SQL)?

Other features to think about

- Pre and Post deployment scripts

  - Security

- SSIS/SSRS/SSAS Deployments

- Drift reports

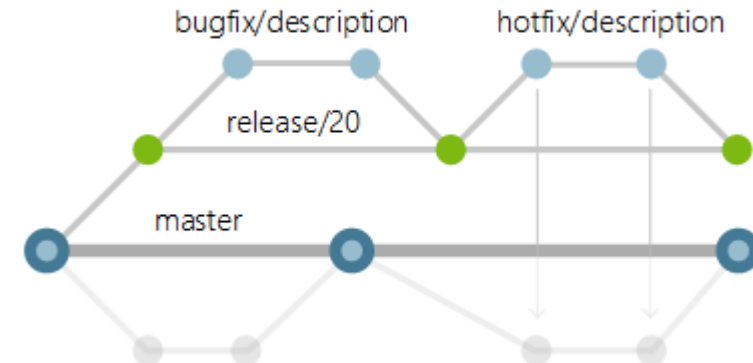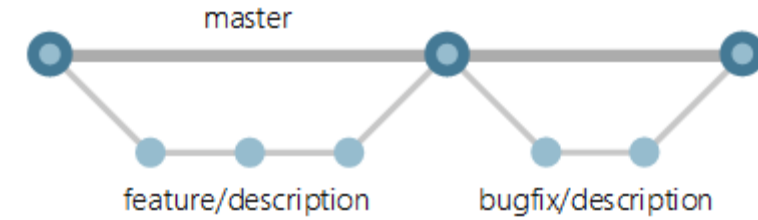- Unit Testing

Azure

What is DevOps for Databases (SQL)?

Branching strategies

Work out your branching and merging strategy

- Master

- Hot fix / Bug

- Feature Branches

Azure

Demo
SSDT in Visual Studio

Azure

What is DevOps for Databases (SQL)?

These are the main challenges with existing Databases

- Circular References

- 3 and 4 part object names

- Orphaned objects

- Deprecated objects

- SQL Jobs

- Data

https://blogs.solidq.com/en/sqlserver/ssdt-how-to-solve-the-circular-references-issue/

https://www.sqlservercentral.com/articles/two-approaches-to-addressing-circular-references-in-ssdt

What is DevOps for Databases (SQL)?

Deployment challenges

- Refactoring – Boiler plate

- Table renames and splits

- Data / Transactions

- Branching and Merging
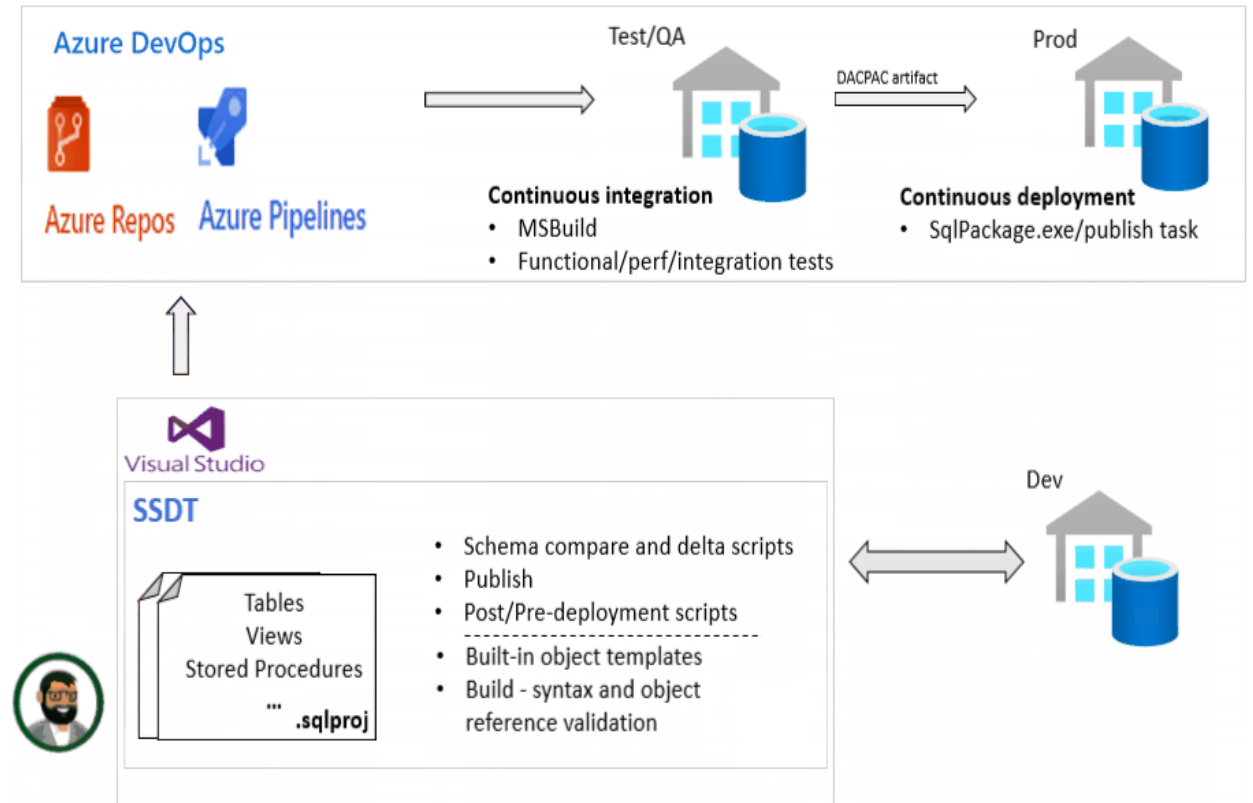
What is DevOps for Databases (SQL)?

Environments

Deploy via Azure DevOps, for example to environments
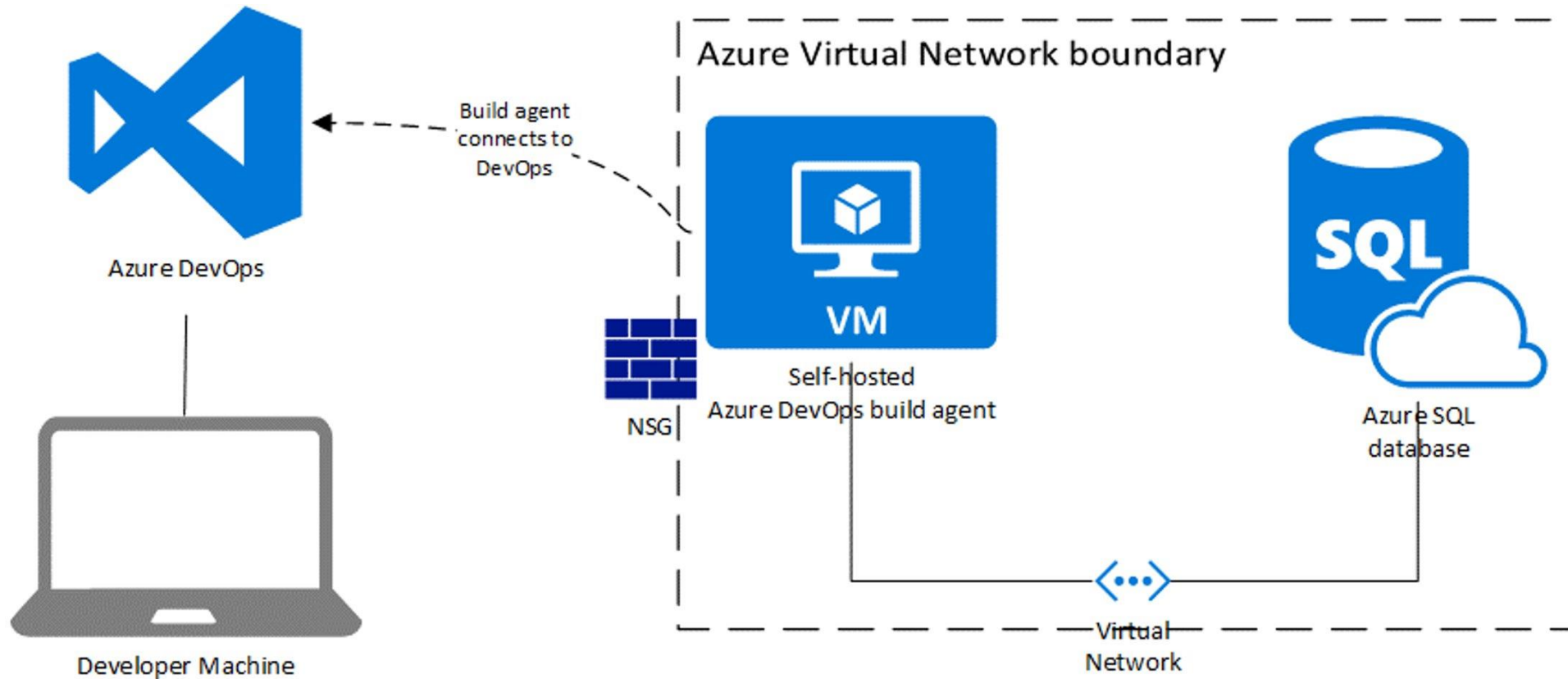
-> Dev, Test, Pre-Prod, Prod

Using different parameters

Building out environments including Infrastructure (Server + Database)

What is DevOps for Databases (SQL)?

**Enterprise deployment with Private Link
& Hosted agent**

Demo
Azure DevOps

What is DevOps for Databases (SQL)?

Other tools (not an exhaustive or preferred list!)

Redgate (SQL + Data Compare, Ready to Roll etc)

Apex SQL

SentryOne

TsqlT Unit testing Framework

Jenkins, Octopus and TeamCity

Blogs/Twitter/Slack :

Alex Yates / DLM : https://twitter.com/_AlexYates_

Ed Elliot : https://twitter.com/EdDebug

Slack : sqlcommunity.slack.com

Redgate/COEO : https://www.red-gate.com/hub/events/whats-on/database-devops-the-benefits-for-your-organization-2

Links

- SSDT Overview : https://docs.microsoft.com/en-us/sql/ssdt/sql-server-data-tools?view=sql-server-ver15

- Download SSDT : https://docs.microsoft.com/en-us/sql/ssdt/download-sql-server-data-tools-ssdt?view=sql-server-ver15

- DevOps for Azure SQL : https://devblogs.microsoft.com/azure-sql/devops-for-azure-sql/

- Good blog on Database Dev Ops – Part 1: https://the.agilesql.club/2016/01/what-is-ssdt-all-about-aka-why-should-i-bother/

- Part 2: https://the.agilesql.club/2016/01/what-is-ssdt-part-2-more-reasons-to-bother/

- What is a DACPAC: https://www.red-gate.com/simple-talk/sql/database-delivery/microsoft-and-database-lifecycle-management-dlm-the-dacpac/

- Branching guidelines : https://docs.microsoft.com/en-us/azure/devops/repos/git/git-branching-guidance?view=azure-devops

Microsoft Azure

Any questions?

Slides will be provided

Thank you

Ian Pike
Twitter: @ianpike
https://www.linkedin.com/in/ipike/

Manchester Data Platform UG
Co-organiser
https://www.meetup.com/McrDataPlatform/
https://dpac.community/