PASS
SQLSATURDAY Denmark, Virtual

Database CI/CD

with Containers & Azure DevOps

Chris Taylor, Data Platform Architect, Data Masterminds

Sponsors

Track

Event

Teams Meetings

- [Azure BI - Join Microsoft Teams Meeting](#)
- [Azure DB - Join Microsoft Teams Meeting](#)
- [Cloud Development - Join Microsoft Teams Meeting](#)
- [Data Platform - Join Microsoft Teams Meeting](#)
- [Power BI - Join Microsoft Teams Meeting](#)

Chris Taylor

Data Platform Architect, Data Masterminds

✉ christaylor@datamasterminds.io

📍 Newcastle Upon Tyne, UK

🐦 @SQLGeordie

Ⓦ www.chrisjarrintaylor.co.uk

▶ https://bit.ly/3cly8kq

datamasterminds

Experience

Worked with SQL Server since 2001

Community

Newcastle DPaC (PASS) Leader

Power BI Newcastle (PBIUG) Leader

DataRelay Newcastle Organiser

Cricket/Football Coaching

What we'll be doing today

- Azure Repo
- Containers
- Azure Container Registry
- Azure DevOps Pipelines
  - Build
    - New Docker Image and dacpac
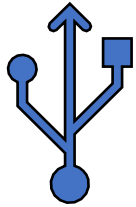 - Release
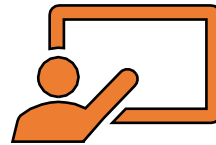   - Kubernetes (AKS)

Not on the Agenda

- DevOps Practices

Session Aim

Insight into Azure DevOps workflow and Container Integration

Learn by example

- Demo's

- My Mistakes

Enough of a taste to get the Container and Azure DevOps bug and start experimenting!

Azure DevOps Components

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.

What are Containers

- Next evolution in virtualisation

- Lightweight, stand alone, executable package of a piece of software
  - Separation of applications or services on the same container host
  - Isolated, resource controlled, and portable operating environment
  - Containerized software will always run the same, regardless of the environment

- Enables true independence between applications / infrastructure / developers / IT ops

"Basically, a container is an isolated place where an application can run without affecting the rest of the system, and without the system affecting the application."

https://docs.microsoft.com/en-us/virtualization/windowscontainers/quick-start/
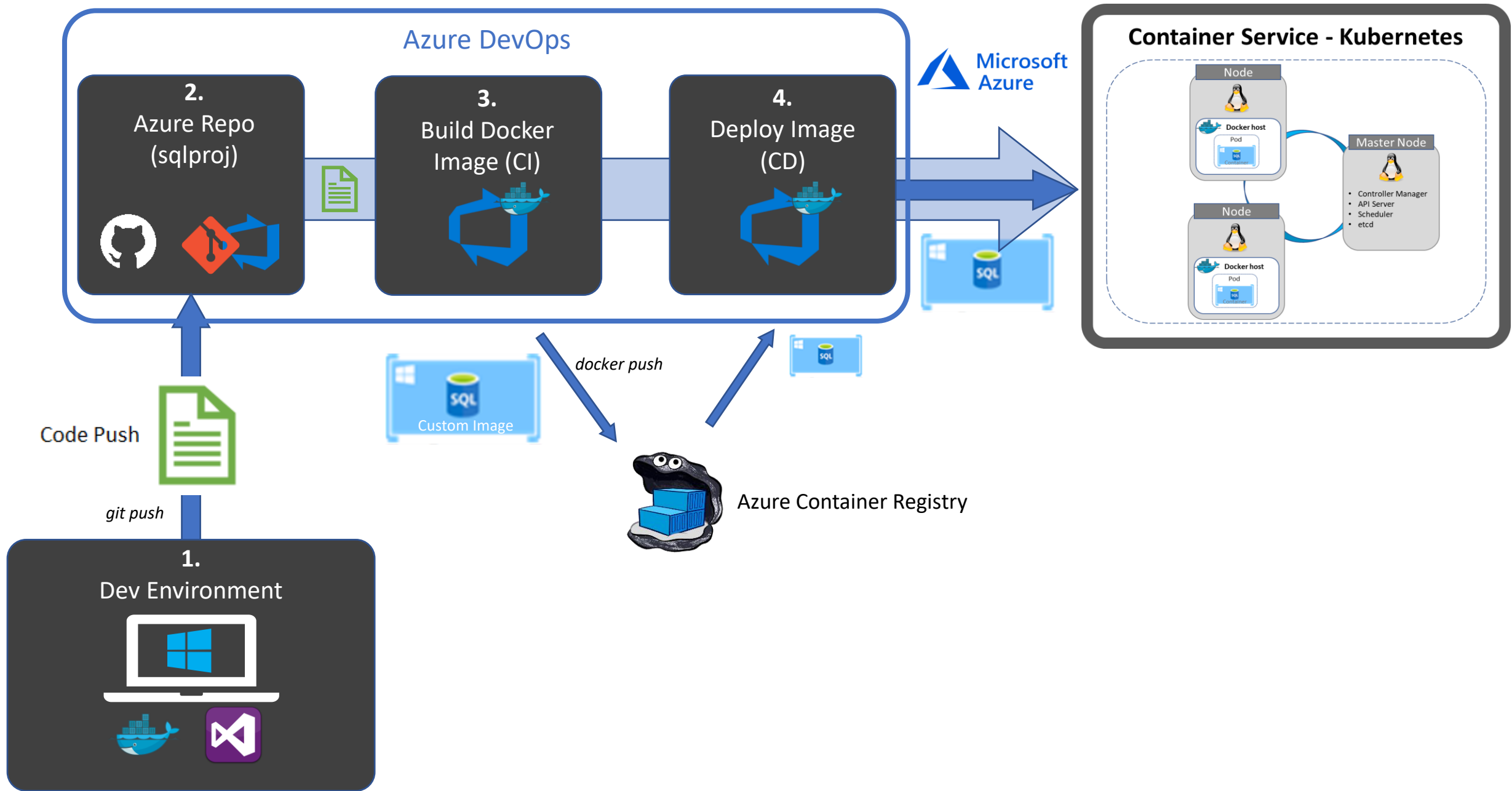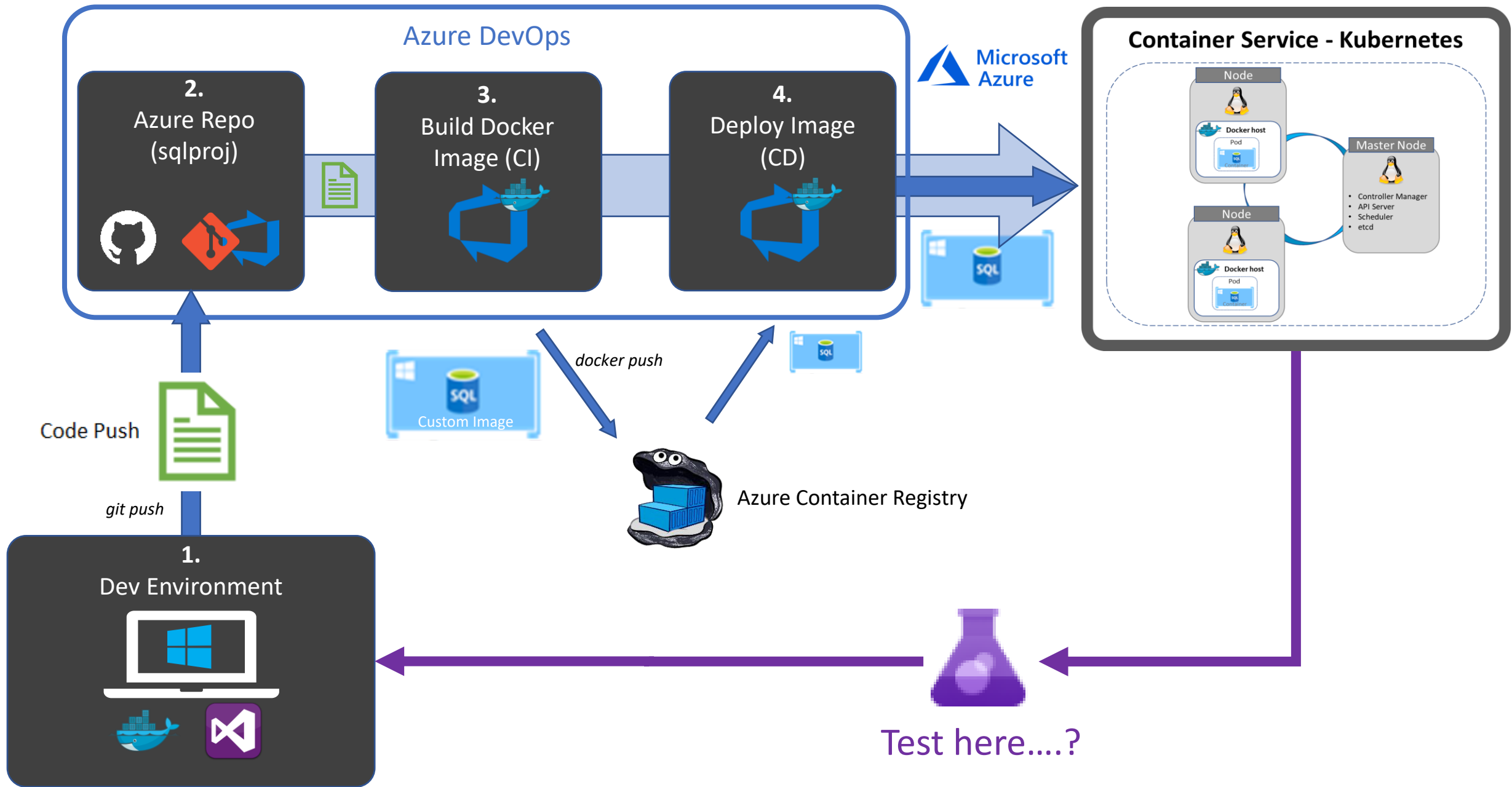
Stateless or Stateful?

Stateless

- Simple
- True definition of what a Container is

Stateful

- More work
  - Persistent Storage
  - State Management System

* Demos will show both *

Azure DevOps

Container Service - Kubernetes

2.
Azure Repo
(sqlproj)

3.
Build Docker
Image (CI)

4.
Deploy Image
(CD)

Microsoft Azure

Node

Master Node
- Controller Manager
- API Server
- Scheduler
- etcd

Node

Custom Image

docker push

Azure Container Registry

Code Push

git push

1.
Dev Environment

Test here....?

Azure DevOps

2. Azure Repo (sqlproj)

3. Build Docker Image (CI)

4. Deploy Image (CD)

Microsoft Azure

Container Service - Kubernetes

Node

Docker host

Pod

Master Node

- Controller Manager
- API Server
- Scheduler
- etcd

Node

Docker host

Pod

Code Push

git push

1. Dev Environment

Custom Image

docker push

Azure Container Registry

https://docs.microsoft.com/en-us/dotnet/standard/containerized-lifecycle-architecture/docker-devops-workflow/create-ci-cd-pipelines-azure-devops-services-aspnetcore-kubernetes
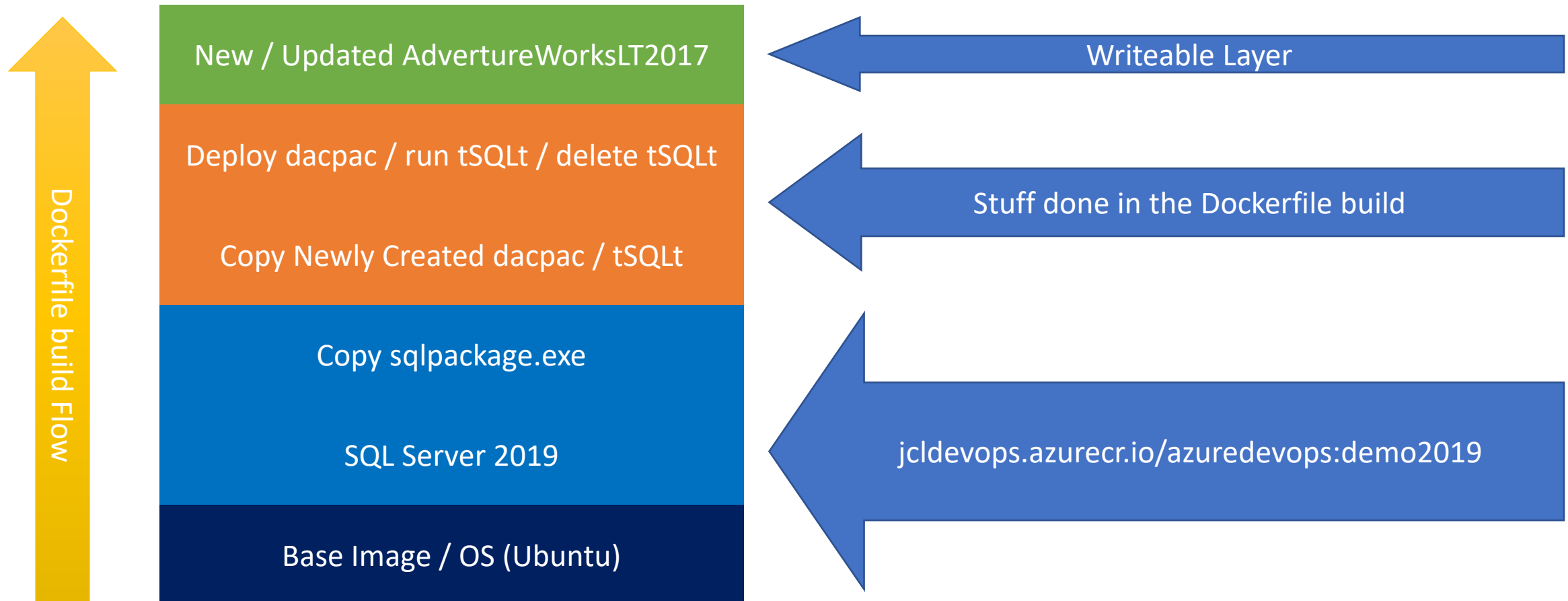
New / Updated Docker Image

DEMO

Demo ReCap….

Pro's

- Everything a container should be
  - Portable
  - Dev's can pull and run
- Container Image Build fails if tests fail
  - *Others may disagree*

Con's

- Database within container (think VLDB)
  - Stateless
- Requires self-hosted agent(s) to persist data

Conclusion – Azure DevOps

Good

- Quick and easy to get started

- Never build a docker image manually again!

- Could take it further to build/destroy k8s cluster also

Not so good

- tSQLt integration
  - Tasks are Windows agent only

- YAML reverse engineer

- Use self hosted agents to gain an understanding of folder structure
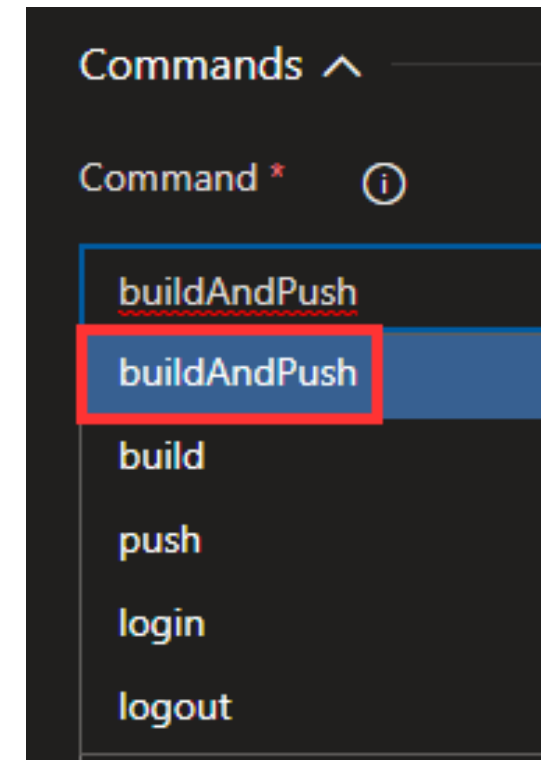
- Constantly changing!!!

Example Task Version Changes

v1 Docker Task Commands

v2 Docker Task Commands

Issue Raised: https://github.com/MicrosoftDocs/vsts-docs/issues/4039
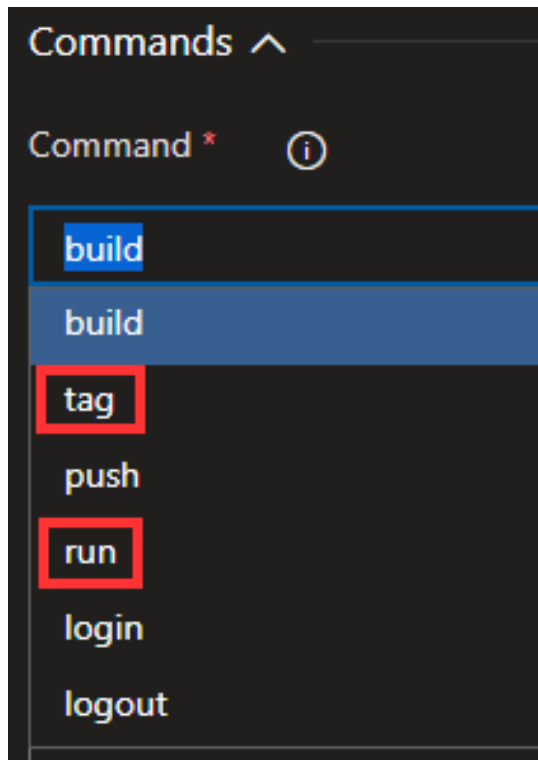
Summary

- Azure Repo
- Containers
- Azure Container Registry
- Azure DevOps Pipelines
  - Build
  - Release
- Kubernetes (AKS)

Contact

✉ christaylor@datamasterminds.io

📍 Newcastle Upon Tyne, UK

🐦 @SQLGeordie

Ⓦ www.chrisjarrintaylor.co.uk

▶ https://bit.ly/3cly8kq

DATAmasterminds

PASS SQLSATURDAY

Thank you

Links

- [SQL Geordie Blog](#)
- [SQLGeordie Github](#)
- [SQLGeordie Youtube (Recorded Demo's)](#)