De Power BI Gebruikersdagen worden mede mogelijk gemaakt door:

PBIG
POWER BI GEBRUIKERSGROEP

PLATINUM

delaware

Smart. wortell

ilionx

easydash

GOUD

Nova Silva

creates.

Tabular Editor

EIFFEL
Voorblijven. Niet bijblijven.

KASPAROV FINANCE & BI

macaw

rockfeather

GET RESPONSIVE

ZILVER

VICTA
BUSINESS INTELLIGENCE

Dynamic People

Motion10
AN hso COMPANY

VisionBI
Smart Data Experts

VALID
STAY AHEAD

inergy

valcon

iqbs

Quanto
collective analytics

COMMUNITY

Kimura
data intelligence

DashData.

volda;
INFORMATIESPECIALISTEN

Power BI Connector
by DAVISTA

AZURROFINANCE

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Azure DevOps voor Power BI

Koos van Strien
Wortell Smart Learning

Smart.
wortell

About Koos

- Trainer
- Coach
- Consultant
- Wortell Smart Learning

Course Overview

- Introduction to CI/CD and managed deployments
- Overview of Azure DevOps
- Setting Up the Stage using Azure DevOps and Power BI Actions
- Level-up: more scenarios for automating your deployments
- Structured Deployments and Way of Working

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CI/CD and Managed Deployment

Azure DevOps for Power BI

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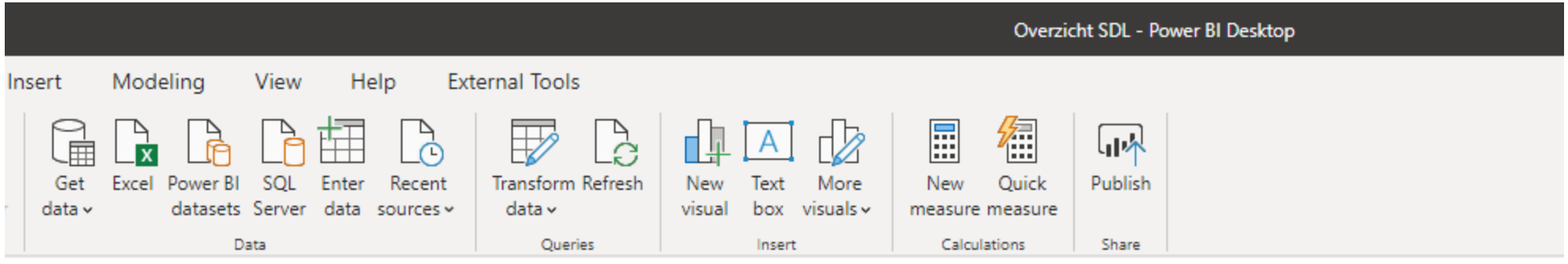
Where to deploy your Power BI report?



Development

Test

Acceptance

Production

DTAP – where is your data from?

	Dev	Test	Acc	Prod
Report				
Data model				
Data mart?				
Data Warehouse?				
External sources?				

DTAP – where is your data from?

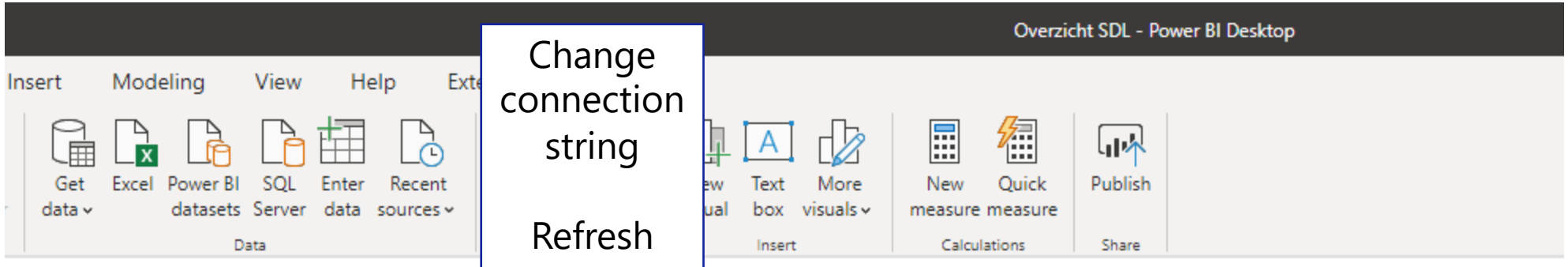
	Dev	Test	Acc	Prod
Report				Production
Data model				Production
Data mart?				Production
Data Warehouse?				Production
External sources?				Production

DTAP – where is your data from?

	Dev	Test	Acc	Prod
Report	Dev	Test	Acc	Production
Data model				Production
Data mart?				Production
Data Warehouse?				Production
External sources?				Production

- Privacy
  - Absenteeism
- Sensitive data
  - Competition
  - Data leaks
  - Ability to collaborate with partners or advisors

Where to deploy your Power BI report?



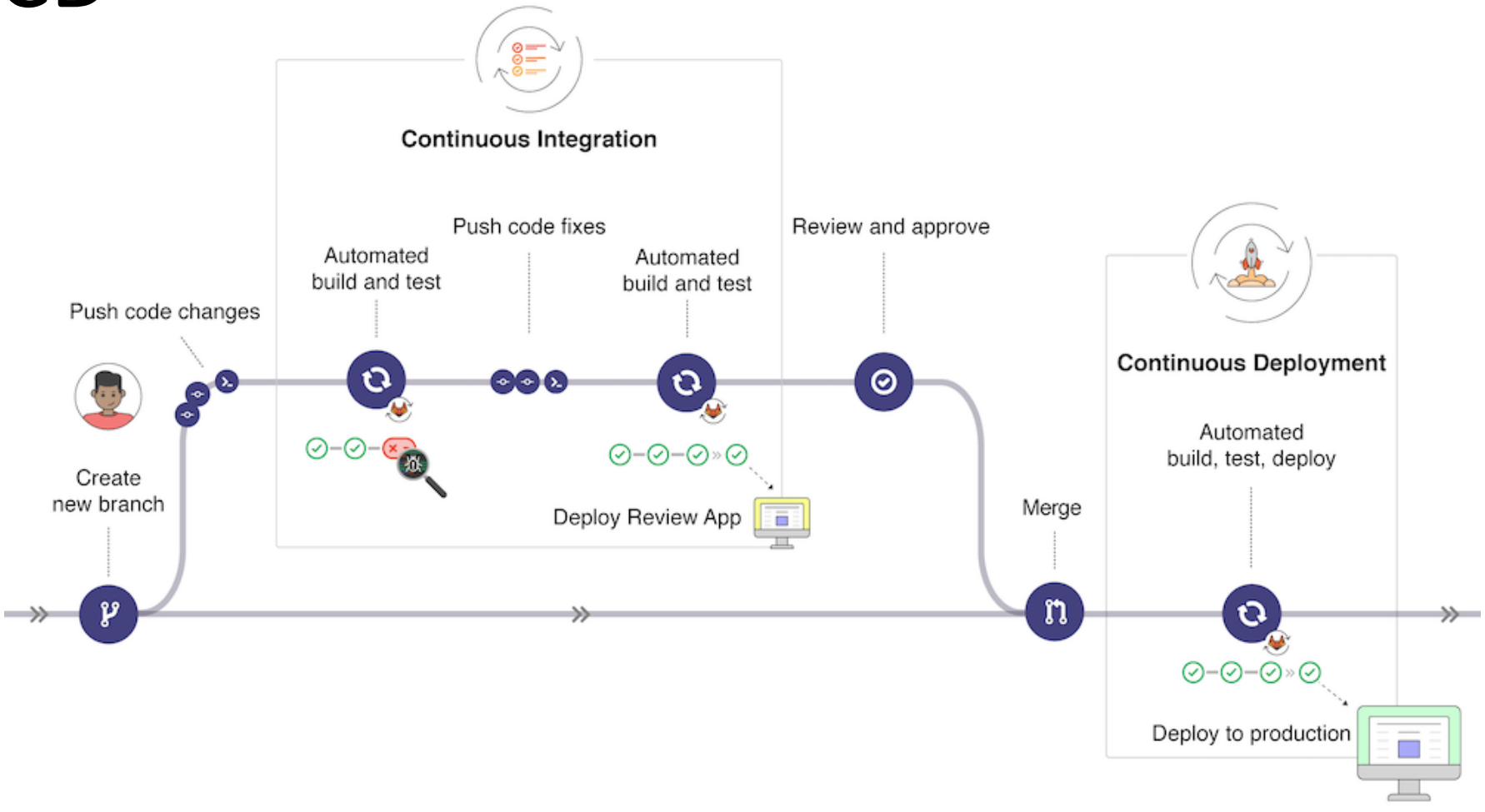
Change connection string

Refresh report

Publish

Development → Test → Acceptance → Production

CI / CD



Source: [CI/CD concepts | GitLab]

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Overview of Azure DevOps

Azure DevOps for Power BI

Overview of Azure DevOps

https://azure.microsoft.com/en-us/services/devops/

- Agile tools to support planning & track work (Kanban, Scrum)
- Build & release management
- Git repositories for source control
- Tools for testing
  - Manual testing
  - Load testing
  - Continuous testing
- Artifacts management / package repositories
- Extensions (integrates with Campfire, Slack, Trello, Uservoice, etc.)

Overview of Azure DevOps

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  - Manual testing
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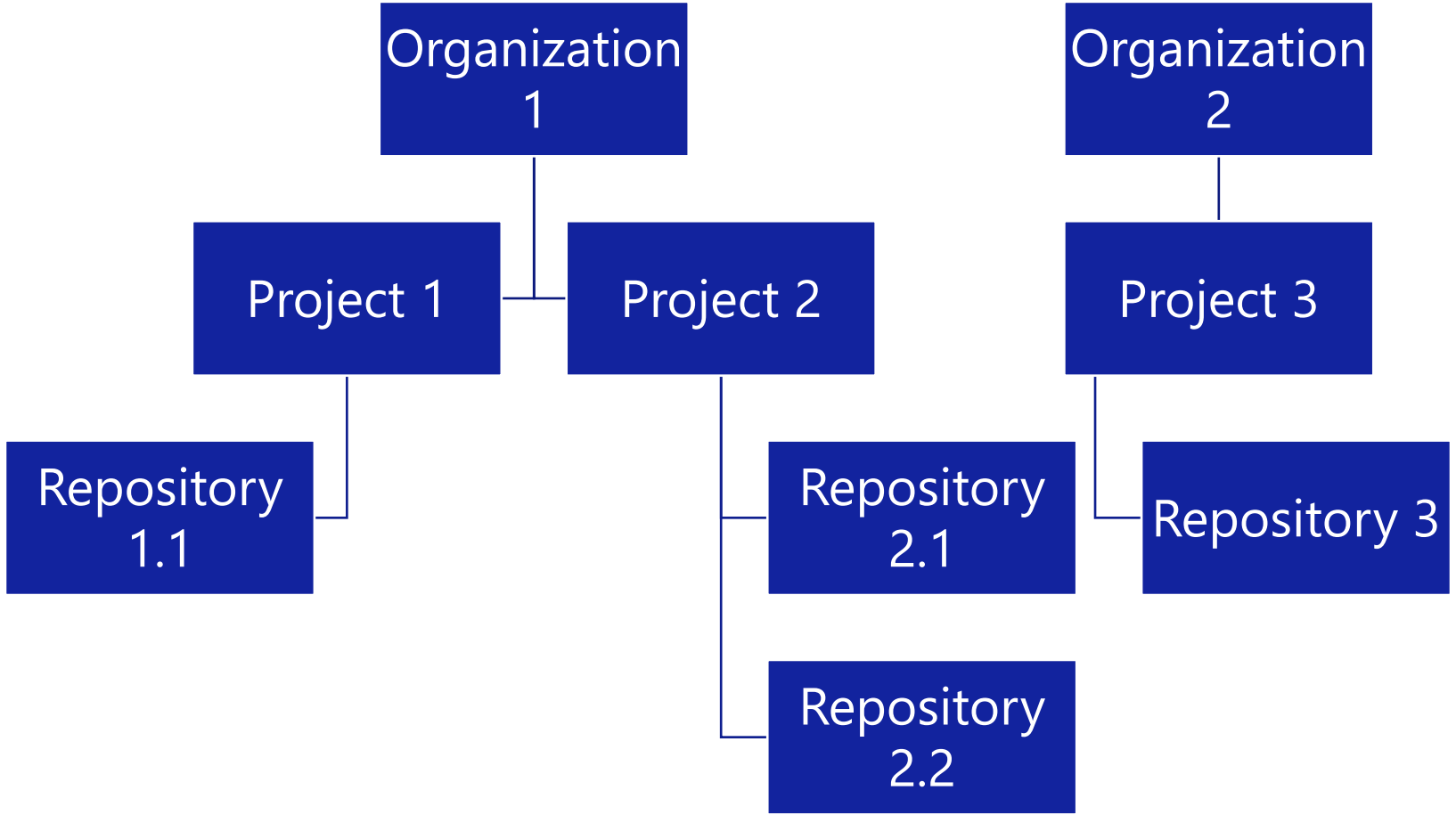
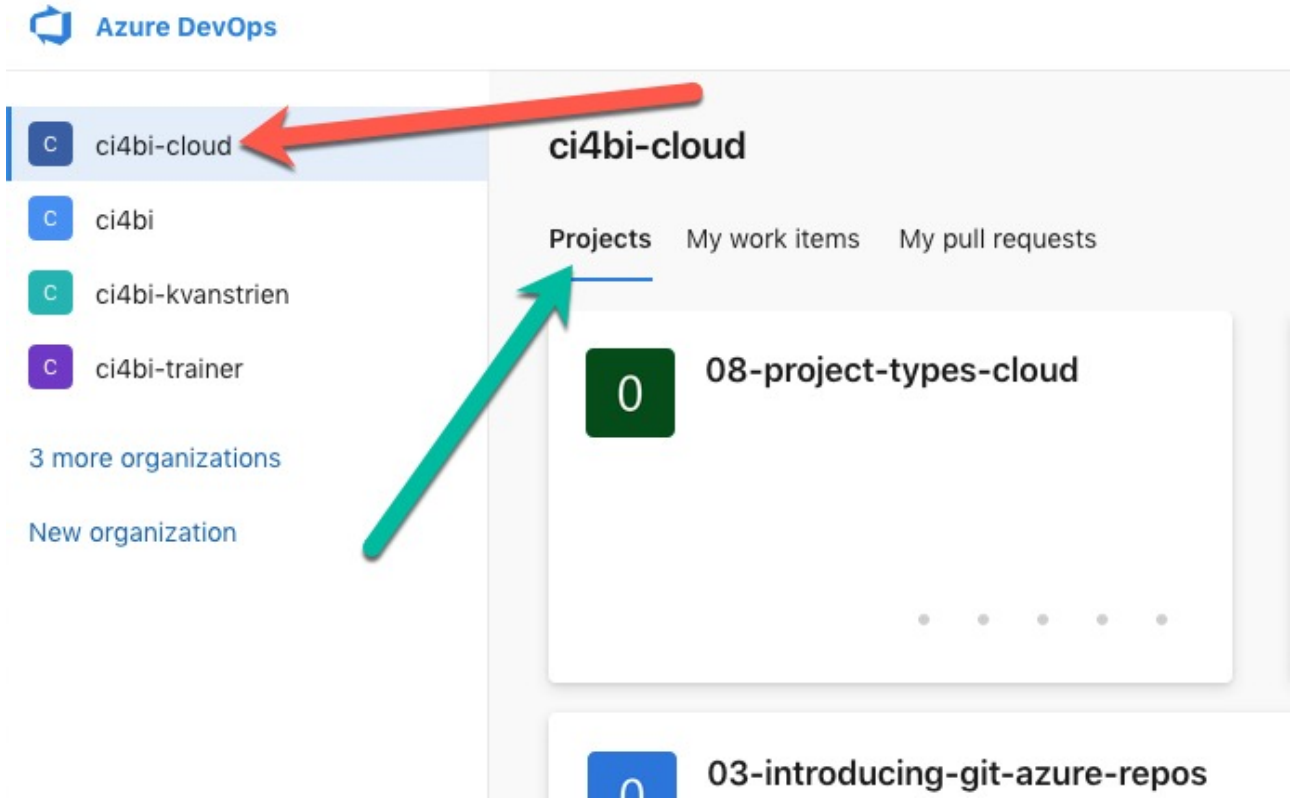
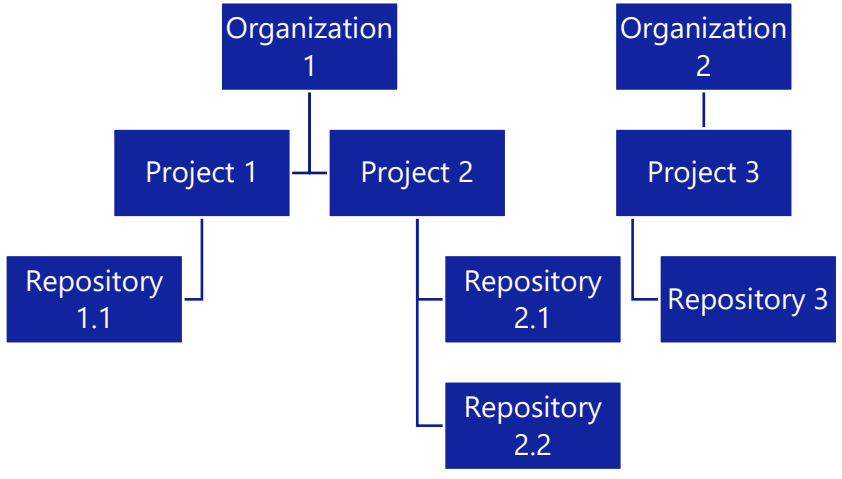
- Artifacts management / package repositories
- Extensions (~~integrates with …~~ Power BI Actions)

Organizations, projects and repositories



Organizations, projects and repositories





Organizations

- Mechanism for organizing / connecting groups of related projects
  - Per company? Per business unit? For you?
  - Best to start with one
  - Each organization has its own "free tier"
    - 1800 minutes hosted Pipeline job / month + one self-hosted job
    - Boards
    - Unlimited private repos
    - Artifacts
    - Load testing
    - Unlimited stakeholders
    - (up to 5 "Basic" users per service type)

https://docs.microsoft.com/en-us/azure/devops/user-guide/plan-your-azure-devops-org-structure?view=azure-devops

Projects

- Container for
  - Boards and backlogs
  - Pipelines for CI/CD
  - Repos
  - Continuous Test integration
- Single vs. multiple?
  - Single with many repos / teams
  - Many with own sets of repos, builds, workitems, etc.?
- For granular security, choose multiple
- Multiple teams → multiple boards

https://docs.microsoft.com/en-us/azure/devops/organizations/projects/about-projects?view=azure-devops

Repositories

- Exist within Project
- Git or TFVC
- Git
  - No limit on number of Git repos
  - Decentralized (more on that later)
  - “One repo per independently deploy-able product or service”
- TFVC
  - One big repository
- One vs. Many

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Overview of Azure DevOps

Interface tour

Azure DevOps Interface Tour

- Organizations, Projects, Repositories
- Boards
  - Board view
  - Backlog view
- Pipelines
  - Build pipeline
  - Release pipeline
- Overview: Summary, Dashboards, Wiki

Overview of Azure DevOps - Summary

- Most important components:
  - Repos – contains repositories (VS Solutions, projects, Power BI reports, etc.)
  - Boards – contains planning & work
  - Pipelines – build & deployment automation

Setting up Azure DevOps

- https://wortell-smart-learning.github.io/azure-devops-powerbi/
  - Start with #2
  - #1 you already did as a preparation for this precon
- Before we start:
  - Unsure about rights in AAD, Power BI admin, etc.?
  - → Ask for a Wortell Smart Learning-account
  - Username: smartXX@wortellsmartlearning.onmicrosoft.com
    - Where XX is a number from 01 to at least 10
  - **Password**: WortellSmartLearning.nl

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Setting the stage

Use Azure DevOps and Power BI Actions for automated deploys

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What we want to achieve

- First, “just” deployment
  - No changing of data sources
  - Get something working first

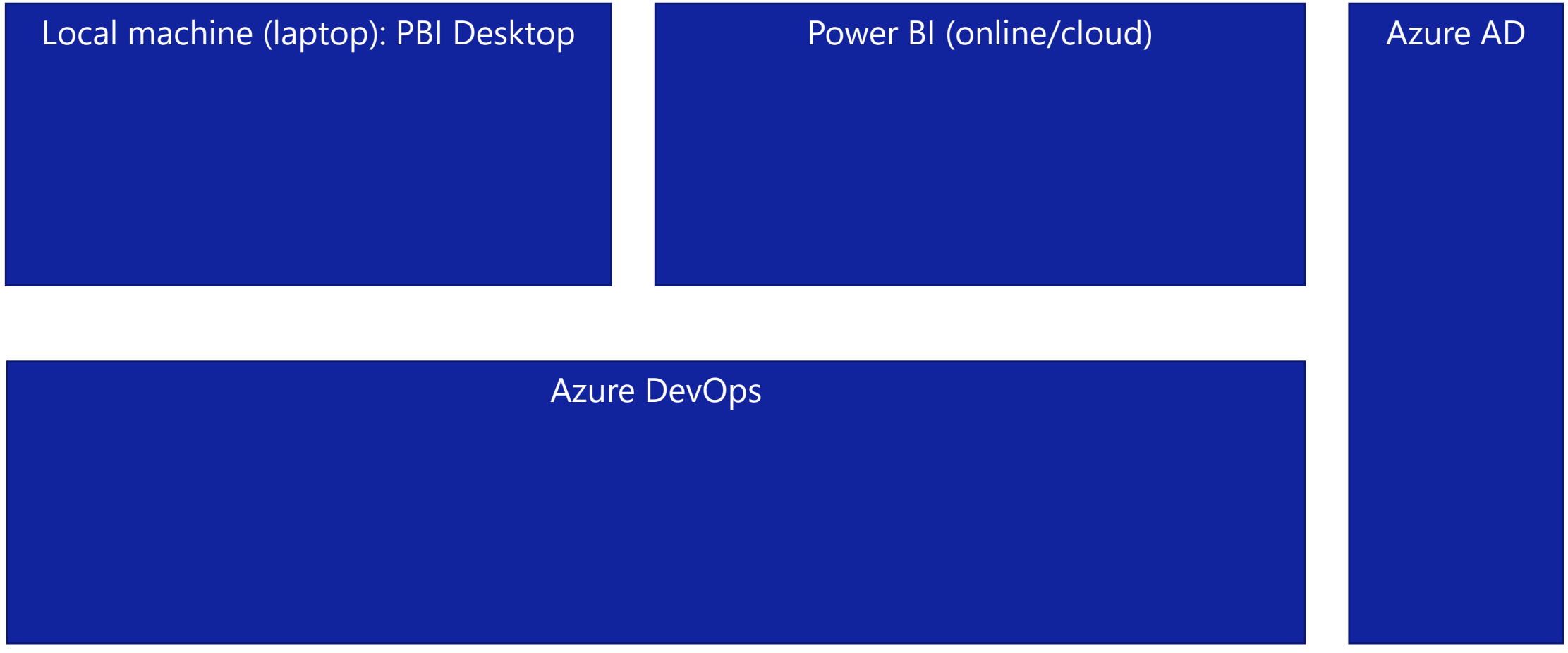
What we want to achieve (2)

- A Power BI report should be stored in Azure DevOps Repos for version control
- An Azure DevOps Pipeline should be able to deploy this report to a Power BI workspace

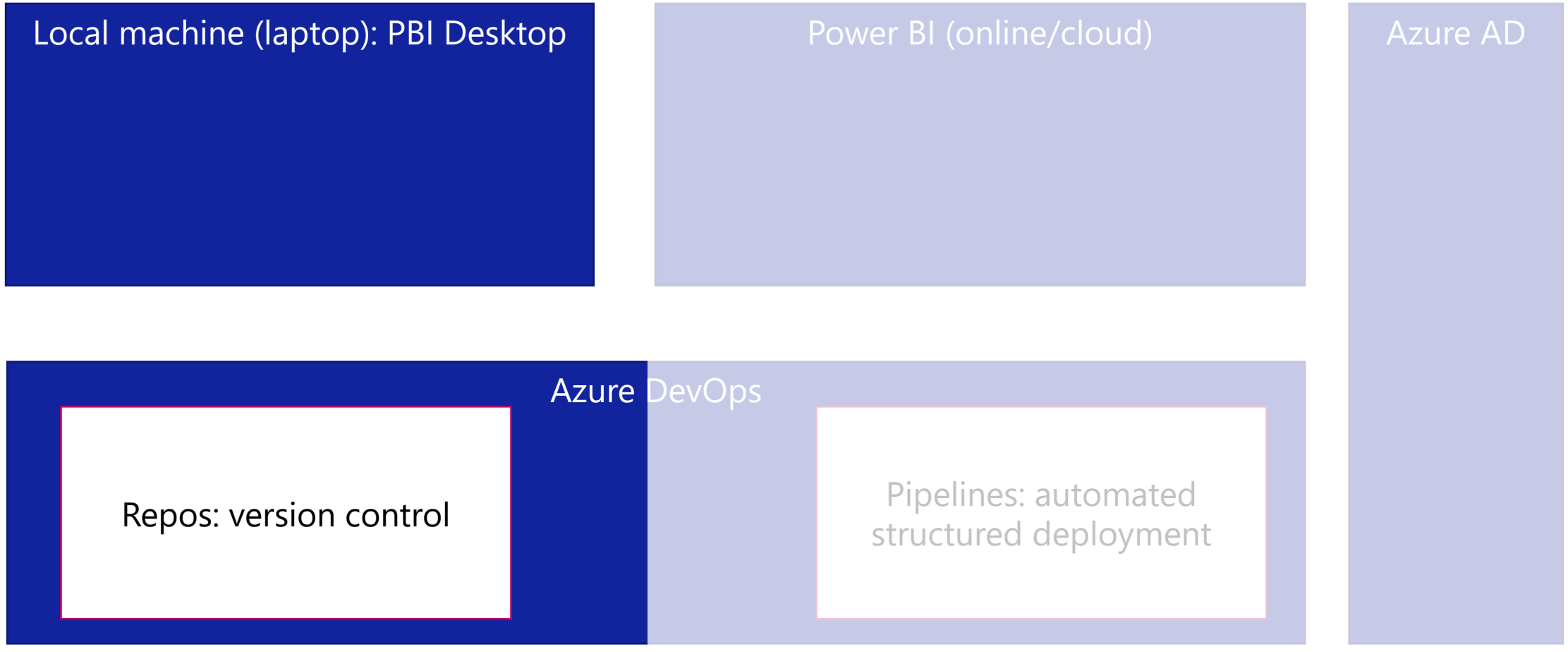
A Power BI report should be stored in Azure DevOps Repos for version control

Azure DevOps for Power BI – Setting the Stage

Solution Structure



Solution Structure



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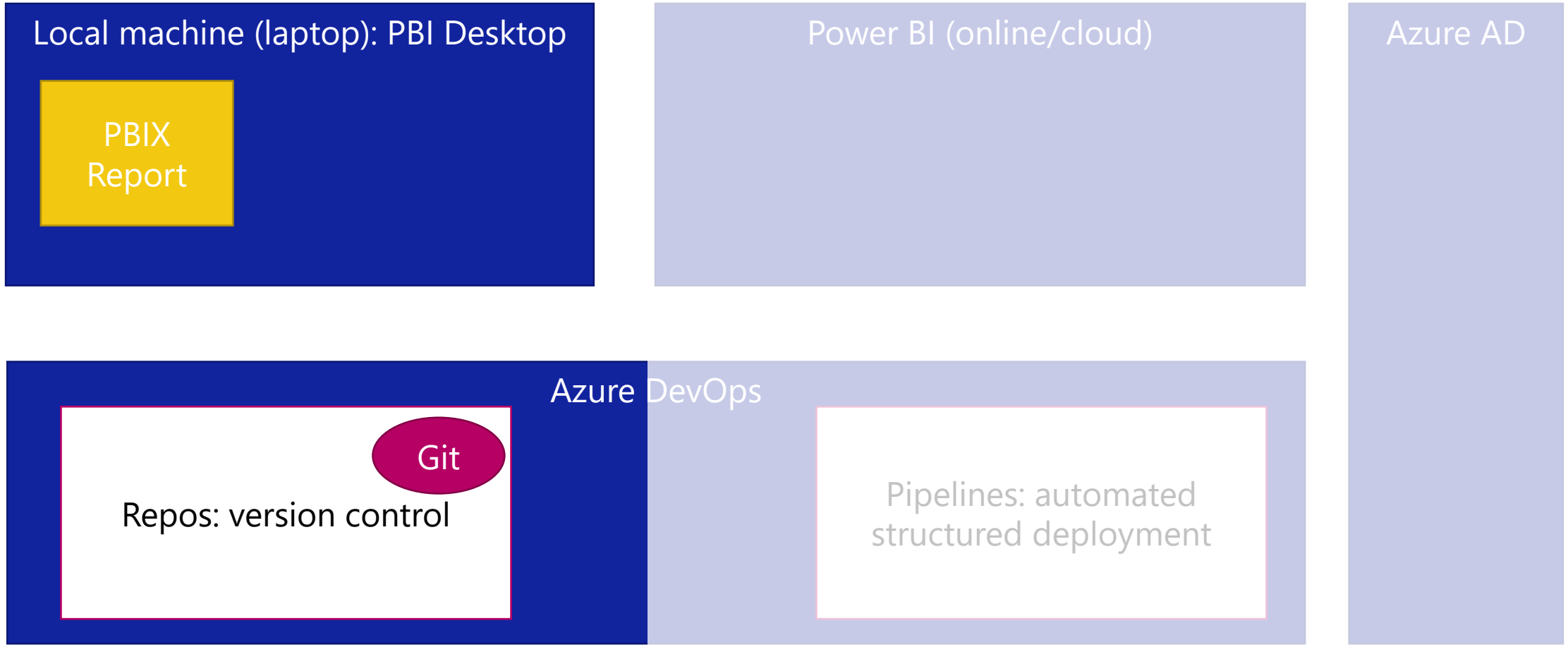
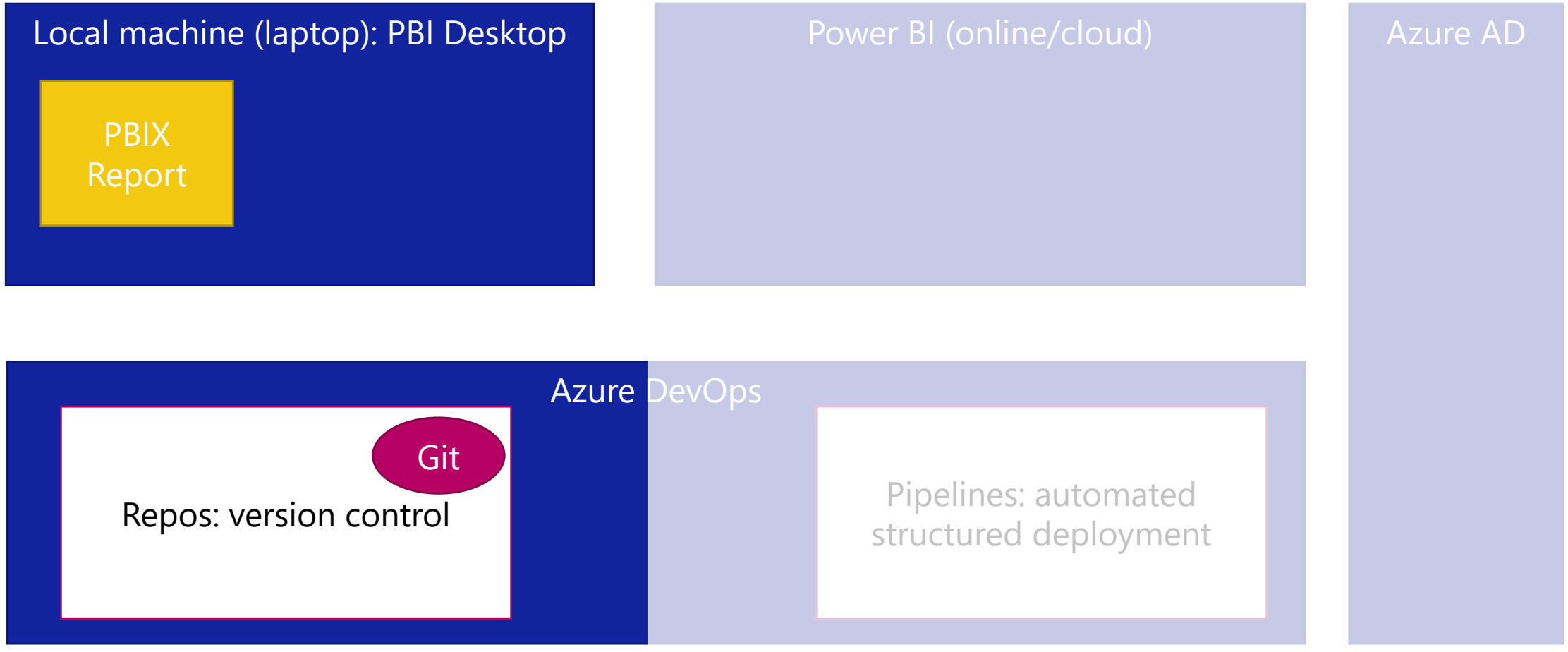
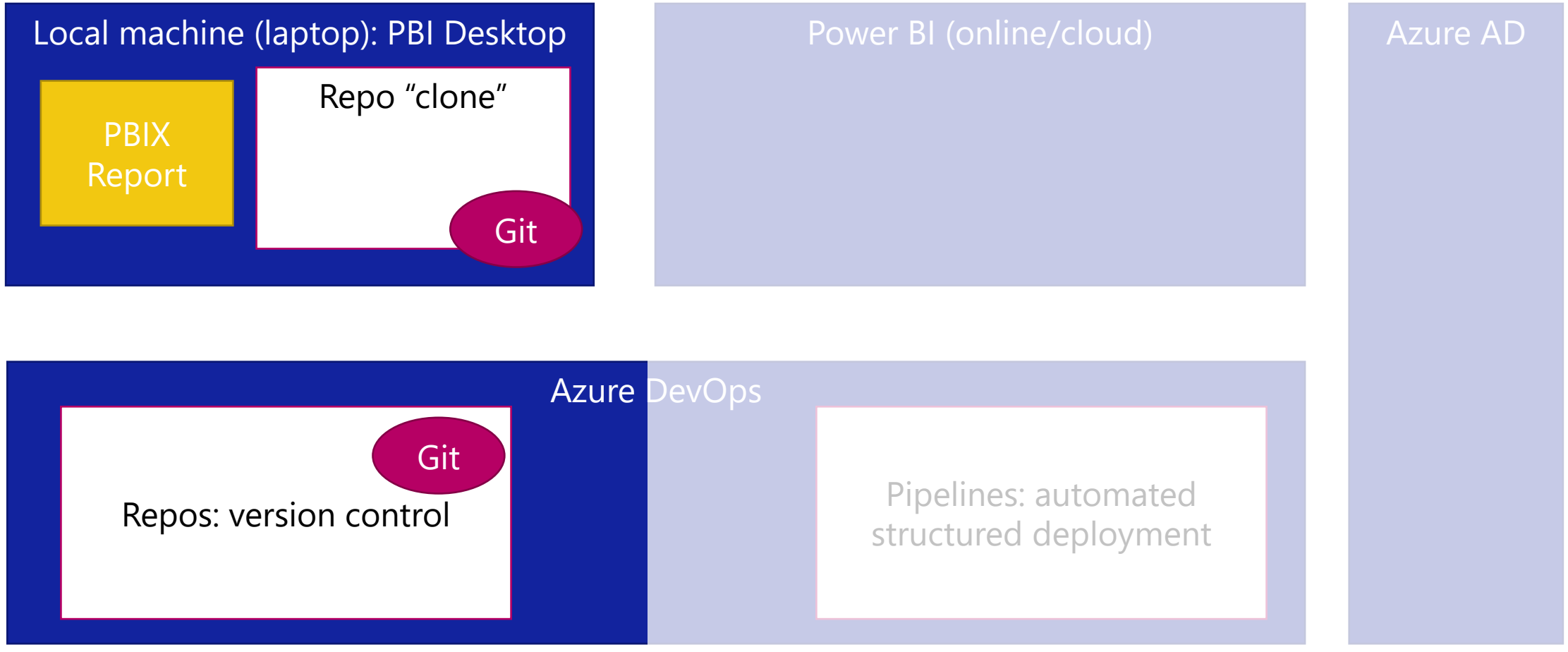


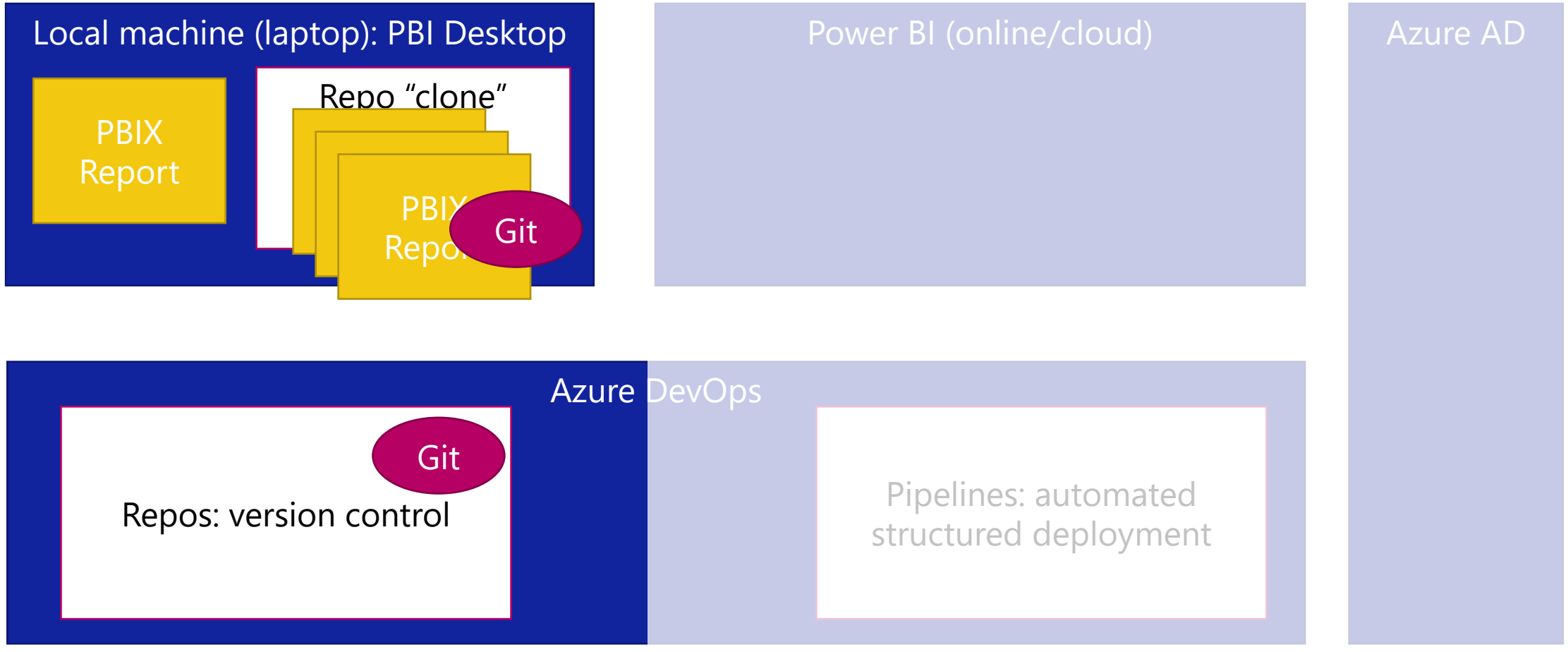
Solution Structure - Git



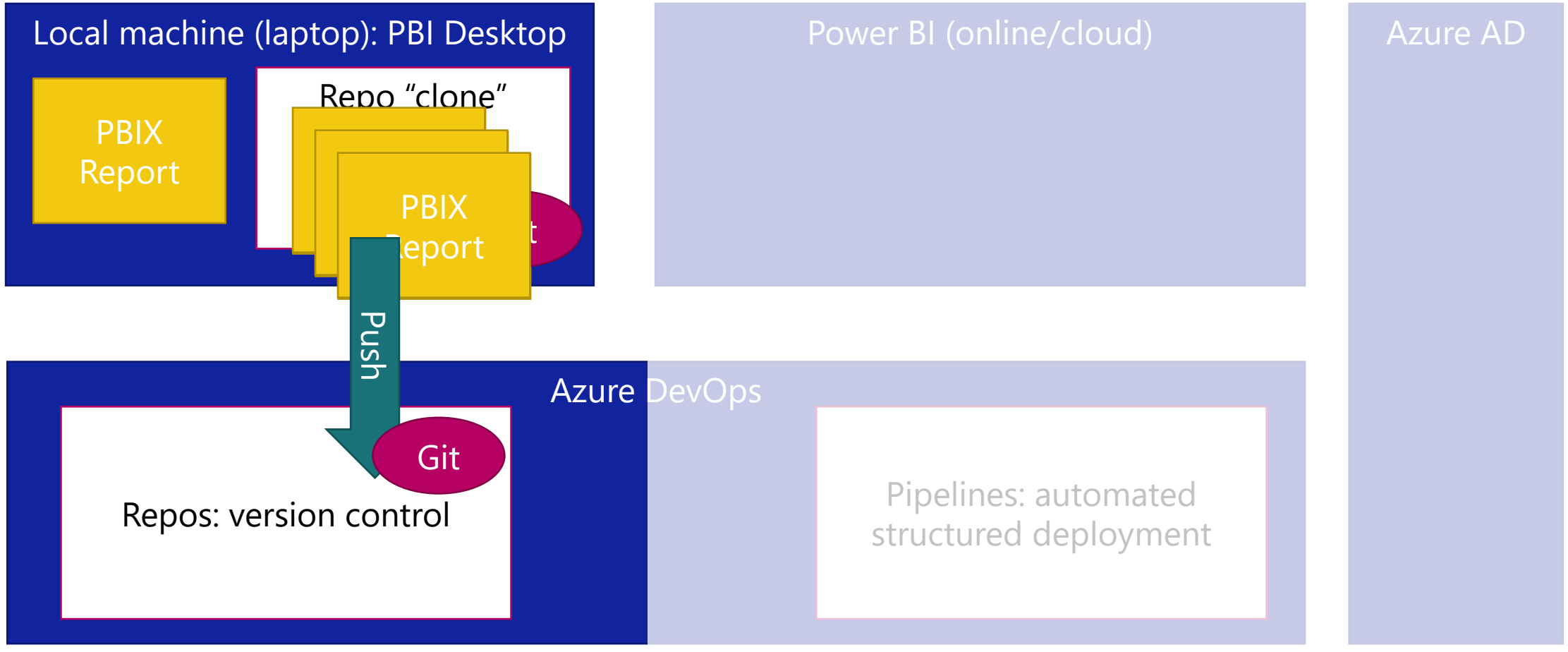
Solution Structure – Git **commit**



Solution Structure - Git



Solution Structure – Git **Push**



Getting started with Git

- **Clone** copies a repository to your PC
- **Commit** brings data under version control (locally)
- **Push** brings your version history to the server
- (Guess what? **Pull** gets the version history *from* the server)

Setting up Azure DevOps Repos

- https://wortell-smart-learning.github.io/azure-devops-powerbi/
  - #02, #03, #04

What we want to achieve (2)

- A Power BI report should be stored in Azure DevOps Repos for version control
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An Azure DevOps Pipeline should be able to deploy this report to a Power BI workspace

Azure DevOps for Power BI – Setting the Stage

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Solution Structure

Local machine (laptop) with PBI Desktop

Power BI (online/cloud)

Azure AD

Azure DevOps

Repos: ve

Pipelines: automated structured deployment

Solution Structure

Local machine (laptop) with PBI Desktop

Power BI (online/cloud)

Rights to deploy in a given workspace (workspace access)

Rights to use the Power BI API (tenant setting)

Azure AD

Security group

Service principal

Azure DevOps

Repos: ve

Pipeline definition (what tasks should be executed)

Setting up Azure DevOps Pipelines

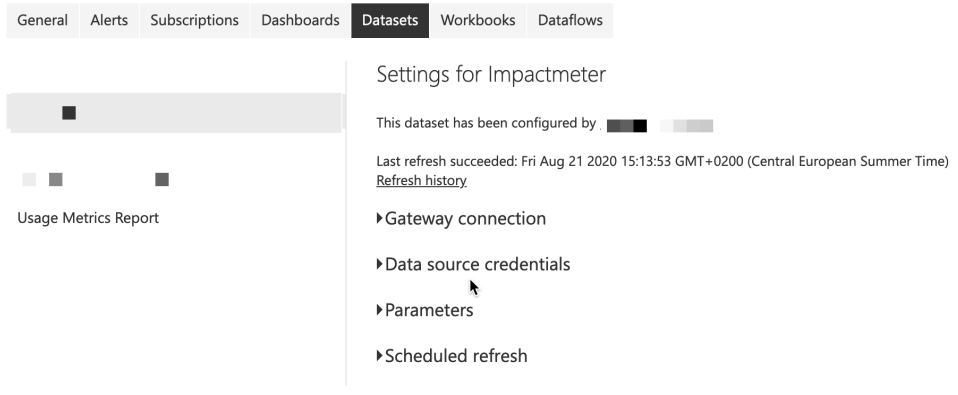
- https://wortell-smart-learning.github.io/azure-devops-powerbi/
  - #05, #06, #07

Advanced scenarios for deployment

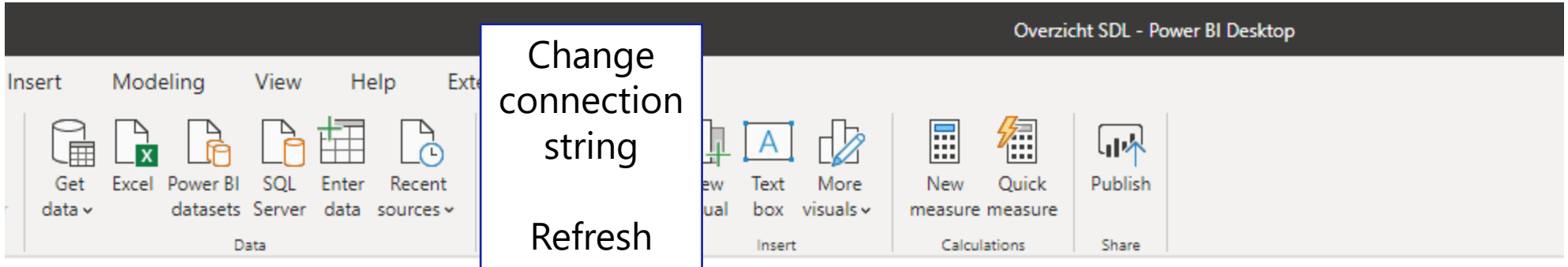
- Changing Data Sources
- Wait steps
- PowerShell instead of Power BI Actions

Changing Data Sources

- As report owner, you can change a data source in two ways:
  - Dataset parameters (via the GUI)
  - Alter the data source directly (via the API)
- In both cases, you must be the owner of the dataset!



What we would like to automate



Change connection string

Refresh report

Publish

Development

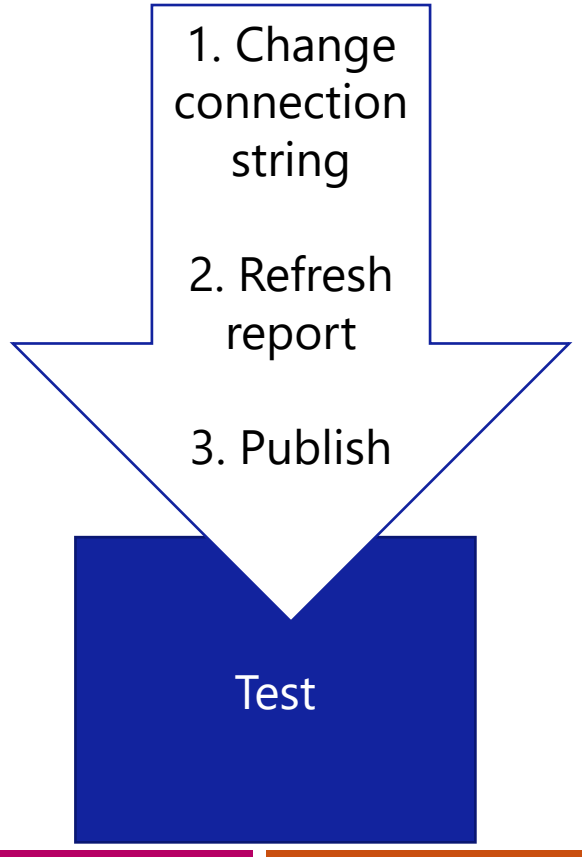
Test

Acceptance

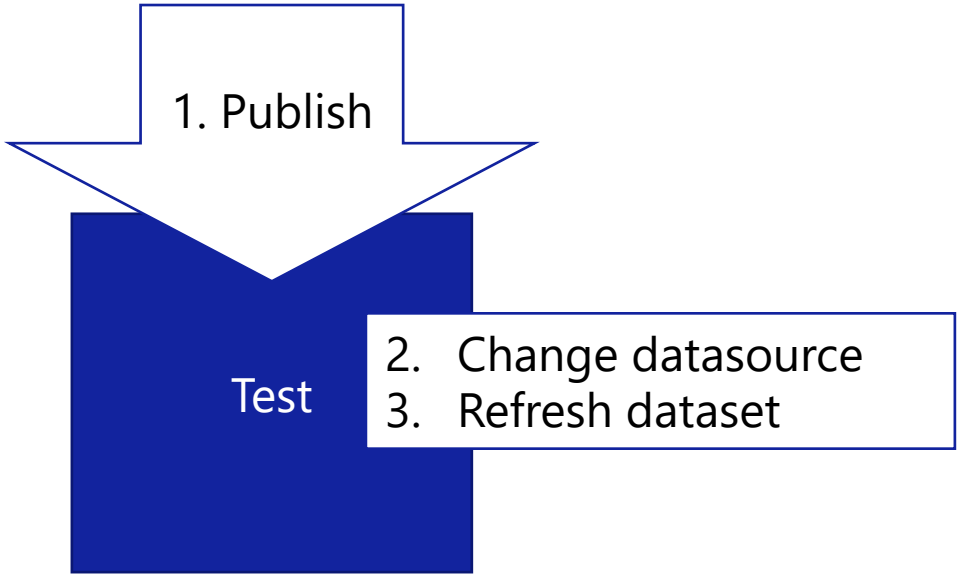
Production

Change Data Sources at Deployment

What we want to achieve



How we can do it



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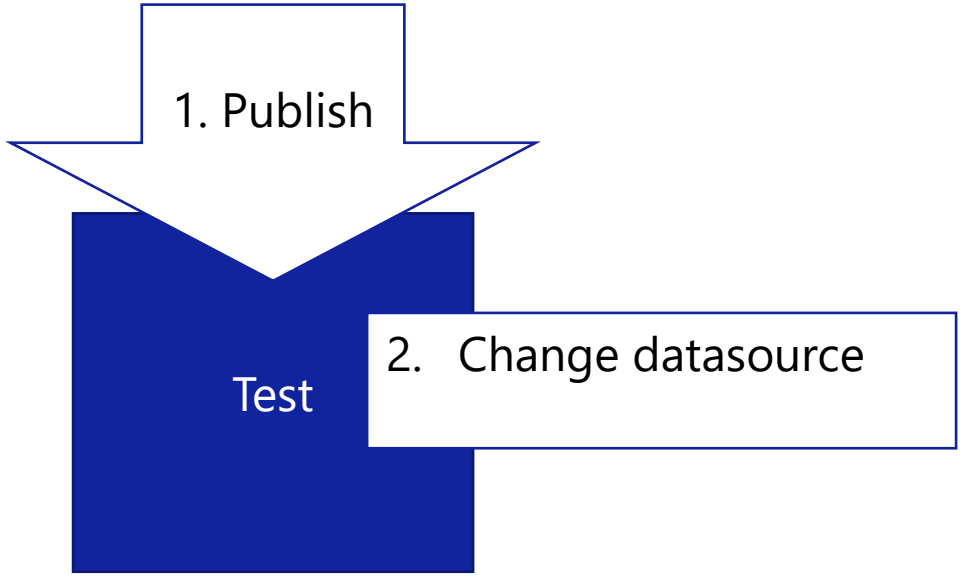

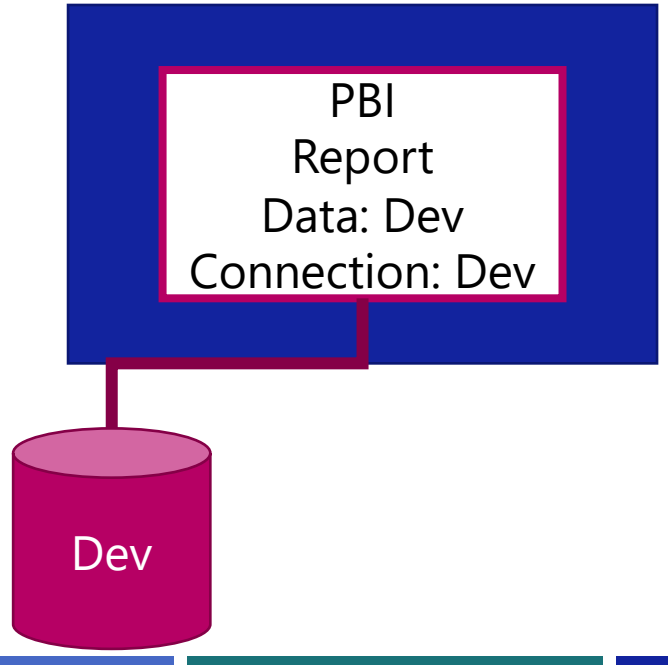

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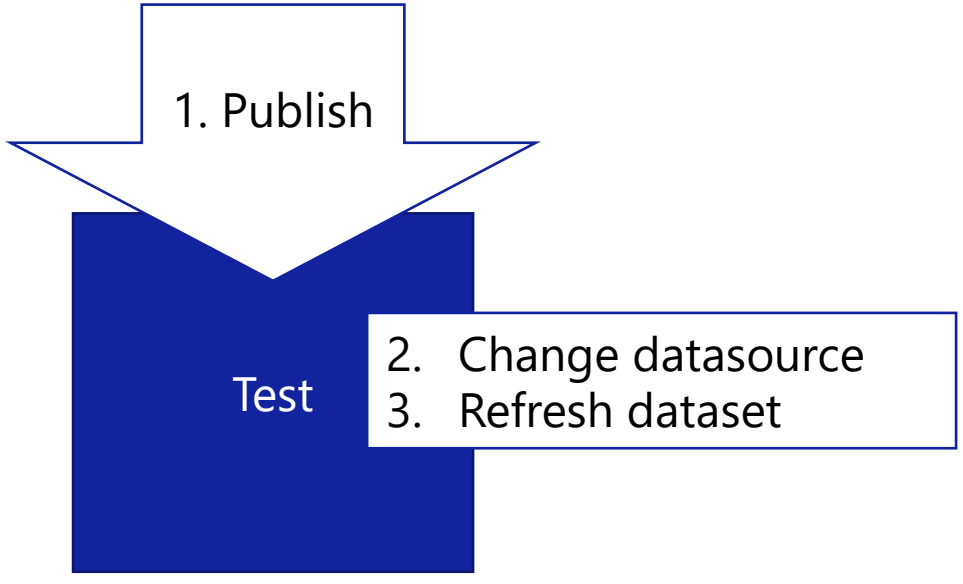

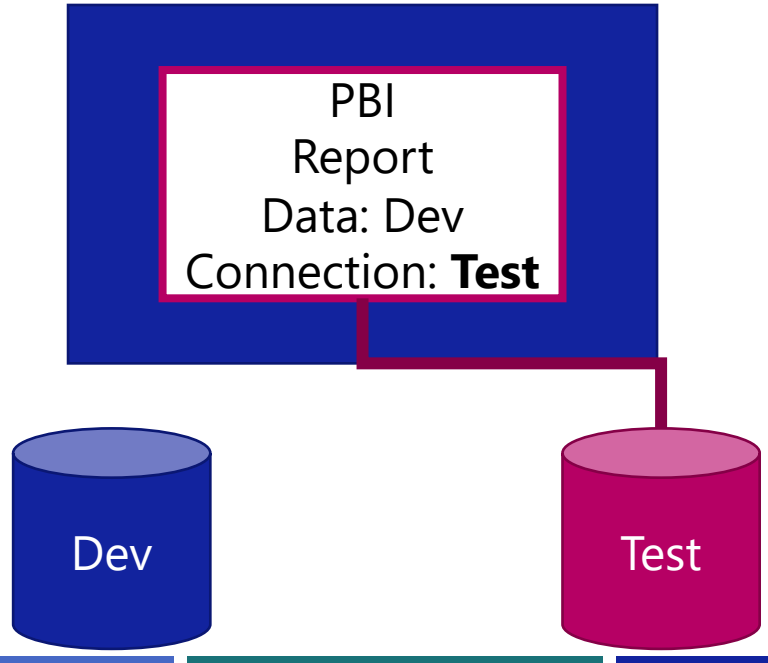

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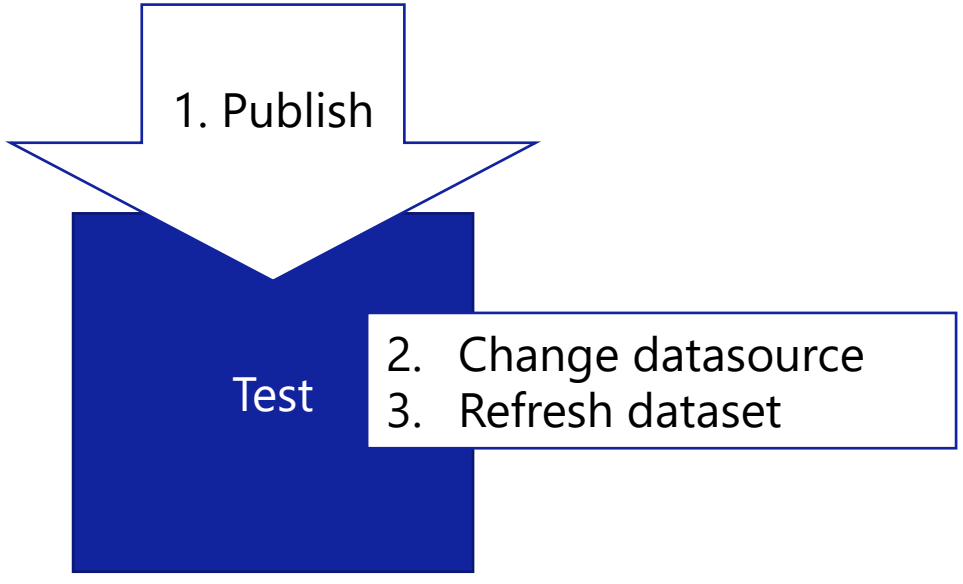

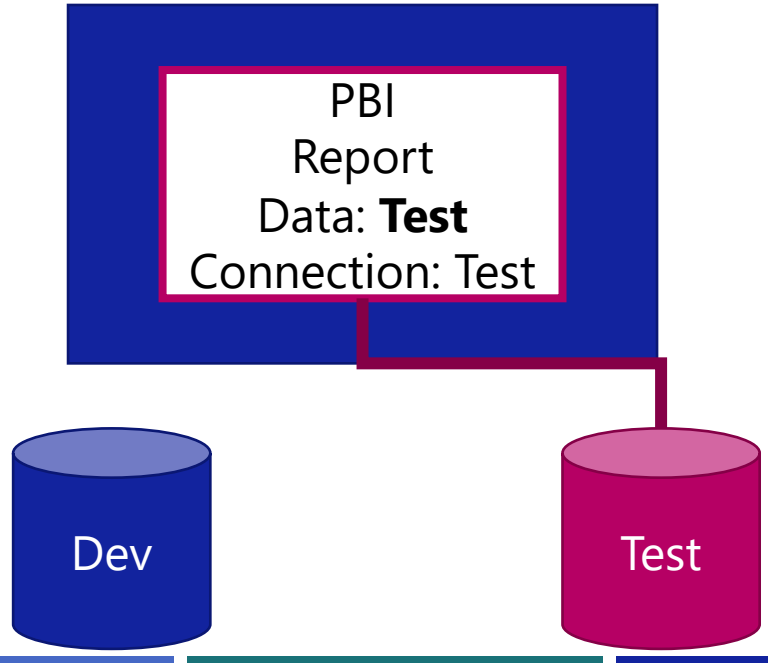

Using Variables

- Instead of a value, you can also create *variables*
  - Safe
  - Adaptable
- Let’s show..

Adding more stages

- … while making ultimate benefit of the stages ☺

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Power BI in Git

do’s and don’ts

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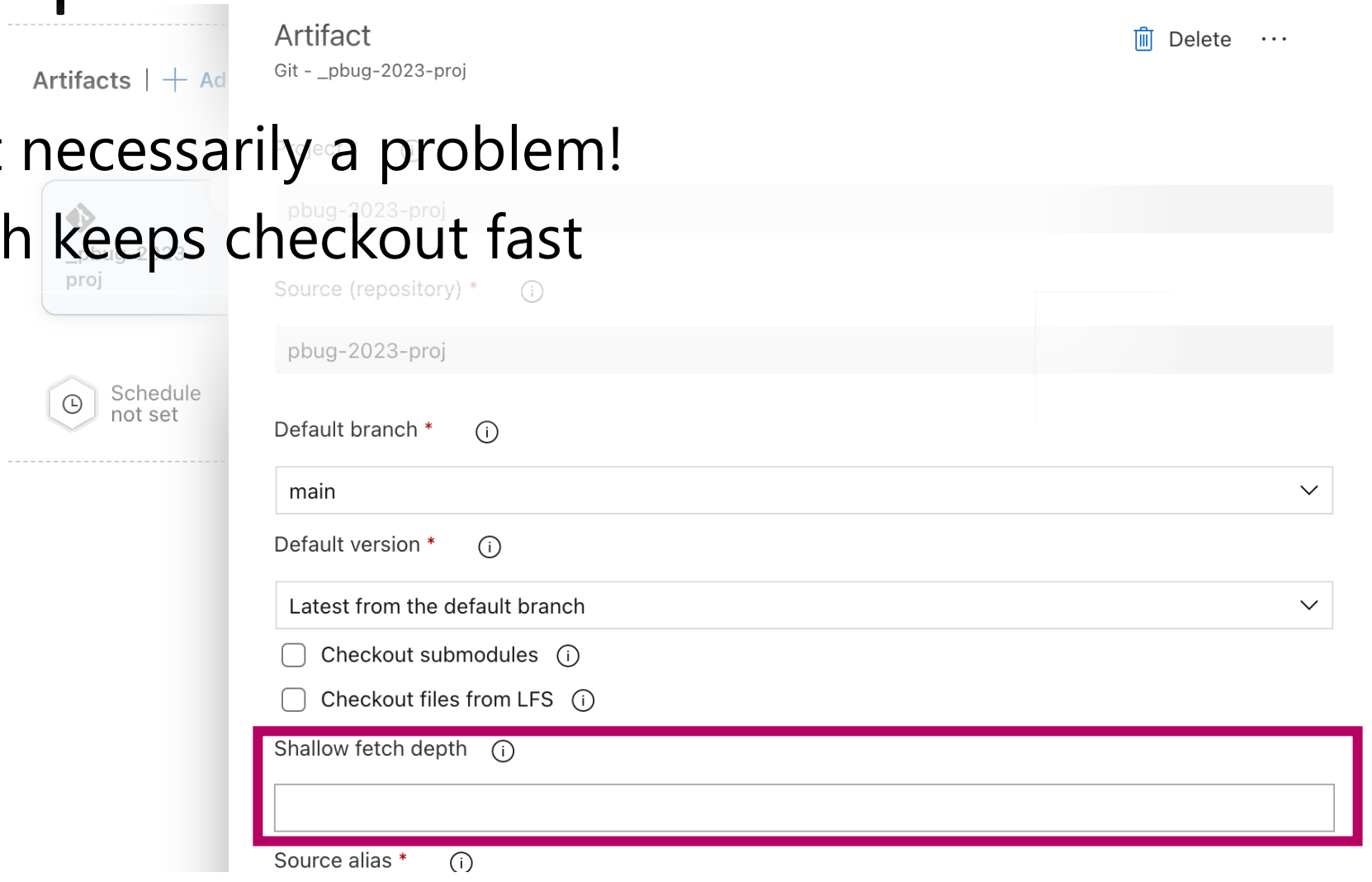
Pbix-file = model + data

- Internally, “just a zip file”
  - Data is encrypted
- Possible issues with Git
  - Git uses compression
  - That doesn’t work on already-zipped-files
  - 100 versions of 100 MB = 10 GB

Handling big repositories

- Big repository isn't necessarily a problem!
- Shallow fetch depth keeps checkout fast



Split the model from the data

- Just “un-zip” the PBI file before commit?
- Not recommended

Split the model from the data

- Split report-files from dataset-files
  - Frontend:
    - Report-only PBIX
    - Small
    - Easy process for frontend devs
  - Backend:
    - Export dataset PBIX as PBIT before commit
    - No data is inside Git
    - Small

pbi-tools CLI

- Creates source-control-friendly “project” out of your PBIX file
- Can “compile” the project back into either:
  - PBIX (for report-only files)
  - PBIT (for dataset-files)