



Azure DevOps voor Power BI

Gestructureerd en geautomatiseerde deployments voor
Power BI
Koos van Strien



Power BI Gebruikersdag 2020

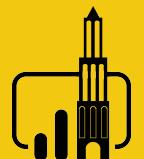
#pbig2020

Met dank aan onze partners

Platinum partners



Gold partners



Power BI Gebruikersdag 2020



Met dank aan onze partners

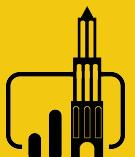
Silver partners



KPI Solutions
Business Intelligence



Community partners

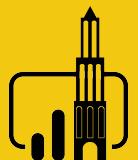


Power BI Gebruikersdag 2020



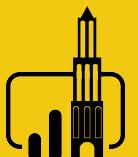
About Koos

- Trainer
- Coach
- Consultant
- BI Trainer.nl -> Sigma Data 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



CI/CD and Managed Deployment

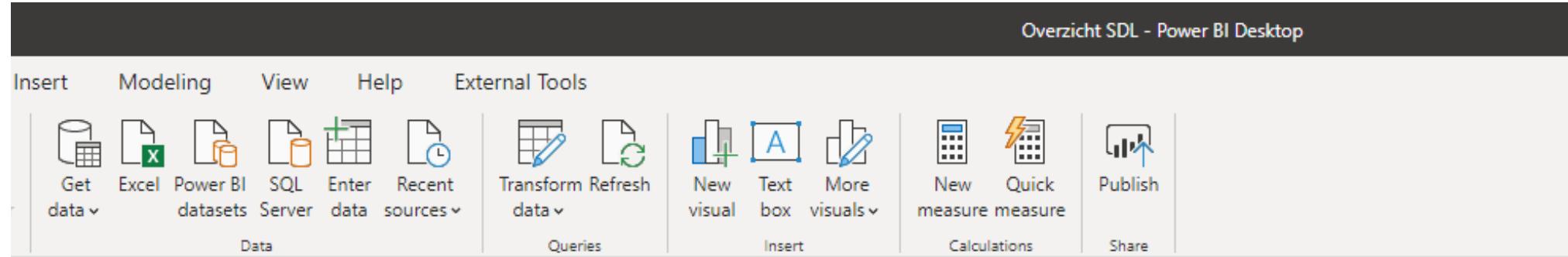
Azure DevOps for Power BI



Power BI Gebruikersdag 2020



Where to deploy your Power BI report?

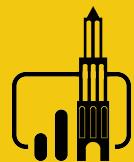


Development

Test

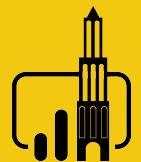
Acceptance

Production



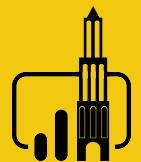
DTAP – where is your data from?

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



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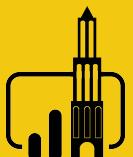
	Dev	Test	Acc	Prod
Report				Production
Data model				Production
Data mart?				Production
Data Warehouse?				Production
External sources?				Production



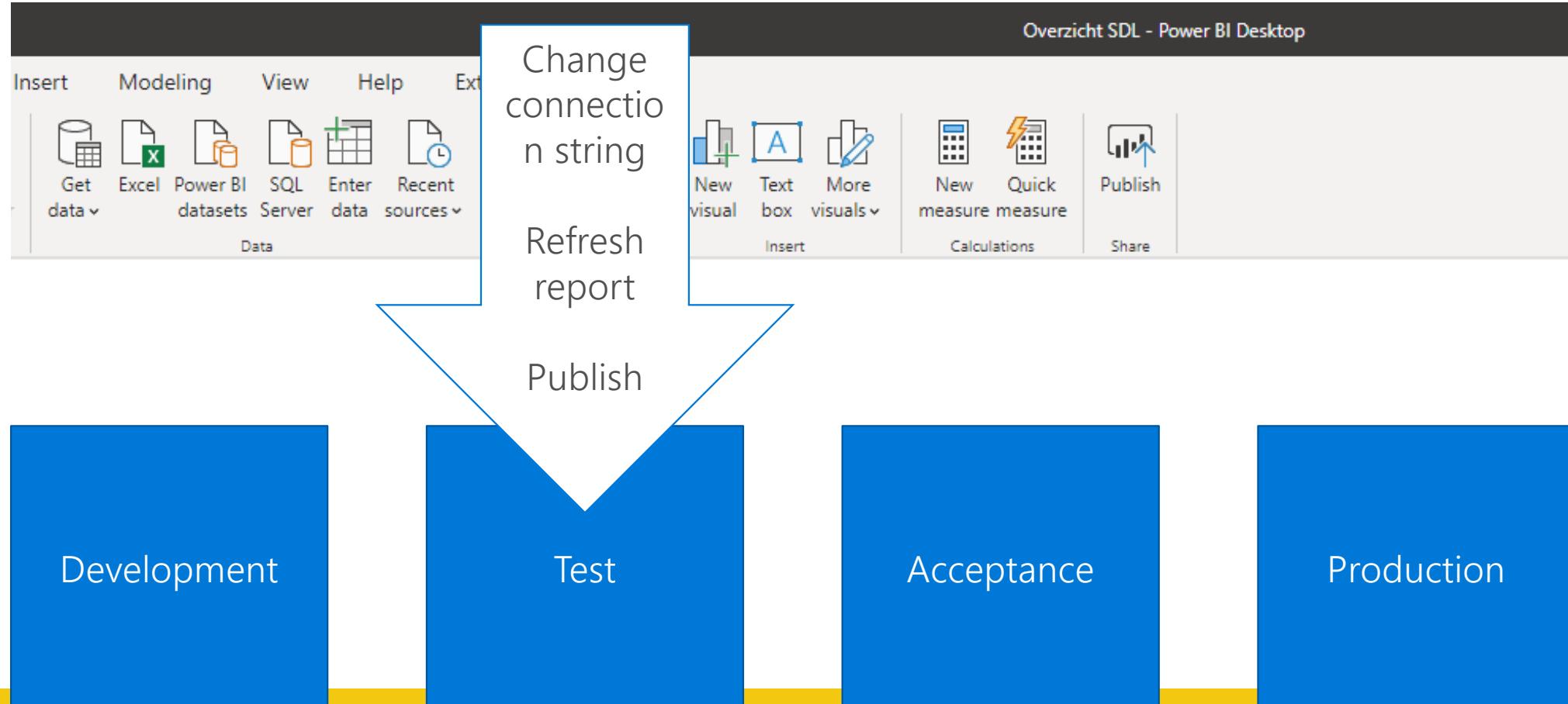
DTAP – where is your data from?

	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

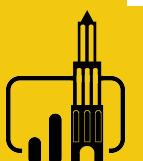
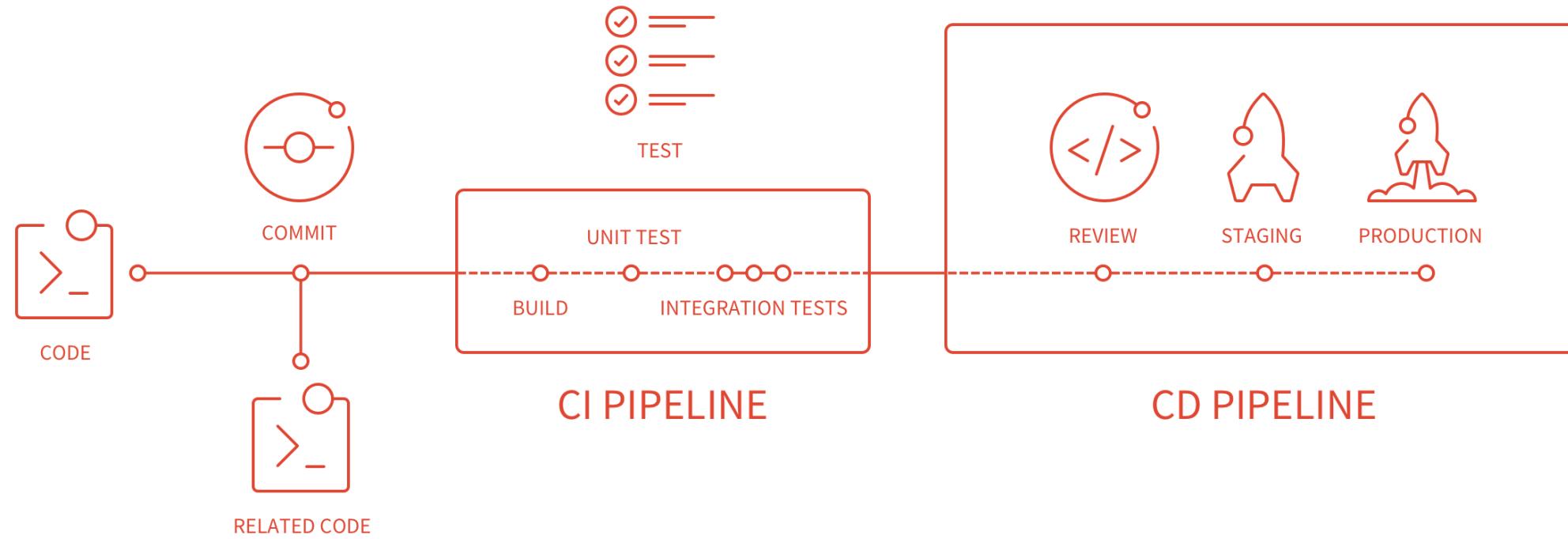


Where to deploy your Power BI report?



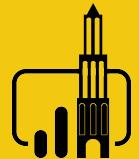


CI / CD



Overview of Azure DevOps

Azure DevOps for Power BI

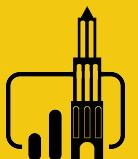


Power BI Gebruikersdag 2020



Overview of Azure DevOps

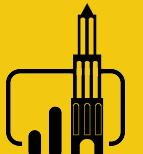
- Agile tools to support planning & track work (Kanban, Scrum)
- Build & release management
- Git repositories for source control
- Tools for testing
 - Manual testing
 - Load testing
 - Continuous testing
- Artifacts management / package repositories
- Extensions (integrates with Campfire, Slack, Trello,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



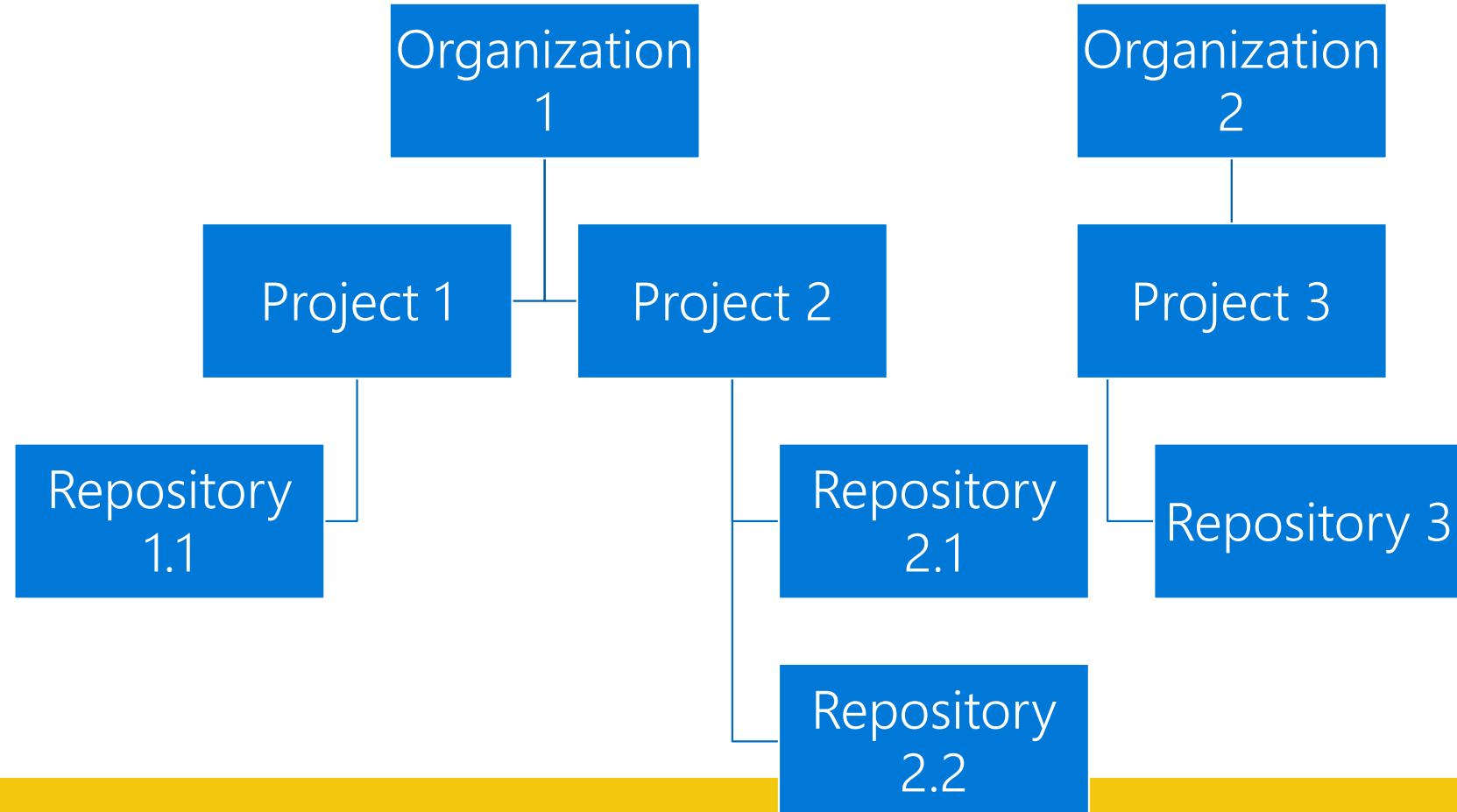
Overview of Azure DevOps

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- Extensions (~~integrates with ...~~ Power BI Actions)

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



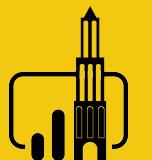
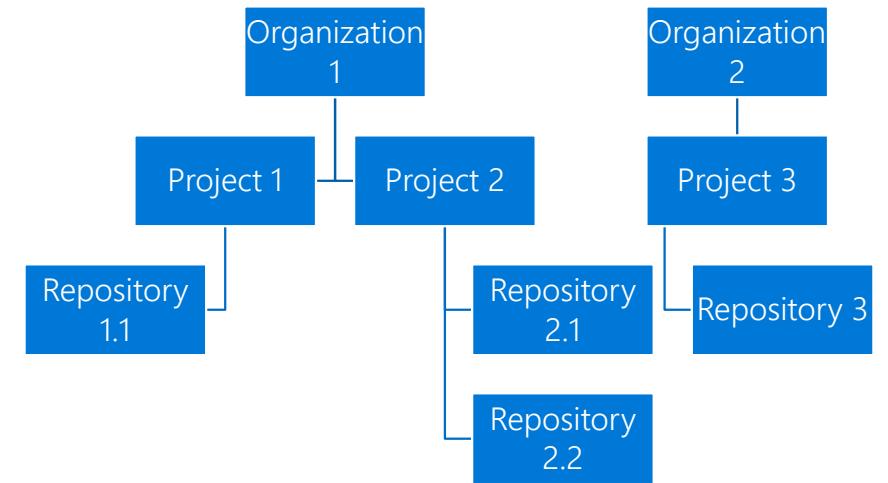
Organizations, projects and repositories



Organizations, projects and repositories

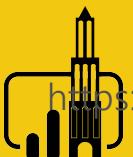
Azure DevOps

The screenshot shows the Azure DevOps interface. On the left, there's a sidebar with organization names: ci4bi-cloud (selected), ci4bi, ci4bi-kvanstrien, ci4bi-trainer, 3 more organizations, and New organization. The main area has a header "ci4bi-cloud" with tabs for Projects, My work items, and My pull requests. Below the header, it says "0 08-project-types-cloud". At the bottom, there's another card for "0 03-introducing-git-azure-repos". A red arrow points from the "ci4bi-cloud" organization name in the sidebar to the "ci4bi-cloud" header in the main area. A teal arrow points from the "08-project-types-cloud" card in the main area up towards the "ci4bi-cloud" header.



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>

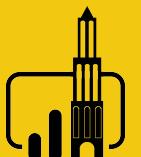
Power BI Gebruikersdag 2020



Projects

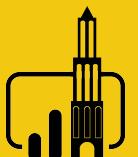
- Container for
 - Boards and backlogs
 - Pipelines for CI/CD
 - Repos
 - Continuous Test integration
- Single vs. multiple?
 - Single with many repos / teams
 - Many with own sets of repos, builds, workitems, etc.?
- For granular security, choose multiple
- Multiple teams → multiple boards

<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



Overview of Azure DevOps

Interface tour

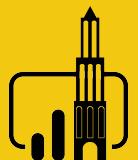


Power BI Gebruikersdag 2020



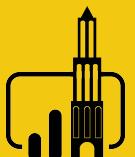
Azure DevOps Interface Tour

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



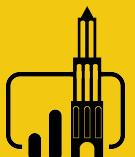
Overview of Azure DevOps - Summary

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



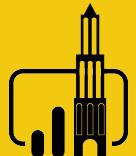
Setting up Azure DevOps

- <https://github.com/vstrien/devopspowerbi>
 - 01-inrichten-organization-project.md (Dutch)
- Before we start:
 - If unsure about rights in AAD, Power BI admin, etc. – use BITrainer-account
 - Backside of business card – username
 - Username: pbig-1 → pbig-1@bitrainer.nl
 - Password for everyone: BITrainer.nl



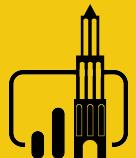
Setting the stage

Use Azure DevOps and Power BI Actions for automated deploys



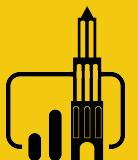
What we want to achieve

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



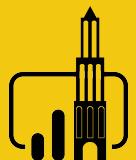
What we want to achieve (2)

- 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

Local machine (laptop) with PBI
Desktop

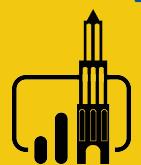
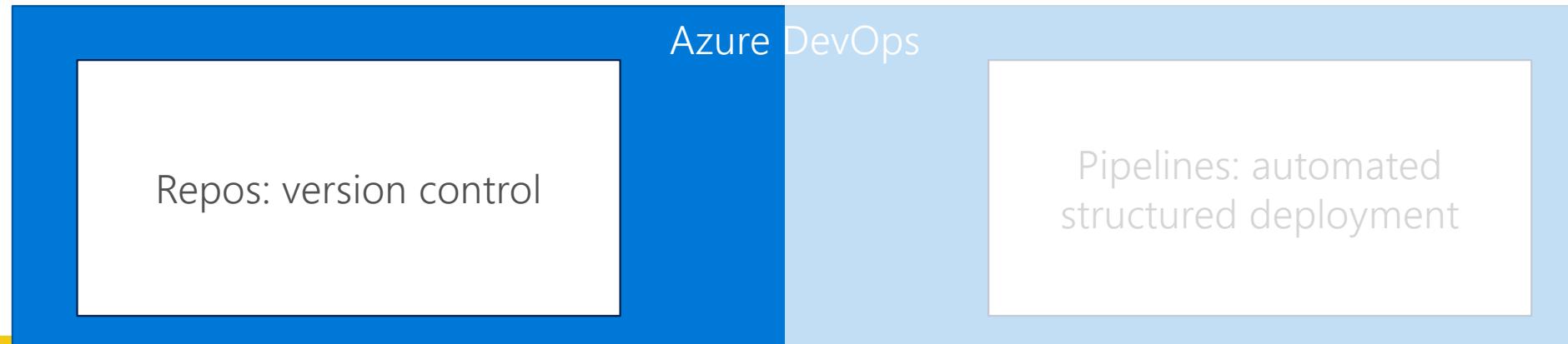
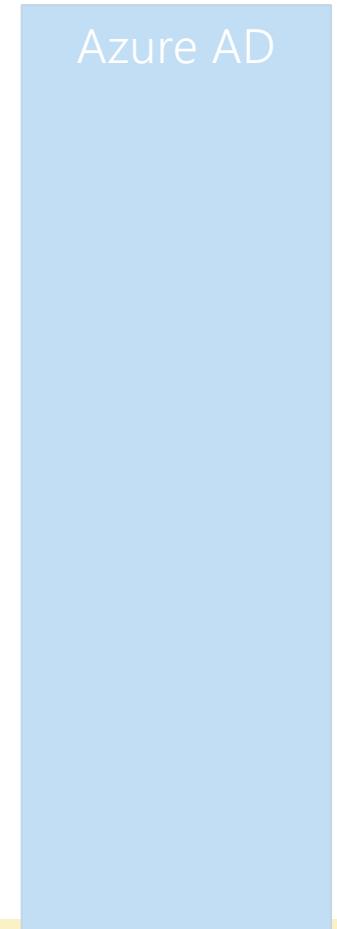
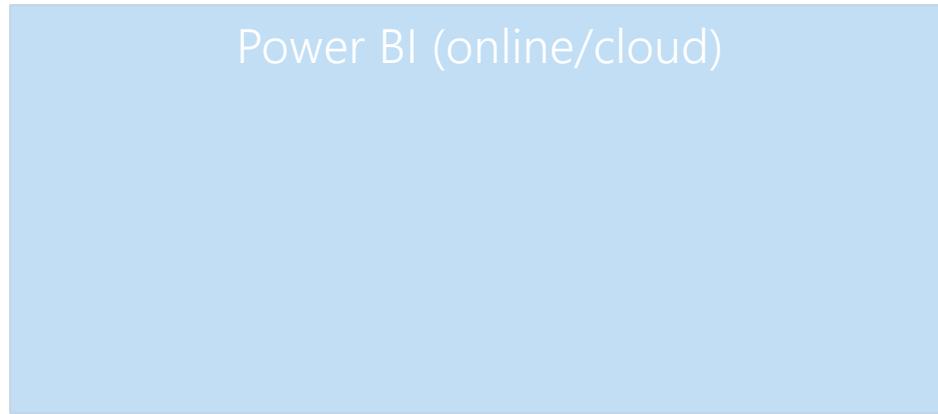
Power BI (online/cloud)

Azure AD

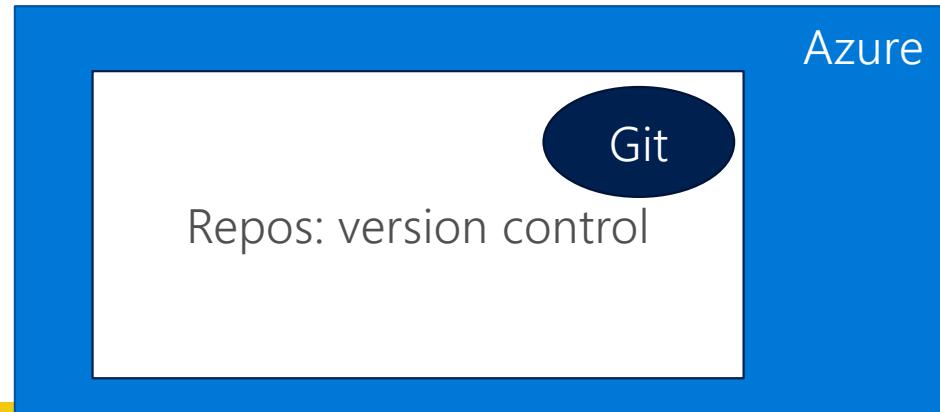
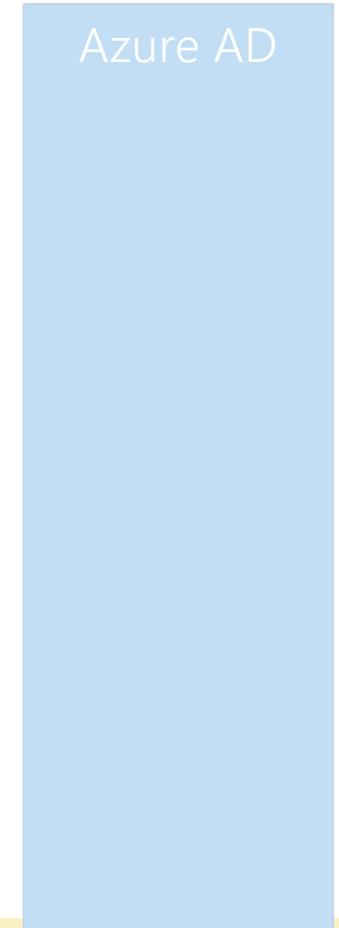
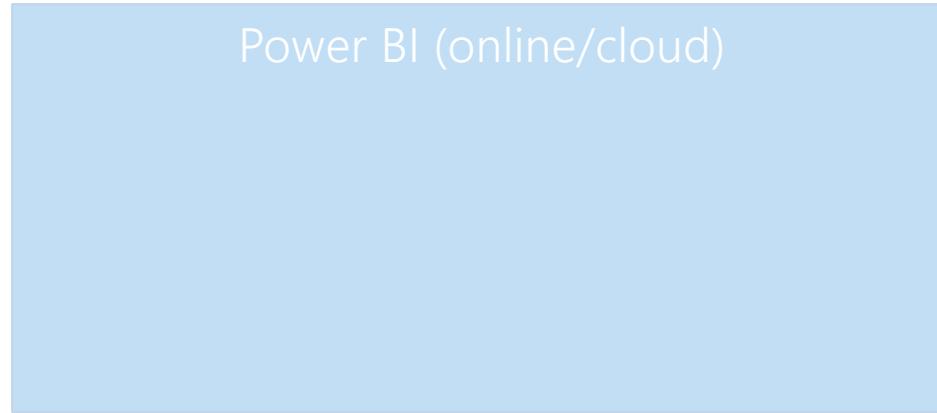
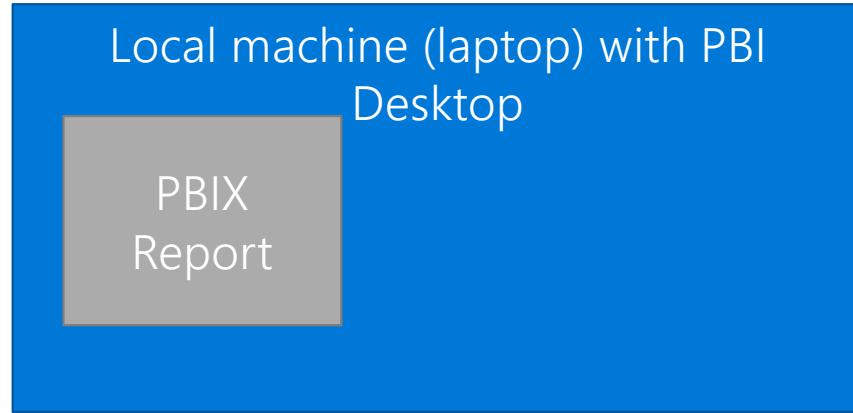
Azure DevOps



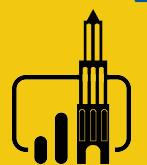
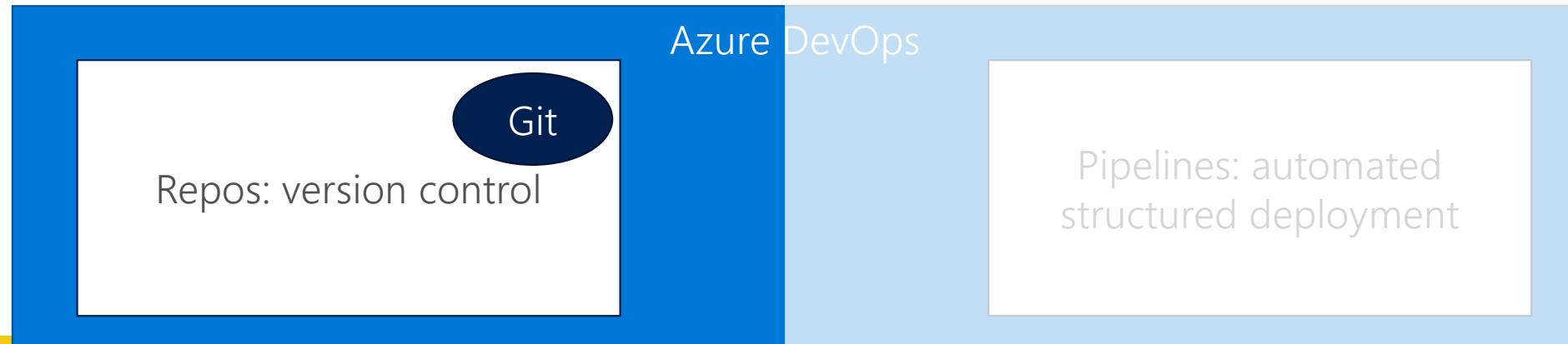
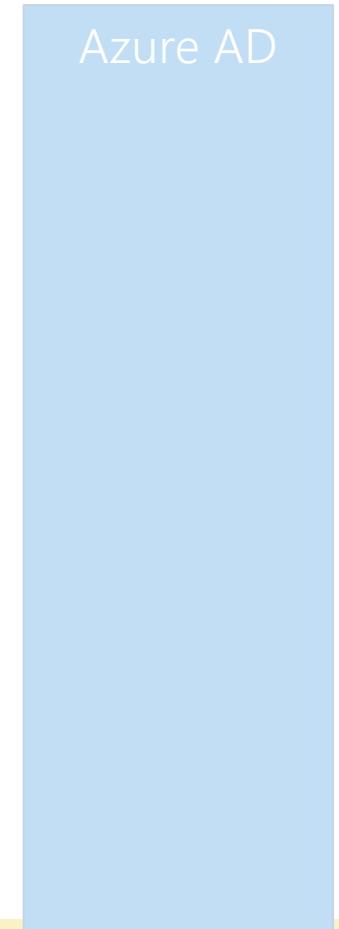
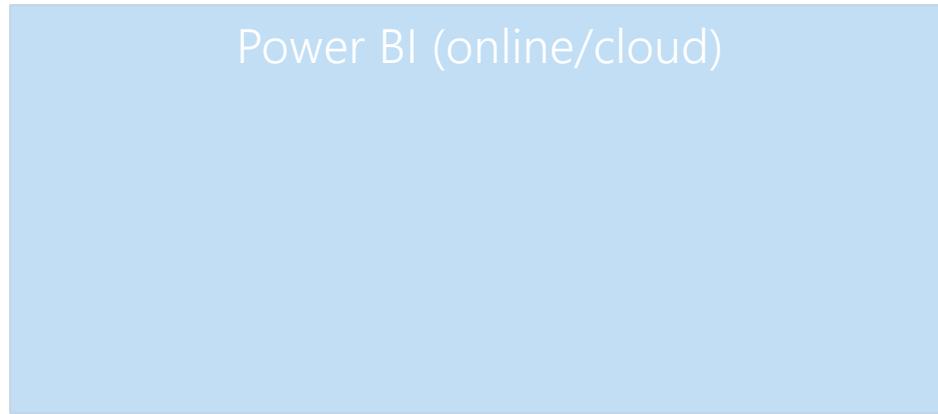
Solution Structure



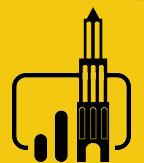
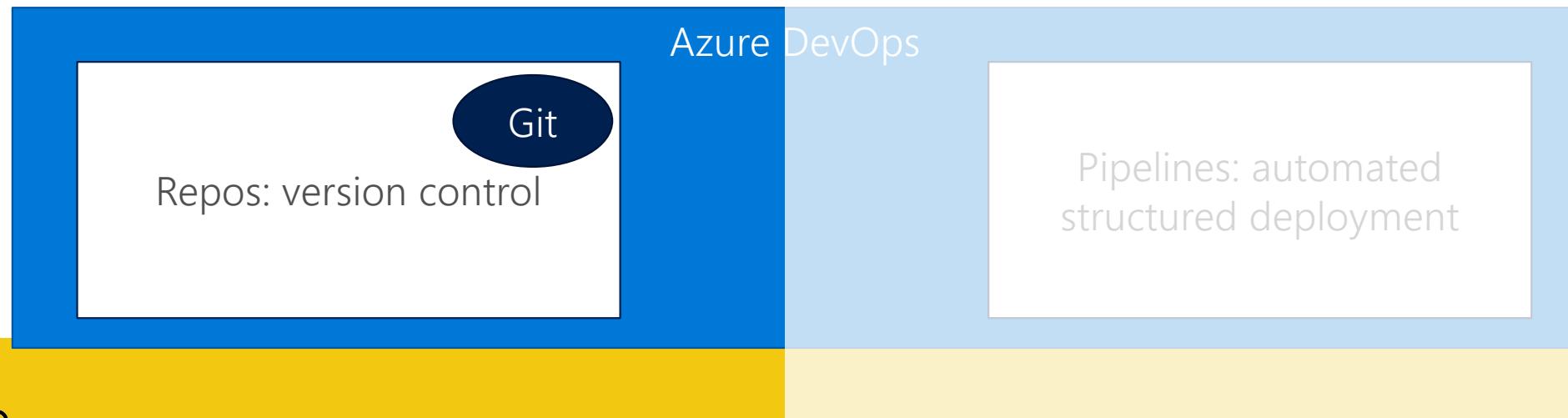
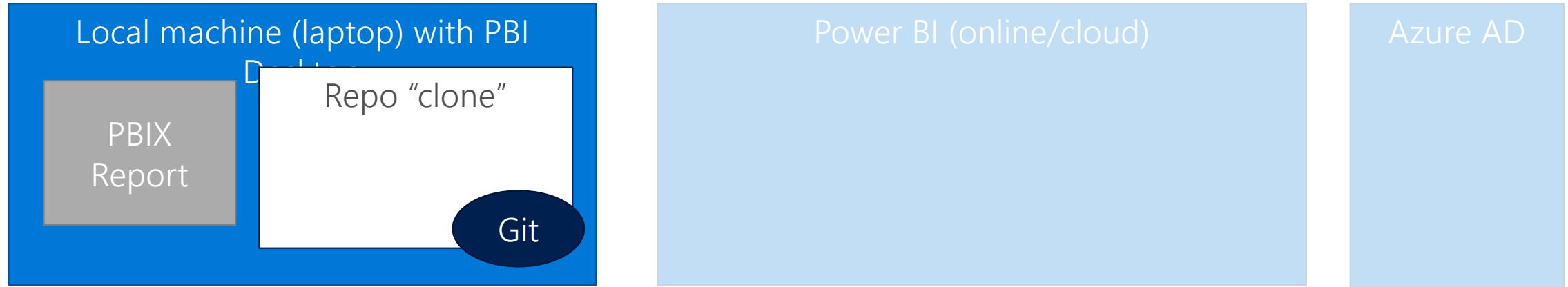
Solution Structure



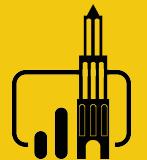
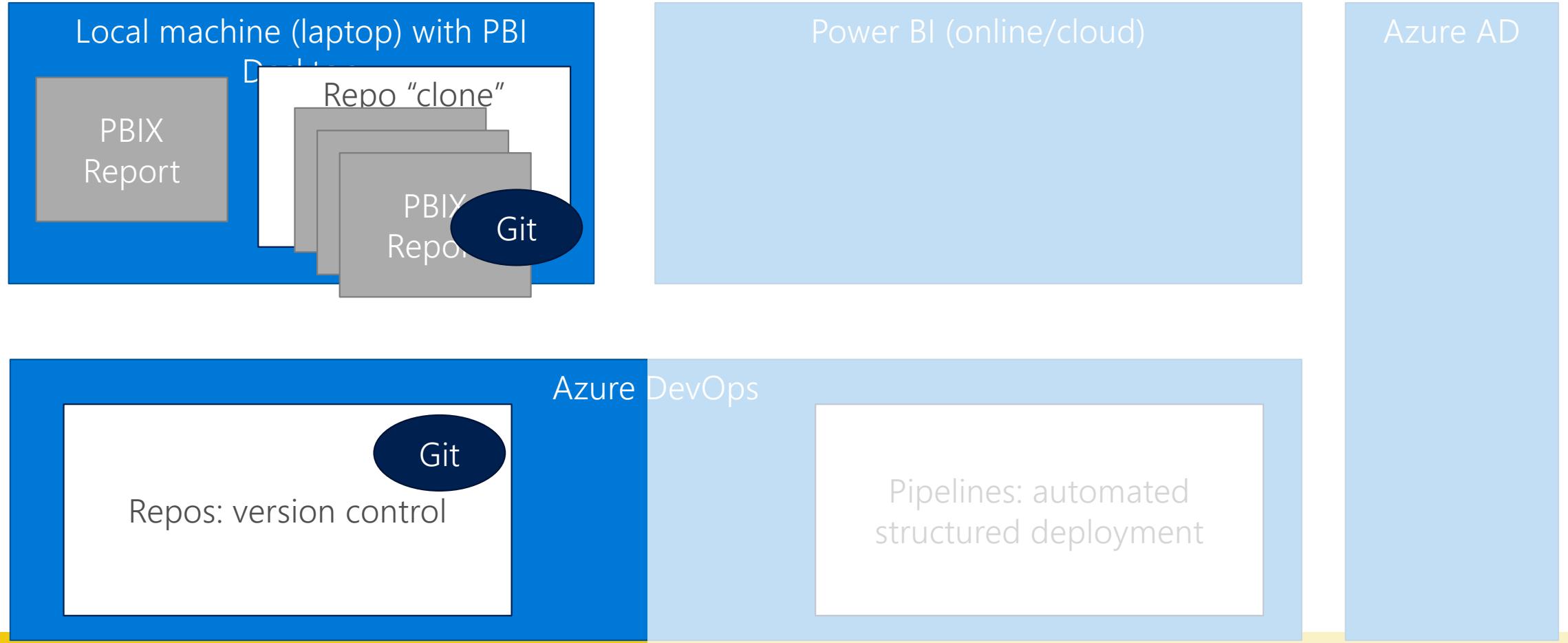
Solution Structure - Git



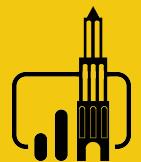
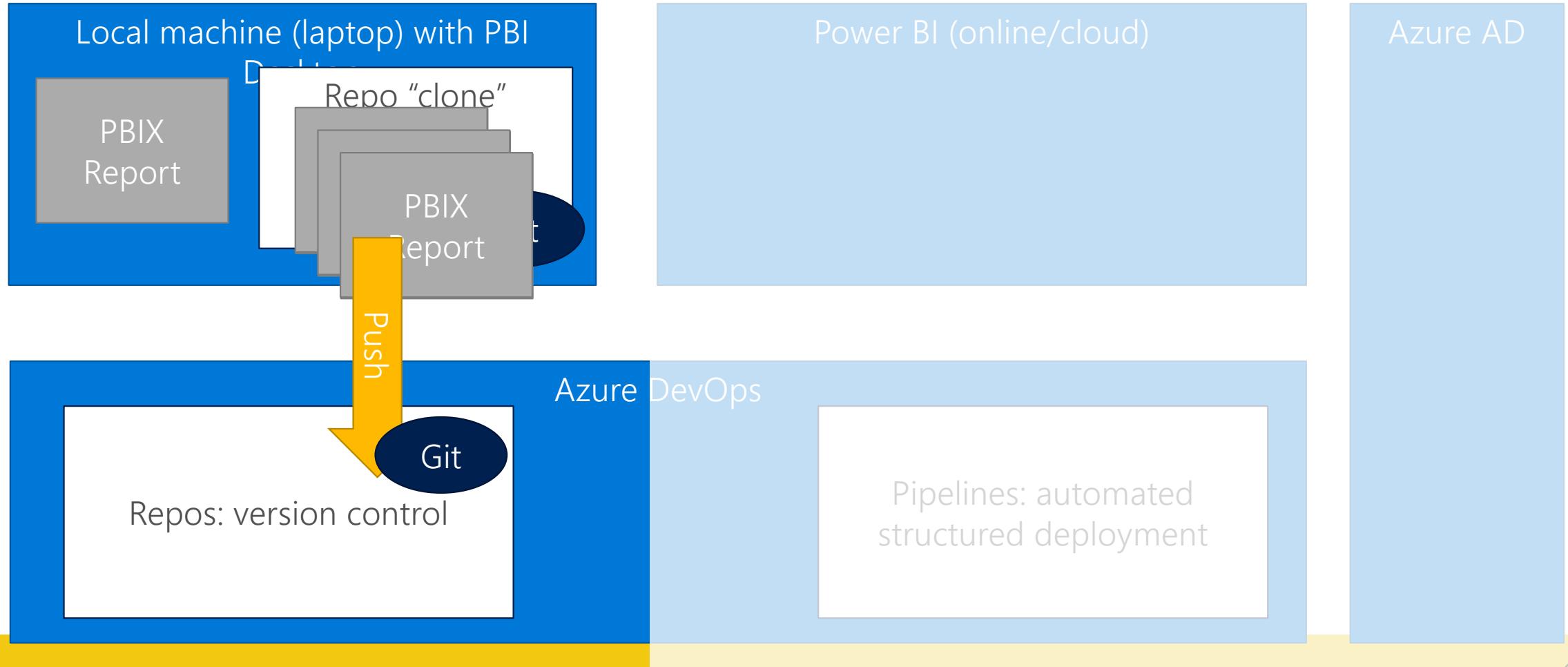
Solution Structure – Git commit



Solution Structure - Git

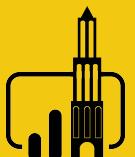


Solution Structure – Git Push



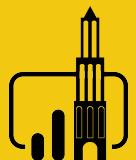
Getting started with Git

- 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)



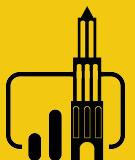
Setting up Azure DevOps Repos

- <https://github.com/vstrien/devopspowerbi>
 - 02-opzetten-git-repository.md
 - 03-clone-van-git-repository-lokaal.md
 - 04-powerbi-in-git.md



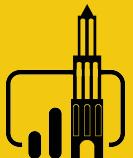
What we want to achieve (2)

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- An Azure DevOps Pipeline should be able to deploy this report to a Power BI workspace

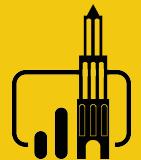
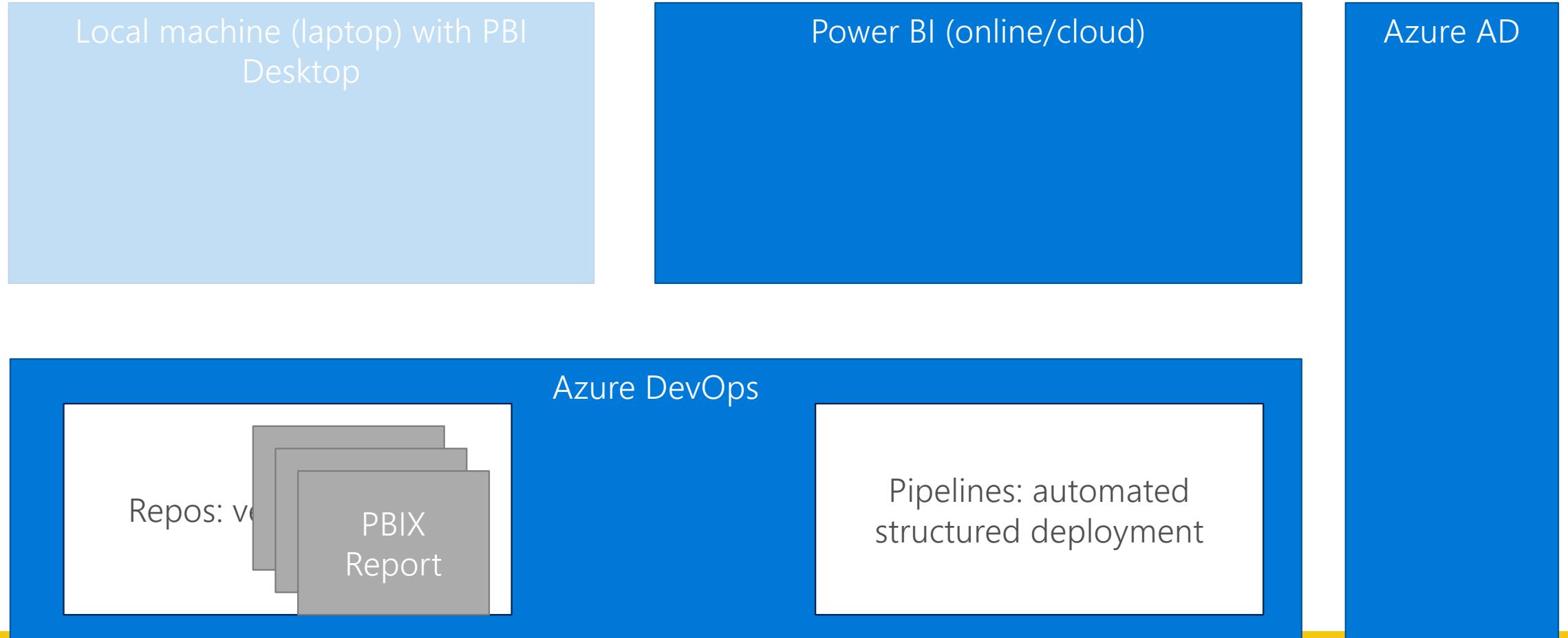


An Azure DevOps Pipeline
should be able to deploy this
report to a Power BI workspace

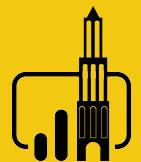
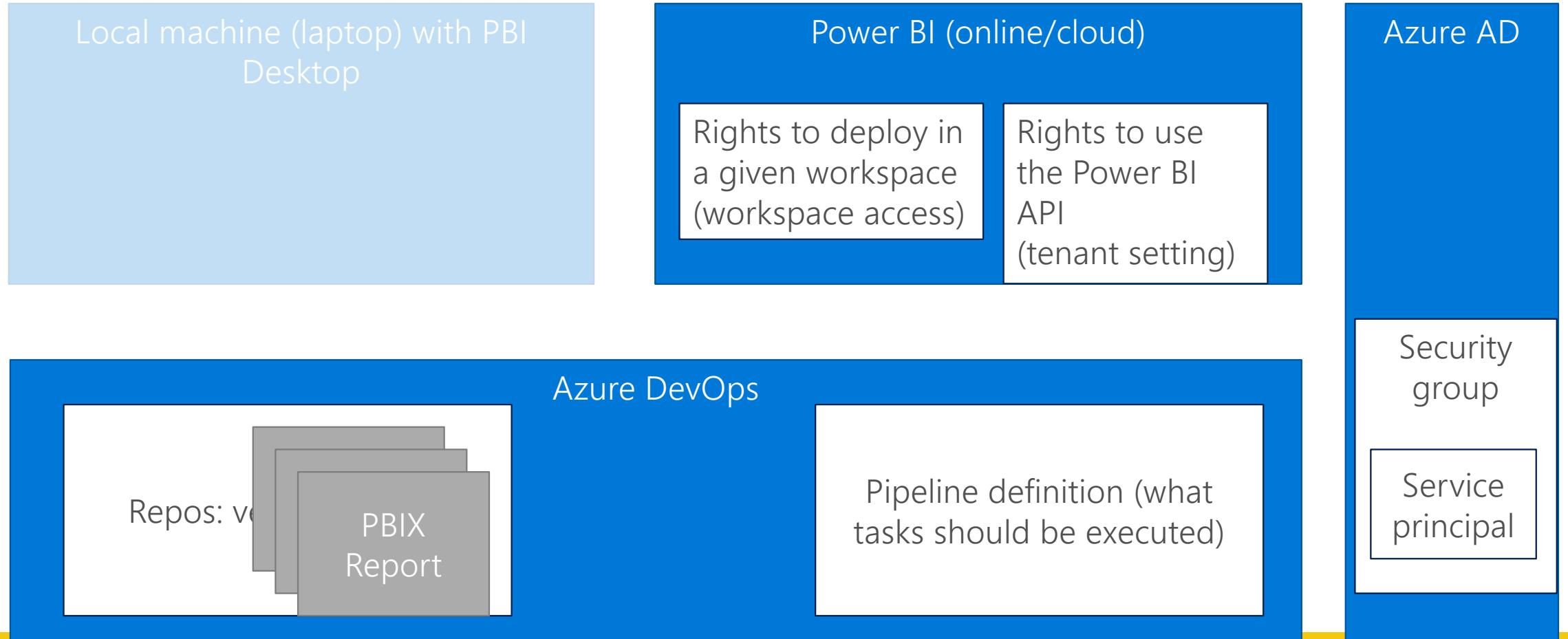
Azure DevOps for Power BI – Setting the Stage



Solution Structure

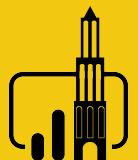


Solution Structure



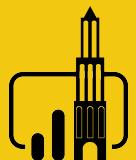
Setting up Azure DevOps Pipelines

- <https://github.com/vstrien/devopspowerbi>
 - 05-inrichten-azure-devops-release-pipeline.md
 - 06-inrichten-devops-release-stage.md
 - 07-rechten-aanpassen-powerbi-admin.md



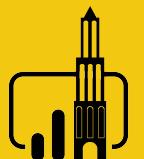
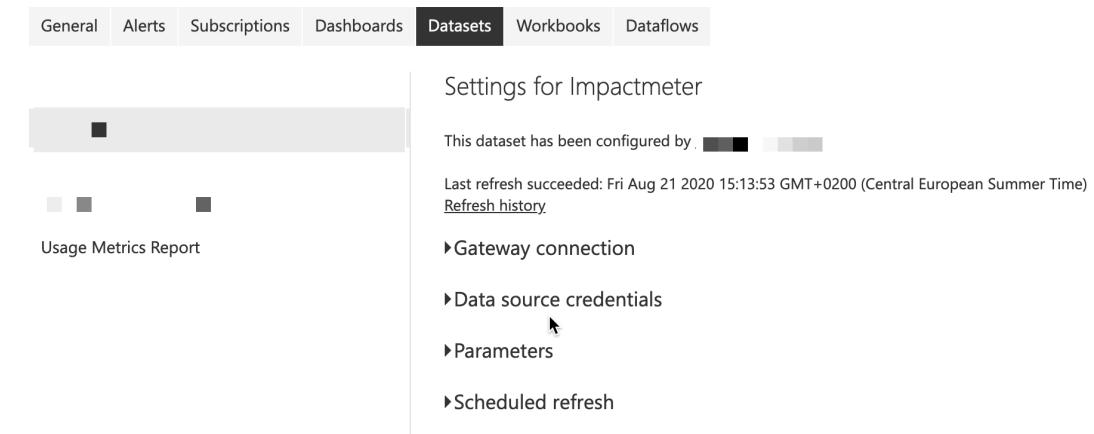
Advanced scenarios for deployment

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

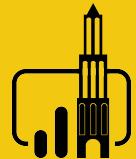
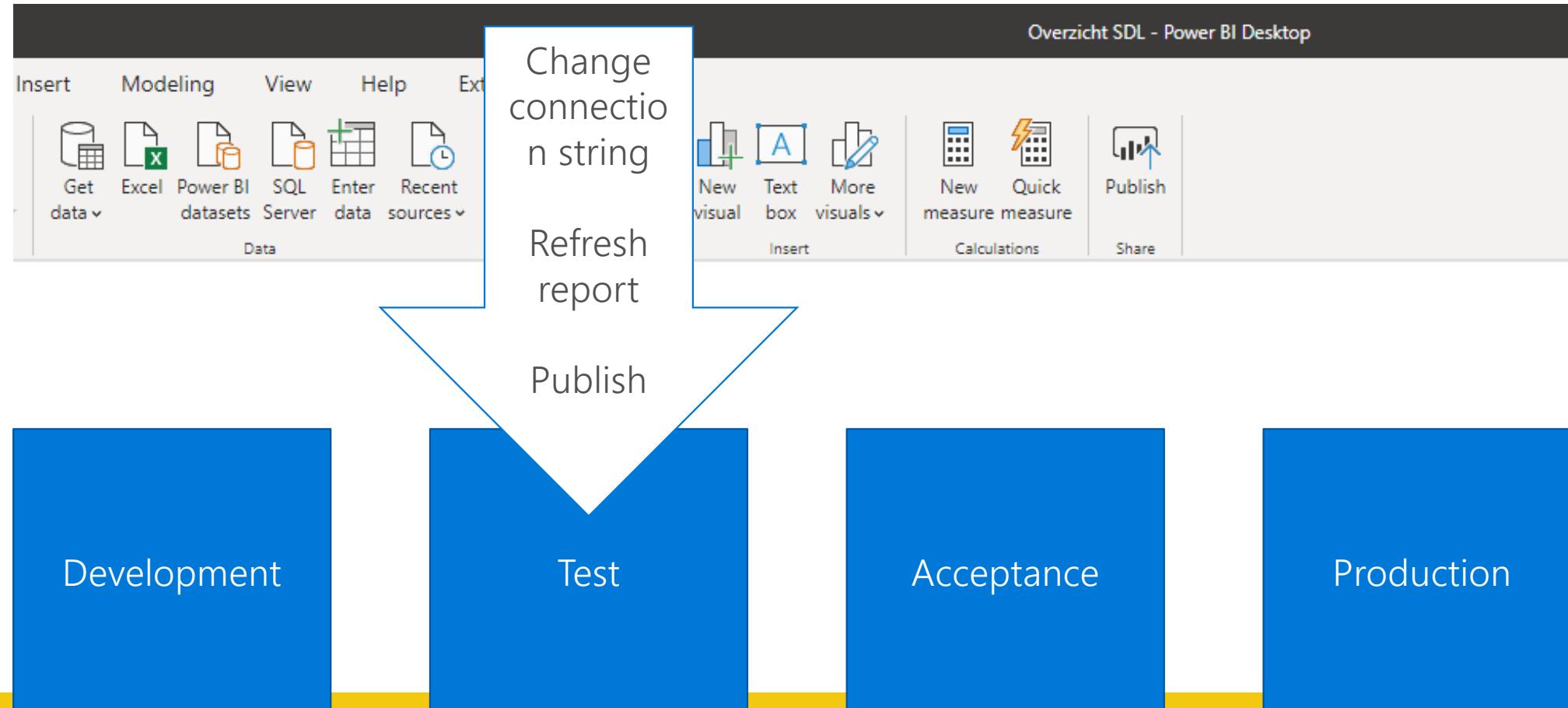


Changing Data Sources

- 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 Data Sources at Deployment

What we want to achieve

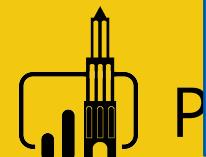
1. Change connection string
2. Refresh report
3. Publish

How we can do it

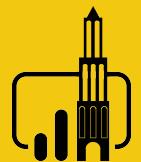
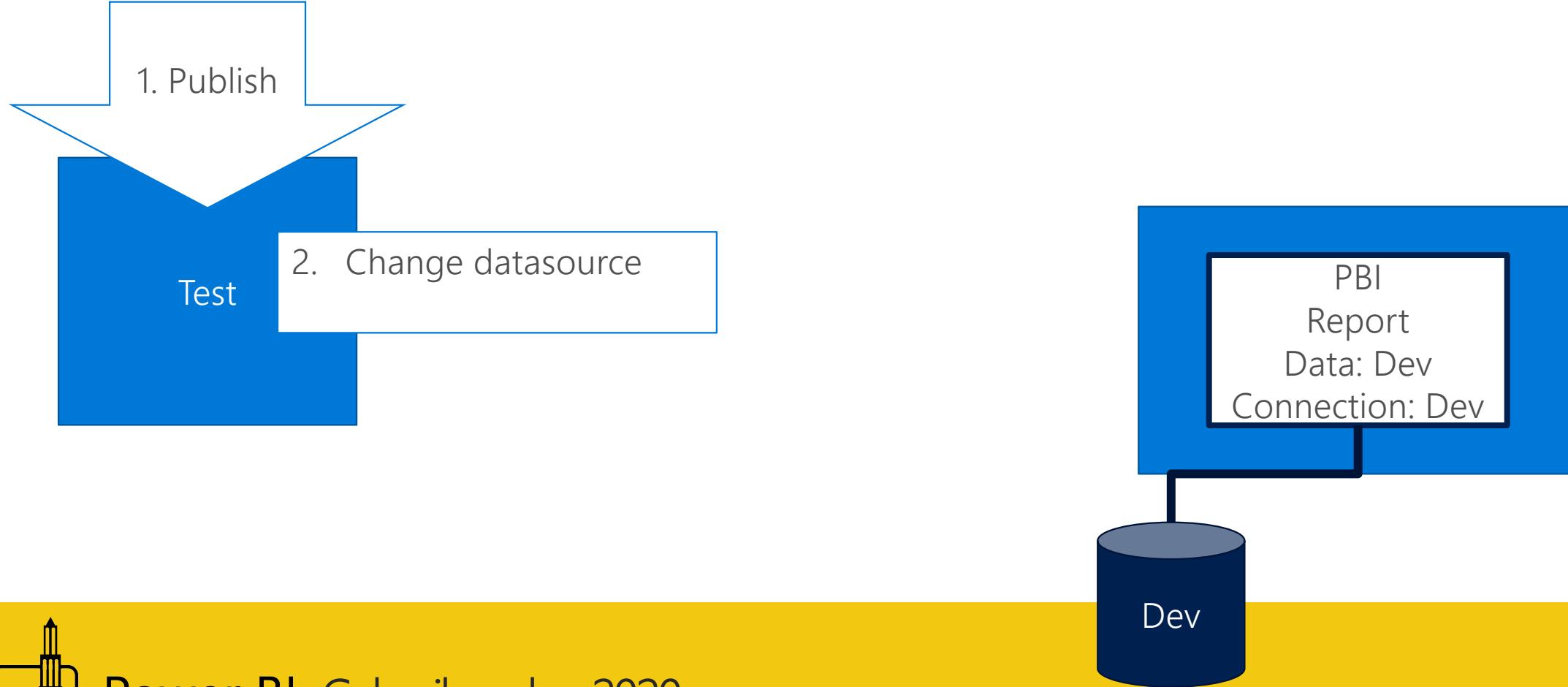
1. Publish

Test

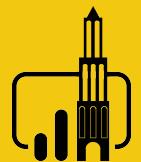
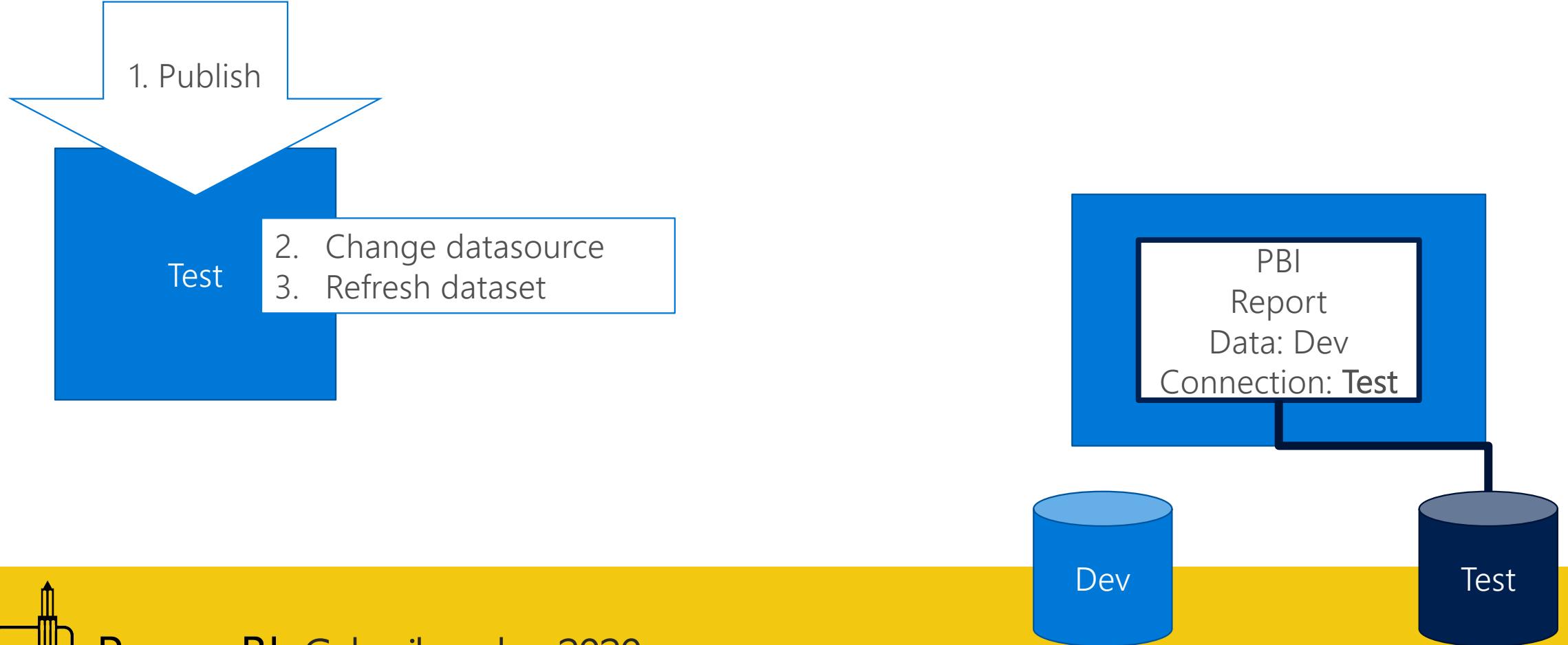
2. Change datasource
3. Refresh dataset



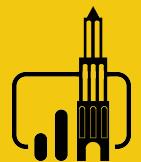
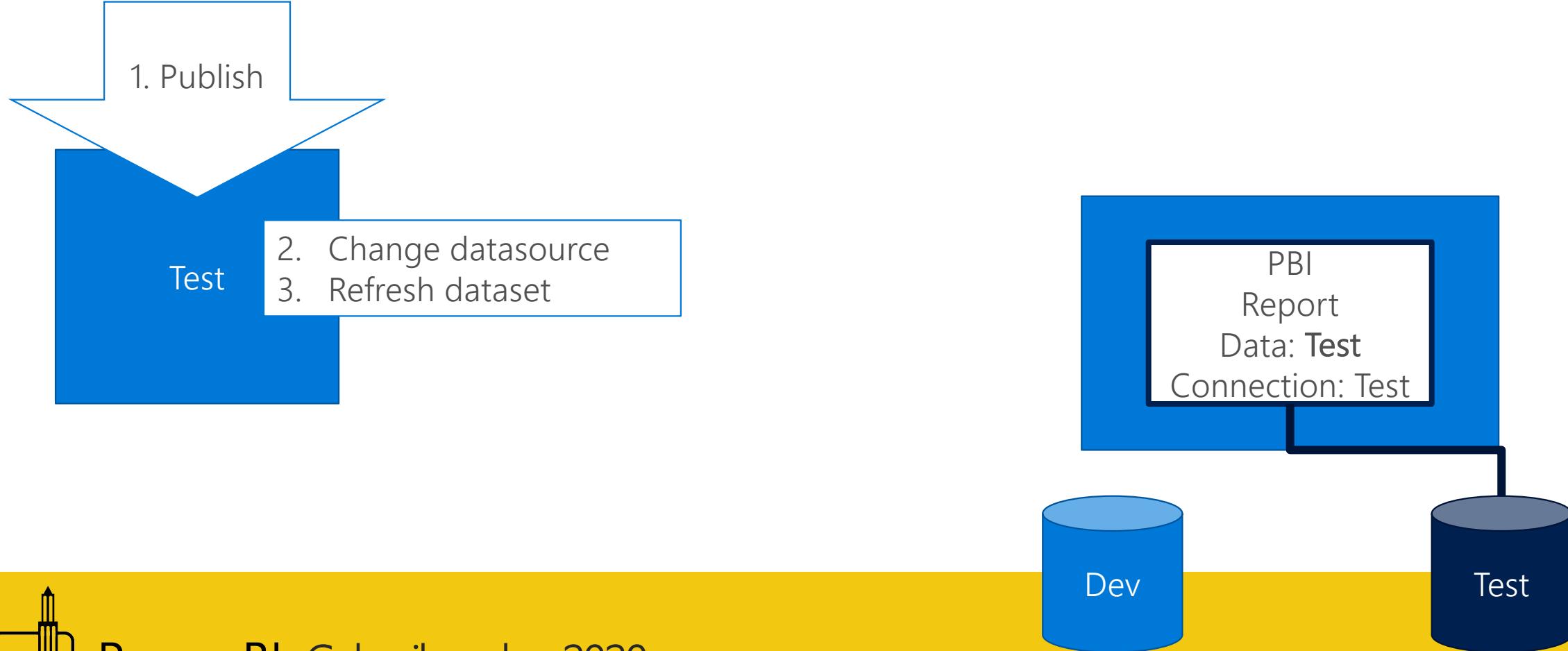
Change Data Sources at Deployment



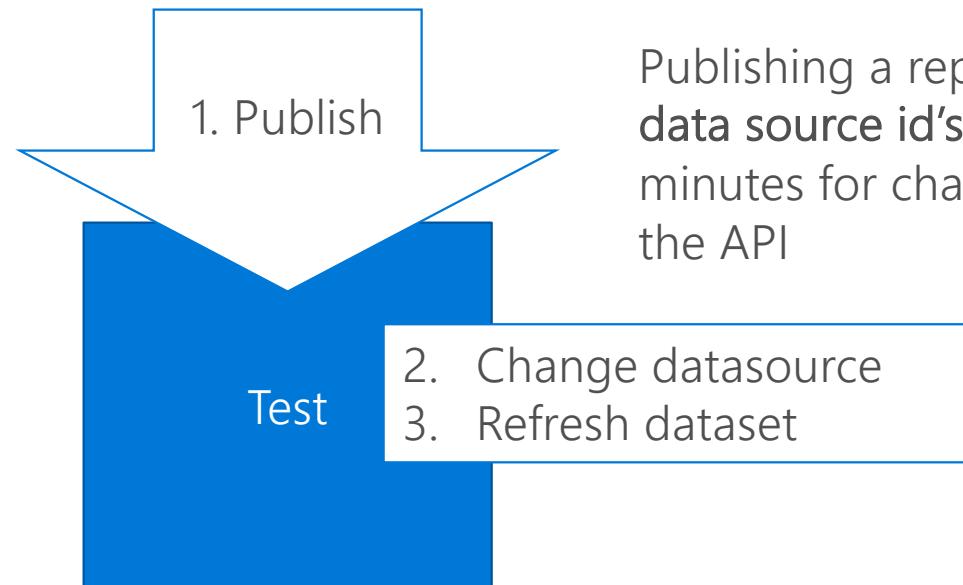
Change Data Sources at Deployment



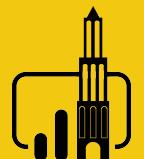
Change Data Sources at Deployment



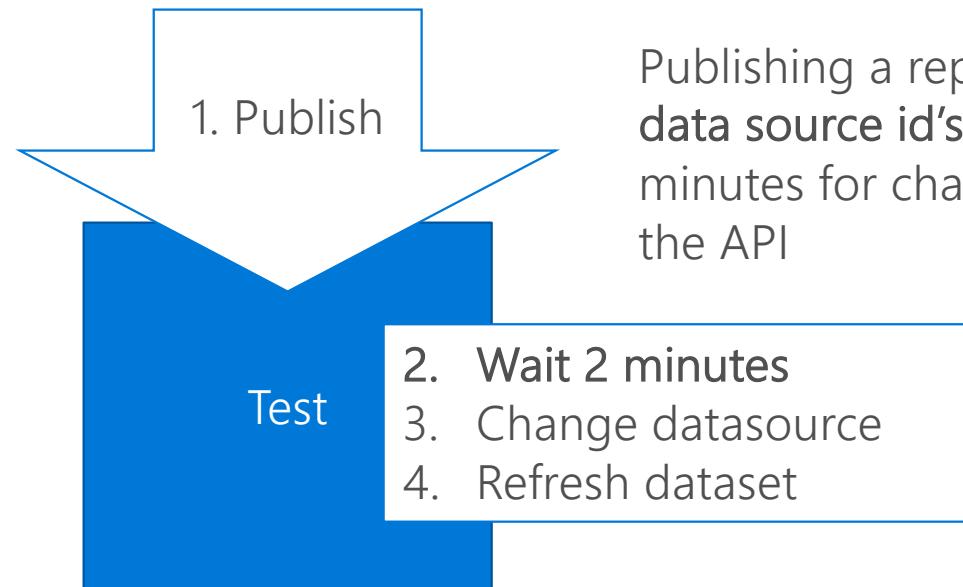
One More Thing about Changing Data Sources



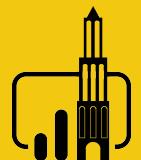
Publishing a report generates new data source id's. It takes a few minutes for changes to be visible in the API



One More Thing about Changing Data Sources

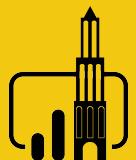


Publishing a report generates new data source id's. It takes a few minutes for changes to be visible in the API



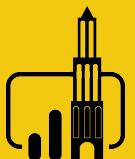
Changing Credentials programmatically

- Using PowerShell
- Passing credentials in a safe way



The Helper Script

- Written in PowerShell
- Adapted from several examples
- Parameters:
 - sourceReportGroupName "demo-pbug-2020"
 - appld "*(app id)*"
 - tenantId "*(tenant id)*"
 - clientSecret "*(client secret)*"
 - dbuser "*(database user)*"
 - dbpass "*(database password)*"



How to Use the Helper Script

1. Bring the .ps1-script inside your repository
2. Add a “PowerShell” task in the release pipeline
3. Use variables to securely store passwords



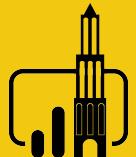
Using Variables

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



Adding more stages

- ... while making ultimate benefit of the stages ☺





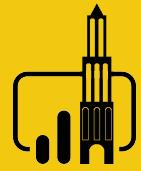
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Bedankt!
Thank you!

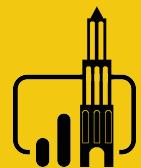


Vul alsjeblieft
de evaluatie in



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the evaluation



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