



**Power BI
Deployment
Pipelines**



Azure DevOps

Application Lifecycle Management for Power BI



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Macaw Netherlands



@MarcLelijveld



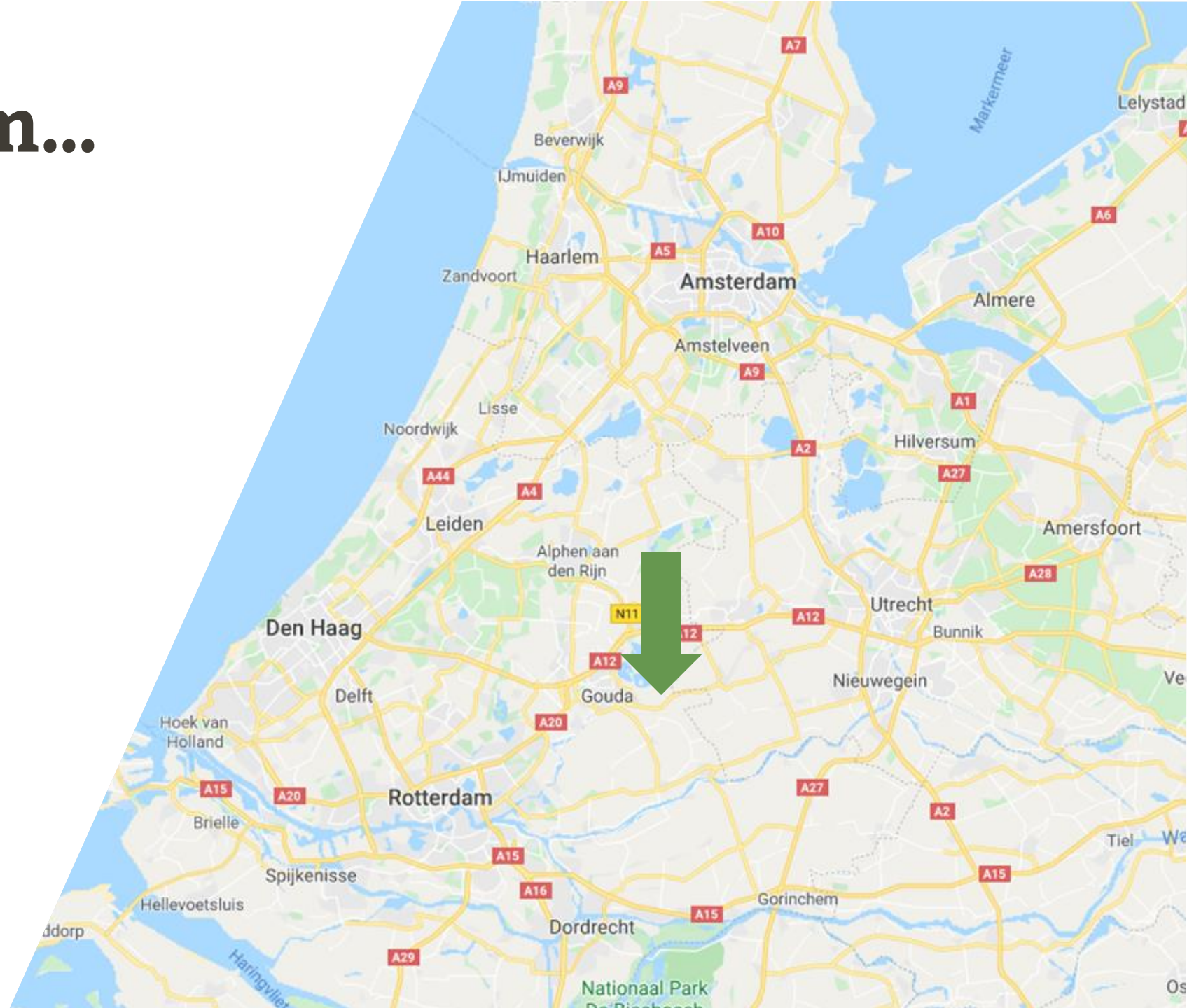
[linkedin.com/in/MarcLelijveld](https://www.linkedin.com/in/MarcLelijveld)



Data-Marc.com

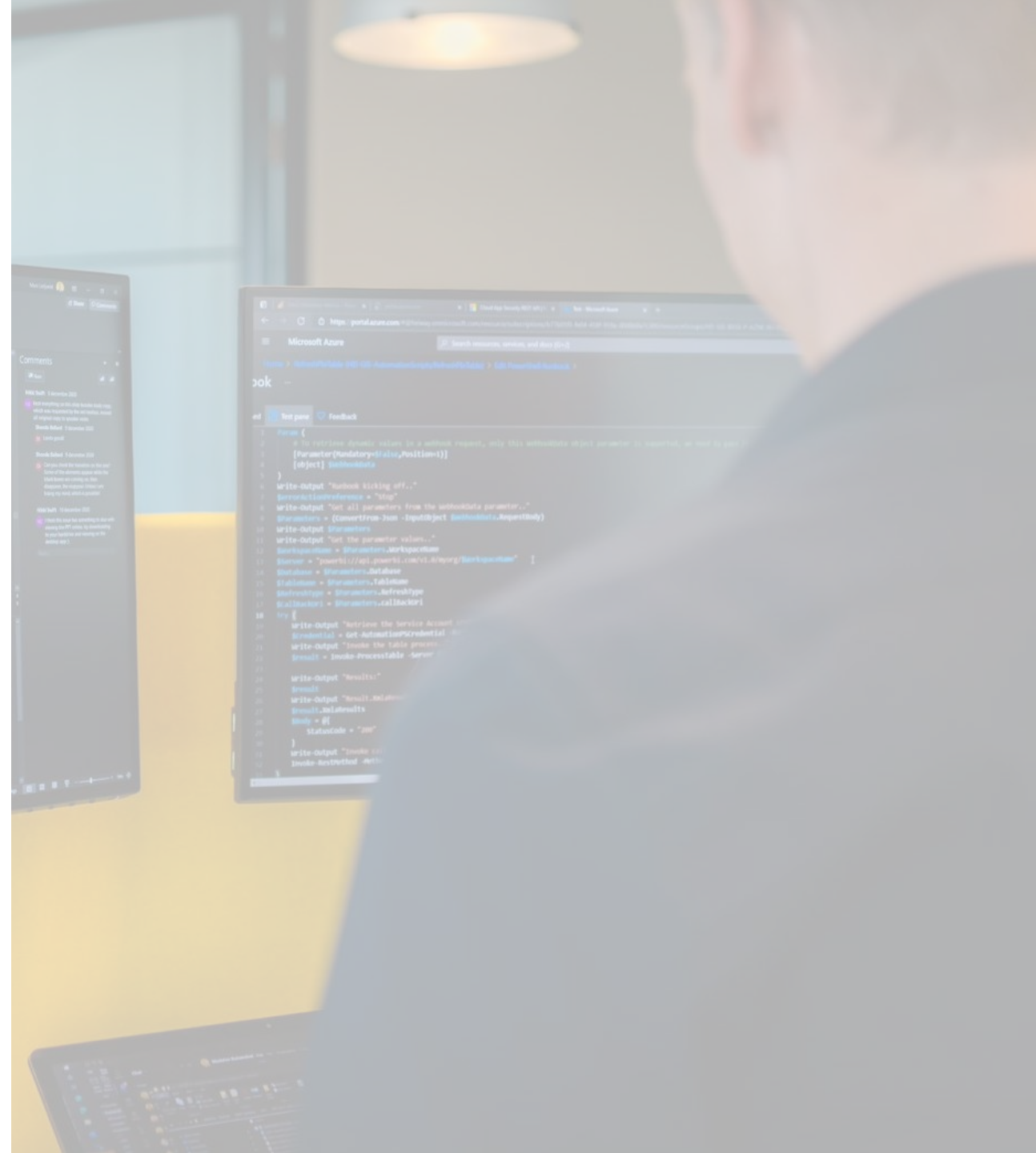


Where I'm from...



What we cover today

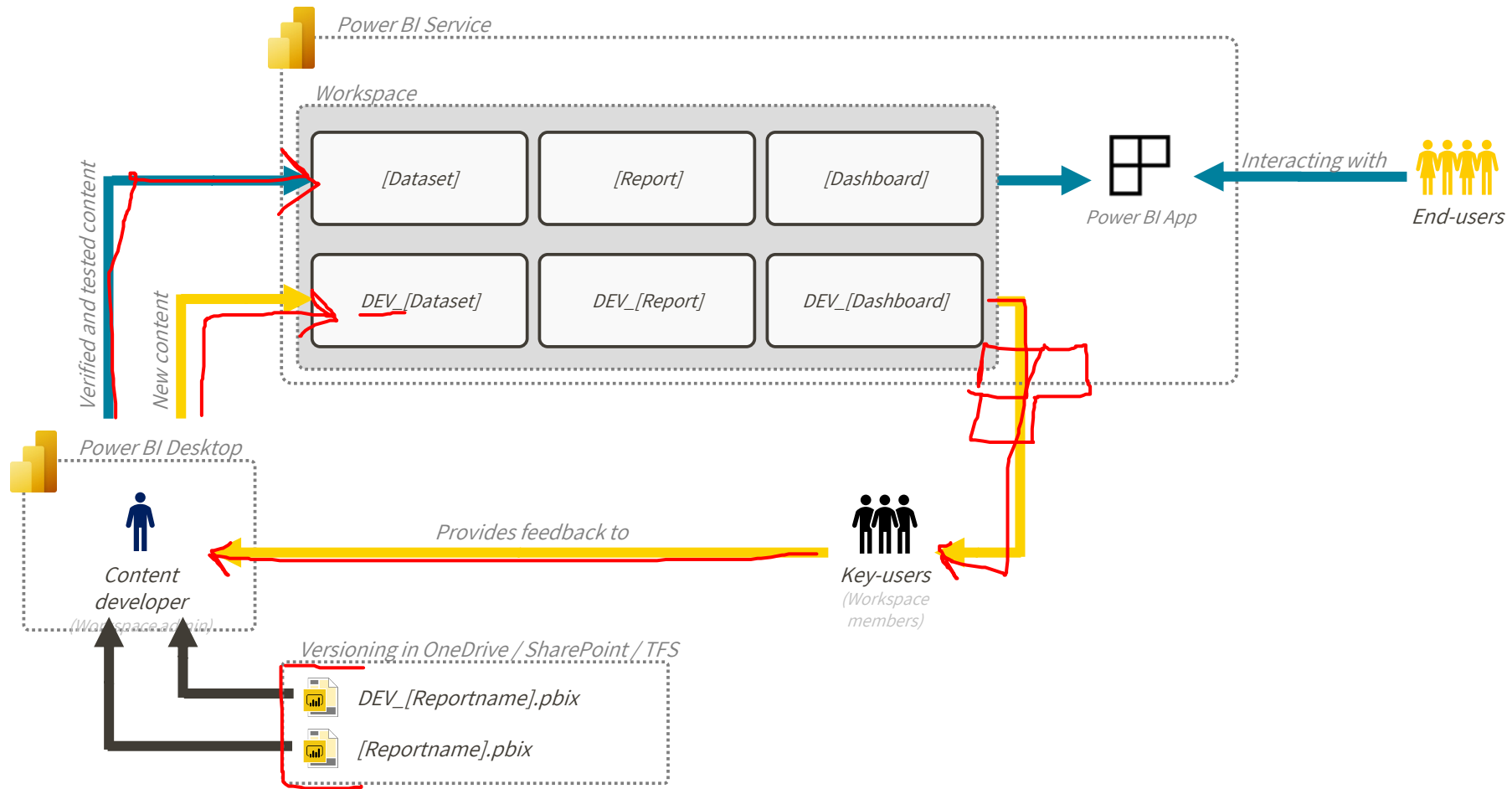
- Deployment framework
- Native Deployment Pipelines
- Azure DevOps integration
- Wrap up



The background of the slide features a grayscale silhouette of a construction site. Two workers are visible against a complex steel truss structure. One worker on the left is standing with arms raised, holding onto a horizontal beam. The second worker on the right is bent over, working on a lower part of the frame. The overall scene is a technical and industrial representation of construction.

Deployment setup – self service

Deployment setup (self service scale)



Deployment setup (self service scale)

Parameters

New

EnvironmentSwitch

Name
EnvironmentSwitch

Description
Switch between Development, Acceptance and Production environment.

Required

Type
Text

Suggested Values
List of values

1	https://
2	https://
3	https://

Default Value
https://

Current Value
https://

OK Cancel

Settings for Parameterize Datasource

[Refresh history](#)

▶ Gateway connection

▶ Data source credentials

▾ Parameters

EnvironmentSwitch
Switch between Development, Acceptance and Production environment

https://SomeSite.sharepoint.com/sites/Site01/

SwitchFolderLocation
Switchs folders

C:\Users\MarcL\Documents\Study.xlsx

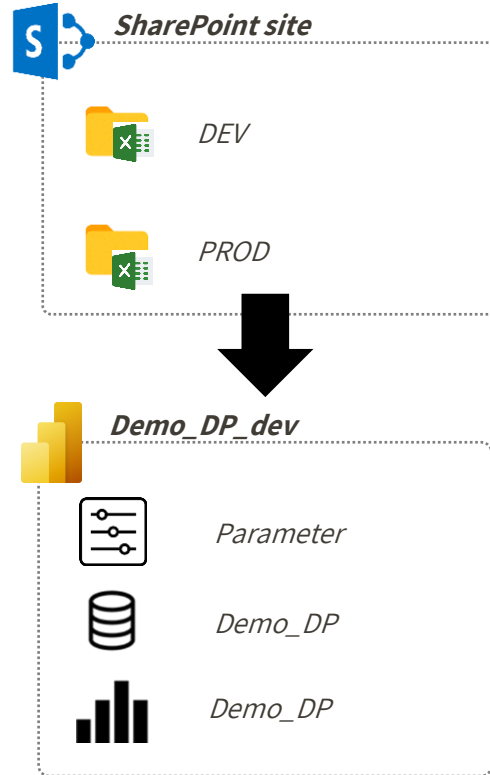
Apply Discard

▶ Scheduled refresh

▶ Q&A and Cortana

▶ Featured Q&A questions

Demo context (self service scale)





ALM - Parameter

- Home
- Conversations
- Documents**
- Shared with us
- Notebook
- Pages
- Site contents
- Recycle bin
- Edit

[+ New](#)
[Upload](#)
[Edit in grid view](#)
[Sync](#)
[Add shortcut to OneDrive](#)
[Export to Excel](#)
[Automate](#)

Documents

	Name	Modified	Modified By	+ Add column
	DEV	February 5	Demo User	
	PROD	February 5	Demo User	

File Home Transform Add Column View Tools Help

Close & Apply New Source Recent Sources Enter Data Data source settings Manage Parameters Refresh Preview Advanced Editor Manage Query Choose Columns Remove Columns Keep Rows Remove Rows Sort Split Column Group By Data Type: Binary Use First Row as Headers Replace Values Merge Queries Append Queries Combine Files Text Analytics Vision Azure Machine Learning

- Queries [7]
- Transform File from Data [3]
 - Sample Query [2]
 - Sample File
 - Sample File Parameter1 (Sample File)
 - Transform Sample File from Data
 - Transform File from Data
 - Other Queries [3]
 - EnvironmentSwitch (/DEV/)**
 - SharePoint Folder
 - Data

Table.SelectRows(Source, each Text.Contains([Folder Path], EnvironmentSwitch))

Content	Name	Extension	Date accessed	Date modified	Date created	Attributes	
1	Binary	Transactions_tm500.csv		5-2-2022 20:58:51	5-2-2022 20:58:51	Record	http

Query Settings

PROPERTIES

Name: SharePoint Folder

[All Properties](#)

APPLIED STEPS

- Source
- Filtered Rows

File Home Transform Add Column View Tools Help

Close & Apply New Source Recent Sources Enter Data Data source settings Manage Parameters Refresh Preview Properties Advanced Editor Manage Columns Remove Columns Keep Rows Remove Rows Sort Split Column Group By Data Type: Binary Use First Row as Headers Replace Values Merge Queries Append Queries Combine Files Text Analytics Vision Azure Machine Learning

Queries [7]

- Transform File from Data [3]
 - Sample Query [2]
 - Sample File
 - Sample File Parameter1 (Sample File)
 - Transform Sample File from Data
 - Transform File from Data
 - Other Queries [3]
 - EnvironmentSwitch (/PROD/)**
 - SharePoint Folder
 - Data

fx = Table.SelectRows(Source, each Text.Contains([Folder Path], EnvironmentSwitch))

	Content	Name	Extension	Date accessed	Date modified	Date created	Attributes	
1	Binary	Transactions_tm500.csv	.csv	null	5-2-2022 20:59:04	5-2-2022 20:59:04	Record	http
2	Binary	Transactions_tm1500.csv	.csv	null	5-2-2022 20:59:04	5-2-2022 20:59:04	Record	http
3	Binary	Transactions_tm1000.csv	.csv	null	5-2-2022 20:59:04	5-2-2022 20:59:04	Record	http
4	Binary	Transactions_tm2000.csv	.csv	null	5-2-2022 20:59:04	5-2-2022 20:59:04	Record	http
5	Binary	Transactions_tm2584.csv	.csv	null	5-2-2022 20:59:04	5-2-2022 20:59:04	Record	http

Query Settings

PROPERTIES
Name
SharePoint Folder
[All Properties](#)

APPLIED STEPS
Source
Filtered Rows

SharePoint Folder

Display Options ▾ ?

```
let
  Source = SharePoint.Files("https://datamarc.sharepoint.com/sites/ALM-Parameter/", [ApiVersion = 15]),
  #"Filtered Rows" = Table.SelectRows(Source, each Text.Contains([Folder Path], EnvironmentSwitch))
in
  #"Filtered Rows"
```

✓ No syntax errors have been detected.

Done

Cancel



Create a deployment pipeline

Use a pipeline to manage your workspace content through the deployment stages, continuously delivering the latest content to your users.

Deployment Pipelines

1 Create a pipeline

Start by creating the pipeline you'll use for managing and deploying the workspace content

2 Assign your workspace

Select your workspace and assign it to a deployment stage (development, test, or production).

3 Develop and test your content

Manage, preview, and compare your workspace content until it's ready for releasing to users

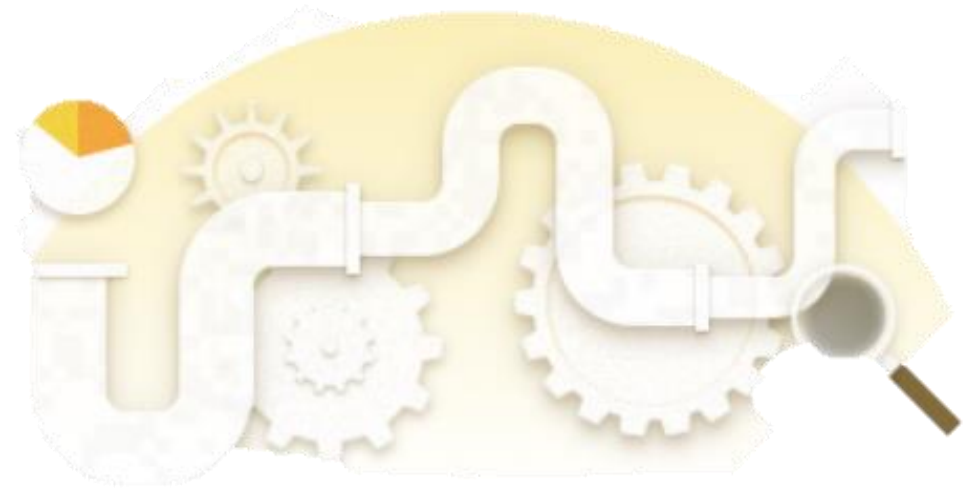
4 Share with your users

Deploy your content to production and share it with your organization

Create a pipeline

How it works

- Meta data deployment
- Incremental (selective) deployment
- Requires Premium!
- No versioning capabilities



Deployment pipeline overview



Pipeline Default Setup

Demo purposes

Deployment history Access Settings ...

Development [Learn more](#)

Design, review, and revise your content in a development workspace. When it's ready to test and preview, deploy the content to the test stage.

Test [Learn more](#)

Test and verify your content in a preproduction workspace. When it's ready to distribute, deploy the content to the production stage.

Production [Learn more](#)

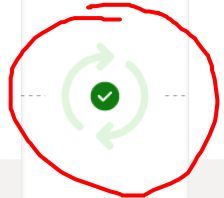
Your content has been tested and is ready to distribute to your consumers as an app or by access to the production workspace.

ALM - DEV

Dataflows: 0
Datamarts (Preview): 0
Datasets: 1
Reports: 1

Demo_Parameter
Demo_Parameter

Deploy to test



ALM - Test Deployed: 10/10/2022, 10:56:18 AM

Dataflows: 0
Datamarts (Preview): 0
Datasets: 1
Reports: 1

Demo_Parameter
Demo_Parameter

Deploy to production



ALM - Prod

Dataflows: 0
Datamarts (Preview): 0
Datasets: 0
Reports: 0

Publish app Update app

Deployment settings

Pipeline Default Setup
Demo purposes

Development [Learn more](#)
Design, review, and revise your content in a development workspace. When it's ready to test and preview, deploy the content to the test stage.

Test [Learn more](#)
Test and verify your content in a preproduction workspace. When it's ready to distribute, deploy the content to the production stage.

ALM - DEV

- Dataflows: 0
- Datamarts (Preview): 0
- Datasets: 1
- Reports: 1

Demo_Parameter

ALM - Test Deployed: 10/10/2022, 10:56:18 AM

- Dataflows: 0
- Datamarts (Preview): 0
- Datasets: 1
- Reports: 1

Demo_Parameter

Demo_Parameter

Show less ^ Publish app [Deploy to test](#)

Show less ^ Publish app [Deploy to production](#)

← Demo_Parameter

Create rules defining parameter values and data sources for this artifact. These rules will be applied when deploying to this stage. You can go to [artifact settings](#) to edit parameters directly. [Learn more](#)

Data source rules

There may be connections to other dataflows that aren't displayed here. During deployment we'll update these connections for you. You can see all the connections and impacted data sources in the lineage view.

[Open lineage view](#)

No rules were added yet
Define the data source that will be connected to this artifact.

[+ Add rule](#)

Parameter rules

For this parameter

Apply this value

EnvironmentSwitch

/PROD/



























[+ Add rule](#)

Rules will be applied when you deploy to this stage
To edit parameters and data sources directly, go to [artifact settings](#)

Deployment history

All Test Production

All

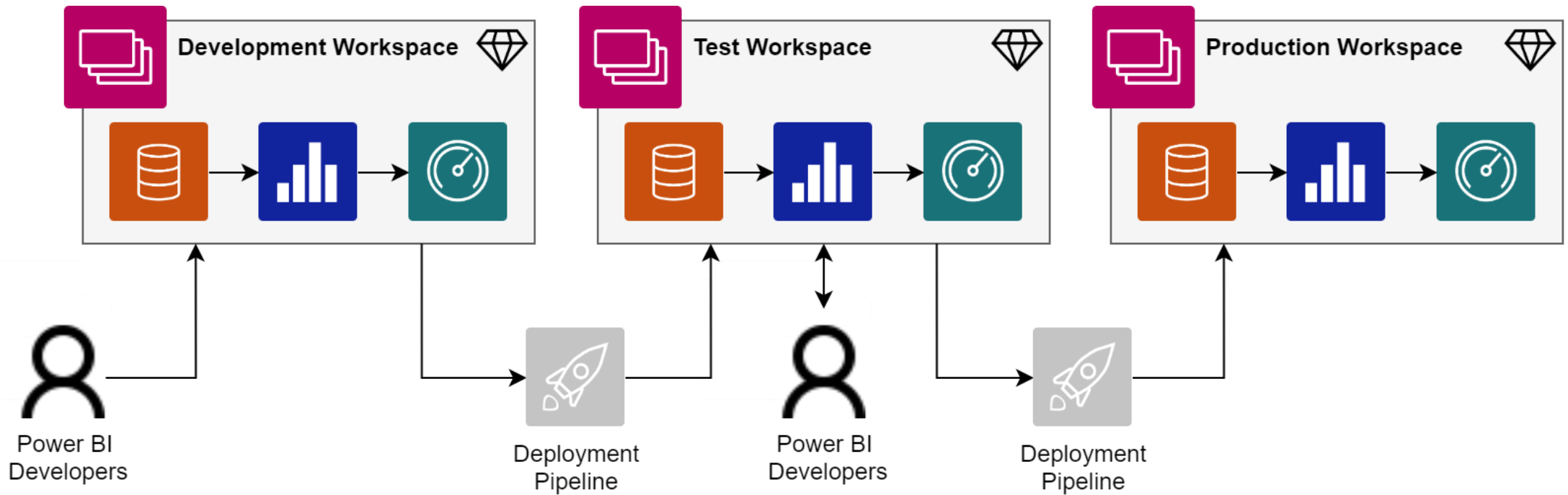
Deployed to	Date and time	Deployed by	Items	Note	ID	Status
Test	10/10/22, 10:56 AM	 Demo User				
Test deployment 10/10/22, 10:56 AM						
<u>Deployment preparing ALM for Power BI session</u>						
Test	10/08/22, 4:44 PM	 P... (Service Principal)				
Test	10/08/22, 4:27 PM	 P... (Service Principal)				
Test	09/09/22, 9:39 AM	 P... (Service Principal)				
Test	09/09/22, 9:22 AM	 P... (Service Principal)				
Test	08/25/22, 3:23 PM	 P... (Service Principal)	 			

Demo time!

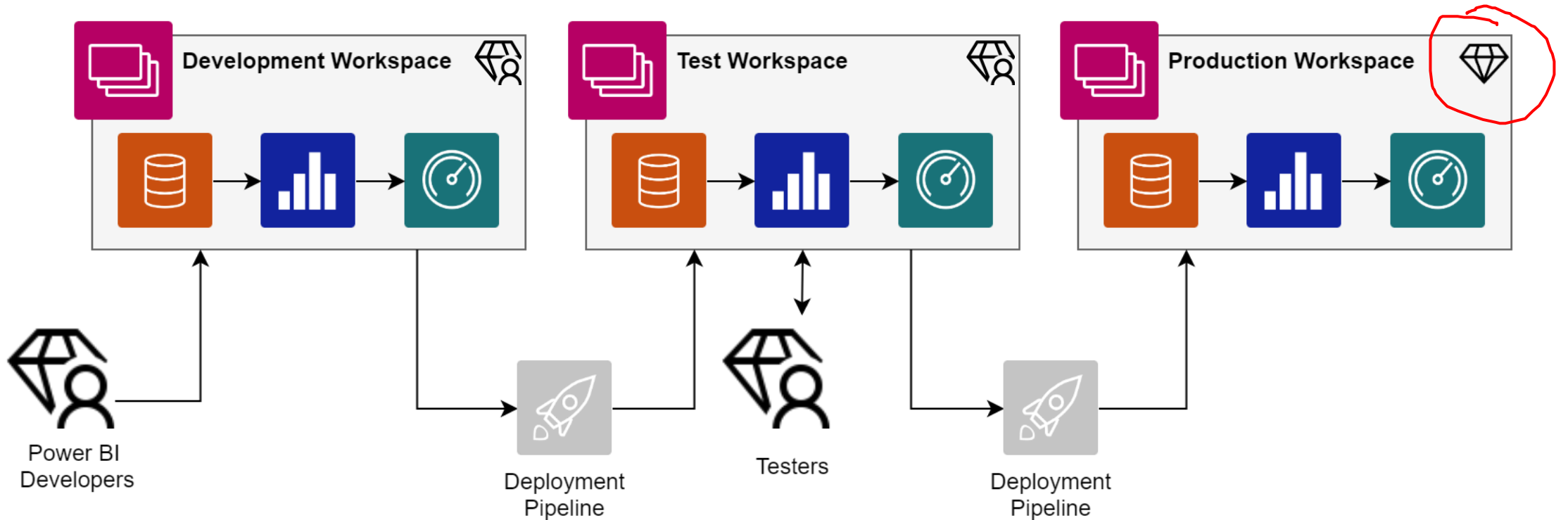
Because life is boring without risks



Default setup



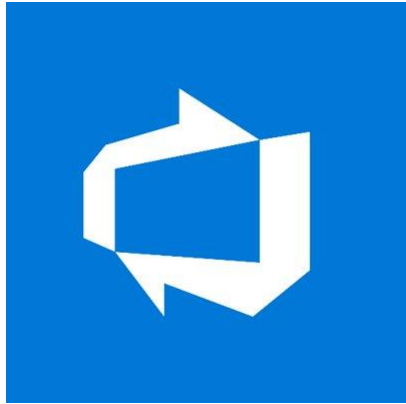
Possible option to lower capacity allocation



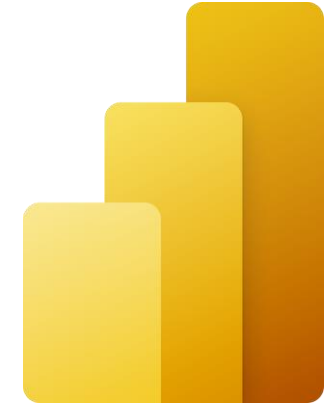
Integrate Power BI Deployment Pipelines with Azure DevOps



Deployment scenario (at enterprise scale)



Azure DevOps



Power BI Service

Azure DevOps



Azure Boards

Deliver value to your users faster using proven agile tools to plan, track, and discuss work across your teams.



Azure Test Plans

Test and ship with confidence using manual and exploratory testing tools.



Azure Pipelines

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



Azure Artifacts

Create, host, and share packages with your team, and add artifacts to your CI/CD pipelines with a single click.



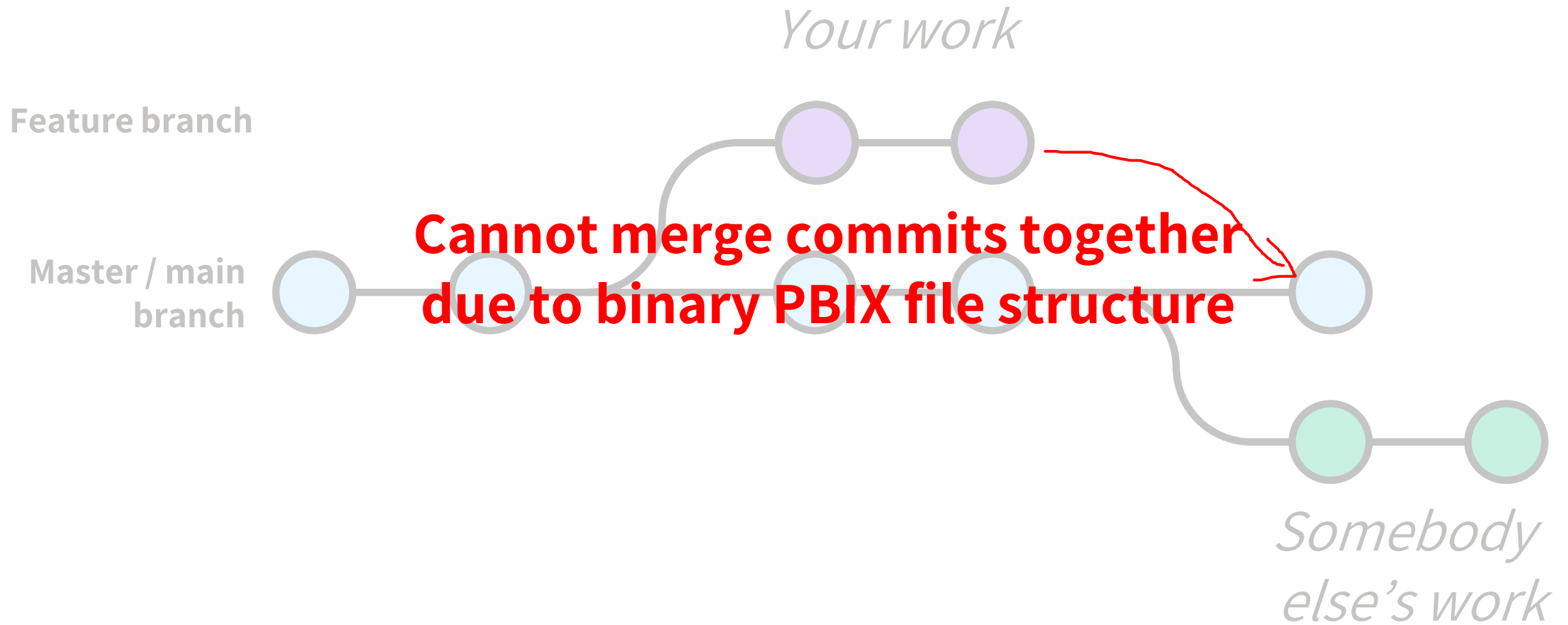
Azure Repos

Get unlimited, cloud-hosted private Git repos and collaborate to build better code with pull requests and advanced file management.

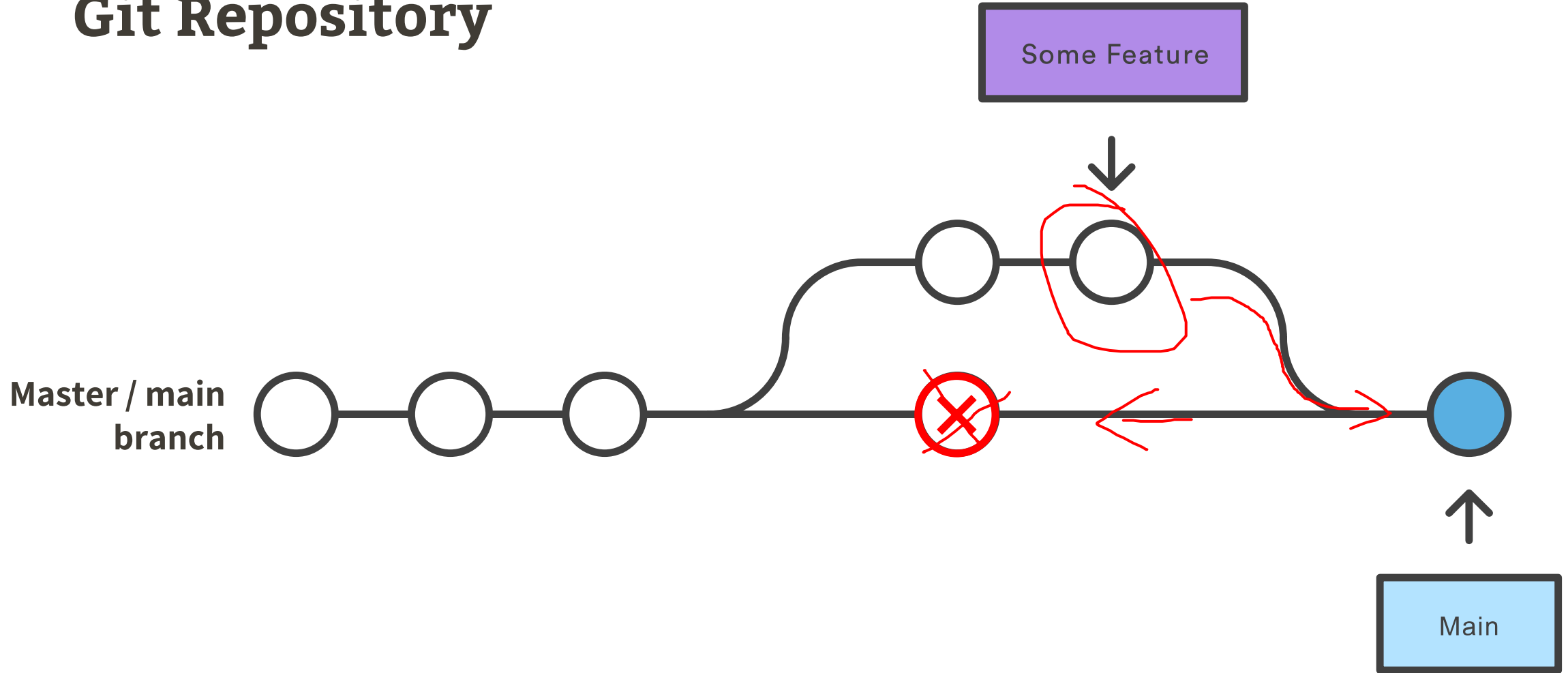
Extensions Marketplace

Access extensions from Slack to SonarCloud to 1,000 other apps and services—built by the community.

Git Repository



Git Repository



How to deal with Power BI files?



PBIX is binary – hard to track changes



PBIX can become extremely large – if it includes data







Don't want to store any secrets or passwords
(e.g. to data sources)

Azure DevOps

Repository

```
1 import React from 'react';  
2 import ReactDOM from 'react-dom';  
3 import App from './App';
```

CI/CD pipeline

	Code PackageFramework  master	Pushed	5 min ago
	Build mobile-tests	Succeeded	1 min ago
	Production web-deploy	In Progress	1 min ago

Azure resources

<http://fabrkiamfiber.azurewebsites.net>



Power BI REST API

HTTP

Copy

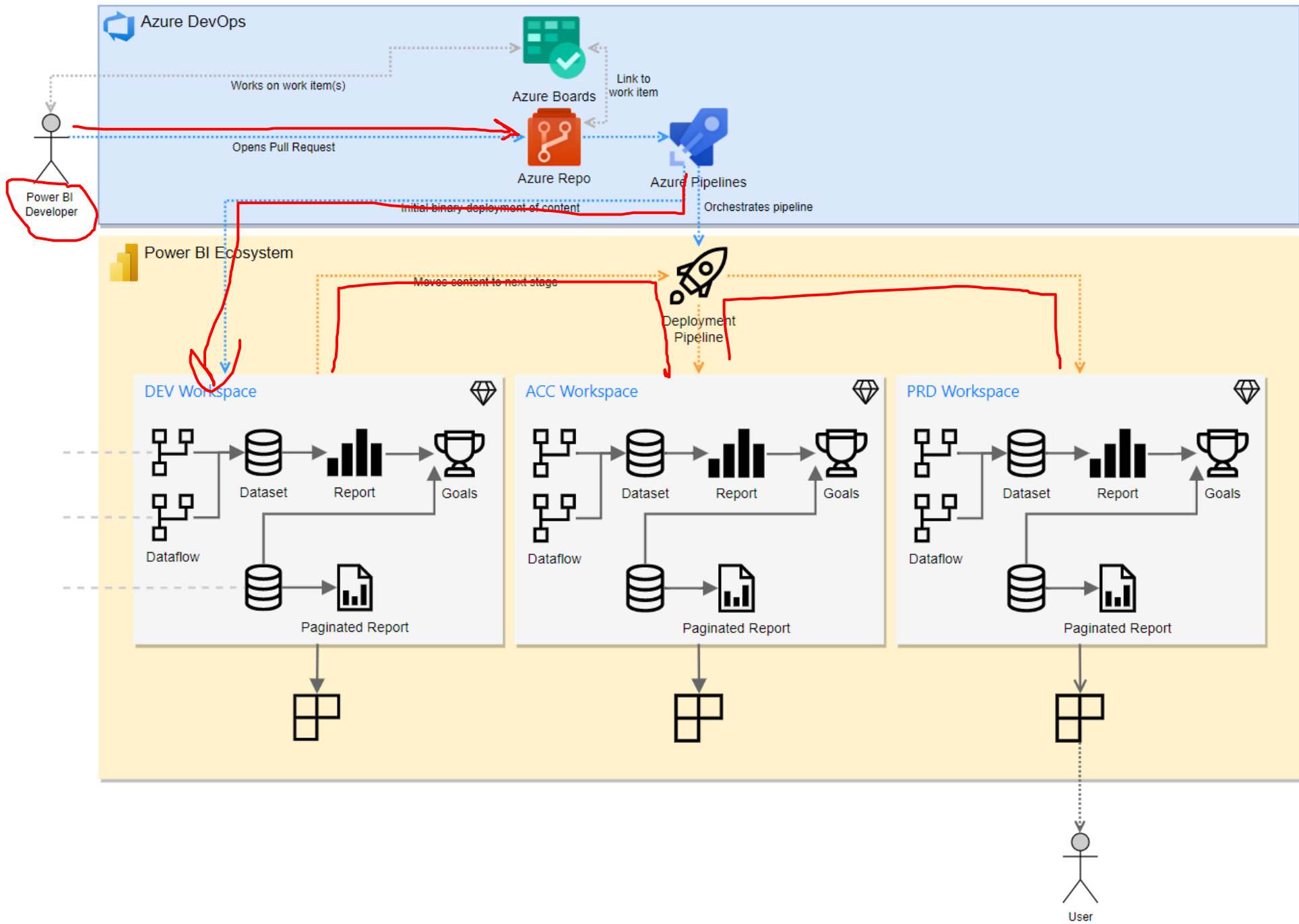
POST <https://api.powerbi.com/v1.0/myorg/pipelines/a5ded933-57b7-41f4-b072-ed4c1f9d5824/deployAll>

Request

JSON

Copy

```
{
  "value": [
    {
      "id": "1065e6a3-a020-4c0c-ada7-92b5fe99eec5",
      "type": "Deploy",
      "status": "NotStarted",
      "lastUpdatedTime": "2020-12-13T09:26:43.153",
      "executionStartTime": "2020-12-13T09:25:43.153Z",
      "executionEndTime": "2020-12-13T09:26:43.153Z",
      "sourceStageOrder": 0,
      "targetStageOrder": 1
    }
  ]
}
```



How to get the files in the repo?

Command line

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19044.2006]
(c) Microsoft Corporation. All rights reserved.

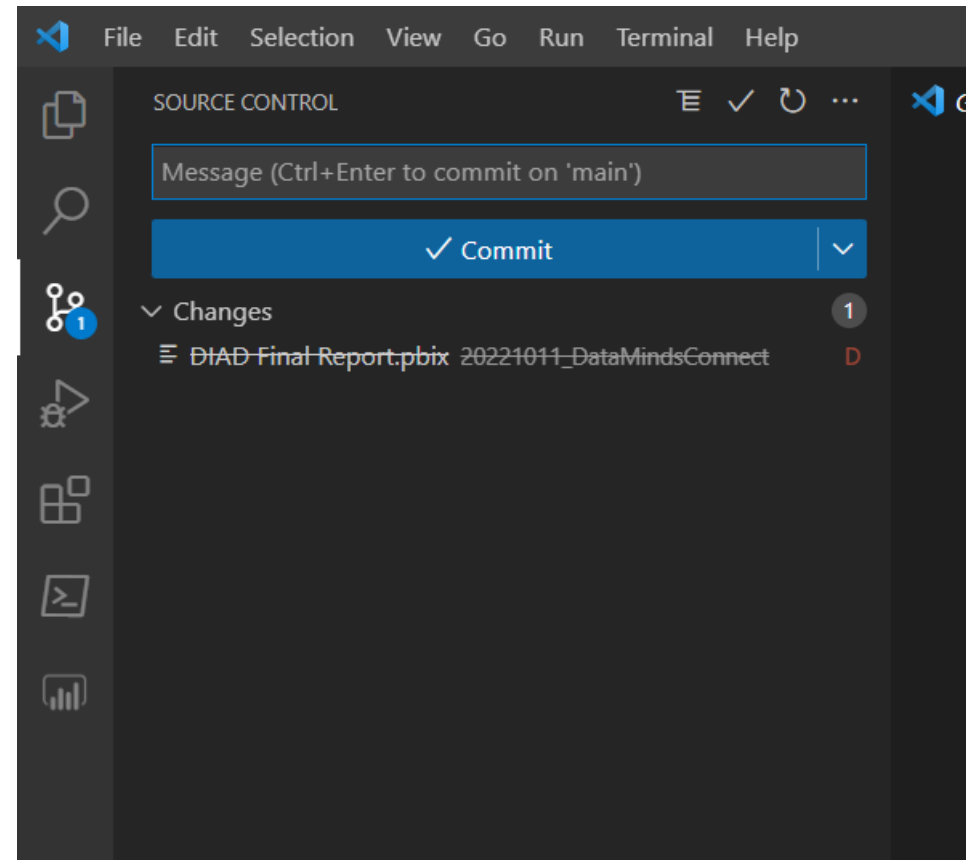
C:\Git\PBI%20Deployment%20Pipeline>git status
On branch main
Your branch is up to date with 'origin/main'.

Changes not staged for commit:
  (use "git add/rm <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
    deleted:    20221011_DataMindsConnect/DIAD Final Report.pbix

no changes added to commit (use "git add" and/or "git commit -a")

C:\Git\PBI%20Deployment%20Pipeline>git add .
```

Visual Studio Code



Demo time!

Because life is boring without risks



Things to keep in mind

Make sure permissions are set correctly!

- Add the Service principal to each stage workspace and the deployment pipeline itself
- Grant delegated API permissions to the service principal in AAD (Pipelines & workspace permissions)

Get the DevOps extension

- Macaw extension for binary file upload for dev + pipeline tasks
- Microsoft extension if you prefer MSFT managed task, but does not support binary file upload



Macaw Power BI Extensions

Macaw | 969 installs | (1) | Free

Power BI release manager tasks for VSTS.

Get it free

[Overview](#) [Q & A](#) [Rating & Review](#)

Macaw Power BI Extensions is a Build and Release Task for Azure Pipelines. With this tasks you can control your Power BI deployment in Azure DevOps

Actions that can be performed with this extension are:

- Group tasks
 - Create or Update Power BI workspace
 - Delete Power BI workspace
 - Write all workspace info to JSON logfile
- Report tasks
 - Create or Update Power BI Report
 - Delete Power BI Report
 - Delete Power BI DataSet
 - Update the datasources of the specified dataset
 - Update the parameters values for the specified dataset

For the custom task to work as it should, you need to configure the following parameters:

- ClientId: The client id of the native Azure Active Directory application. This application should have the appropriate rights in order to use the Power BI Api. To register an application, check the following URL: [Register an Azure AD app to embed Power BI content](#)
- Username: The username of the user that will perform the actions. Make sure the account does not have Multi

Agent phase

Run on agent



Power BI Group Tasks: CreateWorkspace

Power BI: Group Tasks



Power BI Report Task: CreateReport

Power BI: Report Tasks



Power BI Report Task: UpdateParameter

Power BI: Report Tasks

Categories

Azure Pipelines

Works with

Azure DevOps Services

Azure DevOps Server

Resources

License



Power BI automation tools

Microsoft | 📄 2,334 installs | ★★★★★ (0) | Free

Automate release management tasks related to Power BI deployment pipelines

Get it free

Overview

Q & A

Rating & Review

The Power BI [deployment pipelines](#) tool enables BI teams to build an efficient and reusable release process for their Power BI content. You can leverage the tasks in this Azure DevOps extension to integrate Power BI into your organization's automation process. Here are a few examples of what can be done using the extension:

- Manage Power BI pipelines from start to finish, including creating a pipeline, assigning a workspace to any stage, deploying and deleting the pipeline.
- Assign users to a pipeline.
- Assign users to a workspace.
- Deploy all/selected items in a Power BI pipeline to the next stage.

Learn more about using these tasks [here](#).

To get started with deployment pipelines, learn more [here](#).

Release Notes

Version	Remarks
1.0.2	Public preview release.

Add tasks

Refresh



Delete a deployment p

Delete a Power BI deployment

Categories

Azure Pipelines

Tags

dataset

Deployment Pipelines

PBIX

Power BI

release

Utility task

Works with

Azure DevOps Services

Wrap up

Professionalize your deployment process

Easy **roll-back** within pipelines

Versioning can be achieved with Git

Deployment pipelines is cool! But integration with **DevOps** is even more powerful

Combine them, as they are **better together!**

LET'S
RECAP...

Data – Marc

Blogging about everything related to Data and AI based on Microsoft technology



Integrate Power BI Deployment Pipelines with Azure DevOps

ON [JUNE 4, 2021](#) / BY [MARC](#)

/ IN [AZURE](#), [DEVELOPING](#), [POWER BI REST API](#), [POWER BI SERVICE](#), [POWERSHELL](#), [XMLA ENDPOINTS](#)

Back in 2019, [Ton Swart](#) and I wrote a blog post on [Versioning and CI/CD for Power BI with Azure DevOps](#). Back then, there were not many options available for versioning and professionalizing your ALM story for Power BI. Till today, this blog post is still my most read blog on Data-Marc.com which makes us proud.

SEARCH



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Thanks for attending!

<https://data-marc.com/?s=Deployment>



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