Task:

- Collect some meteorology information using API from https://www.metaweather.com/api/
- The data about air temperature, max and min temperature and humidity for yesterday and that date in a year ago on St. Petersburg.
- **Back-end (collects data) must:**

✓ Retrieve a portion of data from API and store it in a database

✓ Update data on demand

✓ Update DB schema if needed on app's update

- **Front-end (outputs data) must:**

✓ Display any portion of the data stored in the DB

✓ Provide a method to trigger data update process

- **Database:**

✓ Choose Database type and data scheme in a suitable manner.

✓ Data must be stored in a persistent way

✓ It's better to use cloud native DB solutions like an RDS/AzureSQL/CloudSQL.

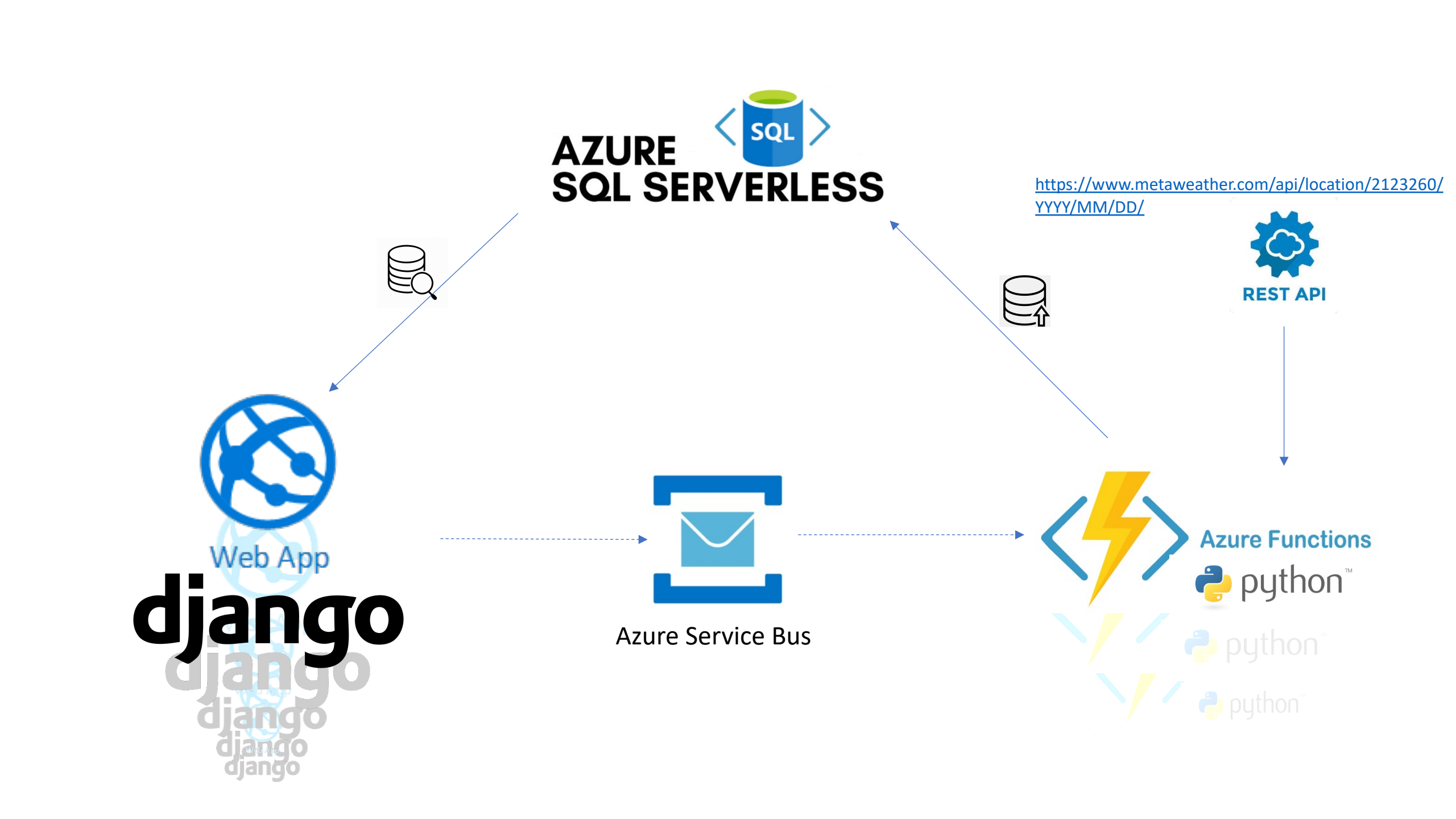
Personal Goals:

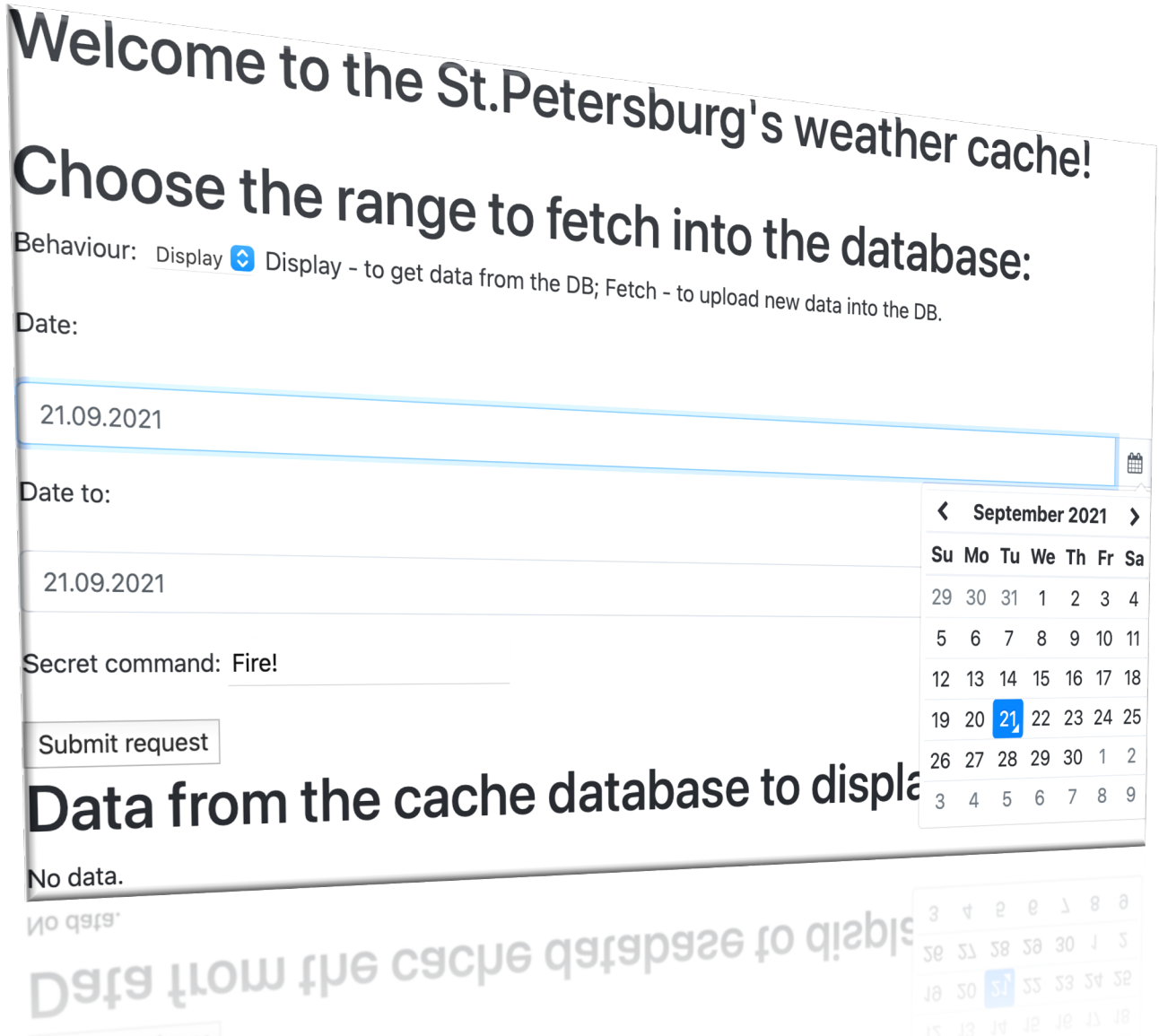
- Cheap
- Serverless
- Cloud-native
- Use MS tools and Azure DevOps service

Web App

AZURE
SQL SERVERLESS

Azure Functions


AZURE
SQL SERVERLESS
https://www.metaweather.com/api/location/2123260/
YYYY/MM/DD/
REST API
Web App
django
Azure Service Bus
Azure Functions
python



- Cloud-native
- Scalable
- Simple

https://github.com/users/devops-ci-cd/projects/1

Estimate of the costs for Azure resources
Azure Kubernetes Service

Microsoft Azure Estimate			
Kubernetes solution			
Service type	Region	Description	Estimated monthly cost
Azure Kubernetes Service (AKS)	West Europe	1 F1 (1 vCPU, 2 GB RAM) x 730 Hours (Pay as you go), Linux; 0 managed OS disks – S4, 0 clusters	€34.97
IP Addresses	West Europe	0 Dynamic IP Addresses, 1 Static IP Addresses, 0 Remaps	€2.22
Service Bus	West Europe	Basic tier: 1 million messaging operations/mo	€0.04
Azure Functions	West Europe	Consumption tier, 128 MB memory, 100 milliseconds execution time, 31 executions/mo	€0.00
Azure SQL Database	West Europe	Single Database, vCore, {1}, General Purpose, Serverless, Gen 5, Local Redundancy, 0.75 Billed vCores, 5 GB Storage, 0 GB Backup Storage	€11.83
Support		Support	€0.00
		Licensing Program	Microsoft Online Services Agreement
		Total	€49.05

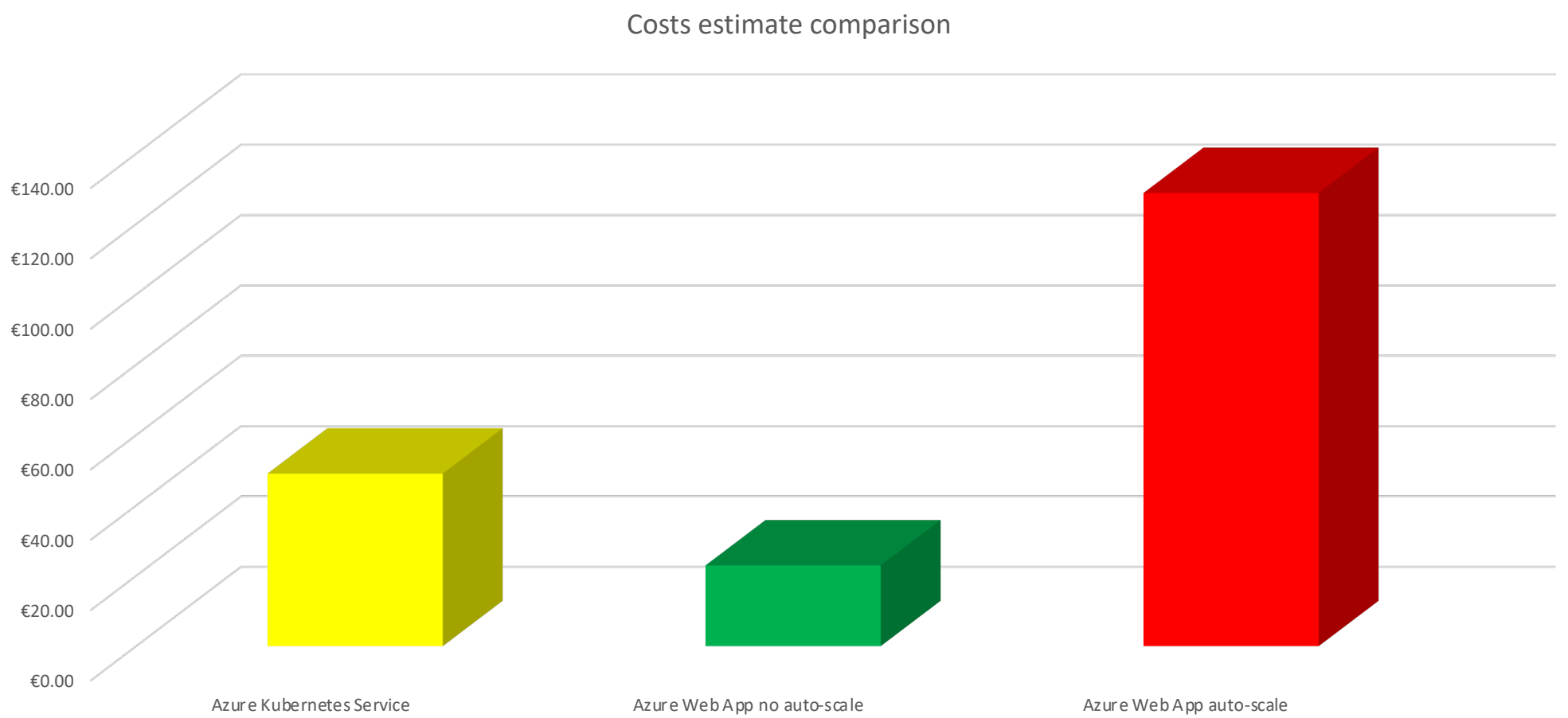
Estimate of the costs for Azure resources
Azure Web App no auto-scale

Microsoft Azure Estimate			
Azure Web App no auto-scale			
Service type	Region	Description	Estimated monthly cost
App Service	West Europe	Basic Tier; 1 B1 (1 Core(s), 1.75 GB RAM, 10 GB Storage) x 730 Hours; Linux OS	€11.08
Azure Functions	West Europe	Consumption tier, 128 MB memory, 100 milliseconds execution time, 31 executions/mo	€0.00
Service Bus	West Europe	Basic tier: 1 million messaging operations/mo	€0.04
Azure SQL Database	West Europe	Single Database, vCore, {1}, General Purpose, Serverless, Gen 5, Local Redundancy, 0.75 Billed vCores, 5 GB Storage, 0 GB Backup Storage	€11.83
Support		Support	€0.00
		Licensing Program	Microsoft Online Services Agreement
		Total	€22.95

Estimate of the costs for Azure resources
Azure Web App auto-scale

Microsoft Azure Estimate			
Azure Web App auto-scale			
Service type	Region	Description	Estimated monthly cost
App Service	West Europe	Standard Tier; 2 S1 (1 Core(s), 1.75 GB RAM, 50 GB Storage) x 730 Hours; Linux OS	€116.97
Azure Functions	West Europe	Consumption tier, 128 MB memory, 100 milliseconds execution time, 31 executions/mo	€0.00
Service Bus	West Europe	Basic tier: 1 million messaging operations/mo	€0.04
Azure SQL Database	West Europe	Single Database, vCore, {1}, General Purpose, Serverless, Gen 5, Local Redundancy, 0.75 Billed vCores, 5 GB Storage, 0 GB Backup Storage	€11.83
Support		Support	€0.00
		Licensing Program	Microsoft Online Services Agreement
		Total	€128.84

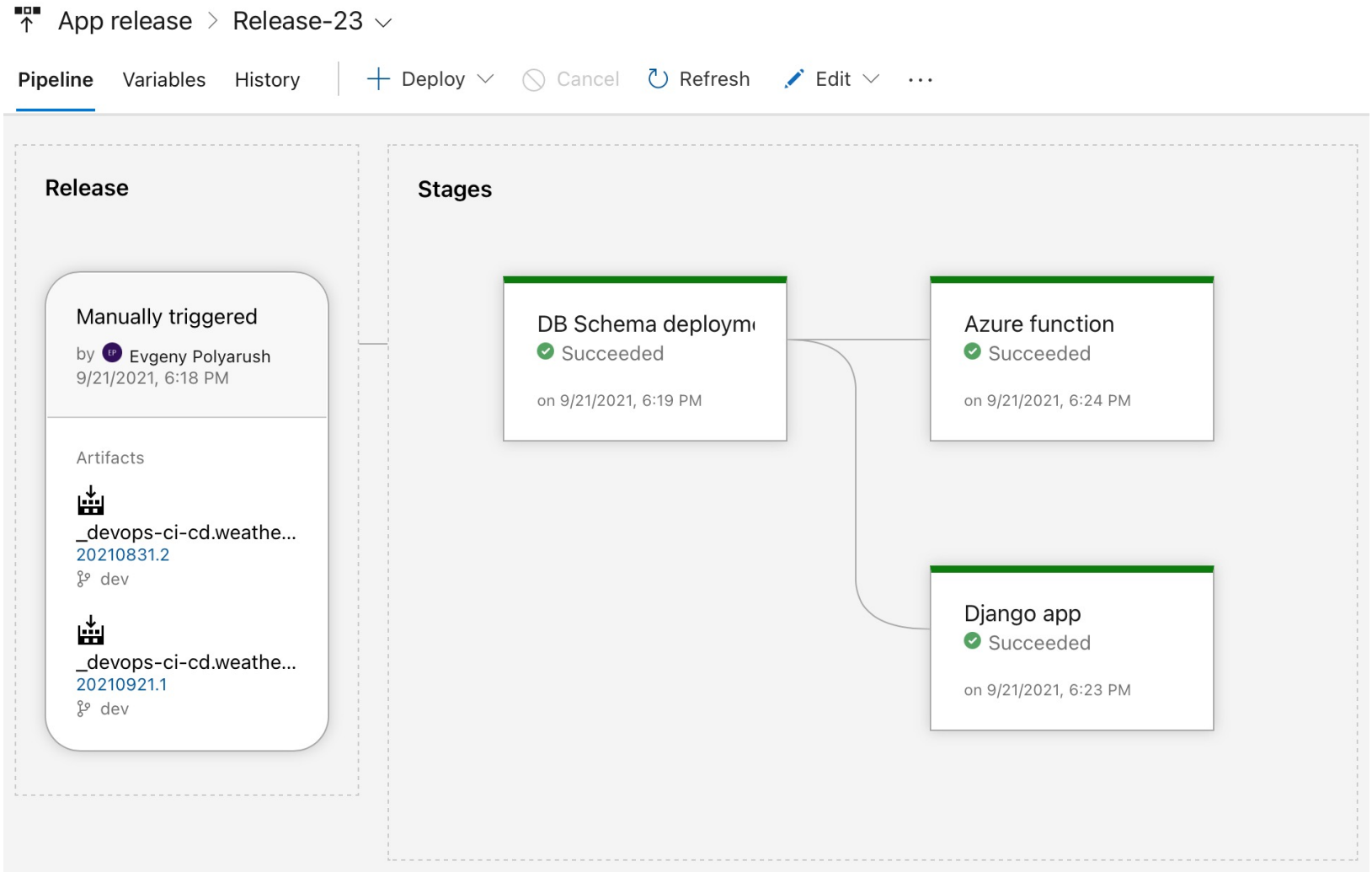
Summary on per month estimate



The DevOps workflow

- Based on Azure DevOps CI/CD portal
- GitHub instead of built-in Azure DevOps Repos
- Individual repo for each team (Infrastructure, Frontend, Backend)
- Two separate pipelines: Infrastructure and Application
- A GitHub commit triggers building pipeline, new build triggers release pipeline
- Yaml pipeline for Builds, classic pipelines for Releases
- Infrastructure resource names are always unique, so the Release can be reused

The DevOps workflow



Issues

- A Release retains snapshot of global variables, so depended releases must be recreated to use new values
- Error: "Requested feature is not available in resource group EPM-RDSP. Please try using a different resource group or create a new one.” It is not possible to create Linux Azure App Service if another App Service already exists in rg https://docs.microsoft.com/en-us/azure/app-service/overview#limitations
- Python Azure function requires specific app config (env variables) to be deployed correctly