

Piotr Rogala

Azure lessons learned



Future Processing



Demand



Chmurowisko



Expert Summit 2022

All about Microsoft® technologies

ONLINE

Sala A

Godz. 11:30

Azure “lessons learned”



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Piotr Rogala

Working in



Senior Azure Cloud Architect Lead

Blog



MVP Azure



Group leader



Microsoft Azure
User Group Poland



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Questions?



JustCloud.pl

O mnie

Blog

Meetup's

Kontakt



Kontakt

Jeśli chcesz się ze mną skontaktować to możesz to zrobić za pomocą tego formularza lub poprzez [LinkedIn](#), do zobaczenia!

E-mail

Message

Send message

Agenda

1. **Platform** - Azure and best practices
2. **Costs and automation** - \$ in project
3. **DevOps** - why?
4. **Planning** - the best approach to implementation
5. **Summary**





Platform

Azure and best practices

Platform



Regiony	Polska Środkowa
Już wkrótce	
LOKALIZACJA	Warszawa
ROK OTWARCIA	Coming soon
OBECNOŚĆ STREF DOSTĘPNOŚCI	Już wkrótce
Zgodność	Oferty platformy Azure z zakresu zgodności
REZYDENCJA DANYCH	Stored at rest in Poland Dowiedz się więcej
ODZYSKIWANIE PO AWARII	Już wkrótce
PRODUKTY WEDŁUG REGIONÓW	Coming soon
DOSTĘPNA DLA	Już wkrótce

<https://azure.microsoft.com/pl-pl/explore/global-infrastructure/geographies/#geographies>

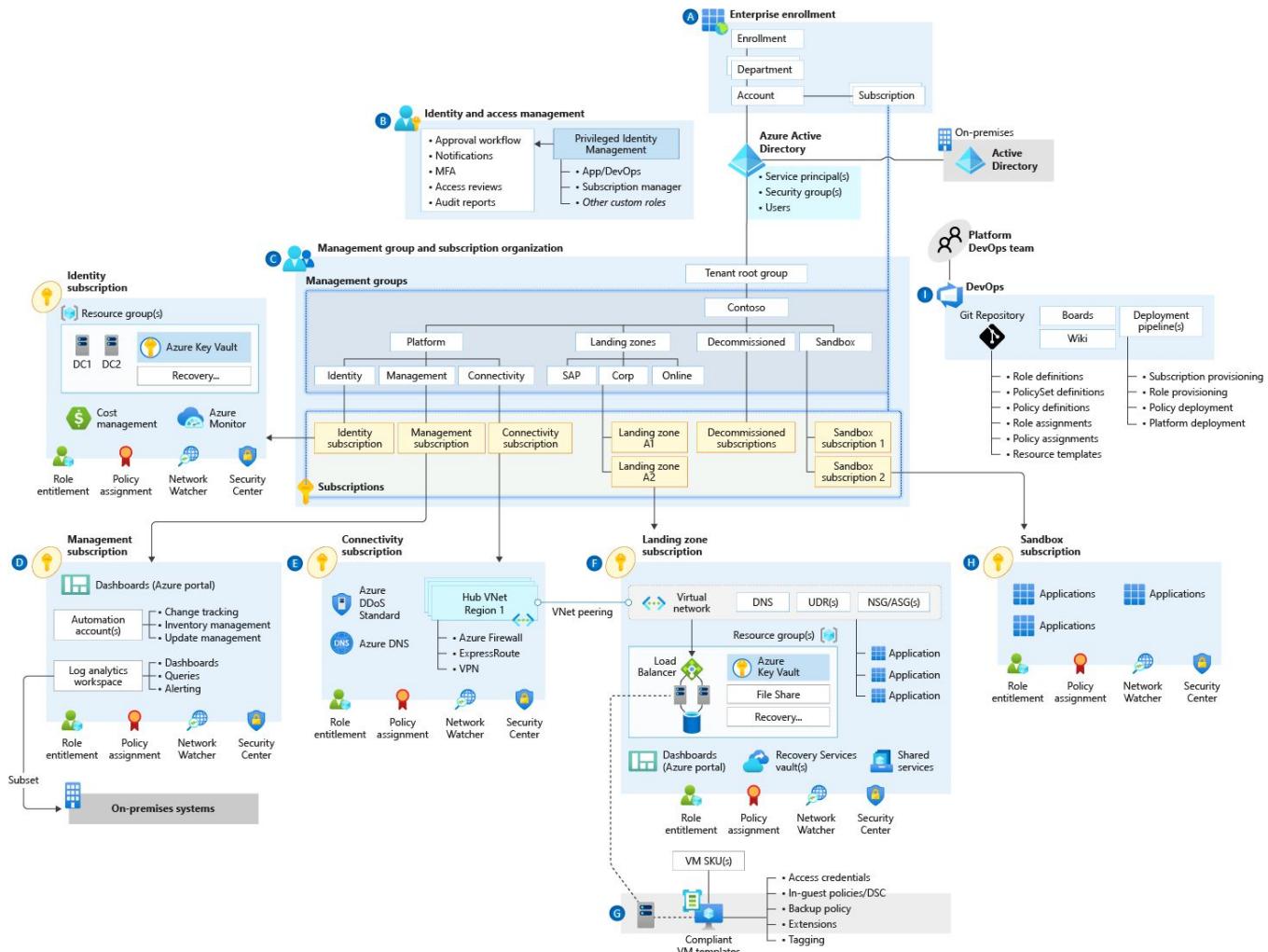
Platform

Landing Zone

<https://learn.microsoft.com/en-us/azure/cloud-adoption-framework/ready/landing-zone>

Options:

<https://learn.microsoft.com/en-us/azure/cloud-adoption-framework/ready/landing-zone/implementation-options>



Costs and automation

\$ in project



Costs

- Cost management
- Budget
- Calculator
 - <https://azure.microsoft.com/en-us/pricing/calculator/>
- Remove resources after tests
 - Automation
- Start / Stop VM
 - Automation

The screenshot displays the Azure Cost Management portal interface. At the top, it shows subscription details: Subscription ID, Directory (Microsoft), My role (Contributor), Offer (Enterprise MSDN Dev/Test), and Offer ID (MS-AZR-0148P). It also indicates the subscription name (Trey Research R&D Playground), current billing period (2/1/2019-2/28/2019), currency (USD), and status (Active).

The main area is divided into several sections:

- Costs by resource:** A donut chart showing resource costs: 182.91 USD (monthvstanopee for screenfarm), 63.50 USD (synthdrivel), 138.40 USD (screenfarm), and 27.75 USD (Others).
- Spending rate and forecast:** A line graph showing spending over time. The Y-axis represents spending in USD (0 to 1,600). The X-axis shows dates from 02/03 to 02/24. The graph shows a sharp increase in spending, starting around 312.56 USD on 02/03 and reaching a forecasted total of 1.46 K USD by 02/24.
- Budgets:** A list of budgets with their names, scopes, creation dates, expiration dates, budgets, forecasts, evaluated spends, and progress percentages.

Name	Scope	Creation date	Expiration date	Budget	Forecasted	Evaluated spend	Progress
EAAccount-BoTest...	(Billing acc...)	2/1/2021	1/31/2023	\$100.00	\$0.00	\$0.00	0.00%
EAAccount-BoTest-A...	(Enrollment ...)	2/1/2021	1/31/2023	\$100.00	\$0.00	\$0.00	0.00%
Pri_Forecast	(Billing acc...)	2/1/2021	2/28/2022	\$100.00	\$120.5K	\$26,046	100.00%
Pri_actualForecast	(Billing acc...)	2/1/2021	1/31/2023	\$200.00	\$120.5K	\$26,046	100.00%
EAAccount-BoTest-B...	(Department)	2/1/2021	1/31/2023	\$100.00	\$4,572	\$1,088	100.00%
Pri_EdgecaseTest	(Billing acc...)	2/1/2021	2/28/2022	\$100.00	\$515.23	\$131.43	100.00%
ACM_Department_B...	(Department)	10/1/2019	9/30/2021	\$55,000.00	0	\$4,272	7.77%
Enrollment_budget	(Billing acc...)	4/1/2020	3/31/2022	\$45,000.00	0	\$26,046	57.88%
ACM	(Billing acc...)	8/1/2020	7/31/2022	\$30,000.00	0	\$0.00	0.00%
JoTestBudget	(Billing acc...)	11/1/2020	10/31/2022	\$50,000.00	0	\$26,046	52.09%
DemoTestBudget	(Billing acc...)	12/1/2020	11/30/2022	\$40,000.00	0	\$26,046	65.12%
ClaroTIGT	(Billing acc...)	12/1/2020	11/30/2022	\$35,000.00	0	\$26,046	74.42%

Orphaned items

- Something generates costs

Microsoft Azure

Search resources, services, and docs (G+)

Dashboard > Virtual machines > wsb-work > test-us-1

test-us-1 | Protected resources

DDoS protection plan

Add Refresh

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

VNET Firewall Application Gateway Bastion Host Load balancers

Filter by name... Subscription == 4 selected

Showing 0 to 0 of 0 records.

No results.

Resource group

PowerShell

```
PS /home/piotr> Get-AzDdosProtectionPlan -ResourceGroupName test-us-1
```

Name	Id	Etag	ProvisioningState	VirtualNetworks
test-us-1	/subscriptions/.../resourceGroups/.../providers/Microsoft.Network/ddosProtectionPlans/test-us-1	W/"572fbeb...53e"	Succeeded	[{"Id": "/subscriptions/.../resourceGroups/.../providers/Microsoft.Network/virtualNetworks/...-work-vnet"}]

Notifications

More events in the activity log →

Dismiss all

! Executed delete command on 1 selected items

Succeeded: 0, Failed: 1, Canceled: 0.

Error details

[test-us-1](#): DDoS Protection Plan /subscriptions/.../resourceGroups/.../providers/Microsoft.Network/ddosProtectionPlans/test-us-1 cannot be deleted because it is in use with virtual networks /subscriptions/.../resourceGroups/.../virtualNetworks/...-work-vnet. Please disable DDoS standard on the virtual network as explained in the documentation link : <https://docs.microsoft.com/en-us/azure/virtual-network/manage-ddos-protection#disable-ddos-for-a-virtual-network>. (Code: InUseDdosProtectionPlanCannotBeDeleted)

See less ^

9 minutes ago

Unexpected costs

Microsoft Azure Sponsorship

C

8

Subscription Cost: \$7707.56

SERVICE NAME	SERVICE RESOURCE	SPEND
Azure DDOS Protection	Standard Plan	\$5336.18
Application Gateway	Standard Fixed Cost	\$509.07
Storage	Cool LRS Data Stored	\$261.21
Security Center	Standard Node	\$208.9
Container Registry	Premium Registry Unit	\$174.94
Azure App Service	P1 v2 App	\$163.81
Azure Database for MySQL	2 vCore	\$158.32

ACE (Azure Cost Estimator)



kamil-mrzyglod Kamil Mrzygłód

<https://github.com/TheCloudTheory/arm-estimator>



Automated cost estimation of your Azure infrastructure made easy. Works with ARM Templates and Bicep.

Demo

Run configuration:

```
--> SubscriptionId: f81e70a7-e819-49b2-a980-8e9c433743dd
--> Resource group: arm-estimator-uksouth-rg
--> Template file: templates/backup.json
--> Deployment mode: Incremental
--> Threshold: Not Set
--> Parameters file: Not Set
--> Currency: EUR
--> Generate JSON output?: True
```

What If status:

```
--> Waiting for response from What If API.
--> Detected 12 resources.
```

```
[Create] ace-vm-01 [Microsoft.Compute/virtualMachines]
[Create] ace-vm-02 [Microsoft.Compute/virtualMachines]
[Create] ace-nic-01 [Microsoft.Network/networkInterfaces]
[Create] ace-nic-02 [Microsoft.Network/networkInterfaces]
[Create] ace-nsg [Microsoft.Network/networkSecurityGroups]
[Create] ace-pip-01 [Microsoft.Network/publicIPAddresses]
[Create] ace-pip-02 [Microsoft.Network/publicIPAddresses]
[Create] ace-vnet [Microsoft.Network/virtualNetworks]
[Create] ace-vault [Microsoft.RecoveryServices/vaults]
[Create] vm;iaasvmcontainerv2;arm-estimator-uksouth-rg;ace-vm-01 [Microsoft.RecoveryServices/vaults/backupFab
[Create] vm;iaasvmcontainerv2;arm-estimator-uksouth-rg;ace-vm-02 [Microsoft.RecoveryServices/vaults/backupFab
[Create] ace-backup-policy-01 [Microsoft.RecoveryServices/vaults/backupPolicies]
```

Estimations:

```
[Create] ace-vm-01
  \--- Type: Microsoft.Compute/virtualMachines
  \--- Location: EU West
  \--- Total cost: 29.57 EUR
  \--- Delta: +29.57 EUR
```

Aggregated metrics:

```
--> A1 v2 | Virtual Machines Av2 Series | A1 v2 | 0.0405 for 1 Hour
```

Daily automation

- Infrastructure as Code
 - Landing Zone
- Secrets monitoring
- Monitoring for automation
 - Automation account
 - Function App
- Automation for removing test resources



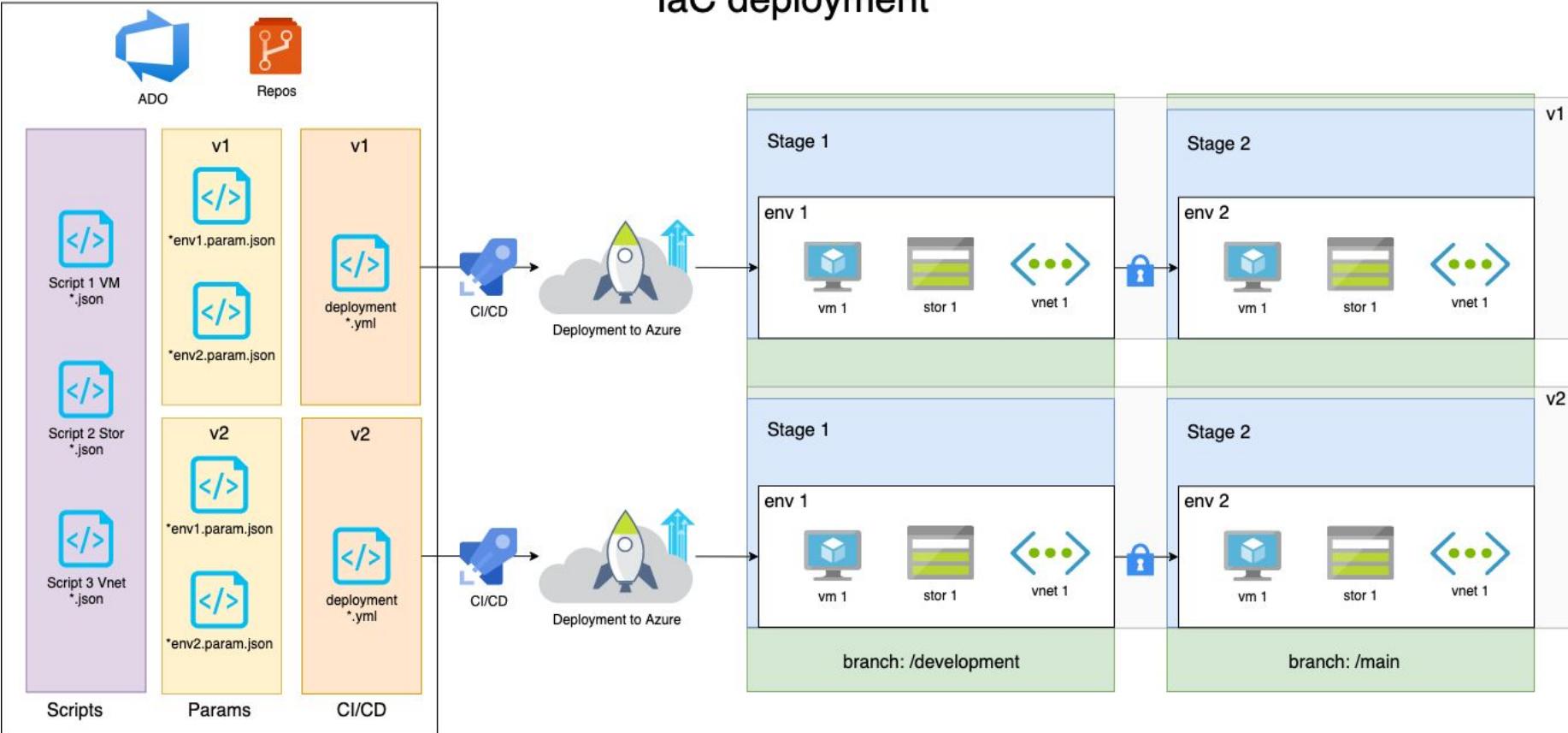
Infrastructure as Code (IaC)

- Infrastructure as code
- Templates
- ARM / Bicep templates
 - Terraform
 - Scripts
 - PowerShell
 - CLI
- The code must be manageable
- Deployment must run idempotently
- Using Git and CI / CD
- Can be recovered in the event of a failure
- Documentation = Code

The screenshot shows a code editor interface with several files open. On the left, the file tree (EXPLORER) includes .env, docker-compose.yml, BACKEND (contracts, docs, scripts, src, storage, test), .dockerignore, .env, .env.stage, .env.test, .gitignore, .npmrc, .nycrc, .travis.yml, apiary.apib, custom-entrypoint.sh, docker-compose.prod.yml, docker-compose.stage.yml, docker-compose.yml (which is the active tab), Dockerfile, Dockerfile.prod, Jenkinsfile, LICENSE, Logo.png, package.json, README.md, rpc.dev.Dockerfile, and rpc.mainnet.Dockerfile. On the right, the content of the docker-compose.yml file is displayed:

```
version: '2'
services:
  ico:
    image: jincort/backend-ico-dashboard
    build:
      context: ./
      dockerfile: Dockerfile
    ports:
      - 80:3000
      - 3000:3000
      - 443:4000
    links:
      - auth
      - redis
      - verify
      - rpc
    volumes:
      - ./:/usr/src/app
    depends_on:
      - rpc
      - mongo
    tty: true
  networks:
    default:
      ipv4_address: 10.100.0.2
  auth:
    image: jincort/backend-auth:product
    environment:
      REDIS_HOST: redis
      REDIS_PORT: 6379
      FORCE_HTTPS: disabled
      JWT_KEY: "uZrJ!xe*xN?!,oU.u*;QOSM"
      THROTLER_WHITE_LIST: "127.0.0.1,10.100.0.2"
      TENANT_WHITE_LIST: "127.0.0.1,10.100.0.2"
    ports:
      - "3000"
      - "4000"
    links:
      - redis
```

IaC deployment



Secrets monitoring

Run Time range : Last 24 hours Save Share New alert rule Export Pin to

```
1 AppRegistrationExpiration_CL
2 | where Status_s == "Expired" or Status_s == "ExpiringSoon"
3 | project DisplayName_s, ObjectId_g, ApplicationId_g, Status_s, DaysToExpiration_d, Type
```

...

Results Chart 

ObjectId_g	ApplicationId_g	Status_s	DaysToExpiration_d
c	e0 9a	0	Expired -339
E	b7a 15c	e	ExpiringSoon 11
E	c4 ef8	04	ExpiringSoon 11
f	1 e9	13	ExpiringSoon 11
E	cc ebl	3	ExpiringSoon 11
E	ca 20	5d	Expired -295
E	ca 20	5d	Expired -296
c	'6a6 8c	b	Expired -366
f	b274441-180-4633-914-31871338482	Evnired	-507

Secrets monitoring



⚠ Your Azure Monitor alert was triggered

We are notifying you because there are 18 counts of "Monitoring-AppRegistrationExpiration-v1".

Essentials

Name	Monitoring-AppRegistrationExpiration-v1
Description	AppRegistrationExpiration - please check App Registration keys or certificates in Azure Active Directory. v1
Severity	1
Resource	justcloud-log
Search interval start time	September 18, 2022 9:36:15 UTC
Search interval duration	1440 min

Insights

Top 10 result(s)

DisplayName_s	auf ud:
ObjectId_g	dc
ApplicationId_g	9e
Status_s	Expired
DaysToExpiration_d	-339
Type	AppRegistrationExpiration_CL
DisplayName_s	Az 8a
ObjectId_g	5c
ApplicationId_g	15d
Status_s	ExpiringSoon
DaysToExpiration_d	11
Type	AppRegistrationExpiration_CL

Azure Monitor

- Alerts v1 and v2
- Max 48h

v1

⚠ Your Azure Monitor alert was triggered

We are notifying you because there are 6 counts of "Monitoring-KeyVaultExpiration-v1".

Essentials

Name	Monitoring-KeyVaultExpiration-v1
Description	KeyVaultExpiration_CL - please check in Key Vault secrets, keys or certificates. v1
Severity	1
Resource	justcloud-log
Search interval start time	September 18, 2022 9:33:08 UTC
Search interval duration	1440 min

[View results >](#)

Search query

```
KeyVaultExpiration_CL
| where Status_s == "Expired" or Status_s == "ExpiringSoon"
| project VaultName_s, Name_s, Id_s, Expires_DateTime_s, Status_s, DaysToExpiration_d, ItemType_s
```

Insights

Top 10 result(s)

VaultName_s	justcloudvault
Name_s	test-secret-1
Id_s	https://...

v2

Fired:Sev3 Azure Monitor Alert Monitoring-AppRegistrationExpiration-v2 on justcloud-log (microsoft.operationalinsights/workspaces) at 9/19/2022 10:21:31 PM

[View the alert in Azure Monitor >](#)

Summary

Alert name	Monitoring-AppRegistrationExpiration-v2
Severity	Sev3
Monitor condition	Fired
Affected resource	justcloud-log
Resource type	microsoft.operationalinsights/workspaces
Resource group	lab-la
Subscription	Microsoft Azure Sponsorship
Description	Monitoring-AppRegistrationExpiration-v2
Monitoring service	Log Alerts V2
Signal type	Log
Fired time	September 19, 2022 22:21 UTC
Alert ID	50fcc794-25df-26b6-634f-538c51b99342
Alert rule ID	https://portal.azure.com/#blade/Logs/UpdateLogSubscription/98%2Fresource%2f.insights%2fRegistrationEvent

[Filtered search results](#) [View query results](#)
[Search results](#) [View query results](#)

Monitoring automation

Automation Account

WVDAutoScaleAutoAccwestus
Automation Account

Search (Ctrl+ /) Delete Move Feedback Refresh

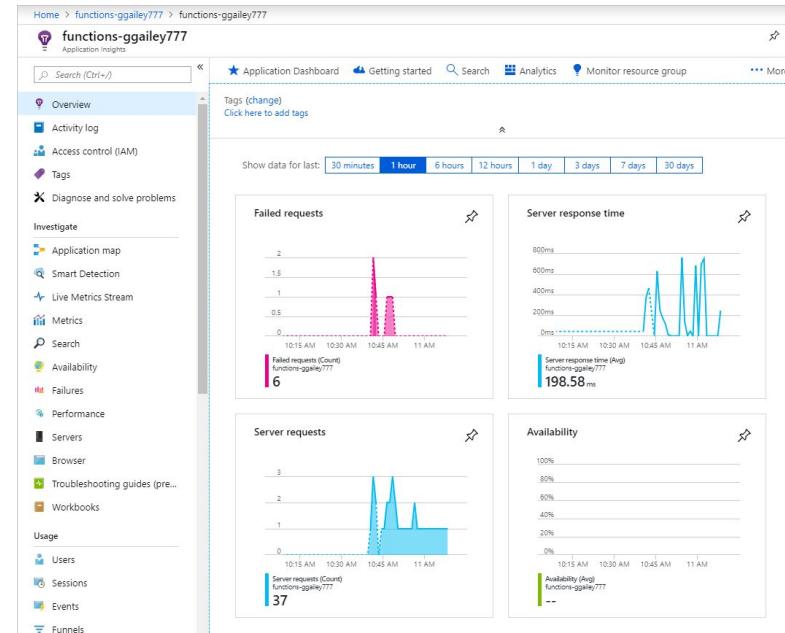
Resource group... : rcmsdev-wvd
Location : West US
Subscription (change) : RCMS_Dev
Tags (change) : Click here to add tags

Job Statistics Last 24 Hours

Status	Count
Failed	22
Suspended	0
Completed	0
Running	0
Queued	0
Stopped	0

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Configuration Management Inventory Change tracking State configuration (DSC) Update management Update management Process Automation Runbooks Jobs

Function App



Auto remover and start/stop

Dashboard > Automation Accounts > lab-aa | Runbooks > Import a runbook >

Browse Gallery ...

Automation runbooks have been integrated with GitHub. All the runbooks can be found [here](#). Share your runbooks and contribute to the Automation community.

Dashboard > Automation Accounts > lab-aa | Runbooks > Import a runbook >



remove

Remove Az Empty Resource Group

PowerShell Runbook



Very simple powershell function which is meant to remove all empty resource groups which are found. Function is accepting empty and remove

Tags: Microsoft Azure, Resource Groups

Parallel complete removal of Azure VM resources based on VM resource tags

PowerShell Workflow Runbook



This solution completely removes Azure VM resources in Azure subscription based on resource tags using PowerShell Workflow. Managed/unmanaged OS/Data disks

Tags: Azure, Microsoft Azure, Powershell

Remove python 2 package from Automation account

Python 2 Runbook



This Azure Automation runbook runs in Azure to remove a package from Azure Automation. It requires the subscription id, all packages.

Tags: Azure Automation, Python

Browse Gallery ...

Automation runbooks have been integrated with GitHub. All the runbooks can be found [here](#). Share your runbooks and contribute to the Automation community.

resource group

Start Azure V2 VMs

Graphical Runbook



This Graphical PowerShell runbook connects to Azure using an Automation Run As account and starts all V2 VMs in an Azure subscription or in the ass

Tags: Azure Virtual Machines, Start VM, GraphicalPS

Stop Azure V2 VMs

Graphical Runbook



This Graphical PowerShell runbook connects to Azure using an Automation Run As account and stops all V2 VMs in an Azure subscription or i

Tags: Azure Virtual Machines, Stop VM, GraphicalPS

Scheduled Virtual Machine Shutdown/Startup

PowerShell Runbook



Automates the scheduled startup and shutdown of Azure virtual machines. Schedules are implemented by tagging VMs or resource groups w

Tags: VM Lifecycle Management, Dev / Test Environments



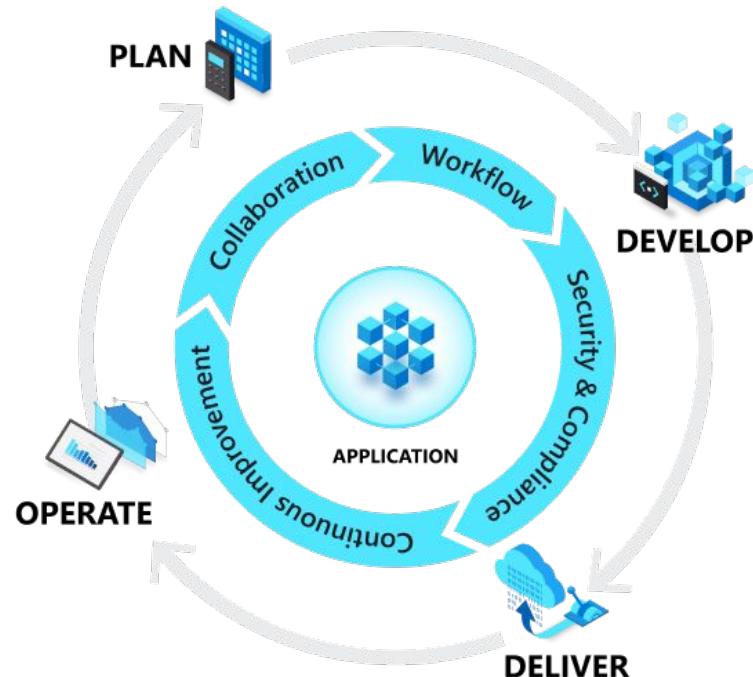
**TEAM
WORK**

DevOps

why?

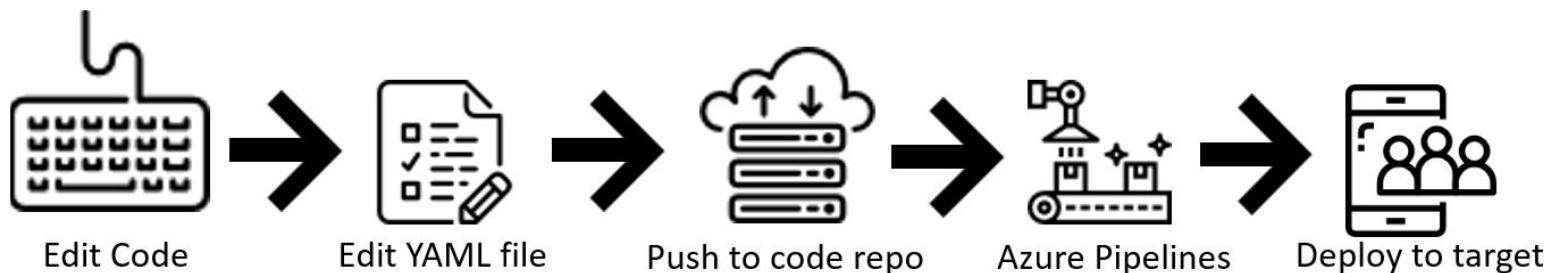
What is DevOps?

- Team
- Delivering value
- Automation
- Feedback
- Improvement
- ... over and over again



Azure DevOps - Pipelines

- CI and CD process
- Supports YAML and GUI (old)
- Approval process
- Supports: Git, GitHub, Bitbucket etc.

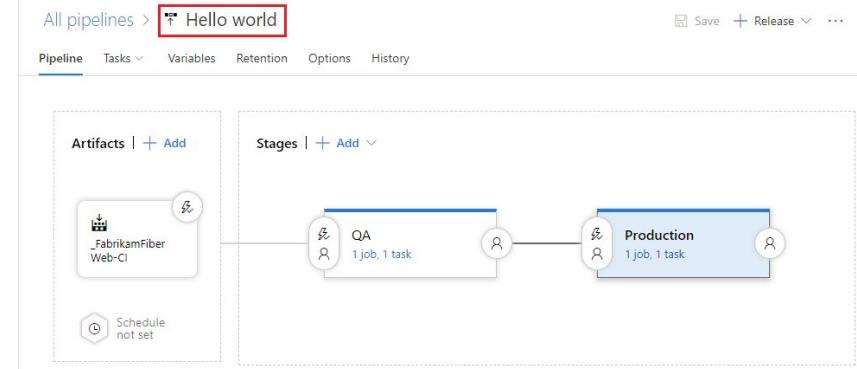


Azure DevOps - Pipelines

New pipeline

Review your pipeline YAML

```
❖ IaC / azure-pipeline-terraform-microservice-destroy.yml * ⌂
4 # https://aka.ms/yaml
5
6 trigger: none
7
8 pool:
9   - name: TestPool
10  - demands:
11    - Agent.OS -equals Linux
12
13 steps:
14   - task: TerraformTaskV2@2
15     inputs:
16       provider: 'azurerm'
17       command: 'init'
18       workingDirectory: '$(System.DefaultWorkingDirectory)/Terraform/Azure/kubernetesCluster'
19       backendServiceArm: 'PrivateSubscription'
20       backendAzureRmResourceGroupName: 'patricksdemostorage'
21       backendAzureRmStorageAccountName: 'patricksdemostorage'
22       backendAzureRmContainerName: 'microservice'
23       backendAzureRmKey: 'microservice.state'
24     settings:
25       task: TerraformTaskV2@2
26         inputs:
27           provider: 'azurerm'
28           command: 'destroy'
29           workingDirectory: '$(System.DefaultWorkingDirectory)/Terraform/Azure/kubernetesCluster'
30           environmentServiceNameAzureRM: 'PrivateSubscription'
```





Planning

the best approach to implementation

Tools

- Azure DevOps Boards
- GitHub Boards
- Jira

Projects / Beyond Gravity

Board

Epics: 3 | Stories: 12 | Tasks: 12 | Issues: 12 | Pull Requests: 12 | Comments: 12

4 days remaining | Complete sprint | ...

GROUP BY Choices

TO DO	IN PROGRESS	IN REVIEW	DONE
Implement feedback collector NUC-205	Update T&C copy with v1.9 from the writers guild in all products that have cross country compliance NUC-213	Multi-dest search UI web NUC-338	Quick booking for accomodations - web NUC-336
Bump version for new API for billing NUC-206	Tech spike on new stripe integration with paypal NUC-215	Adapt web app no new payments provider NUC-346	Fluid booking on tablets NUC-343
Add NPS feedback to wallboard NUC-208	Refactor stripe verification key validator to a single call to avoid timing out on slow connections NUC-216	Shopping cart purchasing error - quick fix required. NUC-354	Change phone number field type to 'phone' NUC-217

Design Agile Team | View as Backlog

Stories | Board | Analytics | ...

New	Active	Resolved	Closed
+ New item 950 Slow response on information form Raissa Pokrovskaya 5 State: New Parent: Customer Web ... Jia-hao Tseng 3 State: New Parent: Customer Web ... 0/2 1	951 Hello World Web Site Christie Church 3 State: Resolved Parent: Customer Web ... Raissa Pokrovskaya 5 State: Active Parent: Customer Web ... 0/3	952 Change initial view Christie Church 3 State: Resolved Parent: Customer Web ... Helena Petersen 8 State: Closed Parent: Mobile feedback	954 Design feedback interface Helena Petersen 8 State: Closed Parent: Mobile feedback
+ Add Task <input type="checkbox"/> Add switching context <input type="checkbox"/> Apply security measures <input type="checkbox"/> screen design			

OctoArcade Invaders

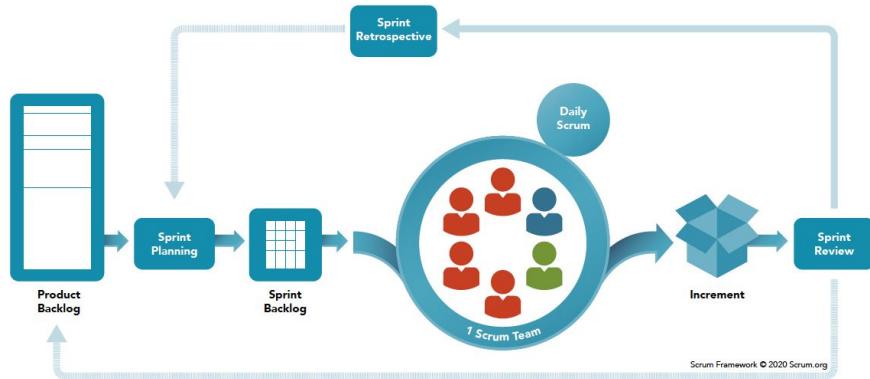
The Plan | Game loop Backlog | Standup | + New view

Not Started	Planning	Building	Complete
OctoArcade #10 Integrate with Leaderboard Service Need help	OctoArcade #42 Creative design update to aliens for variety	OctoArcade #19 Updates to alien, beam, and cannon sprites Design	OctoArcade #56 Game brief and go-no-go
OctoArcade #13 Interviews with media outlets	OctoArcade #73 Alpha go-no-go meeting	OctoArcade #3 New start screen and multiplayer selection	OctoArcade #21 Engine prototype (physics, rendering) Need help
OctoArcade #45 Save score across levels	OctoArcade #12 Easter egg with high score unlocking a new paid level on map 8	OctoArcade #38 Updates to velocity of the ship and alien movements Bug	OctoArcade #31 Initial concept art
+ New view			

Methodology

- Agile mindset
- Kanban board
- Daily meetings
- Sprints
 - Ex. 2 weeks

SCRUM FRAMEWORK



Summary

- Remember about best practices
 - Cloud Adoption Framework
 - Well-Architected Framework
 - Agile mindset
- IaC
 - Landing Zone
- Automation for daily work
 - Automate step-by-step

SUMMARIZE



AND REFLECT

makeameme.org

Questions?



JustCloud.pl

O mnie

Blog

Meetup's

Kontakt



Kontakt

Jeśli chcesz się ze mną skontaktować to możesz to zrobić za pomocą tego formularza lub poprzez [LinkedIn](#), do zobaczenia!

E-mail

Message

Send message



Q&A

