

# Developers

Interdyscyplinarne wydarzenie dla programistów

Serverless w Chmurze.  
AWS Lambda vs Azure Functions

Michał Furmankiewicz, Przemysław Malak

Chmurowisko Sp. z o.o.

# Oczekiwania

- Zakładamy, że znacie podstawy funkcji w Azure i Lambdy w AWS
- Pokażemy Wam 4 dema
- Pokażemy różnice w podejściu i architekturze, omówimy znane i mniej znane limity
- Jak to zawsze w Chmurach ☺ za “chwilę” pewne limity i ograniczenia mogą być nieaktualne



# AWS



# „Lokalny” development i deployment, telemetria, wersje



[Create New Queue](#)[Queue Actions](#)Filter by Prefix:  Enter Text...

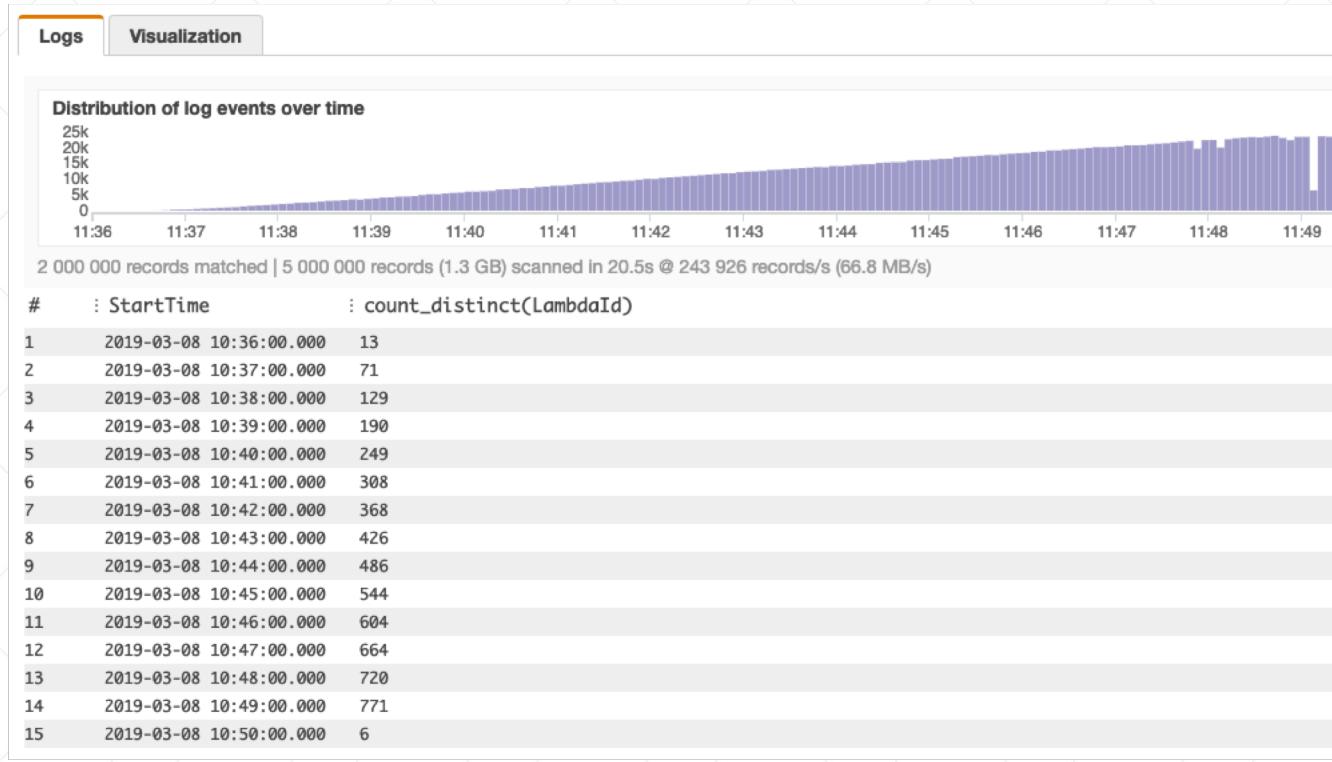
1 to 1 of 1 items

| Name              | Queue Type | Content-Based Deduplication | Messages Available | Messages in Flight | Created                       |
|-------------------|------------|-----------------------------|--------------------|--------------------|-------------------------------|
| 4developers_queue | Standard   | N/A                         | 0                  | 0                  | 2019-03-08 11:17:57 GMT+01:00 |

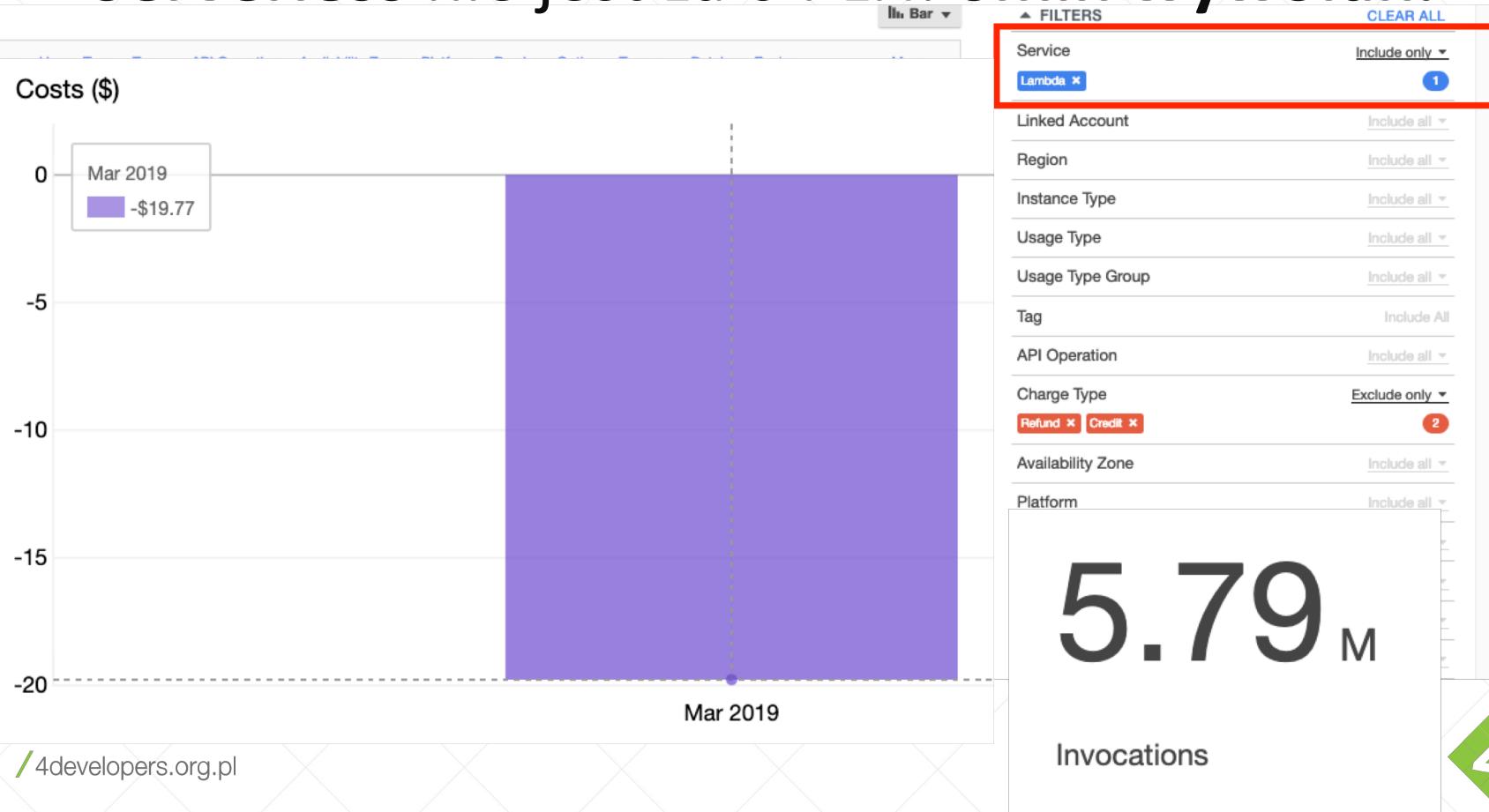
1 SQS Queue selected

[Details](#) [Permissions](#) [Redrive Policy](#) [Monitoring](#) [Tags](#) [Encryption](#) [Lambda Triggers](#)**Name:** 4developers\_queue**Default Visibility Timeout:****URL:** [https://sns.eu-west-1.amazonaws.com/655379451354/4developers\\_queue](https://sns.eu-west-1.amazonaws.com/655379451354/4developers_queue)**Message Retention Period:****ARN:** arn:aws:sns:eu-west-1:655379451354:4developers\_queue**Maximum Message Size:****Created:****Receive Message Wait Time:****Last Updated:****Messages Available (Visible):****Delivery Delay:****Messages in Flight (Not Visible):****Queue Type:** Standard**Messages Delayed:****Content-Based Deduplication:** N/A

# Skalowanie -> London 1M – 0.2s delay



# Serverless nie jest za 0 PLN. 6mln wywołań.



dev.azure.com/pmalak/4Developers

Save to Instapaper Instapaper Text Amazon EC2 I... Comparison AWS Tools for Microsoft Visual Studio Team Services - Visual Studio Marketplace

Azure DevOps pmalak / 4Developers / Overview / Summary

4 Developers +

4 Developers

Overview

Summary

Dashboards

Wiki

Boards

Repos

Pipelines

Test Plans

Artifacts

4 Developers

Project stats

No stats are available at this moment  
Setup a service to see project activity.

Welcome to the project!

What service would you like to start with?

Boards Repos Pipelines

Test Plans Artifacts

or manage your services

Members 1

P

Project settings

Search

Private Invite

AWS Tools for Microsoft Visual Studio Team Services - Visual Studio Marketplace

Project stats

No stats are available at this moment  
Setup a service to see project activity.

Welcome to the project!

What service would you like to start with?

Boards Repos Pipelines

Test Plans Artifacts

or manage your services

Members 1

P

Project settings

# AZURE

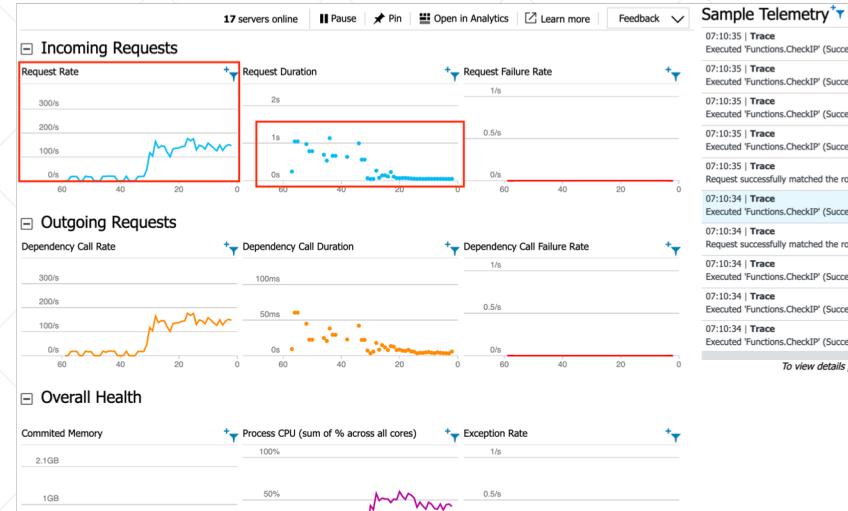
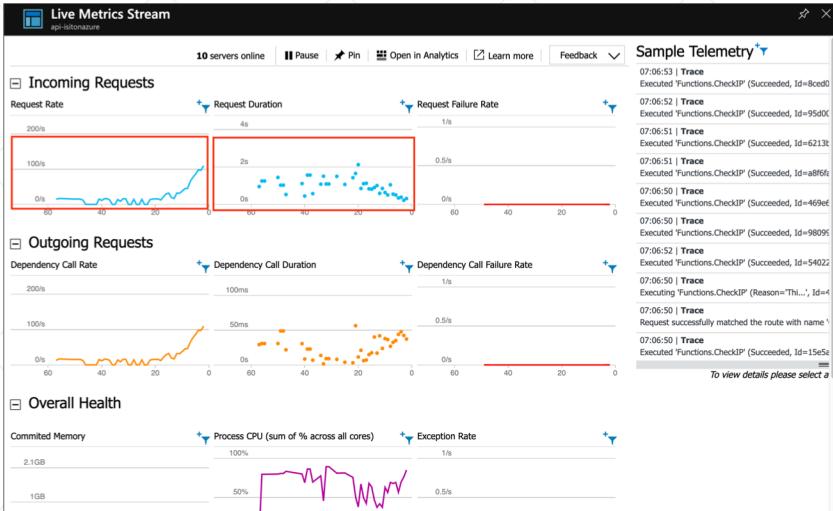


# „Lokalny” development i deployment, proces CI/CD



# Skalowanie i “cold start”





# „Miedzymordzie” czyli API Management (wersje, autoryzacja, throthgling)



Search (Ctrl+ /)

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

**Management**

Quickstart

**APIs**

Products

Named values

Tags

Analytics (preview)

Users

Subscriptions

Groups

Notifications

Notification templates

Issues

Repository

Management API

urity

Identities

Publisher portal   Developer portal

REVISION 1 UPDATED Apr 7, 2019, 11:35:26 AM

Design Settings Test Revisions Change log

Frontend

GET /CheckIP

Inbound processing

Modify the request before it is sent to the backend service.

Policies

base

set-backend-service

rate-limit-by-key

Outbound processing

Modify the response before it is sent to the client.

Policies

base

+ Add policy

Backend

Azure FunctionApp

api-isitonazure

Policies

base

All APIs

api-isitonazure ...

Echo API ...

All operations

POST CheckIP ...

GET CheckIP ...

The diagram illustrates the API management flow. It starts with the 'Frontend' section containing a GET operation to '/CheckIP'. This leads to the 'Inbound processing' section, which contains a 'Policies' block with three items: 'base', 'set-backend-service', and 'rate-limit-by-key'. A red box highlights the 'set-backend-service' and 'rate-limit-by-key' policies. From there, the flow continues to the 'Outbound processing' section, which also has a 'Policies' block with a 'base' item and a '+ Add policy' button. Finally, the request reaches the 'Backend' section, specifically an 'Azure FunctionApp' named 'api-isitonazure', which contains its own 'Policies' block with a single 'base' item.

# Telemetria – Application Insights



# Live Metrics Stream

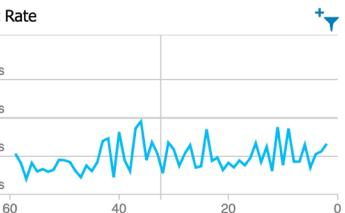
api-isitonazure

4 servers online

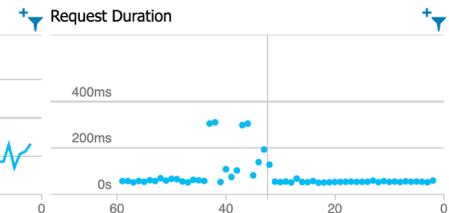
[Pause](#)[Pin](#)[Open in Analytics](#)[Learn more](#)[Feedback](#)

## Incoming Requests

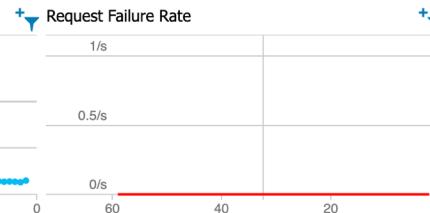
Request Rate



Request Duration

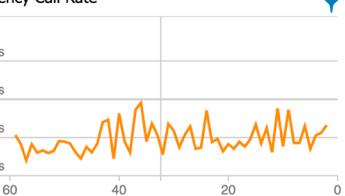


Request Failure Rate

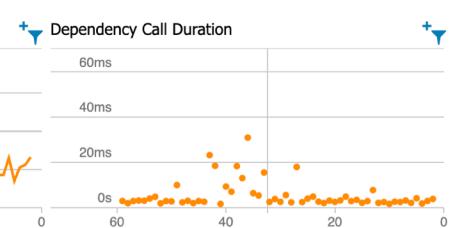


## Outgoing Requests

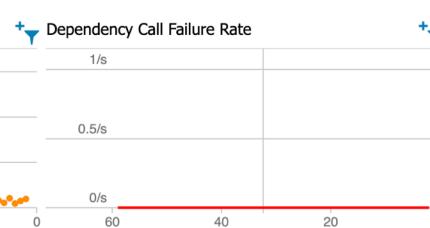
Dependency Call Rate



Dependency Call Duration

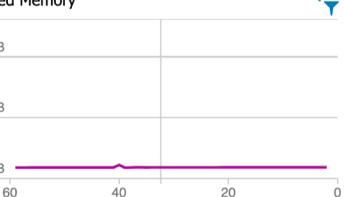


Dependency Call Failure Rate



## Overall Health

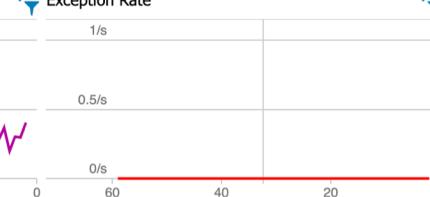
Committed Memory



Process CPU (sum of % across all cores)



Exception Rate



## Servers

[Select columns](#)

## Sample Telemetry

16:05:10 | Trace

@2e7ad2f9f64fa45...b468660afe1d2fe  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

16:05:10 | Trace

@a9d4cad7bd10f6f..f4ea51c69240ec  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

16:05:10 | Trace

@a390be84ca03a75...35ca9b7bd58e1f  
Executed 'Functions.CheckIP' (Succeeded, Id=b7d0d718-64de-423b-a516-38104e72d61f)

16:05:09 | Trace

@ef89bd4c8f18031...b8fbef0ade1eb  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

16:05:08 | Trace

@2e7ad2f9f64fa45...b468660afe1d2fe  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

16:05:08 | Trace

@a9d4cad7bd10f6f..f4ea51c69240ec  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

16:05:08 | Trace

@a390be84ca03a75...35ca9b7bd58e1f  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

16:05:07 | Trace

@ef89bd4c8f18031...b8fbef0ade1eb  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

16:05:06 | Trace

@a9d4cad7bd10f6f..f4ea51c69240ec  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

16:05:06 | Trace

@2e7ad2f9f64fa45...b468660afe1d2fe  
Executed 'Functions.CheckIP' (Succeeded, Id=e307bfb8-c6f-4e05-b734-f1c5906695f7)

16:05:06 | Trace

@a390be84ca03a75...35ca9b7bd58e1f  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

To view details please select a document from the above list

## Live Metrics Stream

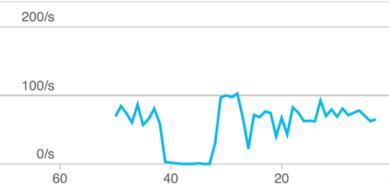
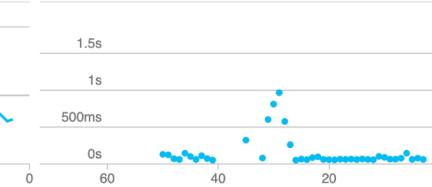
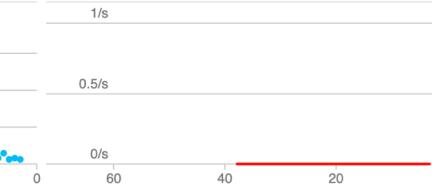
api-isitonazure

9 servers online

**Pause****Pin****Open in Analytics****Learn more****Feedback** ▾

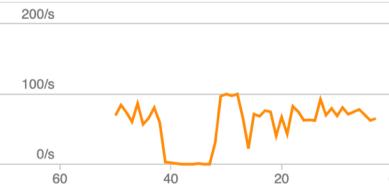
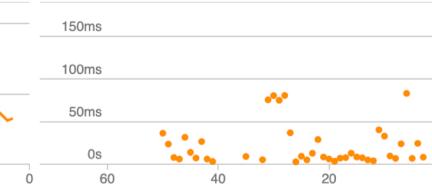
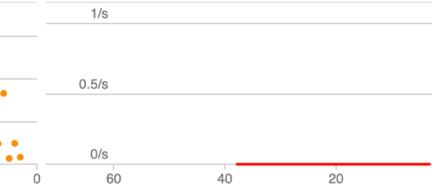
### Incoming Requests

Request Rate

**Request Duration****Request Failure Rate**

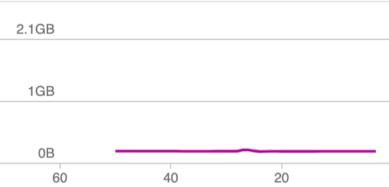
### Outgoing Requests

Dependency Call Rate

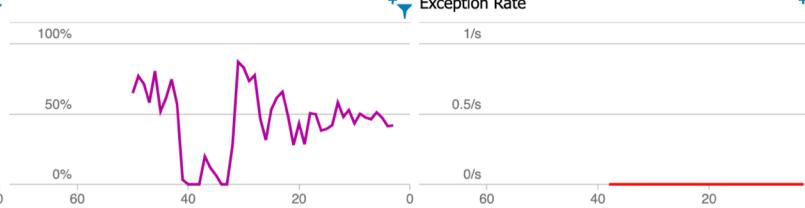
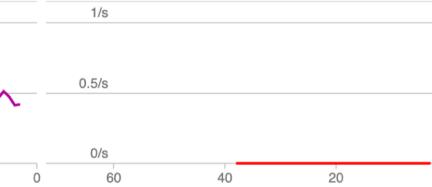
**Dependency Call Duration****Dependency Call Failure Rate**

### Overall Health

Committed Memory



Process CPU (sum of % across all cores)

**Exception Rate**

### Sample Telemetry

16:08:24 | Trace

@38e0d0a7c48d8cb...5ea4bc1535ba  
Executed 'Functions.CheckIP' (Succeeded, Id=adbba038-9c65-4771-a4b1-abf137e424f0)

16:08:24 | Trace

@ef89bd4c8f18031...b8bfef0ade1eb  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

16:08:24 | Trace

@e5f3094bd196c1...c41c3f7ade383  
Executed 'Functions.CheckIP' (Succeeded, Id=c79764da-9228-4340-89aa-abc77bfdac2b)

16:08:23 | Trace

@5b690f2f8e5b012...50498abc63b20  
Executed 'Functions.CheckIP' (Succeeded, Id=28f2a081-fcd1-44c6-8b64-019dff35363)

16:08:23 | Trace

@a390be84ca03a75...35ca9b7bd58e1  
Executed 'Functions.CheckIP' (Succeeded, Id=fa471e31-c45b-4597-ab8d-cc16ed747ec4)

16:08:23 | Trace

@a9d4cad7bd10f6f...f4ea51c69240e  
Executed 'Functions.CheckIP' (Succeeded, Id=feaace09-3560-42dd-8ff0-862e37a7c020)

16:08:22 | Trace

@ef89bd4c8f18031...b8bfef0ade1eb  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

16:08:22 | Trace

@2e7ad2f9f64fa45...b468660afe1d2  
Request successfully matched the route with name 'CheckIP' and template 'api/CheckIP'

16:08:22 | Trace

@1405d982b4a15ef...dd8b91fc472b0  
Executed 'Functions.CheckIP' (Succeeded, Id=ce37df03-3a5e-4586-aba9-952069c7aaa5)

16:08:22 | Trace

@9e5f3094bd196c1...c41c3f7ade383  
Executed 'Functions.CheckIP' (Succeeded, Id=cd772197-68a7-4482-9b83-85dfda0ad4b)

16:08:22 | Trace

@38e0d0a7c48d8cb...5ea4bc1535ba  
Executed 'Functions.CheckIP' (Succeeded, Id=6df18d4f-b87b-4c2a-bc98-874164b31ea1)

16:08:22 | Trace

@d98b935261bd2af...5192705b3be20  
Executed 'Functions.CheckIP' (Succeeded, Id=deefaa98-7327-4832-9a65-bfbab1743cbf)

To view details please select a document from the above list

# AWS LAMBDA

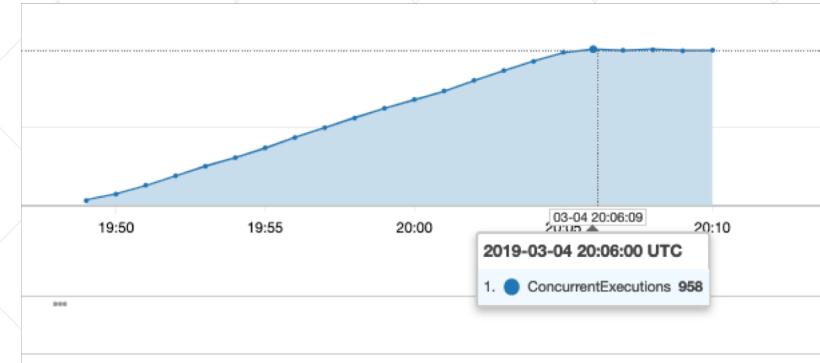
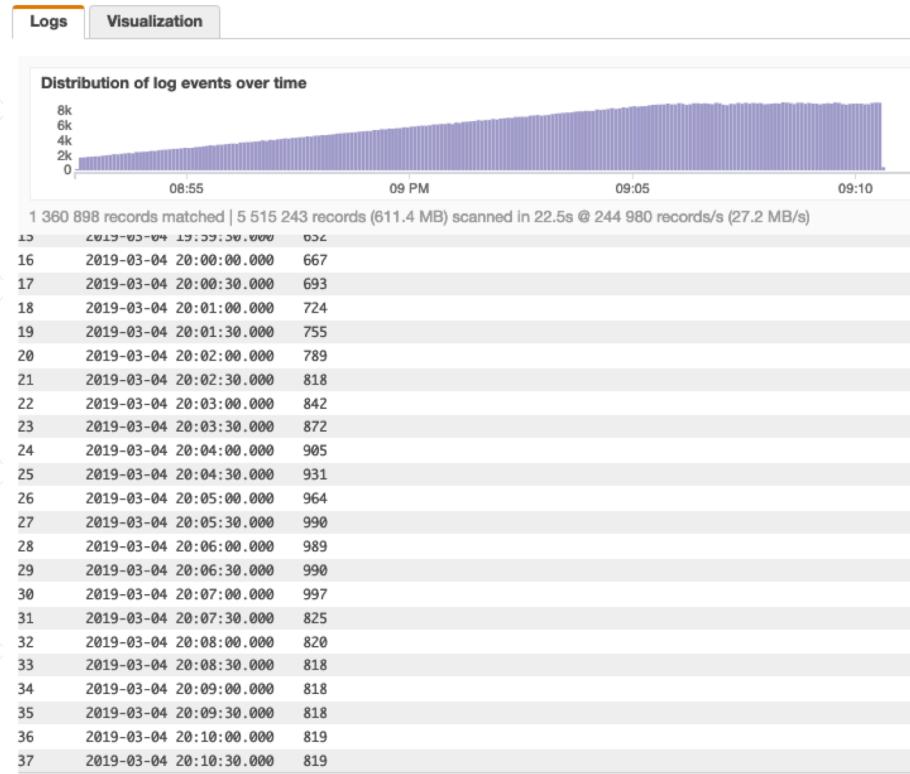


# AWS Lambda – Słowem podsumowania

- Maksymalnie 15 min
- Brak stanu i “cold start”
- Brak kontroli nad środowiskiem
- Brak lokalnej przestrzeni (512 MB in /tmp)
- Rozmiar payload (6MB – sync, 256kB – async)
- Do 3GB RAM
  
- Praktycznie nieograniczona liczba języków programowania (custom runtimes)
- Co raz więcej narzędzi do developmentu



# Limit 1k concurrent invocations (SQS)



## Concurrency

Unreserved account concurrency **2500**

- Use unreserved account concurrency
- Reserve concurrency

Good Morning,

I trust your weekend was a good one.

I've heard from the service team who has informed me that if your request is a Lambda SQS event source, then the maximum limit is 1000 concurrency. If you would like to proceed with this raise, reply via this case so that I may inform the service team for further assistance.

View this document for more information,

<https://docs.aws.amazon.com/lambda/latest/dg/scaling.html>

If your limit is not an Lambda SQS event source, please advise what your event is to be submit to the team for evaluation.

I look forward to your reply.



# AZURE FUNCTIONS



# AZURE – Słowem podsumowania

- Bardzo miły lokalny development

- Cold starts – ale mamy plany dedykowane

- Mamy kontrolę nad środowiskiem

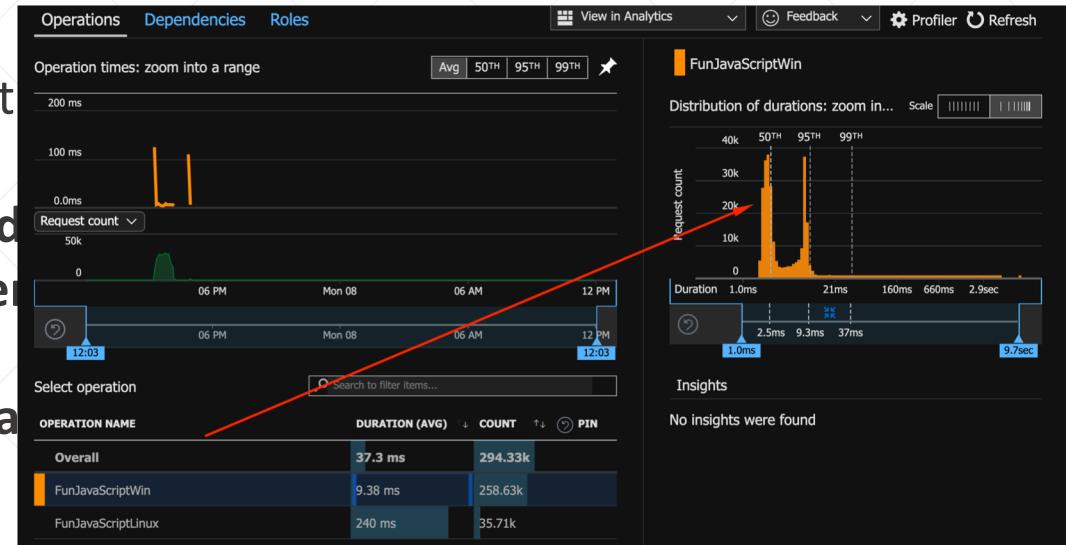
- Ograniczona liczba języków C#, Java, Python

- Wydajność

- Plany oparte o Windows są lepiej zoptymalizowane

- Wydajność \*może zależeć od triggera, który ją wyzwala

- Ciągle w AWS mogę w większej liczbie używać funkcji niż w Azure.



# Azure vs AWS



# azurevsawsconsumption01 - Performance

Application Insights

Search (Ctrl+ /) Last 24 hours Roles = All + funnel icon

Server Browser

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

Investigate

- Application map
- Smart Detection
- Live Metrics Stream
- Metrics
- Search
- Availability
- Failures
- Performance
- Servers
- Browser
- Troubleshooting guides (previe...)
- Workbooks

Operations Dependencies Roles View in Analytics Feedback Profiler Refresh

Operation times: zoom into a range Avg 50TH 95TH 99TH zoom icon

Request count

400 ms  
200 ms  
0.0ms  
10k  
0

Apr 07 06 AM 12 PM 06 PM

07:06 07:06

Duration 1.0ms 8.4ms 34ms 90ms 250ms

50TH 95TH 99TH

Request count

2k  
1.5k  
1k  
500  
0

1.0ms 1.5ms 37ms 220ms 580ms

Overall

Distribution of durations: zoom in... Scale grid icons

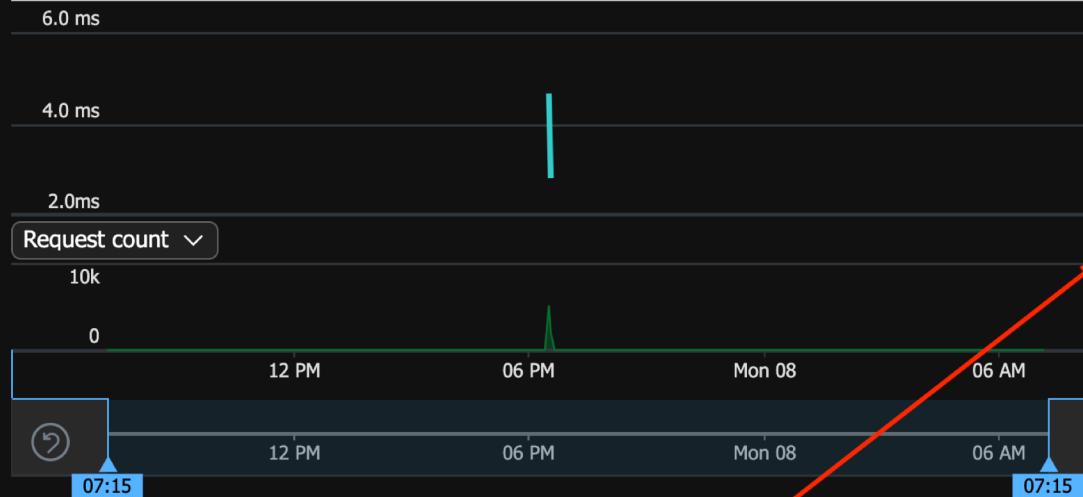
Insights

No insights were found

Drill into...

| OPERATION NAME    | DURATION (A... <span>duration icon</span> ) | COUNT <span>count icon</span> | PIN <span>pin icon</span> |
|-------------------|---|-------------------------------|---------------------------|
| Overall           | 11.6 ms                                     | 16.97k                        |                           |
| SimpleGetCompiled | 4.03 ms                                     | 6.99k                         |                           |
| SimpleGet         | 16.9 ms                                     | 9.98k                         |                           |

## Operation times: zoom into a range

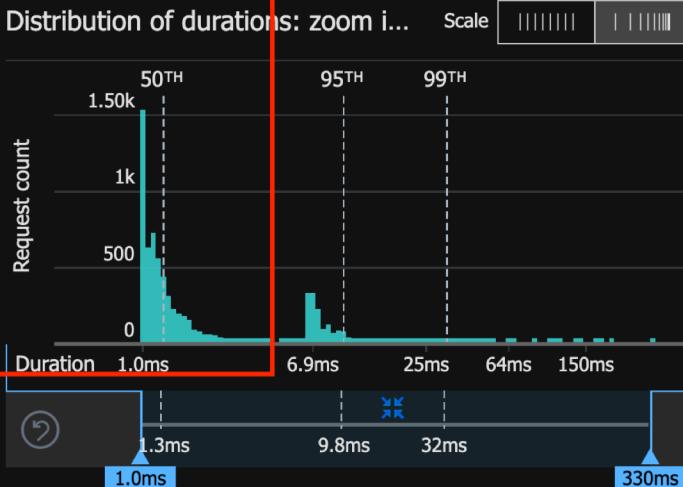
Avg 50<sup>TH</sup> 95<sup>TH</sup> 99<sup>TH</sup> ↗

## Select operation

Search to filter items...

| OPERATION NAME    | DURATION (AVG) | COUNT  | PIN |
|-------------------|----------------|--------|-----|
| Overall           | 11.6 ms        | 16.97k |     |
| SimpleGet         | 16.9 ms        | 9.98k  |     |
| SimpleGetCompiled | 4.03 ms        | 6.99k  |     |

## SimpleGetCompiled



## Insights (2)

36% COMMON PROPERTIES:  
resultCode, performanceBucket, cl...

34% COMMON PROPERTIES:  
resultCode, performanceBucket, cl...

# AWS Results

```
using Amazon.Lambda.APIGatewayEvents;
using Amazon.Lambda.Core;

[assembly: LambdaSerializer(typeof(Amazon.Lambda.Serialization.Json.JsonSerializer))]

namespace AWSLambda1
{
    public class Function
    {
        public APIGatewayProxyResponse FunctionHandler(APIGatewayProxyRequest request, ILambdaContext context)
        {
            return new APIGatewayProxyResponse
            {
                StatusCode = 200,
                Body = "4 Developers"
            };
        }
    }
}
```

0.15 ms

● Duration Minimum

1.95 ms

● Duration Average

268 ms

● Duration Maximum



# Na zakończenie

- Serverless to nie tylko funkcje choć my tylko na nich się skupiliśmy.
- Usług "serverless" u każdego dostawcy jest naprawdę wiele (bazy, API, kolejki, notyfikacje, EventGrid)
- AWS i Azure oferują dojrzałe środowiska rozwoju aplikacji opartych o serverless
- Najbardziej efektywnym językiem w obu przypadkach jest kompliowany **.Net Core** ☺
- Model kosztowy funkcji jest mega atrakcyjny ale przy stałej i dużej skali trzeba uważać na koszty
- Na pewno nie jest to chwilowa fanaberia, koncepcja się mocno rozwija technicznie i w postaci kolejnych wdrożeń.



Twoja opinia na temat naszej prelekcji jest dla nas bardzo ważna.

1. Wejdź w nasz wykład znajdujący się w agendzie w aplikacji Eventory.
2. Oceń naszą prelekcję i dodaj swój komentarz.

Dzięki temu będziemy wiedzieli, co Ci się podobało a co powinniśmy ulepszyć!

