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# Containers without Orchestrator How? When? Why?

**Dariusz Porowski**

# Dariusz Porowski

- Microsoft
  - Software Development Engineer
  - Commercial Software Engineering (CSE)
- Dariusz.Porowski@microsoft.com
- [DariuszPorowski.MS](https://DariuszPorowski.MS)
- [GitHub.com/DariuszPorowski](https://GitHub.com/DariuszPorowski)
- [@DariuszPorowski](https://@DariuszPorowski)





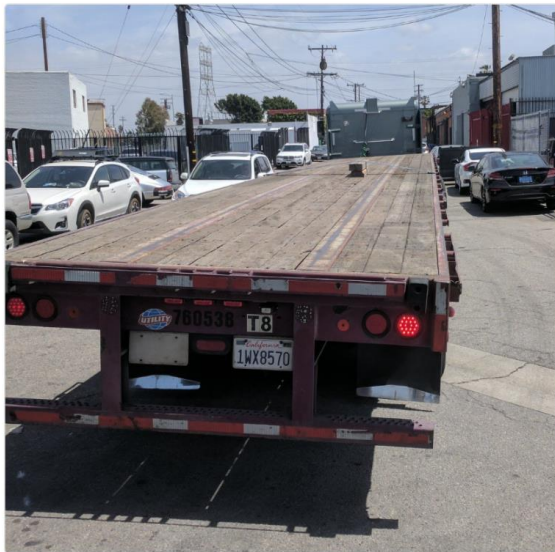
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Deployed my blog on Kubernetes



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# Polkomtel

- Operator of Plus mobile network which was launched in 1996 and currently has around 13,5 million users.
- Plus network covers around 99,6% of the country's population.
- [www.plus.pl](http://www.plus.pl)

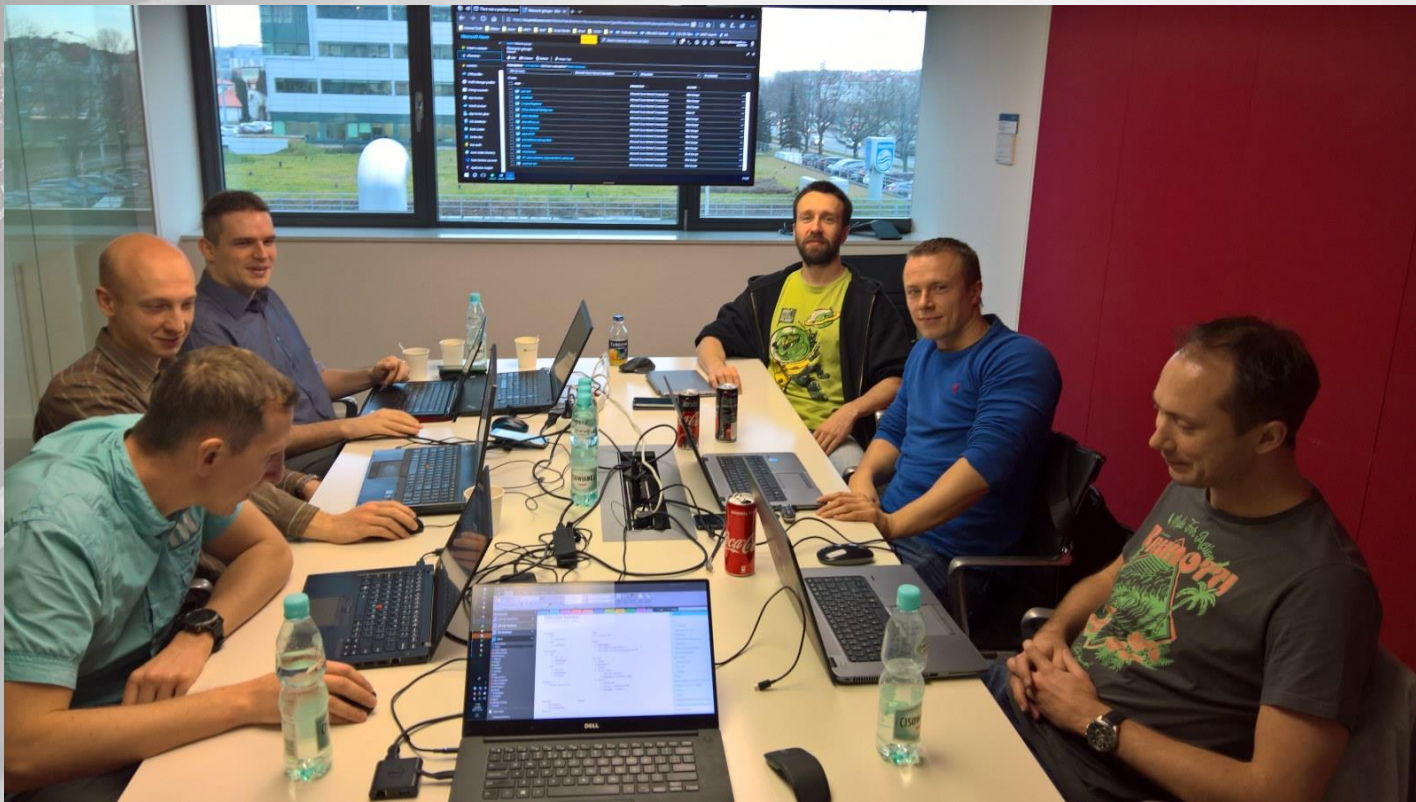


# Polkomtel's problem statement

- Try Java Spring Boot application in Cloud environment
- App designed for Apache Tomcat on Linux (on-premise)
- Improve scalability and reliability
- Reduce administrative overhead (no OS management)
- Near zero-downtime deployments
- DevOps cycle
  - Improve time to market
  - Improve QA
  - Continuous show development progress to business



# PoC with Microsoft



# Outcome after Architecture Design Session

- VMs with Linux and Tomcat server (IaaS)
  - Administrative overhead with OS and application server maintenance
- Managed Kubernetes cluster on Azure (AKS)
  - Application designed for on-premise environment
  - Monolith, not microservices/modern architecture
- Managed Container instances on Azure (ACI)
  - No "Out of the Box" web app related features
- Web App for Containers (App Service for Linux)
  - Great for monolith architecture
  - PaaS benefits designed for Web Apps e.g. slot swaps for rolling updates
  - Bring Your Own Code / Bring Your Own Container

# Agenda / Lessons learned

- Azure App Service on Linux / Web App for Containers
- Own Docker image
- Troubleshooting – SSH, Logs
- Generalize Docker image and push settings
- Docker image optimization
- DevOps pipeline



# Azure App Service

- App Service
  - App Service -> Windows
  - App Service on Linux -> Linux
- Bring Your Own Code
  - Web App
    - Node.js
    - PHP
    - .NET Core
    - Ruby
- Bring Your Own Container
  - Web App for Containers

## App Service on Linux (App Service Plan)



# DEMO #1

Getting started with a Web App for Containers

# Custom Docker image

- Your own **Dockerfile**

```
FROM tomcat:8.5
```

```
EXPOSE 8080
```

```
CMD ["catalina.sh", "run"]
```

# Docker Multi-Stage builds

- Great for local development
- Save time for setup development environment

```
FROM buildBaseImage AS build
```

```
RUN ...
```

```
FROM finalBaseImage AS final
```

```
COPY --from=build <buildSource> <finalDestination>
```

# DEMO #2

Docker Multi-Stage builds



# Azure, we have a problem!



# Connect to container using SSH

- SSH Server
- Mandatory!
  - Username: **root** and password: **Docker!**
  - Port: **2222**
  - sshd\_config
    - Ciphers: aes128-cbc,3des-cbc,aes256-cbc
    - MACs: hmac-sha1,hmac-sha1-96
- `https://<appName>.scm.azurewebsites.net/webssh/host`

```
COPY sshd_config /etc/ssh/
RUN apt-get update \
    && apt-get install -y --no-install-recommends dialog \
    && apt-get update \
    && apt-get install -y --no-install-recommends openssh-server \
    && echo "root:Docker!" | chpasswd

EXPOSE 2222 <yourPort>
```

- ```

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=====|_|=====|_|=/ / _ / _ /
:: Spring Boot ::      (v1.5.10.RELEASE)

```

cloud.developerdays.pl

# DEMO #3

Connect to container using SSH  
Get container logs

# Generic Docker image and custom settings

- Avoid any hardcoded configuration!
- Use **environment variables** as much as possible!
  - **WEBSITES\_PORT** – for custom expose port inside container
  - Connection Strings
  - Configuration
  - etc...



# Docker image optimization

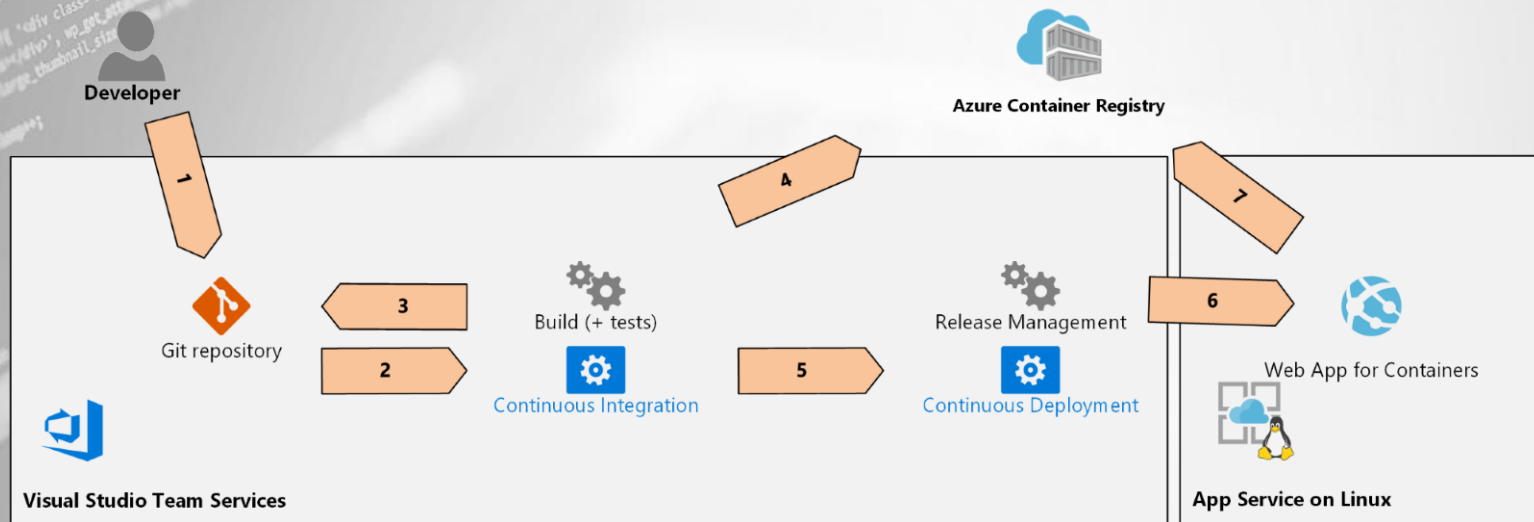
- BASE image matter!
  - **Alpine** Linux is a good idea!
- Layers count matter!
  - Less is MORE!
- Avoid "latest" for tag
  - Use own tag, e.g., build id

```
PS C:\> docker images
```

| REPOSITORY             | TAG              | IMAGE ID     | CREATED        | SIZE    |
|------------------------|------------------|--------------|----------------|---------|
| daporo/javahellotomcat | 0.0.1            | 4d2b29dd21e8 | 6 minutes ago  | → 596MB |
| daporo/javahelloalpine | 0.0.1            | 955acc16db1e | 44 minutes ago | → 121MB |
| tomcat                 | 8.5-jre8         | 108db0e7c85e | 6 days ago     | → 558MB |
| maven                  | 3.5-jdk-8        | 83d235b52940 | 6 days ago     | → 748MB |
| tomcat                 | 8.5-alpine       | d881f0fedc24 | 9 days ago     | → 106MB |
| maven                  | 3.5-jdk-8-alpine | 91138c237846 | 6 weeks ago    | → 118MB |

# DevOps with Visual Studio Team Services

- Do not play with Docker manually!



# DEMO #4

CI/CD in VSTS for Web App for Containers

# Resources

- Technical Case Study – Polkomtel
  - <https://aka.ms/Polkomtel>
- Web App for Containers
  - <https://docs.microsoft.com/en-us/azure/app-service/containers>
- Visual Studio Team Services
  - <https://docs.microsoft.com/en-us/vsts>
- [GitHub.com/DariuszPorowski](https://github.com/DariuszPorowski)
- [DariuszPorowski.MS](https://DariuszPorowski.MS)

# Summary



Source: <https://twitter.com/dexhorthy/status/856639005462417409>



# BONUS! What's new for Web App for Containers

- Multi-Container App
- Docker Compose or Kubernetes deployment experience
- Persistent storage support
  - WEBSITES\_ENABLE\_APP\_SERVICE\_STORAGE: true
- Docs: <https://docs.microsoft.com/en-us/azure/app-service/containers/tutorial-multi-container-app>

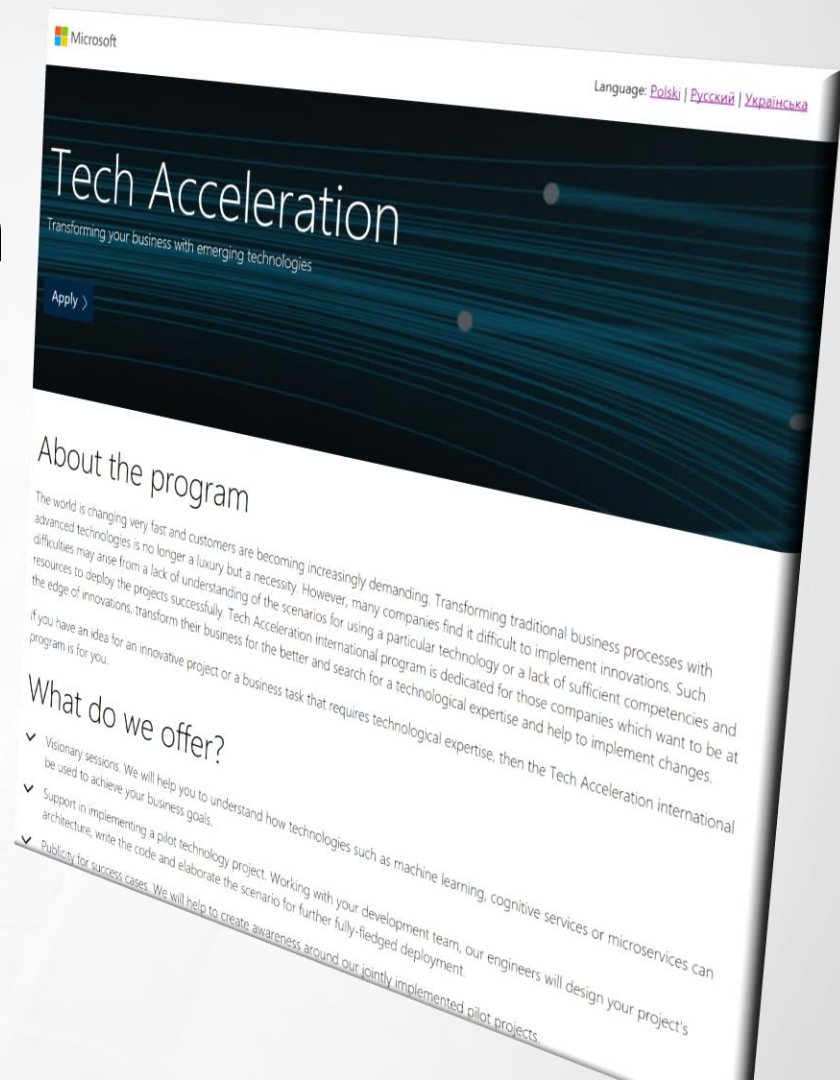
# BONUS! Tech Case Study

- K8s related Tech Case Study with Quadient
- “From long semi-manual VMs setup to quick standardized solution deployment based on Docker containers and Kubernetes for legacy monolithic Java application”
- <https://aka.ms/Quadient>



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