Containers without Orchestrator

Dariusz Porowski

Sr. Technical Evangelist, Commercial Software Engineering (CSE)

Microsoft Central & Eastern Europe (CEE)

GitHub.com/DariuszPorowski   @DariuszPorowski

Dariusz Porowski

- Senior Technical Evangelist
- Commercial Software Engineering (CSE)
- Central & Eastern Europe (CEE)
- Microsoft
- Based in Poland

- Dariusz.Porowski@microsoft.com

*Source: https://twitter.com/dexhorthy/status/856639005462417409*

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

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
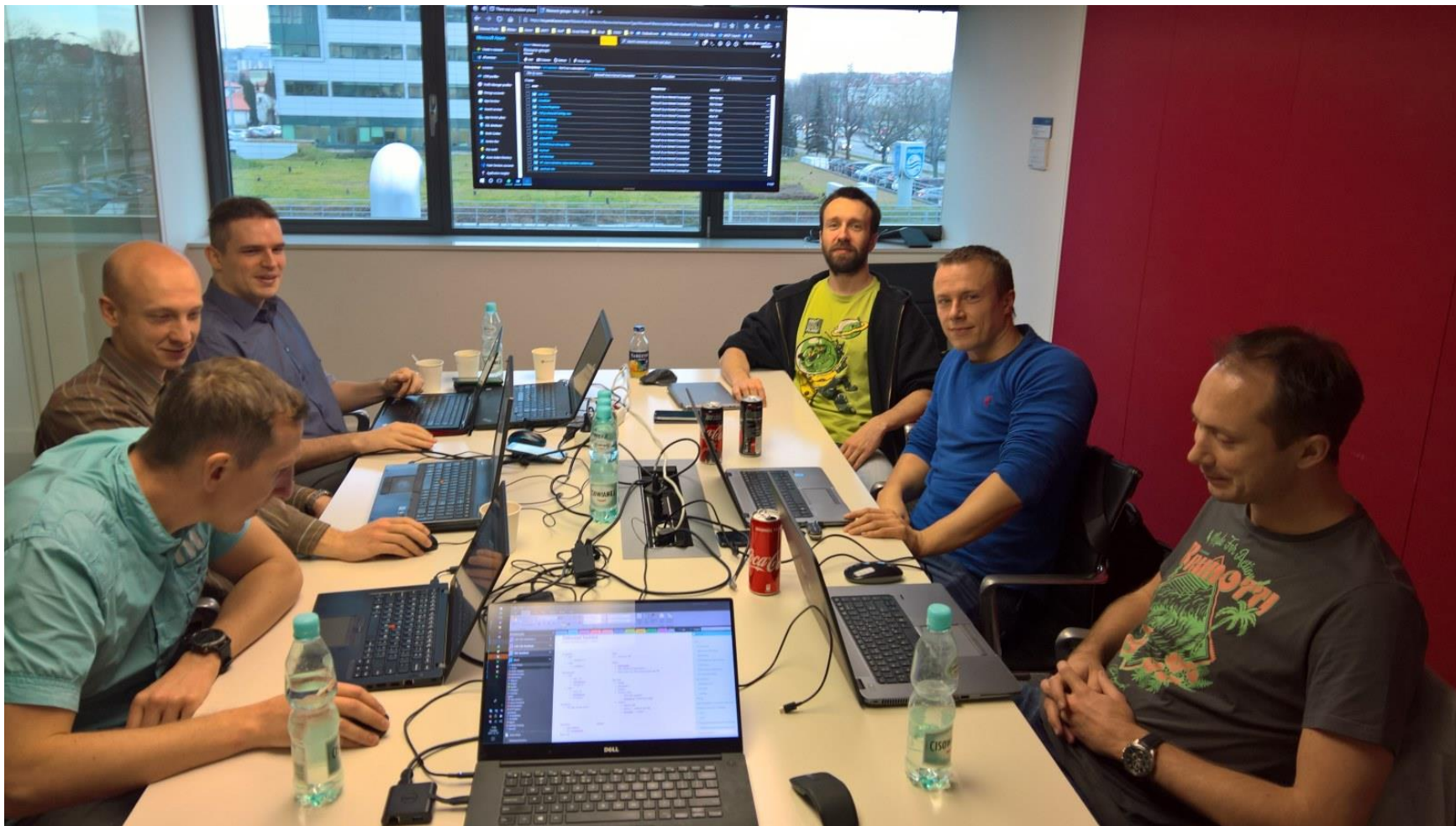
Outcome after Architecture Design Session

- 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

Lessons learned from the field

- Azure App Service on Linux / Web App for Containers
- Custom Docker image
- Connect to container using SSH
- Generic Docker image and custom settings
- Docker image optimization
- CI/CD 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)

Web App for Containers

Web App

Web App for Containers

Web App
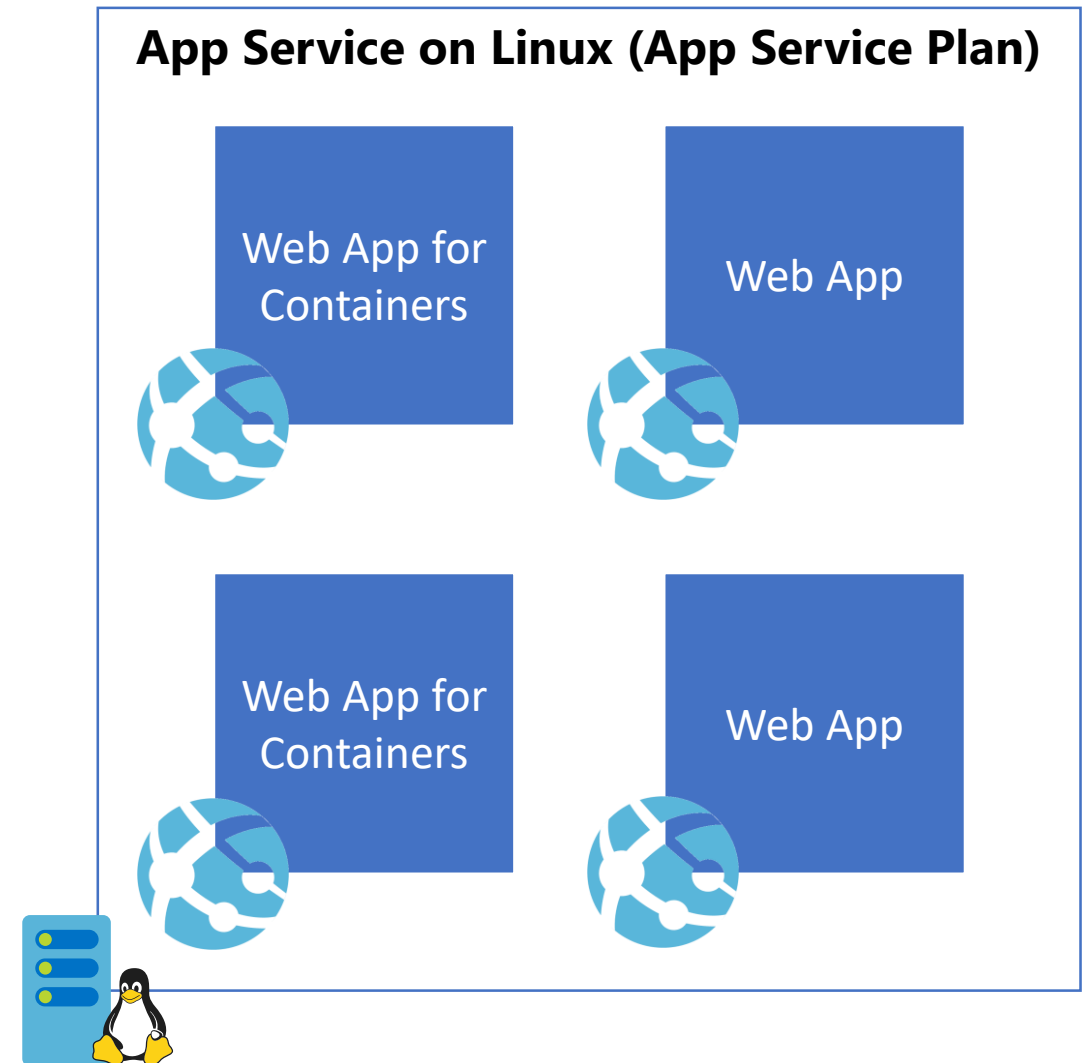
DEMO time

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 time

H... 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

```
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>
```

DEMO time

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
```
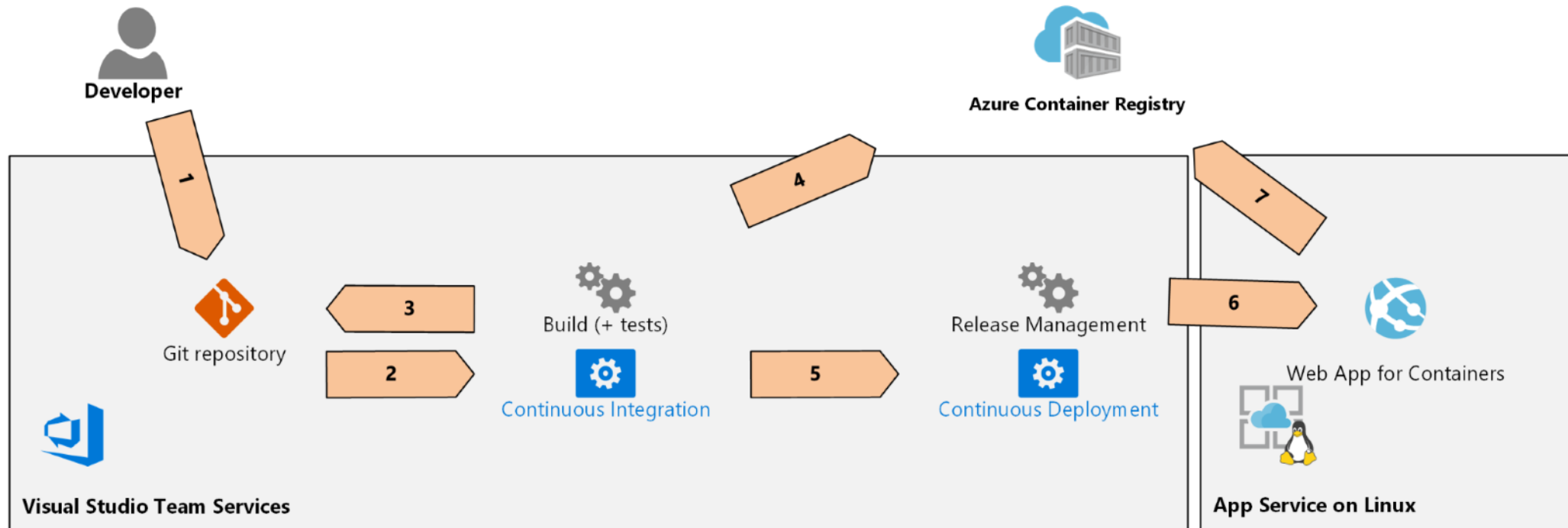
DevOps

DevOps with Visual Studio Team Services

- Do not play with Docker manually!

DEMO time

Resources

- Full Technical Case Studied with Polkomtel
  - https://github.com/DariuszPorowski/TechCaseStudies/tree/master/Polkomtel
- Web App for Containers
  - https://azure.microsoft.com/en-us/services/app-service/containers
  - https://docs.microsoft.com/en-us/azure/app-service/containers
- Visual Studio Team Services
  - https://azure.microsoft.com/en-us/services/visual-studio-team-services
  - https://docs.microsoft.com/en-us/vsts

- https://GitHub.com/DariuszPorowski
- http://DariuszPorowski.MS

Summary

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

Tech-Acceleration.com

- Containers and Microservices
- Serverless
- Artificial Intelligence and Bots
- Internet of Things
- Machine Learning and Big Data

Q&A

Thank you! ☺