Development and Operations: Continuous Delivery in Practice

Dr. Julie Wagner
Senior UX Researcher
at Fujitsu EST
Enchantée

• Studied computer science in Aachen, Germany
• Majored in Human-Computer Interaction
  • Tangible Interaction on Tabletops
• PhD at Université Paris Sud, France
  • Information visualization for astrophysicists
• 6 month Post-doc at Télécom ParisTech, France
• 2 year Post-doc at LMU University, Munich, Germany
• Now UX-researcher at Fujitsu Enabling Software Technology

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Fujitsu Enabling Software Technology

FUJITSU Enabling Software Technology GmbH

- Headquarter: Munich
- Founded in 2002, acquisition from BMW/Softlab
- Subsidiary of Fujitsu Ltd. Japan
- Global development center
  - 45 employees
  - Joint development with Japan, USA, India, Poland
- UX team
  - User studies in collaboration with Japan
  - Teaching user-centered design practices
  - Implementation in collaboration with technical teams
- Main Expertise
  - Cloud integration and PaaS
  - Enterprise Stores / Hybrid Cloud Management

http://www.fujitsu.com/
Overview

• Part 1: Cloud Computing Basics
  • What is a cloud? Cloud service stack? ...and what does Fujitsu contribute to the stack?
  • Why are businesses interested in using the cloud?

• Part 2: Deployment basics

• Part 3: DevOps
  • What is DevOps?
  • What is the goal? What is Continuous delivery?
  • The PICCO team as an example DevOps culture.
  • Why did we choose to use Angular over Polymer?

• Part 4: Let’s get your code deployed on Bluemix.
Part 1: Some Cloud Computing basics
Question: Which cloud services do YOU use?
Cloud Computing

• Focus primarily on services, rather than technology.
• cloud services that are made up of orchestrated technology and/or application
• Cloud services can be sourced from internal IT teams or third parties providing private or public clouds.
• Future for many organizations will involve hybrid clouds.
• Service users can place service requests via self-service and are billed for what they use.

Why are businesses interested in using the cloud?
Cloud Business Perspective

• Small companies outsource the IT team to save money.
  • No infrastructure
  • No need for operations (monitoring and maintaining)
  • However, your data is not in your had. Would a bank host services on google?

• Larger companies demand on premise clouds for security reasons.
  • Virtualization (efficient use of ‘ingredients’ (storage, processing power, etc.))
    • Abstract, pool and automate
  • Automation (eliminating manual human effort)
Virtualization: abstract, pool, automate

• Step 1: Virtualize Compute resources
• Step 2: Virtualize Network and make available to the compute layer for on-demand consumption.
• Step 3: Virtualize Storage area network.

Automate

- Increase resource utilization
- Dynamically allocating resources to apps and services

Virtualization – **efficient** use of resources

**Without**
- 20 servers
- 20% usage
- Manual setup

**With**
- 5 servers
- 80% usage
- Automatic setup
Cloud Computing Service stack

- Infrastructure as a Service
  - Fujitsu’s Infrastructure Manager (UX field studies in Datacenter)
- Platform as a Service
- Software as a Service: gives customers access to software and online storage via remote servers.
Cloud Computing Protocols

• TOSCA: between infrastructure and platform
• Cloud Foundry: between platform and application
Cloud Foundry – Service Brokers

- Industry standard for Cloud Applications
- When a developer provisions and binds a service to an application, the service broker for that service is responsible for providing the service instance.
Login to Bluemix and have a look to the Catalog.
EST Product 1: Open service catalog manager

Example OSCM interface

Case Study: Booking VMs or database services for students of a course. Delete after time elapsed.
Private vs. public cloud vs. hybrid cloud

• Behind a firewall, fenced-in
• Dedicated specific resources
• Single-tenant

• Offers range of services to multiple clients on shared infrastructure
• E.g. Google drive, iCloud, Dropbox
• Multi-tenant

• Combines scalability with security
• Combination of both
Pay-for-use model for cloud computing

• Service over the Internet
• delivery of on-demand computing resources, from application to datacenter on pay-for-use basis.
• Private Cloud Computing: Client owns or leases hardware and provides the consumption model (keep track of cross-department services).
• Public cloud computing: users pay for resources based on usage.
EST Product 2: Cloud Service PICCO

• Makes cloud costs (usage) transparent.

• Several users:
  • Administration: budget-forecasts
  • Manager: Cost overview
  • Developer: feedback if service behaves correctly
EST Product 3: RunMyProcess

• Visual programming of processes.
• Example: Vacation request
Summary

• Cloud infrastructure management
• Cloud Computing Service stack
• Cloud Foundry as a protocol
Part 2: Some deployment basics
What is Docker?

• Executable binary, run by the host OS under a set of restrictions (e.g. process isolation).
• Kernel supported ability to run executables under strict restrictions.
• Docker is one of many container technologies
• Popular for the repository (Docker Hub) and management tools, extremely easy to work with.
Docker images vs. Containers

- Image: Immutable file that is essentially a snapshot of a container.
- Container: lightweight and portable encapsulations of an environment in which to run applications, Process running in a restricted mode.
- Turn image into container: Docker engine takes image, add read-write file system on top, initializes settings (ports, container name, ID and resource limits)
- What is the advantage of using containers?
Container management

• Deploy, manage and run application components
• Providers: Bluemix, google cloud, Amazon web service
• Several infrastructure compute technologies: Docker containers, OpenStack virtual machines, Cloud Foundry apps.
• Monitoring of the environment
EST Activity 4: Kubernetes Dashboard

• Contribution to a Dashboard for Kubernetes Container Management.
• Pause. App anlagen.

Create and monitor an empty app
1. Laden Sie den Teilcode herunter und extrahieren Sie das Paket in ein neues Verzeichnis, um Ihre Entwicklungsumgebung einzurichten.

Nach der Installation der Befehlszeilenanwendungen können Sie beginnen:


Installieren Sie vor Beginn die IBM® Bluemix®- und Cloud Foundry-Befehlszeilenanwendungen.

Mit Hilfe der Befehlszeilenanwendungen können Sie Anwendungen und Serviceinfrastukturen bereitstellen und ändern.

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Part 3: What is DevOps
DevOps

• Intersection between development, QA and operations
  • Coding and deployment in isolation, error prone.
• A culture
• Requires a different way of team collaboration
• With the goal
  • of delivering Software in a certain timespan
  • of making Software products more robust
• Requires various tools and team-routines

What is the average time between deployments at Amazon?
Continuous Delivery (CD)

- Software engineering approach
- Software product in short development cycles
- Software can be reliably released at any time
- Build, test and release software faster and more frequent
  - “when you integrate your code more frequently, the possibility of having a misunderstanding that might lead to a build-breaking problem became less common.” (Kyle Brown, CTO at IBM)
  - Instead of a stressful ‘big bang’ release, frequent and small releases.
Picco DevOps Chain

Developer

CodeBeamer Features

Bugzilla Bugs

WebStorm Code

Gulp Build

Gulp Test

GitHub Code Review

No?

GitHub Merge

Jenkins triggered Build

Jenkins triggered Integration Tests

Jenkins Build Docker Image

Artifactory copy to Artifactory

Jenkins internal autodeploy

Integration Tests

Google Registry

Manually triggered automatic deployment

Merge into Master

Stabilized?

Test successful?
Sketch YOUR DevOps Chain
Part 4: Deployment
Create GIT repository
Clone GIT repository
Change, commit and push your code
backend
Owner: backendlmu

Git COMMITS
Branch: master ▼ (showing 4 of 4 commits)

- my message  (SHA 7f1dd3a84e91bd76fd5de1a65732b4517d191fb) by Julie Wagner on

- Deploy that  (SHA 28311725da50176dd01451d762bfc14e5332b1ce) by Julie Wagner on

- Add starter application package  (SHA 66374dd5fa97dc427345b015ee37239da63ـ062) by Erik on
Build + Deploy
What else?

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