From 6 weeks to 6 minutes
About DUO

Education Implementation Service of the Ministry of Education, Culture and Science

- Student Finance (€4.3bn)
- School Finance (€30bn)
- Exam services
- Childcare Register
- Government Data Center (ODCN)

- 2700 employees, 500+ IT staff
DUO Infrastructure 2010

Legacy

June 30 2016, From 6 weeks to 6 minutes
Business not satisfied

- **Quality**: IT products did not meet the business requirements
- **Time-to-market**: IT could not deliver fast enough
Vision

The processes and the infrastructure for the realisation, testing and management of JAVA applications comply with the principles of DevOps and Continuous Delivery.
And there were 2 other problems...

- JAVA 5 to JAVA 6 migration

- Websphere lacks financial scalability
Selection criteria

Functionality:
- J2EE Full profile certified
- Management tooling

Support:
- Enterprise support available

Market penetration:
- Relevant references

Financial:
- Financially scalable
- Free version available

Open Source:
- Preferred, not required (comply or explain)
And the winner is.....
### Xebia Maturity model for CD

<table>
<thead>
<tr>
<th>Level 5</th>
<th>DevOps</th>
<th>Reporting</th>
<th>Testing</th>
<th>Provisioning</th>
<th>Deploying</th>
<th>Building</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete</td>
<td>Operations and development are both part of the multidisciplinary delivery team and share responsibilities.</td>
<td>Reports also provide trend analysis.</td>
<td>100% fully automated tests all the way to production</td>
<td>Service portal requesting an environment.</td>
<td>Continuous end-to-end deployments.</td>
<td>End-to-end automated gate builds.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 4</th>
<th>DevOps</th>
<th>Reporting</th>
<th>Testing</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Advanced</td>
<td>An envy of operations works along in project, an envy of development works along with operations.</td>
<td>Dashboard provides insight from different perspectives and shows history and progression through a build monitor to all.</td>
<td>Automated dynamic quality tests like security scans, functional and performance tests guarantee quality of code.</td>
<td>Environments can be created and torn down by a push of the button. Operating System is virtualized.</td>
<td>Test-gated deployments of end-to-end applications. Deployments occur over multiple environments.</td>
<td>Central build environment. Teams actively reuse generic components in a secure and controlled manner.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Level 3</th>
<th>DevOps</th>
<th>Reporting</th>
<th>Testing</th>
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</tr>
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<tbody>
<tr>
<td>Average</td>
<td>Development and operations work together when this is required.</td>
<td>Graphical and textual reports accessible through dashboard.</td>
<td>Automated static code and security analysis after code check in.</td>
<td>Environments are identical. Several tools used to provision and configure an environment.</td>
<td>Environments are identical. Roll out of applications performed by a push of the button. Auto- deployment to D, T, A and P.</td>
<td>Build on commit. Archived components are made available for reuse by other teams.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Level 2</th>
<th>DevOps</th>
<th>Reporting</th>
<th>Testing</th>
<th>Provisioning</th>
<th>Deploying</th>
<th>Building</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginner</td>
<td>Code accompanied with release notes with which operations should install and manage the application.</td>
<td>Reports generated on request by system administrator. Reports are graphical in nature.</td>
<td>Automated tests are initiated as soon as code is checked in. Tests are focused on unit/component testing only.</td>
<td>Scripted installations per component for each server. Surrounding systems manually configured.</td>
<td>Self-service deployments to development and test.</td>
<td>Automated builds are performed in a central area and activated manually.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 1</th>
<th>DevOps</th>
<th>Reporting</th>
<th>Testing</th>
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<th>Building</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>Operations engaged at the end of the project.</td>
<td>Reports generated on request by system administrator. Reports are text based.</td>
<td>All tests require manual activity. Some tests are automated but have to be initiated by hand.</td>
<td>Manual installation and configuration of software for databases, application servers, etc.</td>
<td>Deployment through execution of separate deployment middleware scripts. Manual configurations and installs / env.</td>
<td>Builds are performed on local workstation by use of one or more separate build scripts.</td>
</tr>
</tbody>
</table>
Old process...
New process...
Principles

• We standardize **everything**.
  Machines, infrastructure, test data, application configuration

• We automate **everything**.
  Provisioning, Deploy, Test

• We use knowledge and expertise from partners (RedHat, Xebia)

• Self service
  Developers can create, delete and change their own infrastructure
  Operations can (un)deploy their applications to all environments
  Developers can monitor their applications and infrastructure
Silo

- A logical application container which contains several generic infrastructure components

- Currently supported components
  - Pre-configured and hardened (security) JBoss EAP 6 instances
    - resource adapters, data sources, drivers and default ports
  - DB2 databases & schema(s)
  - coming up...
    - Fuse ESB
    - WebSphere MQ Queues and Topics
    - etc.
DUO provisioning & deployment infrastructure

- Orchestration & Selfservice
- Management & Configuration
- Identity Management
- Application Deployment
- Monitoring & Logging

Application silo
Demo

https://youtu.be/yalAqIxQUaw
Application migration

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Migration Phase 1- Preparation (2014)

- Migration assessment
- Proof of Concepts
- Pilot projects
- Planning
- Documentation
Knowledge management

- Knowledge sharing crucial!

- Efficient, motto: “No problem is solved twice, no question is asked twice.”

- How? central knowledge library
  - Step-by-step Migration Manual
  - Migration Cookbook
  - Platform FAQ
  - Pilot projects
  - Core team
Migration Phase 2- Large scale migration

• Application migration

• Enablement workshops

• Support teams and applications

• Improvement cycle: system, standards, documentation ...

2016 Q4: IBM Websphere decommissioned
Findings

- OpenSource functional/technical equivalent to other commercial enterprise products
- More flexibility
- Fast provisioning and deployment.
- Developers and Business have become enthusiastic
- Financially scalable
Annual Software Support

3X

7X

Application Server

ESB

COTS

RedHat

OpenSource
Financial scalability: 2 extra cores will cost you….

![Bar chart showing financial scalability comparison between Application Server and ESB for COTS and RedHat OpenSource solutions. The chart displays a 20X and 38X increase in cost for each category.](chart.png)
Roadmap

- 2016/2017 Replace Cordys ESB with RedHat Fuse
- 2017 PaaS/ Containerization (OpenShift?)
- 2016/2017 DevOps organization (40 teams)
Questions?