Introduction to DevOps

Leif Sørensen, CD Coach, partner and co-founder at Praqma
les@praqma.net

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Praqma

- Continuous Delivery & DevOps experts and evangelists
- Tools & Automation experts
- We help customers with practical implementation of their development process
- 7 years, 20 employees, offices in Copenhagen, Aarhus, Oslo & Stockholm
- New venture: Container Solutions Denmark, together with Trifork
- Jenkins CI User Events: Copenhagen, 2011 - 2015
- CoDe Conferences: Oslo, Stockholm, Copenhagen, 2014,15
- Next: Continuous Delivery & DevOps Conference, Copenhagen, October 7th
- Service partner to:
Agenda

Traditional Development & Operations
Definition of DevOps
Why DevOps - Agile development & Continuous Delivery
Why DevOps - Infrastructure & Tools
Why DevOps - Unicorns - the internet startups
NoOps
Challenges - Organisation /Maturity / Technical debt
How to get started
Agenda

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Traditional Dev/Ops organisation

Development
- Responsible and measured on delivery of business functionality
- Require and like changes
- Poor understanding of writing “operational” applications

Operations
- Responsible and measured on stability & availability
- Dislike changes
- Maybe even outsourced
Traditional Dev/Ops organisation

- No common tools
- Handover points, check points (operations desperately trying to control ensure deliveries are living up to their demands)
  - Don’t catch problems
  - Slow and expensive
- Support is difficult, and often across Dev & Ops
- A lot of ‘blame games’
- Development projects and support are also separated - making it worse
Operations handover
Operations handover
Operations handover
Operations handover
Traditional Dev/Ops organisation

2 organisations with very different priorities and goals, different tools, different attitude and mentality, often 2 companies, working together to implement a pipeline for delivering software from developer to production

Bound to fail
Andon cord
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What is DevOps?

Is it a culture?
Is it a job title?
Is it a team?
Is it a way of organizing?
Is it a tool stack?
Or just a way of thinking?
Definition of DevOps

DevOps is agile IT operations delivery, required to match the cadence of agile IT development.

DevOps is the philosophy of unifying Development and Operations at the culture, practice, and tool levels, to achieve accelerated and more frequent deployment of changes to Production (The IT Sceptic)

DevOps emerged in 2009 when a group of Belgian developers hosted DevOps Days, which advocated collaboration between developers and operational staff
Definition of DevOps

The term “DevOps” typically refers to the emerging professional movement that advocates a collaborative working relationship between Development and IT Operations, resulting in the fast flow of planned work (i.e., high deploy rates), while simultaneously increasing the reliability, stability, resilience and security of the production environment (Gene Kim).
Operations tasks

- Architectural layout
- Performance
- Sizing
- Provisioning
- User management
- "Iron and wire"
- Quality gateways

- Deployment
- Database management
- Job scheduling
- Surveillance and monitoring
- Incident management
- 1st level support and dispatching
DevOps Deliveries

A dynamic platform, where resources can be provisioned automatic on the fly. The resources must be available for development, test and production. An automatic CD Pipeline, that goes the whole way to production.
Quality Assurance

Continuous Delivery & DevOps provides new possibilities for test environments for manual and automated tests
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Agile Manifesto

- Four doctrines
- Twelve Principles

_We follow these principles:_

Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.

_Working software is the primary measure of progress._

Business people and developers must work together daily throughout the project.
Continuous Delivery Pipeline

Automated Platform

VCS

Developer

Work item

I'm done!

...nope!

Done done

Continuous Delivery Pipeline
Agile defies phases

Waterfall

Development → Integration → Testing → Deployment → Release

Agile

Development + Integration + Testing + Deployment + Release

Watergile? Agilefall?

Integration → Testing → Deployment → Release
Continuous Delivery (CD) Story-line

Continuous Delivery Pipeline

Automation Platform

VCS

Developer

Work item

Operations

I'm done!

...nope!

Done done

Continuous Delivery

Platform
Is this a problem?

Unachieved goals:
● Unpredictable deliveries
● No visibility into the progress
● Cannot deliver fast
● Building up technical debt
● Quality is put on as an afterthought

It is very expensive, to develop software that you do not put into production
CD Story-line

Automation Platform

VCS

Developer

Work item

Continuous Delivery Pipeline

I'm done!

...nope!

Done done
Continuous Delivery

- When we implement CD, we do a lot of operations work - that should be reused
- Highly automated process
- Requires a lot of environments for build, test,...
- Require ability to dynamically provision new environments
- Dev needs Ops for this
- CD can help creating trust between Dev & Operations
- You don’t “do” DevOps. You “do” Continuous Delivery
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Infrastructure & Tools

- Important to see the tool stack as one integrated tool stack for Development and Operations
- Infrastructure as code
- Configuration as code
- You need tools for CI Server, Configuration management, Provisioning,...
Infrastructure on demand

You can buy infrastructure a lot cheaper and simpler than making a big IT Operations outsourcing deal with XXX
Tools - Docker

Build, Ship and Run
Any App, Anywhere

Docker - An open platform for distributed applications for developers and sysadmins.
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The forerunners - Unicorns

Amazon, Facebook, Twitter, Google, Netflix

Internet startups, the application is the business, more focus on new functionality than errors (?), can test in production (?), ...

NoOps
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Developers: we don’t need operations! They are just a pain!
With the right tools and services - we would rather do it all ourselves!
Operations tasks

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- Performance
- Sizing
- Provisioning
- User management
- "Iron and wire"
- Quality gateways
- Deployment
- Database management
- Job scheduling
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- 1st level support and dispatching
NoOps

- NoOps means developers can code and let a service deploy, manage and scale their code.
- NoOps means automated systems managing app lifecycles, not SysAdms. “the point isn’t that ops are going away, but they’re going away for developers” (Derrick Harris at GigaOm)
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Challenges - Organisation

- Your Dev and Ops people have conflicting goals
- Your Operations people have been beaten into defensive mode
- Everybody are just so used to the Dev versus Ops way of working
Challenges - Technical
Continuous Delivery Maturity

Build
- Novice: Verification before commit, nightly build
- Beginner: CI server triggered by commit, artifacts are managed
- Intermediary: No build scripts - only configurations, dependencies are managed
- Advanced: Distributed builds, staged build sequence
- Expert: Build on VM, CI server orchestrate VMs

Test + QA
- Novice: Unit Test, code coverage
- Beginner: Additional code metrics, mock-ups & proxies
- Intermediary: Peer-reviews, automated functional test
- Advanced: Automated deployment, maintain test data, test in target
- Expert: Automated acceptance test

SCM
- Novice: “Early branching”, branches used for releases, merges are rare
- Beginner: “Late branching”, branches used for work isolation, merges are common
- Intermediary: All commits are tied to tasks, individual history rewrite in DVCS
- Advanced: Pre-tested commits, integration branch is pristine
- Expert: Automatically generated release notes and audit trails

Visibility
- Novice: Build status is notified to committer
- Beginner: Latest build status is available to all stakeholders
- Intermediary: Trend reports, build status can be subscribed to (pull vs push)
- Advanced: Monitors in work areas show real-time status
- Expert: Build reports and statistics are shared with customer
Operational Maturity

- Application versus database changes
- Non-monolithic architecture - Microservices
- Operational, testable, supportable applications
- Tracebility / Visibility
- Configuration, Infrastructure as code
Technical debt

Henrik Kniberg: The Solution to Technical Debt http://blog.crisp.se/2013/07/12/henrikniberg/the-solution-to-technical-debt
Technical debt

Anything about your code & development environment that slows you down. For example:

- Unclear, unreadable code
- Lack of test automation, build automation, deployment automation, and anything else that could be automated that you do manually today
- Duplicate code
- Tangled architecture & unnecessarily complex dependencies
- Slow, ineffective tools
- Uncommitted code & long-lived branches (hides problems that will slow you down later)
- Important technical documentation that is missing or out-of-date
- Unnecessary technical documentation that is being maintained and kept up-to-date
- Lack of test environments
- Long build-test cycle & lack of continuous integration
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How to get started

- You don’t “do” DevOps. You “do” Continuous Delivery (except Cloud - Private or public. That you just do!)
- Insourse your operations, move it into the cloud, or find an outsourcing partner who can deliver DevOps (not tools, but services)
- Ensure that everybody have the same goal: developing and delivering working software
- Ensure you have people who want to develop and improve
- Think deployment & operations from the beginning of the project - Involve Operations
More materials


Continuous Delivery & DevOps Conferences, Jenkins CI User Events: http://www.code-conf.com/

Top 11 Things You Need To Know About DevOps, Gene Kim (http://www2.netuitive.com/rs/netuitive/images/Top11ThingsToKnowAboutDevOps.pdf)

The Convergence of DevOps, John Willis: (http://itrevolution.com/the-convergence-of-devops/)
The end - thank you!