Walking the Tightrope

Between Agile Product Development & IT Operations

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Purpose of this presentation

"To retell my experiences of ramping up an agile development team, coordinating work with IT operations, and sharing the lessons I learned."

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Before we start

- Not here to pass judgment, cast dispersions or generalize “developers” and/or “sysadmins”
- Merely recounting my observations
- For the sake of clarity:
  - Development (m/f) => developer
  - IT Operations (m/f) => sysadmin

Developer

Sysadmin

Introduction

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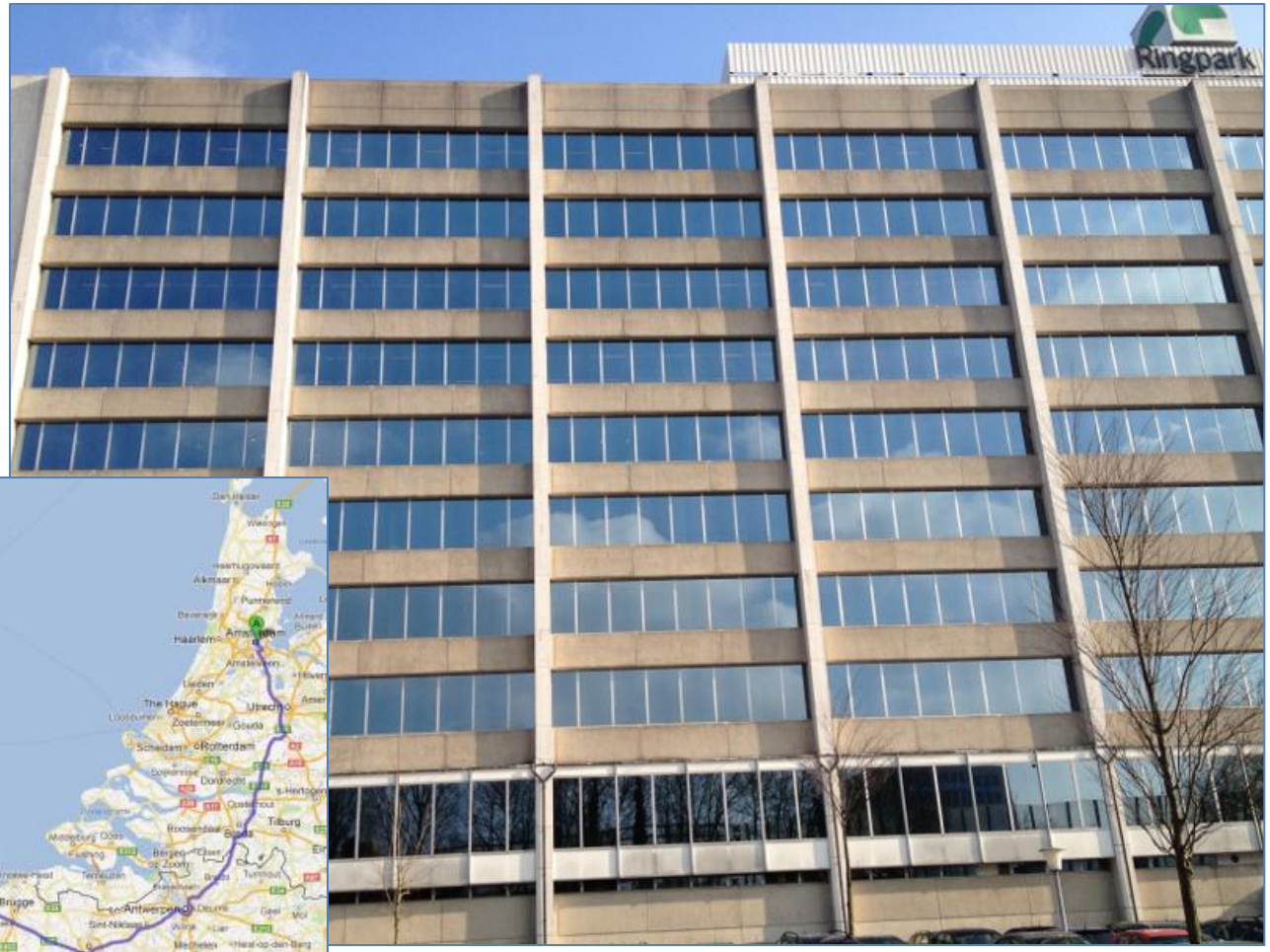
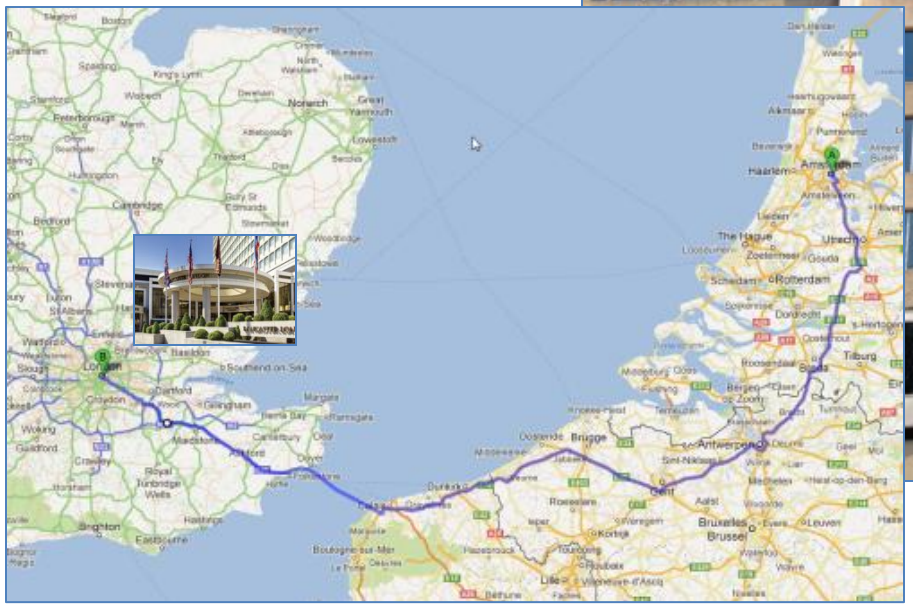
Amsterdam





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E-Government solutions

- Advanced web-based product suite providing multi-channel access to rich content (laws, tax, regulatory, etc).
- Saas, open connectivity.
- High-performance and scalable platform.
- Web accessibility: “webrichtlijnen” and “drempelvrij” for handicapped.
- Government, semi-government institutions, municipalities and provinces.

Case study: the VIND4 project

“Voor iedereen het juiste antwoord!”

LEGAL

?

ALL …

?

VIND4

TAX

?

REGULATORY

?

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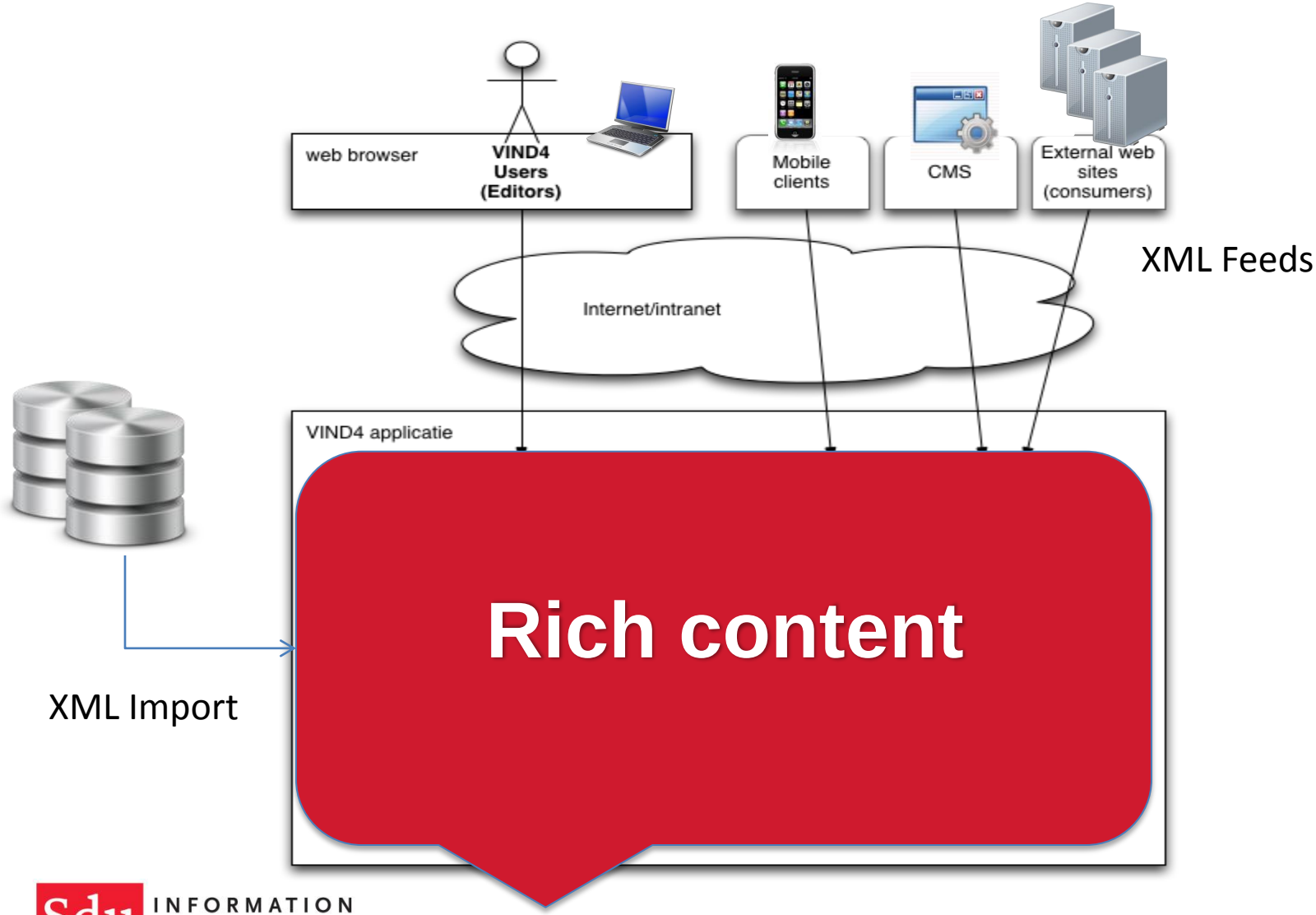
VIND4 platform architecture



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Development team at work

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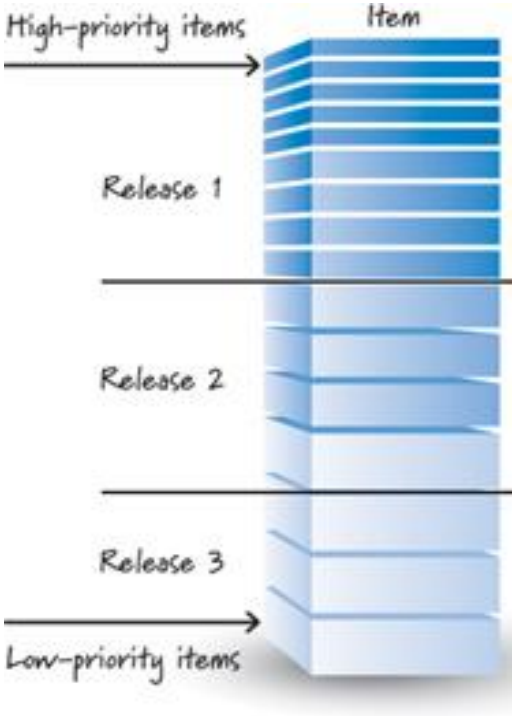
Our purpose

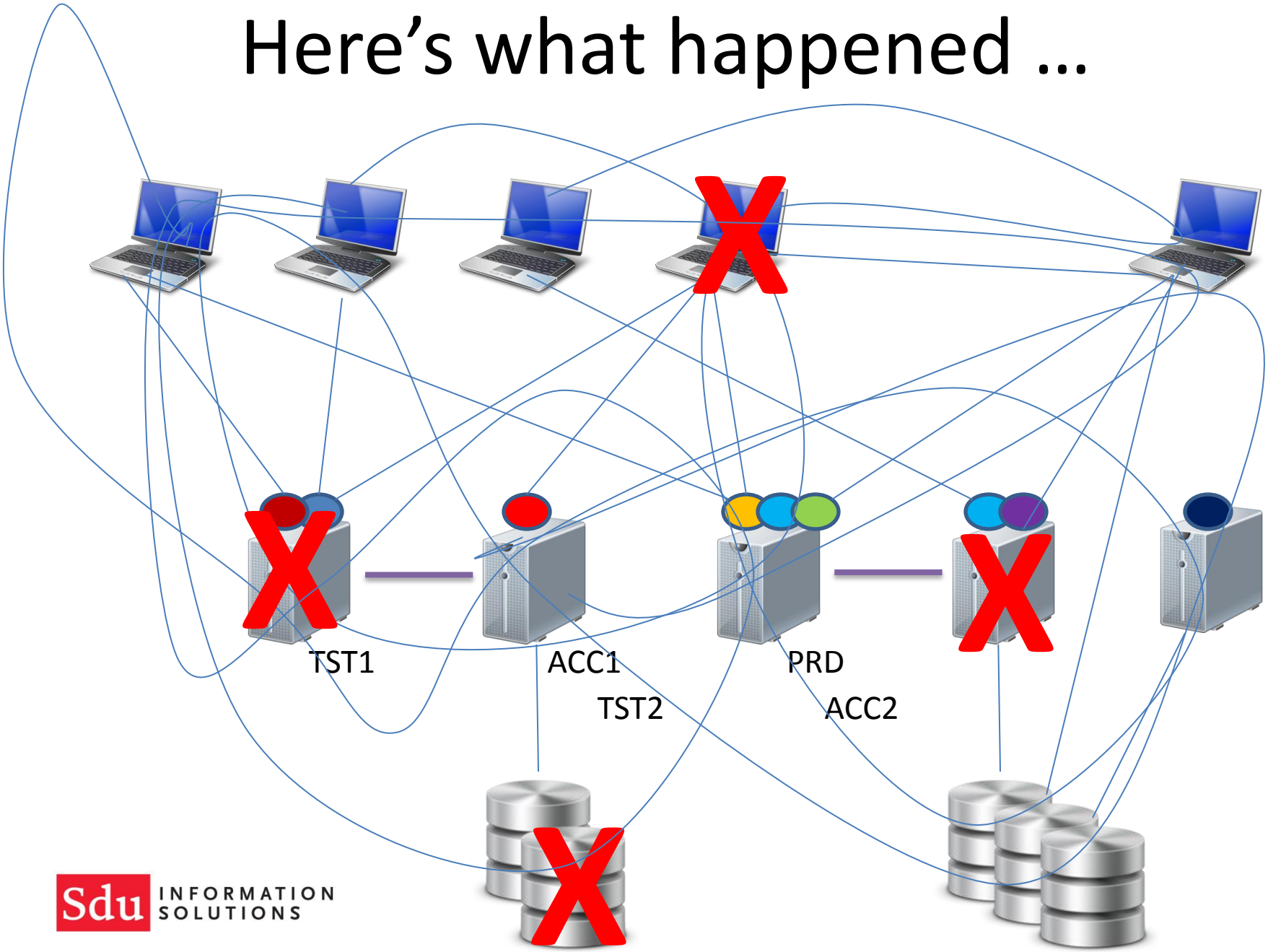
- Delivery high-quality software quickly, efficiently and on schedule.
- Understand the requirements of an ever-changing market (product owner).
- Translate product roadmaps into releases.
- Use the right technology.
- Ensure new products are future-proof.

A short history



- Product is end-of-life
- Decide to rewrite in Java
- Recruit and ramp up team
- Introduce agile and scrum
- Define product backlog
- Start implementation
- (Moving along just fine, sprint 1,2,3 …)
- Oops, need “proper” development environment.

Here’s what happened …



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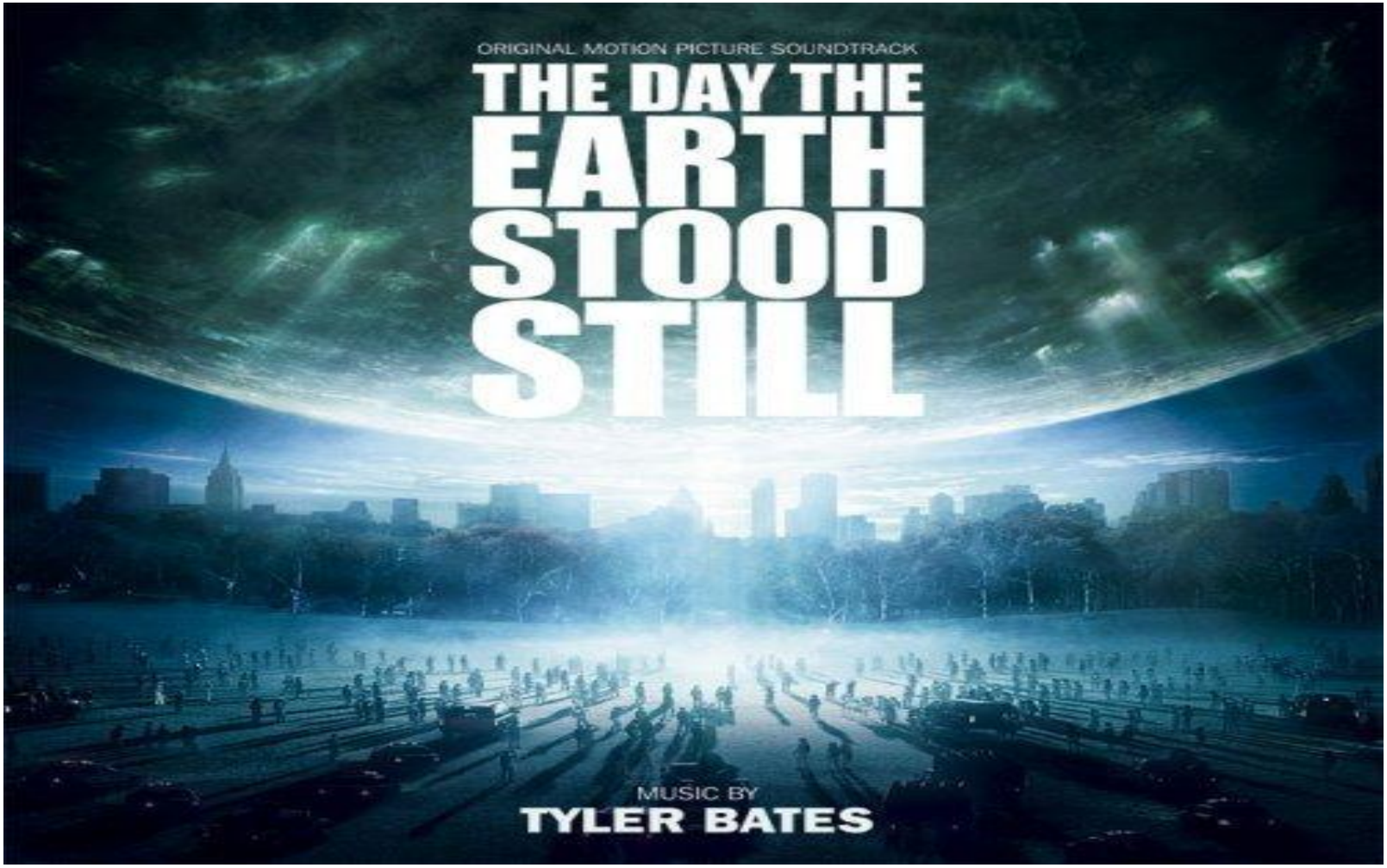
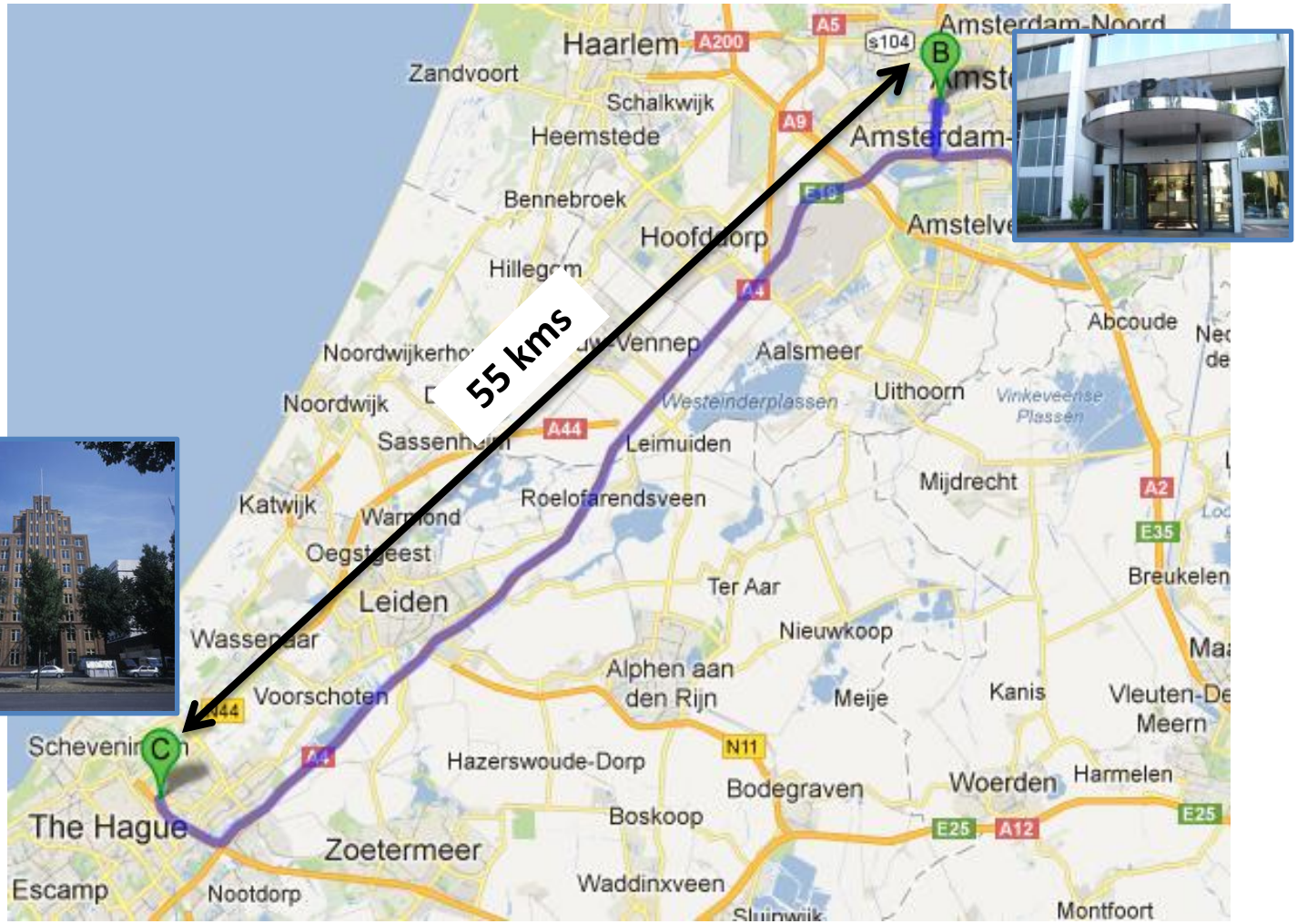
Disaster strikes!



Clash of cultures

Different locations



(55 kms = 34 miles)

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Worlds apart?

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55 / 40,075 = 0.14 % of earth's circumference

DEV | OPS

http://www.slideshare.net/jallspaw/10-deploys-per-day-dev-and-ops-cooperation-at-flickr

Different cultures

- Command line
- Performance
- Scalability
- Security
- High-availability
- Firewalls
- Load balancers
- Floating IP addresses
- DNS, LDAP, SSG
- Blue Coat

Sysadmin

- Fancy IDE
- Coding conventions
- Java, C/C++
- Objects and methods
- HTML/CSS
- JavaScript
- Debuggers
- Subversion/CVS
- XML/XSLT
- Web services

Developer

Agile development

Developer

- Lots of small changes often (every 2 weeks)
- Breaking the system is good
- Empirical / adventurous
- Open source / latest gimmicks (cheap)
- Components (software modules)
- Developers “think” they are the smartest

Operations

Sysadmin

- Large changes infrequently (4x per year)
- Breaking the system is bad
- Preventive and careful (monitoring)
- Proven technology (expensive)
- Low-level building blocks
- Sysadmins “know” that they are the smartest

Plan-driven versus Scrum

Dimension	Plan-Driven	Scrum
Degree of process definition	Well-defined set of sequential steps	Complex process that would defy a complete up-front definition
Randomness of output	Little or no output variability	Expect variability because we are not trying to build the same thing over and over
Amount of feedback used	Little and late	Frequent and early

Tackling problems

- How many comment lines in a given file?
- A comment line begins with the '#' character.

```java
import java.util.*;
import java.io.*;

public class CountComments {

    public static void main(String[] args) throws IOException {
        String fileName = args[0];
        List<String> lines = readLines(fileName);
        int count = countCommentLines(lines);
        System.out.println(count);
    }

    public static int countCommentLines(List<String> lines) throws IOException {
        int count = 0;
        for (String line : lines) {
            if (line.startsWith("#")) {
                ++count;
            }
        }
        return count;
    }

    private static List<String> readLines(String fileName) throws IOException {
        BufferedReader reader = new BufferedReader(new FileReader(fileName));
        String s;
        List<String> lines = new ArrayList<String>();
        while ((s = reader.readLine()) != null) {
            lines.add(s);
        }
        return lines;
    }

}
```

?

Developer

Sysadmin

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    }

}
```

```
$ egrep '^#' fname | wc -l
```

Developer

Sysadmin

Which is better?

- To discourage change to ensure stability and predictability.

  … or …

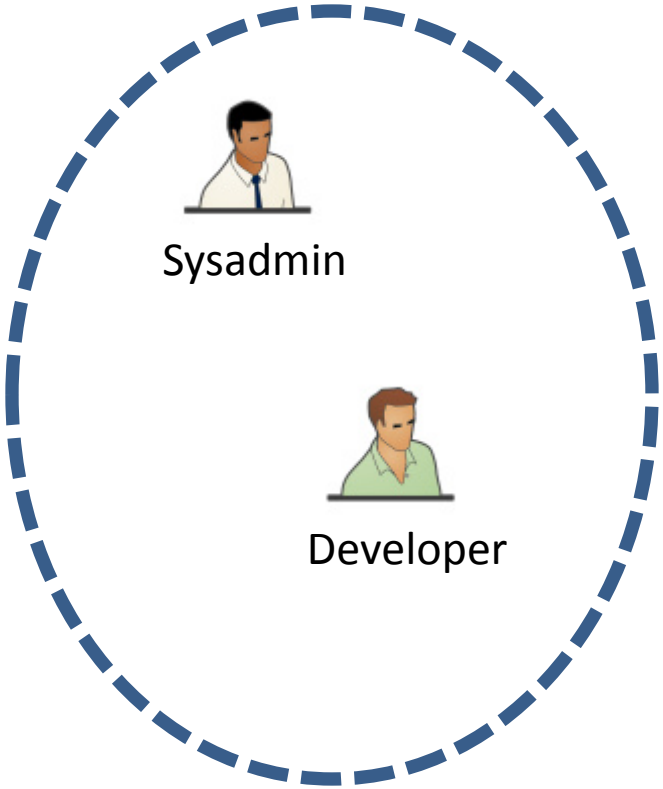
- To embrace frequent (continuous) change to decrease time-to-market and boost profits.

Can we have both?

- To discourage change to ensure stability and predictability. ✗
- To embrace frequent (continuous) change to decrease time-to-market and boost profits. ✗
- To embrace change, ensure stability **and** predictability, **and** decrease time-to-market **and** boost profits.

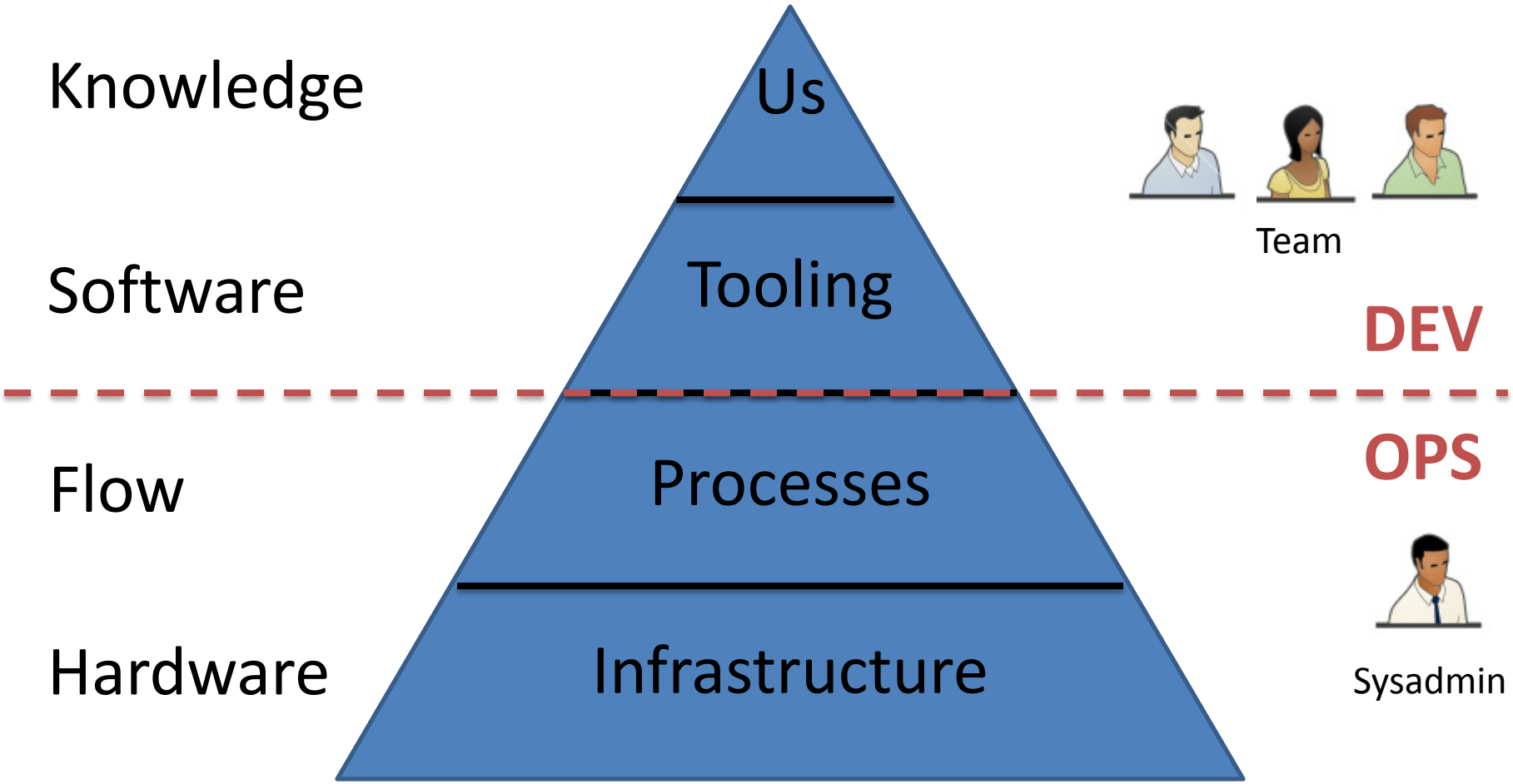
Things in common

- Highly skilled
- Well educated
- Technical specialists
- Problem solvers
- Sleep late … work late …
- Love to work with gadgets
- Read science fiction
- Drink beer and play pool



Self-supporting differences

Self-supporting pyramid



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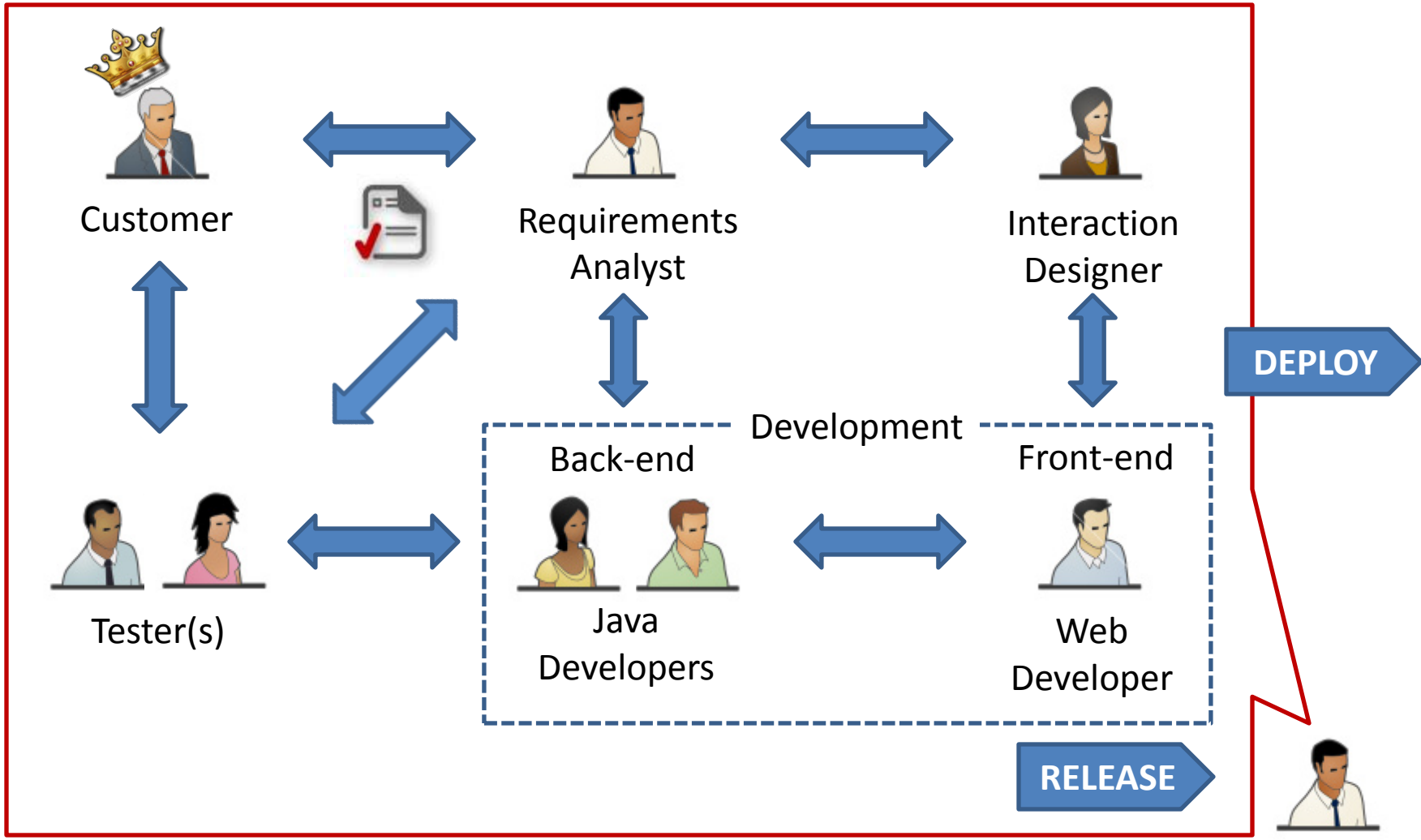
Start-to-finish flow



Types of disciplines

- Requirements analysis
- Interaction and graphics design
- Web development (front-end)
- Java development (back-end)
- Internal testing
- Acceptance testing (customer)
- Deployment (production)

Development

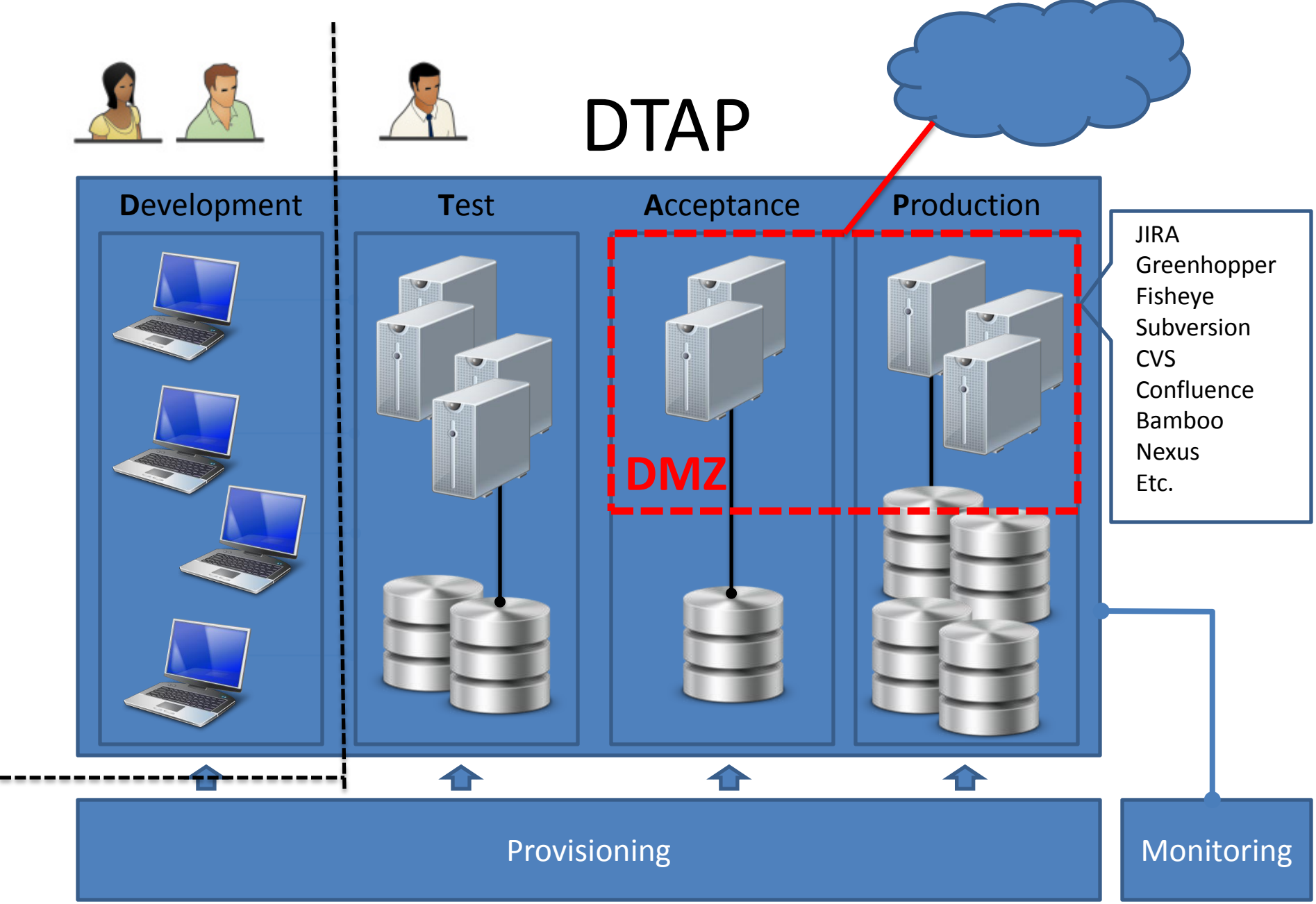
Testing

Sysadmin

Tooling

- JIRA — Issue tracking, timesheets
- GreenHopper — Scrum add-on
- FishEye — Code review
- Bamboo — Continuous integration
- Confluence — Documentation
- Source code
- Online collaboration
- puppet labs — Provisioning and deployment

Atlassian



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Agile software development

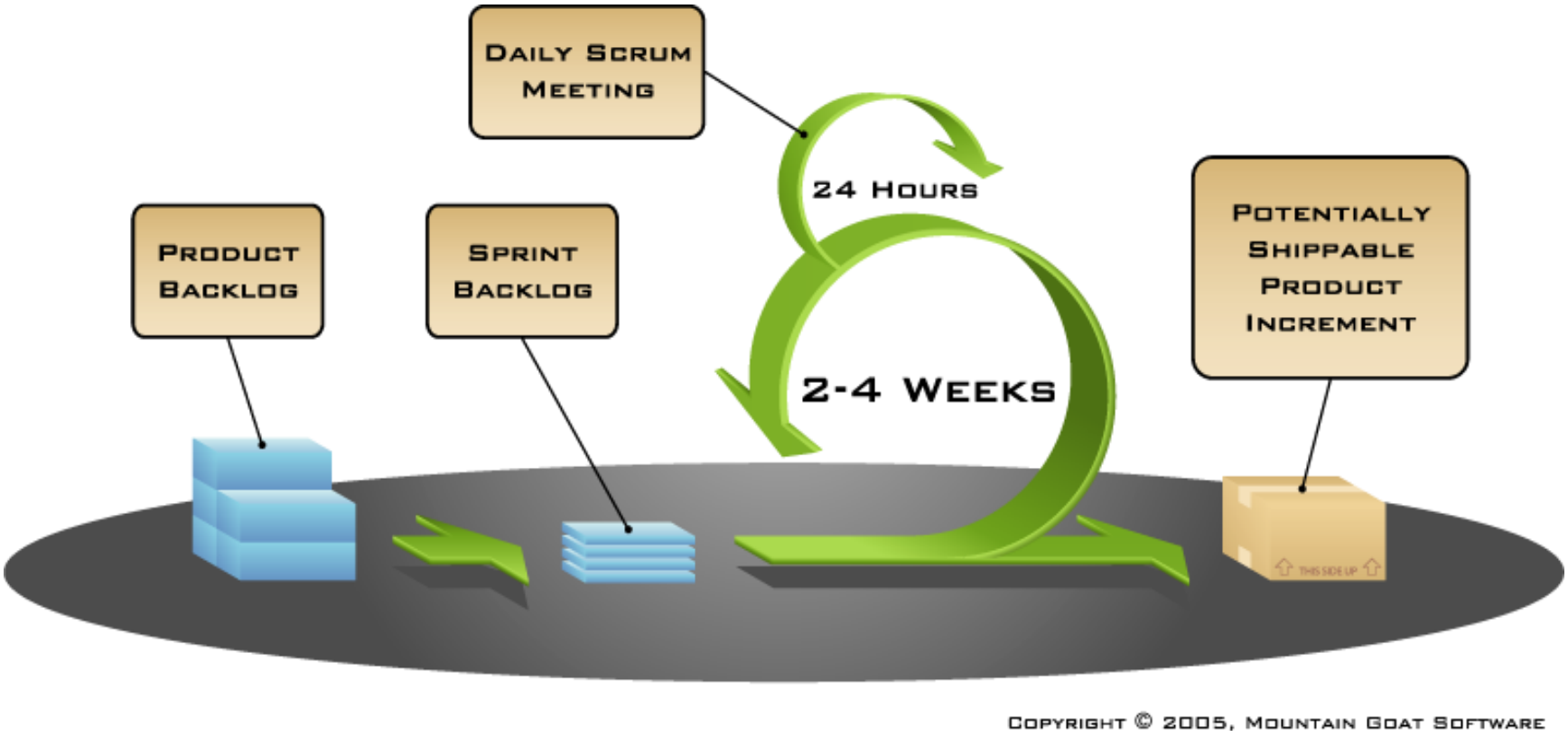
Manifesto for Agile Development

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

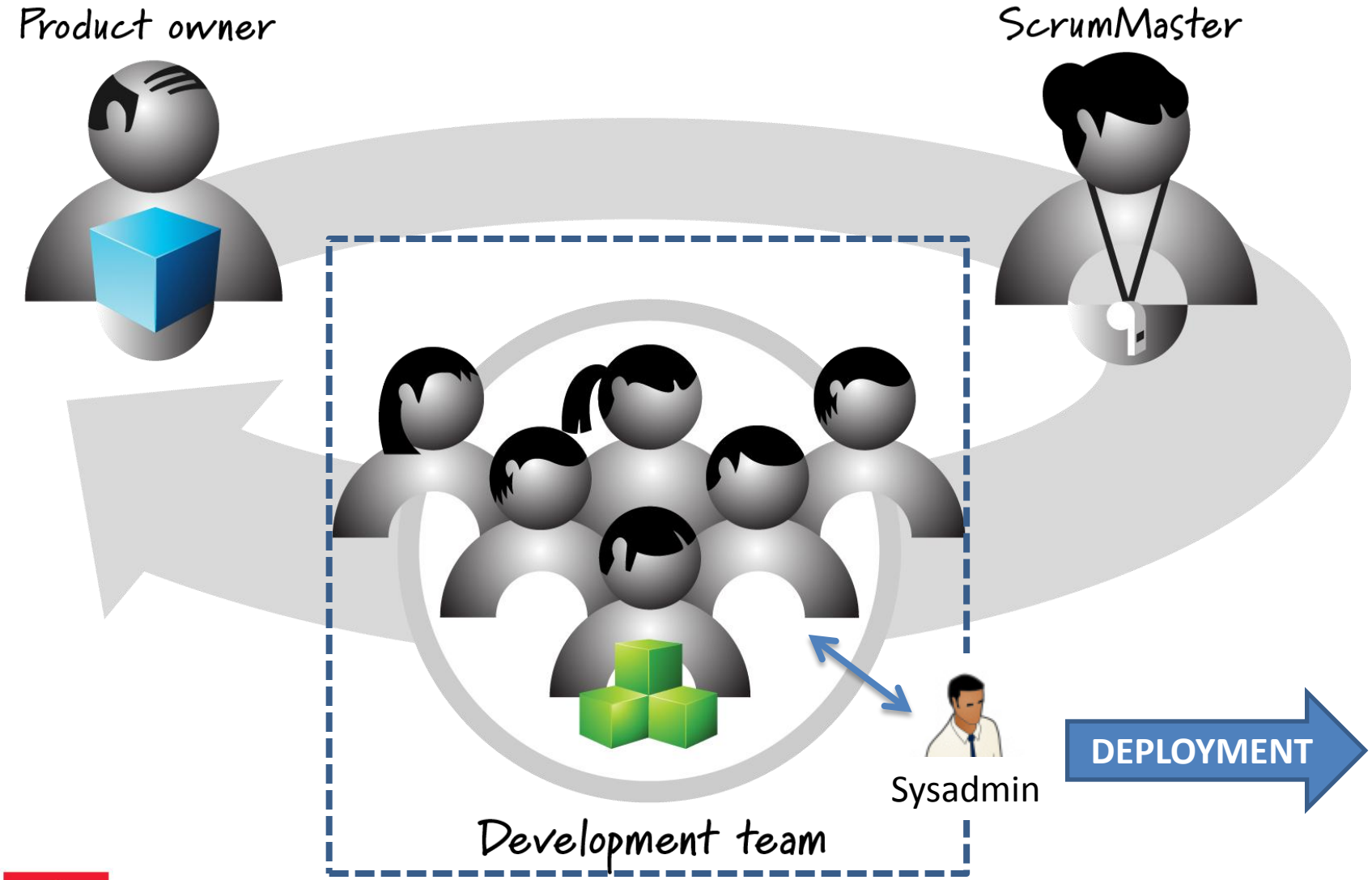
Scrum methodology

- Iterative and incremental
- Quick results
- Progress through refinement
- Potentially deliverable product per cycle
- Improvement by learning
- Many feedback loops

Scrum cycles



There are 3 Scrum roles



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Server management and configuration

Puppet

- Open source framework for managing life-cycle of multiple server configurations (Linux)
- (Initial) build, installation, upgrades, maintenance, migrations, end-of-life
- Client-server model: Puppet master + agents
- Configuration language (Ruby)
- Resource abstraction layer

Installing Postfix

```
# /etc/puppet/modules/postfix/manifests/init.pp
class postfix {
    package { postfix: ensure => installed }
    service { postfix: ensure => running, enable => true }

    file { "/etc/postfix/main.cf":
        content => template("postfix/main.cf.erb"),
        mode => 755,
    }
}
```

Idempotent (enforce state)

```
# /root/learning-manifests/file.pp
file {'testfile':
    path    => '/tmp/testfile',
    ensure  => present,
    mode    => 0640,
    content => "I'm a test file.",
}
```

Continuous delivery

Continuous delivery

- An automated release process which reduces development cycle time, getting features and bug-fixes to users fast.
- Every single change (configurations, source code, environment, data) triggers flow via pipeline.
- The team deploys any software version to any environment through fully automated process.

Deploy and release

- Integrate testing, deployment and release activities into the development process.
- Ensure that product is always in a “releasable” state.

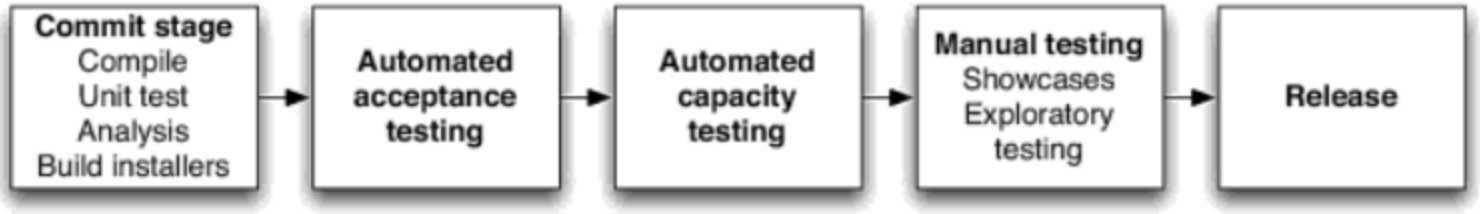


Figure 1.1 *The deployment pipeline*

(Mini-) Development cycle

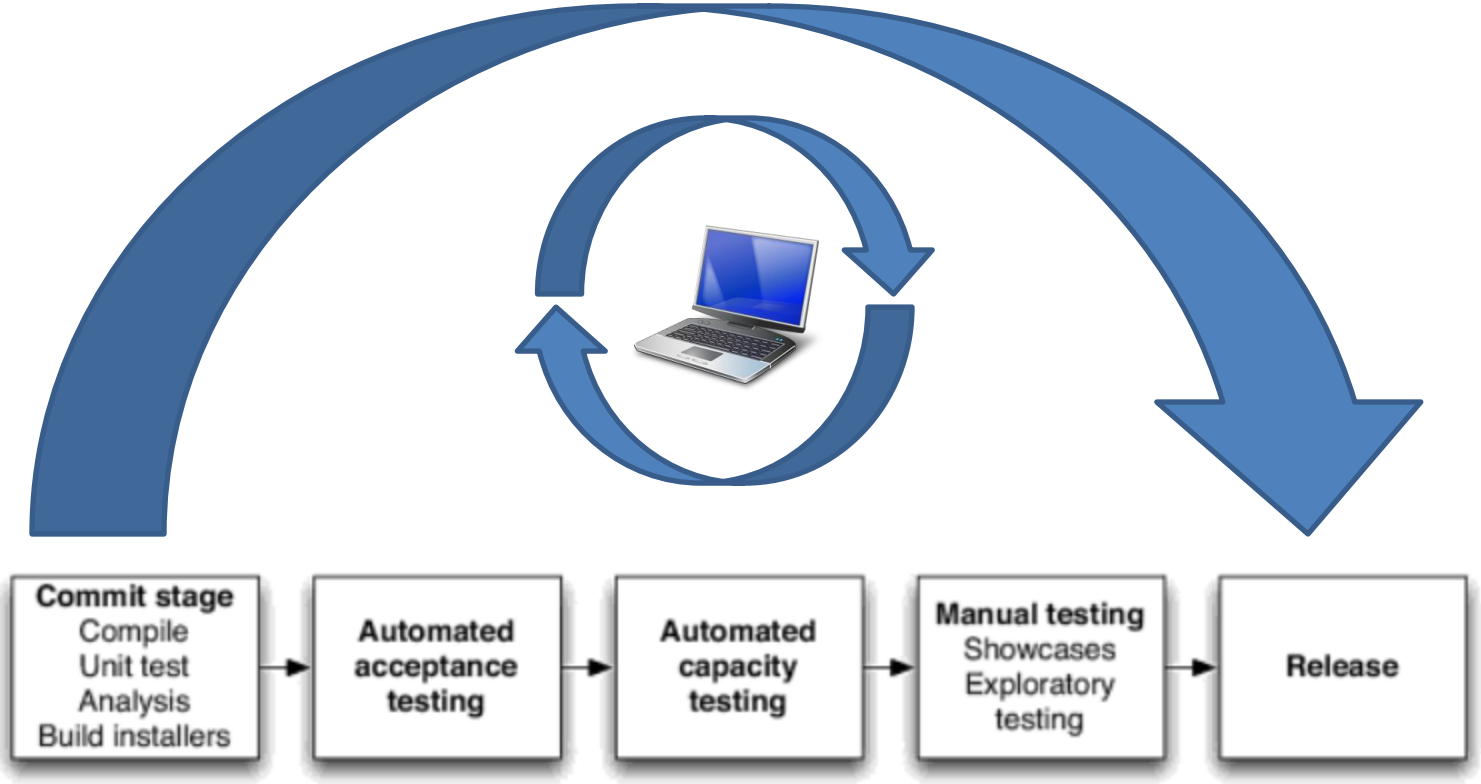


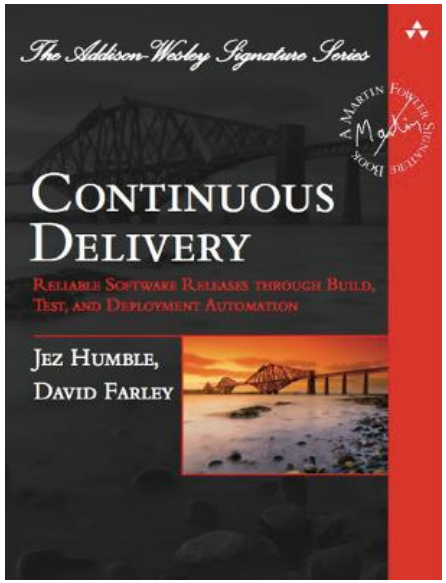
Figure 1.1 *The deployment pipeline*

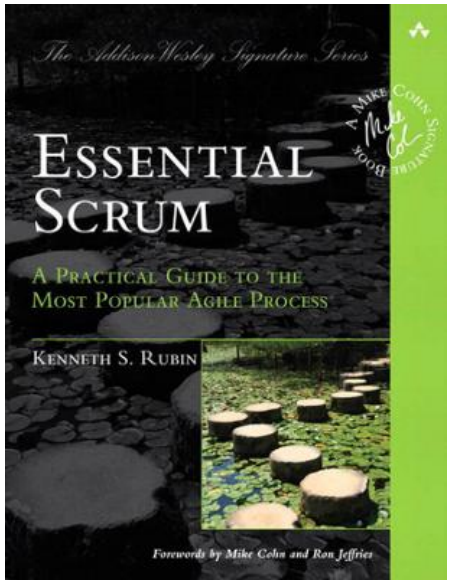
Conclusions

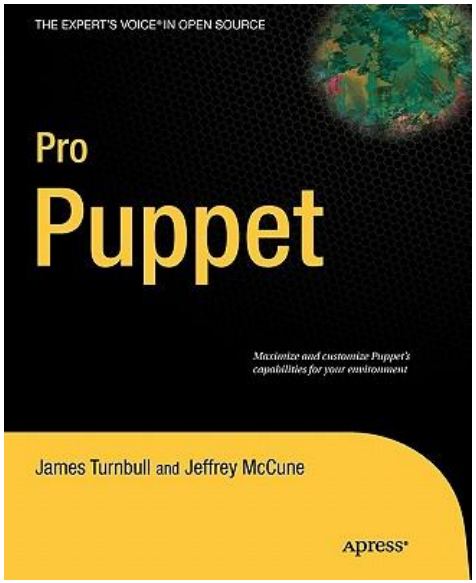
Lessons learned

- Sysadmin onboard early.
- Clear guidelines and best practices.
- Well-defined roles and permissions.
- Kickoff meeting (explain DTAP).
- Sysadmin in middle of developers.
- Weekly DevOp meetings.
- Document network landscape (updated).
- Go out and play pool!

Recommended books







- Continuous Delivery, Humble and Farley
- Essential Scrum, Rubin
- Pro Puppet, Turnbull and McCune

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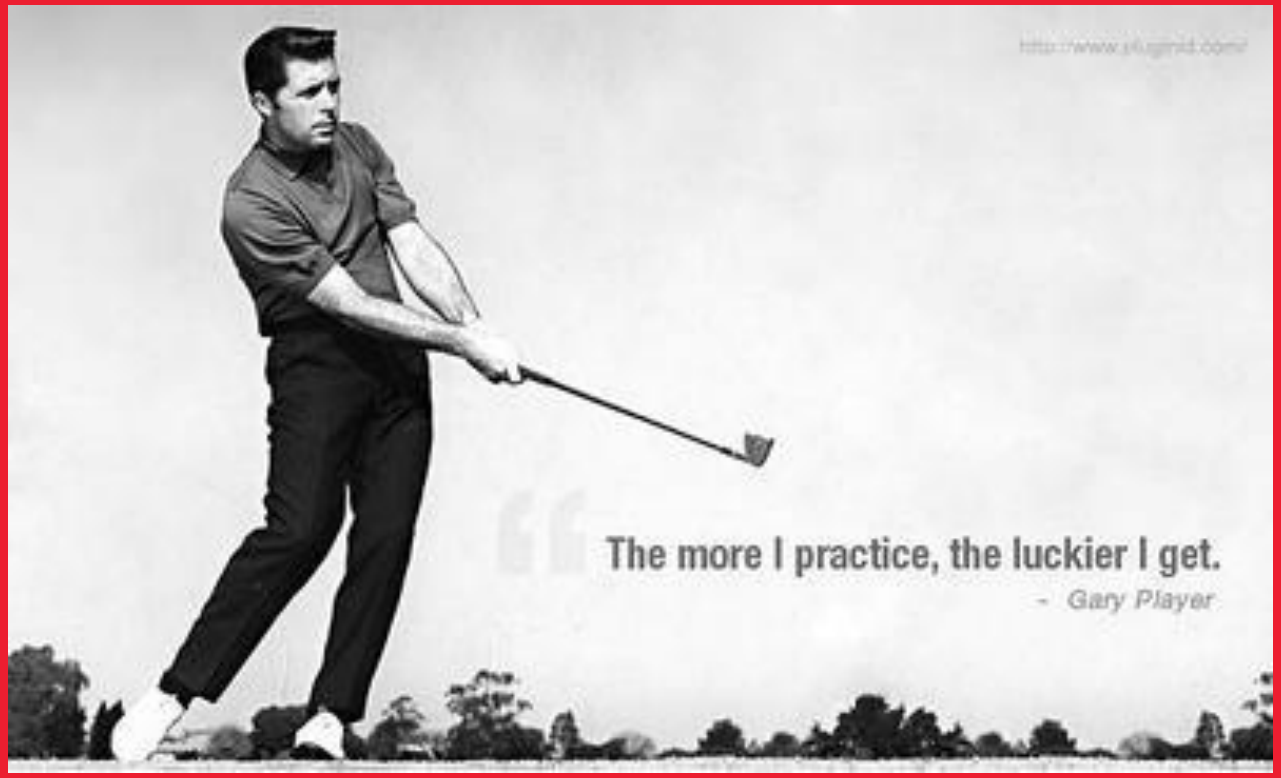
The more I practice, the luckier I get.
- Gary Player