

DevOps and Software Architectural implications

Fish

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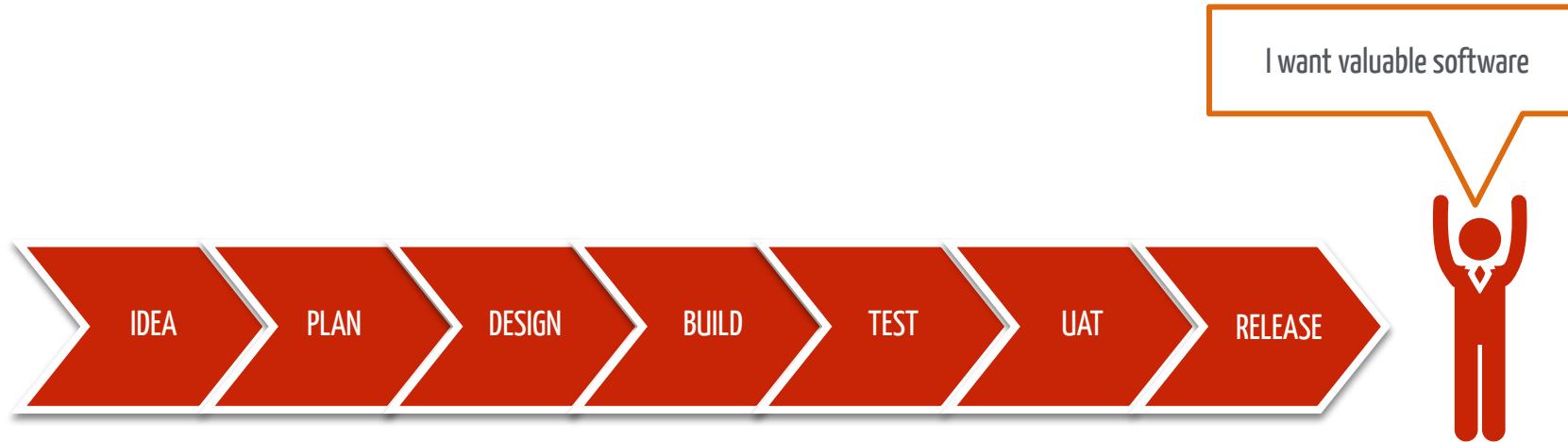
THE ATTENDANTS WILL LEARN...

- The DevOps Pipeline
 - What is the DevOps Pipeline?
 - Stages;
 - Moving through it.
- Software Architecture and DevOps;
 - What is Software Architecture?
 - Business goals+architecture+DevOps;
 - Quality attributes;
 - Tatics, Patterns and Styles;
- Service-oriented Development
 - What is Microservices?
 - Do we have other Approaches?
 - How is DevOps related to Microservices?
 - Conway's Law;
- What are the architectural structure implications of adopt Microservices in environments?
 - Imutability
 - Database;
 - SOA vs Microservices;
 - Tatics, Patterns, and Style;
 - Quality Attributes;
 - Scalability (the scale cube);
 - PaaS;

Remembering

- What is DevOps?
- Operations?

The phases of software delivery process



What is a DevOps pipeline (Netflix)?

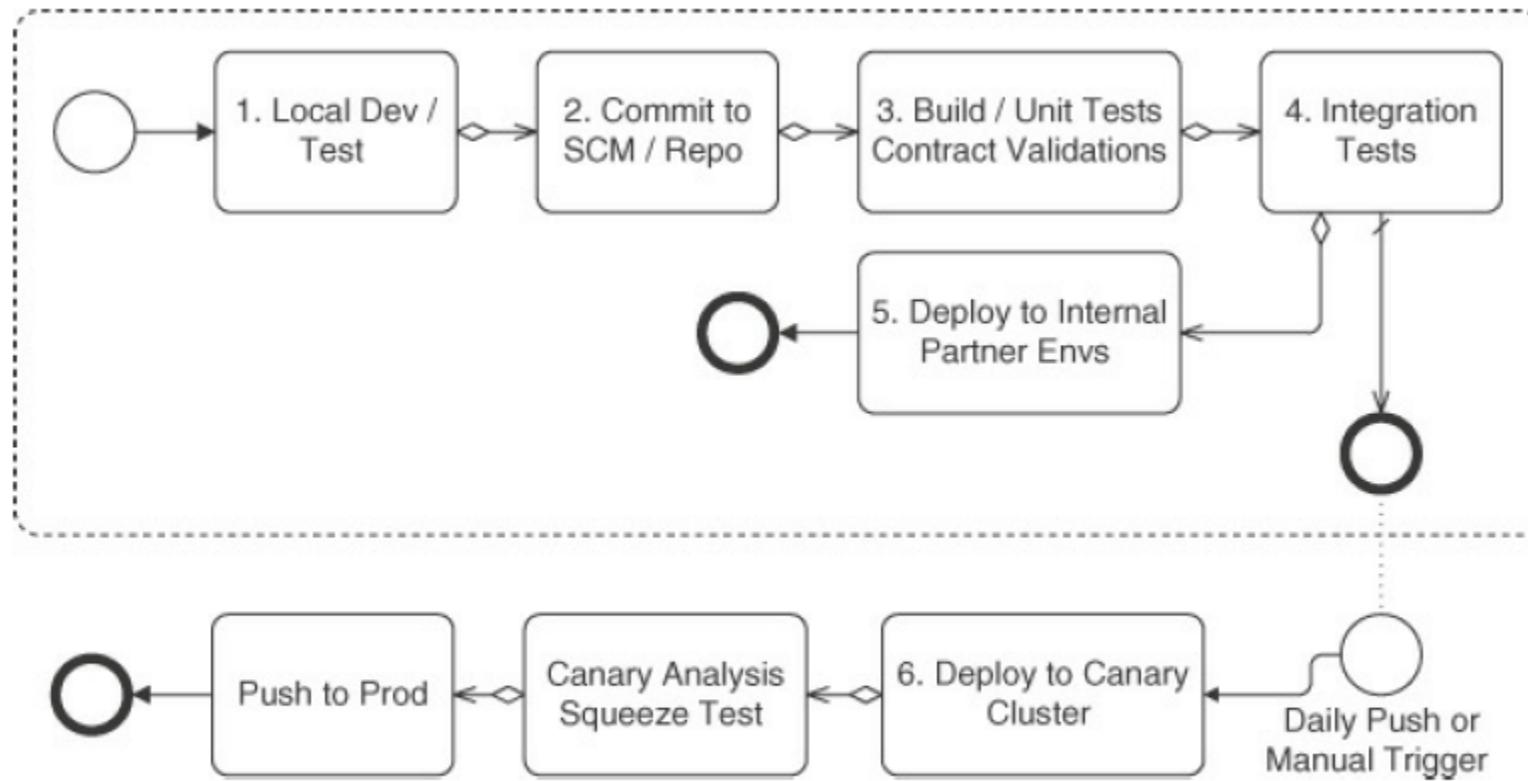
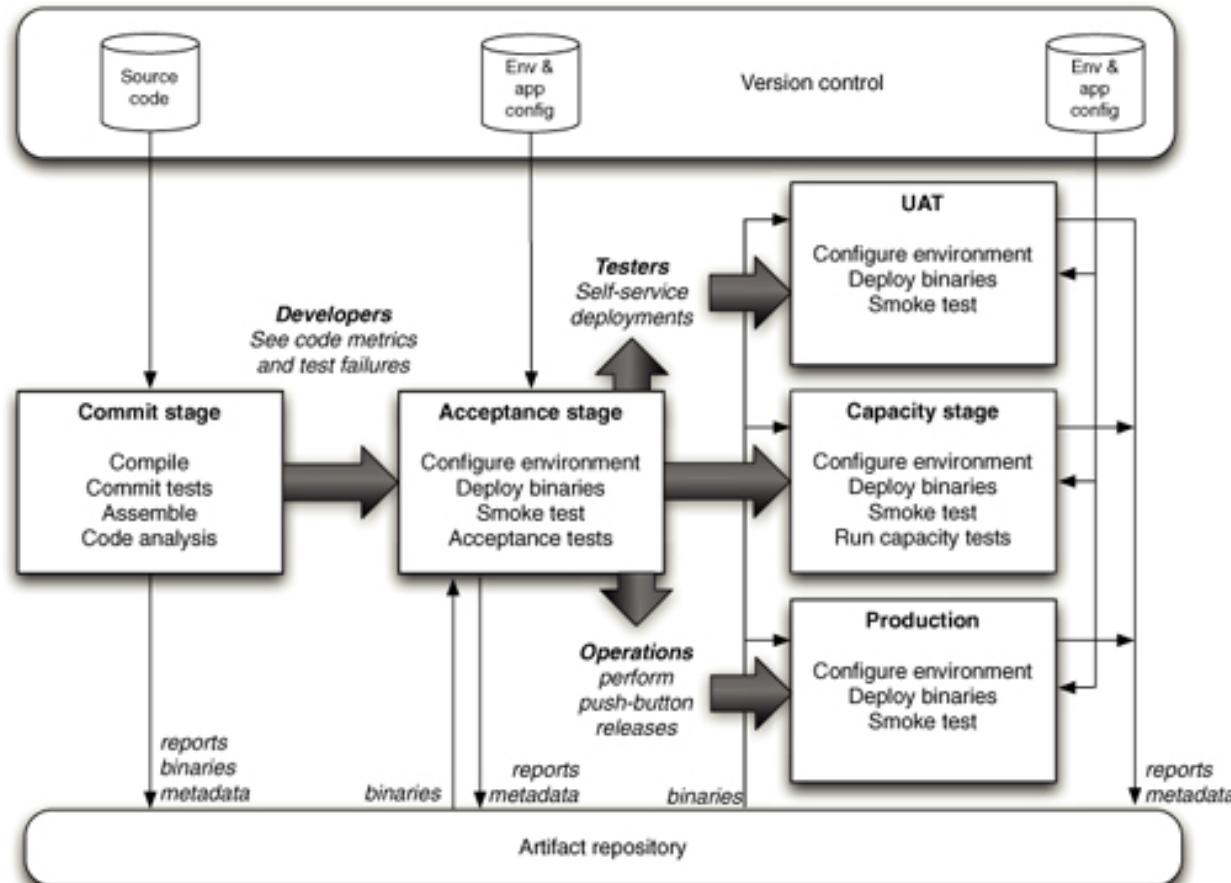


FIGURE 1.3 Netflix path to production. (Adapted from <http://techblog.netflix.com/2013/11/preparing-netflix-api-for-deployment.html>) [Notation: BPMN]

What is a DevOps pipeline (ThoughtWorks)?



What is a DevOps pipeline (SEI)?

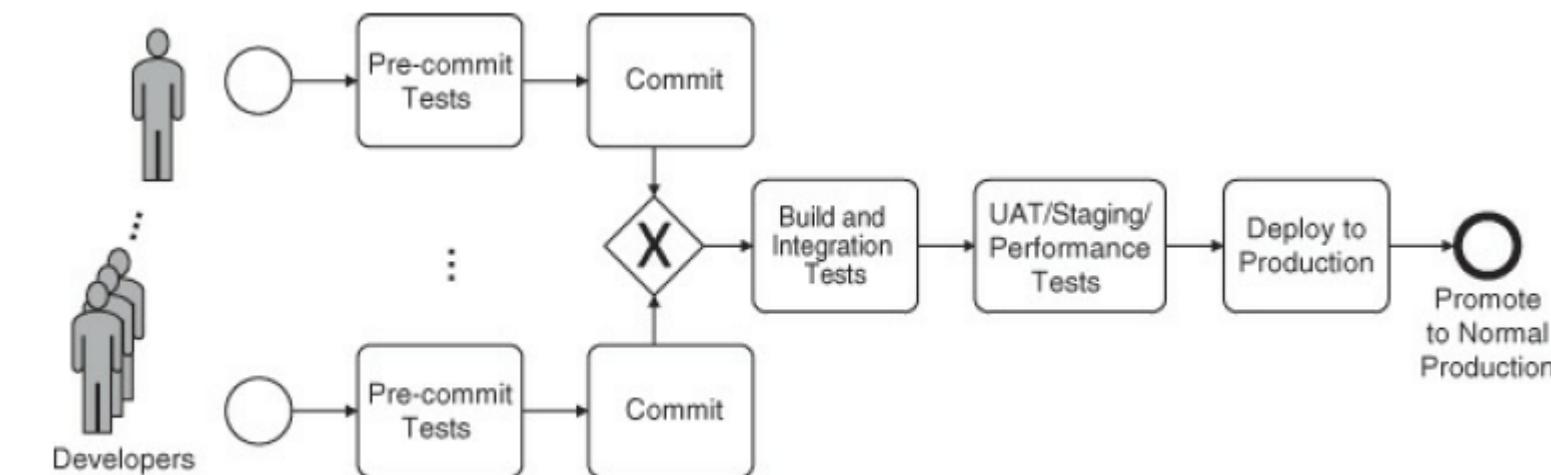
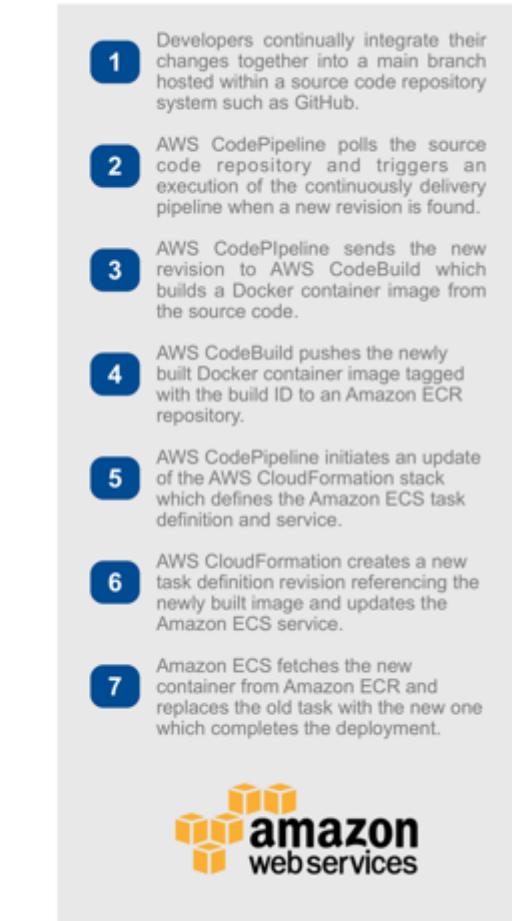
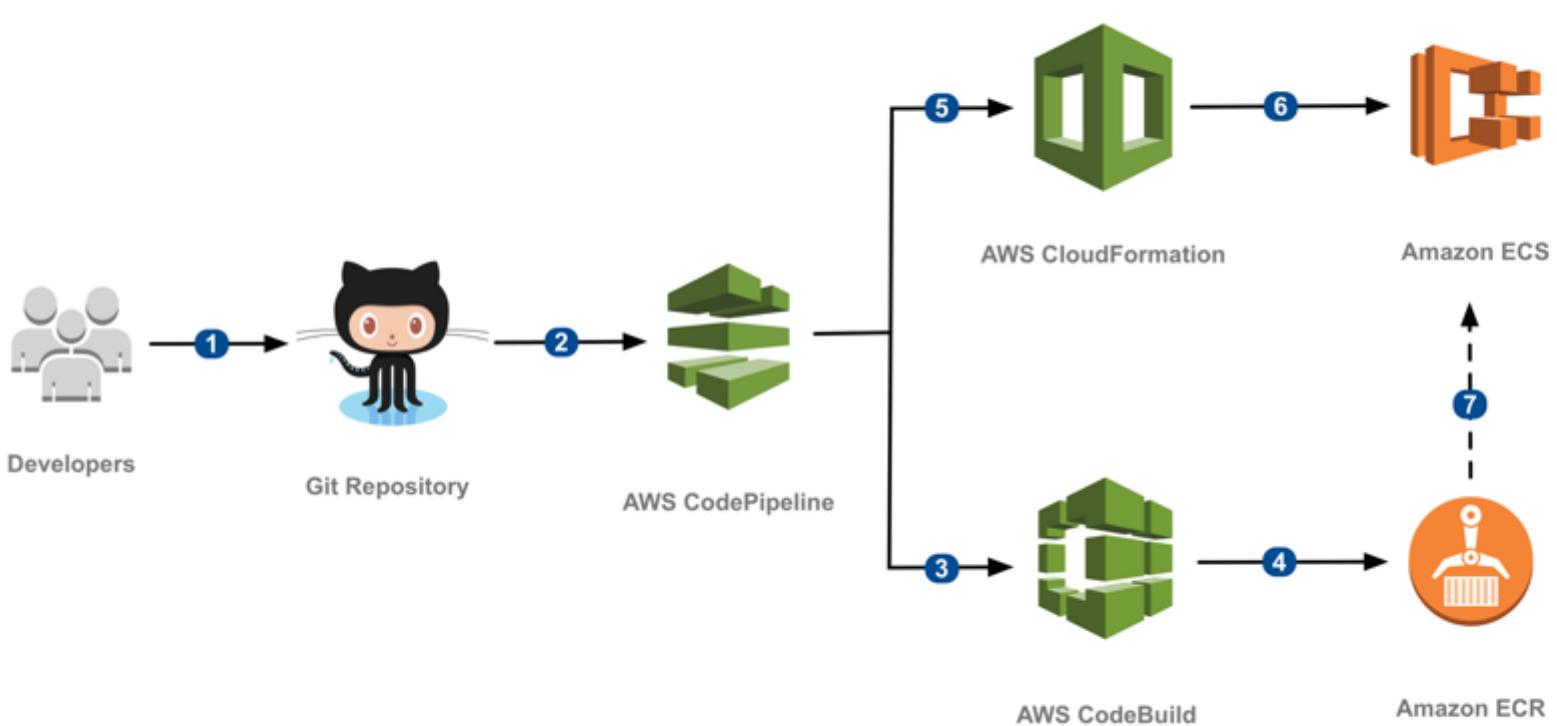


FIGURE 5.1 Deployment pipeline [Notation: BPMN]

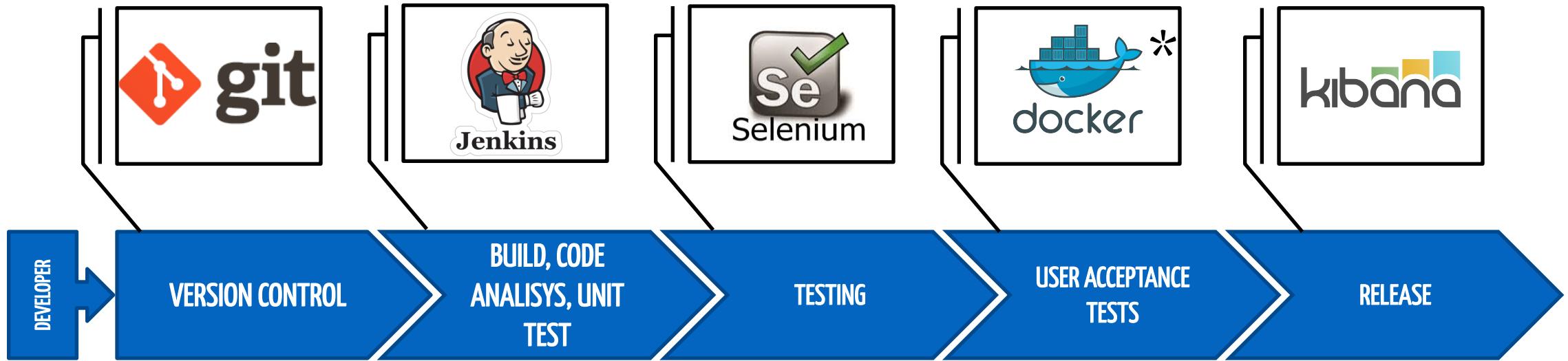
What is a DevOps pipeline (AWS)?



Definition

- “a deployment pipeline is an automated manifestation of your process for getting software from version control into the hands of your users...” Jez Humble

A pipeline incarnation



* Use containers at beginning of development. Here, I inserted ant UAT for convenience

Pipeline, environments



Moving through the deployment pipeline: building a deployable



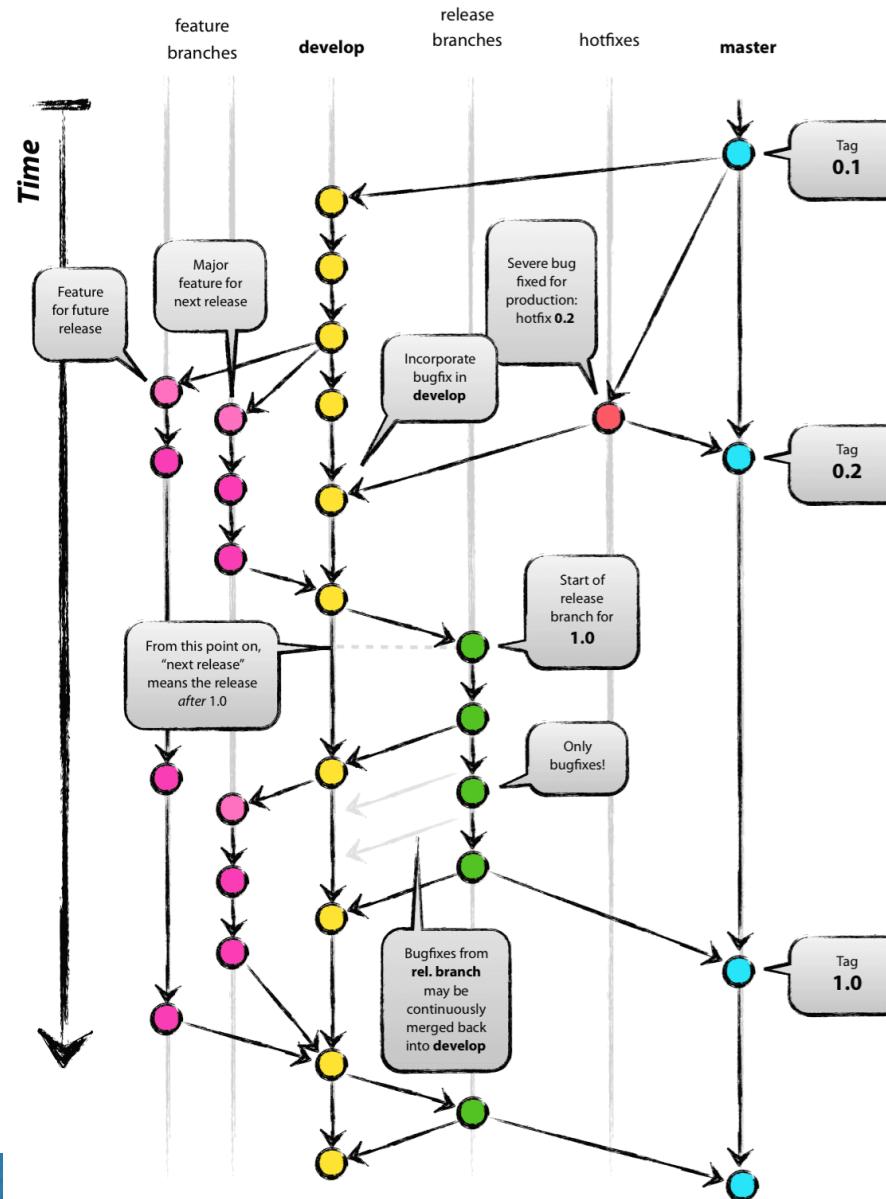
1. Generating sources.
2. Compiling sources.
3. Compiling test sources.
4. Executing tests (unit tests, integration tests, etc).
5. Packaging (into jar, war, ejb-jar, ear, rpm).
6. Running health checks (static analyzers like Checkstyle, Findbugs, PMD, test coverage, Sonarqube).
7. encapsulating environments
8. Generating reports.

Get source

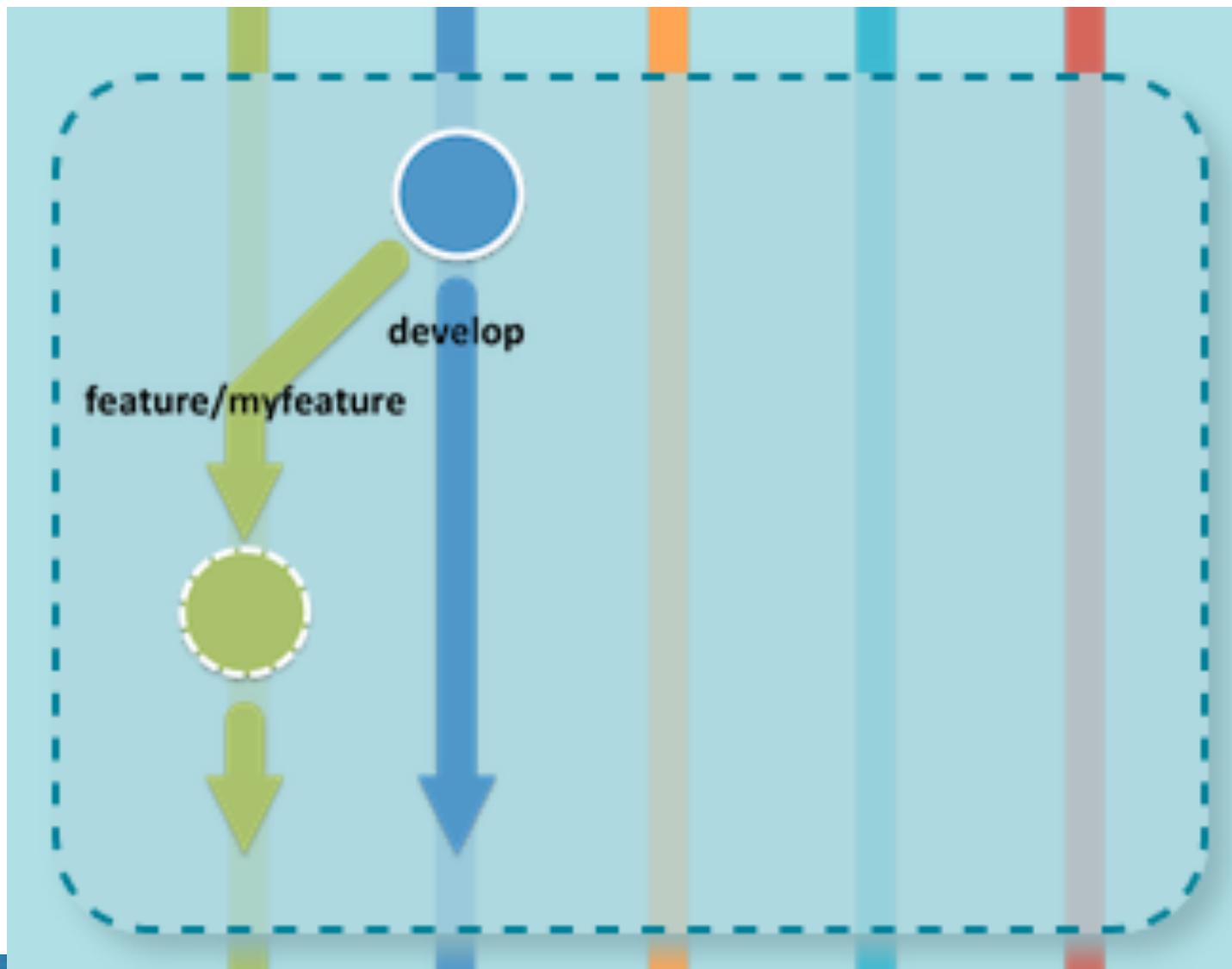


```
git clone https://github.com/jfsc/spring-petclinic.git
```

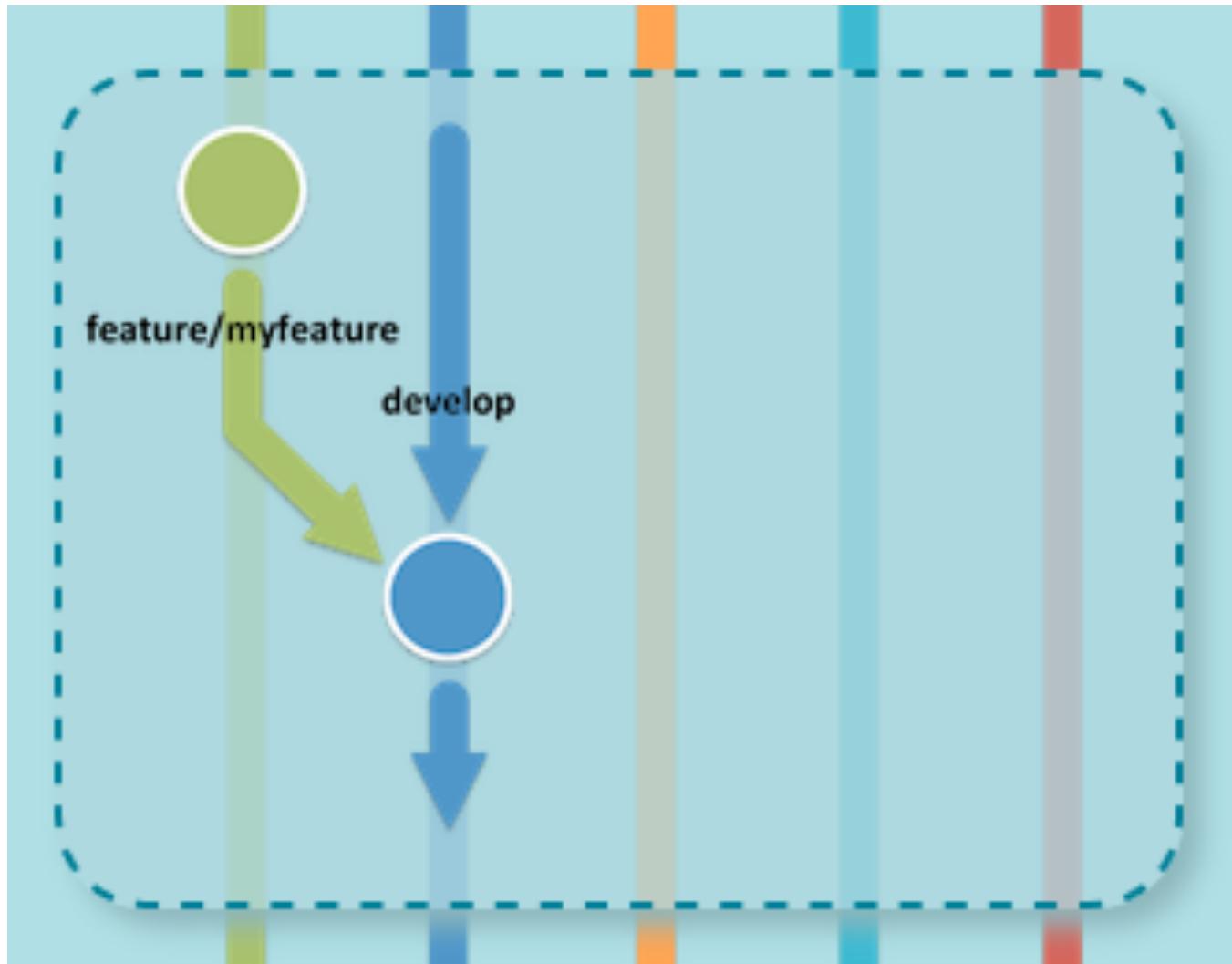
Branching



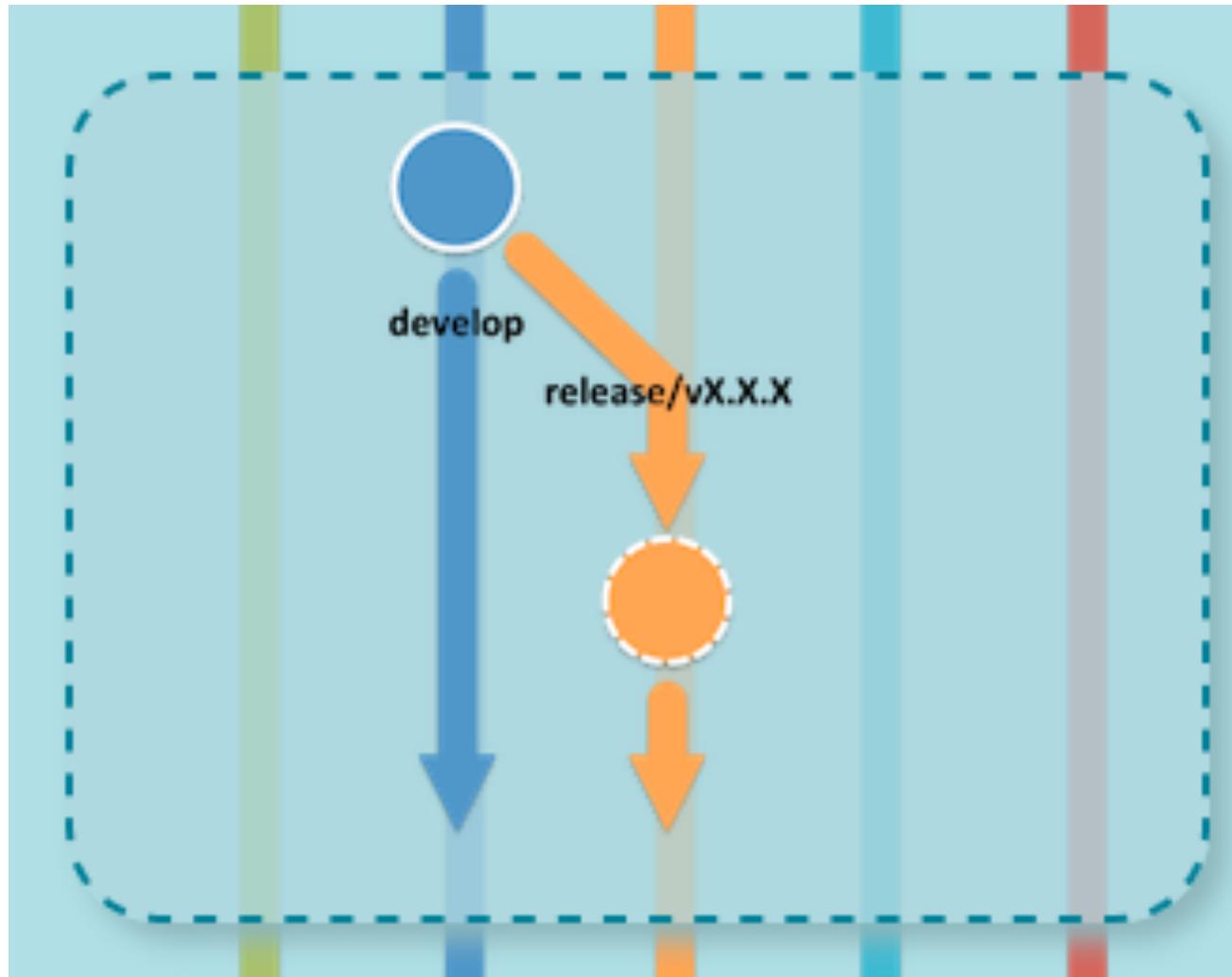
Branching



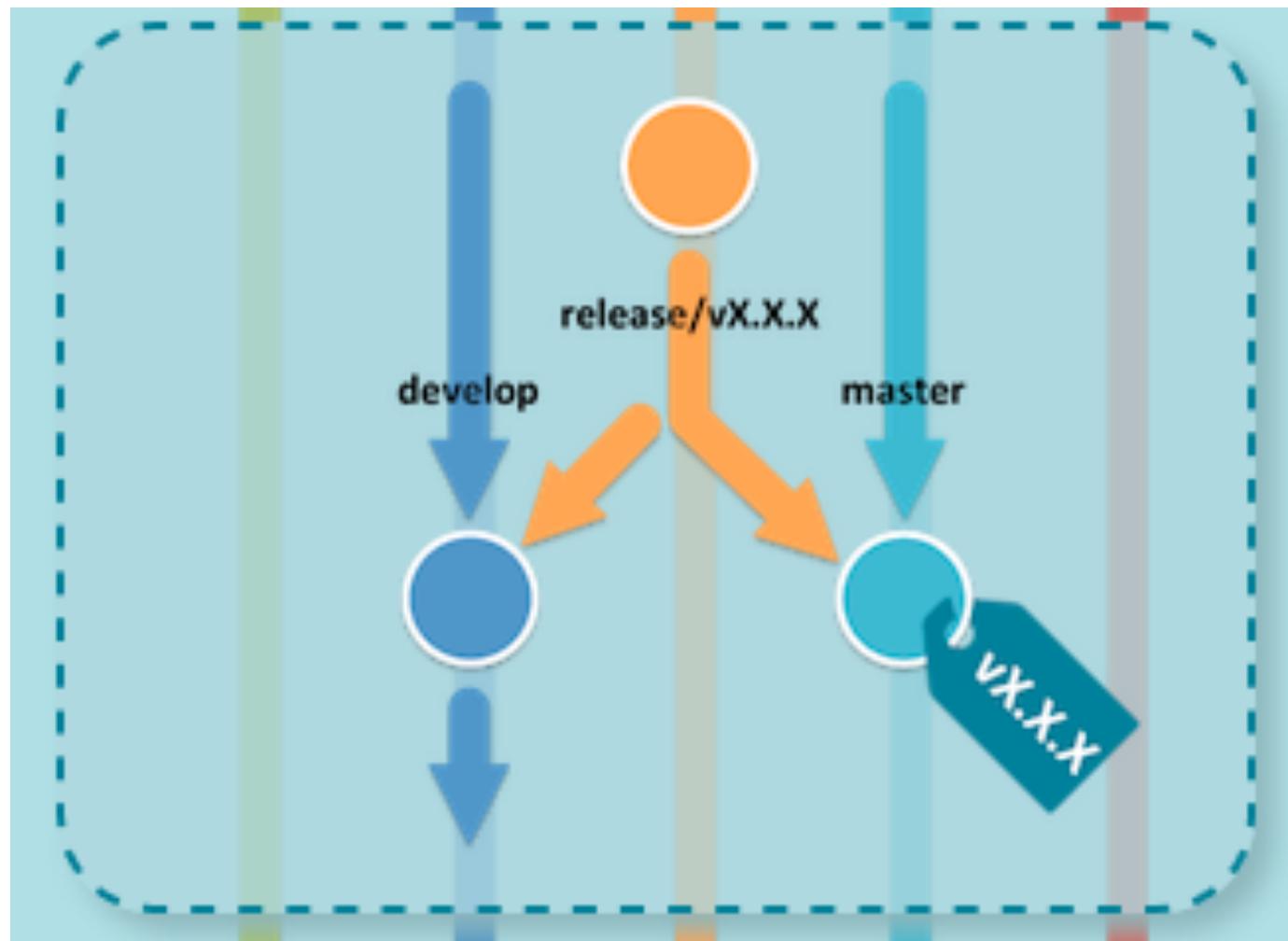
Branching



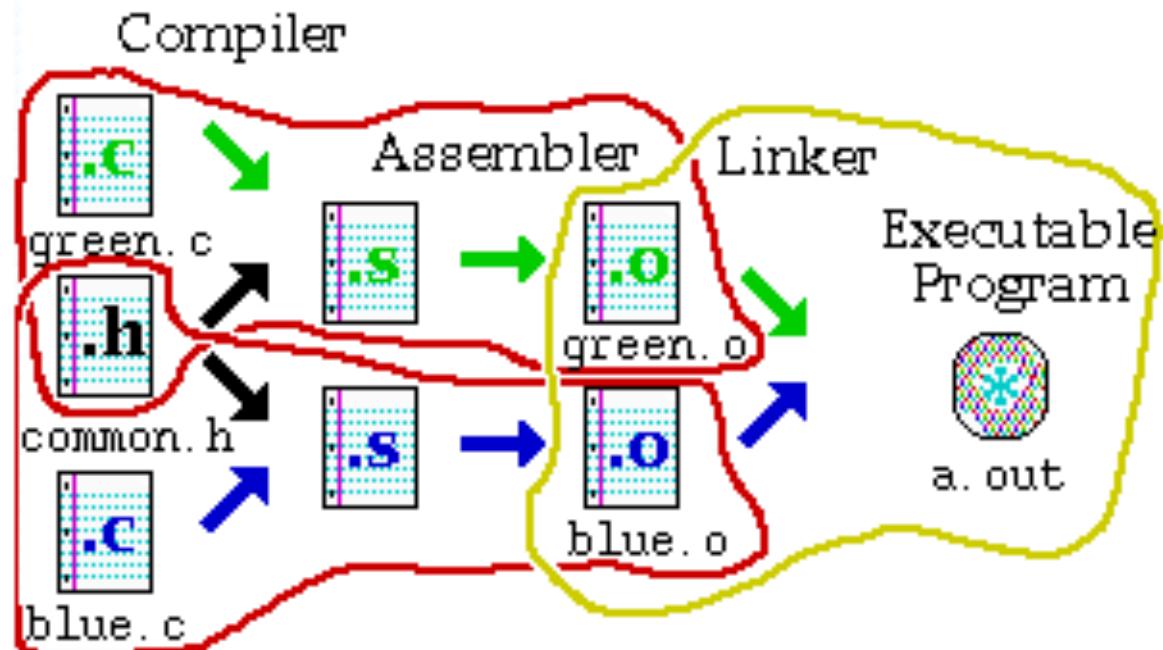
Branching



Branching



Compiling



```
andes:~rcompl/softdev> gcc -c green.c
andes:~rcompl/softdev> ls -ls green.o
3 -rw-r--r-- 1 13042 users 2312 Mar 13 13:40 green.o
andes:~rcompl/softdev> file green.o
green.o: ELF 64-bit LSB relocatable, AMD x86-64, version 1 (SYSV), not stripped
andes:~rcompl/softdev> gcc -c blue.c
andes:~rcompl/softdev> gcc green.o blue.o
andes:~rcompl/softdev> ls -ls a.out
8 -rwxr-xr-x 1 13042 users 7864 Mar 13 13:40 a.out
andes:~rcompl/softdev> a.out
Result of Monte Carlo integration is 3.582862
andes:~rcompl/softdev> gcc -o green green.o blue.o
andes:~rcompl/softdev> file green
green: ELF 64-bit LSB executable, AMD x86-64, version 1 (SYSV), for GNU/Linux 2.4.10
andes:~rcompl/softdev> green
Result of Monte Carlo integration is 3.582862
andes:~rcompl/softdev>
```

From <https://goo.gl/MNLHZI>

Compile and run UnitTests



```
javac -cp .:"/Applications/IntelliJ IDEA 13 CE.app/Contents/lib/*" SetTest.java
```

```
java -cp .:"/Applications/IntelliJ IDEA 13 CE.app/Contents/lib/*" org.junit.runner.JUnitCore SetTest  
JUnit version 4.11  
.  
Time: 0.007  
OK (1 test)
```

Packaging



- (*.JAR; *.WAR; *.EAR, *.DLL)
- (*.RPM, *.EXE, *.O)

Code Analysis



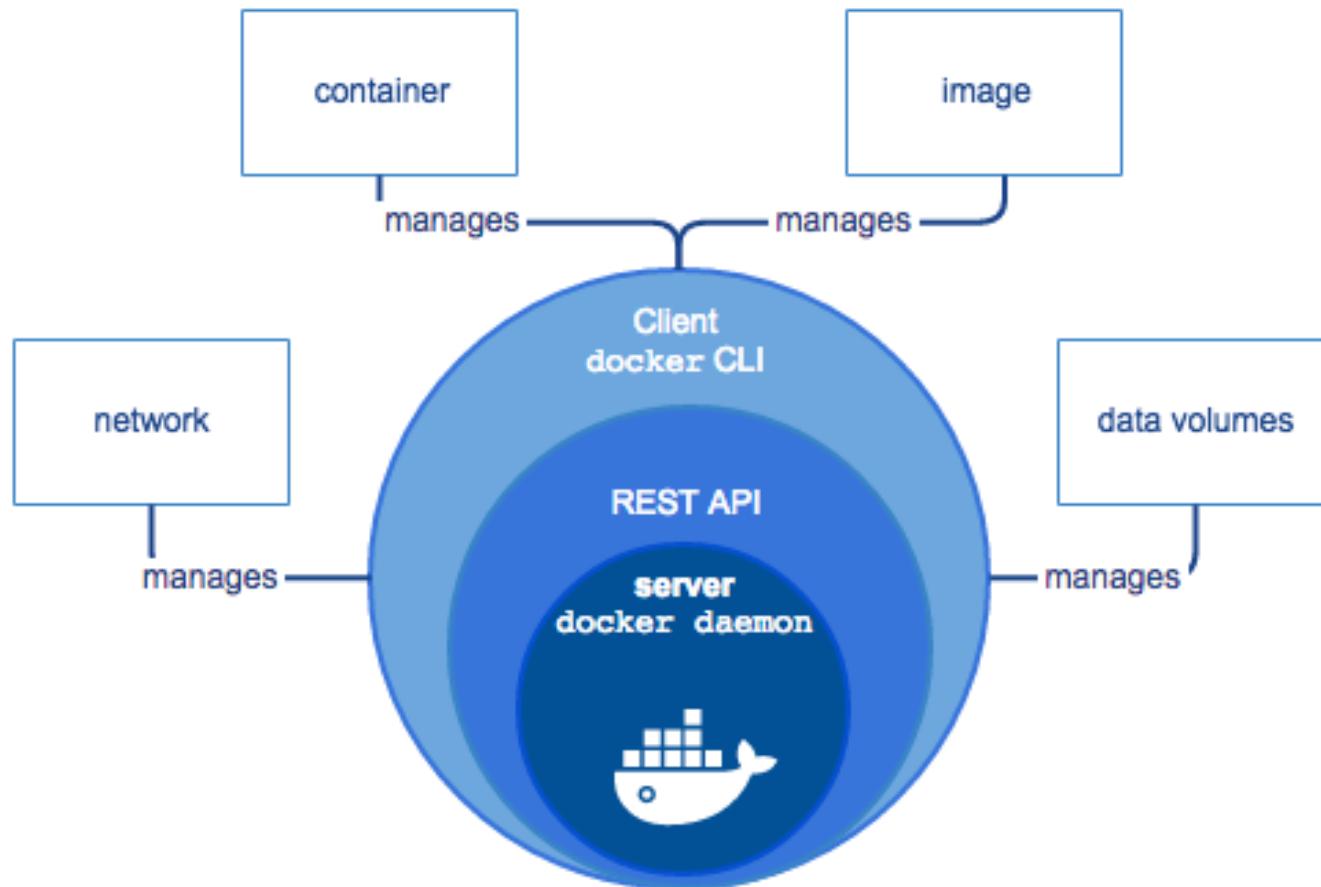
SonarQube (*)
Cobertura

Store Envs

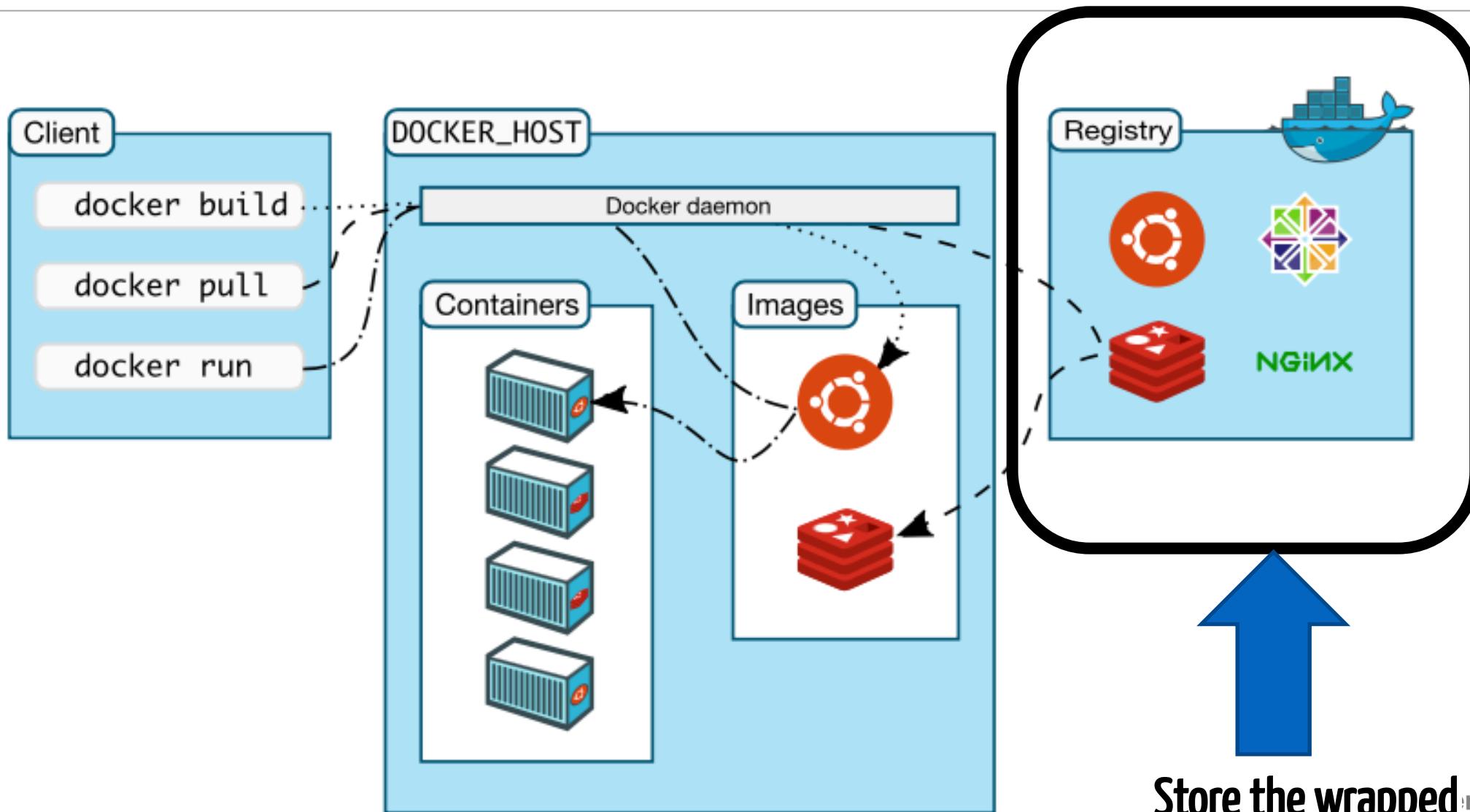


- Docker
- VMs

Store Envs : Docker



Store Envs : Docker



Store the wrapped
env here

Testing



- Manual (Exploratory)
- Automatic

UAT:User Acceptance Testing



- Smoke Tests
- Customer Validation

PRODUCTION



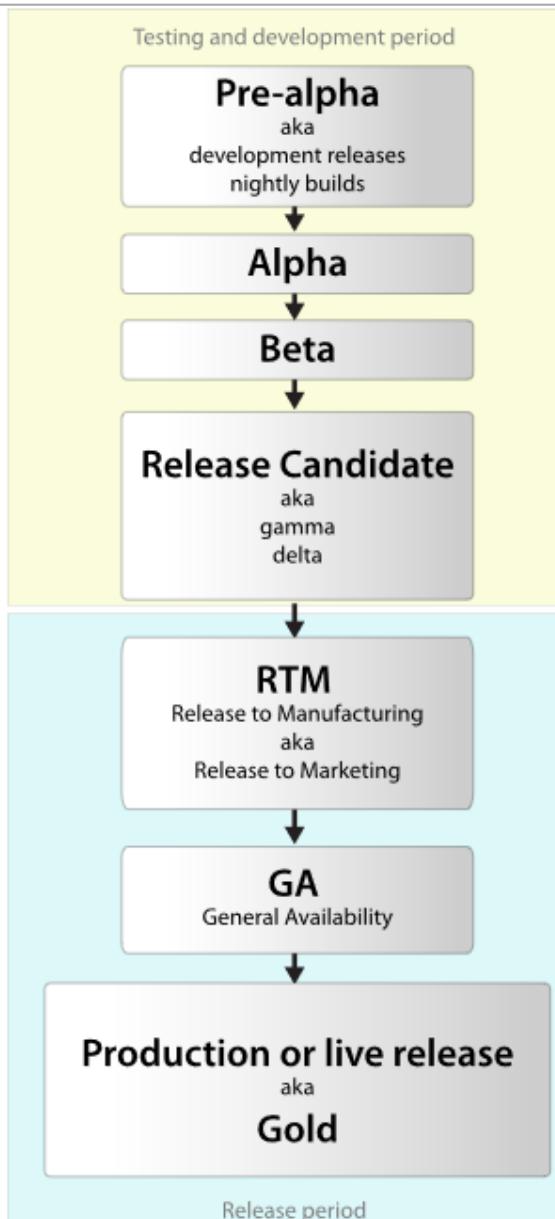
- Release
- Measurement

Release Management



“Release management is the process of managing, planning, scheduling and controlling a software build through different stages and environments; including testing and deploying software releases” [wiki]

A Release lifecycle



Release Naming



1 . 3 . 5

BREAKING . FEATURE . FIX

Breaking
change

New
Feature

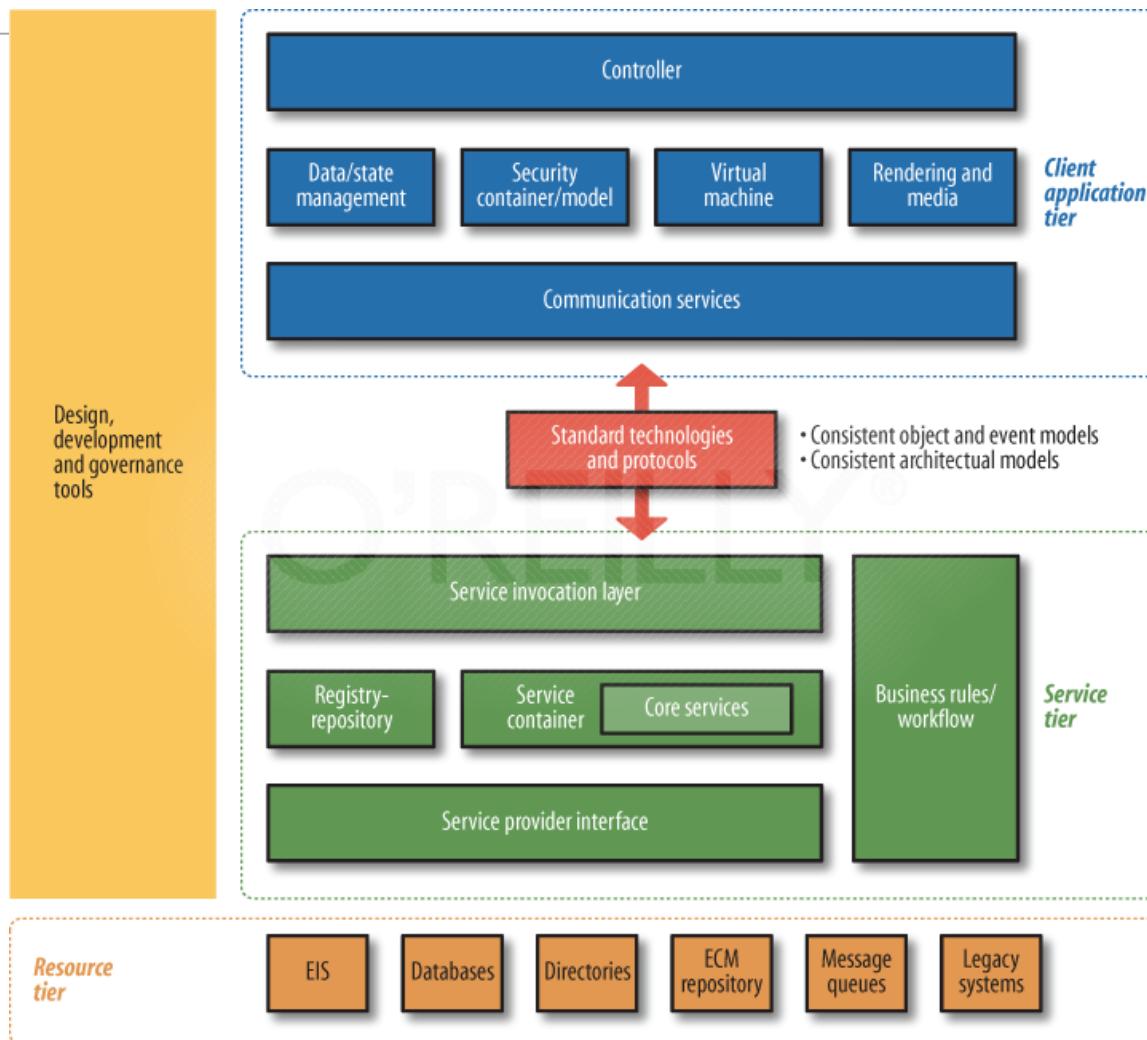
Fixing
bugs

What is software architecture?

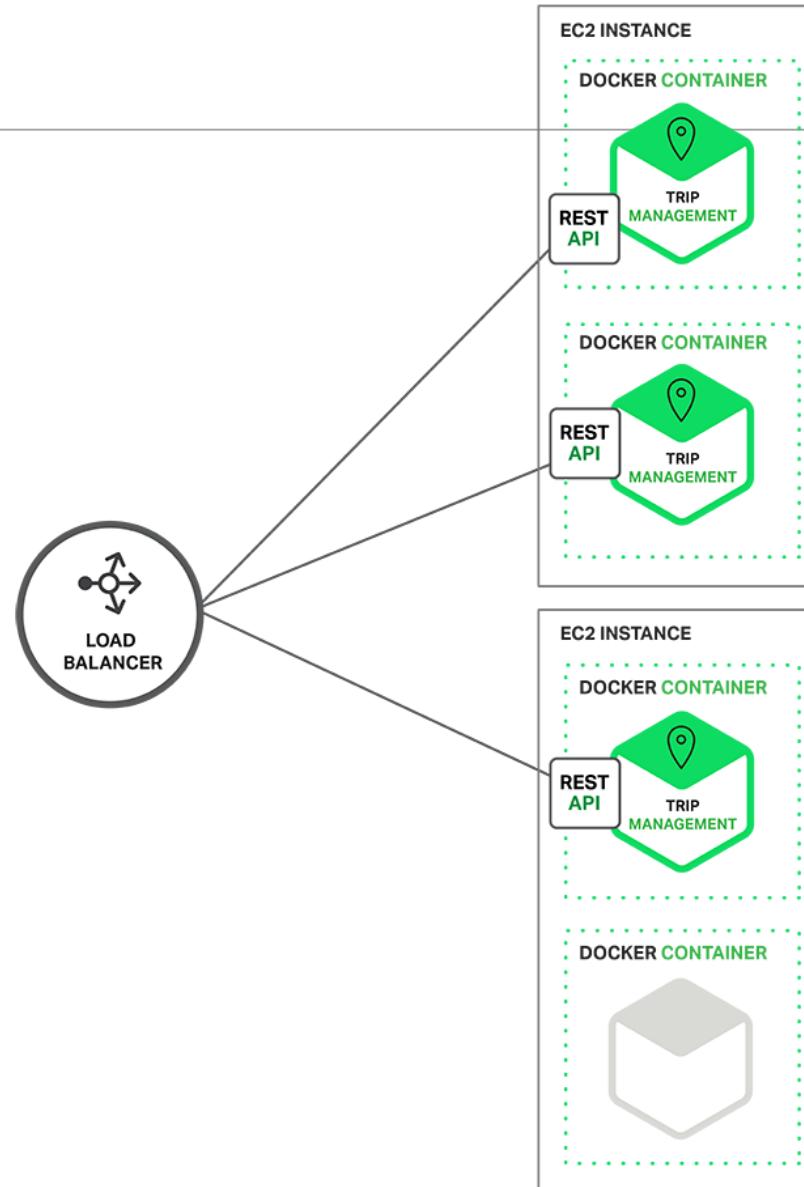
“is the set of structures needed to reason about the system, which comprises software elements, the relations among them, and the properties of both”

CMU Definition

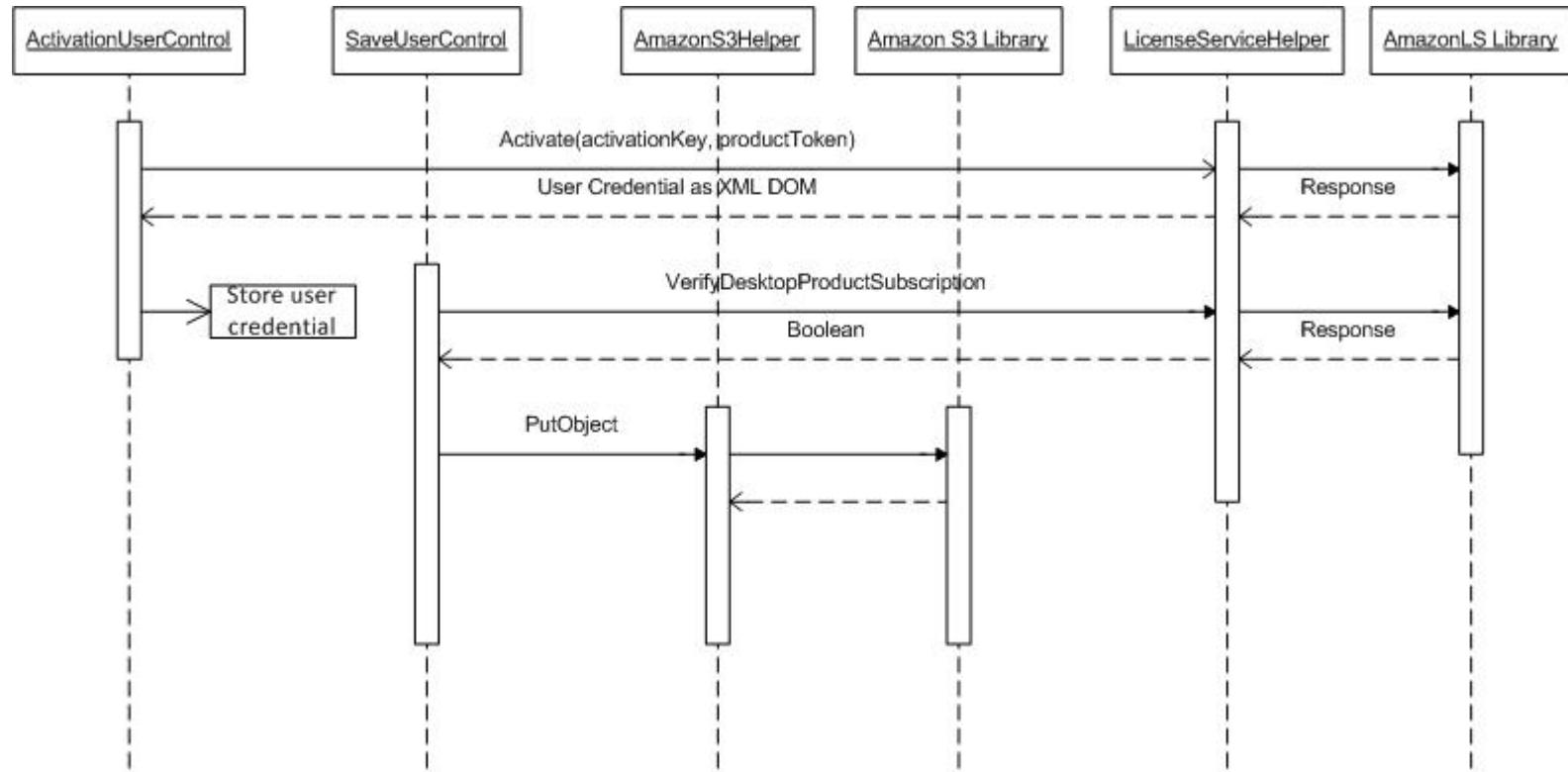
View: Static View



Views: Deployment View



View: Dinamic



Business goals+architecture+DevOps

- WOW, this is software is very slow!
- Hey, my world of warcraft credentials were stolen!
- We will have 130.000 users in the system.

Business goals are related to quality attributes.

Quality

- Quality is the user perception of value;
- Depends on priority of Customer