

FROM A BLANK SHEET OF PAPER TO INDUSTRIALIZED SOFTWARE ENGINEERING

@Forbes Digital Commerce

(Laurent Prévost, April 15th 2014)

WHAT ABOUT ME?

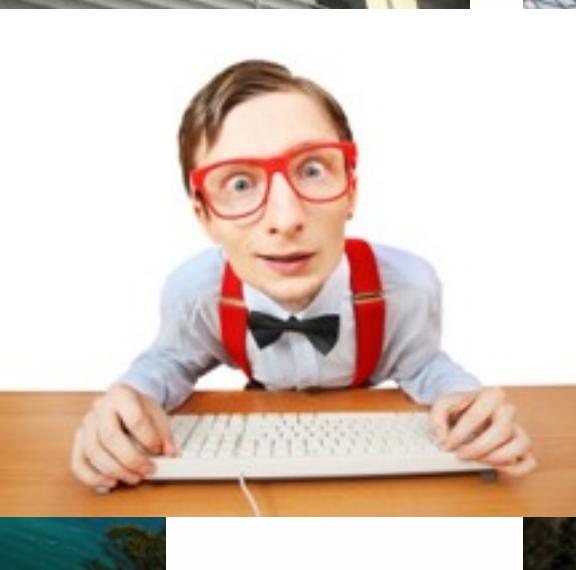
Laurent Prévost
33, M, Yverdon-les-Bains

Infrastructure Developer Manager
@ Forbes Digital Commerce

Started at Lotaris / FDC in 2011, I was the first Dev / Ops / DevOps

AGENDA

- **Lotaris Reminder!**
- **Projects evolution**
 - 0 Developer project
 - 1 Developer project
 - 2-20 Developers project
 - How to scale next?



Lotaris [SA | Pte. Ltd | Inc.]

- A **COMPANY**, founded in 2007
 - ~30 employees
 - Headquarters in Yverdon (Y-Park)
 - Offices in Singapore, San Francisco
- **INTERNATIONAL ENVIRONMENT**
 - Customers spread around the world
 - Engineering in Switzerland / Singapore / Romania
 - Sales in USA / Singapore



Nothing new since last week!

**THE WORLD IS
CONTINUOUSLY EVOLVING.
SO ARE WE.**

0 DEVELOPER

EARLY DAYS: BEFORE MY STUDIES...

- CODING SOMETHING WAS JUST A HOBBY. I WAS SIMPLY NOT AWARE OF TERMS LIKE:

- Quality
- Tests
- Source Control Management
- Environments
- Production
- ...



GEEK OFFICE?

- THINGS WERE SIMPLE: MY WORK HAD NO IMPACT ON ANYONE BUT ME.

1 DEVELOPER

GROWING UP: LEARNING FUNDAMENTALS...



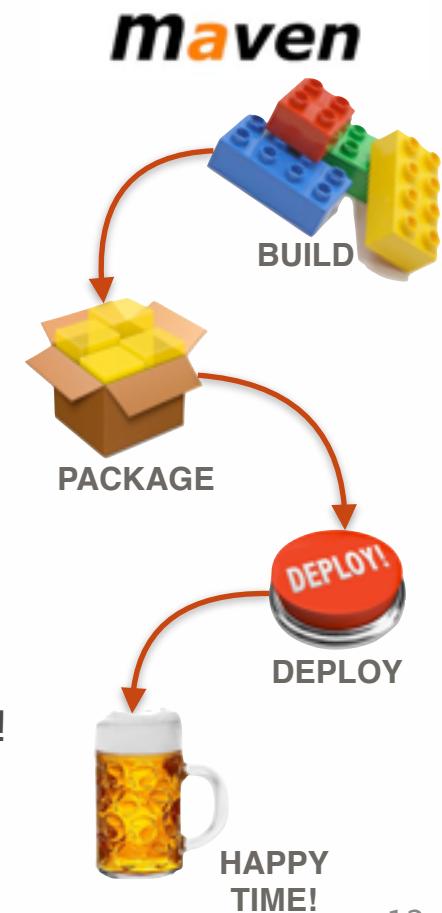
- HOW CAN I RESTORE THE STATE OF MY MINI-PROJECT TO WHERE IT WAS 3 DAYS AGO?
 - Source Control Management
- OK, FINE. BUT WHICH ONE? SUBVERSION! THIS WAS THE MOST POPULAR AT THAT TIME (CVS WAS OLD SCHOOL)
 - svn checkout <url>
 - svn add/remove <file>
 - svn commit -m <message>
- OK, COOL! I LIVE IN A MODERN WORLD! I CAN TRAVEL IN THE PAST! BUT, WHAT ABOUT RUNNING MY PROJECT?
 - Well, why not simply use embedded features of my IDE?



2-5 DEVELOPERS

HEY GUYS! I STARTED TO WORK FOR REAL! HUM, WELL, NOT SO REAL BUT I TRY TO DO MY BEST!

- OK, WE ARE A TEAM. NOW, SCM IS JUST NOT AN OPTION.
 - Subversion is a good choice to keep things simple in a small team if cutting-edge is not a requirement.
- BUT HOW CAN I BE SURE THAT MY COLLEAGUES HAVE THEIR COMPUTERS SETUP LIKE MINE? HOW CAN WE PRODUCE BUILDS IN A PREDICTABLE AND RELIABLE WAY?
 - We need a Software Project Management Tool! WAT?
- GREAT! WE ARE THE GURUS OF PROJECT MANAGEMENT TOOLS!
 - Bonus: Our project dependencies are managed by version!!!



```
cd /Users/lprevost/Documents/git/digital-commerce-core; JAVA_HOME=/Library/Java/JavaVirtualMachines/jdk1.7.0_40.jdk/Contents/Home M2_HOME=/opt/apache-maven-3.0.5 /opt/apache-maven-3.0.5/bin/mvn --fail-fast clean install -e -PlotarisBuildSource -PlotarisBuildTarget -PlotarisTest
```

Scanning for projects...

Reactor Build Order:

Digital Commerce Core POM
Digital Commerce Core JAR
...

Building Digital Commerce Core POM 1.0.0-SNAPSHOT

[clean:clean]

[install:install]

```
Installing /Users/lprevost/Documents/git/digital-commerce-core/pom.xml to /Users/lprevost/.m2/repository/com/lotaris/digital-commerce-core/1.0.0-SNAPSHOT/digital-commerce-core-1.0.0-SNAPSHOT.pom
```

Building Digital Commerce Core JAR 1.0.0-SNAPSHOT

[clean:clean]

```
Deleting /Users/lprevost/Documents/git/digital-commerce-core/digital-commerce-core-jar/target
```

[resources:resources]

```
Using 'UTF-8' encoding to copy filtered resources.
```

```
Copying 1 resource
```

```
skip non existing resourceDirectory /Users/lprevost/Documents/git/digital-commerce-core/digital-commerce-core-jar/META-INF
```

[compiler:compile]

```
Changes detected - recompiling the module!
```

```
Compiling 17 source files to /Users/lprevost/Documents/git/digital-commerce-core/digital-commerce-core-jar/target/classes
```

[resources:testResources]

```
Using 'UTF-8' encoding to copy filtered resources.
```

```
skip non existing resourceDirectory /Users/lprevost/Documents/git/digital-commerce-core/digital-commerce-core-jar/src/test/resources
```

[compiler:testCompile]

```
No sources to compile
```

[surefire:test]

```
No tests to run.
```

HEY GUYS! IT WORKS ON MY MACHINE!

- THAT'S PRETTY COOL! WE HAVE THE ABILITY TO TRAVEL INTO THE PAST, WE HAVE THE ABILITY TO BETTER MANAGE OUR PROJECTS.

- BUT HOW DO WE DEPLOY OUR APP ON A SERVER THAT LOOKS LIKE A “REAL” ENVIRONMENT?

- We need software to orchestrate our builds and deploy our app on a test server: Hudson/Jenkins

- GREAT! THAT STARTS TO LOOK LIKE INDUSTRIALIZED SOFTWARE ENGINEERING!

- Bonus: We have Nightly Builds!

- WAIT!!! OH! WE HAVE JUST ENTERED THE WORLD OF CONTINUOUS INTEGRATION!



TEAM



CUSTOMIZE



CONFIGURE

Jenkins for the Lotaria Builder server.

Name	Last Success	Last Failure	Last Duration
LME-ANDROID-APP	2 mo 1 day (#390)	N/A	3 min 55 sec
LME-CL-ANDROID	N/A	N/A	N/A
LME-CL-ANDROID-2	2 mo 1 day (#317)	N/A	
LME-CL-ANDROID-SECURE	N/A	N/A	
LME-CleanWorkspace	4 mo 6 days (#260)	N/A	
LME-Clearage	4 mo 6 days (#270)	N/A	
LME-Component	2 mo 1 day (#320)	N/A	
LME-CORE-SECURE	N/A	N/A	
LME-GlassfishRestart	4 mo 6 days (#280)	N/A	
LME-PM-ANDROID	N/A	N/A	
LME-Release-LotariaCertificateProvider	N/A	N/A	
LME-Release-ServerLibrary	N/A	N/A	
LME-Symfony	6 days 19 hr (#118)	N/A	
LME-Trunk-MigrationAnalysis	N/A	N/A	
LMEPRF-Desktop	N/A	N/A	
LOT-CL	N/A	N/A	
H3-UML-Component	N/A	N/A	
H3-UML-Release-CL	N/A	N/A	

Legend:

Builder: Invoke top-level Maven targets
Maven Version: Maven 3
Goals: clean, install, -PcleanBuildSource, -PcleanBuildTarget, -PcleanCleanups, -PcleanProd
or /u01/glassfish/v.m2/jenkins/m3-settings-\$[Environment].xml

Conditional step (single)

Run if: **Not**

1. Regular expression match

Expression: ^LME-BO|LME-CORE-TO\$
Label: \$Component

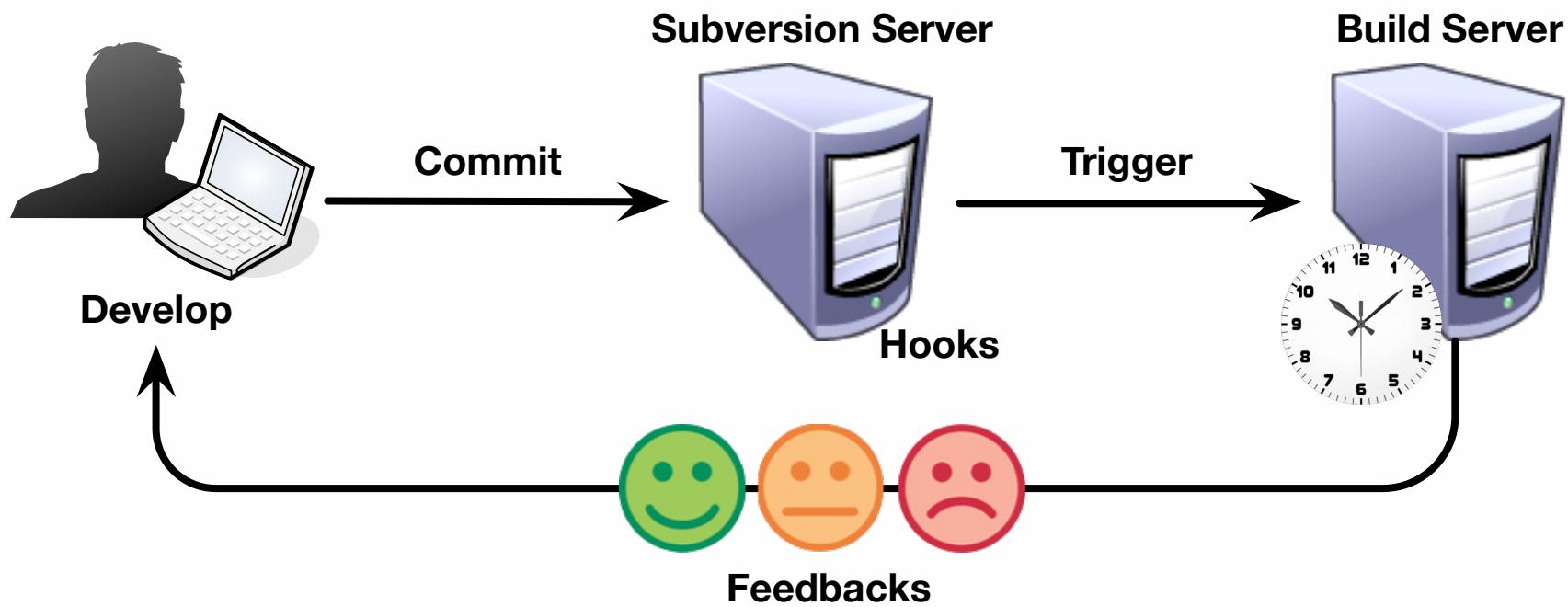
Builder: Invoke top-level Maven targets
Maven Version: Maven 3
Goals: deploy,deploy-file, -PcleanBuildSource, -PcleanBuildTarget, -PcleanProd, -PcleanDeployer
or /u01/glassfish/v.m2/jenkins/m3-settings-\$[Environment].xml

Conditional step (single)

Run if: **String match**

String 1: \$Component

OK! THIS IS WHAT IS HAPPENING NOW...



THAT'S GREAT, BUT WHAT ABOUT QUALITY?

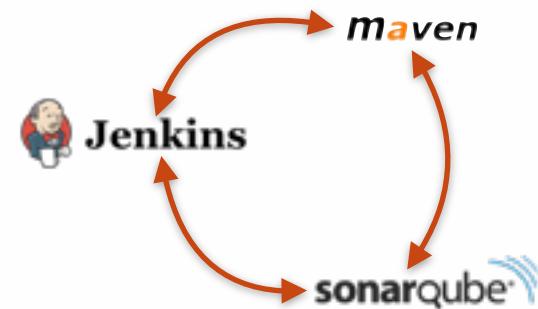
- TRUE! WE NEED TO ADD QUALITY ASSURANCE TO OUR PROCESS. BUT HOW DO WE DO IT?

- We already have all the tools we need to start QA!

- YES! WE CAN REUSE JENKINS JOBS AND ADAPT THEM TO THE QA NEEDS!

- WE CAN START TO USE FANCY TOOLS LIKE SONAR TO MONITOR THE QUALITY OF OUR CODE!

- Bonus: We start to have a real dev infrastructure with cool stuff!



Version 1.0-SNAPSHOT - 19 Feb 2014 03:32 Time changes...

Most violated rules Any severity More

Rule	Count
Javadoc Method	4,911
Replace Vector With List	440
Bad practice - Class is Serializable, but doesn't define serialVersionUID	368
Modifier Order	338
Loose coupling	323

Lines of code
185,313
304,341 lines ▲
58,761 statements
3,385 files

Classes
3,371
766 packages
11,695 methods
8,002 accessors

Comments:
19.5%
44,885 lines
78.4% docu. API
1,957 undocu. API

Duplications
4.3%
13,237 lines
824 blocks
232 files

Complexity
2.5 method
8.5 class
8.5 file
Total: 28,731 ▲

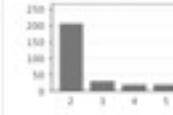
Methods Files

Violations
10,787
Rules compliance **83.9%**

Severity	Count
Blocker	0
Critical	245
Major	9,259
Minor	905
Info	378

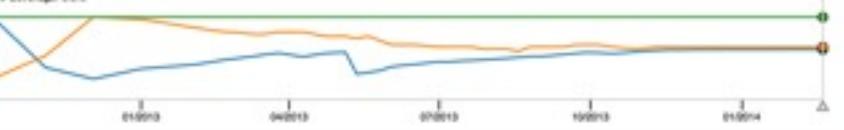
Package tangle index
7.3%
> 407 cycles

LCOM4
1.1 /class
8.1% files having LCOM4



Complexity: 28,731
Rules compliance: 83.9%
Coverage: 0.0%

19 Feb 2014
1.0-SNAPSHOT



Date	Complexity
02 Oct 2012	28,731
19 Feb 2014	28,731

Lines of code
218,074 → 185,313

Lines
651,177 → 304,341

Statements
54,842 → 58,761

Files
4,701 → 3,385

Classes
4,593 → 3,371

Methods
21,357 → 11,695

Accessors
6,410 → 8,002

19 Feb 2014
1.0-SNAPSHOT

Category	Value
Comments (%)	31.4% → 19.5%
Comment lines	99,809 → 44,885
Public documented API (%)	92.5% → 78.4%
Public undocumented API	1,604 → 1,957

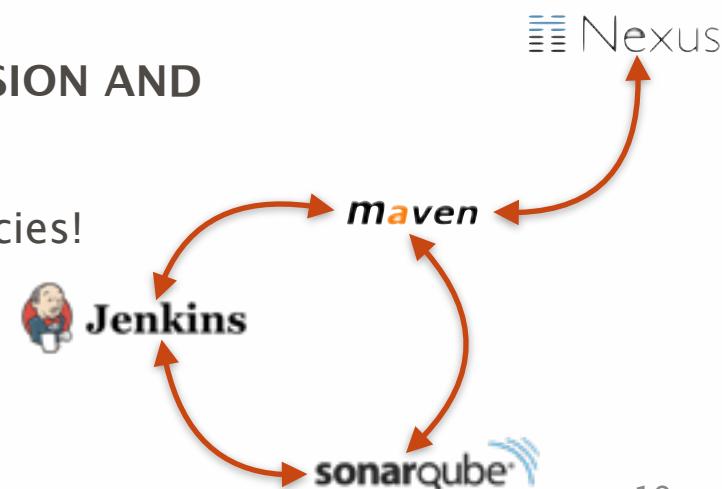
19 Feb 2014
1.0-SNAPSHOT

Category	Value
Duplicated lines (%)	9.6% → 4.3%
Duplicated lines	43,368 → 13,237
Duplicated blocks	1,062 → 824
Duplicated files	584 → 232

PFIOU! WHAT A WAY SINCE THE BEGINNING!

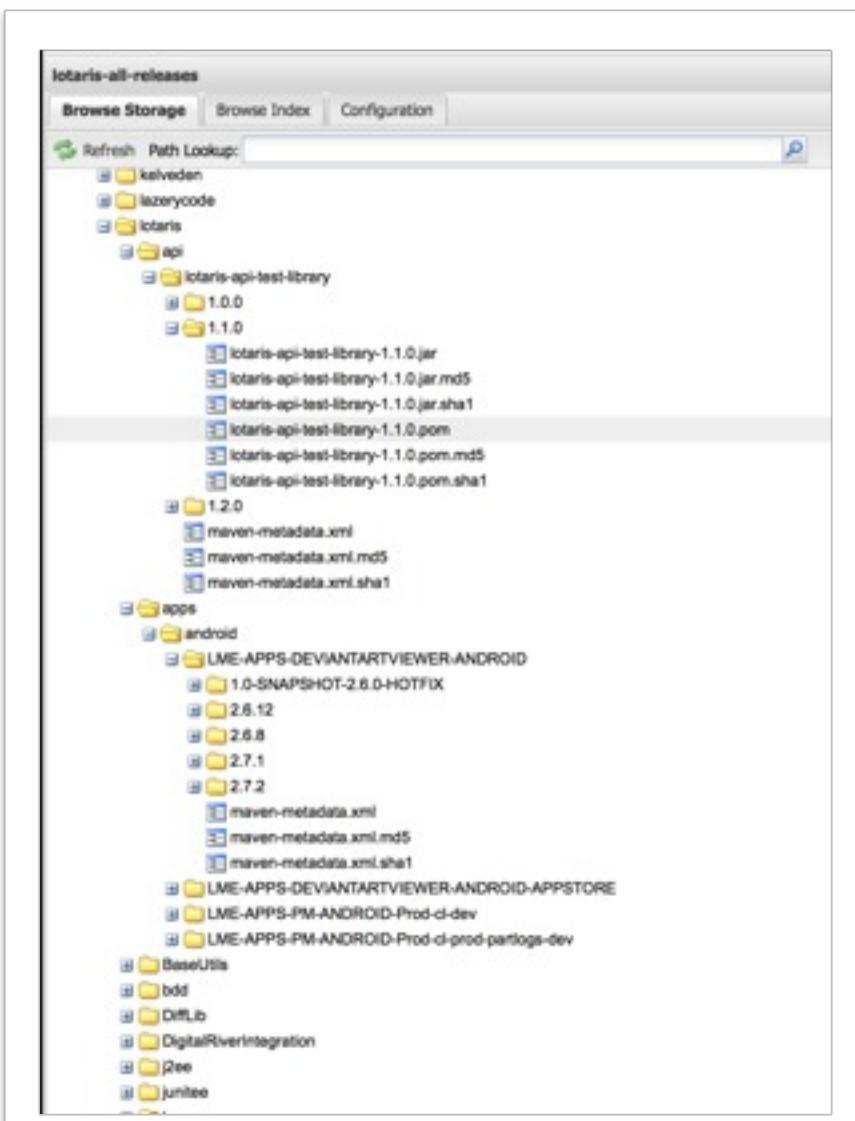
WHAT? WHAT DO YOU MEAN BY PRODUCTION?

- OK! WHEN WE BUILD SOFTWARE, WE PRODUCE “ARTIFACTS”. THESE ARE THE “BITS” THAT WE PUT IN PRODUCTION.
 - But how do we move the artifacts across the environments?
 - How does the ops team get access to these artifacts?
 - Hum, it looks like we need to run our own (internal) artifacts repository?
- GREAT! WE CAN STORE OUR ARTIFACTS BY VERSION AND BY ENVIRONMENT!
 - Bonus: We have more control on our dependencies!



Repositories

Repository	Type	Quality	Format	Policy	Repository Status
lotaris-all-releases	group	ANALYZE	maven2		
lotaris-all-snapshots	group	ANALYZE	maven2		
lotaris-prod-releases	group	ANALYZE	maven2		
Public Repositories	group	ANALYZE	maven2		
Public Snapshot Repositories	group	ANALYZE	maven2		
3rd party	hosted	ANALYZE	maven2	Release	In Service
Apache	proxy	ANALYZE	maven2	Release	In Service
Apache Snapshots	proxy	ANALYZE	maven2	Snapshot	In Service
Central M1 shadow	virtual	ANALYZE	maven1	Release	In Service
Codehaus Old	proxy	0 0	maven2	Release	In Service
Codehaus Snapshots	proxy	ANALYZE	maven2	Snapshot	In Service
Google Code	proxy	0 0	maven2	Release	In Service
google-api-services	proxy	ANALYZE	maven2	Release	In Service
Ibiblio	proxy	0 0	maven2	Release	In Service
JasperSourceForge	proxy	0 0	maven2	Release	In Service
java.net - Maven 2	proxy	6 31	maven2	Release	In Service
java.net-m1	proxy	0 1	maven1	Release	In Service
java.net-m1 M2 shadow	virtual	ANALYZE	maven2	Release	In Service
Jayway Sonatype	proxy	0 0	maven2	Release	In Service
Jayway Sonatype Snapshot	proxy	ANALYZE	maven2	Snapshot	In Service
JBoss	proxy	0 0	maven2	Release	In Service
lotaris-archetypes	hosted	ANALYZE	maven2	Release	In Service



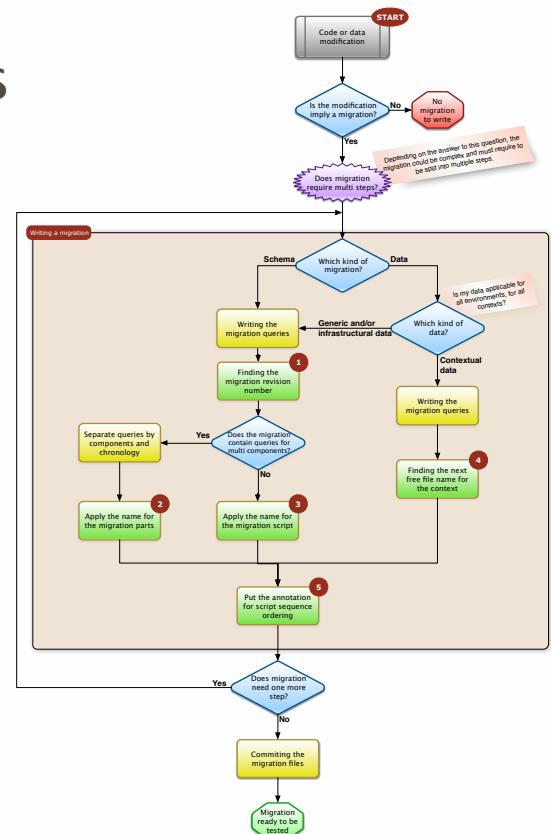
WHAT THE HELL IS THAT? WHY MY APPLICATION IS NOT WORKING ON PRODUCTION?

- WHAT? I FORGET TO MENTION THAT MY FEATURE HAS INTRODUCED A CHANGE IN THE DB SCHEMA?

- Well, let's manage that manually... really?

- TIME TO PUT IN PLACE A PROCESS FOR CHANGE MANAGEMENT, FOCUSED ON DATA MIGRATIONS.

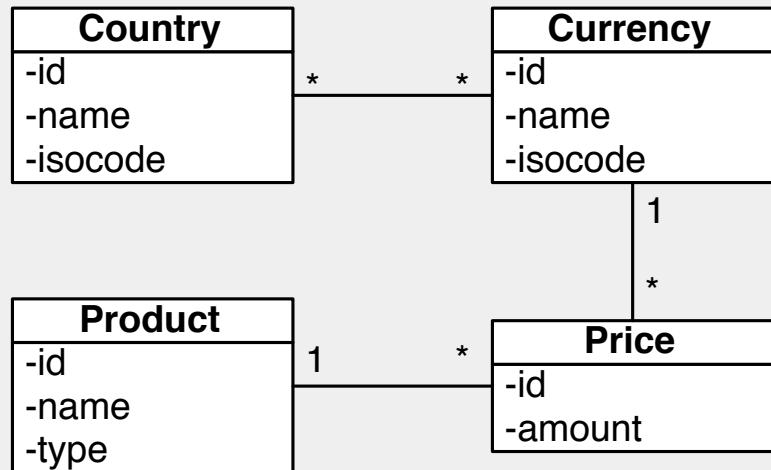
- Change monitoring (with triggers)
- Migration scripts management
- Release management
- Bonus: A new job is born – Migration Manager



Product			
-id -name -price -currency			

Product table			
ID	NAME	PRICE	CURRENCY
1	Apple	1.00	CHF
2	Cucumber	3.00	USD
3	Strawberry	0.50	EUR
4	Pumpkin	15.00	AUD
5	Mushroom	2.00	CAD
6	Onion	150.00	JPY
7	Corn	4.50	CHF
8	Tomato	3.50	CHF
9	Potato	0.75	USD
10	Bean	100.00	JPY

A: Before modification



B: After modification

Schema and data transformation

Migrations

To: Migrations
 [LME] [QA-047] [CORE] [22508] Possible migration detected

A change to a class model, sample-data or a file *.sql has been detected

gdiniant
 2013-02-01 09:33:04 +0000 (Fri, 01 Feb 2013)
 106
 [QA-047] [CORE] [LIME-5816] Added a nice explicit error message when the credit card last name is missing.

=====

Component: LME-CORE
 =====
 U branches/LME/QA-047/LME-CB/LME-CORE/LME-CORE-ear/src/main/resources/sample-data.xml

=====

Diffs for: LME-CORE
 =====

Sample data is often too long to be displayed. Only first 40 lines are shown below.
 Index: sample-data.xml
 =====

```
-- sample-data.xml (revision 22507)
+++ sample-data.xml (revision 22508)
@@ -42790,6 +42790,12 @@
 <value>740000000052</value>
 <value>7200000021392</value>
 </row>
+ <row>
+ <value><![CDATA[Invalid credit card name]]></value>
+ <value>72000000102335</value>
+ <value>740000000052</value>
+ <value>7200000021393</value>
+ </row>
</table>
<table name="LIB_HBINSTRINGBUNDLE">
<column>ID</column>
@@ -49865,6 +49871,11 @@
 <null>
 <value>core.springBean.consumerAccount.authenticate.moduleNotFound</value>
 </row>
+ <row>
+ <value>7200000021393</value>
+ <null>
+ <value>core.service.paymentModule.cybersource.error.invalidCardName</value>
+ </row>
</table>
<table name="LIB_MOBILE_COUNTRY">
<column>COUNTRY_ID</column>
```

=====

Take a look to be sure this revision implies a migration.

Migrations

To: Migrations
 [LME] [QA-047] [CORE] [22509] Possible migration detected

A change to a class model, sample-data or a file *.sql has been detected

gdiniant
 2013-02-01 09:33:59 +0000 (Fri, 01 Feb 2013)
 63
 [QA-047] [CORE] [LIME-5816] Migration script for revision 22508

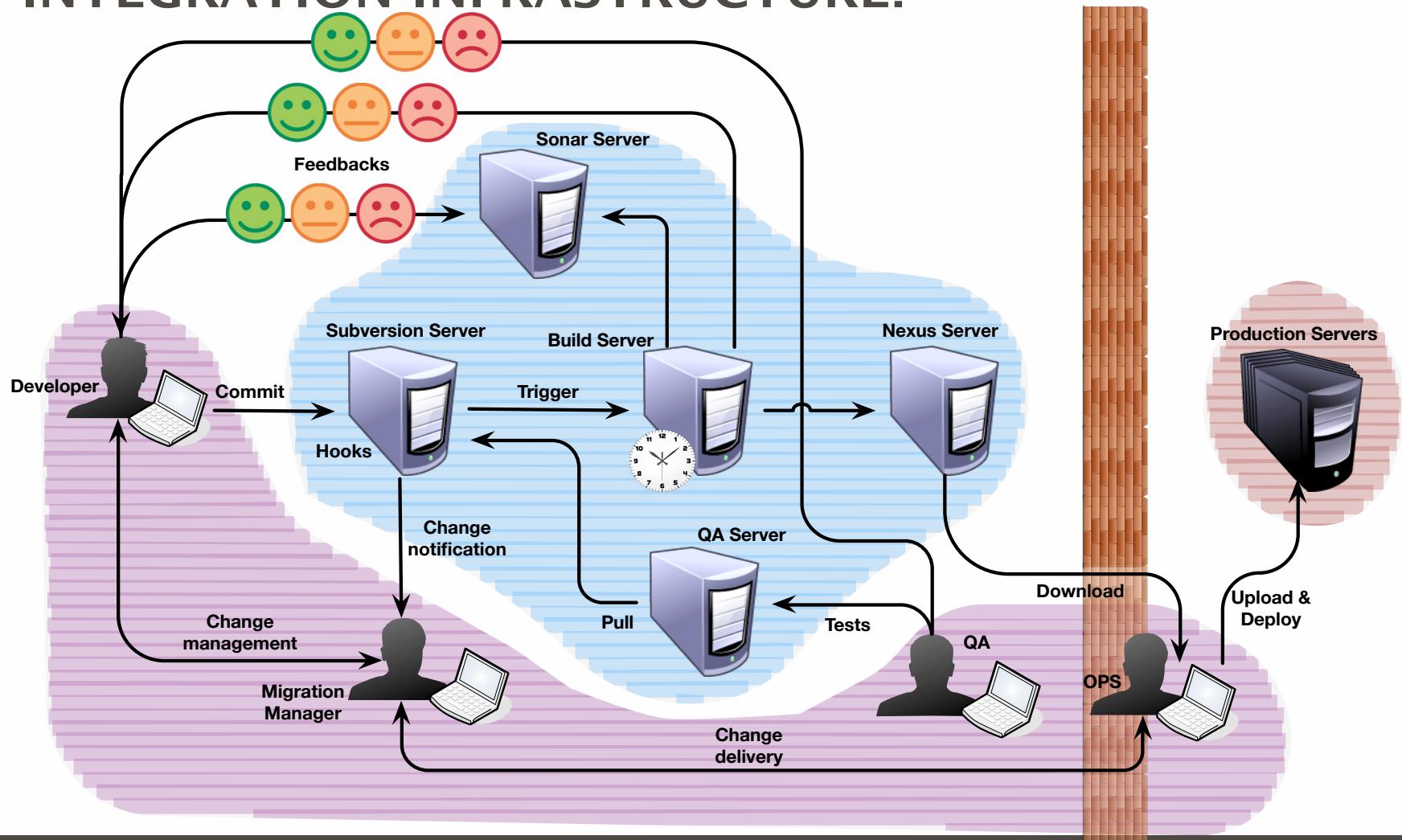
=====

Component: LME-CORE
 =====

A branches/LME/QA-047/LME-CB/LME-CORE/LME-CORE-ear/src/main/resources/migration/r22508.sql

Take a look to be sure this revision implies a migration.

AT LAST, WE HAVE A REAL CONTINUOUS INTEGRATION INFRASTRUCTURE!



COOL! LOTS OF NEW TOYS! CAN WE ADD MORE?

- SURE WE CAN! DID I TELL YOU ABOUT TESTS?

- Hum, well. Do we really need to test our code? I hate writing useless stuff!

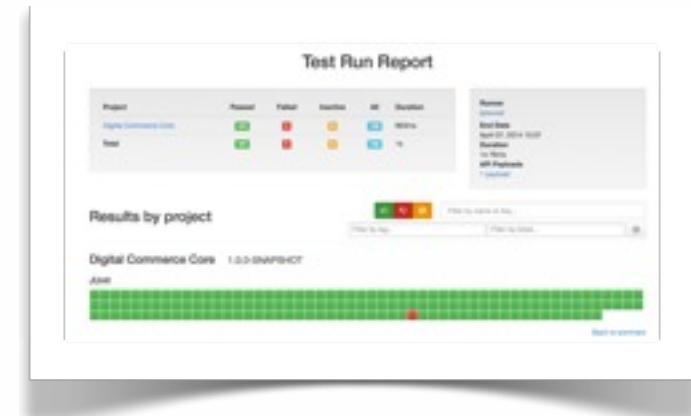
- IDIOT! TESTS ARE USEFUL! THEY BRING CONFIDENCE INTO YOUR DELIVERIES! THEY REDUCE THE NUMBER OF BUGS! AND THEY SAVE TIME FOR USEFUL TASKS!

- Ok, ok! Let's try to write tests! But how?
Which tools? Which techno?

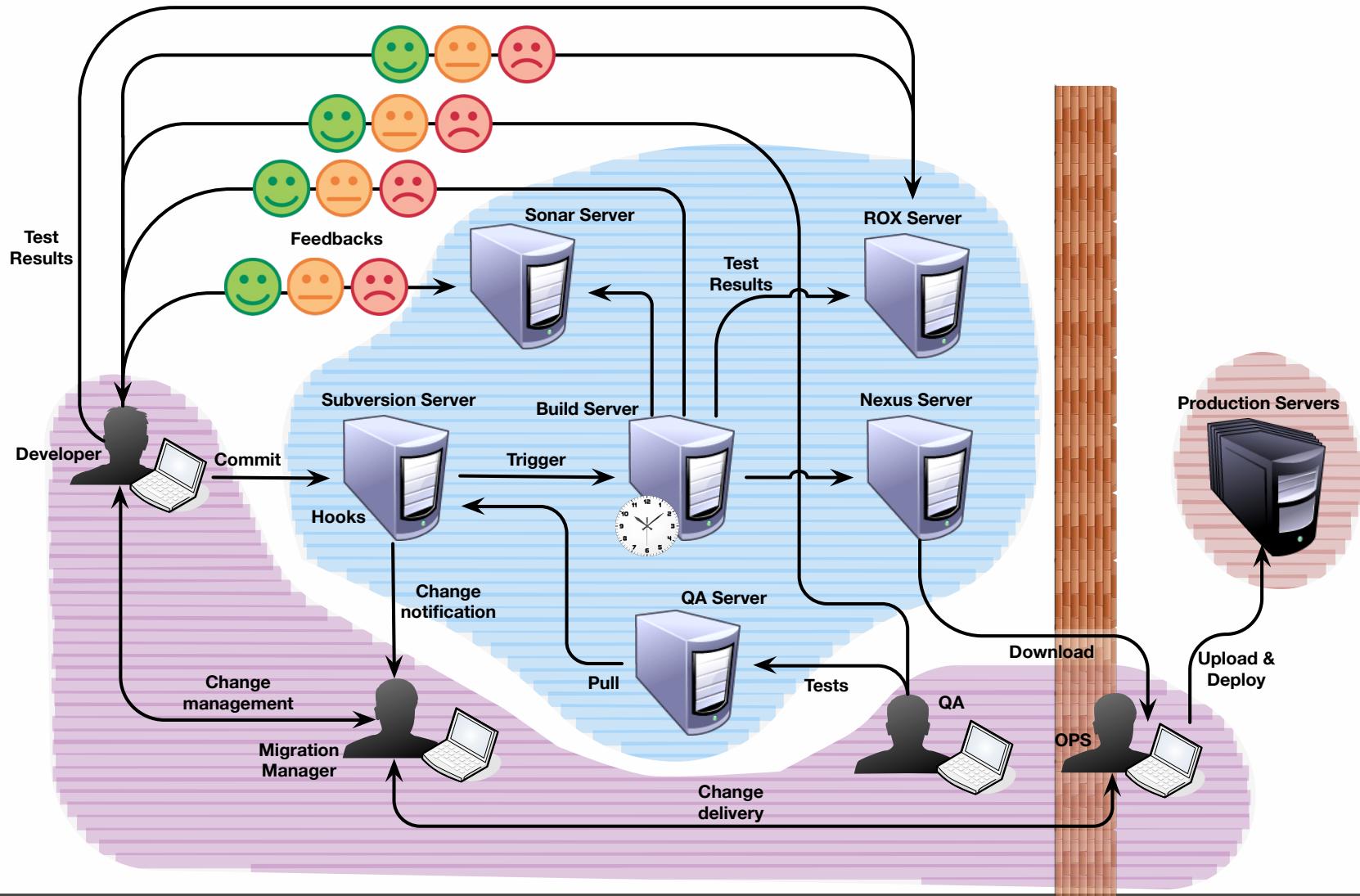
- WHAT ABOUT ROX CENTER?

- ROX what?

- LONG STORY SHORT: OUR CUSTOM SOLUTION TO RUN ALL SORTS OF TESTS AND TO GIVE INTEGRATED FEEDBACK TO DEVELOPERS



CONTINUOUS INTEGRATION AND TEST REPORTS!



HOW DO WE SCALE?

WE HAVE A PROCESS AND TOOLS TO SUPPORT IT

- UNTIL NOW OUR CREW MEMBERS ARE WORKING ON ONE PRODUCT AS A SINGLE TEAM. THIS MAKES COLLABORATION AND COORDINATION “RELATIVELY” EASY.
- BUT WHAT HAPPENS WHEN WE GROW, WHEN WE SPLIT THE TEAM AND WORK ON MULTIPLE PRODUCTS IN PARALLEL?
 - How do we coordinate activities?
 - How do we manage dependencies?
 - How do we share artifacts and services?
- WE NEED TO ADAPT OUR ORGANIZATION, OUR PROCESSES, OUR TOOLS
 - You have heard about our methodology, i.e. Scrum vs. Lean



BEYOND “BATCH” DELIVERY “A LA SCRUM”

- IT SEEMS THAT WE ARE ALWAYS IN A RUSH TO DELIVER FEATURES AT THE END OF THE SPRINT. IT ALSO SEEMS THAT EVERY RELEASE HAS TOO MUCH IMPACT ON THE SERVICE WE RUN IN PRODUCTION.
 - Ok, why don't we work on smaller features and deliver them as soon as they are ready! Facebook is deploying new features several times a day, can we do the same?
- FAIR ENOUGH. BUT SUBVERSION IS GETTING IN THE WAY...
 - Creating a new branch is just too slow. It does not allow us to work in small groups on “feature branches”.
- WHAT ABOUT GIT?
 - Decentralized
 - Faster
 - Makes it possible to implement custom workflows
 - The new de-facto standard!



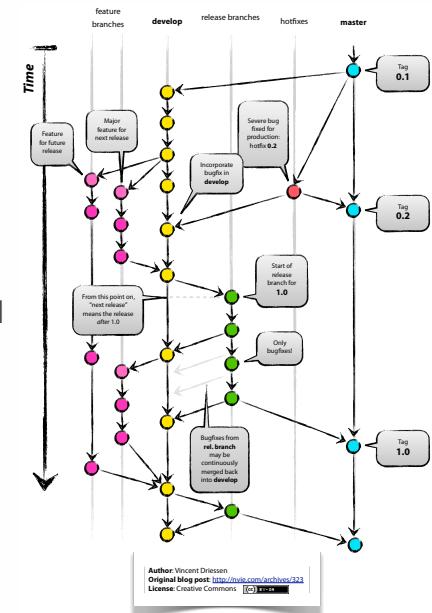
A NEW TOOL! LOOKS MORE TRICKY THAN SVN...

- **PULL, PUSH, ADD, REMOVE, COMMIT, FETCH! MY BRAIN HURTS!**

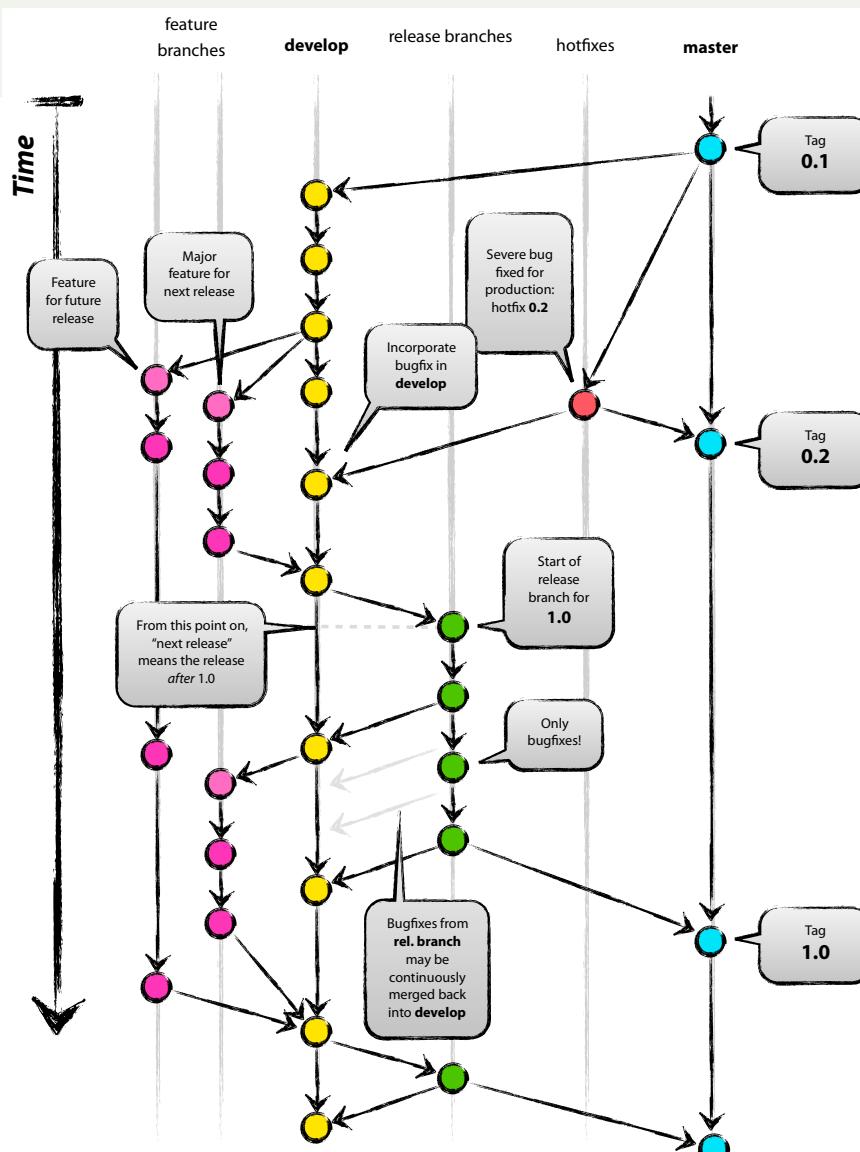
- That's normal: it means that you are on the right track with git!
- Now, you should think about choosing/experimenting a workflow!

- **UH? WHAT IS A WORKFLOW ANYWAY?**

- It is what defines the way you work as a team and how you release your software in different environments.
- It defines the rules that dictate how you use git concepts (commands, branches, etc.) in your own process.

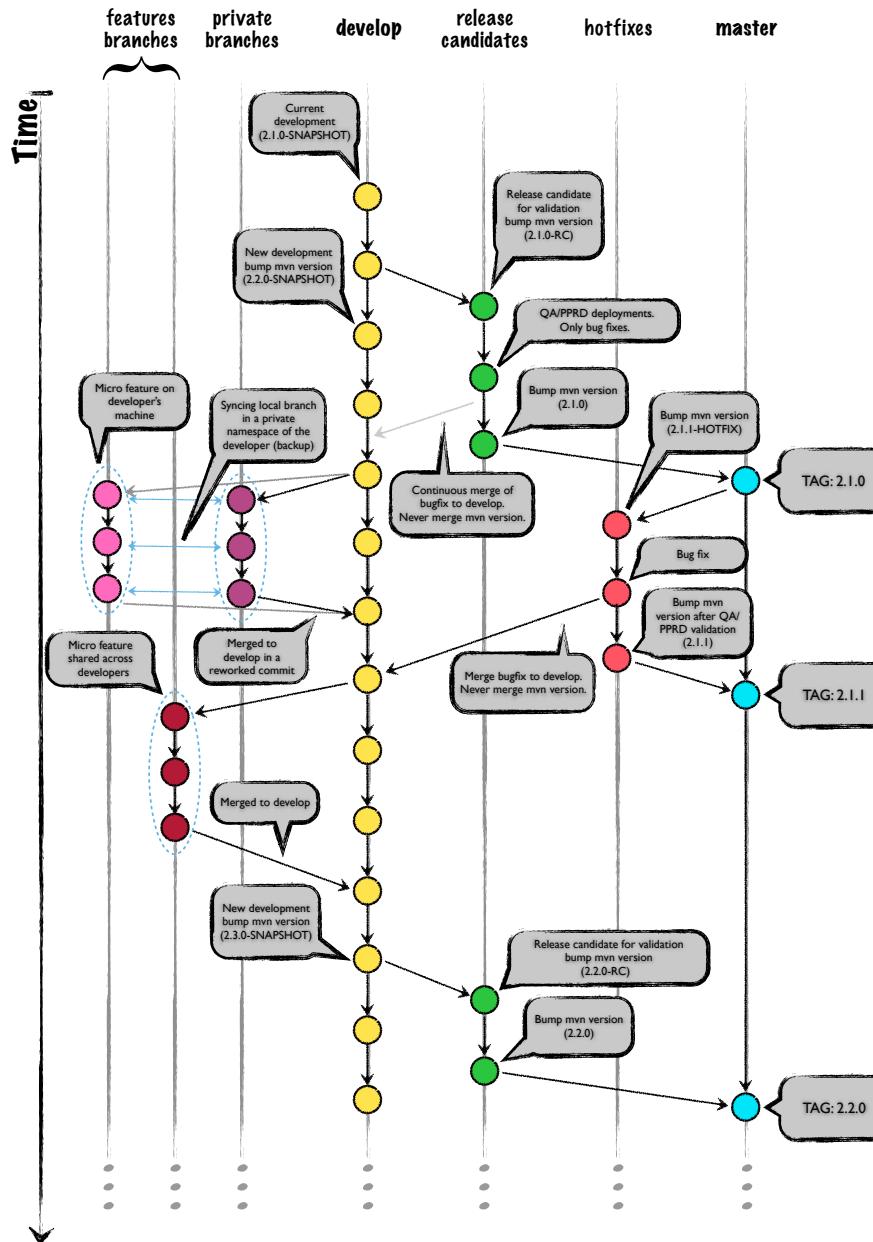


WELL KNOWN WORKFLOW INSPIRED FROM 70'S SOFTWARE PROJECT LIFECYCLE

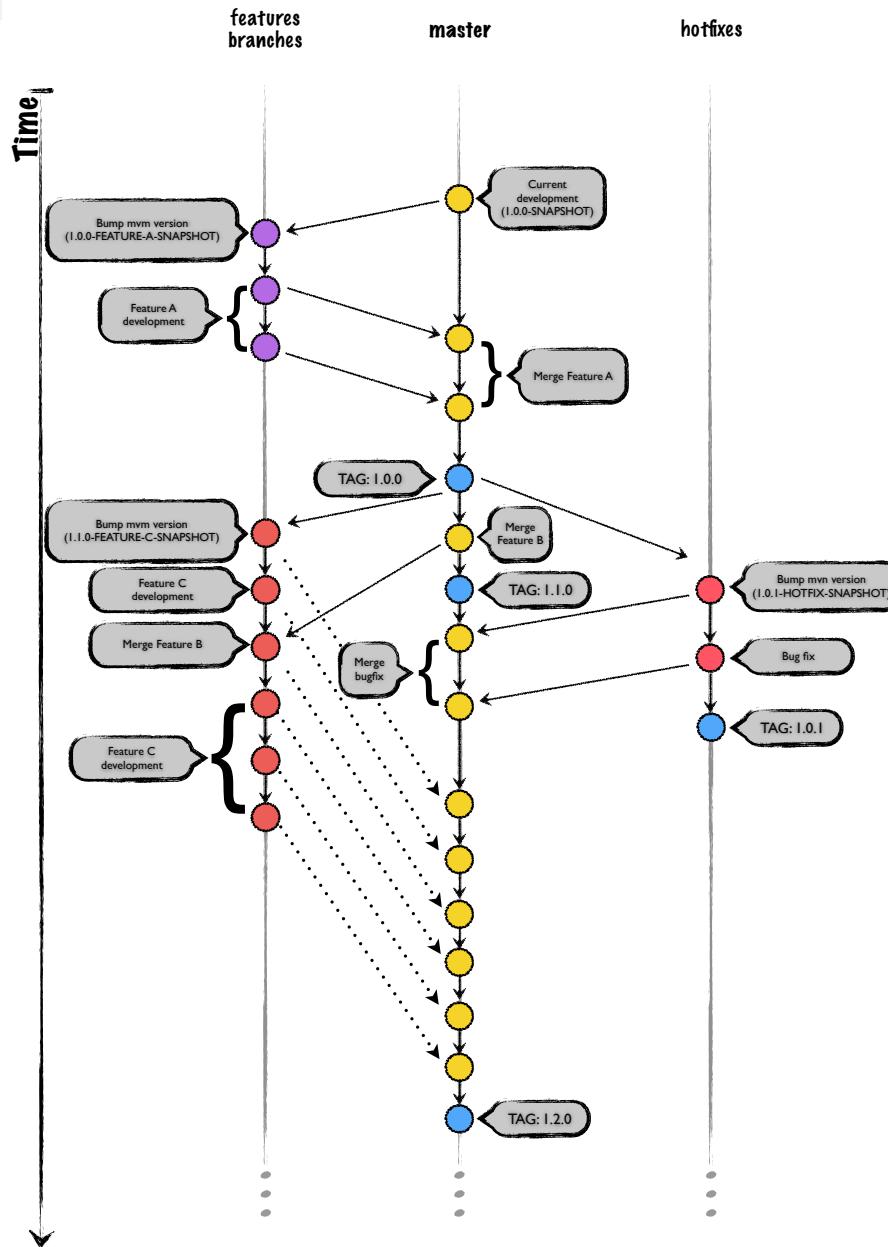


Author: Vincent Driessen
 Original blog post: <http://nvie.com/archives/323>
 License: Creative Commons

I THINK THAT
THIS
WORKFLOW
CAPTURES HOW
WE SHOULD
MANAGE OUR
CODEBASE



AFTER AN INITIAL TRIAL PHASE, TIME TO SIMPLIFY THINGS A BIT



BTW, A WEB UI SHOWING ACTIVITY IN OUR GIT REPOS WOULD BE USEFUL

- THERE ARE SOME SAAS SERVICES, SUCH AS:

- GitHub
- BitBucket
- Gitorious
- But for various reasons, we cannot use them in our infrastructure...



- OK, THERE ARE ALTERNATIVES:

- Stash
- GitLab
- GitHub Enterprise

- AND STASH IS AN ATLISSIAN PRODUCT!

The screenshot shows the Atlassian Stash web interface. The top navigation bar includes links for 'File', 'Console', 'Branches', 'Put Requests', and 'Settings'. Below this is a header for the 'cycle-server' repository. The main content area displays a table of commit history. The columns are 'Author', 'Commit', and 'Message'. The commits listed are:

Author	Commit	Message
Manoel Pachá	4f380ff	Merged demo script (and 1 email update to project settings) from 'demo-script' branch into master
Manoel Pachá	1e050c0	Merge pull request #101 from 'CDFlow/cycle-server' into 'master' by 'Manoel Pachá' (was 'Manoel Pachá' commented 10/20/2016)
Robert Spiegel	3f810cc	Added GET based on key
Manoel Pachá	1e050c0	Merge pull request #101 from 'CDFlow/cycle-server' into 'master' by 'Manoel Pachá' (was 'Manoel Pachá' commented 10/20/2016)
Manoel Pachá	3f810cc	Merge pull request #101 from 'CDFlow/cycle-server' into 'master' by 'Manoel Pachá' (was 'Manoel Pachá' commented 10/20/2016)
Robert Spiegel	3f810cc	Removed unneeded tag
Manoel Pachá	1e050c0	Merge pull request #101 from 'CDFlow/cycle-server' into 'master' by 'Manoel Pachá' (was 'Manoel Pachá' commented 10/20/2016)
Manoel Pachá	3f810cc	Merge pull request #101 from 'CDFlow/cycle-server' into 'master' by 'Manoel Pachá' (was 'Manoel Pachá' commented 10/20/2016)
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Robert Spiegel	3f810cc	Merge pull request #101 from 'CDFlow/cycle-server' into 'master' by 'Manoel Pachá' (was 'Manoel Pachá' commented 10/20/2016)
Manoel Pachá	1e050c0	Merge pull request #101 from 'CDFlow/cycle-server' into 'master' by 'Manoel Pachá' (was 'Manoel Pachá' commented 10/20/2016)
Robert Spiegel	3f810cc	Renamed cache keys
Manoel Pachá	1e050c0	Catalog Resource extends again NestedController

@Stash Projects Repositories

Coyote coyote-server

Files Commits Branches Pull requests Settings

master ...

Author	Commit	Message
Bianca Rada	d13b48d	Merged demo script (and 1 small update to project settings) from demo-script branch into master
Simon Outaway	415e222	Merge pull request #13 in COY/coyote-server from rolandgy/patch-1
Roland Gyavol	f041513	Added GET based on key
Simon Outaway	6150218	Merge pull request #11 in COY/coyote-server from valentin-delaye/patch-1
Valentin Delaye	3c0f245	Remove unwanted tag
Valentin Delaye	11e160d	Merge branch 'master' of esn/research-aws-entitlements into master
Valentin Delaye	1a1f4e4	Merge branch 'master' of esn/research-aws-entitlements into master
Simon Outaway	6154033	Merge pull request #12 in COY/coyote-server from baptisteroth/patch-1
Baptiste Roth	oce3618	Added documentation for a 304
Baptiste Roth	data19c0	Renamed cache keys
Valentin Delaye	3a7d954	Catalog (Resource extends again AbstractController)

ID	Title	Author	Reviewers	Source	Destination
#10	OAuth token	Baptiste Roth		oauth-client	master
#15	DemoScript: discussed changes + fixreturning	Bianca Rada		oaright-documenting	master
#13	Get entity by key	Roland Gyavol		get-entity-by-key	master
#11	Basic auth	Valentin Delaye		basic-auth	master
#12	Core cache	Baptiste Roth		core-cache	master
#8	Random key	Roland Gyavol		random-key	master
#6	Catalog index	Baptiste Roth		catalog-index	master
#7	Catalog optimization	Baptiste Roth		catalog-optimization	master
#9	Conventional routes	Roland Gyavol		conventional-routes	master
#14	Rollback	Roland Gyavol		delete-one-rollback	master
#16	Entity naming conventions	Baptiste Roth		entity-naming-conventions	master
#17	Password encoder removal	Baptiste Roth		password-encoder-removal	master
#18	Random	Baptiste Roth		random	master

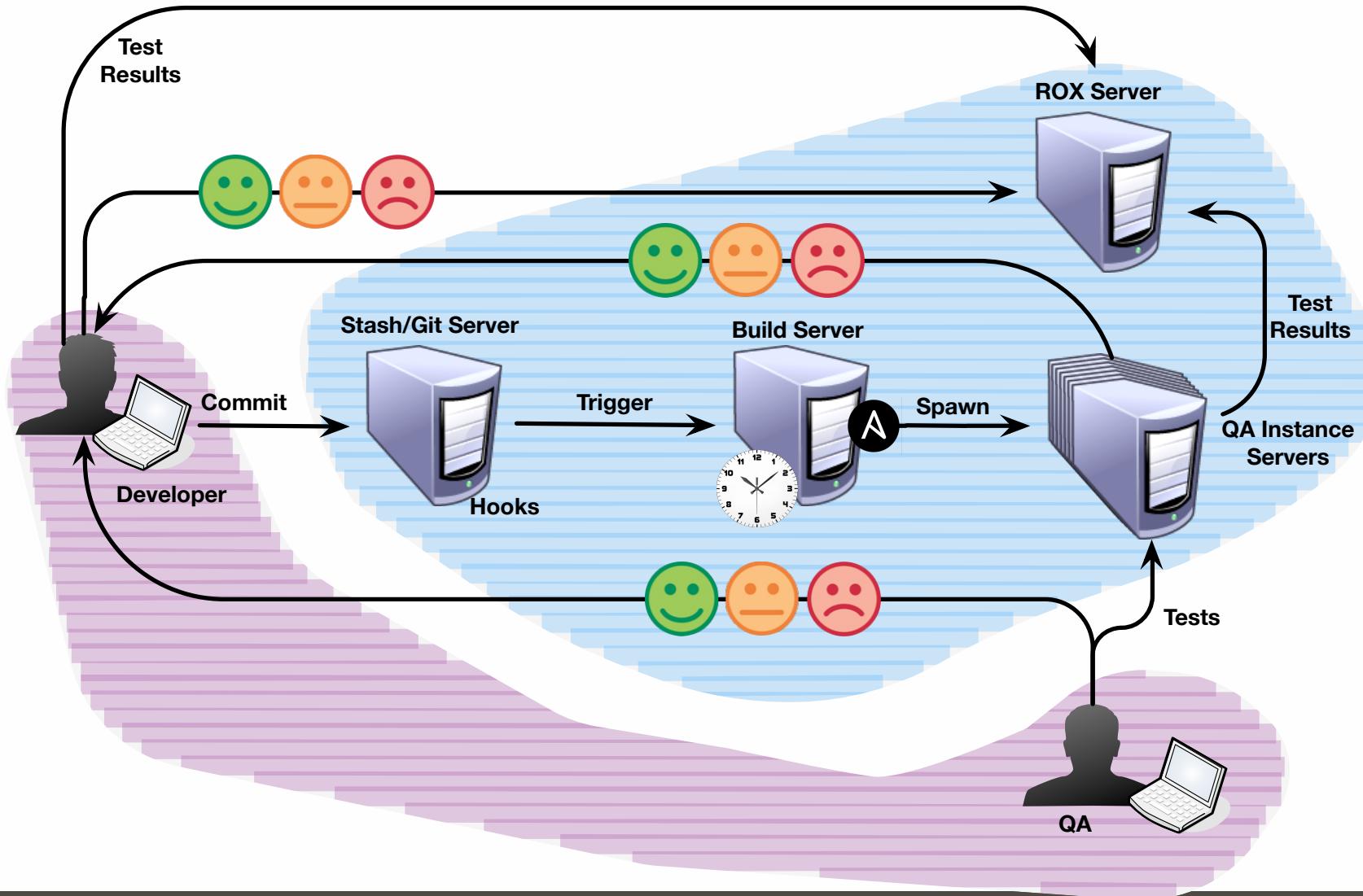
Branch	Behind/Ahead
http-basic	0 · 1
master DEFAULT BRANCH	
demo-images	0 · 0
infra-stuff	20 · 14
products-api	16 · 29
image-handling	16 · 15
demo-script	20 · 40
redis	102
new-paths	180
testutil	179 · 9

COOL! A NEW TOOL AND OUR OWN WORKFLOW!

- HOUSTON! WE HAVE A PROBLEM!
 - What problem?
- WE ONLY HAVE ONE QA SERVER. WE CANNOT TEST/VALIDATE TWO FEATURES IN PARALLEL!
 - Indeed, that is a problem! A bottleneck.
 - It's time to think different! To think bigger! To think awesome infrastructure!
- WHAT ARE YOU TALKING ABOUT?
 - Already heard about Amazon Web Services and other cloud-elastic-magic services?
- HUM, WELL... AT LEAST I AM AWARE OF THE IDEA...



CREATING QA SERVERS ON THE FLY AND RUNNING TESTS IN PARALLEL



YEAH! WE HAVE VIRTUALLY THOUSANDS OF QA ENVIRONMENTS!

- WELL, MAYBE. BUT WE DO NOT HAVE THOUSANDS OF HUMAN TESTERS FOR RUNNING MANUAL TESTS.



- We need to continue our efforts to automate more and more tests, including:
 - Integration / API tests
 - Selenium tests
 - Unit tests
 - Manual tests should be kept to a minimum, even they cannot be avoided.
-
- OK, LET'S REUSE WHAT WE CAN AND DEVELOP CUSTOM TESTING HELPERS/WRAPPERS!
 - And let's not forget to integrate them all with ROX!

JUnit

GREAT! OUR QA CAN FOCUS ON REAL PROBLEMS AND HAVE LESS BORING REPETITIVE TASKS!

- TRUE. BUT CAN WE FURTHER INCREASE OUR CONTROL ON QUALITY?

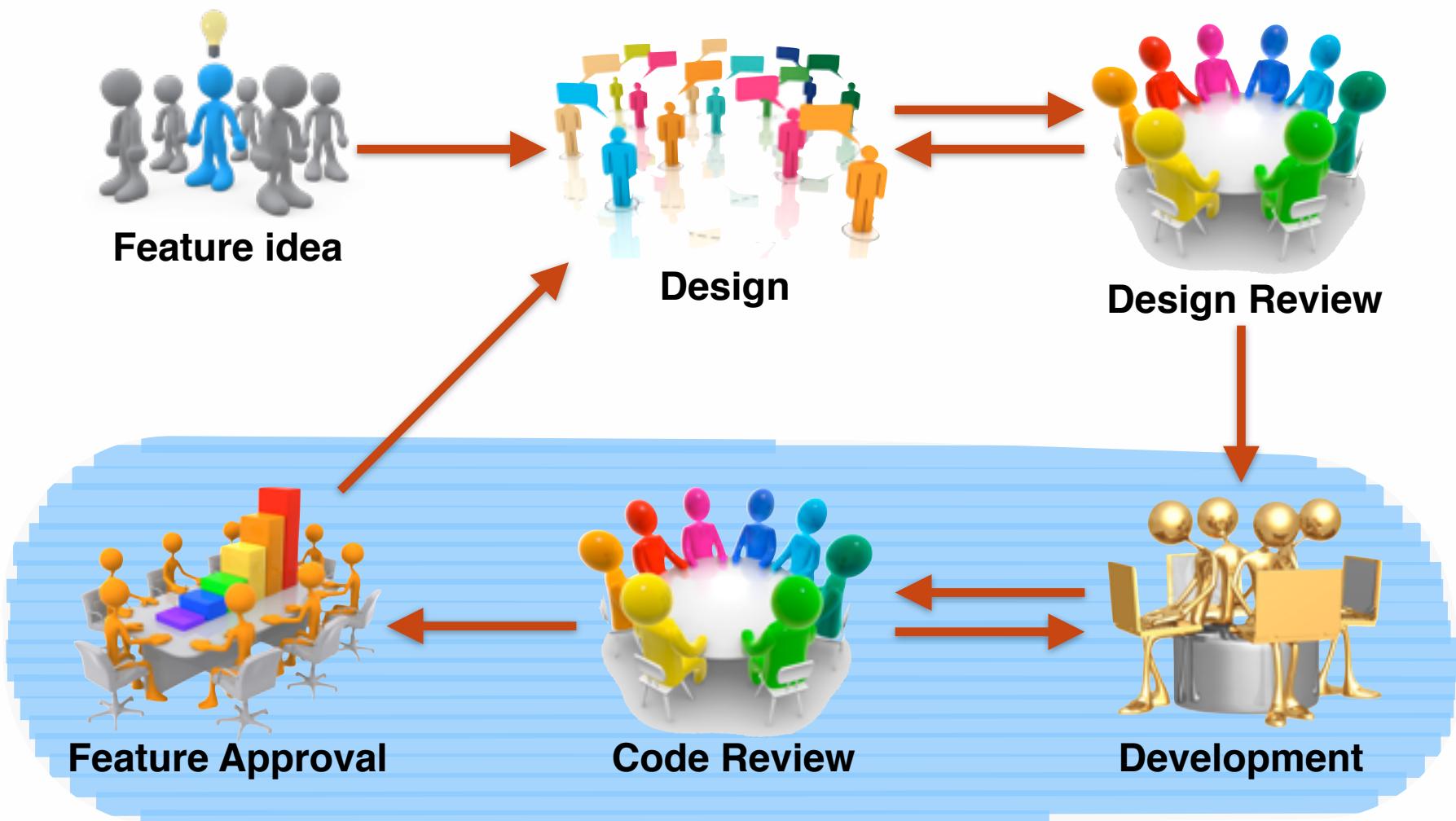
- Would formal review meetings, integrated in our lean workflow, help?
 - Design review meeting
 - Code review meeting
 - Approval meeting

- GREAT! SHOULD WE AWARD “MEETING POINTS” TO TEAM MEMBERS, FOR THE FUN?

- Nah! The goal is to improve the overall quality not to loose our time.



CONCRETELY, HUMAN PROCESS BASED ON SOLID TOOLS!



WOW! WE HAVE COME A LONG WAY SINCE THE BEGINNING... BUT WE ARE NOT DONE!

- ADDING PERFORMANCE TESTS TO OUR CONTINUOUS BUILD PROCESS
 - Automatic performance tests vs. performance test campaigns
- AUTOMATE THE RELEASE ON DEMO ENVIRONMENTS
 - Keep the data vs. drop the data
- AUTOMATE THE PROCESS UP TO THE (HOT) UPGRADE OF PROD
 - Towards true Continuous Delivery
- FIND WAYS TO AVOID BOTTLENECKS INSIDE A FEATURE DEVELOPMENT
 - Too many meetings?
 - Key people not available?

DEMO

REFERENCES

- **SUBVERSION**

- <http://subversion.apache.org/>

- **MAVEN**

- <http://maven.apache.org/>

- Complete Reference:

- <http://books.sonatype.com/mvnref-book/reference/public-book.html>

- By Examples:

- <http://books.sonatype.com/mvnex-book/reference/public-book.html>

- **JENKINS**

- <http://jenkins-ci.org/>

- <https://wiki.jenkins-ci.org/display/JENKINS/Use+Jenkins>

- SONARQUBE

- <http://www.sonarqube.org/>
- <http://docs.codehaus.org/display/SONAR/Documentation>

- NEXUS

- <http://www.sonatype.org/nexus/>
- Repository Management with Nexus
 - <http://www.sonatype.com/resources/books/repository-management-with-nexus>

- GIT

- <http://git-scm.com/>
- <http://git-scm.com/documentation>
- <http://git-scm.com/book>
- <http://training.github.com/>
- <http://try.github.io/levels/1/challenges/1>
- <http://nvie.com/posts/a-successful-git-branching-model/>

- **GIT TOOLS AND SERVICES**

- <http://github.com/>
- <http://www.gitorious.com/>
- <https://www.gitlab.com/>
- <http://www.sourcetreeapp.com/>

- **AMAZON WEB SERVICES**

- <http://aws.amazon.com/>

- **TESTING**

- Repository Management with Nexus
 - <http://www.seleniumhq.org/>
 - <http://junit.org/>

DISCUSSION

YOUR TURN