What SCM is useful and necessary on DevOps projects?

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Preamble

Premise:

- no project can be (successfully) carried out without SCM
- it might not be called SCM
- it might not be carried out by SCM people
- so, from the outside it might seem like SCM is absent in DevOps

Research Questions

RQs: What are the relations between SCM and DevOps?

- what things from traditional SCM are *not needed* in a DevOps context?
- what *new things* need to be added to the SCM toolbox?
- how should ”old principles” *be cast* in a DevOps context?

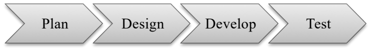
Agenda

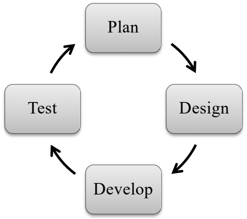
Agenda:

- Motivation
- What is DevOps?
- What is SCM?
- SCM for DevOps findings

Motivation

SCM needs to change/adapt:


Plan
Design
Develop
Test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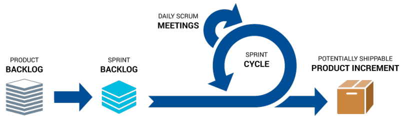
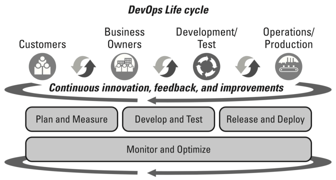
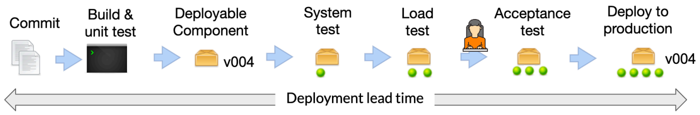

PRODUCT BACKLOG
SPRINT BACKLOG
DAILY SCRUM MEETINGS
SPRINT CYCLE
POTENTIALLY SHIPPABLE PRODUCT INCREMENT


DevOps Life cycle
Customers
Business Owners
Development/ Test
Operations/ Production
Continuous innovation, feedback, and improvements
Plan and Measure
Develop and Test
Release and Deploy
Monitor and Optimize

What is DevOps – short version

DevOps is: “a set of practices intended to **reduce the time** between **committing a change** to a system and the change being placed into normal **production**, while ensuring **high quality**”


Commit
Build & unit test
Deployable Component
v004
System test
Load test
Acceptance test
Deploy to production
v004
Deployment lead time

Also includes **monitoring** and **measuring** of the software in runtime!

What is DevOps – longer version I

Culture (People, processes and tools)

Automation (Do it once, do it twice – automate)

Lean (Continuous improvement and learning)

Measurement (development, production, business)

Sharing (Collaborate, give feedback, don’t copy)

What is DevOps – longer version II

Goals:

- improved deployment frequency
- lower failure rate of new releases
- shortened lead time between fixes
- faster mean time to recovery

Aims to maximize the **predictability**, **efficiency**, **security** and **maintainability** of operational processes.

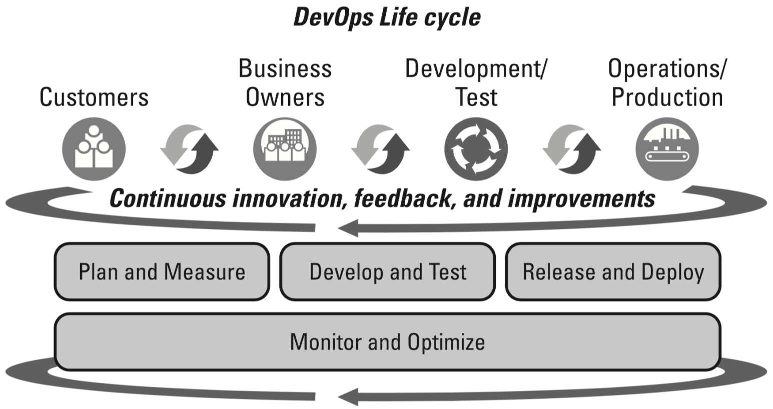
What is DevOps – longer version III

How does DevOps differ from Agile/Scrum/XP?

What more is DevOps than “just”: Dev + Ops?

Is it “monitoring and measuring users” to know what they like?

In order to get as fast as possible from idea to use we take a **small** (part of an) idea and work **continuously** on it in a **cross-functional** way until it is in production and then we **monitor** what happens when it is used to get **feedback** that creates new small ideas that ……



What is SCM – short version

Software Configuration Management is this cool stuff that will facilitate a team to coordinate people and things so they can carry out changes in an orderly fashion right from idea/conception to production – and retirement – and avoid any chaos and confusion in the process.

SCM will make sure that you know exactly what you have, not just when it is in production but also while you are developing it and SCM will provide a project with all the quality gates they could desire for.

SCM can be done in formal and rigid ways (top-down/waterfall) - or it can be done in more informal and flexible ways (bottom-up/Agile, DevOps).

What is SCM – longer version I

It is about tracking, managing and controlling **changes** to (re-)establish **baselines**.

A process for establishing and maintaining **consistency** and **integrity** of a product. Provides **visibility**, control, orderly change.

Provisions for the **storing**, tracking and updating of **all parts**.

Tracks requirements (change requests) **throughout the life-cycle**.

Establishes baselines and performs a standard change management process through to “release management and delivery”.

Configuration management database – Configuration Items, their attributes and the dependencies between them.

What is SCM – longer version II

Part CM:

- Identification (configuration items, traceability)
- Control (change process, change requests, CCB)
- Status Accounting (recording and reporting information)
- Audit (assesses compliance with requirements before acceptance of change into a baseline)

Part Software:

- Build management
- Process management (adherence to development processes)
- Environment management
- Teamwork (facilitate team interactions)
- Defect tracking

What is SCM – longer version III

- Coordination problems: SD, DM, SU
- Coordination strategies: locking, copy/merge, LT/SLT
- branching strategies
- history and diffing

- CI, CMDB, traceability, BoM
- CSA
- CR, change process, CBB
- CA, baselines

SCM for DevOps findings – I

Different types of SCM:

- Strategic SCM
- Operational SCM

How to organize SCM:

- Company (usually start-up) with only one team (3-8 people):
  - SCM as a service / consultant + ”deputy”

- Company with 3-4+ teams:
  - SCM “team”
  - SCM on teams

SCM for DevOps findings – II

DevOps – mostly – has three parts/ingredients:

- agile in some way
- Dev + Ops – together or cross-functional
- “monitor and measure”

and we need SCM to service and support each part/context

SCM for Agile I

SCM-related Agile practices:

- Collective Code Ownership
- Continuous Integration
- Test-Driven Development
- Frequent Releases
- Planning Game
- Refactoring

SCM for Agile II

SCM sub-practices for Agile:

- use a version control tool
- define configuration items and their structure
- use a build tool
- automate and optimise the Release process
- physical audit in Release process
- impact analyse stories during Planning Game
- impact analyse refactorings
- incremental refactoring
- use a copy-merge work model
- keep the repository clean
- write proper commit comments
- trace changes to stories

SCM for Dev + Ops (=CoDe?)

SCM sub-practices for CoDe:

- automate deploys
- create pipelines
- provision environments
- build quality gates
- separate code and configuration data (one build)
- architecture (microservices):
  - high cohesion
  - low coupling
  - traceability (dependencies)
  - selective testing

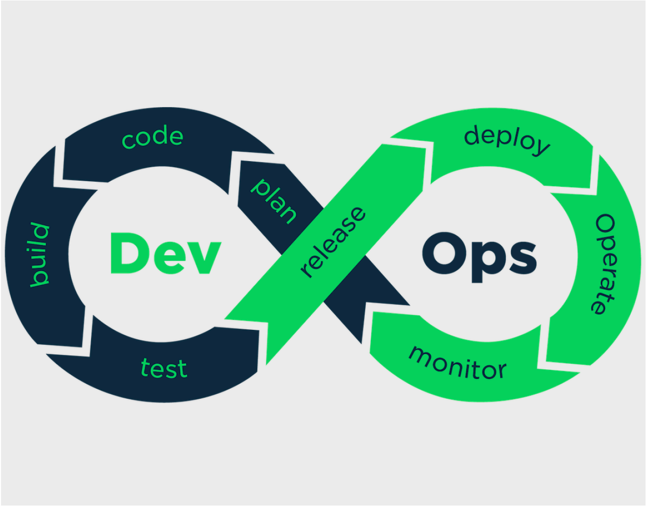
SCM for DevOps

SCM sub-practices for DevOps:

- Plan & Measure:
  - CCB
  - CSA?

- Monitor & Optimize:
  - A/B testing
  - canary releases
  - variants
  - CSA?

Initial analysis



Initial analysis

Plan:

- Change Requests from ”all sources”
- ”Change Control Board”
- => Change Requests to be implemented

Code:

- handling parallel work
- Continuous Integration
- => source code to build

Initial analysis

Build:

- automation of build process
- identification of build (BoM)
- => systems to be tested

Test:

- test automation
- test selection
- => verified system

Initial analysis

Release:

- packaging of release
- configuration audit
- => system to be deployed

Deploy:

- system configuration
- deployment automation
- => deployed system

Initial analysis

Operate:

- ???
- ???
- => data?

Monitor:

- define metrics to monitor
- collect and process data
- => proposed Change Requests

SCM = DevOps?

DevOps is: “a set of practices intended to reduce the time between committing a change to a system and the change being placed into normal production, while ensuring high quality”

SCM is: “this cool stuff that will facilitate a team to coordinate people and things so they can carry out changes in an orderly fashion right from idea/conception to production - and retirement - and avoid any chaos and confusion in the process”

Ops: resist change
Dev: live on change – often and fast
SCM can make both happy – plus more (PM, company, customer)

Let’s join forces – DevOps can get help from SCM, SCM can learn from DevOps

Conclusions

DevOps change requests to SCM:

- help us – please ;-)
- handle many small changes – roughly one day to one week/task
- keep us in the flow – once we stop we are dead
- make it fast – we hate to wait
- KISS – because **we** will do it (as instructed)