

A background image showing a business meeting. In the foreground, a person's hand is writing on a document. In the background, another person's hand is holding a pen over a document. The documents contain charts and graphs.

# Continuous Delivery And Cloud Foundry

# Objectives of PCF

- Purpose:
  - SCM, CD and CI in CF.
- Product:
  - SCM
  - CD
  - CI
- Process:
  - Understand Cloud Foundry Continuous Integration and Continuous Delivery.

# Table of Contents

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- Defining Terms:
  - SCM, CI, CD
- Continuous Integration with CloudBees and Pivotal Cloud Foundry

# DEFINING TERMS

# Defining Terms

## ■ **SCM** - Source Control Management

- i.e Version Control
- Tool Examples: Git, SVN, CVS, Clear Case, Perforce, etc.

## ■ **CI** - Continuous Integration

- Running automated compilation, checks, and tests on a frequent basis
- Tool Examples: Bamboo, Hudson/Jenkins, Cruise Control, Team City, Concourse

## ■ **CD** - Continuous Delivery

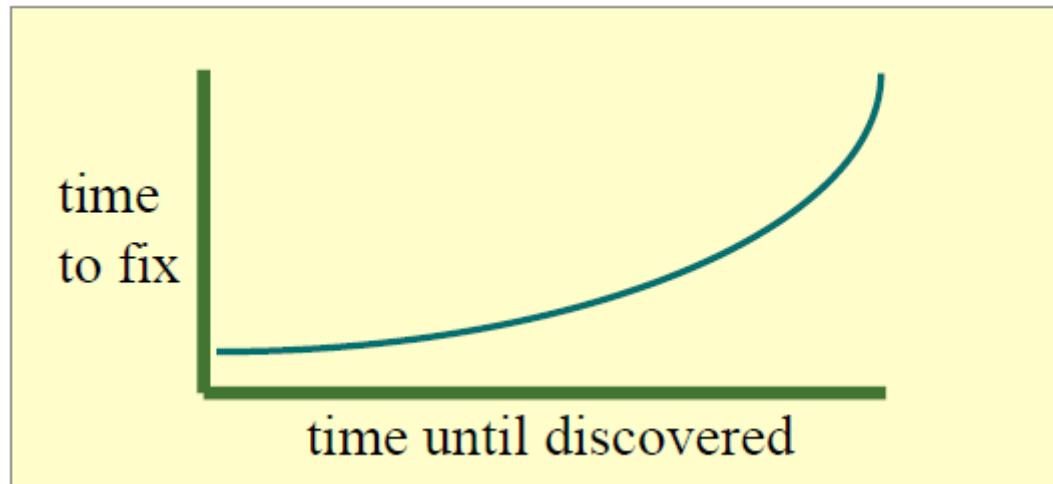
- CI + automated deployment

# Continuous Integration

- First seen as part of XP (eXtreme Programming)
- Goal: prevent integration / deployment problems by discovering them early
- Automatically run tests and packaging activities on periodic basis
  - Once per day
  - Each time a commit is made to SCM

# Benefits of Continuous Integration

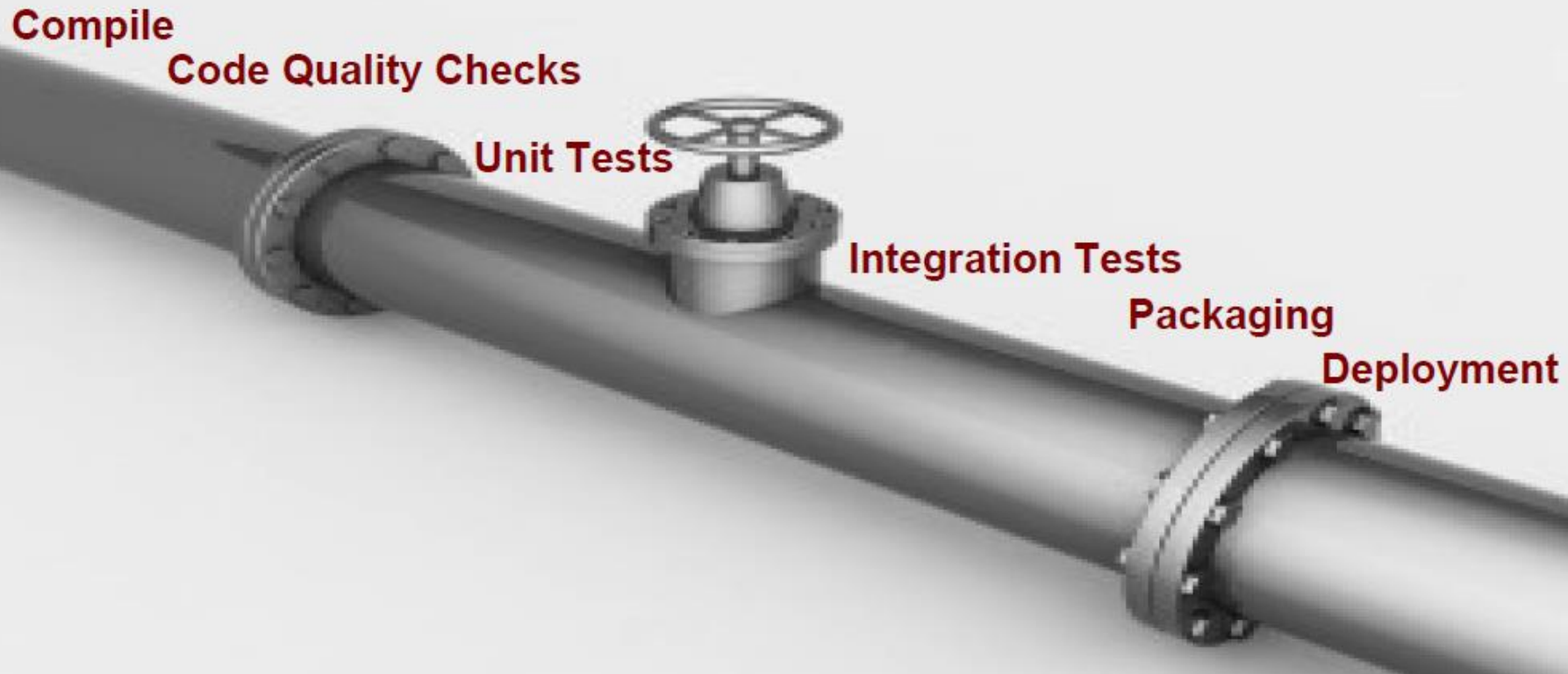
- The cost to fix a bug grows exponentially in proportion to the time before it is discovered



- Continuous Integration (CI) focuses on reducing the time before the bug is discovered
  - Effective CI requires automated tests

# Continuous Delivery

- Continuous Integration + Automated Deployment
- Continuously run through the “Deployment Pipeline”





# Continuous Delivery

- You're doing continuous delivery when:
- Your software is deployable throughout its lifecycle
- Your team prioritizes keeping the software deployable over working on new features
- Anybody can get fast, automated feedback on the production readiness of their systems any time somebody makes a change to them
- You can perform push-button deployments of any version of the software to any environment on demand

Martin Fowler, May 2013

# **CONTINUOUS INTEGRATION WITH CLOUDBEES AND PIVOTAL CLOUD FOUNDRY**

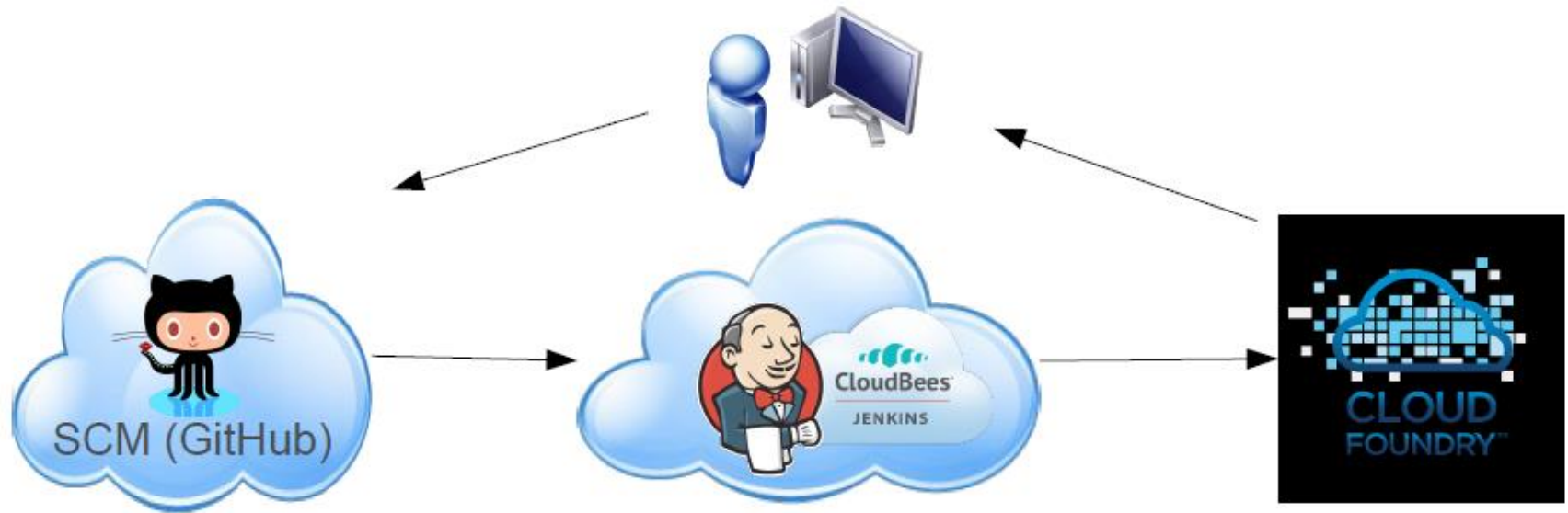
# What Is CloudBees?

- Public Cloud-Based provider of Continuous Delivery services
  - Based on open-source Jenkins
- Features
  - Good integration with lots of SCM tools
  - Ability to run many build tools
  - Maven, Gradle, Ant, etc
  - Great integration with PWS
- Good basis for our upcoming lab!
  - Or you can use your own Jenkins installation



# Example Continuous Delivery Pipeline

Featuring SCM, CloudBees, and Pivotal CF



- Developer commits code to SCM (GitHub)
- CloudBees monitors repository for commit, launches builds process
- CloudBees pushes application to Cloud Foundry (PWS)

**Note:** CloudBees uses oAuth to connect to GitHub and PWS

# Establish Accounts

- You will need accounts for
  - GitHub
  - Pivotal Web Services
  - CloudBees
- Simply visit [cloudbees.com](http://cloudbees.com) to establish an account
  - Use the "Free" Plan

# CloudBees /Jenkins - Get started with Builds

- Look for this item to setup CloudBees to do builds:



- This can take several minuets to provision a new account to do builds

# CloudBees /Jenkins – New Build

ClickStart Ecosystem Support Documentat

Jenkins ▾

Home

Apps

Builds

Databases

Repos

New Item

People

Build History

Project Relationship

Check File Fingerprint

Manage Jenkins

DEV@cloud Slave Templates

Support

Credentials

My Views

Groups

Roles

Item name

☐ Build a free-style software project

This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

☒ Build a maven project

Build a maven project. Jenkins takes advantage of your POM files and drastically reduces the configuration.

☐ Build multi-configuration project

Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.

☐ Folder

Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.

☐ Monitor an external job

This type of job allows you to record the execution of a process run outside Jenkins, even on a remote machine. This is designed so that you can use Jenkins as a dashboard of your existing automation system. See [the documentation for more details](#).

☐ Copy existing Item

Copy from

OK

- Many other options available
  - See CloudBees documentation

# CloudBees /Jenkins – Configuration Option

- Many options available, these are just the highlights
  - See CloudBees documentation

- Set the name:

Maven project name

my-deployment-example

- Copy the public key
  - IF your GitHub repository is private

## CloudBees DEV@cloud Authorization

CloudBees Public Key

```
ssh-dss
AAAAB3NzaC1kc3MAAACBALRL1WytwgRI1QtIH2t0r8SOXAMCHWj+I3
v7atEmD0aUXABDchM1zaLs+QTGUHJt2NLHimOLok8i1zGzDe0CRMzC
LvJ51+ifTd569fyhkQQZBvR8Qem8bmcnjg+Y7acUP7mN7ivGSQtg8FQ
IgnGtw4gGlqEbZvvCEjNoQHnuJF7rAAAAFQDOA3EJNHcbHasd1mZWz
```





# CloudBees /Jenkins – SCM Integration

- Tell CloudBees about your SCM repository
  - we will use GitHub in our example:

## Source Code Management

☐ CVS

☐ CVS Projectset

☒ Git

Repositories

Repository URL

Credentials

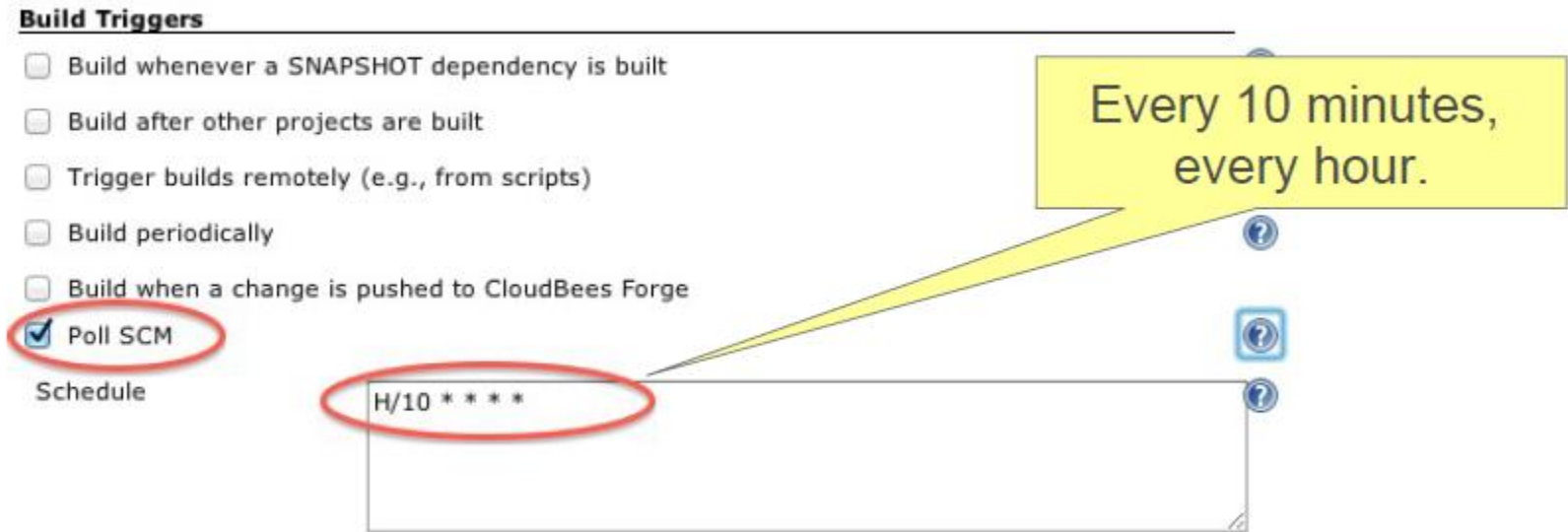
- none -

 Add

- Many options available here depending on SCM type.

# CloudBees /Jenkins – Identify Build Triggers

- Under what circumstances should CloudBees launch the build process?



- Polling SCM - Can be expensive.
  - SCM push option available with more configuration
- Schedule - Based on Cron syntax
  - "H" symbol introduces random 'hash' for better load handling

# CloudBees /Jenkins – Add Post-Build actions to push to Cloud Foundry

- Multiple post actions available
  - i.e deploy Maven artifacts

- CF will receive a request for authorization

- Similar options to CLI / Manifest

**Post-build Actions**

**Deploy applications**  
When build is ☒ Stable ☐ Unstable

Host service

**Cloud Foundry**  
Target API end-point  ?  
Cloud Foundry sponsored by Pivotal

Credentials  ?

Organization

Space

Applications

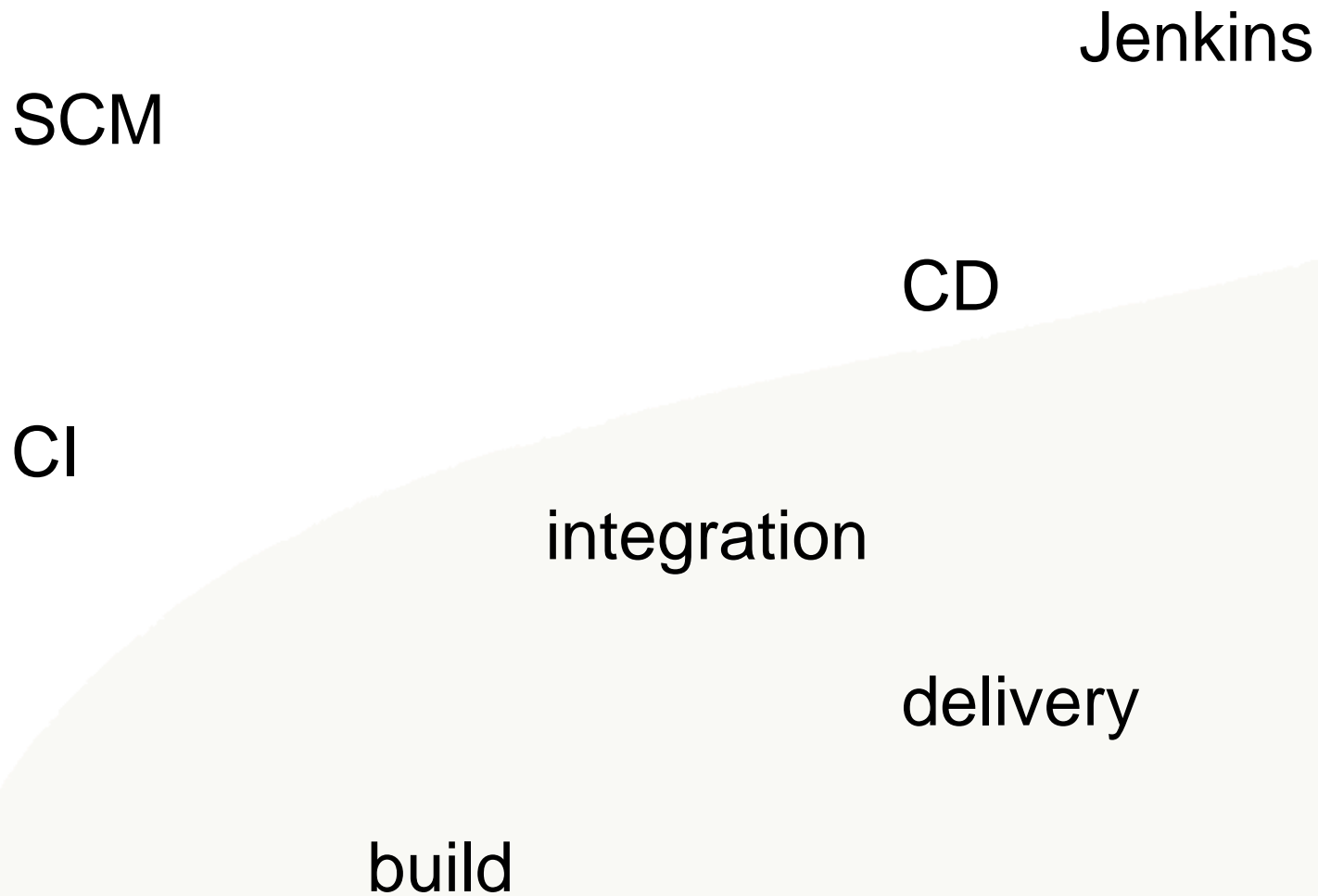
**Application**  
Name  ?  
Deployment URL  ?  
Buildpack URL   
Command  ▼  
Number of instances  ?  
Memory Reservation  ?  
Services  ?  
Environment variables  ?

# Pivotal CF - CloudBees as a Service

- Pivotal CF 1.3 includes CloudBees as a service
  - Installed by administrator
- Advantages over external CloudBees SaaS:
  - Installed within enterprise (private)
  - Authentication integrated with Pivotal CF
  - Easy to scale

# Recap

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