



Continuous Delivery and Cloud Foundry

Combining SCM, CD, and CF

Example: CD with Jenkins

Roadmap

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

Defining Terms

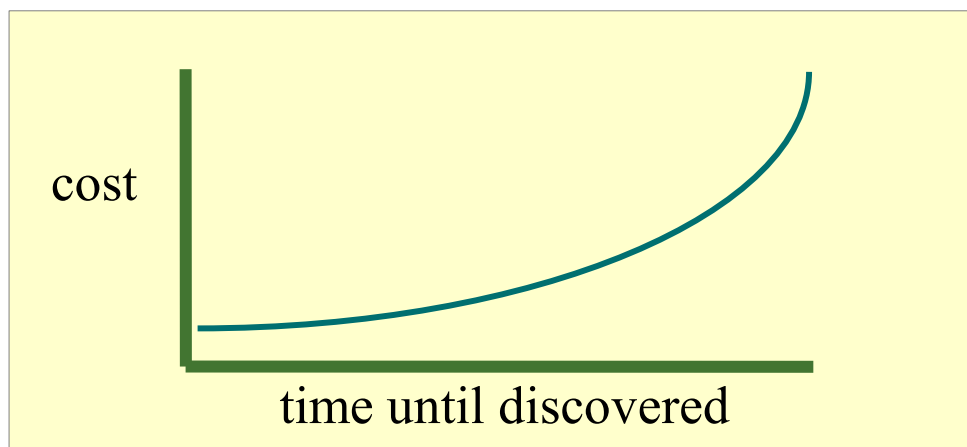
- **SCM** – Source Control Management
 - i.e. Version Control
 - Tool Examples: Git, SVN, CVS, Clear Case, Perforce, etc.
- **CI** – Continuous Integration
 - Running automated compilation, checks, and tests on a frequent basis
 - Tool Examples: Bamboo, Hudson/Jenkins, Cruise Control, Team City, Concourse
- **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

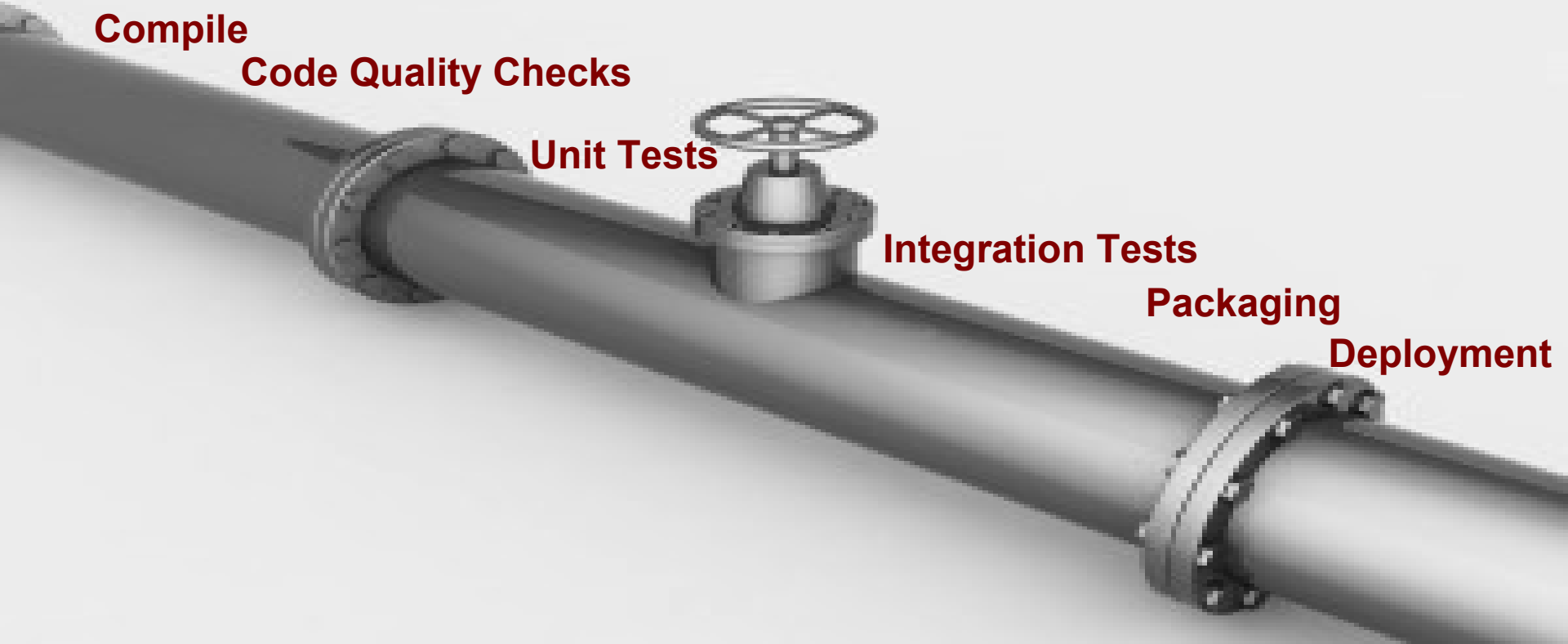
- The cost of a bug grows exponentially in proportion to the time before it is discovered



- 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

Roadmap

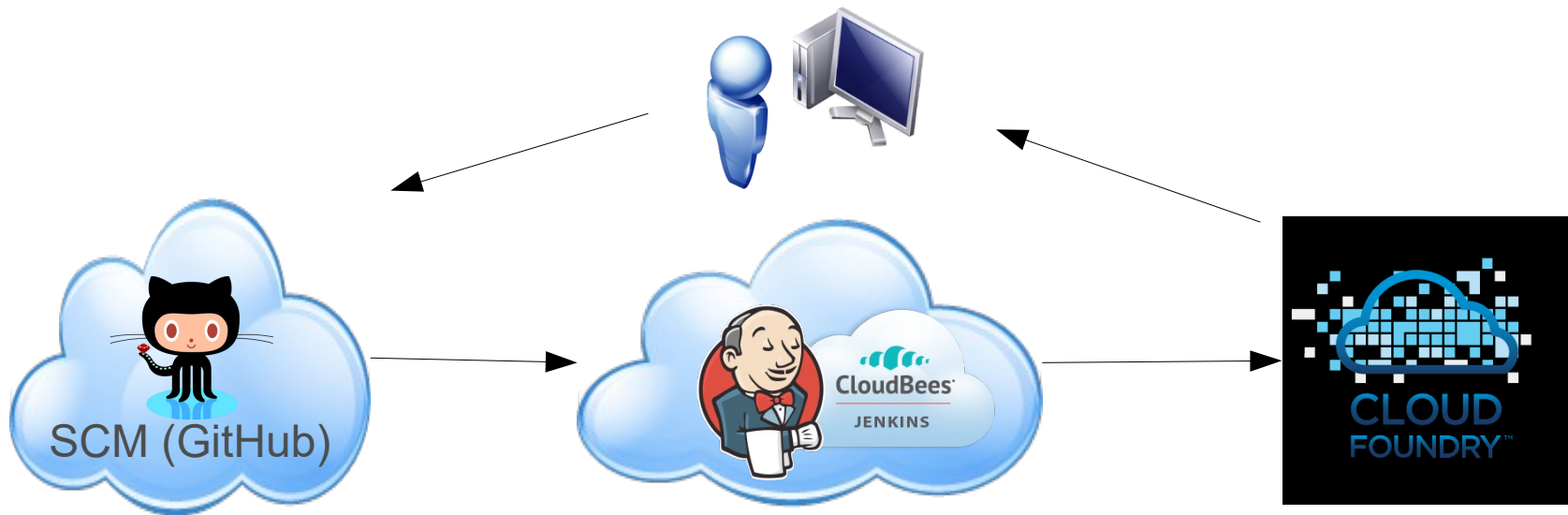
- Defining Terms: SCM, CI, CD
- **Continuous Integration with CloudBees and Pivotal Cloud Foundry**

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



- 1) Developer commits code to SCM (GitHub)
- 2) CloudBees monitors repository for commit, launches build process
- 3) 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 to establish an account.
 - Use the “Free” Plan

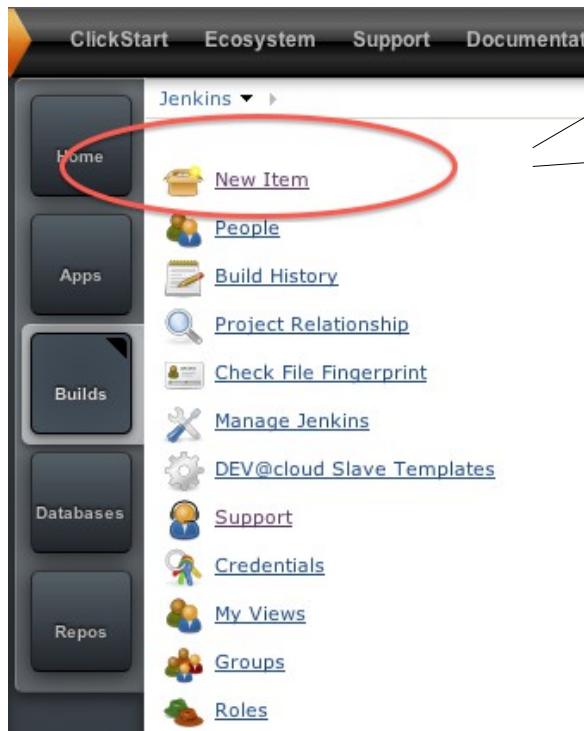
CloudBees / Jenkins – Get Started with Builds

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



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

CloudBees / Jenkins - New Build



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

- Many other options available
 - See CloudBees documentation

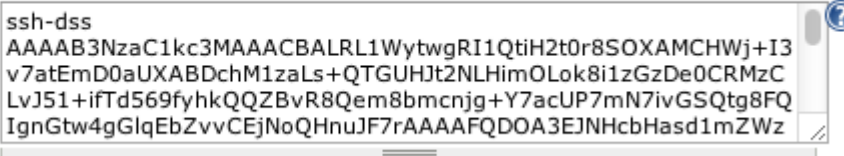
CloudBees / Jenkins - Configuration Options

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

Maven project name

- 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?

Build Triggers

- ☐ Build whenever a SNAPSHOT dependency is built
- ☐ Build after other projects are built
- ☐ Trigger builds remotely (e.g., from scripts)
- ☐ Build periodically
- ☐ Build when a change is pushed to CloudBees Forge
- ☒ Poll SCM

Schedule

H/10 * * * *

Every 10 minutes, every hour.

- 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 may include CloudBees as a Service
 - If previously installed by administrator
- Advantages over external CloudBees SaaS:
 - Installed within enterprise (private)
 - Authentication integrated with Pivotal CF
 - Easy to scale

Lab

Deploy to PWS via CloudBees