

How to Git Good: Experiences From the Industry

BY DANIEL COSTANTIN




Before I Begin

The views and opinions expressed in this presentation are that of my own and do not reflect that of my employers (past and present).

This presentation is based on my own experience, research and experimentation.



Presentation Overview

1. Who am I?
 2. Project management and planning strategies.
 3. Git branching, Gitflow, Git commits, pull requests and issue tracking.
 4. GitHub actions and AWS CI / CD pipeline.
 5. Questions.
- 

Who am I? – This Guy!

- Daniel Costantin
- Industry Experience
 - Senior Platform Engineer at Harvest Technology (1 year)
 - Senior Associate at PricewaterhouseCoopers Australia (5 years)
 - Casual Academic (tutor) at Edith Cowan University (2 years)
- Education
 - Master of Cyber Security - Edith Cowan University
 - Bachelor of Commerce (Business Information Technology and Systems) – Curtin University



Who am I? – This Guy! (Continued)

Cloud Focused



Cyber Security Focused



Main Focus of this Presentation

GitHub branching, planning and managing group workflows in with regular commits.

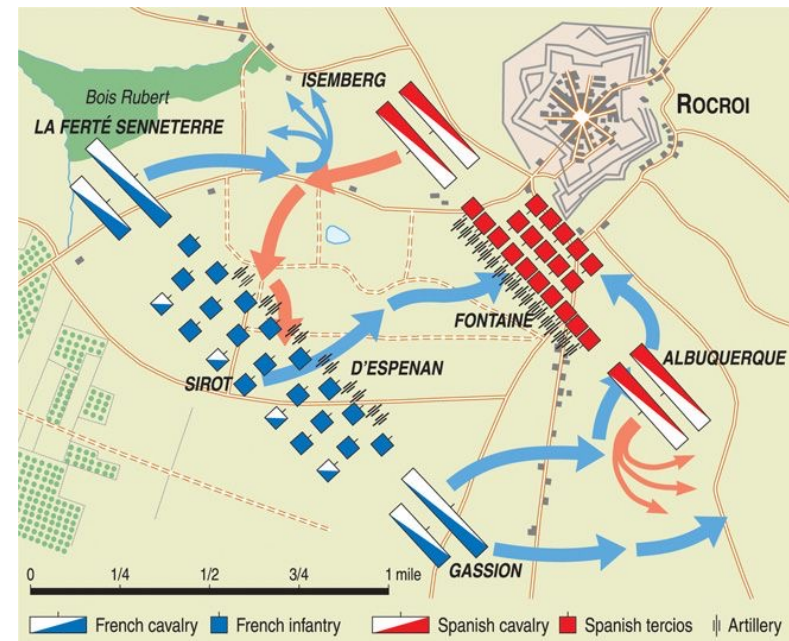


Continuous Integration and Continuous Delivery of your code.



Project Planning

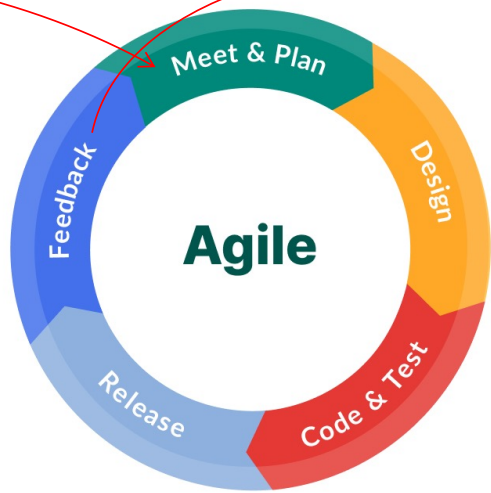
- By far the most important thing.
- Most common thing that is overlooked.
- Without proper planning, your project will fail!



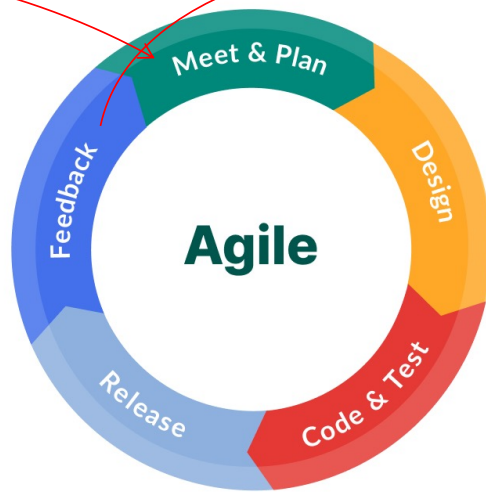
Project Management Strategies



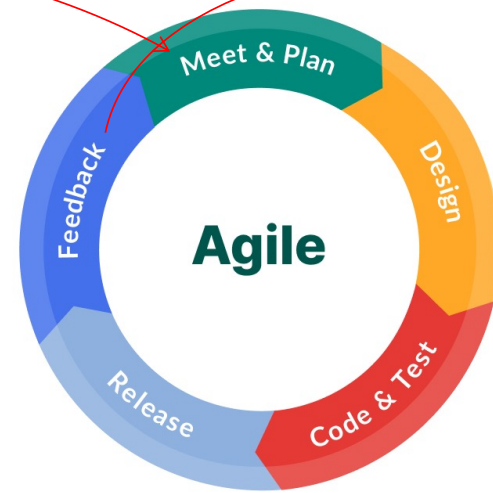
Project Management Strategies (Continued)



Sprint 1



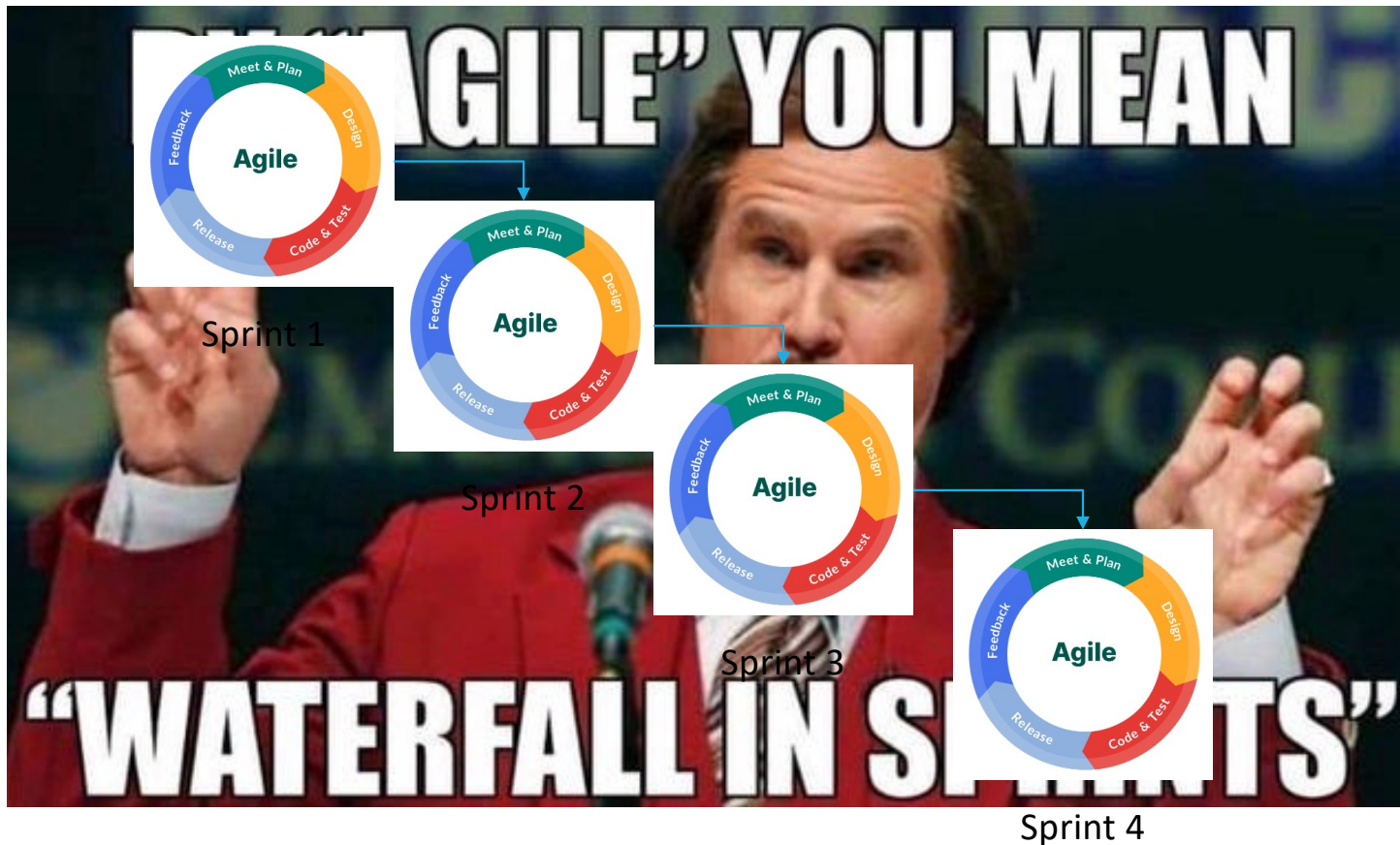
Sprint 2



Sprint 3



Project Management Strategies (Continued)



What is Agile?

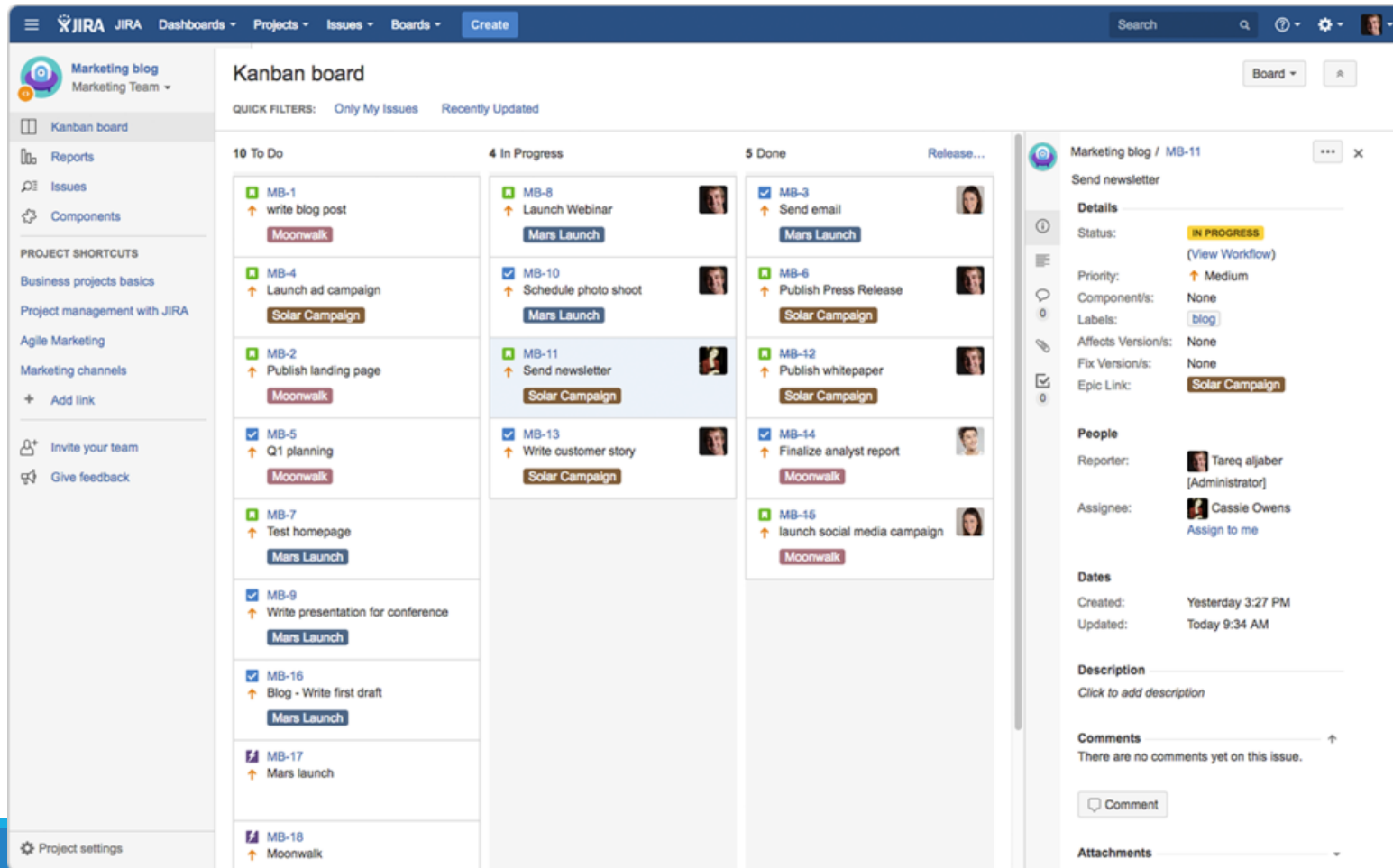
- A different approach to software development.
- Constant feedback / updates and improvement.
- Promotes speed.
- Small changes.
- Break down large tasks into smaller ones.
- Fail fast, fail often.



Managing Your Project



Example Jira Board



JIRA JIRA Dashboards ▾ Projects ▾ Issues ▾ Boards ▾ Create

Marketing blog
Marketing Team ▾

Kanban board

QUICK FILTERS: Only My Issues Recently Updated

Board ▾ A

10 To Do 4 In Progress 5 Done Release...

MB-1
↑ write blog post
Moonwalk

MB-4
↑ Launch ad campaign
Solar Campaign

MB-2
↑ Publish landing page
Moonwalk

MB-5
↑ Q1 planning
Moonwalk

MB-7
↑ Test homepage
Mars Launch

MB-9
↑ Write presentation for conference
Mars Launch

MB-16
↑ Blog - Write first draft
Mars Launch

MB-17
↑ Mars launch

MB-18
↑ Moonwalk

MB-8
↑ Launch Webinar
Mars Launch

MB-10
↑ Schedule photo shoot
Mars Launch

MB-11
↑ Send newsletter
Solar Campaign

MB-13
↑ Write customer story
Solar Campaign

MB-3
↑ Send email
Mars Launch

MB-6
↑ Publish Press Release
Solar Campaign

MB-12
↑ Publish whitepaper
Solar Campaign

MB-14
↑ Finalize analyst report
Moonwalk

MB-15
↑ launch social media campaign
Moonwalk

Marketing blog / MB-11

Send newsletter

Details

Status: **IN PROGRESS**
(View Workflow)

Priority: **Medium**

Component/s: None

Labels: **blog**

Affects Version/s: None

Fix Version/s: None

Epic Link: **Solar Campaign**

People

Reporter: **Tareq aljaber**
[Administrator]

Assignee: **Cassie Owens**
Assign to me

Dates

Created: Yesterday 3:27 PM

Updated: Today 9:34 AM

Description

Click to add description

Comments

There are no comments yet on this issue.

Comment

Attachments

Example Trello Board

The screenshot shows a Trello board titled "Product Launch" which is a public template. The board is organized into five columns: "Helpful Launch Info", "To Do", "In Progress", "Ready For Launch", and "Launched".

- Helpful Launch Info:** Contains information such as "What Is This?", "Target Product Launch Date: December 1, 2017", "Marketing docs and assets" (1 item), and "Power-Ups For All Launch Timeline" (0/28 items).
- To Do:** Lists tasks like "Fix alignment issue on /pricing", "Power-Up Demos for Sales", "Update assorted references to Power-Ups" (0/5), "Script communications for support", "TypeForm for beta testers", "Power-Ups For All Webinar" (0/5), "In-App final copy review", and "Outreach to 3rd party Power-Ups about Power-Ups for All" (0/4).
- In Progress:** Includes "Gather customer quotes/testimonials", "Illustrations for social, blog, pr" (1 item), "Content audit for outdated language", and "PR outreach".
- Ready For Launch:** Features "Social promotion" (Aug 21), "Video 'commercial'" (Jul 16), "Blog post - Announcement" (Jul 19), "In-App Announcement" (Jul 23), and "Product Hunt" (Jul 29, 5/5).
- Launched:** Contains "Messaging Doc" (Nov 13), "(Internal) Power-Ups FAQ" (Nov 13), "Marketing Training on Power-Ups" (Nov 9), and "Sales Training On Power-Ups" (Nov 14).

The board also includes a "Helpful Launch Info" section on the left and a "Product Hunt" card in the "Ready For Launch" column. The interface shows various navigation and utility icons at the top, including a search bar, a "Create Board from Template" button, and a "Share Template" link.

Example Trello Boards



The Dev Board



The KANBAN
Board



Build a
Barker MVP



35 Example
Trello Boards



Example Microsoft Project Board

The screenshot displays the Microsoft Project Professional interface in 'Task Board' view. The ribbon includes 'File', 'Task', 'Resource', 'Report', 'Project', 'View', 'Help', 'P2O', and 'Format'. The 'View' tab is active, showing options for 'Task Views' (Gantt Chart, Task Board, Network Diagram, Calendar, Other Views) and 'Resource Views' (Resource Usage, Resource Sheet, Team Planner, Other Views). The main workspace is divided into four columns: 'Not Started' (0% complete), 'Next up' (0% complete), 'Quality Assurance' (10% complete), and 'In progress' (50% complete). A 'TASK BOARD' sidebar on the left contains a list of tasks, with 'Determine project scope' selected. A context menu is open over this task, with 'Assign Resources...' highlighted and circled in red, accompanied by a red circle with the number '12'. An 'Assign Resources' dialog box is open on the right, showing a table of resources from Project1. The 'Analyst' resource is selected in the table. The dialog includes buttons for 'Assign', 'Remove', 'Replace...', 'Graph', 'Close', and 'Help'. Below the table, it states: 'Hold down Ctrl and click to select multiple resources'.

Resource Name	R/D	Units	Cost
<input checked="" type="checkbox"/> Analyst		100%	£0.00
<input type="checkbox"/> Deployment Team			
<input type="checkbox"/> Developer			
<input type="checkbox"/> Management			
<input type="checkbox"/> Project Manager			
<input type="checkbox"/> Technical Communicat			
<input type="checkbox"/> Testers			
<input type="checkbox"/> Trainers			

Examples of Good and Bad Tickets

Add authentication

Optimise function to calculate personal tax rate

Compare OAuth VS OneLogin

Implement compliance

Download more RAM

Create Docker container

Start on Logging service

Fix spelling of authentication failure message

Create staging pipeline for the document builder repository

Update website to conform to the new design documentation

Purchase hardware

Deploy backend

Purchase hardware for IoT PoC

Create unit tests for new QR code generator



Examples of Good and Bad Tickets (Continued)

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Optimise function to calculate personal tax rate

Compare OAuth VS OneLogin

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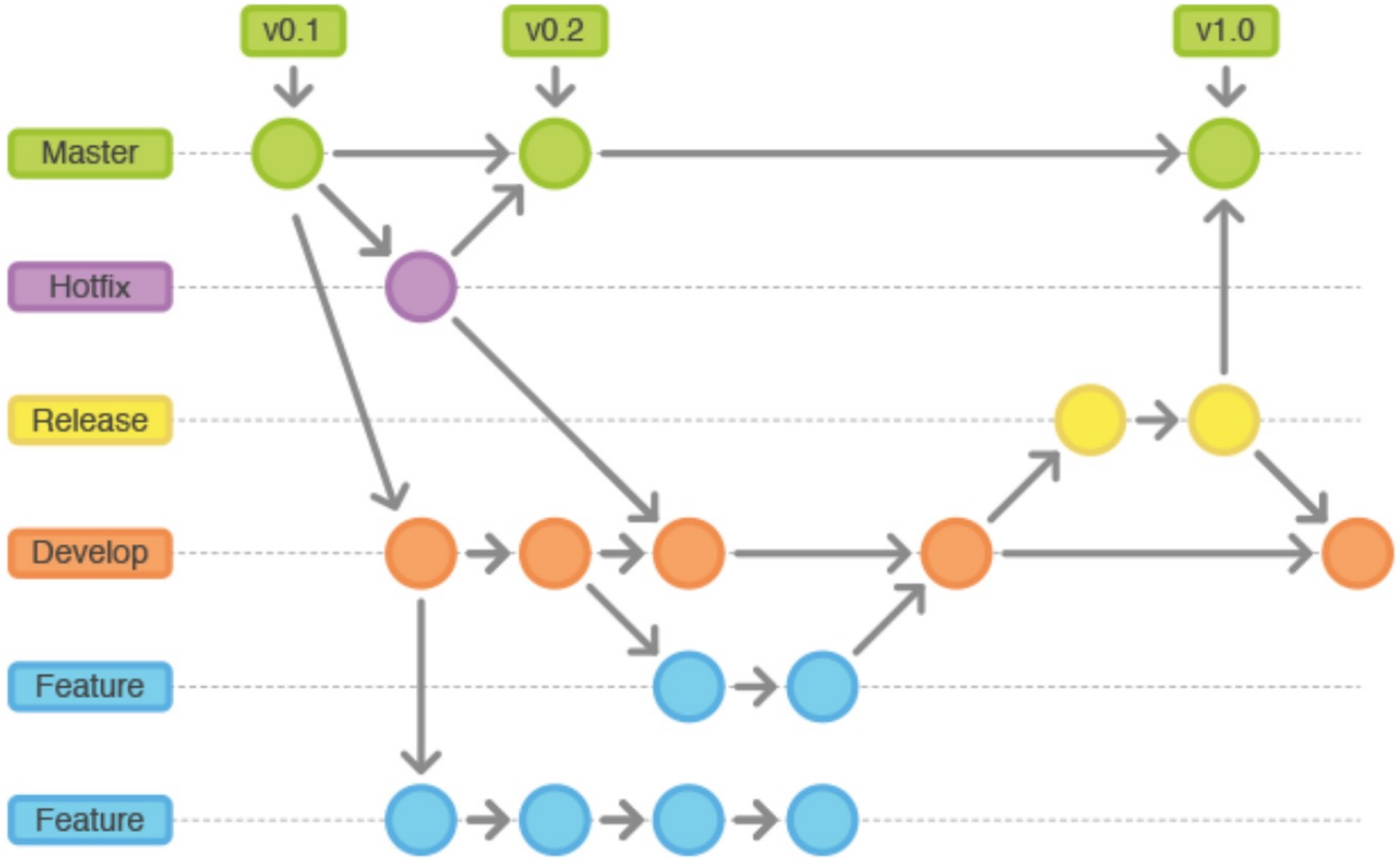
Purchase hardware for IoT PoC

Create unit tests for new QR code generator

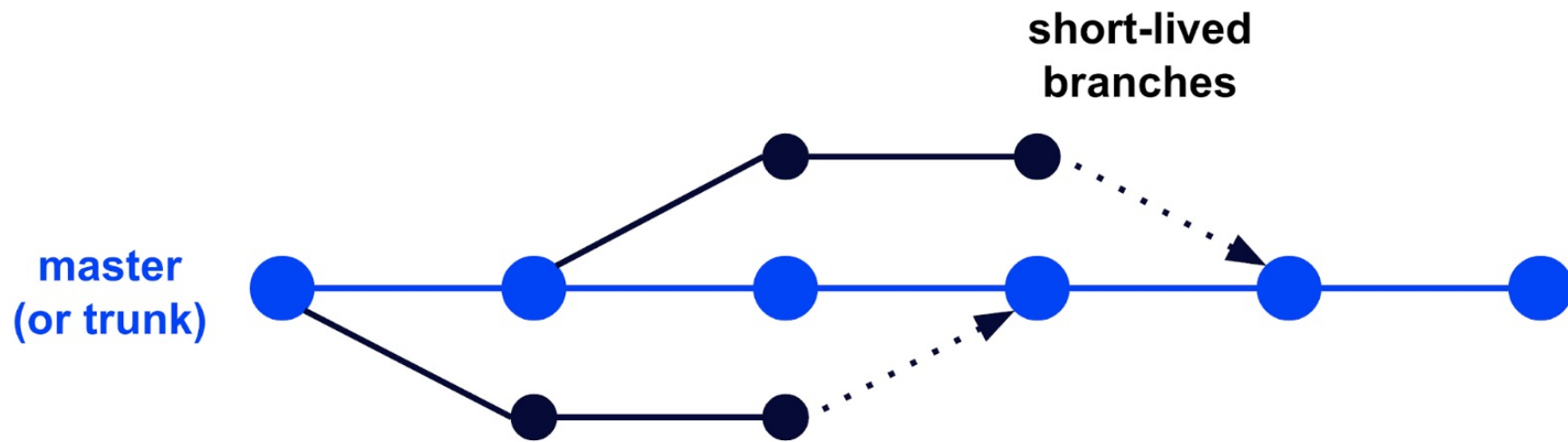
Git with the Flow

- Provides better control over your code.
- Allows you to have a development, staging and production environments.
- Very important to your health and sanity.





🌀 Trunk-based development



..... ➔ **merging is done more frequently and more easily for shorter branches**


Additional Branches

- bugfix/
- documentation/
- experimental/
- emergency/
- security/
- staging/

- You can use whatever you like, but you must all agree on them and their uses.



Examples of Good Branches

- `git checkout -b feature/upload-profile-picture`
 - `git checkout -b feature/containerise-application`
 - `git checkout -b bugfix/json-parsing-issue`
 - `git checkout -b release/codename-alpha`
 - `git checkout -b hotfix/incorrectly-declared-class`
 - `git checkout -b experimental/additional-encryption-ciphers`
 - `git checkout -b refactor/authentication-evaluation`
 - `git checkout -b documentation/pipeline-instructions`
- 

Examples of Good Branches (Continued)

- `git checkout -b feature/ID-1234/add-product-api`
- `git checkout -b feature/ID-5432/list-product-api`

Examples of Bad Branches

- `git checkout -b stuff`
- `git checkout -b stuff2`
- `git checkout -b test`
- `git checkout -b feature/implement-iso-compliance-control-page-10-control-27`

Git Branching References



Git Branching
Naming
Convention
Best Practices



Gitflow
Workflow



GitHub
Branching



GitHub
Branching Best
Practices



Trunk-based
Development VS
Gitflow

Are you ready to Commit?

- Only commit when you are ready!
- You can stash your code if you are not ready to commit.
- Like branches, you can agree on the commit format.



	COMMENT	DATE
○	CREATED MAIN LOOP & TIMING CONTROL	14 HOURS AGO
○	ENABLED CONFIG FILE PARSING	9 HOURS AGO
○	MISC BUGFIXES	5 HOURS AGO
○	CODE ADDITIONS/EDITS	4 HOURS AGO
○	MORE CODE	4 HOURS AGO
○	HERE HAVE CODE	4 HOURS AGO
○	AAAAAAAAA	3 HOURS AGO
○	ADKFJSLKDFJSDKLFJ	3 HOURS AGO
○	MY HANDS ARE TYPING WORDS	2 HOURS AGO
○	HAAAAAAAAAANDS	2 HOURS AGO

AS A PROJECT DRAGS ON, MY GIT COMMIT MESSAGES GET LESS AND LESS INFORMATIVE.

Examples of Good Commits

- `git commit -m "Added tax calculation function"`
- `git commit -m "Added unit tests"`
- `git commit -m "Imported common libraries"`

- `git commit -m "feat: example hello world api endpoint"`
- `git commit -m "feat(1234): added authentication logic to api endpoint"`
- `git commit -m "documentation(5432): added docker build and run commands"`

Examples of Bad Commits

- `git commit -m "added stuff"`

 - `git commit -m "test"`
 - `git commit -m "test"`
 - `git commit -m "test"`

 - `git commit -m "a"`
 - `git commit -m "b"`
 - `git commit -m "c"`
- 

Git Commit References



Amazon Web
Services GitHub
Repositories



Conventional
Commits



Git commit
message
convention



Microsoft GitHub
Repositories



May I Check Your Commit?

- Did you know Git can perform checks before you commit?
- This is known as Git Hooks.
- huksy is a great example:



Found an Issue?

- Just like project planning, you can record issues.
- You can use GitHub issues or the previously mentioned project management tools.
- Please make sure you include as much information as you can!



Git Issues References



My GitHub
Closed Issues



GitHub Issues
Template



GitHub Pull
Request
Template


Pull Requests

- There is no right or wrong way to create pull requests.
- Just like branches and commits, you can make your own pull request templates.
- You can reference commits, issues and close issues when a pull request is merged.
- Make sure you delete your branch once the pull request has been merged!





Bad Pull Request Example

device login and assign #127




 Merged  merged 1 commit into `develop` from `feature/device-login` on 20 May




Conversation 0 Commits 1 Checks 0 Files changed 6




  commented on 20 May 😊 ...

No description provided.

device login and assign 20b8723

   approved these changes on 20 May View changes

   merged commit `e9cac2c` into `develop` on 20 May Revert

   deleted the `feature/device-login` branch 2 months ago Restore branch

Good Pull Request Example

Feature/ssl connector #9

Merged [redacted] merged 8 commits into main from feature/ssl-connector 6 days ago

Conversation 0 Commits 8 Checks 0 Files changed 8

[redacted] commented 6 days ago • edited

This PR includes the following changes:

- Updated the Node.JS code so that the connection to the Amazon Aurora RDS database is encrypted using SSL / TLS.
- Added additional references to the REFERENCES.md file.

Closes: #8

- [redacted] added 8 commits 6 days ago
- Added new references 8c6ae5b
 - Added RDS certificate note 727cd91
 - Ignore certificates 2af1619
 - Create database SSL c67a28a
 - Create table SSL ec737f9
 - Add sample data SSL a4237dd
 - Select all data SSL 33ca7e1
 - Get records count SSL 48fbdcl

[redacted] self-assigned this 6 days ago

[redacted] merged commit 753436a into main 6 days ago Revert

[redacted] deleted the feature/ssl-connector branch 6 days ago Restore branch

Pull Request Controls

Review required [Show all reviewers](#)
At least 1 approving review is required by reviewers with write access. [Learn more.](#)

1 pending reviewer

Some checks were not successful [Hide all checks](#)
1 failing and 3 successful checks

- Python Pull Request Check / pylint (pull_request)** Failing after 31s — pylint [Details](#)
- Node.js Pull Request Check / Linting (pull_request)** Successful in 1m [Details](#)
- Node.js Pull Request Check / Prettier (pull_request)** Successful in 16s [Details](#)
- Node.js Pull Request Check / Build on ubuntu-18.04 x86_64 (16.x) (pull_request)** Successful in 1m [Details](#)

Merging is blocked
Merging can be performed automatically with 1 approving review.

Merge without waiting for requirements to be met (bypass branch protections)

Squash and merge [You can also open this in GitHub Desktop or view command line instructions.](#)

All checks have passed [Hide all checks](#)
2 successful checks

- Run Python PEP8 Linting / Linting (push)** Successful in 13s [Details](#)
- Run pytest Unit Tests / Unit-Tests (pull_request)** Successful in 12s [Details](#)

This branch has no conflicts with the base branch
Merging can be performed automatically.

Squash and merge [or view command line instructions.](#)

Pull Requests Courtesy

- Pull requests are opportunities for you to learn and grow as a developer.
- It is not a blame game or “my code is better than yours”.
- Call out anything that is clearly bad.
- Be open to improvements.

Me: "Hey can you review my pull request ?"

Them: "Sure"

Me:



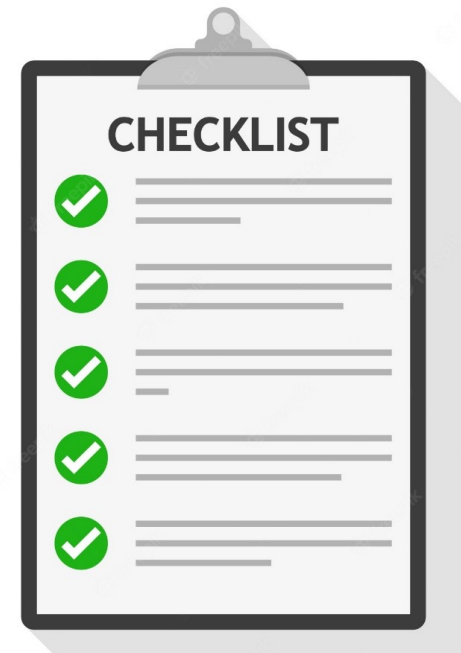
Resolving Merge Conflicts

- Talk to your fellow developers!
- Refrain from “I know what I’m doing, I don’t need to ask for help”.
- If you make small changes and merge often, you can avoid this.
- Don’t make too many different changes in your branches.



Your Pull Request Process

- What checks (if any) will you include in pull requests?
- Do all pull requests need to be reviewed or by the branch type?
- What if a developer is not familiar with a particular language? What happens to approvals?
- Are you allowed to self merge a documentation only pull request?
- Is there a process if you need to merge a pull request immediately?











DevSecOps Tips and Tricks

Dependabot alerts

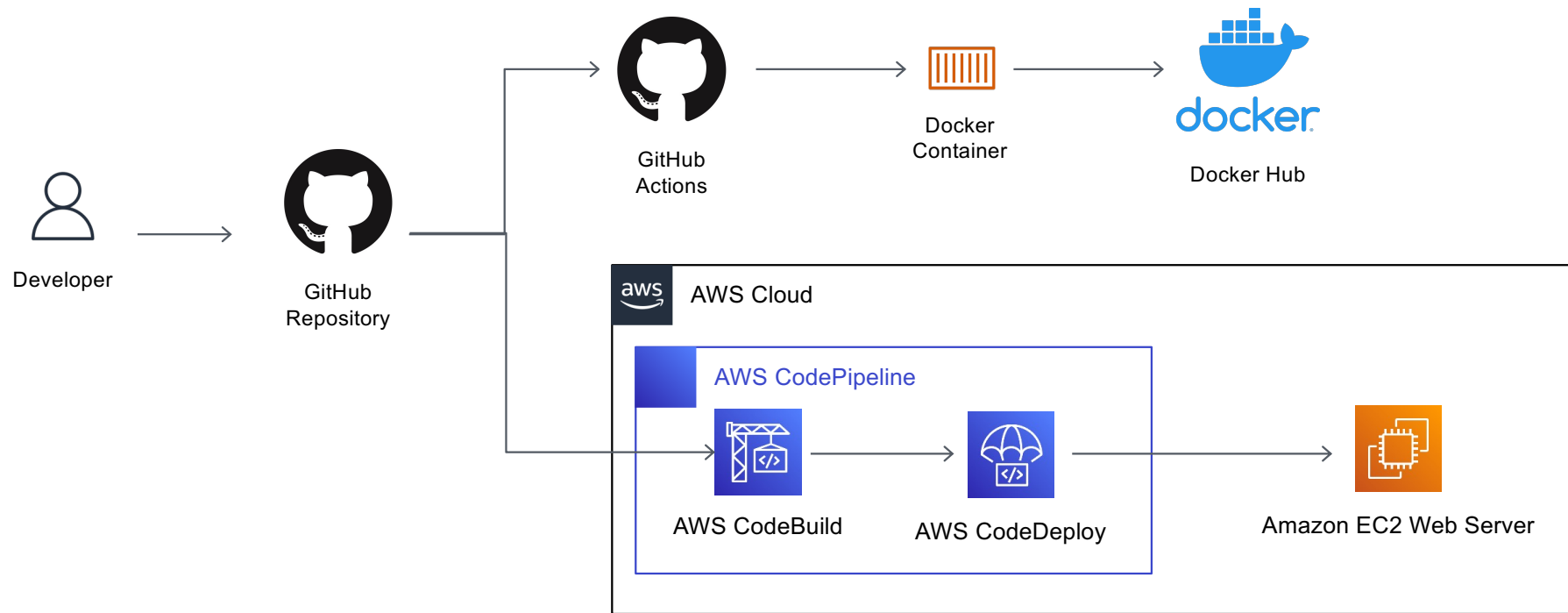
Dismiss all ▾

is:open package:com.thoughtworks.xstream:xstream manifest:webgoat-lessons/vulnerable-components/pom.xml

✕ Clear current search query, filters, and sorts

33 Open ✓ 0 Closed	Package ▾	Ecosystem ▾	Manifest ▾	Sort ▾
 Denial of Service by injecting highly recursive collections or maps in XStream High				 #16
com.thoughtworks.xstream:xstream (Maven) · webgoat-lessons/vulnerable-components/pom.xml · #128 opened 6 days ago				
 XStream is vulnerable to an Arbitrary Code Execution attack High				 #16
com.thoughtworks.xstream:xstream (Maven) · webgoat-lessons/vulnerable-components/pom.xml · #127 opened 6 days ago				
 XStream is vulnerable to an Arbitrary Code Execution attack High				 #16
com.thoughtworks.xstream:xstream (Maven) · webgoat-lessons/vulnerable-components/pom.xml · #126 opened 6 days ago				
 A Server Side Request Forgery Request can be initiated unmarshalling with XStream to access data streams from an				 #16

Demonstration Overview



Demonstration Time

STAND BACK



**I'M GOING TO TRY
SCIENCE**



Final References



Docker Hub
Repository



GitHub
Repository



Questions?

