NYU COURANT INSTITUTE OF MATHEMATICAL SCIENCES

Agile Development and Planning

Fall 2020, CSCI-GA 2820, Graduate Division, Computer Science

Instructor:

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Objectives

The objectives of this class are to:

- Gain a good overview Agile Development and ZenHub
- How to plan using a Kanban Board and Backlogs
- How to use Epics, Stories, Story Points
- How to create Milestones and use Burndown Charts

“I love deadlines. I like the whooshing sound they make as they fly by.”

–Douglas Adams

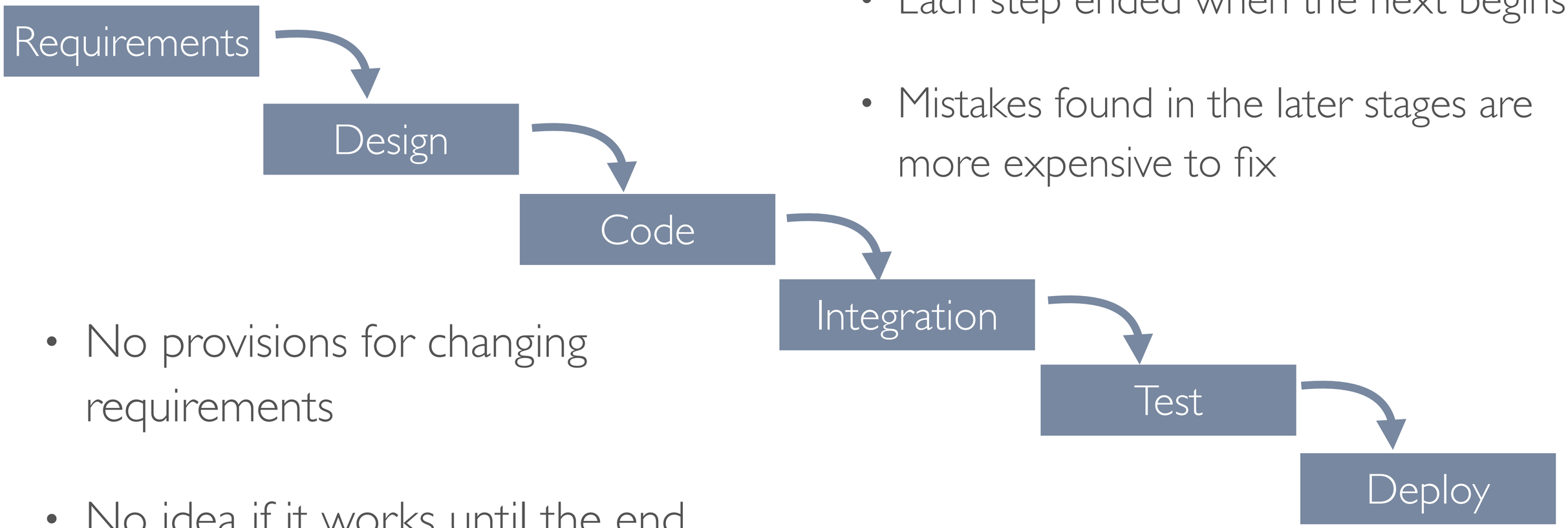
How do you avoid this?

“Don’t decide everything at the point that you know the least”

Navigating the Unknown

- It would be difficult, if not impossible, to plot a course to the other side of these penguins by this vantage point
  - btw, the penguins will move as you do
- But we can start the journey with what we do know, and as we move forward, the course will reveal itself from our more advanced vantage point
- Developing software is no different

Traditional Waterfall Development

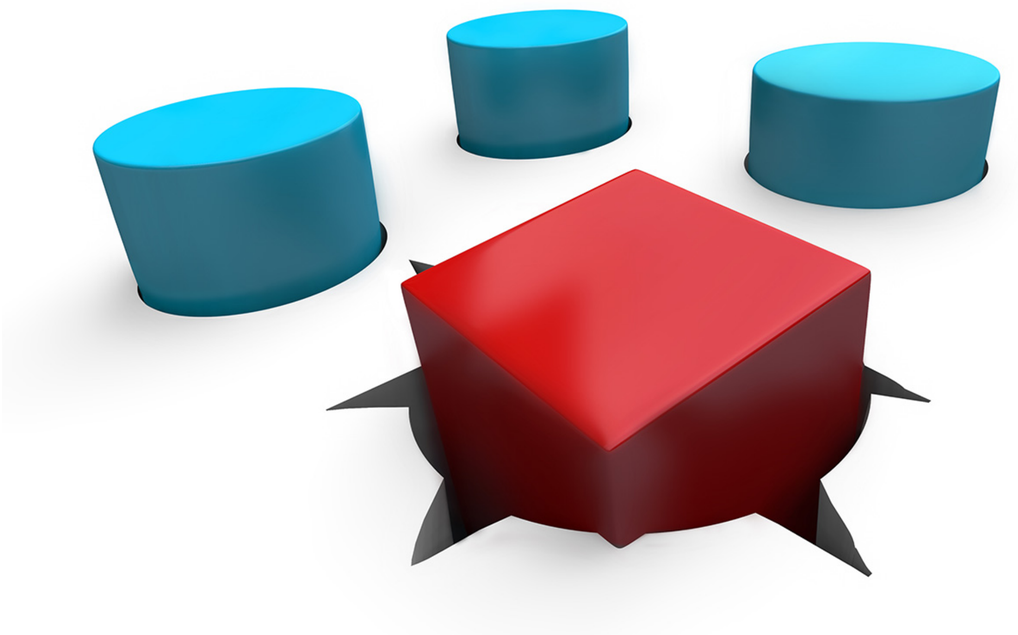


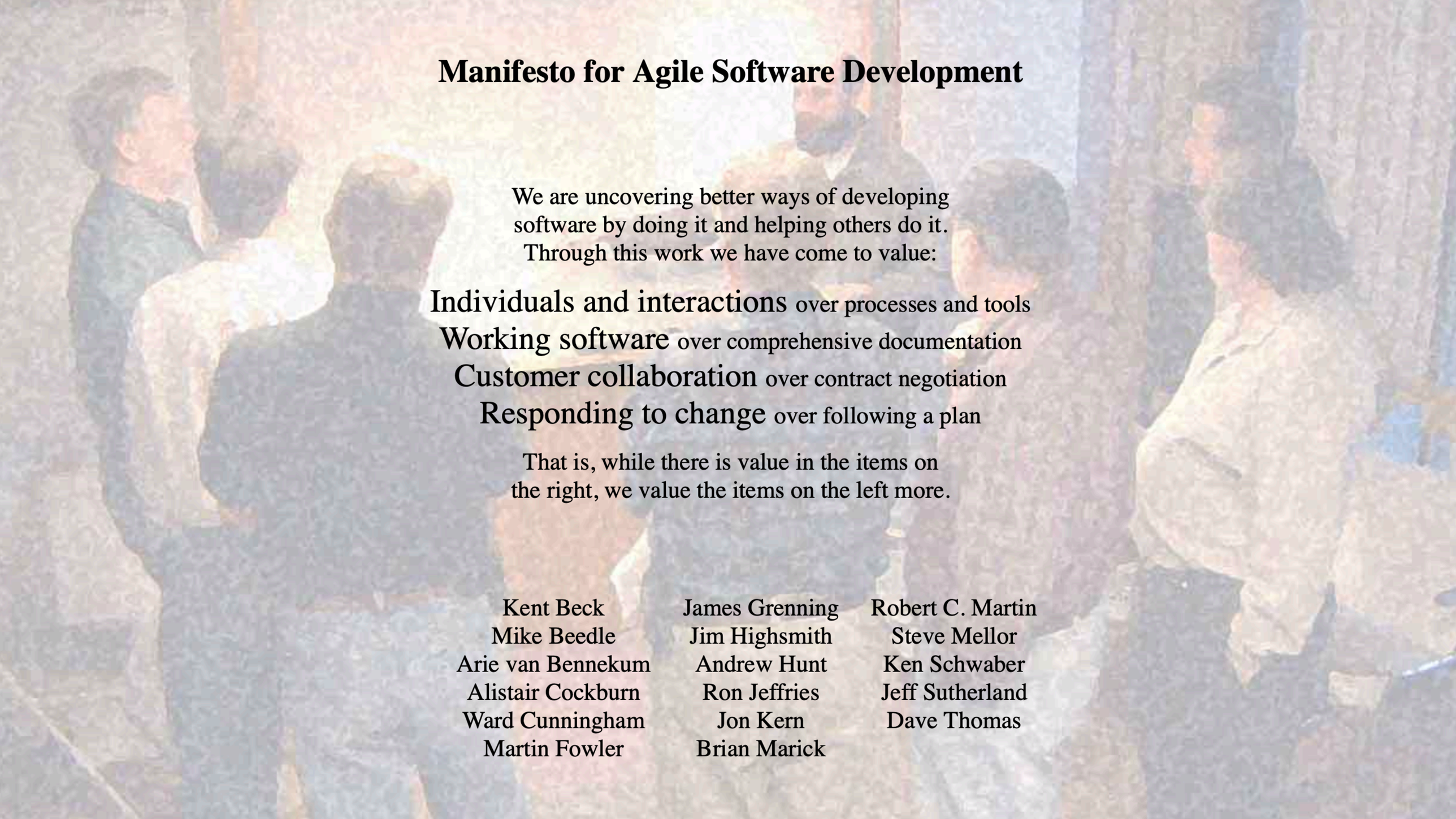
- Each step ended when the next begins
- Mistakes found in the later stages are more expensive to fix

- No provisions for changing requirements
- No idea if it works until the end

Problems with this approach?

- There was usually a long time between software releases
- Because all of the teams worked separately, the development team was not always aware of operational roadblocks that might prevent the program from working as anticipated
- The people the furthest from the code who knew the least about it were deploying it into production





Manifesto for Agile Software Development

We are uncovering better ways of developing
software by doing it and helping others do it.
Through this work we have come to value:

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

That is, while there is value in the items on
the right, we value the items on the left more.

Kent Beck
Mike Beedle
Arie van Bennekum
Alistair Cockburn
Ward Cunningham
Martin Fowler
James Grenning
Jim Highsmith
Andrew Hunt
Ron Jeffries
Jon Kern
Brian Marick
Robert C. Martin
Steve Mellor
Ken Schwaber
Jeff Sutherland
Dave Thomas

12 Principles Behind the Agile Manifesto

1. Our highest priority is to satisfy the customer through early and **continuous delivery** of valuable software.
2. **Welcome changing requirements**, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the **shorter timescale**.
4. Business people and developers must **work together** daily throughout the project.
5. Build projects around **motivated individuals**. Give them the environment and support they need, and **trust** them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is **face-to-face** conversation.
7. **Working software** is the primary measure of progress.
8. Agile processes promote **sustainable development**. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
9. Continuous attention to **technical excellence** and good design enhances agility.
10. **Simplicity**--the art of maximizing the amount of work not done--is essential.
11. The best architectures, requirements, and designs emerge from **self-organizing teams**.
12. At regular intervals, the **team reflects** on how to become more effective, then **tunes and adjusts** its behavior accordingly.

As Scott Ambler elucidated...

- **Tools and processes are important**, but it is more important to have **competent people working together** effectively.
- **Good documentation is useful** in helping people to understand how the software is built and how to use it, but **the main point of development is to create software**, not documentation.
- **A contract is important** but is no substitute for working closely with customers to **discover what they need**.
- **A project plan is important**, but it must not be too rigid to **accommodate changes** in technology or the environment, stakeholders' priorities, and people's understanding of the problem and its solution.

https://en.wikipedia.org/wiki/Agile_software_development#The_Manifesto_for_Agile_Software_Development

What Agile is not...

- Agile is not a new version of a waterfall SDLC, where you do legacy development in sprints
- Agile is not just the development team in each sprint, like you do in waterfall development.
- The Agile Manifesto does not include the term “agile project management” (and so there are no "project managers" in Agile)

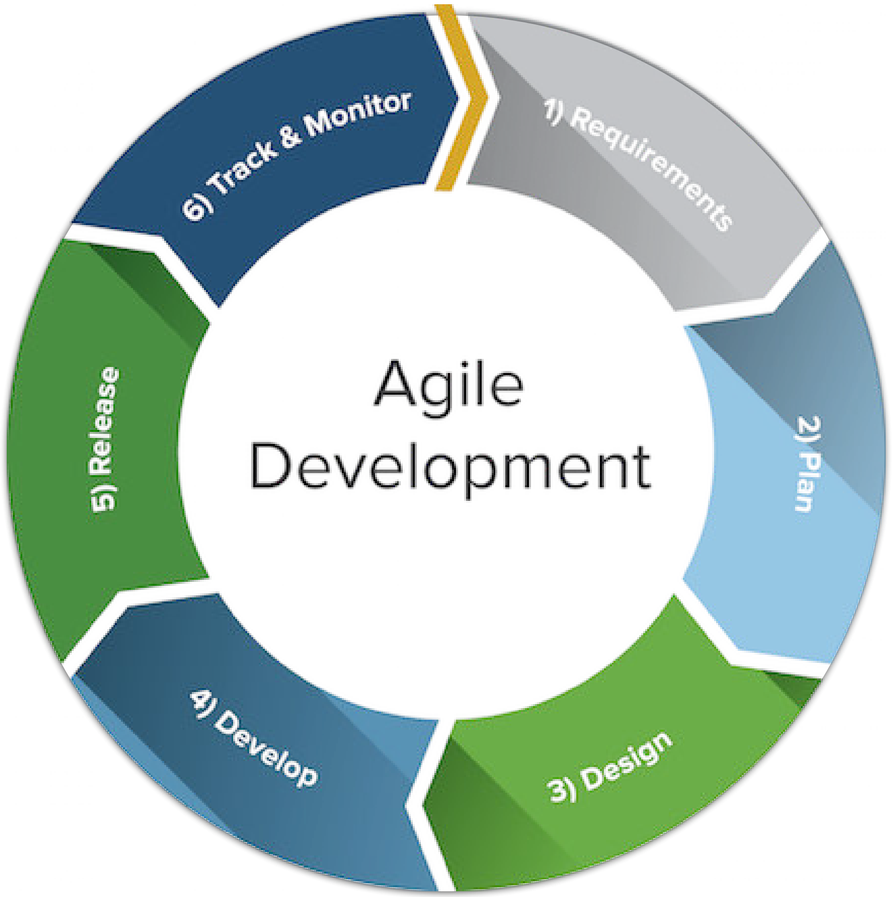
https://enterprisersproject.com/article/2019/9/agile-project-management-dark-side

“Build what ***is*** needed, not what ***was*** planned.”

–Agile Methodology

Agile Development

- Requirements and solutions evolve through the collaborative effort of **self-organizing** and **cross-functional** teams and their customers
- It advocates **adaptive planning**, evolutionary development, early delivery, and **continual improvement**
- It encourages rapid and flexible **response to change**



Agile and Scrum

Scrum is the most popular Agile development framework

Agile and Scrum

- **Agile** is a PHILOSOPHY for doing work
  - Not prescriptive
- **Scrum** is a METHODOLOGY for doing work
  - That adds PROCESS to Agile thinking

Scrum

Easy to understand — Difficult to master

- A management framework for incremental product development using one or more small cross-functional, self-organizing teams
- Provides a structure of roles, meetings, rules, and artifacts
- Uses fixed-length iterations, called Sprints, which are typically two weeks long
  - Scrum teams attempt to build a potentially shippable (properly tested) product increment every iteration

Ingredients of Scrum

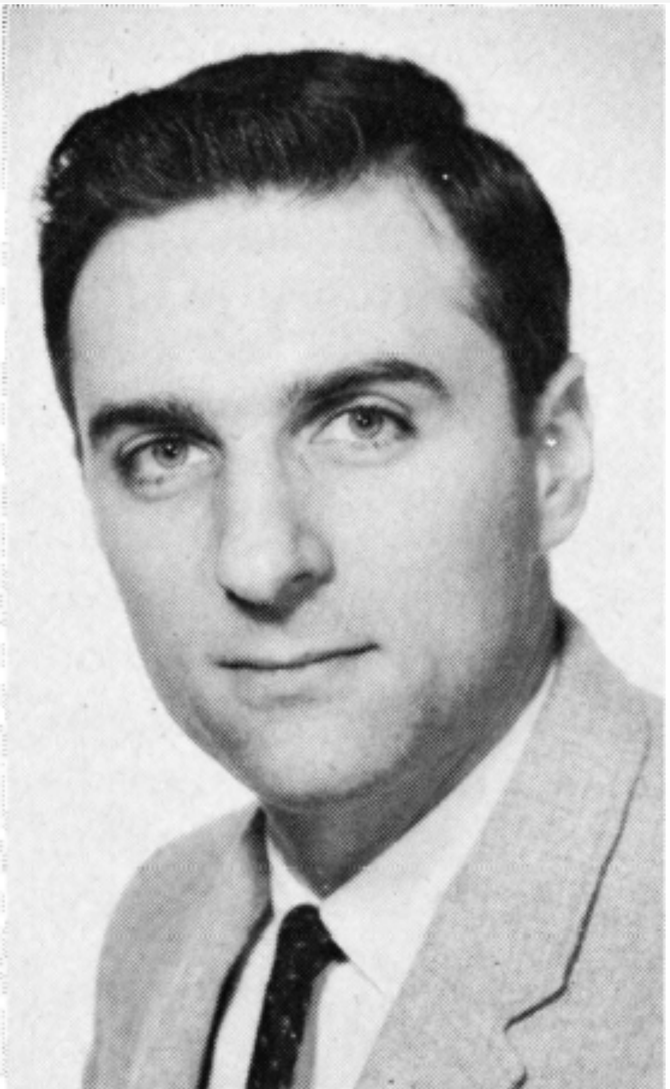
- Roles
  - Product Owner + Development Team + Scrum Master
- Artifacts
  - Product Backlog + Sprint Backlog + Done Increment
- Events
  - Sprint Planning + Daily Scrum + Sprint Review + Sprint Retrospective + Sprint

Benefits of Scrum

- Organizations that have adopted agile Scrum have experienced:
  - Higher productivity
  - Better-quality products
  - Reduced time to market
  - Improved stakeholder satisfaction
  - Better team dynamics
  - Happier employees

Proper Organization is Critical to Success !!!

Conway’s Law



Any organization that designs a system (defined broadly) will produce a design whose structure is a copy of the organization's communication structure

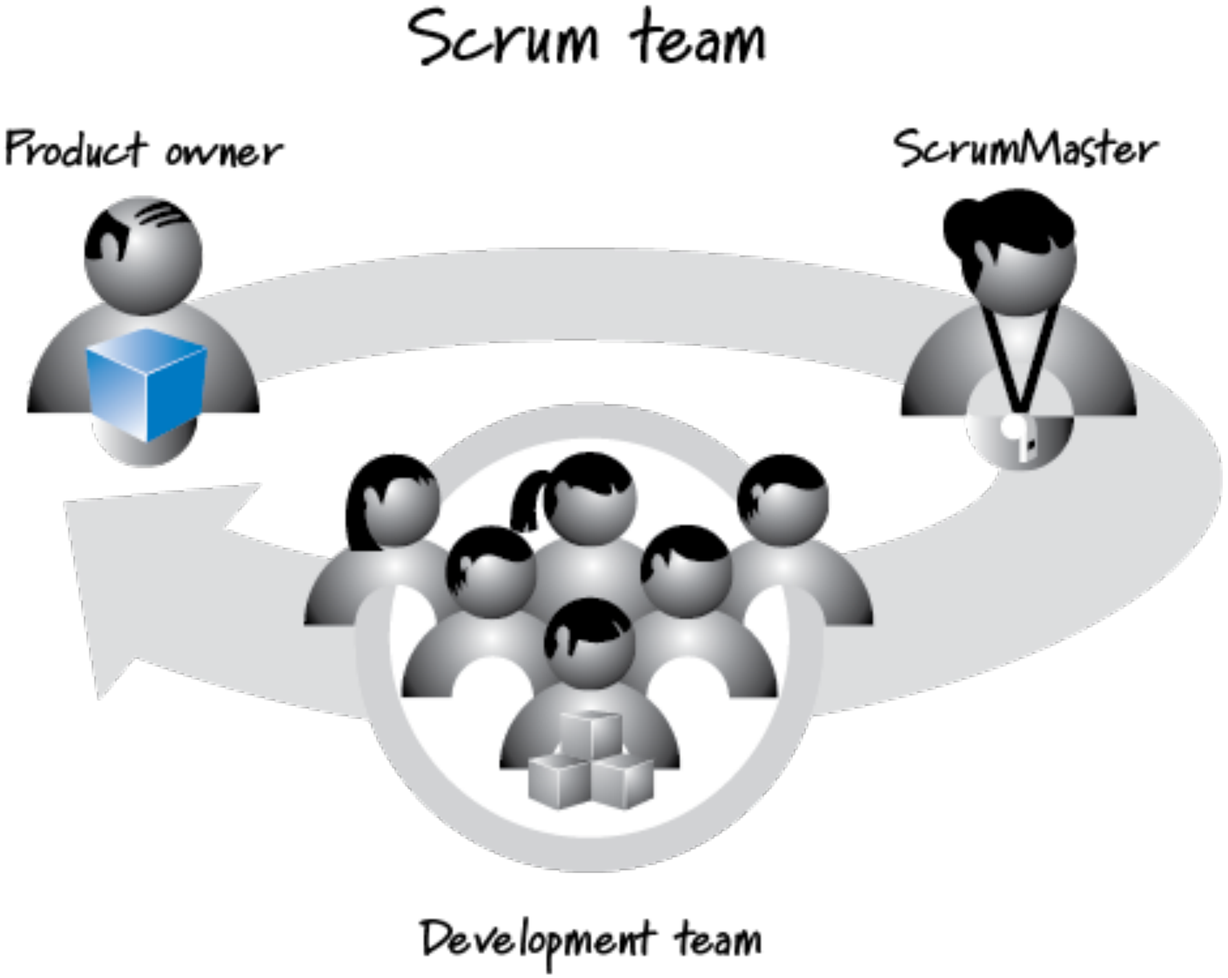
- Melvin Conway, Datamation, 1968

e.g., if you ask an organization with 4 teams to write a compiler... you will get a 4-pass compiler!

http://www.melconway.com/Home/Conways_Law.html

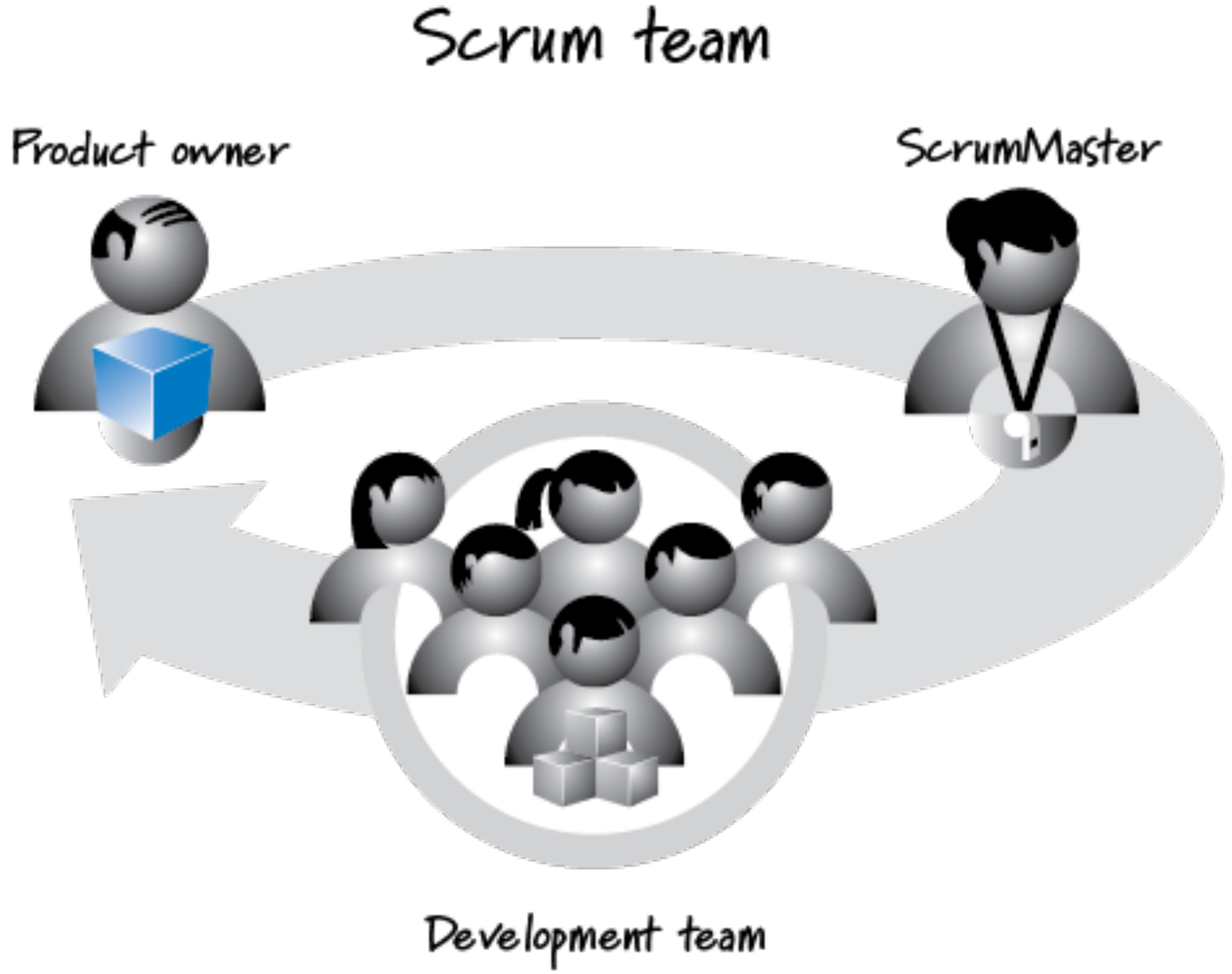
Organization of Scrum Teams

- Small team (7 +/- 2)
- Dedicated
- Co-located
- Cross-functional
- Self managing



Scrum Roles

- Product Owner
- Scrum Master
- Development Team



Product Owner

- Represents the stakeholder interests
- Responsible for product vision
- Final arbiter of requirements questions
- Constantly re-prioritizes the Product Backlog, adjusting any expectations such as release plans
- Accepts or rejects each product increment
- Decides whether to ship
- Decides whether to continue development
- May contribute as a team member

Scrum Master

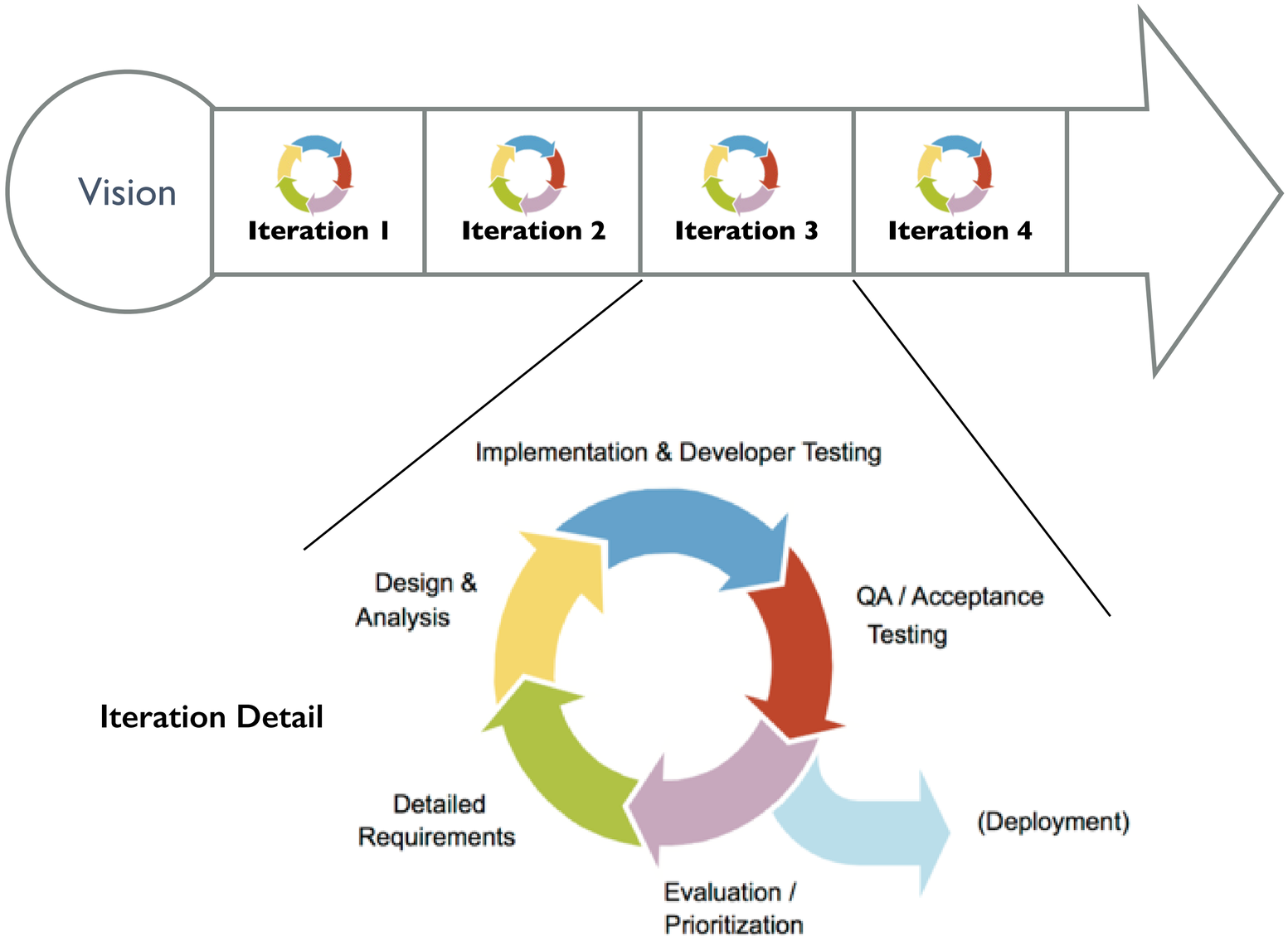
(Agile Coach)

- Facilitates the Scrum process
- Creates an environment conducive to team self-organization
- Shields the team from external interference and distractions to keep it "in the zone"
- Helps resolve impediments
- Enforces Sprint timeboxes
- Captures empirical data to adjust forecasts
- Has no management authority over the team (anyone with authority over the team is by definition not its ScrumMaster)

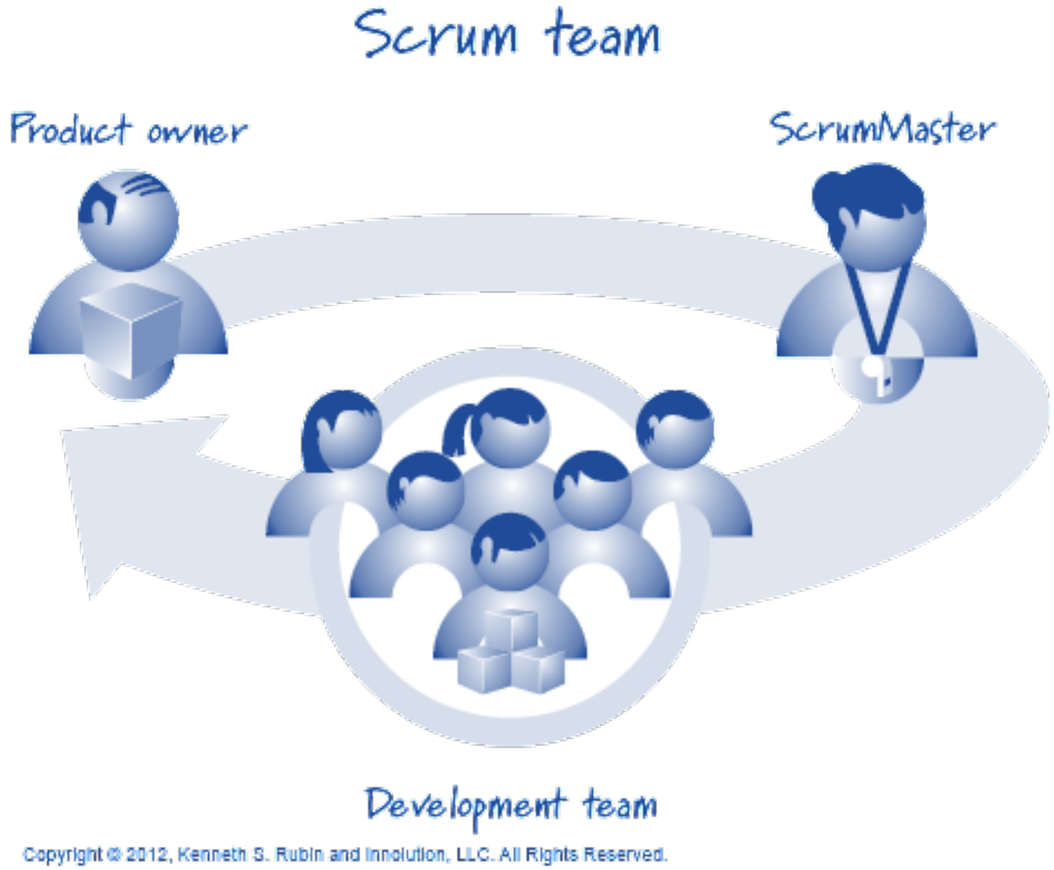
Scrum Team

- Cross-functional (e.g., includes members with testing skills, and often others not traditionally called developers: business analysts, domain experts, etc.)
- Self-organizing / self-managing, without externally assigned roles
- Consists of 5 ± 2 dedicated co-located collaborative members
  - Most successful when located in one team room, particularly for the first few Sprints
  - Most successful with long-term, full-time membership. Scrum moves work to a flexible learning team and avoids moving people or splitting them between teams.
- Negotiates commitments with the Product Owner — one Sprint at a time
- Has autonomy regarding how to reach commitments

Agile Development Is Iterative



How Agile are your teams?



- ☑ Small team (5 +/- 2)
- ☑ Dedicated
- ☑ Co-located
- ☑ Cross-functional
- ☑ Self managing

Scrum Health Check

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- ✓ The accountabilities of Product Owner, Development Team(s) and Scrum Master are identified and enacted?

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✓ Work is organized in consecutive Sprints of 4 weeks or less?

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- √ The accountabilities of Product Owner, Development Team(s) and Scrum Master are identified and enacted?
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- √ There is an ordered Product Backlog?

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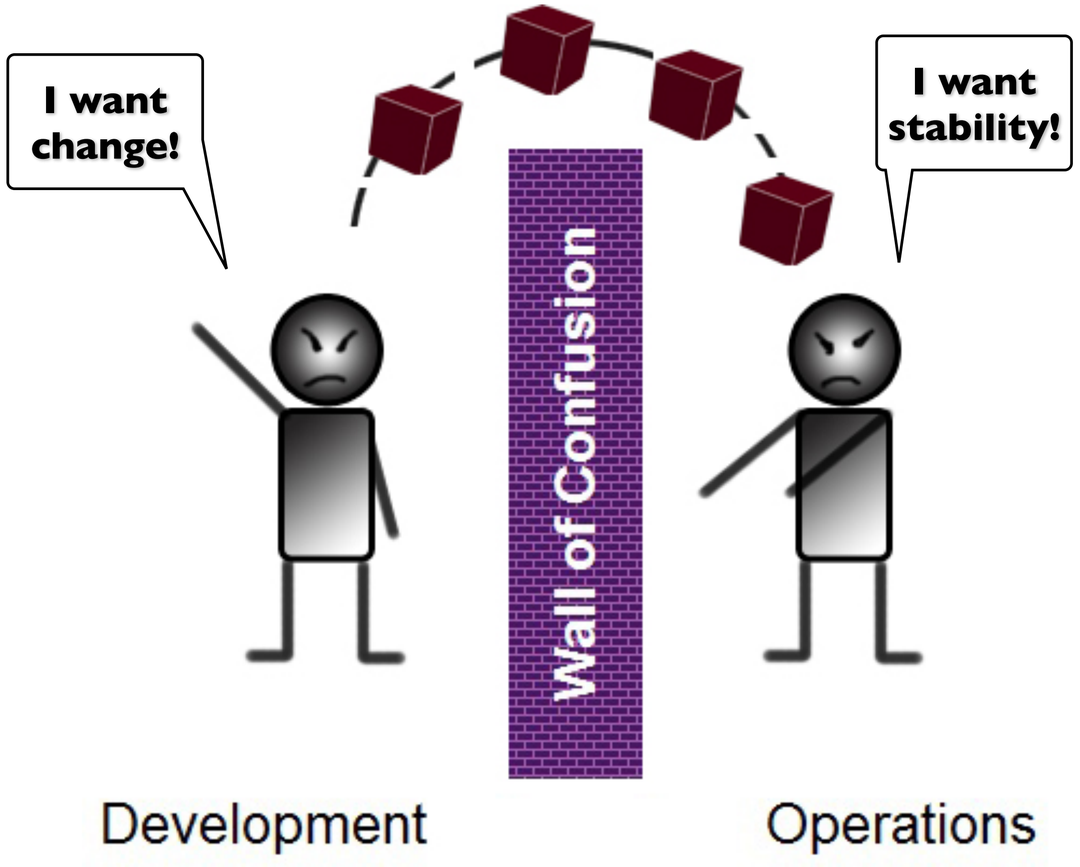
- √ Product Backlog is updated as a result of the Sprint Review?
- √ Product Owner, Development Team(s) and Scrum Master align on the work process for their next Sprint at the Sprint Retrospective?

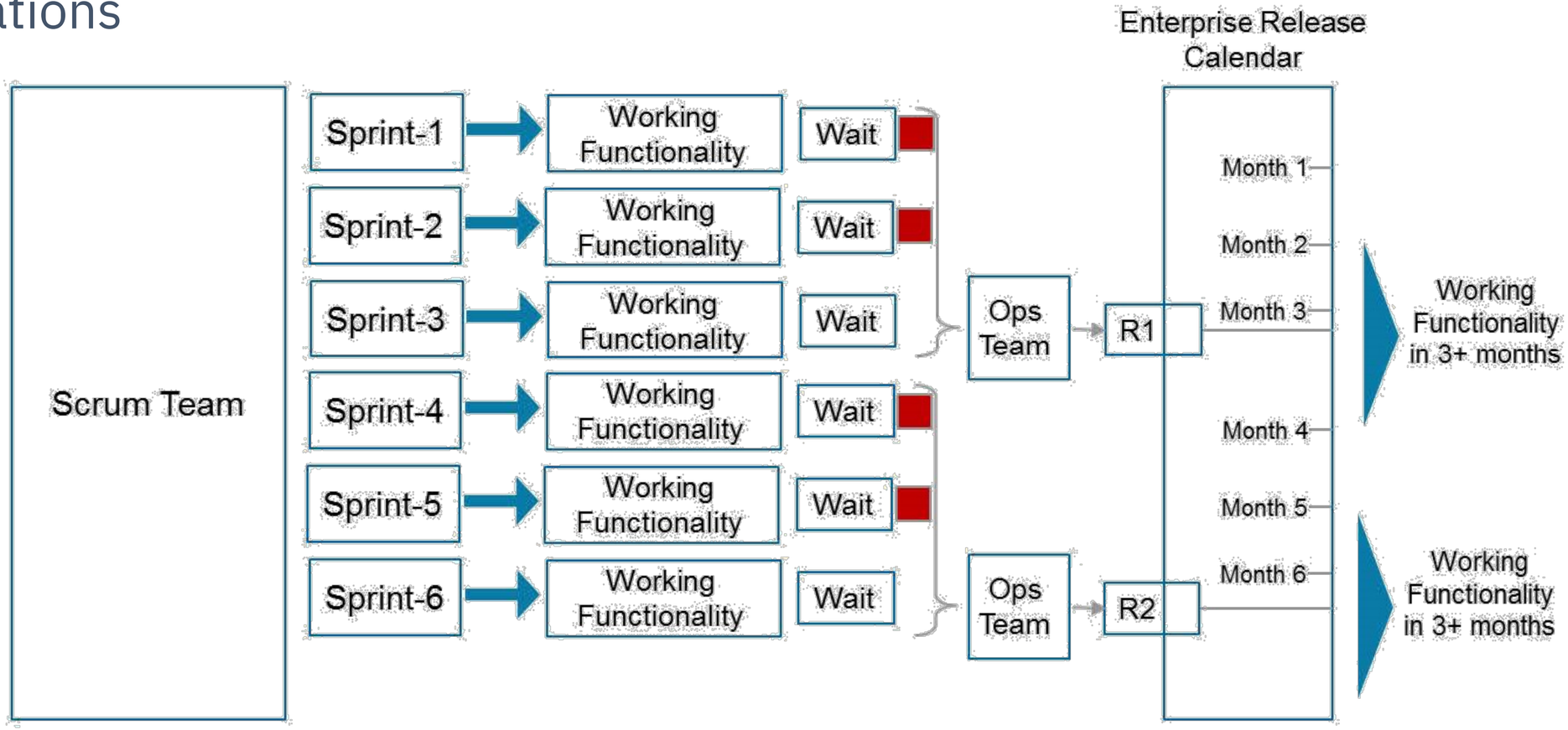
The Agile Dilemma

- While Agile improved the speed and accuracy of software for developers
- It did nothing for operations
- Many development teams just got frustrated by ops not being able to deliver at the speed of development



Why isn’t Agile alone good enough?

- While Agile improved the speed and accuracy of software for developers, it did nothing for operations

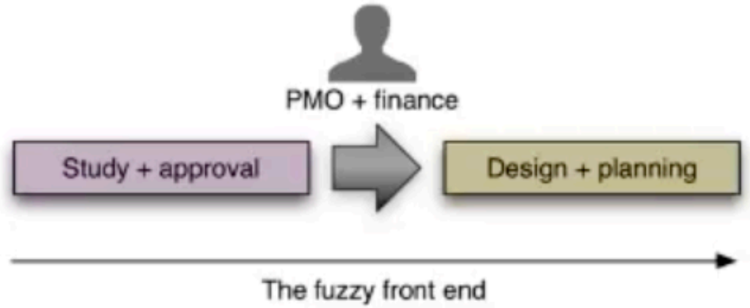


https://www.scrumalliance.org/community/articles/2014/april/devops-and-agile

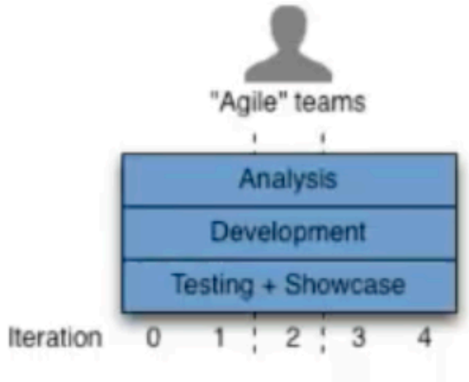
Dysfunctional Agile Org

a.k.a Water-Scrum-Fall

Organizations that wants to change without actually changing anything!



water



scrum

fall

Goal of Agile and DevOps are Aligned

The Goal of Agile

- Develop software faster
- Be responsive to changes
- Obtain higher quality results

The Goals of DevOps

- Accelerate time to market
- Improve IT’s value by more closely aligning development, IT operations, and the business
- Increase IT productivity

Agile Antipatterns

- Lack of real Product Owner
- If your teams are too large
- If your teams and not dedicated
- If your teams are geographically distributed
- If you teams siloed
- If your teams are not self managing

YOU WILL FAIL!!!

...and you should not wonder why

Why does disfunction happen?

Formulas for Failure

Does your DevOps Transformation look like this?

Product Manager = Product Owner

Project Manager = Scrum Master

Developers = Scrum Team

Comparing Traditional and DevOps/Agile Roles

Role	Traditional IT	Role	Agile IT
Product Manager	Business person who manages the budget and doesn't really need to be technical	**Product Owner**	Visionary that leads the team in a series of experiments design to achieve the goal. Conduit between the stakeholders and the team translating between business and technical goals.
Project Manager	Task Master that keeps everyone marching to a fixed plan. Documents impediments as project risks	**Scrum Master**	Coach that keeps the team focused on the current sprint and eliminating impediments while buffering team from interruptions
Development Team	Made up of developers only	**Scrum team**	Cross-functional team consisting of developers, testers, security, business analysts, operations, etc.

“Until and unless business leaders accept the idea that they are no longer managing projects with fixed functions, timeframes, and costs, as they did with waterfall, they will struggle to use agile as it was designed to be used.”

–Bob Kantor, Founder Kantor Consulting Group, Inc.

“DevOps is Agile applied beyond the development team”

Agile Tenets

Agile takes ideas from Lean Manufacturing and Extreme Programming (XP)

- Working in Small Batches
- Creating Minimum Viable Products (MVP)
- Using Behavior Driven Design (BDD) to make sure that you are building the *right thing*
- Practicing Test Driven Development (TDD) to make sure that you are building the *thing right*
- Pair Programming to improve code quality and knowledge saturation

Think Working in Small Batches

- Imagine you need to mail 10 brochures to customers, by going through the following stages:
  - Step 1: Fold 10 brochures
  - Step 2: Insert them into envelopes
  - Step 3: Seal the envelopes
  - Step 4: Stamp the envelopes

Delivering 5 Brochures

Assume each step takes 1 minute to complete

Batch of 5 Brochures

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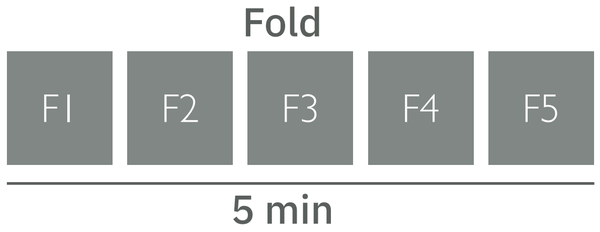

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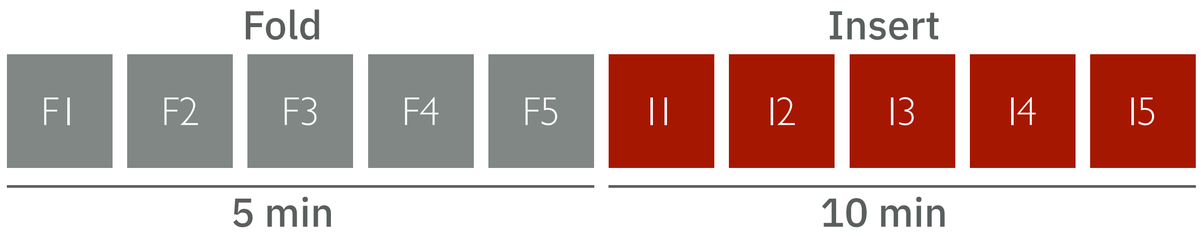

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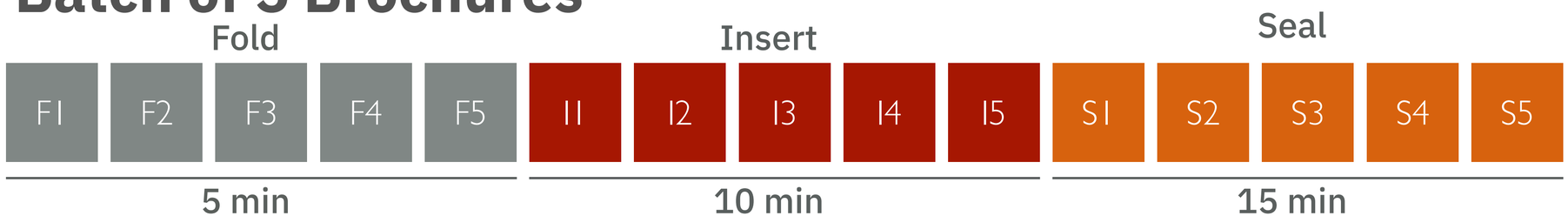

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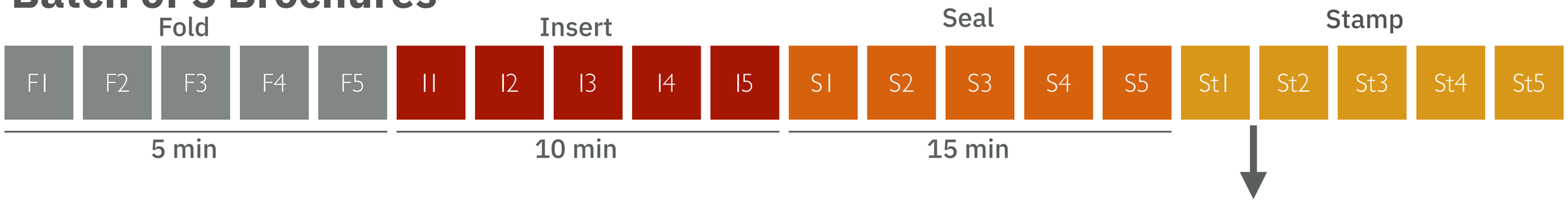

Single Piece Flow

Delivering 5 Brochures

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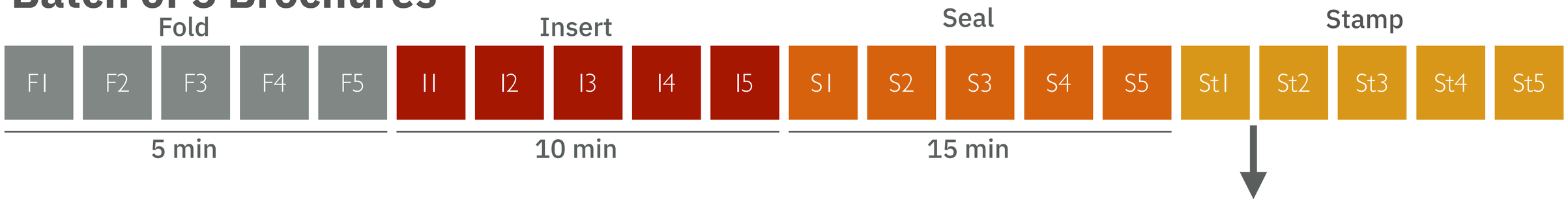

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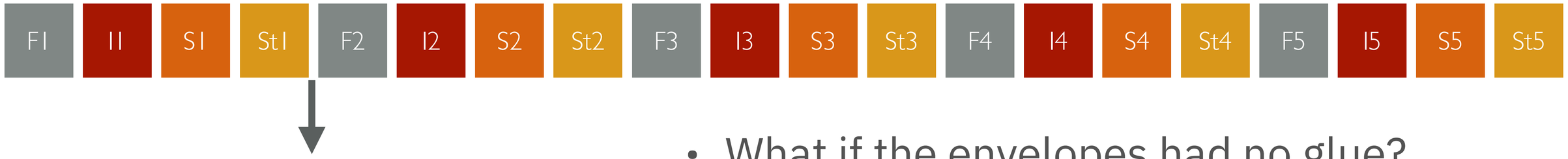
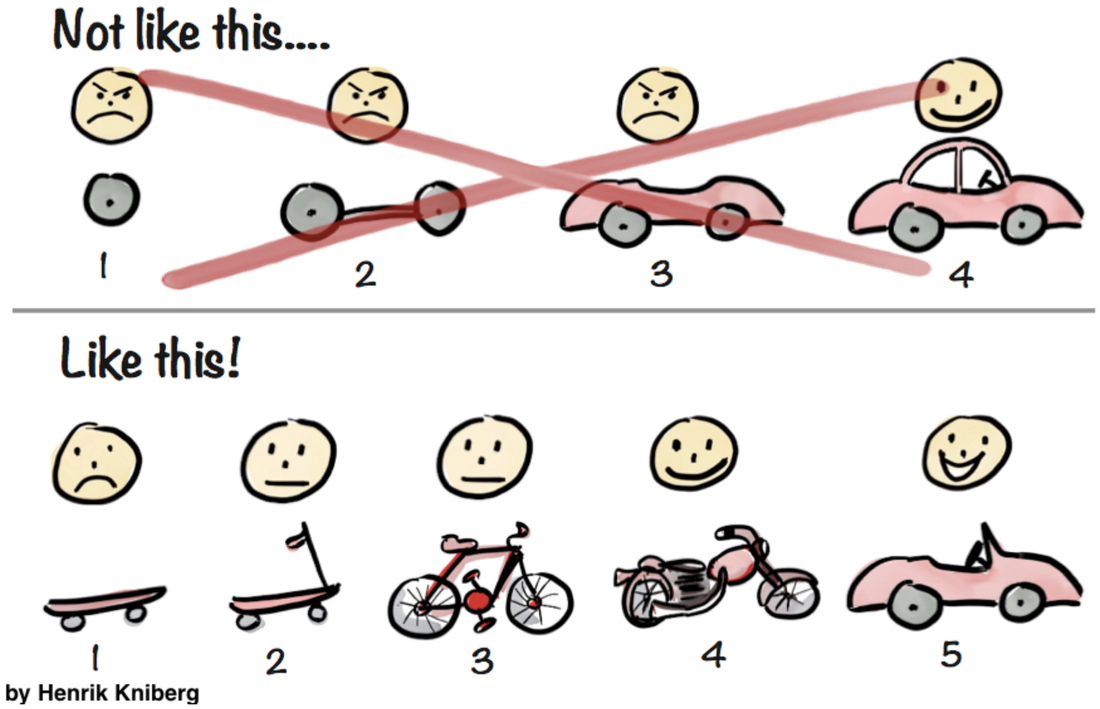


- What if the envelopes had no glue?
- What of there were a typo in the brochure?

Minimum Viable Product

- MVP is NOT the result of "Phase 1" of a project
- It IS the cheapest/easiest thing you can build to start testing your value hypothesis and learning
- The former focuses on delivery, while the latter focuses on learning



What is Agile Development?

- Agile is an *iterative* approach to software development consistent with the **Agile Manifesto**
- Emphasizing flexibility, interactivity, and a high level of transparency
- Using small, co-located, cross-functional, self-organizing teams.

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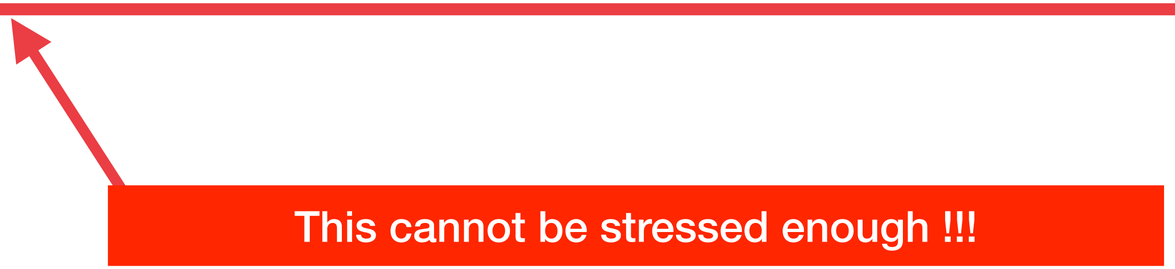


Spotify Engineering Culture

(Agile Enterprise Transition with Scrum and Kanban)

Spotify Engineering Culture

https://www.youtube.com/watch?v=R2o-Xm3UVjs

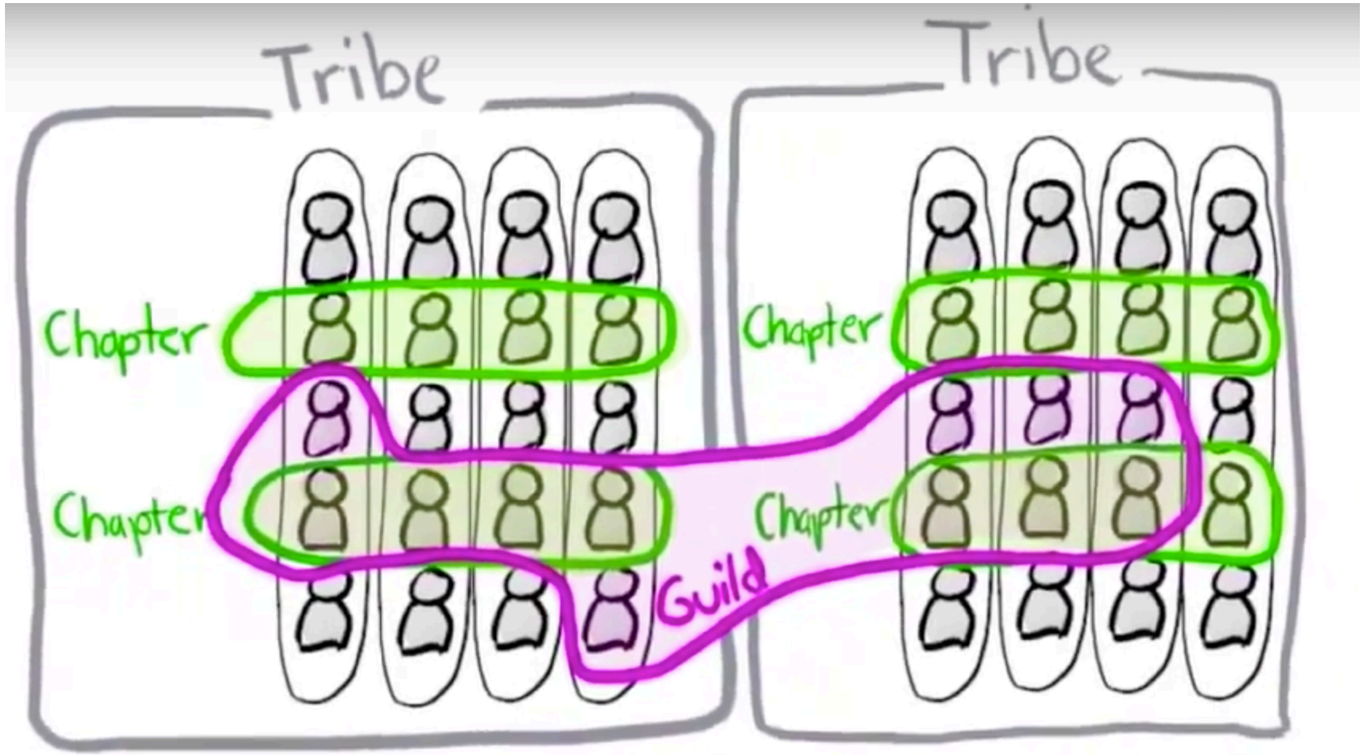
Spotify® Engineering Culture

Rules are a good start, then break them when needed

Agile > Scrum
Principles > Practices
Servant Leaders > Process Master
Community > Structure
Enable > Serve
Trust > Control
Failure Recovery > Failure Avoidance
Impact > Velocity
Innovation > Predictability
Value Delivery > Plan Fulfillment
Chaos > Bureaucracy

Spotify® Organizational Structure

- **Squads** are grouped into Tribes (light-weight matrix)
- **Chapters** of competency areas are formed across Squads
- **Guilds** are informal light-weight community of interests across the company



Spotify® Autonomous Squads

Loosely coupled, Tightly aligned squads

- Each Squad has it’s own mission aligned with the business
  - Feels like a "mini-startup"
  - Self Organizing / Cross-functional
  - 5-7 engineers, less than 10
- Squads have end-to-end responsibility for what they build
  - Build, commit, deploy, maintenance, operations, EVERYTHING!!!
  - With a long term mission usually around a single business domain

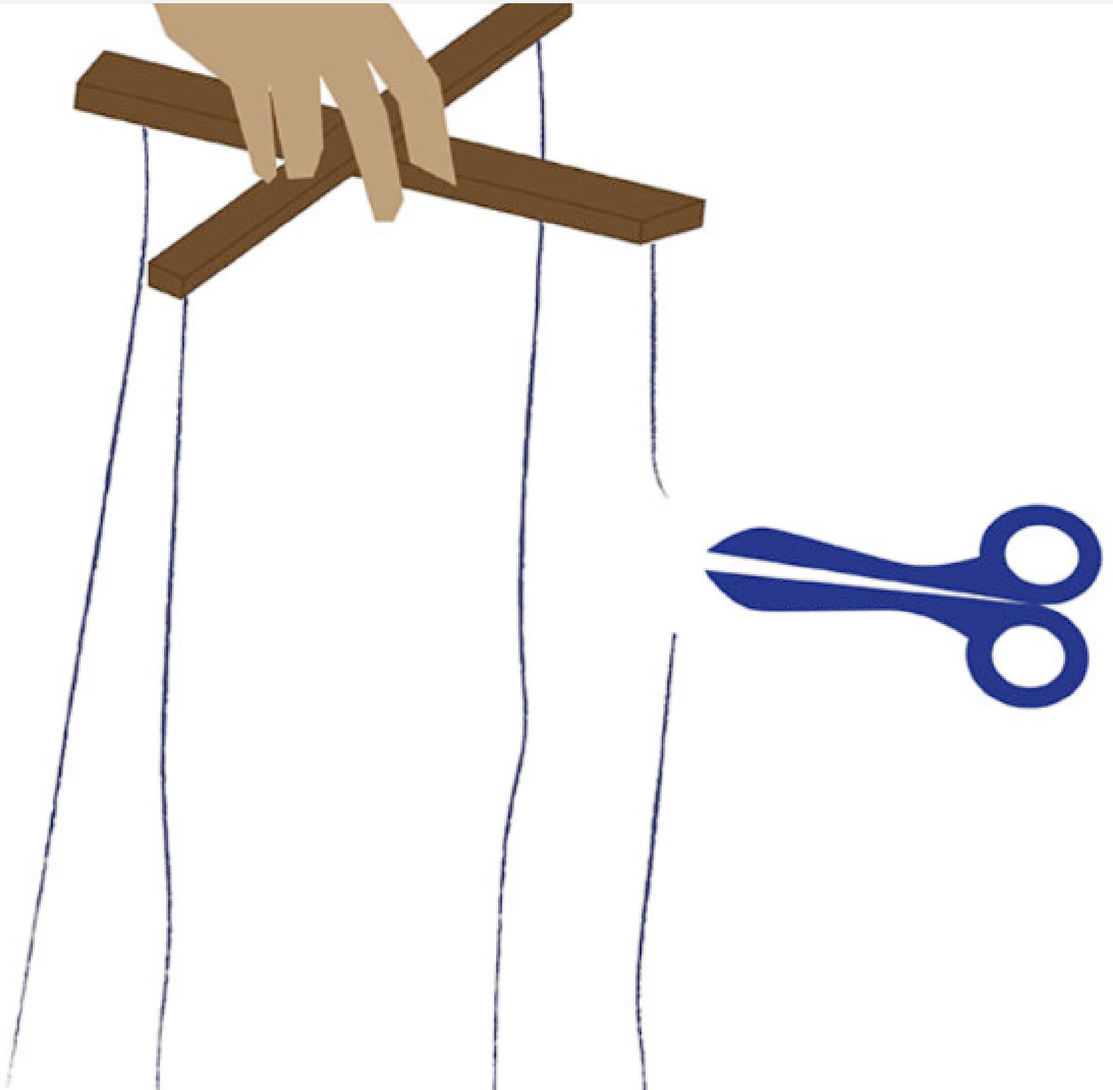
"Two Pizza Teams"

Spotify Changes to Scrum

- Renamed **Scrum Master** to **Agile Coach**
  - Because they wanted servant leaders vs process masters
- Renamed **Scrum Team** to **Squad**
  - Because their key driving force is Autonomy

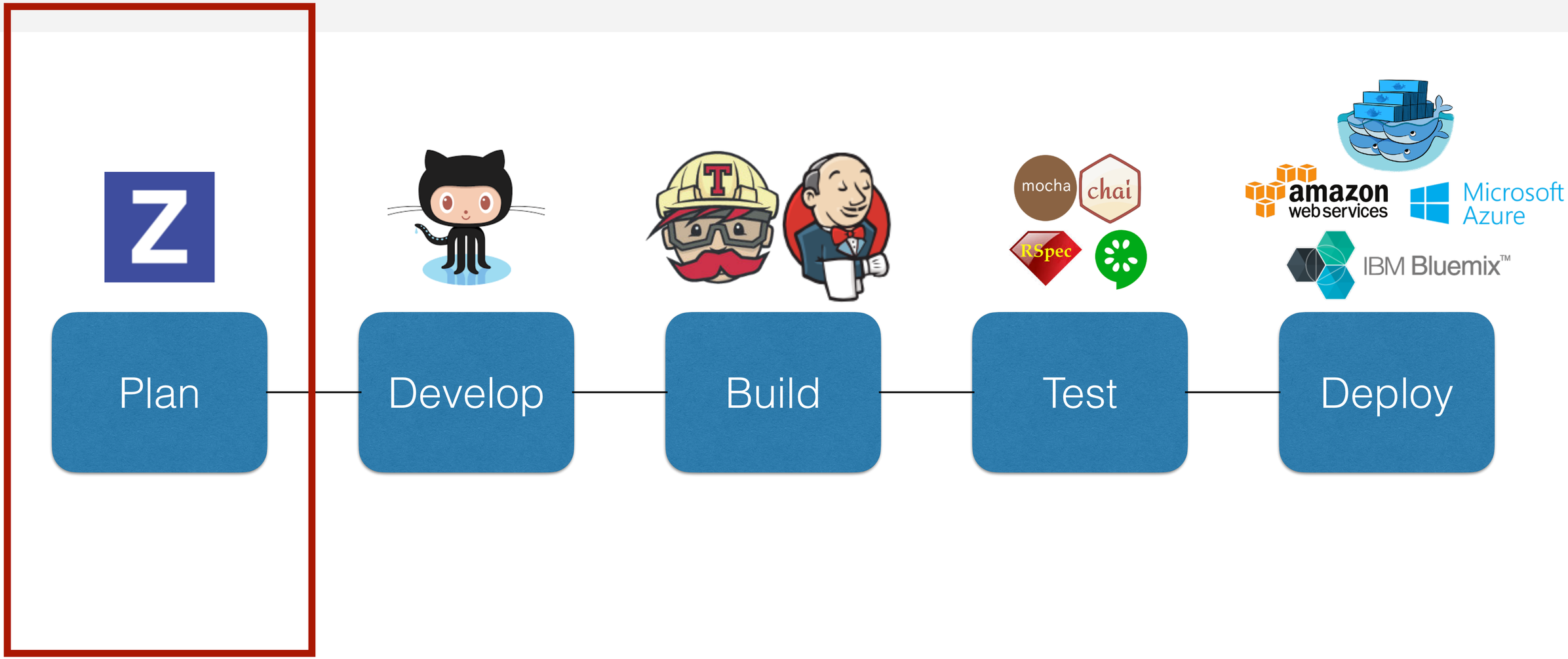
Why is Autonomy Important?

- It’s motivating… and motivated people build better stuff
- Autonomy is fast — letting decisions happen locally in the squad
- It minimizes hand-offs and waiting so you don’t get bogged down

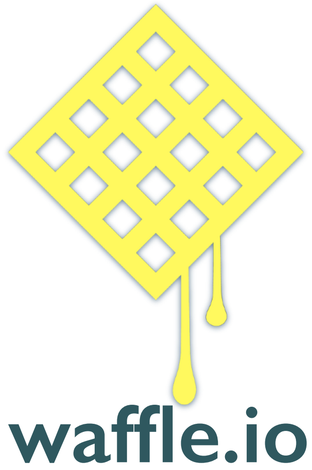


Agile Planning

DevOps Pipeline



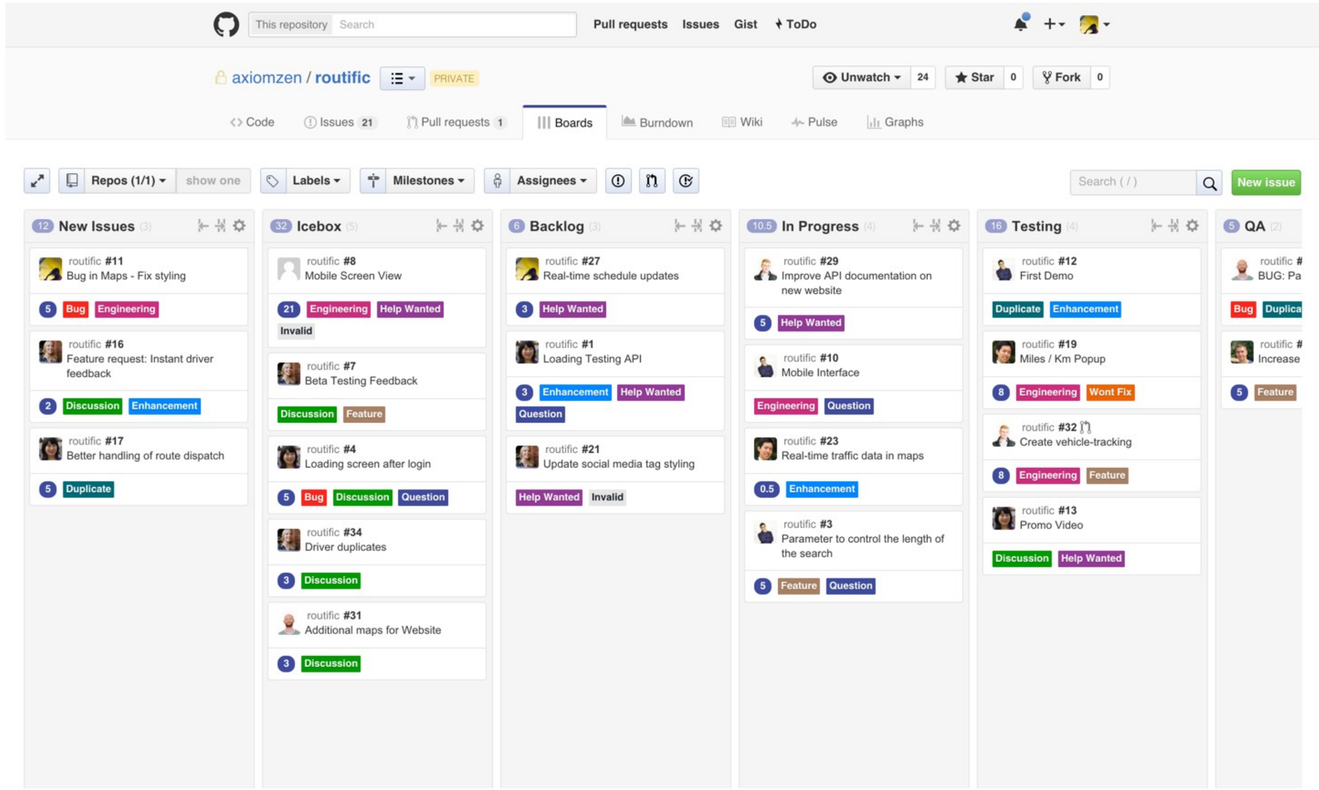
Agile Planning Tools



ZenHub is a Tool for Managing Agile Development

Using ZenHub for Planning

- ZenHub is a plug-in to GitHub
- It provides a Kanban Board and Burndown Charts for project management
- Customizable and integrated with GutHub (one tool)



Why Use ZenHub?

- Helps you manage where you are in project based on GitHub Issues
- Gives you an easy way to let management know how you are doing
- Because it’s integrated with GitHub, it is always up to date
- Developers only need to use one tool: **GitHub**

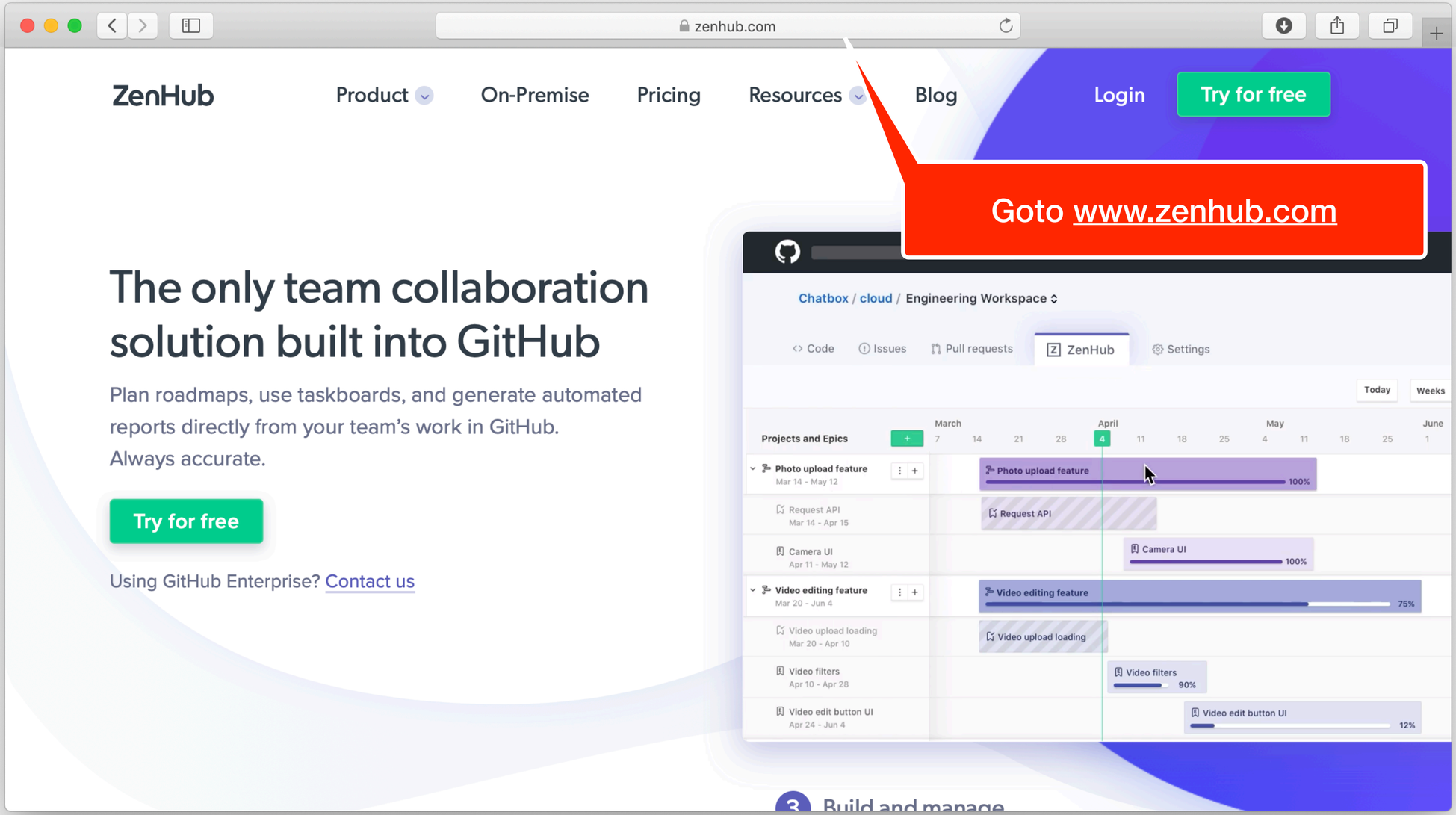
Demonstration

“live session”

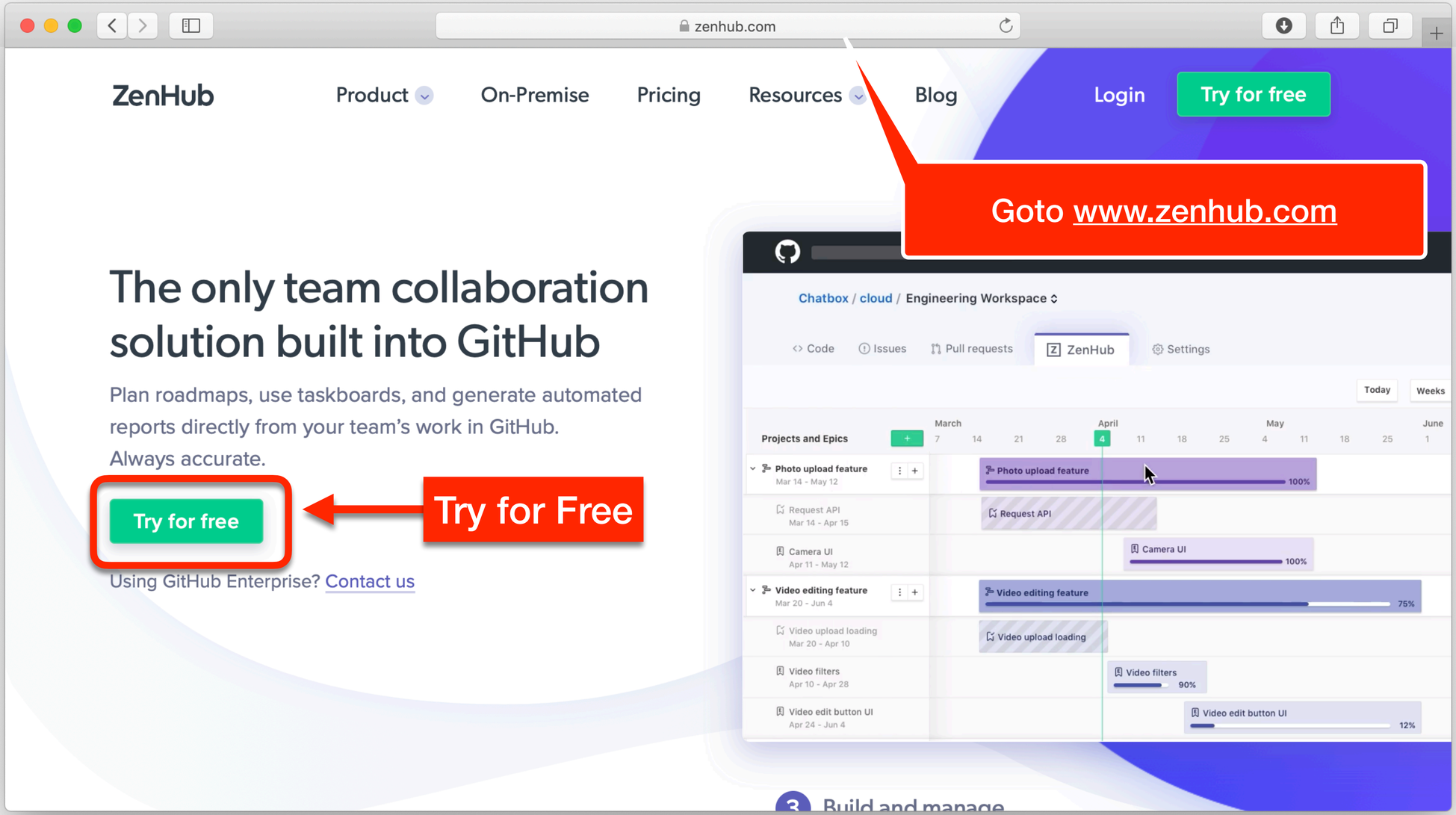
Some Assembly Required

- Tools you will need to complete this lab:
  - GitHub Account
  - Chrome or Firefox Browser
  - ZenHub Browser Plug-in

Enabling ZenHub



Enabling ZenHub



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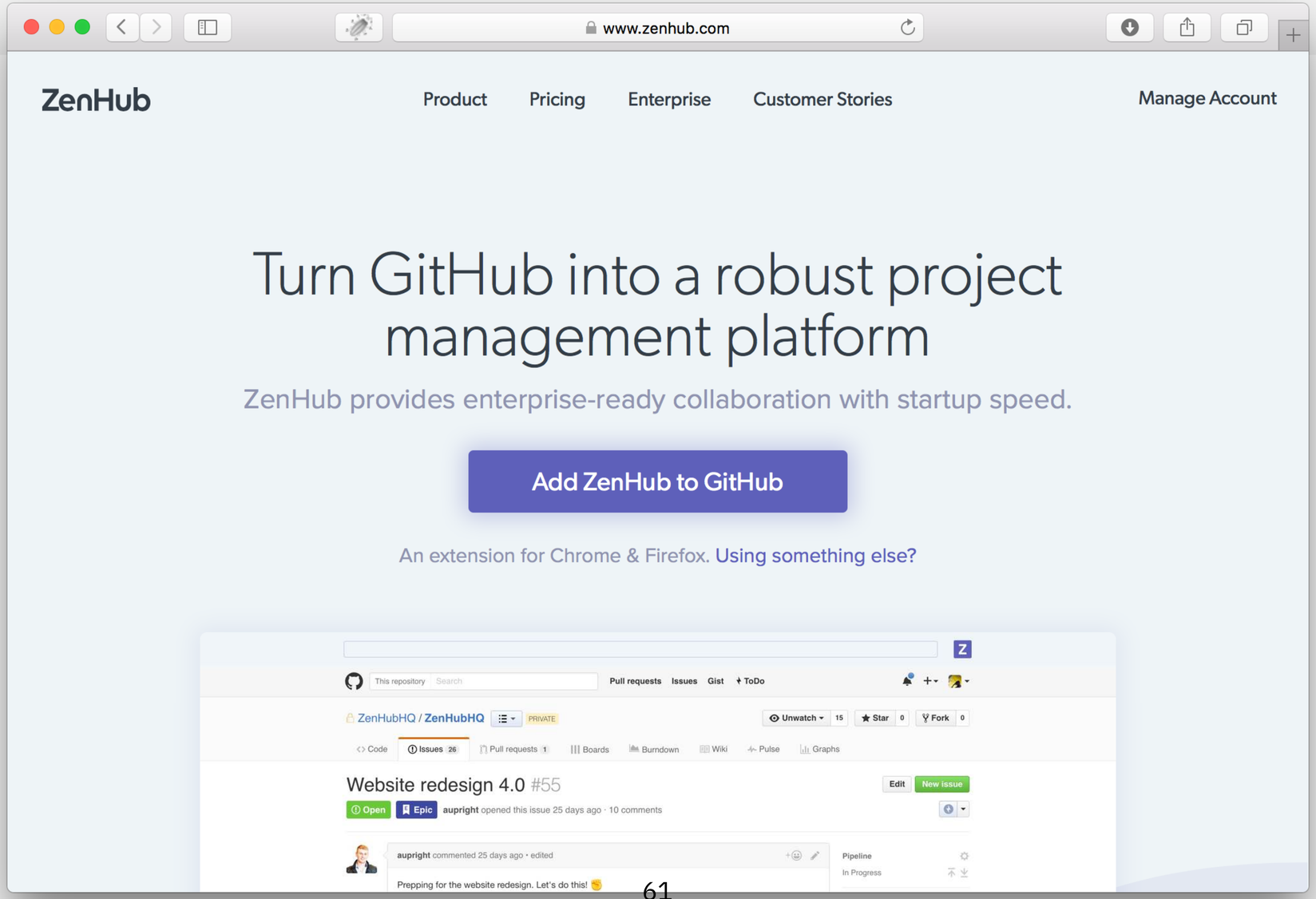
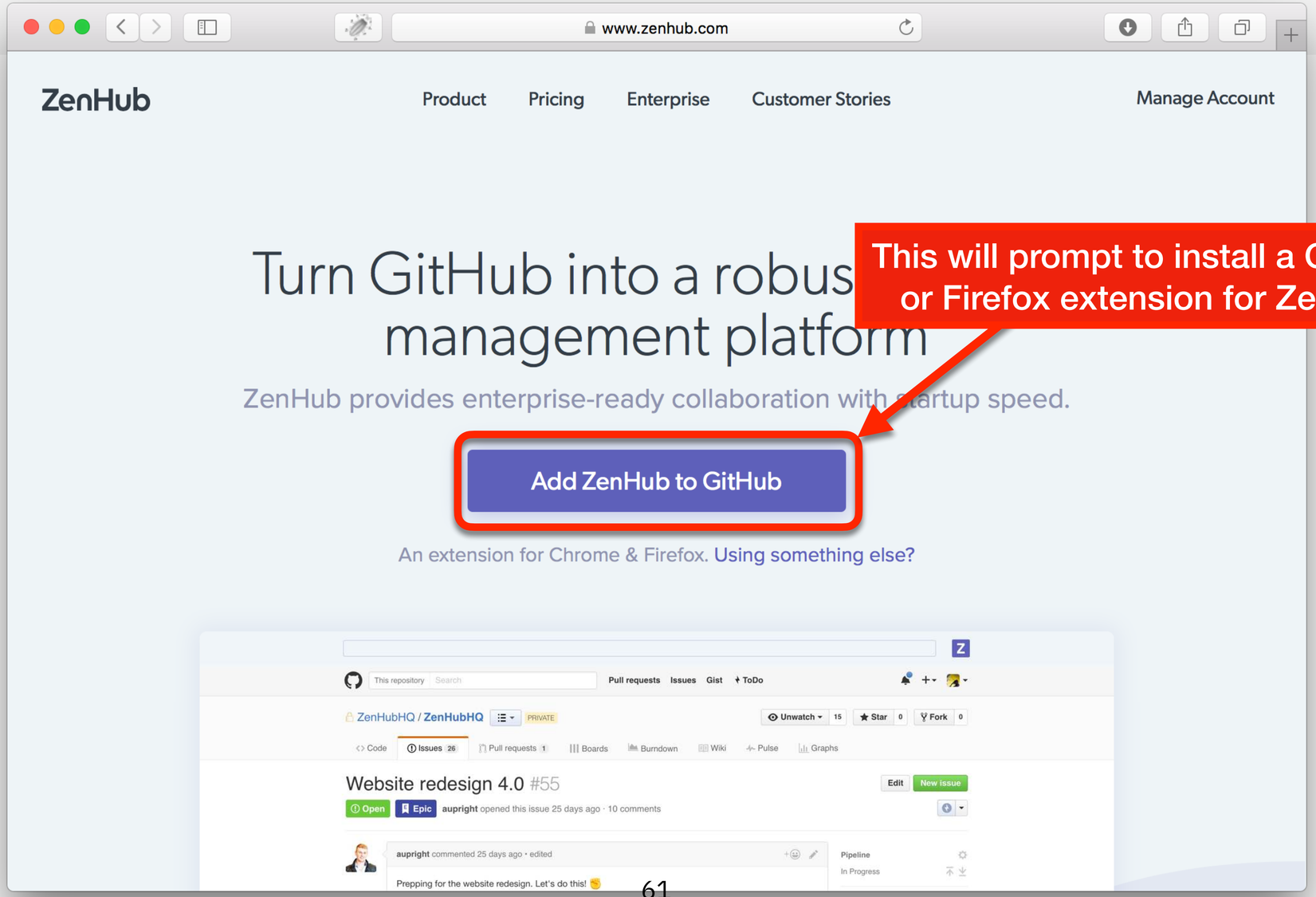
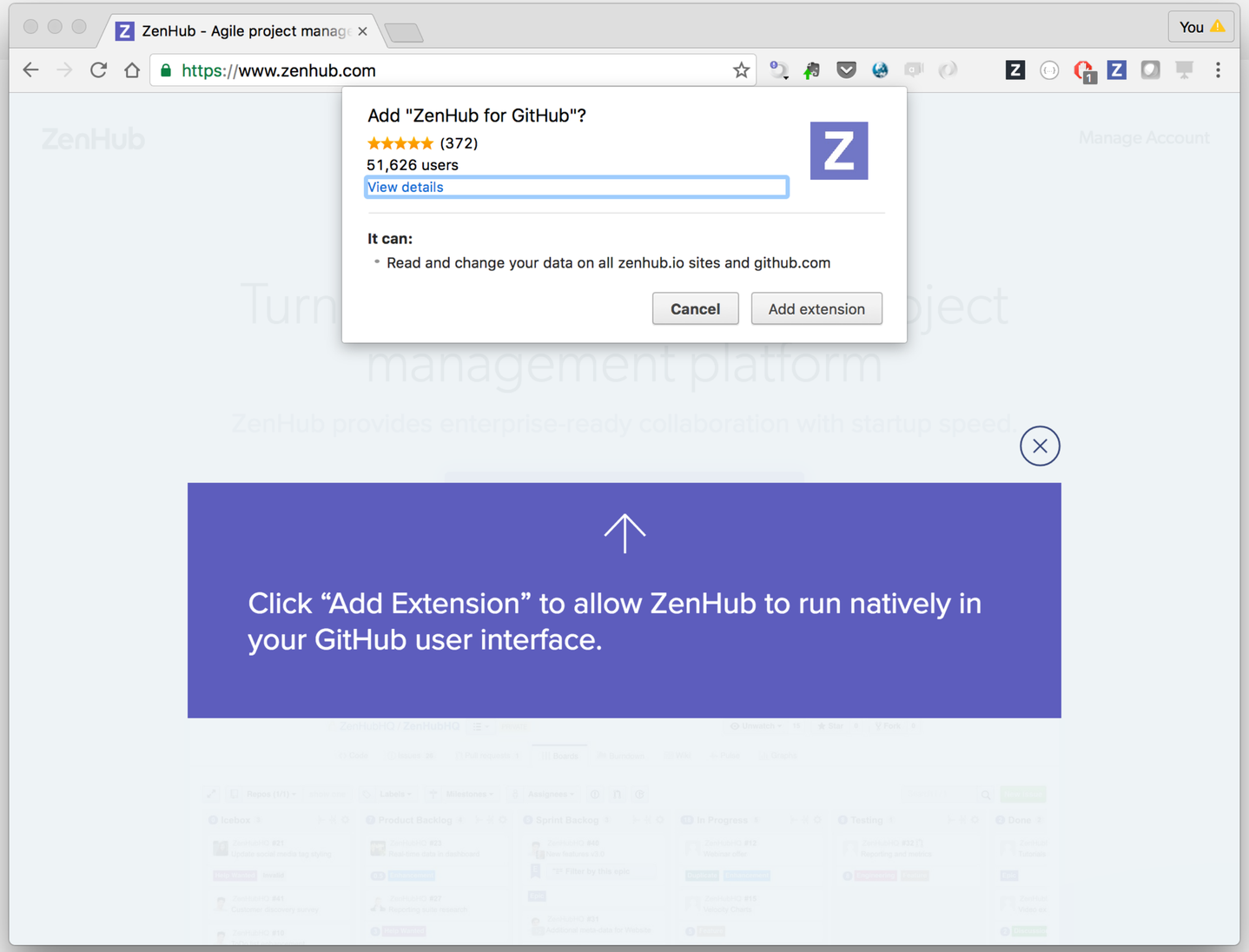


Enabling ZenHub



Install the Plug-in



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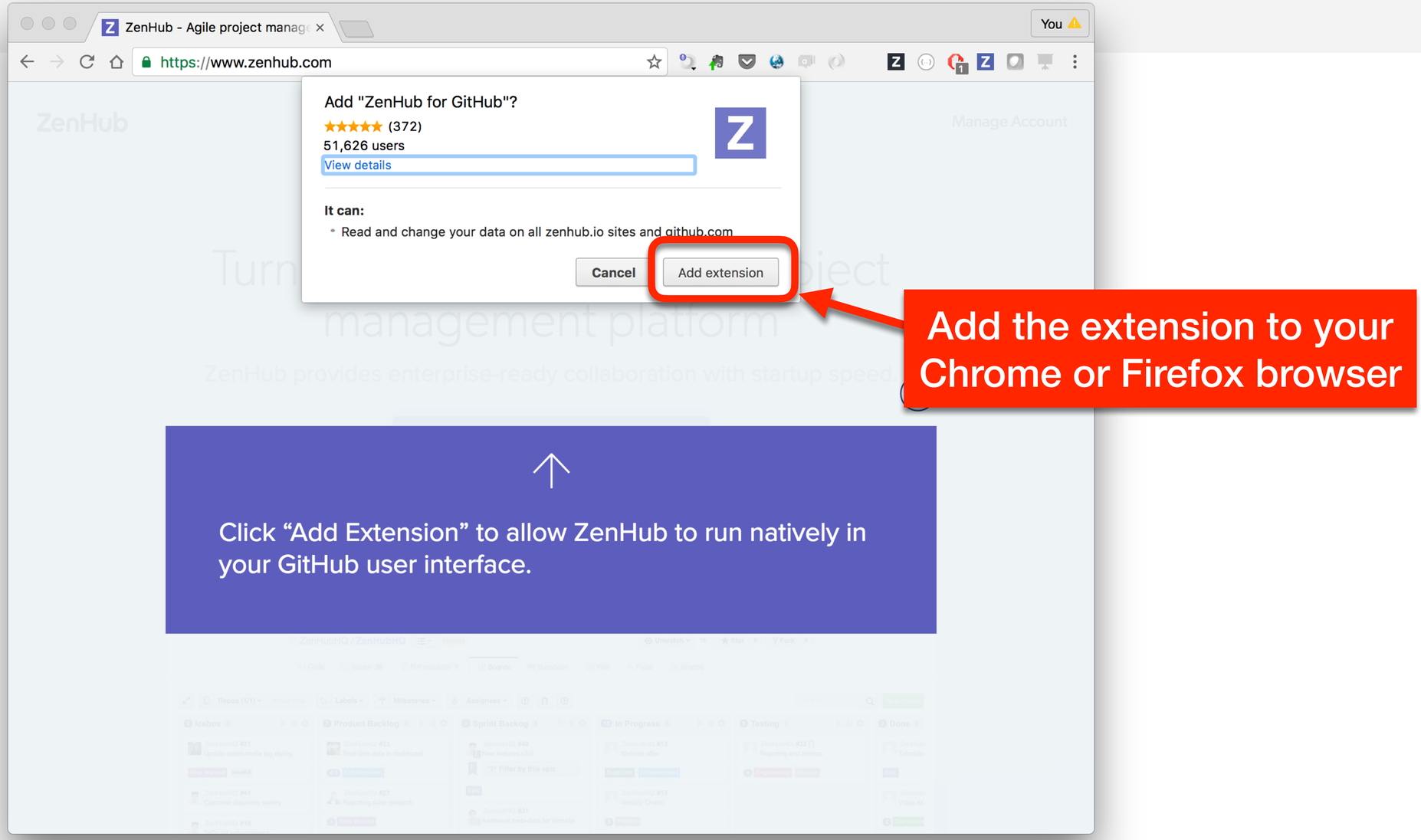
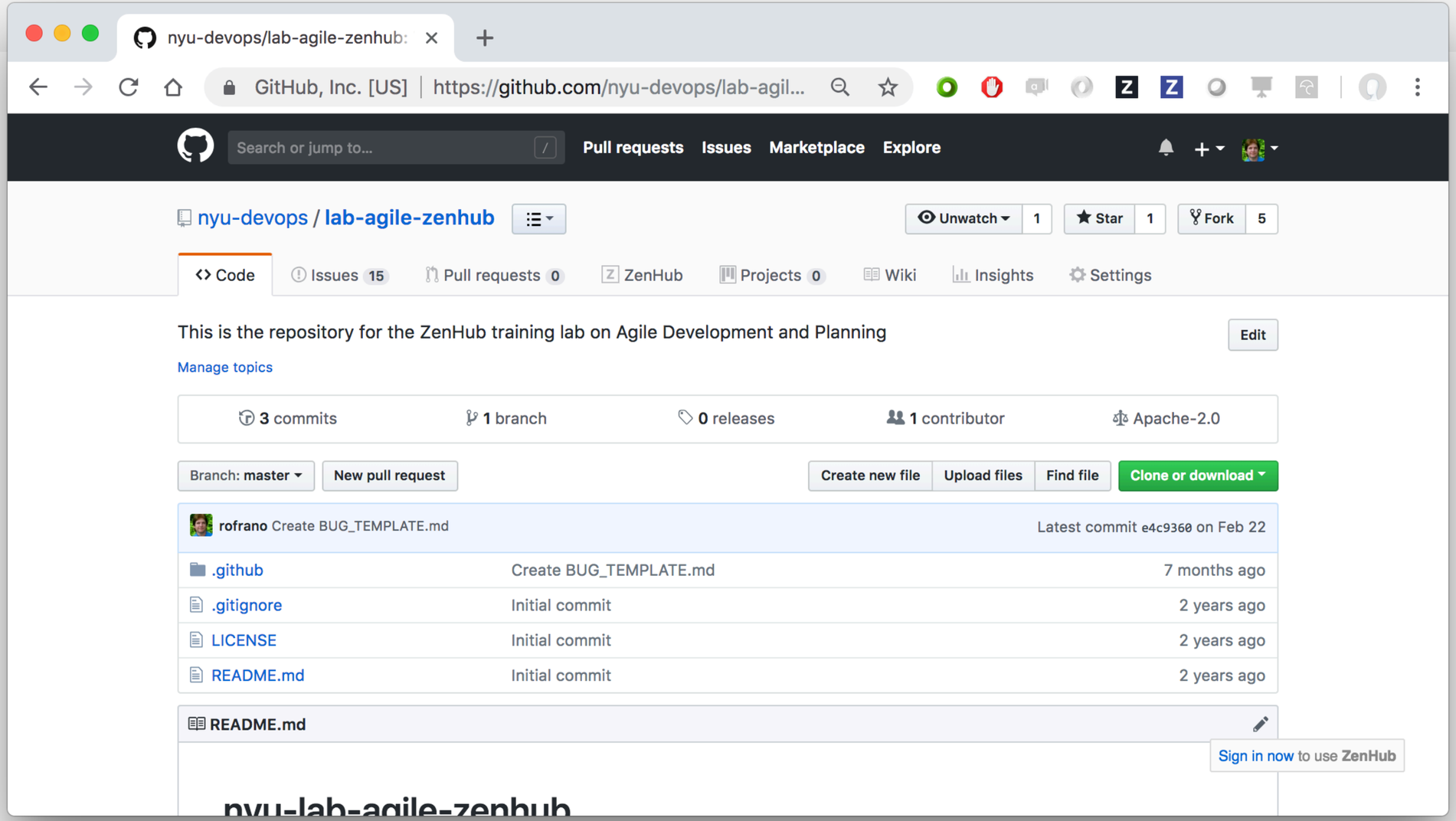


ZenHub Adds Boards & Burndown



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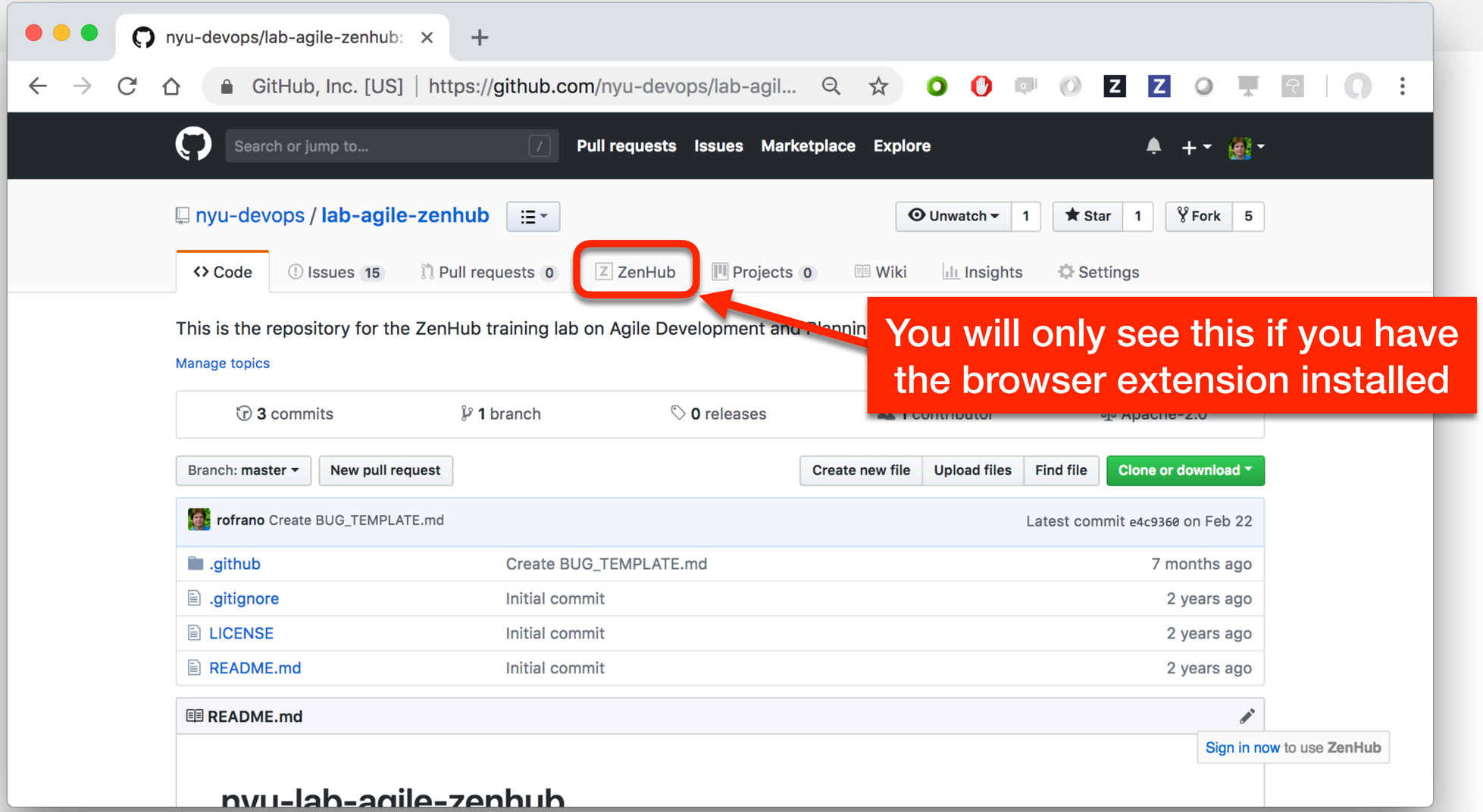
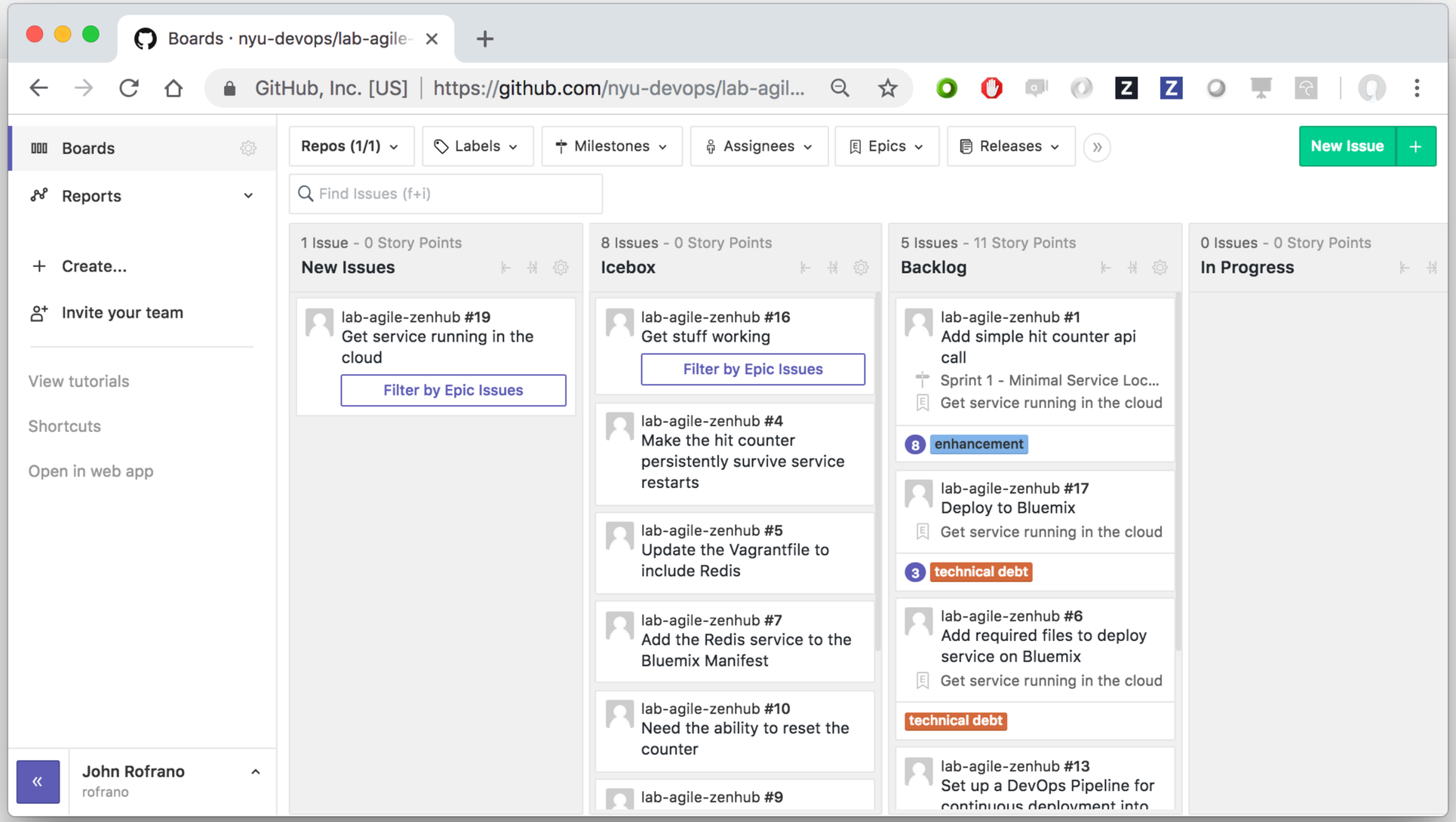


Kanban Board



What is Kanban?

kanban | ˈkänbän | noun

(also kanban system) a Japanese manufacturing system in which the supply of components is regulated through the use of an instruction card sent along the production line.

- an instruction card used in a kanban system.

ORIGIN

1970s: Japanese, literally ‘billboard, sign’

Core Principles of Kanban

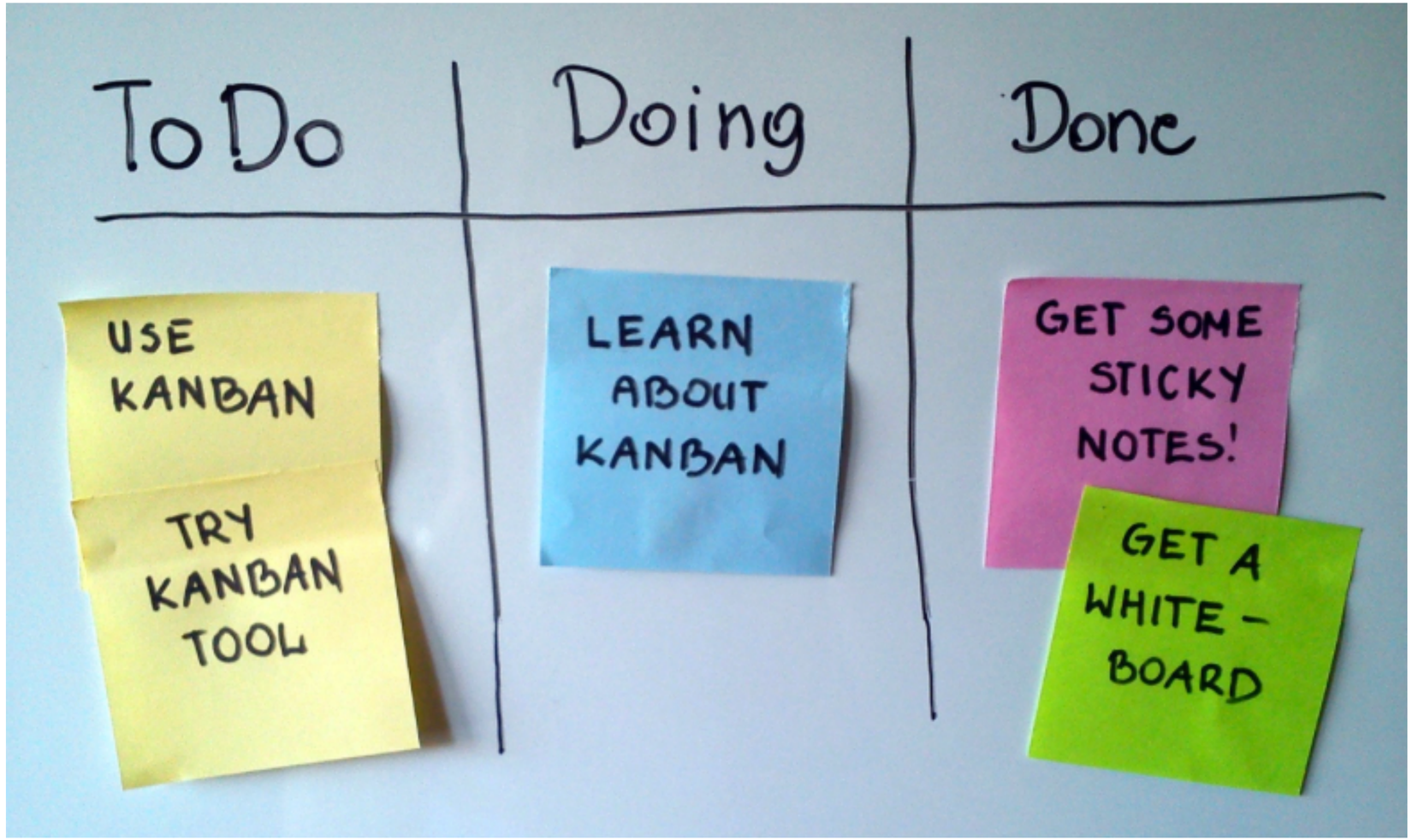
- **Visualize the workflow:** You cannot manage what you cannot see. By making all the work visible, including blockers and queues, you can identify issues early on and improve collaboration.
- **Limit work in progress (WIP):** Work in progress limits (WIP limits) determine the minimum and maximum amount of work for each column on the board or for each workflow.
- **Manage and enhance the flow:** Ideally, you want a fast, smooth flow, which shows that the team is creating value quickly. The team should analyze problems in the flow then implement changes.
- **Make process policies explicit:** Everyone needs to understand how things work or what “done” really means. You can modify the board to make these processes more clear; for example, you could redesign it to specify how the work should flow.
- **Continuously improve:** Teams measure their effectiveness by tracking flow, measuring cycle time, and increasing quality of work.

Scrum vs Kanban

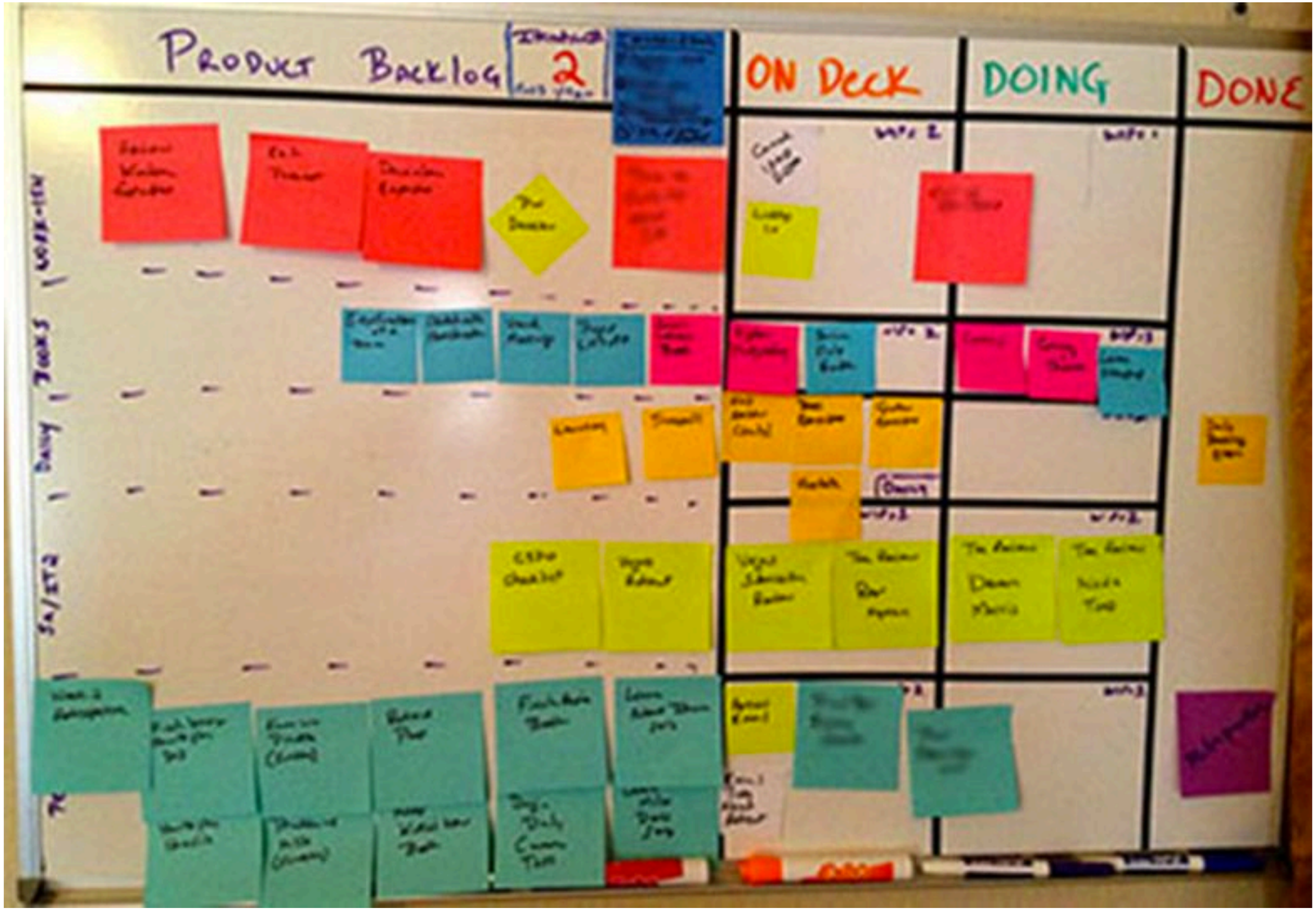
	SCRUM	KANBAN
Cadence	Regular fixed length sprints (ie, 2 weeks)	Continuous flow
Release methodology	At the end of each sprint if approved by the product owner	Continuous delivery or at the team's discretion
Roles	Product owner, scrum master, development team	No existing roles. Some teams enlist the help of an agile coach.
Key metrics	Velocity	Cycle time
Change philosophy	Teams should strive to not make changes to the sprint forecast during the sprint. Doing so compromises learnings around estimation.	Change can happen at any time

https://www.atlassian.com/agile/kanban

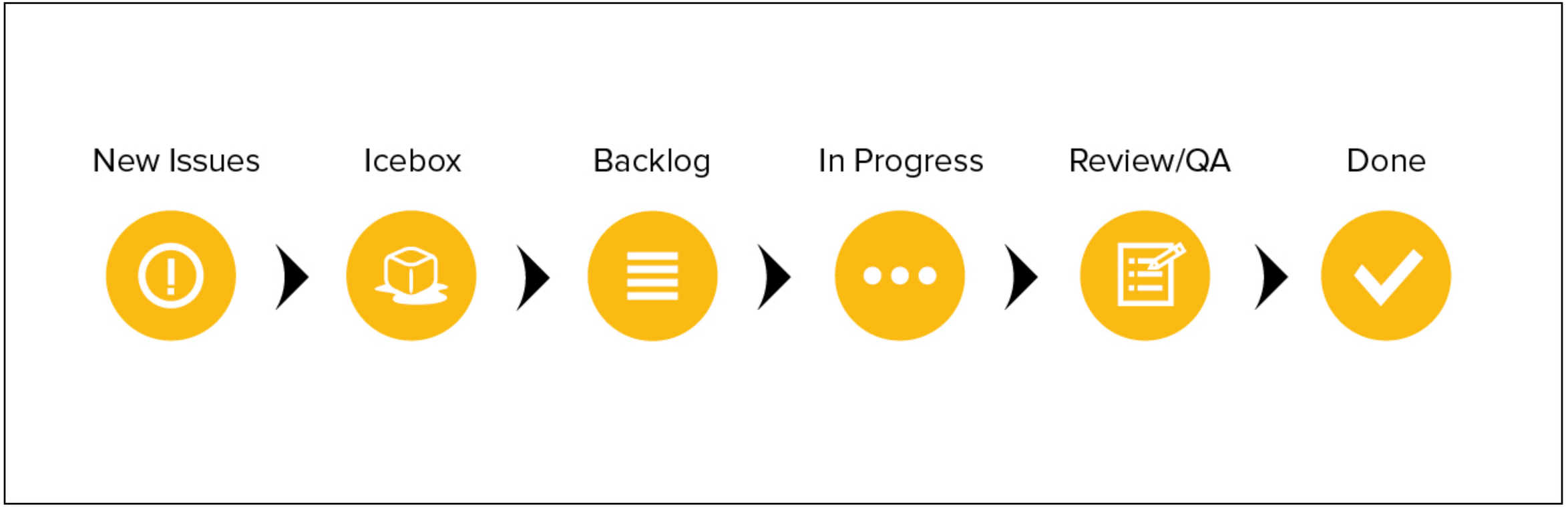
What is a KanBan Board?



Kanban Example



Default ZenHub Pipelines



Default ZenHub Pipelines

- **New Issues** - is the landing point for new Issues. Anyone can create new Issues. They should be triaged weekly.
- **Icebox** - represents items that are a low priority in the Product Backlog. This keeps them out of the way of current work while not forgetting about them entirely
- **Backlog** - is a prioritized backlog of items ready for development. The higher an issue is on this list, the higher the priority. Higher-priority items will typically have more in-depth information

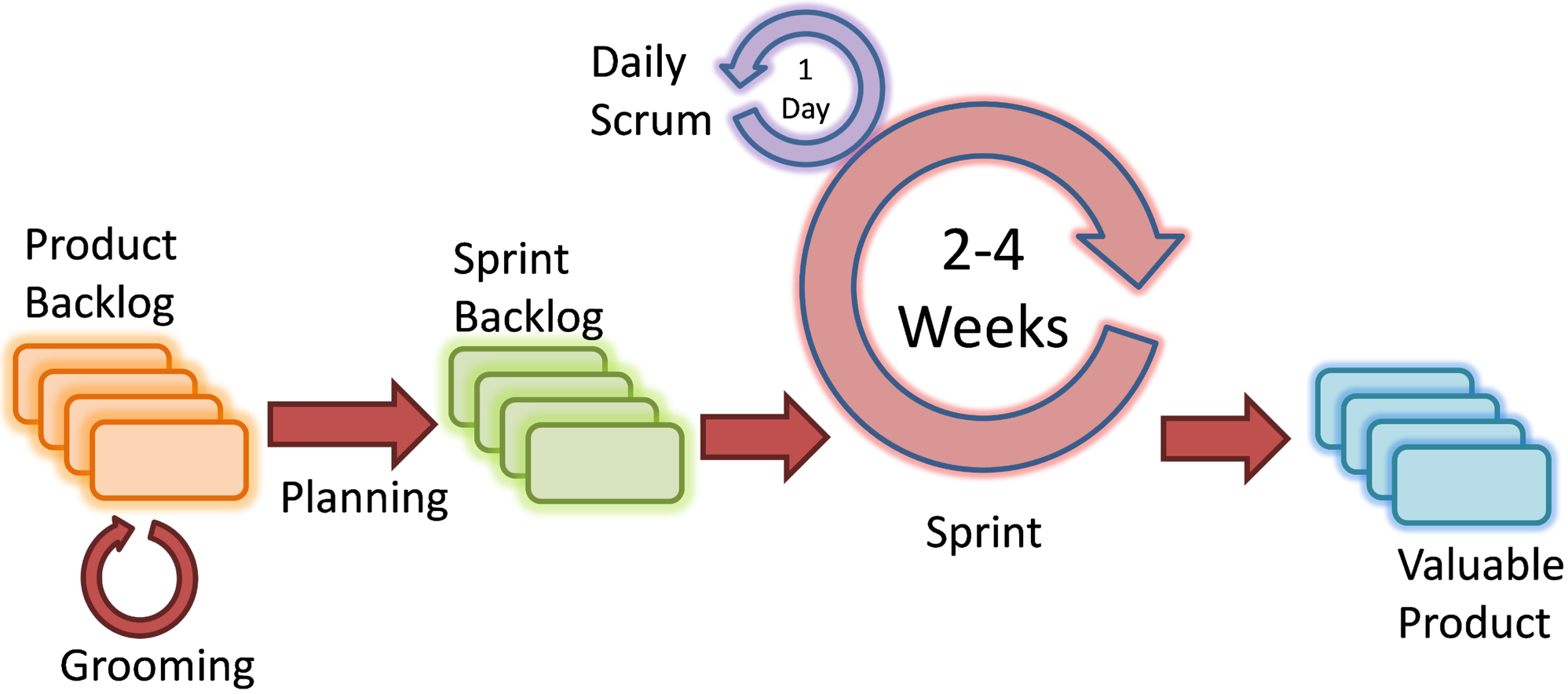
Default ZenHub Pipelines

- **In Progress** - This is what is actively being worked on. Each Issue in this pipeline should have an assigned owner who is responsible for its completion. This communicates to the rest of the team that the task is underway
- **Review/QA** - Issues that are open to the team for review and testing. Usually this means the code is deployed and ready for further examination.
- **Done** - Issues in this pipeline need no further work and are ready to be closed. Having a good ‘Definition of Done’ agreed upon before work starts on an Issue is very helpful here!

Sprint

- A Sprint is one iteration through the design, code, test, deploy cycle
- Usually 2 weeks in duration but could be shorter or longer (but not too much longer... remember working in "small batches")
- Every Sprint should have a Goal this way everyone knows what goal they are working towards

Steps in the Scrum process



The 5 Scrum Meetings

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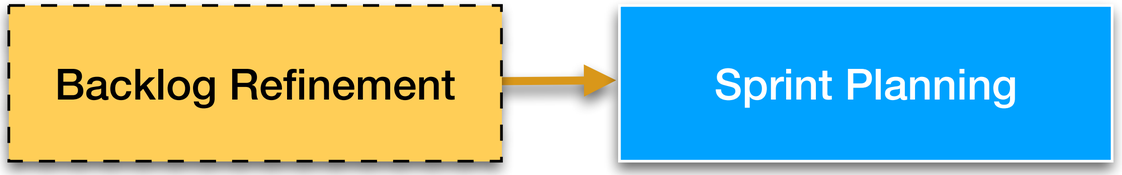

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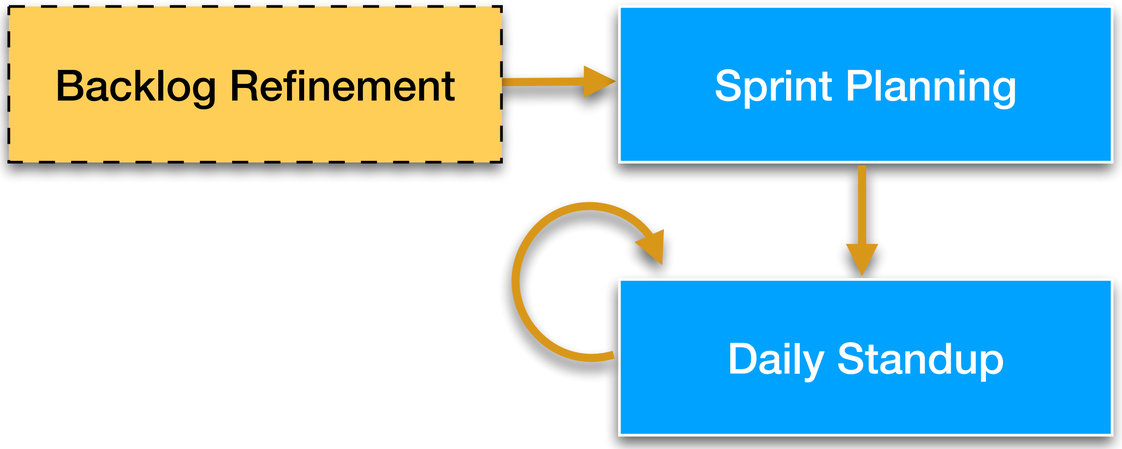

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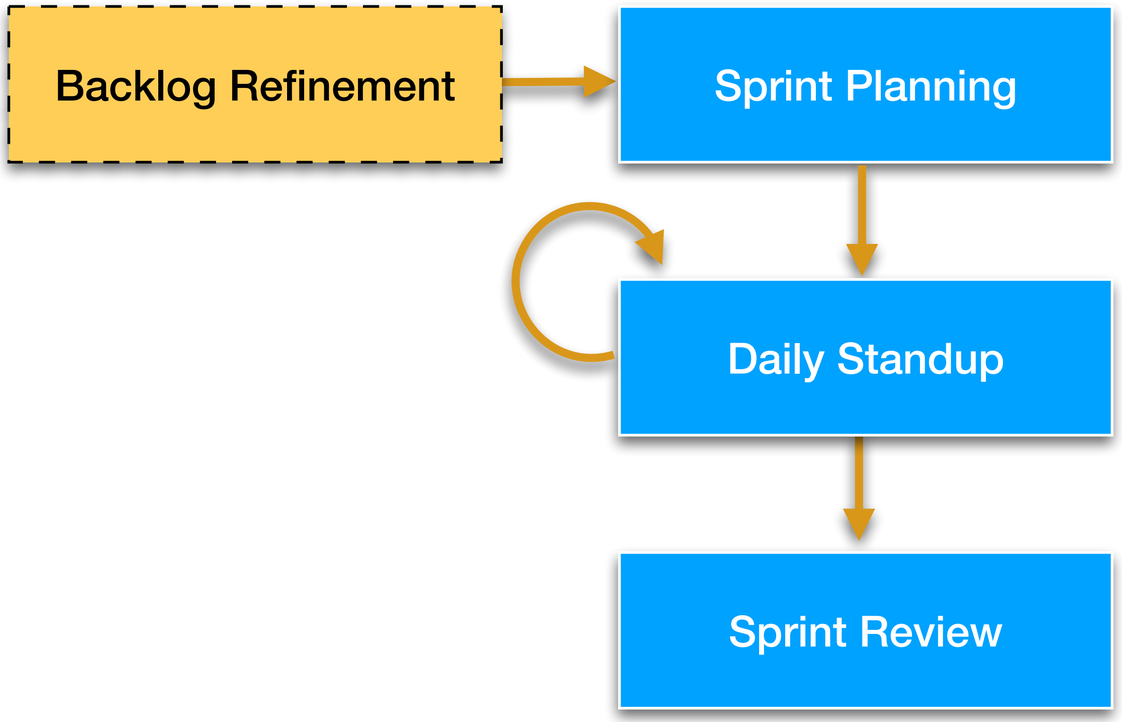

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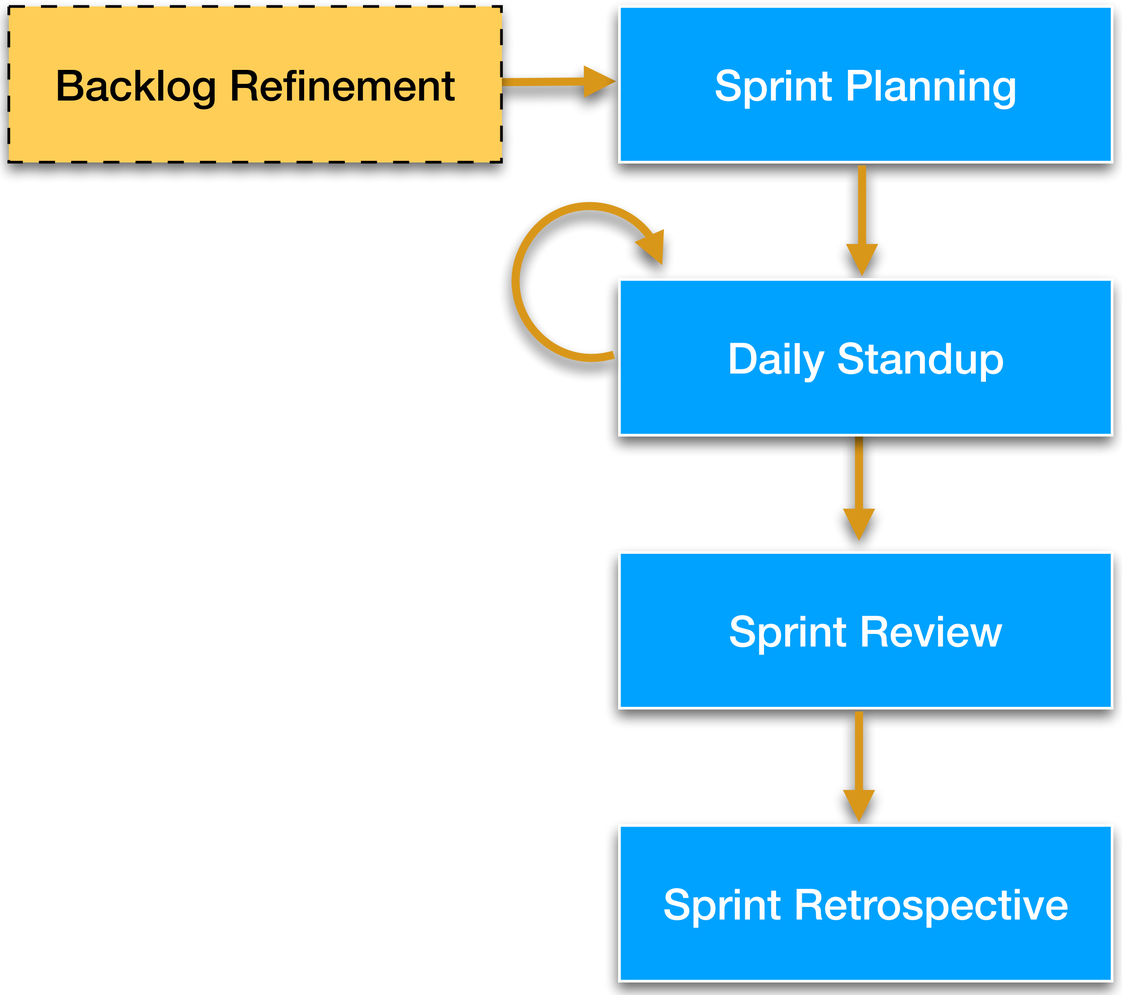

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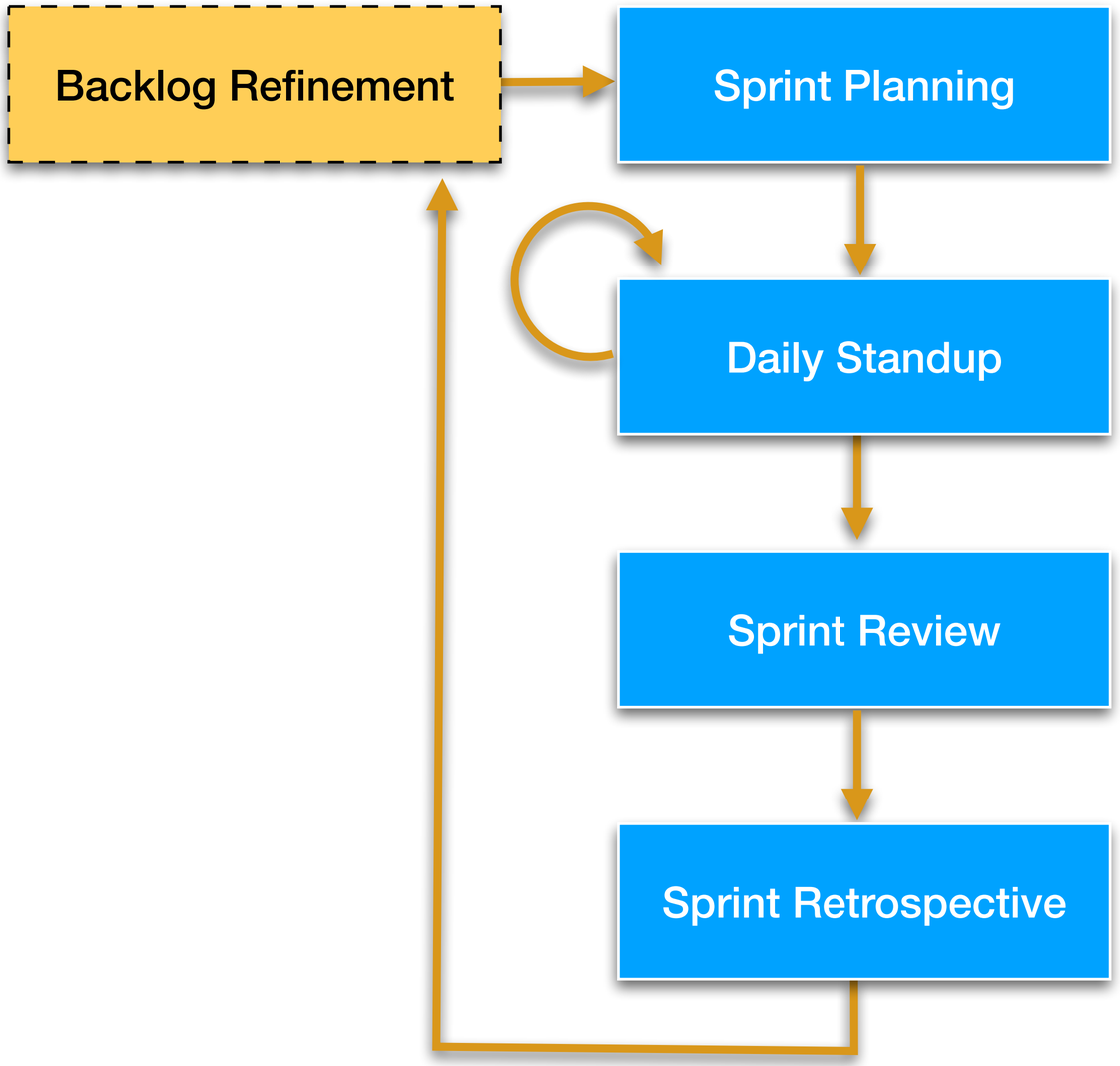

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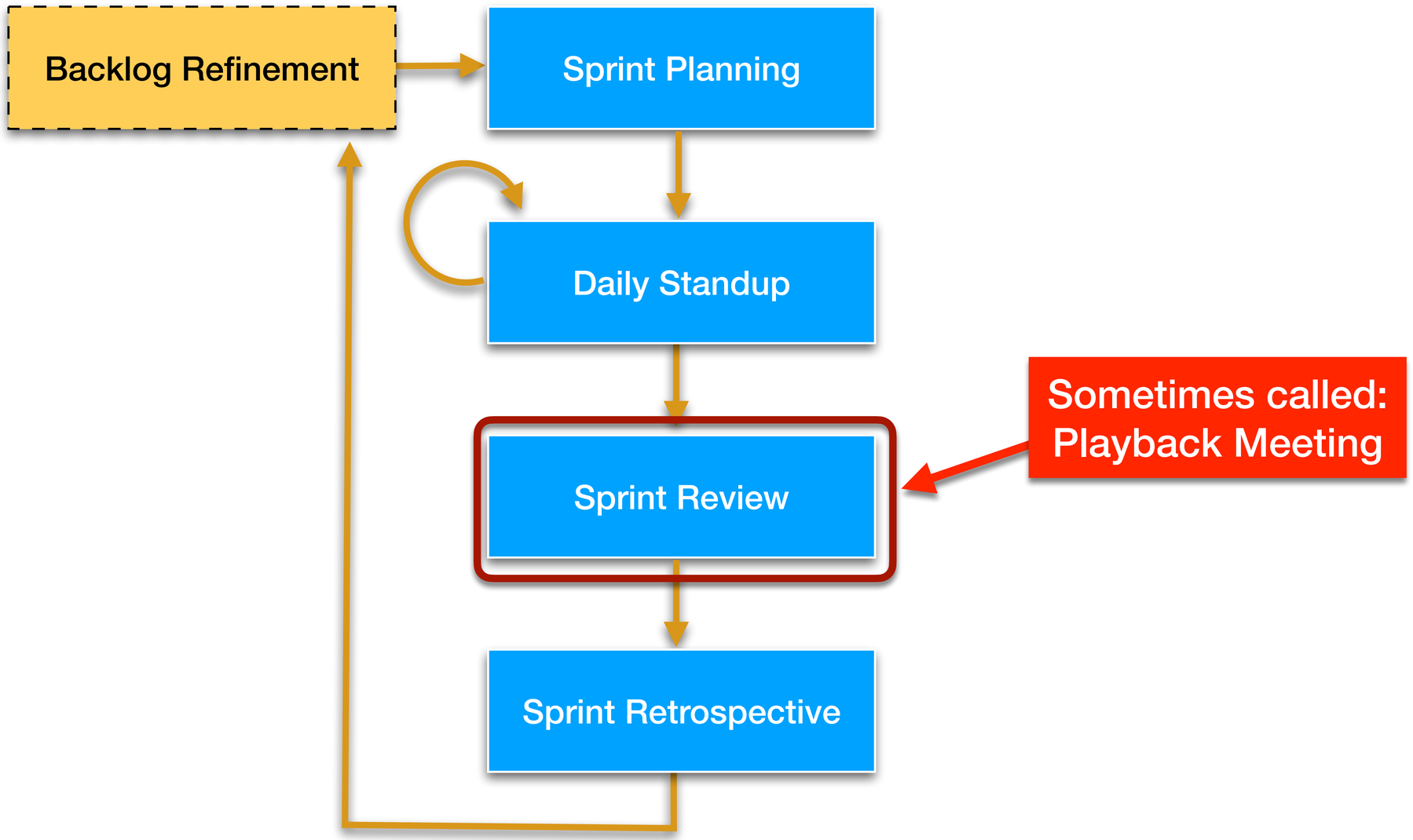
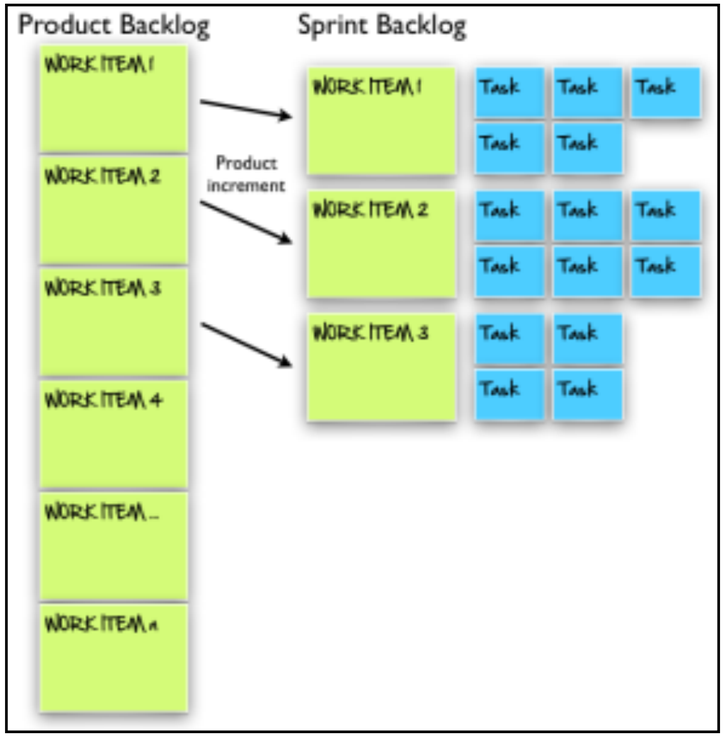


Agile concepts and GitHub

- Sprint → Milestone
- Epics → Epics
- User Stories → GitHub Issues
- Tasks → Markdown Checklist (- [ ])
- Product backlog → Open issues without a Milestone
- Sprint backlog → Issues with a Milestone

Backlogs Drive the Plan

- Product Backlog
  - A ranked list of all of the Stories we might implement some day
- Release Backlog (optional - only if you still do releases)
  - A ranked list of all of the Stories that comprise the next release
- Sprint Backlog
  - A ranked list of the Stories we have agreed to implement this sprint



RIP: Fixed Releases

- **Facebook:** Major release one a week (usually Tuesdays), minor releases daily
- **Amazon:** Several deploys per week
- **StackOverflow:** multiple deploys per day (Jeff Atwood, co-founder)
- **GitHub:** tens of deploys per day (Zach Holman)
- **Rationale:** risk == number of engineering hours since last deployement. (i.e., less hours == less risk)
- **Bottom line:** Feature deployment should be a ***non-event*** that happens all the time.

Backlog Refinement Meeting

Attendees: Product Owner, Scrum Master, Development Team (optional)

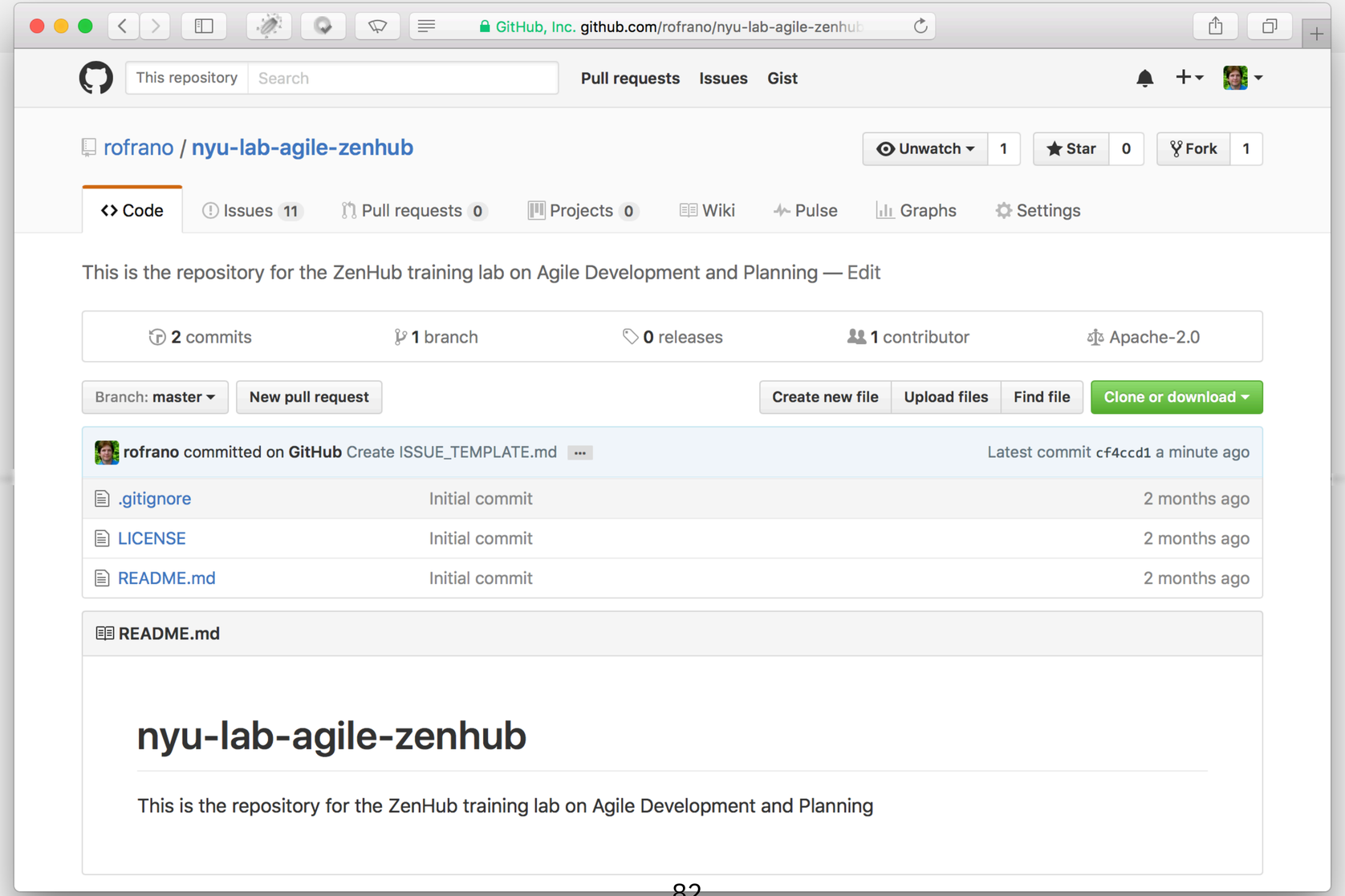
- Product Owner sorts the Product Backlog in Priority Order to meet business objectives
- The team may estimate the amount of effort they would expend to complete items in the Product Backlog and provides other technical information to help the Product Owner prioritize them
- Large vague items are split and clarified, considering both business and technical concerns
  - Sometimes a subset of the team, in conjunction with the Product Owner and other stakeholders, will compose and split Product Backlog Items before involving the entire team in estimation

Grooming the Backlog

- Make sure that all Issues are groomed and stories are complete
- Keep the Backlog ranked by priority so that the important Issues are always on top
  - The priority is determined by the "**So that**" benefit statement
- Size the Issues if possible or leave to Sprint Planning

One Time Setup

Create an Issue Template



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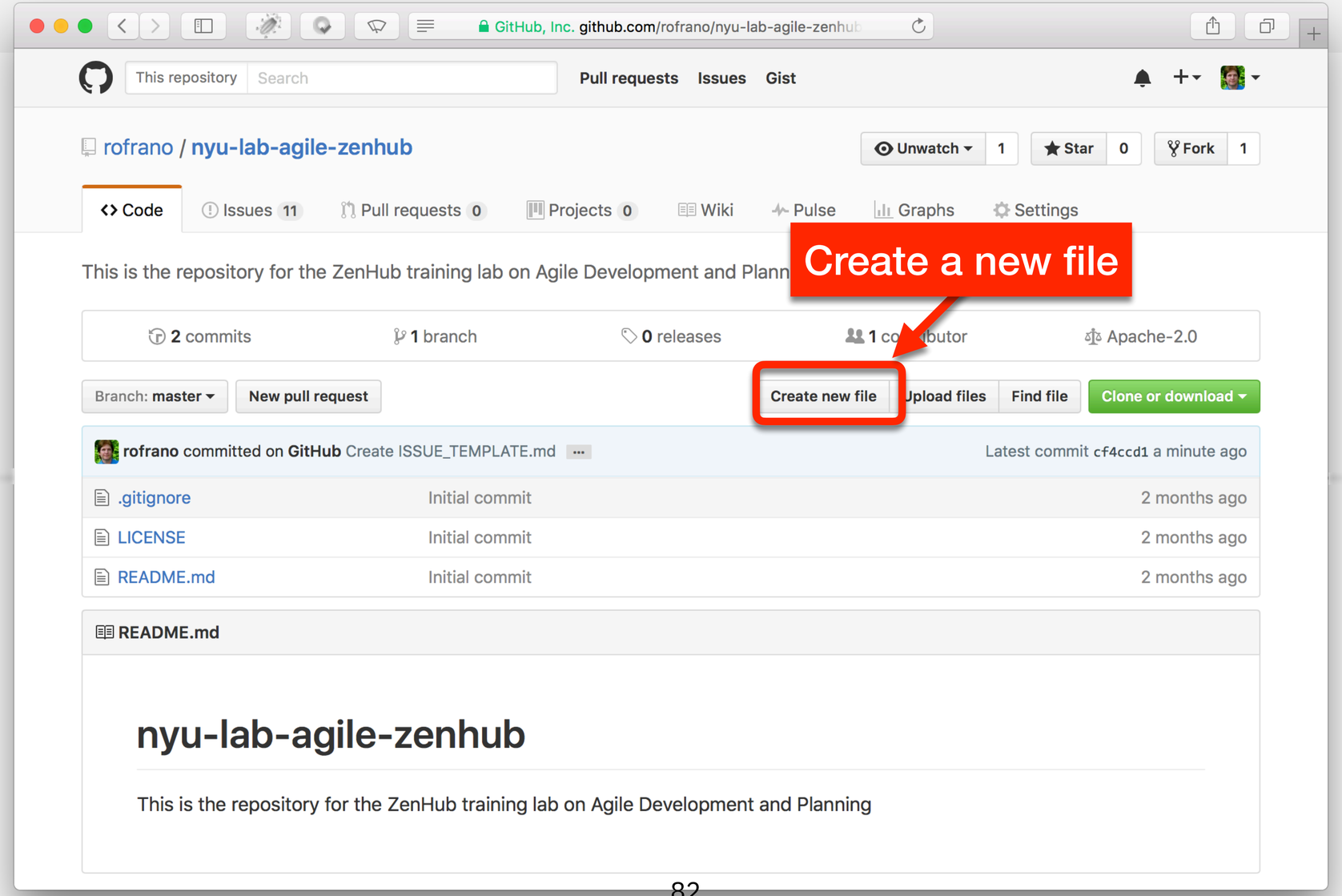

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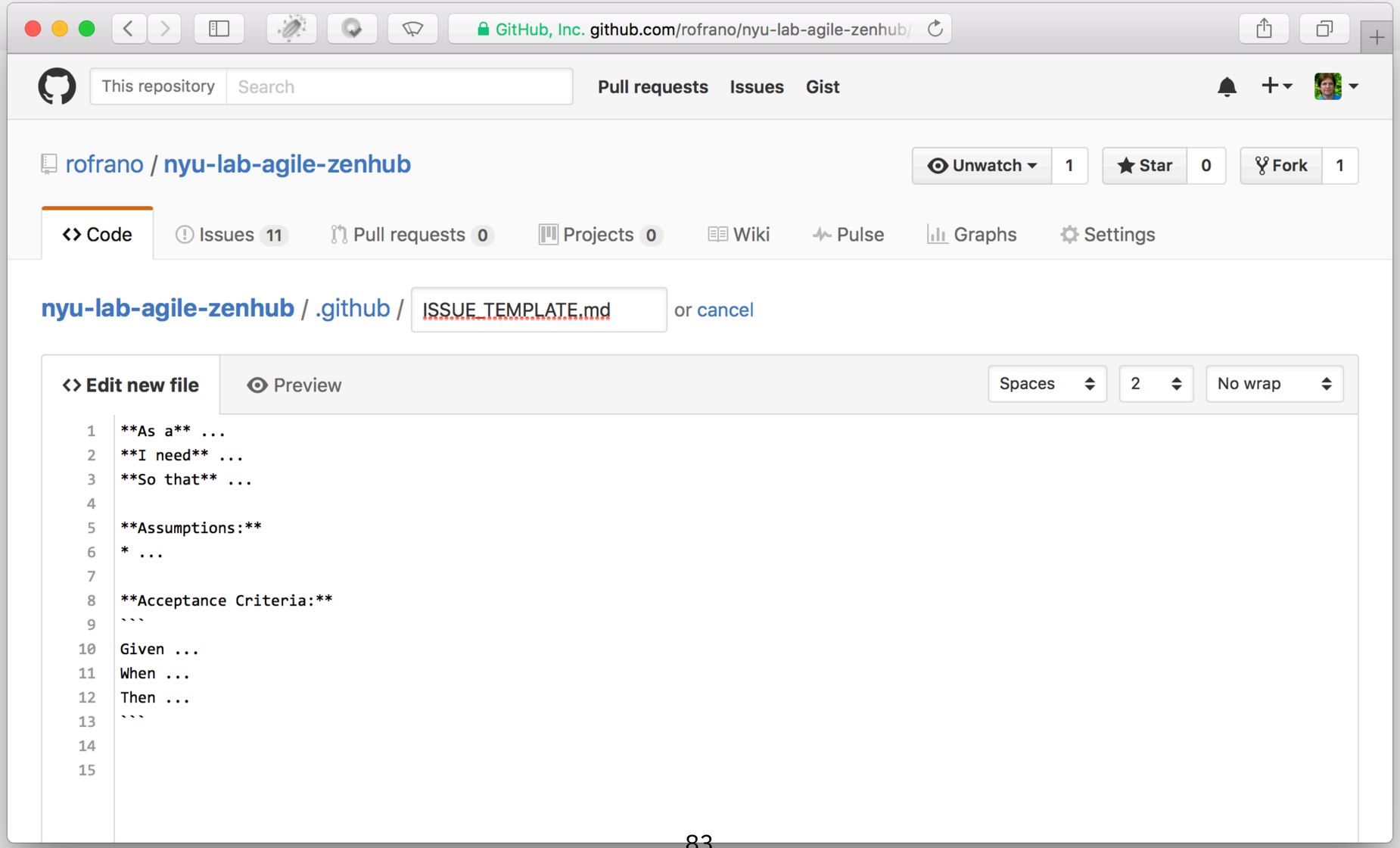

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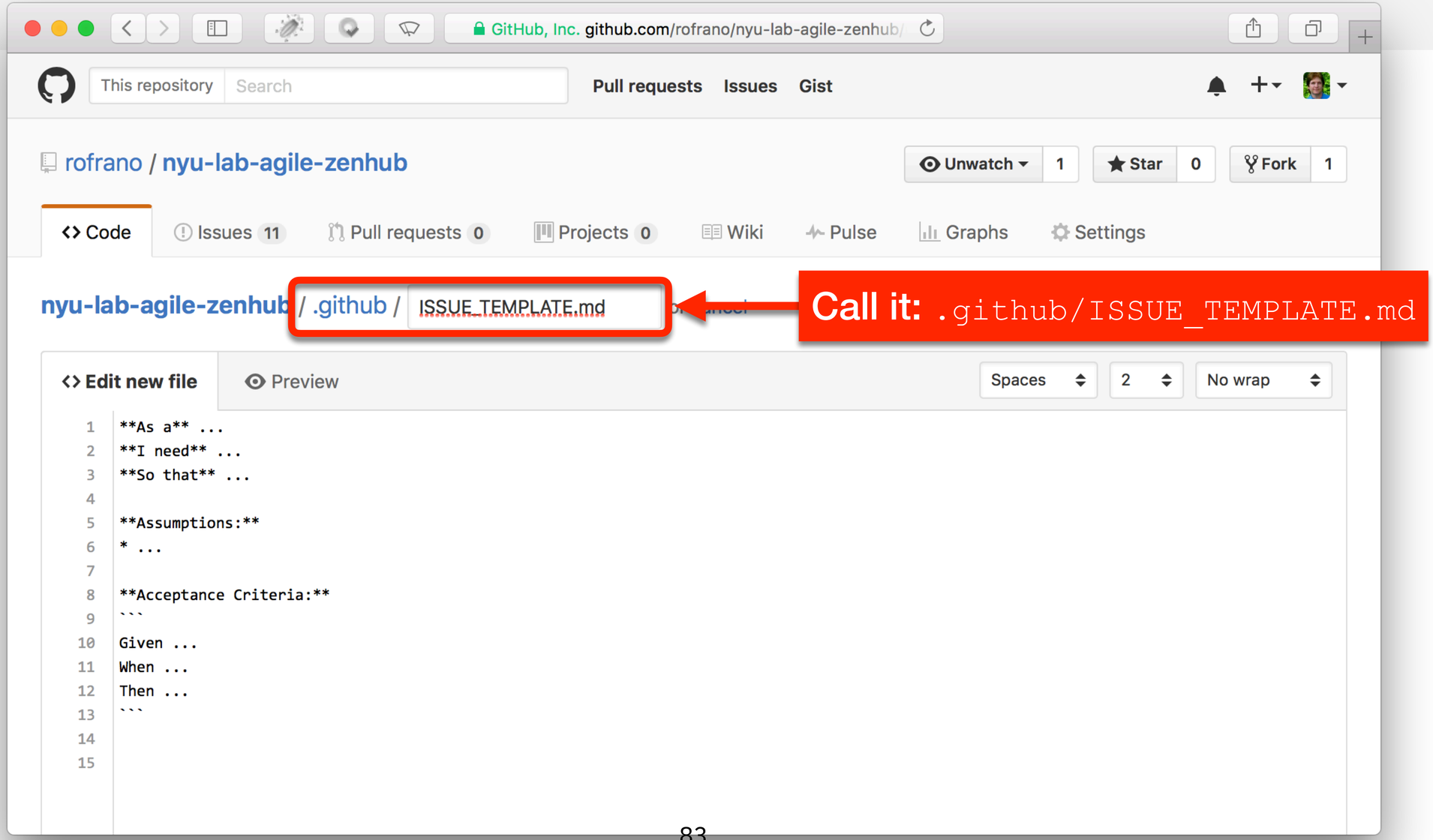
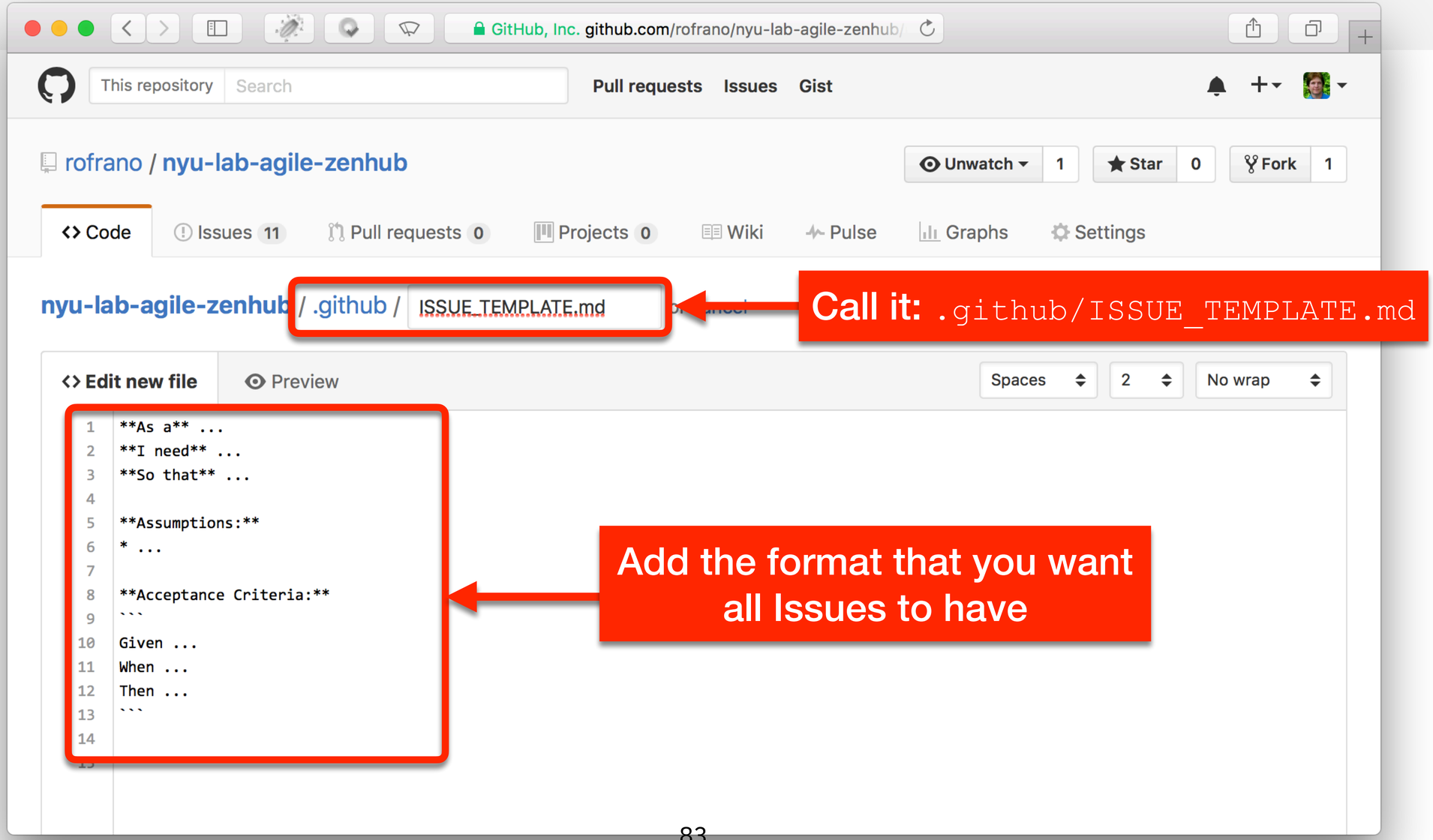
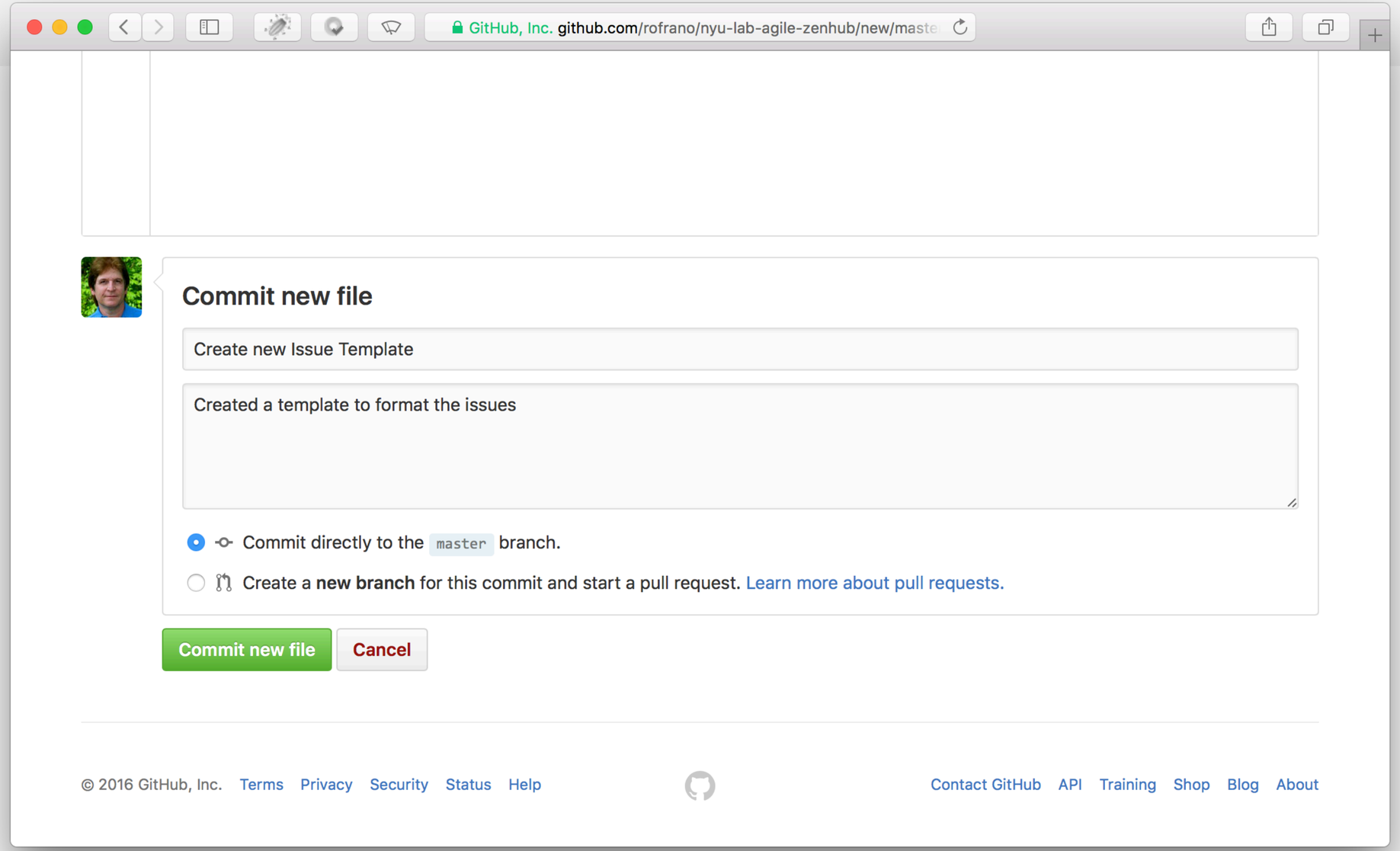


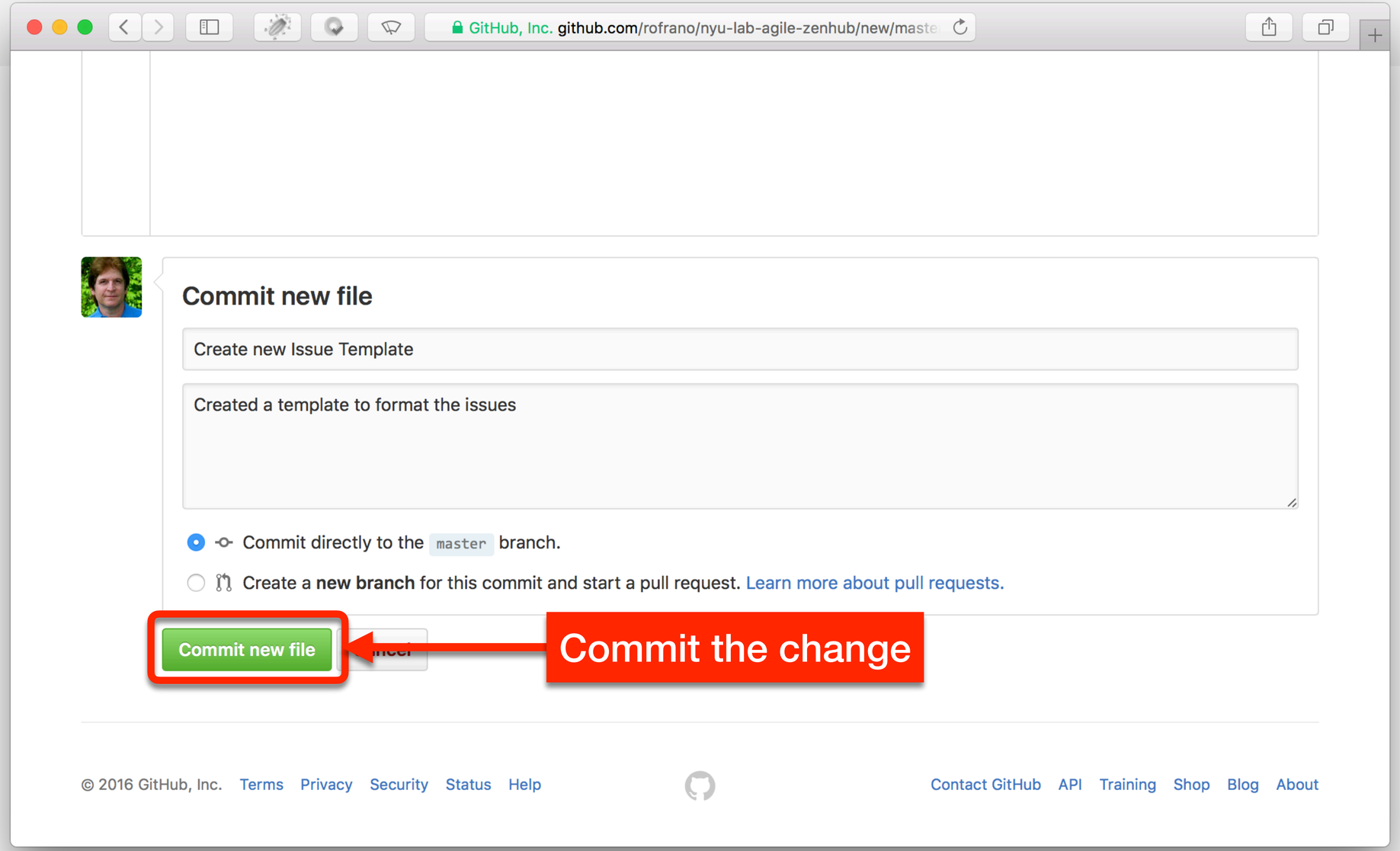
Create an Issue Template



Commit the Template



Commit the Template



GitHub Issues

- **Issues** are the way GitHub tracks things to do
  - They could be **Features Requests**
  - They could be **User Stories**
  - They could be **Bug Reports**
  - They could be just about anything you need them to be

Requirements for Hit Counter Service

- Create a simple hit counter api called: `/counter`
- Write it in Python Flask
- Setup Vagrant support so that developers can work locally
- Deploy to IBM Cloud
- Set up a DevOps Pipeline for continuous deployment into IBM Cloud
- Make the hit counter persistently survive service restarts
- Need Swagger API documentation
- Add the ability to use multiple counters
- Need the ability to remove a counter
- Need the ability to reset the counter
- Eventually make the hit counter deployable in Docker

User Stories

What Are User Stories?

- A user story represents a small piece of business value that a team can deliver in an iteration
- While traditional requirements (like use cases) try to be as detailed as possible, a user story is defined incrementally, in three stages:
    1. The brief description of the need
    2. The conversations that happen during backlog grooming and iteration planning to solidify the details
    3. The tests that confirm the story's satisfactory completion

INVEST

- Well-formed stories will meet the criteria of Bill Wake's INVEST acronym:

Independent	We want to be able to develop in any sequence
Negotiable	Avoid too much detail; keep them flexible so the team can adjust how much of the story to implement
Valuable	Users or customers get some value from the story
Estimatable	The team must be able to use them for planning
Small	Large stories are harder to estimate and plan. By the time of iteration planning, the story should be able to be designed, coded, and tested within the iteration
Testable	Document acceptance criteria, or the definition of done for the story, which lead to test cases

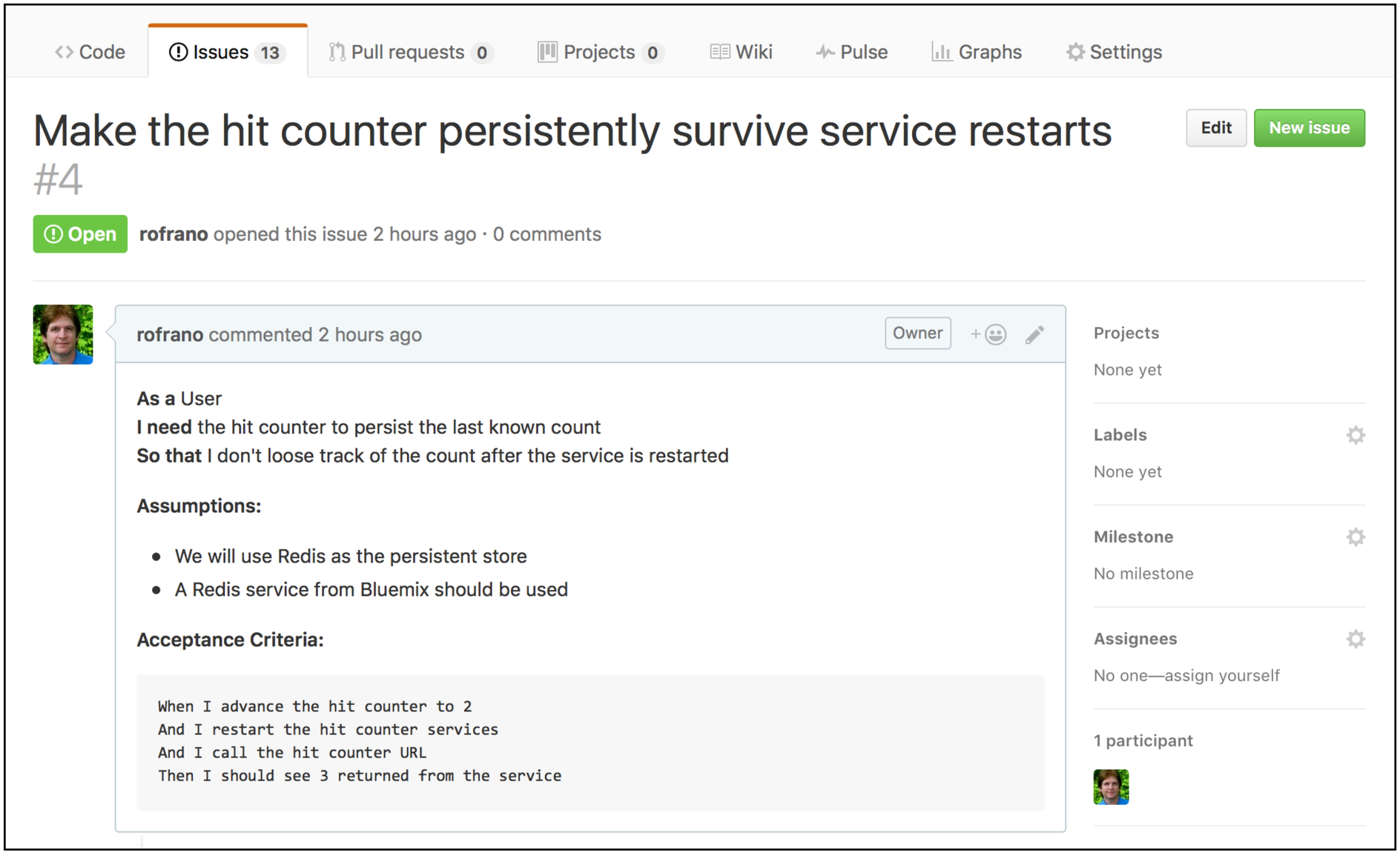
Story driven development

- User Stories document a persona requesting a function to achieve a goal
- The typical form is as follows:
  - **As a** <*some role*>
  - **I need** <*some function*>
  - **So that** <*i get some benefit*>
- User Stories can be entered into GitHub as **Issues**

Defining Done

- I like to include the following in each User Story
- **Assumptions**
  - List any assumptions about how to implement the Story
- **Acceptance Criteria**
  - Define what it means to be "*done*"

Example User Story



Make the hit counter persistently survive service restarts

As a User
I need the hit counter to persist the last known count
So that I don't loose track of the count after the service is restarted

Assumptions:

- We will use Redis as the persistent store
- A Redis service from Bluemix should be used

Acceptance Criteria:

```
When I advance the hit counter to 2
And  I restart the hit counter services
And  I call the hit counter URL
Then I should see 3 returned from the service
```

Template for Bug Reports

500 Server Error (TypeError) if ContentType is not set

If you send a request without setting the `ContentType` to `application/json` the app throws a TypeError when trying to validate the data.

Steps to Reproduce:
Send a `post /pets` to create a new pet but to don't set the `ContentType` in the header

Expected Result:
400 Bad Request

Observed Result:
500 Server Error

Template for Bug Reports

500 Server Error (TypeError) if ContentType is not set

If you send a request without setting the `ContentType`
throws a TypeError when trying to validate the data

Steps to Reproduce:
Send a `post /pets` to create a new pet but to don't s

Expected Result:
400 Bad Request

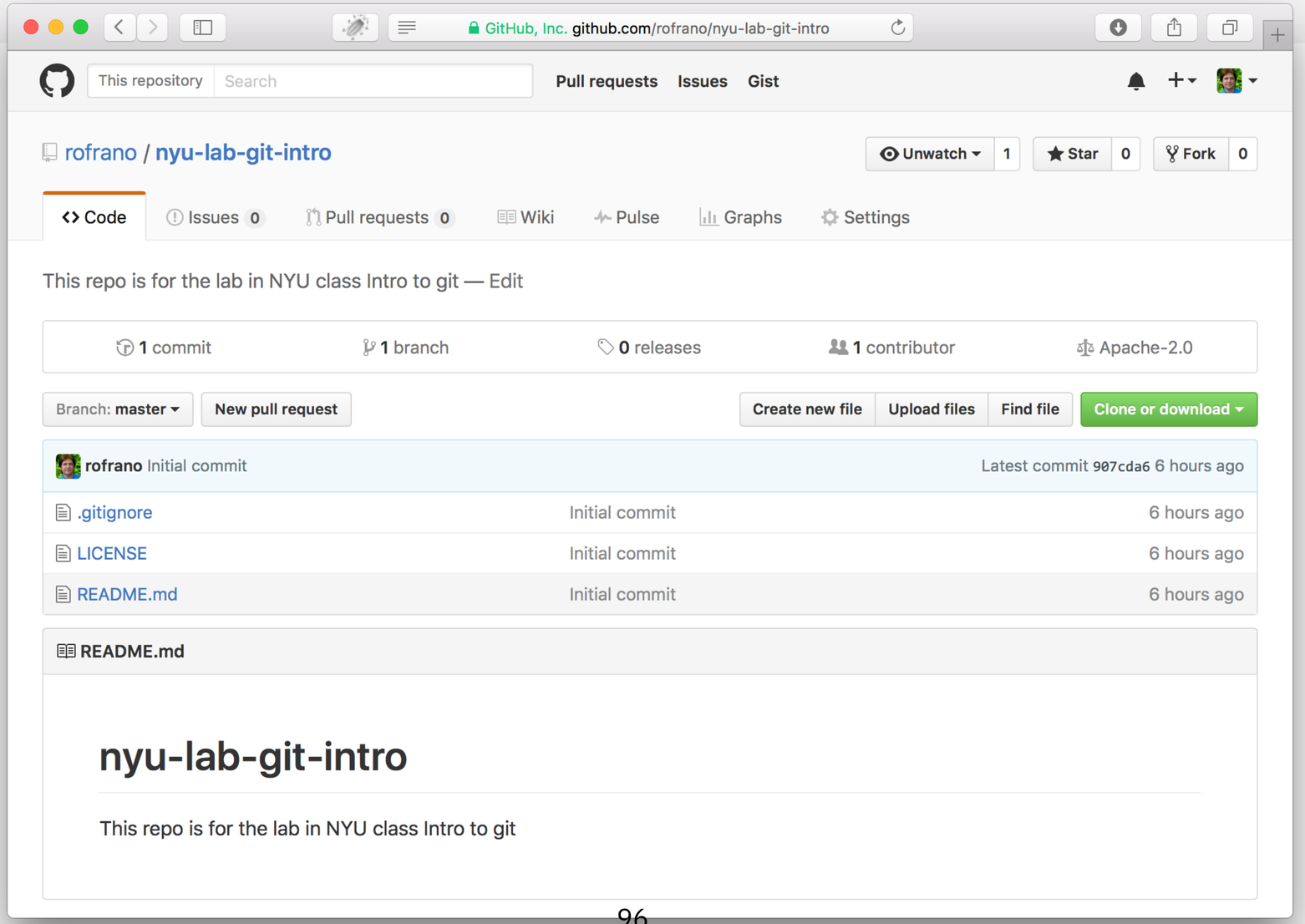
Observed Result:
500 Server Error

All bug reports should have a good title, meaningful description, steps to reproduce, and the expected and observed result

Hypothesis driven development

- Hypotheses pair a statement that asserts or predicts value with a testable condition that can be measured.
- The typical form is as follows:
  - **We believe that** <*function*>
  - **Will lead to** <*outcome*>
  - **And this will be proven when** <*measurable condition*>
- Where possible, the signal that is being measured should be an *actionable* metric and not a *vanity metric*

We Need an Issue to Work On



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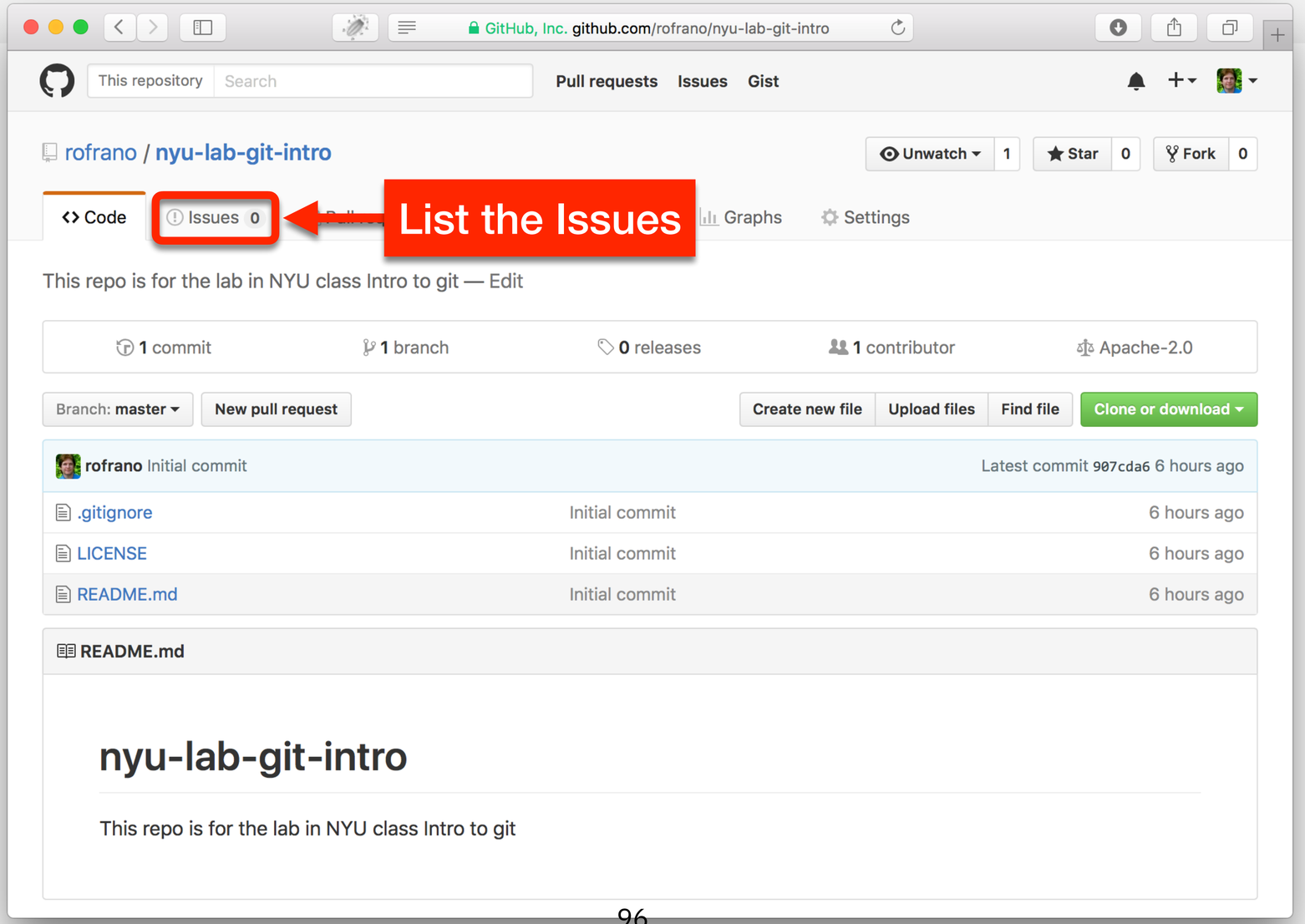
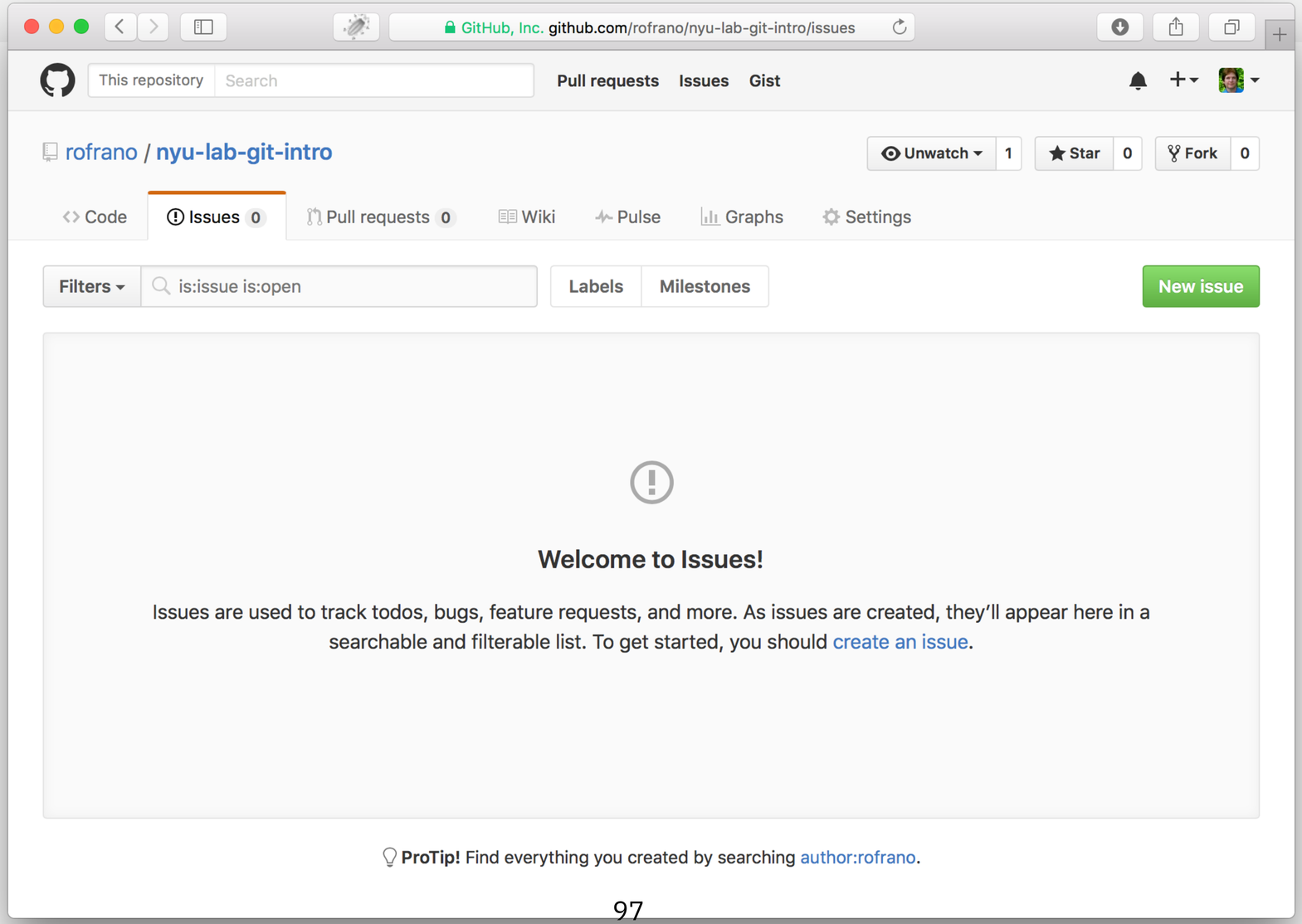


Create a New Issue



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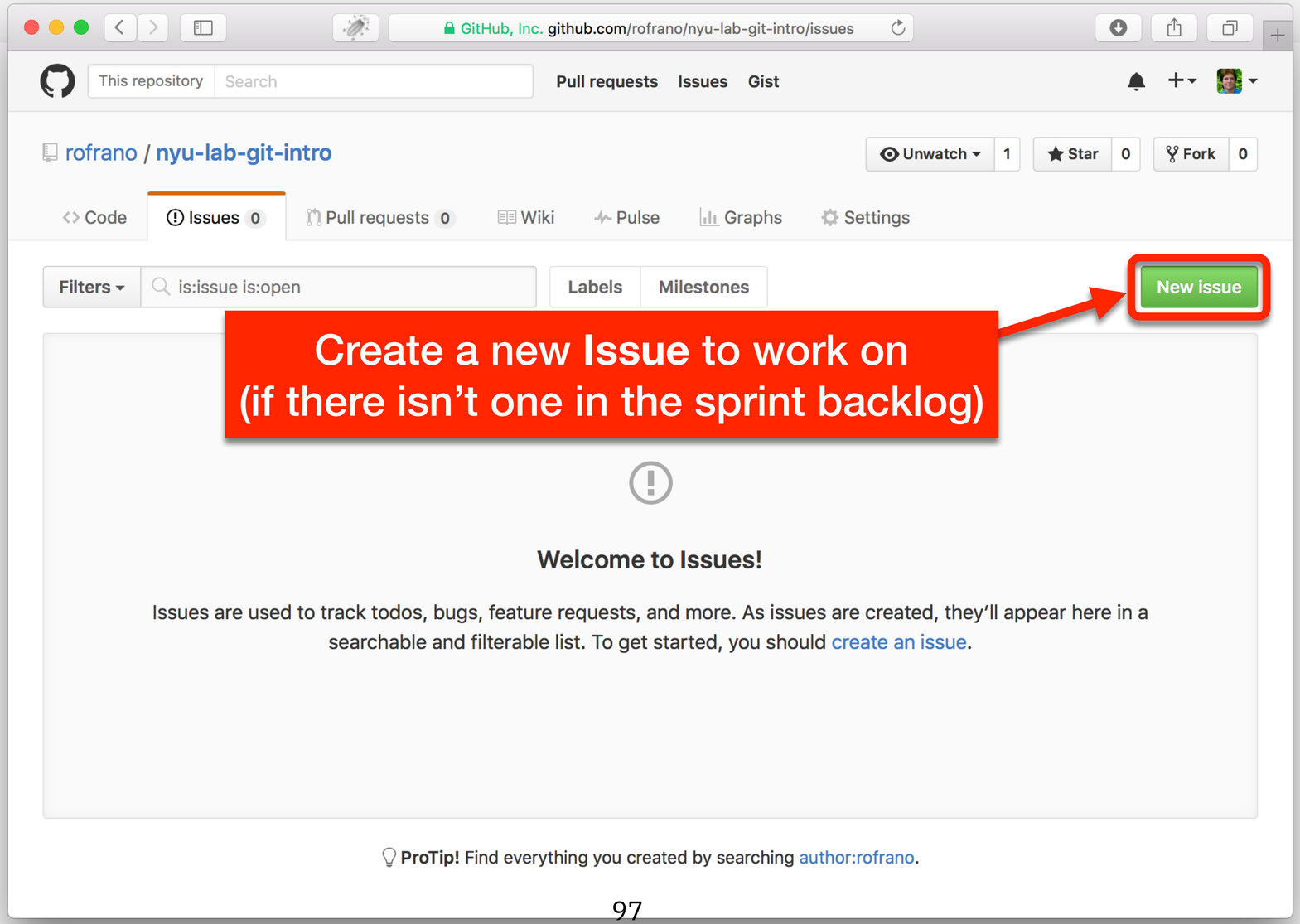
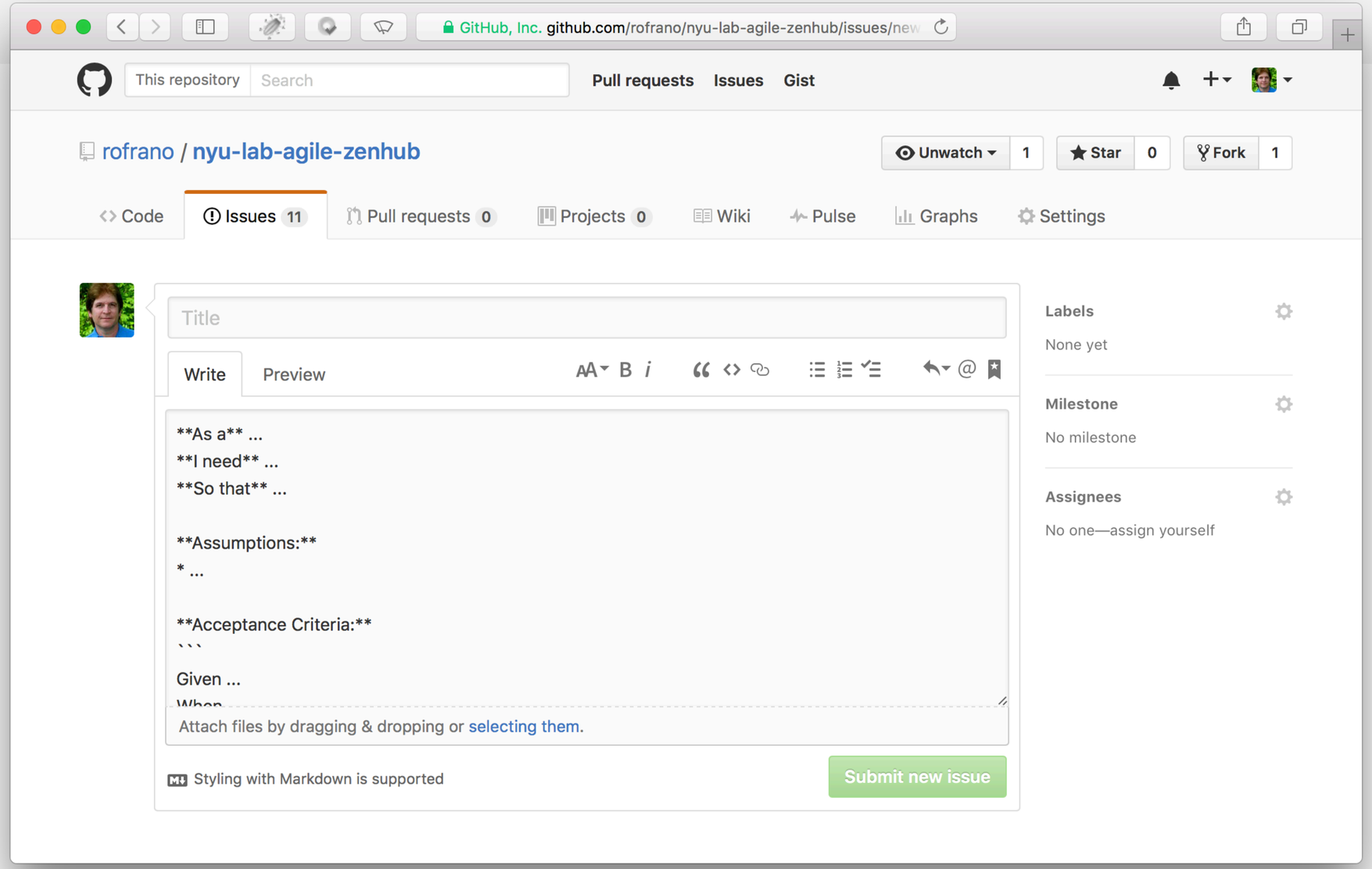
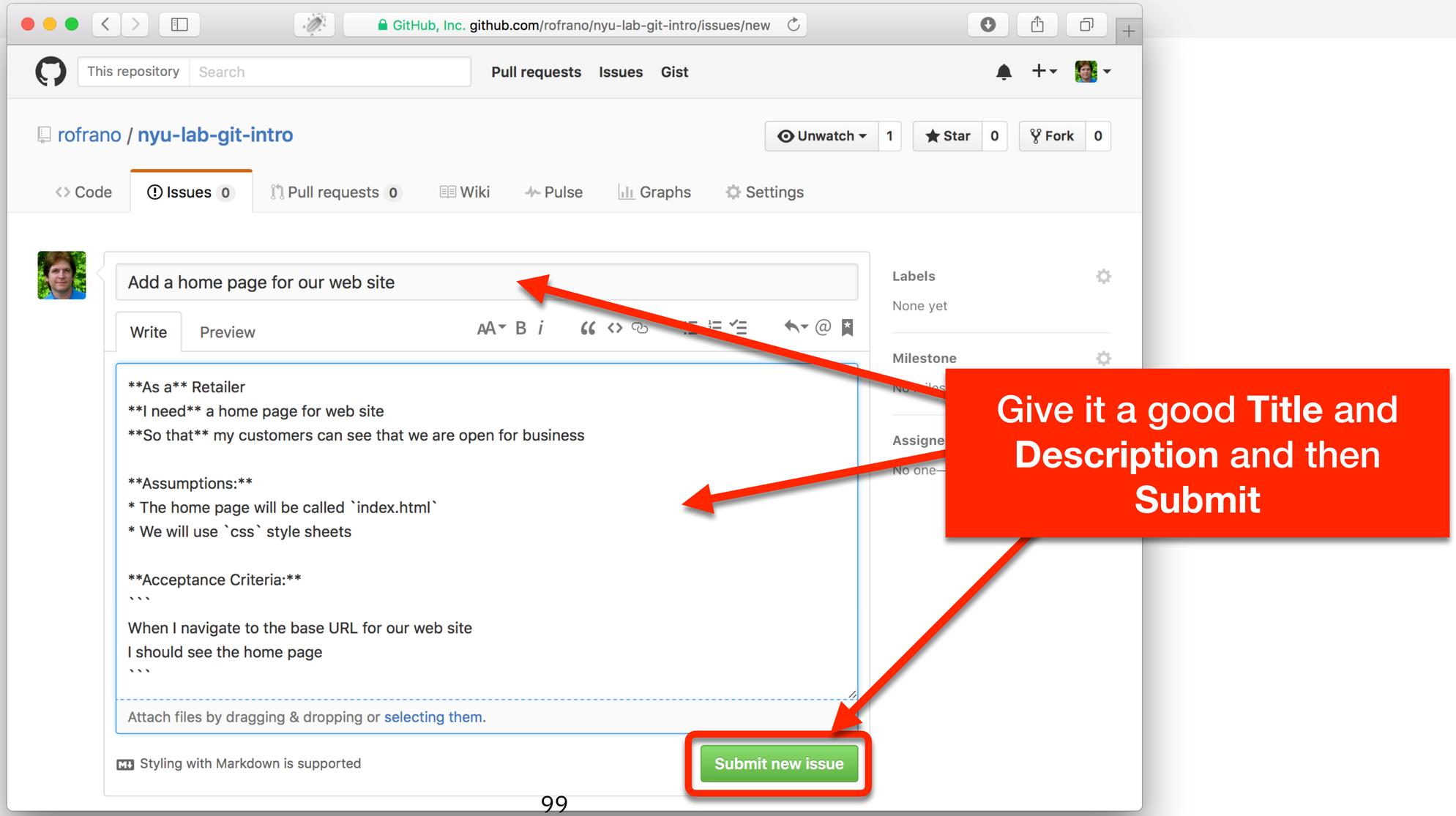


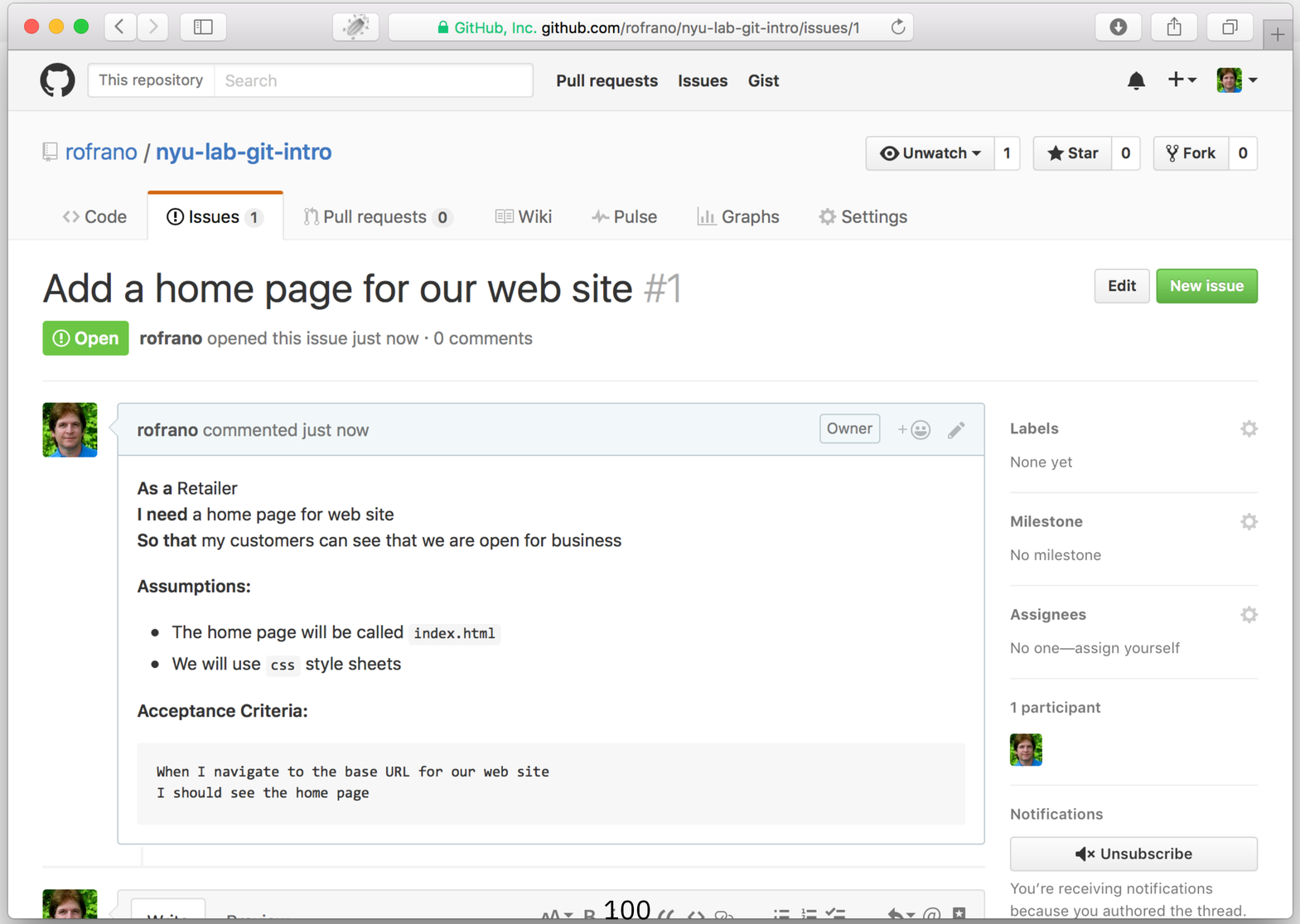
New Issue Page



Fill Out The Issue



Issues are Assigned Numbers



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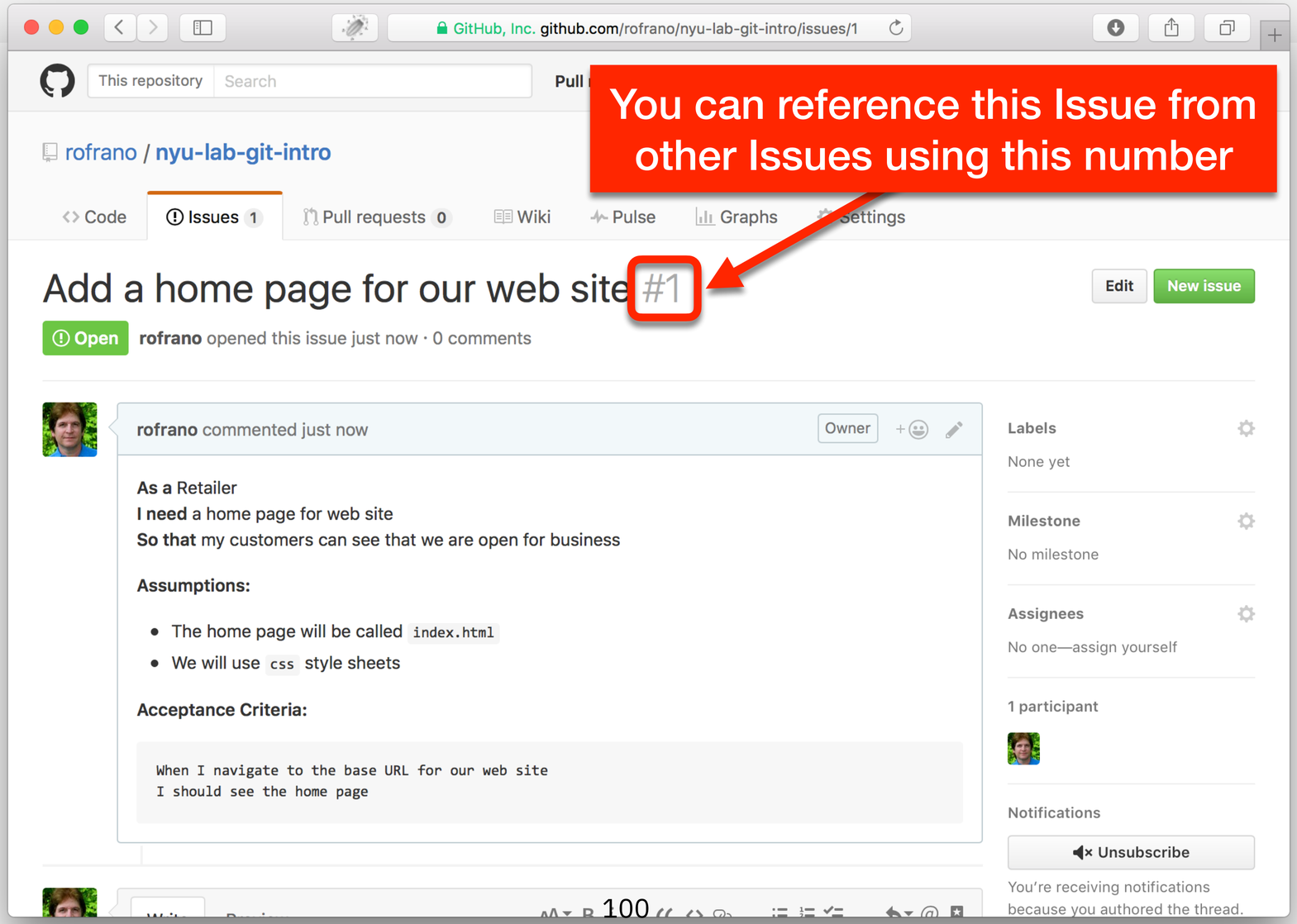
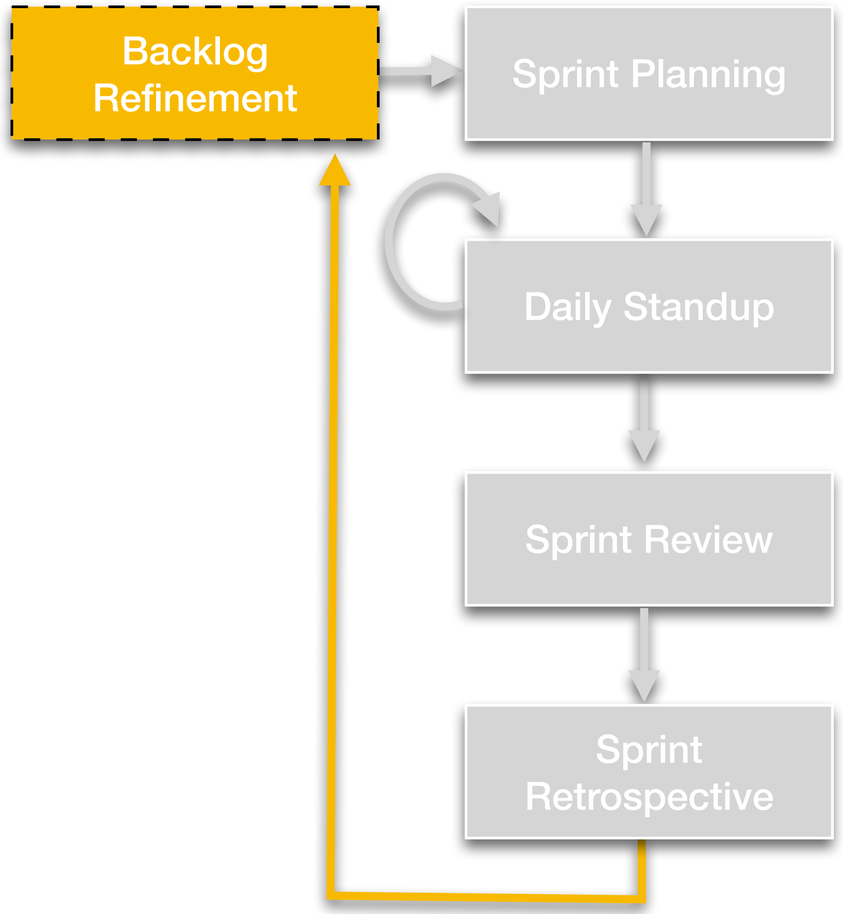



BUSINESS SOLUTION
GLOBAL NETWORK

Backlog Refinement

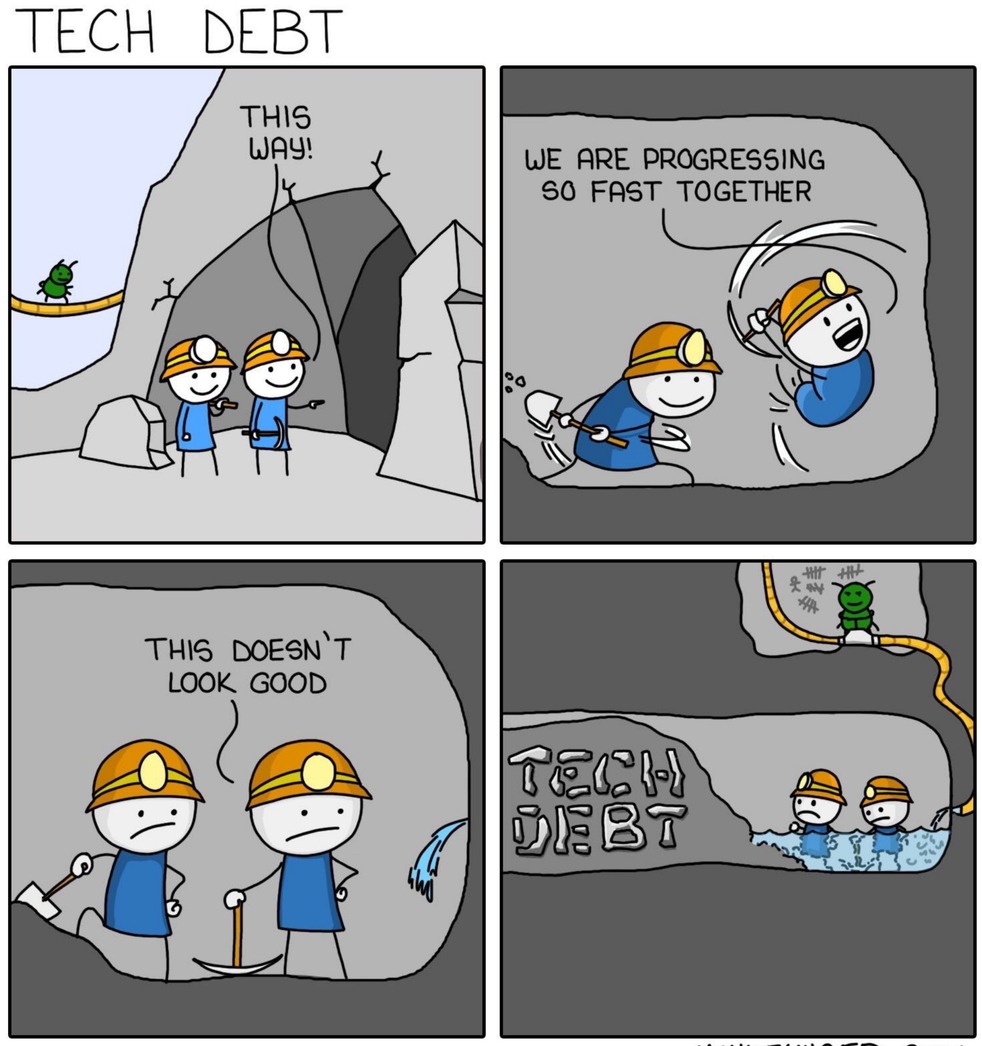
Mechanics of Backlog Refinement

- Goal: At the end of Backlog Refinement the New Issues column is empty
- Take Stories from New Issues and...
  - Move them into the ranked Backlog if they will be worked on soon
  - Move them into the Ice Box if they are a good idea but not now
  - Reject them if they are not where you want to go
- Groom the Backlog by ranking the Stories in order of importance and making sure the story contains enough information for a developer to start working on it

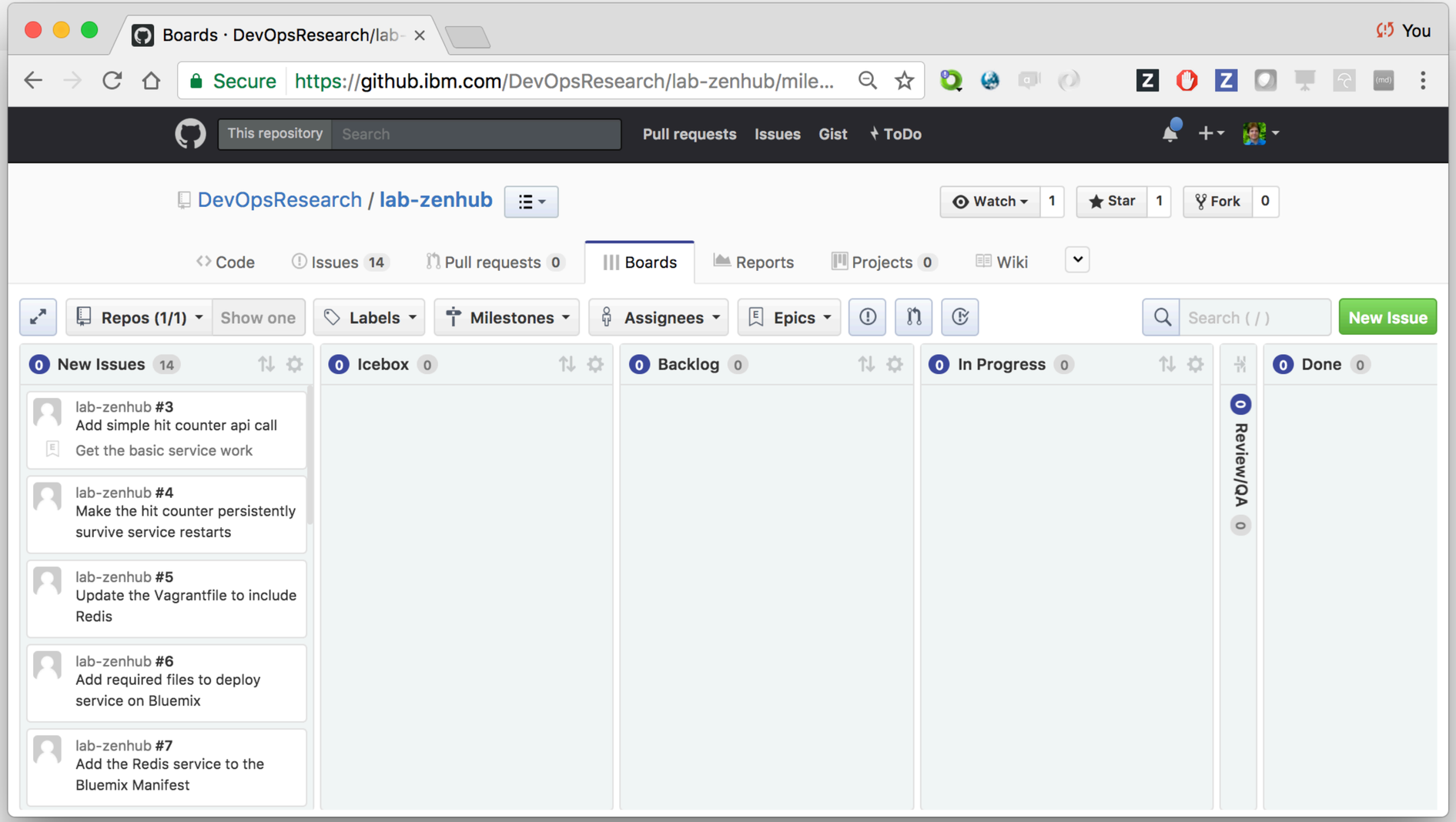


Technical Debt

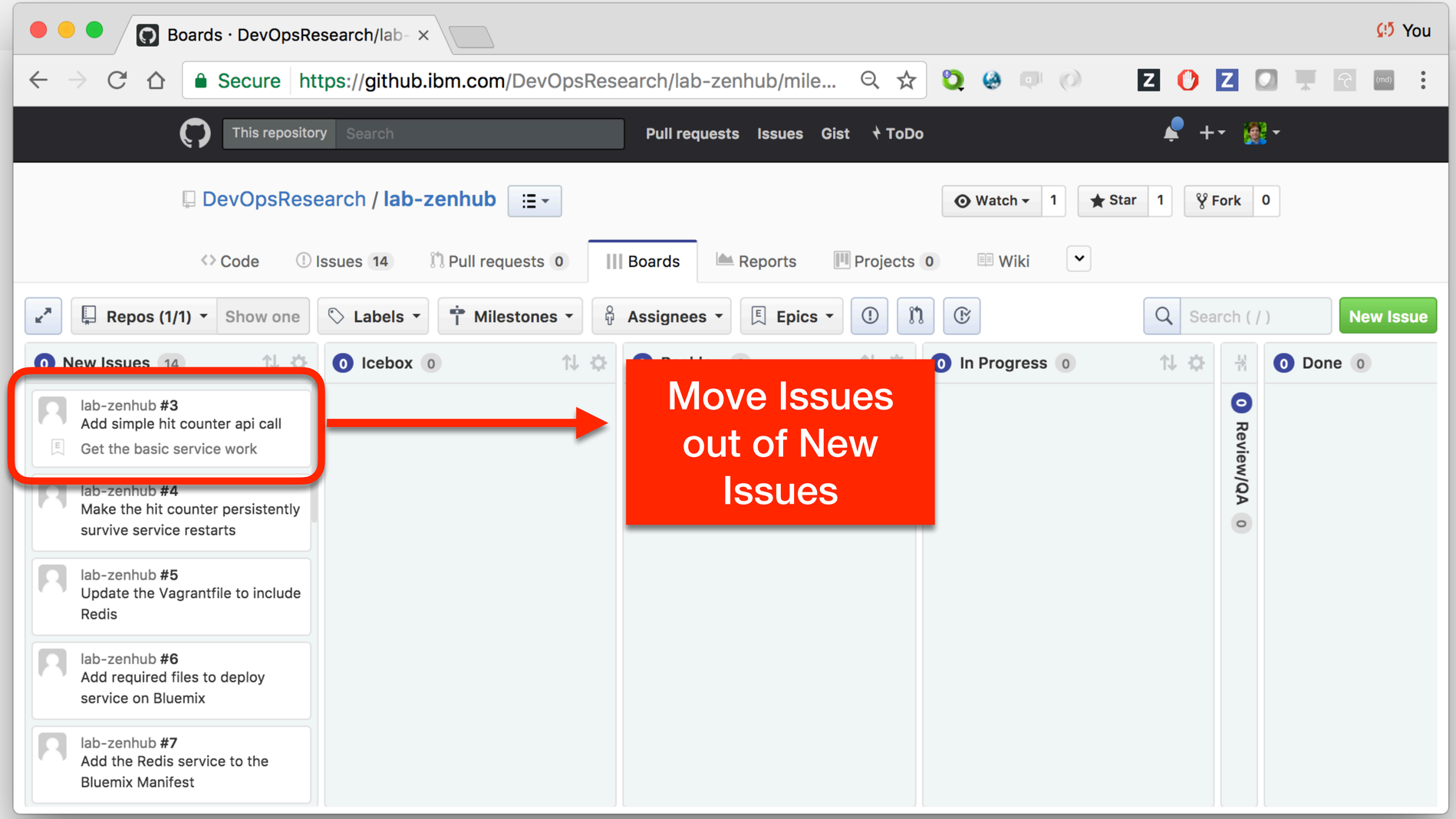
- Technical debt is anything you need to do that doesn't involve creating a new feature
- Technical debt builds up when you take shortcuts
- Examples of Technical Debt:
  - Code refactoring
  - Setup and maintenance of environments
  - Changing technology like databases



Accept or Reject Open Issues



Accept or Reject Open Issues

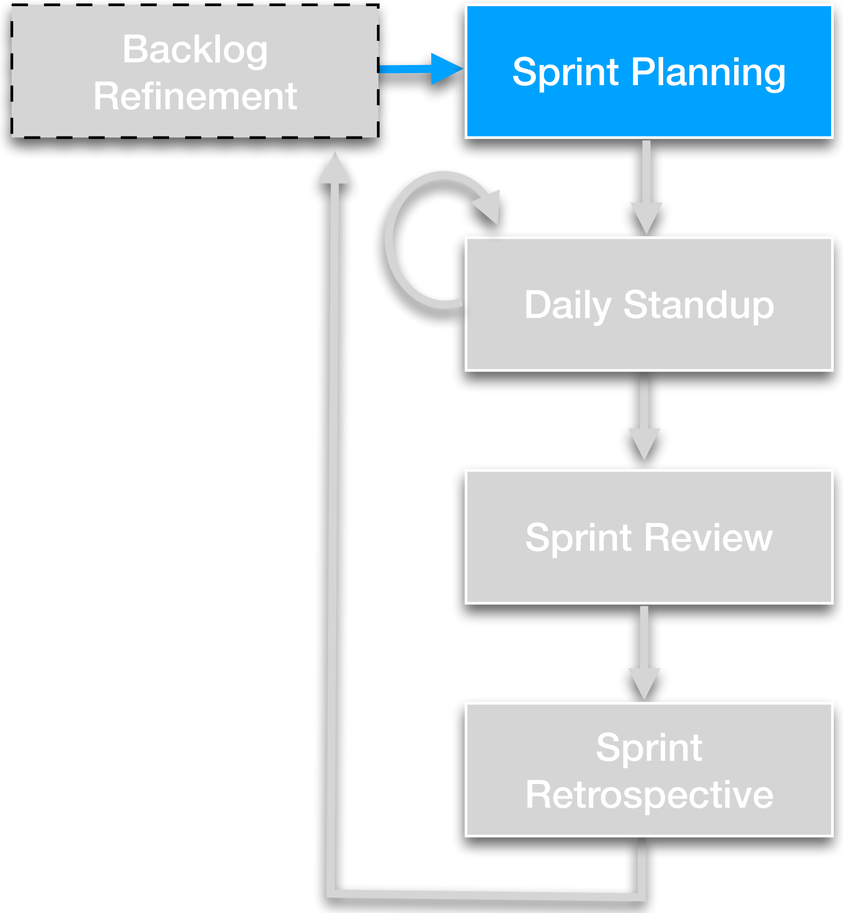


Sprint Planning

Sprint Planning

Attendees: Product Owner, Scrum Master, Development Team

- The Product Owner is responsible for declaring which Product Backlog Items are the most important to the business during Backlog Refinement
- The Development Team looks at the latest product Increment, projected velocity, and past performance. Based on the data, the Development Team forecast what can be achieved.
- The team Assigns work from the Product Backlog to the Sprint Milestone.
- Plan to spend 4 hours for a 2 week sprint



Sprint Planning

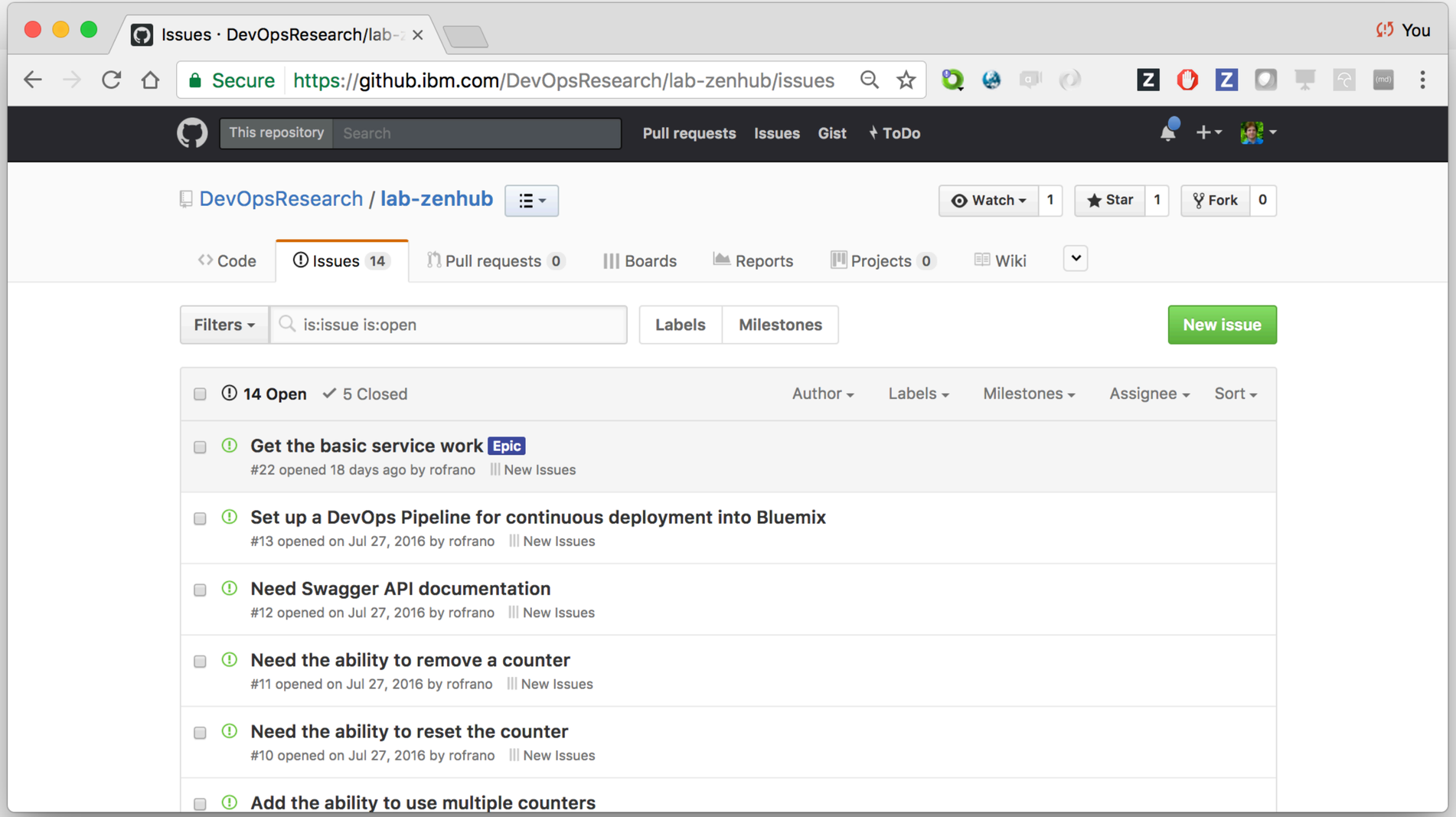
- Steps for creating a Sprint Plan:

  1. Create a Milestone for the Sprint
  2. Assign Issues from the Backlog to the Milestone
  3. Filter ZenHub by the Milestone to work the plan

Sprint Planning Goals

- Each Sprint should have a clearly defined Business Goal
- The Product Owner comes with a proposal of the Sprint Goal and Product Backlog Items supporting it.
- The whole Scrum Team collaborates on crafting the Sprint Goal, so everybody understands why we are building the Increment.

Create a Milestone



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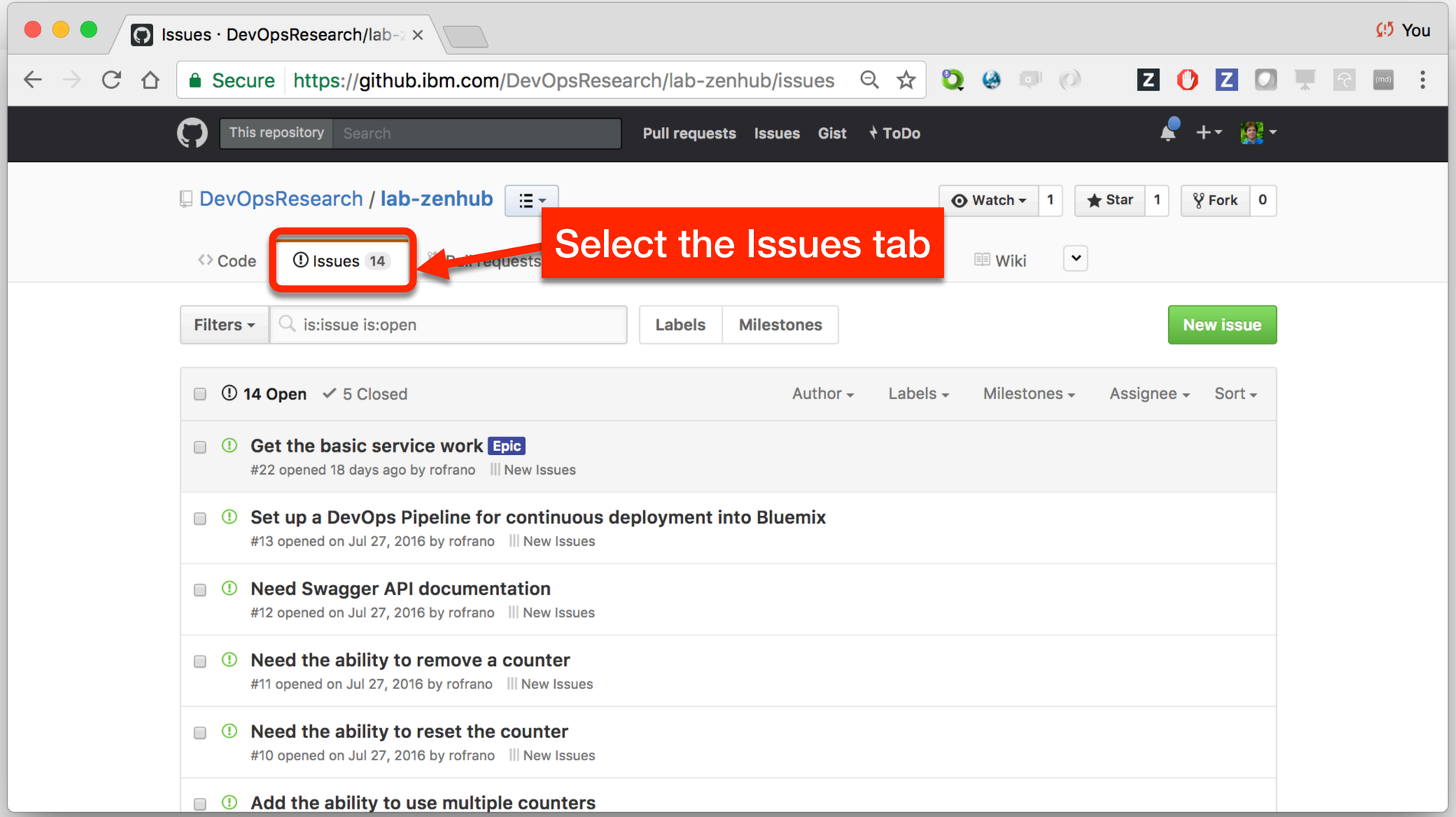

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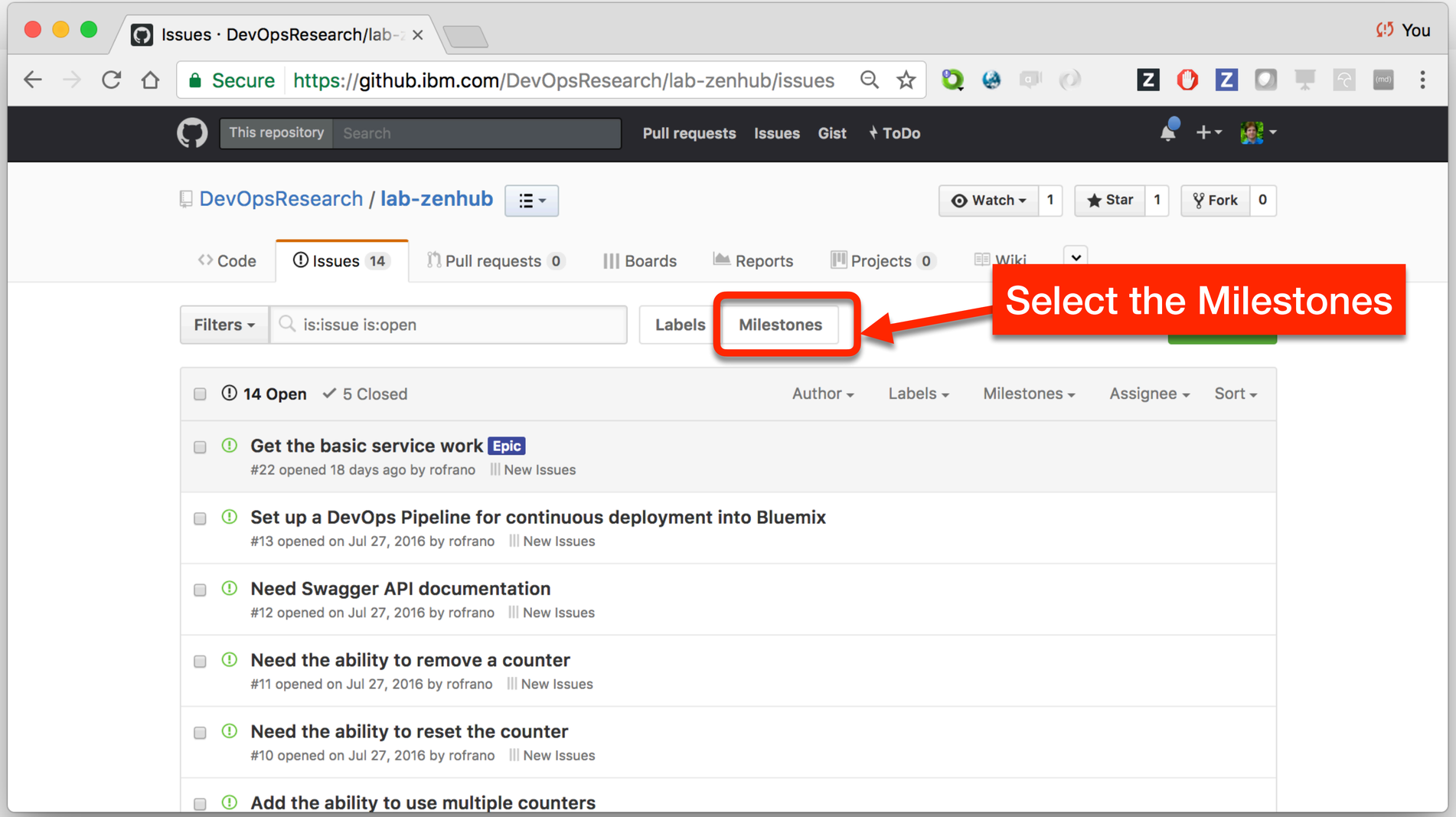
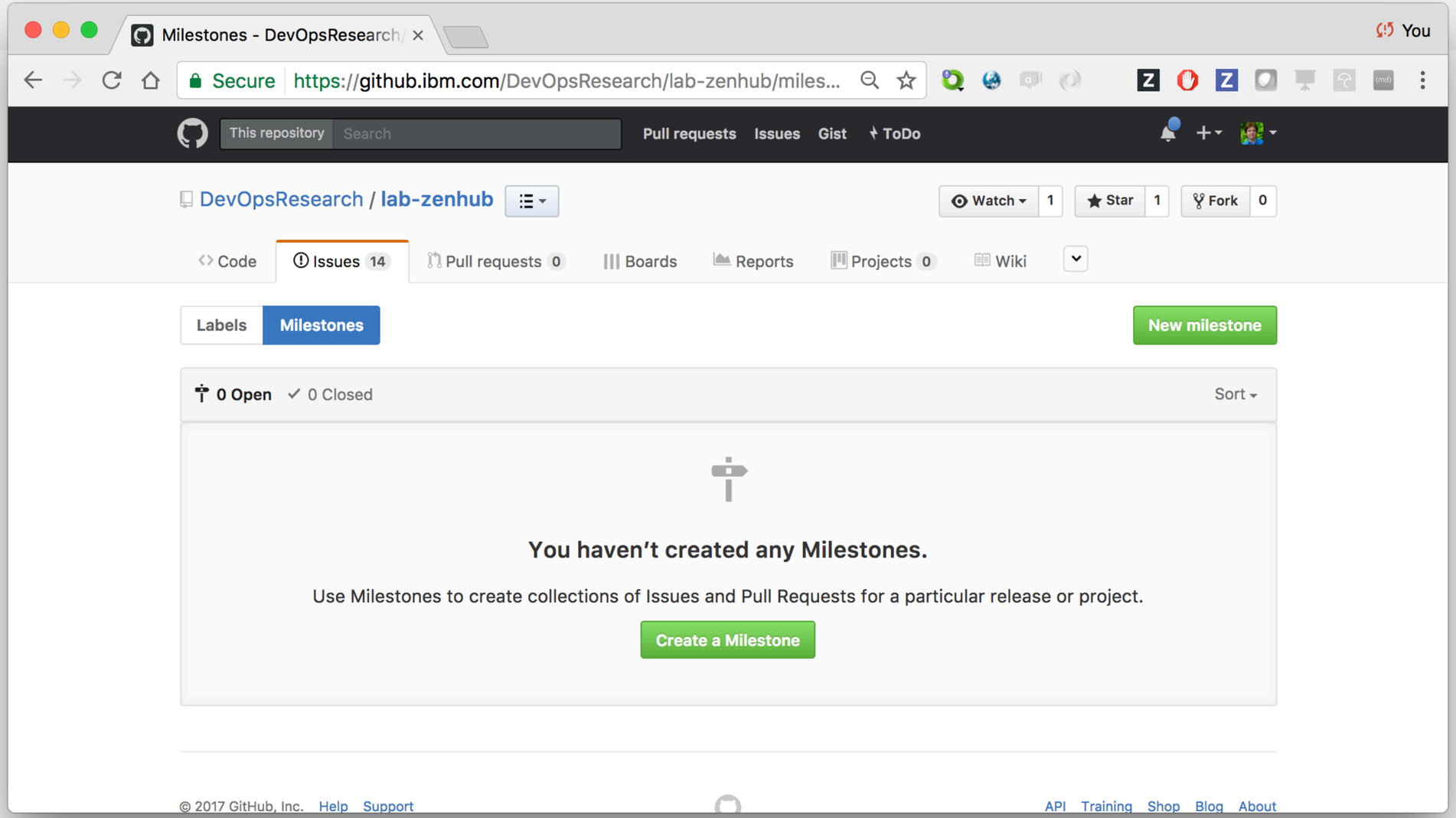


Select New Milestone



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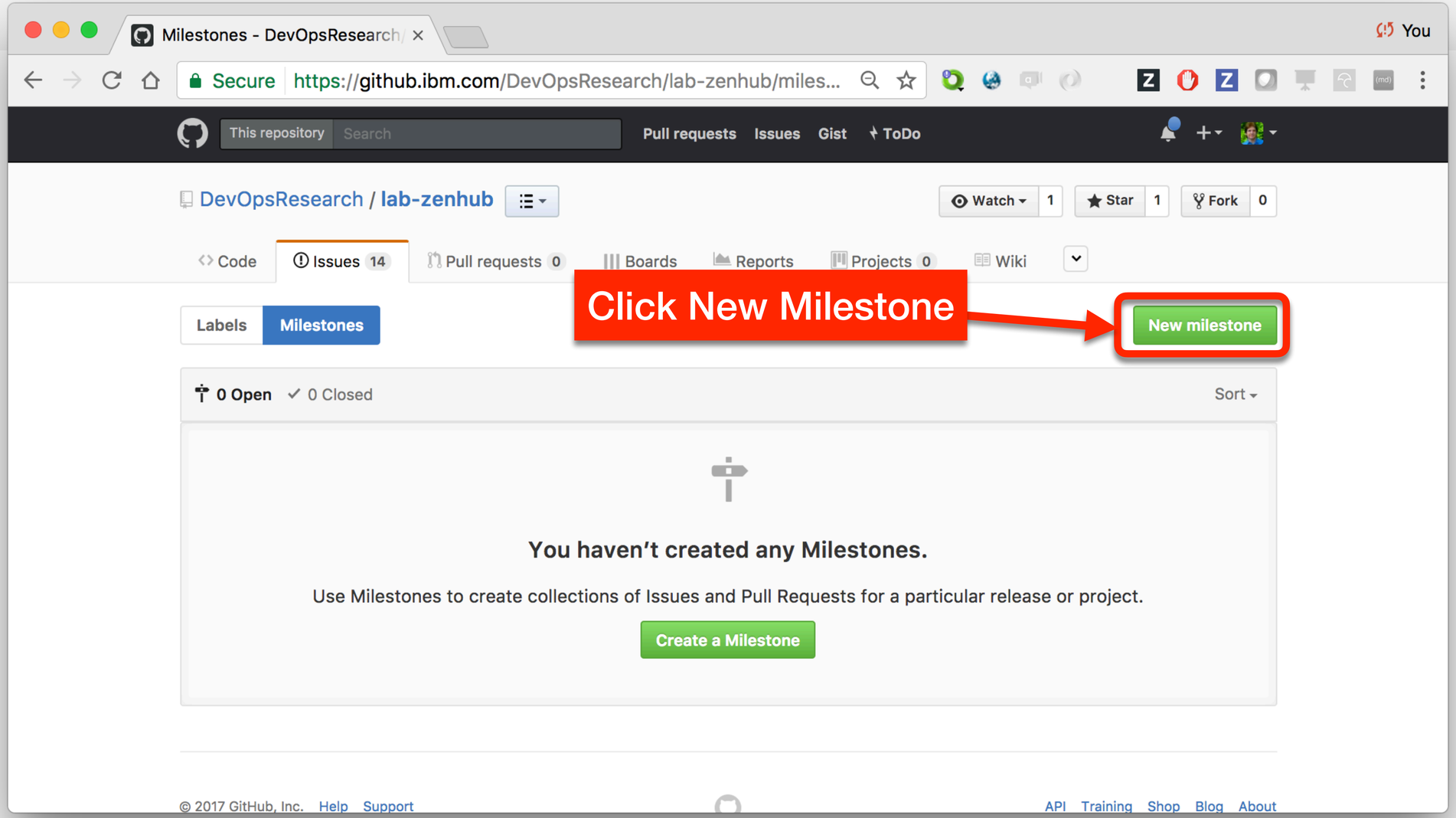

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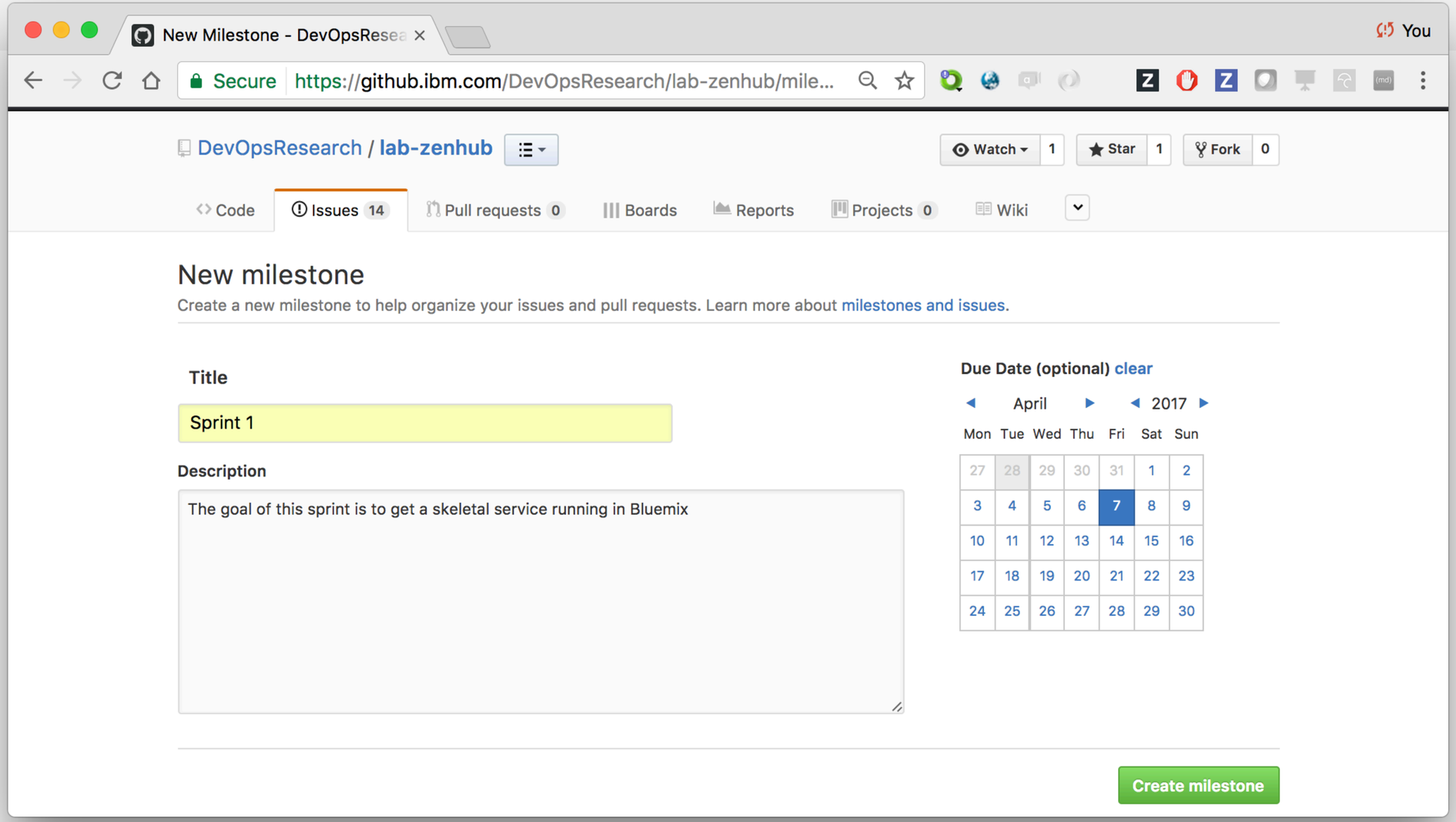

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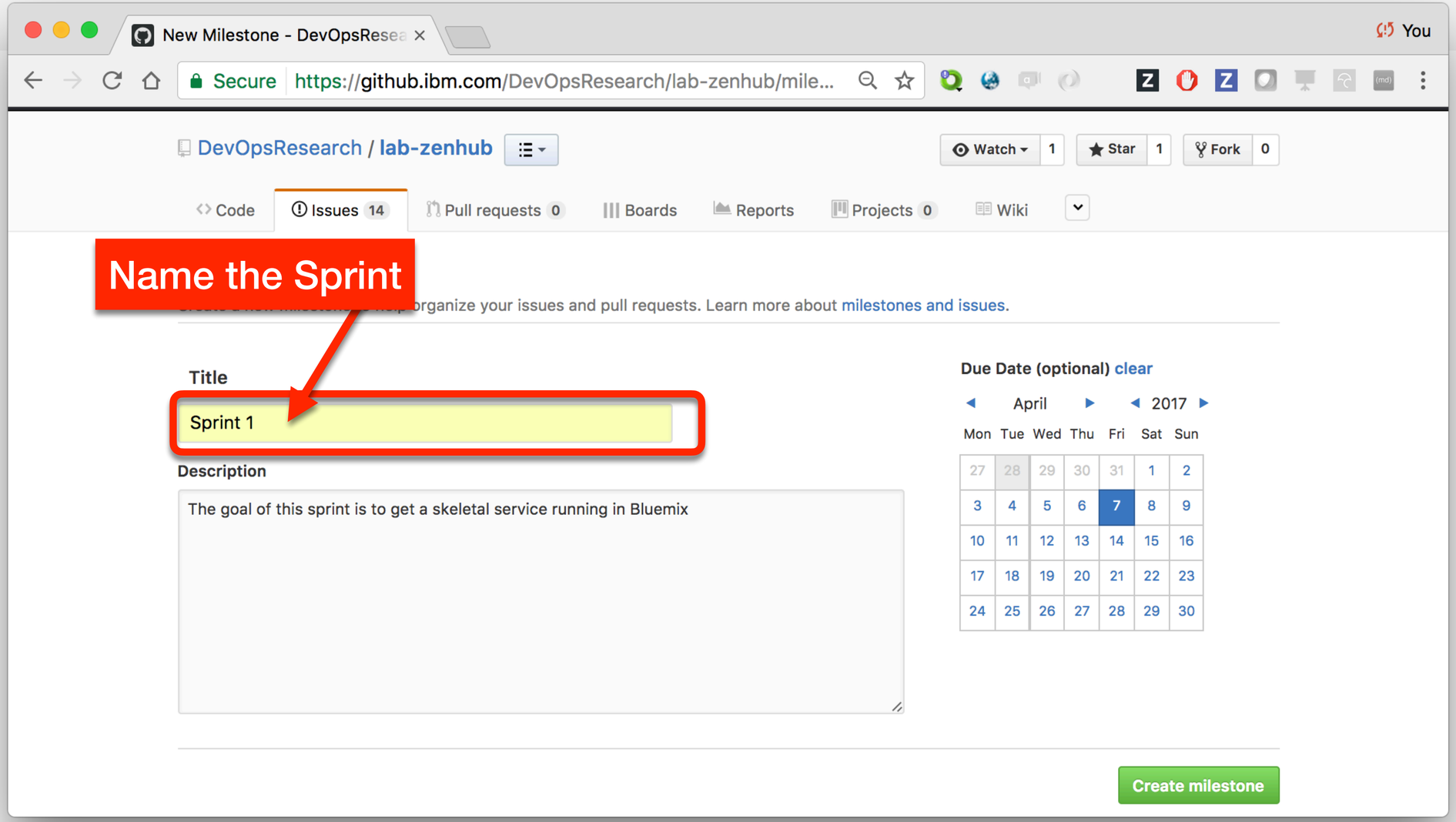

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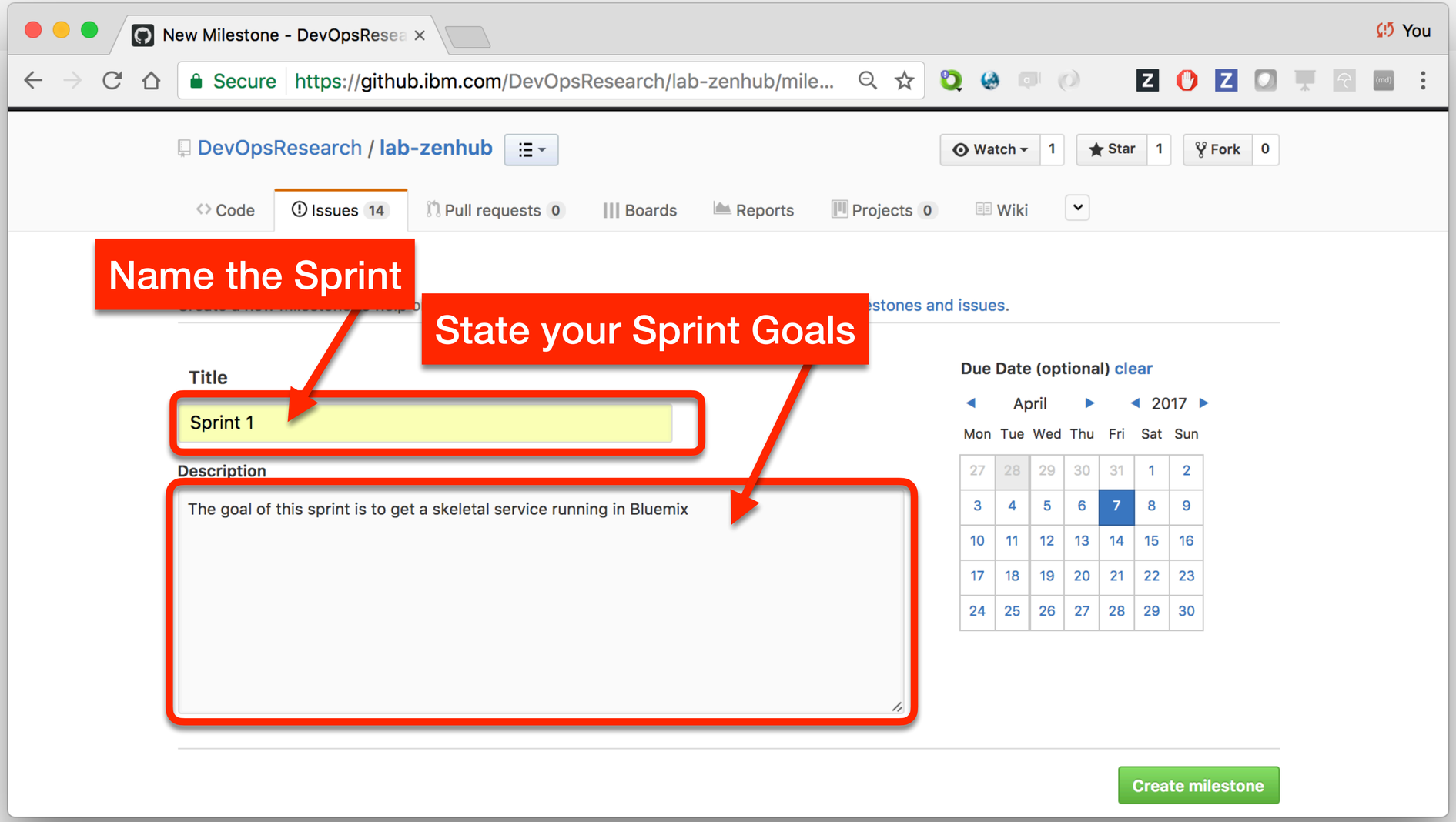

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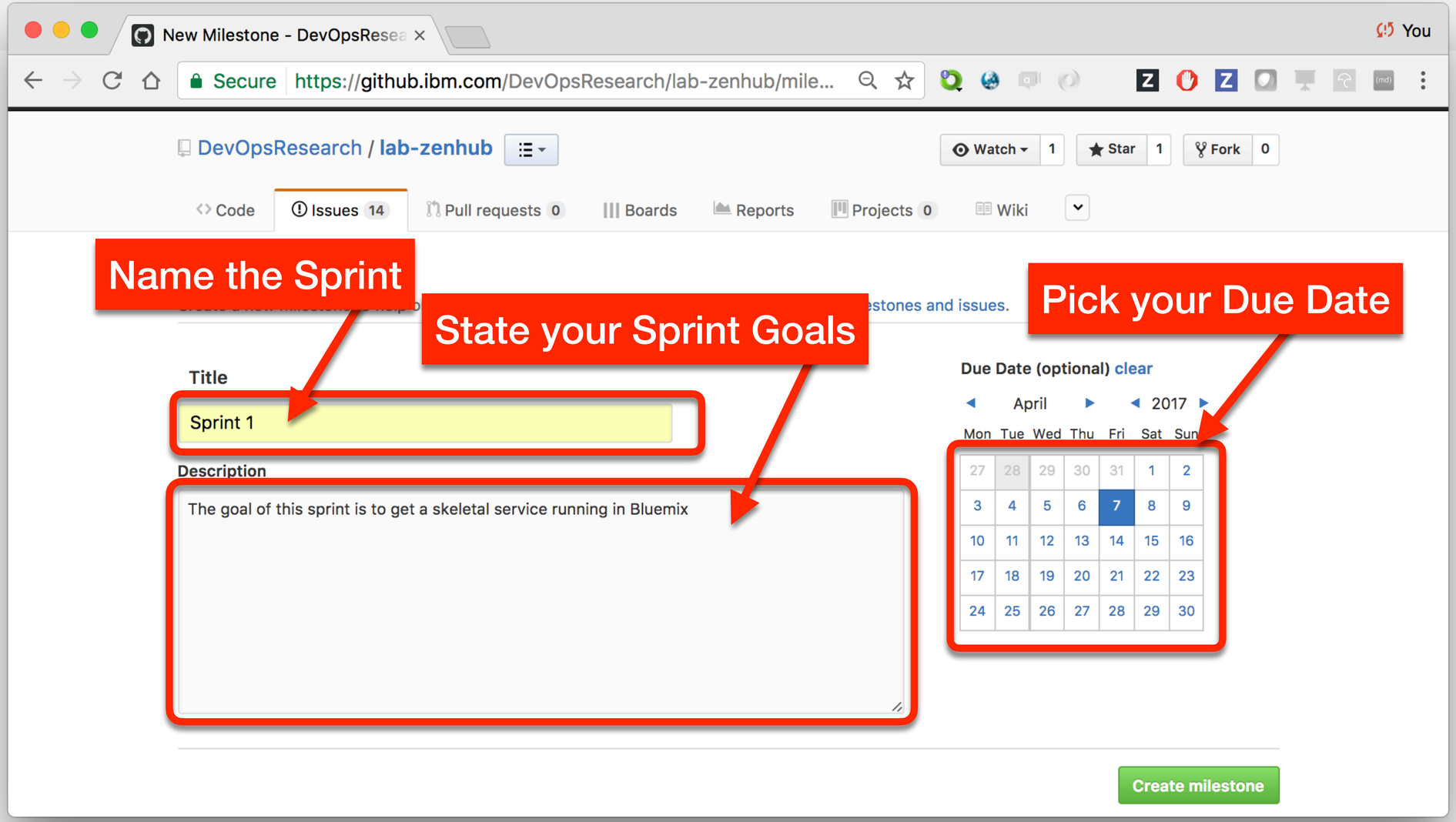

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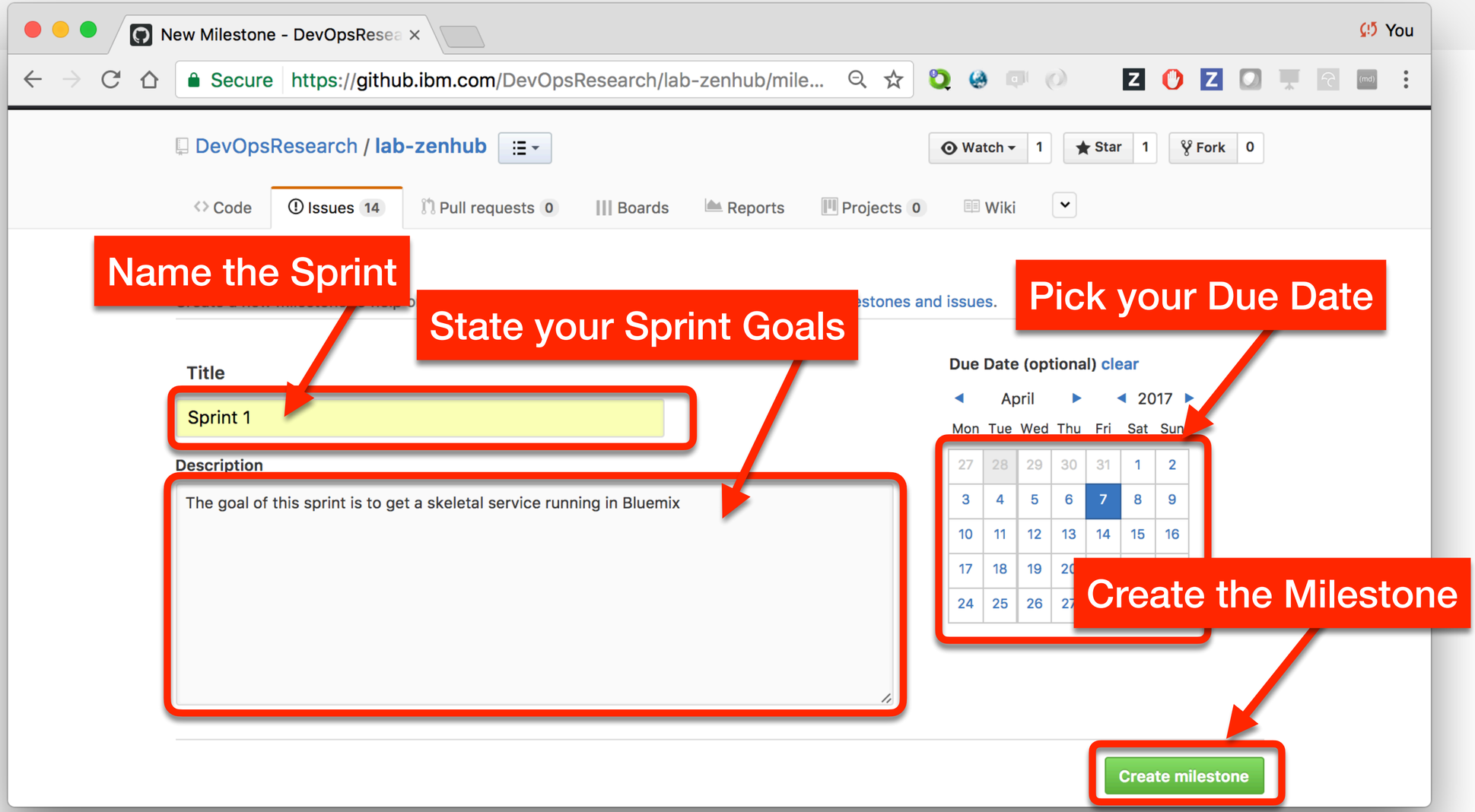


Mechanics of Sprint Planning

- Take Issues from the top of the ranked Backlog and assign them to the Sprint Milestone
- Groom the Story by clarifying and assigning Story Points, Labels, and making sure the story contain enough information for a developer to start working on it
- Stop adding Stories when your team’s Velocity is reached

Team Velocity

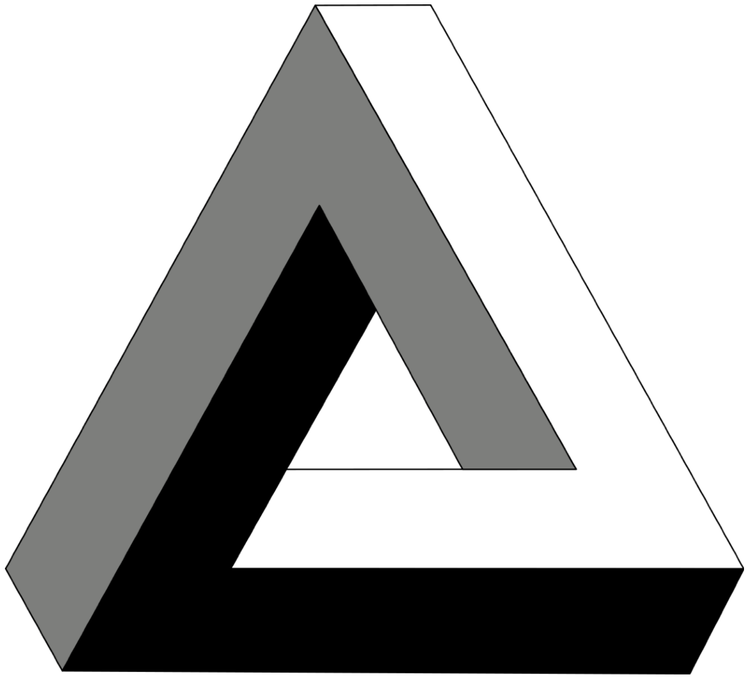
- The number of Story Points a team can complete in a single Sprint
- This will change over time as the team gets better at estimating and better at executing
- The Velocity is unique to the team because the story point assignment is unique to the team

Story Points

- Story Points acknowledge the fact that sizing using absolute time-to-complete is highly inaccurate so it uses an estimate of complexity
- It is measurement of a feature’s size *relative* to other features usually expressed in T-Shirt sized (S, M, L, X) or Fibonacci numbers (1, 2, 3, 5, 8, 13, 21)
- The important thing is to agree on "average" and evaluate from that (i.e., is it the same, larger, or smaller than average)

What Does a Story point measure?

Effort



Complexity

Uncertainty

What Size Should A User Story Be?

- A Story should be small enough to be coded and tested within a single Sprint iteration — ideally just a few days
- When a Story is too large in scope it is considered to be an Epic
- Backlog items tend to start as Epics when they are lower priority and less defined
- For sprint planning, Epics should be broken down into smaller stories, but not so small that you have moved into detailed design.

How Tall Are These Buildings?

This is sometimes called "Planning Poker"

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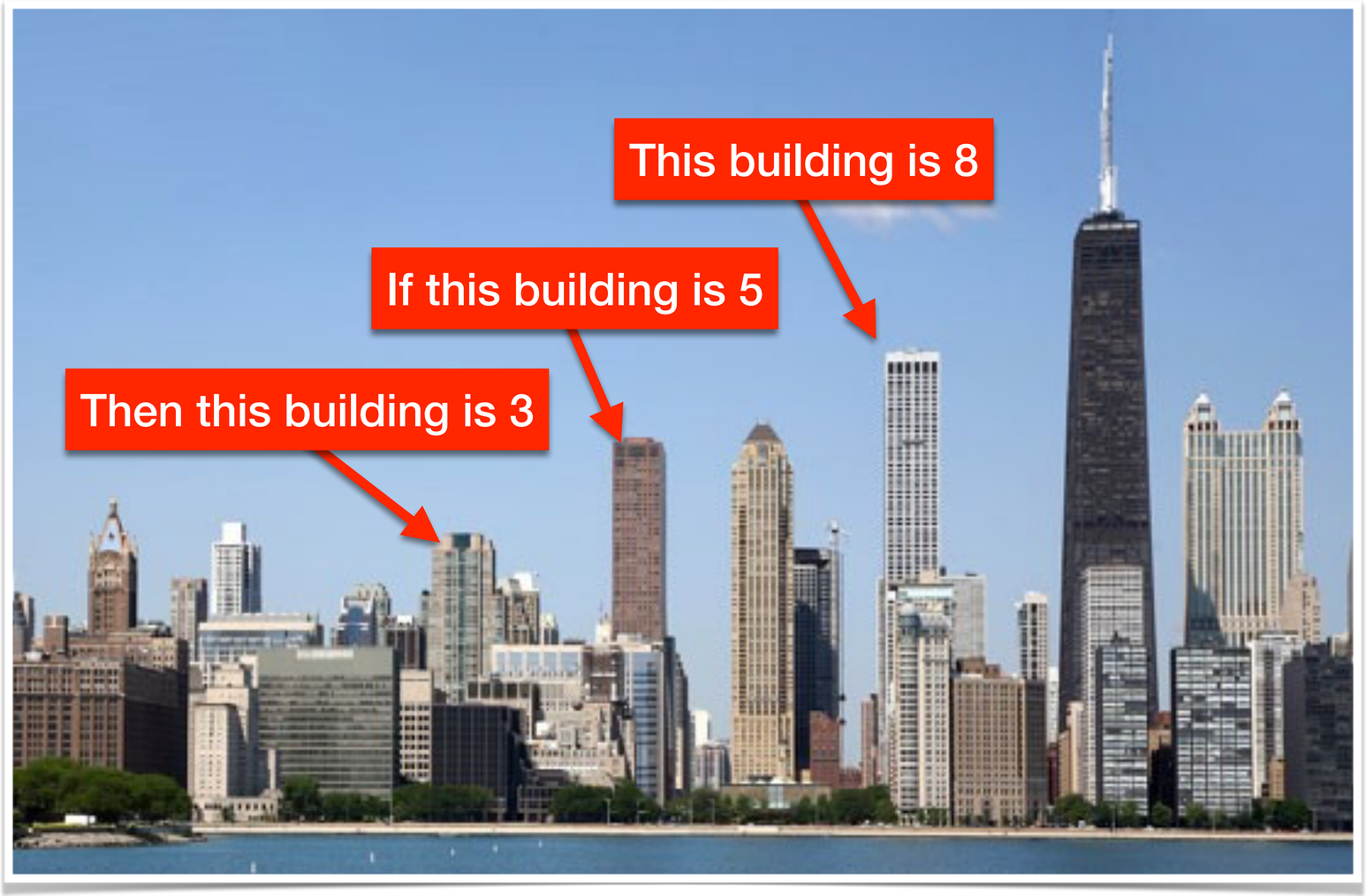

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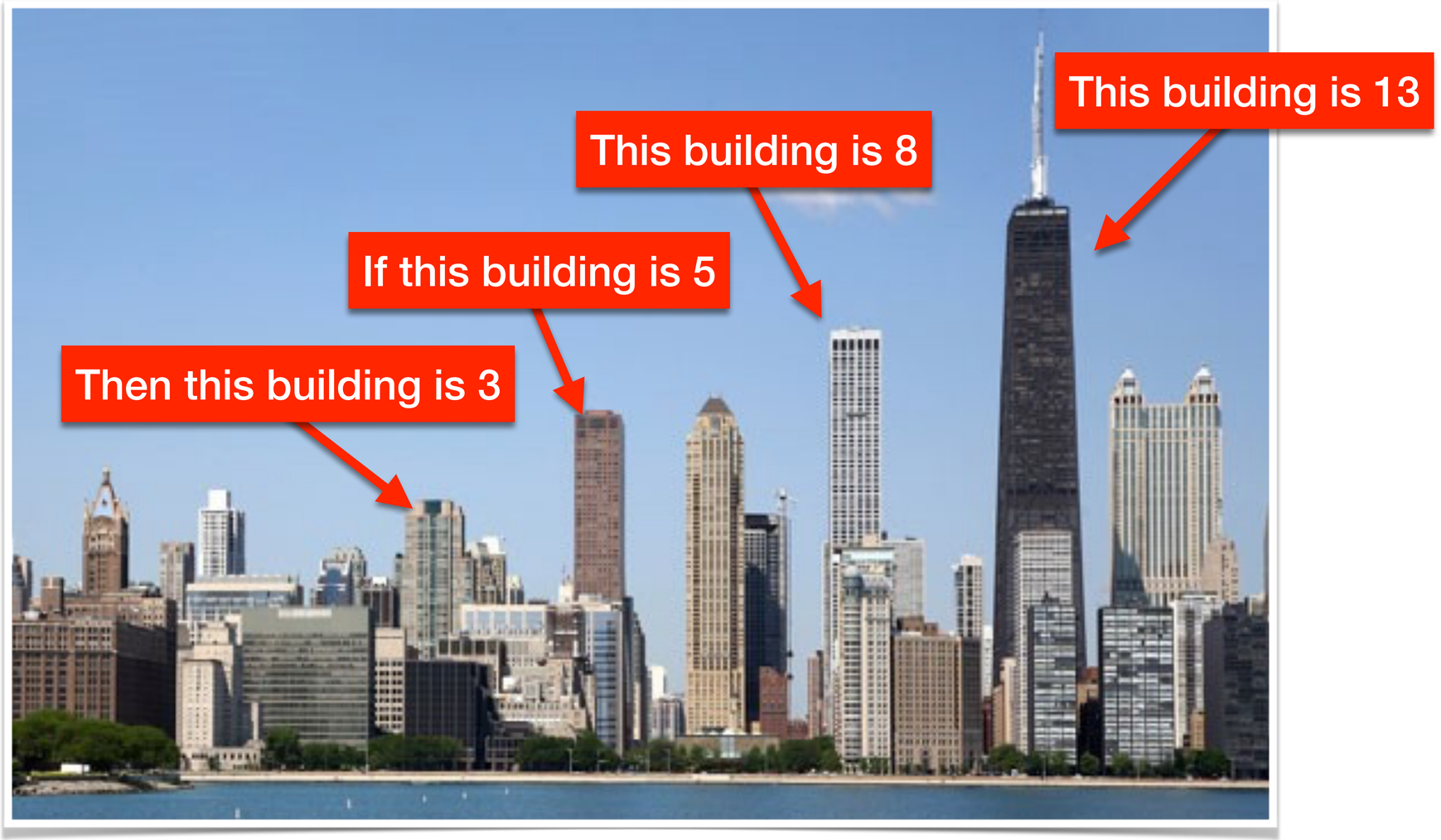
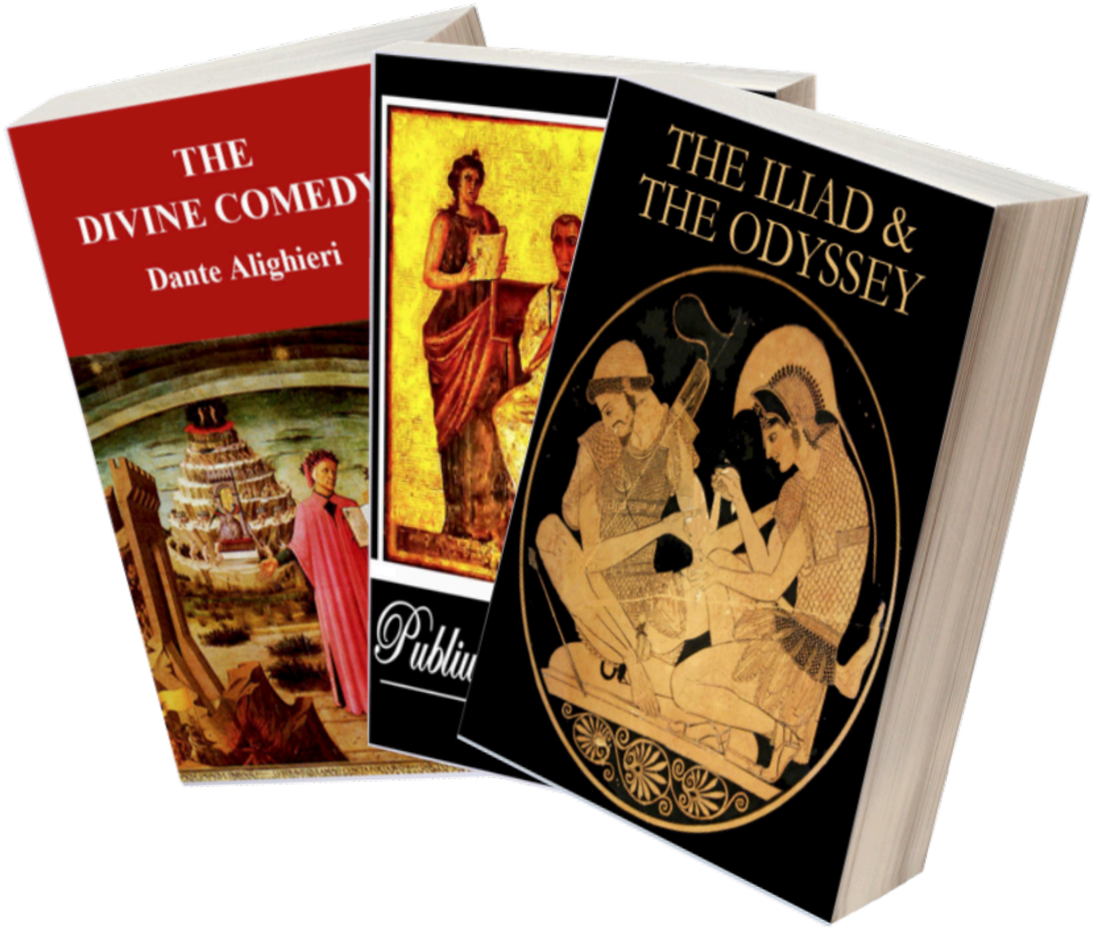


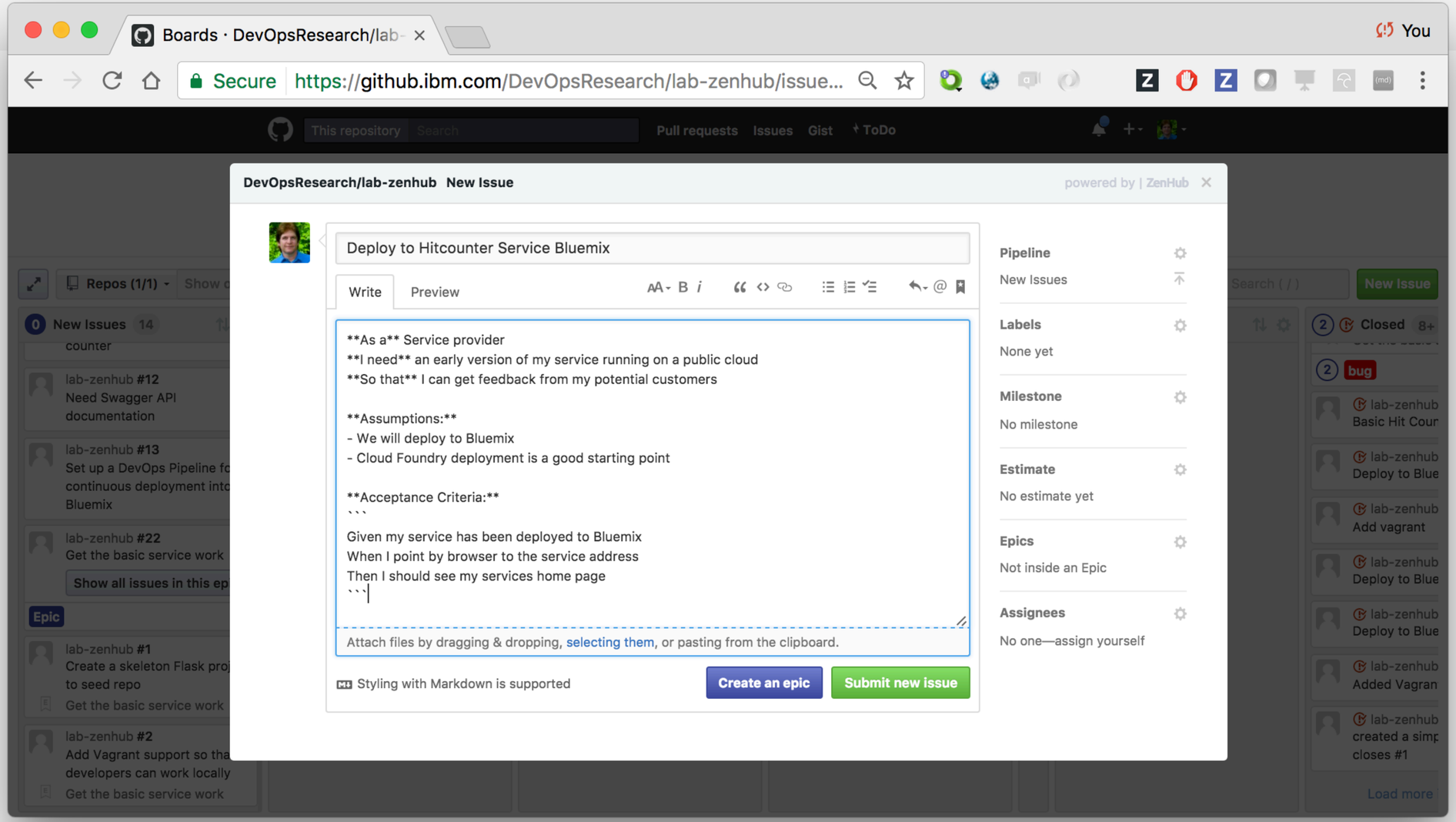
What about really big Ideas?

Epics

- Epics are Stories that are so big, they need to be broken up into smaller Stories
  - A single Story should be smaller than a Sprint
  - Epics are usually larger than a Sprint
- Epics are a way of grouping Stories with a common goal together
- Epics can be *larger* than a Milestone



Let’s Make an Epic



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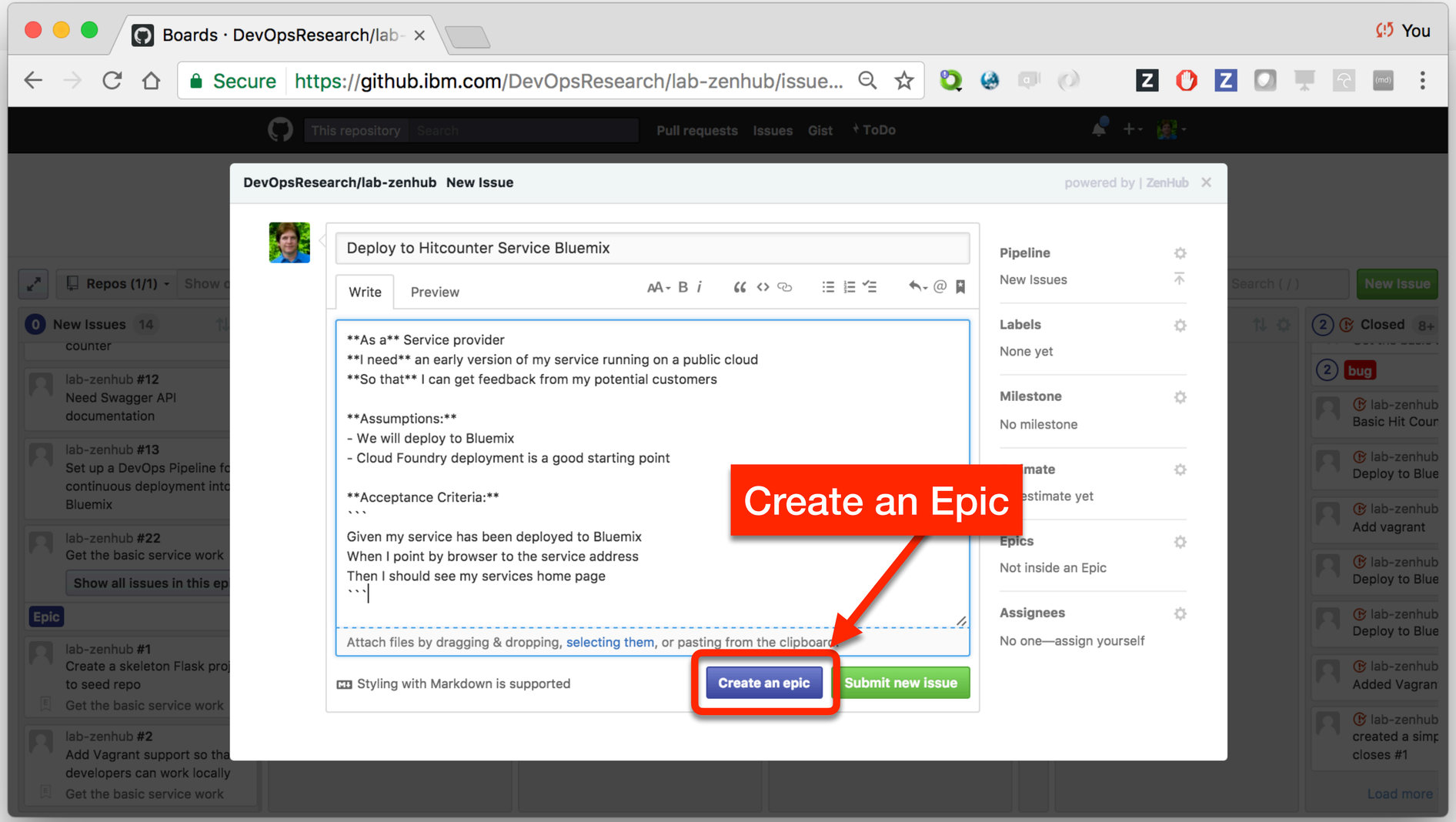
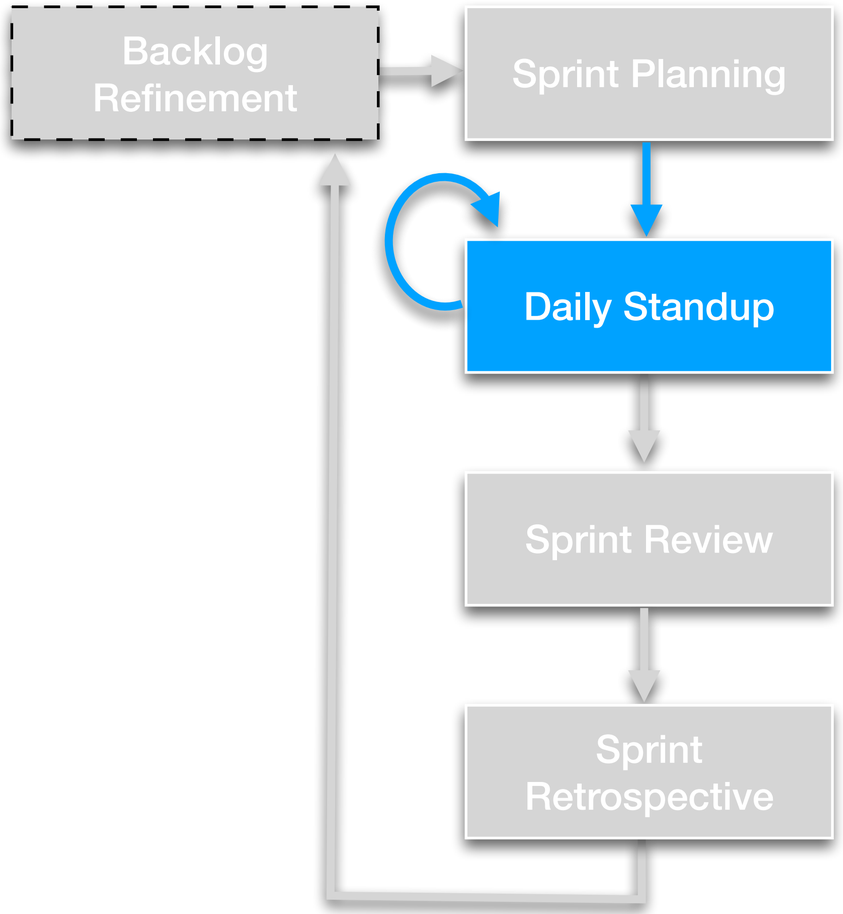


Daily Execution

Daily Standup

Attendees: Scrum Master, Development Team, Product Owner (optional)

- Occurs every day at the same time and place
- Called a "standup" because everyone should remain standing during the meeting to keep it short
  - Timeboxed to 15 minutes
  - Not a project status meeting — all status should be tabled for later discussion
- Each team member briefly reports on their work



Daily Standup Questions

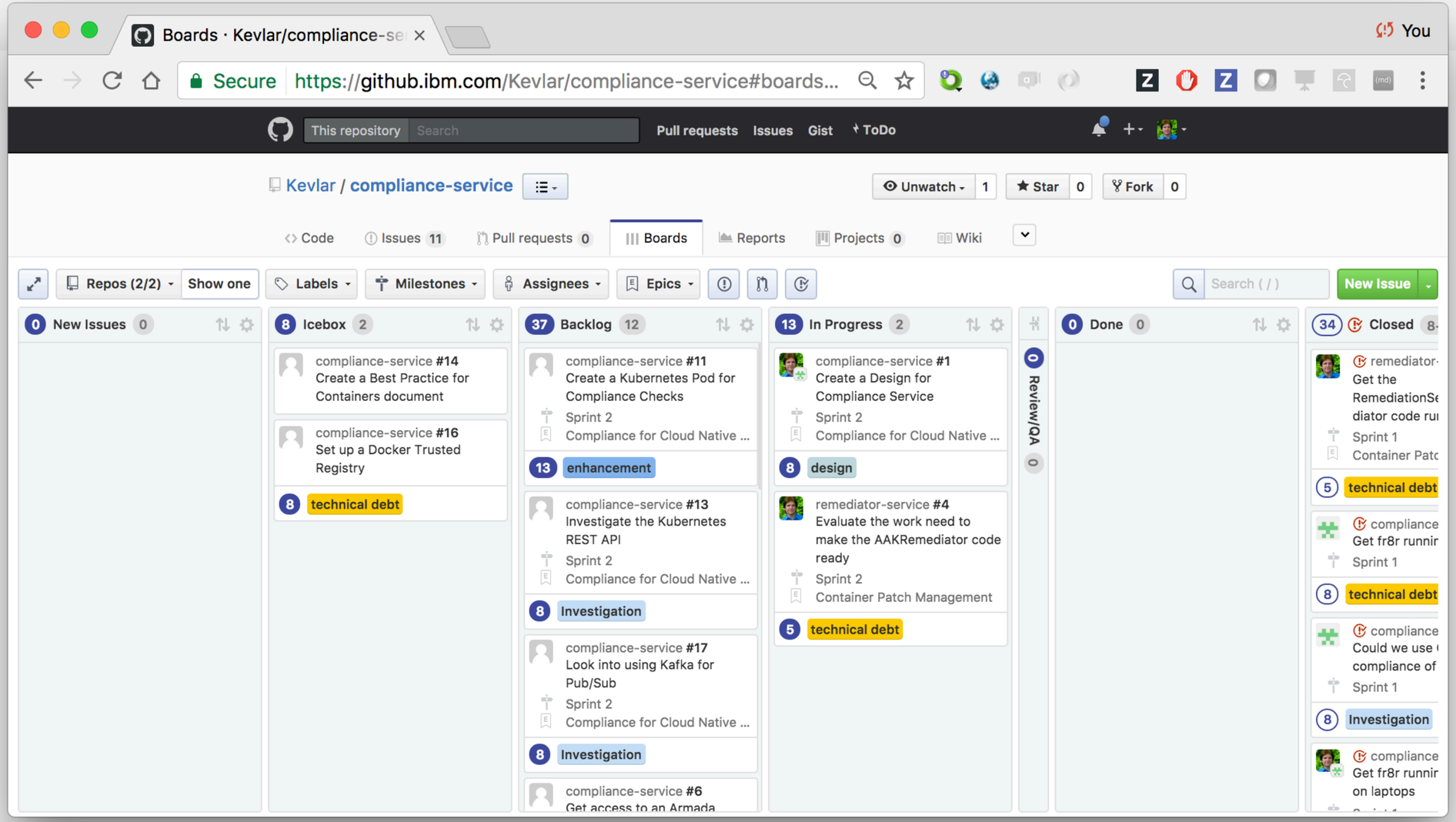
Attendees: Scrum Master, Development Team, Product Owner (optional)

- Each team member answers three questions:
  1. What did I accomplish the previous day?
  2. What will I work on today?
  3. What blockers or impediments are in my way?

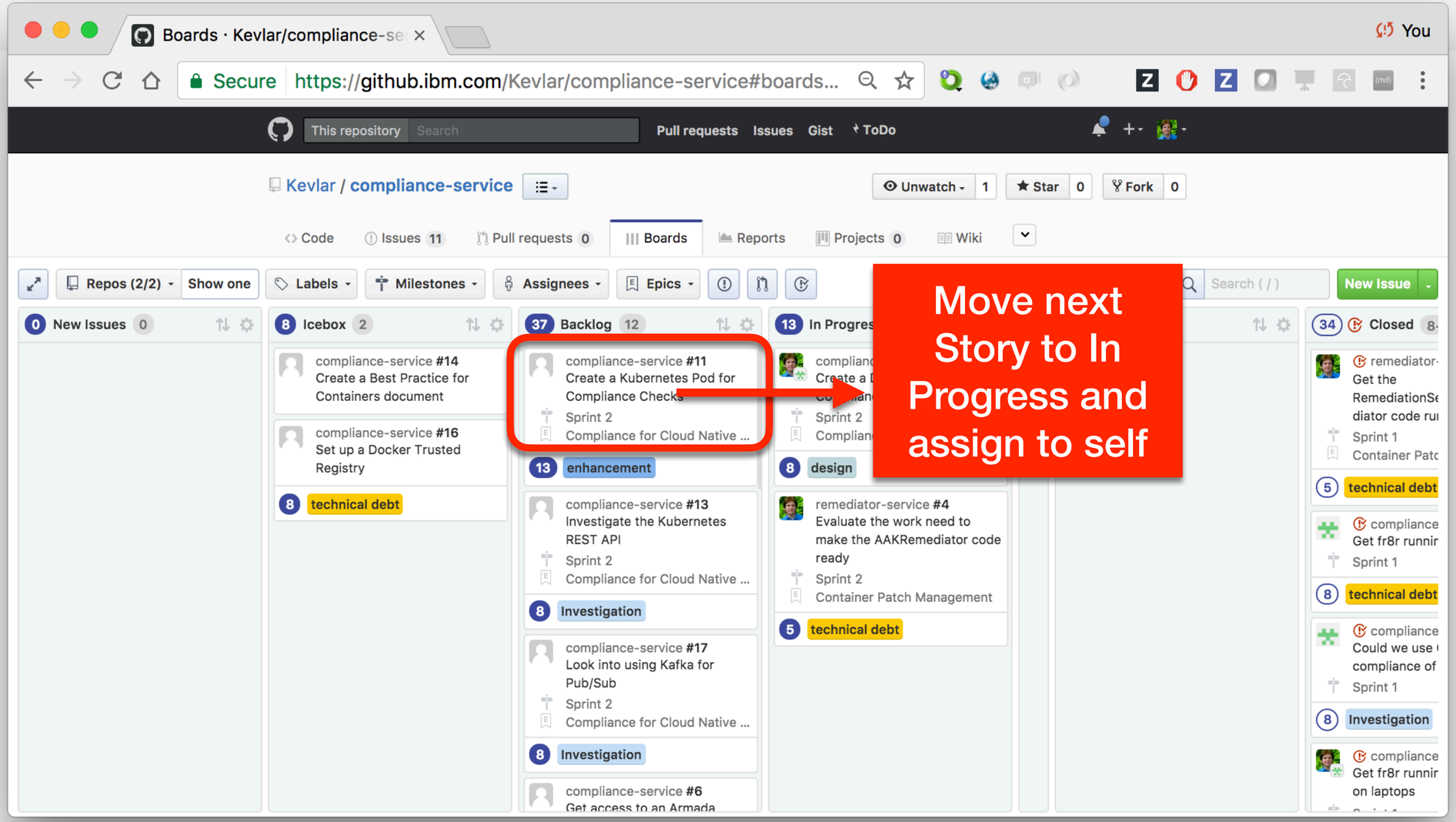
Daily Execution

- Take the next highest priority item from the Sprint Backlog
- Assign it to yourself
- Start working on it
- No one should have more than one story assigned to them unless they are blocked and want to start a second story while waiting
- When you are finished, move the Story to the Done column

Daily Execution



Daily Execution



Measuring Progress

Milestones and Burn-downs

- Milestones can be created for your project
  - e.g., Sprint, Beta Drop, Demo, Release 1, etc.
- Burn-down charts can be used to measure your progress against a Milestone

Burn-Down

- The measurement of Story Points completed vs Story Points remaining for a given Sprint
- Over time the Story Points remaining should go down, hence the name: Burn-down.

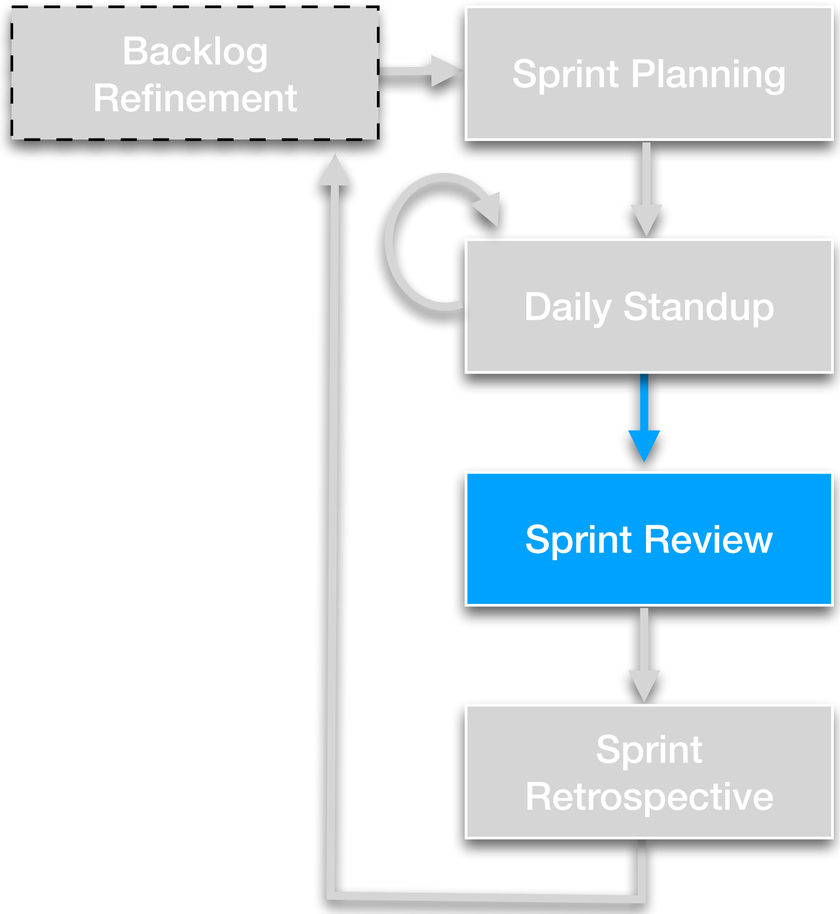
Burndown Chart

Sprint Review / Playback

Sprint Review / Playback

Attendees: Product Owner, Scrum Master, Development Team, (optionally Stakeholders + Customers)

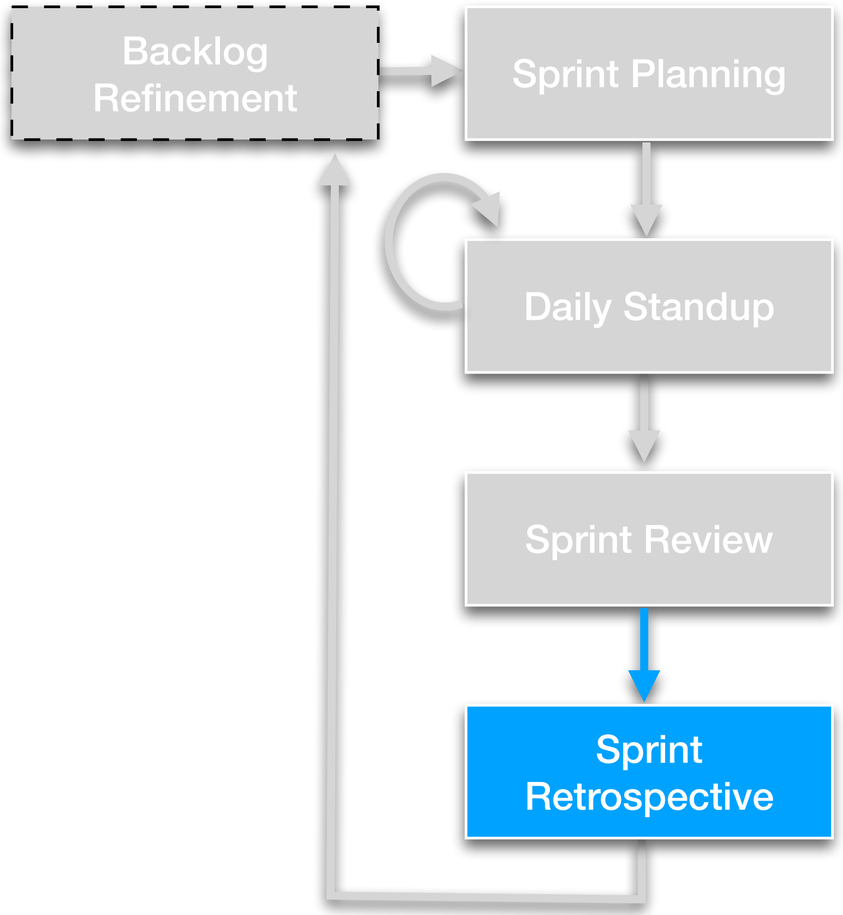
- Live Demonstration of implemented Stories
- Product Owner determines if done based on acceptance criteria and those stories are Closed
- Feedback gets converted into new Product Backlog Stories
  - This is where iterative development allows the creation of products that couldn’t have been specified up front in a plan-driven approach



Sprint Retrospective

Attendees: Scrum Master, Development Team

- Team reflects on their progress for the Sprint
  - What went well? (keep doing)
  - When did not go well? (stop doing)
  - What should we change for the next Sprint?
- This is *critical* for maintaining a healthy team



Metrics and Feedback

Vanity Metrics

...good for feeling awesome, bad for action

- Consider the total number of daily “hits” to your website is 10,000
- Now what? (what does a "hit" represent?)
  - Do you really know what actions you took in the past that drove those visitors to you?
  - Do you really know which actions to take next?
  - In most cases, I don’t think it’s very helpful

Actionable Metrics

- Imagine you add a new feature to your website, and you do it using an A/B split-test in which 50% of customers see the new feature and the other 50% don't.
- A few days later, you take a look at the revenue you've earned from each set of customers, noticing that group B has 20% higher revenue per-customer.
- Think of all the decisions you can make:
  - Obviously, roll out the feature to 100% of your customers
  - Continue to experiment with more features like this one and ...
  - Realize that you've probably learned something that's particular valuable to your customers.

What did we learn?

- Your should have a good overview Agile Development and ZenHub
- How to do planning using a Kanban Board
- How write User Stories and Epics
- How to create Milestones and use Burndown Charts

Additional Reading

- **Scrum Training Series**
  - http://scrumtrainingseries.com
- **Product Owner**
  - https://www.youtube.com/watch?v=502ILHjX9EE
  - https://dzone.com/articles/hiring-42-scrum-product-owner-interview-questions
- **Metrics**
  - https://dzone.com/articles/agile-metricsthe-good-the-bad-and-the-ugly
- **Spotify Engineering Culture**
  - https://labs.spotify.com/2014/03/27/spotify-engineering-culture-part-1/
  - https://labs.spotify.com/2014/09/20/spotify-engineering-culture-part-2/