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Gitlab DevOps Tool



Gitlab DevOps Tool

- Gitlab will be used during the course to progressively build our secure software development build pipeline.
- Gitlab provides the follow key capabilities:
 - Git repositories
 - Controlled change management through branch protection and change review
 - Automated build process based on triggers such as code checkins
 - Execution of compile, tests, scanning, packaging, and deployment of applications
 - Repository to manage dependencies
- Provides Continuous Integration/Continuous Deployment (CI/CD) capability
- Goal is to build security testing methods into the CI/CD pipeline



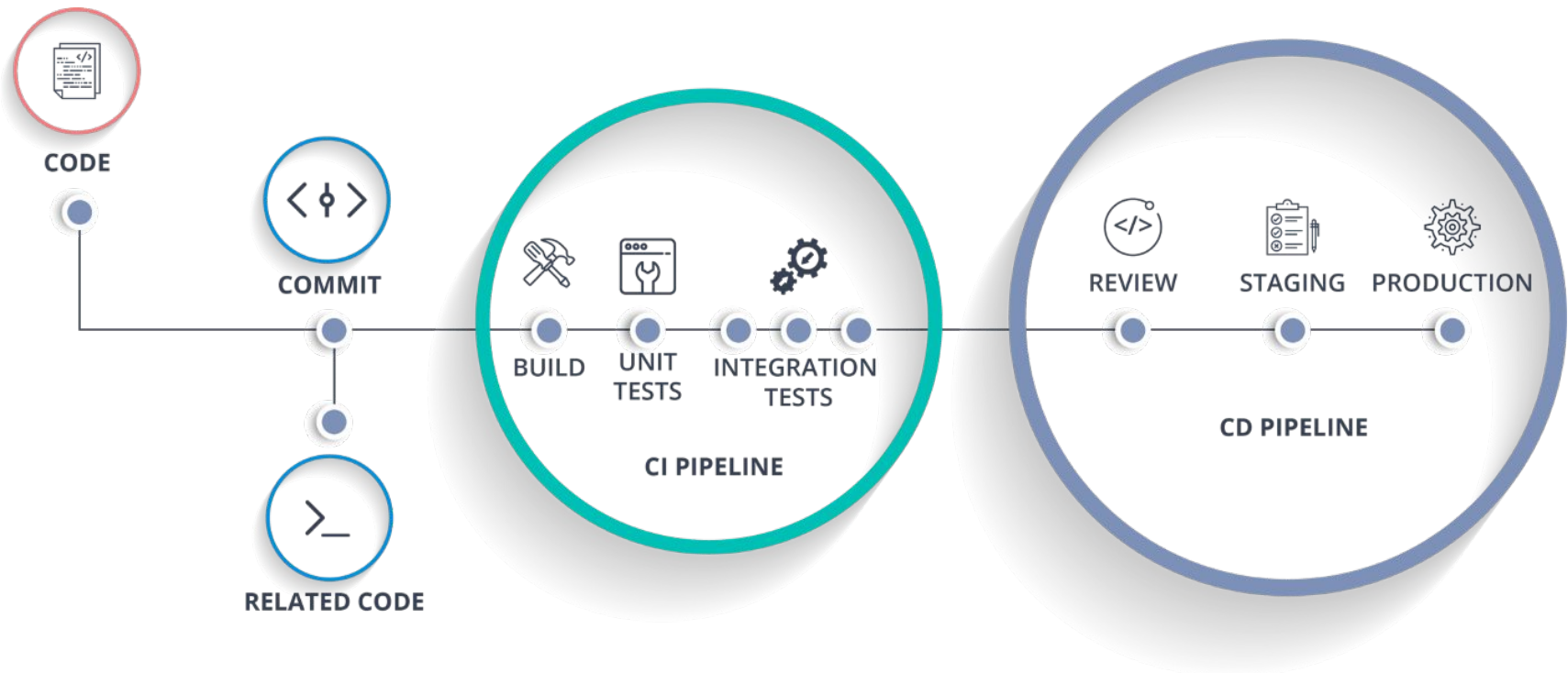
CI/CD Key Concepts

- **Continuous integration (CI)**
 - Automating the integration of code changes from multiple contributors into a single software project.
 - The central repository is where builds and tests then run.
 - Automated tools are used to assert the new code's correctness before integration.
 - Source code version control system (Git) is the crux of the CI process

- **Continuous Deployment (CD)**
 - Extension of continuous integration since it automatically deploys all code changes to a testing and/or production environment after the build stage.
 - Further testing can be performed on deployed environments.
 - Software releases can be promoted to a production environment or official release



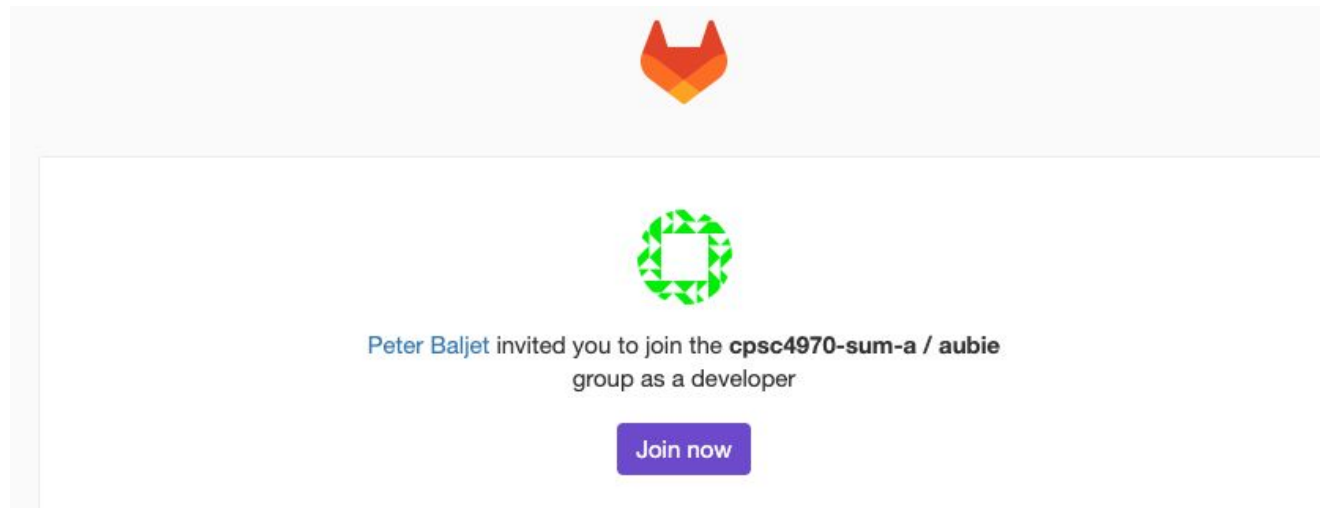
What is CI/CD





Gitlab Setup


- You should have received an email providing access your Gitlab group.
 - Group: “CPSC4970-summer-a/<student>”
 - Setup an account with your Auburn email address
- This Gitlab group will be used throughout the course
 - Assignment repositories will be added throughout the course.









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Gitlab Overview - Login View



Menu



 



 Search GitLab





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
 


 


 


 


A


 

























 cpsc4970-sum-a > aubie

A

aubie 

Group ID: 52899974  [Leave group](#)

[New subgroup](#)

[New project](#)

Recent activity

Last 90 days

Merge Requests created

2

Issues created

0


Members added


2

Subgroups and projects


Shared projects

Archived projects

 W

Welcome 

Maintainer

 0

just now

6



Gitlab Overview - Setup SSH Key

Select the Assignment 1a Project

The screenshot shows the GitLab web interface. At the top is a dark blue header with the GitLab logo, a menu icon, a search bar, and several utility icons. Below the header, the 'Projects' section is visible, with a 'New project' button on the right. Under 'Your projects' (1), there is a list of projects. The first project is 'Assignment 1a' by user 'cpssc4970-sum-a / aubie'. It has a lock icon, a 'Developer' role tag, 0 stars, 0 forks, and was updated 9 minutes ago. The project description is 'Clone Repo & Push branches'.

Add an SSH key...following instructions.

This screenshot shows the same project page as before, but with an additional warning banner at the top. The banner is yellow and contains a warning icon, the text 'You can't push or pull repositories using SSH until you add an SSH key to your profile.', and two buttons: 'Add SSH key' and 'Don't show again'. Below the banner, the project details for 'Assignment 1a' are shown, including the project ID '35977724', 1 commit, 1 branch, 0 tags, 72 KB files, and 72 KB storage. The 'Clone Repo & Push branches' link is also visible.



Clone Welcome Remote Repository

- **git clone <repository url>**
 - Most common method to clone a remote repository
 - May need to enter credentials or configurable keys to clone

```
$ git clone https://gitlab.com/cpsc4970-sum-a/aubie/welcome.git
Cloning into 'welcome'...
remote: Enumerating objects: 6, done.
remote: Total 6 (delta 0), reused 0 (delta 0), pack-reused 6
Unpacking objects: 100% (6/6), done.
```

- **git remote -v**
 - Lists remote repositories for push/pull.
 - Also known as “upstream”

```
(main) $ git remote -v
origin https://gitlab.com/cpsc4970-sum-a/aubie/welcome.git (fetch)
origin https://gitlab.com/cpsc4970-sum-a/aubie/welcome.git (push)
```




Pushing changes to remote repo

- **git push**
 - Defaults to push current branch
 - May be rejected if changes exist on remote branch
 - Good practice to do **git pull** to bring down existing changes first.
 - Will create branch on remote if it does not exist
- **git branch -a**
 - Shows all local and remote branches
 - **git checkout <branchname>** will bring down branch locally



Gitlab Merge Requests

- Pushing changes to Gitlab will create merge requests.
- Merge requests are a control mechanism for reviewing changes to a branch before they are actually committed.
- Privileges for merging is given to authorized individuals who are knowledgeable and experience to review code
 - Adherence to standards
 - Functional correctness
 - Quality of code
 - Security related issues.



Assignment 1a

- Practice working with git local and remote repositories
- Graded based on pushing commits and branches to Gitlab repo
- Feel free to practice outside of the assignment. No points deducted for additional commits and branches present.