

# DevOps & SDLC

# About Us

Ethan Geiger

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Full-stack developer in People Services IT at Winsupply for 1.5 years, working on a variety of financial applications, both legacy and newly developed. Intern with the Infrastructure team for 1.5 years prior, gaining experience with systems administration, client support, and software development.

Sean Kahle

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Started with Winsupply as an intern with the Infrastructure team, gaining exposure to many different aspects of IT. Afterwards, began a full-time position as a Systems Administrator for two years, working on various IT Infrastructure projects. A little over two years ago, I transitioned into a software development role with our Platform Development team where I provide assistance towards our containerization and developer workflow evolution.

# Class Repo

<https://github.com/pattonsgirl/CS3900-AppSoftwareDev/tree/main/DevOps>

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sakahle clarified tasks in assignment 1 fbb4312 · last week History

Name	Last commit message	Last commit date
..		
Assignment1	clarified tasks in assignment 1	last week
Assignment2	clarified tasks in assignment 1	last week
Assignment3	clarified tasks in assignment 1	last week
README.md	clarified tasks in assignment 1	last week

README.md

## DevOps (Development Operations)

DevOps will be teaching three units during this course that will weave in before they are applied in a module.

1. How to use containers as a development environment
2. How to use GitHub Actions and cloud services (pipelines)
3. Automating testing during the development process

Each will have an individual assignment to apply the topic and build your understanding.

# Git Refresher

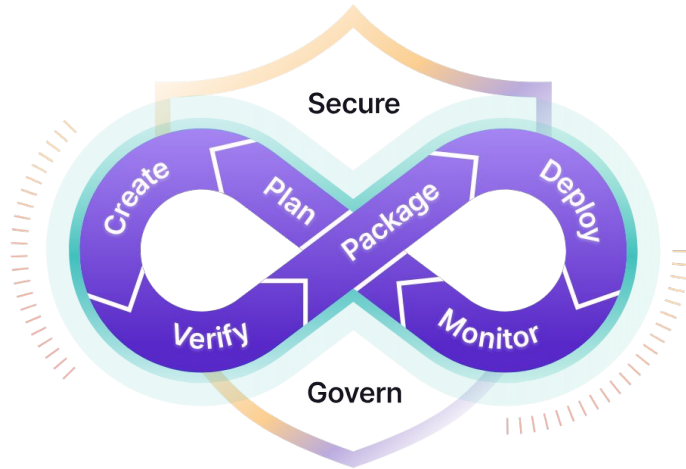
As a reminder, **git** will be relied on very heavily for the content of this course. If you would like to refresh yourself on basic git commands, this video should be very helpful. A link to the video can also be found in the DevOps README file in the class GitHub repository.



[Git Tutorial for Beginners: Command-Line Fundamentals - YouTube](#)

# What is DevOps?

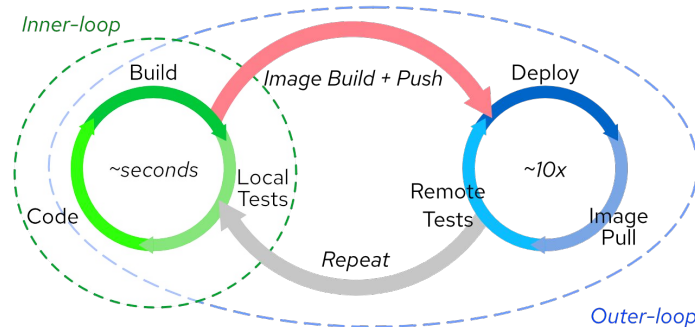
“DevOps combines development (Dev) and operations (Ops) to increase the efficiency, speed, and security of software development and delivery compared to traditional processes.” - *A Guide to Getting Started in DevOps*, from GitLab

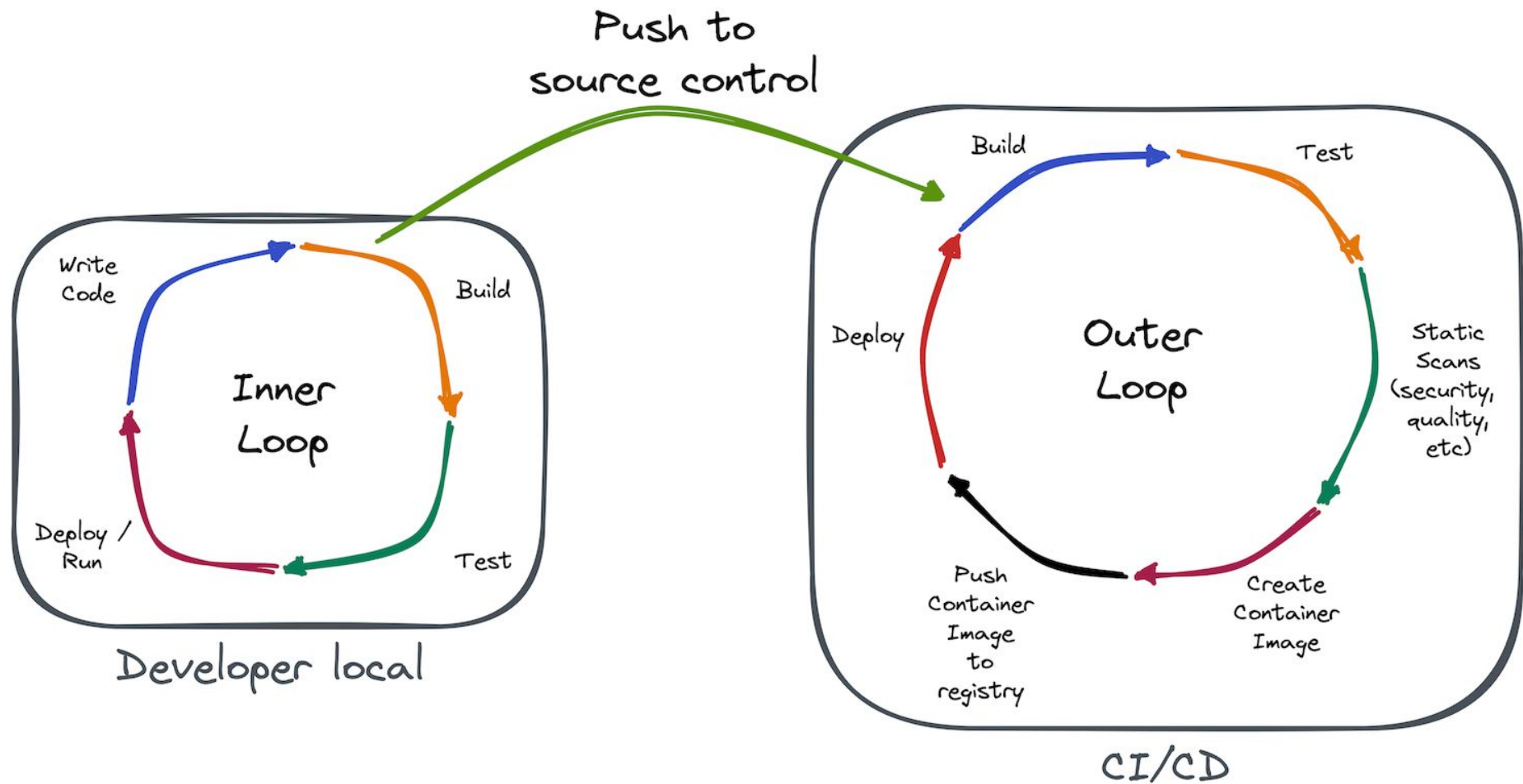


# What is DevOps?

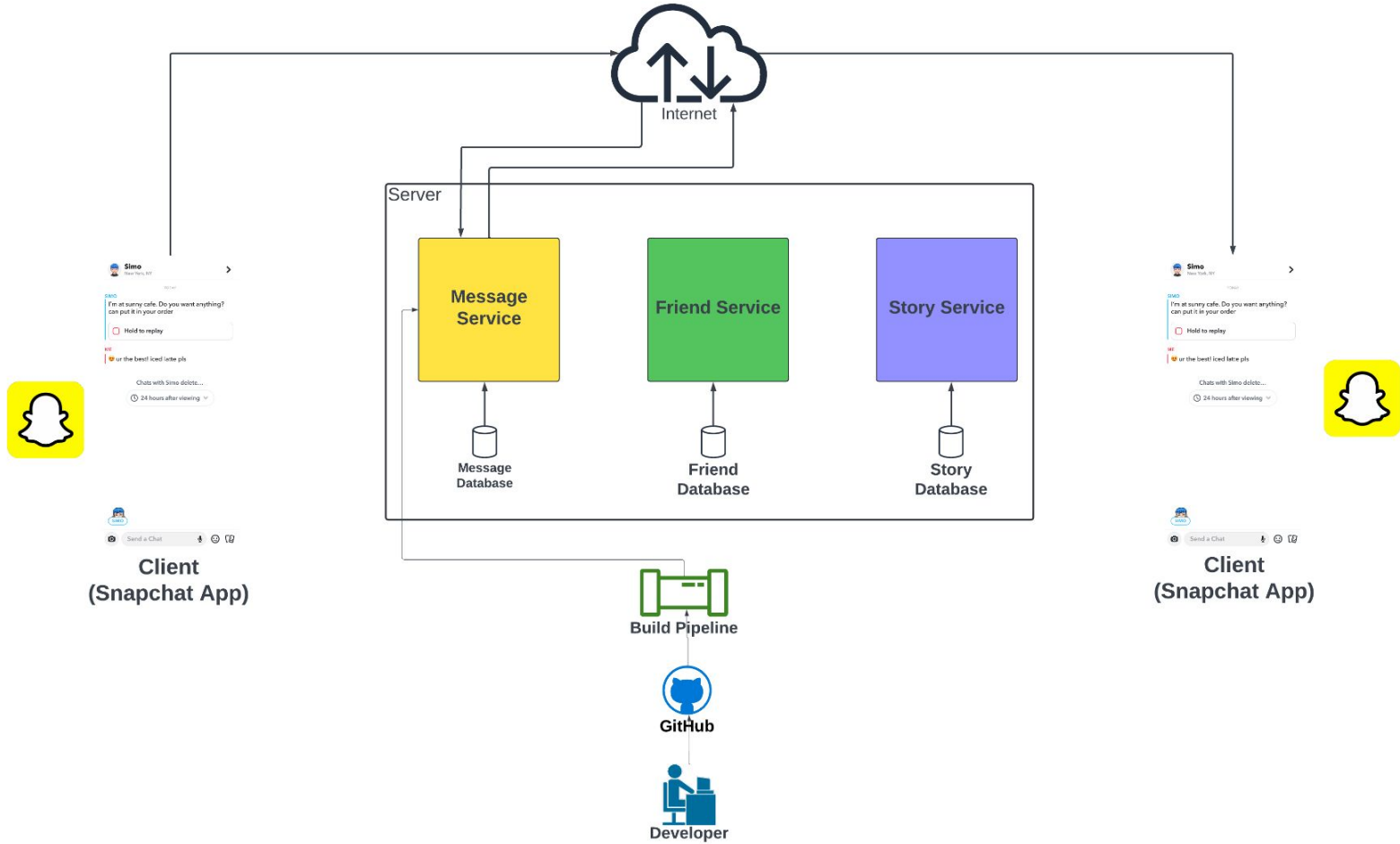
## Goals:

- Encourage software to be scalable, more secure, more reliable and easier to deliver
- Development and Operations teams are no longer separated from each other
- Focuses on frequent and smaller updates to support the business





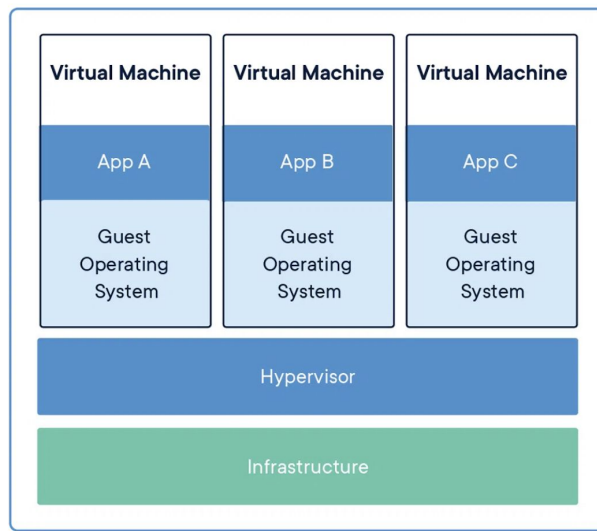
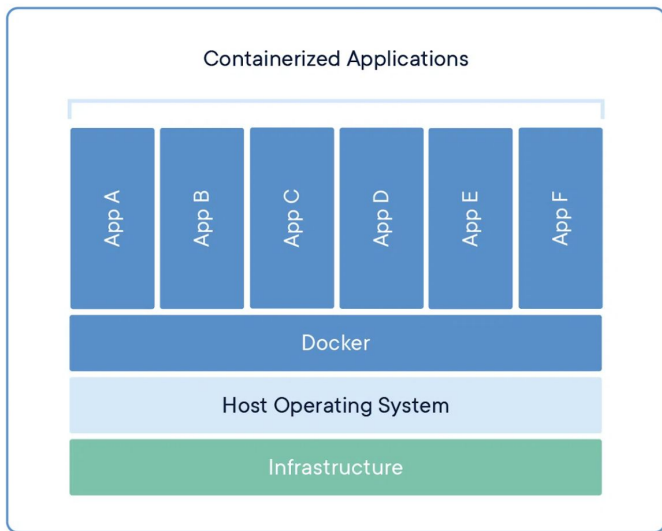
# Example Development Loop





# Intro to Containerization

Containerization is a software deployment process that bundles an application's code with all the files and libraries it needs to run on any infrastructure.



# How does it work? (cont.)

## Linux Kernel namespaces

- Allow isolating processes, network ports, and filesystem mounts

## Control Groups (cgroups)

- Allow for fine-grained control and enforcement of limits on resources (on the previously mentioned namespaces for example)



# Running a Container

<https://docs.docker.com/reference/cli/docker/container/run/>

# Building an Image

<https://docs.docker.com/get-started/docker-concepts/building-images/build-tag-and-publish-an-image/>

## Building a MariaDB image



# DBeaver

<https://dbeaver.io/download/>

The screenshot shows the DBeaver Community website. The header includes the DBeaver logo, the text "DBeaver Community", and "Free Universal Database Tool". There are social media links for GitHub (38,969 stars), Facebook, and Twitter (@dbeaver\_news). A search bar is also present.

The main navigation bar includes links for Home, About, Download, Documentation, News, Support, DBeaver PRO, CloudBeaver, DBeaver Merch, and Join our team.

The "Download" section is highlighted with a red box. It features two columns:

- DBeaver Community 24.1.5**
  - Released on August 18th 2024 (Milestones).
  - It is free and open source (license).
  - Also you can get it from the [GitHub mirror](#).
  - [System requirements](#).
- DBeaver PRO 24.1**
  - Released on June 12th, 2024
  - PRO version website: [dbeaver.com](#)
  - [Trial version is available](#).

The "Windows" section is also highlighted with a red box. It lists:

- Windows (installer)
- Windows (zip)

Below this, there is a link to download the installer from Microsoft Store.

The "Mac OS X" section is also highlighted with a red box. It lists:

- MacOS for Apple Silicon (dmg)
- MacOS for Intel (dmg)

Below this, there is a link to Brew Cask (brew install --cask dbeaver-community).

The "Linux" section lists:

- Linux Debian package (installer)
- Linux RPM package (installer)
- Linux (tar.gz)

The "DBeaver PRO features:" section lists:

- Advanced security: master password and strong credentials encryption to secure and easy database connection.
- Enterprise-level authentication methods: SAML, SSO, OKTA, and Kerberos. SSO authentication cloud services such as GCP, AWS, and Azure.
- Advanced SQL databases support: MySQL, PostgreSQL, SQL Server, Oracle and others
- NoSQL databases support: MongoDB, Cassandra, Redis, CouchDB and others
- Cloud databases support: Redshift, Google BigQuery, Oracle Cloud and others
- Native cloud support for Google Cloud, AWS, and Azure.
- Access all files in any region with the S3 browser to upload, store, share, and save files like in a regular file system.
- AI assistant in SQL and Visual Query Builder to create complex SQL scripts automatically
- Database schema development with ERD Edit Mode.

# Docker Compose

- Defines and runs multi-container Docker applications
- Provides an isolated environment
- Uses YAML to configure all units of the application

# Classwork Time

<https://github.com/pattonsgirl/CS3900-AppSoftwareDev/tree/main/DevOps/Assignment1>