Git and Software Tools for CO_2 Transport and Storage

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FECM/NETL Carbon Management Research Project Review Meeting

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Outline

Project Overview

- Purpose
- Objectives
- Summary of Work

Lessons Learned

- Git and GitHub Tools
- Software Tools

EDX4CCS Software Virtualization Effort

The purpose of this **EDX4CCS** task is to help **BIL-funded tools** and methods integrate with the **disCO_2ver** platform.

Needs:

- Help and information on what methods are available to provide access to developed software and what choices will fit each tool best.
- Support taking the step from a working tool to a virtualized tool that is available to users.

Objectives:

- Provide guidance and lessons learned for future CO_2 Transport and Storage (CTS) Software Tools.
- Help bridge the gap between tools and users through virtualization.

discover
Data Infrastructure to Accelerate CCS

EDX®
Energy Data eXchange

EDX4CCS Software Virtualization Effort

Goals

Completed:

- Identified CTS tools already on EDX for inclusion in the DisCO_2ver tools group (6/23).
- Created and tested container configuration files for the Data Preview Tool (12/23).
- Created a desktop runnable bundle of the CO_2 Pipeline Routing Tool (6/24).

In Progress/Upcoming:

- Create and test a container configuration file for NRAP's OpenIAM tool (8/24).
- Offer guidance documentation for CS BIL modelers to inform development for DisCO_2ver connection (8/24).
- Release three CS BIL tools on EDX DisCO_2ver to demonstrate viability (3/25).

Git and GitHub Tools for CTS

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What is git?

Git is a version control system useful for maintaining a history of changes to a repository of code

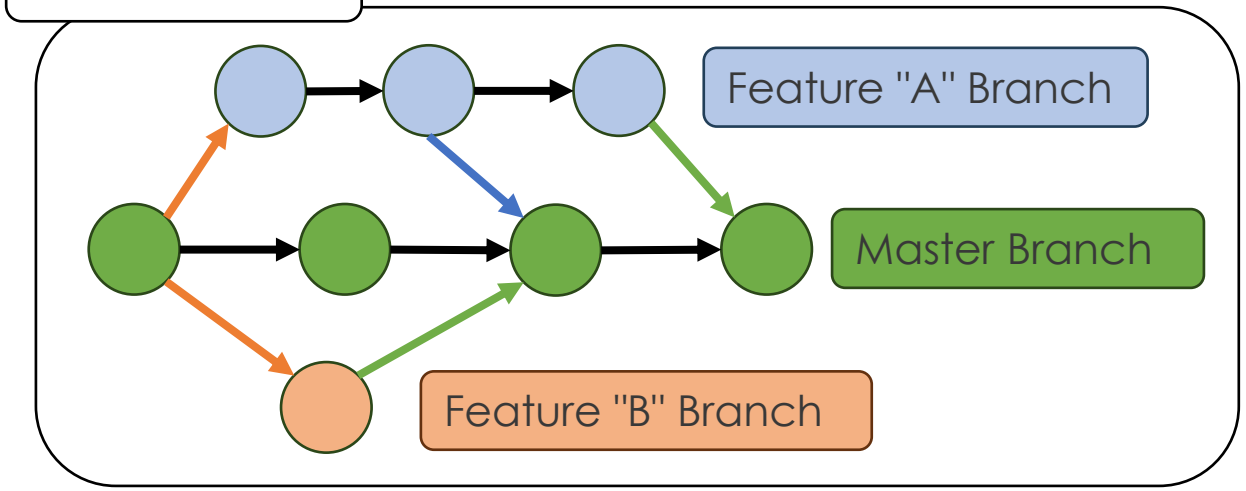
Committing →

Committing is saving the changes made to a repository, usually with a short descriptive message

Branching →

Branching is an action where an alternate history of a repository is created starting at a specific commit, to optionally be merged later

Workflow:



Merging →

Merging allows one branch to be combined into another, combining histories

Cherry Picking →

Cherry picking allows specified commits to be selectively merged from one branch to another, leaving both intact

History

The state of a repository is saved in its history after each change is committed

Git and GitHub Tools for CTS

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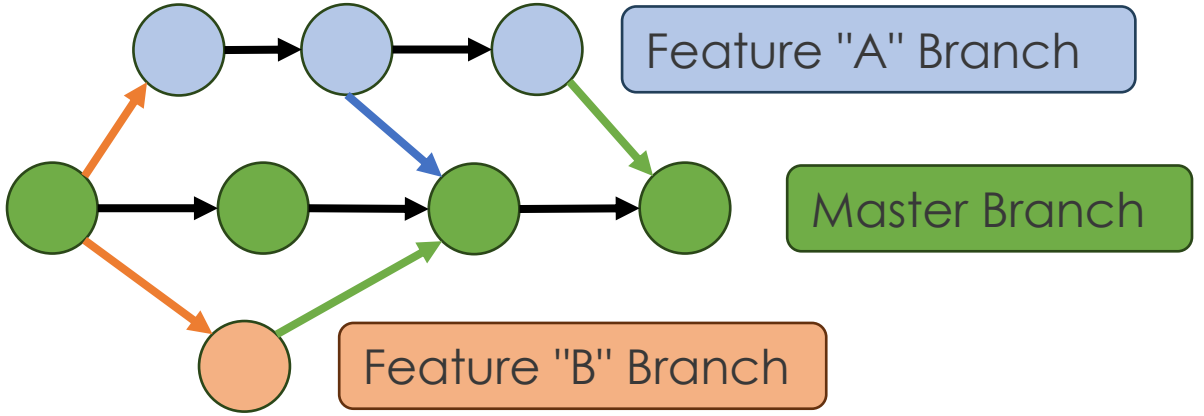
Why is Git useful?

- Reverting changes
- Working collaboratively
- Maintaining multiple versions



git

Git and GitHub Tools for CTS

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GitHub: An online platform for hosting git repositories

- Public/private repositories
- User access control
- GitHub Actions
  - Automated testing
  - Automated building
- Reporting and tracking issues
- Visualizing changes to the codebase
- Providing releases
- GitHub Advanced Security (GHAS)

Software Tools for CTS

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Tools that have made a big impact

- Packaging tools
  - Electron
  - PyInstaller
- Container tools
  - Docker
- Orchestration/Infrastructure-as-Code (IaC)
  - Kubernetes/Helm Charts
- Source code analysis tools

kubernetes

the stats

54 RIC PRESENTATIONS

22 POSTERS

30 TOOL DEMOS

MONDAY

Presentations
(10:30AM - 5:25PM)

- 16 disCO2ver presentations

TUESDAY

Presentations
(10:30AM - 5:45PM)

- 17 SMART presentations
- 2 disCO2ver presentations
- 2 Geographic focus/tool presentations

Posters
(5:45PM - 7:45PM)

- 18 CTS Posters
- 2 PSCC Posters
- 1 CDR Poster
- 1 MLEF Poster

Tool Demos
(5:45PM - 7:45PM)

- 30 Tool Demos
  - SMART
  - NRAP
  - EDX
  - EDX4CCS

WEDNESDAY

Presentations
(2:10PM - 4:30PM)

- 3 transport, research, development, and demonstration activities presentations
- 1 transport modeling presentation
- 1 secure storage (basalts/mafic) presentation

THURSDAY

Presentations
(10:30AM - 5:20PM)

- 8 NRAP presentations
- 2 NETL RIC Presentations
- 2 Offshore presentations

NETL Research · Carbon Storage Program

NRAP National Risk Assessment Partnership

SMART

EDX disco2ver

https://edx.netl.doe.gov/disco2ver


DEMO & POSTER
SESSION
TUESDAY, AUGUST 6, 2024
5:45 PM - 7:45PM
BALLROOM GALLERY
Data Preview Tool
EDX
discover
CARBON TRANSPORT & STORAGE DATA AND
INNOVATION TO BRIDGE THE DIGITAL DIVIDE

NETL RESOURCES

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