Overview of NCI's GitHub Enterprise Capabilities and Best Practices

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AGENDA

GitHub Features & Capabilities

GitHub Best Practices

Getting Started or Help with NCI's GitHub Enterprise

Questions & Answers

Useful Links

GitHub Features & Capabilities

Software is hard – especially for public sector

Technical debt

Burden imposed to manage application code continues to accumulate

Knowledge management gaps

Existing codebases not as well understood

App and data silos

Complex system integrations that are difficult to dissect

The GitHub experience

A single integrated enterprise-ready platform

Security at every step of the workflow

Industry-best collaborative tools for developers

Powered By AI

GitHub

Platform

Integrations & APIs

Powered by AI

Collaboration

Pull requests | Projects | Issues | Discussions | Merge queue | Search

Productivity

CI/CD with Actions | Automation | Copilot | Codespaces | Runners | npm

Security

Advanced Security | Secret scanning | Security overview | Supply chain | Dependabot

Scale

100M+ developers | Source code management

Issues & Projects

Project management made simple

Start with an issue

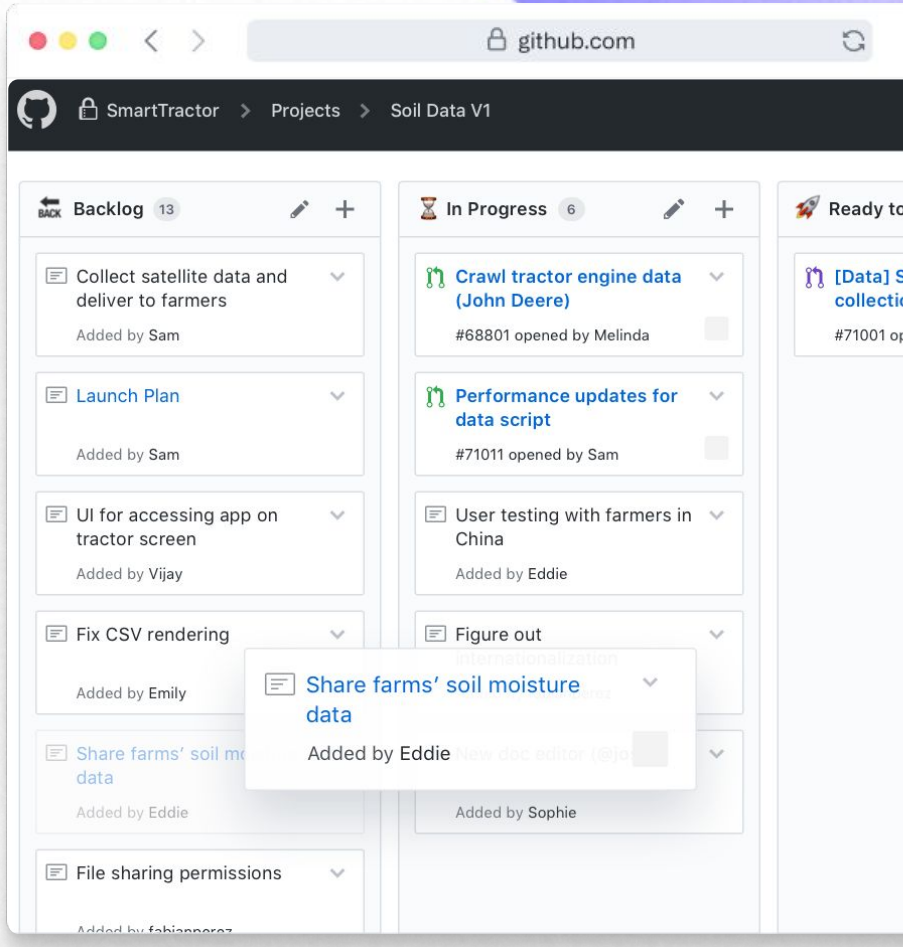
Create an issue to suggest a new idea or track a bug.
Then organize and assign tasks to your team.

Link issues and pull requests

Track updates to your project without complicating your workflow by crosslinking between issues and pull requests anywhere in your GitHub organization.

See your work take shape with Projects

Visualize all of your work and prioritize it right alongside your code with projects boards. See what tasks are planned or in-progress, either in a repository or across your organization.



Repos

Enabling open-source culture and best practices in your organization

Increased collaboration

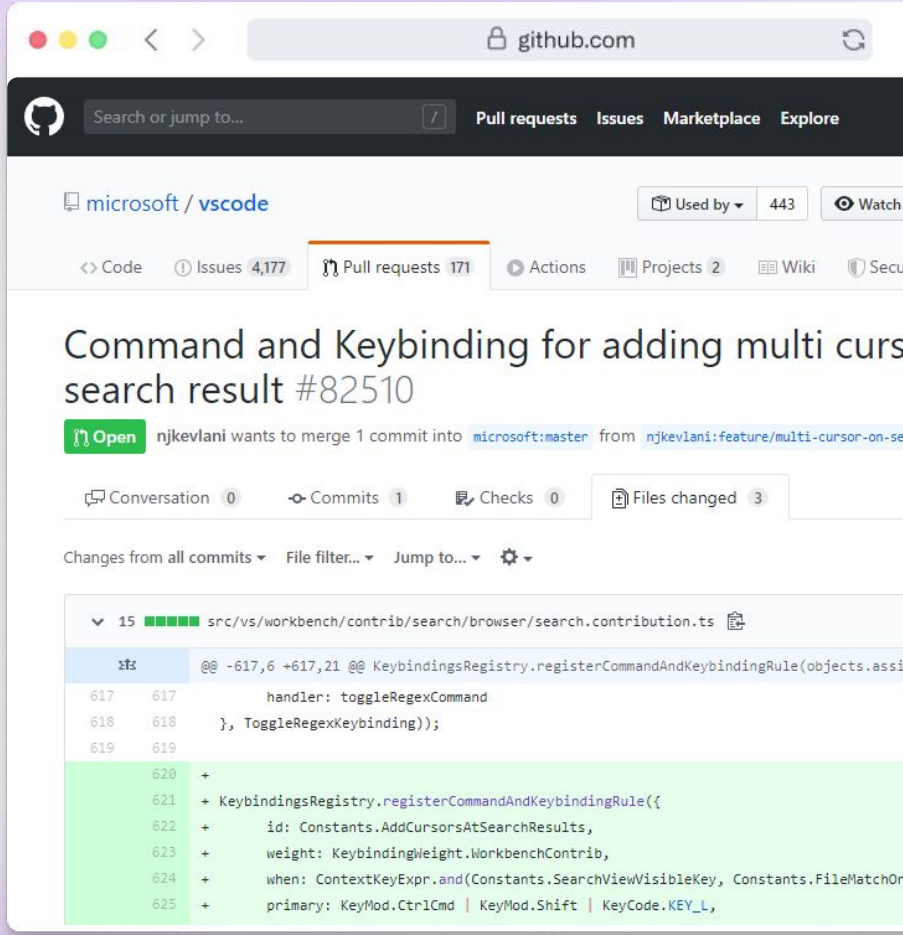
Create an innersource work culture by encouraging teams to collaborate within your organization using the same processes and practices as open-source communities.

Breaking silos

Simplify collaboration across teams to allow for easier sharing of knowledge, improved code reuse, and secured workflows.

Higher developer satisfaction

Leverage innersource and open-source practices to increase developers' satisfaction and allow them to work on interesting projects and improve their skills.



Actions

Enterprise-grade CI/CD that supports Windows, Linux, Mac

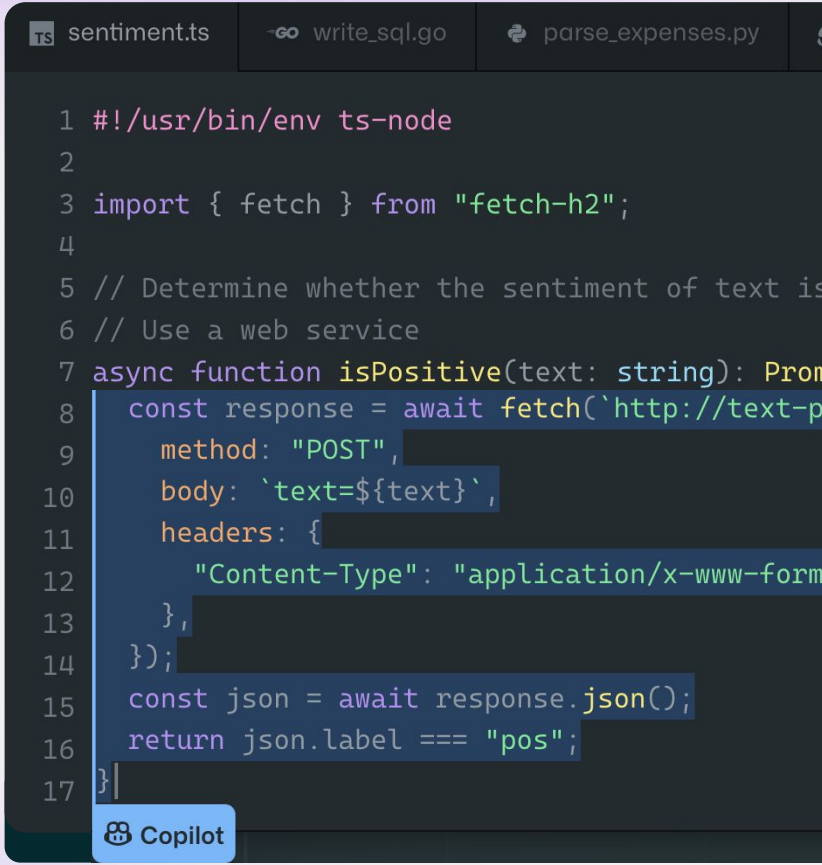
- Marketplace of 18,650+ Actions by our community
- Any operating system, cloud and on-prem
- Friction-free service or self-hosted runners
- Natively integrated into GitHub workflows

Copilot

Your AI pair programmer.

Uses the context you've provided and synthesizes code to match.

- Convert comments to code
- Autofill for repetitive code
- Autosuggest tests
- Show alternatives



The Copilot effect.

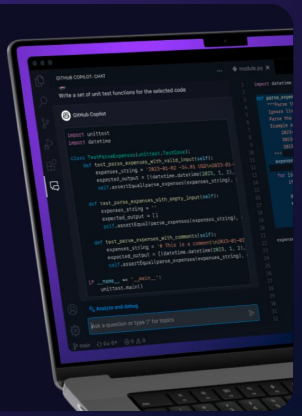
The world's most widely adopted AI developer tool.

- Maximize developer happiness
- Increase developer productivity
- Accelerate software development

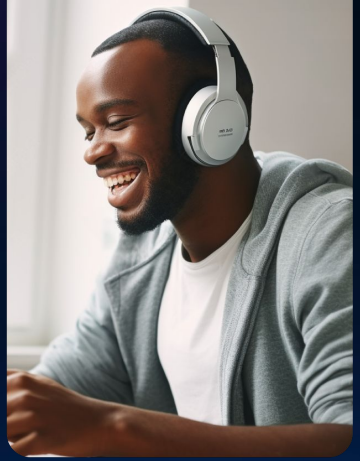
1st overall pick among developers.

55% of developers using AI coding tools choose GitHub Copilot

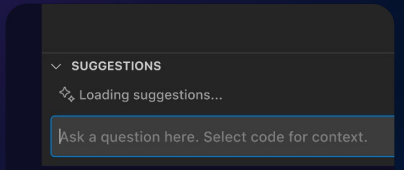
stackoverflow



75% of developers are more fulfilled



75% of developers want to try it next year



Copilot enables faster coding by 55%

More than 1.5M developers

Demo

Developer productivity with Copilot goes beyond speed.

87% less **mental effort** on repetitive tasks

74% focus on more **satisfying** work

73% say they are more **in the flow**

Developer productivity with Copilot means developers focus on what matters most.

More time on

- Designing
- Brainstorming
- Collaborating
- Iterating
- Planning

Less time on

- Writing Tests, Repetitive Code, & Boilerplate
- Debugging
- Searching Documentation
- Finding Vulnerabilities
- Deciphering Existing Code
- Correcting Syntax
- Summarizing Changes and Comments
- Learning Git Commands

GitHub Best Practices

Repository Best Practices

GitHub Repository Do/Don’ts

Do	Don’t
Store code, scripts, text-based configurations	Store images, videos, data, binary files
Variables and URIs	Store credentials or other authentication secrets
	Store sensitive information

GitHub Pages

Documentation

Static Content

Low or Non-sensitive Info

Using a Jekyll Theme

Securing Secrets

Secret Variables

- Repository,
- Environment,
- Organization.

GPG for Larger (48+ KB) Secrets

Base64 Small Binaries

About Secrets

GitHub Actions

Use Atomic Building Blocks

Scripts Before Docker

Use Matrix Jobs

Using workflows

Staying Informed of your Software Supply Chain

Dependencies defined in lock/manifest files

Supported Package Managers

Dependencies resolved at compilation/build:

Dependency Submission API (Beta)

Dependency Graph

Generate a SPDX-compatible Software Bill of Materials (SBOM)

Dependency alerts for direct and indirect vulnerabilities

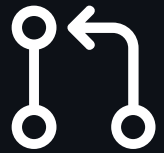
Automating your Dependency Updates

Add and configure a dependabot.yml file

20+ configuration options, including:

- Schedule,
- Grouping patterns,
- Version/Security updates.

Automate CI tests with Actions once the Pull Request is created



Organization Best Practices

Protect the Access to your Code

Require Two-factor Authentication (2FA)

Configure and enforce Single Sign On (SSO)

Enforcing SAML SSO
Require 2FA

Enable Fine-grained Personal Access Tokens

Restrict Personal Access Tokens

Setting PAT Policies for your Organization

Simplify Access Management

With GitHub Teams

Manage group access across multiple repositories

Synchronize Azure AD or Okta Groups to GitHub Teams

GitHub Teams

Configuring Team Sync

Standardize and Accelerate New Projects

Repository Templates

Workflow Templates

Project Templates

Enforce Code Security

Dependency Graph, Alerts, and Updates

Secret Scanning

Code Scanning

Configuring default setup for code scanning at scale

Enabling features for all repos

Getting Started or Help with NCI's GitHub Enterprise

Main Knowledge Article:
https://service.cancer.gov/ncisp?id=nci_kb_article&sys_kb_id=4c26ece01bc17d50079dea4ce54bcbd6

Service Catalog:
https://service.cancer.gov/ncisp?id=nci_sc_cat_item&sys_id=2df2bd6ddb504f002cbcfb0e0f96197c

Questions & Answers

Useful Links

Events	GitHub Learning Pathways	Microsoft Learn for GitHub
GitHub Universe, November 8-9	Automation	Application Lifecycle Management
	Security	Automate with GitHub Actions
GitHub Certifications	Governance	Collaboration and GitHub Pages
Beta in November, and GA in early 2024	GitHub Skills	Inner/Open Sourcing with GitHub