GitHub @ Penn State: What IT Pros Need to Know

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First: A quick exercise

Let’s signup for GitHub Enterprise!

If you haven’t already signed up:

1. 🔍 Go to softwarerequest.psu.edu
2. Search for GitHub
3. Click the green “Order” button
4. Review the terms and click “Order”
5. ⏳ Wait for account provisioning

After that, follow the invite in your inbox to log in at github.com using your Penn State SSO!

Agenda

- What is Git and how to use it?
- About GitHub Enterprise Cloud
- Best Practices
- Automation
- Migrating to GitHub
- Resources for you and your customers

Sign up for
GitHub Enterprise

What is Git and how to use it?

What is Git?

Git is a version control system, that helps:

- Tracking code changes
- Tracking who made changes
- Coding collaboration

It’s like a time machine & team organizer for your code

Git Terminology and Commands

Term	Command	Definition
Repository	git init	A folder where Git tracks your project and its history.
Clone	git clone <URL>	Make a copy of a remote repository on your computer.
Stage	git add <filename>	Tell Git which changes you want to save next.
Commit	git commit –m “change”	Save a snapshot of your staged changes.
Branch	git branch my-branch	Work on different versions or features at the same time.
Merge	git merge <branch>	Combine changes from different branches.
Pull	git pull	Get the latest changes from a remote repository.
Push	git push	Send your changes to a remote repository.
Log/History	git log	Detailed record of every change made to the project

Note: Most Git actions (like staging, committing, and viewing history) happen on your own computer.

About GitHub Enterprise Cloud

What is GitHub?

GitHub is a platform for hosting, sharing, and collaborating on code. It's built around **Git**, a version control system that tracks changes to files over time.

With GitHub you can:

- Store you code in repositories
- Collaborate with others via branches and pull requests
- Review and discuss code with comments
- Automate builds and testing

GitHub Uses

- 👦 💻 Software Development
- 📚 Instruction & Coursework
- 🧪 Research Collaboration
- 🔄 Automation & Workflows
- 🌐 Publishing & Websites
- 👬 Team Collaboration

Penn State’s GitHub Enterprise Cloud

GitHub Enterprise is GitHub tailored for organizations, offering advanced features for security, compliance, and scalability.

Key features:

- 🔐 Single Sign-On (SSO) with Penn State credentials
- 👩‍🏫 Available to Faculty, Staff, and Students NEW
- 🛡️ Enterprise-level security & compliance controls
- 🚀 Unlimited private repositories
- 🤝 Team and organization management for better collaboration

GitHub Enterprise Terminology

Term	Definition
Organization	A shared account for managing multiple repositories and users (e.g., a department or team).
Team	A group of users within an organization with defined repository access. Can be an UMG or Azure Group
Collaborator	A person with access to a repository. Can be internal (within the org) or external.
Repository (Repo)	A project space on GitHub that contains your code, issues, settings, and more.
Pull Request (PR)	A GitHub feature for reviewing and merging code from one branch into another.
Actions	GitHub's built-in automation platform for CI/CD and workflow automation.
GitHub Pages	A feature to host static websites directly from a repo.
GitHub Projects	A kanban-style board for managing issues, PRs, and tasks—now built on GitHub Issues.

🏢 GitHub Organizations

Shared Collaboration Spaces

- Enable team-based work across multiple repositories with enhanced security and admin tools.

Default Access

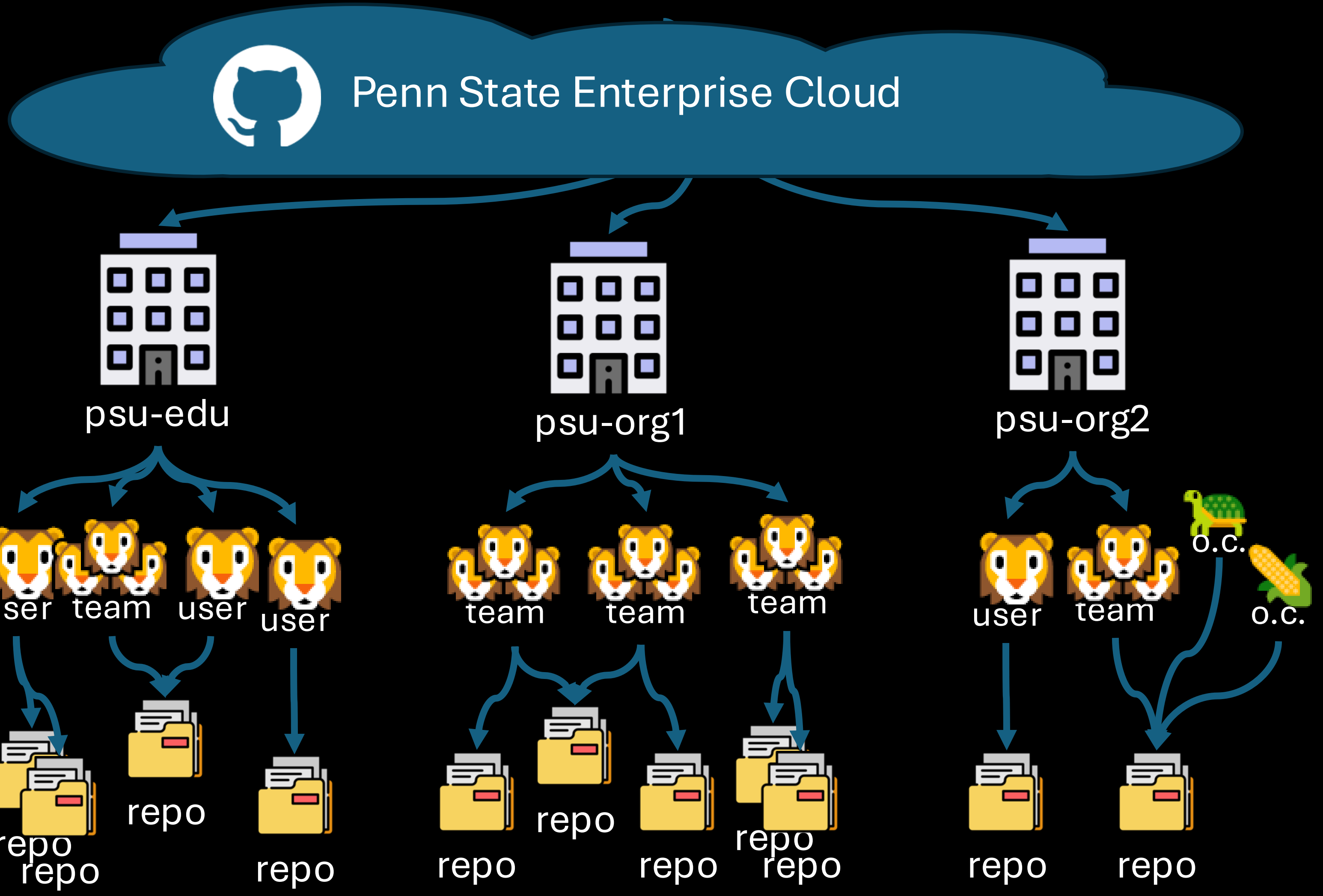
- All Penn State users are auto-invited to psu-edu, our default GitHub Organization.

Need More Features?

- Departments, projects, or research groups can request their own Organization with added capabilities.

Need an Organization for your unit/group? Fill out a Request!

GitHub Enterprise Structure



Organizations

- Group teams and repositories under shared policies, settings, and authentication
- Setup a Cost Center for potential chargebacks
- Use Teams for more granular access control

Teams

- Logical groups of org members
- Support nested structures
- Non-parent Teams can sync with Azure AD Groups
- Manage repository access

Outside Collaborators (O.C.)

- Non–Penn State users
- Invited at the repository level only

Repos

- Where the code, project, issues, etc. lives

🔓 Security Features

Feature	Description	Availability
Dependabot Alerts & Updates	Scans for vulnerable dependencies and alerts users; Opens PR to update it	✅ Public & private repos
Branch Protection Rules	Require PR review, status checks, signed commits, etc.	✅ Public & private repos
Secret Scanning Alerts	Scans for exposed credentials (e.g., API keys)	✅ Public & private repos
Security Overview Dashboard	Centralized dashboard of alerts and scanning status	✅ Public & private repos
Audit Logs	Track activity like repo changes, access events, and user logins	✅ Public & private repos
IP Allow Lists	Restrict access to GitHub to specific IP ranges	✅ Public & private repos
Token & SSH Key Expiration Policies	Enforce expiration for credentials	✅ Public & private repos

Legend: ✅ Included in our service

💰 Any costs for Penn State GitHub Service?

Feature	Public Repos	Internal/Private Repos	Notes
Basic Git Functionality	✅ Unlimited	✅ Unlimited	
GitHub Pages and Projects	✅	✅	
Actions	✅ 2,000/mo.	⚠️ Limited	
Dependabot Alerts	✅	✅	
Secret Scanning	✅	💰 Add-on cost	Own 🏢 only
Large File Storage	💰 Add-on cost	💰 Add-on cost	Own 🏢 only
CodeSpaces	💰 Add-on cost	💰 Add-on cost	Own 🏢 only
GitHub CoPilot	💰 Personal subscription	💰 Business subscription	Own 🏢 only

Legend: ✅ Included ❌ Not available ⚠️ Limited 💰 Available for an **extra cost** 🏢 GH Organization

🤖 GitHub Copilot at Penn State

Important Notes

- Not the same as Microsoft Copilot or Copilot for Microsoft 365
- Only applies to GitHub.com Copilot features

Eligibility & Access

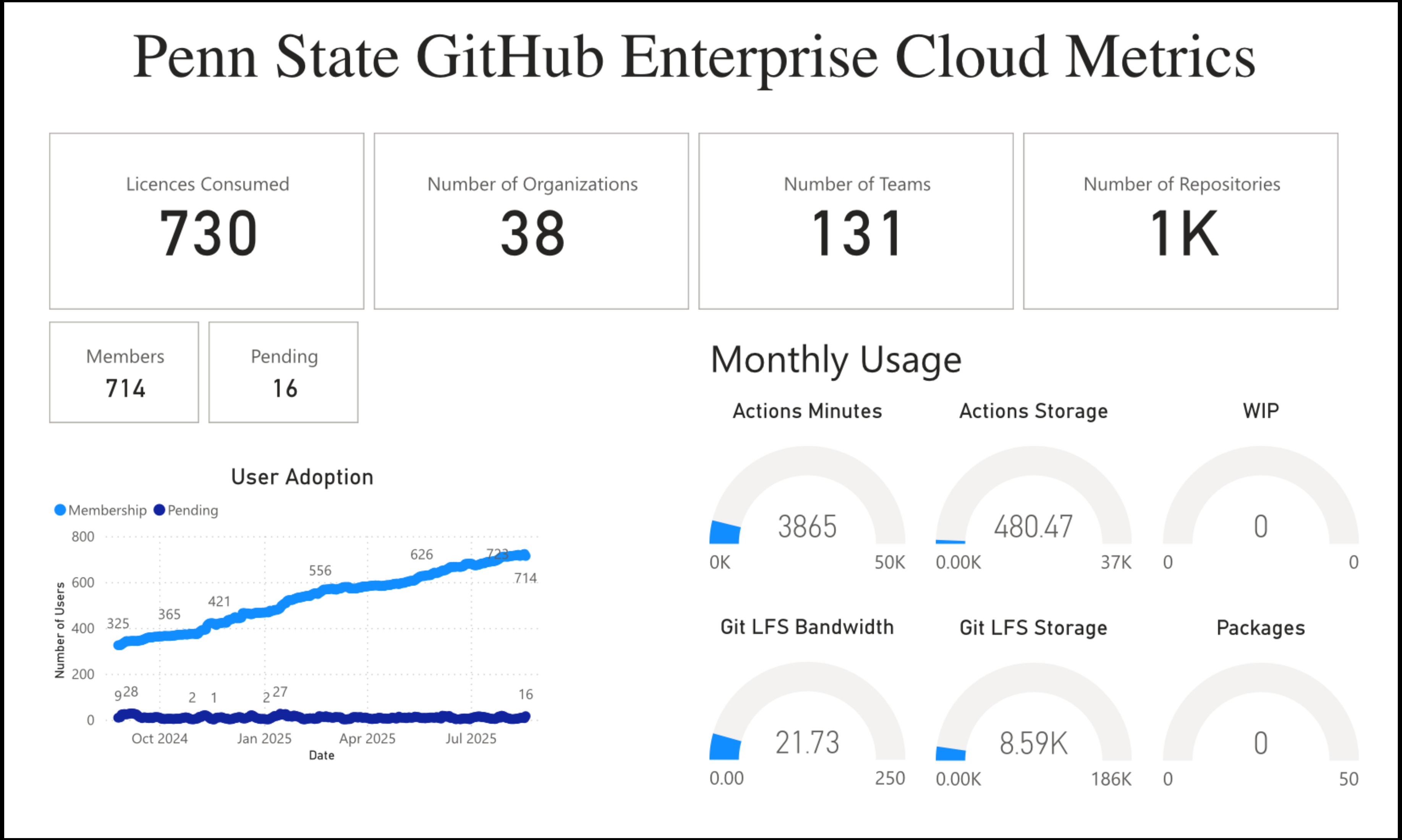
- Faculty & Students: Free access available for verified users
- Staff: 30-day free trial
- Paid license requires supervisor approval and departmental funding

Licensing Info

- Only Copilot Individual & Business is supported
- Copilot Enterprise not available currently for Penn State

Pro Tip: After activation, disable data sharing in Copilot Privacy Settings

Who at Penn State is using it today?



Penn State GitHub Enterprise Cloud Metrics

Licences Consumed	Number of Organizations	Number of Teams	Number of Repositories
730	38	131	1K

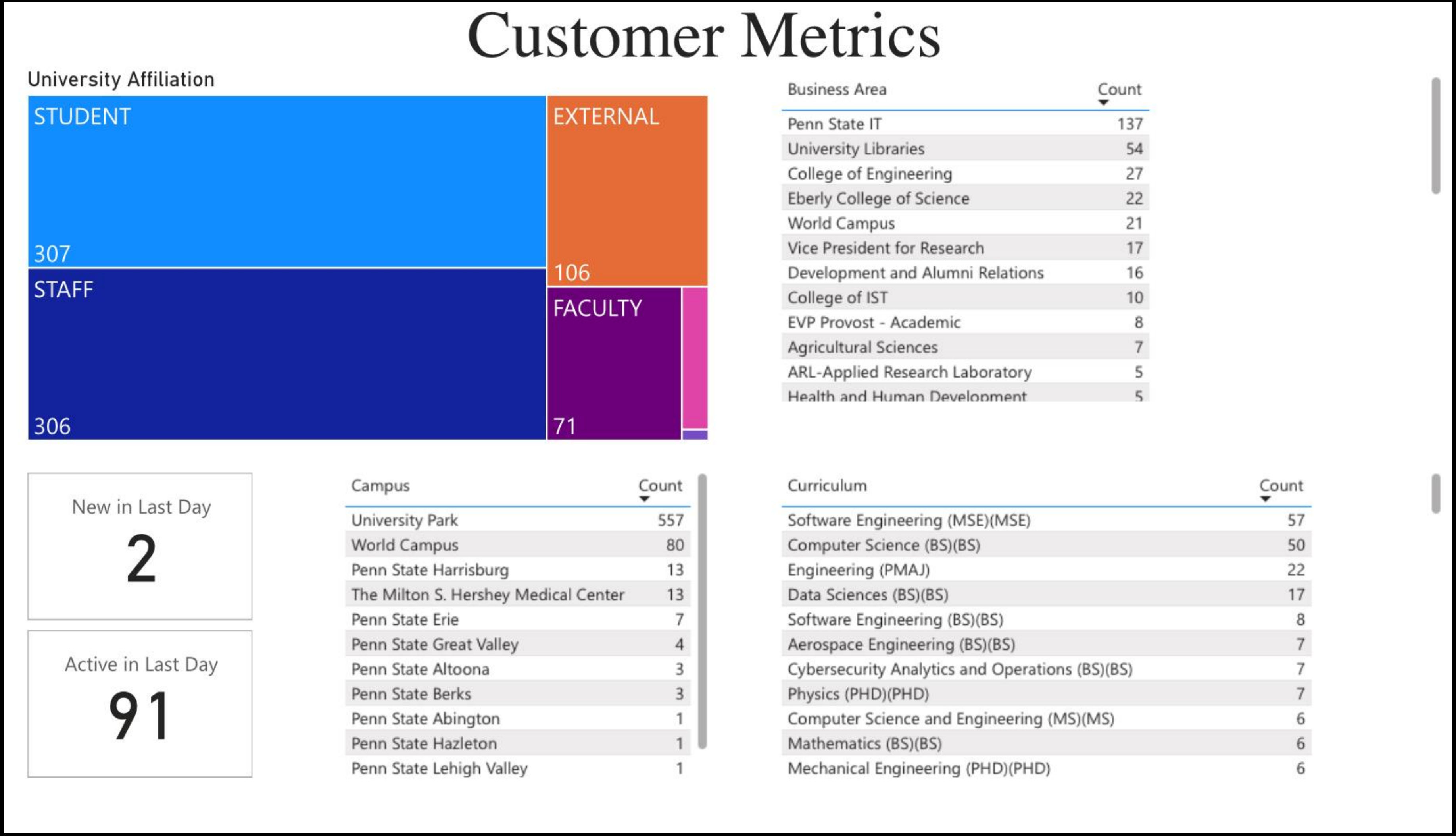
Members	Pending
714	16

User Adoption

Monthly Usage

As of 8/19/2025

Who at Penn State is using it today?



Customer Metrics

University Affiliation

Business Area	Count
Penn State IT	137
University Libraries	54
College of Engineering	27
Eberly College of Science	22
World Campus	21
Vice President for Research	17
Development and Alumni Relations	16
College of IST	10
EVP Provost - Academic	8
Agricultural Sciences	7
ARL-Applied Research Laboratory	5
Health and Human Development	5

New in Last Day

2

Active in Last Day

91

Campus	Count
University Park	557
World Campus	80
Penn State Harrisburg	13
The Milton S. Hershey Medical Center	13
Penn State Erie	7
Penn State Great Valley	4
Penn State Altoona	3
Penn State Berks	3
Penn State Abington	1
Penn State Hazleton	1
Penn State Lehigh Valley	1

Curriculum	Count
Software Engineering (MSE)(MSE)	57
Computer Science (BS)(BS)	50
Engineering (PMAJ)	22
Data Sciences (BS)(BS)	17
Software Engineering (BS)(BS)	8
Aerospace Engineering (BS)(BS)	7
Cybersecurity Analytics and Operations (BS)(BS)	7
Physics (PHD)(PHD)	7
Computer Science and Engineering (MS)(MS)	6
Mathematics (BS)(BS)	6
Mechanical Engineering (PHD)(PHD)	6

As of 8/19/2025

Best Practices

📦 Repositories

- **Types:** 🌎 Public | 🦁 Internal | 🔒 Private
- **Access**: Invite teams or users, set roles (Read–Admin)
- **Protect branches**: Use review rules on main branch
- **Use teams**: Easier than managing individual access
- **Name wisely:** Clear, consistent repo naming
- **Add basics**: README.md, .gitignore

👥 Collaboration

Within Penn State

- Ensure collaborators have an active Penn State GitHub account
- Invite them to the appropriate organization (e.g., psu-org1)
- Add them to a team for scoped access and easier management

External Collaborators

(e.g., visiting faculty, vendors, sponsored accounts)

- Can only be invited at the individual repository level
- Cannot be added to teams or organization-wide roles
- Access should be reviewed regularly and limited to what's needed

Automation

⚙️ What is CI/CD?

CI/CD = Continuous Integration + Continuous Deployment/Delivery

- **CI**: Automatically build & test code when changes are made
- **CD**: Automatically deploy code to production/staging

Enables **faster feedback**, **fewer errors**, and **repeatable workflows**

🤖 GitHub Actions – Automation Engine

GitHub Actions lets you:

- Automate **builds, tests, deployments**, and more
- Trigger workflows on **push, pull request, schedule, or custom events**
- Use **prebuilt actions** or write your own

✅ Fully integrated into GitHub

✅ Supports matrix builds, containers, secrets, and self-hosted runners

🔁 Common CI/CD Use Cases

- **Run unit tests** on pull requests
- **Lint and format code** before merging
- **Build and publish** Docker containers
- **Deploy to cloud** (e.g., AWS, Azure, GCP, Netlify, Firebase)
- **Send alerts** to Teams/Slack/Discord
- **Schedule nightly jobs** or cleanup tasks

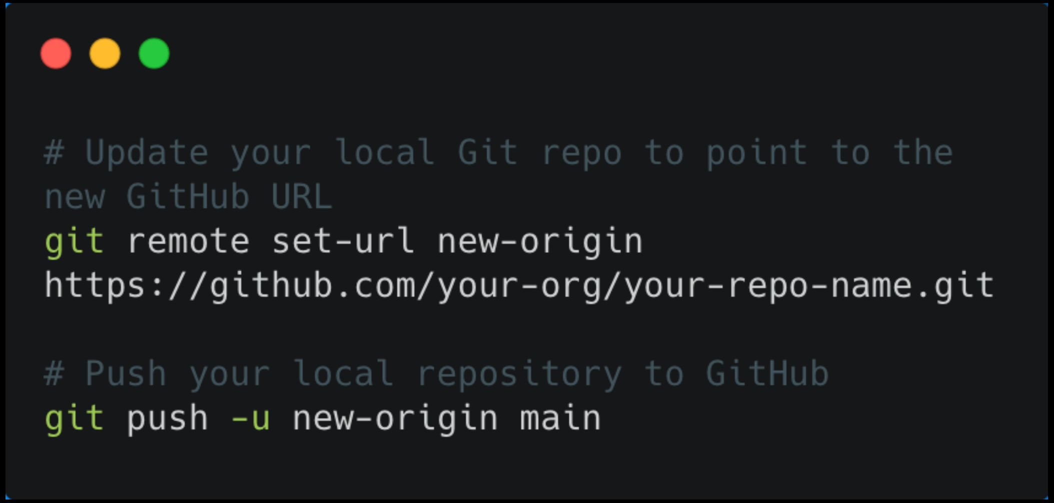
📦 🚚 Migrating to GitHub

Typical Migration Workflow

1. Inventory existing repositories
2. Clean up old or inactive projects
3. Export & import repositories
4. Recreate workflows (CI/CD)
5. Map users & permissions
6. Test & validate
7. Decommission the original repository/project

🧰 Tools that Help

- Git Commands
  - Create an empty repo in GitHub
  - Get the GitHub clone URL
  - Add your local Git repo origin w/ URL
  - Git push local repo to new origin



```
# Update your local Git repo to point to the
new GitHub URL
git remote set-url new-origin
https://github.com/your-org/your-repo-name.git

# Push your local repository to GitHub
git push -u new-origin main
```

- GitHub Importer
- GitHub CLI

Resources for you and your customers

🧠 Knowledge Base Articles

Over 30 articles in Penn State’s Knowledge Base!

- Signing up for Service - KB0019812
- Getting Started - KB0020754
- Frequently Asked Questions - KB0019927
- For IT - KB0020773

Several articles on migrating from GitLab to GitHub too!

📚 Trainings

LinkedIn Learning – linkedinlearning.psu.edu

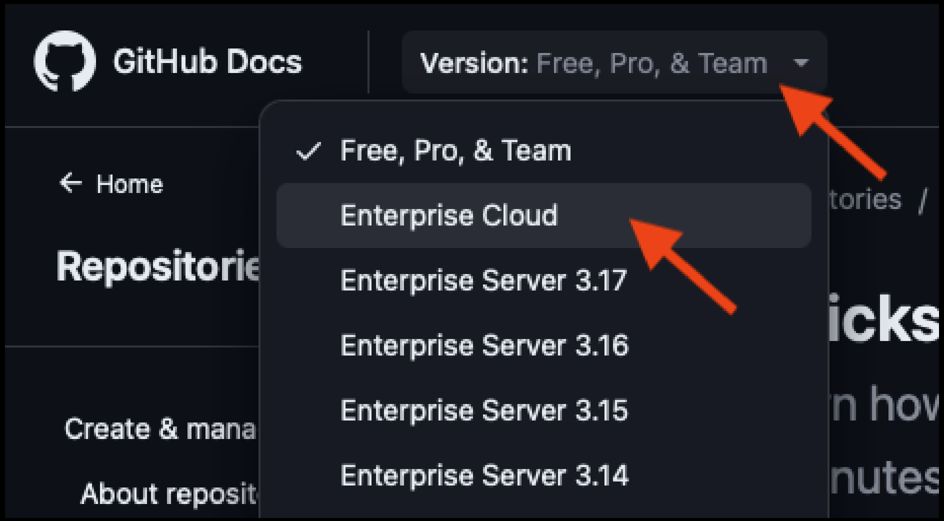
- Git Essential Training
- Learning Git and GitHub

GitHub Skills - https://skills.github.com

GitHub Documentation

https://docs.github.com

Pro Tip: Make sure you select “Enterprise Cloud” for version.



🙋‍♀️ Getting Help

📜 Open a GitHub Support Ticket

- Visit GitHub Support → Log in → *My Tickets* → *New Ticket*
  Choose personal or organizational context and submit your issue.

🏛️ Access to a Penn State GitHub Organization

- Visit http://github.psu.edu and email the org admins listed for access.

💬 Contact the Penn State GitHub Team

- Submit a request through the Code Repository Service help form.

Presentation Resources and Questions

Thanks for coming!

Questions?

Presentation slides and links available at:

https://github.com/psu-github/2025-GitHub-Presentation-Resources