GitHub

Study Guide
GitHub Administration

Get exam-ready for the GitHub Administration Certification with our comprehensive study guide. We've curated the essential resources and learning activities to better prepare you for the GitHub Administration exam and boost your chances of success.

Audience Profile

This exam is designed for system administrators, software developers, application administrators, and IT professionals with intermediate-level experience in GitHub Enterprise Administration.

Objective Domains

An objective domain for a certification exam, often referred to as a "domain" or "exam domain," is a structured outline or framework that defines the specific knowledge, skills, and topics that the certification exam will cover. It provides a clear roadmap for what candidates should expect to encounter on the exam and what they need to study and prepare for.

The domains provided in this study guide are intended to provide insight into the topic categories covered in the GitHub Administration exam, along with the learning objective within each domain.

Domain Breakdown
Domain 1: Support GitHub Enterprise for users and key stakeholders
Domain 2: Manage user identities and GitHub authentication
Domain 3: Describe how GitHub is deployed, distributed, and licensed
Domain 4: Manage access and permissions based on membership
Domain 5: Enable secure software development and ensure compliance
Domain 6: Manage GitHub Actions
Domain 7: Manage GitHub Packages

Recommendations and Best Practices for Success

To increase your chances of success in passing the GitHub Administration exam, it's essential to start with a solid foundation of basic experience, exposure, and proficiency of GitHub Administration. The recommended learning paths for this exam provide you with an in-depth study of the learning content, followed by hands-on exercises and preparation assessment questions that were created to enable you to fine-tune your knowledge and readiness for the certification exam.

Content Resources

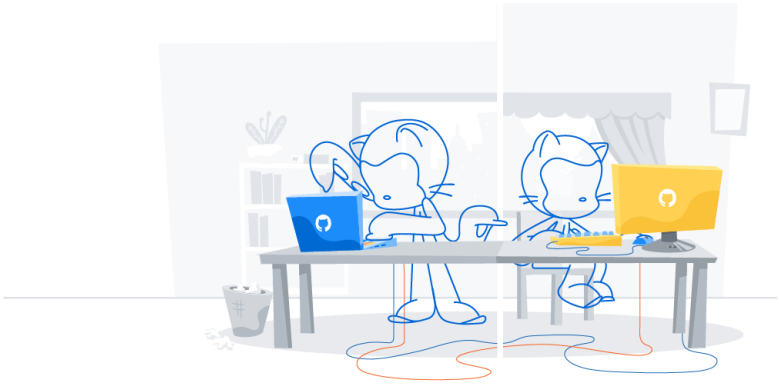
The following resources have been created in collaboration with GitHub as recommended content that covers the learning objectives in each domain for the GitHub Administration exam. Both Microsoft Learn and LinkedIn Learning provide a complete learning path for the exam, but offer a different learning experience.

Microsoft Learn

The GitHub Administration learning path on MS Learn provides a robust collection of learning modules designed to prepare you for the GitHub Actions exam. As a GitHub administrator, you need to maintain a healthy, robust, and secure GitHub environment that supports the needs of your organization's requirements and developer workflows. The following modules will provide an overview of the various options and customizations available to you as an administrator on the GitHub platform. Gain more insight into managing user identities and authentication, deployment options, access and permissions, and securing software development and ensuring compliance.

LinkedIn Learning

Immerse yourself in the **Prepare for the GitHub Administration Certification** learning path on LinkedIn Learning, featuring an series of video courses designed specifically for the GitHub Administration exam. As a GitHub administrator, your role is pivotal in maintaining a robust, secure, and highly efficient GitHub environment that perfectly aligns with the unique needs of your organization and its developer workflows. Explore our curated modules, guided by industry experts, to delve deep into the plethora of options and customizations available to you as a GitHub administrator. Gain valuable insights into user identity management, authentication, deployment strategies, access control, and security measures critical for software development and compliance.
(**This learning path will be available in November, 2023**)



Domain 1: Support GitHub Enterprise for users and key stakeholders

Support GitHub Enterprise for users and key stakeholders
Distinguish problems that can be solved by an administrator from those that need GitHub Support
Describe how to generate support bundles and diagnostics
Describe how GitHub's products and services are used within the enterprise to identify underutilized features, integrations in use, most active teams, and repositories.
Recommend standards for developer workflows, including code collaboration (fork-and-pull versus branching), branching, branch protection rules, code owners, the code review process, automation, and release strategy.
Explain the tooling ecosystem at the enterprise
Explain the enterprise's CI/CD strategy
Discuss how to recommend tooling and workflows to teams within an enterprise
Explain how GitHub APIs can be used to extend the capabilities of the administrator from the user interface, such as querying or storing the audit log
Locate an asset from the GitHub Marketplace for a specific need (i.e. find the Azure Pipelines GitHub App in the Marketplace, install it, and configure it to deploy your code)
Contrast a GitHub App and an action (i.e. their permissions, how they're built, how they're consumed)
List the benefits and risks of using apps and actions from the GitHub Marketplace

Domain 2: Manage user identities and GitHub authentication

Manage user identities and GitHub authentication
List the implications of enabling SAML single sign-on (SSO) for an individual organization versus all organizations in an enterprise account
List the steps to enable and enforce SAML SSO for a single organization and multiple organizations using enterprise accounts.
Explain how to require two-factor authentication (2FA) for an organization.
Explain how to choose supported identity providers.
Describe how identity management and authorization works on GitHub
List the consequences of a user's membership in the instance, an organization, or multiple organizations
Describe the authentication and authorization model (specifically, how users get to the system, and how they're granted access to specific things within GitHub)
List the supported SCIM providers (Azure, Okta, self-created)
Describe how the SCIM protocol works and how GH supports it
Describe how Team synchronization works
Contrast team synchronization and SCI

Domain 3: Describe how GitHub is deployed, distributed, and licensed

Contrast the capabilities of GHES, GHEC, and GHAE
Describe GitHub Enterprise Cloud (GHEC)
Describe GitHub Enterprise Server (GHES)
Describe GitHub AE

Differentiate how products are billed, including seat licenses, GitHub Actions, and GitHub Packages
Describe pricing for GitHub Actions
Describe pricing and support options for organizations
Describe how to find statistics of license usage for a specific organization
Describe how to find statistics of license usage for machine accounts and peripheral services
Explain the consumption of metered products given a report (i.e. GitHub Actions minutes or storage for GitHub Packages)

Domain 4: Manage access and permissions based on membership

Describe enterprise permissions and policies
Explain the benefits and costs of deploying a single organization versus multiple organizations
Describe how to set default read permissions versus default write permissions across organizations
Describe Team sync through AD
Explain maintainability; writing scripts against multiple orgs and multiple access rights
Describe how to adjust enterprise policies and organization permissions in alignment with a company's trust and control position

Describe enterprise permissions and policies
Define a GitHub organization
List the possible roles of an organization member
Contrast permissions for organization members, owners, and billing managers
Describe the difference between being an organization member and an outside collaborator
List the consequences of a user's membership in an instance or organization
Explain how to give a user the minimum required permissions for repository, organization, or team access.
List the benefits and the drawbacks of creating a new organization

Describe team permissions
Define Teams in a GitHub organization
List the possible roles of a team member
Describe the different permission models

Repository permissions
Explain the actions of a user given a list of their permissions, such as repository role, team membership, or organization membership (https://github.com/organizations/<ORG_NAME>/settings/member_privileges)
List the repository membership options
Explain audit access to a repository

Domain 5: Enable secure software development and ensure compliance

Enable secure software development and ensure compliance
Explain how GitHub supports the enterprise's security posture
Describe scrubbing sensitive data from a Git repository (filter-branch / BFG)
Describe scrubbing sensitive data from GitHub (contacting support)
Explain how to choose a policy based on how much control is required
Explain the impacts of choosing a specific set of policies
Define organization policies
Define enterprise policies

Describe how to use the audit log APIs (Rest and GraphQL) to explain a missing asset
Define the use case for audit logs
Describe security and compliance concepts with GitHub
Explain how to provide reports for auditing

Define and explain the importance of the security features of a GitHub repository
Explain the importance of a security policy
Define a vulnerability
Describe a vulnerable dependency
Explain the importance of secret scanning
Explain the importance of code scanning
Describe automated code scanning (CodeQL)
Explain the dependency graph
Explain the importance of a security advisory
Describe Dependabot
Detect and fix outdated dependencies with security vulnerabilities
Describe security vulnerability alerts
Create and implement a security response plan that addresses sensitive data on a GitHub repository
Describe how to use SSH keys and Deploy keys to access repository data

API access and integrations
List supported access tokens (e.g. PAT, Installation Tokens, OAuth and GitHub app OAuth tokens, Device Tokens, Refresh tokens)
Explain how to find a token's rate limits
Describe GitHub Apps, their repository permissions, user permissions, and event subscriptions
Describe OAuth Apps, their permissions, and event subscriptions
Contrast the use of a personal access token (PAT) or a GitHub App for authenticating a machine account
Describe the use of machine accounts versus GitHub apps
Explain how to approve or deny user-created GitHub Apps and OAuth apps based on a security policy
Define an enterprise managed user (EMU)

Domain 6: Manage GitHub Actions

Distribute actions and workflows to the enterprise
Identify reuse templates for actions and workflows
Define an approach for managing and leveraging reusable components (i.e. repos for storage, naming conventions for files/folders, plans for ongoing maintenance)
Define how to distribute actions for an enterprise
Explain how to control access to actions within the enterprise
Configure organizational use policies for GitHub Actions

Manage runners for the enterprise
Describe the effects of configuring IP allow lists on GitHub-hosted and self-hosted runners
Configure IP allow lists on internal applications and systems to allow interaction with GitHub-hosted runners
List the effects and potential abuse vectors of enabling self-hosted runners on public repositories
Select appropriate runners to support workloads (i.e. using a self-hosted versus GitHub-hosted runner, choosing supported operating systems)
Contrast GitHub-hosted and self-hosted runners
Configure self-hosted runners for enterprise use (i.e. including proxies, labels, networking)
Manage self-hosted runners using groups (i.e. managing access, moving runners into and between groups)
Monitor, troubleshoot, and update self-hosted runners

Manage encrypted secrets in the enterprise
Identify the scope of encrypted secrets
Explain how to access encrypted secrets within actions and workflows
Explain how to manage organization-level encrypted secrets
Describe how to manage repository-level encrypted secrets
Describe how to use 3rd party vaults

Domain 7: Manage GitHub Packages

Manage encrypted secrets in the enterprise
Describe which GH Packages are supported
Describe how to access, write, and share GH Packages
Describe how to use GH Packages in workflows (i.e. with GH Actions or other CI/CD tools)
Explain the differences and use cases between GH Packages and releases