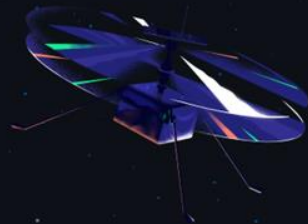




# Copilot Administration & Security

Let's build from here



## AGENDA

Copilot Fundamentals

Copilot X

Policies and settings

Telemetry

Data privacy

Troubleshooting

Integrations

Q & A - Wrap Up



# “Copilot for Business - Introduction” (deck)





# Policies and settings

# Policies in Copilot Can be Categorized Under



Enterprise Policies

Organization Policies

# Enterprise Policies

An enterprise admin is able to control whether **suggestions matching public code** is allowed or blocked. The three options are

- Blocked
- Allow
- No Policy

An enterprise admin is able to **manage Copilot Chat access**. The three options are

- No Policy
- Enabled
- Disabled

An enterprise admin is able to **manage organizational access to Copilot**. The three options are

- Disabled
- Allow for all organizations
- Allow for specific organizations

## GitHub Copilot

---

### Suggestions matching public code

GitHub Copilot can allow or block suggestions matching public code. See [the GitHub Copilot documentation](#) to learn more.

No Policy ▾

### GitHub Copilot Chat

Grant beta access for all organizations with access to Copilot within this enterprise.  
If allowed, organizations can access GitHub Copilot Chat feature and you agree to [pre-release terms](#).

No Policy ▾

### Manage organization access to GitHub Copilot

Assign which organizations will have access to GitHub Copilot inside your enterprise. Admins of an organization with approved access will receive an email with setup instructions.

☐ Disabled

Disable GitHub Copilot access for my organizations

☒ Allow for all organizations

Allow access to GitHub Copilot for all organizations, including any created in the future

☐ Allow for specific organizations (7 organizations enabled)

Only specifically-selected organizations may use GitHub Copilot

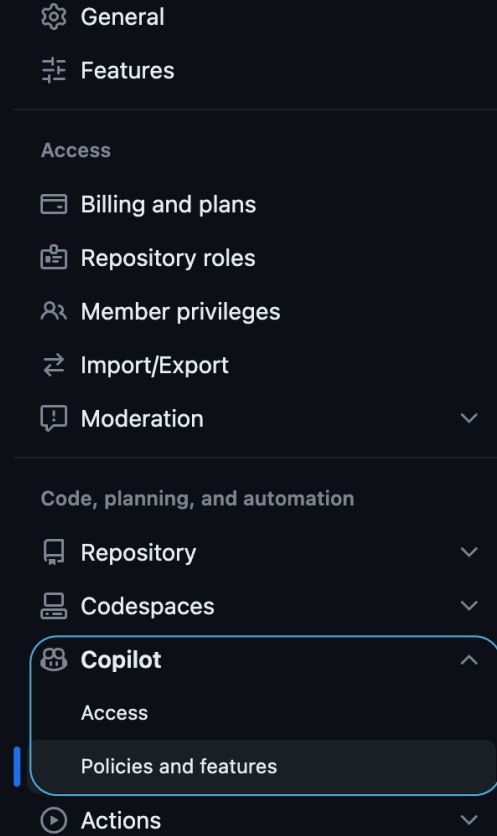
Your enterprise's use of GitHub Copilot is governed by the [GitHub Copilot Product Specific Terms](#).

Save

# Organization Settings

Organization settings of Copilot can be categorized under two headings

- **Access**
- **Policies and features**



# Organization Settings Contd.

## Access Settings:

Allows an Org Admin or owner to

- View Number of Copilot license utilized
- Estimated cost of Copilot Usage within the Org
- Policy to enable Copilot for all members in the org or selective members
- Extract report of Copilot activity per user

### GitHub Copilot

#### Copilot seats

831 seats

Number of purchased seats in this organization.  
[Learn more on licenses.](#)

#### Estimated monthly cost

\$15,789.00


Each purchased seat is \$19 USD/month.  
[Review billing details.](#)



#### Copilot in your organization

Control which users or teams will have access to GitHub Copilot inside your organization. Invited users with approved access will receive an email with setup instructions. [Organization settings documentation.](#)


Enabled for: All members of the organization ▾


### Access management

 Get report

  abhi-dutta

831 members with access to Copilot

 Sort ▾

 @abhi-dutta

Last active 2 days ago



# Organization Settings Contd.

## Copilot user activity report sample data

octodemo-seat-usage-1696435416

Login	Status	Team	Last Activity Date	Last Editor Used
Abc	Active	No team	2023-10-04	vscode/1.83.0-insider/copilot-chat/0.8.2023092902
Lakes	Active	No team	2023-09-13	vscode/1.82.0/copilot-chat/0.7.2023090101
Chaos	Active	No team	2023-10-04	vscode/1.82.1/copilot/1.111.404
Akjsda	Active	No team	2023-10-04	vscode/1.82.2/copilot-chat/0.7.1
Sbdkajs	Active	No team	2023-10-04	vscode/1.82.3/copilot-chat/0.7.1
Asa	Active	No team	2023-05-26	vscode/1.78.2/copilot/1.86.82
Baksjdb	Active	No team	2023-10-04	vscode/1.82.3/copilot-chat/0.7.2023090101
Jshbda	Active	No team	2023-10-04	/

# Organization Settings Contd.

## Policies & features:

- Policies and features settings allow an org owner to define policies which will be applicable to all the users that have been onboarded to GitHub Copilot under the org
- Allows org owners to define whether “public code” matching is allowed in suggestions
- Can users use Copilot Chat (beta) feature in the supported IDE’s

### GitHub Copilot policies and features

#### Policies

##### Suggestions matching public code

Copilot can allow or block suggestions matching public code.

Allowed ▾

#### Technical preview

Enable or disable limited public beta access for members of your organization with access to GitHub Copilot. Note that users from other organizations may gain access if permitted by their administrators.

#### Features

##### GitHub Copilot Chat Beta

GitHub Copilot to explain a piece of code, propose bug fixes, or generate unit tests in a chat interface from your editor. If enabled, you agree to [pre-release terms](#).

Enabled ▾





## Client Side Settings

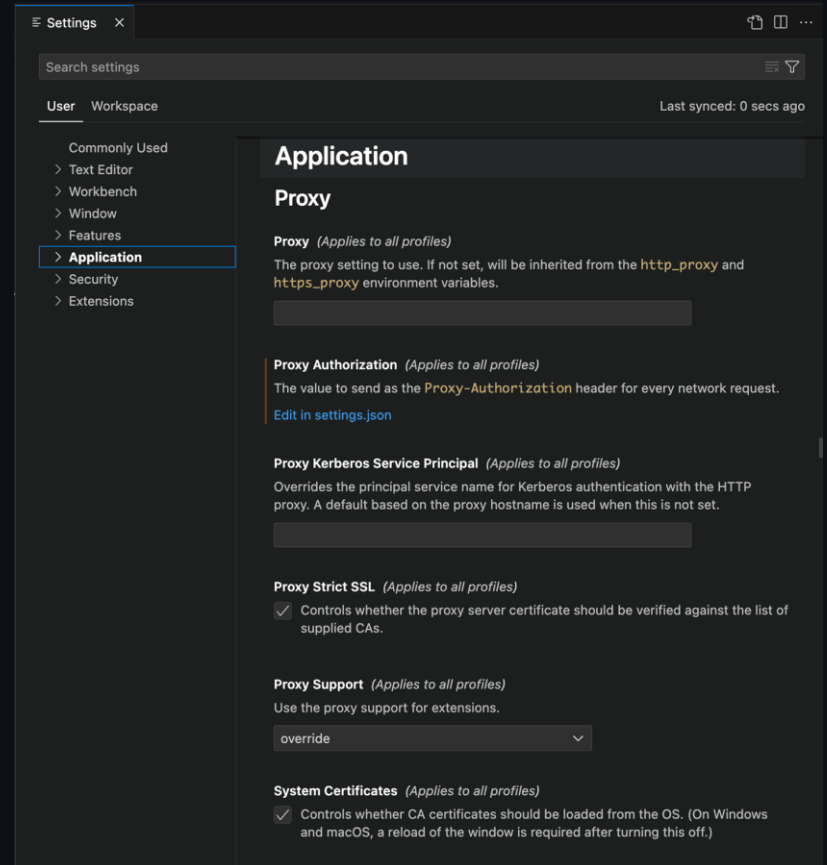
# Network Settings

## Proxy Settings:

- GitHub Copilot supports basic HTTP proxy setups. If you need to authenticate to a proxy, GitHub Copilot supports basic authentication or authentication with Kerberos. \*If the proxy URL starts `https://`, the proxy is not currently supported.
- If you don't configure a proxy directly in your editor, GitHub Copilot checks if a proxy URL is set in any of the following environment variables, listed from highest to lowest priority.
  - `HTTPS_PROXY`
  - `https_proxy`
  - `HTTP_PROXY`
  - `http_proxy`

## Authentication Modes:

- Basic Authentication
- Kerberos Authentication



# Firewall Settings

If you or your organization employs security measures like a firewall, it may be beneficial to include certain domain URLs in an "allowlist" and open specific ports and protocols.

<u>Domain and/or URL</u>	<u>Purpose</u>
<a href="https://github.com/login/*">https://github.com/login/*</a>	Authentication
<a href="https://api.github.com/user">https://api.github.com/user</a>	User Management
<a href="https://api.github.com/copilot_internal/*">https://api.github.com/copilot_internal/*</a>	User Management
<a href="https://copilot-telemetry.githubusercontent.com/telemetry">https://copilot-telemetry.githubusercontent.com/telemetry</a>	Telemetry
<a href="https://default.exp-tas.com/">https://default.exp-tas.com/</a>	Telemetry
<a href="https://copilot-proxy.githubusercontent.com/">https://copilot-proxy.githubusercontent.com/</a>	API service for Copilot suggestions
<a href="https://origin-tracker.githubusercontent.com">https://origin-tracker.githubusercontent.com</a>	API service for Copilot suggestions
<a href="https://*.githubcopilot.com">https://*.githubcopilot.com</a>	API service for Copilot suggestions



## IDE Advanced Settings

# Supported IDEs



Visual Studio



Visual Studio Code



Vim/Neovim



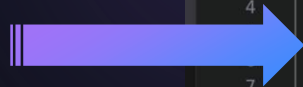
Jet Brains



# Enable non-programming Meta Files

In **settings.json**, add

```
"github.copilot.enable":  
{  
  "*": true,  
  "yaml": true,  
  "plaintext": false,  
  "markdown": true  
}
```

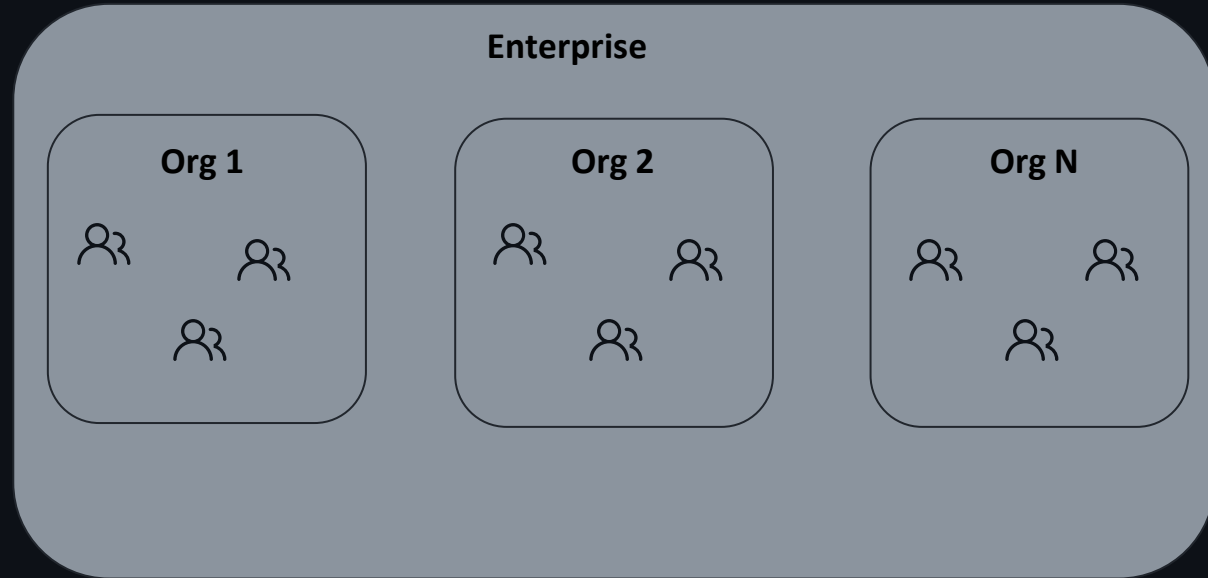
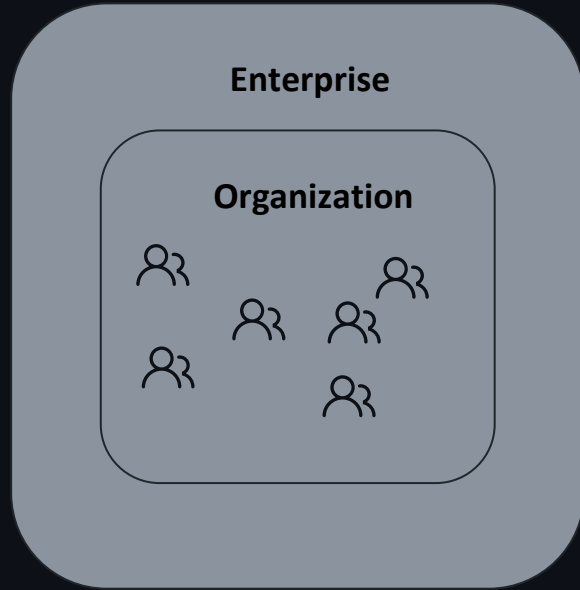


```
{ settings.json •  
Users > bryantson > Library > Application Support > Code > User > {} settings.json > ...  
1 {  
2   "editor.inlineSuggest.enabled": true,  
3   "github.copilot.enable": {  
4     "*": true,  
5     "yaml": true,  
6     "plaintext": false,  
7     "markdown": true  
8   },  
9   "[python]": {  
10     "editor.formatOnType": true  
11   },  
12   "github.copilot.advanced": {  
13  
14   },  
15   "editor.inlineSuggest.showToolbar": "always",  
16   "window.zoomLevel": 1,  
17   "appService.connections": []  
18 }  
19 }
```



## User Onboarding Best Practices

# Single Org vs Multi Org





# Telemetry



# Telemetry from GitHub REST API



Get Copilot for Business seat information and settings for an organization

GET /orgs/{org}/copilot/billing

cURL

```
curl -L \  
  -H "Accept: application/vnd.github+json" \  
  -H "Authorization: Bearer <YOUR-TOKEN>" \  
  -H "X-GitHub-API-Version: 2022-11-28" \  
  https://api.github.com/orgs/ORG/copilot/billing
```

Example response

Status: 200

```
{  
  "seat_breakdown": {  
    "total": 12,  
    "added_this_cycle": 9,  
    "pending_invitation": 0,  
    "pending_cancellation": 0,  
    "active_this_cycle": 12,  
    "inactive_this_cycle": 11  
  },  
  "seat_management_setting": "assign_selected",  
  "public_code_suggestions": "block"  
}
```

Note: As of 5th Oct 2023 - The GitHub Copilot for Business API endpoints are in public beta and subject to change.



# Telemetry from GitHub REST API



List all Copilot for Business seat assignments for an organization

GET /orgs/{org}/copilot/billing/seats

cURL

```
curl -L \  
  -H "Accept: application/vnd.github+json" \  
  -H "Authorization: Bearer <YOUR-TOKEN>" \  
  -H "X-GitHub-API-Version: 2022-11-28" \  
  https://api.github.com/orgs/ORG/copilot/billing/seats
```

Note: As of 5th Oct 2023 - The GitHub Copilot for Business API endpoints are in public beta and subject to change.

## Response

Example response

Status: 200

```
{  
  "total_seats": 2,  
  "seats": [  
    {  
      "created_at": "2021-08-03T18:00:00-06:00",  
      "updated_at": "2021-09-23T15:00:00-06:00",  
      "pending_cancellation_date": null,  
      "last_activity_at": "2021-10-14T00:53:32-06:00",  
      "last_activity_editor": "vscode/1.77.3/copilot/1.86.82",  
      "assignee": {  
        "login": "octocat",  
        "id": 1,  
        "node_id": "MDQ6VXNlcjE=",  
        "avatar_url": "https://github.com/images/error/octocat_happy.gif",  
        "gravatar_id": "",  
        "url": "https://api.github.com/users/octocat",
```



# Telemetry from GitHub REST API



Get Copilot for Business seat assignment details for a user

GET /orgs/{org}/members/{username}/copilot

cURL

```
curl -L \  
  -H "Accept: application/vnd.github+json" \  
  -H "Authorization: Bearer <YOUR-TOKEN>" \  
  -H "X-GitHub-API-Version: 2022-11-28" \  
  https://api.github.com/orgs/ORG/members/USERNAME/copilot
```

Example response

Status: 200

```
{  
  "created_at": "2021-08-03T18:00:00-06:00",  
  "updated_at": "2021-09-23T15:00:00-06:00",  
  "pending_cancellation_date": null,  
  "last_activity_at": "2021-10-14T00:53:32-06:00",  
  "last_activity_editor": "vscode/1.77.3/copilot/1.86.82",  
  "assignee": {  
    "login": "octocat",  
    "id": 1,  
    "node_id": "MDQ6VXNlcjE=",  
    "avatar_url": "https://github.com/images/error/octocat_happy.gif",  
    "gravatar_id": "",  
    "url": "https://api.github.com/users/octocat",  
    "html_url": "https://github.com/octocat",  
    "followers_url": "https://api.github.com/users/octocat/followers",  
    "following_url":
```

Note: As of 5th Oct 2023 - The GitHub Copilot for Business API endpoints are in public beta and subject to change.







# Telemetry from GitHub Audit Logs



Copilot for Business users will now be able to review updates and changes to their Copilot settings through the audit log.

With any large organization or enterprise, it's important to be able to trace settings updates and purchases. We want to empower our organization and enterprise admins to be able to investigate any changes to their Copilot for Business account and settings without having to reach out to support.

### Audit log

Events Log streaming Settings

Filters

Clear current search query

#### Events matching search query

**dhruvg20 – copilot.cfb\_seat\_added**  
Copilot for Business seat was added for [dhruv-gupta-live](#) in the [\[redacted\]](#) organization because they were added to the organization  
Unknown location | Unknown IP address | 2 weeks ago | ...

**jschanfung – copilot.cfb\_org\_settings\_changed**  
Copilot Chat setting changed from unconfigured to enabled for the [\[redacted\]](#) organization  
[Australia](#) | [120.158.194.167](#) | 2 weeks ago | ...

**dhruvg20 – copilot.cfb\_seat\_added**  
Copilot for Business seat was added for [jschanfung](#) in the [\[redacted\]](#) organization because they were added to the organization  
Unknown location | Unknown IP address | on Sep 1 | ...

**dhruvg20 – copilot.cfb\_seat\_added**  
Copilot for Business seat was added for [dhruv-gupta-live](#) in the [\[redacted\]](#) organization  
[India](#) | [101.0.62.219](#) | on Jun 14 | ...

**dhruvg20 – copilot.cfb\_seat\_added**  
Copilot for Business seat was added for [dhruvg20](#) in the [\[redacted\]](#) organization  
[India](#) | [101.0.62.219](#) | on Jun 14 | ...



# Telemetry - Future Roadmap

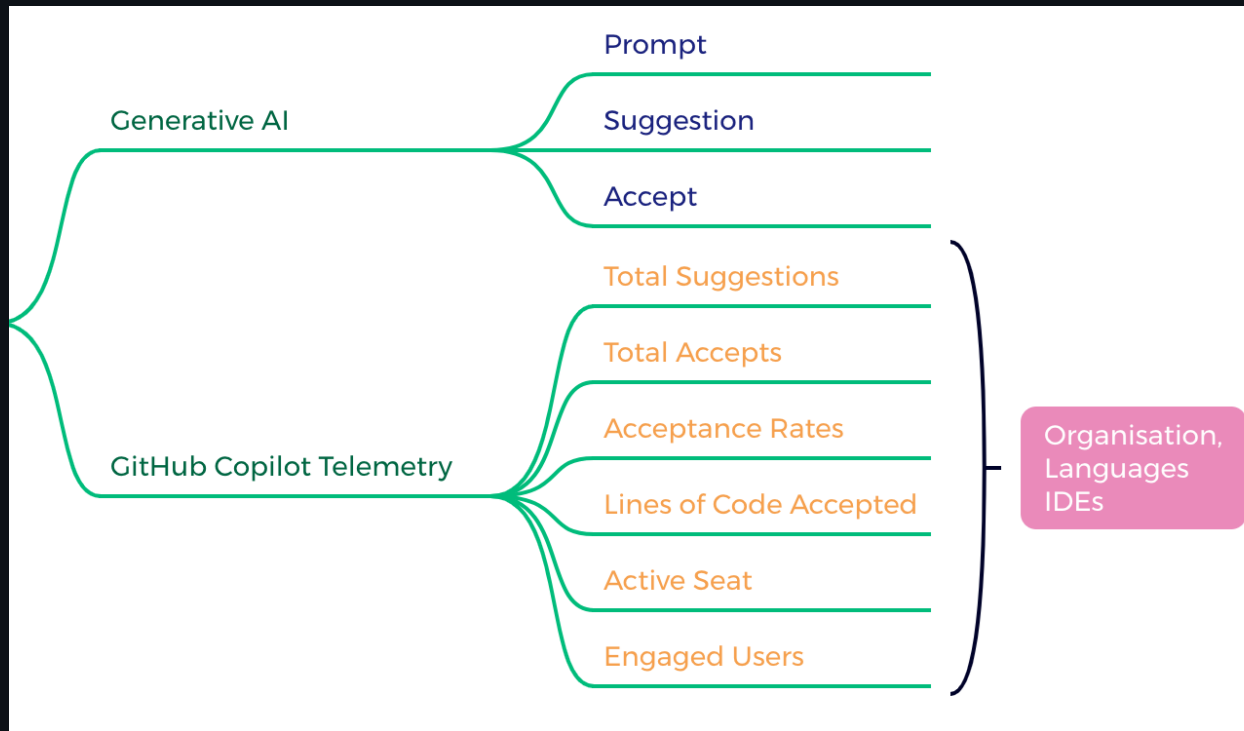


Copilot for Business Telemetry from GitHub Account Team

GitHub Copilot now has a better AI model and new capabilities

Research: quantifying GitHub Copilot's impact on developer productivity and happiness

GitHub Copilot is generally available to all developers





# Data privacy

# What Personal Data is Collected & How?

## ❖ User Engagement Data

- Events generated with an IDE
- Personal Data such as pseudonymous identifiers

## ❖ Prompts

- Collection of code & contextual information to generate suggestions
- User using a designated keyboard shortcut or pauses typing to request a suggestion

## ❖ Suggestions

- One or more lines of proposed code and other output returned

# Personal Data - Cont'd

- Uses the source code in IDE only to generate a suggestion.
- Performs several scans to identify and remove certain information within a prompt.
- Prompts are only transmitted to the AI model to generate suggestions in real-time
- Deleted once the suggestions are generated.
- User engagement data is used to improve the performance of the Copilot Service; specifically, it's used to
  - a. Fine-tune ranking
  - b. Sort algorithms
  - c. Craft prompts

# Under the hood - Responding to a prompt

- Suggestions are not copied and pasted from any code database.
- Uses probabilistic reasoning to generate suggestions.
- GitHub Copilot sends a prompt to its AI model, which makes a probabilistic determination of what is likely to come next in your coding sequence and provides suggestions.

# Aiding Secure Development

GitHub Copilot leverages a variety of security measures to

- Remove sensitive information in code
- Block insecure coding patterns
- Detect vulnerable patterns in incomplete fragments of code.

# FAQ

- How long the collected personal data will be retained?
  - User Engagement Data - 24 Months
  - Prompts - Discarded once a suggestion is returned
  - Suggestions - Not Retained
- Can the users control the sharing & use of their data?
  - Not possible & its required for the use of GitHub Copilot and will continue to be collected, processed, and shared with Microsoft when you use GitHub Copilot.



# FAQ - Cont'd

- How does our collected data gets processed by GitHub?
  - Billing & Account Management
  - Produce Aggregated Reports
- How's our collected data used?
  - To measure the impact it has on the user
  - Fine Tune ranking & Sorting Algorithms and Prompt Crafting
  - Detect violation of **Acceptable Use Policies**.
  - Developers and their use of developer tools and services.

# FAQ - Cont'd

- Telemetry?
  - No, Telemetry is not available
- Organization-wide policy management
  - Yes, Policy settings can be implemented at an Organization level.
- Audit Logs?
  - Yes, Audit Logs are available along with Copilot specific events
- Http Proxy Support
  - Yes, HTTP proxy support via custom certificates available

# GitHub Copilot Trust Center

As GitHub's Chief Legal Officer, I understand the nuanced challenges of enabling company-wide AI adoption, especially in an evolving regulatory landscape. GitHub Copilot is enterprise-ready, but organizations need to clearly understand how the tool meets their compliance, security, and accessibility requirements.

Our aim is to bring you that clarity with the **GitHub Copilot Trust Center**.



<https://resources.github.com/copilot-trust-center/>



# Troubleshooting

# Common Issues

- [GitHub's Status Page](#)
- [Update GitHub Copilot Extension](#)
- [Error: "GitHub Copilot could not connect to server. Extension activation failed"](#)
- [GitHub Copilot not suggesting multiple lines of code](#)
- [Open Discussions on Copilot Community with relevant files](#)

# Viewing Logs for GitHub Copilot

Supported IDEs



Visual Studio



Visual Studio Code



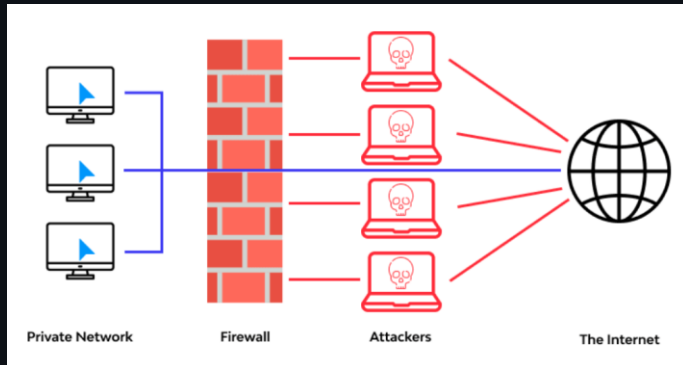
Vim/Neovim



Jet Brains

# Firewall settings

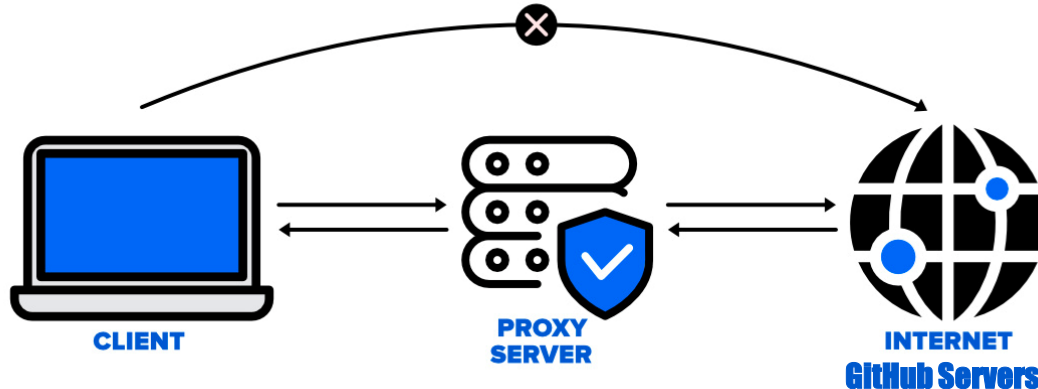
- Organization employs security measures like a firewall or proxy server
- Allowlist domain urls, specific ports & protocols
- Interaction with Remote Learning Model
- Trusted domain URLs



Domain and/or URL	Purpose
<code>https://github.com/login/*</code>	Authentication
<code>https://api.github.com/user</code>	User Management
<code>https://api.github.com/copilot_internal/*</code>	User Management
<code>https://copilot-telemetry.githubusercontent.com/telemetry</code>	Telemetry
<code>https://default.exp-tas.com/</code>	Telemetry
<code>https://copilot-proxy.githubusercontent.com/</code>	API service for Copilot suggestions
<code>https://origin-tracker.githubusercontent.com</code>	API service for Copilot suggestions
<code>https://*.githubcopilot.com</code>	API service for Copilot suggestions

# Network Proxy setup

- Company Equipment or Corporate Network
- Connecting to Internet via VPN or HTTP Proxy server
- Prevent connecting to GitHub' Servers





# Network Proxy Errors

- Error: GitHub Copilot could not connect to server. Extension activation failed: "read ETIMEDOUT" or "read ECONNRESET"
- Configuring network settings for GitHub Copilot
- Proxy Specific errors:
  - Proxy's URL https:// currently not supported by GitHub Copilot
  - Authenticated supported basic authentication or with Kerberos
  - Custom certificates issues

# Diagnosing Network Issues

- curl requests with --verbose
- curl --verbose [https://copilot-proxy.githubusercontent.com/\\_ping](https://copilot-proxy.githubusercontent.com/_ping)
- curl --verbose -x http://YOUR-PROXY-URL:PORT -i -L [https://copilot-proxy.githubusercontent.com/\\_ping](https://copilot-proxy.githubusercontent.com/_ping)
- --insecure -> Certificate related issues
- diagnostic logs from editors

# Certificate-related errors

- Errors: "certificate signature failure", "custom certificate", or "unable to verify the first certificate"
- GitHub Copilot only supports custom certificates if you use Github Copilot for Business
- Corporate proxy configure different proxy and does not intercept
- Certificates installed on machine, and GitHub Copilot find certificates
- Ignore Certificate Errors in Proxy settings  
Warning: Ignoring certificate errors can cause security issues and is not recommended

# Issues with GitHub Copilot Chat

- Org or Enterprise owners give access to GitHub Copilot Chat beta for users
- Install GitHub Copilot Chat Prerequisites
- Authentication Issues
- Error: "Oops, your response got filtered"



# Integrations

# GitHub REST API for Copilot for Business

- Get Copilot for Business seat information and settings for an organization
- List all Copilot for Business seat assignments for an organization
- Add teams to the Copilot for Business subscription for an organization
- Remove teams from the Copilot for Business subscription for an organization
- Add users to the Copilot for Business subscription for an organization
- Remove users from the Copilot for Business subscription for an organization
- Get Copilot for Business seat assignment details for a user

# Audit Logs

Review the actions taken by users at an Organisation & Enterprise level.

- Organization's Copilot settings and policies
  - Changes to the Enablement Policy
  - Org Settings changes
  - Enterprise settings changes
- Addition or removal of seats
  - Seat management changed
  - Seat assignment reused
  - Seat assignment refreshed
- Editor chat Settings
- Code Referencing Settings


# Audit Log Events

cfb_enterprise_settings_changed	copilot.cfb_seat_cancelled
copilot.cfb_enterprise_org_enablement_changed	copilot.cfb_seat_assignment_reused
clickwrap_save_event	copilot.cfb_seat_assignment_refreshed
cfb_org_settings_changed	copilot.cfb_seat_assignment_created
copilot.cfb_seat_cancelled_by_staff	copilot.cfb_seat_assignment_unassigned
cfb_seat_management_changed	editor_chat_setting
copilot.cfb_seat_added	code_referencing_setting





# Audit Logs


To review the actions taken by users at an Enterprise level.


 amarun22-emu


Arun EMU


 India


 Organizations


 People

 Identity provider

 Policies

 GitHub Connect

 Code Security

 Settings

Profile

Billing

Enterprise licensing

Authentication security

Code security and analysis


Verified & approved domains

Audit log

Hooks


Announcement


Support

 Compliance


Audit log


EventsLog streamingSettings

Filters 

 Clear current search query

Events matching search query

 amarun22-1111\_arunemu – copilot.cfb\_enterprise\_org\_enablement\_changed

Copilot for Business access policy changed from enabled for selected organizations to enabled for selected organizations in the amarun22-emu enterprise  
[India](#) | on Aug 29 |   
▼ View SSO details  
[amarun22-1111](#)

@timestamp1693288311218

\_document\_idS1Zg5kFyf3hWlqU0\_MDXiA

actioncopilot.cfb\_enterprise\_org\_enablement\_changed

actoramarun22-1111\_arunemu

actor\_id95283618

businessamarun22-emu

business\_id10353


created\_at1693288311218


current\_valueselected\_organizations


operation\_typemodify


previous\_valueselected\_organizations

user\_agentMozilla/5.0 (Macintosh; Intel Mac OS X 10\_15\_7) AppleWebKit...

 amarun22-1111\_arunemu – copilot.cfb\_enterprise\_org\_enablement\_changed

Copilot for Business access policy changed for the amarun22-emu enterprise  
[India](#) | on Aug 29 |   
▶ View SSO details

 amarun22-1111\_arunemu – copilot.cfb\_org\_settings\_changed

changed from to for the arun-emu-org1 organization  
[India](#) | on Jul 21 |   
▶ View SSO details

# Audit Logs

To review the actions taken by users at an Organisation level.

Overview

Repositories

Projects

Packages

Teams

People

Security

Insights

Settings

Organization, part of [amarun22-emu](#) [Switch to another account](#)

General

Features

Access

Billing and plans

Repository roles

Member privileges

Import/Export

Moderation

Code, planning, and automation

Repository

Codespaces

Copilot

Actions

Webhooks

Discussions

Packages

Pages

Projects

Security

Authentication security

Code security and analysis

Compliance

Verified and approved domains

Secrets and variables

Third-party Access

OAuth application policy

GitHub Apps

Personal access tokens

Integrations

Scheduled reminders

Messages

Announcement

Archive

Sponsorship log

Audit log

Deleted repositories

Developer settings

Events

Settings

Audit log

Filters

action:copilot

Export Git Events

Export

Clear current search query

Events matching search query

amarun22-1111\_arunemu – copilot.cfb\_org\_settings\_changed

changed from to for the arun-emu-org1 organization

India | on Jul 21

View SSO details

amarun22-1111

@timestamp	1689938761373
_document_id	XeWt-KnOmMJoXNTEo5xC5w
action	copilot.cfb_org_settings_changed
actor	amarun22-1111_arunemu
actor_id	95283618
business	amarun22-emu
business_id	10353
created_at	1689938761373
operation_type	modify
org	arun-emu-org1
org_id	95336983
user_agent	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit...

Newer

Older

ProTip!

Exclude events created by you with -actor:amarun22-1111\_arunemu

**DEMO**



Thank you