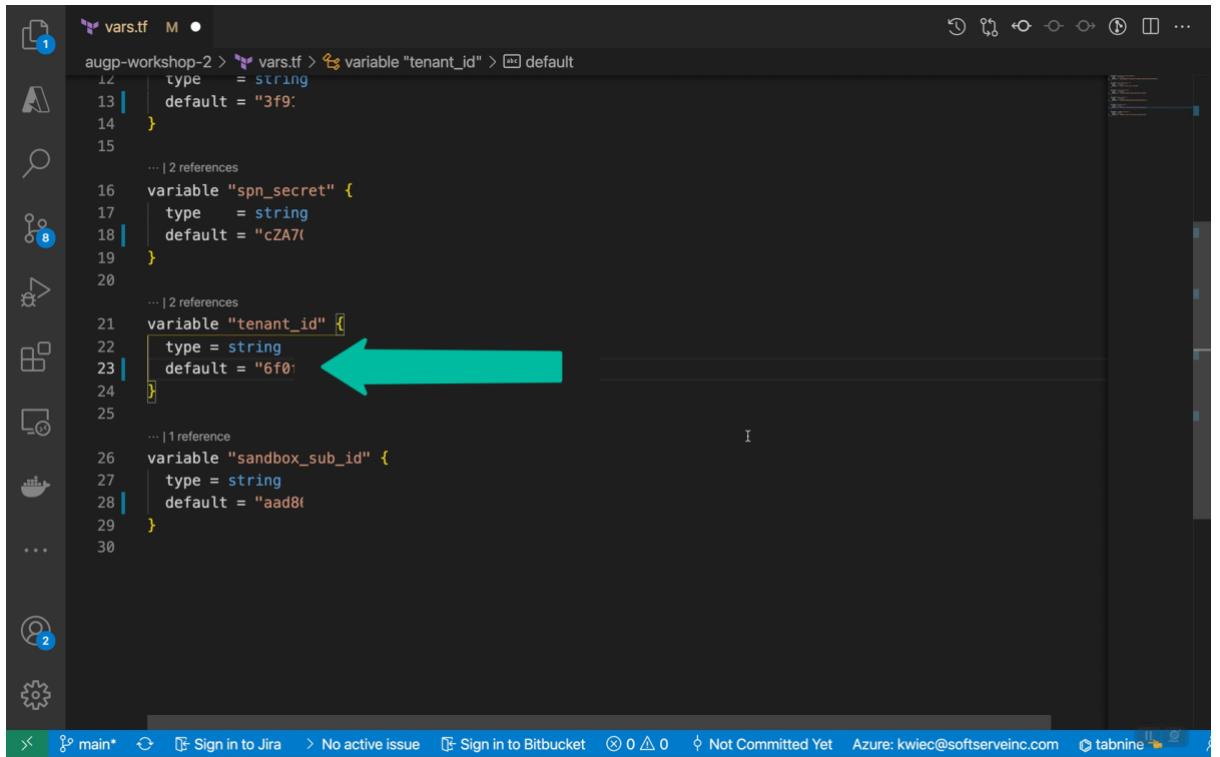


# Ćwiczenie 2 – Terraform jako narzędzie do zarządzania Azure Active Directory, Azure i Azure DevOps

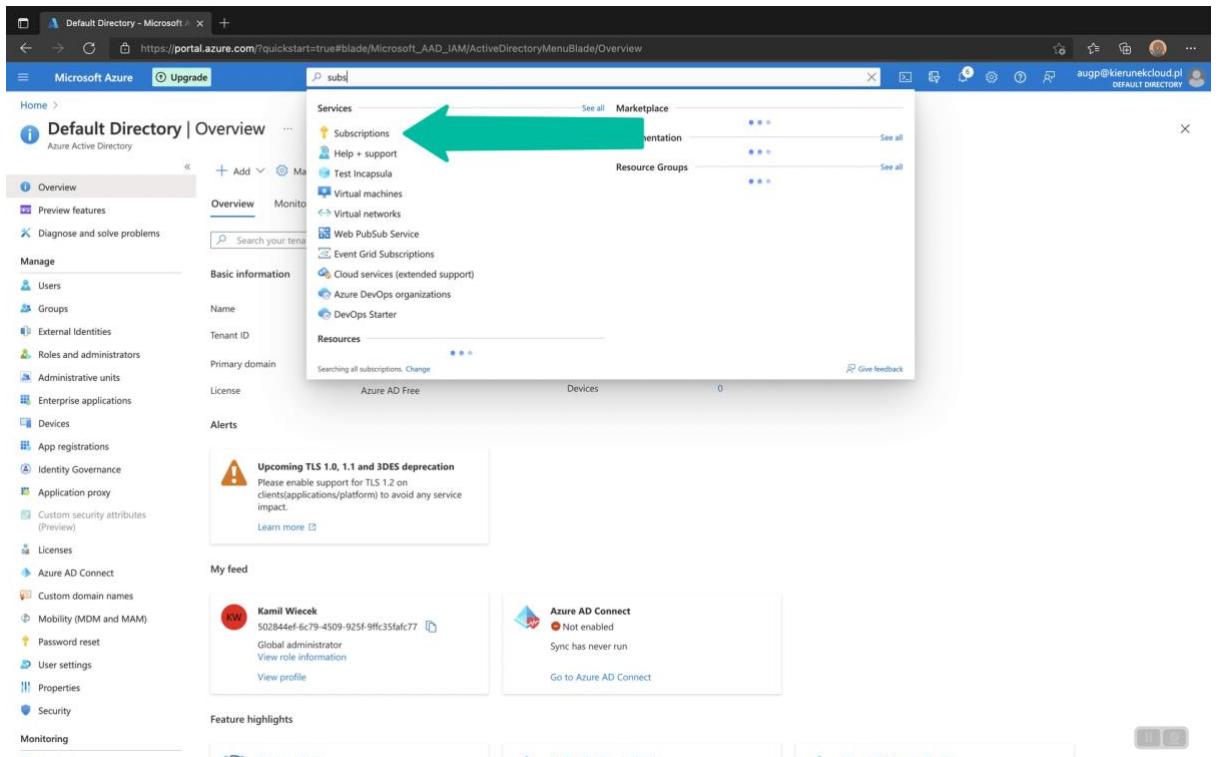
1. Wykonaj clone repozytorium: <https://github.com/kwiecek/augp-workshop-2>
2. Zmodyfikuj plik vars.tf.

The screenshot shows the Microsoft Azure portal homepage. At the top, there's a navigation bar with links for Home, Microsoft Azure, Upgrade, and a search bar. Below the navigation bar is a section titled "Azure services" with icons for Create a resource, Management groups, Policy, Azure Active Directory, Key vaults, registries, Defender for..., Security Baselines, Resource groups, and More services. A green arrow points from the "Azure Active Directory" icon towards the "tenant\_id" field in the second screenshot. Below the services bar is a "Recent resources" table listing various Azure resources like Container instances, Resource groups, Storage accounts, and Subscriptions, along with their last viewed times. At the bottom of the page are sections for "Navigate" (Subscriptions, Resource groups, All resources, Dashboard) and "Tools" (Microsoft Learn, Azure Monitor, Security Center, Cost Management).

The screenshot shows the Microsoft Azure Active Directory Overview page. At the top, there's a navigation bar with Home, Microsoft Azure, Upgrade, and a search bar. Below the navigation bar is a "Default Directory | Overview" section with tabs for Overview, Monitoring, and Tutorials. The Overview tab is selected. It displays basic information about the tenant, including Name (Default Directory), Tenant ID (6f0f590-433d-4b9e-b4a4-3095f60991d), Primary domain (augpkierunkcloud.onmicrosoft.com), License (Azure AD Free), and metrics for Users (3), Applications (10), and Devices (0). A green arrow points from the "tenant\_id" value (6f0f590-433d-4b9e-b4a4-3095f60991d) towards the "tenant\_id" field in the third screenshot. Below the basic information is an "Upcoming TLS 1.0, 1.1 and 3DES deprecation" alert, which encourages enabling support for TLS 1.2 on clients/applications/platform to avoid any service impact. The page also includes sections for My feed (listing Kamil Wiecek and Azure AD Connect) and Feature highlights.



```
augp-workshop-2 > vars.tf > variable "tenant_id" > default
12 |     type = string
13 |     default = "3f9"
14 |
15 ...
16 variable "spn_secret" {
17     type = string
18     default = "cZA7(
19 }
20 ...
21 variable "tenant_id" [
22     type = string
23     default = "6f01"
24 ]
25 ...
26 variable "sandbox_sub_id" {
27     type = string
28     default = "aad8(
29 }
30
```



Default Directory - Microsoft / Overview https://portal.azure.com/?quickstart=true#blade/Microsoft\_AAD\_IAM/ActiveDirectoryMenuBlade/Overview

Microsoft Azure Upgrade

Home > Default Directory | Overview Azure Active Directory

Overview Preview features Diagnose and solve problems Add + Manage

Basic information Name: tenant ID: Primary domain: License: Azure AD Free Devices

Alerts

Upcoming TLS 1.0, 1.1 and 3DES deprecation Please enable support for TLS 1.2 on clients/applications/platform to avoid any service impact. Learn more ↗

Services See all Marketplace Subscriptions Help + support Test Encapsulation Virtual machines Web PubSub Service Event Grid Subscriptions Cloud services (extended support) Azure DevOps organizations DevOps Starter

Resource Groups See all

Subscriptions See all

Help + support See all

Test Encapsulation See all

Virtual machines See all

Web PubSub Service See all

Event Grid Subscriptions See all

Cloud services (extended support) See all

Azure DevOps organizations See all

DevOps Starter See all

Marketplace

Give feedback

Kamil Wiecek 502844ef-6c79-4509-925f-9ff35fafc77 Global administrator View role information Go to Azure AD Connect

Azure AD Connect Not enabled Sync has never run Go to Azure AD Connect

My feed

Feature highlights

Screenshot of the Microsoft Azure Subscriptions blade showing a single subscription entry. A green arrow points to the 'sandbox\_sub\_id' column.

| Subscription name    | Subscription ID                      | My role | Current cost | Status | ...    |
|----------------------|--------------------------------------|---------|--------------|--------|--------|
| Azure subscription 1 | aad861cc-eb75-42fd-9f9e-29f1aa3e1465 |         | /            | Active | [More] |

Screenshot of the Microsoft Azure Subscriptions blade showing a single subscription entry. A green arrow points to the 'sandbox\_sub\_id' column.

| Subscription name    | Subscription ID                      | My role | Current cost | Status | ...    |
|----------------------|--------------------------------------|---------|--------------|--------|--------|
| Azure subscription 1 | aad861cc-eb75-42fd-9f9e-29f1aa3e1465 |         | /            | Active | [More] |

The screenshot shows the Microsoft Azure Subscriptions blade. On the left, there's a sidebar with 'Subscriptions' selected. The main area lists 'Subscription name' (Azure subscription 1) and has a search bar with 'app reg'. A green arrow points from the search bar towards the service list on the right. The service list includes 'App registrations', 'App Services', 'App Service Certificates', 'App Service Domains', 'App Service Environments', 'App Service plans', 'App Configuration', 'App proxy', 'Function App', and 'Application gateways'. Below this is a 'Resources' section with a note 'No results were found.'

The screenshot shows the Microsoft Azure App registrations blade. On the left, there's a sidebar with 'App registrations' selected. The main area lists 'Owned applications' and has a search bar with 'Search resources, services, and docs (G+)'. A green arrow points from the search bar towards the registration list. The list shows two entries: 'app-augp-terraform' and 'app-terraform'. Each entry has a 'Display name' (AP), 'Application (client) ID', 'Created on', and 'Certificates & secrets' status. The first entry's Application (client) ID is 3f91c43d-5d4b-433e-a54e-da22f7ce855a, created on 11/22/2021, with current certificates. The second entry's Application (client) ID is 3c1e7492-3fdb-4479-9a6f-e05a92c915b2, created on 11/14/2021, with current certificates.

<https://go.microsoft.com/fwlink/?linkid=2132805>

**Register an application**

Name: app-terraform-1

Supported account types:

- Accounts in this organizational directory only (Default Directory only - Single tenant)
- Accounts in any organizational directory (Any Azure AD directory - Multitenant)
- Accounts in any organizational directory (Any Azure AD directory - Multitenant) and personal Microsoft accounts (e.g. Skype, Xbox)
- Personal Microsoft accounts only

Help me choose...

Redirect URI (optional): Web e.g. https://example.com/auth

By proceeding, you agree to the Microsoft Platform Policies

**Register**

**app-terraform-1**

Overview

Display name: app-terraform-1

Application (client) ID: 3b29ce77-206c-4ed2-b3b5-70e3d33cf947

Object ID: 4b602771-cc8e-446b-8c0b-7bf360faa71f

Client credentials: Add a certificate or secret

Redirect URIs: Add a Redirect URI

Application ID URI: Add an Application ID URI

Managed application in ...: app-terraform-1

Certificates & secrets

Token configuration

API permissions

Expose an API

App roles

Owners

Roles and administrators | Preview

Manifest

Get Started Documentation

**Build your application with the Microsoft identity platform**

The Microsoft identity platform is an authentication service, open-source libraries, and application management tools. You can create modern, standards-based authentication solutions, access and protect APIs, and add sign-in for your users and customers. [Learn more](#)

**Call APIs**

Use our SDKs to sign in users and call APIs in a few steps. Use the quickstarts to start a web app, mobile app, SPA, or daemon app.

**Sign in users in 5 minutes**

**Configure for your organization**

Screenshot of the Microsoft Azure portal showing the 'Certificates & secrets' section for an app registration named 'app-terraform-1'. The 'Client secrets' tab is selected, showing a table with one row of data:

| Description       | Expires    | Value | Secret ID |
|-------------------|------------|-------|-----------|
| New client secret | 2022-11-28 | ly... | 8p...     |

A green arrow points to the 'Add' button at the top right of the table.

Screenshot of the Microsoft Azure portal showing the 'Certificates & secrets' section for the same app registration. A success message 'Successfully updated application app-terraform-1-credentials' is displayed. The 'Client secrets' table shows the newly added secret:

| Description       | Expires    | Value | Secret ID |
|-------------------|------------|-------|-----------|
| New client secret | 2022-11-28 | ly... | 8p...     |

A green arrow points to the 'Copy to clipboard' button next to the secret value, with the text 'spn\_secret' written below it.

[https://portal.azure.com/?quickstart=true#blade/Microsoft\\_AAD\\_RegisteredApps/ApplicationMenuBlade/Overview/appId/3b29ce77-206c-4ed2-b3b5-70e3d33cf947/objectId/4b602771-cc...](https://portal.azure.com/?quickstart=true#blade/Microsoft_AAD_RegisteredApps/ApplicationMenuBlade/Overview/appId/3b29ce77-206c-4ed2-b3b5-70e3d33cf947/objectId/4b602771-cc...)

app-terraform-1

Overview

Client credentials

spn\_object\_id

Copy to clipboard

Display name : app-terraform-1

Application (client) ID : 3b29ce77-206c-4ed2-b3b5-70e3d33cf947

Object ID : 4b602771-cc8e-446b-8c0b-7bf360faa71f

Directory (tenant) ID : 6f0f590-433d-4b9e-b4a4-3095f6f0991d

Supported account types : My organization only

Client credentials : 0 certificate, 1 secret

Add a Redirect URI

Application ID URI : Add an Application ID URI

Managed application in ... : app-terraform-1

Get Started Documentation

### Build your application with the Microsoft identity platform

The Microsoft identity platform is an authentication service, open-source libraries, and application management tools. You can create modern, standards-based authentication solutions, access and protect APIs, and add sign-in for your users and customers. [Learn more](#)

**Call APIs**  
Build more powerful apps with rich user and business data from Microsoft services and your own company's data sources.

**Sign in users in 5 minutes**  
Use our SDKs to sign in users and call APIs in a few steps. Use the quickstarts to start a web app, mobile app, SPA, or daemon app.

**Configure for your organization**  
Assign users and groups, apply conditional access policies, configure single sign-on, and more in Enterprise applications.

[https://portal.azure.com/?quickstart=true#blade/Microsoft\\_AAD\\_RegisteredApps/ApplicationMenuBlade/CallAnAPI/appId/3b29ce77-206c-4ed2-b3b5-70e3d33cf947/objectId/4b602771-cc...](https://portal.azure.com/?quickstart=true#blade/Microsoft_AAD_RegisteredApps/ApplicationMenuBlade/CallAnAPI/appId/3b29ce77-206c-4ed2-b3b5-70e3d33cf947/objectId/4b602771-cc...)

app-terraform-1 | API permissions

API / Permissions name

Type

Description

Admin consent requ...

Status

User.Read

Delegated

Sign in and read user profile

No

To view and manage permissions and user consent, try [Enterprise applications](#).

<https://go.microsoft.com/fwlink/?linkid=2152292>

**Request API permissions - Microsoft Azure**

https://portal.azure.com/?quickstart=true#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/CallAnAPI/appid/3b29ce77-206c-4ed2-b3b5-70e3d33cf947/objectId/4b602771-cc...      

Microsoft Azure  Search resources, services, and docs (G+)

Home > App registrations > app-terraform-1

## app-terraform-1 | API permissions

Overview Quickstart Integration assistant

Branding Authentication Certificates & secrets Token configuration API permissions

Expose an API App roles Owners Roles and administrators | Preview Manifest

Troubleshooting New support request

Configured permissions

The "Admin consent required" column shows the default value for an organization. However, your app will be used. Learn more about permissions and consent

+ Add a permission  Grant admin consent for Default Directory

| API / Permissions name | Type      | Description                   |
|------------------------|-----------|-------------------------------|
| User.Read              | Delegated | Sign in and read user profile |

To view and manage permissions and user consent, try Enterprise applications.

Request API permissions

Select an API

Microsoft APIs APIs my organization uses My APIs

Commonly used Microsoft APIs

**Microsoft Graph** Take advantage of the tremendous power of Microsoft Graph to access Office 365, OneDrive, SharePoint, and Windows 10. 

|   |   |  |
|---|---|--|
| Azure Cosmos DB   | Azure Data Explorer   | Azure Data Lake  |
| Fast NoSQL database with open APIs for any scale.                                   | Perform ad-hoc queries on terabytes of data to build near real-time and complex analytics solutions | Access to storage and compute for big data analytic scenarios  |
| Azure DevOps  | Azure Key Vault   | Azure Maps   |
| Integrate with Azure DevOps and Azure DevOps server                                 | Manage your key vaults as well as the keys, secrets, and certificates within your Key Vaults        | Create location-aware web and mobile applications using simple and secure geospatial services, APIs, and SDKs in Azure   |
| Azure Service Management  | Azure Storage   | Office 365 Management APIs   |
| Programmatic access to much of the functionality available through the Azure portal | Secure, massively scalable object and data lake storage for unstructured and semi-structured data   | Retrieve information about user, admin, system, and policy actions and events from Office 365 and Azure AD activity logs |

More Microsoft APIs

|   |   |   |
|---|---|---|
| Azure Batch   | Azure Communication Services  | Azure Data Catalog  |
| Schedule large-scale parallel and HPC applications in the cloud | Rich communication experiences with the same secure CPaaS platform used by Office 365 | Programmatic access to Data Catalog resources to register, annotate and |

**Request API permissions - Microsoft Azure**

https://portal.azure.com/?quickstart=true#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/CallAnAPI/appid/3b29ce77-206c-4ed2-b3b5-70e3d33cf947/objectId/4b602771-cc...      

Microsoft Azure  Search resources, services, and docs (G+)

Home > App registrations > app-terraform-1

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+ Add a permission  Grant admin consent for Default Directory

| API / Permissions name | Type      | Description                   |
|------------------------|-----------|-------------------------------|
| User.Read              | Delegated | Sign in and read user profile |

To view and manage permissions and user consent, try Enterprise applications.

Request API permissions

Microsoft APIs APIs my organization uses My APIs

Commonly used Microsoft APIs

**Microsoft Graph** https://graph.microsoft.com/ Docs 

What type of permissions does your application require?

Delegated permissions Your application needs to access the API as the signed-in user. 

Select permissions 

| Permission  | Admin consent required |
|---|------------------------|
| directory.read  | Yes                    |
| Directory   | Yes                    |
| Directory.Read.All <input type="checkbox"/>                 | Yes                    |
| Read directory data   | Yes                    |
| Directory.ReadWrite.All <input checked="" type="checkbox"/> | Yes                    |
| Read and write directory data                               | Yes                    |

Add permissions 

Microsoft Azure Upgrade Search resources, services, and docs (G+/-) augs@kierunekcloud.pl DEFAULT DIRECTORY

Home > App registrations > app-terraform-1

## app-terraform-1 | API permissions

Search (Cmd +/)

Overview Quickstart Integration assistant

Manage

- Branding
- Authentication
- Certificates & secrets
- Token configuration
- API permissions**
- Expose an API
- App roles
- Owners
- Roles and administrators | Preview
- Manifest

Support + Troubleshooting

Troubleshooting New support request

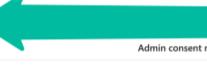
**Configured permissions**

The "Admin consent required" column shows the default value for an organization. However, user consent can be customized per permission, user, or app. This column may not reflect the value in your organization, or in organizations where this app will be used. [Learn more](#)

Applications are authorized to call APIs when they are granted permissions by users/admins as part of the consent process. The list of configured permissions should include all the permissions the application needs. [Learn more about permissions and consent](#)

| API / Permissions name  | Type        | Description                   | Admin consent requ... | Status                        |
|-------------------------|-------------|-------------------------------|-----------------------|-------------------------------|
| Microsoft Graph (2)     |             |                               |                       | ...                           |
| Directory.ReadWrite.All | Application | Read and write directory data | Yes                   | ⚠ Not granted for Default ... |
| User.Read               | Delegated   | Sign in and read user profile | No                    | ...                           |

To view and manage permissions and user consent, try [Enterprise applications](#).



Microsoft Azure Upgrade Search resources, services, and docs (G+/-) augs@kierunekcloud.pl DEFAULT DIRECTORY

Home > App registrations > app-terraform-1

## app-terraform-1 | API permissions

Search (Cmd +/)

Overview Quickstart Integration assistant

Manage

- Branding
- Authentication
- Certificates & secrets
- Token configuration
- API permissions**
- Expose an API
- App roles
- Owners
- Roles and administrators | Preview
- Manifest

Support + Troubleshooting

Troubleshooting New support request

**Grant admin consent confirmation.**

Do you want to grant consent for the requested permissions for all accounts in Default Directory? This will update any existing admin consent records this application already has to match what is listed below.

**Yes**

**Configured permissions**

Applications are authorized to call APIs when they are granted permissions by users/admins as part of the consent process. The list of configured permissions should include all the permissions the application needs. [Learn more about permissions and consent](#)

+ Add a permission  Grant admin consent for Default Directory

| API / Permissions name  | Type        | Description                   | Admin consent requ... | Status                        |
|-------------------------|-------------|-------------------------------|-----------------------|-------------------------------|
| Microsoft Graph (2)     |             |                               |                       | ...                           |
| Directory.ReadWrite.All | Application | Read and write directory data | Yes                   | ⚠ Not granted for Default ... |
| User.Read               | Delegated   | Sign in and read user profile | No                    | ...                           |

To view and manage permissions and user consent, try [Enterprise applications](#).



Microsoft Azure Upgrade

Home > App registrations > app-terraform-1

## app-terraform-1 | API permissions

Search (Cmd +/)

Refresh Got feedback?

Successfully granted admin consent for the requested permissions.

The "Admin consent required" column shows the default value for an organization. However, user consent can be customized per permission, user, or app. This column may not reflect the value in your organization, or in organizations where this app will be used. Learn more about permissions and consent

**Configured permissions**

Applications are authorized to call APIs when they are granted permissions by users/admins as part of the consent process. The list of configured permissions should include all the permissions the application needs. Learn more about permissions and consent

| API / Permissions name  | Type        | Description                   | Admin consent requ... | Status                      |
|-------------------------|-------------|-------------------------------|-----------------------|-----------------------------|
| Directory.ReadWrite.All | Application | Read and write directory data | Yes                   | Granted for Default Dire... |
| User.Read               | Delegated   | Sign in and read user profile | No                    | Granted for Default Dire... |

To view and manage permissions and user consent, try Enterprise applications.

Overview Quickstart Integration assistant Branding Authentication Certificates & secrets Token configuration API permissions Expose an API App roles Owners Roles and administrators | Preview Manifest Support + Troubleshooting Troubleshooting New support request

Microsoft Azure Upgrade

Home > App registrations > app-terraform-1

## app-terraform-1 | App roles

Search (Cmd +/)

+ Create app role

App roles

App roles are custom roles assigned as permissions during a consent process.

How do I assign App roles?

Display name

No app roles have been created.

Subscriptions Azure Active Directory  Microsoft Entra groups Policy Container registries Microsoft Defender for Cloud Security Baselines

Recent resources

- aci-frontendkawi-dev
- rg-frontendlkwi-dev
- sfrontendlkwi1
- rg-frontendlkwi-dev
- acfrontendlkwishared

Searching all subscriptions: Change Give feedback

App registrations Subscriptions Azure Active Directory Microsoft Entra groups Policy Container registries Microsoft Defender for Cloud Security Baselines

Container instances Resource group Storage account Resource group Container registry

Overview Quickstart Integration assistant Branding Authentication Certificates & secrets Token configuration API permissions Expose an API App roles Owners Roles and administrators | Preview Manifest Support + Troubleshooting Troubleshooting New support request

**Default Directory | Roles and administrators**

**Your Role: Global administrator**

**Administrative roles**

Administrative roles are used for granting access for privileged actions in Azure AD. We recommend using these built-in roles for delegating access to manage broad application configuration permissions without granting access to manage other parts of Azure AD not related to application configuration. Learn more.

Learn more about Azure AD role-based access control

| Role  | Description   | Type     |
|---|---|----------|
| <input type="checkbox"/> Global administrator | Can manage all aspects of Azure AD and Microsoft services that use Azure AD identities. | Built-in |
| <input type="checkbox"/> Global reader        | Can read everything that a global administrator can, but not update anything.           | Built-in |

**Search:** global

**Left sidebar:**

- Overview
- Preview features
- Diagnose and solve problems
- Manage
  - Users
  - Groups
  - External identities
  - Administrative units
  - Cloud applications
  - Administrations
  - Identity governance
  - Application proxy
  - Conditional security attributes
  - Users & Groups Connect
  - Cloud domain names
  - Mobility (MDM and MAM)
  - Password reset
  - User settings
  - Properties
  - Security
- Monitoring

**Add assignments - Microsoft**

**Global administrator | Assignments**

**Add assignments**

You can also assign built-in roles to groups now. Learn More

**Search:** app-terraform-1

**Selected items:**

- app-terraform-1  
3b29ce77-206c-4ed2-b3b5-70e3d33cf947

**Add**

**Left sidebar:**

- All roles
- Diagnose and solve problems
- Manage
  - Assignments
  - Description
- Activity
  - Bulk operation results
- Troubleshooting + Support
- New support request

The screenshot shows the Microsoft Azure portal under the 'Global administrator' role. The user is navigating to the 'Assignments' section. A green arrow points from the top left towards the 'Subscriptions' section. A success message box is visible in the top right corner: 'Successfully added assignment' and 'Successfully added assignment app-terraform-1'. The search bar at the top has 'subscr' typed into it.

The screenshot shows the Microsoft Azure portal under the 'Default Directory' role. The user is viewing the 'Subscriptions' blade. A green arrow points from the top left towards the list of subscriptions. The list contains one item: 'Azure subscription 1' with the ID '29f1aa3e1465'. The status is 'Active'. The search bar at the top has 'Search resources, services, and docs (G+)' typed into it.

Azure subscription 1 - Microsoft Azure

https://portal.azure.com/?quickstart=true#@augp.kierunekcloud.onmicrosoft.com/resource/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/users

Microsoft Azure Upgrade

Search resources, services, and docs (G+)

Home > Subscriptions > Azure subscription 1

## Subscriptions

Default Directory

+ Add Manage Policies ...

View list of subscriptions for which you have role-based access control (RBAC) permissions to manage Azure resources. To view subscriptions for which you have billing access, click here.

Showing subscriptions in Default Directory. Don't see a subscription? Switch directories

My role: 8 selected Status: 3 selected

Apply

Show 1 of 1 subscriptions global Show only subscriptions selected in the subscriptions filter

Search

Subscription name: Azure subscription 1

Subscription

Check access Role assignments Roles Deny assignments Classic administrators

Access control (IAM)

Tags

Diagnose and solve problems

Security

Events

Cost Management

Cost analysis

Cost alerts

Budgets

Advisor recommendations

Billing

Invoices

Settings

Programmatic deployment

Billing properties

Resource groups

Resources

Preview features

Usage + quotas

Policies

Management certificates

My permissions

Check access Review the level of access a user, group, service principal, or managed identity has to this resource. Learn more

View my access

Find: Search by name or email address

Grant access to this resource

Grant access to resources by assigning a role.

Add role assignment Use the classic experience Learn more

View access to this resource

View the role assignments that grant access to this and other resources.

View

Learn more

View deny assignments

View the role assignments that have been denied access to specific actions at this scope.

View

Learn more

Create a custom role

Create a custom role for Azure resources with your own set of permissions to meet the specific needs of your organization.

Add

Learn more

< Previous 1 Next >



Azure subscription 1 - Microsoft Azure

https://portal.azure.com/?quickstart=true#@augp.kierunekcloud.onmicrosoft.com/resource/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/users

Microsoft Azure Upgrade

Search resources, services, and docs (G+)

Home > Subscriptions > Azure subscription 1

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Default Directory

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View list of subscriptions for which you have role-based access control (RBAC) permissions to manage Azure resources. To view subscriptions for which you have billing access, click here.

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Show 1 of 1 subscriptions global Show only subscriptions selected in the subscriptions filter

Search

Subscription name: Azure subscription 1

Subscription

Add role assignment

Add co-administrator

Add custom role

Check access Review the level of access a user, group, service principal, or managed identity has to this resource. Learn more

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Learn more

Create a custom role

Create a custom role for Azure resources with your own set of permissions to meet the specific needs of your organization.

Add

Learn more

< Previous 1 Next >



**Add role assignment - Microsoft Azure**

Home > Subscriptions > Azure subscription 1 > Add role assignment

Got feedback?

Role Members \* Review + assign

A role definition is a collection of permissions. You can use the built-in roles or you can create your own custom roles. [Learn more](#) [Use classic experience](#)

| Name ↑↓                              | Description ↑↓  | Type ↑↓     | Category ↑↓           | Details |
|--------------------------------------|---|-------------|-----------------------|---------|
| Owner                                | Grants full access to manage all resources, including the ability to assign roles in Azure RBAC.  | BuiltinRole | General               | View    |
| Contributor                          | Grants full access to manage all resources, but does not allow you to assign roles in Azure RBAC, manage assignments in Azure Bluepr... | BuiltinRole | General               | View    |
| Reader                               | View all resources, but does not allow you to make any changes.   | BuiltinRole | General               | View    |
| AcrDelete                            | acr delete  | BuiltinRole | Containers            | View    |
| AcrImageSigner                       | acr image signer  | BuiltinRole | Containers            | View    |
| AcrPull                              | acr pull  | BuiltinRole | Containers            | View    |
| AcrPush                              | acr push  | BuiltinRole | Containers            | View    |
| AcrQuarantineReader                  | acr quarantine data reader  | BuiltinRole | Containers            | View    |
| AcrQuarantineWriter                  | acr quarantine data writer  | BuiltinRole | Containers            | View    |
| AgFood Platform Service Admin        | Provides admin access to AgFood Platform Service  | BuiltinRole | AI + Machine Learning | View    |
| AgFood Platform Service Contributor  | Provides contribute access to AgFood Platform Service   | BuiltinRole | AI + Machine Learning | View    |
| AgFood Platform Service Reader       | Provides read access to AgFood Platform Service   | BuiltinRole | AI + Machine Learning | View    |
| AnyBuild Builder                     | Basic user role for AnyBuild. This role allows listing of agent information and execution of remote build capabilities.                 | BuiltinRole | None                  | View    |
| API Management Service Contributor   | Can manage service and the APIs   | BuiltinRole | Integration           | View    |
| API Management Service Operator Role | Can manage service but not the APIs   | BuiltinRole | Integration           | View    |
| API Management Service Reader Role   | Read-only access to service and APIs  | BuiltinRole | Integration           | View    |

Review + assign Previous Next

**Select members - Microsoft Azure**

Home > Subscriptions > Azure subscription 1 > Add role assignment

Got feedback?

Role Members \* Review + assign

Selected role Owner

Assign access to  User, group, or service principal  Managed identity

Members + Select members

| Name                | Object ID | Type |
|---------------------|-----------|------|
| No members selected |           |      |

Description Optional

Select members: app-terraform-1

Selected members: app-terraform-1 Remove

Review + assign Previous Next

The image shows two screenshots of the Azure portal interface. The top screenshot is titled 'Add role assignment - Microsoft Azure' and shows the 'Review + assign' tab selected. It displays fields for 'Role' (None), 'Scope' (/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465), and 'Members' (No members selected). The bottom screenshot is titled 'Azure subscription 1 - Microsoft Azure' and shows the 'Projects - Home' page for the organization 'augp'. It lists several projects: 'workshop-app' (Generated by Azure DevOps Demo Generator), 'IMPORT' (Generated by Azure DevOps Demo Generator), 'AUGP-DO2' (Generated by Azure DevOps Demo Generator), 'AUGP-DO', 'AUGP-WebApp' (Generated by Azure DevOps Demo Generator), 'CoE', 'DG-Automate-Docker' (Generated by Azure DevOps Demo Generator), and 'DG-AzureFunctions' (Generated by Azure DevOps Demo Generator). A large green arrow points from the top screenshot down to the bottom screenshot.

Azure DevOps Home page for organization 'augp'. The sidebar shows 'Organization settings' and 'Establishing secure connection...'. The main area lists several projects: 'workshop-app' (W), 'IMPORT' (I), 'AUGP-D' (A), 'AUGP-DO' (A), 'AUGP-DO2' (A), 'AUGP-WebApp' (A), 'CoE' (C), 'DG-Automate-Docker' (D), and 'DG-AzureFunctions' (D). A green arrow points from the top right towards the 'AUGP-D' project card.

Azure DevOps User settings page under 'Platform Ops'. The left sidebar shows 'User settings' with 'Personal access tokens' selected. The main area displays 'Personal Access Tokens' with two entries: 'pat' (Full access) and 'Code (Read & write)'. A green arrow points from the top right towards the 'Create a new personal access token' modal. The modal has the following fields:

|                  |  |
|------------------|--|
| Name             | pat-full   |
| Organization     | augp   |
| Expiration (UTC) | 30 days (28/12/2021)   |
| Scopes           | <input checked="" type="radio"/> Full access<br><input type="radio"/> Custom defined |

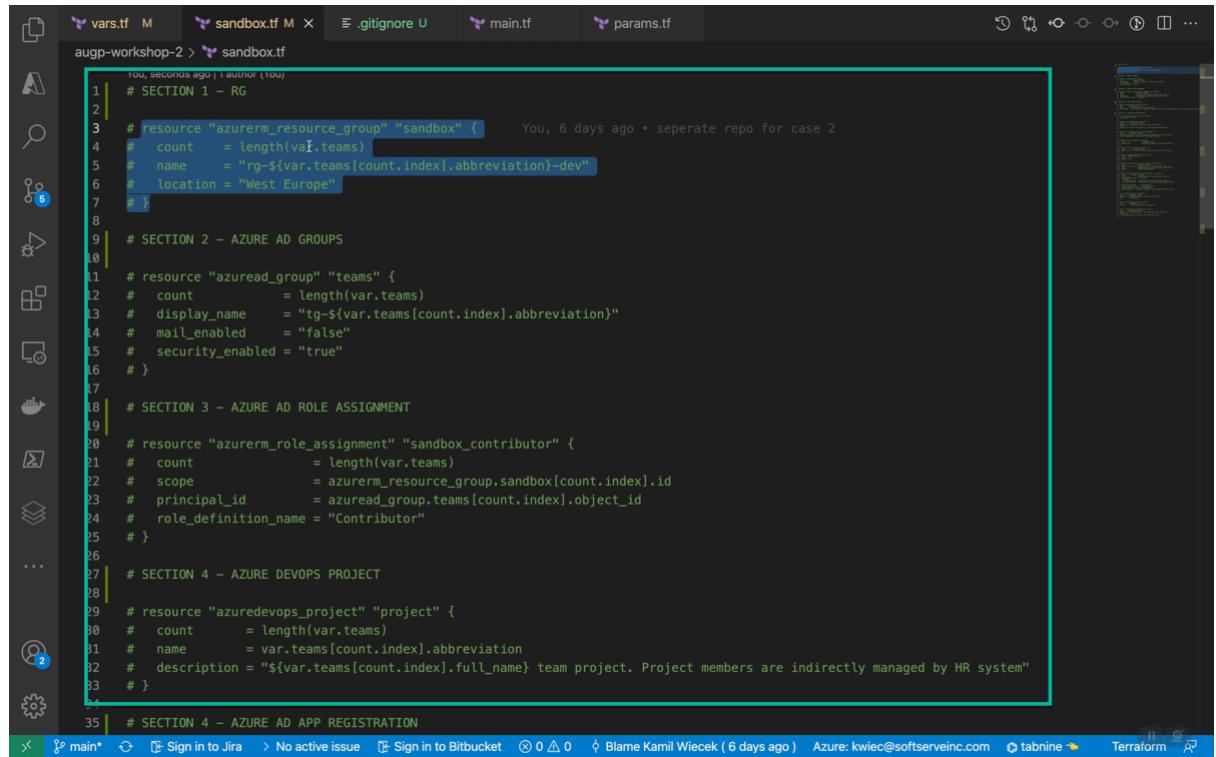
A large green arrow points from the bottom right towards the 'Create' button in the modal.

A screenshot of the Azure DevOps 'Personal Access Tokens' page. On the left, there's a sidebar with 'User settings' (Platform Ops), 'Account' (Profile, Time and Locale, Permissions), 'Preferences' (Notifications, Theme, Usage), and 'Security' (Personal access tokens, SSH public keys, Alternate credentials, Authorizations). The 'Personal access tokens' section is selected. In the main area, there's a table with three rows: 'Git: https://dev.azure.com/augp on the website. Code (Read & write)' (Status: Active, Organization: augp), 'pat-full' (Full access) (Status: Active, Organization: augp), and 'pat' (Full access) (Status: Active, Organization: augp). A modal window titled 'Success!' is open, stating 'You have successfully added a new personal access token. Copy the token now!'. It shows a copied token '23f...' and a warning: 'Warning - Make sure you copy the above token now. We don't store it and you will not be able to see it again.' A green arrow points from the word 'personal\_access\_token' in the question to the copied token in the modal.

A screenshot of the same Azure DevOps 'Personal Access Tokens' page. The URL in the browser bar is highlighted with a green arrow and labeled 'org\_service\_url'. The rest of the interface is identical to the first screenshot, showing the list of tokens and the successful creation message.

### 3. Wykonajmy terraform init.

Upewnij się, że wszystkie linie w sandbox.tf są wykomentowane.



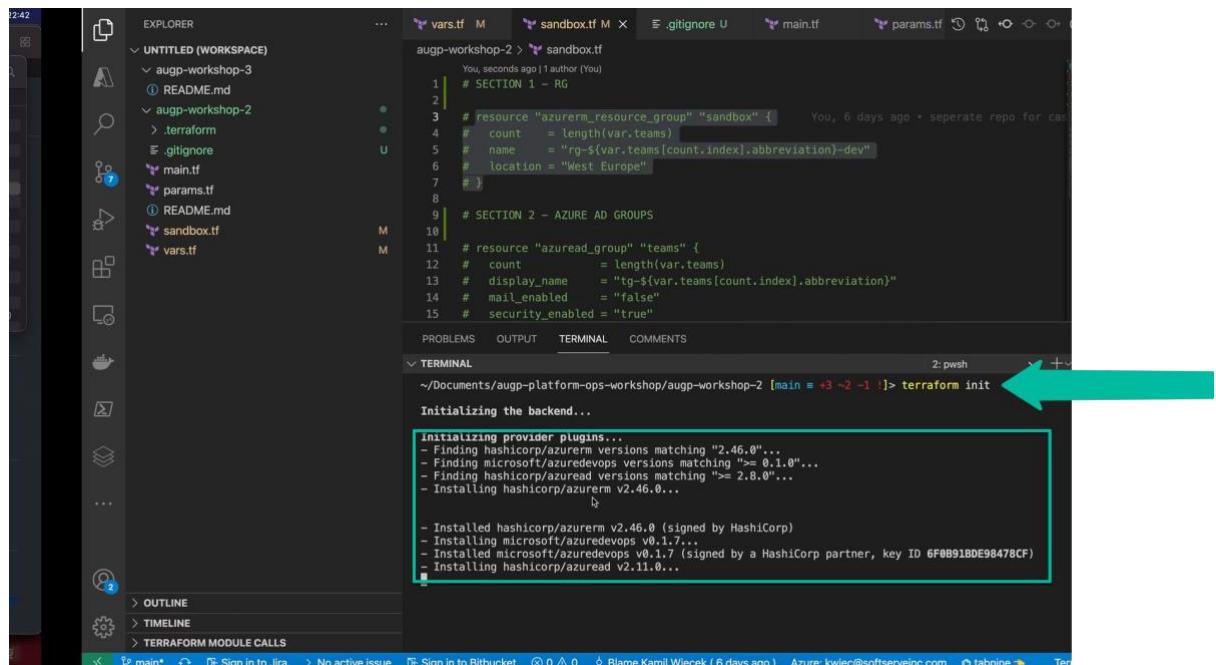
```
You, 6 days ago | 1 author (You)
# SECTION 1 - RG
# resource "azurerm_resource_group" "sandbox" {      You, 6 days ago * seperate repo for case 2
  #   count    = length(var.teams)
  #   name     = "rg-${var.teams[count.index].abbreviation}-dev"
  #   location = "West Europe"
}

# SECTION 2 - AZURE AD GROUPS
# resource "azuread_group" "teams" {
  #   count        = length(var.teams)
  #   display_name = "tg-${var.teams[count.index].abbreviation}"
  #   mail_enabled = "false"
  #   security_enabled = "true"
}

# SECTION 3 - AZURE AD ROLE ASSIGNMENT
# resource "azurerm_role_assignment" "sandbox_contributor" {
  #   count        = length(var.teams)
  #   scope        = azurerm_resource_group.sandbox[count.index].id
  #   principal_id = azuread_group.teams[count.index].object_id
  #   role_definition_name = "Contributor"
}

# SECTION 4 - AZURE DEVOPS PROJECT
# resource "azuredevops_project" "project" {
  #   count        = length(var.teams)
  #   name         = var.teams[count.index].abbreviation
  #   description  = "${var.teams[count.index].full_name} team project. Project members are indirectly managed by HR system"
}

# SECTION 4 - AZURE AD APP REGISTRATION
```



```
2:42
EXPLORER
UNTITLED (WORKSPACE)
  - augp-workshop-3
    README.md
  - augp-workshop-2
    .gitignore
    main.tf
    params.tf
    README.md
    sandbox.tf
    vars.tf

... vars.tf M sandbox.tf M .gitignore U main.tf params.tf

augp-workshop-2 > sandbox.tf
You, 6 days ago | 1 author (You)
# SECTION 1 - RG
# resource "azurerm_resource_group" "sandbox" {      You, 6 days ago * seperate repo for case 2
  #   count    = length(var.teams)
  #   name     = "rg-${var.teams[count.index].abbreviation}-dev"
  #   location = "West Europe"
}

# SECTION 2 - AZURE AD GROUPS
# resource "azuread_group" "teams" {
  #   count        = length(var.teams)
  #   display_name = "tg-${var.teams[count.index].abbreviation}"
  #   mail_enabled = "false"
  #   security_enabled = "true"
}

# SECTION 3 - AZURE AD ROLE ASSIGNMENT
# resource "azurerm_role_assignment" "sandbox_contributor" {
  #   count        = length(var.teams)
  #   scope        = azurerm_resource_group.sandbox[count.index].id
  #   principal_id = azuread_group.teams[count.index].object_id
  #   role_definition_name = "Contributor"
}

# SECTION 4 - AZURE DEVOPS PROJECT
# resource "azuredevops_project" "project" {
  #   count        = length(var.teams)
  #   name         = var.teams[count.index].abbreviation
  #   description  = "${var.teams[count.index].full_name} team project. Project members are indirectly managed by HR system"
}

# SECTION 4 - AZURE AD APP REGISTRATION
```

TERMINAL

```
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main = +3 ~2 -1] > terraform init
Initializing the backend...
```

```
Initializing provider plugins...
- Finding hashicorp/azurerm versions matching "2.46.0"...
- Finding microsoft/azureddevops versions matching ">= 0.1.0"...
- Finding hashicorp/azuread versions matching ">= 2.8.0"...
- Installing hashicorp/azurerm v2.46.0...
- Installed hashicorp/azurerm v2.46.0 (signed by HashiCorp)
- Installing microsoft/azureddevops v0.1.7...
- Installed microsoft/azureddevops v0.1.7 (signed by a HashiCorp partner, key ID 6F0B91BDE98478CF)
- Installing hashicorp/azuread v2.11.0...
```

The screenshot shows the VS Code interface with the terminal tab active. The terminal output is as follows:

```
Partner and community providers are signed by their developers.  
If you'd like to know more about provider signing, you can read about it here:  
https://www.terraform.io/docs/cli/plugins/signing.html  
Terraform has created a lock file .terraform.lock.hcl to record the provider  
selections it made above. Include this file in your version control repository  
so that Terraform can guarantee to make the same selections by default when  
you run "terraform init" in the future.  
Terraform has been successfully initialized!  
You may now begin working with Terraform. Try running "terraform plan" to see  
any changes that are required for your infrastructure. All Terraform commands  
should now work.  
If you ever set or change modules or backend configuration for Terraform,  
rerun this command to reinitialize your working directory. If you forget, other  
commands will detect it and remind you to do so if necessary.  
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main = +4 ~2 -1 ]>  
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main = +4 ~2 -1 ]>  
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main = +4 ~2 -1 ]> terraform plan
```

The screenshot shows the VS Code interface with the terminal tab active. The terminal output is identical to the one in the previous screenshot, except for the final command:

```
...  
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main = +4 ~2 -1 ]>  
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main = +4 ~2 -1 ]>  
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main = +4 ~2 -1 ]> terraform plan
```

A green arrow points to the last command, `terraform plan`, indicating the user's intended action.

```

aupg-workshop-2 > sandbox.tf
    # SECTION 1 - RG
    3 # resource "azurerm_resource_group" "sandbox" {
    4 #   count      = length(var.teams)
    5 #   name       = "rg-${var.teams[count.index].abbreviation}-dev"
    6 #   location   = "West Europe"
    7 }

    # SECTION 2 - AZURE AD GROUPS
    9
    10 # resource "azuread_group" "teams" {
    11 #   count      = length(var.teams)
    12 #   display_name = "tg-${var.teams[count.index].abbreviation}"
    13 #   mail_enabled = "false"
    14 #   security_enabled = "true"

No changes. Your infrastructure matches the configuration.

```

#### 4. Poćwicz:

- terraform plan
- terraform apply
- terraform destroy

Wdroż dla każdego projektu w firmie: RG, Grupę w Azure AD, Role assignment dla tej grupy; projekt w Azure DevOps i uprawnienia do tego projektu;

```

aupg-workshop-2 > sandbox.tf > resource "azurerm_resource_group" "sandbox"
    # SECTION 1 - RG
    1 # resource "azurerm_resource_group" "sandbox" {
    2 #   count      = length(var.teams)
    3 #   name       = "rg-${var.teams[count.index].abbreviation}-dev"
    4 #   location   = "West Europe"
    5

    # SECTION 2 - AZURE AD GROUPS
    6
    7 # resource "azuread_group" "teams" {
    8 #   count      = length(var.teams)
    9 #   display_name = "tg-${var.teams[count.index].abbreviation}"
    10 #   mail_enabled = "false"
    11

No changes. Your infrastructure matches the configuration.

```

The screenshot shows the VS Code interface with the Terraform extension. The Explorer sidebar shows a workspace named 'augs-workshop-2' containing files like README.md, .gitignore, main.tf, params.tf, and several provider configuration files. The code editor displays a Terraform script with a resource block for an Azure Resource Group named 'sandbox'. The terminal tab shows the output of the 'terraform plan' command, which indicates one resource creation action:

```
You, seconds ago | 1 author (You)
# SECTION 1 - RG
resource "azurerm_resource_group" "sandbox" {
  count   = length(var.teams)
  name    = "rg-${var.teams[count.index].abbreviation}-dev"
  location = "West Europe"
}
# SECTION 2 - AZURE AD GROUPS
# resource "azuread_group" "teams" {
#   count      = length(var.teams)
#   display_name = "tg-${var.teams[count.index].abbreviation}"
#   # mail_enabled = "false"
# }

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# azurerm_resource_group.sandbox[0] will be created
+ resource "azurerm_resource_group" "sandbox" {
  + id      = (known after apply)
  + location = "westeurope"
  + name    = "rg-augpweb1-dev"
}

Plan: 1 to add, 0 to change, 0 to destroy.
```

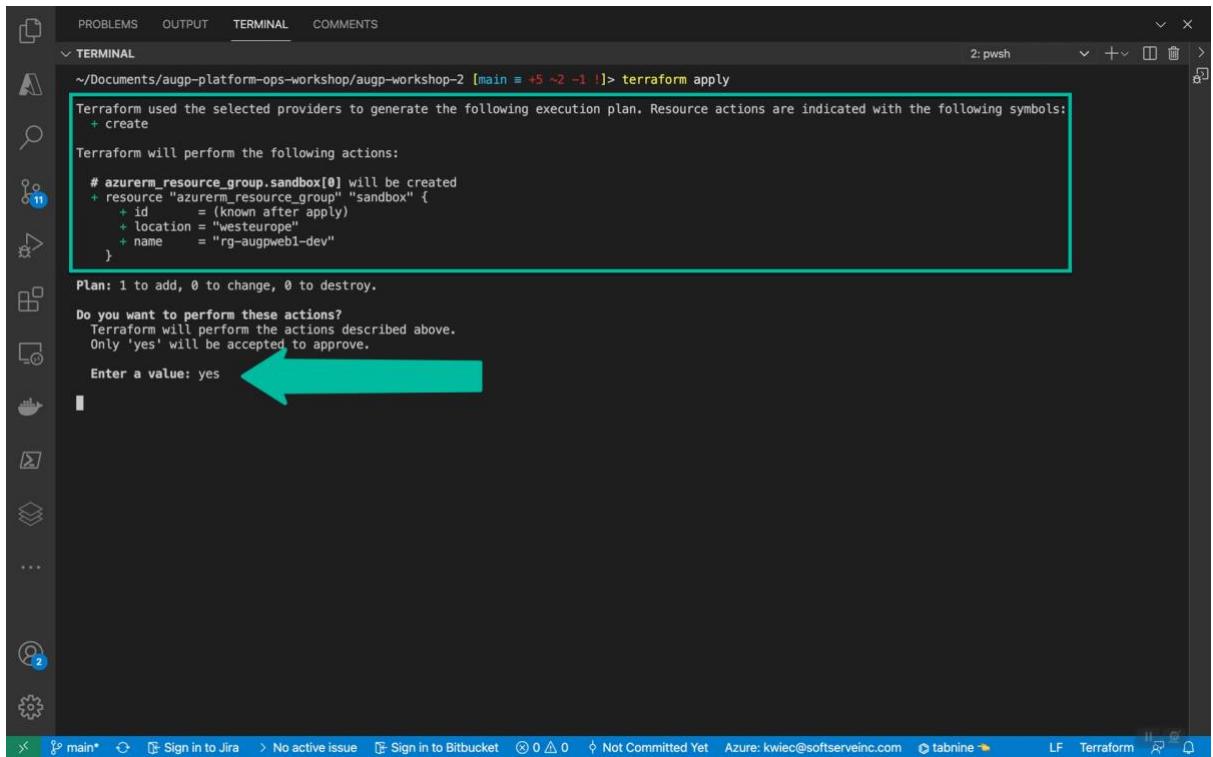
This screenshot is identical to the one above, showing the same workspace and Terraform code. However, a large green arrow points from the bottom right towards the terminal tab, highlighting the command 'terraform apply' which was run to execute the plan. The terminal output now shows the command being run:

```
2: psh
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# azurerm_resource_group.sandbox[0] will be created
+ resource "azurerm_resource_group" "sandbox" {
  + id      = (known after apply)
  + location = "westeurope"
  + name    = "rg-augpweb1-dev"
}

Plan: 1 to add, 0 to change, 0 to destroy.
```



```
PROBLEMS OUTPUT TERMINAL COMMENTS
TERMINAL
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main ≡ +5 ~2 -1 !]> terraform apply
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

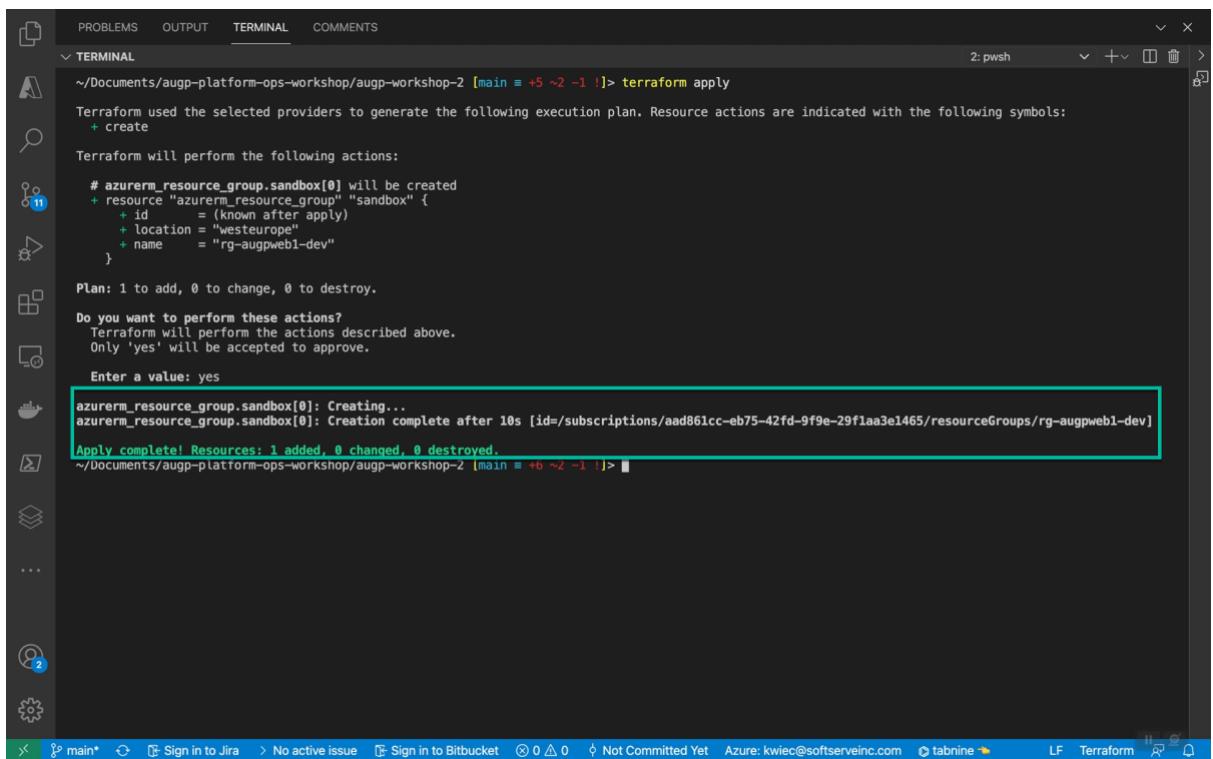
Terraform will perform the following actions:

# azurerm_resource_group.sandbox[0] will be created
+ resource "azurerm_resource_group" "sandbox" {
    + id      = (known after apply)
    + location = "westeurope"
    + name    = "rg-augpweb1-dev"
}

Plan: 1 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes
```



```
PROBLEMS OUTPUT TERMINAL COMMENTS
TERMINAL
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main ≡ +5 ~2 -1 !]> terraform apply
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# azurerm_resource_group.sandbox[0] will be created
+ resource "azurerm_resource_group" "sandbox" {
    + id      = (known after apply)
    + location = "westeurope"
    + name    = "rg-augpweb1-dev"
}

Plan: 1 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes
azurerm_resource_group.sandbox[0]: Creating...
azurerm_resource_group.sandbox[0]: Creation complete after 10s [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev]
Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main ≡ +6 ~2 -1 !]>
```

Sprawdź wdrożoną zmianę.

Screenshot of the Azure Resource Groups page showing a list of resource groups and their details.

The left sidebar shows a tree view of resource groups:

- Default Resource Group - NEU
- NetworkWatcherRG
- rg-devopsagents-shared
- rg-frontendkawi-dev
- rg-frontendkawi-prod
- rg-frontendkawi-shared
- rg-frontendkw-dev
- rg-frontendkw-prod
- rg-frontendkw-shared
- rg-new

The main table lists the resource groups with their subscription and location details:

| Name                     | Subscription         | Location     |
|--------------------------|----------------------|--------------|
| DefaultResourceGroup-NEU | Azure subscription 1 | North Europe |
| NetworkWatcherRG         | Azure subscription 1 | West Europe  |
| rg-devopsagents-shared   | Azure subscription 1 | West Europe  |
| rg-frontendkawi-dev      | Azure subscription 1 | West Europe  |
| rg-frontendkawi-prod     | Azure subscription 1 | West Europe  |
| rg-frontendkawi-shared   | Azure subscription 1 | West Europe  |
| rg-frontendkw-dev        | Azure subscription 1 | West Europe  |
| rg-frontendkw-prod       | Azure subscription 1 | West Europe  |
| rg-frontendkw-shared     | Azure subscription 1 | West Europe  |
| rg-new                   | Azure subscription 1 | West Europe  |

Pagination: < Previous Page 1 of 1 Next >

Screenshot of the Azure Resource Groups page showing a list of resource groups and their details.

The left sidebar shows a tree view of resource groups:

- Default Resource Group - NEU
- NetworkWatcherRG
- rg-devopsagents-shared
- rg-frontendkawi-dev
- rg-frontendkawi-prod
- rg-frontendkawi-shared
- rg-frontendkw-dev
- rg-frontendkw-prod
- rg-frontendkw-shared
- rg-new

A large green arrow points to the "Refresh" button in the top navigation bar.

The main table lists the resource groups with their subscription and location details:

| Name                     | Subscription         | Location     |
|--------------------------|----------------------|--------------|
| DefaultResourceGroup-NEU | Azure subscription 1 | North Europe |
| NetworkWatcherRG         | Azure subscription 1 | West Europe  |
| rg-devopsagents-shared   | Azure subscription 1 | West Europe  |
| rg-frontendkawi-dev      | Azure subscription 1 | West Europe  |
| rg-frontendkawi-prod     | Azure subscription 1 | West Europe  |
| rg-frontendkawi-shared   | Azure subscription 1 | West Europe  |
| rg-frontendkw-dev        | Azure subscription 1 | West Europe  |
| rg-frontendkw-prod       | Azure subscription 1 | West Europe  |
| rg-frontendkw-shared     | Azure subscription 1 | West Europe  |
| rg-new                   | Azure subscription 1 | West Europe  |

Pagination: < Previous Page 1 of 1 Next >

The screenshot shows the Microsoft Azure portal's Resource groups page. At the top, there are navigation links for 'Resource groups', 'Default Directory', 'Create', 'Manage view', 'Refresh', 'Export to CSV', 'Open query', 'Assign tags', and 'Feedback'. Below this is a search bar with the placeholder 'Search resources, services, and docs (G+?)'. The main area displays a table of resource groups. The columns are 'Name', 'Subscription', and 'Location'. The 'Name' column lists resource groups like 'DefaultResourceGroup-NEU', 'NetworkWatcherRG', and 'rg-augpweb1-dev'. The 'Subscription' column shows 'Azure subscription 1' repeated for each group. The 'Location' column shows locations such as 'North Europe', 'West Europe', and 'West Europe'. A red box highlights the 'rg-augpweb1-dev' entry in the 'Name' column. At the bottom of the table, there are buttons for 'No grouping' and 'List view'. Below the table, there are pagination controls: '< Previous', 'Page 1 of 1', and 'Next >'. On the right side of the table, there are three vertical dots for each row.

Wykonaj instrukcję `destroy` i potwierdź wykonanie zmiany w portalu.

The screenshot shows the VS Code interface with the 'TERMINAL' tab active. The terminal window displays the following Terraform session:

```

azurerm_resource_group.sandbox[0]: Creation complete after 10s [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev]
Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
~/Documents/augp-platform-ops-workshop-augp-workshop-2 [main ~+6 ~2 -1]terraform destroy
azurerm_resource_group.sandbox[0]: Refreshing state... [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev] ←
Note: Objects have changed outside of Terraform
Terraform detected the following changes made outside of Terraform since the last "terraform apply":
# azurerm_resource_group.sandbox[0] has been changed
  resource "azurerm_resource_group" "sandbox" {
    id      = "/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev"
    name   = "rg-augpweb1-dev"
    + tags  = {}
  }
Unless you have made equivalent changes to your configuration, or ignored the relevant attributes using ignore_changes, the following plan may include actions to undo or respond to these changes.

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
- destroy

Terraform will perform the following actions:
# azurerm_resource_group.sandbox[0] will be destroyed
- resource "azurerm_resource_group" "sandbox" {
  - id      = "/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev" -> null
  - location = "westeurope" -> null
  - name   = "rg-augpweb1-dev" -> null
  - tags   = {} -> null
}

Plan: 0 to add, 0 to change, 1 to destroy.

Do you really want to destroy all resources?
Terraform will destroy all your managed infrastructure, as shown above.
There is no undo. Only 'yes' will be accepted to confirm.

Enter a value: yes

```

A green arrow points from the terminal output to the 'Enter a value: yes' prompt at the bottom of the terminal window.

```

PROBLEMS OUTPUT TERMINAL COMMENTS
TERMINAL
Note: Objects have changed outside of Terraform
Terraform detected the following changes made outside of Terraform since the last "terraform apply":
# azurerm_resource_group.sandbox[0] has been changed
~ resource "azurerm_resource_group" "sandbox" {
  id      = "/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev"
  name    = "rg-augpweb1-dev"
  + tags  = {}
}
Unless you have made equivalent changes to your configuration, or ignored the relevant attributes using ignore_changes, the following plan may include actions to undo or respond to these changes.

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
- destroy

Terraform will perform the following actions:

# azurerm_resource_group.sandbox[0] will be destroyed
- resource "azurerm_resource_group" "sandbox" {
  - id      = "/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev" -> null
  - location = "westeurope" -> null
  - name    = "rg-augpweb1-dev" -> null
  - tags    = {} -> null
}

Plan: 0 to add, 0 to change, 1 to destroy.

Do you really want to destroy all resources?
Terraform will destroy all your managed infrastructure, as shown above.
There is no undo. Enter 'yes' will be accepted to confirm.

Enter a value: yes
azurerm_resource_group.sandbox[0]: Destroying... [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev]
azurerm_resource_group.sandbox[0]: Still destroying... [id=/subscriptions/aad861cc-eb75-42fd-9f9e-...a3e1465/resourceGroups/rg-augpweb1-dev, 10s elapsed]
azurerm_resource_group.sandbox[0]: Destruction complete after 18s
Destroy complete! Resources: 1 destroyed.

```

Resource groups

| Name                         | Subscription                | Location           |
|------------------------------|-----------------------------|--------------------|
| (a) DefaultResourceGroup-NEU | Azure subscription 1        | North Europe       |
| (a) NetworkWatcherRG         | Azure subscription 1        | West Europe        |
| <b>(a) rg-augpweb1-dev</b>   | <b>Azure subscription 1</b> | <b>West Europe</b> |
| (a) rg-devopsagents-shared   | Azure subscription 1        | West Europe        |
| (a) rg-frontendkawi-dev      | Azure subscription 1        | West Europe        |
| (a) rg-frontendkawi-prod     | Azure subscription 1        | West Europe        |
| (a) rg-frontendkawi-shared   | Azure subscription 1        | West Europe        |
| (a) rg-frontendkw-dev        | Azure subscription 1        | West Europe        |
| (a) rg-frontendkw-prod       | Azure subscription 1        | West Europe        |
| (a) rg-frontendkw-shared     | Azure subscription 1        | West Europe        |
| (a) rg-new                   | Azure subscription 1        | West Europe        |

| Name                         | Subscription         | Location     |
|------------------------------|----------------------|--------------|
| (a) DefaultResourceGroup-NEU | Azure subscription 1 | North Europe |
| (a) NetworkWatcherRG         | Azure subscription 1 | West Europe  |
| (a) rg-devopsagents-shared   | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-dev      | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-prod     | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-shared   | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-dev        | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-prod       | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-shared     | Azure subscription 1 | West Europe  |
| (a) rg-new                   | Azure subscription 1 | West Europe  |

Wdróż RG ponownie, pomijając konieczność potwierdzenia.

```

Terraform will perform the following actions:

# azurerm_resource_group.sandbox[0] will be destroyed
- resource "azurerm_resource_group" "sandbox" {
  - id      = "/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev" -> null
  - location = "westeurope" -> null
  - name    = "rg-augpweb1-dev" -> null
  - tags    = {} -> null
}

Plan: 0 to add, 0 to change, 1 to destroy.

Do you really want to destroy all resources?
Terraform will destroy all your managed infrastructure, as shown above.
There is no undo. Only 'yes' will be accepted to confirm.

Enter a value: yes

azurerm_resource_group.sandbox[0]: Destroying... [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev]
azurerm_resource_group.sandbox[0]: Still destroying... [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev, 10s elapsed]
azurerm_resource_group.sandbox[0]: Destruction complete after 18s

Destroy complete! Resources: 1 destroyed.

~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main +6 ~2 -1 ]: terraform apply --auto-approve ←

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
- create

Terraform will perform the following actions:

# azurerm_resource_group.sandbox[0] will be created
+ resource "azurerm_resource_group" "sandbox" {
  + id      = (known after apply)
  + location = "westeurope"
  + name    = "rg-augpweb1-dev"
}

Plan: 1 to add, 0 to change, 0 to destroy.

azurerm_resource_group.sandbox[0]: Creating...
azurerm_resource_group.sandbox[0]: Creation complete after 4s [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main +6 ~2 -1 ]:

```

Wdróż kolejne modyfikacje i potwierdź zmiany w UI.

```

1 # SECTION 1 - RG
...
3 resource "azurerm_resource_group" "sandbox" {
4   count      = length(var.teams)
5   name       = "rg-${var.teams[count.index].abbreviation}-dev"
6   location   = "West Europe"
7 }
...
11 resource "azuread_group" "teams" {
12   count      = length(var.teams)
13   display_name = "tg-${var.teams[count.index].abbreviation}"
14   mail_enabled = "false"
15   security_enabled = "true"
16 }
...
18 # SECTION 3 - AZURE AD ROLE ASSIGNMENT
...
20 # resource "azurerm_role_assignment" "sandbox_contributor" {
21 #   count      = length(var.teams)
22 #   scope      = azurerm_resource_group.sandbox.id
23 #   principal_id = azuread_group.teams[count.index].object_id
24 #   role_definition_name = "Contributor"
25 # }
...
27 # SECTION 4 - AZURE DEVOPS PROJECT
...
29 # resource "azuredevops_project" "project" {
30 #   count      = length(var.teams)
31 #   name       = var.teams[count.index].abbreviation
32 #   description = "${var.teams[count.index].full_name} team project. Project members are indirectly managed by HR system"
33 # }

```

PROBLEMS OUTPUT TERMINAL COMMENTS

TERMINAL

```

Terraform will perform the following actions:

# azurerm_resource_group.sandbox[0] will be destroyed
- resource "azurerm_resource_group" "sandbox" {
  - id          = "/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev" -> null
  - location    = "westeurope" -> null
  - name        = "rg-augpweb1-dev" -> null
  - tags         = {} -> null
}

Plan: 0 to add, 0 to change, 1 to destroy.

Do you really want to destroy all resources?
Terraform will destroy all your managed infrastructure, as shown above.
There is no undo. Only 'yes' will be accepted to confirm.

Enter a value: yes

azurerm_resource_group.sandbox[0]: Destroying... [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev]
azurerm_resource_group.sandbox[0]: Still destroying... [id=/subscriptions/aad861cc-eb75-42fd-9f9e-...a3e1465/resourceGroups/rg-augpweb1-dev, 10s elapsed]
azurerm_resource_group.sandbox[0]: Destruction complete after 18s

Destroy complete! Resources: 1 destroyed.
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main = +6 ~2 -1 :] > terraform apply --auto-approve

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# azurerm_resource_group.sandbox[0] will be created
+ resource "azurerm_resource_group" "sandbox" {
  + id          = (known after apply)
  + location    = "westeurope"
  + name        = "rg-augpweb1-dev"
}

Plan: 1 to add, 0 to change, 0 to destroy.
azurerm_resource_group.sandbox[0]: Creating...
azurerm_resource_group.sandbox[0]: Creation complete after 4s [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main = +6 ~2 -1 :] > terraform apply

```

PROBLEMS OUTPUT TERMINAL COMMENTS

TERMINAL

```
Unless you have made equivalent changes to your configuration, or ignored the relevant attributes using ignore_changes, the following plan may include actions to undo or respond to these changes.
```

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:

- + create

Terraform will perform the following actions:

```
# azureread_group.teams[0] will be created
+ resource "azureread_group" "teams" {
    + display_name          = "tg-augpweb1"
    + id                    = (known after apply)
    + mail                  = (known after apply)
    + mail_enabled          = false
    + mailNickname          = (known after apply)
    + members               = (known after apply)
    + object_id              = (known after apply)
    + onpremises_domain_name = (known after apply)
    + onpremises_netbios_name = (known after apply)
    + onpremises_sam_account_name = (known after apply)
    + onpremises_security_identifier = (known after apply)
    + onpremises_sync_enabled = (known after apply)
    + owners                = (known after apply)
    + preferred_language     = (known after apply)
    + prevent_duplicate_names = false
    + proxy_addresses        = true
    + security_enabled       = (known after apply)
    + visibility             = (known after apply)
}
```

Plan: 1 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?  
Terraform will perform the actions described above.  
Only 'yes' will be accepted to approve.

Enter a value: yes

```
azureread_group.teams[0]: Creating...
azureread_group.teams[0]: Creation complete after 5s [id=21221893-8177-421a-b4af-861b585e0362]
```

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

~\Documents\augp-platform-ops-workshop\augp-workshop-2 [main ≡ +6 ~2 -1 ]> █

Resource groups - Microsoft | Settings - Personal access tokens | +

<https://portal.azure.com/?quickstart=true#/blade/HubsExtension/BrowseResourceGroups>

Microsoft Azure | Upgrade

Search resources, services, and docs (G/)

Resource groups

Default Directory

+ Create Manage view Refresh Export to CSV

Filter for any field... Subscription = all Location =

Showing 1 to 10 of 10 records.

| Name                         |
|------------------------------|
| [?] DefaultResourceGroup-NEU |
| [?] NetworkWatcherRG         |
| [?] rg-devopsagents-shared   |
| [?] rg-frontendkawi-dev      |
| [?] rg-frontendkawi-prod     |
| [?] rg-frontendkawi-shared   |
| [?] rg-frontendkw-dev        |
| [?] rg-frontendkw-prod       |
| [?] rg-frontendkw-shared     |
| [?] rg-new                   |

Recent services

Resource groups Policy App registrations Subscriptions Azure Active Directory Container registries Defender for... ←

Recent resources

Azure subscription 1 aci-frontendkawi-dev rg-frontendkawi-dev sfrontendkawi rg-frontendkwi-dev

No grouping List view

Location ↑

North Europe ...  
West Europe ...

< Previous Page 1 of 1 Next >

The screenshot shows the Microsoft Azure portal interface. The user is on the 'Groups | All groups' page under the 'Default Directory - Azure Active Directory' section. A green arrow points to the 'All groups' link in the left sidebar. The main content area displays a table with one row, highlighting the group 'tg-augpweb1'. The table columns are Name, Object Id, Group Type, Membership Type, and Email.

| Name        | Object Id                            | Group Type | Membership Type | Email |
|-------------|--------------------------------------|------------|-----------------|-------|
| tg-augpweb1 | 21221893-8177-421a-b4af-861b585e0362 | Security   | Assigned        |       |

The screenshot shows a code editor with a dark theme, displaying Terraform configuration files. A green box highlights the 'sandbox.tf' file content, which includes sections for Azure AD role assignment and Azure DevOps project creation. The configuration uses variables like `var.teams` and `azurerm\_resource\_group.sandbox` to manage multiple teams.

```

# SECTION 3 - AZURE AD ROLE ASSIGNMENT
resource "azurerm_role_assignment" "sandbox_contributor" {
  count      = length(var.teams)
  scope      = azurerm_resource_group.sandbox[count.index].id
  principal_id = azurerm_group.teams[count.index].object_id
  role_definition_name = "Contributor"
}

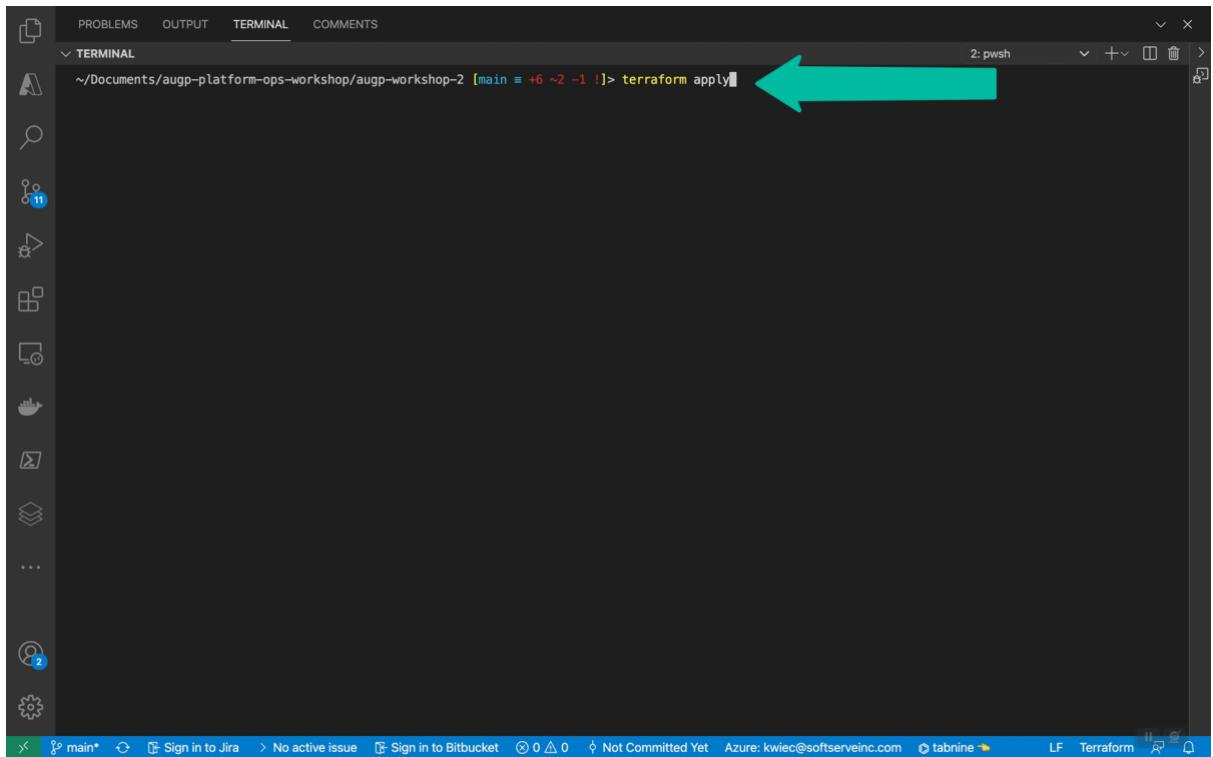
# SECTION 4 - AZURE DEVOPS PROJECT
resource "azuredevops_project" "project" {
  count      = length(var.teams)
  name       = var.teams[count.index].abbreviation
  description = "${var.teams[count.index].full_name} team project. Project members are indirectly managed by HR system"
}

# SECTION 4 - AZURE AD APP REGISTRATION
# data "azuread_application_template" "example" {
#   display_name = "Marketo"
# }

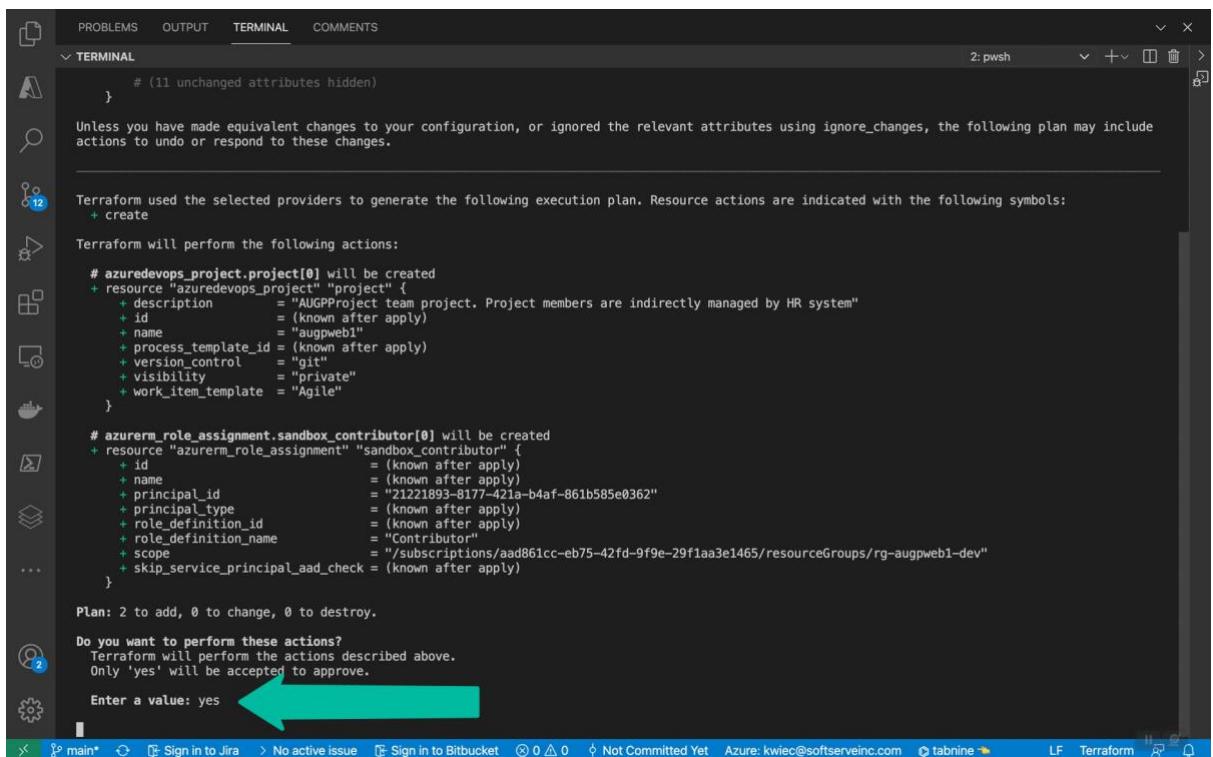
# resource "azuread_application" "appreg" {
#   count      = length(var.teams)
#   display_name = "app-${var.teams[count.index].abbreviation}"
#   owners     = []
#   template_id = data.azuread_application_template.example.template_id
# }

# resource "azuread_application_password" "example" {
#   count      = length(var.teams)
#   application_object_id = azuread_application.appreg[count.index].object_id
# }

```



```
PROBLEMS OUTPUT TERMINAL COMMENTS
TERMINAL
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main ≡ +6 ~2 -1 !]> terraform apply
```



```
PROBLEMS OUTPUT TERMINAL COMMENTS
TERMINAL
# (11 unchanged attributes hidden)
}

Unless you have made equivalent changes to your configuration, or ignored the relevant attributes using ignore_changes, the following plan may include actions to undo or respond to these changes.

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# azureddevops_project.project[0] will be created
+ resource "azureddevops_project" "project" {
    + description      = "AUGPProject team project. Project members are indirectly managed by HR system"
    + id              = (known after apply)
    + name            = "augpweb1"
    + process_template_id = (known after apply)
    + version_control   = "git"
    + visibility        = "private"
    + work_item_template = "Agile"
}

# azurerm_role_assignment.sandbox_contributor[0] will be created
+ resource "azurerm_role_assignment" "sandbox_contributor" {
    + id              = (known after apply)
    + name            = (known after apply)
    + principal_id    = "21221893-8177-421a-b4af-861b585e0362"
    + principal_type  = (known after apply)
    + role_definition_id = (known after apply)
    + role_definition_name = "Contributor"
    + scope           = "/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev"
    + skip_service_principal_aad_check = (known after apply)
}

Plan: 2 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.
```

Enter a value: yes

PROBLEMS OUTPUT TERMINAL COMMENTS

TERMINAL

```
+ create
Terraform will perform the following actions:

# azurdevops_project.project[0] will be created
+ resource "azurdevops_project" "project" {
    + description      = "AUGPProject team project. Project members are indirectly managed by HR system"
    + id              = (known after apply)
    + name            = "augpweb1"
    + process_template_id = (known after apply)
    + version_control   = "git"
    + visibility        = "private"
    + work_item_template = "Agile"
}

# azurerm_role_assignment.sandbox_contributor[0] will be created
+ resource "azurerm_role_assignment" "sandbox_contributor" {
    + id              = (known after apply)
    + name            = (known after apply)
    + principal_id    = "21221893-8177-421a-b4af-861b585e0362"
    + principal_type  = (known after apply)
    + role_definition_id = (known after apply)
    + role_definition_name = "Contributor"
    + scope           = "/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev"
    + skip_service_principal_aad_check = (known after apply)
}

Plan: 2 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes

azurdevops_project.project[0]: Creating...
azurdevops_project.project[0]: Creation complete after 7s [id=2f2991fc-4d1c-418b-9298-3dad42daba73]
azurerm_role_assignment.sandbox_contributor[0]: Creating...
azurerm_role_assignment.sandbox_contributor[0]: Still creating... [10s elapsed]
azurerm_role_assignment.sandbox_contributor[0]: Still creating... [20s elapsed]
azurerm_role_assignment.sandbox_contributor[0]: Creation complete after 30s [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-augpweb1-dev/providers/Microsoft.Authorization/roleAssignments/d3ac00d5-116a-fb20-394a-071c68f2539d]

Apply complete! Resources: 2 added, 0 changed, 0 destroyed.
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main ≡ +6 ~2 -1 ]>
```

Resource groups - Microsoft | Projects - Home | +

<https://portal.azure.com/?quickstart=true#blade/HubsExtension/BrowseResourceGroups>

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Resource groups ...

Default Directory

+ Create Manage view Refresh Export to CSV Open query Assign tags Feedback

Filter for any field... Subscription == all Location == all Add filter

No grouping List view

Showing 1 to 11 of 11 records.

| Name                         | Subscription         | Location     |
|------------------------------|----------------------|--------------|
| (a) DefaultResourceGroup-NEU | Azure subscription 1 | North Europe |
| (a) NetworkWatcherRG         | Azure subscription 1 | West Europe  |
| (a) rg-augpweb1-dev          | Azure subscription 1 | West Europe  |
| (a) rg-devopsagents-shared   | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-dev      | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-prod     | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-shared   | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-dev        | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-prod       | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-shared     | Azure subscription 1 | West Europe  |
| (a) rg-new                   | Azure subscription 1 | West Europe  |

< Previous Page 1 of 1 Next >

**rg-augpweb1-dev | Access control (IAM)**

Check access    Role assignments

Subscription: rg-augpweb1-dev

25    2000

Search by name or email    Type: All    Role: All    Scope: This resource

Showing a filtered set of results. Total number of role assignments: 11

| Name        | Type  | Role        | Scope         | Condition |
|-------------|-------|-------------|---------------|-----------|
| tg-augpweb1 | Group | Contributor | This resource | None      |

Azure DevOps

Search

Filter projects

Projects    My work items    My pull requests

AUGP-DO

AUGP-DO2  
Generated by Azure DevOps Demo Generator

AUGP-WebApp  
Generated by Azure DevOps Demo Generator

CoE

DG-Automate-Docker  
Generated by Azure DevOps Demo Generator

DG-AzureFunctions  
Generated by Azure DevOps Demo Generator

DG-PartsUnlimited-YAML  
Generated by Azure DevOps Demo Generator

Organization settings

Screenshot of the Azure DevOps interface showing the 'augp' organization with several projects listed:

- workshop-app** (W)
- IMPORT** (I)
- AUGP-DO2** (A)
- AUGP-DO** (A)
- AUGP-DO2** (A)
- augpweb1** (A) - This project is highlighted with a green border.
- AUGP-WebAPP** (A)
- CoE** (C)
- DG-Automate-Docker** (D)

The 'augpweb1' project is described as "AUGPProject team project. Project members are indirectly managed by HR system".

Below the organization view, a code editor shows a Terraform script (sandbox.tf) with a section highlighted in red:

```

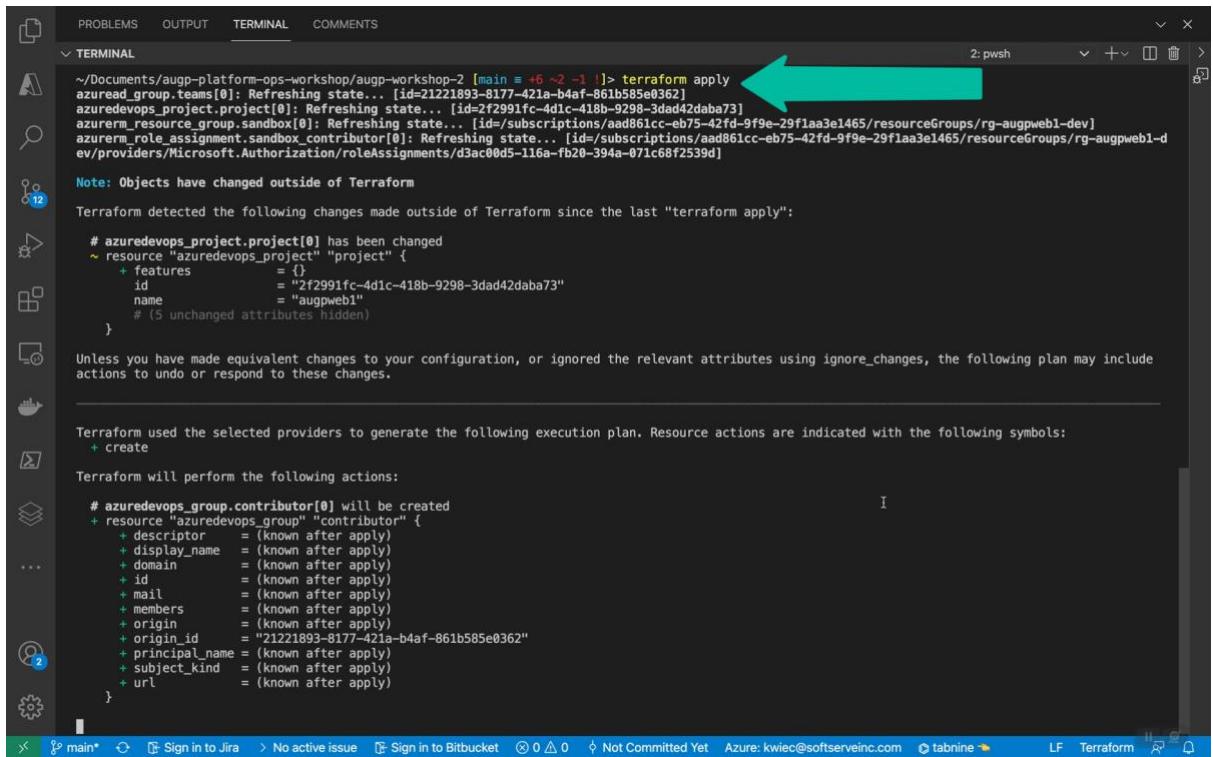
# SECTION 5 - AZURE DEVOPS PERMISSIONS
...
resource "azureddevops_group" "contributor" {
  count      = length(var.teams)
  project_id = azureddevops_project.project[count.index].id
  name       = "Contributors"
}

...
resource "azureddevops_group" "contributor" {
  count      = length(var.teams)
  origin_id  = azureddevops_group.teams[count.index].id
}

...
resource "azureddevops_group_membership" "contr" {
  count      = length(var.teams)
  group     = data.azureddevops_group.contributor[count.index].descriptor
  members   = [
    azureddevops_group.contributor[count.index].descriptor
  ]
}

```

The bottom status bar shows various links and icons, including "Sign in to Jira", "Sign in to Bitbucket", and "Blame Kamil Wiecek (6 days ago)".



```
PROBLEMS OUTPUT TERMINAL COMMENTS
✓ TERMINAL
~> terraform apply
azureread_group.teams[0]: Refreshing state... [id=21221893-8177-421a-b4af-861b585e0362]
azureddevops_project.project[0]: Refreshing state... [id=f2f991fc-4d1c-418b-9298-3dad42daba73]
azurerm_resource_group.sandbox[0]: Refreshing state... [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29flaa3e1465/resourceGroups/rg-augpweb1-dev]
azurerm_role_assignment.sandbox_contributor[0]: Refreshing state... [id=/subscriptions/aad861cc-eb75-42fd-9f9e-29flaa3e1465/resourceGroups/rg-augpweb1-dev/providers/Microsoft.Authorization/roleAssignments/d3ac00d5-116a-fb2b-394a-071c68f2539d]

Note: Objects have changed outside of Terraform

Terraform detected the following changes made outside of Terraform since the last "terraform apply":

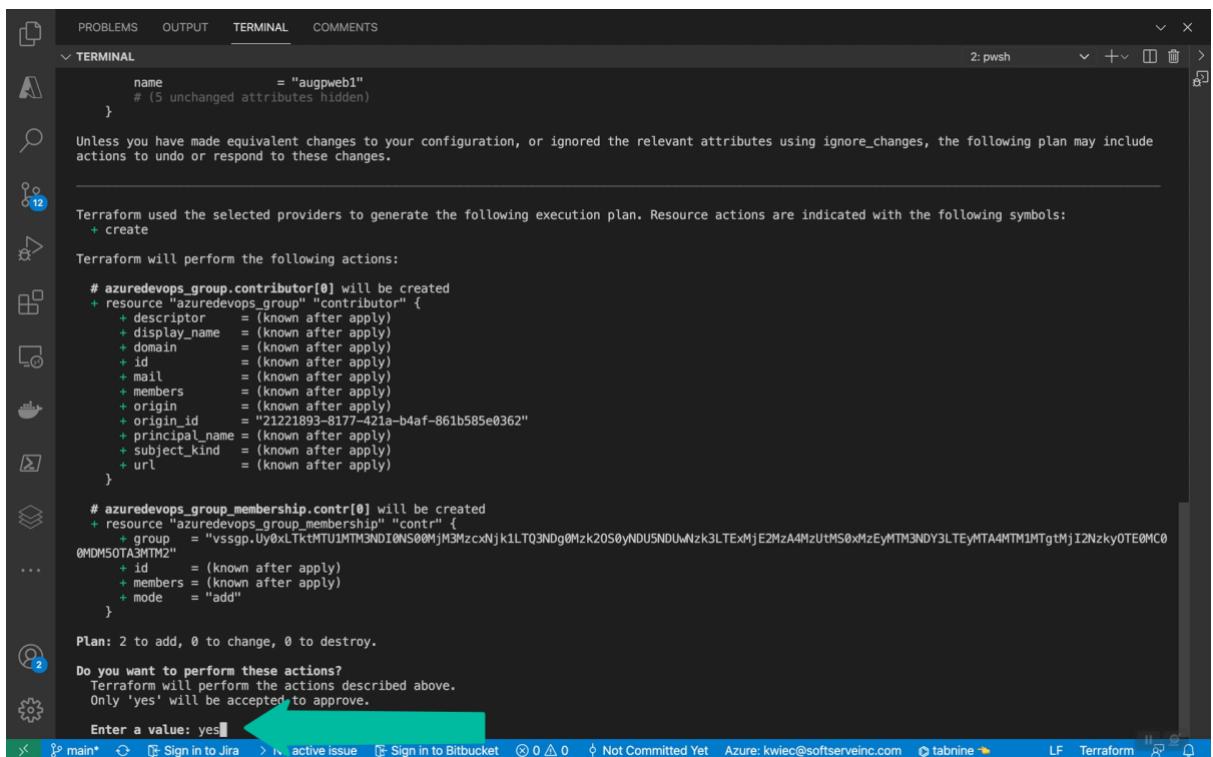
# azureddevops_project.project[0] has been changed
~ resource "azureddevops_project" "project" {
  + features = {}
  + id       = "f2f991fc-4d1c-418b-9298-3dad42daba73"
  + name     = "augpweb1"
}

Unless you have made equivalent changes to your configuration, or ignored the relevant attributes using ignore_changes, the following plan may include actions to undo or respond to these changes.

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# azureddevops_group.contributor[0] will be created
+ resource "azureddevops_group" "contributor" {
  + descriptor = (known after apply)
  + display_name = (known after apply)
  + domain = (known after apply)
  + id = (known after apply)
  + mail = (known after apply)
  + members = (known after apply)
  + origin = (known after apply)
  + origin_id = "21221893-8177-421a-b4af-861b585e0362"
  + principal_name = (known after apply)
  + subject_kind = (known after apply)
  + url = (known after apply)
}
```



```
PROBLEMS OUTPUT TERMINAL COMMENTS
✓ TERMINAL
  name      = "augpweb1"
  # (5 unchanged attributes hidden)

Unless you have made equivalent changes to your configuration, or ignored the relevant attributes using ignore_changes, the following plan may include actions to undo or respond to these changes.

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

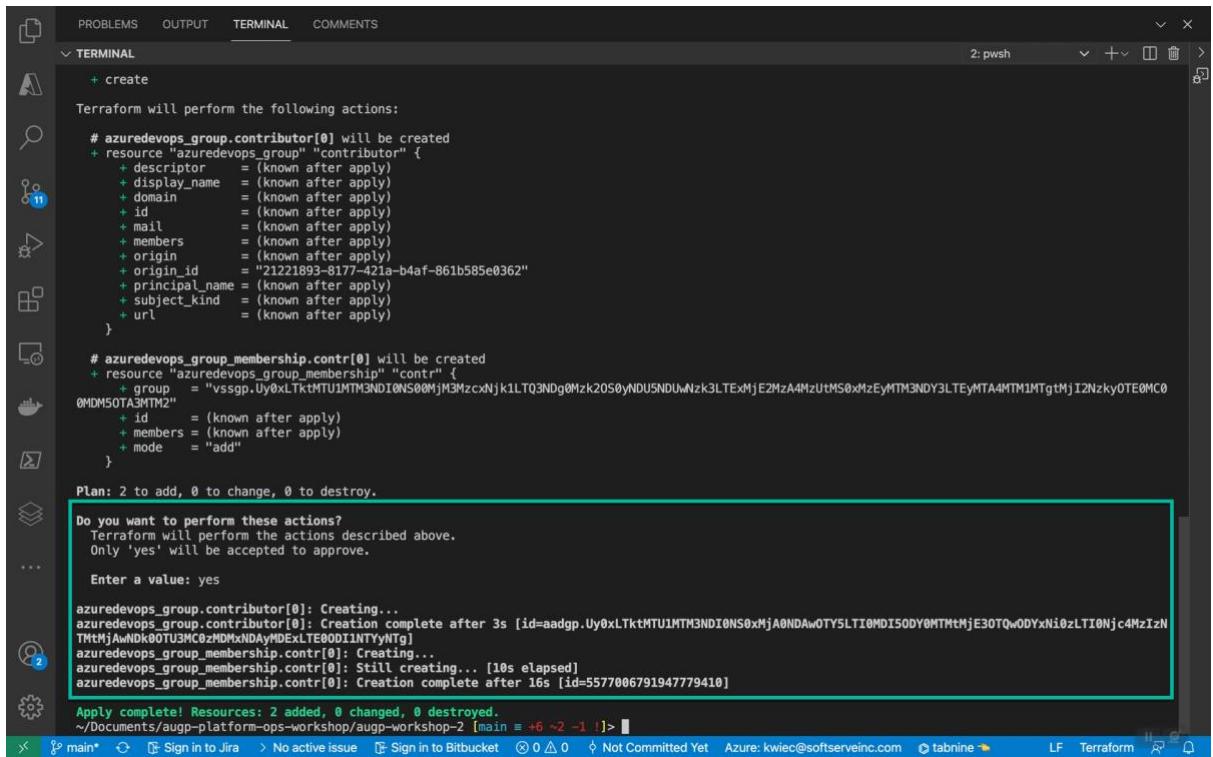
# azureddevops_group.contributor[0] will be created
+ resource "azureddevops_group" "contributor" {
  + descriptor = (known after apply)
  + display_name = (known after apply)
  + domain = (known after apply)
  + id = (known after apply)
  + mail = (known after apply)
  + members = (known after apply)
  + origin = (known after apply)
  + origin_id = "21221893-8177-421a-b4af-861b585e0362"
  + principal_name = (known after apply)
  + subject_kind = (known after apply)
  + url = (known after apply)
}

# azureddevops_group_membership.contr[0] will be created
+ resource "azureddevops_group_membership" "contr" {
  + group   = "vssgp.Uy0xLTktMTU1MTM3NDI0N500MjM3MzcNjklLTQ3NDg0Mzk2050yNDU5NDUwNzK3LTEXMjE2MzA4MzUtMS0xMzEyMTM3NDY3LTEyMTA4MTM1MTgtMjI2NzkyOTE0MC00MDM50TA3MTM2"
  + id     = (known after apply)
  + members = (known after apply)
  + mode   = "add"
}

Plan: 2 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes
```



```

PROBLEMS OUTPUT TERMINAL COMMENTS
TERMINAL
+ create
Terraform will perform the following actions:

# azureddevops_group.contributor[0] will be created
+ resource "azureddevops_group" "contributor" {
    + descriptor = (known after apply)
    + display_name = (known after apply)
    + domain = (known after apply)
    + id = (known after apply)
    + mail = (known after apply)
    + members = (known after apply)
    + origin = (known after apply)
    + origin_id = "21221893-8177-421a-b4af-861b585e0362"
    + principal_name = (known after apply)
    + subject_kind = (known after apply)
    + url = (known after apply)
}

# azureddevops_group_membership.contr[0] will be created
+ resource "azureddevops_group_membership" "contr" {
    + group = "vssgp.Uy0xLTktNTU1MTM3NDI0NS0xMjA0NDAwOTY5LTi0MDi50DY0MTMtMjE30TQwODYxNi0zLTI0NjC4MzIzN0MDM50TA3MTM2"
    + id = (known after apply)
    + members = (known after apply)
    + mode = "add"
}

Plan: 2 to add, 0 to change, 0 to destroy.

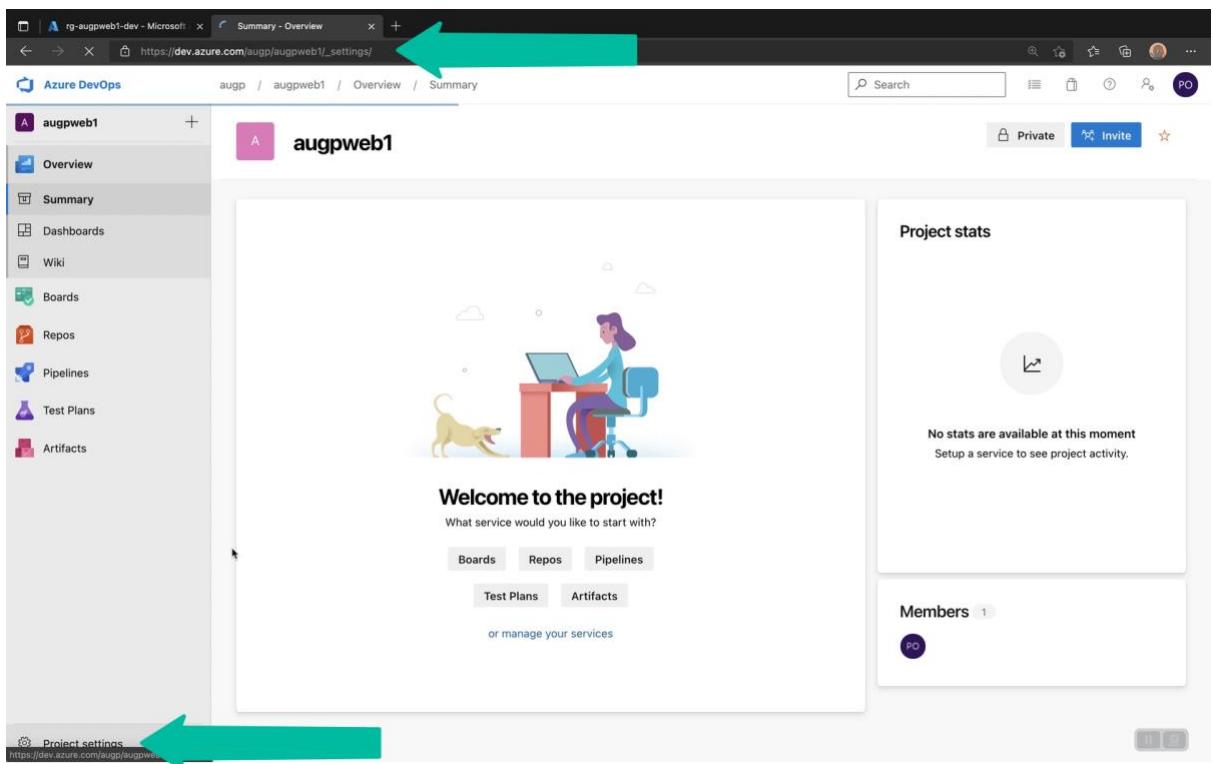
Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes

azureddevops_group.contributor[0]: Creating...
azureddevops_group.contributor[0]: Creation complete after 3s [id=aaadgp.Uy0xLTktNTU1MTM3NDI0NS0xMjA0NDAwOTY5LTi0MDi50DY0MTMtMjE30TQwODYxNi0zLTI0NjC4MzIzNTMMjAwNDk0TU3MC0zNDxhD4ayhDExlTE00DTi1NTYnNTg]
azureddevops_group_membership.contr[0]: Creating...
azureddevops_group_membership.contr[0]: Still creating... [10s elapsed]
azureddevops_group_membership.contr[0]: Creation complete after 16s [id=5577006791947779410]

Apply complete! Resources: 2 added, 0 changed, 0 destroyed.
~/Documents/augp-platform-ops-workshop/augp-workshop-2/main ≡ +6 ~2 -1 ]>

```



The screenshot shows the Azure DevOps project summary page for 'augpweb1'. The URL is [https://dev.azure.com/augp/augpweb1/\\_settings](https://dev.azure.com/augp/augpweb1/_settings). A green arrow points to the 'Project settings' link at the bottom left of the page.

The page displays the following information:

- Project stats:** No stats are available at this moment. Setup a service to see project activity.
- Members:** 1 member (PO).
- Welcome to the project!** What service would you like to start with? Options include Boards, Repos, Pipelines, Test Plans, and Artifacts.
- Project navigation:** Overview, Summary, Dashboards, Wiki, Boards, Repos, Pipelines, Test Plans, Artifacts.

Screenshot of the Azure DevOps Project Settings - Permissions page for the 'augpweb1' project.

The left sidebar shows the 'Permissions' section selected under 'General'.

The main area displays a table of permissions:

| Name                      | Description   | Type  | Members |
|---------------------------|---|-------|---------|
| BA Build Administrators   | Members of this group can create, modify and delete build definitions and manage queued and completed builds. | Group | 2       |
| C Contributors            | this group can add, modify, and delete items within the project.  | Group | 2       |
| PA Project Administrators | Members of this group can perform all operations in the team project.   | Group | 1       |
| PU Project Valid Users    | Members of this group have access to the team project.  | Group | 5       |
| R Readers                 | Members of this group have access to the team project.  | Group | 0       |
| AT augpweb1 Team          | The default project team.   | Team  | 1       |

A large green arrow points to the 'Contributors' row.

Screenshot of the Azure DevOps Project Settings - Permissions page for the 'augpweb1' project, specifically viewing the 'Contributors' group.

The left sidebar shows the 'Permissions' section selected under 'General'.

The main area shows the details for the '[augpweb1]Contributors' group:

**[augpweb1]Contributors**  
Members of this group can add, modify, and delete items within the team project.

Permissions Members Member of Settings

Search users and groups

Table of members:

| Name             | Type     | Username or scope |
|------------------|----------|-------------------|
| AT augpweb1 Team | group    | [augpweb1]        |
| T tg-augpweb1    | ad group | [TEAM FOUNDATION] |

A green box highlights the 'ad group' entry for 'tg-augpweb1'.

VS Code interface showing the `params.tf` file. The file contains the following Terraform code:

```
variable "teams" {
  type = list(object({
    full_name   = string
    abbreviation = string
  }))
  default = [
    {
      full_name   = "AUGPProject"
      abbreviation = "augpweb1"
    },
    ...
    {
      full_name   = "AugpPlatformOps"
      abbreviation = "apo"
    }
  ]
}
```

Two red arrows point to the following lines of code:

- A top arrow points to the line `abbreviation = "apo"`.
- A bottom arrow points to the line `full_name = "AugpPlatformOps"`.

VS Code interface showing the terminal window. The terminal is running a PowerShell session (pwsh) and displays the command:

```
~/Documents/augp-platform-ops-workshop/augp-workshop-2 [main ≡ +6 ~3 -1 ]> terraform apply
```

A red arrow points to the `terraform apply` command at the end of the line.

PROBLEMS OUTPUT TERMINAL COMMENTS

TERMINAL

```
# azuredevops_group_membership.contr[1] will be created
+ resource "azuredevops_group_membership" "contr" {
  + group    = (known after apply)
  + id       = (known after apply)
  + members  = (known after apply)
  + mode     = "add"
}

# azuredevops_project.project[1] will be created
+ resource "azuredevops_project" "project" {
  + description      = "AUGPPlatformOps team project. Project members are indirectly managed by HR system"
  + id               = (known after apply)
  + name             = "apo"
  + process_template_id = (known after apply)
  + version_control   = "git"
  + visibility        = "private"
  + work_item_template = "Agile"
}

# azurerm_resource_group.sandbox[1] will be created
+ resource "azurerm_resource_group" "sandbox" {
  + id       = (known after apply)
  + location = "westeurope"
  + name     = "rg-apo-dev"
}

# azurerm_role_assignment.sandbox_contributor[1] will be created
+ resource "azurerm_role_assignment" "sandbox_contributor" {
  + id           = (known after apply)
  + name         = (known after apply)
  + principal_id = (known after apply)
  + principal_type = (known after apply)
  + role_definition_id = (known after apply)
  + role_definition_name = "Contributor"
  + scope        = (known after apply)
  + skip_service_principal_aad_check = (known after apply)
}

Plan: 7 to add, 0 to change, 1 to destroy.
```

Do you want to perform these actions?  
Terraform will perform the actions described above.  
Only 'yes' will be accepted to approve.

Enter a value: yes

Spaces: 2 UTF-8 LF Terraform

PROBLEMS OUTPUT TERMINAL COMMENTS

TERMINAL

```
+ scope          = (known after apply)
+ skip_service_principal_aad_check = (known after apply)

Plan: 7 to add, 0 to change, 1 to destroy.
```

Do you want to perform these actions?  
Terraform will perform the actions described above.  
Only 'yes' will be accepted to approve.

Enter a value: yes

```
azureddevops_group_membership.contr[0]: Destroying... [id=5577006791947779410]
azureddevops_group_membership.contr[0]: Destruction complete after 6s
azureddevops_project.project[1]: Creating...
azureddevops_teams[1]: Creating...
azureddevops_project.project[1]: Creation complete after 9s [id=18f8b16d-c64a-40c2-90bb-01c52765e91e]
data_azureddevops_group_contributor[1]: Reading...
data_azureddevops_group_contributor[0]: Reading... [id=vssgp.Uy0xLTktMTU1MTM3NDI0NS00MjM3MzcxNjk1LTQ3NDg0Mzk20S0yNDU5NDUwNzk3LTExmje2MzA4MzUtmS0xMzEyMTM3
NDY3LTeyTA4MTM1MTgtMjI2NzkyOTE0MC08MDMS0TA3MTM2]
azureddevops_teams[1]: Creation complete after 10s [id=c74a3ff5-08e5-493e-a14d-856943110908]
azureddevops_group_contributor[1]: Creating...
azureddevops_group_contributor[0]: Read complete after 1s [id=vssgp.Uy0xLTktMTU1MTM3NDI0NS00MjM3MzcxNjk1LTQ3NDg0Mzk20S0yNDU5NDUwNzk3LTExmje2MzA4MzUtmS0xMzEyMTM3
NDY3LTeyTA4MTM1MTgtMjI2NzkyOTE0MC08MDMS0TA3MTM2]
data_azureddevops_group_contributor[1]: Read complete after 1s [id=vssgp.Uy0xLTktMTU1MTM3NDI0NS0xODQwMzc50T14LTEyNTQ1Mzk4NDAtmjo0y0DE3NDc40S02Nja50TayMzgt
MS0xLz1kNDczMjI0LTly0TMwNTgMjQyMjYLNz2MNs0yTUyMz0yD0G1]
azureddevops_group_contributor[1]: Creation complete after 1s [id=adagp.Uy0xLTktMTU1MTM3NDI0NS0xMja0NDAwOTTy5LTi0MD150Dy0MTMhje30TqW0DYxN102LTQxMTQ1NjU4M
zETMzgM0jUyMj5Nw0yhza2HjeWjAxLTExMjUx0Dk40TY]
azureddevops_group_membership.contr[1]: Creating...
azureddevops_group_membership.contr[0]: Creating...
azureddevops_group_membership.contr[0]: Still creating... [10s elapsed]
azureddevops_group_membership.contr[1]: Still creating... [10s elapsed]
azureddevops_group_membership.contr[0]: Creation complete after 17s [id=5577006791947779410]
azureddevops_group_membership.contr[1]: Creation complete after 17s [id=8674665223082153551]
azureddevops_resource_group.sandbox[1]: Creating...
azureddevops_resource_group.sandbox[1]: Creation complete after 3s [id=subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-apo-dev]
azureddevops_role_assignment.sandbox_contributor[1]: Creating...
azureddevops_role_assignment.sandbox_contributor[1]: Still creating... [10s elapsed]
azureddevops_role_assignment.sandbox_contributor[1]: Still creating... [20s elapsed]
azureddevops_role_assignment.sandbox_contributor[1]: Still creating... [30s elapsed]
azureddevops_role_assignment.sandbox_contributor[1]: Creation complete after 31s [id=subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-ap
o-dev/providers/Microsoft.Authorization/roleAssignments/62fa38e8-69c6-3a3b-b591-34049fa8ff9f]
```

Apply complete! Resources: 7 added, 0 changed, 1 destroyed

~ /Documents/augp-platform-ops-workshop/augp-workshop-2 [main ≡ +6 ~3 -1 ]>

Spaces: 2 UTF-8 LF Terraform

Screenshot of the Azure Resource Groups page showing 11 resource groups. A large green arrow points to the 'Refresh' button in the top navigation bar.

Resource groups

| Name                         | Subscription         | Location     |
|------------------------------|----------------------|--------------|
| (a) DefaultResourceGroup-NEU | Azure subscription 1 | North Europe |
| (a) NetworkWatcherRG         | Azure subscription 1 | West Europe  |
| (a) rg-augpweb1-dev          | Azure subscription 1 | West Europe  |
| (a) rg-devopsagents-shared   | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-dev      | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-prod     | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-shared   | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-dev        | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-prod       | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-shared     | Azure subscription 1 | West Europe  |
| (a) rg-new                   | Azure subscription 1 | West Europe  |

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Screenshot of the Azure Resource Groups page showing 12 resource groups. A large green arrow points to the 'rg-apo-dev' resource group entry in the list.

Resource groups

| Name                         | Subscription         | Location     |
|------------------------------|----------------------|--------------|
| (a) DefaultResourceGroup-NEU | Azure subscription 1 | North Europe |
| (a) NetworkWatcherRG         | Azure subscription 1 | West Europe  |
| (a) rg-apo-dev               | Azure subscription 1 | West Europe  |
| (a) rg-augpweb1-dev          | Azure subscription 1 | West Europe  |
| (a) rg-devopsagents-shared   | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-dev      | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-prod     | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-shared   | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-dev        | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-prod       | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-shared     | Azure subscription 1 | West Europe  |
| (a) rg-new                   | Azure subscription 1 | West Europe  |

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Screenshot of the Azure Resource Groups page showing 12 resource groups. A large green arrow points to the 'rg-apo-dev' resource group entry in the list.

Resource groups

| Name                         | Subscription         | Location     |
|------------------------------|----------------------|--------------|
| (a) DefaultResourceGroup-NEU | Azure subscription 1 | North Europe |
| (a) NetworkWatcherRG         | Azure subscription 1 | West Europe  |
| (a) rg-apo-dev               | Azure subscription 1 | West Europe  |
| (a) rg-augpweb1-dev          | Azure subscription 1 | West Europe  |
| (a) rg-devopsagents-shared   | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-dev      | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-prod     | Azure subscription 1 | West Europe  |
| (a) rg-frontendkawi-shared   | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-dev        | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-prod       | Azure subscription 1 | West Europe  |
| (a) rg-frontendkw-shared     | Azure subscription 1 | West Europe  |
| (a) rg-new                   | Azure subscription 1 | West Europe  |

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Screenshot of the Microsoft Azure portal showing the Access control (IAM) section for the rg-apo-dev resource group.

The URL is <https://portal.azure.com/?quickstart=true#@augpkierunekcloud.onmicrosoft.com/resource/subscriptions/aad861cc-eb75-42fd-9f9e-29f1aa3e1465/resourceGroups/rg-apo-dev/users>

**Resource groups** sidebar:

- Default Resource Group - NEU
- NetworkWatcherRG
- rg-apo-dev
- rg-augpweb1-dev
- rg-devopsagents-shared
- rg-frontendkawi-dev
- rg-frontendkawi-prod
- rg-frontendkawi-shared
- rg-frontendlkw-dev
- rg-frontendlkw-prod
- rg-frontendlkw-shared
- rg-new

**rg-apo-dev | Access control (IAM)** page:

Check access | **Role assignments** (highlighted by a red arrow)

Subscription: 26 / 2000

Search by name or email: Type: All Role: All This resource (highlighted by a red arrow)

Showing a filtered set of results. Total number of role assignments: 11

| Name   | Type  | Role        | Scope         | Condition |
|--------|-------|-------------|---------------|-----------|
| tg-apo | Group | Contributor | This resource | None      |

Screenshot of the Azure DevOps organization dashboard for the 'augp' organization.

The URL is <https://dev.azure.com/augp/>

**Azure DevOps** header:

Search bar: New organization

Projects:

- augp** (selected)
- workshop-app**
- IMPORT** (Generated by Azure DevOps Demo Generator)

**Projects** (list view):

- AUGP-DO**
- AUGP-DO2** (Generated by Azure DevOps Demo Generator)
- augpweb1** (AUGPProject team project. Project members are indirectly managed by HR system)
- AUGP-WebApp** (Generated by Azure DevOps Demo Generator)
- CoE**
- DG-Automate-Docker** (Generated by Azure DevOps Demo Generator)

Organization settings link: <https://dev.azure.com/augp/>

Screenshot of the Azure DevOps Projects - Home page (https://dev.azure.com/augp/). The page shows a list of projects under the organization 'augp'.

The projects listed are:

- apo** (AUGPPlatformOps team project. Project members are indirectly managed by HR system)
- AUGP-DO**
- AUGP-DO2** (Generated by Azure DevOps Demo Generator)
- augpweb1** (AUGPProject team project. Project members are indirectly managed by HR system)
- AUGP-WebApp** (Generated by Azure DevOps Demo Generator)
- CoE**
- workshop-app**
- IMPORT** (Generated by Azure DevOps Demo Generator)

Organization settings are shown at the bottom left, indicating 'Waiting for web.vortex.data.micros...'.

