4.- AZ-104 Azure RBAC - Role-based Access Control

- AZ-104 Azure RBAC - Understanding Roles in Azure
- AZ-104 Azure RBAC - Assigning access to resources
- AZ-104 Azure RBAC - LAB Using service Principal Identity to List AD Roles
- AZ-104 Azure RBAC - Creating custom roles

AZ-104 Azure RBAC - Understanding Roles in Azure

Manage RBAC

- Describing RBAC
- Describing Azure Roles
- Describing Azure AD Roles
- Azure Roles vs Azure AD Roles
- RBAC Architecture

Describing RBAC

"Who can do what, where, who what and where"

Describing Azure Roles

- Owner: Full access to resources and delegates access to other users
- Reader: Provides the ability to view sources, cannot perform actions on resources
- contributor: Can create and manage resources
- User Access Administrator: Can delegate access to resources

Describing Azure Entra ID Roles

- Special set of roles for providing access to manage identity objects inside our azure tenant, to manage user application or devices not resources.
- Global Administrator: Provide access to manage AD Resources
- Billing Administrator: Perform billing tasks

- User Administrator: Can manage users and groups inside Azure Entra ID Tenant
- Helpdesk Administrator: perform password resets if SSPR is not enabled.

Microsoft Entra and Azure roles

Microsoft Entra roles and Azure roles are often confused when you first work with Azure. Microsoft Entra roles provide the mechanism for managing permissions to Microsoft Entra resources, like user accounts and passwords. Azure roles provide a wealth of capabilities for managing Azure resources like virtual machines (VMs) at a granular level.

Azure Roles	Microsoft Entra ID Roles
Manage access to Azure resources like VMs, storage, networks, and more	Manage access to Microsoft Entra resources like user accounts and passwords
Multiple scope levels (management group, subscription, resource group, resource)	Scope only at tenant level
Role information accessible through Azure portal, Azure CLI, Azure PowerShell, Azure Resource Manager templates, REST API	Role information accessible in Azure admin portal, Microsoft 365 admin center, Microsoft Graph, Microsoft Graph PowerShell

Azure Roles	Azure Entra ID Roles
Manage access to Azure resources	Manage access to Azure AD Resources at tenant
Scope can be at multiple levels	Scope is at tenant level
Support custom roles	Support custom roles
Main roles: • Owner • Contributor • Reader • User Access Administrator	Main roles: • Global Administrator • User Administrator • Billing Administrator

Azure Roles	Azure Entra ID Roles
Control access to azure resources, VMs, Virtual Networks	Control Access to Azure AD REsources, user objects, group devices, ad features
Referred to as Azure RBAC	Built in roles
Built in roles	Custom roles
custom roles	Scope at Azure AD Tenant level, provide access for user that exist inside of our Azure Entra ID tenants to perform administrative functions inside of the tenant itself
Scope at management groups subscription groups resource groups and resources using identities that exist inside our azure AD Tenant	

AZ-104 Azure RBAC - Assigning access to resources

Secure Azure RBAC

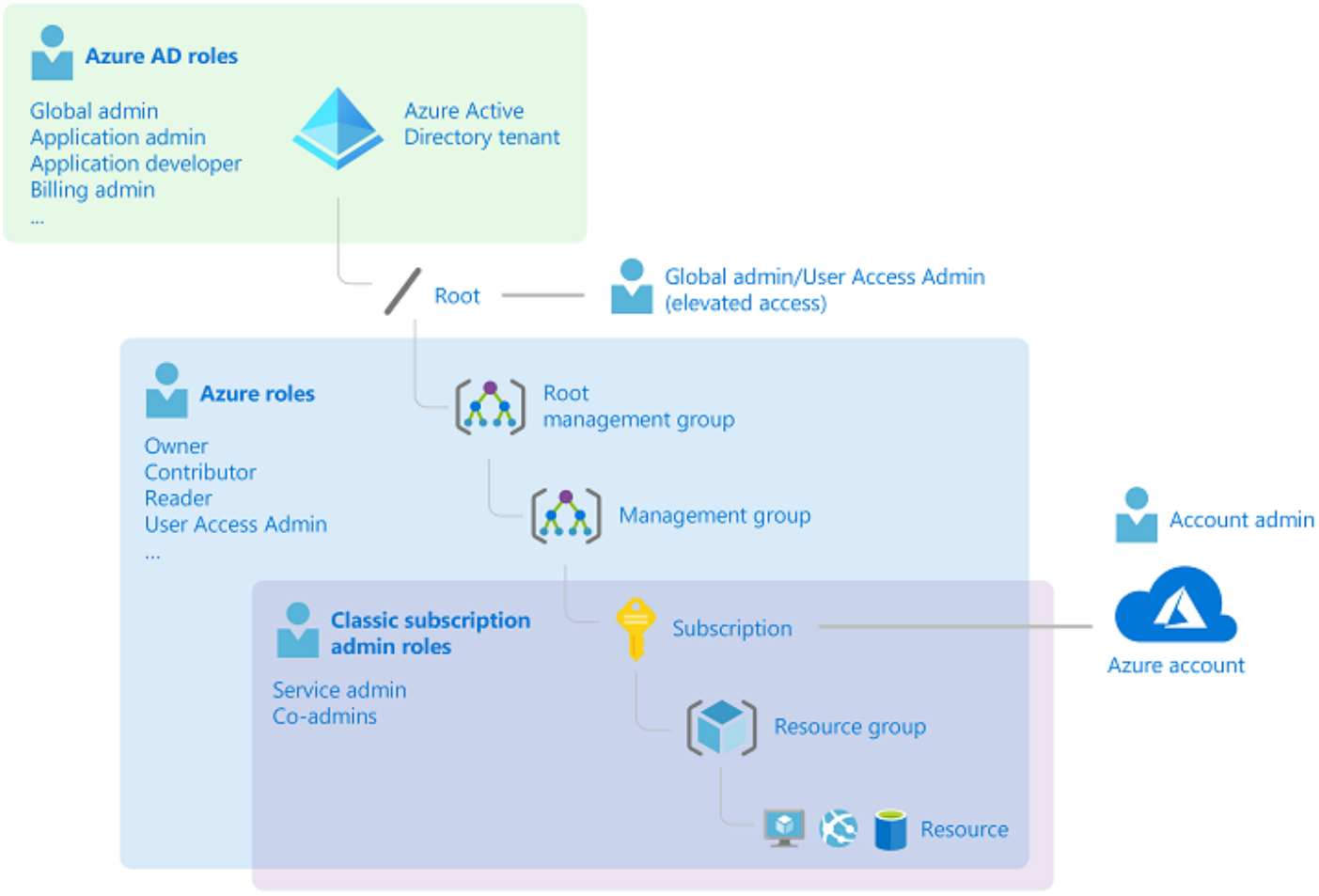
- Explaning Azure RBAC
- Understanding Role definitions
- Additive Property

Explaining Azure RBAC

Azure RBAC is an authorization system

- Security Principal: Defining the who we want to authorize, WHO?
- Role Definition: assign a role definition to that identity, WHAT?
- Scope: where we are defining where we are going to perform this actions, WHERE?

We have to provide this access explicit, there is an implicit deny



Understanding Role Definitions

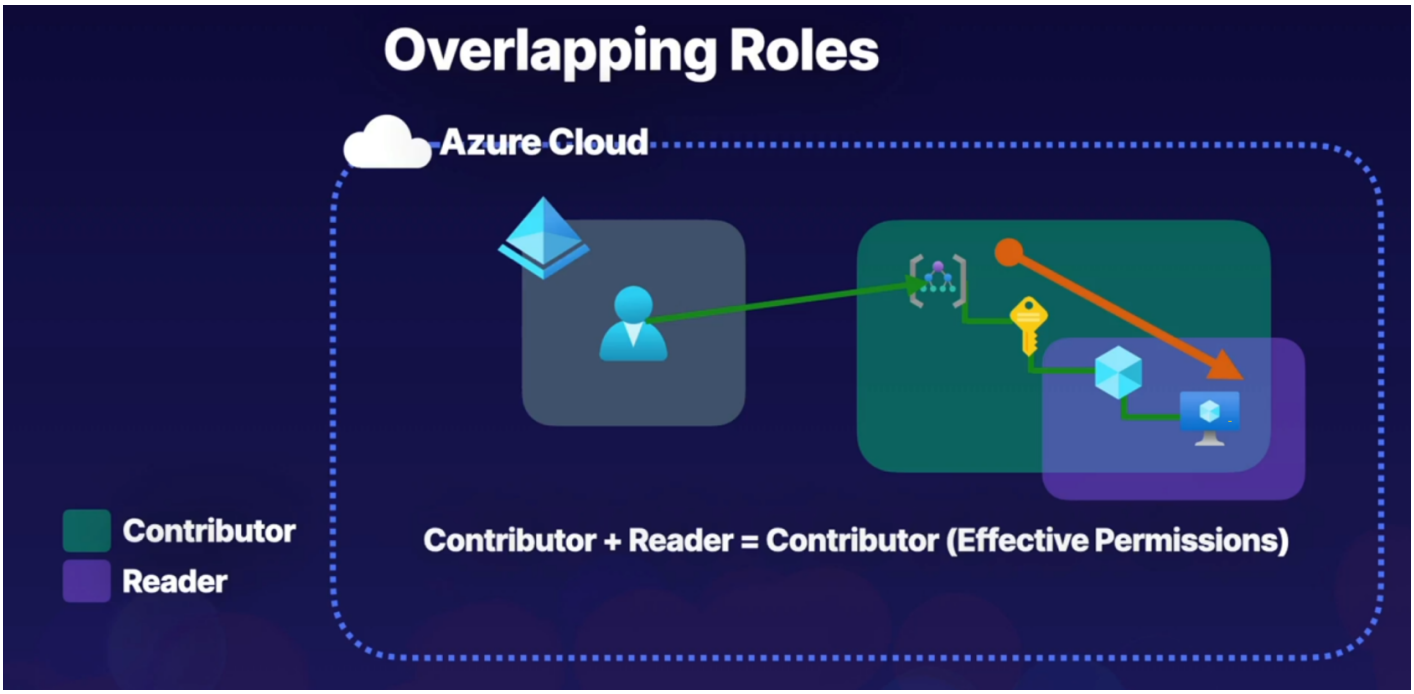
Contributor

- Actions: Define what actions are allowed to be performed on the management plane, managing resources inside of azure like starting or stopping virtual machines.
- NotActions: Actions we are going to deny on managing resources inside of Azure. For example, if we wanted to allow a user to perform a restart on a virtual machine, we could outline that in Actions, but it could be overwritten and overruled by a NotAction denying that same action inside this role definition.

Then we have the next component, which are our DataActions, and our NotDataActions.And these are the same kind of thing as our Actions and NotActions, except for rather than being on the control plane of managing Azure resources, this will take an impact on data-related actionssuch as working with data inside of Azure Storage accounts.

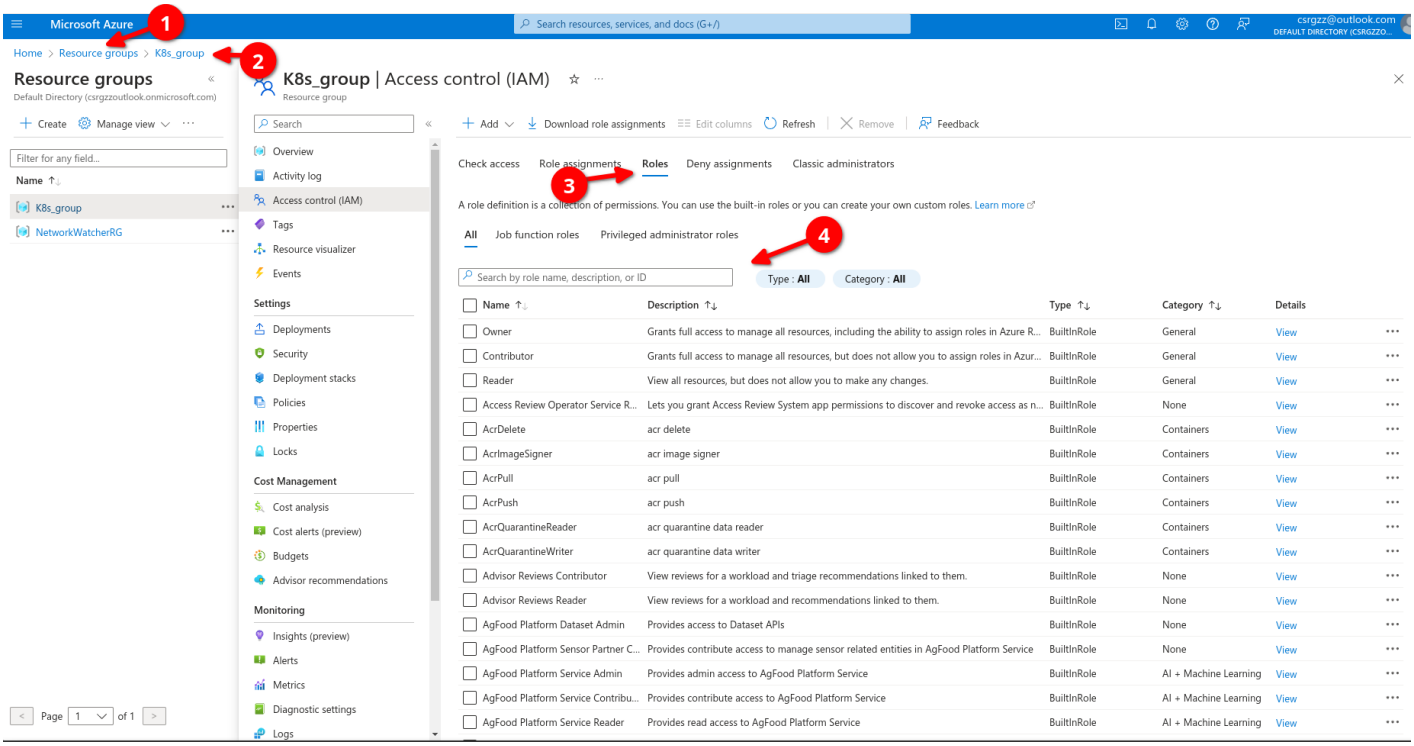
- AssignableScope: where we define where we're going to assign the scope for this resource. And it can be all the way down
  to a specific resource, where we assign the scope to a resource group, to a subscription, or even a management group.

For example, if we have this user here in our Azure Active Directory tenant that is assigned the Contributor role at the management group scope here, but also assigned a Reader role at a resource group scope inside of the same hierarchical structure, what we have to understand when we have overlapping roles like this, and multiple role assignments for a single identity, is that roles follow an additive property. So what we do is we add the effective permissions of each of these role definitions, and by performing this addition, this will inform us what the effective permissions will be. So in this case, Contributor + Reader = Contributor, because Contributor provides Reader functionality. So effectively, this user will have Contributor at the management group scope, and that will be inherited all the way down. And there's no additional permissions that are being provided by actually having the Reader role assignment. So this user's permissions will just waterfall all the way down and be inherited to the lowest level.

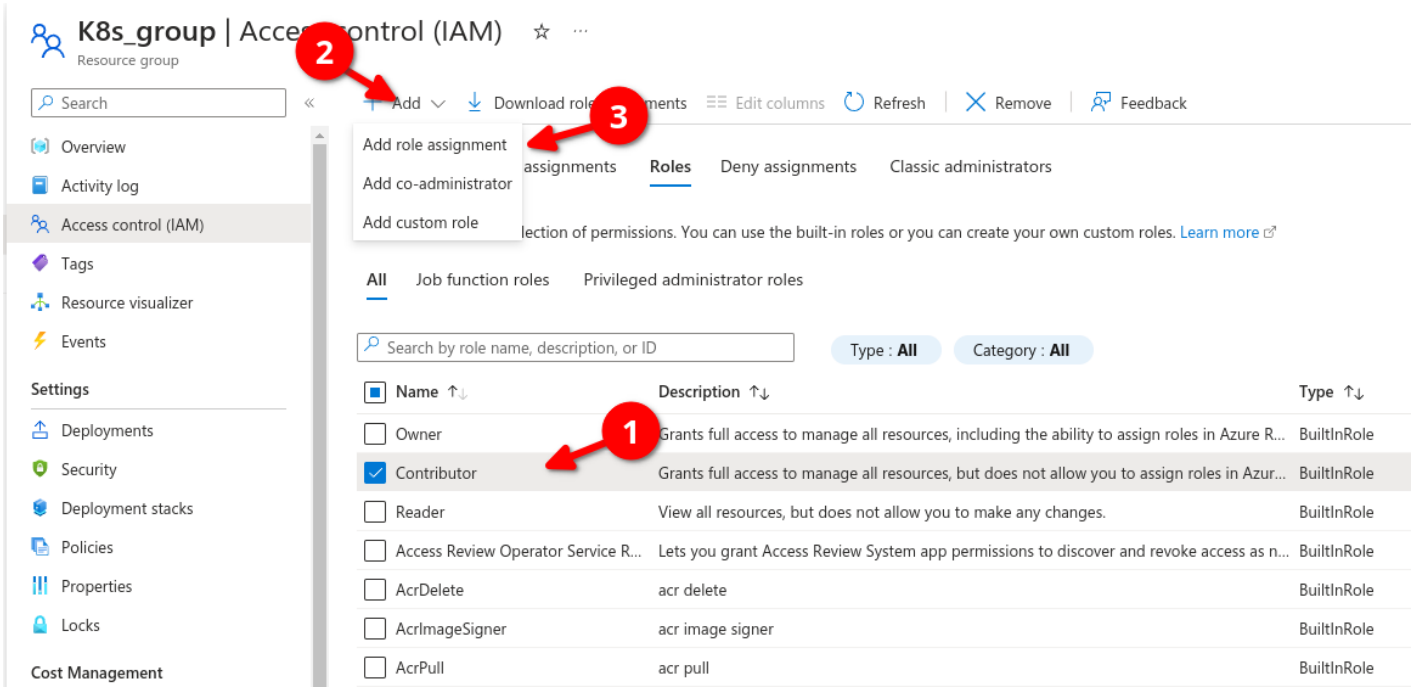


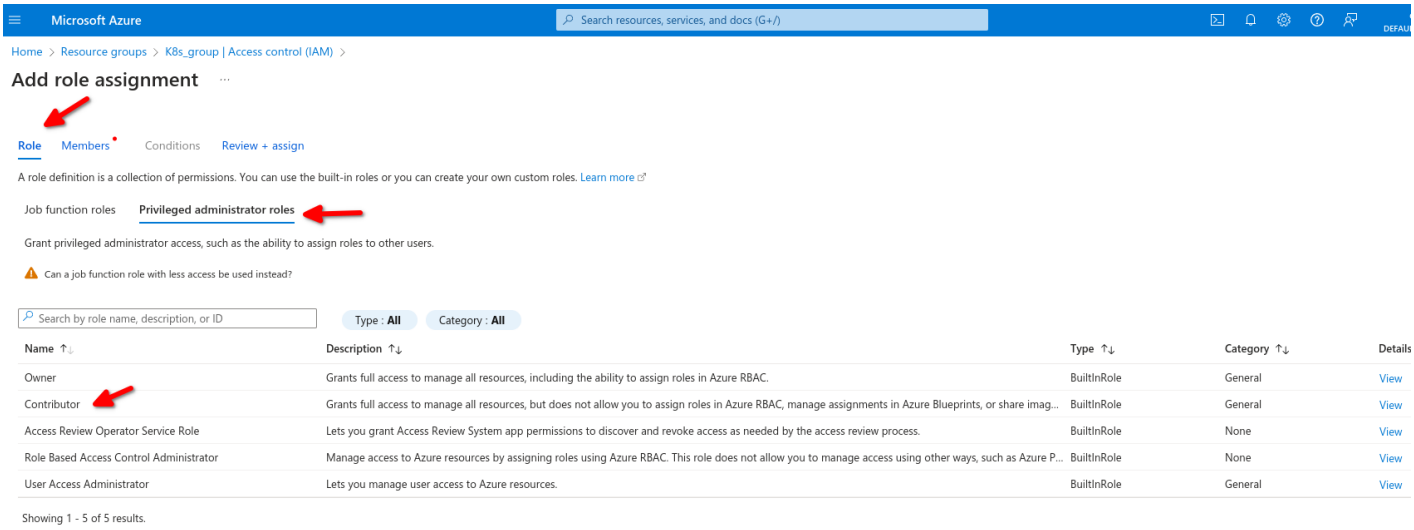
Assigning access

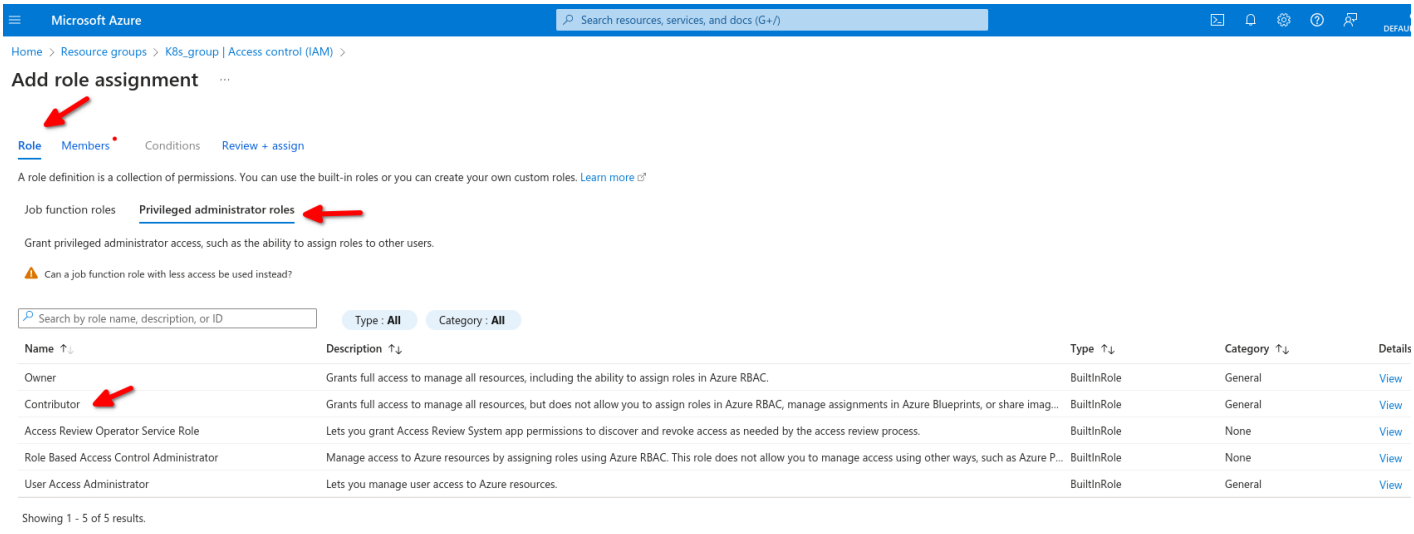
Lets go to resource groups and select a group (K8s_group in example below) then if we go to roles we can see all role assignments, here we can determine a user can be a contributor (grants full access to manage all roesources bu tdoes not allow you to assign roles in Azure RBAC)

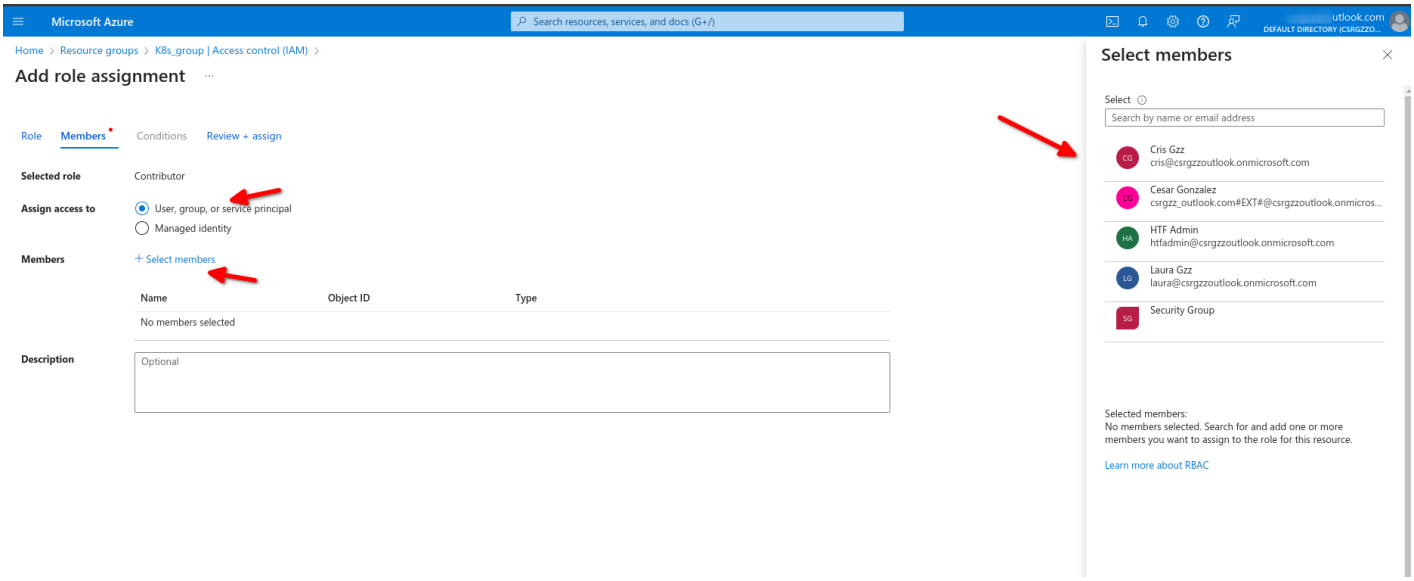


We select contributor,, then add then add role assignment

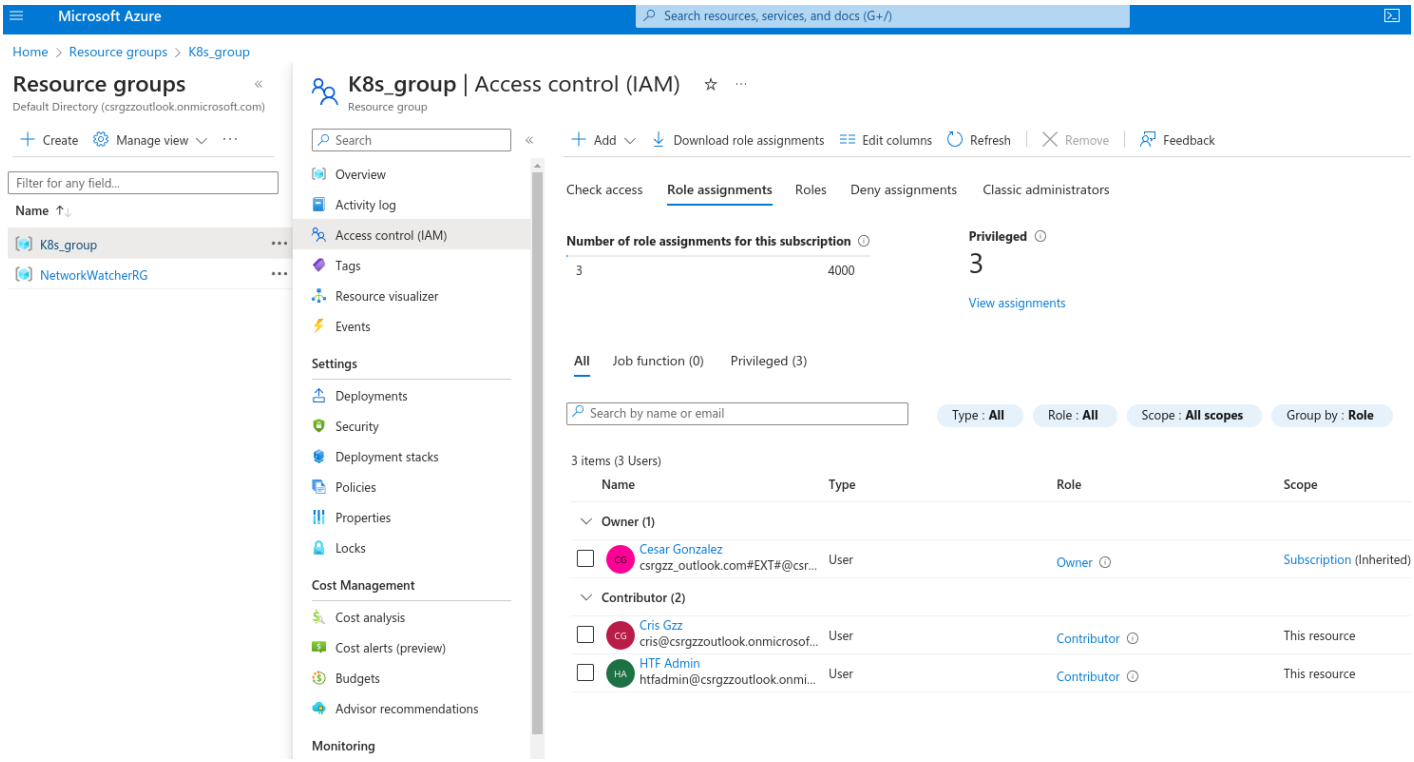

K8s_group | Access control (IAM)
Resource group
Search
Overview
Activity log
Access control (IAM)
Tags
Resource visualizer
Events
Settings
Deployments
Security
Deployment stacks
Policies
Properties
Locks
Cost Management
Add
Download role assignments
Edit columns
Refresh
Remove
Feedback
Add role assignment
Add co-administrator
Add custom role
Roles
Deny assignments
Classic administrators
Learn more
All
Job function roles
Privileged administrator roles
Search by role name, description, or ID
Type : All
Category : All
Name
Description
Type
Owner
Grants full access to manage all resources, including the ability to assign roles in Azure R...
BuiltInRole
Contributor
Grants full access to manage all resources, but does not allow you to assign roles in Azur...
BuiltInRole
Reader
View all resources, but does not allow you to make any changes.
BuiltInRole
Access Review Operator Service R...
Lets you grant Access Review System app permissions to discover and revoke access as n...
BuiltInRole
AcrDelete
acr delete
BuiltInRole
AcrImageSigner
acr image signer
BuiltInRole
AcrPull
acr pull
BuiltInRole
1
2
3


Microsoft Azure
Search resources, services, and docs (G+/)
Home > Resource groups > K8s_group | Access control (IAM) >
Add role assignment
Role
Members
Conditions
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
Job function roles
Privileged administrator roles
Grant privileged administrator access, such as the ability to assign roles to other users.
Can a job function role with less access be used instead?
Search by role name, description, or ID
Type : All
Category : All
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 Blueprints, or share imag...
BuiltInRole
General
View
Access Review Operator Service Role
Lets you grant Access Review System app permissions to discover and revoke access as needed by the access review process.
BuiltInRole
None
View
Role Based Access Control Administrator
Manage access to Azure resources by assigning roles using Azure RBAC. This role does not allow you to manage access using other ways, such as Azure P...
BuiltInRole
None
View
User Access Administrator
Lets you manage user access to Azure resources.
BuiltInRole
General
View
Showing 1 - 5 of 5 results.

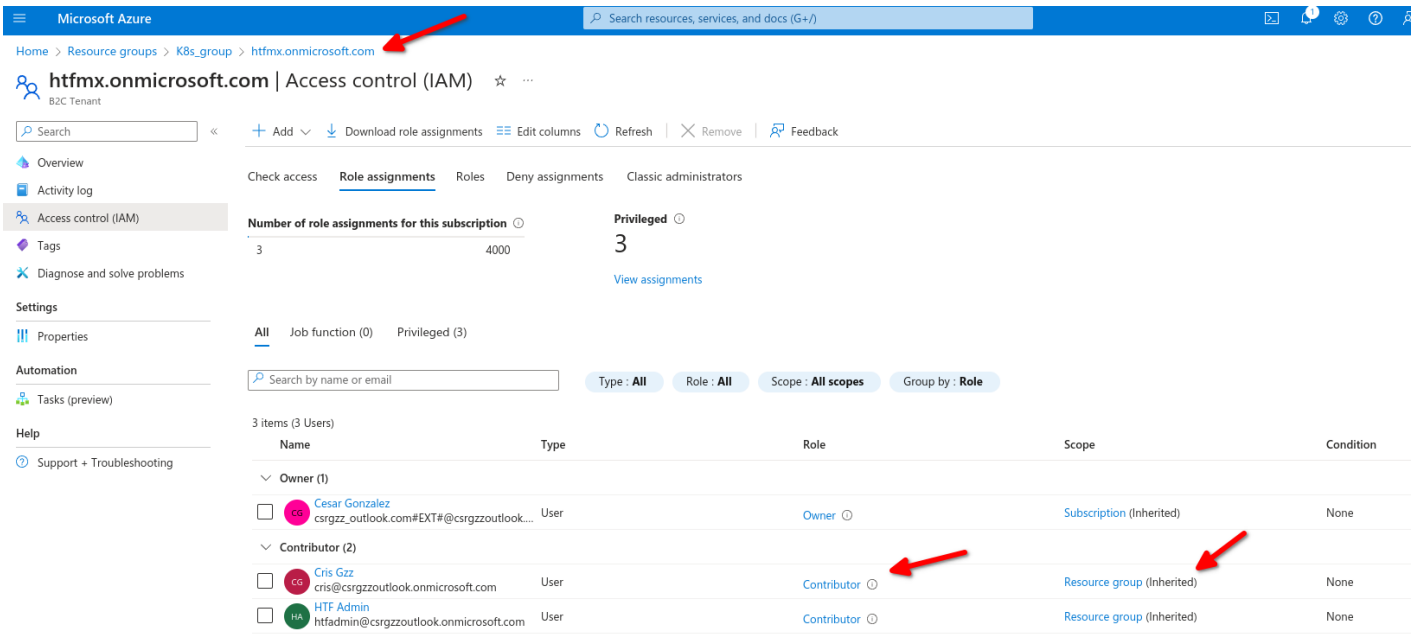




Now back on resources group we can see the role assignments



Same inside those resources it inherited the assignment



Authorization system

- Provide identities with access to azure resources

- Roles are a collection of permissions
- There is a scoping hierarchy for role assignment
- Implicit deny - Explicit Allow - Explicit Deny

AZ-104 Azure RBAC - LAB Using service Principal Identity to List AD Roles

In this hands-on lab, you are tasked with gathering the role definitions and role assignments for your organization.

You do not have access to the portal, so you must collect this information via SSH connection, by using a Linux VM and a service principal. Once you have gained access to the Azure subscription, use the Azure CLI to collect the required information, and output to a file so you can email it to your manager.

Solution

Log in to the virtual machine using the credentials provided:

```
ssh cloud_user@<PUBLIC_IP_ADDRESS>
```

Log in to Azure using the Service Principal

1. Once connected to the lab VM, perform the `az login` command with the `--service-principal` flag to login to the Azure account:

```
az login --service-principal \
-u "<CLIENT_ID>" \
-p "<CLIENT_SECRET>" \
--tenant "<TENANT_ID>"
```

> **NOTE:** To get your own `Tenant ID`, search for `Tenant properties` in the Azure portal. The value will be under the `Tenant ID` field.

If you experience an error regarding invalid arguments, please see the Additional Information section for the details of a fix.

List the Role Definitions and Role Assignments

1. List the role definitions:

```
az role definition list
```

2. Output the list to a file named `roleinfo.json`:

```
az role definition list > roleinfo.json
```

3. List the role assignments:

```
az role assignment list --all
```

4. Append the list to the `roleinfo.json` file:

```
az role assignment list --all >> roleinfo.json
```

5. Verify that the file was created successfully:

```
vi roleinfo.json
```

```
cloud_user@lab-VM:~$ az login --service-principal \
> -u "4f5230cd-58fe-45d3-89bc-a14cc732d64a" \
> -p "w5cl28fSpGDA88Qy7uC.8T~t~so~f-~H-3" \
> --tenant "3617ef9b-98b4-40d9-ba43-e1ed6709cf0d"
[
  {
    "cloudName": "AzureCloud",
    "homeTenantId": "3617ef9b-98b4-40d9-ba43-e1ed6709cf0d",
    "id": "0f39574d-d756-48cf-b622-0e27a6943bd2",
    "isDefault": true,
    "managedByTenants": [],
    "name": "P3-Real Hands-On Labs",
    "state": "Enabled",
    "tenantId": "3617ef9b-98b4-40d9-ba43-e1ed6709cf0d",
    "user": {
      "name": "4f5230cd-58fe-45d3-89bc-a14cc732d64a",
      "type": "servicePrincipal"
    }
  }
]
cloud_user@lab-VM:~$
```

AZ-104 Azure RBAC - Creating custom roles

Custom Roles RBAC

- Describing custom roles
- Creating role definitions

- Custom role definition
- No built in role met requirement
- user access administrator or owner role for the account

Assignment and scope of custom roles

Users with the User Access Administrator or Owner roles can create or assign custom roles in Azure RBAC.

You can assign custom roles to:

Security principal	Summary
User	An individual who has a profile in Microsoft Entra ID
Group	A set of users created in Microsoft Entra ID
Service principals	A security identity used by applications or services to access specific Azure resources

Security principal	Summary
Managed identity	An identity in Microsoft Entra ID that is automatically managed by Azure

Sometimes, built-in roles don't grant the precise level of access you need. Custom roles allow you to define roles that meet the specific needs of your organization. You can assign the Azure custom roles you create to users, groups, and service principals at the scope of subscription, resource group, or resource.

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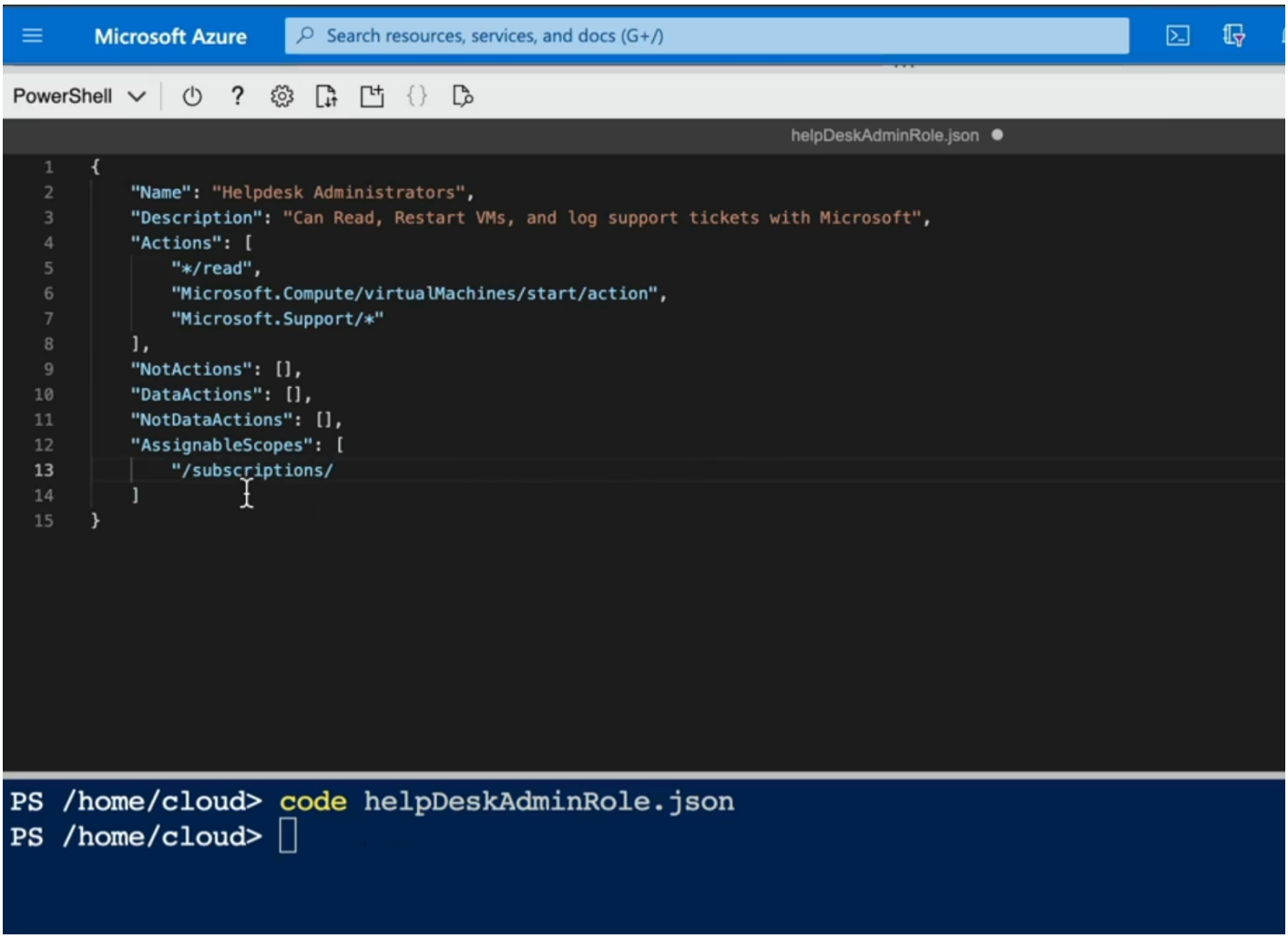
Diagram that shows relationship of Azure roles and Microsoft Entra roles.

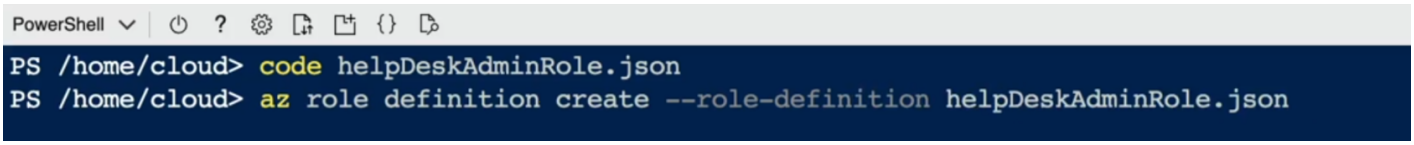
helpdesk.json

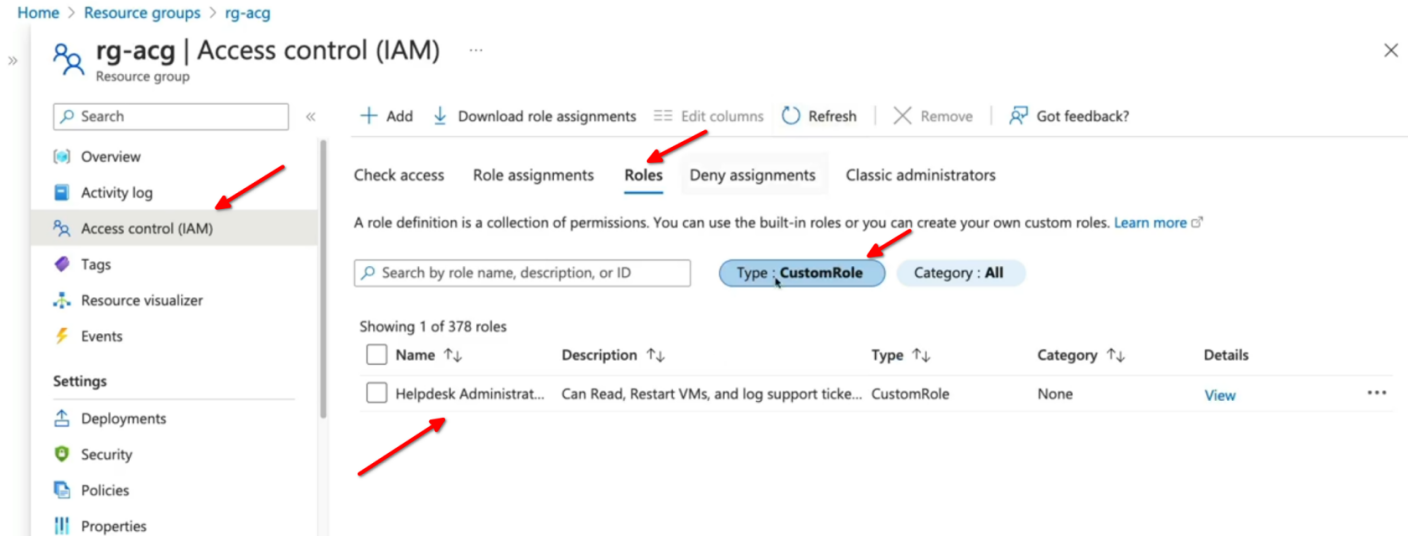
```
Name    "Helpdesk Administrators"
Description    "Can Read, Restart VMs, and log support tickets with Microsoft"
Actions
0    "*/read"
1    "Microsoft.Compute/virtualMachines/start/action"
2    "Microsoft.Support/*"
NotActions    []
DataActions    []
NotDataActions    []
AssignableScopes
0    "/subscriptions/subscriptionId"
```

Open powershell tytpe ini code and name of the json file, right click on top bar to save and exit editor

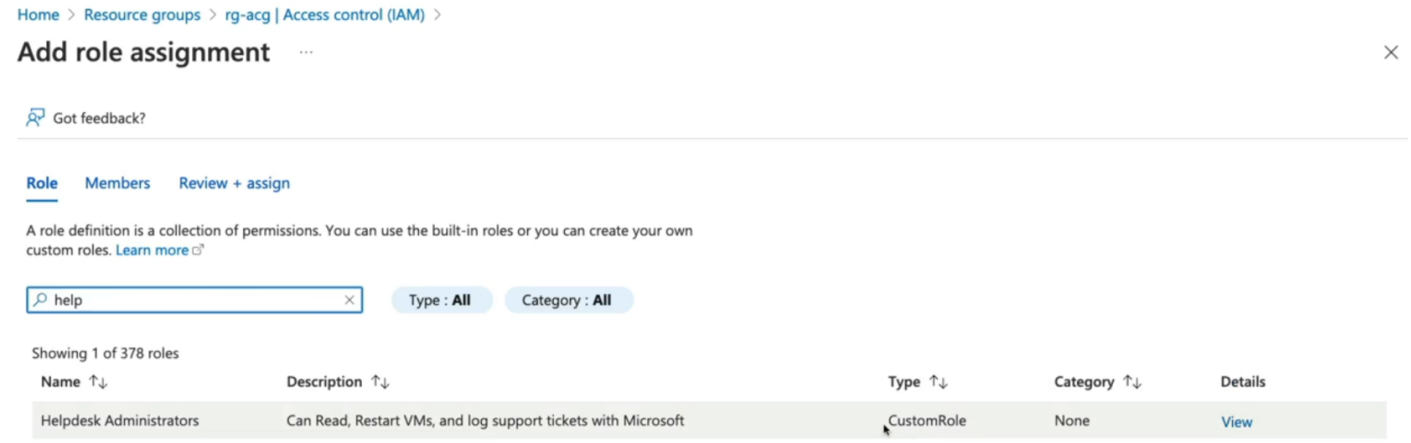


create custom role

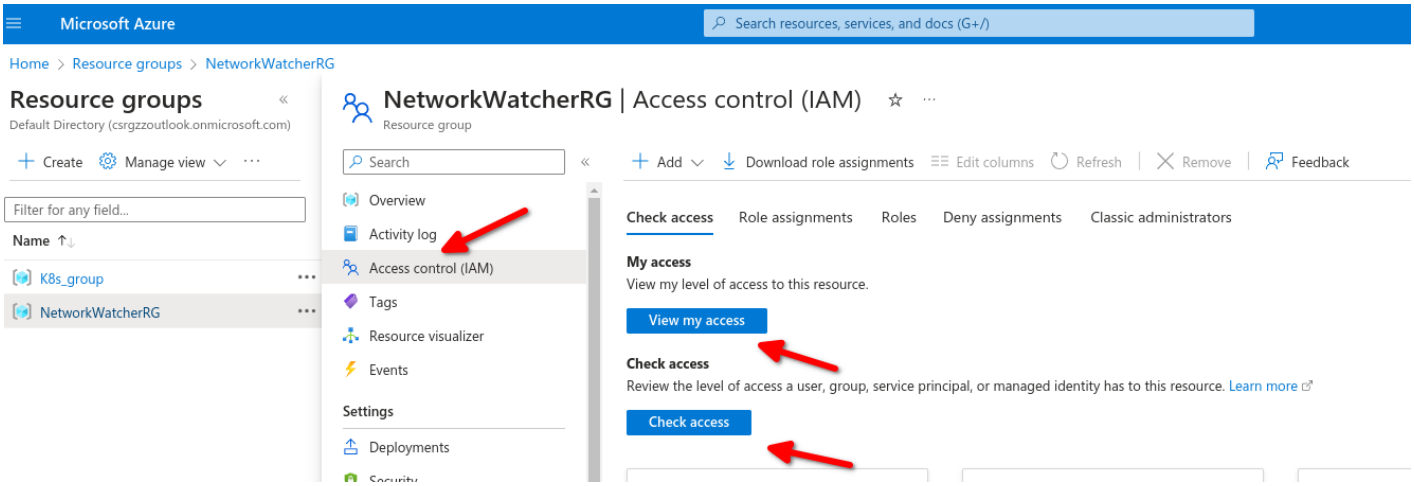




Assign, you can assign to members groups, etc.



Here we can check our own access or check someone else access



- Provide identities with access to Azure Resources
- Roles are collection of permissions
- Scoping hierarchy for role assignments
- Custom role definition
- No built-in role meets requirements
- User Access Administrator or Owner role for the account