Experiment no. 9

Aim: To study and implement Identity and Access Management (IAM) practices on AWS/Azure cloud.

Requirements: Azure account

Theory:

Microsoft Azure IAM, also known as Access Control (IAM), is the product provided in Azure for RBAC and governance of users and roles. Identity management is a crucial part of cloud operations due to security risks that can come from misapplied permissions. Whenever you have a new identity (a user, group, or service principal) or a new resource (such as a virtual machine, database, or storage blob), you should provide proper access with as limited of a scope as possible. Here are some of the questions you should ask yourself to maintain maximum security:

1. Who needs access?

Granting access to an identity includes both human users and programmatic access from applications and scripts. If you are utilizing Azure Active Directory, then you likely want to use those managed identities for role assignments. Consider using an existing group of users or making a new group to apply similar permissions across a set of users, as you can then remove a user from that group in the future to revoke those permissions.

Programmatic access is typically granted through Azure service principals. Since it's not a user logging in, the application or script will use the App Registration credentials to connect and run any commands.

2. What role do they need?

Azure IAM uses roles to give specific permissions to identities. Azure has a number of built-in roles based on a few common functions:

- **Owner** – Full management access, including granting access to others
- **Contributor** – Management access to perform all actions except granting access to others
- **User Access Administrator** – Specific access to grant access to others
- **Reader** – View-only access

These built-in roles can be more specific, such as “Virtual Machine Contributor” or “Log Analytics Reader”. However, even with these specific pre-defined roles, the principle of least privilege shows that you’re almost always giving more access than is truly needed.

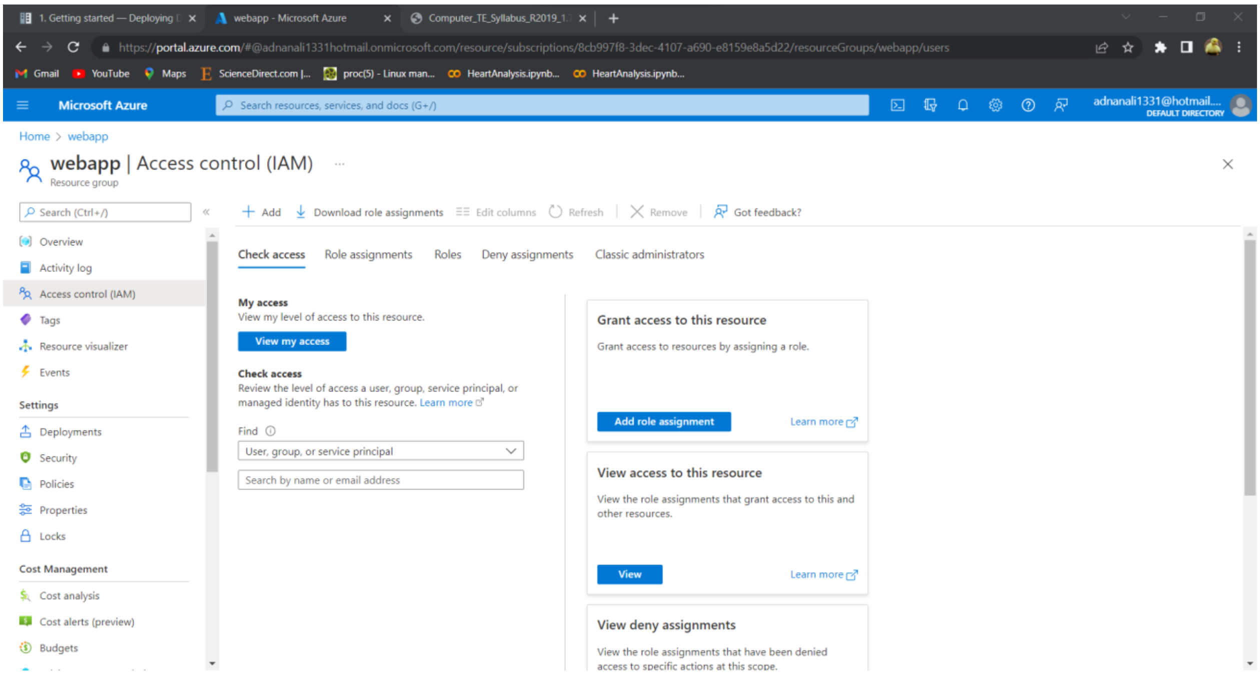
For even more granular permissions, you can create Azure custom roles and list specific commands that can be run.

3. Where do they need access?

The final piece of an Azure IAM permission set is deciding the specific resource that the identity should be able to access. This should be at the most granular level possible to maintain maximum security. For example, a Cloud Operations Manager may need access at the management group or subscription level, while a SQL Server utility may just need access to specific database resources. When creating or assigning the role, this is typically referred to as the “scope” in Azure.

The scope of a role is to always think twice before using the subscription or management group as a scope. The scale of your subscription is going to come into consideration, as organizations with many smaller subscriptions that have very focused purposes may be able to use the subscription-level scope more frequently. On the flip side, some companies have broader subscriptions, then use resource groups or tags to limit access, which means the scope is often smaller than a whole subscription.

Output:



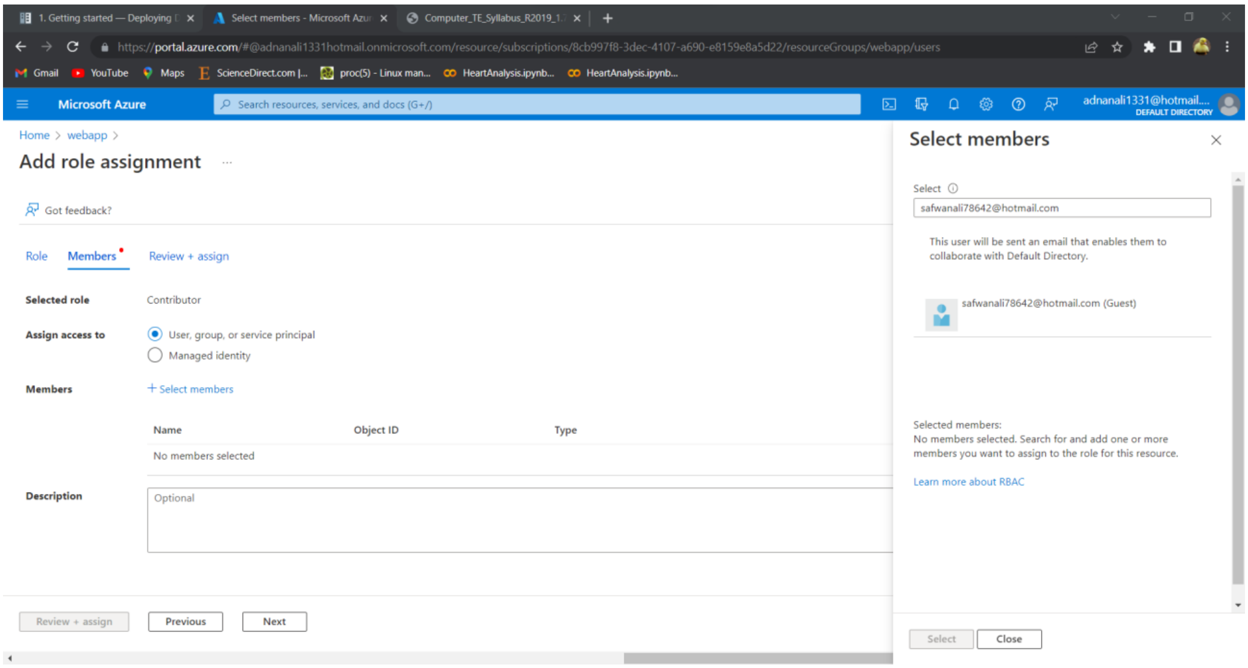
View my level of access to this resource.

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

Grant access to resources by assigning a role.

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

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



Selected role: Contributor

Assign access to: ● User, group, or service principal ○ Managed identity

Members:

No members selected

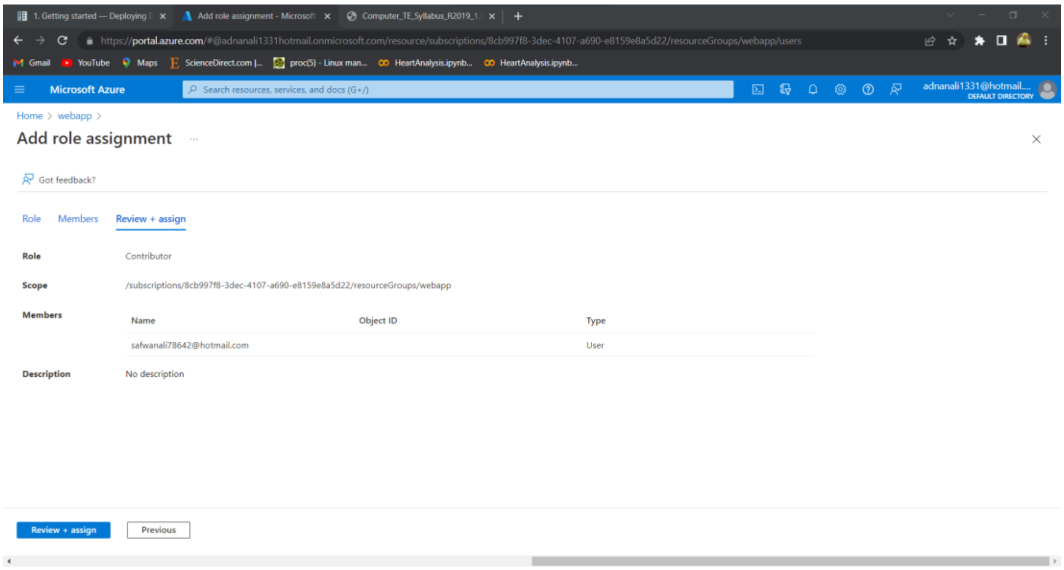
Description: Optional

Select: safwanali78642@hotmail.com

This user will be sent an email that enables them to collaborate with Default Directory.

safwanali78642@hotmail.com (Guest)

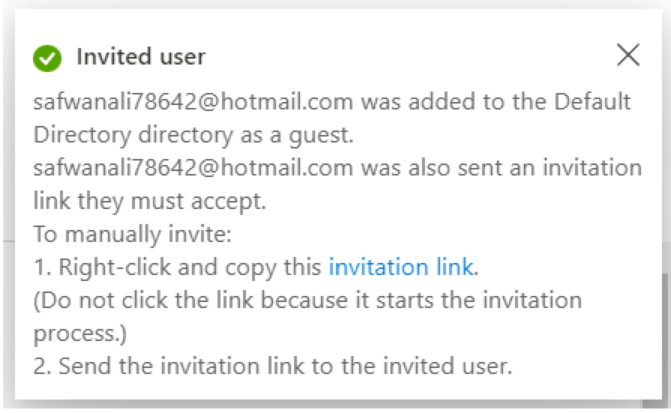
Selected members:
No members selected. Search for and add one or more members you want to assign to the role for this resource.


1. Getting started — Deploying
Add role assignment - Microsoft
Computer_TE_Syllabus_R2019_1.
https://portal.azure.com/#@adnanali1331hotmail.onmicrosoft.com/resource/subscriptions/8cb997f8-3dec-4107-a690-e8159e8a5d22/resourceGroups/webapp/users
Gmail
YouTube
Maps
ScienceDirect.com |...
proc(5) - Linux man...
HeartAnalysis.ipynb...
HeartAnalysis.ipynb...
Microsoft Azure
Search resources, services, and docs (G+/)
adnanali1331@hotmail....
DEFAULT DIRECTORY
Home > webapp >
Got feedback?
Role
Members
Review + assign
Review + assign
Previous

Add role assignment

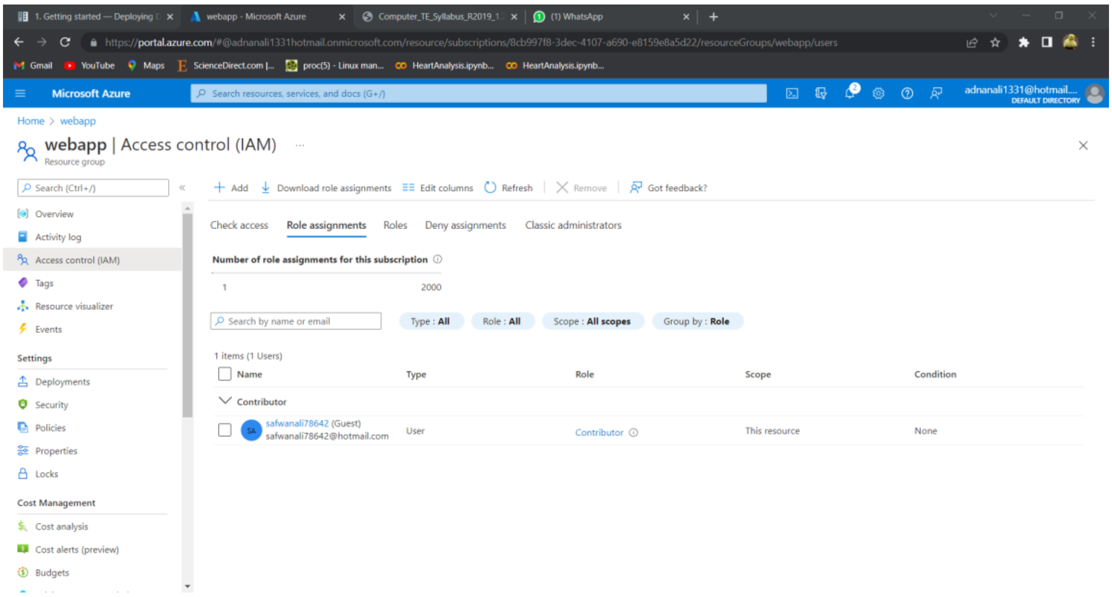
Role	Contributor
Scope	/subscriptions/8cb997f8-3dec-4107-a690-e8159e8a5d22/resourceGroups/webapp
Members	
Description	No description

Name	Object ID	Type
safwanali78642@hotmail.com		User



Invited user

safwanali78642@hotmail.com was added to the Default Directory directory as a guest.
safwanali78642@hotmail.com was also sent an invitation link they must accept.
To manually invite:
1. Right-click and copy this invitation link.
(Do not click the link because it starts the invitation process.)
2. Send the invitation link to the invited user.



webapp | Access control (IAM)

Number of role assignments for this subscription

1 2000

1 items (1 Users)

Name	Type	Role	Scope	Condition
Contributor				
safwanali78642 (Guest) safwanali78642@hotmail.com	User	Contributor	This resource	None

Conclusion: We have successfully implemented Identity and Access Management (IAM) practices on Azure cloud.