PRACTICAL NO. 7
Identity Management

LOB6: Understand the cloud computing services and Identity management in the cloud.
LO6: Implement programs for cloud computing services and Identity management.

Identity Management:

Identity management in cloud computing is the subsequent step of identity and access management (IAM) solutions. However, it is a lot more than merely a straightforward web app single sign-on (SSO) solution. This next generation of IAM solution is a holistic move of the identity provider right to the cloud.

Innovations in the user identity management space have been a trend in the past couple of years. Most of these developments across business and technology fronts have been around identity management in cloud computing, enabling the authentication and authorization processes right in the cloud.

The primary goal of identity management in cloud computing is dealing with personal identity information so that a user's access to data, computer resources, applications, and services is controlled accurately.

Identity management in cloud computing is the subsequent step of identity and access management (IAM) solutions. However, it is a lot more than merely a straightforward web app single sign-on (SSO) solution. This next generation of IAM solution is a holistic move of the identity provider right to the cloud.

Known as Directory-as-a-Service (DaaS), this particular service is the advanced version of the conventional and on-premises solutions, including Lightweight Directory Access Protocol (LDAP) as well as Microsoft Active Directory (AD).

Features of a Modern Cloud Identity Management Solution:

The following are a few advantages of identity management in cloud computing:

● It offers a consistent access control interface: Applicable for all cloud platform services; Cloud IAM solutions provide a clean and single access control interface.

● It offers superior security levels: If needed, we can easily define increased security levels for crucial applications.

● It lets businesses access resources at diverse levels: Businesses can define roles and grant permissions to explicit users for accessing resources at diverse granularity levels.

Why Do You Need Cloud IAM?

Identity management in cloud computing incorporates all categories of user-base who can operate in diverse scenarios and with specific devices. A modern cloud Identity and Access Management (IAM) solution helps to:

- Connect professionals, employees, IT applications, and devices securely either on-premise or the cloud and through involved networks.
- It makes it easy to share the network abilities with the entire grid of users who were precisely connected with it.
- It offers zero management overhead, enhanced security levels, and easy management of diverse users with directory service in a SaaS solution.
- It is utterly known that cloud-based services are enabled, configured, and hosted by external providers. This scenario may also get the least hassle, either for users or clients. As a result, many organizations can enhance their productivity with cloud IAM.
- SaaS protocol is created and used as a hub for connecting with all virtual networks of distributors, suppliers, and partners.
- Business users can deal with all services and programs in one place with cloud services, and Identity management can be enabled with a click on a single dashboard.
- Easily connect your cloud servers, which are virtually hosted at Google Cloud, AWS, or elsewhere right next to your current LDAP or AD user store.
- Widen and extend your present LDAP or AD directory right to the cloud.
- Deal with Linux, Windows, and Mac desktops, laptops, and servers established at different locations.
- Connect different users to diverse applications that use LDAP or SAML-based authentication.
- Effortlessly handle user access controls to WiFi networks securely by using a cloud RADIUS service.
- Enable GPO-like functionalities across diverse Windows, Mac, and Linux devices.
- Facilitate both system-based as well as application-level multi-factor authentications (2FA).

These abilities help build a platform that connects users to virtually all IT resources through any provider, protocol, platform, or location.

AAA (Authentication, Authorization, Accounting):

AAA is a standard-based framework used to control who is permitted to use network resources (through authentication), what they are authorized to do (through authorization), and capture the actions performed while accessing the network (through accounting).

1. Authentication:

The process by which it can be identified that the user, which wants to access the network resources, valid or not by asking some credentials such as username and password. Common methods are to put authentication on console port, AUX port, or vty lines.

2. Authorization:

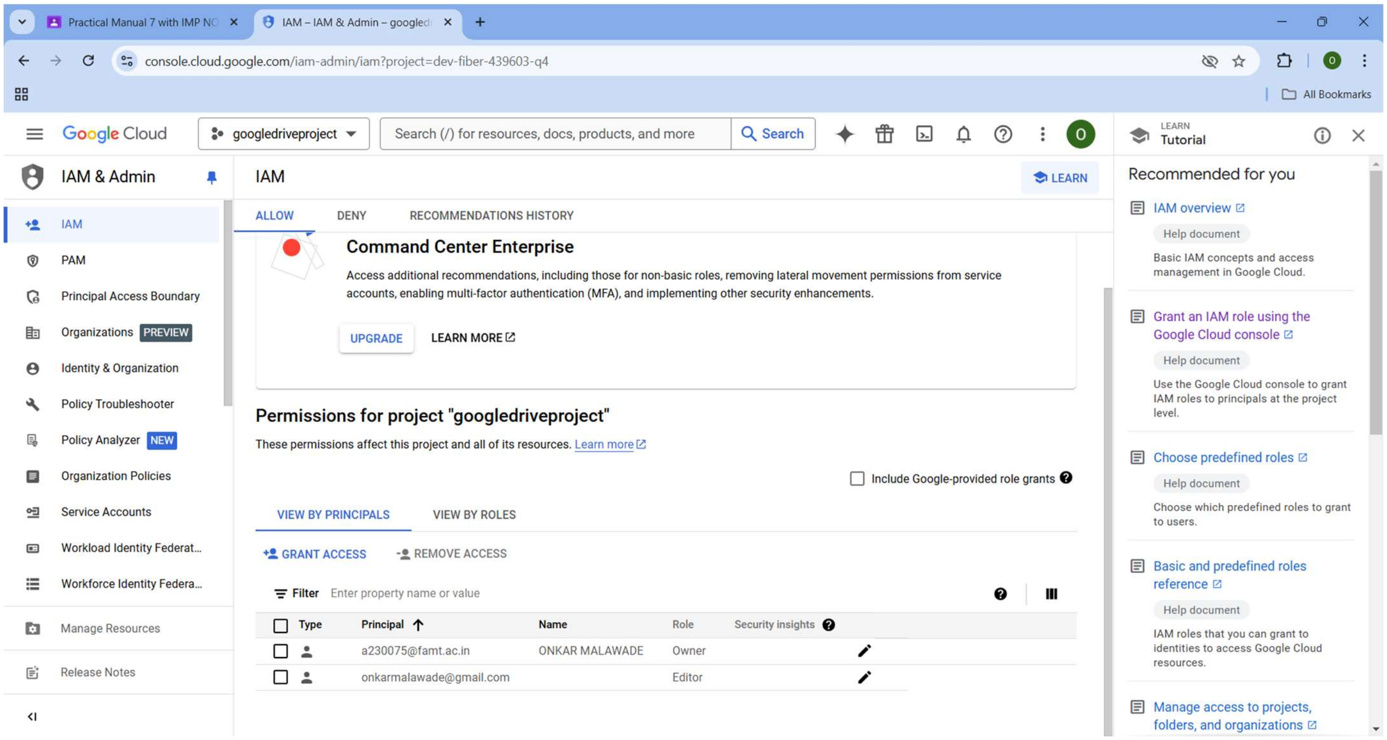
It provides capabilities to enforce policies on network resources after the user has gained access to the network resources through authentication. After the authentication is successful, authorization can be used to determine what resources is the user allowed to access and the operations that can be performed.

3. Accounting:

It provides means of monitoring and capturing the events done by the user while accessing the network resources. It even monitors how long the user has access to the network. The administrator can create an accounting method list to specify what should be accounted for and to whom the accounting records should be sent.

Exercise:

a) Implementation of identity management.
Run this website **console.cloud.google.com/** Open Project



Command Center Enterprise

Access additional recommendations, including those for non-basic roles, removing lateral movement permissions from service accounts, enabling multi-factor authentication (MFA), and implementing other security enhancements.

Permissions for project "googledriveproject"

These permissions affect this project and all of its resources. Learn more

□ Include Google-provided role grants

□ Type	Principal ↑	Name	Role	Security insights
□	a230075@famt.ac.in	ONKAR MALAWADE	Owner	
□	onkarmalawade@gmail.com		Editor	

IAM overview
Help document
Basic IAM concepts and access management in Google Cloud.

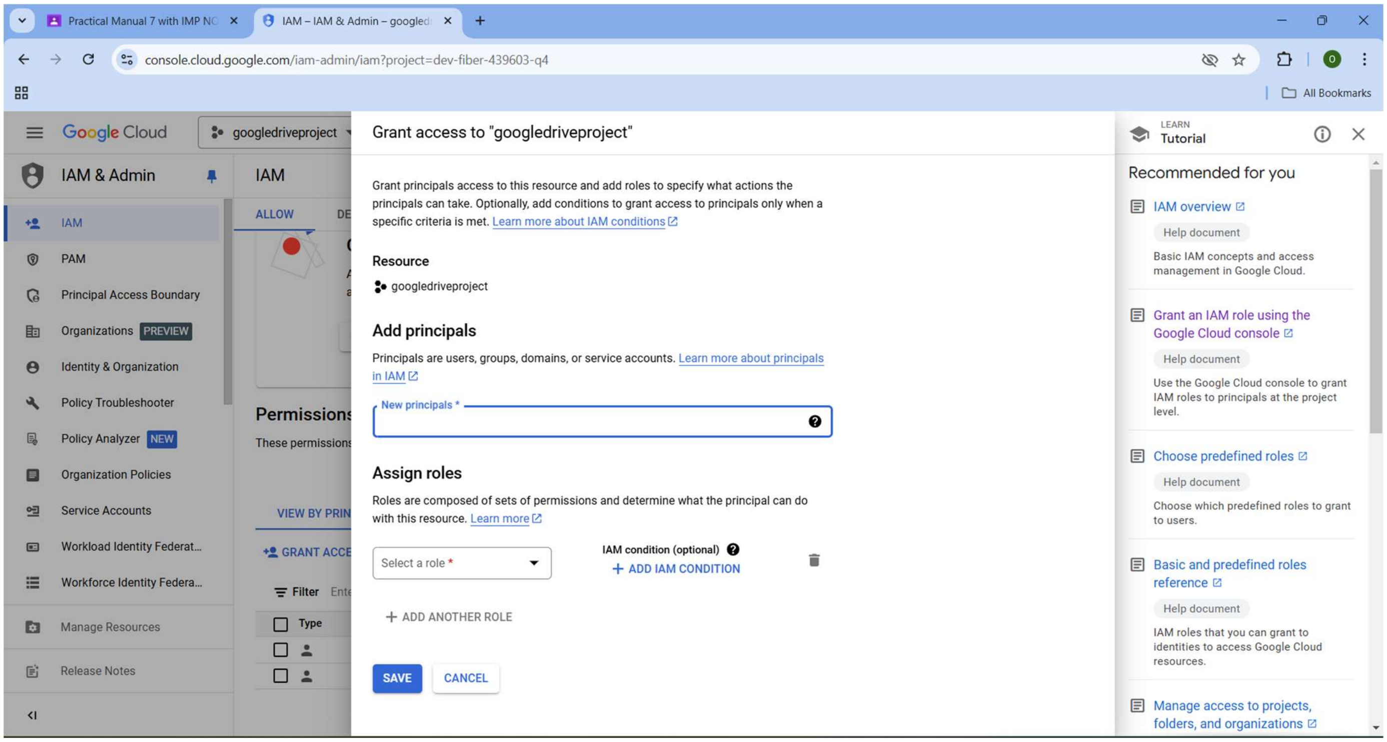
Grant an IAM role using the Google Cloud console
Help document
Use the Google Cloud console to grant IAM roles to principals at the project level.

Choose predefined roles
Help document
Choose which predefined roles to grant to users.

Basic and predefined roles reference
Help document
IAM roles that you can grant to identities to access Google Cloud resources.

Manage access to projects, folders, and organizations

Create a Role with Principals:



Grant access to "googledriveproject"

Grant principals access to this resource and add roles to specify what actions the principals can take. Optionally, add conditions to grant access to principals only when a specific criteria is met. Learn more about IAM conditions

Resource

googledriveproject

Add principals

Principals are users, groups, domains, or service accounts. Learn more about principals in IAM

New principals *

Assign roles

Roles are composed of sets of permissions and determine what the principal can do with this resource. Learn more

Select a role *

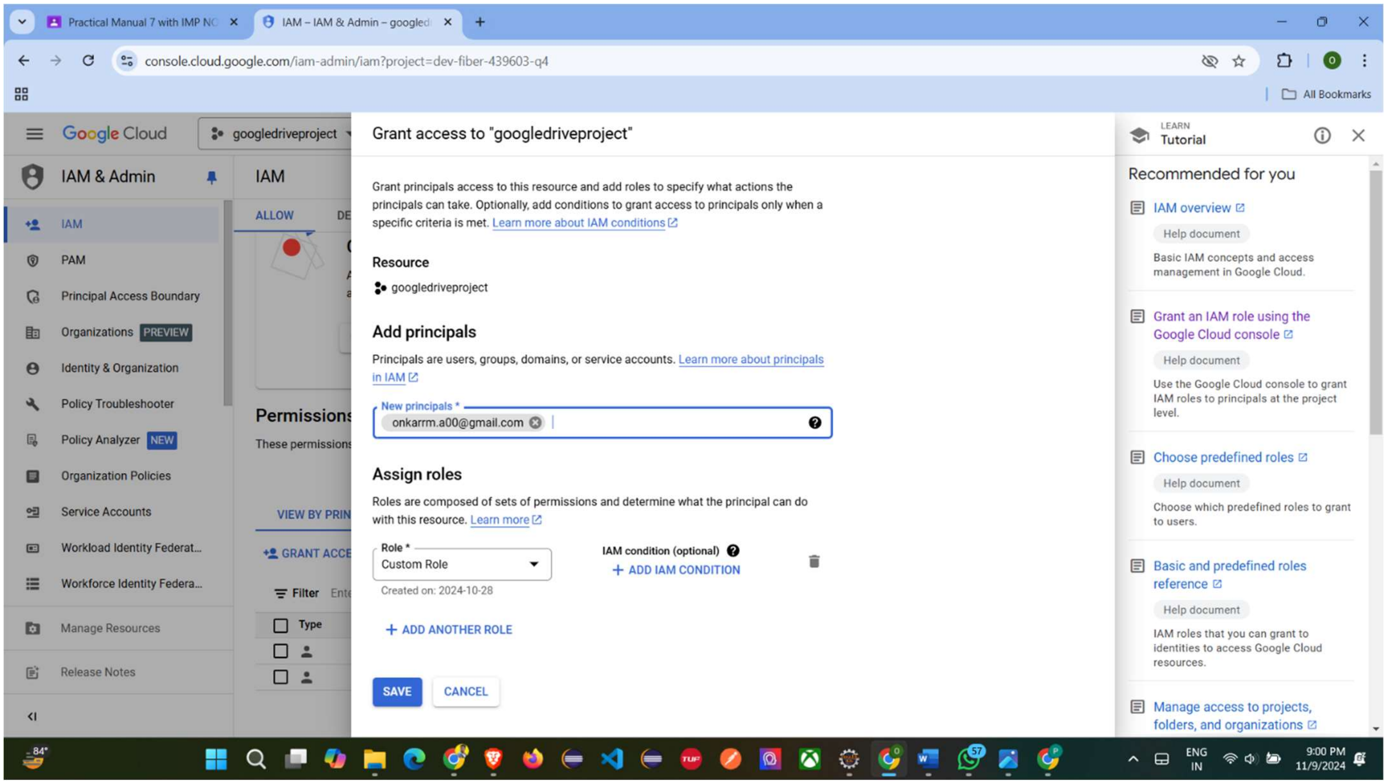
IAM condition (optional)

Basic IAM concepts and access management in Google Cloud.

Use the Google Cloud console to grant IAM roles to principals at the project level.

Choose which predefined roles to grant to users.

IAM roles that you can grant to identities to access Google Cloud resources.



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Resource

googledriveproject

Add principals

Principals are users, groups, domains, or service accounts. Learn more about principals in IAM

New principals *: onkarrm.a00@gmail.com

Assign roles

Roles are composed of sets of permissions and determine what the principal can do with this resource. Learn more

Role *: Custom Role

Created on: 2024-10-28

IAM condition (optional)

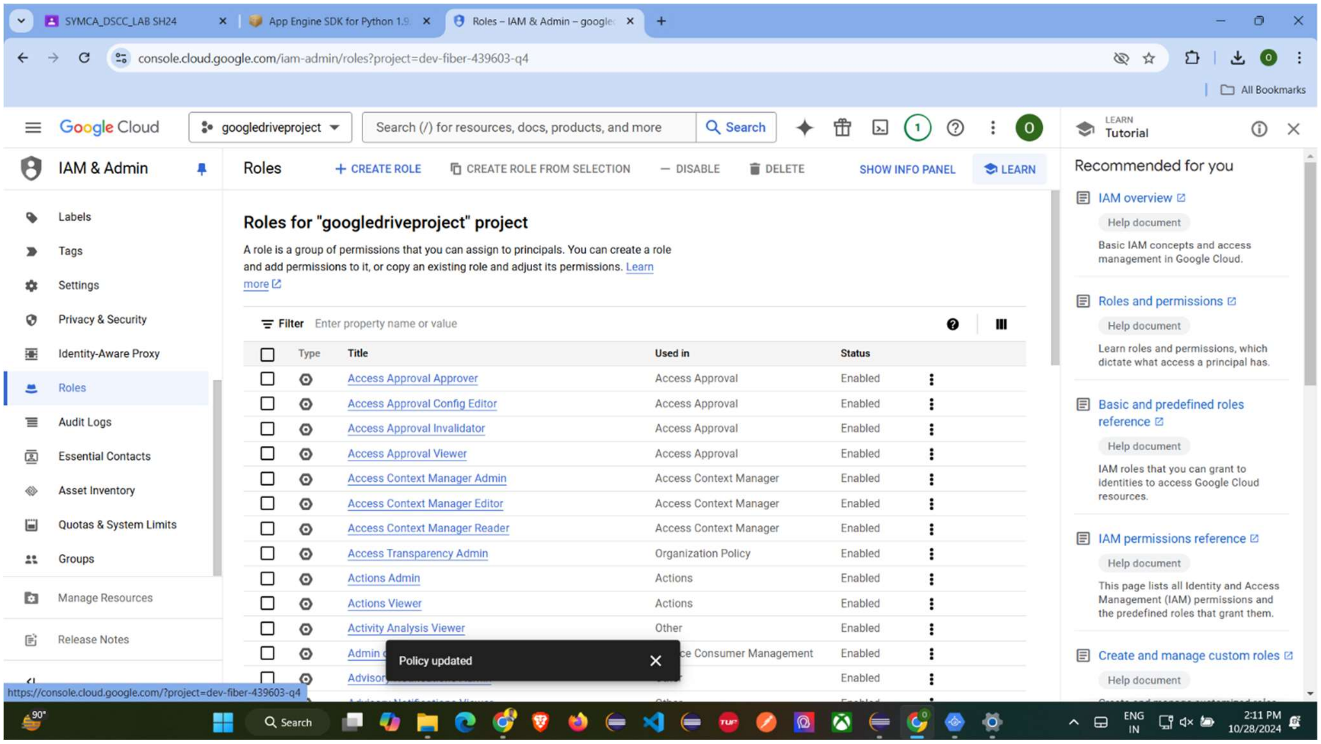
Basic IAM concepts and access management in Google Cloud.

Use the Google Cloud console to grant IAM roles to principals at the project level.

Choose which predefined roles to grant to users.

IAM roles that you can grant to identities to access Google Cloud resources.

New Role Added in Principals Click on the Roles:



Roles for "googledriveproject" project

A role is a group of permissions that you can assign to principals. You can create a role and add permissions to it, or copy an existing role and adjust its permissions. Learn more

Filter Enter property name or value

□	Type	Title	Used in	Status
□	⊙	Access Approval Approver	Access Approval	Enabled
□	⊙	Access Approval Config Editor	Access Approval	Enabled
□	⊙	Access Approval Invalidator	Access Approval	Enabled
□	⊙	Access Approval Viewer	Access Approval	Enabled
□	⊙	Access Context Manager Admin	Access Context Manager	Enabled
□	⊙	Access Context Manager Editor	Access Context Manager	Enabled
□	⊙	Access Context Manager Reader	Access Context Manager	Enabled
□	⊙	Access Transparency Admin	Organization Policy	Enabled
□	⊙	Actions Admin	Actions	Enabled
□	⊙	Actions Viewer	Actions	Enabled
□	⊙	Activity Analysis Viewer	Other	Enabled
□	⊙	Admin	ce Consumer Management	Enabled
□	⊙	Advisor		Enabled

Policy updated ✕

Recommended for you

IAM overview
Help document
Basic IAM concepts and access management in Google Cloud.

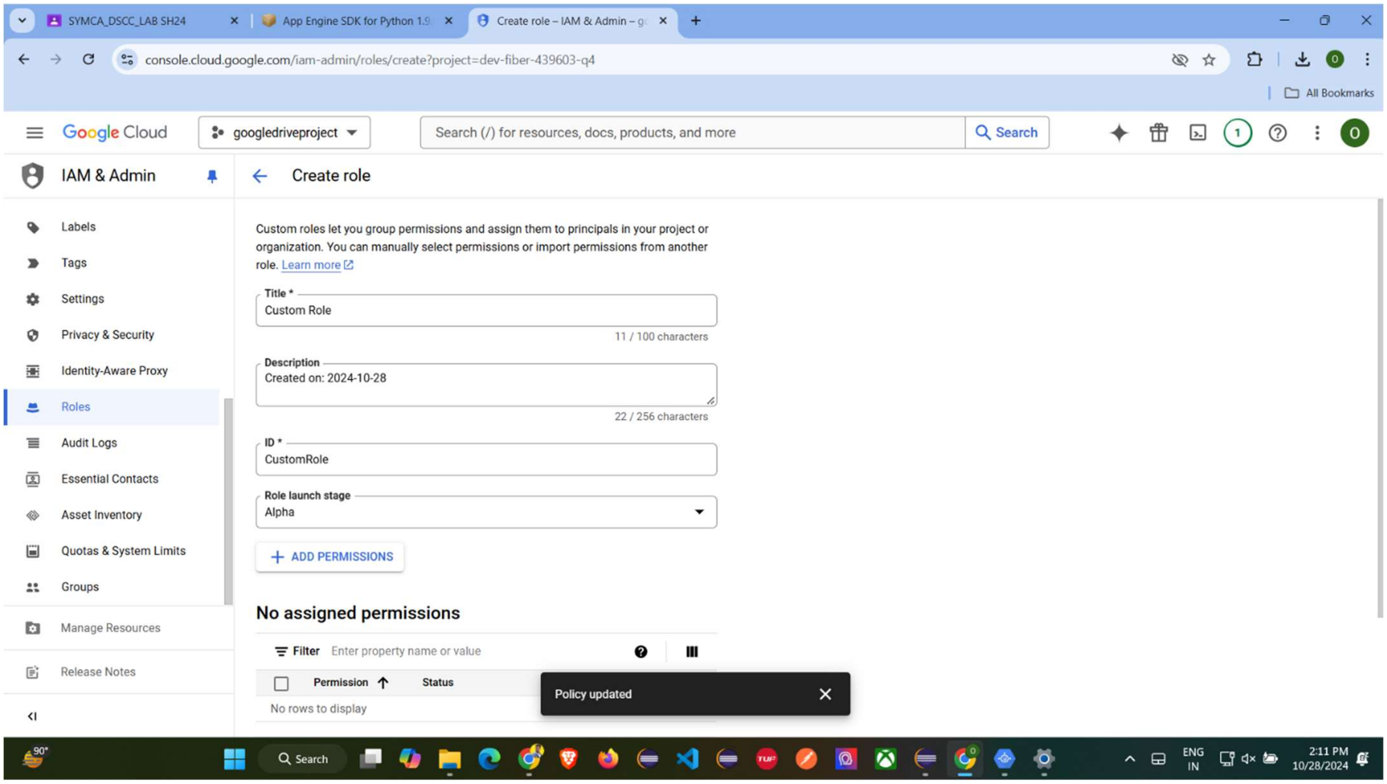
Roles and permissions
Help document
Learn roles and permissions, which dictate what access a principal has.

Basic and predefined roles reference
Help document
IAM roles that you can grant to identities to access Google Cloud resources.

IAM permissions reference
Help document
This page lists all Identity and Access Management (IAM) permissions and the predefined roles that grant them.

Create and manage custom roles
Help document

Create Custom Role with Properly:



Create role

Custom roles let you group permissions and assign them to principals in your project or organization. You can manually select permissions or import permissions from another role. Learn more

Title *: Custom Role
11 / 100 characters

Description: Created on: 2024-10-28
22 / 256 characters

ID *: CustomRole

Role launch stage: Alpha

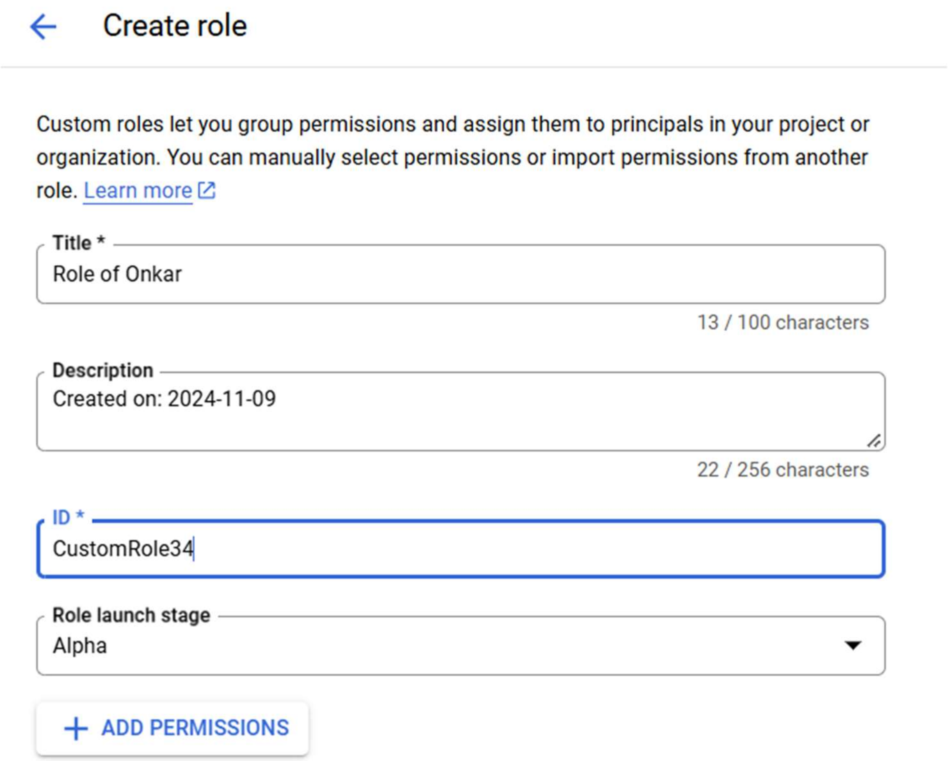
No assigned permissions

Filter Enter property name or value

□	Permission ↑	Status

No rows to display

Policy updated ✕



Create role

Custom roles let you group permissions and assign them to principals in your project or organization. You can manually select permissions or import permissions from another role. Learn more

Title *: Role of Onkar

13 / 100 characters

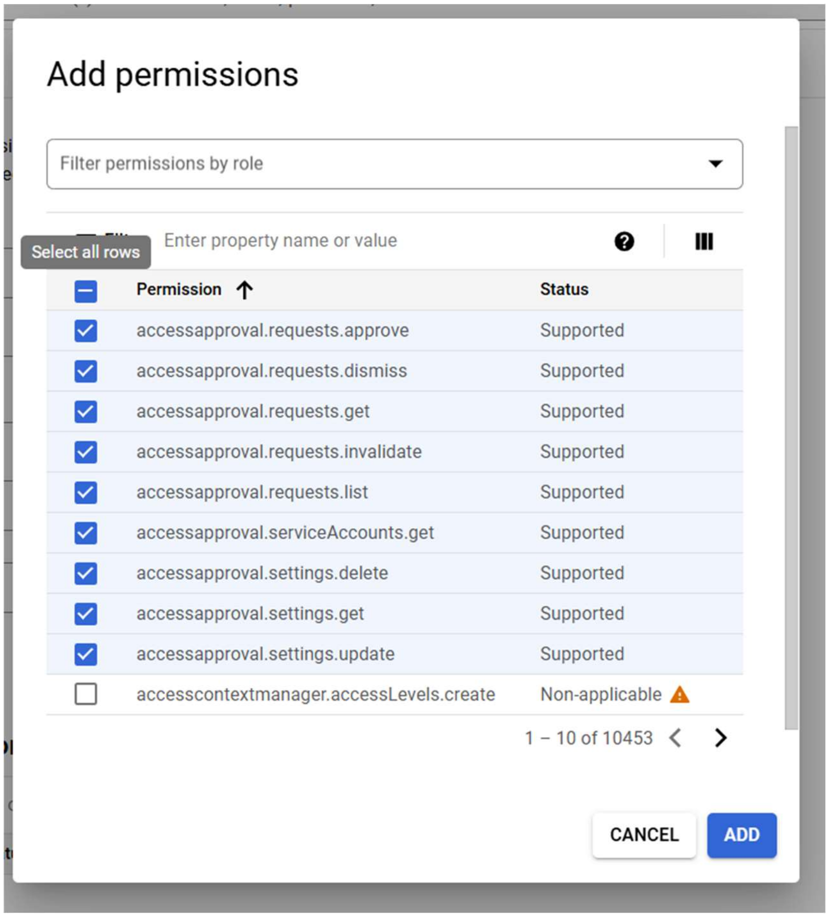
Description: Created on: 2024-11-09

22 / 256 characters

ID *: CustomRole34

Role launch stage: Alpha

Save it and Add Permissions:

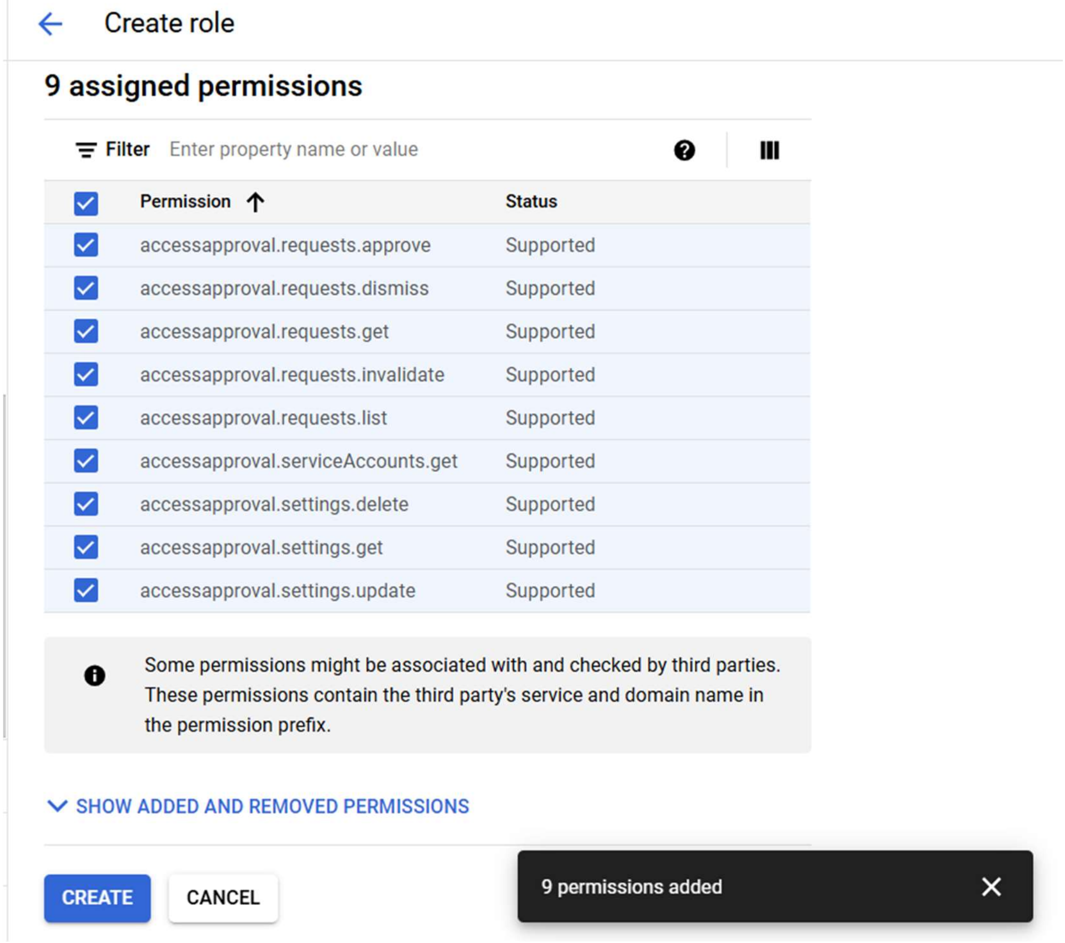


Add permissions

	Permission ↑	Status
☑	accessapproval.requests.approve	Supported
☑	accessapproval.requests.dismiss	Supported
☑	accessapproval.requests.get	Supported
☑	accessapproval.requests.invalidate	Supported
☑	accessapproval.requests.list	Supported
☑	accessapproval.serviceAccounts.get	Supported
☑	accessapproval.settings.delete	Supported
☑	accessapproval.settings.get	Supported
☑	accessapproval.settings.update	Supported
□	accesscontextmanager.accessLevels.create	Non-applicable ⚠

1 – 10 of 10453

Confirm it and it Save that:



Create role

9 assigned permissions

Filter Enter property name or value

☑	Permission ↑	Status
☑	accessapproval.requests.approve	Supported
☑	accessapproval.requests.dismiss	Supported
☑	accessapproval.requests.get	Supported
☑	accessapproval.requests.invalidate	Supported
☑	accessapproval.requests.list	Supported
☑	accessapproval.serviceAccounts.get	Supported
☑	accessapproval.settings.delete	Supported
☑	accessapproval.settings.get	Supported
☑	accessapproval.settings.update	Supported

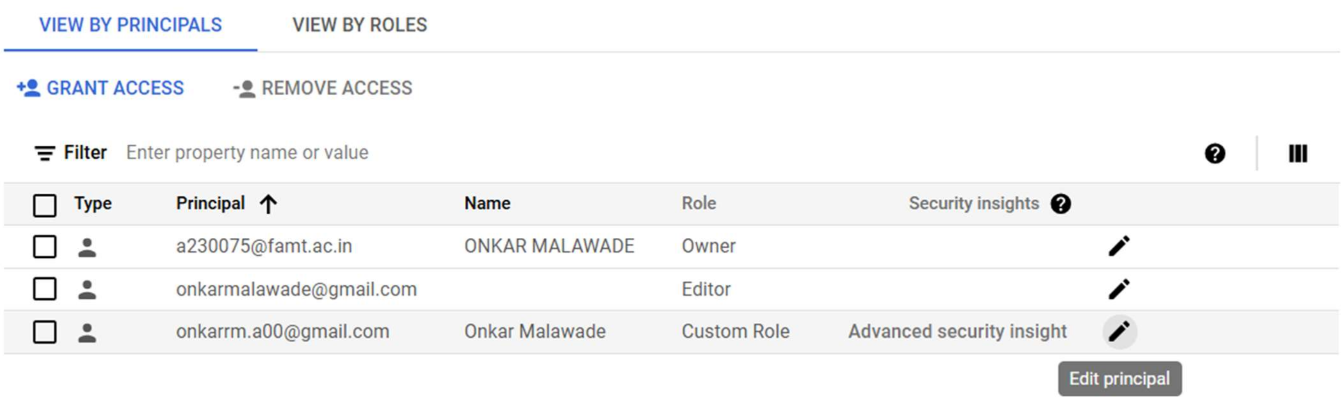
Some permissions might be associated with and checked by third parties. These permissions contain the third party's service and domain name in the permission prefix.

SHOW ADDED AND REMOVED PERMISSIONS

CREATE CANCEL

9 permissions added ✕

Assign Role to Newly Created Principals Edit Principal:



VIEW BY PRINCIPALS VIEW BY ROLES

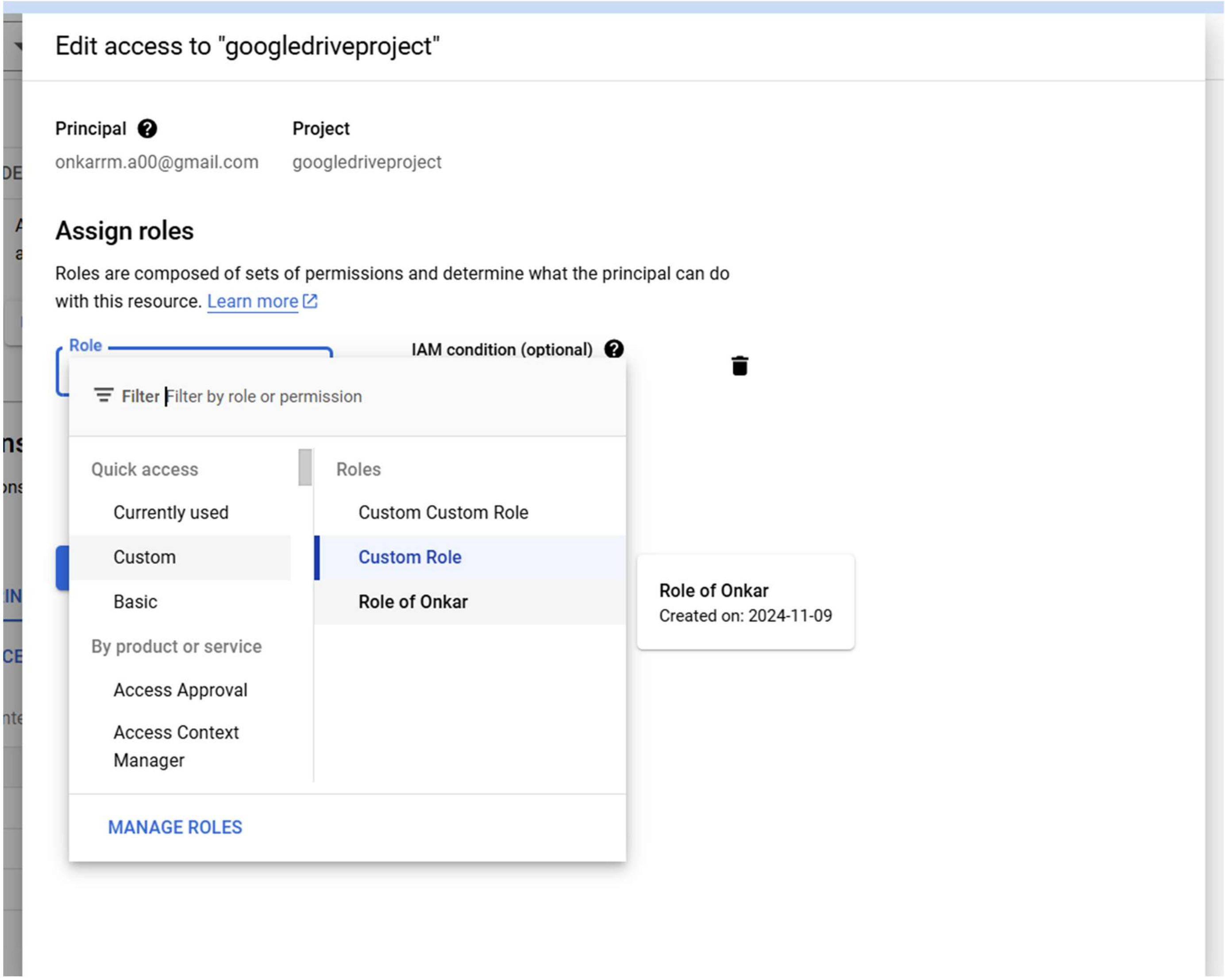
GRANT ACCESS REMOVE ACCESS

Filter Enter property name or value

□ Type	Principal ↑	Name	Role	Security insights	
□	a230075@famt.ac.in	ONKAR MALAWADE	Owner		✎
□	onkarmalawade@gmail.com		Editor		✎
□	onkarrm.a00@gmail.com	Onkar Malawade	Custom Role	Advanced security insight	✎

Edit principal

Search Newly Created Role:



Edit access to "googledriveproject"

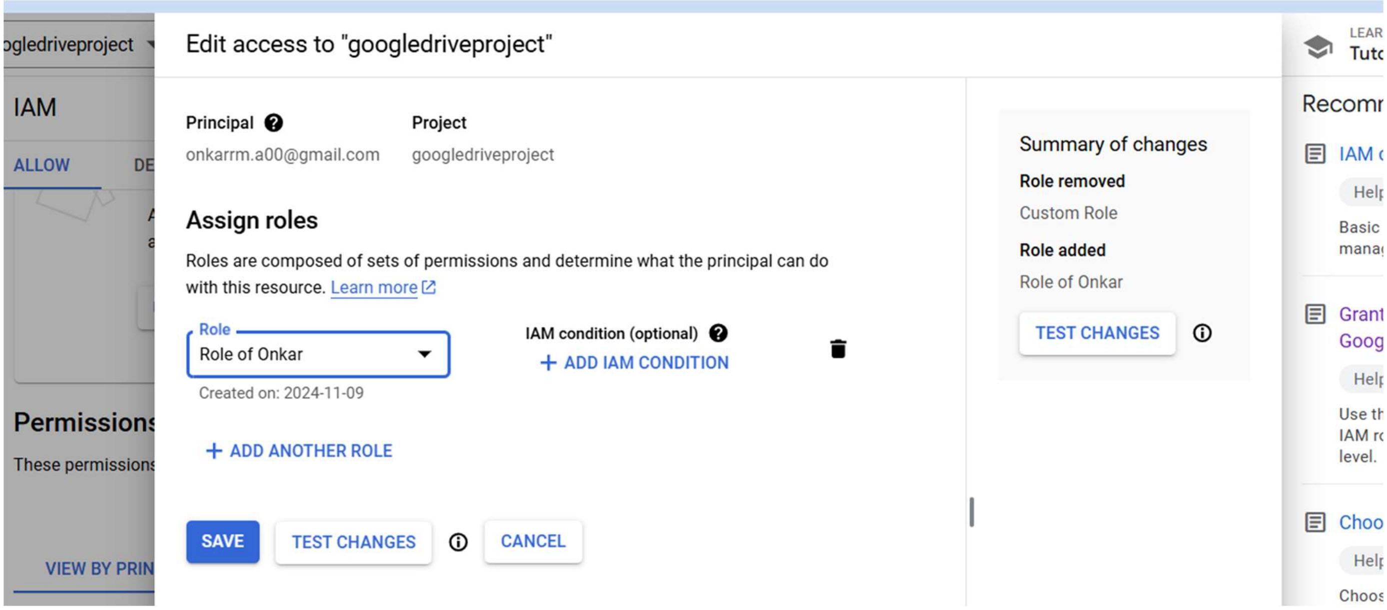
Principal: onkarrm.a00@gmail.com

Project: googledriveproject

Assign roles

Roles are composed of sets of permissions and determine what the principal can do with this resource. Learn more

Role of Onkar
Created on: 2024-11-09



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Role: Role of Onkar

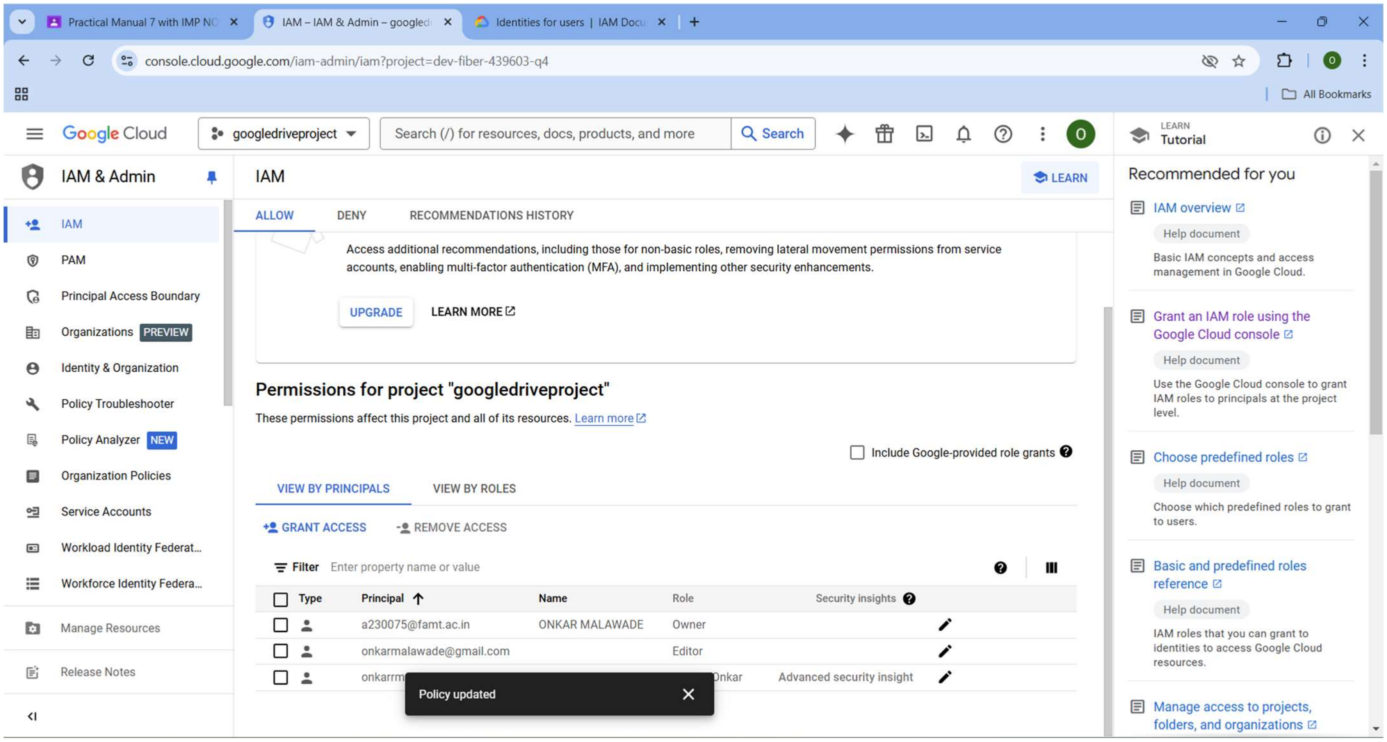
Created on: 2024-11-09

Summary of changes

Role removed: Custom Role

Role added: Role of Onkar

Save it and it will give you Policy Updated Message:



console.cloud.google.com/iam-admin/iam?project=dev-fiber-439603-q4

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□	onkarmalawade@gmail.com		Editor	
□	onkarrm		nkar	Advanced security insight

Policy updated ✕

Google Cloud
googledriveproject
Search (/) for resources, docs, products, and more
Search
IAM & Admin
IAM
PAM
Principal Access Boundary
Organizations PREVIEW
Identity & Organization
Policy Troubleshooter
Policy Analyzer NEW
Organization Policies
Service Accounts
Workload Identity Federat...
Workforce Identity Federa...
Manage Resources
Release Notes
LEARN
ALLOW
DENY
RECOMMENDATIONS HISTORY
UPGRADE
LEARN MORE
VIEW BY PRINCIPALS
VIEW BY ROLES
GRANT ACCESS
REMOVE ACCESS
Filter Enter property name or value
LEARN Tutorial
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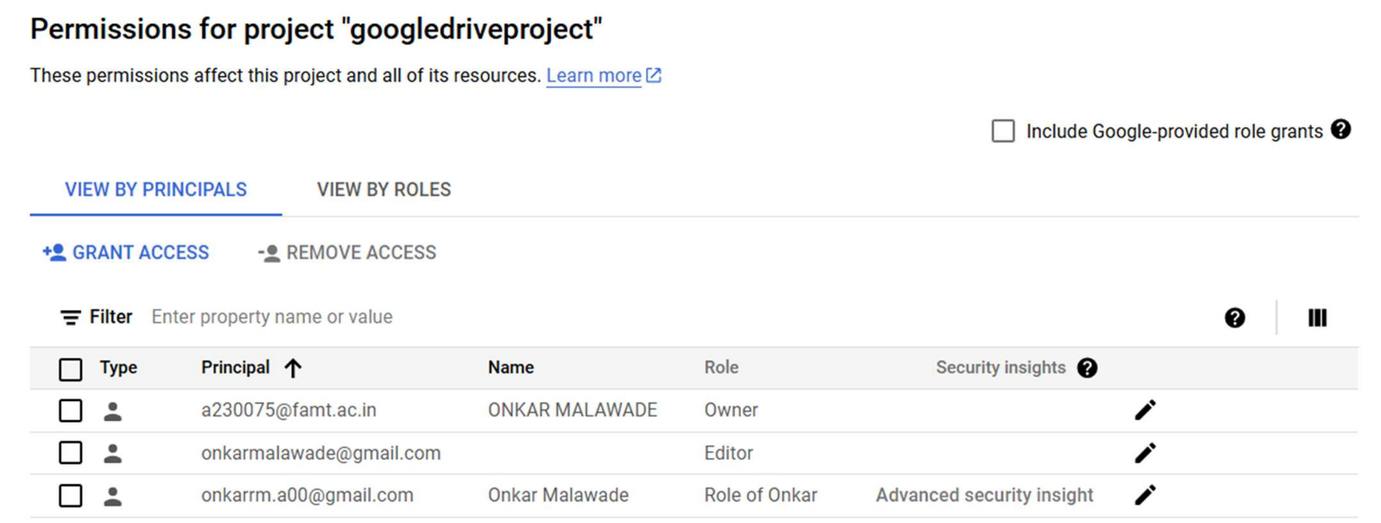
New Role Assigned:



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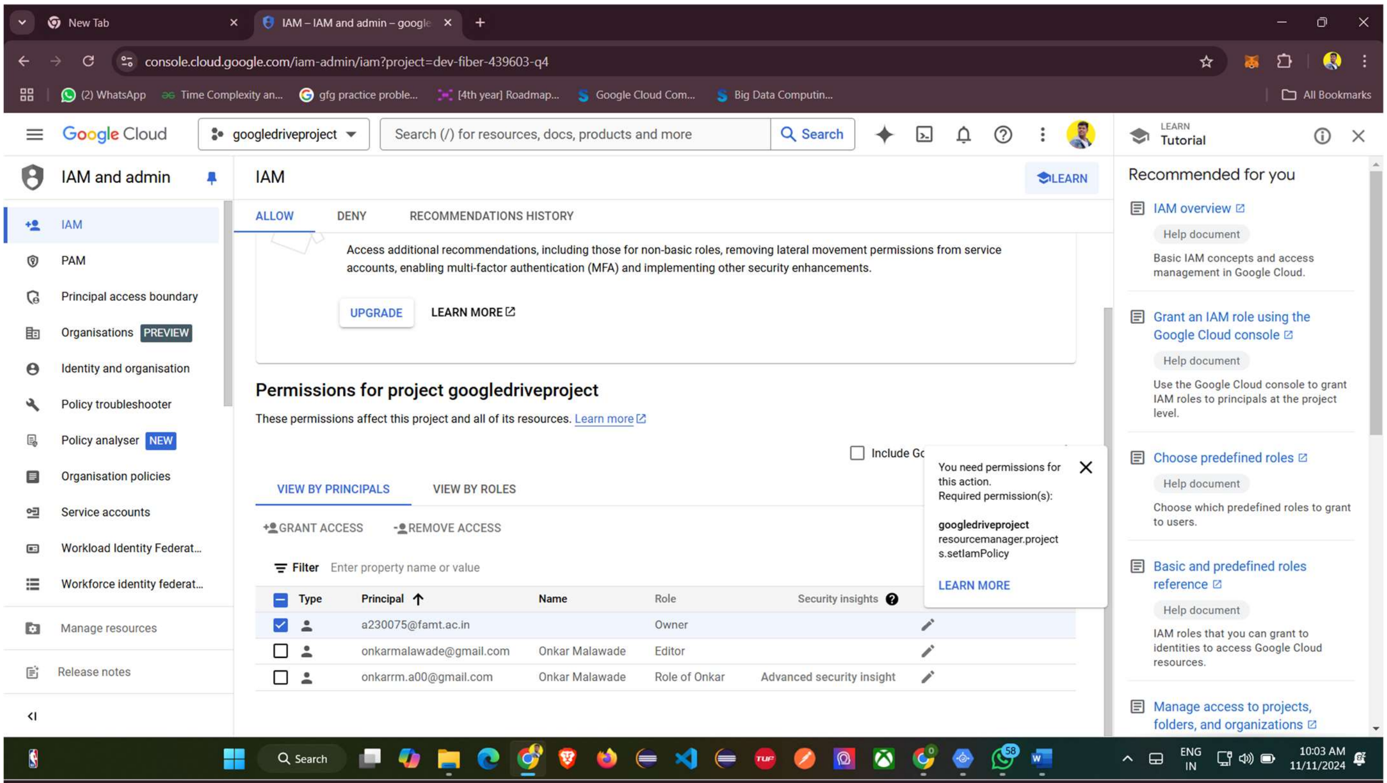
□	onkarrm.a00@gmail.com	Onkar Malawade	Role of Onkar	Advanced security insight

Editor Cannot Grant Permission to other members:



IAM

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Permissions for project googledriveproject

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☐ Include Go

You need permissions for this action.
Required permission(s):

googledriveproject
resourcemanager.projects.setIamPolicy

LEARN MORE

☐	Type	Principal ↑	Name	Role	Security insights
☑	👤	a230075@famt.ac.in		Owner	
☐	👤	onkarmalawade@gmail.com	Onkar Malawade	Editor	
☐	👤	onkarrm.a00@gmail.com	Onkar Malawade	Role of Onkar	Advanced security insight

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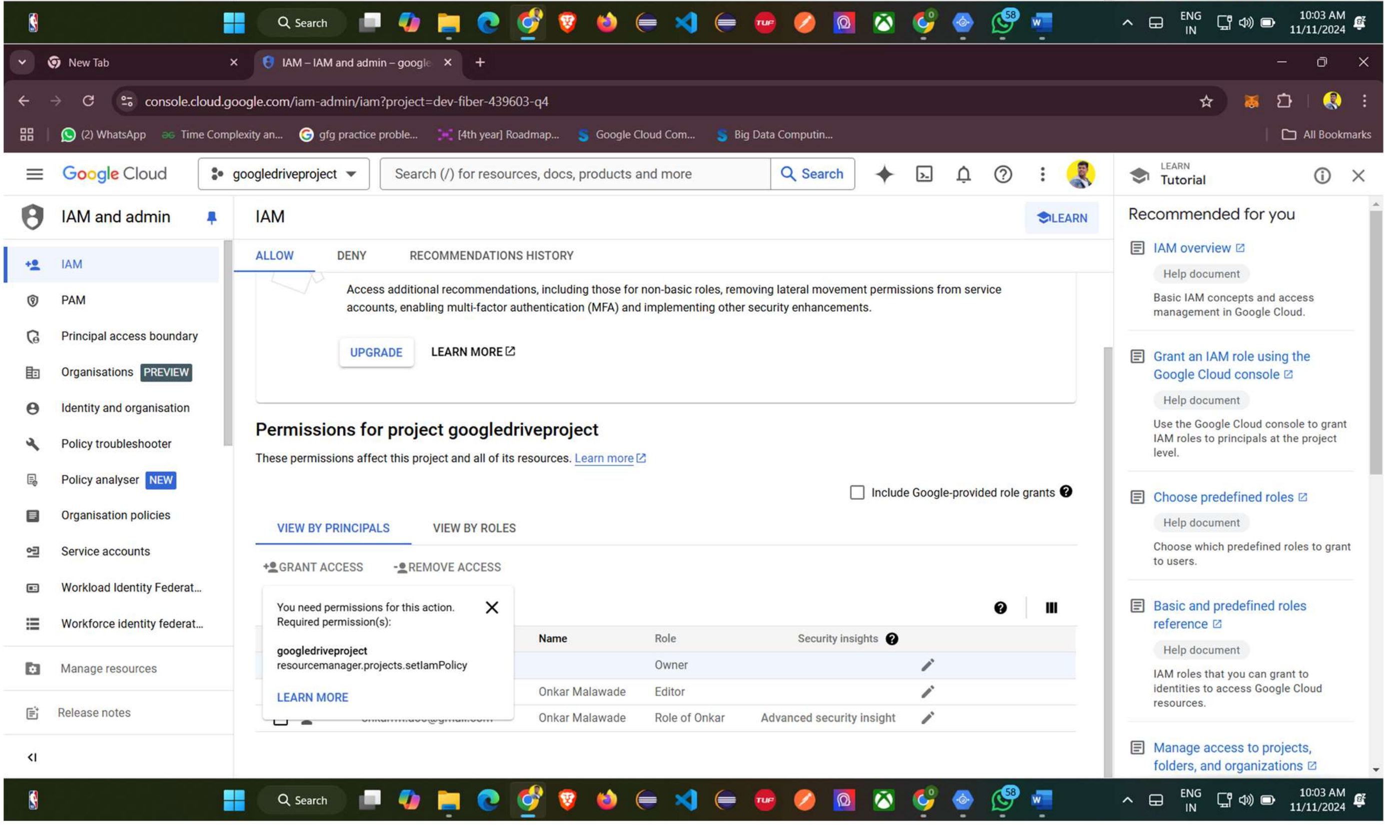
IAM roles that you can grant to identities to access Google Cloud resources.



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LEARN MORE

Name	Role	Security insights
	Owner	
Onkar Malawade	Editor	
Onkar Malawade	Role of Onkar	Advanced security insight

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