

## **CST8912 – Cloud Solution Architecture**

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### **Graded Lab Activity #8**

Lab 8

CST8912\_011

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Submitted to : Prof. Tanishq Bansal

## Introduction:

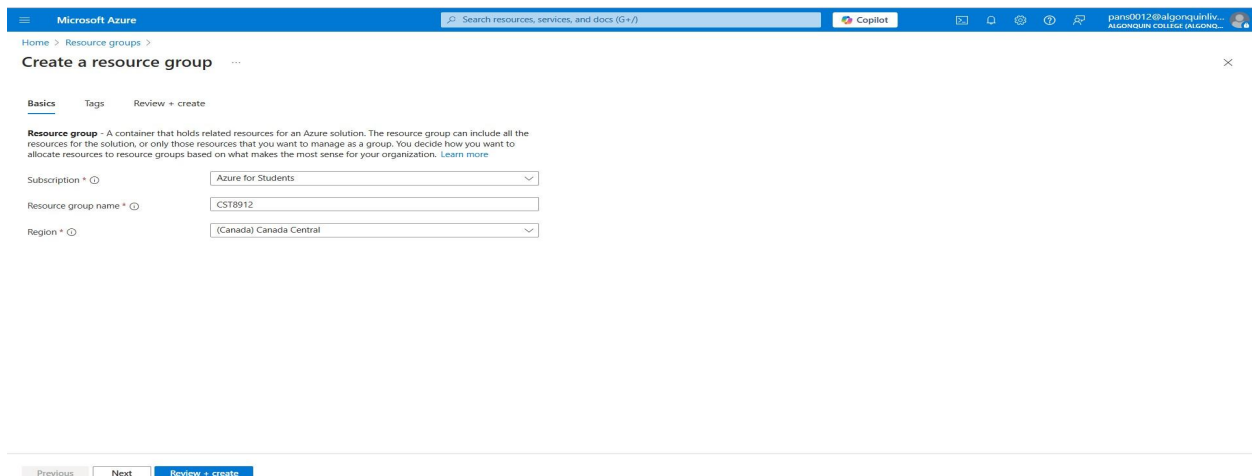
Tagging your resources for a cloud environment is a crucial task for IT, especially when managing and deploying for multiple departments and projects. Tags are one of the elementary tasks included in the Cloud Adoption Framework that lets you take the benefit of the cloud resources to their fullest and ensure that you are taking the maximum advantage of the money spent in the cloud.

Tagging is considered one of the fundamental pillars of Cloud Governance to ensure the workloads deployed in the cloud are organized and stay that way for the entire lifecycle of the resources. Tagging the cloud resources opens up the world of possibility for you to leverage other services such as Cloud Policy and Cloud Runbooks to automate various tasks for specific resources and ensure their compliance in an automated fashion.

### Task 1: Assign tags via the Azure portal

1. Sign in to the Azure portal - <https://portal.azure.com>.
2. Search for and select Resource groups.
3. From the Resource groups, select + Create.

Setting	Value
Subscription name	your subscription
Resource group name	CST8912
Location	Canada Central



Microsoft Azure

Search resources, services, and docs (G+I)

Copilot

Home > Resource groups >

Create a resource group

Basics Tags Review + create

**Resource group** - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. [Learn more](#)

Subscription \* Azure for Students

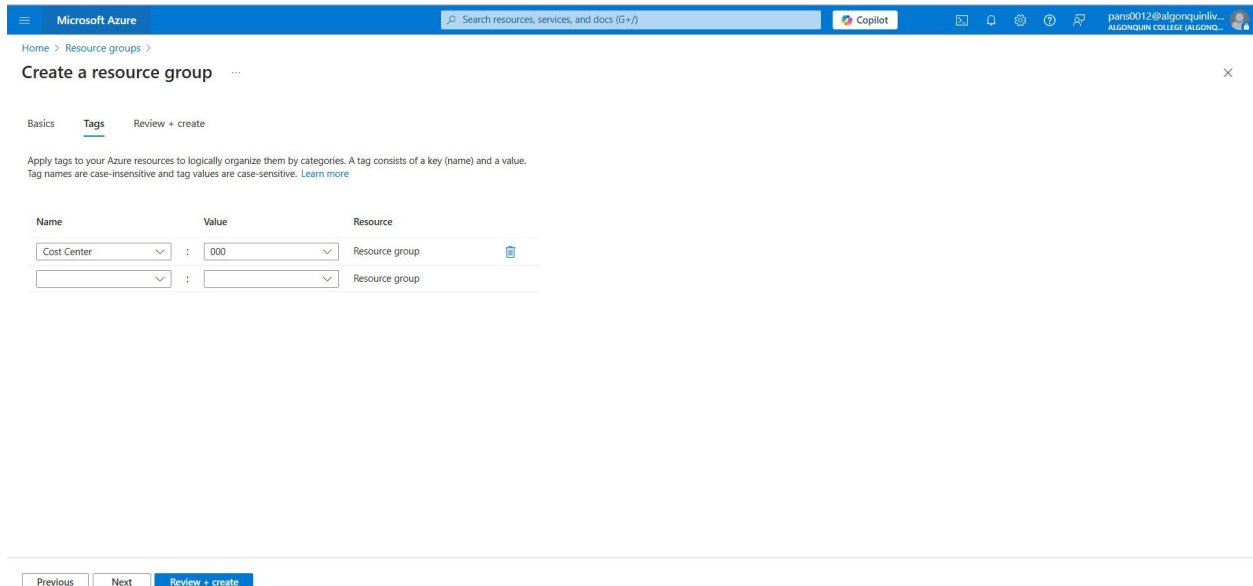
Resource group name \* CST8912

Region \* (Canada) Canada Central

Previous Next Review + create

## 5. Select Next: Tags and create a new tag.

Setting	Value
Name	Cost Center
Value	000



Microsoft Azure

Home > Resource groups >

### Create a resource group

Basics **Tags** Review + create

Apply tags to your Azure resources to logically organize them by categories. A tag consists of a key (name) and a value. Tag names are case-insensitive and tag values are case-sensitive. [Learn more](#)

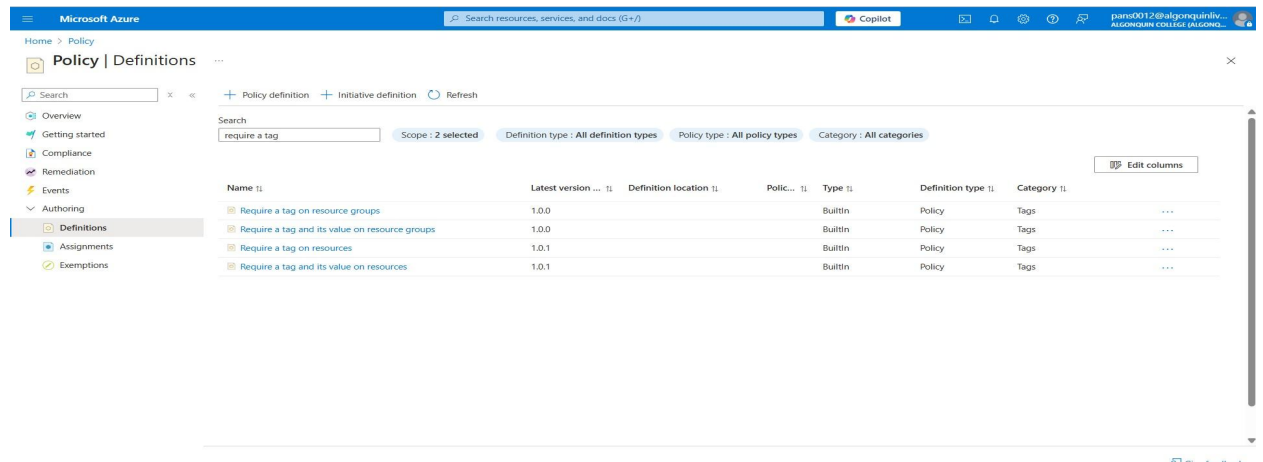
Name	Value	Resource
Cost Center	000	Resource group
		Resource group

Previous Next **Review + create**

## 6. Select Review + Create, and then select Create.

## Task 2: Enforce tagging via an Azure policy

## 7. In the Authoring blade, select Definitions. Take a moment to browse through the list of built-in policy definitions that are available for you to use. Notice you can also search for a definition.



Microsoft Azure

Home > Policy

### Policy | Definitions

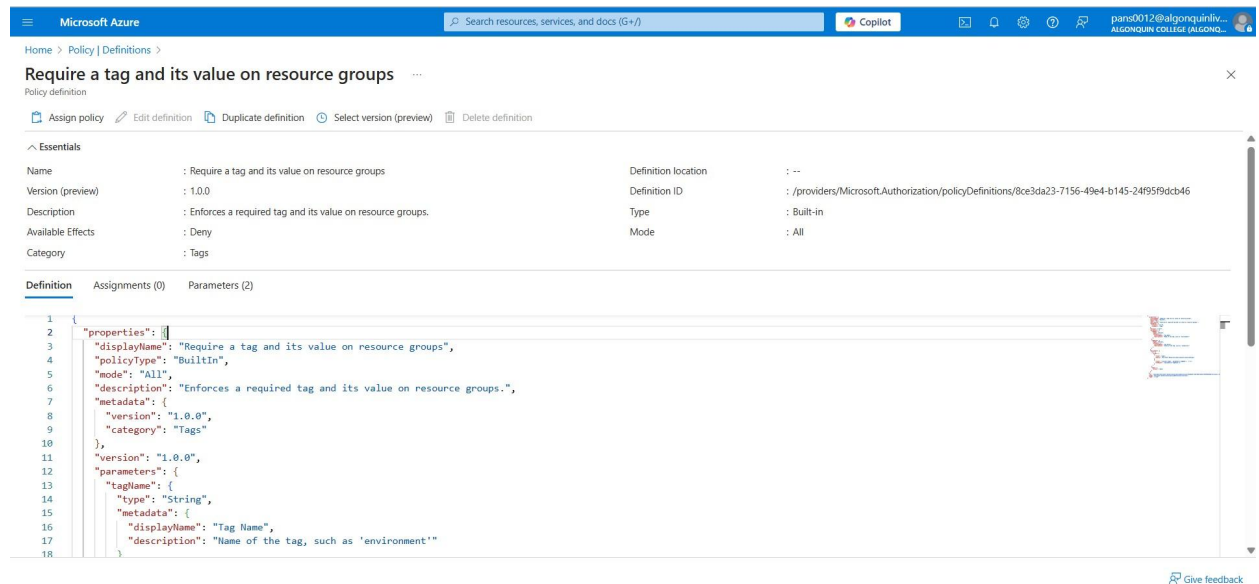
Search

Scope: 2 selected Definition type: All definition types Policy type: All policy types Category: All categories

Name	Latest version	Definition location	Policy type	Type	Definition type	Category
Require a tag on resource groups	1.0.0		Builtin	Policy	Tags	
Require a tag and its value on resource groups	1.0.0		Builtin	Policy	Tags	
Require a tag on resources	1.0.1		Builtin	Policy	Tags	
Require a tag and its value on resources	1.0.1		Builtin	Policy	Tags	

Give feedback

8. Search for “require a tag”
9. Screenshot of the policy definition.



Microsoft Azure

Home > Policy | Definitions > Require a tag and its value on resource groups

Policy definition

Assign policy Edit definition Duplicate definition Select version (preview) Delete definition

Essentials

Name: Require a tag and its value on resource groups

Version (preview): 1.0.0

Description: Enforces a required tag and its value on resource groups.

Available Effects: Deny

Category: Tags

Definition location: --

Definition ID: /providers/Microsoft.Authorization/policyDefinitions/8ce3da23-7156-49e4-b145-24f95f9db46

Type: Built-in

Mode: All

Definition Assignments (0) Parameters (2)

```

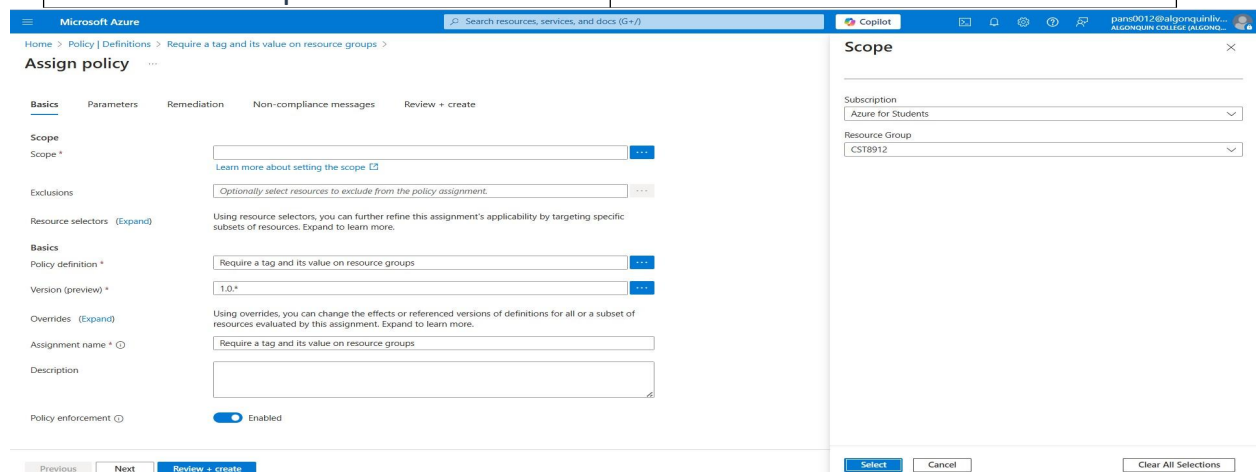
1 {
2   "properties": {
3     "displayName": "Require a tag and its value on resource groups",
4     "policyType": "BuiltIn",
5     "mode": "All",
6     "description": "Enforces a required tag and its value on resource groups.",
7     "metadata": {
8       "version": "1.0.0",
9       "category": "Tags"
10    },
11    "parameters": {
12      "tag": {
13        "type": "String",
14        "metadata": {
15          "displayName": "Tag Name",
16          "description": "Name of the tag, such as 'environment'"
17        }
18      }
19    }
20  }
21 }

```

Give feedback

10. Click the entry representing the Require a tag and its value on resources built-in policy. Take a minute to review the definition.
11. On the Require a tag and its value on resources built-in policy definition blade, click Assign.
12. Specify the Scope by clicking the ellipsis button and selecting the following values. Click Select when you are done.

Setting	Value
Subscription	your subscription
Resource Group	CST8912



Microsoft Azure

Home > Policy | Definitions > Require a tag and its value on resource groups > Assign policy

Basics Parameters Remediation Non-compliance messages Review + create

Scope

Scope \*

Learn more about setting the scope

Exclusions

Optionally select resources to exclude from the policy assignment.

Resource selectors (Expand)

Using resource selectors, you can further refine this assignment's applicability by targeting specific subsets of resources. Expand to learn more.

Basics

Policy definition \* Require a tag and its value on resource groups

Version (preview) \* 1.0.\*

Overrides (Expand)

Using overrides, you can change the effects or referenced versions of definitions for all or a subset of resources evaluated by this assignment. Expand to learn more.

Assignment name \* Require a tag and its value on resource groups

Description

Policy enforcement Enabled

Previous Next Review + create

Scope

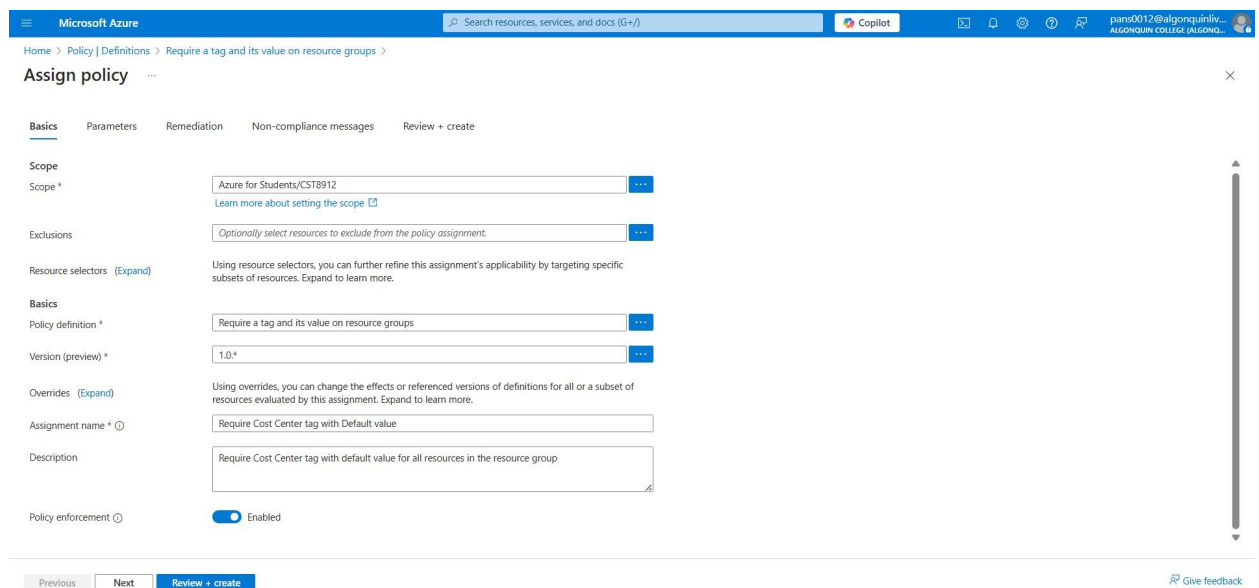
Subscription Azure for Students

Resource Group CST8912

Select Cancel Clear All Selections

13. Configure the Basics properties of the assignment by specifying the following settings (leave others with their defaults):

Setting	Value
Assignment name	Require Cost Center tag with Default value
Description	Require Cost Center tag with default value for all resources in the resource group
Policy enforcement	Enabled



Microsoft Azure

Search resources, services, and docs (G+)

Copilot

Home > Policy | Definitions > Require a tag and its value on resource groups >

Assign policy

Basics Parameters Remediation Non-compliance messages Review + create

Scope

Scope \*

Azure for Students/CST8912

Learn more about setting the scope

Exclusions

Optionally select resources to exclude from the policy assignment.

Resource selectors (Expand)

Using resource selectors, you can further refine this assignment's applicability by targeting specific subsets of resources. Expand to learn more.

Basics

Policy definition \*

Require a tag and its value on resource groups

Version (preview) \*

1.0.\*

Overrides (Expand)

Using overrides, you can change the effects or referenced versions of definitions for all or a subset of resources evaluated by this assignment. Expand to learn more.

Assignment name \*

Require Cost Center tag with Default value

Description

Require Cost Center tag with default value for all resources in the resource group

Policy enforcement

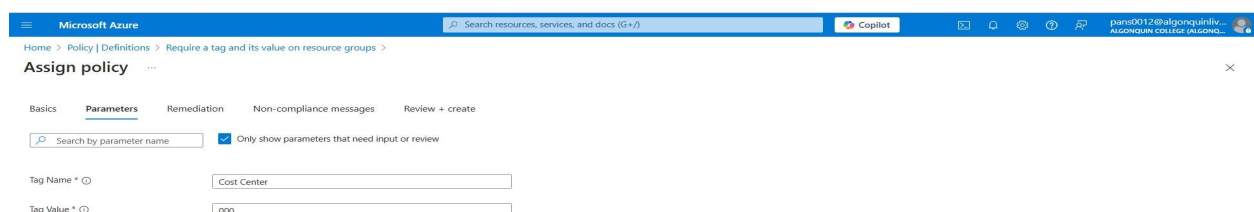
Enabled

Previous Next Review + create

Give feedback

15. Click Next twice and set Parameters to the following values:

Setting	Value
Tag Name	Cost Center
Tag Value	000



Microsoft Azure

Search resources, services, and docs (G+)

Copilot

Home > Policy | Definitions > Require a tag and its value on resource groups >

Assign policy

Basics Parameters Remediation Non-compliance messages Review + create

Search by parameter name

Only show parameters that need input or review

Tag Name \*

Cost Center

Tag Value \*

000

17. Click Next and review the Remediation tab. Leave the Create a Managed Identity checkbox unchecked

18. Click Review + Create and then click Create.

19. Note: Now you will verify that the new policy assignment is in effect by attempting to create an Azure Storage account in the resource group. You will create the storage account without adding the required tag.

20. Note: It might take between 5 and 10 minutes for the policy to take effect.

21. In the portal, search for and select Storage Account, and select + Create.

22. On the Basics tab of the Create storage account blade, complete the configuration.

Setting	Value
Resource group	CST8912
Storage account name	any globally unique combination of between 3 and 24 lower case letters and digits, starting with a letter

23. Select Review and then click Create.

24. You should receive a Validation failed message. View the message to identify the reason for the failure. Verify the error message states that the resource deployment was disallowed by the policy.

### **Task 3:** Apply tagging via an Azure policy

1. In this task, we will use the new policy definition to remediate any non-compliant resources. In this scenario, we will make any child resources of a resource group inherit the Cost Center tag that was defined on the resource group.
2. In the Azure portal, search for and select Policy.
3. In the Authoring section, click Assignments.

Microsoft Azure

Search resources, services, and docs (G+/I)

Copilot

Home > Policy

Policy | Assignments

Search

Assign policy Assign initiative Refresh

Filter by name or ID...

Scope : 2 selected Definition type : All definition types

Total Assignments 2 Initiative Assignments 1 Policy Assignments 1

Assignment name Scope Type

ASC Default (subscription: 63593e07-b1bc-4b20-8c26-b7fafac46e9f) Azure for Students Initiative

Require Cost Center tag with Default value Azure for Students/CST8912 Policy

Edit columns

Edit assignment

View compliance

View definition

Delete assignment

Duplicate assignment

Create exemption

Give feedback

- In the list of assignments, click the ellipsis icon in the row representing the Require Cost Center tag with Default value policy assignment and use the Delete assignment menu item to delete the assignment.

Microsoft Azure

Search resources, services, and docs (G+/I)

Copilot

Home > Policy

Policy | Assignments

Search

Assign policy Assign initiative Refresh

Filter by name or ID...

Scope : 2 selected Definition type : All definition types

Total Assignments 2 Initiative Assignments 1 Policy Assignments 1

Assignment name Scope Type

ASC Default (subscription: 63593e07-b1bc-4b20-8c26-b7fafac46e9f) Azure for Students Initiative

Require Cost Center tag with Default value Azure for Students/CST8912 Policy

Edit columns

Delete assignment

Do you want to delete the policy assignment 'Require Cost Center tag with Default value'?

Yes No

Give feedback

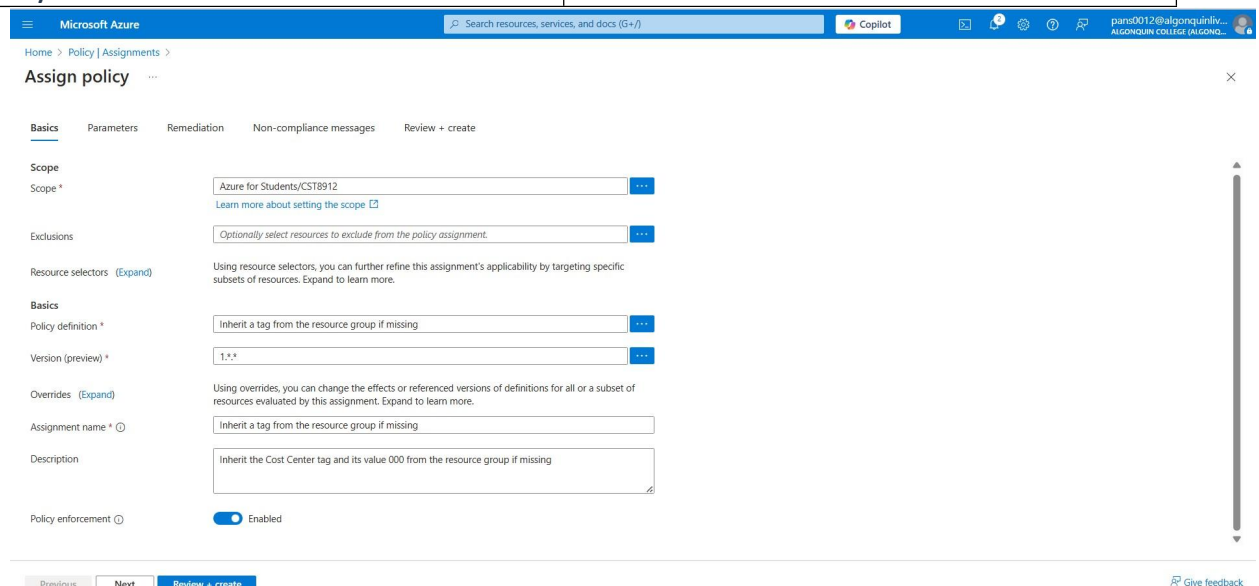
- Click Assign policy and specify the Scope by clicking the ellipsis button and selecting the following values:

Setting	Value
Subscription	your Azure subscription

Resource Group	CST8912
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- To specify the Policy definition, click the ellipsis button and then search for and select Inherit a tag from the resource group if missing.
- Select Add and then configure the remaining Basics properties of the assignment.

Setting	Value
Assignment name	Inherit the Cost Center tag and its value 000 from the resource group if missing
Description	Inherit the Cost Center tag and its value 000 from the resource group if missing
Policy enforcement	Enabled



- Click Next twice and set Parameters to the following values:

Setting	Value
Tag Name	Cost Center

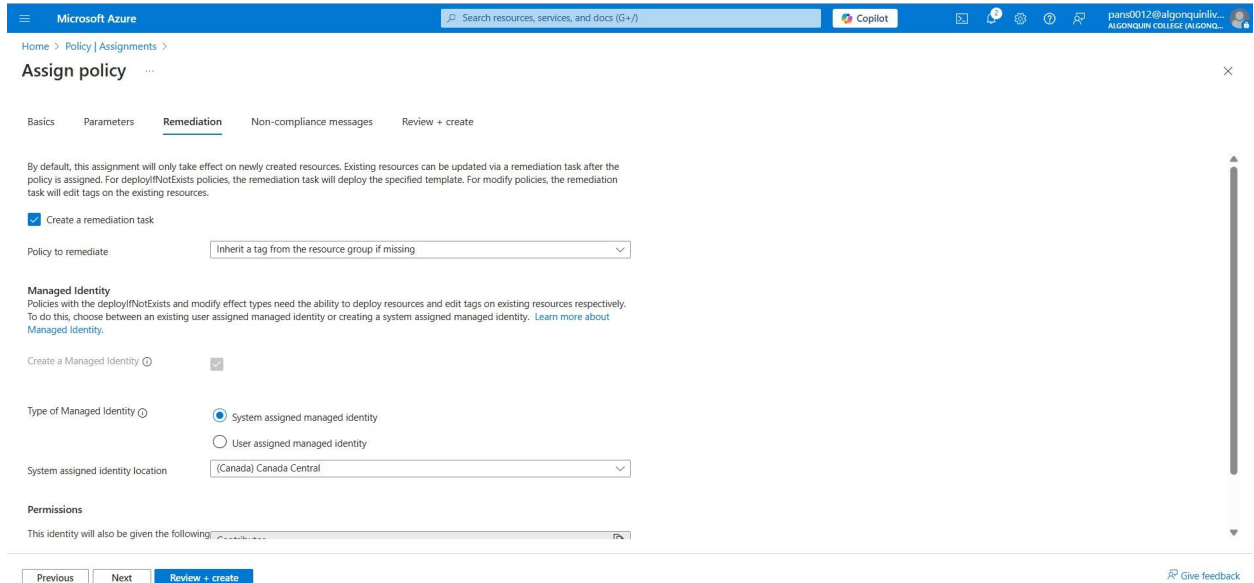
- Click Next and, on the Remediation tab, configure the following settings (leave others with their defaults):

Setting	Value
---------	-------



Create a remediation task	enabled
Policy to remediate	Inherit a tag from the resource group if missing

## 10. Screenshot of the policy remediation page.



Microsoft Azure

Home > Policy | Assignments >

### Assign policy

Basics Parameters **Remediation** Non-compliance messages Review + create

By default, this assignment will only take effect on newly created resources. Existing resources can be updated via a remediation task after the policy is assigned. For deployIfNotExists policies, the remediation task will deploy the specified template. For modify policies, the remediation task will edit tags on the existing resources.

☒ Create a remediation task

Policy to remediate: Inherit a tag from the resource group if missing

**Managed Identity**  
Policies with the deployIfNotExists and modify effect types need the ability to deploy resources and edit tags on existing resources respectively. To do this, choose between an existing user assigned managed identity or creating a system assigned managed identity. [Learn more about Managed Identity.](#)

Create a Managed Identity ☒

Type of Managed Identity ☒ System assigned managed identity ☐ User assigned managed identity

System assigned identity location: (Canada) Canada Central

**Permissions**  
This identity will also be given the following:

Previous Next Review + create

[Give feedback](#)

## 11. Click Review + Create and then click Create.

**Note:** To verify that the new policy assignment is in effect, you will create another Azure storage account in the same resource group without explicitly adding the required tag.

**Note:** It might take between 5 and 10 minutes for the policy to take effect. Search for and select Storage Account, and click + Create.

## 12. On the Basics tab of the Create storage account blade, verify that you are using the Resource Group that the Policy was applied to and specify the following settings (leave others with their defaults) and click Review:

Setting	Value
Storage account name	any globally unique combination of between 3 and 24 lower case letters and digits, starting with a letter

Microsoft Azure

Search resources, services, and docs (G+/I)

Copilot

Home > Storage accounts >

### Create a storage account

Azure Storage is a Microsoft-managed service providing cloud storage that is highly available, secure, durable, scalable, and redundant. Azure Storage includes Azure Blobs (objects), Azure Data Lake Storage Gen2, Azure Files, Azure Queues, and Azure Tables. The cost of your storage account depends on the usage and the options you choose below. [Learn more about Azure storage accounts](#)

**Project details**

Select the subscription in which to create the new storage account. Choose a new or existing resource group to organize and manage your storage account together with other resources.

Subscription \*

Resource group \*  [Create new](#)

**Instance details**

Storage account name \*

Region \*  [Deploy to an Azure Extended Zone](#)

Primary service

Performance \* ☒ Standard: Recommended for most scenarios (general-purpose v2 account)  
☐ Premium: Recommended for scenarios that require low latency.

Redundancy \*

[Previous](#) [Next](#) [Review + create](#)

[Give feedback](#)

13. Verify that this time the validation passed and click Create.

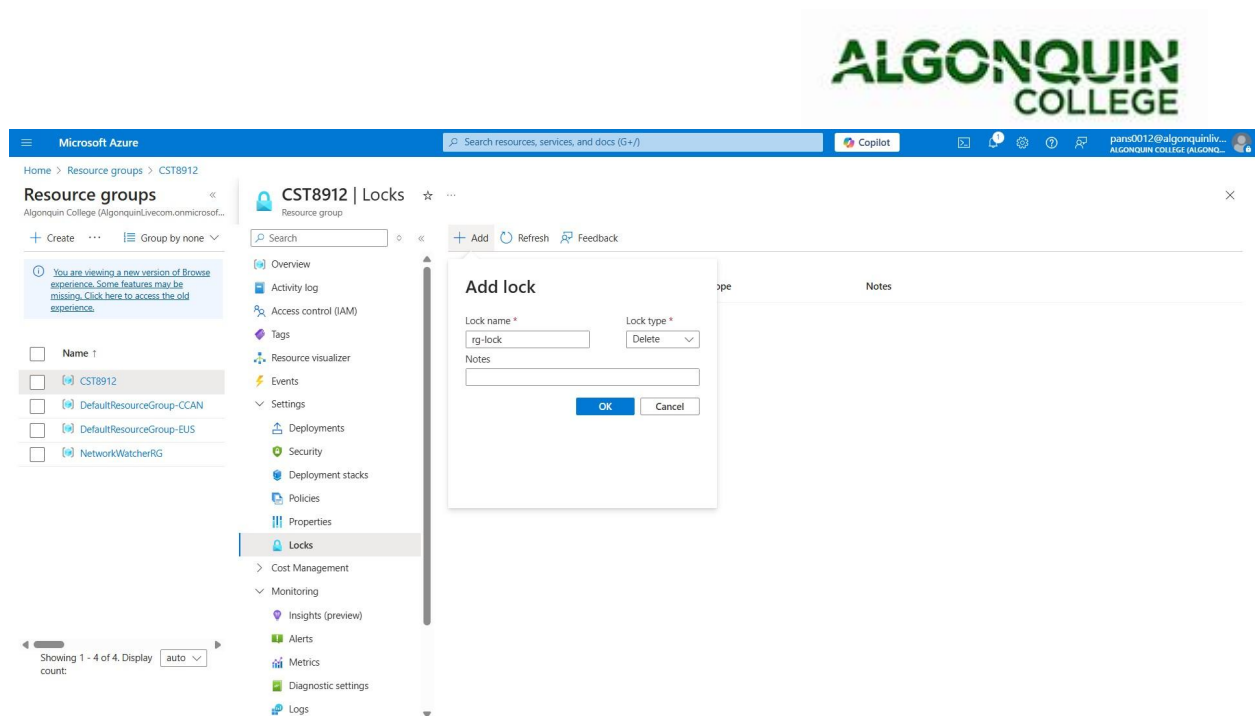
14. Once the new storage account is provisioned, click Go to resource.

15. On the Tags blade, note that the tag Cost Center with the value 000 has been automatically assigned to the resource.

#### Task 4: Configure and test resource locks

1. Search for and select your resource group.
2. In the Settings blade, select Locks.
3. Select Add and complete the resource lock information. When finished select Ok.

Setting	Value
Lock name	rg-lock
Lock type	delete (notice the selection for read-only)



4. Navigate to the resource group Overview blade, and select Delete resource group.
5. In the Enter resource group name to confirm deletion textbox provide the resource group name, cst8912. Notice you can copy and paste the resource group name.
6. Notice the warning: Deleting this resource group and its dependent resources is a permanent action and cannot be undone. Select Delete.
7. You should receive a notification denying the deletion.

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and the user profile. The main content area is titled 'Resource groups' and shows a list of resource groups on the left. The right pane displays the 'Essentials' section for the 'satyam4storage' resource group, including subscription details, location, and a list of resources. A notification banner at the top right states: 'Executed delete command on 2 selected items. Succeeded: 0, Failed: 2, Canceled: 0.' Below this, error details are provided for two storage accounts: 'satyam4storage' and 'satyamstorage5678', both indicating a 'ScopeLocked' error.

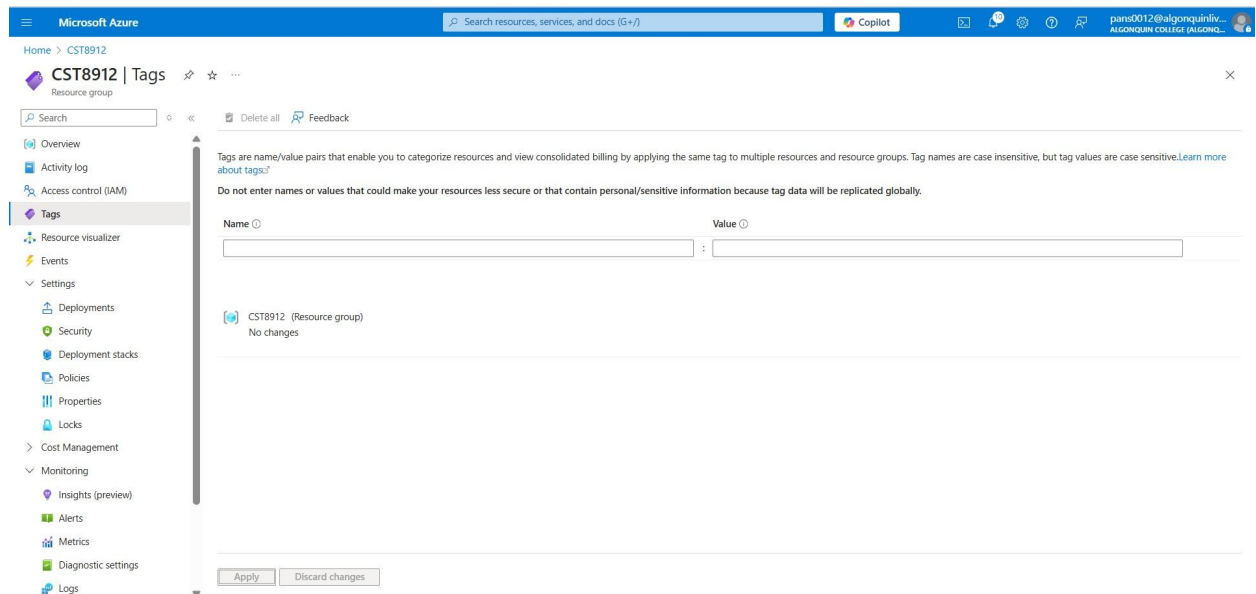
## Task 5: Clean up the resources

1. In the portal, search for and select Policy.
2. In the Authoring section, click Assignments, click the ellipsis icon to the right of the assignment you created in the previous task and click Delete assignment.

The screenshot shows the Microsoft Azure portal interface for the 'Policy | Assignments' section. The left navigation pane shows the 'Policy' section expanded, with 'Assignments' selected. The main content area displays a list of policy assignments. A modal dialog box is open, asking 'Do you want to delete the policy assignment? Inherit a tag from the resource group if missing?' with 'Yes' and 'No' buttons. The dialog box is titled 'Delete assignment'.

3. In the portal, search for and select Storage accounts.

- In the list of storage accounts, select the resource group corresponding to the storage account you created in the last task of this lab. Select Tags and click Delete (Trash can to the right) to the Role:Infra tag and press Apply.



- Click Overview and click Delete on the top of the storage account blade. When prompted for the confirmation, in the Delete storage account blade, type the name of the storage account to confirm and click Delete.

