

CLOUD COMPUTING
LAB 13



Submitted To:
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BSE V-A
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Task 1 — Create IAM Group and Output Details

task1_project_directory.png

```
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13 (main) $ mkdir -p ~/Lab13
cd ~/Lab13
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13/Lab13 (main) $
```

task1_file_created.png

```
● @KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13/Lab13 (main) $ ls
main.tf
```

task1_main_tf.png

```
Task > main.tf > output "group_details"
provider "aws" {
    shared_config_files      = ["~/.aws/config"]
    shared_credentials_files = ["~/.aws/credentials"]
}

resource "aws_iam_group" "developers" {
```

task1_terraform_init.png

```
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform init
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.
```

task1_terraform_apply.png

```
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13/Lab13 (main) $ terraform apply -auto-approve
Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

Outputs:

group_details = {
    "group_arn" = "arn:aws:iam::941618064465:group/groups/developers"
    "group_name" = "developers"
    "unique_id" = "AGPA5WPGPNRISOVQNE5"
```

task1_terraform_output.png

```
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13/Lab13 (main) $ terraform
group_details = {
    "group_arn" = "arn:aws:iam::941618064465:group/groups/developers"
    "group_name" = "developers"
    "unique_id" = "AGPA5WPGPNRISOVQNE5"
```

task1_aws_console_group.png

The screenshot shows the AWS IAM Groups page. At the top, there's a search bar and a 'Create group' button. Below that, a table lists one user group:

Group name	Users	Permissions	Creation time
developers	0	Defined	1 minute ago

Task 2 — Create IAM User with Group Membership

task2_main_tf_user.png

```
Task > ⚡ main.tf > ⚡ output "user_details"
output "group_details" {
}

resource "aws_iam_user" "lb" {
  name = "loadbalancer"
  path = "/users/"
  force_destroy = true
  tags = {
    DisplayName = "Load Balancer"
  }
}
```

task2_terraform_apply.png

```
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13/Lab13 (main) $ terraform apply -auto-approve

  "group_arn" = "arn:aws:iam::941618064465:group/groups/developers"
  "group_name" = "developers"
  "unique_id" = "AGPA5WPGPNRISOVQPNES"
}
user_details = {
  "unique_id" = "AIDA5WPGPNRI5E5P3HF3E"
  "user_arn" = "arn:aws:iam::941618064465:user/users/loadbalancer"
  "user_name" = "loadbalancer"
```

task2_terraform_output.png

```
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform output
group_details = {
  "group_arn" = "arn:aws:iam::941618064465:group/groups/developers"
  "group_name" = "developers"
  "unique_id" = "AGPA5WPGPNR1WSOVQPNE5"
}
user_details = {
  "unique_id" = "AIDA5WPGPNR15E5P3HF3E"
  "user_arn" = "arn:aws:iam::941618064465:user/users/loadbalancer"
  "user_name" = "loadbalancer"
```

task2_aws_console_user.png

task2_aws_console_user_groups.png

Summary		Creation time	ARN
User group name	developers	January 31, 2026, 17:55 (UTC+00:00)	arn:aws:lambda:797096399715:group/developers
Users (1)	Permissions	Access Advisor	Edit
Users in this group (1)		Remove	Add users
An IAM user is an entity that you create in AWS to represent the person or application that uses it to interact with AWS.			
<input type="text"/> Search		Groups	Last activity
<input type="checkbox"/> User name		Creation time	
<input type="checkbox"/> loadbalancer		None	3 minutes ago

Task 3 — Attach Policies to IAM Group

task3_main_tf_policies.png

```
Task > main.tf > resource "aws_iam_group_policy_attachment" "change_password"
output "user_details" {
}

resource "aws_iam_group_policy_attachment" "developer_ec2_fullaccess" {
    group = aws_iam_group.developers.name
    policy_arn = "arn:aws:iam::aws:policy/AmazonEC2FullAccess"
```

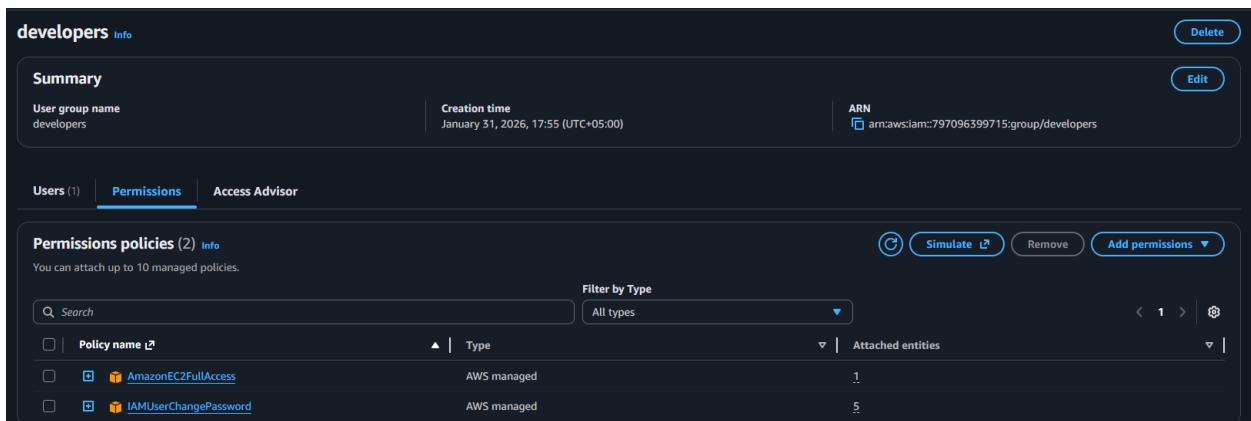
task3_terraform_apply.png

```
@KomalKashif ➔ /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform apply -auto-approve
Apply complete! Resources: 2 added, 0 changed, 0 destroyed.

Outputs:

group_details = {
  "group_arn" = "arn:aws:iam::941618064465:group/groups/developers"
  "group_name" = "developers"
```

task3_aws_console_policies.png



Task 4 — Create Login Profile for IAM User

task4_variables_tf.png

```
variable "iam_password" {
  description = "Temporary password for the IAM user"
  type        = string
  sensitive   = true
  default     = "IdontKnow"
}
```

task4_create_login_script.png

```
Task > $ create-login-profile.sh
#!/usr/bin/env bash
set -euo pipefail

USERNAME="$1"
PASSWORD="$2"
```

task4_chmod_script.png

task4_main_tf_login_profile.png

```
resource "null_resource" "create_login_profile" {
  triggers = {
    password_hash = sha256(var.iam_password)
    user          = aws_iam_user.lb.name
  }
}
```

task4_terraform_apply.png

```
@KomalKashif ➔ /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform apply -auto-approve
Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

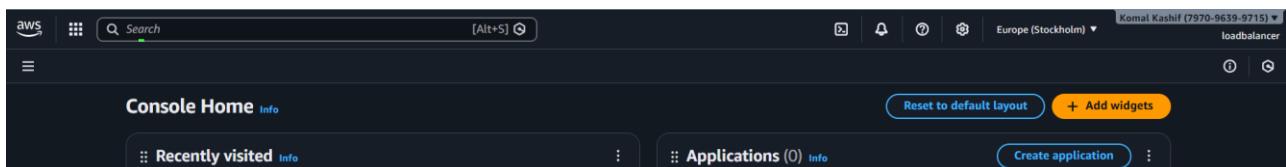
Outputs:

group_details = {
  "group_arn" = "arn:aws:iam::941618064465:group/groups/developers"
  "group_name" = "developers"
```

task4_aws_cli_verify.png

```
@KomalKashif ➔ /workspaces/CC_KomalKashif_031-Lab-13 (main) $ aws iam get-login-profile \
  --user-name loadbalancer
{
  "LoginProfile": {
    "UserName": "loadbalancer",
    "CreateDate": "2026-01-28T08:31:30+00:00",
    "PasswordResetRequired": true
  }
}
```

task4_aws_console_login.png



Task 5 — Generate Access Keys for IAM User

task5_main_tf_access_keys.png

```
Task > 🏛 main.tf > ...
# Access key for IAM user
resource "aws_iam_access_key" "lb_access_key" {
  user = aws_iam_user.lb.name
```

task5_terraform_apply.png

```
@KomalKashif ➔ /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform apply -auto-approve -var="iam_password=MySecurePass123!"
Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
```

task5_terraform_output.png

```
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform output
access_key_id = "AKIA5WPGPNRIYT2DNYFM"
access_key_secret = <sensitive>
group_details = {
  "group_arn" = "arn:aws:iam::941618064465:group/groups/developers"
  "group_name" = "developers"
  "unique_id" = "AGPA5WPGPNRIWSOVQPNE5"
}
user_details = {
  "unique_id" = "AIDA5WPGPNRI5E5P3HF3E"
  "user_arn" = "arn:aws:iam::941618064465:user/users/loadbalancer"
  "user_name" = "loadbalancer"
```

task5_tfstate_secret.png

```
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13 (main) $ cat terraform.tfstate | grep -A 10 "access_key_secret"
"access_key_secret": {
  "value": "O9BbFIWKW7J5vRngSzuvVZTiMkUXFtCMoBc9122",
  "type": "string",
  "sensitive": true
},
"group_details": {
  "value": {
    "group_arn": "arn:aws:iam::941618064465:group/groups/developers",
    "group_name": "developers",
    "unique_id": "AGPA5WPGPNRIWSOVQPNE5"
```

Task 6 — Implement Terraform Remote State with S3

task6_main_tf_backend.png

```
terraform {
  backend "s3" {
    bucket = "myapp-s3-bucket-laab13"
    key    = "myapp/terraform.tfstate"
    region = "me-central-1"
    encrypt = true
    use_lockfile = true
```

task6_terraform_init_migrate.png

```
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform init -migrate-state
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.
```

task6_terraform_apply.png

```
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform apply -auto-approve -var="iam_password=MySecurePass123!"
Apply complete! Resources: 0 added, 0 changed, 0 destroyed.
```

task6_local_state_backup.png

```
@KomalKashif → /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform ls -la terraform.tfstate*
-rw-rw-rw- 1 vscode vscode     0 Jan 28 09:02 terraform.tfstate
-rw-rw-rw- 1 vscode vscode 6882 Jan 28 09:02 terraform.tfstate.backup
```

task6_terraform_destroy.png

```
@KomalKashif ➔ /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform destroy -auto-approve
aws_iam_group_policy_attachment.developer_ec2_fullaccess: Destruction complete after 1s
aws_iam_user_group_membership.lb_membership: Destruction complete after 1s
aws_iam_group.developers: Destroying... [id=developers]
aws_iam_access_key.lb_access_key: Destruction complete after 1s
aws_iam_user.lb: Destroying... [id=loadbalancer]
aws_iam_group.developers: Destruction complete after 1s
aws_iam_user.lb: Destruction complete after 3s

Destroy complete! Resources: 7 destroyed.
```

Task 7 — Create Multiple Users from CSV File

task7_locals_tf.png

```
Task > 🏛 locals.tf > 📁 locals
locals {
  users = csvdecode(file("users.csv"))
}
```

task7_users_csv.png

```
Task > 📜 users.csv
user_name
Michael
Dwight
Jim
Pam
Ryan
```

task7_main_tf_multiple_users.png

```
Task > 🏛 main.tf > 📁 resource "aws_iam_access_key" "users_access_keys" > ⚒ user
# Create multiple IAM users from CSV
resource "aws_iam_user" "users" {
  for_each = { for user in local.users : user.user_name => user }

  name      = each.value.user_name
  path      = "/users/"
  force_destroy = true
```

task7_terraform_init.png

```
@KomalKashif ➔ /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform init
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.
```

task7_terraform_apply.png

```
@KomalKashif ➔ /workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform apply -auto-approve -var="iam_password=MySecurePass123!"
Apply complete! Resources: 107 added, 0 changed, 0 destroyed.
```

Cleanup:

cleanup_destroy_complete.png

```
@KomalKashif ~/workspaces/CC_KomalKashif_031-Lab-13 (main) $ terraform destroy -auto-approve
aws_iam_user.users["Dwight"]: Destruction complete after 3s
aws_iam_user.users["Phyllis"]: Destruction complete after 3s
aws_iam_user.users["Robert"]: Destruction complete after 3s
aws_iam_user.users["Jim"]: Destruction complete after 5s
aws_iam_user.users["David"]: Destruction complete after 3s
aws_iam_user.users["Peter"]: Destruction complete after 3s
aws_iam_user.users["Michael"]: Destruction complete after 3s
aws_iam_user.users["Meredith"]: Destruction complete after 5s
aws_iam_user.users["Kevin"]: Destruction complete after 8s

Destroy complete! Resources: 107 destroyed.
```

cleanup_aws_console_users_deleted.png

These are just the previous users which are left.

User name	Path	Groups	Last activity	MFA	Password age	Console last sign-in	Access key ID	Active key age	Active key	Access
Admin	/	0	12 days ago	-	24 days	24 days ago	Active - AKIA3TFVF2N...	12 days	1	
Assignment-2	/	0	31 days ago	-	32 days	-	Active - AKIA3TFVF2N...	32 days	3	
KomalKashif	/	0	17 hours ago	-	-	-	Active - AKIA3TFVF2N...	4 days	1	
Lab15	/	0	6 days ago	-	14 days	-	Active - AKIA3TFVF2N...	14 days	6	

cleanup_aws_console_group_deleted.png

Group name	Users	Permissions	Creation time
No resources to display			

cleanup_final_files.png

```
total 44
drwxrwxrwx+ 3 vscode vscode 4096 Jan 28 09:12 .
drwxrwxrwx+ 3 vscode vscode 4096 Jan 28 07:46 ..
-rwxrwxrwx  1 vscode vscode  422 Jan 28 08:26 create-login-profile.sh
-rw-rw-rw-  1 vscode vscode   49 Jan 28 09:11 locals.tf
-rw-rw-rw-  1 vscode vscode 2535 Jan 28 09:16 main.tf
-rw-rw-rw-  1 vscode vscode    0 Jan 28 07:46 README.md
drwxr-xr-x+ 3 vscode vscode 4096 Jan 28 09:02 .terraform
-rw-r--r--  1 vscode vscode 2422 Jan 28 08:31 .terraform.lock.hcl
-rw-rw-rw-  1 vscode vscode    0 Jan 28 09:02 terraform.tfstate
-rw-rw-rw-  1 vscode vscode 6882 Jan 28 09:02 terraform.tfstate.backup
-rw-rw-rw-  1 vscode vscode  166 Jan 28 09:13 users.csv
-rw-rw-rw-  1 vscode vscode  149 Jan 28 08:25 variables.tf
```