FATIMA JINNAH WOMEN UNIVERSITY

Submitted To:

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Section:

5A

Cloud Computing

LAB 10

TASK 1and 2

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ sudo apt update
Building dependency tree... Done
Reading state information... Done
51 packages can be upgraded. Run 'apt list --upgradable' to see them.
@23-22411-027-max ➜/workspaces/lab10cc (main) $ sudo apt install gh -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
gh is already the newest version (2.83.1).
0 upgraded, 0 newly installed, 0 to remove and 51 not upgraded.
@23-22411-027-max ➜/workspaces/lab10cc (main) $ gh --version
gh version 2.83.1 (2025-11-13)
https://github.com/cli/cli/releases/tag/v2.83.1
@23-22411-027-max ➜/workspaces/lab10cc (main) $ gh auth login -s codespace
? Where do you use GitHub? GitHub.com
The value of the GITHUB_TOKEN environment variable is being used for authentication.
To have GitHub CLI store credentials instead, first clear the value from the environment.
@23-22411-027-max ➜/workspaces/lab10cc (main) $
@23-22411-027-max ➜/workspaces/lab10cc (main) $
@23-22411-027-max ➜/workspaces/lab10cc (main) $ gh codespace list
NAME                 DISPLAY NAME  REPOSITORY          BRANCH  STATE      CREATED AT
humble-lamp-96vxx...  humble lamp   23-22411-027-max/...  main    Available  about 15 minutes ago
@23-22411-027-max ➜/workspaces/lab10cc (main) $ ^C
@23-22411-027-max ➜/workspaces/lab10cc (main) $ gh codespace ssh -c humble-lamp-96vxx...
getting full codespace details: HTTP 404: Not Found (https://api.github.com/user/codespaces/humbl
e-lamp-96vxx...?internal=true&refresh=true)
```

```
  inflating: aws/dist/awscli/topics/s3-faq.rst
  inflating: aws/dist/awscli/topics/return-codes.rst
  inflating: aws/dist/awscli/topics/s3-config.rst
  inflating: aws/dist/awscli/topics/config-vars.rst
  inflating: aws/dist/awscli/topics/ddb-expressions.rst
  inflating: aws/dist/awscli/data/metadata.json
  inflating: aws/dist/awscli/data/ac.index
  inflating: aws/dist/awscli/data/cli.json
   creating: aws/dist/prompt_toolkit-3.0.51.dist-info/licenses/
  inflating: aws/dist/prompt_toolkit-3.0.51.dist-info/INSTALLER
  inflating: aws/dist/prompt_toolkit-3.0.51.dist-info/WHEEL
  inflating: aws/dist/prompt_toolkit-3.0.51.dist-info/RECORD
  inflating: aws/dist/prompt_toolkit-3.0.51.dist-info/top_level.txt
  inflating: aws/dist/prompt_toolkit-3.0.51.dist-info/METADATA
  inflating: aws/dist/prompt_toolkit-3.0.51.dist-info/licenses/LICENSE
  inflating: aws/dist/prompt_toolkit-3.0.51.dist-info/licenses/AUTHORS.rst
  inflating: aws/dist/wheel-0.45.1.dist-info/LICENSE.txt
  inflating: aws/dist/wheel-0.45.1.dist-info/INSTALLER
  inflating: aws/dist/wheel-0.45.1.dist-info/RECORD
  inflating: aws/dist/wheel-0.45.1.dist-info/entry_points.txt
  inflating: aws/dist/wheel-0.45.1.dist-info/WHEEL
  inflating: aws/dist/wheel-0.45.1.dist-info/METADATA
  inflating: aws/dist/wheel-0.45.1.dist-info/REQUESTED
  inflating: aws/dist/wheel-0.45.1.dist-info/direct_url.json
You can now run: /usr/local/bin/aws --version
```

```
  inflating: aws/dist/wheel-0.45.1.dist-info/direct_url.json
You can now run: /usr/local/bin/aws --version
@23-22411-027-max ➜/workspaces/lab10cc (main) $ aws --version
aws-cli/2.32.26 Python/3.13.11 Linux/6.8.0-1030-azure exe/x86_64.ubuntu.24
@23-22411-027-max ➜/workspaces/lab10cc (main) $ aws configure
AWS Access Key ID [None]: AKIATC2FAR6CN26MZ4OS
AWS Secret Access Key [None]: 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
Default region name [None]: me-central-1
Default output format [None]: json
@23-22411-027-max ➜/workspaces/lab10cc (main) $ cat ~/.aws/credentials
cat ~/.aws/config
[default]
aws_access_key_id = AKIATC2FAR6CN26MZ4OS
aws_secret_access_key = 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
[default]
region = me-central-1
output = json
@23-22411-027-max ➜/workspaces/lab10cc (main) $ aws sts get-caller-identity
{
    "UserId": "AIDATC2FAR6CKZM7UCAFY",
    "Account": "212208750468",
    "Arn": "arn:aws:iam::212208750468:user/Admin"
}
@23-22411-027-max ➜/workspaces/lab10cc (main) $ wget -O- https://apt.releases.hashicorp.com/gpg
| sudo gpg --dearmor -o /usr/share/keyrings/hashicorp-archive-keyring.gpg
--2026-01-01 16:29:14--  https://apt.releases.hashicorp.com/gpg

Resolving apt.releases.hashicorp.com (apt.releases.hashicorp.com)... 18.172.78.12, 18.172.78.3
18.172.78.65, ...
Connecting to apt.releases.hashicorp.com (apt.releases.hashicorp.com)|18.172.78.12|:443... cor
ted.
HTTP request sent, awaiting response... 200 OK
Length: 3980 (3.9K) [binary/octet-stream]
Saving to: 'STDOUT'

-                       100%[=================================>]   3.89K  --.-KB/s    in 0s

2026-01-01 16:29:14 (838 MB/s) - written to stdout [3980/3980]

@23-22411-027-max ➜/workspaces/lab10cc (main) $ echo "deb [arch=$(dpkg --print-architecture)
ned-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg] https://apt.releases.hashicorp.com $
ep -oP '(?<=UBUNTU_CODENAME=).*' /etc/os-release || lsb_release -cs) main" | sudo tee /etc/apt
urces.list.d/hashicorp.list
deb [arch=amd64 signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg] https://apt.relea
.hashicorp.com noble main
@23-22411-027-max ➜/workspaces/lab10cc (main) $ sudo apt update
sudo apt install terraform -y
Get:1 https://apt.releases.hashicorp.com noble InRelease [12.9 kB]
Hit:2 https://packages.microsoft.com/repos/microsoft-ubuntu-noble-prod noble InRelease
Get:3 https://apt.releases.hashicorp.com noble/main amd64 Packages [266 kB]
Hit:4 https://repo.anaconda.com/pkgs/misc/debrepo/conda stable InRelease
Hit:5 https://dl.yarnpkg.com/debian stable InRelease
Hit:6 http://archive.ubuntu.com/ubuntu noble InRelease
```

```
Building dependency tree... Done
Reading state information... Done
51 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  terraform
0 upgraded, 1 newly installed, 0 to remove and 51 not upgraded.
Need to get 30.6 MB of archives.
After this operation, 101 MB of additional disk space will be used.
Get:1 https://apt.releases.hashicorp.com noble/main amd64 terraform amd64 1.14.3-1 [30.6 MB]
Fetched 30.6 MB in 0s (138 MB/s)
Selecting previously unselected package terraform.
(Reading database ... 58629 files and directories currently installed.)
Preparing to unpack .../terraform_1.14.3-1_amd64.deb ...
Unpacking terraform (1.14.3-1) ...
Setting up terraform (1.14.3-1) ...
@23-22411-027-max ➜/workspaces/lab10cc (main) $ which terraform
terraform --version
/usr/bin/terraform
Terraform v1.14.3
on linux_amd64
@23-22411-027-max ➜/workspaces/lab10cc (main) $
@23-22411-027-max ➜/workspaces/lab10cc (main) $ vim main.tf
```

```
on linux_amd64
@23-22411-027-max ➜/workspaces/lab10cc (main) $
@23-22411-027-max ➜/workspaces/lab10cc (main) $ vim main.tf
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform init
Initializing the backend...
Initializing provider plugins...
- Finding latest version of hashicorp/aws...
- Installing hashicorp/aws v6.27.0...
- Installed hashicorp/aws v6.27.0 (signed by HashiCorp)
Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.

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.
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ cat .terraform.lock.hcl
# This file is maintained automatically by "terraform init".
# Manual edits may be lost in future updates.

provider "registry.terraform.io/hashicorp/aws" {
  version = "6.27.0"
  hashes = [
    "h1:bixp2PSsP5ZGBczGCxcbSDn6lF5QFlUXlNroq9cdab4=",
    "zh:177a24b806c72e8484b5cabc93b2b38e3d770ae6f745a998b54d6619fd0e8129",
    "zh:4ac4a85c14fb868a3306b542e6a56c10bd6c6d5a67bc0c9b8f6a9060cf5f3be7",
    "zh:552652185bc85c8ba1da1d65dea47c454728a5c6839c458b6dcd3ce71c19ccfc",
    "zh:60284b8172d09aee91eae0856f09855eaf040ce3a58d6933602ae17c53f8ed04",
    "zh:6be38d156756ca61fb8e7c752cc5d769cd709686700ac4b230f40a6e95b5dbc9",
    "zh:7a409138fae4ef42e3a637e37cb9efedf96459e28a3c764fc4e855e8db9a7485",
    "zh:8070cf5224ed1ed3a3e9a59f7c30ff88bf071c7567165275d477c1738a56c064",
    "zh:894439ef340a9a79f69cd759e27ad11c7826adeca27be1b1ca82b3c9702fa300",
    "zh:89d035eebf08a97c89374ff06040955ddc09f275ecca609d0c9d58d149bef5cf",
    "zh:985b1145d724fc1f38369099e4a5087141885740fd6c0b1dbc492171e73c2e49",
    "zh:9b12af85486a96aedd8d7984b0ff811a4b42e3d88dad1a3fb4c0b580d04fa425",
    "zh:a80b47ae8d1475201c86bd94a5dcb9dd4da5e8b73102a90820b68b66b76d50fd",
    "zh:d3395be1556210f82199b9166a6b2e677cee9c4b67e96e63f6c3a98325ad7ab0",
    "zh:db0b869d09657f6f1e4110b56093c5fcdf9dbdd97c020db1e577b239c0adcbce",
    "zh:ffc72e680370ae7c21f9bd3082c6317730df805c6797427839a6b6b7e9a26a01",
  ]
}
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

```
    "zh:d3395be1556210f82199b9166a6b2e677cee9c4b67e96e63f6c3a98325ad7ab0",
    "zh:db0b869d09657f6f1e4110b56093c5fcdf9dbdd97c020db1e577b239c0adcbce",
    "zh:ffc72e680370ae7c21f9bd3082c6317730df805c6797427839a6b6b7e9a26a01",
  ]
}
@23-22411-027-max ➜/workspaces/lab10cc (main) $ ls .terraform/
providers
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

TASK3

```
provider "aws" {
  shared_config_files      = ["~/.aws/config"]
  shared_credentials_files = ["~/.aws/credentials"]
}
# Create a VPC
resource "aws_vpc" "development_vpc" {
  cidr_block = "10.0.0.0/16"
}

# Create a Subnet
resource "aws_subnet" "dev_subnet_1" {
  vpc_id            = aws_vpc.development_vpc.id
  cidr_block        = "10.0.10.0/24"
  availability_zone = "me-central-1a"
}
~
```

```
            "BlockPublicAccessStates": {
                "InternetGatewayBlockMode": "off"
            },
            "SubnetId": "subnet-0465ba73cad9d00ea",
            "State": "available",
            "VpcId": "vpc-0da9fd3963ba1b855",
            "CidrBlock": "10.0.10.0/24",
            "AvailableIpAddressCount": 251,
:
{
    "Subnets": [
        {
            "AvailabilityZoneId": "mec1-az1",
            "MapCustomerOwnedIpOnLaunch": false,
            "OwnerId": "212208750468",
            "AssignIpv6AddressOnCreation": false,
            "Ipv6CidrBlockAssociationSet": [],
            "SubnetArn": "arn:aws:ec2:me-central-1:212208750468:subnet/subnet-0465ba73cad9d00ea",
            "EnableDns64": false,
            "Ipv6Native": false,
            "PrivateDnsNameOptionsOnLaunch": {
                "HostnameType": "ip-name",
                "EnableResourceNameDnsARecord": false,
                "EnableResourceNameDnsAAAARecord": false
            },
            "BlockPublicAccessStates": {
```

```
{
    "Subnets": [
        {
            "AvailabilityZoneId": "mec1-az1",
            "MapCustomerOwnedIpOnLaunch": false,
            "OwnerId": "212208750468",
            "AssignIpv6AddressOnCreation": false,
            "Ipv6CidrBlockAssociationSet": [],
            "SubnetArn": "arn:aws:ec2:me-central-1:212208750468:subnet/subnet-0465ba73cad9d00e
            "EnableDns64": false,
            "Ipv6Native": false,
            "PrivateDnsNameOptionsOnLaunch": {
                "HostnameType": "ip-name",
                "EnableResourceNameDnsARecord": false,
                "EnableResourceNameDnsAAAARecord": false
            },
            "BlockPublicAccessStates": {
                "InternetGatewayBlockMode": "off"
            },
            "SubnetId": "subnet-0465ba73cad9d00ea",
            "State": "available",
            "VpcId": "vpc-0da9fd3963ba1b855",
            "CidrBlock": "10.0.10.0/24",
            "AvailableIpAddressCount": 251,
            "AvailabilityZone": "me-central-1a",
:
```



```
}
@23-22411-027-max →/workspaces/lab10cc (main) $ aws ec2 describe-subnets --filter "Name=subnet-i
d,Values=subnet-0465ba73cad9d00ea"
{
    "Subnets": [
        {
            "AvailabilityZoneId": "mec1-az1",
            "MapCustomerOwnedIpOnLaunch": false,
            "OwnerId": "212208750468",
            "AssignIpv6AddressOnCreation": false,
            "Ipv6CidrBlockAssociationSet": [],
            "SubnetArn": "arn:aws:ec2:me-central-1:212208750468:subnet/subnet-0465ba73cad9d00ea",
            "EnableDns64": false,
            "Ipv6Native": false,
            "PrivateDnsNameOptionsOnLaunch": {
                "HostnameType": "ip-name",
                "EnableResourceNameDnsARecord": false,
                "EnableResourceNameDnsAAAARecord": false
            },
            "BlockPublicAccessStates": {
                "InternetGatewayBlockMode": "off"
            },
            "SubnetId": "subnet-0465ba73cad9d00ea",
            "State": "available",
            "VpcId": "vpc-0da9fd3963ba1b855",
            "CidrBlock": "10.0.10.0/24",
```

```
provider "aws" {
  shared_config_files      = ["~/.aws/config"]
  shared_credentials_files = ["~/.aws/credentials"]
}

~
~
~
~
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~
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~
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~
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~
~
:wq
```

TASK4

main.tf

```
22  resource "aws_subnet" "dev_subnet_1_existing" {
23    vpc_id            = data.aws_vpc.existing_vpc.id
24    cidr_block        = "172.31.48.0/24"
25    availability_zone = "me-central-1a"
26  }
27
28
```

PROBLEMS OUTPUT TERMINAL PORTS bash

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform destroy -target=aws_subnet.dev_subnet_
1_existing
Warning: Applied changes may be incomplete

The plan was created with the -target option in effect, so some changes requested in the
configuration may have been ignored and the output values may not be fully updated. Run the
following command to verify that no other changes are pending:
    terraform plan

Note that the -target option is not suitable for routine use, and is provided only for
exceptional situations such as recovering from errors or mistakes, or when Terraform
specifically suggests to use it as part of an error message.


Destroy complete! Resources: 1 destroyed.
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

```
Destroy complete! Resources: 1 destroyed.
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform refresh
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-0da9fd3963ba1b855]
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0a3ccfa34f8ccf642]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0465ba73cad9d00ea]
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

```
aws_vpc.development_vpc: Refreshing state... [id=vpc-0da9fd3963ba1b855]
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0a3ccfa34f8ccf642]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0465ba73cad9d00ea]
@23-22411-027-max →/workspaces/lab10cc (main) $ terraform apply
```

```
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0465ba73cad9d00ea]
@23-22411-027-max →/workspaces/lab10cc (main) $ terraform apply
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-0da9fd3963ba1b855]
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0a3ccfa34f8ccf642]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0465ba73cad9d00ea]

Terraform used the selected providers to generate the following execution plan. Resource a
are indicated with the following symbols:
  + create

Terraform will perform the following actions:
```

```
    }

Plan: 1 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

  Enter a value: yes

aws_subnet.dev_subnet_1_existing: Creating...
aws_subnet.dev_subnet_1_existing: Creation complete after 1s [id=subnet-0d04b6c84b5b904cc]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
@23-22411-027-max →/workspaces/lab10cc (main) $
```

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```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform destroy
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-0da9fd3963ba1b855]
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0a3ccfa34f8ccf642]
aws_subnet.dev_subnet_1_existing: Refreshing state... [id=subnet-0d04b6c84b5b904cc]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-0465ba73cad9d00ea]

Terraform used the selected providers to generate the following execution plan. Resource action
are indicated with the following symbols:
  - destroy

Terraform will perform the following actions:

  # aws_subnet.dev_subnet_1 will be destroyed
  - resource "aws_subnet" "dev_subnet_1" {
      - arn                                            = "arn:aws:ec2:me-central-1:212208750468
ubnet/subnet-0465ba73cad9d00ea" -> null
      - assign_ipv6_address_on_creation                = false -> null
      - availability_zone                              = "me-central-1a" -> null
      - availability_zone_id                           = "mec1-az1" -> null
      - cidr_block                                     = "10.0.10.0/24" -> null
      - enable_dns64                                   = false -> null
      - enable_lni_at_device_index                     = 0 -> null
      - enable_resource_name_dns_a_record_on_launch    = false -> null
      - enable_resource_name_dns_aaaa_record_on_launch = false -> null
```

```
22411-027-max →/workspaces/lab10cc (main) $ terraform destroy
  - tags                                                = {} -> null
  - tags_all                                            = {} -> null
  - vpc_id                                              = "vpc-0a3ccfa34f8ccf642" -> null
    # (4 unchanged attributes hidden)
}

aws_vpc.development_vpc will be destroyed
resource "aws_vpc" "development_vpc" {
  - arn                                  = "arn:aws:ec2:me-central-1:212208750468:vpc/vpc-
963ba1b855" -> null
  - assign_generated_ipv6_cidr_block     = false -> null
  - cidr_block                           = "10.0.0.0/16" -> null
  - default_network_acl_id               = "acl-0ab2f4af542e19713" -> null
  - default_route_table_id               = "rtb-0f0c78e5eba33d650" -> null
  - default_security_group_id            = "sg-0f51d241d2df7cf5e" -> null
  - dhcp_options_id                      = "dopt-00ffe05575f320712" -> null
  - enable_dns_hostnames                 = false -> null
  - enable_dns_support                   = true -> null
  - enable_network_address_usage_metrics = false -> null
  - id                                   = "vpc-0da9fd3963ba1b855" -> null
  - instance_tenancy                     = "default" -> null
  - ipv6_netmask_length                  = 0 -> null
  - main_route_table_id                  = "rtb-0f0c78e5eba33d650" -> null
  - owner_id                             = "212208750468" -> null
  - region                               = "me-central-1" -> null
  - tags                                 = {} -> null
```

```
Plan: 0 to add, 0 to change, 3 to destroy.

Do you really want to destroy all resources?
  Terraform will destroy all your managed infrastructure, as shown above.
  There is no undo. Only 'yes' will be accepted to confirm.

  Enter a value: yes

aws_subnet.dev_subnet_1_existing: Destroying... [id=subnet-0d04b6c84b5b904cc]
aws_subnet.dev_subnet_1: Destroying... [id=subnet-0465ba73cad9d00ea]
aws_subnet.dev_subnet_1: Destruction complete after 1s
aws_subnet.dev_subnet_1_existing: Destruction complete after 1s
aws_vpc.development_vpc: Destroying... [id=vpc-0da9fd3963ba1b855]
aws_vpc.development_vpc: Destruction complete after 1s

Destroy complete! Resources: 3 destroyed.
@23-22411-027-max →/workspaces/lab10cc (main) $
```


PROBLEMS OUTPUT TERMINAL PORTS bash
@23-22411-027-max →/workspaces/lab10cc (main) $ terraform destroy
Destroy complete! Resources: 3 destroyed.
@23-22411-027-max →/workspaces/lab10cc (main) $ terraform plan
data.aws_vpc.existing_vpc: Reading...
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0a3ccfa34f8ccf642]
Terraform used the selected providers to generate the following execution plan. Resource actio
are indicated with the following symbols:
+ create
Terraform will perform the following actions:
# aws_subnet.dev_subnet_1 will be created
+ resource "aws_subnet" "dev_subnet_1" {
+ arn = (known after apply)
+ assign_ipv6_address_on_creation = false
+ availability_zone = "me-central-1a"
+ availability_zone_id = (known after apply)
+ cidr_block = "10.0.10.0/24"
+ enable_dns64 = false
+ enable_resource_name_dns_a_record_on_launch = false
+ enable_resource_name_dns_aaaa_record_on_launch = false
+ id = (known after apply)
+ ipv6_cidr_block_association_id = (known after apply)
+ ipv6_native = false
+ map_public_ip_on_launch = false
+ owner_id = (known after apply)
+ private_dns_hostname_type_on_launch = (known after apply)

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform plan
      + map_public_ip_on_launch                          = false
      + owner_id                                         = (known after apply)
      + private_dns_hostname_type_on_launch              = (known after apply)
      + region                                           = "me-central-1"
      + tags_all                                         = (known after apply)
      + vpc_id                                           = (known after apply)
    }

  # aws_subnet.dev_subnet_1_existing will be created
  + resource "aws_subnet" "dev_subnet_1_existing" {
      + arn                                            = (known after apply)
      + assign_ipv6_address_on_creation                = false
      + availability_zone                              = "me-central-1a"
      + availability_zone_id                           = (known after apply)
      + cidr_block                                     = "172.31.48.0/24"
      + enable_dns64                                   = false
      + enable_resource_name_dns_a_record_on_launch    = false
      + enable_resource_name_dns_aaaa_record_on_launch = false
      + id                                             = (known after apply)
      + ipv6_cidr_block_association_id                 = (known after apply)
      + ipv6_native                                    = false
      + map_public_ip_on_launch                        = false
      + owner_id                                       = (known after apply)
      + private_dns_hostname_type_on_launch            = (known after apply)
      + region                                         = "me-central-1"
      + tags_all                                       = (known after apply)
      + vpc_id                                         = "vpc-0a3ccfa34f8ccf642"
```

Ln 2

```
@23-22411-027-max →/workspaces/lab10cc (main) $ terraform plan

  # aws_vpc.development_vpc will be created
  + resource "aws_vpc" "development_vpc" {
      + arn                                  = (known after apply)
      + cidr_block                           = "10.0.0.0/16"
      + default_network_acl_id               = (known after apply)
      + default_route_table_id               = (known after apply)
      + default_security_group_id            = (known after apply)
      + dhcp_options_id                      = (known after apply)
      + enable_dns_hostnames                 = (known after apply)
      + enable_dns_support                   = true
      + enable_network_address_usage_metrics = (known after apply)
      + id                                   = (known after apply)
      + instance_tenancy                     = "default"
      + ipv6_association_id                  = (known after apply)
      + ipv6_cidr_block                      = (known after apply)
      + ipv6_cidr_block_network_border_group = (known after apply)
      + main_route_table_id                  = (known after apply)
      + owner_id                             = (known after apply)
      + region                               = "me-central-1"
      + tags_all                             = (known after apply)
    }

Plan: 3 to add, 0 to change, 0 to destroy.
```

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform apply
      + instance_tenancy                    = "default"
      + ipv6_association_id                 = (known after apply)
      + ipv6_cidr_block                     = (known after apply)
      + ipv6_cidr_block_network_border_group = (known after apply)
      + main_route_table_id                 = (known after apply)
      + owner_id                            = (known after apply)
      + region                              = "me-central-1"
      + tags_all                            = (known after apply)
    }

Plan: 3 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

  Enter a value: yes

aws_subnet.dev_subnet_1_existing: Creating...
aws_vpc.development_vpc: Creating...
aws_subnet.dev_subnet_1_existing: Creation complete after 1s [id=subnet-09699014af76d2361]
aws_vpc.development_vpc: Creation complete after 2s [id=vpc-05fa3b8da2b90e4f0]
aws_subnet.dev_subnet_1: Creating...
aws_subnet.dev_subnet_1: Creation complete after 0s [id=subnet-06f7de8d8bcc68a78]
```

main.tf

main.tf

```
12  resource "aws_vpc" "development_vpc" {
13  }
14
15  # Create a subnet in the VPC
16  resource "aws_subnet" "dev_subnet_1" {
17    vpc_id            = aws_vpc.development_vpc.id
18    cidr_block        = "10.0.10.0/24"
19    availability_zone = "me-central-1a"
20    tags = {
21      Name = "subnet-1-dev"
22    }
23  }
24
25  # Create a subnet in the existing default VPC
26  resource "aws_subnet" "dev_subnet_1_existing" {
27    vpc_id            = data.aws_vpc.existing_vpc.id
```

```
resource "aws_subnet" "dev_subnet_1_existing" {
  vpc_id            = data.aws_vpc.existing_vpc.id
  cidr_block        = "172.31.48.0/24"
  availability_zone = "me-central-1a"
  tags = {
    Name = "subnet-1-default"
  }
}

# Data source for existing default VPC
data "aws_vpc" "existing_vpc" {
  default = true
}
```

```
@23-22411-027-max →/workspaces/lab10cc (main) $ terraform refresh
terraform apply -auto-approve
  # aws_vpc.development_vpc will be updated in-place
  ~ resource "aws_vpc" "development_vpc" {
        id                                   = "vpc-05fa3b8da2b90e4f0"
      ~ tags                                 = {
          + "Name"    = "development"
          + "vpc_env" = "dev"
        }
      ~ tags_all                             = {
          + "Name"    = "development"
          + "vpc_env" = "dev"
        }
        # (19 unchanged attributes hidden)
    }

Plan: 0 to add, 3 to change, 0 to destroy.
aws_vpc.development_vpc: Modifying... [id=vpc-05fa3b8da2b90e4f0]
aws_subnet.dev_subnet_1_existing: Modifying... [id=subnet-09699014af76d2361]
aws_subnet.dev_subnet_1_existing: Modifications complete after 1s [id=subnet-09699014af76d
aws_vpc.development_vpc: Modifications complete after 1s [id=vpc-05fa3b8da2b90e4f0]
aws_subnet.dev_subnet_1: Modifying... [id=subnet-06f7de8d8bcc68a78]
aws_subnet.dev_subnet_1: Modifications complete after 0s [id=subnet-06f7de8d8bcc68a78]

Apply complete! Resources: 0 added, 3 changed, 0 destroyed.
```

```
terraform apply -auto-approve
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform plan
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-05fa3b8da2b90e4f0]
data.aws_vpc.existing_vpc: Read complete after 1s [id=vpc-0a3ccfa34f8ccf642]
aws_subnet.dev_subnet_1_existing: Refreshing state... [id=subnet-09699014af76d2361]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-06f7de8d8bcc68a78]

No changes. Your infrastructure matches the configuration.

Terraform has compared your real infrastructure against your configuration and found no
differences, so no changes are needed.
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform apply
data.aws_vpc.existing_vpc: Reading...
aws_vpc.development_vpc: Refreshing state... [id=vpc-05fa3b8da2b90e4f0]
data.aws_vpc.existing_vpc: Read complete after 0s [id=vpc-0a3ccfa34f8ccf642]
aws_subnet.dev_subnet_1_existing: Refreshing state... [id=subnet-09699014af76d2361]
aws_subnet.dev_subnet_1: Refreshing state... [id=subnet-06f7de8d8bcc68a78]

No changes. Your infrastructure matches the configuration.

Terraform has compared your real infrastructure against your configuration and found no
differences, so no changes are needed.

Apply complete! Resources: 0 added, 0 changed, 0 destroyed.
```

TASK5

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform destroy

Do you really want to destroy all resources?
  Terraform will destroy all your managed infrastructure, as shown above.
  There is no undo. Only 'yes' will be accepted to confirm.

  Enter a value: yes

aws_subnet.dev_subnet_1: Destroying... [id=subnet-06f7de8d8bcc68a78]
aws_subnet.dev_subnet_1_existing: Destroying... [id=subnet-09699014af76d2361]
aws_subnet.dev_subnet_1_existing: Destruction complete after 1s
aws_subnet.dev_subnet_1: Destruction complete after 1s
aws_vpc.development_vpc: Destroying... [id=vpc-05fa3b8da2b90e4f0]
aws_vpc.development_vpc: Destruction complete after 0s

Destroy complete! Resources: 3 destroyed.
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ cat terraform.tfstate
{
  "version": 4,
  "terraform_version": "1.14.3",
  "serial": 28,
  "lineage": "76201655-f6c4-bc86-9160-4def2625cba3",
  "outputs": {},
  "resources": [],
  "check_results": null
}
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ cat terraform.tfstate.backup
          },
          "sensitive_attributes": [],
          "identity_schema_version": 0,
          "identity": {
            "account_id": "212208750468",
            "id": "vpc-05fa3b8da2b90e4f0",
            "region": "me-central-1"
          },
          "private": "eyJzY2hlbWFfdmVyc2lvbiI6IjEifQ=="
        }
      ]
    }
  ],
  "check_results": null
}
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

Ln 39, Col 1 (878 selected) Sp

```
Apply complete! Resources: 3 added, 0 changed, 0 destroyed.
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform state list
data.aws_vpc.existing_vpc
aws_subnet.dev_subnet_1
aws_subnet.dev_subnet_1_existing
aws_vpc.development_vpc
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

Ln 39, Col 1

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform state show aws_vpc.development_vpc
    ipv6_cidr_block_network_border_group = null
    ipv6_ipam_pool_id                    = null
    ipv6_netmask_length                  = 0
    main_route_table_id                  = "rtb-0c4e47cc9ad968398"
    owner_id                             = "212208750468"
    region                               = "me-central-1"
    tags                                 = {
        "Name"    = "development"
        "vpc_env" = "dev"
    }
    tags_all                             = {
        "Name"    = "development"
        "vpc_env" = "dev"
    }
}
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

TASK6

main.tf

```
35  # Data source for existing default VPC
36  data "aws_vpc" "existing_vpc" {
37    default = true
38
39  }
40  output "dev-vpc-id" {
41    value = aws_vpc.development_vpc.id
42  }
43  output "dev-subnet-id" {
44    value = aws_subnet.dev_subnet_1.id
45  }
46  output "dev-vpc-arn" {
47    value = aws_vpc.development_vpc.arn
48  }
49  output "dev-subnet-arn" {
50    value = aws_subnet.dev_subnet_1.arn
51  }
52
```

```
}
output "dev-vpc-cidr_block" {
  value = aws_vpc.development_vpc.cidr_block
}
output "dev-vpc-region" {
  value = aws_vpc.development_vpc.region
}
output "dev-vpc-tags_name" {
  value = aws_vpc.development_vpc.tags["Name"]
}
output "dev-vpc-tags_all" {
  value = aws_vpc.development_vpc.tags_all
}
output "dev-subnet-cidr_block" {
  value = aws_subnet.dev_subnet_1.cidr_block
}
output "dev-subnet-region" {
  value = aws_subnet.dev_subnet_1.availability_zone
}
output "dev-subnet-tags_name" {
  value = aws_subnet.dev_subnet_1.tags["Name"]
}
```

```
output "dev-vpc-tags_name" {
  value = aws_vpc.development_vpc.tags["Name"]
}
output "dev-vpc-tags_all" {
  value = aws_vpc.development_vpc.tags_all
}
output "dev-subnet-cidr_block" {
  value = aws_subnet.dev_subnet_1.cidr_block
}
output "dev-subnet-region" {
  value = aws_subnet.dev_subnet_1.availability_zone
}
output "dev-subnet-tags_name" {
  value = aws_subnet.dev_subnet_1.tags["Name"]
}
output "dev-subnet-tags_all" {
  value = aws_subnet.dev_subnet_1.tags_all
}
```

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform apply
terraform apply

Terraform has compared your real infrastructure against your configuration and found no
differences, so no changes are needed.

Apply complete! Resources: 0 added, 0 changed, 0 destroyed.

Outputs:

dev-subnet-arn = "arn:aws:ec2:me-central-1:212208750468:subnet/subnet-0f155986ee54f6a7f"
dev-subnet-cidr_block = "10.0.10.0/24"
dev-subnet-id = "subnet-0f155986ee54f6a7f"
dev-subnet-region = "me-central-1a"
dev-subnet-tags_all = tomap({
  "Name" = "subnet-1-dev"
})
dev-subnet-tags_name = "subnet-1-dev"
dev-vpc-arn = "arn:aws:ec2:me-central-1:212208750468:vpc/vpc-08cca1cfbb8c158e1"
dev-vpc-cidr_block = "10.0.0.0/16"
dev-vpc-id = "vpc-08cca1cfbb8c158e1"
dev-vpc-region = "me-central-1"
dev-vpc-tags_all = tomap({
  "Name" = "development"
  "vpc_env" = "dev"
})
dev-vpc-tags_name = "development"
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

Ln 76, Col 1 Spaces

cleanup

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ terraform destroy
  - dev-subnet-tags_name  = "subnet-1-dev" -> null
  - dev-vpc-arn           = "arn:aws:ec2:me-central-1:212208750468:vpc/vpc-08cca1cfbb8c158e1" -
null
  - dev-vpc-cidr_block    = "10.0.0.0/16" -> null
  - dev-vpc-id            = "vpc-08cca1cfbb8c158e1" -> null
  - dev-vpc-region        = "me-central-1" -> null
  - dev-vpc-tags_all      = {
      - Name    = "development"
      - vpc_env = "dev"
    } -> null
  - dev-vpc-tags_name     = "development" -> null

Do you really want to destroy all resources?
  Terraform will destroy all your managed infrastructure, as shown above.
  There is no undo. Only 'yes' will be accepted to confirm.

  Enter a value: yes

aws_subnet.dev_subnet_1: Destroying... [id=subnet-0f155986ee54f6a7f]
aws_subnet.dev_subnet_1_existing: Destroying... [id=subnet-089e19f0e5620e1fa]
aws_subnet.dev_subnet_1: Destruction complete after 1s
aws_vpc.development_vpc: Destroying... [id=vpc-08cca1cfbb8c158e1]
aws_subnet.dev_subnet_1_existing: Destruction complete after 1s
aws_vpc.development_vpc: Destruction complete after 1s

Destroy complete! Resources: 3 destroyed.
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```

```
@23-22411-027-max ➜/workspaces/lab10cc (main) $ cat terraform.tfstate
cat terraform.tfstate.backup
            "tags": {
              "Name": "development",
              "vpc_env": "dev"
            },
            "tags_all": {
              "Name": "development",
              "vpc_env": "dev"
            }
          },
          "sensitive_attributes": [],
          "identity_schema_version": 0,
          "identity": {
            "account_id": "212208750468",
            "id": "vpc-08cca1cfbb8c158e1",
            "region": "me-central-1"
          },
          "private": "eyJzY2hlbWFfdmVyc2lvbiI6IjEifQ=="
        }
      ]
    }
  ],
  "check_results": null
}
@23-22411-027-max ➜/workspaces/lab10cc (main) $
```