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B2 DevOps

SPCM LAB

Experiment 1

```
x leon@192 ~$ sudo dnf install terraform -y
Hashicorp Stable - x86_64 786 kB/s | 1.3 MB 00:01
Last metadata expiration check: 0:00:01 ago on Fri 16 Feb 2024 01:18:39 AM IST.
Dependencies resolved.

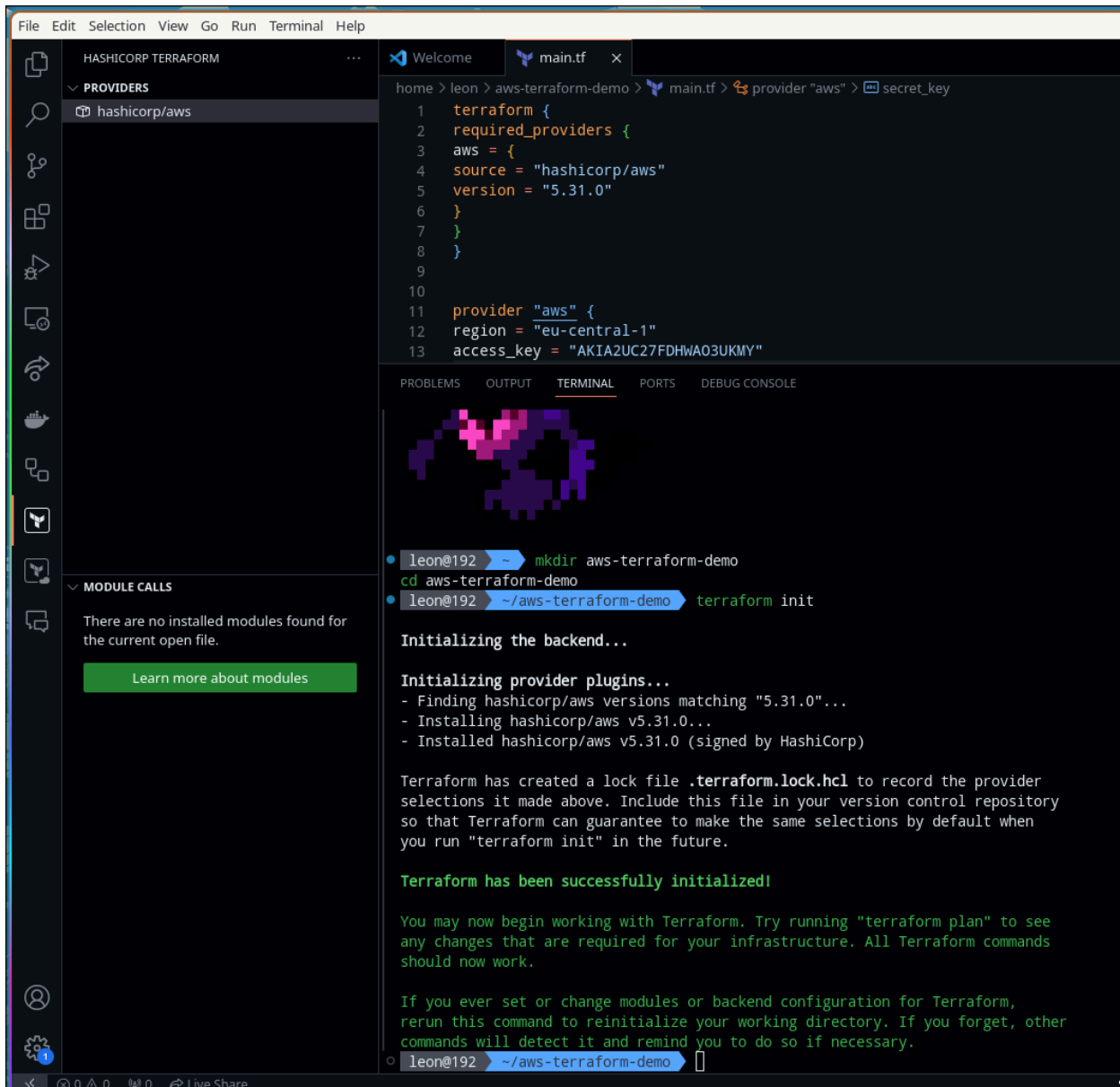
Package Architecture Version Repository Size
Installing:
terraform x86_64 1.7.3-1 hashicorp 26 M

Transaction Summary
Install 1 Package

Total download size: 26 M
Installed size: 81 M
Downloading Packages:
terraform-1.7.3-1.x86_64.rpm 6.3 MB/s | 26 MB 00:04

Total 6.3 MB/s | 26 MB 00:04
Hashicorp Stable - x86_64 3.2 kB/s | 3.9 kB 00:01
Importing GPG key 0xA621E701:
Userid : "HashiCorp Security (HashiCorp Package Signing) <security+packaging@hashicorp.com>"
Fingerprint: 798A EC65 4E5C 1542 8C8E 42EE AA16 FCBC A621 E701
From : https://rpm.releases.hashicorp.com/gpg
leon@192 ~$ terraform -v
Terraform v1.7.3
on linux_amd64
leon@192 ~$
```

Experiment 2



Experiment 3

```
ip
Welcome main.tf instance.tf x
home > leon > aws-terraform-demo > instance.tf > resource "aws_instance" "My-instance"
1 resource "aws_instance" "My-instance" {
2   instance_type = "t2.micro"
3   ami = "ami-0faab6bdbac9486fb"
4   count = 1
5   tags = {
6     Name = "UPES-EC2-Instnace"
7   }
8 }
9
```

```
leon@192 ~/aws-terraform-demo terraform plan
Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# aws_instance.My-instance[0] will be created
+ resource "aws_instance" "My-instance" {
+   ami = "ami-0faab6bdbac9486fb"
+   arn = (known after apply)
+   associate_public_ip_address = (known after apply)
+   availability_zone = (known after apply)
+   cpu_core_count = (known after apply)
+   cpu_threads_per_core = (known after apply)
+   disable_api_stop = (known after apply)
+   disable_api_termination = (known after apply)
+   ebs_optimized = (known after apply)
+   get_password_data = false
+   host_id = (known after apply)
+   host_resource_group_arn = (known after apply)
+   iam_instance_profile = (known after apply)
+   id = (known after apply)
+   instance_initiated_shutdown_behavior = (known after apply)
+   instance_lifecycle = (known after apply)
+   instance_state = (known after apply)
+   instance_type = "t2.micro"
+   ipv6_address_count = (known after apply)
+   ipv6_addresses = (known after apply)
+   key_name = (known after apply)
+   monitoring = (known after apply)
+   outpost_arn = (known after apply)
+   password_data = (known after apply)
+   placement_group = (known after apply)
+   placement_partition_number = (known after apply)
+   private_ip = (known after apply)
+   public_dns = (known after apply)
+   public_ip = (known after apply)
+   secondary_private_ips = (known after apply)
+   security_groups = (known after apply)
+   source_dest_check = true
+   spot_instance_request_id = (known after apply)
+   subnet_id = (known after apply)
+   tags = {
+     "Name" = "UPES-EC2-Instnace"
+   }
+   tags_all = {
+     "Name" = "UPES-EC2-Instnace"
+   }
+   tenancy = (known after apply)
+   user_data = (known after apply)
+   user_data_base64 = (known after apply)
+   user_data_replace_on_change = false
+   vpc_security_group_ids = (known after apply)
}
```

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

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_instance.My-instance[0]: Creating...

aws_instance.My-instance[0]: Still creating... [10s elapsed]

aws_instance.My-instance[0]: Still creating... [20s elapsed]

aws_instance.My-instance[0]: Still creating... [30s elapsed]

aws_instance.My-instance[0]: Creation complete after 35s [id=i-07572fa1583924789]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

leon@192 ~/aws-terraform-demo

Instances (1) [Info](#)

Find Instance by attribute or tag (case-sensitive)

Any state

<input type="checkbox"/>	Name ✎	Instance ID	Instance state ▼	Instance type ▼	Status check	Alarm status	Availability Zone ▼
<input type="checkbox"/>	UPES-EC2-Inst...	i-07572fa1583924789	Running 🔍 🔍	t2.micro	Initializing	View alarms +	eu-central-1b

```

- root_block_device {
  - delete_on_termination = true -> null
  - device_name           = "/dev/sda1" -> null
  - encrypted             = false -> null
  - iops                  = 100 -> null
  - tags                  = {} -> null
  - throughput            = 0 -> null
  - volume_id             = "vol-0c25d10f9168045d5" -> null
  - volume_size           = 8 -> null
  - volume_type           = "gp2" -> null
}
}

```

Plan: 0 to add, 0 to change, 1 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_instance.My-instance[0]: Destroying... [id=i-07572fa1583924789]
aws_instance.My-instance[0]: Still destroying... [id=i-07572fa1583924789, 10s elapsed]
aws_instance.My-instance[0]: Still destroying... [id=i-07572fa1583924789, 20s elapsed]
aws_instance.My-instance[0]: Still destroying... [id=i-07572fa1583924789, 30s elapsed]
aws_instance.My-instance[0]: Destruction complete after 31s




```

Destroy complete! Resources: 1 destroyed.

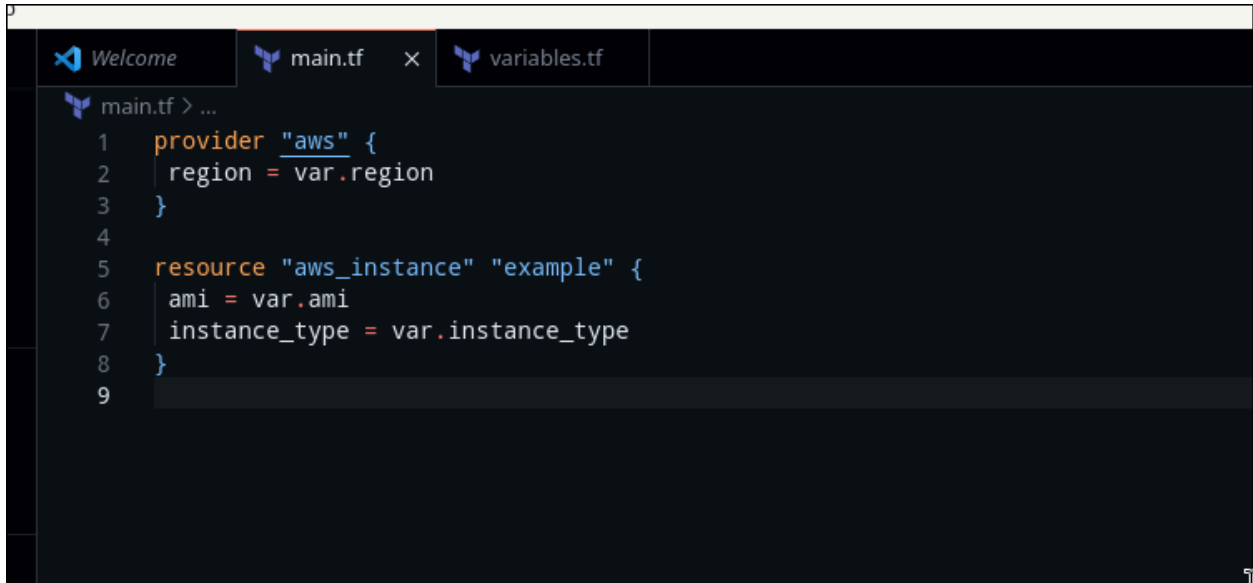
Instances (1) [Info](#)

Find Instance by attribute or tag (case-sensitive)

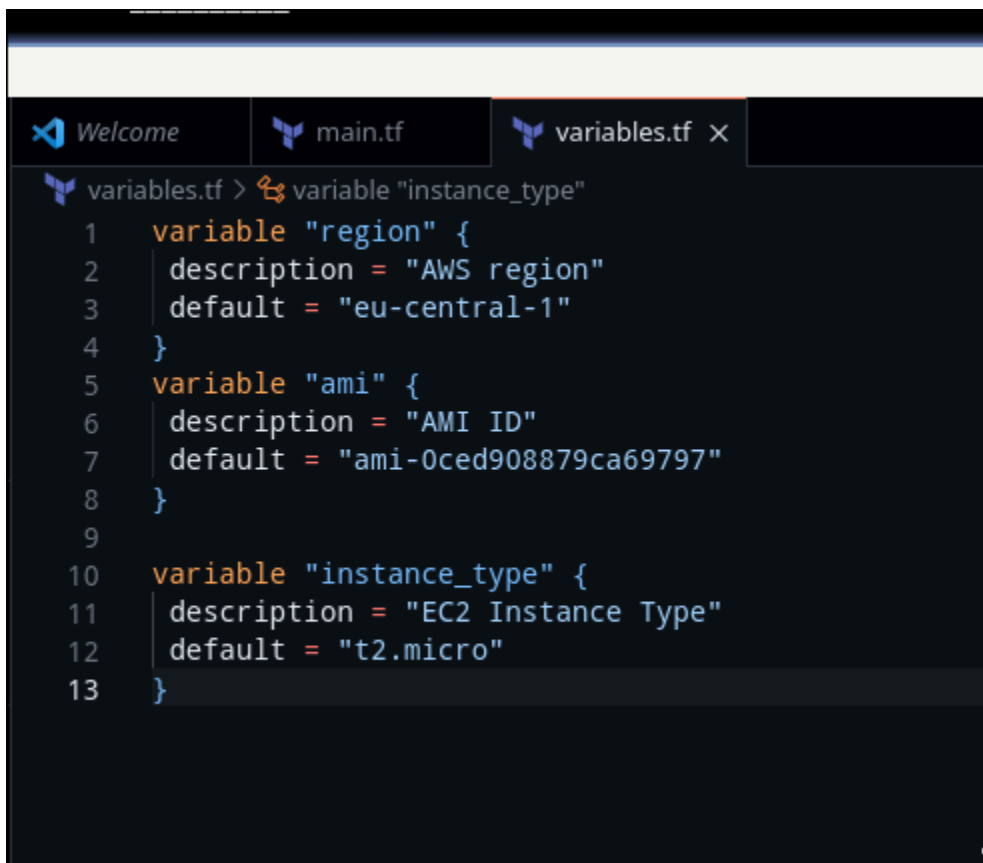
Any state ▼

<input type="checkbox"/>	Name  ▼	Instance ID	Instance state ▼	Instance type ▼	Status check
<input type="checkbox"/>	UPES-EC2-Inst...	i-07572fa1583924789	Terminated  	t2.micro	-

Experiment 4



```
main.tf > ...
1  provider "aws" {
2    region = var.region
3  }
4
5  resource "aws_instance" "example" {
6    ami = var.ami
7    instance_type = var.instance_type
8  }
9
```



```
variables.tf > variable "instance_type"
1  variable "region" {
2    description = "AWS region"
3    default = "eu-central-1"
4  }
5  variable "ami" {
6    description = "AMI ID"
7    default = "ami-0ced908879ca69797"
8  }
9
10 variable "instance_type" {
11   description = "EC2 Instance Type"
12   default = "t2.micro"
13 }
```

```

+ primary_network_interface_id = (known after apply)
+ private_dns                  = (known after apply)
+ private_ip                   = (known after apply)
+ public_dns                    = (known after apply)
+ public_ip                     = (known after apply)
+ secondary_private_ips         = (known after apply)
+ security_groups               = (known after apply)
+ source_dest_check             = true
+ spot_instance_request_id      = (known after apply)
+ subnet_id                     = (known after apply)
+ tags_all                      = (known after apply)
+ tenancy                       = (known after apply)
+ user_data                     = (known after apply)
+ user_data_base64              = (known after apply)
+ user_data_replace_on_change   = false
+ vpc_security_group_ids        = (known after apply)
}

```

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_instance.example: Creating...

aws_instance.example: Still creating... [10s elapsed]

aws_instance.example: Still creating... [20s elapsed]

aws_instance.example: Still creating... [30s elapsed]

aws_instance.example: Still creating... [40s elapsed]

aws_instance.example: Creation complete after 45s [id=i-05ab4f6a057952bf7]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

leon@192 ~/terraform-variables

Instances (1/1) Info									
Find Instance by attribute or tag (case-sensitive)				Any state					
Instance state = running X				Clear filters		< 1 >			
<input checked="" type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...
<input checked="" type="checkbox"/>		i-05ab4f6a057952bf7	Running	t2.micro	Initializing	View alarms +	eu-central-1b	ec2-18-156-4-237.eu-c...	18.156.4.237

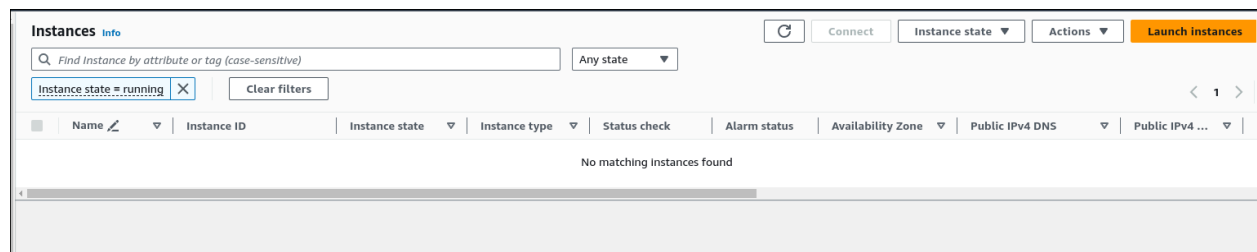
```
Plan: 0 to add, 0 to change, 1 to destroy.

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_instance.example: Destroying... [id=i-05ab4f6a057952bf7]
aws_instance.example: Still destroying... [id=i-05ab4f6a057952bf7, 10s elapsed]
aws_instance.example: Still destroying... [id=i-05ab4f6a057952bf7, 20s elapsed]
aws_instance.example: Still destroying... [id=i-05ab4f6a057952bf7, 30s elapsed]
aws_instance.example: Destruction complete after 32s

Destroy complete! Resources: 1 destroyed.
```



Experiment 5

```
main.tf x variables.tf
main.tf > ...
1 provider "aws" {
2   region = var.region
3 }
4 resource "aws_instance" "example" {
5   ami = var.ami
6   instance_type = var.instance_type
7 }
8
```



```
main.tf  variables.tf x
variables.tf > variable "instance_type"
1  variable "region" {
2    description = "AWS region"
3    default = "us-west-2"
4  }
5  variable "ami" {
6    description = "AMI ID"
7    default = "ami-0c55b159cbfafe1f0"
8  }
9  variable "instance_type" {
10   description = "EC2 Instance Type"
11   default = "t2.small"
12 }
13
```

```
PROBLEMS  OUTPUT  TERMINAL  PORTS  DEBUG CONSOLE

+ vpc_security_group_ids          = (known after apply)
}

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_instance.example: Creating...
aws_instance.example: Still creating... [10s elapsed]
aws_instance.example: Still creating... [20s elapsed]
aws_instance.example: Still creating... [30s elapsed]
aws_instance.example: Creation complete after 34s [id=i-02d0d6f1013b2fa0a]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
leon@192 ~/terraform-cli-variables
```

Instances (3) info										Connect	Instance state	Actions	Launch instances
Find Instance by attribute or tag (case-sensitive)										Any state			
<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic			
<input type="checkbox"/>		i-05ab4f6a057952bf7	Terminated	t2.micro	-	View alarms	eu-central-1b	-	-	-			
<input type="checkbox"/>		i-02d0d6f1013b2fa0a	Running	t2.micro	Initializing	View alarms	eu-central-1b	ec2-3-120-237-107.eu-...	3.120.237.107	-			
<input type="checkbox"/>	UPES-EC2-Inst...	i-07572fa1583924789	Terminated	t2.micro	-	View alarms	eu-central-1b	-	-	-			

The screenshot shows a VS Code editor with two files open: `main.tf` and `variables.tf`. The `variables.tf` file contains the following HCL code:

```
variable "region" {
  description = "AWS region"
  default = "us-west-2"
}

variable "ami" {
  description = "AMI ID"
  default = "ami-0c55b159cbfafef0"
}

variable "instance_type" {
  description = "EC2 Instance Type"
  default = "t2.small"
}
```

The terminal window shows the output of a Terraform command, likely `terraform destroy`. The output indicates that the resources were successfully destroyed:

```
Enter a value: yes

aws_instance.example: Creating...
aws_instance.example: Still creating... [10s elapsed]
aws_instance.example: Still creating... [20s elapsed]
aws_instance.example: Still creating... [30s elapsed]
aws_instance.example: Creation complete after 34s [id=i-02d0d6f1013b2fa0a]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
• |leon@192 ~$ terraform destroy
aws_instance.example: Refreshing state... [id=i-02d0d6f1013b2fa0a]

No changes. No objects need to be destroyed.

Either you have not created any objects yet or the existing objects were already deleted outside of Terraform.

Destroy complete! Resources: 0 destroyed.
|leon@192 ~$ terraform-cli-variables
```

Instances (4) Info									
Find Instance by attribute or tag (case-sensitive)									
Any state									
<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...
<input type="checkbox"/>		i-05ab4f6a057952bf7	Terminated	t2.micro	-	View alarms	eu-central-1b	-	-
<input type="checkbox"/>	SPCM-Exp-5	i-00c8e54302202ed96	Shutting-d...	t2.micro	-	View alarms	eu-central-1b	ec2-3-79-18-216.eu-ce...	3.79.18.216
<input type="checkbox"/>		i-02d0d6f1013b2fa0a	Terminated	t2.micro	-	View alarms	eu-central-1b	-	-
<input type="checkbox"/>	UPES-EC2-inst...	i-07572fa1583924789	Terminated	t2.micro	-	View alarms	eu-central-1b	-	-

Experiment 6