Lab 1: Installing Terraform on Ubuntu and Preparing Machine for Microsoft Azure

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Level: Beginner
Platform: Ubuntu Linux + Microsoft Azure

Learning Objective

By the end of this lab, participants will be able to:

- Understand what Terraform is and why it is used
- Install Terraform on an Ubuntu machine
- Install and configure Azure CLI
- Connect their Ubuntu machine with Microsoft Azure
- Prepare the system for provisioning Azure resources using Terraform

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Learning Outcome

After completing this lab, participants will:

- Have Terraform installed and verified
- Have Azure CLI installed and authenticated
- Understand Azure authentication concepts
- Be ready to create Azure resources using Terraform
- Have a fully prepared local environment for Terraform-Azure labs

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Step-by-Step Hands-On Lab

Step 1: Understand the Tools

What is Terraform?

Terraform is an Infrastructure as Code (IaC) tool. It helps us to create, manage, update, and delete cloud resources using code instead of manual clicking.

What is Microsoft Azure?

Microsoft Azure is a cloud platform that provides services like Virtual Machines, Networks, Storage, Databases, and many more.

Terraform + Azure = Automatic Cloud Infrastructure Creation

Step 2: Update Ubuntu System

Open terminal and run:

```
sudo apt update
sudo apt upgrade -y
```

This ensures your system is updated before installation.

Step 3: Install Required Packages

```
sudo apt install -y gnupg software-properties-common curl
```

These packages help in downloading and verifying Terraform.

Step 4: Install Terraform on Ubuntu

4.1 Add HashiCorp GPG Key

```
curl -fsSL https://apt.releases.hashicorp.com/gpg | sudo gpg --dearmor -o /usr/
share/keyrings/hashicorp-archive-keyring.gpg
```

4.2 Add Terraform Repository

```
echo "deb [signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg] https://
apt.releases.hashicorp.com $(lsb_release -cs) main" | sudo tee /etc/apt/
sources.list.d/hashicorp.list
```

4.3 Install Terraform

```
sudo apt update
sudo apt install terraform -y
```

Step 5: Verify Terraform Installation

```
terraform -version
```

If Terraform is installed correctly, you will see the version output.

Step 6: Install Azure CLI

Azure CLI is required to connect Terraform with Azure.

```
curl -sL https://aka.ms/InstallAzureCLIDeb | sudo bash
```

Step 7: Verify Azure CLI Installation

```
az version
```

Step 8: Login to Microsoft Azure

```
az login
```

A browser will open. Login using your Azure account.

After successful login, Azure will show subscription details.

Step 9: Check Azure Subscription

```
az account show
```

This command shows:

- Subscription ID
- Tenant ID
- Subscription Name

Step 10: Set Default Subscription (If Multiple)

```
az account list
```

Copy the required subscription ID and run:

```
az account set --subscription "SUBSCRIPTION_ID"
```

Step 11: Create Terraform Working Directory

```
mkdir terraform-azure-lab
cd terraform-azure-lab
```

Step 12: Create First Terraform File

```
touch main.tf
```

Step 13: Configure Azure Provider

Open the file:

```
nano main.tf
```

Add this content:

```
terraform {
  required_providers {
    azurerm = {
      source  = "hashicorp/azurerm"
      version = "~> 3.0"
    }
  }
}

provider "azurerm" {
  features {}
}
```

Save and exit.

Step 14: Initialize Terraform

```
terraform init
```

This downloads Azure provider plugins.

Step 15: Validate Configuration

```
terraform validate
```

Step 16: Check Terraform Setup

```
terraform providers
```

Environment Ready ✅

Now your Ubuntu machine is ready to:

- Use Terraform
- Connect with Azure
- Create Azure resources
- Run Terraform labs

Beginner Understanding Summary

Tool	Purpose
Terraform	Infrastructure automation
Azure CLI	Connect system to Azure
Provider (azurerm)	Terraform plugin for Azure
main.tf	Terraform configuration file
