Question 1Skipped

What is the correct syntax for defining a ***list of strings*** for a variable in Terraform?

```
1. variable "public_subnets" {
2.   description = "The number of public subnets for VPC"
3.   type       = list(string)
4.   default    = 2
5. }
```

Explanation

The syntax provided defines a variable for the number of public subnets, not a list of strings. It is not the correct syntax for defining a list of strings in Terraform.

```
1. variable "resource_tags" {
2.   description = "Tags to set for all resources"
3.   type       = list(string)
4.   default    = {
5.     project    = "exam-prep",
6.     environment = "prod"
7.     instructor  = "krausen"
8.   }
9. }
```

Explanation

The syntax provided defines a map of key-value pairs, not a list of strings. It is not the correct syntax for defining a list of strings in Terraform.

Correct answer

```
1. variable "public_subnet_cidr_blocks" {
2.   type = list(string)
3.   default = [
4.     "10.0.1.0/24",
5.     "10.0.1.0/24",
6.     "10.0.1.0/24",
7.     "10.0.1.0/24",
8.   ]
9. }
```

Explanation

The syntax provided correctly defines a list of strings for the variable "public_subnet_cidr_blocks" in Terraform. The values are enclosed in double quotes and separated by commas within square brackets.

```
1. variable "aws_region" {
2.   description = "AWS region"
3.   type      = list(string)
4.   default    = "us-west-1"
5. }
```

Explanation

The syntax provided defines a variable for the AWS region as a single string value, not a list of strings. It is not the correct syntax for defining a list of strings in Terraform.

Overall explanation

In Terraform, you can use a list of strings variable to store multiple string values and reference those values in your Terraform configuration. Here's how you can use a list of strings variable in Terraform:

1. Define the variable: To define a list of strings variable in Terraform, you need to specify the **type** as **list(string)**. Here's an example:

```
1. variable "example_list" {
2.   type = list(string)
3. }
```

1. Assign values to the variable: You can assign values to a list of strings variable in your Terraform configuration, for example:

```
1. variable "example_list" {
2.   type = list(string)
3.   default = ["string1", "string2", "string3"]
4. }
```

In this example, the **example_list** variable is defined as a list of strings and its default value is set to a list of three strings.

https://developer.hashicorp.com/terraform/tutorials/configuration-language/variables#list-public-and-private-subnets

https://developer.hashicorp.com/terraform/language/expressions/types#list

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 2Skipped

What environment variable can be set to enable detailed logging for Terraform?

TF_INFO

Explanation

The environment variable `TF_INFO` is not used to enable detailed logging for Terraform. It is typically used to display informational messages and not for detailed logging purposes.

TF_DEBUG

Explanation

The environment variable `TF_DEBUG` is not used to enable detailed logging for Terraform. It is typically used for debugging purposes and not for detailed logging.

Correct answer

TF_LOG

Explanation

The correct environment variable to enable detailed logging for Terraform is `TF_LOG`. Setting this variable will provide detailed logs for troubleshooting and debugging purposes.

TF_TRACE

Explanation

The environment variable `TF_TRACE` is not used to enable detailed logging for Terraform. It is typically used for tracing and providing additional information during execution.

Overall explanation

Terraform has detailed logs that can be enabled by setting the TF_LOG environment variable to any value. This will cause detailed logs to appear on stderr.

You can set TF_LOG to one of the log levels TRACE, DEBUG, INFO, WARN or ERROR to change the verbosity of the logs. TRACE is the most verbose and it is the default if TF_LOG is set to something other than a log level name.

https://developer.hashicorp.com/terraform/internals/debugging

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 3Skipped

A user has created three workspaces using the command line - prod, dev, and test. The user wants to create a fourth workspace named stage.

Which command will the user execute to accomplish this task?

terraform workspace -create stage

Explanation

The command "terraform workspace -create stage" is not the correct syntax for creating a new workspace in Terraform. The correct syntax uses the "new" keyword without the hyphen.

Correct answer

terraform workspace new stage

Explanation

The correct command to create a new workspace in Terraform is "terraform workspace new ". This command will create a new workspace named "stage" as requested by the user.

terraform workspace -new stage

Explanation

The command "terraform workspace -new stage" is not the correct syntax for creating a new workspace in Terraform. The correct syntax uses the "new" keyword without the hyphen.

terraform workspace create stage

Explanation

The command "terraform workspace create " is not the correct syntax for creating a new workspace in Terraform. The correct syntax uses the "new" keyword instead of "create".

Overall explanation

The user can execute the following command to create a fourth workspace named **stage**:

1. $ terraform workspace new stage

This command will create a new Terraform workspace named **stage**. The user can then switch to the new workspace using the **terraform workspace select** command and use it to manage resources in the new environment.

https://developer.hashicorp.com/terraform/cli/commands/workspace/new

Domain

Objective 4 - Use Terraform Outside of Core Workflow

Question 4Skipped

What Terraform command can be used to manually unlock the state for the defined configuration?

Removing the lock on a state file is not possible

Explanation

It is possible to remove the lock on a state file in Terraform using the terraform force-unlock command. This command allows the user to forcibly unlock the state file and make necessary changes.

Correct answer

terraform force-unlock

Explanation

The correct Terraform command to remove the lock on the state for the current configuration is terraform force-unlock. This command is specifically designed to force unlock the state file and allow modifications to be made.

terraform unlock

Explanation

The Terraform command terraform unlock does not exist in the Terraform documentation. Therefore, this command is not valid and cannot be used to remove the lock on the state for the current configuration.

terraform state-unlock

Explanation

The Terraform command terraform state-unlock does not exist in the Terraform documentation. This command is not a valid command for removing the lock on the state file.

Overall explanation

The **terraform force-unlock** command can be used to remove the lock on the Terraform state for the current configuration. Another option is to use the "terraform state rm" command followed by the "terraform state push" command to forcibly overwrite the state on the remote backend, effectively removing the lock. It's important to note that these commands should be used with caution, as they can potentially cause conflicts and data loss if not used properly.

Be very careful forcing an unlock, as it could cause data corruption and problems with your state file.

https://developer.hashicorp.com/terraform/cli/commands/force-unlock

Domain

Objective 7 - Implement and Maintain State

Question 5Skipped

What feature of Terraform Cloud allows you to publish and maintain a set of custom modules that can only be used within your organization?

Terraform registry

Explanation

The Terraform registry is a public repository of modules that can be used by any Terraform user, but it is not specific to an organization and does not provide the same level of control as a private registry.

custom VCS integration

Explanation

Custom VCS integration refers to the ability to connect Terraform Cloud to a version control system to manage infrastructure as code, but it does not specifically address the publishing and maintenance of custom modules within an organization.

remote runs

Explanation

Remote runs in Terraform Cloud allow users to execute Terraform configurations in a remote environment, but it does not directly relate to the publishing and maintenance of custom modules within an organization.

Correct answer

private registry

Explanation

The private registry feature in Terraform Cloud allows users to publish and maintain custom modules within their organization, providing a secure and controlled environment for sharing infrastructure configurations.

Overall explanation

You can use modules from a private registry, like the one provided by Terraform Cloud. Private registry modules have source strings of the form <HOSTNAME>/<NAMESPACE>/<NAME>/<PROVIDER>. This is the same format as the public registry, but with an added hostname prefix.

https://www.datocms-assets.com/2885/1602500234-terraform-full-feature-pricing-tablev2-1.pdf

Domain

Objective 9 - Understand Terraform Cloud Capabilities

Question 6Skipped

You are developing a new Terraform module to demonstrate features of the most popular HashiCorp products. You need to spin up an AWS instance for each tool, so you create the resource block as shown below using the for_each meta-argument.

```
1. resource "aws_instance" "bryan-demo" {
2.   # ...
3.   for_each = {
```

```
4.      "terraform": "infrastructure",
5.      "vault":    "security",
6.      "consul":   "connectivity",
7.      "nomad":    "scheduler",
8.    }
9.  }
```

After the deployment, you view the state using the terraform state list command. What resource address would be displayed for the instance related to vault?

aws_instance.bryan-demo["2"]

Explanation

The resource address aws_instance.bryan-demo["2"] is not the correct format when using the for_each meta-argument in Terraform. The key-value pairs provided in the for_each block are used as keys to uniquely identify each instance, so the correct format includes the specific key, in this case, "vault".

Correct answer

aws_instance.bryan-demo["vault"]

Explanation

The correct resource address format for the instance related to "vault" when using the for_each meta-argument in Terraform is aws_instance.bryan-demo["vault"]. This format allows Terraform to uniquely identify and manage each instance based on the key-value pair provided in the for_each block.

aws_instance.bryan-demo.vault

Explanation

The resource address format aws_instance.bryan-demo.vault is not valid when using the for_each meta-argument in Terraform. The correct format includes the key enclosed in square brackets, such as aws_instance.bryan-demo["vault"], to properly reference the instance related to "vault".

aws_instance.bryan-demo[1]

Explanation

The resource address aws_instance.bryan-demo[1] is not the correct format when using the for_each meta-argument in Terraform. The key-value pairs provided in the for_each block are used as keys to uniquely identify each instance, so the correct format includes the specific key, in this case, "vault".

Overall explanation

In Terraform, when you use the **for_each** argument in a resource block, Terraform generates multiple instances of that resource, each with a unique address. The address of each instance

is determined by the keys of the **for_each** map, and it is used to identify and manage each instance of the resource.

For example, consider the following resource block in the question:

```
1. resource "aws_instance" "bryan-demo" {
2.   # ...
3.   for_each = {
4.     "terraform": "infrastructure",
5.     "vault":    "security",
6.     "consul":   "connectivity",
7.     "nomad":    "scheduler",
8.   }
9. }
```

In this example, Terraform will create four instances of the **aws_instance** resource, one for each key in the **for_each** map. The addresses of these instances will be **aws_instance.bryan-demo["terraform"]** , **aws_instance.bryan-demo["vault"]**,**aws_instance.bryan-demo["consul"]**, and **aws_instance.bryan-demo["nomad"]**.

When you reference the properties of these instances in your Terraform code, you can use the address and property reference syntax to access the properties of each instance. For example, you can access the ID of the first instance using **aws_instance.bryan-demo["vault"].id**.

Using the **for_each** argument in a resource block is a powerful way to manage multiple instances of a resource, and it provides a convenient way to reuse the same resource configuration for multiple instances with different properties.

https://developer.hashicorp.com/terraform/cli/v1.1.x/state/resource-addressing

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 7Skipped

Terraform is distributed as a single binary and available for many different platforms. Select all operating systems that Terraform is available for. (select five)

Correct selection

FreeBSD

Explanation

Terraform is available for FreeBSD, making this choice correct. See the latest versions of Terraform to see the platforms it's available for here: https://releases.hashicorp.com/terraform/

Correct selection

macOS

Explanation

Terraform is available for macOS, making this choice correct. See the latest versions of Terraform to see the platforms it's available for here: https://releases.hashicorp.com/terraform/

Correct selection

Windows

Explanation

Terraform is available for Windows, making this choice correct. See the latest versions of Terraform to see the platforms it's available for here: https://releases.hashicorp.com/terraform/

Correct selection

Linux

Explanation

Terraform is available for Linux, so this choice is correct. See the latest versions of Terraform to see the platforms it's available for here: https://releases.hashicorp.com/terraform/

AIX

Explanation

Terraform is not available for AIX, making this choice incorrect. See the latest versions of Terraform to see the platforms it's available for here: https://releases.hashicorp.com/terraform/

Correct selection

Solaris

Explanation

Terraform is available for Solaris, making this choice correct. See the latest versions of Terraform to see the platforms it's available for here: https://releases.hashicorp.com/terraform/

Overall explanation

Terraform is a cross-platform tool and can be installed on several operating systems, including:

1. **Windows**: Terraform can be installed on **Windows** operating systems using the Windows installer.
2. **macOS**: Terraform can be installed on macOS using the macOS installer or using Homebrew.

3. **Linux**: Terraform can be installed on **Linux** operating systems using the binary distribution or through package management systems, such as apt or yum.
4. **Unix**: Terraform can be installed on Unix-like operating systems using the binary distribution.

There is no Terraform binary for AIX. Terraform is available for macOS, FreeBSD, OpenBSD, Linux, Solaris, and Windows.

See the latest versions of Terraform to see the platforms it's available for here: https://releases.hashicorp.com/terraform/

https://www.terraform.io/downloads.html

Domain

Objective 3 - Understand Terraform Basics

Question 8Skipped

After many years of using Terraform Community (Free), you decide to migrate to Terraform Cloud. After the initial configuration, you create a workspace and migrate your existing state and configuration. What Terraform version would the new workspace be configured to use after the migration?

the most recent version of Terraform available

Explanation

The new workspace will not automatically be configured to use the most recent version of Terraform available. It will retain the version used during the migration process to prevent any compatibility issues.

the latest major release of Terraform

Explanation

The new workspace will not be configured to use the latest major release of Terraform automatically. It will stick to the version used during the migration to maintain stability and avoid any unexpected changes.

whatever version is defined in the terraform block

Explanation

The new workspace will not be configured to use whatever version is defined in the `terraform` block of the configuration. It will continue to use the version that was used during the migration process to ensure a smooth transition and consistent behavior.

Correct answer

the same Terraform version that was used to perform the migration

Explanation

The new workspace in Terraform Cloud will be configured to use the same Terraform version that was used to perform the migration. This ensures compatibility and consistency with the existing state and configuration.

Overall explanation

When you create a new workspace, Terraform Cloud automatically selects the most recent version of Terraform available. **If you migrate an existing project from the CLI to Terraform Cloud, Terraform Cloud configures the workspace to use the same version as the Terraform binary you used when migrating**. Terraform Cloud lets you change the version a workspace uses on the workspace's settings page to control how and when your projects use newer versions of Terraform.

It's worth noting that Terraform Cloud also provides the ability to upgrade your Terraform version in a controlled manner. This allows you to upgrade your Terraform version in a safe and predictable way, without affecting your existing infrastructure or state.

https://developer.hashicorp.com/terraform/tutorials/cloud/cloud-versions

Domain

Objective 9 - Understand Terraform Cloud Capabilities

Question 9Skipped

Which of the following variable declarations is going to result in an error?

1. variable "example" {}

Explanation

This is a valid variable declaration with an empty block for the variable "example". This is a common way to declare a variable without specifying any additional attributes or values.

```
variable "docker_ports" {
  type = list(object({
    internal = number
    external = number
    protocol = string
  }))
```

Explanation

This is a valid variable declaration for the variable "docker_ports". It specifies the type as a list of objects with specific attributes (internal, external, protocol). The declaration is complete and does not contain any errors.

```
variable "example" {
  description = "This is a test"
  type        = map
```

4. default = {"one" = 1, "two" = 2, "Three" = "3"}
5. }

Explanation

This variable declaration is valid as it includes a description, type, and default value for the variable "example". The type specified is a map, and the default value is a valid map with key-value pairs.

Correct answer

1. variable "example" {
2. description = "This is a variable description"
3. type = list(string)
4. default = {}
5. }

Explanation

The variable declaration in Choice A is going to result in an error because the default value is assigned as an empty map {}. The type specified for the variable is list(string), so assigning an empty map as the default value is not valid and will cause an error.

Overall explanation

This variable declaration for a type list is incorrect because a list expects square brackets [ ] and ***not*** curly braces. All of the others are correct variable declarations.

From the official HashiCorp documentation found here:

Lists/tuples are represented by a pair of square brackets containing a comma-separated sequence of values, like ["a", 15, true].

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 10Skipped

Understanding how indexes work is essential when working with different variable types and resource blocks that use count or for_each. Therefore, what is the output value of the following code snippet?

1. variable "candy_list" {
2. type = list(string)
3. default = ["snickers", "kitkat", "reeces", "m&ms"]
4. }
5.

```
6. output "give_me_candy" {
7.  value = element(var.candy_list, 2)
8. }
```

m&ms

Explanation

The output value of the code snippet is not "m&ms" because the element function is used to access the element at index 2 in the candy_list variable, which is "reeces" and not "m&ms".

Correct answer

reeces

Explanation

The output value of the code snippet is "reeces" because the element function is used to access the element at index 2 in the candy_list variable, which is "reeces".

kitkat

Explanation

The output value of the code snippet is not "kitkat" because the element function is used to access the element at index 2 in the candy_list variable, which is "reeces" and not "kitkat".

snickers

Explanation

The output value of the code snippet is not "snickers" because the element function is used to access the element at index 2 in the candy_list variable, which is "reeces" and not "snickers".

Overall explanation

In this example, the **candy_list** variable is a list of strings, and the **output** block retrieves the third element in the list (at index 2) and outputs it as the value of **give_me_candy**.

Remember that an index starts at [0], and then counts up. Therefore, the following represents the index value as shown in the variable above:

- **[0]** = snickers
- **[1]** = kitkat
- **[2]** = reeces
- **[3]** = m&ms

https://developer.hashicorp.com/terraform/language/functions/index_function

https://developer.hashicorp.com/terraform/language/functions/element

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 11Skipped

You are performing a code review of a colleague's Terraform code and see the following code. Where is this module stored?

```
module "vault-aws-tgw" {
  source  = "terraform-vault-aws-tgw/hcp"
  version = "1.0.0"

  client_id     = "4djlsn29sdnjk2btk"
  hvn_id        = "a4c9357ead4de"
  route_table_id = "rtb-a221958bc5892eade331"
}
```

Correct answer

the Terraform public registry

Explanation

The code specifies a source from "terraform-vault-aws-tgw/hcp", which is a typical format for modules stored in the Terraform public registry. This choice is correct based on the information provided in the code snippet.

in a local file under a directory named terraform/vault-aws-tgw/hcp

Explanation

The code specifies a source from "terraform-vault-aws-tgw/hcp", but it does not indicate that the module is stored in a local file under a directory named "terraform/vault-aws-tgw/hcp". This choice is incorrect based on the information provided in the code snippet.

in a Terraform Cloud private registry

Explanation

The code does not indicate that the module is stored in a Terraform Cloud private registry. It specifies a source from "terraform-vault-aws-tgw/hcp", which is more indicative of the Terraform public registry. This choice is incorrect based on the information provided in the code snippet.

a local code repository on your network

Explanation

The code specifies a source from "terraform-vault-aws-tgw/hcp", which indicates that the module is not stored in a local code repository on your network. It is referencing an external source.

Overall explanation

You can use the Terraform Public Registry by referencing the modules you want to use in your Terraform code and including them as part of your configuration.

To reference a module from the Terraform Public Registry, you can use the **module** block in your Terraform code. For example, if you want to use a VPC module from the registry, you would add the following code to your Terraform configuration:

```
module "vpc" {
  source = "terraform-aws-modules/vpc"
  version = "2.34.0"

  # Add any required variables and configuration here
}
```

The **source** attribute specifies the module source, which is the repository on the Terraform Public Registry. The **version** attribute specifies the version of the module you want to use.

You can also pass values for variables in the module by them within the **module** block. For example:

```
module "vpc" {
  source = "terraform-aws-modules/vpc"
  version = "2.34.0"

  name = "my-vpc"
  cidr = "10.0.0.0/16"
  azs  = ["us-west-2a", "us-west-2b", "us-west-2c"]
}
```

Once you've specified the module in your Terraform code, you can use it as you would any other resource. For example, you could reference the VPC ID created by the VPC module with the following code:

```
1. output "vpc_id" {
2.   value = module.vpc.vpc_id
3. }
```

You can find more information on using modules from the Terraform Public Registry in the Terraform documentation: **https://www.terraform.io/docs/configuration/modules.html**

Domain

Objective 5 - Interact with Terraform Modules

Question 12Skipped

Harry has deployed resources on Azure using Terraform. However, he has discovered that his co-workers Ron and Ginny have manually created a few resources using the Azure console. Since it is company policy to manage production workloads using IaC, how can Harry bring these resources under Terraform management without negatively impacting the availability of the deployed resources?

rewrite the Terraform configuration file to deploy new resources, run a terraform apply, and migrate users to the newly deployed resources. Manually delete the other resources created by Ron and Ginny.

Explanation

Rewriting the Terraform configuration file to deploy new resources and manually deleting the resources created by Ron and Ginny is not a recommended approach as it involves unnecessary manual intervention and potential data loss. This method does not align with the best practice of managing resources using IaC.

resources created outside of Terraform cannot be managed by Terraform

Explanation

The statement that resources created outside of Terraform cannot be managed is incorrect. Terraform provides the capability to import existing resources and manage them through the use of `terraform import` or the `import` block. This choice does not align with the functionality provided by Terraform for managing existing resources.

run a terraform get to retrieve other resources that are not under Terraform management

Explanation

Running `terraform get` is used to retrieve modules from remote repositories, not to bring existing resources under Terraform management. This command is not suitable for the scenario where Harry needs to manage resources created outside of Terraform.

Correct answer

use terraform import or the import block to import the existing resources under Terraform management

Explanation

Using `terraform import` or the `import` block allows Harry to bring the existing resources under Terraform management without disrupting the availability of the deployed resources. This method ensures that the resources are managed by Terraform while preserving their current state.

Overall explanation

To manage the resources created manually by Ron and Ginny in Terraform without negatively impacting the availability of the deployed resources, Harry can follow the steps below:

1. Import the existing resources: Harry can use the **terraform import** command to import the existing resources into Terraform. The **terraform import** command allows you to import existing infrastructure into Terraform, creating a Terraform state file for the resources. You can also create an import block to pull in resources under Terraform management.

2. Modify the Terraform configuration: After importing the resources, Harry can modify the Terraform configuration to reflect the desired state of the resources. This will allow him to manage the resources using Terraform just like any other Terraform-managed resource

3. Test the changes: Before applying the changes, Harry can use the **terraform plan** command to preview the changes that will be made to the resources. This will allow him to verify that the changes will not negatively impact the availability of the resources.

4. Apply the changes: If the changes are correct, Harry can use the **terraform apply** command to apply the changes to the resources.

By following these steps, Harry can start managing the manually created resources in Terraform while ensuring that the availability of the deployed resources is not impacted.

The terraform import command is used to import existing resources into Terraform. This allows you to take resources that you've created by some other means and bring them under Terraform management.

*Note that terraform import **DOES NOT** generate configuration, it only modifies state. You'll still need to write a configuration block for the resource for which it will be mapped using the terraform import command.*

https://developer.hashicorp.com/terraform/language/import

https://developer.hashicorp.com/terraform/cli/commands/import

Domain

Objective 4 - Use Terraform Outside of Core Workflow

Question 13Skipped

A user runs terraform init on their RHEL-based server, and per the output, two provider plugins are downloaded:

1. $ terraform init
2.
3. Initializing the backend...
4.
5. Initializing provider plugins...
6. - Checking for available provider plugins...
7. - Downloading plugin for provider "aws" (hashicorp/aws) 2.44.0...
8. - Downloading plugin for provider "random" (hashicorp/random) 2.2.1...
9.
10. Terraform has been successfully initialized!

Where are these plugins downloaded and stored on the server?

The .terraform.plugins directory in the current working directory

Explanation

The `.terraform.plugins` directory does not exist in Terraform's standard directory structure. The correct directory for storing provider plugins is `.terraform/providers` within the current working directory.

Correct answer

The .terraform/providers directory in the current working directory

Explanation

The provider plugins are downloaded and stored in the `.terraform/providers` directory within the current working directory. This directory is specifically used by Terraform to manage provider plugins.

The .terraform.d directory in the current working directory

Explanation

The `.terraform.d` directory is not the correct location for storing provider plugins. The correct directory for storing provider plugins is `.terraform/providers` within the current working directory.

/etc/terraform/plugins

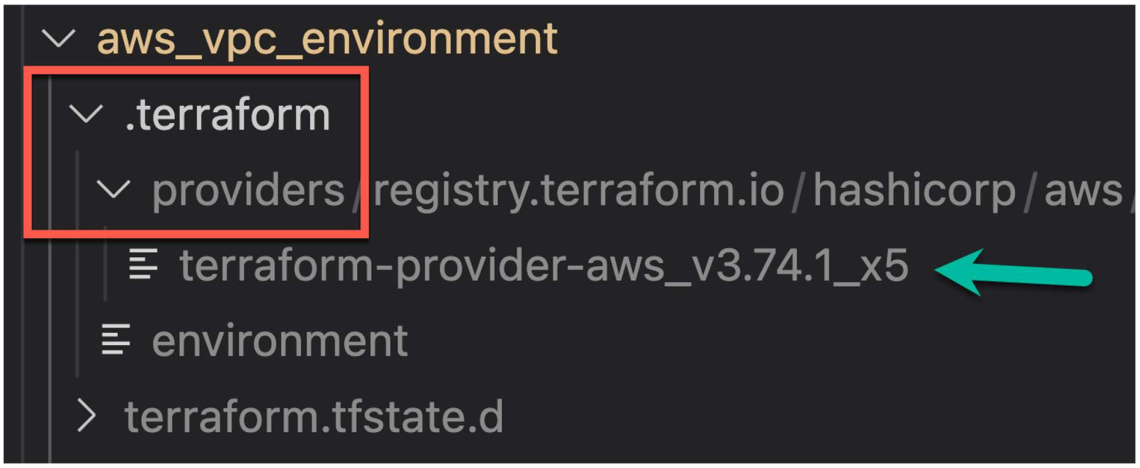
Explanation

The `/etc/terraform/plugins` directory is not the default location for storing provider plugins in Terraform. Provider plugins are typically stored in the `.terraform/providers` directory within the current working directory.

Overall explanation

By default, terraform init downloads plugins into a subdirectory of the working directory, .terraform/providers so that each working directory is self-contained.

See the example below, where I ran a terraform init and you can see the resulting directory (highlighted in the red box) and then the actual provider that was downloaded (highlighted by the green arrow)



https://developer.hashicorp.com/terraform/plugin#installing-plugins

Domain

Objective 3 - Understand Terraform Basics

Question 14Skipped

When writing Terraform code, how many spaces between each nesting level does HashiCorp recommend that you use?

1

Explanation

Using only 1 space between each nesting level is not the recommended practice by HashiCorp for writing Terraform code, as it may lead to confusion and difficulty in understanding the code structure.

Correct answer

2

Explanation

HashiCorp recommends using 2 spaces between each nesting level in Terraform code for better readability and maintainability.

5

Explanation

Using 5 spaces between each nesting level is not the recommended practice by HashiCorp for writing Terraform code, as it deviates from the standard indentation guidelines provided by HashiCorp.

4

Explanation

Using 4 spaces between each nesting level is not the recommended practice by HashiCorp for writing Terraform code.

Overall explanation

HashiCorp, the creator of Terraform, recommends using **two spaces** for indentation when writing Terraform code. This is a convention that helps to improve readability and consistency across Terraform configurations.

For example, when defining a resource in Terraform, you would use two spaces to indent each level of the resource definition, as in the following example:

```
1. resource "aws_instance" "example" {
2.   ami           = "ami-0c55b159cbfafe1f0"
3.   instance_type = "t2.micro"
4.
5.   tags = {
6.     Name = "example-instance"
7.   }
8. }
```

While this is the recommended convention, ***it is not a strict requirement*** and Terraform will still function correctly even if you use a different number of spaces or a different type of indentation. However, using two spaces for indentation is a widely adopted convention in the Terraform community and is recommended by HashiCorp to improve the readability and maintainability of your Terraform configurations.

Check this link for more information

Domain

Objective 3 - Understand Terraform Basics

Question 15Skipped

Emma is a Terraform expert, and she has automated *all the things* with Terraform. A virtual machine was provisioned during a recent deployment, but a local script did not work correctly. As a result, the virtual machine needs to be destroyed and recreated.

How can Emma quickly have Terraform recreate ***the one resource*** without having to destroy everything that was created?

use terraform import to import the error so Terraform is aware of the problem

Explanation

The `terraform import` command is used to import existing infrastructure into Terraform, not to recreate a single resource. It does not directly address the need to quickly recreate a specific resource without impacting others.

use terraform refresh to refresh the state and make Terraform aware of the error

Explanation

The `terraform refresh` command is used to update the state file with the current state of the infrastructure, but it does not specifically target the recreation of a single resource. It is not the most efficient way to address the issue of recreating a specific resource quickly.

Correct answer

use terraform apply -replace=aws_instance.web to mark the virtual machine for replacement

Explanation

Using `terraform apply -replace=aws_instance.web` allows Emma to mark the specific virtual machine resource for replacement without affecting other resources that were created. This command is useful for quickly recreating a single resource.

use terraform state rm aws_instance.web to remove the resource from the state file, which will cause Terraform to recreate the instance again

Explanation

The command `terraform state rm aws_instance.web` removes the specified resource from the state file, prompting Terraform to recreate the instance during the next apply. This method is not recommended in this scenario as it removes the resource entirely from the state.

Overall explanation

The **terraform apply -replace** command manually marks a Terraform-managed resource for replacement, forcing it to be destroyed and recreated on the **apply** execution.

You could also use **terraform destroy -target <virtual machine>** and destroy only the virtual machine and then run a terraform apply again.

IMPORTANT - PLEASE READ

This command replaces **terraform taint**, which was the command that would be used up until 0.15.x. You may still see **terraform taint** on the actual exam until it is updated.

https://developer.hashicorp.com/terraform/cli/commands/taint

https://developer.hashicorp.com/terraform/cli/commands/plan#replace-address

Domain

Objective 4 - Use Terraform Outside of Core Workflow

Question 16Skipped

When multiple arguments with single-line values appear on consecutive lines at the same nesting level, HashiCorp recommends that you:

put arguments in alphabetical order

1. name = "www.example.com"
2. records = [aws_eip.lb.public_ip]
3. type = "A"
4. ttl = "300"
5. zone_id = aws_route53_zone.primary.zone_id

Explanation

Putting arguments in alphabetical order is not a recommendation from HashiCorp. It may not provide any significant benefit in terms of readability or maintainability of the Terraform configuration.

place a space in between each line

1. type = "A"

2.
3. ttl = "300"
4.
5. zone_id = aws_route53_zone.primary.zone_id

Explanation

HashiCorp does not recommend placing a space in between each line for consecutive arguments with single-line values at the same nesting level. This practice may introduce unnecessary whitespace and reduce code compactness.

Correct answer

align the equals signs

1. ami = "abc123"
2. instance_type = "t2.micro"

Explanation

HashiCorp recommends aligning the equals signs for better readability and consistency in the code. This helps in quickly identifying and understanding the key-value pairs in the configuration.

place all arguments using a variable at the top

1. ami = var.aws_ami
2. instance_type = var.instance_size
3. subnet_id = "subnet-0bb1c79de3EXAMPLE"
4. tags = {
5. Name = "HelloWorld"
6. }

Explanation

Placing all arguments using a variable at the top is not a recommendation from HashiCorp. While using variables can improve code maintainability, there is no specific guideline to place all arguments using variables at the top.

Overall explanation

HashiCorp style conventions suggest that you align the equals sign for consecutive arguments for easing readability for configurations:

1. ami = "abc123"
2. instance_type = "t2.micro"
3. subnet_id = "subnet-a6b9cc2d59cc"

Notice how the equal (=) signs are aligned, even though the arguments are of different lengths.

https://developer.hashicorp.com/terraform/language/syntax/style

Domain

Objective 3 - Understand Terraform Basics

Question 17Skipped

Terraform Cloud is more powerful when you integrate it with your version control system (VCS) provider. Select all the supported VCS providers from the answers below. (select four)

Correct selection

GitHub Enterprise

Explanation

Terraform Cloud also supports integration with GitHub Enterprise, providing organizations with the flexibility to use their self-hosted GitHub instance for version control and collaboration within Terraform Cloud.

CVS Version Control

Explanation

CVS Version Control is not a supported VCS provider for Terraform Cloud. Terraform Cloud does not offer integration with CVS repositories for version control and collaboration.

Correct selection

Azure DevOps Server

Explanation

Terraform Cloud supports integration with Azure DevOps Server, allowing users to connect their Azure DevOps repositories with Terraform Cloud for version control and collaboration in a Microsoft environment.

Correct selection

Bitbucket Cloud

Explanation

Bitbucket Cloud is another supported VCS provider for Terraform Cloud, enabling users to integrate their Bitbucket repositories with Terraform Cloud for seamless version control and collaboration.

Correct selection

GitHub.com

Explanation

Terraform Cloud supports integration with GitHub.com, allowing users to easily connect their Terraform Cloud workspace to their GitHub repositories for version control and collaboration.

Overall explanation

Terraform Cloud supports the following VCS providers as of March 2024:

- GitHub.com
- GitHub App for TFE
- GitHub.com (OAuth)
- GitHub Enterprise
- GitLab.com
- GitLab EE and CE
- Bitbucket Cloud
- Bitbucket Data Center
- Azure DevOps Server
- Azure DevOps Services

https://developer.hashicorp.com/terraform/cloud-docs/vcs#supported-vcs-providers

Domain

Objective 9 - Understand Terraform Cloud Capabilities

Question 18Skipped

Which code snippet would allow you to retrieve information about existing resources and use that information within your Terraform configuration?

Correct answer

```
1. data "aws_ami" "aws_instance" {
2.   most_recent = true
3.
4.   owners = ["self"]
5.   tags = {
```

```
    Name   = "app-server"
    Tested = "true"
  }
}
```

Explanation

This code snippet defines a data block for retrieving information about an AWS AMI (Amazon Machine Image) based on specific criteria like owners and tags. This data can then be used within the Terraform configuration to make decisions or set attributes based on the retrieved information.

```
module "deploy-servers" {
  source  = "./app-cluster"

  servers = 5
}
```

Explanation

This code snippet defines a module block for deploying servers from a specified source. While modules are useful for organizing and reusing Terraform configurations, this snippet does not focus on retrieving information about existing resources for use in the configuration.

```
provider "google" {
  project = "acme-app"
  region  = "us-central1"
}
```

Explanation

This code snippet defines a provider block for Google Cloud Platform, specifying the project and region. While providers are essential for interacting with cloud platforms, this snippet does not directly address retrieving information about existing resources for use in Terraform configuration.

```
locals {
  service_name = "forum"
  owner       = "Community Team"
}
```

Explanation

This code snippet defines local values for service_name and owner, which can be used for storing and reusing values within the Terraform configuration. However, it does not directly involve retrieving information about existing resources for use in the configuration.

```
1. resource "aws_instance" "web" {
2.   ami           = "ami-a1b2c3d4"
3.   instance_type = "t2.micro"
4. }
```

Explanation

This code snippet defines a resource block for creating an AWS EC2 instance with specific attributes like AMI and instance type. While creating new resources is a common task in Terraform, this snippet does not address retrieving information about existing resources for use in the configuration.

Overall explanation

In Terraform, data blocks are used to retrieve data from external sources, such as APIs or databases, and make that data available to your Terraform configuration. With data blocks, you can use information from external sources to drive your infrastructure as code, making it more dynamic and flexible.

For example, you can use a data block to retrieve a list of Amazon Machine Images (AMIs) from AWS, and then use that data to select the appropriate AMI for a virtual machine you are provisioning:

```
1. data "aws_ami" "example" {
2.   most_recent = true
3.
4.   filter {
5.     name   = "name"
6.     values = ["amzn2-ami-hvm-2.0.*-x86_64-gp2"]
7.   }
8.
9.   filter {
10.    name   = "virtualization-type"
11.    values = ["hvm"]
12.  }
13. }
```

```
14.
15. resource "aws_instance" "example" {
16.   ami           = data.aws_ami.example.id
17.   instance_type = "t2.micro"
18. }
```

In this example, the **data** block retrieves the most recent Amazon Linux 2 HVM AMI, and the **aws_instance** resource uses the selected AMI to create a virtual machine.

Data blocks can be used to retrieve information from a wide range of sources, such as databases, APIs, and cloud providers. This information can then be used to conditionally create, update, or delete resources, making your Terraform configurations more flexible and adaptable to changing requirements.

https://developer.hashicorp.com/terraform/language/data-sources

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 19Skipped

Oscar is modifying his Terraform configuration file but isn't 100% sure it's correct. He is afraid that changes made could negatively affect production workloads.

How can Oscar validate the changes that will be made without impacting existing workloads?

Correct answer

run a terraform plan and validate the changes that will be made

Explanation

Running a terraform plan allows Oscar to preview the changes that will be made to the infrastructure without actually applying them. This way, he can validate the changes and ensure they won't negatively impact existing workloads before making any modifications.

run terraform refresh to compare his existing configuration file against the current one

Explanation

terraform refresh is used to update the state file with the real-world infrastructure. It does not provide a preview of the changes that will be made, so it is not suitable for Oscar to validate the changes without impacting existing workloads.

run terraform apply -lock=false when executing the the changes made to the configuration

Explanation

Running terraform apply -lock=false will instruct Terraform to not hold a state lock during the operation. This is dangerous if others might concurrently run commands against the same

workspace. Using this method does not allow Oscar to validate the changes without affecting production workloads.

run a terraform validate to ensure the changes won't impact the production workloads

Explanation

While terraform validate checks the syntax and configuration of the Terraform files, it does not provide a preview of the changes that will be made. Therefore, it is not the best option for Oscar to validate the changes without impacting existing workloads.

Overall explanation

The terraform plan command is used to create an execution plan. Terraform performs a refresh, unless explicitly disabled, and then determines what actions are necessary to achieve the desired state specified in the configuration files.

This command is a convenient way to check whether the execution plan for a set of changes matches your expectations without making any changes to real resources or the state.

https://developer.hashicorp.com/terraform/cli/commands/plan

Domain

Objective 6 - Use the core Terraform workflow

Question 20Skipped

You and a colleague are working on updating some Terraform configurations within your organization. You need to follow a new naming standard for the local name within your resource blocks. However, you don't want Terraform to replace the object after changing your configuration files.

As an example, you want to change data-bucket to now be prod-encrypted-data-s3-bucket in the following resource block:

```
1. resource "aws_s3_bucket" "data-bucket" {
2.   bucket = "corp-production-data-bucket"
3.
4.   tags = {
5.     Name       = "corp-production-data-bucket"
6.     Environment = "prod"
7.   }
8. }
```

After updating the resource block, what command would you run to update the local name while ensuring Terraform does not replace the existing resource?

terraform apply -replace aws_s3_bucket.data-bucket

Explanation

The `terraform apply -replace` command is not the correct option for updating the local name without replacing the existing resource. This command is used to force Terraform to replace a specific resource during the apply process, which is not the desired outcome in this scenario.

Correct answer

terraform state mv aws_s3_bucket.data-bucket aws_s3_bucket.prod-encrypted-data-s3-bucket

Explanation

The correct command to update the local name without replacing the existing resource is to use the `terraform state mv` command. This command will move the existing state object to the new local name specified, ensuring that Terraform does not replace the resource.

terraform state rm aws_s3_bucket.data-bucket

Explanation

The `terraform state rm` command is not the correct option for updating the local name without replacing the existing resource. This command is used to remove a resource from the Terraform state, which is not the desired action in this situation where the goal is to update the local name without replacing the resource.

terraform apply -refresh-only

Explanation

The `terraform apply -refresh-only` command is not the correct option for updating the local name without replacing the existing resource. This command is used to only refresh the state of the resources without making any changes to the infrastructure.

Overall explanation

You can use terraform state mv when you wish to retain an existing remote object but track it as a different resource instance address in Terraform, such as if you have renamed a resource block or you have moved it into a different module in your configuration.

In this case, Terraform would not touch the actual resource that is deployed, but it would simply attach the existing object to the new address in Terraform.

WRONG ANSWERS:

- **terraform apply - replace** - this would cause Terraform to replace the resource
- **terraform apply - refresh-only** - this command is used to reconcile any changes to the real-world resources and update state to reflect those changes. It would not help us solve our problem

- **terraform state rm** - This command is used to remove a resource from state entirely while leaving the real-world resource intact. The bucket would still exist but it wouldn't help us with renaming our resource in our configuration file.

https://developer.hashicorp.com/terraform/cli/commands/state/mv#usage

A specific example relating to this question

Domain

Objective 7 - Implement and Maintain State

Question 21Skipped

You are writing Terraform to deploy resources, and have included provider blocks as shown below:

```
provider "aws" {
  region  = "us-east-1"
}

provider "aws" {
  region = "us-west-1"
}
```

When you validate the Terraform configuration, you get the following error:

```
Error: Duplicate provider configuration

  on main.tf line 5:
   5: provider "aws" {

A default provider configuration for "aws" was already given at
main.tf:1,1-15. If multiple configurations are required, set the xxxx
argument for alternative configurations.
```

What additional parameter is required to use multiple provider blocks of the same type, but with distinct configurations, such as cloud regions, namespaces, or other desired settings?

label

Explanation

The "label" parameter is not a valid parameter in Terraform for defining multiple configurations of the same provider type. To differentiate between configurations, the "alias" parameter should be used.

version

Explanation

The "version" parameter is not used to define multiple configurations of the same provider type in Terraform. It is typically used to specify the version of the provider being used.

multi

Explanation

The "multi" parameter is not a valid parameter in Terraform for defining multiple configurations of the same provider type. The correct parameter to achieve this is the "alias" parameter.

Correct answer

alias

Explanation

The correct additional parameter required to use multiple provider blocks of the same type with distinct configurations is the "alias" parameter. This allows you to differentiate between the different configurations of the same provider type.

Overall explanation

An alias meta-argument is used when using the same provider with different configurations for different resources. This feature allows you to include multiple provider blocks that refer to different configurations. In this example, you would need something like this:

```
1. provider "aws" {
2.   region  = "us-east-1"
3. }
4.
5. provider "aws" {
6.   region = "us-west-1"
7.   alias = "west"
8. }
```

When writing Terraform code to deploy resources, the resources that you want to deploy to the "**west**" region would need to specify the alias within the resource block. This instructs Terraform to use the configuration specified in that provider block. So in this case, the resource would be deployed to "**us-west-2**" region and not the "**us-east-1**" region. this configuration is common when using multiple cloud regions or namespaces in applications like Consul, Vault, or Nomad.

https://developer.hashicorp.com/terraform/language/providers/configuration#alias-multiple-provider-instances

Domain

Objective 3 - Understand Terraform Basics

Question 22Skipped

While Terraform is generally written using the HashiCorp Configuration Language (HCL). What other syntax can Terraform be expressed in?

XML

Explanation

XML is not a valid syntax for expressing Terraform configurations. Terraform primarily uses HCL and JSON for configuration files.

TypeScript

Explanation

TypeScript is not a valid syntax for expressing Terraform configurations. Terraform primarily uses HCL and JSON for configuration files.

Correct answer

JSON

Explanation

Terraform can be expressed in JSON syntax in addition to HCL. JSON is a popular choice for configuration files due to its simplicity and compatibility with various systems.

YAML

Explanation

YAML is not a valid syntax for expressing Terraform configurations. Terraform primarily uses HCL and JSON for configuration files.

Overall explanation

Terraform can be expressed using two syntaxes: **HashiCorp Configuration Language (HCL)**, which is the primary syntax for Terraform, and **JSON**.

The *HCL syntax is designed to be human-readable and easy to write*, and it provides many features designed explicitly for Terraform, such as interpolation, variables, and modules.

The ***JSON syntax is a machine-readable alternative*** to HCL, and it is typically used when importing existing infrastructure into Terraform or when integrating Terraform with other tools that expect data in JSON format.

While Terraform will automatically detect the syntax of a file based on its extension, you can also specify the syntax explicitly by including a **terraform** stanza in the file, as follows:

```
# HCL syntax Example
# terraform { }


# JSON syntax Exmample
{
  "terraform": {}
}
```

Note that while JSON is supported as a syntax, it is not recommended to use it for writing Terraform configurations from scratch, as the HCL syntax is more user-friendly and provides better support for Terraform's specific features.

https://github.com/hashicorp/hcl/blob/main/hclsyntax/spec.md

https://developer.hashicorp.com/terraform/language/syntax/json

Domain

Objective 3 - Understand Terraform Basics

Question 23Skipped

A user creates three workspaces from the command line: prod, dev, and test. Which of the following commands will the user run to switch to the dev workspace?

terraform workspace switch dev

Explanation

The command "terraform workspace switch " is not a valid Terraform command. The correct command to switch workspaces is "terraform workspace select ".

terraform workspace -switch dev

Explanation

The command "terraform workspace -switch dev" is not a valid Terraform command. The correct syntax to switch workspaces is "terraform workspace select ".

terraform workspace dev

Explanation

The command "terraform workspace dev" is not a valid Terraform command to switch workspaces. The correct syntax to switch workspaces is "terraform workspace select ".

Correct answer

terraform workspace select dev

Explanation

The correct command to switch workspaces in Terraform is "terraform workspace select ". Therefore, terraform workspace select dev is the correct command to switch to the "dev" workspace.

Overall explanation

The command used to switch to the dev workspace in Terraform is **terraform workspace select dev**.

Terraform workspaces allow you to manage multiple sets of infrastructure resources that share the same configuration. To switch to a specific workspace in Terraform, you use the **terraform workspace select** command followed by the name of the workspace you want to switch to. In this case, the name of the workspace is "dev".

After running this command, Terraform will switch to the **dev** workspace, and all subsequent Terraform commands will apply to the resources in that workspace. If the **dev** workspace does not yet exist, Terraform will **NOT** create it for you.

Here's an example of using the **terraform workspace select** command to switch to the dev workspace:

1. $ terraform workspace select dev
2. Switched to workspace "dev".

https://developer.hashicorp.com/terraform/cli/commands/workspace/select

Domain

Objective 4 - Use Terraform Outside of Core Workflow

Question 24Skipped

True or False? When using the Terraform provider for Vault, the tight integration between these HashiCorp tools provides the ability to mask secrets in the state file.

True

Explanation

False. The Terraform provider for Vault does not inherently provide the ability to mask secrets in the state file. It is important to handle sensitive information securely in Terraform configurations.

Correct answer

False

Explanation

Correct. The statement is false because the tight integration between Terraform and Vault does not automatically mask secrets in the state file. Developers need to implement secure practices to handle secrets effectively.

Overall explanation

False. By default, Terraform does not provide the ability to mask secrets in the Terraform plan and state files regardless of what provider you are using. While Terraform and Vault are both developed by HashiCorp and have a tight integration, masking secrets in Terraform plans and state files requires additional steps to securely manage sensitive information.

One common approach is to use environment variables to store sensitive information or use Terraform's data sources to retrieve the information from the environment rather than hardcoding the information into the Terraform configuration. This helps to ensure that sensitive information is not stored in plain text in the Terraform configuration files.

https://learn.hashicorp.com/tutorials/terraform/secrets-vault

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 25Skipped

Which Terraform command will check and report errors within modules, attribute names, and value types to ensure they are syntactically valid and internally consistent?

terraform fmt

Explanation

The choice terraform fmt is incorrect as this command is used to rewrite Terraform configuration files to a canonical format and style. It does not check for errors within modules, attribute names, and value types.

terraform format

Explanation

The choice terraform format is incorrect as this command is not a valid Terraform command. The correct command for formatting Terraform configuration files is terraform fmt.

terraform show

Explanation

The choice terraform show is incorrect as this command is used to provide human-readable output from a state or plan file. It does not perform validation checks for errors within modules, attribute names, and value types.

Correct answer

terraform validate

Explanation

The correct choice is terraform validate because this command is specifically designed to check and report errors within modules, attribute names, and value types to ensure they are syntactically valid and internally consistent.

Overall explanation

The **terraform validate** command is used to check and report errors within modules, attribute names, and value types to ensure they are syntactically valid and internally consistent. This command performs basic validation of the Terraform configuration files in the current directory, checking for issues such as missing required attributes, invalid attribute values, and incorrect structure of the Terraform code.

For example, if you run **terraform validate** and there are syntax errors in your Terraform code, Terraform will display an error message indicating the line number and description of the issue. If no errors are found, the command will return with no output.

It's recommended to run **terraform validate** before running **terraform apply**, to ensure that your Terraform code is valid and will not produce unexpected results.

https://developer.hashicorp.com/terraform/cli/commands/validate

Domain

Objective 6 - Use the core Terraform workflow

Question 26Skipped

What tasks can the terraform state command be used for in Terraform?

create a new state file

Explanation

The `terraform state` command is not used to create a new state file. State files are typically created and managed automatically by Terraform during the execution of the infrastructure code.

refresh the existing state

Explanation

The `terraform state` command is not used to refresh the existing state. The `terraform refresh` command is specifically designed for that purpose.

there is no such command

Explanation

The `terraform state` command does exist in Terraform and can be used for various state management tasks. It is not accurate to say that there is no such command.

Correct answer

modify the current state, such as removing items

Explanation

The `terraform state` command can indeed be used to modify the current state by removing items. This is useful for managing the state of resources in Terraform.

Overall explanation

The **terraform state** command and its subcommands can be used for various tasks related to the Terraform state. Some of the tasks that can be performed using the **terraform state** command are:

1. Inspecting the Terraform state: The **terraform state show** subcommand can be used to display the current state of a Terraform configuration. This can be useful for verifying the current state of resources managed by Terraform.
2. Updating the Terraform state: The **terraform state mv** and **terraform state rm** subcommands can be used to move and remove resources from the Terraform state, respectively.
3. Pulling and pushing the Terraform state: The **terraform state pull** and **terraform state push** subcommands can be used to retrieve and upload the Terraform state from and to a remote backend, respectively. This is useful when multiple users or systems are working with the same Terraform configuration.
4. Importing resources into Terraform: The **terraform state import** subcommand can be used to import existing resources into the Terraform state. This allows Terraform to manage resources that were created outside of Terraform.

By using the **terraform state** command and its subcommands, users can manage and manipulate the Terraform state in various ways, helping to ensure that their Terraform configurations are in the desired state.

https://developer.hashicorp.com/terraform/cli/commands/state/list

https://developer.hashicorp.com/terraform/cli/state

Domain

Objective 4 - Use Terraform Outside of Core Workflow

Question 27Skipped

Provider dependencies are created in several different ways. Select the valid provider dependencies from the following list: (select three)

Correct selection

Explicit use of a provider block in configuration, optionally including a version constraint.

Explanation

The explicit use of a provider block in the configuration, along with an optional version constraint, establishes a direct dependency on that specific provider for the resources being managed.

Existence of any provider plugins found locally in the working directory.

Explanation

The existence of provider plugins locally in the working directory does not establish a direct dependency on the provider for the resources being managed. Terraform relies on the configuration and state to determine provider dependencies.

Correct selection

Existence of any resource instance belonging to a particular provider in the current *state*.

Explanation

The existence of any resource instance belonging to a particular provider in the current state signifies a dependency on that provider, as Terraform needs access to the provider to manage the state of those resources.

Correct selection

Use of any resource block or data block in the configuration, belonging to a particular provider

Explanation

When any resource block or data block is used in the configuration, it indicates a dependency on the provider associated with those blocks, as they are responsible for managing those specific resources.

Overall explanation

The existence of a provider plugin found locally in the working directory does not itself create a provider dependency. The plugin can exist without any reference to it in the Terraform configuration.

https://developer.hashicorp.com/terraform/language/providers/requirements

https://developer.hashicorp.com/terraform/cli/commands/providers

Domain

Objective 3 - Understand Terraform Basics

Question 28Skipped

True or False? Rather than use a state file, Terraform can inspect cloud resources on every run to validate that the real-world resources match the desired state.

True

Explanation

This choice is incorrect. Terraform relies on state files to track the current state of infrastructure resources and compare it to the desired state declared in configuration files. Without a state file, Terraform would not be able to accurately determine the changes needed to align real-world resources with the desired state.

Correct answer

False

Explanation

This choice is correct. Terraform requires a state file to store information about the current state of infrastructure resources. By inspecting this state file, Terraform can determine the necessary changes to bring the real-world resources in line with the desired state specified in the configuration files. Without a state file, Terraform would not be able to perform this validation.

Overall explanation

State is a necessary requirement for Terraform to function. And in the scenarios where Terraform may be able to get away without state, doing so would require shifting massive amounts of complexity from one place (state) to another place (the replacement concept).

To support mapping configuration to resources in the real world, Terraform uses its own state structure. Terraform can guarantee one-to-one mapping when it creates objects and records their identities in the state. Terraform state also serves as a performance improvement - rather than having to scan every single resource to determine the current state of each resource.

https://developer.hashicorp.com/terraform/language/state/purpose

Domain

Objective 2 - Understand Terraform's Purpose (vs other IaC)

Question 29Skipped

Freddy and his co-worker Jason are deploying resources in GCP using Terraform for their team. After resources have been deployed, they must destroy the cloud-based resources to save on costs. However, two other team members, Michael and Chucky, are using a Cloud SQL instance for testing and request to keep it running.

How can Freddy and Jason destroy all other resources without negatively impacting the database?

delete the entire state file using the terraform state rm command and manually delete the other resources in GCP

Explanation

Deleting the entire state file using the `terraform state rm` command and manually deleting other resources in GCP is not recommended. This approach bypasses Terraform's management of resources and can lead to inconsistencies in the infrastructure state.

run a terraform destroy, modify the configuration file to include only the Cloud SQL resource, and then run a terraform apply

Explanation

Running `terraform destroy` without removing the Cloud SQL resource from the configuration file will result in the database being destroyed along with other resources. Modifying the configuration file to include only the Cloud SQL resource and then applying the changes will not prevent the database from being deleted.

take a snapshot of the database, run a terraform destroy, and then recreate the database in the GCP console by restoring the snapshot

Explanation

Taking a snapshot of the database and recreating it after running `terraform destroy` is not an efficient solution. This process involves manual steps and does not utilize Terraform's infrastructure as code capabilities to manage resources.

Correct answer

run a terraform state rm command to remove the Cloud SQL instance from Terraform management before running the terraform destroy command

Explanation

Removing the Cloud SQL instance from Terraform management using the `terraform state rm` command ensures that the instance is not included in the resources to be destroyed when running `terraform destroy`. This allows Freddy and Jason to delete all other resources without impacting the database.

Overall explanation

To destroy all Terraform-managed resources except for a single resource, you can use the **terraform state** command to remove the state for the resources you want to preserve. This effectively tells Terraform that those resources no longer exist, so it will not attempt to destroy them when you run **terraform destroy**.

Here's an example of how you could do this:

1. Identify the resource you want to preserve. In this example, let's assume you want to preserve a resource named **prod_db**.

2. Run **terraform state list** to see a list of all Terraform-managed resources.

3. Run **terraform state rm** for each resource you want to keep, like the **prod_db**. For example:

    1. terraform state rm google_sql_database_instance.prod_db
    2. terraform state rm aws_instance.another_instance

4. Run **terraform destroy** to destroy all remaining resources. Terraform will not attempt to destroy the resource you preserved in step 3 because Terraform no longer manages it.

Note that this approach can be dangerous and is not recommended if you have multiple Terraform workspaces or if you are using a remote state backend, as it can cause

inconsistencies in your state file. In those cases, it is usually better to use a separate Terraform workspace for the resources you want to preserve or to utilize Terraform's built-in resource-targeting functionality to destroy only specific resources.

All other options would be too time-consuming or will cause an outage to the database.

https://developer.hashicorp.com/terraform/cli/commands/state/rm

Domain

Objective 7 - Implement and Maintain State

Question 30Skipped

Where does Terraform Community (Free) store the *local* state for workspaces?

directory called terraform.workspaces.tfstate

Explanation

The directory structure `terraform.workspaces.tfstate` is not the standard location where Terraform Community (Free) stores the local state for workspaces. The correct directory structure is `terraform.tfstate.d/`.

a file called terraform.tfstate

Explanation

Terraform Community (Free) does not store the local state for workspaces in a single file called `terraform.tfstate`. Instead, it uses a directory structure to store state files for each workspace individually.

a file called terraform.tfstate.backup

Explanation

The file `terraform.tfstate.backup` is not where Terraform Community (Free) stores the local state for workspaces. The correct location is a directory called `terraform.tfstate.d/`.

Correct answer

directory called terraform.tfstate.d/<workspace name>

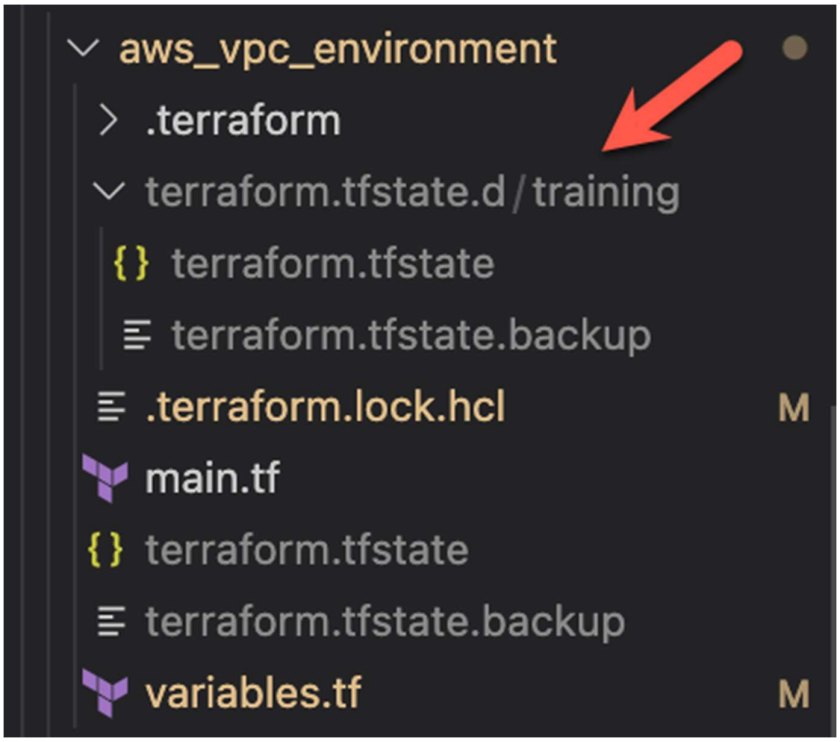
Explanation

Terraform Community (Free) stores the local state for workspaces in a directory called `terraform.tfstate.d/`. This directory structure allows for separate state files for each workspace, making it easier to manage and maintain the state data.

Overall explanation

Terraform Community (Free) stores the local state for workspaces in a file on disk. For local state, Terraform stores the workspace states in a directory called terraform.tfstate.d/<workspace_name>. Here's a screenshot of a Terraform run that was created using a workspace called training. You can see that Terraform created the terraform.tfstate.d directory, and then a directory with the namespace name underneath it.

Under each directory, you'll find the state file, which is name terraform.tfstate



https://developer.hashicorp.com/terraform/cli/workspaces#workspace-internals

Domain

Objective 7 - Implement and Maintain State

Question 31Skipped

A "backend" in Terraform determines how state is loaded and how an operation such as apply is executed. Which of the following is **not** a supported backend type?

s3

Explanation

The "s3" backend type is a supported backend type in Terraform. It allows storing the state file in an Amazon S3 bucket.

Correct answer

github

Explanation

The "github" backend type is not a supported backend type in Terraform. Terraform does not have built-in support for storing state in a GitHub repository.

local

Explanation

The "local" backend type is a supported backend type in Terraform. It stores the state file on the local disk where Terraform is being run.

consul

Explanation

The "consul" backend type is a supported backend type in Terraform. Consul is a popular choice for storing Terraform state.

Overall explanation

GitHub is not a supported backend type.

The Terraform backend is responsible for storing the state of your Terraform infrastructure and ensuring that state is consistent across all team members. Terraform state is used to store information about the resources that Terraform has created, and is used by Terraform to determine what actions are necessary when you run Terraform commands like **apply** or **plan**.

Terraform provides several backend options, including:

- **local** backend: The default backend, which stores Terraform state on the local filesystem. This backend is suitable for small, single-user deployments, but can become a bottleneck as the size of your infrastructure grows or as multiple users start managing the infrastructure.

- **remote** backend: This backend stores Terraform state in a remote location, such as an S3 bucket, a Consul server, or a Terraform Enterprise instance. The remote backend allows multiple users to share the same state and reduces the risk of state corruption due to disk failures or other issues.

- **consul** backend: This backend stores Terraform state in a Consul cluster. Consul provides a highly available and durable storage solution for Terraform state, and also provides features like locking and versioning that are important for collaboration.

- **s3** backend: This backend stores Terraform state in an S3 bucket. S3 provides a highly available and durable storage solution for Terraform state, and is a popular option for storing Terraform state for large infrastructure deployments.

When choosing a backend, you should consider the needs of your infrastructure, including the size of your deployment, the number of users who will be managing the infrastructure, and the level of collaboration that will be required. It's also important to consider the cost and performance characteristics of each backend, as some backends may be more expensive or may require more setup and maintenance than others.

https://developer.hashicorp.com/terraform/language/settings/backends/configuration

Domain

Objective 7 - Implement and Maintain State

Question 32Skipped

Why might a user opt to include the following snippet in their configuration file?

```
terraform {
 required_version = ">= 1.9.2"
}
```

this ensures that all Terraform providers are above a certain version to match the application being deployed

Explanation

This choice is incorrect as the snippet specifically targets the Terraform version required to run the configuration, not the versions of Terraform providers.

Correct answer

The user wants to specify the minimum version of Terraform that is required to run the configuration

Explanation

The snippet specifies the minimum version of Terraform required to run the configuration, ensuring compatibility and preventing potential issues that may arise from using older versions.

versions before Terraform 1.9.2 were not approved by HashiCorp to be used in production

Explanation

This choice is incorrect because the snippet is focused on specifying the minimum required version of Terraform, not on the approval status of older versions by HashiCorp for production use.

The user wants to ensure that the application being deployed is a minimum version of 1.9.2

Explanation

This choice is incorrect because the snippet is actually specifying the minimum version of Terraform required, not the version of the application being deployed.

Overall explanation

The **required_version** parameter in a **terraform** block is used to specify the minimum version of Terraform that is required to run the configuration. This parameter is optional, but it can be useful for ensuring that a Terraform configuration is only run with a version of Terraform that is known to be compatible.

For example, if your Terraform configuration uses features that were introduced in Terraform 1.9.2, you could include the following **terraform** block in your configuration to ensure that Terraform 1.9.2 or later is used:

```
1. terraform {
2.   required_version = ">= 1.9.2"
3. }
```

When you run Terraform, it will check the version of Terraform that is being used against the **required_version** parameter and it will raise an error if the version is lower than the required version.

This can be especially useful in larger organizations or projects where multiple people are working on the same Terraform code, as it helps to ensure that everyone is using the same version of Terraform and reduces the risk of encountering unexpected behavior or bugs due to differences in Terraform versions.

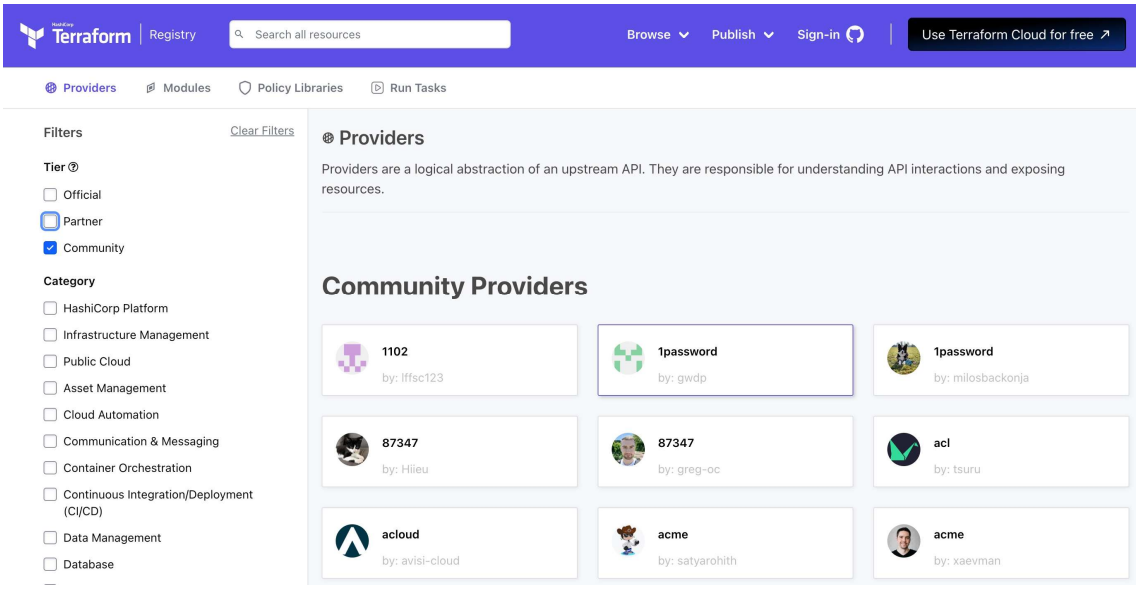
https://developer.hashicorp.com/terraform/language/settings#specifying-a-required-terraform-version

Domain

Objective 3 - Understand Terraform Basics

Question 33Skipped

True or False? Using the latest versions of Terraform, terraform init cannot automatically download community providers.



Correct answer

False

Explanation

The statement "False" is correct because using the latest versions of Terraform, the command `terraform init` can automatically download community providers. This functionality simplifies the process of integrating community providers into Terraform configurations, enhancing the overall user experience.

True

Explanation

The statement "True" is incorrect because using the latest versions of Terraform, the command `terraform init` can automatically download community providers. This feature allows users to easily access and utilize community-created providers without manual intervention.

Overall explanation

False. With the latest versions of Terraform, **terraform init** can automatically download community providers. More specifically, this feature was added with Terraform 0.13. Before 0.13, **terraform init** would **NOT** download community providers.

Terraform includes a built-in provider registry that allows you to easily install and manage the providers you need for your Terraform configuration. When you run **terraform init**, Terraform will check your configuration for any required providers and download them automatically if they are not already installed on your system. This includes both official Terraform providers and community-maintained providers.

To use a community-maintained provider in your Terraform configuration, you need to specify the provider in your configuration using the **provider** block and include the provider's source repository in your configuration. Terraform will download and install the provider automatically when you run **terraform init**, provided that the provider is available in the Terraform provider registry.

https://www.hashicorp.com/blog/automatic-installation-of-third-party-providers-with-terraform-0-13

Domain

Objective 3 - Understand Terraform Basics

Question 34Skipped

Which are some of the benefits of using Infrastructure as Code in an organization? (select three)

IaC is written as an imperative approach, where specific commands need to be executed in the correct order

Explanation

This statement is incorrect. IaC follows a declarative approach, where the desired state of the infrastructure is defined, rather than specific commands to be executed in a particular order.

Correct selection

IaC code can be used to manage infrastructure on multiple cloud platforms

Explanation

IaC code is platform-agnostic and can be used to manage infrastructure across various cloud platforms, providing flexibility and scalability in managing resources.

Correct selection

IaC uses a human-readable configuration language to help you write infrastructure code quickly

Explanation

IaC utilizes a human-readable configuration language, making it easier for developers and operators to understand, write, and maintain infrastructure code efficiently.

Correct selection

IaC allows you to commit your configurations to version control to safely collaborate on infrastructure

Explanation

Using Infrastructure as Code (IaC) allows for configurations to be stored in version control, enabling collaboration, tracking changes, and ensuring consistency in infrastructure deployment.

Overall explanation

Infrastructure as Code has many benefits. For starters, IaC allows you to create a blueprint of your data center as code that can be ***versioned***, ***shared***, and ***reused***. Because IaC is code, it can (and should) be stored and managed in a **code repository**, such as GitHub, GitLab, or Bitbucket. Changes can be proposed or submitted via Pull Requests (PRs), which can help ensure a proper workflow, enable an approval process, and follow a typical development lifecycle.

One of the primary reasons that Terraform (or other IaC tools) are becoming more popular is because they are mostly ***platform agnostic***. You can use Terraform to provision and manage resources on various platforms, SaaS products, and even local infrastructure.

IaC is generally ***easy to read*** (and develop). Terraform is written in HashiCorp Configuration Language (HCL), while others may use YAML or solution-specific languages (like Microsoft ARM). But generally, IaC code is easy to read and understand

Incorrect Answer:

IaC is written using a ***declarative*** approach (***not imperative***), which allows users to simply focus on what the eventual target configuration should be, and the tool manages the process of how that happens. This often speeds things up because resources can be created/managed in parallel when there aren't any implicit or explicit dependencies.

https://developer.hashicorp.com/terraform/tutorials/aws-get-started/infrastructure-as-code

https://www.terraform.io/use-cases/infrastructure-as-code

Domain

Objective 1 - Understand Infrastructure as Code Concepts

Question 35Skipped

Sara has her entire application automated using Terraform, but she needs to start automating more infrastructure components, such as creating a new subnet, DNS record, and load balancer. Sara wants to create these new resources using modules so she easily reuse the code. However, Sara is having problems getting the subnet_id from the *subnet* module to pass to the *load balancer* module.

modules/subnet.tf:

```
1. resource "aws_subnet" "bryan" {
2.   vpc_id     = aws_vpc.krausen.id
3.   cidr_block = "10.0.1.0/24"
4.
5.   tags = {
6.     Name = "Krausen Subnet"
7.   }
8. }
```

What could fix this problem?

references to resources that are created within a module cannot be used within other modules

Explanation

Contrary to this statement, references to resources created within a module can be used in other modules by defining output variables. Therefore, this choice is incorrect as it provides inaccurate information regarding the usability of resources created within modules.

move the *subnet* and *load balancer* resource into the main configuration file so they can easily be referenced

Explanation

Moving the subnet and load balancer resources into the main configuration file may make them easier to reference, but it does not address the specific issue of passing the subnet_id from the subnet module to the load balancer module. This solution does not fix the problem Sara is facing.

publish the module to a Terraform registry first

Explanation

Publishing the module to a Terraform registry is not a solution to the problem of passing the subnet_id between modules. While it may be a good practice for sharing modules with others, it does not address the immediate issue Sara is experiencing.

Correct answer

add an output block to the *subnet* module and retrieve the value using module.subnet.subnet_id for the *load balancer* module

Explanation

Adding an output block to the subnet module allows the subnet_id to be exposed as an output variable. This output variable can then be retrieved using module.subnet.subnet_id in the load balancer module, enabling Sara to pass the subnet_id between modules.

Overall explanation

Modules also have output values, which are defined within the module with the output keyword. You can access them by referring to module.<MODULE NAME>.<OUTPUT NAME>. Like input variables, module outputs are listed under the outputs tab in the Terraform registry.

Module outputs are usually either passed to other parts of your configuration, or defined as outputs in your root module.

https://learn.hashicorp.com/tutorials/terraform/module-use#define-root-output-values

Domain

Objective 5 - Interact with Terraform Modules

Question 36Skipped

True or False? The terraform plan -refresh-only command is used to create a plan whose goal is only to update the Terraform state to match any changes made to remote objects outside of Terraform.

Correct answer

True

Explanation

The statement is true because the terraform plan -refresh-only command is specifically designed to only refresh the Terraform state to match any changes made to remote objects outside of Terraform. It does not apply those changes to the state.

False

Explanation

The statement is false because the terraform plan -refresh-only command is used to create a plan that only refreshes the state without updating it to match changes made to remote objects outside of Terraform. It does not update the Terraform state.

Overall explanation

The **terraform plan -refresh-only** command is used in Terraform to update the state of your infrastructure in memory without making any actual changes to the infrastructure. The **-refresh-only** flag tells Terraform to only update its understanding of the current state of the infrastructure and not to make any changes.

When you run **terraform plan -refresh-only**, Terraform will query the current state of your infrastructure and update its internal state to reflect what it finds. This can be useful if you want to ensure that Terraform has the most up-to-date information about your infrastructure before generating a plan, without actually making any changes.

It is important to note that while the **terraform plan -refresh-only** command updates Terraform's internal state, it does not modify the Terraform state file on disk. The Terraform state file is only updated when Terraform actually makes changes to the infrastructure.

Note that this command replaced the deprecated command **terraform refresh**

https://developer.hashicorp.com/terraform/cli/commands/plan#planning-modes

https://developer.hashicorp.com/terraform/cli/commands/refresh

Domain

Objective 7 - Implement and Maintain State

Question 37Skipped

Environment variables can be used to set the value of input variables. The environment variables must be in the format "____"_<*variablename*>.

Select the correct prefix string from the following list.

TF_VAR_VALUE

Explanation

The prefix TF_VAR_VALUE is not the correct format for setting input variables using environment variables in Terraform. The correct prefix is TF_VAR.

TF_ENV_VAR

Explanation

The prefix TF_ENV_VAR is not the correct format for setting input variables using environment variables in Terraform. The correct prefix is TF_VAR.

TF_ENV

Explanation

The prefix TF_ENV is not the correct format for setting input variables using environment variables in Terraform. The correct prefix is TF_VAR.

Correct answer

TF_VAR

Explanation

The correct prefix string for setting input variables using environment variables in Terraform is TF_VAR. This prefix is recognized by Terraform to assign values to variables.

Overall explanation

Terraform allows you to use environment variables to set values in your Terraform configuration. This can be useful for specifying values specific to the environment in which Terraform is running or providing values that can be easily changed without modifying the Terraform configuration.

To use a variable in Terraform, you need to define the variable using the following syntax in your Terraform configuration:

```
1. variable "instructor_name" {
2.   type = string
3. }
```

You can then set the value of the environment variable when you run Terraform by exporting the variable in your shell before running any Terraform commands:

```
1. $ export TF_VAR_instructor_name="bryan"
2. $ terraform apply
```

https://developer.hashicorp.com/terraform/cli/config/environment-variables

Domain

Objective 3 - Understand Terraform Basics

Question 38Skipped

You are using a Terraform Cloud workspace linked to a GitHub repo to manage production workloads in your environment. After approving a merge request, what *default* action can you expect to be triggered on the workspace?

The workspace will trigger a set of tests, such as terratest and terraform validate, to ensure the code is valid and can be successfully executed by the specific version of Terraform configured for the workspace.

Explanation

Triggering tests like terratest and terraform validate to ensure code validity and successful execution is not the default action after approving a merge request in a Terraform Cloud workspace linked to a GitHub repo. The default action is running a speculative plan.

Terraform Cloud will automatically execute a terraform destroy operation on your production workloads, and apply the new committed code stored in the GitHub repo

Explanation

Automatically executing a terraform destroy operation on production workloads and applying new code stored in the GitHub repo is not the default action triggered on the workspace after approving a merge request. The default action is running a speculative plan to show potential changes.

The workspace will run a speculative plan and automatically apply the changes without any required interaction from the user

Explanation

The workspace will not automatically apply the changes without user interaction. Instead, a speculative plan will be run to show the potential changes, and the user will need to manually apply the changes after reviewing them.

Correct answer

A speculative plan will be run to show the potential changes to the managed environment and validate the changes against any applicable Sentinel policies

Explanation

After approving a merge request, Terraform Cloud will run a speculative plan to show the potential changes that will be applied to the managed environment. This allows users to review and validate the changes against any applicable Sentinel policies before applying them.

Overall explanation

After approving a merge request that modifies Terraform configurations in a GitHub repository linked to a Terraform Cloud workspace, the default action that can be expected to run automatically is a **"speculative plan"** operation.

When you merge a pull request or push changes to the main branch (or any branch you have configured as the trigger for the workspace), Terraform Cloud typically triggers a plan operation. During this plan phase, Terraform examines the proposed changes to your infrastructure and displays a list of actions it would take if applied. It's a way to preview the changes before actually making them.

The plan output shows what resources Terraform would create, modify, or delete, which allows you to review and validate the expected changes. After reviewing the plan, you can then manually apply the changes to your infrastructure through the Terraform Cloud workspace.

Note: You can absolutely configure a Terraform workspace to automatically apply the changes to the code, although that is generally not recommended, ***nor is it the default action***.

Wrong Answers:

- TFC does not automatically run a speculative plan and apply the changes unless you specifically configure the workspace to do so. This is not the default action that would be triggered when you commit new code to the repo

- TFC does not run external tests, such as terratest and terraform validate on your code when you commit it to a repo

- TFC, or Terraform in general, does not destroy managed infrastructure when executing a plan and apply. It will only modify the resources needed to ensure the managed restructure now matches the desired state.

https://developer.hashicorp.com/terraform/cloud-docs/run/remote-operations

Domain

Objective 9 - Understand Terraform Cloud Capabilities

Question 39Skipped

Anyone can publish and share modules on the Terraform Public Registry, and meeting the requirements for publishing a module is extremely easy.

What are some of the requirements that must be met in order to publish a module on the Terraform Public Registry? (select three)

Correct selection

Module repositories must use this three-part name format, *terraform-<PROVIDER>-<NAME>*.

Explanation

The requirement for module repositories to follow the terraform-- naming format is accurate, as this naming convention helps organize and categorize modules on the Terraform Public Registry.

Correct selection

The module must be on GitHub and must be a public repo.

Explanation

The requirement for the module to be on GitHub and a public repository is correct, as the Terraform Public Registry relies on GitHub for module hosting and version control.

The module must be PCI/HIPPA compliant.

Explanation

The statement about the module needing to be PCI/HIPPA compliant is incorrect, as there is no such requirement mentioned for publishing modules on the Terraform Public Registry. Compliance with these standards would depend on the specific use case of the module.

Correct selection

The registry uses tags to identify module versions. Release tag names must be for the format *x.y.z*, and can optionally be prefixed with a v .

Explanation

The requirement for release tag names to follow the x.y.z format and optionally be prefixed with a 'v' is valid, as it ensures consistency and clarity in versioning for modules on the Terraform Public Registry.

Overall explanation

The list below contains all the requirements for publishing a module. Meeting the requirements for publishing a module is extremely easy. The list may appear long only to ensure we're detailed, but adhering to the requirements should happen naturally.

- **GitHub.** The module must be on GitHub and must be a public repo. This is only a requirement for the public registry. If you're using a private registry, you may ignore this requirement

- **Named terraform-<PROVIDER>-<NAME>.** Module repositories must use this three-part name format, where <NAME> reflects the type of infrastructure the module manages and <PROVIDER> is the main provider where it creates that infrastructure. The <NAME> segment can contain additional hyphens. Examples: terraform-google-vault or terraform-aws-ec2-instance.

- **Repository description.** The GitHub repository description is used to populate the short description of the module. This should be a simple one-sentence description of the module.

- **Standard module structure.** The module must adhere to the standard module structure. This allows the registry to inspect your module and generate documentation, track resource usage, parse submodules and examples, and more.

- **x.y.z tags for releases.** The registry uses tags to identify module versions. Release tag names must be a semantic version, which can optionally be prefixed with a v. For example, v1.0.4 and 0.9.2. To publish a module initially, at least one release tag must be present. Tags that don't look like version numbers are ignored.

https://developer.hashicorp.com/terraform/registry/modules/publish#requirements

Domain

Objective 5 - Interact with Terraform Modules

Question 40Skipped

True or False? The following code is an example of an ***implicit dependency*** in Terraform

```
1. resource "aws_instance" "web" {
2.   ami           = "ami-0c55b159cbfafe1f0"
3.   instance_type = "t2.micro"
```

```
}

resource "aws_ebs_volume" "data" {
  availability_zone = "us-west-2a"
  size              = 1

  tags = {
    Name = "data-volume"
  }
}

resource "aws_volume_attachment" "attach_data_volume" {
  device_name = "/dev/xvdf"
  volume_id   = aws_ebs_volume.data.id
  instance_id = aws_instance.web.id
}
```

False

Explanation

This statement is incorrect. The code snippet clearly demonstrates an implicit dependency between the resources "aws_volume_attachment" "attach_data_volume", "aws_ebs_volume.data", and "aws_instance.web". In Terraform, implicit dependencies are recognized based on the resource references within the configuration, even if they are not explicitly defined using the "depends_on" attribute.

Correct answer

True

Explanation

The code snippet provided shows an implicit dependency in Terraform. The resource "aws_volume_attachment" "attach_data_volume" depends on both "aws_ebs_volume.data" and "aws_instance.web" resources without explicitly specifying the dependency using the "depends_on" attribute. Terraform automatically detects this relationship and ensures that the dependencies are resolved in the correct order during the execution.

Overall explanation

Terraform ***implicit dependencies*** refer to the dependencies between resources in a Terraform configuration but are not **explicitly** defined in the configuration. Terraform uses a graph to track

these implicit dependencies and ensures that resources are created, updated, and deleted in the correct order.

For example, suppose you have a Terraform configuration that creates a virtual machine and a disk. In that case, Terraform will implicitly depend on the disk being created before the virtual machine because the virtual machine needs the disk to function. Terraform will automatically create the disk first and then create the virtual machine.

Sometimes, Terraform may miss an implicit dependency, resulting in an error when you run **terraform apply**. In these cases, you can use the **depends_on** argument to explicitly declare the dependency between resources. For example:

```
1. resource "aws_instance" "example" {
2.   ami           = "ami-0c55b159cbfafe1f0"
3.   instance_type = "t2.micro"
4.
5.   depends_on = [
6.     aws_ebs_volume.example
7.   ]
8. }
9.
10. resource "aws_ebs_volume" "example" {
11.   availability_zone = "us-west-2a"
12.   size              = 1
13. }
```

In this example, the **aws_instance** resource depends on the **aws_ebs_volume** resource, and Terraform will create the **aws_ebs_volume** resource first and then the **aws_instance** resource.

In general, Terraform implicit dependencies are handled automatically, but sometimes it may be necessary to use the **depends_on** argument to ensure that resources are created in the correct order.

https://developer.hashicorp.com/terraform/tutorials/certification-associate-tutorials-003/dependencies

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 41Skipped

In the following code snippet, the type of Terraform block is identified by which string?

```
1. resource "aws_instance" "db" {
2.   ami         = "ami-123456"
3.   instance_type = "t2.micro"
4. }
```

t2.micro

Explanation

The string "t2.micro" is not the type of Terraform block in this code snippet. It is the value assigned to the instance_type attribute of the AWS instance resource.

Correct answer

resource

Explanation

The type of Terraform block is identified by the keyword "resource" in this code snippet. This keyword indicates that a new AWS instance resource is being defined.

db

Explanation

The string "db" is not the type of Terraform block in this code snippet. It is the name given to this specific AWS instance resource block.

instance_type

Explanation

The string "instance_type" is not the type of Terraform block in this code snippet. It is the attribute key used to specify the instance type for the AWS instance resource.

Overall explanation

In Terraform, resource blocks define the resources you want to create, update, or manage as part of your infrastructure. Other type of block types in Terraform
include provider, terraform, output, data, and resource.

The format of a resource block configuration is as follows:

```
1. resource "TYPE" "NAME" {
2.   [CONFIGURATION_KEY = CONFIGURATION_VALUE]
3.   ...
4. }
```

where:

- **TYPE** is the type of resource you want to create, such as an AWS EC2 instance, an Azure storage account, or a Google Cloud Platform compute instance.

- **NAME** is a unique identifier for the resource, which you can use in other parts of your Terraform configuration to refer to this resource.

- **CONFIGURATION_KEY** is a key that corresponds to a specific attribute of the resource type.

- **CONFIGURATION_VALUE** is the value for the attribute specified by **CONFIGURATION_KEY**.

For example, here is a simple resource block that creates an Amazon Web Services (AWS) EC2 instance:

```
1. resource "aws_instance" "example" {
2.   ami           = "ami-0323c3dd2da7fb37d"
3.   instance_type = "t2.micro"
4. }
```

In this example, the **resource** block creates an EC2 instance with the specified Amazon Machine Image (AMI) and instance type.

It is important to note that each resource type will have its own set of required and optional attributes, and you must specify the required attributes for each resource type in your Terraform configuration. Some common attributes for AWS EC2 instances include the AMI ID, instance type, and security group.

By defining resources in Terraform, you can manage your infrastructure as code and track changes to your infrastructure over time, making it easier to version control, automate, and collaborate on your infrastructure.

https://developer.hashicorp.com/terraform/language/resources

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 42Skipped

From the code below, identify the ***implicit*** dependency:

```
1.  resource "aws_eip" "public_ip" {
2.    vpc      = true
3.    instance = aws_instance.web_server.id
4.  }
5.
6.  resource "aws_instance" "web_server" {
7.    ami           = "ami-2757f631"
8.    instance_type = "t2.micro"
9.    depends_on    = [aws_s3_bucket.company_data]
10. }
```

Correct answer

The EC2 instance labeled web_server

Explanation

The implicit dependency in the code is the EC2 instance labeled "web_server" because the aws_eip resource depends on the aws_instance.web_server.id for its instance attribute.

The AMI used for the EC2 instance

Explanation

The AMI used for the EC2 instance is not an implicit dependency in this code snippet, as the dependency is explicitly defined using the depends_on attribute for the aws_instance resource.

The S3 bucket labeled company_data

Explanation

The implicit dependency in the code is not the S3 bucket labeled "company_data", as there is no direct relationship between the aws_instance and the aws_s3_bucket in the code provided.

The EIP with an id of ami-2757f631

Explanation

The EIP with an id of "ami-2757f631" is not an implicit dependency in this code snippet, as the EIP resource is dependent on the EC2 instance, not on the specific EIP id mentioned in the code.

Overall explanation

Implicit dependencies are **not** explicitly declared in the configuration but are automatically detected by Terraform based on the relationships between resources. Implicit dependencies allow Terraform to automatically determine the correct order in which resources should be

created, updated, or deleted, ensuring that resources are created in the right order, and dependencies are satisfied.

For example, if you have a resource that depends on another resource, Terraform will automatically detect this relationship and create the dependent resource after the resource it depends on has been created. This allows Terraform to manage complex infrastructure deployments in an efficient and predictable way.

The EC2 instance labeled **web_server** is the ***implicit*** dependency as the **aws_eip** cannot be created until the **aws_instance** labeled **web_server** has been provisioned and the **id** is available.

Note that **aws_s3_bucket.company_data** is an **explicit** dependency for the **aws_instance.web_server**

https://learn.hashicorp.com/tutorials/terraform/dependencies

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 43Skipped

You are adding a new variable to your configuration. Which of the following is **NOT** a valid variable type in Terraform?

Correct answer

float

Explanation

In Terraform, the variable type `float` is not a valid type. Terraform supports variable types such as `string`, `map`, `bool`, and `number`, but not `float`.

number

Explanation

The variable type `number` is a valid type in Terraform. Numbers are used to represent numerical values in Terraform configurations.

map

Explanation

The variable type `map` is a valid type in Terraform. Maps are used to define key-value pairs in Terraform configurations.

bool

Explanation

The variable type `bool` is a valid type in Terraform. Booleans are used to represent true or false values in Terraform configurations.

string

Explanation

The variable type `string` is a valid type in Terraform. Strings are commonly used for representing text values in Terraform configurations.

Overall explanation

The Terraform language uses the following types for its values: string, number, bool, list (or tuple), map (or object). There are no other supported variable types in Terraform, therefore, **float** is incorrect in this question.

Don't forget that variable types are included in a variable block, but they are NOT required since Terraform interprets the type from a default value or value provided by other means (ENV, CLI flag, etc)

```
1. variable "practice-exam" {
2.   description = "bryan's terraform associate practice exams"
3.   type        = string
4.   default     = "highly-rated"
5. }
```

https://developer.hashicorp.com/terraform/language/expressions/types

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 44Skipped

What Terraform command will launch an interactive console to evaluate and experiment with expressions?

terraform get

Explanation

The Terraform command "terraform get" is used to download and update modules defined in the configuration. It is not related to launching an Interactive console for evaluating expressions.

Correct answer

terraform console

Explanation

The correct Terraform command to launch the Interactive console is "terraform console". This command allows users to evaluate and experiment with expressions in an interactive manner.

terraform cli

Explanation

The Terraform command "terraform cli" is not a valid command in Terraform. It does not exist in the Terraform documentation or official commands list.

terraform cmdline

Explanation

The Terraform command "terraform cmdline" is not a valid command in Terraform. It does not exist in the Terraform documentation or official commands list.

Overall explanation

The **terraform console** command in Terraform is a command-line interface (CLI) tool that allows you to interactively evaluate expressions in Terraform. The **terraform console** command opens a REPL (Read-Eval-Print Loop) environment, where you can type Terraform expressions and see the results immediately. This can be useful for testing and debugging Terraform configurations and understanding how Terraform evaluates expressions.

Here are a few examples of how the **terraform console** command can be helpful:

1. Testing expressions: You can use the **terraform console** command to test Terraform expressions and see the results immediately. For example, you can test arithmetic operations, string concatenation, and other Terraform expressions to ensure that they are evaluated correctly.

2. Debugging configurations: If you have a complex Terraform configuration and you're not sure why it's not working as expected, you can use the **terraform console** command to debug the configuration by testing expressions and variables to see their values.

3. Understanding Terraform behavior: If you're new to Terraform and you want to understand how it evaluates expressions and variables, you can use the **terraform console** command to explore Terraform's behavior and see how different expressions are evaluated.

To use the **terraform console** command, simply type **terraform console** in your terminal, and Terraform will open a REPL environment. You can then type Terraform expressions and see the results immediately. You can exit the REPL environment by typing **exit** or **quit**.

It's worth noting that the **terraform console** command operates in the context of a specific Terraform configuration, so you should run the command from within the directory that contains your Terraform configuration files.

https://developer.hashicorp.com/terraform/cli/commands/console

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 45Skipped

Which of the following is a ***valid*** variable name in Terraform?

Correct answer

invalid

Explanation

This is a valid variable name in Terraform as it follows the naming conventions for variables, which allow alphanumeric characters and underscores, and must start with a letter or underscore.

count

Explanation

"count" is not a valid variable name in Terraform as it is a reserved keyword used for resource iteration and cannot be used as a variable name.

lifecycle

Explanation

"lifecycle" is not a valid variable name in Terraform as it is a reserved keyword used for defining resource lifecycle configuration and cannot be used as a variable name.

version

Explanation

"version" is not a valid variable name in Terraform as it is a reserved keyword

Overall explanation

In Terraform, variable names must follow a set of naming conventions to be considered valid. Here are some examples of invalid variable names:

- Names that start with a number: **1_invalid_variable_name**
- Names that contain spaces or special characters (other than underscores): **invalid variable name**
- Names that contain only numbers: **12345**
- Names that are the same as Terraform reserved words, such as **source, version, providers, count, for_each, lifecycle, depends_on, locals.**

It is recommended to use only lowercase letters, numbers, and underscores in variable names and to start variable names with a lowercase letter to ensure they are valid. Additionally, variable names should be descriptive and meaningful to help make your Terraform code more readable and maintainable.

https://developer.hashicorp.com/terraform/tutorials/configuration-language/count

https://developer.hashicorp.com/terraform/language/values/variables#declaring-an-input-variable

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 46Skipped

True or False? Each Terraform workspace uses its own state file to manage the infrastructure associated with that particular workspace.

Correct answer

True

Explanation

Each Terraform workspace indeed uses its own state file to manage the infrastructure specific to that workspace. This separation of state files allows for isolation and independent management of resources within each workspace.

False

Explanation

This statement is incorrect. In Terraform, each workspace is designed to have its own state file to keep track of the infrastructure associated with that workspace. Sharing state files between workspaces can lead to conflicts and inconsistencies in managing resources.

Overall explanation

True. Each Terraform workspace uses its own state file to manage the infrastructure associated with that workspace. This allows Terraform to manage multiple sets of infrastructure independently and avoid conflicts. Each Terraform workspace has its own Terraform state file that keeps track of the resources and their attributes, so changes made in one workspace will not affect the infrastructure managed by other workspaces.

In fact, having different state files provides the benefits of workspaces, where you can separate the management of infrastructure resources so you can make changes to specific resources without impacting resources in others....

https://developer.hashicorp.com/terraform/language/state/workspaces#workspace-internals

Domain

Objective 7 - Implement and Maintain State

Question 47Skipped

Henry has been working on automating his Azure infrastructure for a new application using Terraform. His application runs successfully, but he has added a new resource to create a DNS record using the new Infoblox provider. He has added the new resource but gets an error when he runs a terraform plan.

What should Henry do first before running a plan and apply?

Correct answer

since a new provider has been introduced, terraform init needs to be run to download the Infoblox plugin

Explanation

Running `terraform init` is necessary when a new provider is introduced to download the required plugin. This ensures that Terraform has access to the Infoblox provider and can properly manage the DNS record resource.

you can't mix resources from different providers within the same configuration file, so Henry should create a module for the DNS resource and reference it from the main configuration

Explanation

While it is good practice to organize resources into modules, the error Henry is facing is not due to mixing resources from different providers. Running `terraform init` to download the Infoblox plugin is the immediate step to resolve the issue.

Henry should run a terraform plan -refresh=true to update the state for the new DNS resource

Explanation

Running `terraform plan -refresh=true` is not the appropriate action for resolving the error related to a new provider. The correct step is to run `terraform init` to download the Infoblox plugin before planning and applying the changes.

the Azure plugin doesn't support Infoblox directly, so Henry needs to put the DNS resource in another configuration file

Explanation

The issue is not related to the Azure plugin not supporting Infoblox. The correct action is to run `terraform init` to download the Infoblox plugin, rather than moving the DNS resource to another configuration file.

Overall explanation

In this scenario, Henry has introduced a new provider. Therefore, Terraform needs to download the plugin to support the new resource he has added. Running **terraform init** will download the Infoblox plugin. Once that is complete, a plan and apply can be executed as needed.

You would need to rerun **terraform init** after modifying your code for the following reasons:

1. **Adding a new provider**: If you've added a new provider to your code, you'll need to run **terraform init** to download the provider's binary and configure it.

2. Updating the provider configuration: If you've updated the configuration of an existing provider, you'll need to run **terraform init** to apply the changes.

3. Updating the version of a provider: If you've updated the version of a provider, you'll need to run **terraform init** to download the updated version of the provider's binary.

4. Adding or removing a module: If you've added or removed a module from your code, you'll need to run **terraform init** to download the required modules and dependencies.

In short, **terraform init** is used to initialize a Terraform working directory, and you'll need to rerun it whenever you make changes to your code that affect the providers, modules, or versions you're using.

https://developer.hashicorp.com/terraform/cli/commands/init

Domain

Objective 6 - Use the core Terraform workflow

Question 48Skipped

Which of the following statements represents the most accurate statement about the Terraform language?

Correct answer

Terraform is an immutable, declarative, Infrastructure as Code provisioning language based on Hashicorp Configuration Language, or optionally JSON.

Explanation

Terraform is indeed an immutable and declarative Infrastructure as Code provisioning language. It allows users to define the desired state of their infrastructure and Terraform will make the necessary changes to reach that state. The language is based on HashiCorp Configuration Language (HCL) or JSON for configuration files.

Terraform is a mutable, imperative, Infrastructure as Code provisioning language based on Hashicorp Configuration Language, or optionally YAML.

Explanation

This statement is incorrect. Terraform is not a mutable language and it is not imperative. It is an immutable, declarative Infrastructure as Code provisioning language based on HashiCorp Configuration Language (HCL) or JSON. YAML is not the primary language used for Terraform configuration files.

Terraform is an immutable, imperative, Infrastructure as Code configuration management language based on Hashicorp Configuration Language, or optionally JSON.

Explanation

This statement is inaccurate. Terraform is not an imperative language; it is declarative. Users define the desired state of their infrastructure without specifying the exact steps to achieve that state. This allows Terraform to determine the most efficient way to make changes.

Terraform is a mutable, declarative, Infrastructure as Code configuration management language based on Hashicorp Configuration Language, or optionally JSON.

Explanation

This statement is incorrect. Terraform is not a mutable language; it is immutable. It focuses on defining the desired state of infrastructure and making changes to reach that state, rather than directly modifying existing infrastructure.

Overall explanation

Terraform is written in HashiCorp Configuration Language (HCL). However, Terraform also supports a syntax that is JSON compatible (https://developer.hashicorp.com/terraform/language/syntax/json).

Terraform is primarily designed on ***immutable*** infrastructure principles https://www.hashicorp.com/resources/what-is-mutable-vs-immutable-infrastructure

Terraform is also a ***declarative language***, where you simply declare the desired state, and Terraform ensures that real-world resources match the desired state as written. An imperative approach is different, where the tool uses a step-by-step workflow to create the desired state.

Incorrect Answers:

Terraform is not a configuration management tool
- https://developer.hashicorp.com/terraform/intro/vs/chef-puppet

Domain

Objective 1 - Understand Infrastructure as Code Concepts

Question 49Skipped

When you add a new module to a configuration, Terraform must download it before it can be used. What two commands can be used to download and update modules? (select two)

Correct selection

terraform init

Explanation

The terraform init command is used to initialize a working directory containing Terraform configuration files. It downloads any modules specified in the configuration.

Correct selection

terraform get

Explanation

The terraform get command is used to download modules from the module registry or a version control system, making them available for use in the configuration.

terraform refresh

Explanation

The terraform refresh command is used to update the state file with the current state of the infrastructure. It does not download or update modules.

terraform plan

Explanation

The terraform plan command is used to create an execution plan for applying changes to the infrastructure. It does not download or update modules.

Overall explanation

The two Terraform commands used to download and update modules are:

1. **terraform init**: This command downloads and updates the required modules for the Terraform configuration. It also sets up the backend for state storage if specified in the configuration.

2. **terraform get**: This command is used to download and update modules for a Terraform configuration. It can be used to update specific modules by specifying the module name and version number, or it can be used to update all modules by simply running the command without any arguments.

It's important to note that **terraform init** is typically run automatically when running other Terraform commands, so you may not need to run **terraform get** separately. However, if you need to update specific modules, running **terraform get** can be useful.

https://learn.hashicorp.com/tutorials/terraform/module-create?in=terraform/modules#install-the-local-module

Domain

Objective 5 - Interact with Terraform Modules

Question 50Skipped

You are using Terraform to deploy some cloud resources and have developed the following code. However, you receive an error when trying to provision the resource. Which of the following answers fixes the syntax of the Terraform code?

1. resource "aws_security_group" "vault_elb" {
2. name = "${var.name_prefix}-vault-elb"

```
3.   description = Vault ELB
4.   vpc_id      = var.vpc_id
5.  }
1.  resource "aws_security_group" "vault_elb" {
2.   name       = "${var.name_prefix}-vault-elb"
3.   description = [Vault ELB]
4.   vpc_id      = var.vpc_id
5.  }
```

Explanation

The description value in this choice is enclosed in square brackets, which is incorrect syntax for a string in Terraform. Strings should be enclosed in double quotes, so the correct syntax would be to use double quotes around "Vault ELB".

```
1.  resource "aws_security_group" "vault_elb" {
2.   name       = "${var.name_prefix}-vault-elb"
3.   description = "${Vault ELB}"
4.   vpc_id      = var.vpc_id
5.  }
```

Explanation

In this choice, the description value is enclosed in "${}" which is used for variable interpolation. Since "Vault ELB" is a string and not a variable, it should be enclosed in double quotes instead of "${}".

Correct answer

```
1.  resource "aws_security_group" "vault_elb" {
2.   name       = "${var.name_prefix}-vault-elb"
3.   description = "Vault ELB"
4.   vpc_id      = var.vpc_id
5.  }
```

Explanation

The syntax error in the original code is that the description value is missing quotation marks. By adding the quotes around "Vault ELB", the code will be corrected and the provisioning process will not throw an error.

```
1.  resource "aws_security_group" "vault_elb" {
2.   name       = "${var.name_prefix}-vault-elb"
```

3. description = var_Vault ELB
4. vpc_id = var.vpc_id
5. }

Explanation

The description value in this choice is missing quotation marks and includes an incorrect variable reference. To fix the syntax error, the description should be enclosed in double quotes like "Vault ELB".

Overall explanation

When assigning a value to an argument in Terraform, there are a few requirements that must be met:

1. Data type: The value must be of the correct data type for the argument. Terraform supports several data types, including **strings**, numbers, booleans, lists, and maps.
2. Value constraints: Some arguments may have specific value constraints that must be met. For example, an argument may only accept values within a certain range or values from a specific set of values.

When assigning a value to an argument expecting a string, it must be enclosed in quotes ("...") unless it is being generated programmatically.

https://developer.hashicorp.com/terraform/language/syntax/configuration#arguments-and-blocks

Domain

Objective 3 - Understand Terraform Basics

Question 51Skipped

In order to reduce the time it takes to provision resources, Terraform uses parallelism. By default, how many resources will Terraform provision concurrently during a terraform apply?

20

Explanation

This choice is incorrect as Terraform provisions 10 resources concurrently by default, not 20.

50

Explanation

This choice is incorrect as Terraform provisions 10 resources concurrently by default, not 50.

5

Explanation

This choice is incorrect as Terraform provisions 10 resources concurrently by default, not 5.

Correct answer

10

Explanation

Terraform by default provisions 10 resources concurrently during a `terraform apply` command to speed up the provisioning process and reduce the overall time taken.

Overall explanation

By default, Terraform will provision resources concurrently with a **maximum of 10 concurrent resource operations**. This setting is controlled by the **parallelism** configuration option in Terraform, which can be set globally in the Terraform configuration file or on a per-module basis.

The **parallelism** setting determines the number of resource operations that Terraform will run in parallel, so increasing the **parallelism** setting will result in Terraform provisioning resources more quickly, but can also increase the risk of rate-limiting or other errors from the API.

You can adjust the **parallelism** setting in your Terraform configuration file by adding the following code:

```
terraform {
  parallelism = 20
}
```

This setting sets the maximum number of concurrent resource operations to 10. You can adjust this number to meet your specific needs and constraints.

https://developer.hashicorp.com/terraform/internals/graph#walking-the-graph

Domain

Objective 6 - Use the core Terraform workflow

Question 52Skipped

What do the declarations, such as **name**, **cidr**, and **azs**, in the following Terraform code represent and what purpose do they serve?

```
module "vpc" {
  source  = "terraform-aws-modules/vpc/aws"
  version = "5.7.0"

  name = var.vpc_name
  cidr = var.vpc_cidr
```

```
7.
8.  azs             = var.vpc_azs
9.  private_subnets = var.vpc_private_subnets
10. public_subnets  = var.vpc_public_subnets
11.
12. enable_nat_gateway = var.vpc_enable_nat_gateway
13.
14. tags = var.vpc_tags
15. }
```

Correct answer

these are variables that are passed into the child module likely used for resource creation

Explanation

The declarations like name, cidr, and azs are variables that are being passed into the child module for resource creation. These variables allow for customization and flexibility in configuring the VPC module according to specific requirements.

the value of these variables will be obtained from values created within the child module

Explanation

The values of the variables like name, cidr, and azs are not obtained from values created within the child module. Instead, these variables are typically defined and assigned values in the calling module or through input variables provided during the Terraform execution.

these are the outputs that the child module will return

Explanation

The declarations in the Terraform code are not outputs that the child module will return. Outputs are used to expose certain values to other parts of the Terraform configuration, whereas these declarations are used as input variables.

these are where the variable declarations are created so Terraform is aware of these variables within the calling module

Explanation

The declarations in the code are not where variable declarations are created. They are actually instances where the variables are being assigned values passed from the calling module. Variable declarations are typically defined in separate variable files or within the same module.

Overall explanation

To pass values to a Terraform module when calling the module in your code, you use input variables. Input variables are a way to pass values into a Terraform module from the calling

code. They allow the module to be flexible and reusable, as the same module can be used with different input values in different contexts.

In this example, the values for the **name**, **cidr**, and **azs** inputs are passed to the module as values of variables. The variables are defined in the calling code in the calling module using the **variable** block.

To pass the values to the module, you can specify them in a number of ways, such as:

- Using command-line flags when running Terraform
- Storing the values in a Terraform .tfvars file and passing that file to Terraform when running it
- Using environment variables

For more information on Terraform modules and input variables, I recommend checking out the Terraform documentation: **https://www.terraform.io/docs/modules/index.html**

https://learn.hashicorp.com/tutorials/terraform/module-use#set-values-for-module-input-variables

Domain

Objective 5 - Interact with Terraform Modules

Question 53Skipped

True or False? By default, the terraform destroy command will prompt the user for confirmation before proceeding.

Correct answer

True

Explanation

By default, the terraform destroy command does prompt the user for confirmation before proceeding to ensure that the user is aware of the resources that will be deleted. This is a safety measure to prevent accidental deletion of important infrastructure.

False

Explanation

The statement is incorrect. In reality, the terraform destroy command does prompt the user for confirmation by default. This is to prevent unintended deletion of resources and to give the user a chance to review the actions that will be taken.

Overall explanation

True. By default, Terraform will prompt for confirmation before proceeding with the **terraform destroy** command. This prompt allows you to verify that you really want to destroy the infrastructure that Terraform is managing before it actually does so.

Terraform destroy will always prompt for confirmation before executing unless passed the **-auto-approve** flag.

1. $ terraform destroy
2. Do you really want to destroy all resources?
3. Terraform will destroy all your managed infrastructure, as shown above.
4. There is no undo. Only 'yes' will be accepted to confirm.
5.
6. Enter a value: yes

https://developer.hashicorp.com/terraform/tutorials/aws-get-started/aws-destroy

Domain

Objective 6 - Use the core Terraform workflow

Question 54Skipped

In Terraform, most resource dependencies are handled automatically. Which of the following statements best describes how Terraform resource dependencies are handled?

Resource dependencies are handled automatically by the depends_on meta-argument, which is set to true by default.

Explanation

Resource dependencies are not handled by setting the `depends_on` meta-argument to true by default. Terraform uses implicit ordering requirements based on expressions within resource blocks.

Correct answer

Terraform analyzes any expressions within a resource block to find references to other objects and treats those references as implicit ordering requirements when creating, updating, or destroying resources.

Explanation

Terraform automatically analyzes expressions within a resource block to identify dependencies on other resources. This allows Terraform to determine the correct order of operations when creating, updating, or destroying resources.

Resource dependencies are identified and maintained in a file called resource.dependencies. Each terraform provider is required to maintain a list of all resource dependencies for the provider and it's included with the plugin during initialization when terraform init is executed. The file is located in the terraform.d folder.

Explanation

The information about maintaining resource dependencies in a file called `resource.dependencies` and the location in the `terraform.d` folder is inaccurate. Terraform does not require providers to maintain a separate file for dependencies.

The Terraform binary contains a built-in reference map of all defined Terraform resource dependencies. Updates to this dependency map are reflected in Terraform versions. To ensure you are working with the latest resource dependency map you much be running the latest version of Terraform.

Explanation

The statement regarding a built-in reference map of resource dependencies and the need to update Terraform versions is incorrect. Terraform does not rely on a static map of dependencies within the binary.

Overall explanation

Terraform resource dependencies control how resources are created, updated, and destroyed. When Terraform creates or modifies resources, it must be aware of any dependencies that exist between those resources. By declaring these dependencies, Terraform can ensure that resources are created in the correct order so that dependent resources are available before other resources that depend on them.

To declare a resource dependency, you can use the **depends_on** argument in a resource block. The **depends_on** argument takes a list of resource names and specifies that the resource block in which it is declared depends on those resources.

https://developer.hashicorp.com/terraform/language/resources

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 55Skipped

Why might users want to utilize Sentinel or OPA with Terraform Cloud in their infrastructure workflow? (select four)

Correct selection

To provide real-time feedback on potential security risks in Terraform configurations during the development process

Explanation

Sentinel and OPA can provide real-time feedback on potential security risks present in Terraform configurations during the development process. This allows developers to identify and address security issues early on, reducing the risk of vulnerabilities in the infrastructure.

Correct selection

Sentinel and OPA enable automated policy checks to enforce compliance standards before applying changes to production environments

Explanation

Sentinel and OPA enable automated policy checks that can be used to enforce compliance standards before any changes are applied to production environments. This ensures that all changes meet the required standards and regulations.

Correct selection

Sentinel and OPA can enhance security by preventing unauthorized changes to your managed infrastructure

Explanation

Sentinel and OPA can enhance security by allowing users to define and enforce policies that prevent unauthorized changes to infrastructure. This helps in maintaining the integrity and security of the managed infrastructure.

Correct selection

Organizations can enforce resource naming conventions or approved machine images for improved consistency and clarity

Explanation

Organizations can use Sentinel and OPA to enforce resource naming conventions and approved machine images, which helps in maintaining consistency and clarity across the infrastructure. This can prevent naming conflicts and ensure that only approved resources are used.

To allow users to bypass version control and directly apply changes to production

Explanation

Using Sentinel and OPA with Terraform Cloud does not allow users to bypass version control. Instead, it enforces policies and checks to ensure that changes comply with set standards before being applied to production. This helps in maintaining a secure and compliant infrastructure.

Overall explanation

Using Sentinel and OPA with Terraform Cloud provides several benefits that enhance the overall management and security of your infrastructure. Using Sentinel with Terraform Cloud provides a powerful mechanism to enforce policies, increase security, and maintain compliance in your infrastructure deployments. It gives you greater control and confidence in managing your cloud resources while promoting best practices and reducing the risk of misconfiguration. Here are some specific reasons and examples on why you would use Sentinel with Terraform Cloud:

1. **Policy Enforcement:** Sentinel and OPA enable you to define and enforce policies that govern the configurations and changes made to your infrastructure. You can create custom policies tailored to your organization's needs, ensuring compliance with regulatory requirements, security best practices, and internal standards.
2. **Automated Governance:** With Sentinel and OPA, you can implement automated governance and compliance checks in your Terraform workflows. This means that every time changes are proposed or applied, Sentinel or OPA evaluates those changes against

the defined policies, automatically preventing non-compliant configurations from being deployed.

3. **Enhanced Security:** By incorporating Sentinel or OPA into your Terraform Cloud environment, you can bolster your infrastructure security. Sentinel can flag and block any potentially risky configurations, helping to minimize security vulnerabilities and ensuring that only approved, secure changes are allowed.
4. **Version-controlled Policies:** Sentinel and OPA policies are defined as code, which means they can be stored in version control alongside your Terraform configurations. This allows your policies to be managed, reviewed, and updated through the same version control system, improving collaboration and maintaining a history of policy changes.
5. **Custom Approval Workflows:** You can create customized approval workflows based on policy conditions using Sentinel or OPA. This means that changes to the infrastructure can be automatically approved or flagged for manual review, depending on the defined policies, ensuring tighter control over infrastructure modifications.
6. **Preventing Costly Mistakes:** Sentinel and OPA policies can help catch potential mistakes or misconfigurations before they impact your infrastructure. By running policy checks in real-time, you can identify issues early on and avoid costly downtime or unexpected behavior caused by incorrect configurations.
7. **Consistency and Best Practices:** Utilizing Sentinel/OPA allows you to enforce consistent naming conventions, tagging standards, and other best practices across your infrastructure. This consistency leads to improved manageability and makes it easier for teams to collaborate effectively.
8. **Auditing and Compliance Reporting:** With Sentinel's logging and reporting capabilities, you can track policy decisions and changes made to your infrastructure over time. This audit trail is valuable for compliance purposes and can be used to demonstrate adherence to regulatory requirements.

Wrong Answer:

- Using Sentinel or OPA would NOT allow you to bypass version control. In fact, with TFC, your workspace would likely be configured to ONLY manage changes to your environment using code that is committed to a linked code repository.

https://developer.hashicorp.com/terraform/cloud-docs/policy-enforcement

Domain

Objective 9 - Understand Terraform Cloud Capabilities

Question 56Skipped

In the example below, the depends_on argument creates what type of dependency?

1. resource "aws_instance" "example" {
2. ami = "ami-2757f631"

3. instance_type = "t2.micro"
4. depends_on = [aws_s3_bucket.company_data]
5. }

internal dependency

Explanation

The `depends_on` argument in Terraform does not establish an internal dependency. It explicitly defines a dependency on another resource in the Terraform configuration.

Correct answer

explicit dependency

Explanation

The `depends_on` argument in Terraform creates an explicit dependency between resources. This means that Terraform will wait for the specified resource to be created or updated before proceeding with the dependent resource.

implicit dependency

Explanation

The `depends_on` argument in Terraform creates an explicit dependency between resources, not an implicit one. This means that Terraform will ensure that the resource specified in `depends_on` is created or updated before the dependent resource.

non-dependency resource

Explanation

The `depends_on` argument in Terraform does not indicate a non-dependency resource. It specifically defines a dependency relationship between resources.

Overall explanation

Explicit dependencies in Terraform are dependencies that are explicitly declared in the Terraform configuration. These dependencies are used to control the order in which Terraform creates, updates, and destroys resources.

In Terraform, you can declare explicit dependencies using the **depends_on** argument in a resource block. The **depends_on** argument takes a list of resource names and specifies that the resource block in which it is declared depends on those resources.

For example, consider a scenario where you have a virtual machine (VM) that depends on a virtual network (VNET) and a subnet. You can declare these dependencies using the **depends_on** argument as follows:

1. resource "azurerm_virtual_network" "vnet" {
2. name = "example-vnet"

```
3.    address_space      = ["10.0.0.0/16"]
4.  }
5.
6.  resource "azurerm_subnet" "subnet" {
7.    name              = "example-subnet"
8.    virtual_network_name = azurerm_virtual_network.vnet.name
9.    address_prefix      = "10.0.1.0/24"
10. }
11.
12. resource "azurerm_network_interface" "nic" {
13.  name             = "example-nic"
14.  location          = azurerm_virtual_network.vnet.location
15.  subnet_id         = azurerm_subnet.subnet.id
16.  depends_on = [
17.    azurerm_subnet.subnet,
18.    azurerm_virtual_network.vnet
19.  ]
20. }
```

In this example, the **azurerm_network_interface** resource depends on both the **azurerm_subnet** and the **azurerm_virtual_network** resources, so Terraform will create those resources first, and then create the **azurerm_network_interface** resource.

By declaring explicit dependencies, you can ensure that Terraform creates resources in the correct order, so that dependent resources are available before other resources that depend on them. This helps prevent errors or unexpected behavior when creating or modifying infrastructure, and makes it easier to manage and understand the relationship between resources.

Overall, the use of explicit dependencies is a critical aspect of Terraform, as it helps ensure that resources are created and managed in the correct order and makes it easier to manage and understand the relationship between resources.

https://learn.hashicorp.com/tutorials/terraform/dependencies

Domain

Objective 8 - Read, Generate, and Modify Configuration

Question 57Skipped

When using constraint expressions to signify a version of a provider, which of the following are valid provider versions that satisfy the expression found in the following code snippet: (select two)

```
terraform {
  required_providers {
    aws = {
      source = "hashicorp/aws"
      version ~> "5.36.0"
    }
  }
}
```

Correct selection

AWS provider version: 5.36.3

Explanation

The version "5.36.3" satisfies the constraint expression "~> 5.36.0" as it falls within the same minor version range (5.36.x).

Correct selection

AWS provider version: 5.36.9

Explanation

The version "5.36.9" satisfies the constraint expression "~> 5.36.0" as it falls within the same minor version range (5.36.x).

AWS provider version: 5.3.1

Explanation

The version "5.3.1" does not satisfy the constraint expression "~> 5.36.0" as it is not within the specified minor version range.

AWS provider version: 5.37.0

Explanation

The version "5.37.0" does not satisfy the constraint expression "~> 5.36.0" as it is beyond the specified minor version range.

Overall explanation

In Terraform, required_providers act as traffic controllers for your infrastructure tools. They ensure all modules use the right versions of providers like AWS or Azure, avoiding compatibility

issues and guaranteeing everyone plays by the same rules. Think of them as a clear roadmap for your infrastructure setup, leading to consistent, predictable, and secure deployments.

A version constraint is a string literal containing one or more conditions, which are separated by commas.

Each condition consists of an operator and a version number.

Version numbers should be a series of numbers separated by periods (like 1.2.0), optionally with a suffix to indicate a beta release:

- ~>: Allows only the *rightmost* version component to increment. This format is referred to as the *pessimistic constraint* operator. For example, to allow new patch releases within a specific minor release, use the full version number:
    - ~> 1.0.4: Allows Terraform to install 1.0.5 and 1.0.10 but not 1.1.0.
    - ~> 1.1: Allows Terraform to install 1.2 and 1.10 but not 2.0.

https://developer.hashicorp.com/terraform/language/modules/syntax#version

https://developer.hashicorp.com/terraform/language/expressions/version-constraints#version-constraint-syntax

Domain

Objective 3 - Understand Terraform Basics