

1. What is Terraform ?

Terraform is an open-source Infrastructure as Code (IaC) tool developed by **HashiCorp**. It allows you to **create, manage, and automate cloud infrastructure** using **simple configuration files**.

Terraform हे HashiCorp ने बनवलेले **Infrastructure as Code (IaC)** टूल आहे. याच्या मदतीने आपण **Cloud Infrastructure कोडच्या माध्यमातून तयार आणि व्यवस्थापित** करू शकतो.

2. Why Infrastructure as Code?

Instead of manual steps in a cloud console, code is used to create infrastructure. Cloud console मध्ये हाताने केलेल्या step ऐवजी infrastructure **कोडने** तयार करता येते.

Benefits / फायदे:

- Speed – वेगाने infrastructure तयार होते
- Accuracy – Human errors कमी
- Reusable – पुन्हा पुन्हा वापरता येते
- Version Control – Git मध्ये ट्रॅक करता येते
- Consistent – Dev, Test, Prod environments एकसारखे

3. Key features?

- **Infrastructure as Code (IaC)**
Write infrastructure setup in `.tf` files just like writing code.
- **Multi-Cloud Support**
Works with AWS, Azure, Google Cloud, and even on-prem resources.
- **Automation**
No manual clicking in cloud consoles. Just run commands.
- **Version Control**
You can store infrastructure code in Git for tracking changes.
- **Declarative Approach**
You define the final state, Terraform figures out how to reach there.

4. Terraform workflow?

1. **Write** → Create configuration file (.tf)
2. **Init** → Initialize provider plugins
3. **Plan** → Preview changes
4. **Apply** → Provision resources
5. **Destroy** → Remove resources when not needed

5. What can Terraform create?

Anything in cloud like:

- EC2 instances
- VPC networks
- Databases
- Load balancers
- Storage (S3, Azure Blob etc.)
- Kubernetes clusters

Basically, Terraform is a **remote control** for your cloud infrastructure.

6. Terraform vs CloudFormation

Feature	Terraform	CloudFormation
Cloud Support	Multi-cloud	AWS only
Language	HCL (easy to read)	JSON/YAML
Speed of Adoption	Faster	AWS ecosystem only
Community	Very large	AWS only

7. Terraform File Types

.tf	Main configuration
.tfvars	Variables
terraform.tfstate	State tracking
.terraform.lock.hcl	Provider version lock file

8. What is Terraform State?

Terraform State is a **file** that stores the **current status** of the infrastructure which Terraform manages.

This file is automatically created after you run `terraform apply`.

Default filename:

```
terraform.tfstate
```

It contains:

- Resource names
- Resource IDs (example: AWS EC2 Instance ID)
- Dependencies between resources
- Current configuration details

Terraform State म्हणजे cloud वर Terraform ने कोणकोणते resources तयार केले आहेत त्यांची संपूर्ण माहिती ठेवणारी फाइल.

यात खालील माहिती असते:

- Resource ID
- कोणता resource कोणावर depend आहे?
- Resource चा वर्तमान status

Terraform साठी ही फाइल म्हणजे **reference** ज्यावर तो पुढील काम करतो.

9. Why Terraform State is Required?

Reason	English Explanation	Marathi Explanation
Track Resources	Terraform must know what it already created	Terraform ला आधी तयार केलेली infrastructure माहिती लागते
Performance	Uses state to avoid constantly calling cloud APIs	वारंवार cloud ला विचारण्याची गरज राहत नाही
Sync	Detects changes done outside Terraform (drift)	Cloud मध्ये manually बदल झाले तर detect करते
Plan Accuracy	Terraform plan becomes accurate	Plan बरोबर दाखवते
Dependency Graph	State helps Terraform to know resource relationships	कोणता resource आधी तयार करायचा हे समजते