# Infrastructure as Code (IaC) on Local Machine Using Terraform + Docker

🎯 Objective  
Demonstrate how Infrastructure as Code (IaC) works without cloud by using Terraform to automatically create and destroy Docker containers locally.  
  
🧰 Tools (All Free)  
- Docker Desktop → Acts as local infrastructure (mini-cloud)  
- Terraform → IaC engine for automating infrastructure  
- VS Code → Write Terraform configuration  
  
📁 Step 1 — Install Tools  
1. Install Docker Desktop and verify:  
 docker ps  
2. Install Terraform:  
 wget https://releases.hashicorp.com/terraform/1.9.6/terraform\_1.9.6\_linux\_amd64.zip  
 unzip terraform\_1.9.6\_linux\_amd64.zip  
 sudo mv terraform /usr/local/bin/  
 terraform -v  
  
📁 Step 2 — Create Project Folder  
mkdir terraform-docker-demo  
cd terraform-docker-demo  
  
📄 Step 3 — Create Terraform Configuration File (main.tf)  
terraform {  
 required\_providers {  
 docker = {  
 source = "kreuzwerker/docker"  
 version = "~> 3.0.1"  
 }  
 }  
}  
  
provider "docker" {}  
  
resource "docker\_image" "nginx\_image" {  
 name = "nginx:latest"  
 keep\_locally = false  
}  
  
resource "docker\_container" "nginx\_container" {  
 name = "webserver"  
 image = docker\_image.nginx\_image.latest  
 ports {  
 internal = 80  
 external = 8080  
 }  
}  
  
⚙️ Step 4 — Initialize Terraform  
terraform init  
  
▶️ Step 5 — Plan and Apply the Code  
terraform plan  
terraform apply -auto-approve  
  
✅ Step 6 — Verify the Container  
docker ps  
Then open browser: http://localhost:8080 → "Welcome to Nginx!"  
  
💣 Step 7 — Destroy Infrastructure  
terraform destroy -auto-approve  
  
🧠 How It Works  
Terraform reads the .tf file → Talks to Docker provider → Creates container → Tracks infra in terraform.tfstate → Allows easy destroy.  
  
🧩 Manual vs IaC Comparison  
| Manual (Docker CLI) | IaC (Terraform) |  
|----------------------|----------------|  
| docker run -d -p 8080:80 nginx | terraform apply |  
| docker rm manually | terraform destroy |  
| No infra record | Terraform state maintained |  
  
✅ Summary  
1. Install Docker & Terraform  
2. Write Terraform code  
3. Run terraform apply  
4. Access localhost:8080  
5. Run terraform destroy  
  
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Source: ItTechGenie DevOps Specialist Training Notes  
Topic: IaC with Terraform + Docker (Local Demo)