

HashiCorp Terraform Enterprise Administration Training

OEM: HashiCorp • Duration: 1 Day (8 hrs) • Code: TF-ENT-ADMIN

COURSE MODULES & TOPICS

Module 1: Terraform Enterprise Architecture

- Terraform Enterprise (TFE) overview and positioning vs Terraform Community and HCP Terraform
- Core architecture components: application server, PostgreSQL database, object storage, Redis
- Active/Active architecture for high availability
- Terraform Enterprise vs HCP Terraform (SaaS) — when self-hosting makes sense
- Networking requirements: DNS, load balancer, firewall rules
- Run pipeline architecture: plan, apply, and run environments

Module 2: Installation & Configuration

- Installation prerequisites: compute, storage, and network sizing
- Docker-based installation (Replicated) vs Kubernetes (FDO) installation methods
- Initial admin console setup and license activation
- Configuring the external services mode (PostgreSQL, object storage, Redis)
- TLS certificate configuration for the application
- Post-installation validation and health checks
- Hands-on Lab: Install Terraform Enterprise using the Kubernetes (FDO) method

Module 3: User & Organization Management

- Creating and managing organizations
- User provisioning: local accounts vs SSO/SAML integration
- Team management and team-based permissions
- Organization-level settings and policies
- Managing API tokens for users and teams
- Auditing user and organization activity

Module 4: Workspaces & Projects

- Workspace concepts: version-controlled vs CLI-driven vs API-driven workflows
- Creating and configuring workspaces
- Projects for organizing and grouping related workspaces
- Workspace variables and variable sets
- Run triggers and workspace dependencies
- Workspace-level access controls and team permissions
- Hands-on Lab: Create a project with multiple workspaces and configure variable sets

Module 5: VCS Integration

- Connecting Terraform Enterprise to GitHub, GitLab, Bitbucket, and Azure DevOps
- OAuth client and application configuration for VCS providers
- VCS-driven run workflow: webhooks and automatic plan triggers
- Branch-based workspace strategies
- Speculative plans on pull requests
- Troubleshooting VCS connection issues

Module 6: Remote State Management

- Remote state storage architecture in Terraform Enterprise
- State versioning and state history
- State locking to prevent concurrent modifications
- Migrating existing local or remote state into Terraform Enterprise
- State access controls and team permissions on state data
- Consuming remote state outputs across workspaces (terraform_remote_state / run tasks)
- Hands-on Lab: Migrate a local state file into a Terraform Enterprise workspace

Module 7: Policy as Code (Sentinel)

- Introduction to Sentinel and Policy as Code concepts
- Sentinel policy sets: source, enforcement levels (advisory, soft-mandatory, hard-mandatory)
- Writing Sentinel policies against plan, state, and configuration data
- Attaching policy sets to organizations and workspaces
- Testing and debugging Sentinel policies
- Alternative: Open Policy Agent (OPA) integration for policy enforcement
- Hands-on Lab: Write and enforce a Sentinel policy restricting resource types

Module 8: Private Module Registry

- Purpose and benefits of a private module registry
- Publishing modules from connected VCS repositories
- Module versioning and semantic versioning conventions
- Module usage and consumption across workspaces
- Private provider registry for custom providers
- Module governance and approval workflows

Module 9: Security & RBAC

- Role-Based Access Control (RBAC) model in Terraform Enterprise
- Organization owners, team admins, and custom permission sets
- Workspace-level permission granularity (read, plan, write, admin)
- Secrets management: sensitive variables and environment variable handling
- Integrating with HashiCorp Vault for dynamic secrets
- Network security: firewall rules, private networking, and air-gapped deployments

- Audit logging for compliance and security review

Module 10: Logging & Monitoring

- Application logs: accessing and interpreting TFE component logs
- Audit trails and admin API for activity logging
- Integrating with external monitoring: Prometheus, Datadog, Splunk
- Health check endpoints and uptime monitoring
- Run-level logging and troubleshooting failed runs
- Alerting on system health and capacity thresholds

Module 11: Backup, Restore & Disaster Recovery

- Backup strategy for Terraform Enterprise: database, object storage, and configuration
- Automated vs manual backup procedures
- Restore procedures and validation
- Disaster recovery planning and RTO/RPO considerations
- Blue-green upgrade strategy to minimize downtime
- Hands-on Lab: Perform a backup and validate a restore procedure

Module 12: Scaling, HA & Performance

- Active/Active mode configuration for horizontal scaling
- Load balancer configuration for multi-node deployments
- Capacity planning: concurrent runs, agent pools, and worker scaling
- Terraform Cloud Agents for hybrid and air-gapped infrastructure access
- Performance tuning: database connections, caching, and run queue management
- Upgrade planning and version compatibility considerations
- Course wrap-up and Koenig Certificate of Completion