

An abstract graphic on the left side of the slide. It features a light blue silhouette of a person climbing a rope. The rope is represented by several thick, curved lines in various shades of blue and green. The background is a solid dark blue.

Terraform 101

Infrastructure as Code

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About Me

- Experts Live EU & CH
- Switzerland
- Microsoft Azure MVP
- IT & tech geek
- Speaker & blogger
- Community champion
- Event organizer
- World traveller
- Group fitness fanatic



Infrastructure as Code



What is IaC?

- Process of managing infrastructure components
 - Automated
- Full lifecycle management
 - Initial provisioning
 - In-service maintenance
 - Take out of service (end of life)
- Not only IaaS, but also anything else
 - PaaS, SaaS, containers, serverless, physical etc.



IaC Approaches

- Imperative
 - How should the infrastructure be changed?
- Declarative
 - How should the infrastructure look like?



Terraform



What it is

- From Hashicorp
- Tool to provision and manage infrastructure
 - Infrastructure as Code
 - Cloud/platform-agnostic > supports different platforms
- Declarative approach
 - Using HCL (Hashicorp Configuration Language)
- Full lifecycle management



Full Lifecycle Management

New Service

- Initial service deployment
- From nothing to V1

In Service

- Reconfigure service
- Extend service
- From V1 to V2, V3, V4, V5 etc.

Out Of Service

- Destroy service components



How to start

- Download Terraform
 - Single exe file > terraform.exe
- Free Version
 - For individuals and small teams
- Terraform Enterprise
 - For larger teams
 - Terraform at scale

Configuration Files

- Describe the desired state
 - .tf-files
 - One or multiple files
 - Are merged during runtime
- Use tool of your choice
 - VS Code is your friend
 - Terraform Extension

```
1 #####
2 # Providers
3 #####
4 provider "azurerm" { ...
7
8 #####
9 # Variables
10 #####
11 variable "location" { ...
15 variable "aadgroup1" { ...
19 variable "policydefinition1" { ...
23 variable "owner" {default = "Marcel Zehner"}
24 variable "session" {default = "Mastering Azure Resources"}
25
26 #####
27 # Resource Groups
28 #####
29 resource "azurerm_resource_group" "rg1" { ...
37 resource "azurerm_resource_group" "rg2" { ...
45 resource "azurerm_resource_group" "rg3" { ...
53 resource "azurerm_resource_group" "rg4" { ...
61
```

```
62
63 resource "azurerm_resource_group" "rg4" { ...
64 resource "azurerm_resource_group" "rg5" { ...
65 resource "azurerm_resource_group" "rg6" { ...
66 resource "azurerm_resource_group" "rg7" { ...
67 #####
68 # Resource Groups
69 #####
```



Configuration Files Components

Providers

- API interaction
- Authentication
- Different versions

Resources

- Describes resources
- Dependencies
- Provisioners (script exec)

Input Variables

- Parametrization
- Param file, `TF_VAR_name`, interactive, UI request

Data Sources

- Get data from various sources to use in config
- E.g. Azure Key Vault

Modules

- Abstract complexity
- Multiple resources
- `registry.terraform.io`

Outputs

- Output data from config
- Information about generated values



State

- Stores the state about the managed infrastructure
 - Map Terraform id's to real resources
 - Dependencies (in case of resource deletion)
 - Better performance than live querying
- Local state (default) or remote state
 - .tfstate files
- Used to create execution plans



Terraform Process (simple)

Write
Config
File

- One or multiple files
- Multiple files will be merged

Terraform
Init

- Downloads providers, modules etc.
- Based on configuration files

Terraform
Plan

- Refreshes the known state from the real world
- Creates an execution plan based on the configuration files and state files

Terraform
Apply

- Applies the changes to reach the desired state



Terraform Live Demo

Ein Danke an unsere Sponsoren!



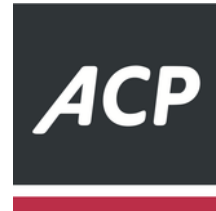
Hewlett Packard
Enterprise

SecureGUARD

e-shelter



INCRAM MICRO



iQSol
Security made in Austria.

TIMEWARP
INFORMATION TECHNOLOGIES



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