MASTERARBEIT/MASTER THESIS

CLOUD-AGNOSTIC DSL FOR INFRASTRUCTURE PROVISIONING

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Task Definition

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Multicloud   AWS

Azure   GCP

IaC   DevOps

Terraform

This thesis can be written in German or English.

Cloud platforms such as Amazon Web Services (AWS), Microsoft Azure and Google Cloud Platform (GCP) allow data center infrastructure (e.g., virtual machines, gateways and storages) to be provisioned within seconds or minutes, rather than days or weeks as in the "old days".

The cloud platform user can define the infrastructure using textual files enabling versioning and reuse. This approach is called Infrastructure as Code (IaC). With IaC, the infrastructure provisioning can be fully automated following the DevOps approach to automate everything (among others to increase deployment speed and quality, enable recovery and reduce risks).

A widely used IaC tool is HashiCorp Terraform:
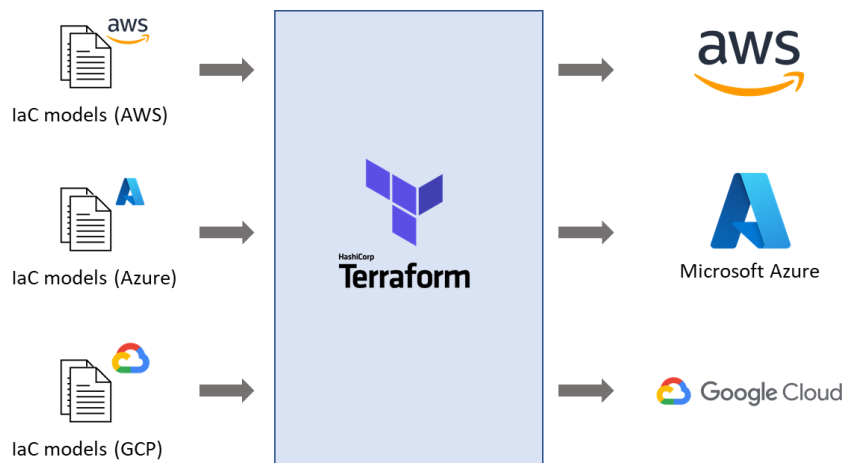
Terraform IaC models are specific to a cloud provider. Hence, a model for AWS cannot be reused for Azure or GCP (and vice versa).

The goal of this thesis is to develop a domain-specific language (DSL) for the domain "infrastructure" that allows to define cloud-agnostic IaC models. The main tasks are:

- Identification of common infrastructure resources (e.g., VMs and gateways)
- Comparison of infrastructure resources of AWS, Azure and GCP
- Designing a DSL (e.g., based on Terraform) for infrastructure provisioning which provides concepts to (i) define common cloud-agnostic infrastructure resources and (ii) specify cloud-specific parts
- Implement a PoC/MVP of the infrastructure provisioning DSL

DESIRABLE PRIOR KNOWLEDGE

- Software Language Engineering
- First experience with a cloud platform (e.g., AWS, Azure or GCP)