Terraform sets up the infrastructure.   
  
Helm packages the application.  
  
Kubernetes manages and orchestrates the application's runtime environment.  
  
Here's a visual representation and a detailed step-by-step breakdown of how these powerful tools seamlessly integrate to ensure efficient and scalable deployments.   
  
The deployment process begins with Terraform, a popular Infrastructure as Code (IaC) tool. Terraform is responsible for provisioning the underlying infrastructure required for the application.   
  
This includes creating Virtual Machines (VMs) which will host the Kubernetes nodes, setting up Networking to ensure communication between the VMs and other services, and provisioning Storage solutions to store persistent data.  
  
Once the infrastructure is in place, Helm comes into play. Helm is a package manager for Kubernetes and uses packages called Helm Charts. These charts contain pre-configured Kubernetes resources. Helm takes these charts and packages the application, preparing it for deployment.  
  
The packaged application is then deployed to a Kubernetes Cluster. Kubernetes is an open-source container orchestration platform designed to automate deploying, scaling, and operating application containers.   
  
Within the Kubernetes cluster, the application is broken down into Pods, which are the smallest deployable units that can be created and managed. These pods run on Nodes, which are the VMs provisioned by Terraform.   
  
Services in Kubernetes provide a way to expose the application (running in pods) to the external world or for internal communication between pods.   
  
Lastly, Deployments in Kubernetes ensure that the desired number of pod replicas are maintained. If a pod goes down, the deployment ensures a new pod is spun up.  
  
In summary, the diagram illustrates a seamless integration of Terraform, Helm, and Kubernetes in the application deployment process.   
  
Terraform sets up the infrastructure, Helm packages the application, and Kubernetes manages and orchestrates the application's runtime environment.  
  
I have written a lot of tutorials and articles on various DevOps topics.  
Check out: <https://lnkd.in/gsKgHrdp>

