ventx GmbH

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Project and Consulting DevOps/Cloud

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Company data

Established: 2014

IT Service Provider for DevOps & Cloud

AWS Consulting Partner

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Infrastructure

- **I**nfrastructure **a**s **C**ode (*"IaC"*):
    - Terraform, Ansible, CloudFormation
    - Immutable, reproducible, consistent infrastructure
- Self-healing infrastructure
- Multi-Tenant, Multi-Stage Terraform stack
- Multi-Cloud & On-Premise capable Kubernetes (*kops*)
- Jenkins Pipelines for CI/CD, Self-Service
- Multi-Availability Zone, cost-effective Load Balancing
- Modern Monitoring Stack:
    - Prometheus, Grafana, CloudWatch, ElasticSearch
- Worldwide Highly Available Content Delivery Network
    - S3, CloudFront, Lambda@Edge for static-content delivery

Infrastructure as Code

→ Only rely on temporary AWS credentials *(Security)*

→ Code can be used for new environments easily *(Portability)*

→ Continuous Deployment with checks and tests *(Deliverability)*

Bitbucket Webhook → API Gateway → Lambda → S3 → CodeBuild → Terraform HashiCorp

1. Bitbucket git commit Webhook → API Gateway
2. Lambda function: clone git, zip, upload → S3 bucket
3. CodeBuild/CodePipeline deploys Terraform stack & modules
   a. *Continuous Infrastructure* checks for new / updated resources
   b. Informs staff for errors *(chatOps)*
   c. Keeps infrastructure always in its desired state *(declarative)*

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Why Infrastructure as Code ?

- **Declarative,** contemporary approach instead of (imperative) manual processes
  - Define desired state of the environment
  - Manual tedious processes are ineffective and error-prone
- **Single Source of Truth** in git repository
  - Represents the desired state of infrastructure
  - Shows relations, dependencies and components of resources
- **Less error-prone**
  - More automation through scriptable, consistent infrastructure
  - Infrastructure code is version-controlled and peer reviewed (PRs)
  - Faster rollback and better traceability
- **Cost-efficient**
  - Engineers spend less time with manual processes, more time for high-value tasks
  - Automatically scale in / out infrastructure as demand grows / shrinks
- **Faster execution**
  - Define infrastructure and spin up environments spanning hundreds, or even thousands of resources
  - Use multiple regions for High Availability easily

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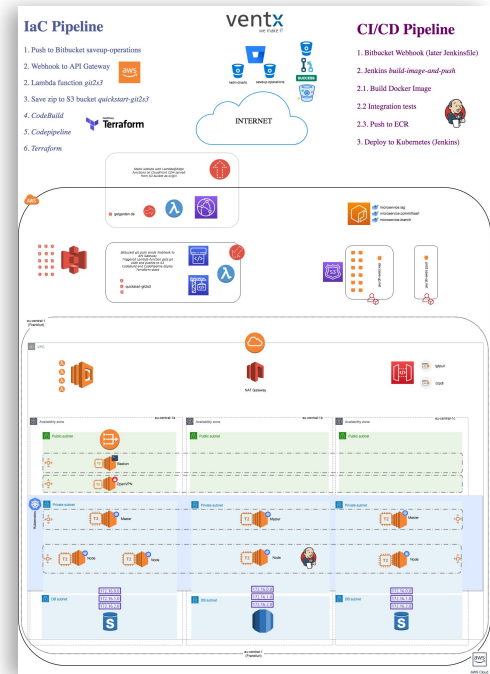
Kubernetes *(K8s)* & Deployments

- Fully containerized, highly available microservice deployments

- Helm charts for all product microservices and internal services

- Templatable charts for Multi-Tenant deployments

- Cost-effective HA Load-Balancing with nginx-ingress

- Automatic SSL/TLS Rollout with cert-manager

- OpenVPN with Multi-Factor-Authentication *(MFA)* for secure k8s API access

- Single Point of Trust via IAM for kubectl / k8s-API access

Why ⎈ **kubernetes** ?

- De-facto Industry standard for container orchestration *(developed by Google, now CNCF)*
- Portable cloud platform *(no vendor lock-in)*
- Increased hardware utilization with fully-containerized environment
- Scalable from hundreds to thousands and even millions of containers
- High portability of software which can run on any Kubernetes cluster
- Fully modular architecture so you can customize your platform as needed
- Easy rollout & rollback
- Health-Checks *(readiness & liveness)*
- Auto-Healing and Auto-Scaling
- Load-Balancing with advanced traffic routing
- Designed for Continuous Deployment

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Why CI/CD ?

- **Continuous Integration**, developers use a shared repository for their work and each commit gets verified by integration tests
    - No more "integration hell"
    - Less errors and faster problem detection
    - Higher developer efficiency
    - Deliver software more rapidly
- **Continuous Delivery**, extends the CI process for faster and more regular deployments
    - Release in small, incremental steps
    - Higher agility in development and release processes
    - Deploy to other environments (staging / production) with deployment pipelines
    - Release more often
    - Less pressure for small changes, iterate faster
    - Fast feedback for developers

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