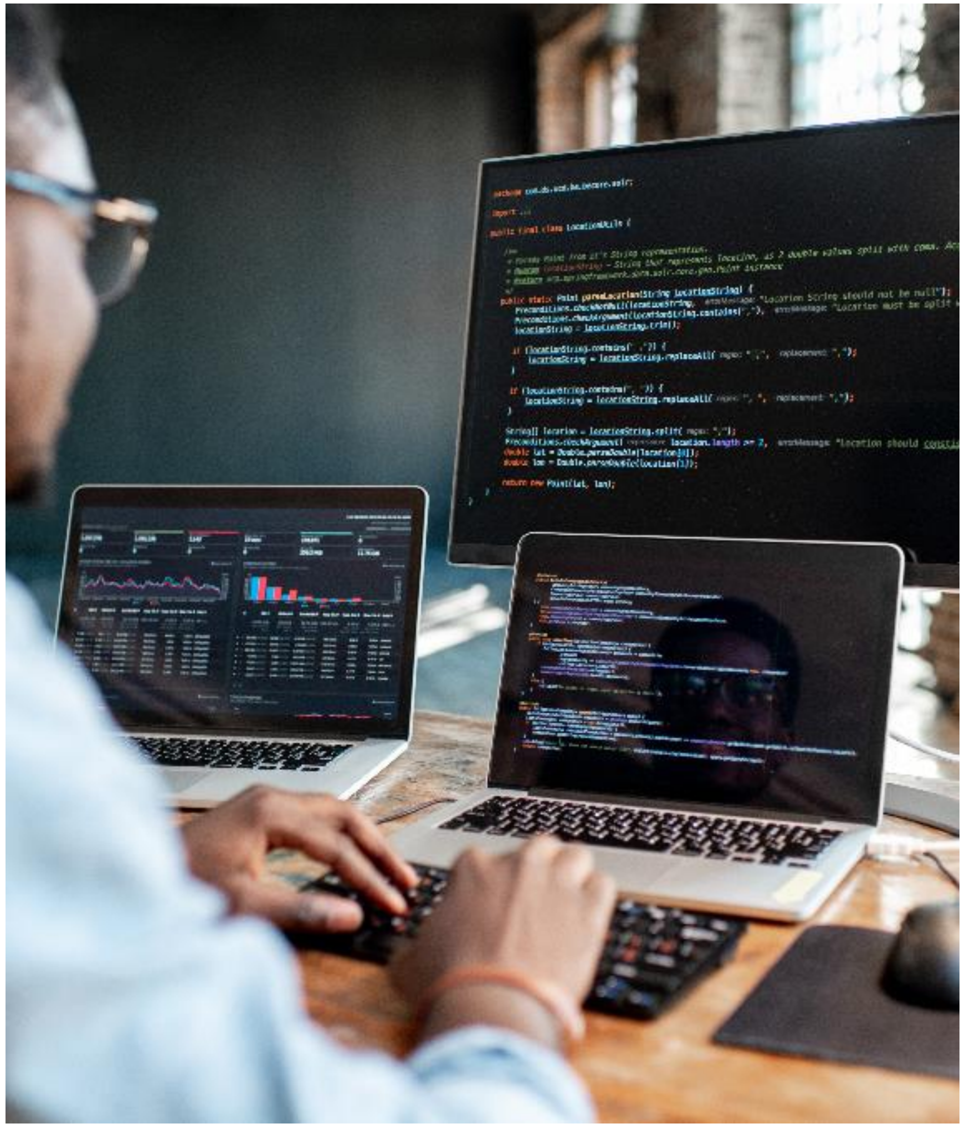
Cloud & DevOps Challenge

CGI

Introduction

From the first line of code to a working solution



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From the first line of code …

Take the opportunity to demonstrate your skills and talents.

Parameters of your challenge

The timeframe for solving the challenge is **up to 4 days.** As soon as you receive this slide deck, the clock starts ticking.

Using the **Internet for research** is explicitly **allowed** – copying an entire solution is what script kiddies do.

Once you are finished, you will have the opportunity to **present your results**. We'll agree on a presentation date and will send out an invite for a MS Teams session afterwards.

Use whatever **technology or tool** you are most **comfortable** with (e.g. Ansible, Bash, Python, Terraform, PowerShell or any kind of automation tool).

Azure can be used. If you need an Azure sandbox, please contact us.

Have fun, and please **don't spend any money** on infrastructure services, domains, or certificates.

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From the first line of code …

Ready, set, go! Launch the rocket.

1 **Deploy a K8s cluster**

The cluster can be deployed on-premises as a standalone solution using any provisioner (e.g. Rancher, k3s, kind, kube-spray, kubeadm) or as a PaaS solution from a public cloud provider. To automate the deployment, Infrastructure as Code (IaC), a script, or a playbook should be used.

The local machine of the challenge participant should be able to connect to the cluster using kubectl, and "kubectl get nodes" should return at least two nodes with the status "Ready."

2 **Run a “Hello-World” Container**

A container with any webserver technology should be deployed to the cluster. The webserver should be accessible through the challengers' browsers and display a simple webpage with a "Hello World" message.

kubernetes

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3 **Autoscaling & traffic routing**

The container should be deployed on multiple nodes, with traffic being distributed to the instances according to the round-robin principle. The container instances scale automatically based on the CPU load.

4 **Ingress-Controller**

The container should be served via an ingress-controller that terminates TLS and returns a valid certificate (self-signed or signed by public CA).

5 **High-available K8s cluster**

Design a high available scenario for a K8s cluster based on a multi-region approach. Traffic routing should be simulated with a proxy-server as loadbalancer or with a PaaS cloud-native service.

Deploy the scenario the same way as part 1 of the challenge.

6 **Monitoring concept**

Describe in high-level terms how you intend to assess the availability of the relevant service endpoints of your solution and which cloud-native approach might be appropriate.

7 **Backup & Recovery concept**

Describe in broad strokes how you handle a scenario with two options. Zero-down time and a maximum MTTR of 4 hours.

8 **Infrastructure Debugging**

Let's assume one of your AKS nodes experiences DNS hiccups.
Find a way to debug and analyze the network packets on the node. Explain why you have chosen this method.

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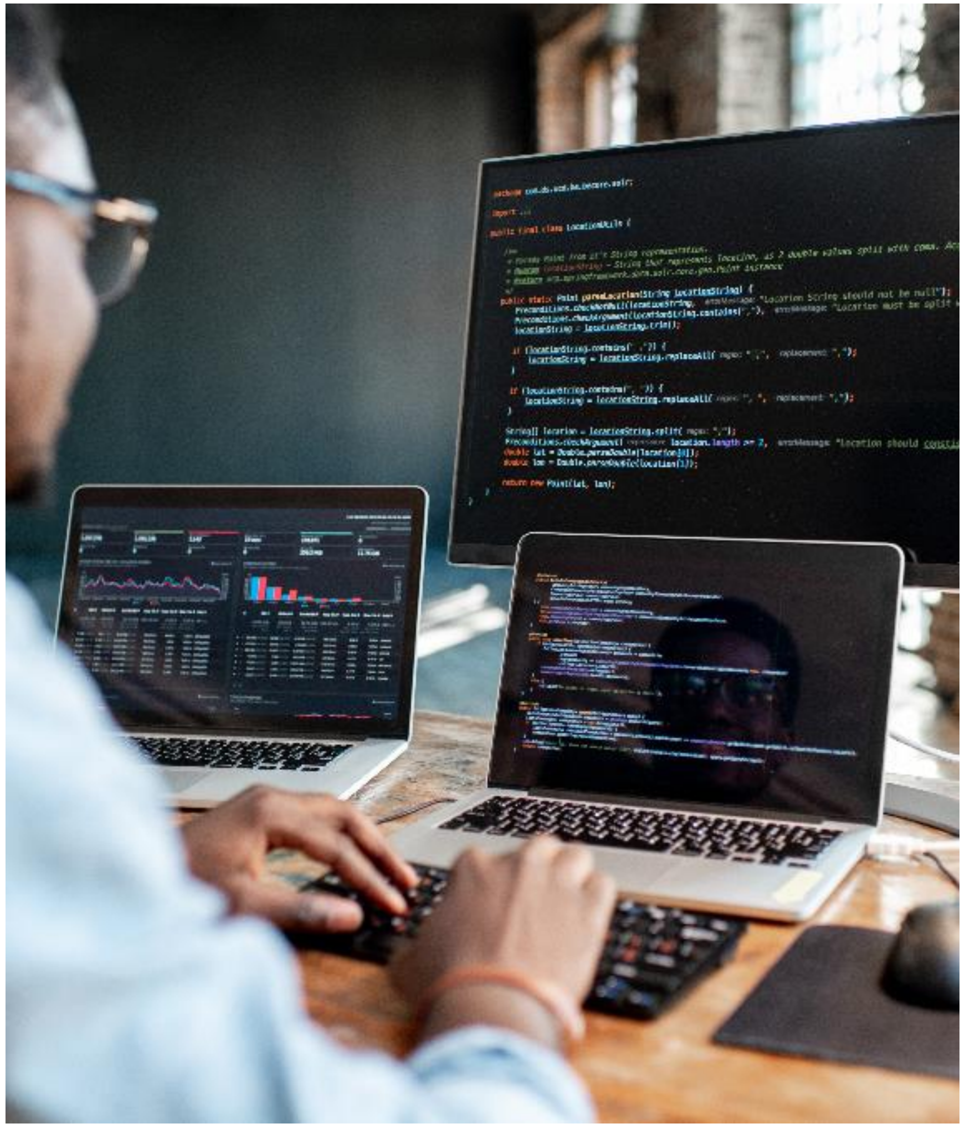
Presentation

We're excited to see your results!



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Invite us for your presentation

Share git repo or any kind of code

```
   ble "base_network_cidr" {
     t = "10.0.0.0/8"


      oogle_compute_network" "example" {
                         = "test-network"
      eate_subnetworks = false


resource "google_compute_subnetwork" "example" {
  count = 4

  name          = "test-subnetwork"
  ip_cidr_range = cidrsubnet(var.base_network_cidr, 4, count.index)
  region        = "us-central1"
  network       = google_compute_network.custom-test.self_link
```

Please prepare a short presentation and demo.

Send your invite to

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