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White paper

Implementing (AWS) **containers** in your organisation in 6 steps

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Introduction

After years of experimenting, more and more organisations are adopting the IT principle of containerisation. Nowadays, containerisation is much more than an IT buzzword. It has developed into a hypervisor-based virtualisation technology with many real-world benefits.

Containerisation is the packaging of software code with just the operating system (OS) libraries and dependencies required to run the code. This technology creates a single, lightweight executable that runs consistently on any infrastructure. Such a software package is called a container. In this whitepaper, we will take a closer look at the main benefits of containers and container technology. We will also show you how to successfully implement AWS containers in your organisation in 6 steps.

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What is an AWS container?

Containers can be seen as the virtual counterparts of their real-life namesakes. They provide users with a standard way to package an application's code configurations and dependencies into one single object. Several containers within your IT infrastructure share the same operating system (OS). This OS is stored on the server and runs as a resource-isolated process. This leads to significant benefits in terms of deployment speed and resource optimisation.

The combination of AWS, Docker and Kubernetes makes deploying and managing containers relatively easy. The Docker platform allows you to build, test and deploy containers in a quick and user-friendly fashion, whilst Kubernetes (Greek for navigator) is the world's leading container management and orchestration system. The AWS cloud platform gives you the option to run and manage the Kubernetes environment yourself with Amazon EC2, but it also allows you to choose a managed and automatically provisioned Kubernetes solution in the form of Amazon EKS.

> **"The combination of AWS, Docker and Kubernetes makes deploying and managing containers relatively easy."**

The benefits of containers

Before we delve a bit deeper into the AWS container implementation process, we should first take a look at the many practical and technical benefits that containers offer. Containers are the logical next step in the IT evolution process. In the 'dark ages' of physical computing, scaling typically meant buying and implementing more hardware. A costly, slow and often inefficient mode of operation.

Things changed when virtualisation stormed the IT stage. Tools like VMware and Hyper-V allowed organisations to provision resources much faster and allocate them to the specific needs and requirements of their applications. However, deploying these applications on virtual machines wasn't always easy and still required a lot of software installations and updates.

Containers have alleviated many limitations of physical computing and virtualisation. We will show you why and how.

Benefit 1: Portability

Other than their often humongous real-life counterparts, software containers are highly portable. What do we mean by this? A container is a smartly compressed and instantly executable software package that is not tied to or dependent on the host operating system. This means that a container is portable and able to run uniformly across any platform or cloud environment.

Transporting a container from a desktop computer to a virtual machine is a piece of cake. Do you want to transfer a container from a Linux to a Windows ecosystem? No problem. And are you looking for a flexible way to move applications between the AWS cloud and Azure? Then containers are the way to go.

Benefit 2: Faster deployment

Using containers allows you to deploy applications a lot faster. Because they don't bear the extra overhead of an operating system, containers are relatively 'lightweight'. This format fuels higher server efficiencies and has the potential to significantly reduce licensing and server costs. Additionally, speeding up start-up times becomes a lot easier if you embrace the possibilities that containers offer.

Benefit 3: Organisational agility

Modern companies need to be agile. This means that they have to be able to respond quickly to changing customer demands and disruptive innovations. Containers make this possible. Software developers can continue using agile or **DevOps** tools and processes for rapid application development and enhancement.

Benefit 4: More efficiency

Containerisation drives efficiency. Because application layers and OS kernels can be shared across several containers, containers take up far less resource capacity than VMs. The big advantage of this compactness is that you can run many more containers than VMs using the same computer capacity. Another efficiency advantage has to do with fault isolation. Since each containerised application operates independently of others, technical or operational issues in one container won't affect the rest of your applications and IT landscape.

Benefit 5: Security

The aforementioned isolation of individual containers also means that malicious code has a limited ability to infect other containers that are part of the same host system. This prevents hazardous content (malware, ransomware) from spreading like wildfire through your IT

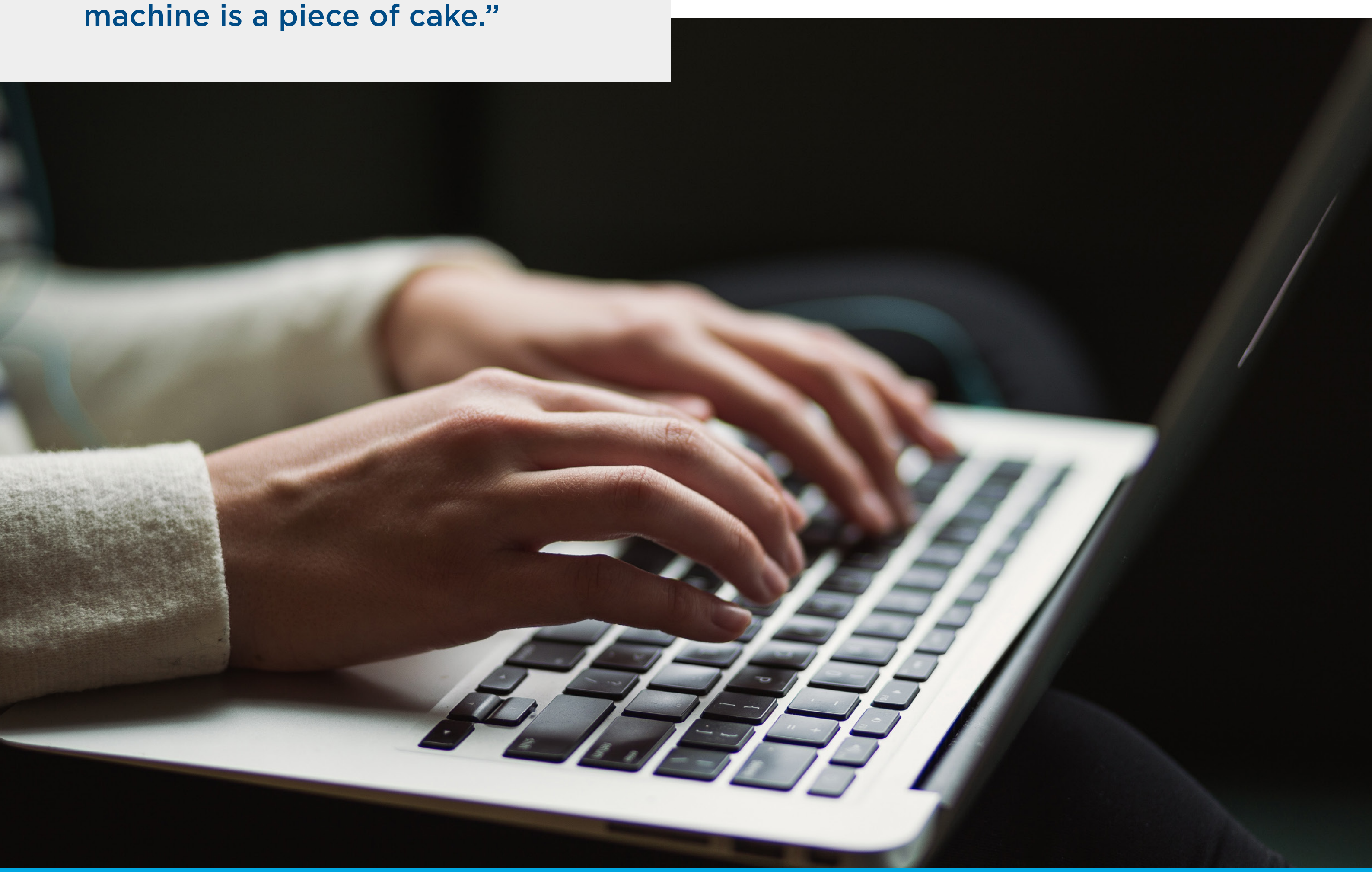
Benefit 6: Effective and easy workload and service management

Containers and the right container orchestration platform automate not only the installation and scaling, but also the management of containerised workloads and services. This eases workload and service management tasks, such as scaling containerised apps, rolling out new and improved versions of applications, and providing monitoring and debugging for all your company-critical applications.

Although you can deploy and manage containers in several cloud environments, AWS holds some distinct advantages over the competition.

- AWS currently offers 210 security, compliance and governance services and key features, which is about 40 more than the next largest cloud provider.
- AWS containers run on the best global container infrastructure. It consists of 69 Availability Zones (AZ) across 22 regions.
- AWS offers the broadest range of container services, whilst all of these services are deeply integrated with the AWS ecosystem by design.

> **“Transporting a container from a desktop computer to a virtual machine is a piece of cake.”**



The 6 steps for implementing containers

But what is the preferred mode of operation when it comes to implementing containers? Be sure to go through the following steps.

Step 1: Find out what container service you need

Finding out what container service you need is the first step towards successfully implementing container technology. For instance, Kubernetes is a platform that you can run entirely by yourself. But you can also opt for a managed solution, such as Amazon EKS. The latter offers a managed, automatically provisioned Kubernetes control plane.

Step 2: Build

The second step is the building phase. This stage of the container lifecycle revolves around one important question: how do I build my containerised application and run it through an automated delivery pipeline?

Step 3: Deliver

The next step consists of delivering your built and containerised application to the right production systems. Amazon EKS and EC2 allow you to automate large parts of the entire delivery pipeline across your application. They provide you with the easiest option to rapidly launch thousands of containers across Amazon's broad range of compute options, using your preferred CI/CD and automation tools.

Step 4: Deploy

Step 4 involves the process of actually deploying your application to the production environment. Deployment means dealing with tasks and issues such as canary testing and orchestrating the replacement of old applications with new ones.

Step 5: Run

Now it's time to set up the management system and the runtime environment around your container. This means determining how to scale your application and how you will recover from failure. You also have to establish how you are going to connect your freshly created container to other applications and services in your IT environment.

Step 6: Maintain

Continuously getting the best out of your containerised applications also requires regular maintenance. Understand potential failures and learn to understand how you can debug those flaws and connect back to the beginning in order to make the appropriate changes.

> **"Finding out what container service you need is the first step towards successfully implementing container technology."**

How does Global Knowledge help?

Global Knowledge possesses a lot of expertise in the field of AWS and container technology. We offer specialised training courses on several subjects. Our **AWS container training course** is an excellent example.

You will learn the basics of container management and orchestration for Kubernetes using Amazon EKS. You will build an Amazon EKS cluster, configure the environment and deploy the cluster. Subsequently, you will also add applications to your cluster. You will manage container images using Amazon Elastic Container Registry (ECR) and learn how to automate application deployment. You will also deploy applications using CI/CD tools.

More information

Would you like to reap the benefits of container technology with AWS? Then don't hesitate to contact us. Just give us a ring at 0118 912 1929, send an email to **info@globalknowledge.co.uk** or use our live chat. We would be happy to make your acquaintance.

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