Docker Basics

Terms

Client/server architecture   Hypervisors

Containers   Images

Dockerfiles   Kernel

Docker daemon (engine)   Process

Docker registries   Virtual machines

Summary

- Docker is a platform for consistently building, running, and shipping applications.

- A virtual machine is an abstraction of hardware resources. Using hypervisors we can create and manage virtual machines. The most popular hypervisors are VirtualBox, VMware and Hyper-v (Windows-only).

- A container is an isolated environment for running an application. It's essentially an operating-system process with its own file system.

- Virtual machines are very resource intensive and slow to start. Containers are very lightweight and start quickly because they share the kernel of the host (which is already started).

- A kernel is the core of an operating system. It's the part that manages applications and hardware resources. Different operating system kernels have different APIs. That's why we cannot run a Windows application on Linux because under the hood, that application needs to talk to a Windows kernel.

- Windows 10 now includes a Linux kernel in addition to the Windows kernel. So we can run Linux applications natively on Windows.

- Docker uses client/server architecture. It has a client component that talks to the server using a RESTful API. The server is also called the Docker engine (or daemon) runs in the background and is responsible for doing the actual work.

- Using Docker, we can bundle an application into an image. Once we have an image, we can run it on any machine that runs Docker.

- An image is a bundle of everything needed to run an application. That includes a cutdown OS, a runtime environment (eg Node, Python, etc), application files, third-party libraries, environment variables, etc.

- To bundle an application into an image, we need to create a Dockerfile. A Dockerfile contains all the instructions needed to package up an application into an image.

- We can share our images by publishing them on Docker registries. The most popular Docker registry is Docker Hub.