* Kubernetes: Container orchestration platform
* Containers solve the problem of making software portable so that applications can run on multiple flatforms.
* A container is a standard unit of software that encapsulates everything that programmers need to build, ship, and run applications.

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* Container engines virtualize the operation system and container engines are responsible for running containers.
* Platform-independent containers are lightweight, fast, isolated, portable and secure.
* Requires less memory space.
* Binaries and libraries within container enable apps to run.
* One machine can host multiple containers

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* Containers are platform independent, can run on cloud, desktop and on-premises
* Containers are OS independent

**Container challenges**

* Security impacted if operating system affected
* Difficult to manage thousands of containers
* Complex to migrate legacy monolithic architecture projects
* difficult to right size containers for specific scenarios

**Container Vendors**

1. **Docker:**  Robust and most popular container
2. **Podman:** Daemon-less architecture providing more security than docker containers
3. **LXC:** Preferred for data-intensive apps and ops
4. **Vagrant**

**Docker :** written in Go

* Docker isolates applications from infrastructure( hardware, operating system, container runtime)
* Uses Linux kernel’s features to deliver functionality
* It also provides versioning for easy testing, rollbacks and redeplyments
* Docker uses namespaces technology to provide an isolated workspace called the container.

**Building and Running containers**

Docker container creation process

* Create a docker file
* Use the docker file to create a container image
* Use the container image to create a running container

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* Dockerfile starts with **FROM** – this is a base image
* Docker build command to create a container image

A diagram of a computer

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* Docker image verification- run $docker images – gives all docker images list as output
* Docker run command – to create a container from image

$ docker run my-app:v1