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Docker

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Agenda

- What is Docker?
- Advantage over classical virtualization
- How to install Docker
- Exercise: How to use Docker

What is Docker?

- **Docker** allows to package an application into a standardized unit for software development:
  – The Docker Container

- A **Docker Container** wraps a piece of software in a complete filesystem which contains all needed resources

- A Docker Container runs on Linux, Windows, OS X, and most Cloud infrastructures
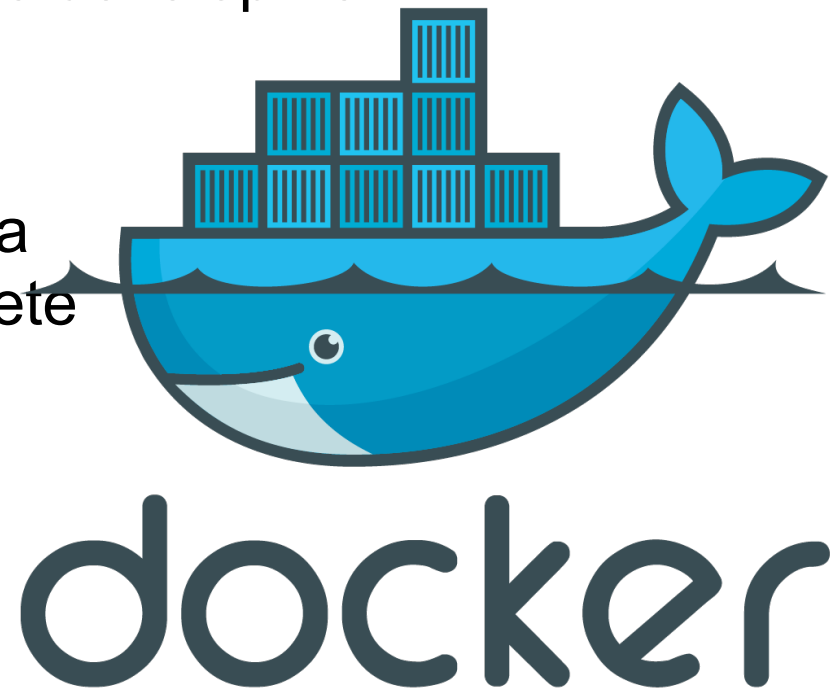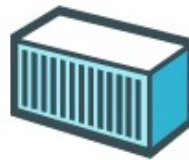
Image source: https://www.docker.com

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Docker promise: Build, Ship, Run!

Build

Develop an app using Docker containers with any language and any toolchain.

Ship

Ship the "Dockerized" app and dependencies anywhere - to QA, teammates, or the cloud - without breaking anything.

Run

Scale to 1000s of nodes, move between data centers and clouds, update with zero downtime and more.

- Reliable deployments
- Build here, run there

Advantage over classical virtualization

- Setting up a Virtual Machine requires additional tools for provisioning such as Puppet, Chef, Ansible, Vagrant, shell scripts and more ...

- Tools as Packer do support builder and provisioners

- But ...

- Docker comes with template **Docker images** hosted at hub.docker.com

- Easy to extend with custom software, libraries, files defined in a single **Dockerfile**

- **Images** are version controlled and lightweight

- Supports the Dev&Ops paradigm **Infrastructure-as-Code**

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Exercise: How to install Docker

- There are official installation guides available for various operating systems.

    - https://docs.docker.com/engine/installation/

- As installation guides are self-explanatory and Docker is pre-installed on all working stations, we can skip to the next chapter.

Exercise: How to use Docker

- Check if correct Docker version is installed:

  ```
  docker version
  ```

- Run first Docker container:

  ```
  docker run hello-world
  ```

- First, Docker Image is searched locally. → not found

- Then, Docker Image is pulled from DockerHub.

- Split up command:

  ```
  docker pull hello-world
  docker run hello-world
  ```

Exercise: How to use Docker

- States of a Docker application:

    - Dockerfile

        - Configuration to create a Docker Image.

    - Docker Image

        - Image can be loaded by Docker and is used to create Docker Container.

    - Docker Container

        - Instance of a Docker Image.

- **Dockerfile**

    - Build a Docker Image

    ```
    docker build -t username/imagename .
    ```

Exercise: How to use Docker

- **Docker Image**

    – List all Docker Images:

    ```
    docker images
    ```

    – Remove Docker Image imagename:

    ```
    docker rmi imagename
    ```

- **Docker Container**

    – List all Docker Containers with size:

    ```
    docker ps -as
    ```

    – Remove Docker Container containername:

    ```
    docker rm containername
    ```

Exercise: How to use Docker

- Remove the Docker Container and Docker Image of the hello-world application.

- Then pull the image (with the pull command) and run it again.

Exercise: How to use Docker

- Other useful Docker commands:

  - `docker create imagename`

  - `docker start containername`

  - `docker stop containername`

  - `docker restart containername`

  - `docker kill containername`

- „httpd" Image can be used to test above documented commands.

What we have learned

- Your are familiar with basic usage and commands of Docker.

Contact & Licence

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