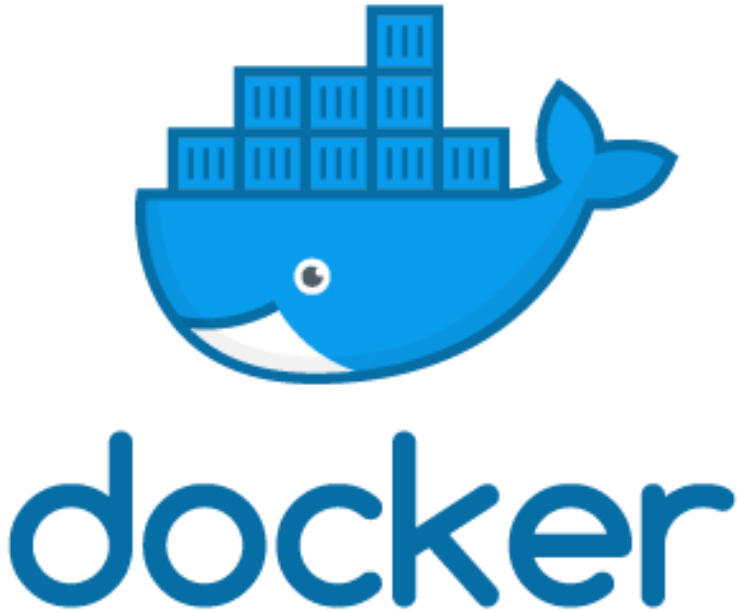
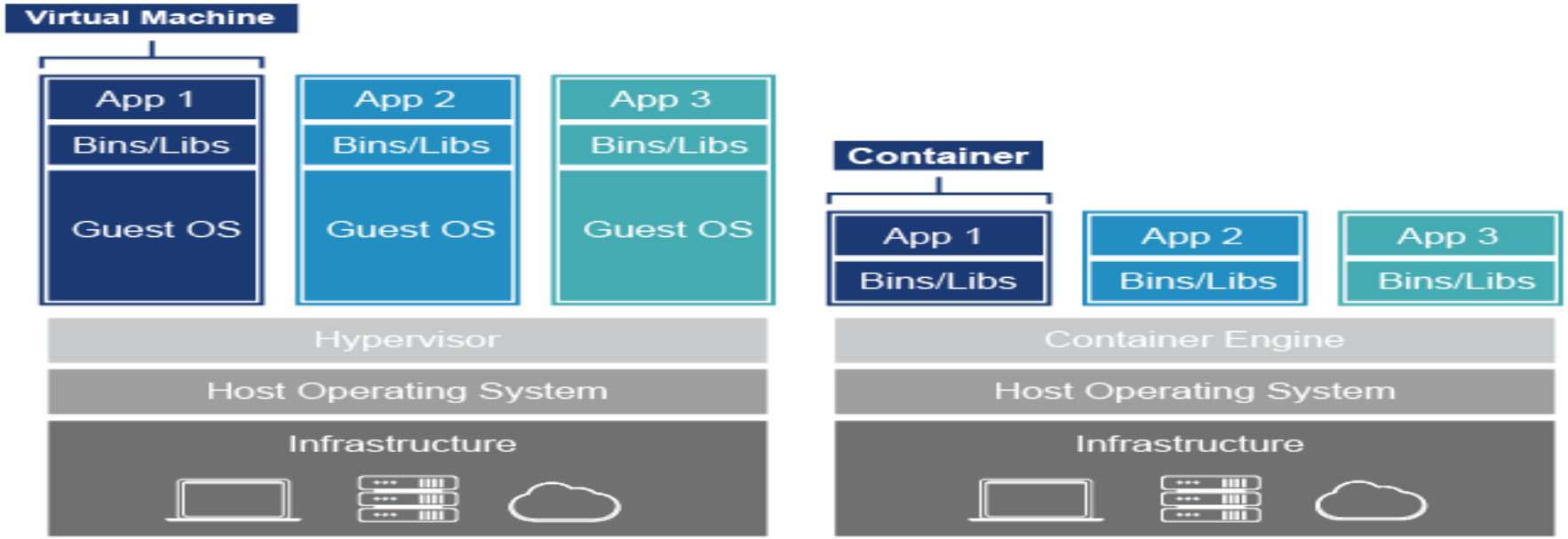


Oracle database build with docker

Dominic



	Virtual Machine	Container
大小	數十GB或更多	通常數百MB
速度	數分鐘或到小時	通常數秒就可生成container
安全性	較強	較弱
擴充性	較低	較高

• IMAGES

An image is a read-only template with instructions for creating a Docker container. Often, an image is based on another image, with some additional customization.

You might create your own images or you might only use those created by others and published in a registry. To build your own image, you create a Dockerfile with a simple syntax for defining the steps needed to create the image and run it.

• CONTAINERS

A container is a runnable instance of an image. You can create, start, stop or delete a container using the Docker API or CLI.

When a container is removed, any changes to its state that are not stored in persistent storage disappear.

• VOLUME

Docker volumes are very useful when we need to persist data in Docker containers or share data between containers.

Docker volumes are important because when a Docker container is destroyed, it’s entire file system is destroyed too. So if we want to keep this data, it is necessary that we use Docker volumes.

- ENVIRONMENT

Docker - 19.03.5
Oracle Database – 11g Release 2 (11.2.0.2) Express Edition (XE)

• INSTALL DOCKER

- Uninstall old versions
  - $ yum remove docker docker-client docker-client-latest docker-common docker-latest docker-latest-logrotate docker-logrotate docker-engine
- Install using the repository
  - $ yum install -y yum-utils device-mapper-persistent-data lvm2
  - $ yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo
- Install Docker Engine
  - $ yum install –y docker-ce docker-ce-cli containerd.io
- To install a specific version
  - $ yum list docker-ce --showduplicates | sort
  - $ yum install docker-ce-<VERSION_STRING> docker-ce-cli-<VERSION_STRING> containerd.io
- Start Docker
  - $ systemctl start docker

• DOWNLOAD IMAGES

- Download images
  - $ docker pull bgreentea/itig-oracledb:11.2.0.2-xe
- Check image
  - $ docker images

```
[root@localhost ~]# docker images
REPOSITORY                                                        TAG                 IMAGE ID            CREATED             SIZE
bgreentea/itig-oracledb                                           11.2.0.2-xe         e7ec47082d3c        2 days ago          1.13GB
oracle/database                                                   11.2.0.2-xe         e7ec47082d3c        2 days ago          1.13GB
oraclelinux                                                       7-slim              fd84774952b5        13 days ago         118MB
calico/node                                                       v3.8.6              1b9ca446b4da        2 months ago        192MB
calico/pod2daemon-flexvol                                         v3.8.6              97bfbee02d48        2 months ago        9.38MB
calico/cni                                                        v3.8.6              33af7d7d46b6        2 months ago        161MB
calico/kube-controllers                                           v3.8.6              550bd139cfa1        2 months ago        48.9MB
kubernetesui/dashboard                                            v2.0.0-beta8        eb51a3597525        3 months ago        90.8MB
centos                                                            7                   5e35e350aded        4 months ago        203MB
registry.cn-hangzhou.aliyuncs.com/google_containers/kube-apiserver            v1.16.0             b305571ca60a        6 months ago        217MB
registry.cn-hangzhou.aliyuncs.com/google_containers/kube-controller-manager   v1.16.0             06a629a7e51c        6 months ago        163MB
registry.cn-hangzhou.aliyuncs.com/google_containers/kube-proxy                v1.16.0             c21b0c7400f9        6 months ago        86.1MB
registry.cn-hangzhou.aliyuncs.com/google_containers/kube-scheduler            v1.16.0             301ddc62b80b        6 months ago        87.3MB
elasticsearch                                                     7.3.2               d7052f192d01        6 months ago        706MB
registry.cn-hangzhou.aliyuncs.com/google_containers/etcd                      3.3.15-0            b2756210eeab        6 months ago        247MB
registry.cn-hangzhou.aliyuncs.com/google_containers/coredns                   1.6.2               bf261d157914        7 months ago        44.1MB
kubernetesui/metrics-scraper                                      v1.0.1              709901356c11        8 months ago        40.1MB
registry.cn-hangzhou.aliyuncs.com/google_containers/pause                     3.1                 da86e6ba6ca1        2 years ago         742kB
bgreentea/itig-oracledb                                           12.2.0.1-ee         12a359cd0528        2 years ago         3.44GB
store/oracle/database-enterprise                                  12.2.0.1            12a359cd0528        2 years ago         3.44GB
```

- See more version
  - $ https://hub.docker.com/repository/docker/bgreentea/itig-oracledb/tags?page=1

• CREATE CONTAINER

- Create container

  $ docker run -d --name <container_name> --shm-size=1g -p 1521:1521 -p 18080:8080 -e ORACLE_PWD =<your_password> -v <volume_name>:/u01/app/oracle/oradata bgreentea/itig-oracledb:11.2.0.2-xe

Parameters	
--name	The name of the container
--shm-size	Amount of Linux shared memory
-p	The port mapping of the host port to the container port.<host_port>:<container_port>
-e	The Oracle Database SYS, SYSTEM and PDB_ADMIN password
-v	The data volume to use for the database. If omitted the database will not be persisted over container recreation.

• ENTER CONTAINER

- Check container
  - $ docker ps –a

```
[root@nl /]# docker ps -a
CONTAINER ID        IMAGE                                  COMMAND                  CREATED             STATUS                    PORTS                                        NAMES
03de528d3c80        bgreentea/itig-oracledb:11.2.0.2-xe    "/bin/sh -c 'exec $O…"   15 minutes ago      Up 15 minutes (healthy)   0.0.0.0:1521->1521/tcp, 0.0.0.0:8088->8080/tcp   myoracle1
```

- Start up sqlplus
  - $ docker exec -it <container_name> bash -c "source /home/oracle/.bashrc; sqlplus /nolog"

```
[root@nl /]# docker exec -it myoracle1 bash -c "source /home/oracle/.bashrc; sqlplus /nolog"
bash: /home/oracle/.bashrc: No such file or directory

SQL*Plus: Release 11.2.0.2.0 Production on Mon Mar 23 07:34:13 2020

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SQL>
```
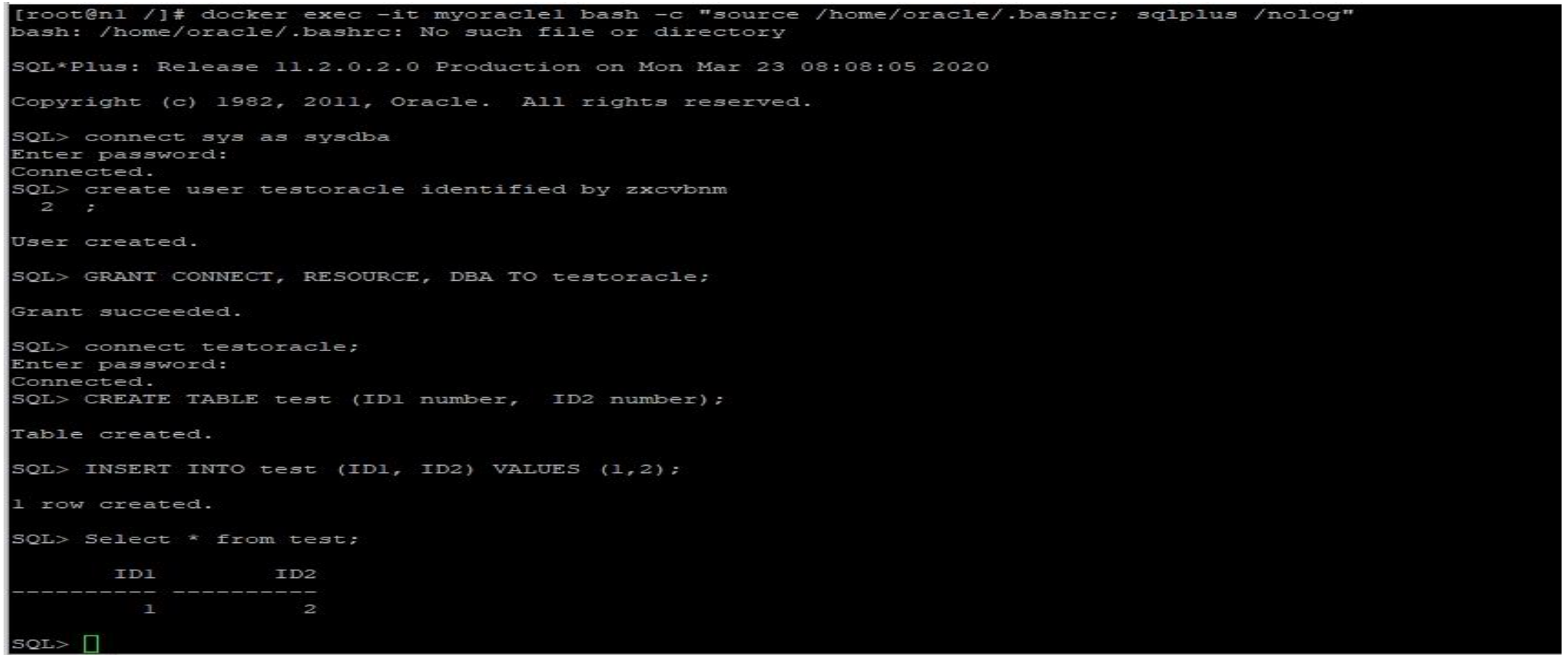

• SQLPLUS COMMAND

- Connect admin
  $ connect sys as sysdba
- Create user
  $ create user <account> identified by <password>;
- Give permission
  $ GRANT CONNECT, RESOURCE, DBA TO <account> ;
- Connect your account
  $ connect <account>
- Create test table
  $ CREATE TABLE test (ID1 number, ID2 number);
- Insert test data
  $ INSERT INTO test (ID1, ID2) VALUES (1,2);
- Check test data
  $ Select * from test;

- SQLPLUS COMMAND



• DOCKER COMMAND

- Stop container
  $ docker stop <container_name> or < container_id>
- Start container
  $ docker start <container_name> or < container_id>
- Remove container
  $ docker rm <container_name> or < container_id>
- Restart container
  $ docker restart <container_name> or < container_id>
- Check container
  $ docker ps -a
- Enter container
  $ docker exec –it <container_name> or <container_id>
- Check volume
  $ docker volume ls
- Check volume path
  $ docker volume inspect <volume_name>
- Check container log
  $ docker logs <container_name> or < container_id>

• ORACLE 11G LIMITATIONS

- Oracle Database XE CPU Limitations

  If Oracle Database XE is installed on a computer with more than one CPU (including dual-core CPUs), then it will consume, at most, processing resources equivalent to one CPU.

- User Data Limitations

  The maximum amount of user data in an Oracle Database XE database cannot exceed 11 gigabytes.

- RAM Limitation

  The maximum amount of RAM that an Oracle Database XE database uses cannot exceed 1 gigabyte, even if more is available.

- More information

  https://docs.oracle.com/cd/E17781_01/install.112/e18802/toc.htm#XEINL117

• ORACLE APEX

Oracle APEX port is 18080 . You can use admin for login .
Oracle APEX admin URL : http://<host_ip>:<apex_port>/apex/apex_admin
Oracle APEX URL : http://<host_ip>:<apex_port>/apex