CentOS7.5 部署 OceanBase Docker 初体验

文档控制：

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1.引言

1.1. 关于此文档

本文档主要介绍在 CentOS7.5 中部署 OceanBase Docker 体验环境的过程，快速地体验 OceanBase 的自动化部署过程，以及了解 OceanBase 集群安装成功后的目录特点和使用方法。

1.2. 参考资料

1. 社区版官网-文档-学习中心-入门教程：实战教程第二章 2.2：如何快速体验 OceanBase
2. 社区版官网-博客-入门实战：实战教程第二章 2.2：如何快速体验 OceanBase
3. 社区版官网-问答：OceanBase CE 容器下载使用简介
4. 教程视频：【2-2-OceanBase Docker 体验.mp4】

2. 安装前准备

2.1. 机器资源要求

OceanBase Docker 容器对资源的要求如下：

- 机器可用内存不少于 10G 。 注意，是剩余可用内存。
- 机器磁盘目录空间不少于 10G 。少于 10G 后面使用可能会不是很方便。如遭遇空间目录问题。
- CPU 建议至少有 2 个 逻辑 CPU 。

2.2. 系统基本检查

系统版本:

```
[root@localhost ~]# uname -osr
Linux 3.10.0-862.el7.x86_64 GNU/Linux
[root@localhost ~]# cat /etc/redhat-release
CentOS Linux release 7.5.1804 (Core)
```

硬盘空间大小:

```
[root@localhost ~]# df -h
Filesystem               Size  Used Avail Use% Mounted on
/dev/mapper/centos-root  450G  3.6G  447G   1% /
devtmpfs                 7.9G     0  7.9G   0% /dev
tmpfs                    7.9G     0  7.9G   0% /dev/shm
tmpfs                    7.9G   11M  7.9G   1% /run
tmpfs                    7.9G     0  7.9G   0% /sys/fs/cgroup
/dev/sda1               1014M  157M  858M  16% /boot
/dev/mapper/centos-home   42G   37M   42G   1% /home
tmpfs                    1.6G   48K  1.6G   1% /run/user/1000
tmpfs                    1.6G     0  1.6G   0% /run/user/0
```

内存大小:

```
[root@localhost ~]# free -m
              total        used        free      shared  buff/cache   available
Mem:          16044         873       14316          12         854       14688
Swap:          8063           0        8063
```

CPU 逻辑核数:

```
[root@localhost ~]# cat /proc/cpuinfo| grep "processor"| wc -l
16
```

2.3. 系统调整

测试环境可关闭防火墙、Selinux 和 NetworkManager

```
[root@localhost ~]# systemctl stop firewalld
[root@localhost ~]# systemctl disable firewalld
[root@localhost ~]# systemctl stop NetworkManager
[root@localhost ~]# systemctl disable NetworkManager
[root@localhost ~]# sed -i 's/SELINUX=enforcing/SELINUX=disabled/g' /etc/selinux/config
```

2.4. 配置主机名，编辑 hosts 文件

配置主机名为 oceanbase,将主机名和 ip 解析写到/etc/hosts 文件:

```
[root@localhost ~]# hostnamectl set-hostname oceanbase
[root@localhost ~]# cat >> /etc/hosts <<EOF
> 192.168.101.86    oceanbase
> EOF
```

3. 安装 Docker

3.1. 常用 Docker 命令参考

```
# 查看 docker 版本
docker version
# 显示 docker 系统的信息
docker info
# 日志信息
docker logs
# 故障检查
service docker status
# 启动关闭 docker
service docker start | stop

# 查看容器日志
docker logs -f <容器名 orID>
```

```
# 清理命令，危险！！！
# 清理不用的容器
docker container prune
# 清理不用的镜像
docker image prune
# 清理不用的卷
docker volume prune
```

3.2. 使用 YUM 安装 docker 软件

```
[root@localhost ~]# yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo
Loaded plugins: fastestmirror, langpacks
adding repo from: https://download.docker.com/linux/centos/docker-ce.repo
grabbing file https://download.docker.com/linux/centos/docker-ce.repo to /etc/yum.repos.d/docker-ce.repo
repo saved to /etc/yum.repos.d/docker-ce.repo
[root@localhost ~]# yum install docker-ce docker-ce-cli containerd.io
```

3.3. 搜索 OceanBase 相关镜像

```
[root@localhost ~]# docker search oceanbase
NAME                              DESCRIPTION                                     STARS     OFFICIAL   AUTOMATED
oceanbase/oceanbase-xe            OceanBase Database 2.2 Express Edition          3
oceanbase/obce-mini               obce-mini is a mini standalone test image fo…  2
obpilot/oceanbase-ce              3 steps to run an OceanBase-CE docker in you…  2
zibuyu886/oceanbase-ce-cluster    OceanBase ce cluster                            1
oceanbase/oceanbase-ce            OceanBase is open source now. This is the do…  1
huweijie/oceanbase-ce-deploy                                                      0
oceanbase/centos7                                                                 0
superbigfu/oceanbase                                                              0
hongweiqin/anolisos-oceanbase     A tentative deploy of oceanbase.                0
stutiredboy/centos_ob             Build environment for OceanBase 3.1 CE. Crea…  0
[root@localhost ~]#
```

3.4. 拉取镜像 oceanbase-ce

```
[root@oceanbase ~]# docker pull obpilot/oceanbase-ce:latest
latest: Pulling from obpilot/oceanbase-ce
Digest: sha256:7ac28415cf27ba19cb47acb67a55ebf9848ad73a63d80b7e2e85d653233dbaeb
Status: Image is up to date for obpilot/oceanbase-ce:latest
docker.io/obpilot/oceanbase-ce:latest
```

3.5. 运行 OceanBase CE 容器

```
[root@oceanbase ~]# docker run -itd -m 10G --name Oceanbase-ce  obpilot/oceanbase-ce:latest
46cdf3b340f509b670f8ad0c996369d1f44bc368c5550a5b425d9d18d9a4e811
```

```
[root@oceanbase ~]# docker ps
CONTAINER ID   IMAGE                          COMMAND       CREATED         STATUS         PORTS                NAMES
46cdf3b340f5   obpilot/oceanbase-ce:latest    "/bin/bash"   4 minutes ago   Up 4 minutes   2881/tcp, 2883/tcp   Oceanbase-ce
```

3.6. 进入容器并启动集群

进入容器:

[root@oceanbase ~]# docker exec -it Oceanbase-ce bash

获取集群信息:

```
[admin@46cdf3b340f5 ~]$ obd cluster list
+-------------------------------------------------------------+
|                        Cluster List                         |
+---------+-----------------------------------+---------------+
| Name    | Configuration Path                | Status (Cached) |
+---------+-----------------------------------+---------------+
| obdemo | /home/admin/.obd/cluster/obdemo | deployed        |
+---------+-----------------------------------+---------------+
```

启动集群:

```
[admin@46cdf3b340f5 ~]$ obd cluster start obdemo
Get local repositories and plugins ok
Open ssh connection ok
Cluster param config check ok
Check before start observer ok
Check before start obproxy ok
Start observer ok
observer program health check ok
Connect to observer ok
Initialize cluster
Cluster bootstrap ok
Wait for observer init ok
+-----------------------------------------------+
|                    observer                   |
+-----------+---------+------+-------+--------+
| ip        | version | port | zone  | status |
+-----------+---------+------+-------+--------+
| 127.0.0.1 | 3.1.1   | 2881 | zone1 | active |
+-----------+---------+------+-------+--------+

Start obproxy ok
obproxy program health check ok
Connect to obproxy ok
Initialize cluster
+-----------------------------------------------+
|                    obproxy                    |
+-----------+------+-----------------+--------+
| ip        | port | prometheus_port | status |
+-----------+------+-----------------+--------+
| 127.0.0.1 | 2883 | 2884            | active |
+-----------+------+-----------------+--------+
obdemo running
```

查看集群详细信息:

```
[admin@46cdf3b340f5 ~]$ obd cluster display obdemo
Get local repositories and plugins ok
Open ssh connection ok
Cluster status check ok
Connect to observer ok
Wait for observer init ok
+-----------------------------------------------+
|                    observer                   |
+-----------+---------+------+-------+--------+
| ip        | version | port | zone  | status |
+-----------+---------+------+-------+--------+
| 127.0.0.1 | 3.1.1   | 2881 | zone1 | active |
+-----------+---------+------+-------+--------+

Connect to obproxy ok
+-----------------------------------------------+
|                    obproxy                    |
+-----------+------+-----------------+--------+
| ip        | port | prometheus_port | status |
+-----------+------+-----------------+--------+
| 127.0.0.1 | 2883 | 2884            | active |
+-----------+------+-----------------+--------+
```

3.7. 连接 OceanBase 集群的内部实例（sys）

```
[admin@46cdf3b340f5 ~]$ obclient -h 127.0.0.1 -uroot@sys -P2881 -prootPWD123 -c -A oceanbase
Welcome to the OceanBase.  Commands end with ; or \g.
Your MySQL connection id is 3221573792
Server version: 5.7.25 OceanBase 3.1.1 (r4-8c615943cbd25a6f7b8bdfd8677a13a21709a05e) (Built Oct 21 2021 10:52:05)

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [oceanbase]> show databases;
+--------------------+
| Database           |
+--------------------+
| oceanbase          |
| information_schema |
| mysql              |
| SYS                |
| LBACSYS            |
| ORAAUDITOR         |
| test               |
+--------------------+
7 rows in set (0.716 sec)

MySQL [oceanbase]>
```

在数据库列表里看到 oceanbase 这个数据库，就表示集群初始化成功。

3.8. 创建业务租户

1、使用 root 账号登录到 sys 租户中，使用 MySQL 访问 OceanBase 数据库：

```
[admin@46cdf3b340f5 ~]$ obclient -h 127.0.0.1 -uroot@sys -P2881 -prootPWD123 -c -A oceanbase
Welcome to the OceanBase.  Commands end with ; or \g.
Your MySQL connection id is 3221573792
Server version: 5.7.25 OceanBase 3.1.1 (r4-8c615943cbd25a6f7b8bdfd8677a13a21709a05e) (Built Oct 21 2021 10:52:05)

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [oceanbase]> show databases;
+--------------------+
| Database           |
+--------------------+
| oceanbase          |
| information_schema |
| mysql              |
| SYS                |
| LBACSYS            |
| ORAAUDITOR         |
| test               |
+--------------------+
7 rows in set (0.716 sec)

MySQL [oceanbase]>
```

2、查询系统资源占用情况：

```
MySQL [oceanbase]> select svr_ip,svr_port,cpu_total,mem_total,disk_total,zone from __all_virtual_server_stat;
+-----------+----------+-----------+------------+------------+-------+
| svr_ip    | svr_port | cpu_total | mem_total  | disk_total | zone  |
+-----------+----------+-----------+------------+------------+-------+
| 127.0.0.1 |     2882 |        14 | 4294967296 | 5368709120 | zone1 |
+-----------+----------+-----------+------------+------------+-------+
1 row in set (0.003 sec)

MySQL [oceanbase]>
```

3、查询系统资源分配：

```
MySQL [oceanbase]> select sum(c.max_cpu),sum(c.max_memory) from __all_resource_pool as a, __all_unit_config as c w
here a.unit_config_id=c.unit_config_id;
+---------------+------------------+
| sum(c.max_cpu) | sum(c.max_memory) |
+---------------+------------------+
|             5 |       1288490188 |
+---------------+------------------+
1 row in set (0.003 sec)

MySQL [oceanbase]>
```

4、创建资源单元：

如果想把剩下的所有资源全部使用掉，CPU 和内存分别为步骤 2 和步骤 3 得到的值，

max_cpu 值设置为第二步得到的 cpu_total 减去第三步得到的 sum(c.max_cpu)，在本例中为 9; max_memory 和 min_memory 设置为第二步的到的 mem_total 值 减去 第三步的到的 sum(c.max_memory)，在本例中为 3,006,477,108。

```
MySQL [oceanbase]> create resource unit unit1
    -> max_cpu = 9,
    -> max_memory = 3006477108,
    -> min_memory = 3006477108,
    -> max_iops = 10000,
    -> min_iops = 1280,
    -> max_session_num = 3000,
    -> max_disk_size = 214748364800;
Query OK, 0 rows affected (0.008 sec)

MySQL [oceanbase]>
```

5、创建资源池：

```
MySQL [oceanbase]> CREATE RESOURCE POOL pool1 UNIT = 'unit1', UNIT_NUM = 1, ZONE_LIST = ('zone1');
Query OK, 0 rows affected (0.011 sec)
```

6、创建租户：

```
MySQL [oceanbase]> CREATE TENANT IF NOT EXISTS test_tenant
    -> charset='utf8mb4',
    -> replica_num=3,
    -> zone_list=('zone1'),
    -> primary_zone='RANDOM',
    -> resource_pool_list=('pool1')
    -> ;
Query OK, 0 rows affected (0.743 sec)

MySQL [oceanbase]>
```

7、登录租户之前，运行以下命令修改参数：

```
MySQL [oceanbase]> alter tenant test_tenant set variables ob_tcp_invited_nodes='%';
Query OK, 0 rows affected (0.011 sec)
```

8、使用新的租户登录系统：

```
[admin@46cdf3b340f5 ~]$ obclient -h 127.0.0.1 -uroot@test_tenant -P2881 -c -A
Welcome to the OceanBase.  Commands end with ; or \g.
Your MySQL connection id is 3221578995
Server version: 5.7.25 OceanBase 3.1.1 (r4-8c615943cbd25a6f7b8bdfd8677a13a21709a05e) (Built Oct 21 2021 10:52:05)

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [(none)]>
```

3.9. 创建业务数据库和表

1、创建一个数据库：

```
[admin@46cdf3b340f5 ~]$ obclient -h 127.0.0.1 -uroot@sys -P2881 -prootPWD123 -c -A oceanbase
Welcome to the OceanBase.  Commands end with ; or \g.
Your MySQL connection id is 3221579047
Server version: 5.7.25 OceanBase 3.1.1 (r4-8c615943cbd25a6f7b8bdfd8677a13a21709a05e) (Built Oct 21 2021 10:52:05)

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [oceanbase]>
MySQL [oceanbase]>
MySQL [oceanbase]>
MySQL [oceanbase]> create database my_db1;
Query OK, 1 row affected (0.020 sec)

MySQL [oceanbase]> show databases;
+--------------------+
| Database           |
+--------------------+
| oceanbase          |
| information_schema |
| mysql              |
| SYS                |
| LBACSYS            |
| ORAAUDITOR         |
| test               |
| my_db1             |
+--------------------+
8 rows in set (0.253 sec)

MySQL [oceanbase]>
```

2、创建业务用户 my_user1,并赋权;

```
MySQL [oceanbase]> grant all privileges on my_db1.* to my_user1 identified by '12345678';
Query OK, 0 rows affected (0.101 sec)
```

```
MySQL [oceanbase]> show grants for my_user1;
+-------------------------------------------------+
| Grants for my_user1@%                           |
+-------------------------------------------------+
| GRANT USAGE ON *.* TO 'my_user1'                |
| GRANT ALL PRIVILEGES ON `my_db1`.* TO 'my_user1' |
+-------------------------------------------------+
2 rows in set (0.254 sec)
```

3、在数据库 my_db1 中创建业务表 my_tab1;

```
MySQL [my_db1]> create table tab1 (id int, name varchar(20));
Query OK, 0 rows affected (0.029 sec)

MySQL [my_db1]> desc tab1;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| id    | int(11)     | YES  |     | NULL    |       |
| name  | varchar(20) | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+
2 rows in set (0.002 sec)

MySQL [my_db1]> insert into tab1 values(1,'King');
Query OK, 1 row affected (0.004 sec)

MySQL [my_db1]> select * from tab1;
+------+------+
| id   | name |
+------+------+
|    1 | King |
+------+------+
1 row in set (0.003 sec)

MySQL [my_db1]>
```