

# PDX-BaaP区块链平台节点部署手册

## 历史记录

编号	修改日期	修改内容	版本号	作者
1	2017-7-12	初版	0.1	孙绍华
2	2017-7-13	补充常见问题和常用操作命令	0.2	孙绍华

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# 1. 运行环境

操作系统：Linux、Windows、MacOS

## 2. 使用说明

### 2.1 安装 Docker

操作系统需要安装 Docker 环境，如果已安装请忽略此步骤；

Docker 版本要求在 1.12 以上，建议安装最新版本。

如果系统为 ubuntu，可以参照以下步骤：

1、切换到 root 权限或者用 sudo

2、升级 source 列表并保证 https 和 ca 证书成功安装

```
sudo apt-get update
```

```
sudo apt-get install apt-transport-https ca-certificates
```

3、增加新的 GPG 密钥

```
apt-key adv --keyserver hkp://p80.pool.sks-keyservers.net:80  
--recv-keys 58118E89F3A912897C070ADBF76221572C52609D
```

4、新增或编辑 source 列表里的 docker.list 文件

```
vi /etc/apt/sources.list.d/docker.list
```

5、如果 docker.list 文件不存在就新增文件，如果存在，则删除已有的 entries

6、按照系统版本增加 entry (Ubuntu Xenial 16.04 (LTS))

```
deb https://apt.dockerproject.org/repo ubuntu-xenial main
```

7、重新执行更新操作，并删除老的 repo

```
sudo apt-get purge lxc-docker //没有安装的话，跳过
```

## 8、查看是否有正确的可用版本

```
sudo apt-cache policy docker-engine
```

## 9、选择一个版本进行安装

```
sudo apt-get install -y docker-engine=17.05.0~ce-0~ubuntu-xenial
```

## 10、安装完成后查看 docker 是否已经启动

```
sudo service docker status
```

如果显示 active(running) 说明已经正常启动，如下图：

```
● docker.service - Docker Application Container Engine
   Loaded: loaded (/lib/systemd/system/docker.service; enabled; vendor preset: enabled)
   Active: active (running) since 四 2017-07-13 08:31:24 CST; 7h ago
     Docs: https://docs.docker.com
  Main PID: 1514 (dockerd)
    Tasks: 36
   Memory: 76.1M
      CPU: 43.926s
   CGroup: /system.slice/docker.service
           └─ 1514 /usr/bin/dockerd -H fd://
              1576 docker-containerd -l unix:///var/run/docker/libcontainerd/docker-containerd.
              22079 docker-containerd-shim 95681841c076f73ed422c0b39fdcf436786bbf3f3e61a75c4738

7月 13 08:31:21 Harrison-Latitude-3580 dockerd[1514]: time="2017-07-13T08:31:21.223233385+08:00"
7月 13 08:31:21 Harrison-Latitude-3580 dockerd[1514]: time="2017-07-13T08:31:21.223514191+08:00"
7月 13 08:31:21 Harrison-Latitude-3580 dockerd[1514]: time="2017-07-13T08:31:21.223584868+08:00"
7月 13 08:31:21 Harrison-Latitude-3580 dockerd[1514]: time="2017-07-13T08:31:21.256124179+08:00"
7月 13 08:31:23 Harrison-Latitude-3580 dockerd[1514]: time="2017-07-13T08:31:23.123533837+08:00"
7月 13 08:31:23 Harrison-Latitude-3580 dockerd[1514]: time="2017-07-13T08:31:23.599157106+08:00"
7月 13 08:31:24 Harrison-Latitude-3580 dockerd[1514]: time="2017-07-13T08:31:24.484548579+08:00"
7月 13 08:31:24 Harrison-Latitude-3580 dockerd[1514]: time="2017-07-13T08:31:24.484729319+08:00"
7月 13 08:31:24 Harrison-Latitude-3580 dockerd[1514]: time="2017-07-13T08:31:24.523316291+08:00"
7月 13 08:31:24 Harrison-Latitude-3580 systemd[1]: Started Docker Application Container Engine.
lines 1-23/23 (END)
```

## 2.2 上传镜像文件

将 PDX 提供的 pdx-baap-0.1.tar 文件上传到服务器的指定目录

注意：

- 1、目录没有要求，任意目录都可以
- 2、镜像的文件名以实际提供的为准

## 2.3 载入镜像文件

命令：sudo docker load -i pdx-baap-0.1.tar

执行命令截图：

```

harrison@Harrison-Latitude-3580:~/soft$
harrison@Harrison-Latitude-3580:~/soft$ sudo docker load -i pdx-baap-0.1.tar
cb11ba605400: Loading layer [=====>] 123.2MB/123.2MB
5a4c2c9a24fc: Loading layer [=====>] 15.87kB/15.87kB
182d2a55830d: Loading layer [=====>] 11.78kB/11.78kB
6f9cf951edf5: Loading layer [=====>] 5.632kB/5.632kB
0566c118947e: Loading layer [=====>] 3.072kB/3.072kB
ce398dd2936b: Loading layer [=====>] 3.072kB/3.072kB
4b3cda266542: Loading layer [=====>] 454.6MB/454.6MB
25025520f63d: Loading layer [=====>] 13.8MB/13.8MB
2eee4914acb7: Loading layer [=====>] 366.2MB/366.2MB
8f0eae2abf2d: Loading layer [=====>] 473.4MB/473.4MB
c0da047fd9fb: Loading layer [=====>] 31.58MB/31.58MB
2e431f4e48da: Loading layer [=====>] 1.095MB/1.095MB
59da02a2cfeb8: Loading layer [=====>] 3.072kB/3.072kB
ca4789c3f8c0: Loading layer [=====>] 3.584kB/3.584kB
a113b34aa949: Loading layer [=====>] 124.5MB/124.5MB
57d1449e1d10: Loading layer [=====>] 9.216kB/9.216kB
b6769541e4d0: Loading layer [=====>] 30.31MB/30.31MB
2bdeb65287c3: Loading layer [=====>] 7.168kB/7.168kB
836330c48b5a: Loading layer [=====>] 4.096kB/4.096kB
851a117603e2: Loading layer [=====>] 3.584kB/3.584kB
a964727761e4: Loading layer [=====>] 141.2MB/141.2MB
Loaded image: pdx/baap:v0.1
harrison@Harrison-Latitude-3580:~/soft$
harrison@Harrison-Latitude-3580:~/soft$

```

## 2.4 查看载入的镜像

命令: `sudo docker images`

执行命令截图:

```

harrison@Harrison-Latitude-3580:~/soft$
harrison@Harrison-Latitude-3580:~/soft$ sudo docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
pdx/baap             v0.1               efad2c108e10       7 minutes ago      1.74GB
harrison@Harrison-Latitude-3580:~/soft$
harrison@Harrison-Latitude-3580:~/soft$

```

## 2.5 创建并启动容器

命令: `sudo docker run --privileged --net=host -p 8080:8080 -p 8545:8545 -p 44444:44444 -p 8989:8989 -d -t pdx/baap:v0.1`

注意:

- 1、其中-t 后边的值为可变参数，规则为：EPOSITORY:TAG，其他参数固定
- 2、EPOSITORY 和 TAG 的值来自于执行命令 `docker images` 显示结果的前两列
- 3、创建并启动容器前请确保宿主机没有启动 MySQL
- 4、创建并启动容器前请确保宿主机没有启动 8080、8545、44444 端口

执行命令截图:

```
harrison@Harrison-Latitude-3580:~/soft$  
harrison@Harrison-Latitude-3580:~/soft$ sudo docker run --privileged --net=host -p 8080:8080 -p 8545:8545 -p 44444:44444 -p 8989:8989 -d -t pdx/baap:v0.1  
f87d09e13dc8882519226552f4311b4d4e0e52a7038d5e4ab9d7e9b972366104  
harrison@Harrison-Latitude-3580:~/soft$
```

## 2.6 查看运行的容器

命令: `sudo docker ps -a`

执行命令截图:

```
harrison@Harrison-Latitude-3580:~/soft$  
harrison@Harrison-Latitude-3580:~/soft$ sudo docker ps -a  
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS              NAMES  
f87d09e13dc8        pdx/baap:v0.1      "/bin/sh -c superv..."   About a minute ago   Up About a minute   8080-8080,8545-8545,44444-44444,8989-8989   sleepy_wozniak  
harrison@Harrison-Latitude-3580:~/soft$  
harrison@Harrison-Latitude-3580:~/soft$
```

## 2.7 进入容器

命令: `sudo docker exec -it f87d09e13dc8 /bin/bash`

注意:

命令中的 f87d09e13dc8 为 CONTAINER ID, CONTAINER ID 是通过执行命令 `docker ps -a` 显示结果的第一列

执行命令截图:

```
harrison@Harrison-Latitude-3580:~/soft$  
harrison@Harrison-Latitude-3580:~/soft$ sudo docker exec -it f87d09e13dc8 /bin/bash  
root@Harrison-Latitude-3580:/#  
root@Harrison-Latitude-3580:/#
```

## 2.8 运行 BaaP 平台

1、给 python 脚本赋执行权限

`cd /data/pdxdaaphome`

`chmod +x *.py`

执行命令截图:

```

root@Harrison-Latitude-3580:/#
root@Harrison-Latitude-3580:/# cd /data/pdxdaaphome
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ll
total 44
drwxr-xr-x  9 root root 4096 7月  19 11:42 ./
drwxr-xr-x 12 root root 4096 7月  19 11:42 ../
drwxr-xr-x 11 1000 1000 4096 7月  19 11:42 apache-tomcat-8.0.35/
-rw-r--r--  1 root root 4505 7月  19 11:37 baap_init.py
-rw-r--r--  1 root root 1521 7月  19 11:37 baap_startup.py
-rw-r--r--  1 root root  929 7月  19 11:37 baap_stop.py
drwxr-xr-x  2 root root 4096 7月  19 11:42 conf/
drwxr-xr-x  8 uucp  143 4096 10月  7  2015 jdk1.8.0_65/
drwxr-xr-x  3 root root 4096 7月  19 11:42 pdx_blockchain/
drwxr-xr-x  2 root root 4096 7月  19 11:42 webdocker/
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# chmod +x *.py
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ll
total 44
drwxr-xr-x  9 root root 4096 7月  19 12:01 ./
drwxr-xr-x 13 root root 4096 7月  19 12:01 ../
drwxr-xr-x 11 1000 1000 4096 7月  19 11:42 apache-tomcat-8.0.35/
-rwxr-xr-x  1 root root 4505 7月  19 11:37 baap_init.py*
-rwxr-xr-x  1 root root 1521 7月  19 11:37 baap_startup.py*
-rwxr-xr-x  1 root root  929 7月  19 11:37 baap_stop.py*
drwxr-xr-x  2 root root 4096 7月  19 11:42 conf/
drwxr-xr-x  8 uucp  143 4096 10月  7  2015 jdk1.8.0_65/
drwxr-xr-x  3 root root 4096 7月  19 11:42 pdx_blockchain/
drwxr-xr-x  2 root root 4096 7月  19 11:42 webdocker/
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome#

```

## 2、配置初始化

```
cd /data/pdxdaaphome
```

```
./baap_init.py
```

注意：

- 输入本节点 IP 时确保和宿主机 IP 一致
- 根节点 IP 为非必填，如果配置的当前节点为根节点，值为空，如果配置的当前节点为子节点，则需要填写根节点的 IP

执行命令截图：

```

root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ll
total 44
drwxr-xr-x  9 root root 4096 7月 19 12:01 ./
drwxr-xr-x 13 root root 4096 7月 19 12:01 ../
drwxr-xr-x 11 1000 1000 4096 7月 19 11:42 apache-tomcat-8.0.35/
-rwxr-xr-x  1 root root 4505 7月 19 11:37 baap_init.py*
-rwxr-xr-x  1 root root 1521 7月 19 11:37 baap_startup.py*
-rwxr-xr-x  1 root root  929 7月 19 11:37 baap_stop.py*
drwxr-xr-x  2 root root 4096 7月 19 11:42 conf/
drwxr-xr-x  8 uucp 143 4096 10月 7 2015 jdk1.8.0_65/
drwxr-xr-x  3 root root 4096 7月 19 11:42 pdx_blockchain/
drwxr-xr-x  2 root root 4096 7月 19 11:42 webdocker/
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ./baap_init.py
mysql: [Warning] Using a password on the command line interface can be insecure.
mysql: [Warning] Using a password on the command line interface can be insecure.
9007f5987db3: Loading layer [=====>] 5.05MB/5.05MB
a2d23301d20f: Loading layer [=====>] 3.584kB/3.584kB
7fd25aac4151: Loading layer [=====>] 103.7MB/103.7MB
372b8295bf3a: Loading layer [=====>] 2.56kB/2.56kB
ed1fcd1c3abd: Loading layer [=====>] 12.01MB/12.01MB
e0525fbbe78b: Loading layer [=====>] 130kB/130kB
537b26b0f6da: Loading layer [=====>] 20.22MB/20.22MB
8adedadallc1: Loading layer [=====>] 2.048kB/2.048kB
Loaded image: pdx_web_docker:1.0

daap初始化须知：
    1 本节点IP 必须配置；此IP 将用于daap 互联需要；
    2 根节点IP 非必配置；此IP 将用于后续节点连入daap 需要；
    3 节点私钥 非必配置；如果不填写，我们将自动为您生成；
    4 节点名称 非必配置；如果不填写，我们将自动为您生成。

输入任意键继续！

[必 填]请输入本节点IP:10.1.1.32
[非必填]请输入根节点IP:
[非必填]请输入本节点的私钥:
[非必填]请输入本节点名称:
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome#

```

### 3、启动 BaaP 平台

```
cd /data/pdxdaaphome
```

```
./baap_start.py
```

执行命令截图：



```

root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ll
total 48
drwxr-xr-x 13 root root 4096 7月 19 12:05 ./
drwxr-xr-x 13 root root 4096 7月 19 12:01 ../
drwxr-xr-x 17 1000 1000 4096 7月 19 12:05 apache-tomcat-8.0.35/
-rwxr-xr-x 1 root root 4505 7月 19 11:37 baap_init.py*
-rwxr-xr-x 1 root root 1521 7月 19 11:37 baap_startup.py*
-rwxr-xr-x 1 root root 929 7月 19 11:37 baap_stop.py*
drwxr-xr-x 2 root root 4096 7月 19 12:03 conf/
drwxr-xr-x 2 root root 4096 7月 19 12:05 file/
drwxr-xr-x 8 uucp 143 4096 10月 7 2015 jdk1.8.0_65/
drwxr-xr-x 4 root root 4096 7月 19 12:03 pdx_blockchain/
drwxr-xr-x 2 root root 4096 7月 19 11:42 webdocker/
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ./baap_startup.py
Tomcat started.
tomcat status :000
tomcat status :302
nohup: appending output to 'nohup.out'
javabc status :000
javabc status :000
javabc status :000
javabc status :000
javabc status :000
javabc status :000
javabc status :000
javabc status :000
javabc status :000
javabc status :000
javabc status :200
root@Harrison-Latitude-3580:/data/pdxdaaphome#

```

#### 4、检查是否启动正常

##### a. 查看 java 进程和个数

```

ps -ef | grep java | grep -v grep
ps -ef | grep java | grep -v grep | wc -l

```

如果有两个进程属于正常

执行命令截图：

```

root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ps -ef | grep java | grep -v grep
root      878      0 33 12:09 ?        00:00:37 /data/pdxdaaphome/jdk1.8.0_65/bin/java -Djava.util.logging.config.file=/data/pdxdaaphome/apache-tomcat-8.0.35/conf/logging.properties -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Djdk.tls.ephemeralDHKeySize=2048 -Djava.endorsed.dirs=/data/pdxdaaphome/apache-tomcat-8.0.35/endorsed-classpath /data/pdxdaaphome/apache-tomcat-8.0.35/bin/bootstrap.jar /data/pdxdaaphome/apache-tomcat-8.0.35/bin/tomcat-juli.jar -Dcatalina.base=/data/pdxdaaphome/apache-tomcat-8.0.35 -Dcatalina.home=/data/pdxdaaphome/apache-tomcat-8.0.35 -Djava.io.tmpdir=/data/pdxdaaphome/apache-tomcat-8.0.35/temp org.apache.catalina.startup.Bootstrap start
root      950      0 55 12:09 ?        00:00:58 java -Xss32m -Xmx2824M -XX:+UseCompressedOops -XX:+HeapDumpOnOutOfMemoryError -XX:-OmitStackTraceInFastThrow -Dethereumj.conf.f
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ps -ef | grep java | grep -v grep | wc -l
2
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome#

```

##### b. 查看 Container 日志：

```

cd /data/pdxdaaphome/apache-tomcat-8.0.35/logs
tail -100f catalina.out

```

## Container 日志截图：

```
14
12-Jul-2017 19:10:44.937 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
12-Jul-2017 19:10:44.937 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djdk.tls.ephemeralDHKeySize=2048
12-Jul-2017 19:10:44.937 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.endorsed.dirs=/data/pdxdaaphome/apache-tomcat-8.0.35/endorsed
12-Jul-2017 19:10:44.938 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Dcatalina.bases=/data/pdxdaaphome/apache-tomcat-8.0.35
12-Jul-2017 19:10:44.938 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Dcatalina.home=/data/pdxdaaphome/apache-tomcat-8.0.35
12-Jul-2017 19:10:44.938 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.io.tmpdir=/data/pdxdaaphome/apache-tomcat-8.0.35/temp
12-Jul-2017 19:10:44.938 INFO [main] org.apache.catalina.core.AprLifecycleListener.lifecycleEvent The APR based Apache Tomcat Native library which allows optimal performance in production environments was not found on the java.library.path: /usr/java/packages/lib/amd64:/usr/lib64:/lib64:/lib:/usr/lib
12-Jul-2017 19:10:45.090 INFO [main] org.apache.coyote.AbstractProtocol.init Initializing ProtocolHandler ["http-nio-8080"]
12-Jul-2017 19:10:45.103 INFO [main] org.apache.tomcat.util.net.NioSelectorPool.getSharedSelector Using a shared selector for servlet write/read
12-Jul-2017 19:10:45.103 INFO [main] org.apache.coyote.AbstractProtocol.init Initializing ProtocolHandler ["ajp-nio-8089"]
12-Jul-2017 19:10:45.106 INFO [main] org.apache.tomcat.util.net.NioSelectorPool.getSharedSelector Using a shared selector for servlet write/read
12-Jul-2017 19:10:45.107 INFO [main] org.apache.catalina.startup.Catalina.load Initialization processed in 521 ms
12-Jul-2017 19:10:45.127 INFO [main] org.apache.catalina.core.StandardService.startInternal Starting service Catalina
12-Jul-2017 19:10:45.127 INFO [main] org.apache.catalina.core.StandardEngine.startInternal Starting Servlet Engine: Apache Tomcat/8.0.35
12-Jul-2017 19:10:45.140 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployWAR Deploying web application archive /data/pdxdaaphome/apache-tomcat-8.0.35/webapps/daap.war
12-Jul-2017 19:10:48.306 INFO [localhost-startStop-1] org.apache.jasper.servlet.TldScanner.scanJars At least one JAR was scanned for TLDs yet contained no TLDs. Enable debug logging for this logger for a complete list of JARs that were scanned but no TLDs were found in them. Skipping unneeded JARs during scanning can improve startup time and JSP compilation time.
2017-07-12 19:10:48.893 INFO b.p.d.w.l.DaapListener localhost-startStop-1 >>> container initializing
2017-07-12 19:10:48.892 INFO b.p.d.w.l.DaapListener localhost-startStop-1 >>> init netty server ...
2017-07-12 19:10:49.061 INFO b.p.d.c.n.s.NettyServer localhost-startStop-1 >>> NettyServer start ok : 0.0.0.0 - 8089
2017-07-12 19:10:49.067 INFO b.p.d.w.l.DaapListener localhost-startStop-1 >>> init grpc server ...
2017-07-12 19:10:49.880 INFO b.p.d.w.l.DaapListener localhost-startStop-1 >>> init db fly ...
2017-07-12 19:10:49.850 INFO b.p.d.c.h.HikariDataSource localhost-startStop-1 >>> HikariPool-1 Started
12-Jul-2017 19:10:50.288 INFO [localhost-startStop-1] com.googlecode.flyway.core.util.logging.ApacheCommons.ApacheCommonLog.Info Current version of schema 'pdxdb': 2
12-Jul-2017 19:10:50.288 INFO [localhost-startStop-1] com.googlecode.flyway.core.util.logging.ApacheCommons.ApacheCommonLog.Info Schema 'pdxdb' is up to date. No migration necessary.
2017-07-12 19:10:50.291 INFO b.p.d.w.l.DaapListener localhost-startStop-1 >>> init mybatis ...
2017-07-12 19:10:51.013 INFO b.p.d.w.l.DaapListener localhost-startStop-1 >>> init container ...
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> contractId = daap://tender-pdx/biz.pdtech/prov, contract-url = http://localhost:8080/daap/contract
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> app count 1:endpoint number1
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> contractId = daap://tender-pdx/platform/register, contract-url = http://localhost:8080/daap/contract
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> app count 2:endpoint number1
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> contractId = daap://tender-pdx/platform/startup, contract-url = http://localhost:8080/daap/contract
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> app count 3:endpoint number1
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> contractId = daap://tender-pdx/biz.pdtech/plugin, contract-url = http://localhost:8080/daap/contract
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> app count 4:endpoint number1
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> contractId = daap://tender-pdx/pdx.dapp/ledger, contract-url = http://localhost:8080/daap/contract
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> app count 5:endpoint number1
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> contractId = daap://tender-pdx/platform/sync, contract-url = http://localhost:8080/daap/contract
2017-07-12 19:10:51.956 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> app count 6:endpoint number1
2017-07-12 19:10:51.957 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> contractId = daap://pdxdev/pdx.dapp/gas, contract-url = http://localhost:8080/gas/rest
2017-07-12 19:10:51.957 INFO b.p.d.c.c.Configuration localhost-startStop-1 >>> app count 7:endpoint number1
2017-07-12 19:10:52.017 INFO b.p.d.w.l.DaapListener localhost-startStop-1 >>> init timer
2017-07-12 19:10:52.022 INFO b.p.d.w.l.DaapListener localhost-startStop-1 >>> StateBackTask schedule ...
2017-07-12 19:10:52.023 INFO b.p.d.w.l.DaapListener localhost-startStop-1 >>> iResultFutureCleaner schedule ...
2017-07-12 19:10:52.024 INFO b.p.d.w.l.DaapListener localhost-startStop-1 >>> HeartBeatTask schedule ...
2017-07-12 19:10:52.025 INFO b.p.d.w.l.DaapListener localhost-startStop-1 >>> inti consumer thread ...
2017-07-12 19:10:52.028 INFO b.p.d.c.s.SyncQueueConsumer [Thread-1] >>> SyncQueueConsumer run ...
12-Jul-2017 19:10:53.017 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployWAR Deployment of web application archive /data/pdxdaaphome/apache-tomcat-8.0.35/webapps/daap.war has finished in 7.868 ms
12-Jul-2017 19:10:53.018 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployDirectory Deploying web application directory /data/pdxdaaphome/apache-tomcat-8.0.35/webapps/host-manager
12-Jul-2017 19:10:53.060 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory /data/pdxdaaphome/apache-tomcat-8.0.35/webapps/host-manager has finished in 42 ms
```

## c. 查看协议栈日志：

```
cd /data/pdxdaaphome/pdx_blockchain/javabc/logs
```

```
less state.log
```

## 协议栈日志截图：

```
2017-07-12 19:01:33.150 INFO [main] com.etherncomp.harmony.Application - Starting Application on Harrison-Latitude-3588 with PID 709 (/data/pdxdaaphome/pdx_blockchain/javabc/ethereum-harmony.jar started by root in /data/pdxdaaphome/pdx_blockchain/javabc)
2017-07-12 19:01:33.182 DEBUG [main] com.etherncomp.harmony.Application - Running with Spring Boot v1.4.1.RELEASE, Spring v4.3.3.RELEASE
2017-07-12 19:01:33.182 INFO [main] com.etherncomp.harmony.Application - No active profile set, falling back to default profiles: default
2017-07-12 19:01:44.571 INFO [localhost-startStop-1] general - Config (yes) : default properties from resource 'ethereum.conf'
2017-07-12 19:01:44.572 INFO [localhost-startStop-1] general - Config (no) : user properties from resource 'ethereum.conf'
2017-07-12 19:01:44.572 INFO [localhost-startStop-1] general - Config (yes) : user properties from resource 'user.conf'
2017-07-12 19:01:44.586 INFO [localhost-startStop-1] general - Config (no) : user properties from file /data/pdxdaaphome/pdx_blockchain/javabc/config/ethereum.conf'
2017-07-12 19:01:44.590 INFO [localhost-startStop-1] general - Config (no) : test properties from resource 'test-ethereum.conf'
2017-07-12 19:01:44.593 INFO [localhost-startStop-1] general - Config (no) : test properties from resource 'test-user.conf'
2017-07-12 19:01:44.598 INFO [localhost-startStop-1] general - Config (yes) : user properties from resource 'ethereum.conf' file 'user.conf'
2017-07-12 19:01:44.599 INFO [localhost-startStop-1] general - Config (no) : user properties from resource 'ethereum.conf' file 'null'
2017-07-12 19:01:44.599 INFO [localhost-startStop-1] general - Config (no) : config passed via constructor
2017-07-12 19:01:45.156 INFO [localhost-startStop-1] general - New nodeid generated: 69162f607791cb073104c798cac1f3bb4778572ad1824243efa3861620bf48c7374129f64f3e45461c27ab779b08586256ae5064bb15182956ec5277f9ed
2017-07-12 19:01:45.157 INFO [localhost-startStop-1] general - Generated nodeID and its private key stored in database-pdx/nodeId.properties
2017-07-12 19:01:45.164 INFO [localhost-startStop-1] general - data/pdxdaaphome/pdx_blockchain/javabc
2017-07-12 19:01:45.269 INFO [localhost-startStop-1] general - Running pdx.issh, core version: 1.0-SNAPSHOT
2017-07-12 19:01:45.272 INFO [localhost-startStop-1] general - git.hash: [e3a73c3]
2017-07-12 19:01:45.272 INFO [localhost-startStop-1] general - Build line: [071-05/a4c0d007e-4d009C=U+00007e/2017-[11:41]
2017-07-12 19:01:45.273 INFO [localhost-startStop-1] general - capability eth version: [62]
2017-07-12 19:01:45.275 INFO [localhost-startStop-1] general - capability ssh version: [3]
2017-07-12 19:01:45.275 INFO [localhost-startStop-1] general - capability bz version: [0]
2017-07-12 19:01:45.327 INFO [localhost-startStop-1] general - leveledb key-value data source created.
2017-07-12 19:01:45.364 INFO [localhost-startStop-1] general - leveledb key-value data source created.
2017-07-12 19:01:45.742 INFO [localhost-startStop-1] general - leveledb key-value data source created.
2017-07-12 19:01:45.745 INFO [localhost-startStop-1] general - leveledb key-value data source created.
2017-07-12 19:01:46.312 INFO [localhost-startStop-1] general - leveledb key-value data source created.
2017-07-12 19:01:47.189 INFO [Thread-5] sync - Sync Manager: ON
2017-07-12 19:01:47.258 INFO [localhost-startStop-1] general - EthereumJ node started: enode://6c94cd4274e430591a656e7f72a8e6ead18208bab2c83dc615646eebcfb08037550357ea267ec134523477ecffc9453ee256cac9abb526d601f594807814d810.1.32-44444
2017-07-12 19:01:47.315 DEBUG [localhost-startStop-1] jsonrpc - time: 60880, rate: 0
2017-07-12 19:01:47.337 INFO [localhost-startStop-1] general - DB is empty - adding Genesis
2017-07-12 19:01:47.694 INFO [localhost-startStop-1] general - Genesis block loaded
2017-07-12 19:01:47.696 INFO [Thread-5] sync - Initializing SyncManager.
2017-07-12 19:01:47.750 INFO [pool-2-thread-1] sync - Peer stats:
Active peers
=====
Other connected peers
=====
2017-07-12 19:01:47.750 INFO [pool-2-thread-1] sync -
2017-07-12 19:01:56.919 INFO [PeerServerThread] net - Listening for incoming connections, port: [44444]
2017-07-12 19:01:56.926 INFO [PeerServerThread] net - Nodeid: [6c94cd4274e430591a656e7f72a8e6ead18208bab2c83dc615646eebcfb08037550357ea267ec134523477ecffc9453ee256cac9abb526d601f594807814d]
2017-07-12 19:01:57.445 INFO [main] general - Ethereum listener added
2017-07-12 19:01:57.445 INFO [main] general - Ethereum listener added
2017-07-12 19:01:58.428 INFO [main] general - Ethereum listener added
2017-07-12 19:01:59.599 INFO [main] general - Ethereum listener added
```

## 2.9 停止 BaaP 平台

```
cd /data/pdxdaaphome
```

```
./baap_stop.py
```

执行命令截图：

```

root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ll
total 48
drwxr-xr-x 13 root root 4096 7月 19 12:05 ./
drwxr-xr-x 13 root root 4096 7月 19 12:01 ../
drwxr-xr-x 17 1000 1000 4096 7月 19 12:05 apache-tomcat-8.0.35/
-rwxr-xr-x 1 root root 4505 7月 19 11:37 baap_init.py*
-rwxr-xr-x 1 root root 1521 7月 19 11:37 baap_startup.py*
-rwxr-xr-x 1 root root 929 7月 19 11:37 baap_stop.py*
drwxr-xr-x 2 root root 4096 7月 19 12:03 conf/
drwxr-xr-x 2 root root 4096 7月 19 12:05 file/
drwxr-xr-x 8 uucp 143 4096 10月 7 2015 jdk1.8.0_65/
drwxr-xr-x 4 root root 4096 7月 19 12:03 pdx_blockchain/
drwxr-xr-x 2 root root 4096 7月 19 11:42 webdocker/
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ./baap_stop.py
停止区块链
停止容器
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ps -ef | grep java | grep -v grep
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome# ps -ef | grep java | grep -v grep | wc -l
0
root@Harrison-Latitude-3580:/data/pdxdaaphome#
root@Harrison-Latitude-3580:/data/pdxdaaphome#

```

## 3. 常见问题

### 3.1 Docker 中的 MySQL 共享文件权限问题

问题描述：

如果宿主机上安装了 MySQL，Apparmor 可能会限制访问您的 Docker 容器上安装的 MySQL 的此共享库，比如 mysql error while loading shared libraries: libaio.so.1

解决方案：

在宿主机上执行以下两条命令：

```

sudo ln -s /etc/apparmor.d/usr.sbin.mysqld
/etc/apparmor.d/disable/

```

```
sudo apparmor_parser -R /etc/apparmor.d/usr.sbin.mysql
```

## 3.2 查看 Container 日志时发现端口被占用问题

问题描述:

日志中有 `java.net.BindException: Address already in use` 异常  
如下图:

```
12-Jul-2017 19:01:31.881 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
12-Jul-2017 19:01:31.881 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djdk.tls.specrealDHKeySize=2048
12-Jul-2017 19:01:31.882 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.endorsed.dirs=/data/pdxdaaphome/apache-tomcat-8.0.35/endorsed
12-Jul-2017 19:01:31.882 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Dcatalina.base=/data/pdxdaaphome/apache-tomcat-8.0.35
12-Jul-2017 19:01:31.882 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Dcatalina.home=/data/pdxdaaphome/apache-tomcat-8.0.35
12-Jul-2017 19:01:31.882 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.io.tmpdir=/data/pdxdaaphome/apache-tomcat-8.0.35/temp
12-Jul-2017 19:01:32.958 SEVERE [main] org.apache.coyote.AbstractProtocol.init Initializing ProtocolHandler ["http-nio-8080"]
12-Jul-2017 19:01:32.958 SEVERE [main] org.apache.coyote.AbstractProtocol.init Failed to initialize end point associated with ProtocolHandler ["http-nio-8080"]
java.net.BindException: Address already in use
    at sun.nio.ch.Net.bind0(Native Method)
    at sun.nio.ch.Net.bind(Net.java:433)
    at sun.nio.ch.Net.bind(Net.java:425)
    at sun.nio.ch.ServerSocketChannelImpl.bind(ServerSocketChannelImpl.java:223)
    at sun.nio.ch.ServerSocketAdaptor.bind(ServerSocketAdaptor.java:74)
    at org.apache.tomcat.util.net.NioEndpoint.bind(NioEndpoint.java:351)
    at org.apache.tomcat.util.net.AbstractEndpoint.init(AbstractEndpoint.java:748)
    at org.apache.coyote.AbstractProtocol.init(AbstractProtocol.java:459)
    at org.apache.coyote.http11.AbstractHttp11Protocol.init(AbstractHttp11Protocol.java:120)
    at org.apache.catalina.connector.Connector.initInternal(Connector.java:966)
    at org.apache.catalina.util.LifecycleBase.init(LifecycleBase.java:102)
    at org.apache.catalina.core.StandardService.initInternal(StandardService.java:568)
    at org.apache.catalina.util.LifecycleBase.init(LifecycleBase.java:102)
    at org.apache.catalina.startup.Catalina.load(Catalina.java:580)
    at org.apache.catalina.startup.Catalina.load(Catalina.java:603)
    at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62)
    at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
    at java.lang.reflect.Method.invoke(Method.java:497)
    at org.apache.catalina.startup.Bootstrap.load(Bootstrap.java:310)
    at org.apache.catalina.startup.Bootstrap.main(Bootstrap.java:484)
```

解决方案:

检查宿主机的端口 8080 启动情况, 如果启动请关掉宿主主机上的 8080 端口

## 4. 操作命令

查看镜像:

```
sudo docker images
```

删除镜像:

```
sudo docker rmi 镜像 Id
```

创建并启动容器:

```
sudo docker run --privileged --net=host -p 8080:8080 -p
8545:8545 -p 44444:44444 -p 8989:8989 -d -t pdx/baap:v0.1
```

进入 Docker 容器

```
docker exec -it dockername /bin/bash
```

导入 Docker 镜像

```
docker load -i my_ubuntu_v3.tar
```

停止 Docker 容器

```
sudo docker stop 1d4f08012119
```

删除 Docker 容器

```
sudo docker rm 1d4f08012119
```

查看 Docker 容器

```
sudo docker ps -a
```

查看 Docker 启动状态

```
sudo service docker status
```

启动 docker

```
sudo service docker start
```

停止 docker

```
sudo service docker stop
```