



北京全息智信科技有限公司

PDX BaaP 平台

节点部署手册

2017 年 11 月

目 录

1 修订记录	3
2 运行环境	3
3 使用说明	3
3.1 安装 Docker.....	3
3.2 下载镜像文件	4
3.3 载入镜像文件	4
3.4 查看载入的镜像.....	5
3.5 创建并启动容器.....	5
3.6 查看运行的容器.....	6
3.7 进入容器.....	6
3.8 运行 BaaP 平台.....	7
3.9 停止 BaaP 平台.....	12
4 常见问题	13
4.1 Docker 中的 MySQL 共享文件权限问题	13
4.2 查看 Container 日志时发现端口被占用问题	14
5 操作命令	14

1 修订记录

编号	修改日期	修改内容
1	2017 年 7 月 12 日	初版
2	2017 年 7 月 13 日	补充常见问题和常用操作命令
3	2017 年 11 月 20 日	优化 Docker 安装方式

2 运行环境

操作系统：ubuntu16.04

3 使用说明

3.1 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、执行安装 docker 命令
sudo apt-get install -y docker.io
- 3、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)

```

3.2 下载镜像文件

1、浏览器访问

<https://trust.pdx.life/service/Download.jsp?file=pdx-baap-v2.0.tar.gz>

2、下载后解压 pdx-baap-v2.0.tar.gz

`tar -zxvf pdx-baap-v2.0.tar.gz`

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。

3.3 载入镜像文件

命令：`sudo docker load -i pdx-baap-v2.0.tar`

执行命令截图：

```

ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$ sudo docker load -i pdx-baap-v2.0.tar
[sudo] password for ubuntu:
f4da48dfcefb: Loading layer [=====>] 4.096kB/4.096kB
eca5b43727fb: Loading layer [=====>] 478.8MB/478.8MB
65d7621142ed: Loading layer [=====>] 8.683MB/8.683MB
983538bf0b75: Loading layer [=====>] 366.2MB/366.2MB
d0f458d8e1cc: Loading layer [=====>] 506.6MB/506.6MB
b66fd76a3527: Loading layer [=====>] 31.6MB/31.6MB
c2f8de0a1bdd: Loading layer [=====>] 1.114MB/1.114MB
979bec1e7595: Loading layer [=====>] 3.072kB/3.072kB
220f25498a57: Loading layer [=====>] 3.584kB/3.584kB
7ca5123dadda: Loading layer [=====>] 128MB/128MB
162d94686b1b: Loading layer [=====>] 5.12kB/5.12kB
3d25c9fcd1b4: Loading layer [=====>] 84.79MB/84.79MB
99d4438c055a: Loading layer [=====>] 8.192kB/8.192kB
fcca4c28600: Loading layer [=====>] 4.608kB/4.608kB
8935592cb95e: Loading layer [=====>] 4.096kB/4.096kB
f0a2ff61b42d: Loading layer [=====>] 141.2MB/141.2MB
Loaded image: pdx/baap:v2.0
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$

```

3.4 查看载入的镜像

命令：sudo docker images

执行命令截图：

```

ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$ sudo docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
pdx/baap             v2.0               f2931b7f73d1       About an hour ago   1.85GB
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$

```

3.5 创建并启动容器

命令：sudo docker run --privileged --net=host -p 8080:8080 -p 8545:8545 -p 30304:30304 -p 8989:8989 -d -t pdx/baap:v2.0

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、30304 端口

执行命令截图：

```
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$ sudo docker run --privileged --net=host -p 8080:8080 -p 8545:8545 -p 30304:30304 -p 8989:8989 -d -t pdx/baap:v2.0
2542ec8dda2eb25e0fb715ba6c69611aec1d63c37594d24ad85593c60614fe6e
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
```

3.6 查看运行的容器

命令：sudo docker ps -a

执行命令截图：

```
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$ sudo docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS              NAMES
2542ec8dda2e        pdx/baap:v2.0      "/bin/sh -c superv..."   About a minute ago   Up About a minute   8080-8989          dazzling_pike
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
```

3.7 进入容器

命令：sudo docker exec -it 2542ec8dda2e /bin/bash

注意：命令中的 2542ec8dda2e 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：

```
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$ sudo docker exec -it 2542ec8dda2e /bin/bash
root@i-ir8oh0kc:/#
root@i-ir8oh0kc:/#
root@i-ir8oh0kc:/#
```

3.8 运行 BaaP 平台

1、给 python 脚本赋执行权限

```
cd /data/pdx/baap/
```

```
chmod +x *.py
```

执行命令截图：

```
root@i-ir8oh0kc:/#
root@i-ir8oh0kc:/# cd /data/pdx/baap/
root@i-ir8oh0kc:/data/pdx/baap# ll
total 44
drwxr-xr-x  9 root root 4096 10月 25 09:58 ./
drwxr-xr-x 12 root root 4096 10月 25 09:58 ../
drwxr-xr-x 11 1000 1000 4096 10月 25 09:57 apache-tomcat-8.0.39/
-rw-r--r--  1 root root 4980 10月 25 08:16 baap_init.py
-rw-r--r--  1 root root 1515 10月 25 08:12 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 10月 25 09:57 conf/
drwxr-xr-x  8 uucp  143 4096 10月  7 2015 jdk1.8.0_65/
drwxr-xr-x  3 root root 4096 10月 25 09:57 pdx_blockchain/
drwxr-xr-x  2 root root 4096 10月 25 09:58 webdocker/
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap# chmod +x *.py
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap# ll
total 44
drwxr-xr-x  9 root root 4096 10月 25 10:56 ./
drwxr-xr-x 13 root root 4096 10月 25 10:56 ../
drwxr-xr-x 11 1000 1000 4096 10月 25 09:57 apache-tomcat-8.0.39/
-rwxr-xr-x  1 root root 4980 10月 25 08:16 baap_init.py*
-rwxr-xr-x  1 root root 1515 10月 25 08:12 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 10月 25 09:57 conf/
drwxr-xr-x  8 uucp  143 4096 10月  7 2015 jdk1.8.0_65/
drwxr-xr-x  3 root root 4096 10月 25 09:57 pdx_blockchain/
drwxr-xr-x  2 root root 4096 10月 25 09:58 webdocker/
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap#
```

2、配置初始化

```
cd /data/pdx/baap/
```

```
/baap_init.py
```

注意：

- 1) 输入本节点 IP 时确保和宿主机 IP 一致
- 2) 种子节点 IP 为非必填，如果配置的当前节点为种子节点，值为空，如果配置的当前节点为子节点，则需要填写种子节点的 IP

执行命令截图：

```
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap# ll
total 44
drwxr-xr-x  9 root root 4096 10月 26 07:17 ./
drwxr-xr-x 13 root root 4096 10月 26 07:17 ../
drwxr-xr-x 11 1000 1000 4096 10月 26 06:50 apache-tomcat-8.0.39/
-rwxr-xr-x  1 root root 4991 10月 26 05:59 baap_init.py*
-rwxr-xr-x  1 root root 1515 10月 25 08:12 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 10月 26 06:50 conf/
drwxr-xr-x  8 uucp 143 4096 10月  7 2015 jdk1.8.0_65/
drwxr-xr-x  3 root root 4096 10月 26 06:50 pdx_blockchain/
drwxr-xr-x  2 root root 4096 10月 26 06:50 webdocker/
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap# ./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
8adedada11c1: Loading layer [=====>] 2.048kB/2.048kB
Loaded image: pdx_web_docker:1.0

baap初始化须知：
  1 本节点 IP 必须配置；此 IP 将用于 baap 互联需要；
  2 种子节点 IP 非必配置；此 IP 将用于后续节点连入 baap 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:192.168.0.9
[非必填]请输入种子节点 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@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap#
```


3、启动 BaaP 平台

```
cd /data/pdx/baap/
```

如果是种子节点执行命令：

```
./baap_startup.py -m
```

如果是子节点执行命令：

```
./baap_startup.py
```

执行命令截图：

```

root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap# ll
total 44
drwxr-xr-x 11 root root 4096 10月 25 10:58 ./
drwxr-xr-x 13 root root 4096 10月 25 10:56 ../
drwxr-xr-x 11 1000 1000 4096 10月 25 09:57 apache-tomcat-8.0.39/
-rwxr-xr-x 1 root root 4980 10月 25 08:16 baap_init.py*
-rwxr-xr-x 1 root root 1515 10月 25 08:12 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 10月 25 10:58 conf/
drwxr-xr-x 8 ucp 143 4096 10月 7 2015 jdk1.8.0_65/
drwxr-xr-x 4 root root 4096 10月 25 10:58 pdx_blockchain/
drwxr-xr-x 2 root root 4096 10月 25 09:58 webdocker/
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap# ./baap_startup.py -m
Tomcat started.
tomcat status :000
tomcat status :000
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
{"jsonrpc":"2.0","id":1,"result":true}
root@i-ir8oh0kc:/data/pdx/baap#

```

4、检查是否启动正常

1) 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@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap# ps -ef | grep java | grep -v grep
root      605      0 13 11:00 ?        00:00:45 /data/pdx/baap/jdk1.8.0.65/bin/java -Djava.util.logging.config.file=/data/pdx/baap/ap
ache-tomcat-8.0.39/conf/logging.properties -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Djdk.tls.ephemeralDHKey
Size=2048 -Djava.protocol.handler.pkgs=org.apache.catalina.webresources -Djava.endorsed.dirs=/data/pdx/baap/apache-tomcat-8.0.39/endo
rsed -classpath /data/pdx/baap/apache-tomcat-8.0.39/bin/bootstrap.jar:/data/pdx/baap/apache-tomcat-8.0.39/bin/tomcat-juli.jar -Dcatal
ina.base=/data/pdx/baap/apache-tomcat-8.0.39 -Dcatalina.home=/data/pdx/baap/apache-tomcat-8.0.39 -Djava.io.tmpdir=/data/pdx/baap/apac
he-tomcat-8.0.39/temp org.apache.catalina.startup.Bootstrap start
root      696      0 99 11:00 ?        00:05:18 java -Xss32m -Xms2824M -Xmx2824M -XX:+UseCompressedOops -XX:+HeapDumpOnOutOfMemoryErr
or -XX:-OmitStackTraceInFastThrow -Dethereumj.conf.file=user.conf -jar ethereum-harmony.jar
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap# ps -ef | grep java | grep -v grep | wc -l
2
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap#
```

2) 查看 Container 日志：

cd /data/pdx/baap/apache-tomcat-8.0.39/logs

tail -100f catalina.out

Container 日志截图：

```
165
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.base=/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 19:10:45.106 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 19:10:48.386 INFO [localhost-startStop-1] org.apache.jasper.servlet.TldScanner.scanAll At least one JAR was scanned for TLDs yet contained no TLDs. Enable debug logging for this logger for a c
omplete list of JARs that were scanned but no TLDs were found in them. Skipping unnecessary JARs during scanning can improve startup time and JSP compilation time.
2017-07-12 19:10:48.985 INFO [b.p.d.w.l.DaapListener [localhost-startStop-1]] >>> container initializing
2017-07-12 19:10:48.992 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 - 8989
2017-07-12 19:10:49.067 INFO [b.p.d.w.l.DaapListener [localhost-startStop-1]] >>> init grpc server ...
2017-07-12 19:10:49.808 INFO [b.p.d.w.l.DaapListener [localhost-startStop-1]] >>> init db fly ...
2017-07-12 19:10:49.858 INFO [c.z.h.HikariDataSource [localhost-startStop-1]] >>> HikariPool-1 - Started.
12-Jul-2017 19:10:50.282 INFO [localhost-startStop-1] com.googlecode.flyway.core.util.LoggingApacheCommonsLog.info Current version of schema 'pdxdb': 2
12-Jul-2017 19:10:50.286 INFO [localhost-startStop-1] com.googlecode.flyway.core.util.LoggingApacheCommonsLog.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.pdxtch/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.pdxtch/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://pdxdev/pdx.dapp/gas, 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 19:10:52.017 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]] >>> TxResultFutureCleaner 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 fini
shed in 7.866 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-manage
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-manage
r has finished in 42 ms
```

3) 查看协议栈日志：

cd /data/pdx/baap/pdx_blockchain/javabc/logs

less state.log

协议栈日志截图：

```
2017-07-12 19:01:32,150 INFO [main] com.ethercamp.harmony.Application - Starting Application on Harrison-Latitude-3580 with PID 769 (/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.ethercamp.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.ethercamp.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 'ethereumj.conf'
2017-07-12 19:01:44,572 INFO [localhost-startStop-1] general - Config (no): user properties from resource 'test-ethereumj.conf'
2017-07-12 19:01:44,586 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/ethereumj.conf'
2017-07-12 19:01:44,598 INFO [localhost-startStop-1] general - Config (no): test properties from resource 'test-ethereumj.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 'user.conf'
2017-07-12 19:01:44,599 INFO [localhost-startStop-1] general - Config (no): user properties from resource 'test-ethereumj.conf'
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: 691f62fd87791cb0751d4c798cac12f3bb4778572ad1824243efa38d162a0ef48c7374129f64f3e54561c27ab779bd8586256ea5b04bb15182956ec122774ed
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 19:01:45,194 INFO [localhost-startStop-1] general - /data/pdxdaaphome/pdx_blockchain/javabc
2017-07-12 19:01:45,269 INFO [localhost-startStop-1] general - Running pdx.json, 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.time: [GMT-05:00-2017-07-12T19:01:45.272-04:00]
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 shh version: [3]
2017-07-12 19:01:45,275 INFO [localhost-startStop-1] general - capability bzz version: [0]
2017-07-12 19:01:45,327 INFO [localhost-startStop-1] general - leveldb key-value data source created.
2017-07-12 19:01:45,364 INFO [localhost-startStop-1] general - leveldb key-value data source created.
2017-07-12 19:01:45,742 INFO [localhost-startStop-1] general - leveldb key-value data source created.
2017-07-12 19:01:45,745 INFO [localhost-startStop-1] general - leveldb key-value data source created.
2017-07-12 19:01:46,312 INFO [localhost-startStop-1] general - leveldb key-value data source created.
2017-07-12 19:01:47,189 INFO [Thread-5] sync - Sync Manager: ON
2017-07-12 19:01:47,256 INFO [localhost-startStop-1] general - Ethereum node started: enode://6c94cd4247e4e30591a656e7ff2a8e6ead18208bab2c83dc615646eebcfb08037550357ea267ec134523477e6cfff9453ee2e56cac9abb5260601f5f94807814d010.1.1.32:44444
2017-07-12 19:01:47,315 DEBUG [localhost-startStop-1] jsonrpc - time: 60000, 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: [6c94cd4247e4e30591a656e7ff2a8e6ead18208bab2c83dc615646eebcfb08037550357ea267ec134523477e6cfff9453ee2e56cac9abb5260601f5f94807814d]
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
```

3.9 停止 BaaP 平台

cd /data/pdx/baap

./baap_stop.py

执行命令截图：

```

root@i-ir8oh0kc:/data/pdx/baap# ll
total 44
drwxr-xr-x 12 root root 4096 10月 25 11:00 ./
drwxr-xr-x 13 root root 4096 10月 25 10:56 ../
drwxr-xr-x 16 1000 1000 4096 10月 25 11:00 apache-tomcat-8.0.39/
-rwxr-xr-x 1 root root 4980 10月 25 08:16 baap_init.py*
-rwxr-xr-x 1 root root 1515 10月 25 08:12 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 10月 25 10:58 conf/
drwxr-xr-x 8 uucp 143 4096 10月 7 2015 jdk1.8.0_65/
drwxr-xr-x 4 root root 4096 10月 25 10:58 pdx_blockchain/
drwxr-xr-x 2 root root 4096 10月 25 09:58 webdocker/
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap# ./baap_stop.py
停止区块链
停止容器
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap# ps -ef | grep java | grep -v grep
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap# ps -ef | grep java | grep -v grep | wc -l
0
root@i-ir8oh0kc:/data/pdx/baap#
root@i-ir8oh0kc:/data/pdx/baap#

```

4 常见问题

4.1 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.mysqlld /etc/apparmor.d/disable/
```

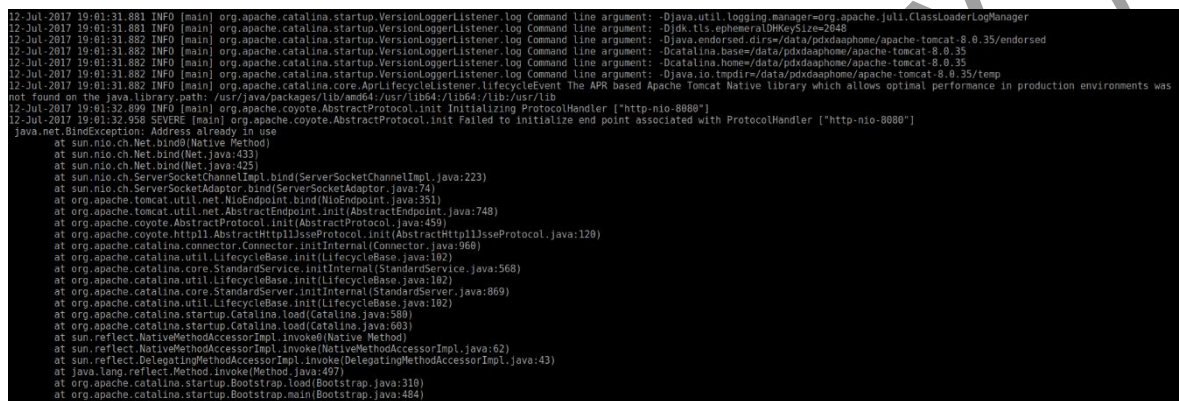
```
sudo apparmor_parser -R /etc/apparmor.d/usr.sbin.mysql
```

4.2 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.ephemeralDHKeySize=2688
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 19:01:31.882 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 19:01:32.899 INFO [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 endpoint 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.AbstractHttp11BaseProtocol.init(AbstractHttp11BaseProtocol.java:120)
    at org.apache.catalina.connector.Connector.initInternal(Connector.java:968)
    at org.apache.catalina.util.LifecycleBase.init(LifecycleBase.java:182)
    at org.apache.catalina.core.StandardService.initInternal(StandardService.java:568)
    at org.apache.catalina.core.StandardServer.initInternal(StandardServer.java:869)
    at org.apache.catalina.util.LifecycleBase.init(LifecycleBase.java:182)
    at org.apache.catalina.startup.Catalina.load(Catalina.java:589)
    at org.apache.catalina.startup.Catalina.load(Catalina.java:583)
    at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
    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:318)
    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

5 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  
18888:18888 -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
```

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