



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

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1 修订记录

编号	修改日期	修改内容	版本号
1	2017 年 7 月 12 日	初版	0.1
2	2017 年 7 月 13 日	补充常见问题和常用操作命令	0.2
3	2017 年 10 月 23 日	Daap 改为 Baap	0.3
4	2017 年 10 月 26 日	修改	1.0
5	2017 年 11 月 1 日	修订格式	1.1
6	2017 年 11 月 2 日	修订格式	1.2

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、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

```
sudo 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
```

注意 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

5、在 docker.list 中按照系统版本增加 entry(Ubuntu Xenial 16.04 (LTS))

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

6、sudo apt-get update

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 95681841c076f73ed422c0b39f9dcfc436786bbf3f3e61a75c4738

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：

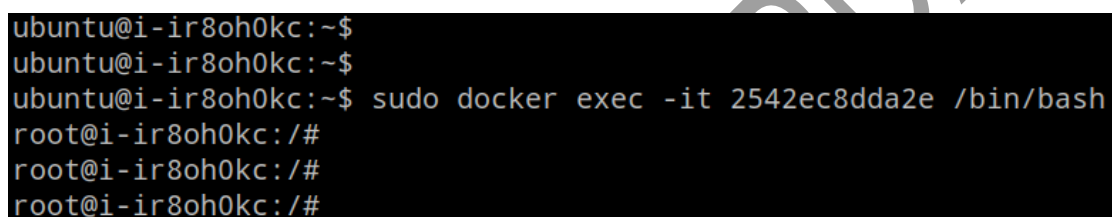
```
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$ sudo docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS              NAMES
2542ec8dda2e       pdx/baap:v2.0      "/bin/sh -c superv...  About a minute ago  Up About a minute  8080-8080,8545-8545,30304-30304,8989-8989  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 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_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：

```
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 19:10:44.938 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 19:10:45.183 INFO [main] org.apache.coyote.AbstractProtocol.init Initializing ProtocolHandler ["ajp-nio-8089"]
12-Jul-2017 19:10:45.186 INFO [main] org.apache.tomcat.util.net.NioSelectorPool.getSharedSelector Using a shared selector for servlet write/read
12-Jul-2017 19:10:45.187 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 scanAllTlds 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 19:10:48.985 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 19:10:49.661 INFO b.p.d.c.n.s.NettyServer [localhost-startStop-1] >>> NettyServer start ok : 0.0.0.0 - 8089
2017-07-12 19:10:49.667 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 19:10:49.850 INFO c.z.h.HikariDataSource [localhost-startStop-1] >>> HikariPool-1 - Started.
12-Jul-2017 19:10:50.283 INFO [localhost-startStop-1] com.googlecode.flyway.core.util.logging.ApacheCommonsLog.info Current version of schema 'pdxdb': 2
12-Jul-2017 19:10:50.286 INFO [localhost-startStop-1] com.googlecode.flyway.core.util.logging.ApacheCommonsLog.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 19:10:51.011 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.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] >>> TaskRunFutureCleaner 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 19:10:53.018 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
```

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 19:01:33.150 INFO [main] com.ethercamp.harmony.Application - Starting Application on Harrison-Latitude-3586 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 -Dethereumj.conf.res resource 'null'
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 -Dethereumj.conf.file file 'user.conf'
2017-07-12 19:01:44.599 INFO [localhost-startStop-1] general Config (no) : user properties from -Dethereumj.nodeconf file 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: 691f62f087791cb07514c798cec12f3b04778572ad1824243efa38d162a8ef48c7374129f64f3e5451c27ab77908586256e3b04bb15182956ec3227f4ed
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 19:01:45.209 INFO [localhost-startStop-1] general Running pdx.json, core version: 1.0 SNAPSHOOT
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-05:00-2017-07-12 19:01:45.272]
2017-07-12 19:01:45.273 INFO [localhost-startStop-1] general capability eth version: [0]
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 bzz version: [0]
2017-07-12 19:01:45.327 INFO [localhost-startStop-1] general leveldb key-value data source created.
2017-07-12 19:01:45.344 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 19:01:46.212 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 - Ethereumj node started: enode://6c94cd4247e4e38591a656e77ff2a8e6ead18208abb2c83dc61564eeebcfb08037550357ea267ec134523477e6cfff9453ee2e56cac9abb2c60601f5948078140d/1.1.32-4444
2017-07-12 19:01:47.315 DEBUG [localhost-startStop-1] jsongrpc - 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: [4444]
2017-07-12 19:01:56.926 INFO [PeerServerThread] net - ModelId: [6c94cd4247e4e38591a656e77ff2a8e6ead18208abb2c83dc61564eeebcfb08037550357ea267ec134523477e6cfff9453ee2e56cac9abb2c60601f594807814d]
2017-07-12 19:01:57.445 INFO [main] general - Ethereumj 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 19:01:59.399 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/
```

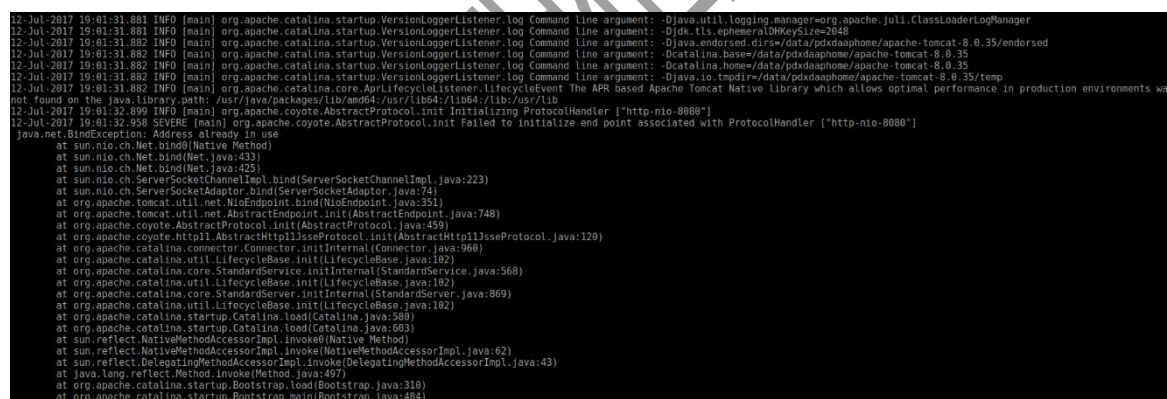
```
sudo apparmor_parser -R /etc/apparmor.d/usr.sbin.mysqlld
```

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=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 19:01:31.882 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:/lib:/lib64:/usr/lib
12-Jul-2017 19:01:32.958 SEVERE [main] org.apache.coyote.AbstractProtocol.init Initializing 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: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.util.LifecycleBase.init(LifecycleBase.java:182)
    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:603)
    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: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
```