

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: ubuntu16.04

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

```
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 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 下载镜像文件

1、请从 PDX 官网下载 docker 镜像文件 pdx-baap-v2.0.tar.gz。具体下载地址见官网产品频道，登录后下载 BaaP Docker 镜像。

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

2.3 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
fccca4c28600: 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:~$
```

2.4 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:~$
```

2.5 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:~$
```

2.6 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   0.0.0.0:8080->8080   dazzling_pike
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
ubuntu@i-ir8oh0kc:~$
```

2.7 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:/#
```

2.8 运行 BaaP 平台

1、给 python 脚本赋执行权限

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

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

```

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#

```

执行命令截图：

2、配置初始化

```

cd /data/pdx/baap/
./baap_init.py

```

注意：

- 输入本节点 IP 时确保和宿主机 IP 一致
- 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

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@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#

```

b. 查看 Container 日志:

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

```
tail -100f catalina.out
```

Container 日志截图:

```
2017-07-12 19:18:44.837 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command Line Argument: -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
2017-07-12 19:18:44.937 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command Line Argument: -Dio.threads=2048
2017-07-12 19:18:44.937 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command Line Argument: -Djava.endorsed.dirs=/data/pdxdaaphome/apache-tomcat-8.0.35/endorsed
2017-07-12 19:18:44.938 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command Line Argument: -Dcatalina.base=/data/pdxdaaphome/apache-tomcat-8.0.35
2017-07-12 19:18:44.938 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command Line Argument: -Dcatalina.home=/data/pdxdaaphome/apache-tomcat-8.0.35
2017-07-12 19:18:44.938 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command Line Argument: -Djava.io.tmpdir=/data/pdxdaaphome/apache-tomcat-8.0.35/temp
2017-07-12 19:18:44.938 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/lib64/libapr1.so.0:/usr/lib64/libapr2.so.0:/usr/lib
2017-07-12 19:18:45.090 INFO [main] org.apache.coyote.AbstractProtocol.init Initializing ProtocolHandler ["http-nio-8080"]
2017-07-12 19:18:45.103 INFO [main] org.apache.tomcat.util.net.NioSelectorPool.getSharedSelector Using a shared selector for servlet write/read
2017-07-12 19:18:45.105 INFO [main] org.apache.coyote.AbstractProtocol.init Initializing ProtocolHandler ["ajp-nio-8089"]
2017-07-12 19:18:45.106 INFO [main] org.apache.tomcat.util.net.NioSelectorPool.getSharedSelector Using a shared selector for servlet write/read
2017-07-12 19:18:45.107 INFO [main] org.apache.catalina.startup.Catalina.load Initialization processed in 521 ms
2017-07-12 19:18:45.127 INFO [main] org.apache.catalina.core.StandardService.startInternal Starting service Catalina
2017-07-12 19:18:45.127 INFO [main] org.apache.catalina.core.StandardEngine.startInternal Starting Servlet Engine: Apache Tomcat/8.0.35
2017-07-12 19:18:45.149 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployWAR Deploying web application archive /data/pdxdaaphome/apache-tomcat-8.0.35/webapps/daap.war
2017-07-12 19:18:46.306 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 19:18:46.905 INFO [b.p.d.w.l.DaaPListener [localhost-startStop-1]] >>> container initializing
2017-07-12 19:18:46.961 INFO [b.p.d.c.n.s.NettyServer [localhost-startStop-1]] >>> NettyServer start ok : 0.0.0.0 - 8089
2017-07-12 19:18:46.967 INFO [b.p.d.w.l.DaaPListener [localhost-startStop-1]] >>> init grpc server ...
2017-07-12 19:18:46.986 INFO [b.p.d.w.l.DaaPListener [localhost-startStop-1]] >>> init db fly ...
2017-07-12 19:18:46.850 INFO [c.z.h.HikariDataSource [localhost-startStop-1]] >>> HikariPool-1 - Started.
2017-07-12 19:18:50.283 INFO [localhost-startStop-1] com.google.code.flyway.core.util.logging.apachecommons.ApacheCommonsLog.info Current version of schema 'pdxdb': 2
2017-07-12 19:18:50.286 INFO [localhost-startStop-1] com.google.code.flyway.core.util.logging.apachecommons.ApacheCommonsLog.info Schema 'pdxdb' is up to date. No migration necessary.
2017-07-12 19:18:50.291 INFO [b.p.d.w.l.DaaPListener [localhost-startStop-1]] >>> init mybatis ...
2017-07-12 19:18:51.813 INFO [b.p.d.w.l.DaaPListener [localhost-startStop-1]] >>> init container ...
2017-07-12 19:18:51.956 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 19:18:51.956 INFO [b.p.d.c.c.Configuration [localhost-startStop-1]] >>> app count 1:endpoint number1
2017-07-12 19:18:51.956 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 19:18:51.956 INFO [b.p.d.c.c.Configuration [localhost-startStop-1]] >>> app count 2:endpoint number1
2017-07-12 19:18:51.956 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 19:18:51.956 INFO [b.p.d.c.c.Configuration [localhost-startStop-1]] >>> app count 3:endpoint number1
2017-07-12 19:18:51.956 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 19:18:51.956 INFO [b.p.d.c.c.Configuration [localhost-startStop-1]] >>> app count 4:endpoint number1
2017-07-12 19:18:51.956 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 19:18:51.956 INFO [b.p.d.c.c.Configuration [localhost-startStop-1]] >>> app count 5:endpoint number1
2017-07-12 19:18:51.957 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 19:18:51.957 INFO [b.p.d.c.c.Configuration [localhost-startStop-1]] >>> app count 6:endpoint number1
2017-07-12 19:18:51.957 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 19:18:51.957 INFO [b.p.d.c.c.Configuration [localhost-startStop-1]] >>> app count 7:endpoint number1
2017-07-12 19:18:52.017 INFO [b.p.d.w.l.DaaPListener [localhost-startStop-1]] >>> init timer ...
2017-07-12 19:18:52.022 INFO [b.p.d.w.l.DaaPListener [localhost-startStop-1]] >>> StateBackTask schedule ...
2017-07-12 19:18:52.023 INFO [b.p.d.w.l.DaaPListener [localhost-startStop-1]] >>> TxResultFutureCleaner schedule ...
2017-07-12 19:18:52.024 INFO [b.p.d.w.l.DaaPListener [localhost-startStop-1]] >>> HeartBeatTask schedule ...
2017-07-12 19:18:52.025 INFO [b.p.d.w.l.DaaPListener [localhost-startStop-1]] >>> inti consumer thread ...
2017-07-12 19:18:52.028 INFO [b.p.d.c.s.SyncQueueConsumer [Thread-1]] >>> SyncQueueConsumer run ...
2017-07-12 19:18:53.017 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
2017-07-12 19:18:53.018 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployDirectory Deploying web application directory /data/pdxdaaphome/apache-tomcat-8.0.35/webapps/host-manager
2017-07-12 19:18:53.060 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/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-3589 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.ethercamp.harmony.Application - Running with Spring Boot v1.4.1.RELEASE, Spring w4.3.3.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 19:01:44.590 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.conf.file file 'null'
2017-07-12 19:01:45.150 INFO [localhost-startStop-1] general - Config ( no ): config passed via constructor
2017-07-12 19:01:45.150 INFO [localhost-startStop-1] general - New nodeID generated: 691f62f60791cb075164c798cac12f3bb4778572ad1824243efa38d162a0ef48c7374129f64f3e54561c27ab779bd8586256ea5b04bb15182956ec
32277Feed
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-05:00:00-2017-11-11:41}
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 shh version: {3}
2017-07-12 19:01:45.275 INFO [localhost-startStop-1] general - capability bzr version: {8}
2017-07-12 19:01:45.327 INFO [localhost-startStop-1] general - leveldb key-value data source created.
2017-07-12 19:01:45.564 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 - EthereumJ node started: enode://6c94cd4247e4e30591a656e7ff2a8efead18208bab2c83dc615646eebcfb08037550357ea267ec134523477e6cff9453ee2e56cac9abb
5266d0f5f94887814d610.1.1.32:4444
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
0
Other connected peers
0
2017-07-12 19:01:47.750 INFO [pool-2-thread-1] sync -
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#

```

2.9 停止 BaaP 平台

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

```
./baap_stop.py
```

执行命令截图：

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.mysql
/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.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 19:01:32.958 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.bind(Native Method)
    at sun.nio.ch.Net.bind(Net.java:435)
    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:588)
    at org.apache.catalina.startup.Catalina.load(Catalina.java:593)
    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 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
```