> 生于忧患，死于安乐

Flink集群部署

Standlone模式

（1）修改 flink/conf/flink-conf.yaml 文件

```
# JobManager runs.

jobmanager.rpc.address: hadoop102

# The RPC port where the JobManager is reachable.
```

（2）修改 /conf/slaves文件

```
hadoop103
hadoop104
```

> 听说以后master/slaves都不能用了，你懂我的意思吧

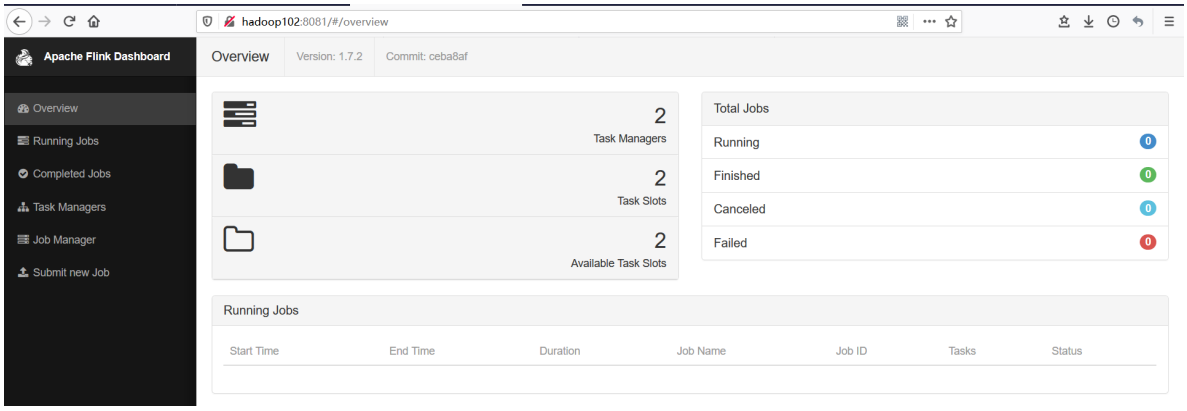
（3）分发给另外两台机子

```
[zhutian@hadoop102 module]$ xsync flink-1.7.2/
```

（4）启动

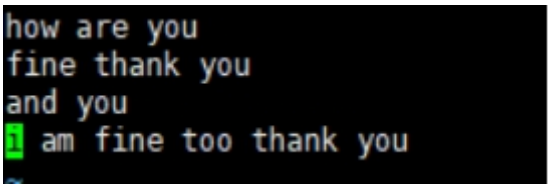
```
[zhutian@hadoop102 flink-1.7.2]$ bin/start-cluster.sh
Starting cluster.
Starting standalonesession daemon on host hadoop102.
Starting taskexecutor daemon on host hadoop103.
Starting taskexecutor daemon on host hadoop104.
[zhutian@hadoop102 flink-1.7.2]$ j
---------- hadoop102 --------
3536 StandaloneSessionClusterEntrypoint
3599 Jps
---------- hadoop103 --------
3384 Jps
3327 TaskManagerRunner
---------- hadoop104 --------
3330 TaskManagerRunner
3384 Jps
[zhutian@hadoop102 flink-1.7.2]$
```

（5）访问Web界面



（6）任务提交到集群

- 准备好数据文件



- 数据文件分发到每台taskmanager中(由于读取数据是从本地磁盘读取，实际任务会被分发到taskmanage的机器中，所以要把目标文件分发。)

```
xsync data.txt
```

- 在集群执行程序

```
/flink run -c com.zhutian.wc.StreamWordCount -p 2 FlinkTutorial-1.0-SNAPSHOT-jar-with-dependencies.jar --host localhost-port 7777
```

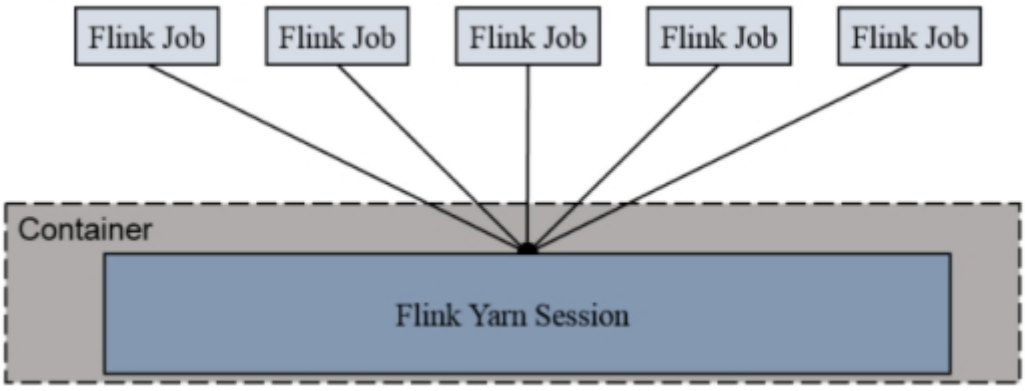
- 然后就可以去Web控制台查看结果了

> 也可以通过Web界面提交任务哦

Yarn模式

> 以Yarn模式部署Flink任务时，要求Flink是有Hadoop支持的版本，**Hadoop环境需要保证版本在2.2以上**，并且集群中安装有HDFS服务。

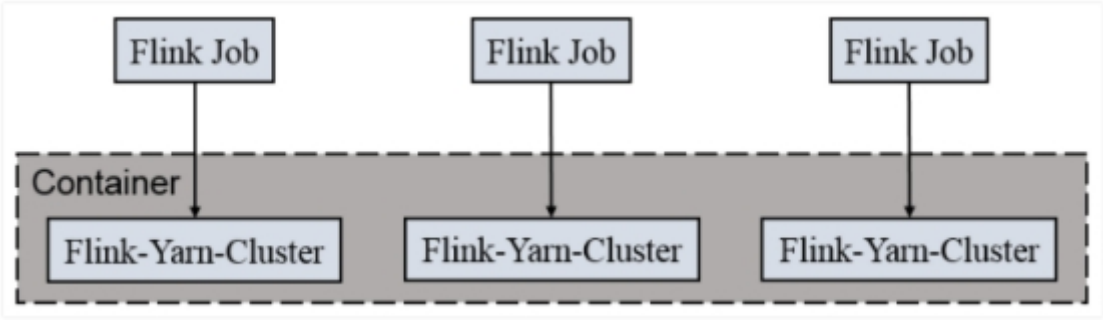
1.Session-cluster模式



Session-Cluster模式需要先启动集群，然后再提交作业，接着会向yarn申请一块空间后，**资源永远保持不变**。如果资源满了，下一个作业就无法提交，只能等到yarn中的其中一个作业执行完成后，释放了资源，下个作业才会正常提交。**所有作业共享Dispatcher和ResourceManager**；共享资源；适合规模小执行时间短的作业。

在yarn中初始化一个flink集群，开辟指定的资源，以后提交任务都向这里提交。这个flink集群会常驻在yarn集群中，除非手工停止。

2.Per-Job-Cluster模式



一个Job会对应一个集群，每提交一个作业会根据自身的情况，都会**单独向yarn申请资源**，直到作业执行完成，**一个作业的失败**与否并不会影响下一个作业的正常提交和运行。独享Dispatcher和ResourceManager，按需接受资源申请；适合规模大长时间运行的作业。

每次提交都会创建一个新的flink集群，任务之间互相独立，互不影响，方便管理。任务执行完成之后创建的集群也会消失。

SessionCluster部署

（1）启动Hadoop集群

> startHadoop.sh和j都是我自己写的脚本，【有问题都可以私聊我WX：focusbigdata，或者关注我的公众号：FocusBigData，注意大小写】

```
[zhutian@hadoop102 flink-1.7.2]$ startHadoop.sh
Starting namenodes on [hadoop102]
hadoop102: starting namenode, logging to /opt/module/hadoop-2.7.2/logs/hadoop-zhutian-namenode-hadoop102.out
hadoop102: starting datanode, logging to /opt/module/hadoop-2.7.2/logs/hadoop-zhutian-datanode-hadoop102.out
hadoop104: starting datanode, logging to /opt/module/hadoop-2.7.2/logs/hadoop-zhutian-datanode-hadoop104.out
hadoop103: starting datanode, logging to /opt/module/hadoop-2.7.2/logs/hadoop-zhutian-datanode-hadoop103.out
Starting secondary namenodes [hadoop104]
hadoop104: starting secondarynamenode, logging to /opt/module/hadoop-2.7.2/logs/hadoop-zhutian-secondarynamenode-hadoop104.out
starting yarn daemons
starting resourcemanager, logging to /opt/module/hadoop-2.7.2/logs/yarn-zhutian-resourcemanager-hadoop103.out
hadoop103: starting nodemanager, logging to /opt/module/hadoop-2.7.2/logs/yarn-zhutian-nodemanager-hadoop103.out
hadoop104: starting nodemanager, logging to /opt/module/hadoop-2.7.2/logs/yarn-zhutian-nodemanager-hadoop104.out
hadoop102: starting nodemanager, logging to /opt/module/hadoop-2.7.2/logs/yarn-zhutian-nodemanager-hadoop102.out
starting historyserver, logging to /opt/module/hadoop-2.7.2/logs/mapred-zhutian-historyserver-hadoop102.out
[zhutian@hadoop102 flink-1.7.2]$ j
---------- hadoop102 --------
5011 Jps
4809 NodeManager
4876 JobHistoryServer
4397 NameNode
4541 DataNode
---------- hadoop103 --------
4499 Jps
4295 NodeManager
4056 ResourceManager
3917 DataNode
---------- hadoop104 --------
3922 DataNode
4039 SecondaryNameNode
4264 Jps
4127 NodeManager
```

（2）启动yarn-session

```
[zhutian@hadoop102 flink-1.7.2]$ bin/yarn-session.sh -n 2 -s 2 -jm 1024 -tm 1024 -nm test -d
Error: A JNI error has occurred, please check your installation and try again
Exception in thread "main" java.lang.NoClassDefFoundError: org/apache/hadoop/yarn/exceptions/YarnException
        at java.lang.Class.getDeclaredMethods0(Native Method)
        at java.lang.Class.privateGetDeclaredMethods(Class.java:2701)
        at java.lang.Class.privateGetMethodRecursive(Class.java:3048)
        at java.lang.Class.getMethod0(Class.java:3018)
        at java.lang.Class.getMethod(Class.java:1784)
        at sun.launcher.LauncherHelper.validateMainClass(LauncherHelper.java:544)
        at sun.launcher.LauncherHelper.checkAndLoadMain(LauncherHelper.java:526)
Caused by: java.lang.ClassNotFoundException: org.apache.hadoop.yarn.exceptions.YarnException
        at java.net.URLClassLoader.findClass(URLClassLoader.java:381)
        at java.lang.ClassLoader.loadClass(ClassLoader.java:424)
        at sun.misc.Launcher$AppClassLoader.loadClass(Launcher.java:335)
        at java.lang.ClassLoader.loadClass(ClassLoader.java:357)
        ... 7 more
```

> 报错了，有点慌，这个提示很猜想到少了依赖包，注意版本，拷贝到lib目录下即可

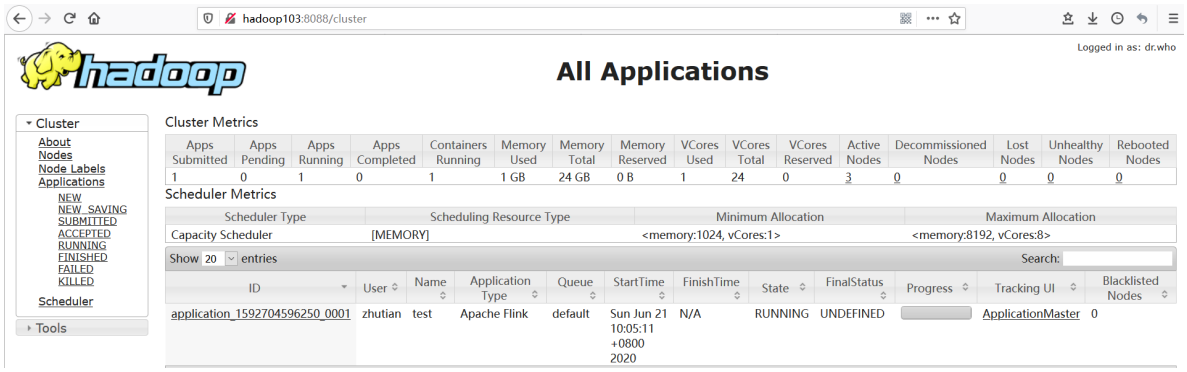
> flink-shaded-hadoop2-uber-1.7.2.jar

```
[zhutian@hadoop102 flink-1.7.2]$ bin/yarn-session.sh -n 2 -s 2 -jm 1024 -tm 1024 -nm test -d
2020-06-21 10:05:06,239 INFO  org.apache.flink.configuration.GlobalConfiguration            - Loading configuration property: jobmanager.rp
ess, hadoop102
2020-06-21 10:05:06,240 INFO  org.apache.flink.configuration.GlobalConfiguration            - Loading configuration property: jobmanager.rp
, 6123
2020-06-21 10:05:06,240 INFO  org.apache.flink.configuration.GlobalConfiguration            - Loading configuration property: jobmanager.he
e, 1024m
2020-06-21 10:05:06,240 INFO  org.apache.flink.configuration.GlobalConfiguration            - Loading configuration property: taskmanager.h
ze, 1024m
2020-06-21 10:05:06,240 INFO  org.apache.flink.configuration.GlobalConfiguration            - Loading configuration property: taskmanager.n
fTaskSlots, 1
2020-06-21 10:05:06,241 INFO  org.apache.flink.configuration.GlobalConfiguration            - Loading configuration property: parallelism.d
 1
```

（3）执行任务

```
./flink run -c com.zhutian.wc.StreamWordCount  FlinkTutorial-1.0-SNAPSHOT-jar-with-dependencies.jar --host localhost -port 7777
```

（4）去yarn控制台查看任务状态



（5）只能手动取消flink集群

```
mode. In order to stop Flink on YARN, use the following command or a YARN web interface to stop it:
yarn application -kill application_1592704596250_0001
```

> 集群启动的时候，会有上面如何停止它的命令

Per-Job-Clusterb部署

（1）启动Hadoop集群

（2）不启动yarn-session，直接执行job

```
/flink run -m yarn-cluster -c com.zhutian.wc.StreamWordCount  FlinkTutorial-1.0-SNAPSHOT-jar-with-dependencies.jar --host localhost -port 7777
```

K8s部署

> 了解就行，不需要自己操作，公司运维都会替你搭好。容器化部署时目前业界很流行的一项技术，基于Docker镜像运行能够让用户更加方便地对应用进行管理和运维。容器管理工具中最为流行的就是Kubernetes（k8s），而Flink也在最近的版本中支持了k8s部署模式。

（1）搭建Kubernetes集群（略）

（2）配置各组件的yaml文件

在k8s上构建Flink Session Cluster，需要将Flink集群的组件对应的docker镜像分别在k8s上启动，包括JobManager、TaskManager、JobManagerService三个镜像服务。每个镜像服务都可以从中央镜像仓库中获取。

（3）启动Flink Session Cluster

```
// 启动jobmanager-service 服务
kubectl create -f jobmanager-service.yaml
// 启动jobmanager-deployment服务
kubectl create -f jobmanager-deployment.yaml
// 启动taskmanager-deployment服务
kubectl create -f taskmanager-deployment.yaml
```

（4）访问Flink UI页面

集群启动后，就可以通过JobManagerServicers中配置的WebUI端口，用浏览器输入以下url来访问Flink UI页面了

```
http://{JobManagerHost:Port}/api/v1/namespaces/default/services/flink-jobmanager:ui/proxy
```