Tensorflow2.0 with grpc+verbs

环境准备

name	version
tensorflow	2.0
gcc,g++	7.3.1 20180303（默认：4.8.5需要升级）
python	2.7.5
bazel	0.26.1
centos	CentOS Linux release 7.8.2003 (Core)
git	2.31.1 (默认: 1.8.3需要升级)

编译

tensorflow源码准备

```
1. git clone https://github.com/tensorflow/tensorflow.git
2. git chekout -b r2.0 origin/r2.0
```

bazel安装

```
1. wget https://releases.bazel.build/0.26.1/release/bazel-0.26.1-installer-linux-x86_64.sh
2. sh bazel-0.26.1-installer-linux-x86_64.sh
3. ln -s /usr/local/bin/bazel /usr/bin/bazel
```

git升级

```
1. yum install http://opensource.wandisco.com/centos/7/git/x86_64/wandisco-git-release-7-2.noarch.rpm
2. yum remove git
3. yum install git
```

git 1.8.3 相关错误：

```
+ git -C /root/.cache/bazel/_bazel_root/79b7ee1a7abc6e1e5deaeaa514986007/external/io_bazel_rules_docker reset --hard 251f6a68b439744094faff800cd029798edf9faa
Unknown option: -C
usage: git [--version] [--help] [-c name=value]
           [--exec-path[=<path>]] [--html-path] [--man-path] [--info-path]
           [-p|--paginate|--no-pager] [--no-replace-objects] [--bare]
           [--git-dir=<path>] [--work-tree=<path>] [--namespace=<name>]
           <command> [<args>]
+ git -C /root/.cache/bazel/_bazel_root/79b7ee1a7abc6e1e5deaeaa514986007/external/io_bazel_rules_docker fetch '' origin 251f6a68b439744094faff800cd029798edf9faa:251f6a68b439744094faff800cd029798edf9faa
Unknown option: -C
usage: git [--version] [--help] [-c name=value]
           [--exec-path[=<path>]] [--html-path] [--man-path] [--info-path]
           [-p|--paginate|--no-pager] [--no-replace-objects] [--bare]
           [--git-dir=<path>] [--work-tree=<path>] [--namespace=<name>]
           <command> [<args>]
+ git -C /root/.cache/bazel/_bazel_root/79b7ee1a7abc6e1e5deaeaa514986007/external/io_bazel_rules_docker fetch origin 251f6a68b439744094faff800cd029798edf9faa:251f6a68b439744094faff800cd029798edf9faa
Unknown option: -C
usage: git [--version] [--help] [-c name=value]
           [--exec-path[=<path>]] [--html-path] [--man-path] [--info-path]
           [-p|--paginate|--no-pager] [--no-replace-objects] [--bare]
           [--git-dir=<path>] [--work-tree=<path>] [--namespace=<name>]
           <command> [<args>]
INFO: Elapsed time: 6.460s
INFO: 0 processes.
FAILED: Build did NOT complete successfully (0 packages loaded)
```

gcc

```
1. wget http://ftp.gnu.org/gnu/gcc/gcc-7.3.0/gcc-7.3.0.tar.gz
2. tar -zvxf gcc-7.3.0.tar.gz
3. cd gcc-7.3.0
4. ./contrib/download_prerequisites
5. mkdir build && cd build
6. ../configure --prefix=/usr/local/gcc --enable-languages=c,c++ --disable-
multilib
7. make && make install
8. mv /usr/bin/{gcc,gcc.bak}
9. mv /usr/bin/{g++,g++.bak}
10. ln -s /usr/local/gcc/bin/gcc /usr/bin/gcc
11. ln -s /usr/local/gcc/bin/g++ /usr/bin/g++
```

依赖包安装

name	version
pip	
numpy	
builtins	
python-devel	
libibverbs-devel	
enum	
keras_preprocessing	
mock	

pip

```
1. wget https://bootstrap.pypa.io/pip/2.7/get-pip.py
2. python get-pip.py
```

numpy

```
1. pip install numpy
```

builtins

```
1. pip install future
```

libibverbs

```
1. yum install libibverbs-devel
```

enum

```
1. pip install enum34
```

keras_preprocessing

```
1. pip install keras_preprocessing
```

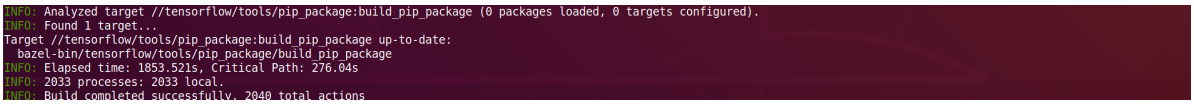
mock

```
1. pip install mock
```

编译tensorflow

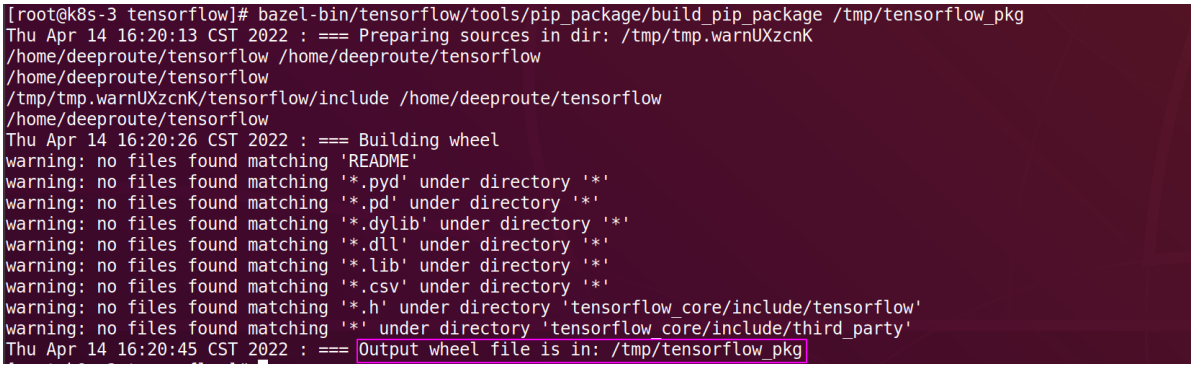
```
1. cd ./tensorflow #进入tensorflow源码目录
2. bazel build --config=opt --config=verbs --distdir=/home/bazel_package
//tensorflow/tools/pip_package:build_pip_package --verbose_failures
```

编译成功如下：



制作安装包

```
1. bazel-bin/tensorflow/tools/pip_package/build_pip_package /tmp/tensorflow_pkg
```



安装

```
1. pip install /tmp/tensorflow_pkg/tensorflow-2.0.4-cp27-cp27mu-linux_x86_64.whl
```

安装失败：

解决：

```
1. sudo pip install icrawler --ignore-installed requests
```

再次安装tensorflow:

```
1. pip install /tmp/tensorflow_pkg/tensorflow-2.0.4-cp27-cp27mu-linux_x86_64.whl
```

测试

下载benchmark源码（server端和client端都需要）

```
1. git clone https://github.com/tensorflow/benchmarks.git
2. git checkout -b cnn_tf_v1.12_compatible origin/cnn_tf_v1.12_compatible
```

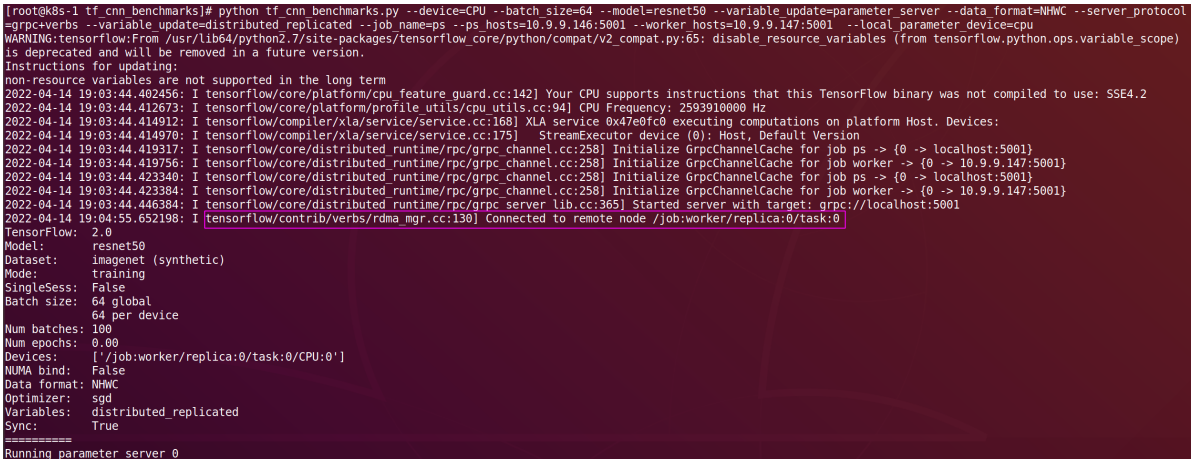
运行：

ps 节点（10.9.9.146），由于没有gpu，使用cpu代替：

```
1. cd benchmarks/scripts/tf_cnn_benchmarks
2. python tf_cnn_benchmarks.py --device=CPU --batch_size=64 --model=resnet50 --
variable_update=parameter_server --data_format=NHWC --server_protocol=grpc+verbs
--variable_update=distributed_replicated --job_name=ps --ps_hosts=10.9.9.146:5001
--worker_hosts=10.9.9.147:5001  --local_parameter_device=cpu
```

worker 节点（10.9.9.147），由于没有gpu，使用cpu代替：

```
1. cd benchmarks/scripts/tf_cnn_benchmarks
2. python tf_cnn_benchmarks.py --device=CPU --batch_size=64 --model=resnet50 --
variable_update=parameter_server --data_format=NHWC --server_protocol=grpc+verbs
--variable_update=distributed_replicated --job_name=worker --
ps_hosts=10.9.9.146:5001 --worker_hosts=10.9.9.147:5001  --
local_parameter_device=cpu
```



参考链接

- https://github.com/tensorflow/benchmarks/tree/cnn_tf_v2.0_compatible
- https://github.com/tensorflow/benchmarks/tree/master/scripts/tf_cnn_benchmarks
- https://github.com/bytedance/byteps/blob/master/docs/step-by-step-tutorial.md