TPU #2

- (10/30)
- higeponさんのpull
  - "Use `tf.config.list_physical_devices('GPU')` instead. "
  - ```
    "tensorflow.python.framework.errors_impl.NotFoundError:
    'GrpcServerResourceHandleOp' is neither a type of a primitive operation
    nor a name of a function registered in binary running on n-a870523f-w-
    0. Make sure the operation or function is registered in the binary
    running in this process. [Op:GrpcServerBind]
    ```
  - `"ImportError: sys.meta_path is None, Python is likely shutting down`
  - ☐ dockerを2.3.0-gpuに変更
- ```
  "{"created":"@1603955618.814133178","description":"Error received from
  peer
  ipv4:10.31.158.66:8470","file":"external/com_github_grpc_grpc/src/core/lib
  /surface/call.cc","file_line":1056,"grpc_message":"Unable to find the
  relevant tensor remote_handle: Op ID: 8321, Output num:
  0","grpc_status":3}
  ```
- 実行
  - ```
    "tensorflow.python.framework.errors_impl.NotFoundError:
    /seed_rl/grpc/python/../grpc_cc.so: undefined symbol:
    _ZN10tensorflow14kernel_factory17OpKernelRegistrar12InitInternalEPKNS_9
    KernelDefEN4absl11string_viewESt10unique_ptrINS0_15OpKernelFactoryESt14
    default_deleteIS8_EE "
    ```
- version戻して実行
  - " `server = grpc.Server([FLAGS.server_address])` " のとこでエラー
    - ```
      grpc/python/opt.pyのgen_grpc_ops.create_grpc_server(self._handle,
      server_addresses) "
      ```
- masterからtp2.3に対応しているdockerとsoファイルを持ってくる
  - `"ImportError: cannot import name 'naming'`
- 戻してprintデバッグ
  - `File "/seed_rl/common/utils.py", line 139, in create_unroll_variable`
  - `"RuntimeError: Error while creating shape`
    - ↑気になる
    - https://github.com/huggingface/transformers/issues/6406

- huggingfaceのtransformerで同様のエラー
- https://github.com/googlecolab/colabtools/issues/1056
- create_unroll_variableを見てみるとnum_actorsが引数に
  - num_actorsが少なくて時間がかかっているとか?
  - でも並列で同じことやるならactorが少ない方が時間かからなそう
  - ひとまずn1-standard-32にしてみる
- 実行
  - 変わらず
- dockerのFROMをgpuなしのtensorflow2.2で実行
  - 変わらず
- 再度戻してlogをみる
  - utils.pyのUnrollStore classの
  - ```
    self._state = tf.nest.map_structure(create_unroll_variable,
    timestep_specs)
    ```
  - でエラーが出ている
  - ```
      File "/usr/local/lib/python3.6/dist-
    packages/tensorflow/python/util/nest.py", line 617, in <listcomp>
    structure[0], [func(*x) for x in entries],
    ```
  - tf.nestはpython3.6のnestを使っている? そこでエラー?
  - zをprintデバッグで見れない
-
- (10/31 午後)
- python3.7に変更したものをpullして実行
  - 関係ありそうなlogをピックアップ
  -
    ```
    Sets are not currently considered sequences, but this may change in the
    future, so consider avoiding using them.
    ```
  - ```
    Unable to destroy remote tensor handles. If you are running a
    tf.function, it usually indicates some op in the graph gets an error:
    'GrpcServerResourceHandleOp' is neither a type of a primitive operation
    nor a name of a function registered in binary running on n-04ac646f-w-
    0. Make sure the operation or function is registered in the binary
    running in this process.
    ```
  - ```
    "/seed_rl/common/utils.py", line 145, in create_unroll_variable "
    ```
  - ```
    "RuntimeError: Error while creating shape "
    ```

- create unroll variableを見ていく使われているのはここ
- timestep_specsにcreate_unroll_varable関数を適用して新しいstateを作成している

-
```
self._state =
tf.nest.map_structure(create_unroll_variable,timestep_specs)
```

- create_unroll_variableの返り値　ここでエラーが出ているよう

-
```
return tf.Variable(z, trainable=False, name=spec.name)
```

  - tf.Variableは変数zをtensoflow変数に変換するメソッド
  - 勾配を計算しない時はtrainableをfalseにする
  - nameは変数名
  - と考えるとzがよくないのでは

  -
```
z = tf.zeros([num_actors, self._full_length] + spec.shape.dims,
dtype=spec.dtype)
```

  - [num_actors, self._full_length] + spec.shape.dimsがshapeを表す
  - この引数はlearnerから渡されている
  - leaner.py

    -
```
store = utils.UnrollStore(FLAGS.num_actors,
FLAGS.unroll_length,(action_specs, env_output_specs,
agent_output_specs))
```

      - 今回のケースでは
      - num_actors = 1
      - unroll_length = 100
      - 以下３つのタプル？ がtimestep_specs(変換対象)に該当する

      -
```
action_specs =
tf.TensorSpec(env.action_space.shape,env.action_space.dt
ype, 'action')
```

      -
```
env_output_specs = utils.EnvOutput(tf.TensorSpec([],
tf.float32, 'reward'),tf.TensorSpec([], tf.bool,
'done'),tf.TensorSpec(env.observation_space.shape,
env.observation_space.dtype,'observation'),tf.TensorSpec
([], tf.bool, 'abandoned'),tf.TensorSpec([], tf.int32,
'episode_step'),)
```

      -
```
agent_output_specs = tf.nest.map_structure(lambda t:
tf.TensorSpec(t.shape[1:], t.dtype),
initial_agent_output)
```

-
  ```
  self._full_length = num_overlapping_steps +
  unroll_length + 1 = 101
  ```

  -
    ```
    Unable to find the relevant tensor remote_handle
    ```

  -
    ```
    timestep_spec=(TensorSpec(shape=(), dtype=tf.int64, name='action'),
    EnvOutput(reward=TensorSpec(shape=(), dtype=tf.float32, name='reward'),
    done=TensorSpec(shape=(), dtype=tf.bool, name='done'),
    observation=TensorSpec(shape=(72, 96, 1), dtype=tf.uint16,
    name='observation'), abandoned=TensorSpec(shape=(), dtype=tf.bool,
    name='abandoned'), episode_step=TensorSpec(shape=(), dtype=tf.int32,
    name='episode_step')), AgentOutput(action=TensorSpec(shape=(),
    dtype=tf.int64, name=None), policy_logits=TensorSpec(shape=(19,),
    dtype=tf.float32, name=None), baseline=TensorSpec(shape=(),
    dtype=tf.float32, name=None)))
    ```

  - これをvariableに変換するところ
- よくわからないsoファイルが関係しているのならtf2.3に入れ替えてみる?

  -
    ```
    "tensorflow.python.framework.errors_impl.NotFoundError:
    /seed_rl/grpc/python/../grpc_cc.so: undefined symbol:
    _ZN4absl14lts_2020_02_2518container_internal18global_next_sampleE
    ```

  - soファイルよくないぽい
- 戻す

  - create_unroll_variable関数の引数specは
  -
    ```
    TensorSpec(shape=(), dtype=tf.int64, name='action')
    ```

  - spec.shape.dims = []
  - つまりこんな感じ
  - z = tf.zeros([1, 100] + [], dtype=tf.int64)
- エラーのおきている `create_unroll_variable(spec)` 関数内の引数spec, zを見てみる
- 出力結果の可視化()
- 1要素目

  -
    ```
    spec = TensorSpec(shape=(), dtype=tf.int64, name='action')
    ```

  -
    ```
    z = tf.Tensor([[0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
    0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
    0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
    0]], shape=(1, 101), dtype=int64)
    ```

- 2要素目

  -
    ```
    spec = TensorSpec(shape=(), dtype=tf.float32, name='reward')
    ```

- ```
  z = tf.Tensor([[0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
  0. 0. 0. 0. 0. 0.0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
  0. 0. 0. 0. 0. 0.0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
  0. 0. 0.0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
  0. 0.0. 0. 0. 0.]], shape=(1, 101), dtype=float32)
  ```

- 3要素目

  - ```
    spec = TensorSpec(shape=(), dtype=tf.bool, name='done')
    ```

  - ```
    z = tf.Tensor([[[False False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False]], shape=(1, 101),
    dtype=bool)
    ```

- 4要素目

  - ```
    spec = TensorSpec(shape=(72, 96, 1), dtype=tf.uint16,
    name='observation')
    ```

  - ```
    spec.shape.dims = [Dimension(72), Dimension(96), Dimension(1)]
    ```

  - ```
    z = tf.Tensor([[[[[0][0][0]...[0][0][0]]...[0]]]]], shape=(1, 101, 72,
    96, 1), dtype=uint16)
    ```

- 5要素目

  - ```
    spec = TensorSpec(shape=(), dtype=tf.bool, name='abandoned')
    ```

  - ```
    z = tf.Tensor([[False False False False False False False False False
    False False False False False False False False False False False False
    False False FalseFalse False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False False False False False
    False False False False False False False False]], shape=(1, 101),
    dtype=bool)
    ```

- 6要素目

  - ```
    spec = TensorSpec(shape=(), dtype=tf.int32, name='episode_step')
    ```

-
  ```
  z = tf.Tensor([[0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
   0]], shape=(1, 101), dtype=int32)
  ```

- 7要素目

  -
    ```
    spec = TensorSpec(shape=(), dtype=tf.int64, name=None)
    ```

  -
    ```
    z = tf.Tensor([[0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
     0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
     0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
     0]], shape=(1, 101), dtype=int64)
    ```

- 8要素目

  -
    ```
    spec = TensorSpec(shape=(19,), dtype=tf.float32, name=None)
    ```

  -
    ```
    spec.shape.dims = [Dimension(19)]
    ```

  -
    ```
    z = tf.Tensor([[[0. 0. 0. ... 0. 0. 0.][0. 0. 0. ... 0. 0. 0.][0. 0. 0.
     ... 0. 0. 0.]... [0. 0. 0. ... 0. 0. 0.][0. 0. 0. ... 0. 0. 0.][0. 0.
     0. ... 0. 0. 0.]]], shape=(1, 101, 19), dtype=float32)
    ```

- 9要素目

  -
    ```
    spec = TensorSpec(shape=(), dtype=tf.float32, name=None)
    ```

  -
    ```
    z = tf.Tensor([[0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
     0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
     0. 0. 0. 0. 0. 0. 0.0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
     0. 0. 0. 0. 0. 0.0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
     0. 0. 0. 0. 0. 00. 0. 0. 0. 0.]], shape=(1, 101), dtype=float32)
    ```

- 個々の値は取れている
- return (zにtf.variableを適用した値)と全ての要素を計算した後のself._stateを見てみる
  - 見れない　なぜ?　処理がここで止まっている?
  -