TensorFlow

TensorFlow API r1.4

tf.train.replica_device_setter

```
replica_device_setter(
    ps_tasks=0,
    ps_device='/job:ps',
    worker_device='/job:worker',
    merge_devices=True,
    cluster=None,
    ps_ops=None,
    ps_strategy=None
)
```

Defined in `tensorflow/python/training/device_setter.py`.

See the guide: Training > Distributed execution

Return a `device function` to use when building a Graph for replicas.

Device Functions are used in `with tf.device(device_function):` statement to automatically assign devices to `Operation` objects as they are constructed, Device constraints are added from the inner-most context first, working outwards. The merging behavior adds constraints to fields that are yet unset by a more inner context. Currently the fields are (job, task, cpu/gpu).

If `cluster` is `None`, and `ps_tasks` is 0, the returned function is a no-op. Otherwise, the value of `ps_tasks` is derived from `cluster`.

By default, only Variable ops are placed on ps tasks, and the placement strategy is round-robin over all ps tasks. A custom `ps_strategy` may be used to do more intelligent placement, such as `tf.contrib.training.GreedyLoadBalancingStrategy`.

For example,

```
# To build a cluster with two ps jobs on hosts ps0 and ps1, and 3 worker
# jobs on hosts worker0, worker1 and worker2.
cluster_spec = {
    "ps": ["ps0:2222", "ps1:2222"],
    "worker": ["worker0:2222", "worker1:2222", "worker2:2222"]}
with tf.device(tf.train.replica_device_setter(cluster=cluster_spec)):
  # Build your graph
  v1 = tf.Variable(...)  # assigned to /job:ps/task:0
  v2 = tf.Variable(...)  # assigned to /job:ps/task:1
  v3 = tf.Variable(...)  # assigned to /job:ps/task:0
# Run compute
```

Args:

- `ps_tasks`: Number of tasks in the `ps` job. Ignored if `cluster` is provided.
- `ps_device`: String. Device of the `ps` job. If empty no `ps` job is used. Defaults to `ps`.
- `worker_device`: String. Device of the `worker` job. If empty no `worker` job is used.
- `merge_devices`: `Boolean`. If `True`, merges or only sets a device if the device constraint is completely unset. merges device specification rather than overriding them.

- `cluster`: `ClusterDef` proto or `ClusterSpec`.
- `ps_ops`: List of strings representing `Operation` types that need to be placed on `ps` devices. If `None`, defaults to `["Variable", "VariableV2", "VarHandleOp"]`.
- `ps_strategy`: A callable invoked for every ps `Operation` (i.e. matched by `ps_ops`), that takes the `Operation` and returns the ps task index to use. If `None`, defaults to a round-robin strategy across all `ps` devices.

Returns:

A function to pass to `tf.device()`.

Raises:

TypeError if `cluster` is not a dictionary or `ClusterDef` protocol buffer, or if `ps_strategy` is provided but not a callable.

Last updated November 2, 2017.