TPU Performance Analysis

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Resources

The notebooks used were collected from https://cloud.google.com/tpu/docs/colabs.

- TensorFlow: Keras Fashion MNIST
- PyTorch: PyTorch/TPU MNIST Training
- Dataset: Fashion MNIST

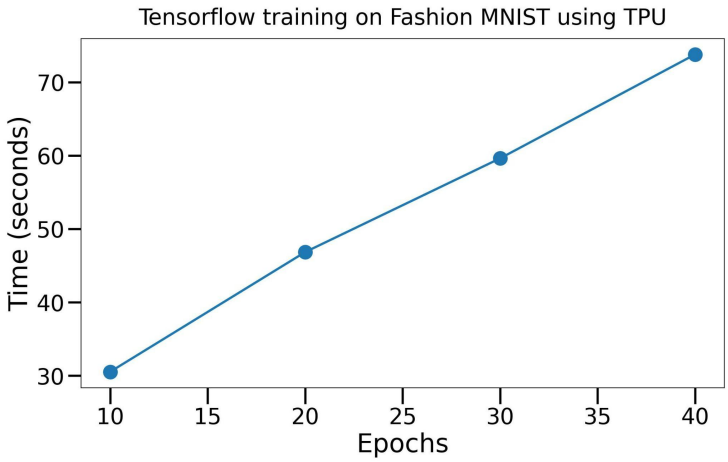
Differences

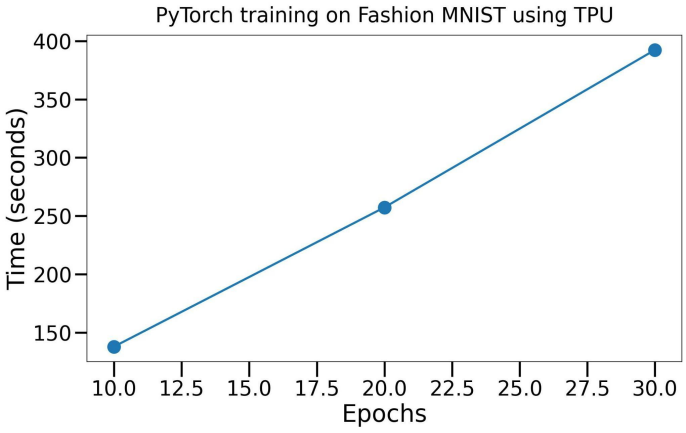
- Note that the model architectures used in those notebooks are different. The TensorFlow one uses a more complex model architecture.
- The batch size and supported TensorFlow version are different. The PyTorch notebook only supports TensorFlow 1.x, which can significantly impact performance.
- Keeping these differences in mind, we need to evaluate the comparison.

Comparison

Each model was trained up to a fixed number of epochs and then evaluated on a separate test set. The execution time is calculated using the *time.perf_counter()* method.

Training Time





Accuracy

Note that the test accuracy in PyTorch keeps increasing much faster than in the TensorFlow model. Not sure why, but it can either be due to a simpler model or some error in their implementation. The TensorFlow model's accuracy looks more sensible.