

Machine Learning 1.5.2

# Using GPUs for Cloudera Machine Learning Projects

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## Using GPUs for Cloudera Machine Learning projects

A GPU is a specialized processor that can be used to accelerate highly parallelized computationally-intensive workloads. Because of their computational power, GPUs have been found to be particularly well-suited to [deep learning](#) workloads. Ideally, CPUs and GPUs should be used in tandem for data engineering and data science workloads. A typical machine learning workflow involves data preparation, model training, model scoring, and model fitting. You can use existing general-purpose CPUs for each stage of the workflow, and optionally accelerate the math-intensive steps with the selective application of special-purpose GPUs. For example, GPUs allow you to accelerate model fitting using frameworks such as [Tensorflow](#), [PyTorch](#), and [Keras](#).

By enabling GPU support, data scientists can share GPU resources available on Cloudera Machine Learning workspaces. Users can request a specific number of GPU instances, up to the total number available, which are then allocated to the running session or job for the duration of the run.

For information on installing your GPUs, see *CDP Private Cloud Data Services Installation Software Requirements*, below.

Enabling GPUs on ML Workspaces

If you are using a Legacy Engine, to enable GPU usage on Cloudera Machine Learning, select GPUs when you are provisioning the workspace. If your existing workspace does not have GPUs provisioned, contact your ML administrator to provision a new one for you. For instructions, see *Provisioning ML Workspaces*.

### Related Information

[CDP Private Cloud Experiences Installation Software Requirements](#)

[Provision an ML Workspace](#)

[Testing GPU Setup](#)

[GPU node setup](#)

## Testing GPU Setup

Use these code samples to test that your GPU setup works with several common deep learning libraries. The specific versions of libraries depend on the particular GPU used and the GPU driver version. You can use this testing for GPU setup using Legacy Engines.

1. Go to a project that is using the CUDA engine and click Open Workbench.
2. Launch a new session with GPUs.
3. Run the following command in the workbench command prompt to verify that the driver was installed correctly:

```
! /usr/bin/nvidia-smi
```

4. Use any of the following code samples to confirm that the new engine works with common deep learning libraries.

PyTorch

```
!pip3 install torch==1.4.0
from torch import cuda
assert cuda.is_available()
assert cuda.device_count() > 0
print(cuda.get_device_name(cuda.current_device()))
```



**Note:** The PyTorch installation requires at least 4 GB of memory.

#### Tensorflow

```
!pip3 install tensorflow-gpu==2.1.0
from tensorflow.python.client import device_lib
assert 'GPU' in str(device_lib.list_local_devices())
device_lib.list_local_devices()
```

#### Keras

```
!pip3 install keras
from keras import backend
assert len(backend.tensorflow_backend._get_available_gpus()) > 0
print(backend.tensorflow_backend._get_available_gpus())
```