Highlight Note

# Creating a Compute Cluster

The most common ways to create a compute cluster are to use the **Compute** page in Azure Machine Learning studio, or to use the Azure Machine Learning SDK. Additionally, you can create compute targets using the Azure Machine Learning extension in Visual Studio Code, or by using the Azure command line interface (CLI) extension for Azure Machine Learning.



## Creating a Compute Cluster with the SDK

A *managed* compute target is one that is managed by Azure Machine Learning, such as an Azure Machine Learning training cluster.

To create an Azure Machine Learning compute cluster compute target, use the **azureml.core.compute.ComputeTarget** class and the **AmlCompute** class, like this:

```
from azureml.core import Workspace
from azureml.core.compute import ComputeTarget, AmlCompute

# Load the workspace from the saved config file
ws = Workspace.from_config()

# Specify a name for the compute (unique within the workspace)
compute_name = 'aml-cluster'

# Define compute configuration
compute_config = AmlCompute.provisioning_configuration(vm_size='STANDARD_DS11_V2',
                                                       min_nodes=0, max_nodes=4,
                                                       vm_priority='lowpriority')

# Create the compute
aml_cluster = ComputeTarget.create(ws, compute_name, compute_config)
aml_cluster.wait_for_completion(show_output=True)
```

In this example, a cluster with up to four nodes that is based on the STANDARD_DS11_v2 virtual machine image will be created. The priority for the virtual machines (VMs) can be set to dedicated, meaning they are reserved for use in this cluster, or to lowpriority, which has a lower cost but means that the VMs can be preempted if a higher priority workload requires the compute. Additionally, there are options to enable SSH access, connect the cluster to a virtual network, and manage the identity the cluster should use for access to other Azure resources.

**Note**: For a full list of **AmlCompute** configuration options, see the **AmlCompute class** SDK documentation.

## Checking for an Existing Compute Target

In many cases, you will want to check for the existence of a compute target, and only create a new one if there isn't already one with the specified name. To accomplish this, you can catch the **ComputeTargetException** exception, like this:

```
from azureml.core.compute import ComputeTarget, AmlCompute
from azureml.core.compute_target import ComputeTargetException
```

```
compute_name = 'aml-cluster'

# Check if the compute target exists
try:
    aml_cluster = ComputeTarget(workspace=ws, name=compute_name)
    print('Found existing cluster.')
except ComputeTargetException:
    # If not, create it
    compute_config = AmlCompute.provisioning_configuration(vm_size='STANDARD_DS11_V2',
                                                           max_nodes=4)
    aml_cluster = ComputeTarget.create(ws, compute_name, compute_config)

aml_cluster.wait_for_completion(show_output=True)
```

**More Information**: For more information about creating compute targets, see **Set up and use compute targets for model training** in the Azure Machine Learning documentation.