

[Metal / MTLTensor](#)

Protocol

MTLTensor

A resource representing a multi-dimensional array that you can use with machine learning workloads.

iOS 26.0+ | iPadOS 26.0+ | Mac Catalyst 26.0+ | macOS 26.0+ | tvOS 26.0+ | visionOS 26.0+

```
protocol MTLTensor : MTLResource
```

Topics

Instance Properties

`var buffer: (any MTLBuffer)?`

A buffer instance this tensor shares its storage with or nil if this tensor does not wrap an underlying buffer.

Required

`var bufferOffset: Int`

An offset, in bytes, into the buffer instance this tensor shares its storage with, or zero if this tensor does not wrap an underlying buffer.

Required

`var dataType: MTLTensorDataType`

An underlying data format of this tensor.

Required

`var dimensions: MTLTensorExtents`

An array of sizes, in elements, one for each dimension of this tensor.

Required

```
var gpuResourceID: MTLResourceID
```

A handle that represents the GPU resource, which you can store in an argument buffer.

Required

```
var strides: MTLTensorExtents?
```

An array of strides, in elements, one for each dimension of this tensor.

Required

```
var usage: MTLTensorUsage
```

A set of contexts in which you can use this tensor.

Required

Instance Methods

```
func getBytes(UnsafeMutableRawPointer, strides: MTLTensorExtents, sliceOrigin: MTLTensorExtents, sliceDimensions: MTLTensorExtents)
```

Copies the data corresponding to a slice of this tensor into a pointer you provide.

Required

```
func replace(sliceOrigin: MTLTensorExtents, sliceDimensions: MTLTensorExtents, withBytes: UnsafeRawPointer, strides: MTLTensorExtents)
```

Replaces the contents of a slice of this tensor with data you provide.

Required

Relationships

Inherits From

MTLAllocation, MTLResource, NSObjectProtocol

See Also

Tensors

```
class MTLTensorDescriptor
```

A configuration type for creating new tensor instances.

```
class MTLTensorExtents
```

An array of length matching the rank, holding the dimensions of a tensor.

```
class MTLTensorReferenceType
```

An object that represents a tensor in the shading language in a struct or array.

```
struct MTLTensorUsage
```

The type that represents the different contexts for a tensor.

```
let MTLTensorDomain: String
```

An error domain for errors that pertain to creating a tensor.

```
protocol MTLTensorBinding
```

An object that represents a tensor bound to a graphics or compute function or a machine learning function.

```
struct MTLTensorError
```

```
enum Code
```

The error codes that Metal can raise when you create a tensor.

```
enum MTLTensorDataType
```

The possible data types for the elements of a tensor.

```
let MTLTensorDomain: String
```

An error domain for errors that pertain to creating a tensor.

```
var MTL_TENSOR_MAX_RANK: Int32
```