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API Collection

# Work submission

Create queues that submit work to the GPU or load assets into GPU resources, and indirect command buffers that group your frequent commands together.

## Topics

### Creating command queues

Command queues encode and submit work to the GPU, which include render, compute, and blit passes.

```
func makeCommandQueue() -> (any MTLCommandQueue) ?
```

Creates a queue you use to submit rendering and computation commands to a GPU.

Required

```
func makeCommandQueue(maxCommandBufferCount: Int) -> (any MTLCommandQueue) ?
```

Creates a queue you use to submit rendering and computation commands to a GPU that has a fixed number of uncompleted command buffers.

Required

### Creating residency sets

A residency set makes a group of resources, such as buffers, textures, and heaps, accessible to a GPU for your command buffers and their shaders.

```
func makeResidencySet(descriptor: MTLResidencySetDescriptor) throws -> any MTLResidencySet
```

Creates a residency set, which can move resources in and out of memory residency.

Required

## Creating I/O command queues

Input/Output command queues load assets from the file system into textures, GPU buffers, and traditional CPU buffers.

```
func makeIOCommandQueue(descriptor: MTLIOCommandQueueDescriptor) throws  
-> any MTLIOCommandQueue
```

Creates an input/output command queue you use to submit commands that load assets from the file system into GPU resources or system memory.

Required

## Creating I/O file handles

Input/Output file handles each represent an asset in the file system that an I/O command queue loads into a resource for your app.

```
func makeIOFileHandle(url: URL) throws -> any MTLIOFileHandle
```

Creates an input/output file handle instance that represents a file at a URL.

Required

```
func makeIOFileHandle(url: URL, compressionMethod: MTLIOCompressionMethod) throws -> any MTLIOFileHandle
```

Creates an input/output file handle instance that represents a compressed file at a URL.

Required

~~```
func makeIOHandle(url: URL) throws -> any MTLIOFileHandle
```~~

Creates an input/output file handle instance that represents a file at a URL.

Required

Deprecated

~~```
func makeIOHandle(url: URL, compressionMethod: MTLIOCompressionMethod) throws -> any MTLIOFileHandle
```~~

Creates an input/output file handle instance that represents a compressed file at a URL.

Required

Deprecated

## Creating indirect command buffers

Indirect command buffers (ICBs) store commands that you can reuse throughout your app's lifetime, instead of encoding the same commands repeatedly.

```
func makeIndirectCommandBuffer(descriptor: MTLIndirectCommandBufferDescriptor, maxCommandCount: Int, options: MTLResourceOptions) -> (any MTLIndirectCommandBuffer)?
```

Creates an indirect command buffer instance.

Required

## See Also

### Working with GPU devices

- ☰ Device inspection

Locate and identify a GPU and the features it supports, and sample its counters.

- ☰ Pipeline state creation

Create pipeline states for render and compute passes, samplers, depth and stencil states, and indirect command buffers.

- ☰ Resource creation

Load assets with input/output queues and make various resource instances, such as buffers, textures, acceleration structures, and memory heaps.

- ☰ Shader library and archive creation

Create static and dynamic shader libraries, and binary shader archives.