System.Runtime.InteropServices.GCHandle Structure

```
[ILASM]
.class public sequential sealed GCHandle extends
System.ValueType

[C#]
public struct GCHandle
```

Assembly Info:

- *Name:* mscorlib
- *Public Key:* [00 00 00 00 00 00 00 00 04 00 00 00 00 00 00 00]
- *Version:* 1.0.x.x
- *Attributes:*
    - CLSCompliantAttribute(true)

Summary

Provides a means for referencing a managed object from unmanaged memory.

Inherits From: System.ValueType

Library: RuntimeInfrastructure

Thread Safety: All public static members of this type are safe for multithreaded operations. No instance members are guaranteed to be thread safe.

Description

Use a **System.Runtime.InteropServices.GCHandle** when an object reference is required to be accessible from unmanaged memory.

The **System.Runtime.InteropServices.GCHandleType** enumeration describes the possible **System.Runtime.InteropServices.GCHandle** types.

[*Note:* If the type of the **System.Runtime.InteropServices.GCHandle** is **System.Runtime.InteropServices.GCHandleType.Normal**, then it is an opaque handle, and the address of the object it references cannot be resolved through it.]

GCHandle.AddrOfPinnedObject() Method

```
[ILASM]
.method public hidebysig instance valuetype System.IntPtr
AddrOfPinnedObject()

[C#]
public IntPtr AddrOfPinnedObject()
```

Summary

Returns the address of an object being referred to by a **System.Runtime.InteropServices.GCHandleType.Pinned** handle.

Return Value

A **System.IntPtr** containing the address of the of the **System.Runtime.InteropServices.GCHandleType.Pinned** object as a **System.IntPtr**.

Exceptions

Exception	Condition
System.InvalidOperationException	The handle type is not **System.Runtime.InteropServices.GCHandleType**

Permissions

Permission	Description
System.Security.Permissions.SecurityPermission	Requires permission to call unmanaged code. See **System.Security.Permissions.SecurityPermissionFlag UnmanagedCode**.

GCHandle.Alloc(System.Object) Method

```
[ILASM]
.method public hidebysig static valuetype
System.Runtime.InteropServices.GCHandle Alloc(object value)

[C#]
public static GCHandle Alloc(object value)
```

Summary

Allocates a **System.Runtime.InteropServices.GCHandleType.Normal** handle for the specified object.

Parameters

Parameter	Description
value	The object for which the **System.Runtime.InteropServices.GCHandle** is created. Can be **null**.

Return Value

A new **System.Runtime.InteropServices.GCHandle** instance that protects the object from garbage collection.

Description

A **System.Runtime.InteropServices.GCHandleType.Normal** handle ensures the object will not be collected by the garbage collector.

If the *value* parameter is **null**, this method returns a valid **System.Runtime.InteropServices.GCHandle**. [*Note:* The target of the handle may be changed via the **System.Runtime.InteropServices.GCHandle.Target** property.]

Permissions

Permission	Description
System.Security.Permissions.SecurityPermission	Requires permission to call unmanaged code. See **System.Security.Permissions.SecurityPermissionFlag UnmanagedCode**.

GCHandle.Alloc(System.Object, System.Runtime.InteropServices.GCHandleType) Method

```
[ILASM]
.method public hidebysig static valuetype
System.Runtime.InteropServices.GCHandle Alloc(object value,
valuetype System.Runtime.InteropServices.GCHandleType type)

[C#]
public static GCHandle Alloc(object value, GCHandleType
type)
```

Summary

Allocates a handle of the specified type for the specified object.

Parameters

Parameter	Description
value	The object for which the **System.Runtime.InteropServices.GCHandle** is created. Can be **null**.
type	A **System.Runtime.InteropServices.GCHandleType** value that specifies the type of **System.Runtime.InteropServices.GCHandle** to create.

Return Value

A new **System.Runtime.InteropServices.GCHandle** instance that protects the object.

Description

If the *value* parameter is **null**, this method returns a valid **System.Runtime.InteropServices.GCHandle**. [*Note:* The target of the handle may be changed via the **System.Runtime.InteropServices.GCHandle.Target** property.]

Permissions

Permission	Description
System.Security.Permissions.SecurityPermission	Requires permission to call unmanaged code. See **System.Security.Permissions.SecurityPermissionFlag**

	UnmanagedCode.

GCHandle.Free() Method

```
[ILASM]
.method public hidebysig instance void Free()

[C#]
public void Free()
```

Summary

Frees a **System.Runtime.InteropServices.GCHandle**.

Description

The caller is required to provide synchronization to prevent multiple threads from executing this method simultaneously for a given handle.

Exceptions

Exception	Condition
System.InvalidOperationException	The handle has already been freed or was never initialized.

Permissions

Permission	Description
System.Security.Permissions.SecurityPermission	Requires permission to call unmanaged code. See **System.Security.Permissions.SecurityPermissionFlag** **UnmanagedCode**.

GCHandle.op_Explicit(System.IntPtr) Method

```
[ILASM]
.method public hidebysig static specialname valuetype
System.Runtime.InteropServices.GCHandle
op_Explicit(valuetype System.IntPtr value)

[C#]
public static explicit operator GCHandle(IntPtr value)
```

Summary

Convert a **System.IntPtr** to a **System.Runtime.InteropServices.GCHandle** instance.

Parameters

Parameter	Description
value	The **System.IntPtr** to be converted.

Return Value

A **System.Runtime.InteropServices.GCHandle**.

Description

System.Runtime.InteropServices.GCHandle instances are stored using an internal integer representation. This method allows you to retrieve a **System.Runtime.InteropServices.GCHandle** from its integer representation.

GCHandle.op_Explicit(System.Runtime.InteropServices.GCHandle) Method

[ILASM]

```
.method public hidebysig static specialname valuetype
System.IntPtr op_Explicit(valuetype
System.Runtime.InteropServices.GCHandle value)
```

[C#]

```
public static explicit operator IntPtr(GCHandle value)
```

Summary

Converts a **System.Runtime.InteropServices.GCHandle** instance to a **System.IntPtr**.

Parameters

Parameter	Description
value	The **System.Runtime.InteropServices.GCHandle** to be converted.

Return Value

A **System.IntPtr** representation of the specified **System.Runtime.InteropServices.GCHandle**.

Description

System.Runtime.InteropServices.GCHandle instances are stored using an internal integer representation. This method allows you to retrieve that representation.

GCHandle.IsAllocated Property

[ILASM]

```
.property bool IsAllocated { public hidebysig specialname
instance bool get_IsAllocated() }
```

[C#]

```
public bool IsAllocated { get; }
```

Summary

Gets a **System.Boolean** value indicating whether the current **System.Runtime.InteropServices.GCHandle** instance is allocated.

Property Value

true if the handle is allocated; otherwise, **false**.

Description

This property is read-only.

Use this method to determine whether the **System.Runtime.InteropServices.GCHandle** is still available.

[*Note:* When the garbage collector collects the object, the handle could still be resurrected in the finalizer.]

GCHandle.Target Property

[ILASM]
```
.property object Target { public hidebysig specialname
instance object get_Target() public hidebysig specialname
instance void set_Target(object value) }
```

[C#]
```
public object Target { get; set; }
```

Summary

Gets or sets a reference to the object the current **System.Runtime.InteropServices.GCHandle** instance represents.

Property Value

The object this handle represents.

Exceptions

Exception	Condition
System.InvalidOperationException	The current **System.Runtime.InteropServices.GCHandle** instance has already been freed or was never initialized.