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:* 2.0.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.Pinned.

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 can 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 can be changed via the System.Runtime.InteropServices.GCHandle.Target property.]

Permissions

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

SecurityPermission	`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.