1 System.Runtime.InteropServices.GCHandle
2 Structure

```
3  [ILAsm]
4  .class public sequential sealed GCHandle extends System.ValueType

5  [C#]
6  public struct GCHandle
```

7 **Assembly Info:**

8 • *Name:* mscorlib
9 • *Public Key:* [00 00 00 00 00 00 00 00 04 00 00 00 00 00 00 00]
10 • *Version:* 2.0.x.x
11 • *Attributes:*
12   o CLSCompliantAttribute(true)

13 **Summary**

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

15 **Inherits From: System.ValueType**

16

17 **Library:** RuntimeInfrastructure

18

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

21

22 **Description**

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

25

26 The `System.Runtime.InteropServices.GCHandleType` enumeration describes the
27 possible `System.Runtime.InteropServices.GCHandle` types.

28

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

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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. SecurityPermission	Requires permission to call unmanaged code. See `System.Security.Permissions.SecurityPermissionFlag.`

	UnmanagedCode.

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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`.

1 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)
```

8 Summary

9 Convert a `System.IntPtr` to a `System.Runtime.InteropServices.GCHandle` instance.

10 Parameters

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

11

12 Return Value

13 A `System.Runtime.InteropServices.GCHandle`.

14 Description

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

18

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.

1   GCHandle.IsAllocated Property

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


[C#]
public bool IsAllocated { get; }
```

7   Summary

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

10   Property Value

11   `true` if the handle is allocated; otherwise, `false`.

12   Description

13   This property is read-only.
14
15   Use this method to determine whether the
16   `System.Runtime.InteropServices.GCHandle` is still available.
17
18   [*Note:* When the garbage collector collects the object, the handle could still be
19   resurrected in the finalizer.]
20
21

22

1 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; }
```

8 **Summary**

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

11 **Property Value**

12 The object this handle represents.

13 **Exceptions**

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

14
15