

# I marked my parameter as [optional], so why do I get an RPC error when I pass NULL?

[devblogs.microsoft.com/oldnewthing/20140919-00](http://devblogs.microsoft.com/oldnewthing/20140919-00)

September 19, 2014



Raymond Chen

Consider the following interface declaration in an IDL file:

```
// Code in italics is wrong
interface IFoo : IUnknown
{
    HRESULT Cancel([in, optional, string] LPCWSTR pszReason);
};
```

The idea here is that you want to be able to call the `Cancel` method as `pFoo->Cancel(NULL)` if you don't want to provide a reason.

If you try this, you'll find that the call sometimes fails with error `0x800706F4`, which decodes to `HRESULT_FROM_WIN32(RPC_X_NULL_REF_POINTER)`. What's going on here?

The `optional` attribute does not mean what you think it means. To a C or C++ programmer, an "optional" pointer parameter typically means that it is valid to pass `NULL` / `nullptr` as the parameter value. But that's not what it means to the IDL compiler.

To the IDL compiler, optional parameters are hints to the scripting engine that the parameter should be passed as `VT_ERROR/DISP_E_PARAMNOTFOUND`. The attribute is meaningful only when applied to parameters of type `VARIANT` or `VARIANT*`.

What you actually want is the `unique` attribute. This somewhat confusingly-named attribute means "The parameter is allowed to be a null pointer." Therefore, the interface should have been written as

```
interface IFoo : IUnknown
{
    HRESULT Cancel([in, unique, string] LPCWSTR pszReason);
};
```

At the lowest level in the marshaler, pointer parameters are marked as `ref`, `unique`, or `ptr`. `ref` parameters may not be null, whereas `unique` and `ptr` parameters are allowed to be null. [Larry Osterman](#) explained to me that the default for interface pointers (anything

derived from `IUnknown` ) is `unique` and the default for all other pointer types is `ref` . Therefore, if you want to say that `NULL` is a valid value for a non-interface pointer parameter, you must say so explicitly by annotating the parameter as `[unique]` .

It's probably too late to change the behavior of MIDL to reject the `[optional]` tag on non-`VARIANT` parameters because in the decades since the attribute was introduced, it's probably being used incorrectly approximately twenty-five bazillion times, and making it an error would break a lot of code. (Even if you just made it a warning, that wouldn't help because a lot of people treat warnings as errors.)

**Exercise:** Why is the `RPC_X_NULL_REF_POINTER` error raised only sometimes?

Raymond Chen

**Follow**

