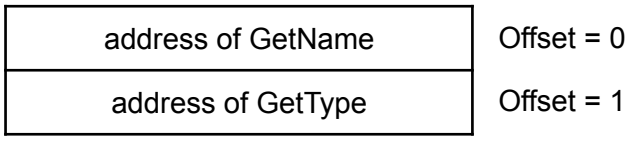
Let's say we start out with two classes:

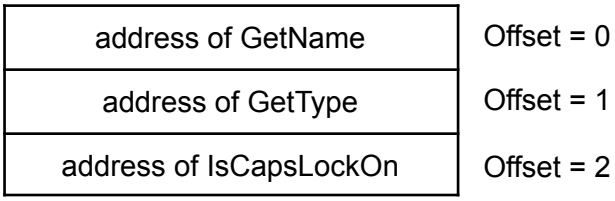
```
class IDevice {
public:
    virtual char const *GetName(void) = 0;
    virtual unsigned GetType(void) = 0;
};

class IKeyboard : public IDevice {
public:
    virtual bool IsCapsLockOn(void) = 0;
};
```

An object of type **IDevice** has a pointer at the beginning of it that points to the **IDevice-vtable**:`



An object of type **IKeyboard** has a pointer at the beginning of it that points to the **IKeyboard-vtable**:



The following code snippet:

```
int main(void)
{
    bool (IKeyboard::*p)(void) = &IKeyboard::IsCapsLockOn;
}
```

creates a member function pointer with the '*vtable offset*' set to **2**, because **IsCapsLockOn** is at offset 2.

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If we were to add a new method to 'IDevice' as follows:

```
class IDevice {
public:
    virtual char const *GetName(void) = 0;
    virtual unsigned GetType(void) = 0;
    virtual bool IsEnabled(void) = 0; // new
};

class IKeyboard : public IDevice {
public:
    virtual bool IsCapsLockOn(void) = 0;
};
```

Then the two vtables would change as follows:

IDevice-vtable:`

address of GetName	Offset = 0
address of GetType	Offset = 1
address of IsEnabled	Offset = 2

IKeyboard-vtable:

address of GetName	Offset = 0
address of GetType	Offset = 1
address of IsEnabled	Offset = 2
address of IsCapsLockOn	Offset = 3

We have an ABI break here because the '*vtable offset*' of **IsCapsLockOn** has changed from **2** to **3**.

The solution to this problem is to mark the two classes as 'extensible' so that the compiler lays out the vtables differently.

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So we mark the two classes as 'extensible' as follows:

```
class IDevice extensible {
public:
    virtual char const *GetName(void) = 0;
    virtual unsigned GetType(void) = 0;
};

class IKeyboard extensible : public IDevice {
public:
    virtual bool IsCapsLockOn(void) = 0;
};
```

The vtables are laid out differently now. An object of type **IDevice** has a pointer at the beginning of it that points to the vtable for **IDevice**:`

address of IDevice-methods-table-for-IDevice	Offset = 0

An object of type **IKeyboard** has a pointer at the beginning of it that points to the vtable for **IKeyboard**:

address of IDevice-methods-table-for-IKeyboard	Offset = 0
address of IKeyboard-methods-table-for-IKeyboard	Offset = 1

And so then we would have 3 more tables as follows:

IDevice-methods-table-for-IDevice:`

address of GetName	Offset = 0
address of GetType	Offset = 1

IDevice-methods-table-for-IKeyboard:

address of GetName	Offset = 0
address of GetType	Offset = 1

IKeyboard-methods-table-for-IKeyboard:

address of IsCapsLockOn	Offset = 0

In order to accommodate this new layout, *member function pointers* will become a little more complicated. Previously a *member function pointer* only had one '*vtable offset*', but now they will have two: a '***primary** vtable offset*' and a '***secondary** vtable offset*'. And so the following line of code:

```
bool (IKeyboard::*p)(void) = &IKeyboard::IsCapsLockOn;
```

creates a member function pointer with the '***primary** vtable offset*' set to **1,** and and the '***secondary** vtable offset*' set to **0**.

With this new vtable layout, it will be possible to add more virtual methods to **IDevice** without breaking the ABI for **IKeyboard**.