
Subject: Optimized bit setting/clearing

Posted by [Oblivion](#) on Tue, 23 Jun 2020 08:44:14 GMT

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Hi,

I've been testing these bithacks on godbolt.org with various compilers and settings.

It seems that conditional bit setting and clearing can be easily optimized (around ~15% in some cases).

Code:

```
int flags = 0;

enum Flags {
    FLAG_1 = 0x01,
    FLAG_2 = 0x02,
};

void Set1(bool b) { flags = (flags & ~FLAG_1) | (-b & FLAG_1); }

void Set2(bool b) { if(b) flags |= FLAG_2; else flags &= ~FLAG_2; }
```

Disassembly (CLANG 10.0. Compilation flags: -O3 -ffunction-sections -fdata-sections):

```
Set1(bool):          # @Set1(bool)
```

```
    mov    eax, dword ptr [rip + flags]
    and    eax, -2
    or     eax, edi
    mov    dword ptr [rip + flags], eax
    ret
```

```
Set2(bool):          # @Set2(bool)
```

```
    mov    eax, dword ptr [rip + flags]
    mov    ecx, eax
    and    ecx, -3
    or     eax, 2
    test   edi, edi
    cmovne eax, ecx
    mov    dword ptr [rip + flags], eax
    ret
```

```
flags:
```

```
    .long 0           # 0x0
```

The resulting assembly code is either smaller and faster in most cases on all compilers or it is equal on some.

Best regards,
