

U++ - Bug #2210

se/FP80 crashes pdb debugger

08/06/2021 09:53 AM - Miroslav Fidler

Status:	New	Start date:	08/06/2021
Priority:	Normal	Due date:	
Assignee:		% Done:	0%
Category:		Estimated time:	0.00 hour
Target version:		Spent time:	0.00 hour

Description

```
#include <Core/Core.h>

using namespace Upp;

#ifdef SIZEOF_INT128 // GNU C
static inline
uint64_t mulhi64(uint64_t a, uint64_t b) {
    unsigned __int128 prod = a * (unsigned __int128)b;
    return prod >> 64;
}

#elif defined(_M_X64) || defined(_M_ARM64) // MSVC
// MSVC for x86-64 or AArch64
// possibly also || defined(_M_IA64) || defined(_WIN64)
// but the docs only guarantee x86-64! Don't use just _WIN64; it doesn't include AArch64 Android / Linux
// https://docs.microsoft.com/en-gb/cpp/intrinsics/umulh
#include <intrin.h>
#define mulhi64 __umulh

#elif defined(_M_IA64) // || defined(_M_ARM) // MSVC again
// https://docs.microsoft.com/en-gb/cpp/intrinsics/umul128
// incorrectly say that __umul128 is available for ARM
// which would be weird because there's no single insn on AArch32
#include <intrin.h>
static inline
uint64_t mulhi64(uint64_t a, uint64_t b) {
    unsigned __int64 HighProduct;
    (void)__umul128(a, b, &HighProduct);
    return HighProduct;
}

#else

1. undef HAVE_FAST_mul64
uint64_t mulhi64(uint64_t a, uint64_t b); // non-inline prototype
// or you might want to define @craigster0's version here so it can inline.
#endif

struct FP80 {
    uint64 m;
    int e;
};
```

```

void Set(uint64 x) {
    int q = SignificantBits64(x);
    m = x << (64 - q);
    e = q - 64;
}
void operator*=(const FP80& b) {
    m = mulhi64(m, b.m);
    e += b.e + 64;
}
void Div2()
{
    e--;
}
String ToString() const { return AsString(m) << ", exp: " << e << ", dbl: " << m * pow(2, e); }
};

```

```

FP80 operator+(FP80 a, FP80 b){
    int shift = a.e - b.e; // <<< Crash here on breakpoint and going Locals
    if(shift < 0) {
        Swap(a, b);
        shift = -shift;
    }
    if(shift > 64)
        return a;
    a.m += b.m >> shift;
    return a;
}

```

```

CONSOLE_APP_MAIN{
    FP80 x;
    x.Set(1);
    DDUMP;
    FP80 ten;
    ten.Set(10);
    x *= ten;
    DDUMP;
    DDUMP;
    DDUMP;
}

```