



Bruce Dawson
@BruceDawson0xB



Following

#Intel I hate that bsr is undefined for zero.
Constant source of /analyze warnings.
3,776 of them for skmath.h(82) in
build.chromium.org/p/chromium.fyi...



FAVORITES

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4:24 PM - 29 Jan 2015



Reply to @BruceDawson0xB



Maciej Sinilo @msinilo · Jan 29

@BruceDawson0xB I actually fixed a rare crash caused by this the other day - msinilo.pl/blog/?p=1260



Sean Barrett @nothings · Jan 29

@msinilo @BruceDawson0xB Seems like they could and should have made _BitScanForward & _BitScanReverse do the right thing.



Rebecca Heineman @burgerbecky · Jan 29

@BruceDawson0xB Undefined behavior, the source of cringe!



Maciej Sinilo @msinilo · Jan 29

@nothings @BruceDawson0xB In our case you could easily argue it was programmer's fault, but still, it's easy to miss





Fabian Giesen @rygorous · Jan 29

@BruceDawson0xB Well, the fix is in (in the form of LZCNT/TZCNT), but it's always going to remain undefined on older processors.



Eric Lengyel @EricLengyel · Jan 29

@rygorous @BruceDawson0xB I always liked how the defined behavior of cntlzw on PowerPC for zero input could be used for fancy tricks.



Fabian Giesen @rygorous · Jan 29

@EricLengyel @BruceDawson0xB Just a matter of picking the right definition: "count leading zeroes" is unambiguous, "bit scan" is not.



Bruce Dawson @BruceDawson0xB · Jan 29

@nothings @msinilo You can't fix it in the compiler - the cost defeats the purpose of the instruction, esp. when the input is known non-zero



Bruce Dawson @BruceDawson0xB · Jan 29

@rygorous I saw your blog post. There's hope -- in the distant future. fgiesen.wordpress.com/2013/10/18/bit...



Sean Barrett @nothings · Jan 29

@BruceDawson0xB @msinilo Whoever defined what the semantics of _BitScan* were could easily have had it emit 3 insns that use z flag.



Sean Barrett @nothings · Jan 29

@BruceDawson0xB @msinilo On modern branch-predicted machines the cost would be minimal.



Sean Barrett @nothings · Jan 29

@BruceDawson0xB @msinilo And of course if we had a good way to communicate "this value can't be 0" (e.g. 'assume'), compiler could skip it.



Bruce Dawson @BruceDawson0xB · Jan 29

@nothings @msinilo The whole point of intrinsics is to map to efficient low-level instructions. Adding two more defeats the purpose.





Sean Barrett @nothings · Jan 29

@BruceDawson0xB @msinilo My BSF and BSR would still be way advantageous to NOT having any way to access that functionality.



Sean Barrett @nothings · Jan 29

@BruceDawson0xB @msinilo So if you roll back time to when someone made this decision, they could have made this decision, and everybody



Sean Barrett @nothings · Jan 29

@BruceDawson0xB @msinilo would have been happy to have a 3-ins output. Plus assume() can make it just as fast. Plus SIMD intrinsics aint 1:1



Tom Forsyth @tom_forsyth · Jan 29

@nothings @BruceDawson0xB @msinilo BSR was added in 386 when not setting a register was not considered a Bad Thing.



Tom Forsyth @tom_forsyth · Jan 29

@nothings @BruceDawson0xB @msinilo But in an OOO arch, conditionally not setting a reg (or a flag) is a disaster for perf.



bmcnett @bmcnett · Jan 29

@msinilo @BruceDawson0xB in 2015, still can't assume all user machines have a proper leading zero count instruction, sigh.



Bruce Dawson @BruceDawson0xB · Jan 29

@nothings @msinilo Developers can access BSF/BSR and can add checks if



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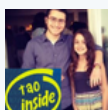


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Sean Barrett @nothings · Jan 29

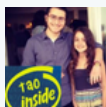
@BruceDawson0xB @msinilo Developer-added checks would be more expensive (test for 0 instead of z-flag.) & undefined behavior isn't worth it.



Alexander Riccio @ariccio · Feb 3

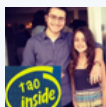
@BruceDawson0xB Seems like the real issue here is that the SAL for _BSR incorrectly describes the behavior of the function,





Alexander Riccio @ariccio · Feb 3

@BruceDawson0xB It seems like the best solution would be if microsoft declared _BitScanReverse as: pic.twitter.com/y9WnZ8vKSS



Alexander Riccio @ariccio · Feb 3

@BruceDawson0xBAAAaaandd filed connect.microsoft.com/VisualStudio/f...



Bruce Dawson @BruceDawson0xB · Feb 3

@ariccio Problem #1: badly designed function. Problem #2: incorrect SAL annotations. I hate #1 more, but #2 is fixable. Go for it.



Bruce Dawson @BruceDawson0xB · Feb 3

@ariccio Uggh. I meant: Problem #1: badly designed *instruction*



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