

new/usr/src/lib/libc/i386/gen/makectxt.c

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3629 Fri Dec 18 13:15:27 2015
new/usr/src/lib/libc/i386/gen/makectxt.c
patch feedback
*****
1 /*
2  * CDDL HEADER START
3  *
4  * The contents of this file are subject to the terms of the
5  * Common Development and Distribution License (the "License").
6  * You may not use this file except in compliance with the License.
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8  * You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
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14 * file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 * If applicable, add the following below this CDDL HEADER, with the
16 * fields enclosed by brackets "[]" replaced with your own identifying
17 * information: Portions Copyright [yyyy] [name of copyright owner]
18 *
19 * CDDL HEADER END
20 */

22 /*
23  * Copyright 2008 Sun Microsystems, Inc. All rights reserved.
24  * Use is subject to license terms.
25  */

27 /*      Copyright (c) 1988 AT&T */
28 /*      All Rights Reserved */

30 #pragma weak _makecontext = makecontext

32 #include "lint.h"
33 #include <stdarg.h>
34 #include <ucontext.h>
35 #include <sys/stack.h>

37 /*
38  * The ucontext_t that the user passes in must have been primed with a
39  * call to getcontext(2), have the uc_stack member set to reflect the
40  * stack which this context will use, and have the uc_link member set
41  * to the context which should be resumed when this context returns.
42  * When makecontext() returns, the ucontext_t will be set to run the
43  * given function with the given parameters on the stack specified by
44  * uc_stack, and which will return to the ucontext_t specified by uc_link.
45  */

47 /*
48  * The original i386 ABI said that the stack pointer need be only 4-byte
49  * aligned before a function call (STACK_ALIGN == 4). The ABI supplement
50  * version 1.0 changed the required alignment to 16-byte for the benefit of
51  * floating point code compiled using sse2. The compiler assumes this
52  * alignment and maintains it for calls it generates. If the stack is
53  * initially properly aligned, it will continue to be so aligned. If it is
54  * not initially so aligned, it will never become so aligned.
55  * alignment and maintains it for calls made from that function. If the
56  * stack is initially properly aligned, it will continue to be so aligned.
57  * If it is not initially so aligned, it will never become so aligned.
58  *
59  * One slightly confusing detail to keep in mind is that the 16-byte
60  * alignment (%esp & 0xf == 0) is true just *before* the call instruction.
61  * The call instruction will then push a return value, decrementing %esp by
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59  * 4. Therefore, if one dumps %esp at the at the very first instruction in
60  * a function, it will end with a 0xc. The compiler expects this and
61  * compensates for it properly.
62  *
63  * Note: If you change this value, you need to change it in the following
64  * files as well:
65  *
66  * - lib/libc/i386/threads/machdep.c
67  * - lib/common/i386/crti.s
68  * - lib/common/i386/crt1.s
69  */
70 #undef STACK_ALIGN
71 #define STACK_ALIGN 16

73 static void resumecontext(void);

75 void
76 makecontext(ucontext_t *ucp, void (*func)(), int argc, ...)
77 {
78     long *sp;
79     long *tsp;
80     va_list ap;
81     size_t size;

83     ucp->uc_mcontext.gregs[EIP] = (greg_t)func;

85     size = sizeof (long) * (argc + 1);

87     tsp = (long *)(((uintptr_t)ucp->uc_stack.ss_sp +
88                    ucp->uc_stack.ss_size - size) & ~(STACK_ALIGN - 1));

90     /*
91      * Since we're emulating the call instruction, we must push the
92      * return address (which involves adjusting the stack pointer to
93      * have the proper 4-byte bias).
94      */
95 #endif /* ! codereview */
96     sp = tsp - 1;

98     *sp = (long)resumecontext; /* return address */

100    ucp->uc_mcontext.gregs[UESP] = (greg_t)sp;

102    /*
103     * "push" all the arguments
104     */
105 #endif /* ! codereview */
106    va_start(ap, argc);
107    while (argc-- > 0)

109        while (argc-- > 0) {
108            *tsp++ = va_arg(ap, long);
109        }

110    va_end(ap);

111    *sp = (long)resumecontext; /* return address */

112    ucp->uc_mcontext.gregs[UESP] = (greg_t)sp;
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