

Appendix: List of events which Linux Kernel State Tracer records

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Event type [hex]	Category	Mnemonic	Description of events	where to hook	filename	data recorded as "log_arg1"	data recorded as "log_arg2"	data recorded as "log_arg3"	data recorded as "log_arg4"	remarks	
01	Process management	PROCESS_CONTEXTSWITCH	Process context switching	schedule()	/kernel/sched.c	address of the task_struct of "prev"	address of the task_struct of "next"	prev_process state (value after switch)	prev_process count (value before switch)	from log_arg3, can determine why processes were switched	
02		PROCESS_WAKEUP	WAKEUP	try to wake up()		value of "p" in the function	synchronous				
03		PROCESS_SIGSEND	sending signal	send_sig info()	/kernel/signal.c	value of "sig" in the function	value of "t" in the function	pointer to info (info)			
04		PROCESS_LTHREADGEN	creating a kernel thread	kernel_thread()	/arch/i386/kernel/process.c	value of "fn" in the function	pointer to argument of kernel thread	flag			
10	Interrupts	INT_HARDWARE_ENTRY	hardware	entrance	do_IRQ()	value of "irq" in the function	interrupt status (status)				
12		INT_TASKLET_ENTRY	software	entrance	tasklet_hi_action()	value of "t->func" in the function					
14		INT_TASKLET_ENTRY	software	entrance	tasklet_action()	value of "t->func" in the function					
16		INT_BH_ENTRY	software	entrance	bh_action()	value of "fn" in the function	address of action (bh_base)				
20	Exceptions	EXCEPTION_ENTRY	de								
			int3								
			overflow								
			bounds								
			invalid_op								
			double_fault								
			coprocessor_segment_overrun								
			invalid_TSS								
			segment_not_present								
			stack_segment	entrance	error_code		handler address (edi)	error code (esi)	exception occurred address (eip)		
			alignment_check								
			coprocessor_error								
	sintd_coprocessor_error										
	debug										
	general_protection										
	page_fault										
	machine_check										
	spurious_interrupt_bug										
	device_not_available										
	nmi										
	device_not_available										
	nmi										
	exceptions other than above two	exit	error_code								
21		EXCEPTION_EXIT		exit							
30	System calls	SYSCALL_ENTRY	entrance	beginning of system call()	/arch/i386/kernel/entry.S	the number of this system call				recording arguments of system calls is optional feature	
31		SYSCALL_EXIT	exit	ending of system call()	/arch/i386/kernel/entry.S	the number of this system call	errno				
40	Filesystems	FS_DEVWR	device IO	creation of request for device	ll_rw_block()	buffer (bh)	READWRITE (rw)	num of blocks to transfer (nr)			
41		FS_DEVEND		completion of request for device	end_buffer_io_sync()	/fs/buffer.c	buffer (bh)	uptodate			
42		FS_BUFBUSY		buffer busy wait	wait_on_buffer()	/fs/buffer.c	buffer (bh)				
50		MEM_SWAPOUT	swap out		try_to_swap_out()	/mm/vmscan.c	pointer to page swapped out (page)				
51		MEM_SWAPIN	swap in		do_swap_page()	/mm/memory.c	pointer to page allocated (new_page)				
52		MEM_DO_NOPAGE	mem_do_nopage		do_no_page()	/mm/memory.c	pointer to page (new page)				
53		MEM_DO_WPPAGE	mem_do_wppage		do_wp_page()	/mm/memory.c	pointer to page (page)				
54		MEM_WAIT_PAGE	mem_wait_page		wait_on_page()	/mm/filemap.c	pointer to page (paddr)	type of page (gfp_mask)	the number of page (order)	call address	
55		MEM_GET_FREEPAGE	mem_get_freepage		get_free_page()	/mm/page_alloc.c	pointer to page (address)	type of page (gfp_mask)	the number of page (order)	call address	
56		MEM_GET_ZEROPAGE	mem_get_zeropage		get_zeroed_page()	/mm/page_alloc.c	pointer to (addr)	the number of page (order)	call address		
57		MEM_FREEPAGE	mem_freepage		free_page()	/mm/page_alloc.c	address (addr)	size	call address		
58		MEM_VMALLOC	mem_vmalloc		vmalloc()	/mm/vmalloc.c	address (addr)				
59	MEM_VFREE	mem_vfree		vfree()	/mm/vmalloc.c	address (addr)					
5a	MEM_CACHE_CREATE	mem_cache_create		kmem_cache_create()	/mm/slab.c	name	size	cachep			
5b	MEM_CACHE_ALLOC	mem_cache_alloc		kmem_cache_alloc()	/mm/slab.c	cachep	flags	obip	call address		
5c	MEM_MALLOC	mem_malloc		kmalloc()	/mm/slab.c	cachep	flags	obip	call address		
5d	MEM_CACHE_FREE	mem_cache_free		kmem_cache_free()	/mm/slab.c	cachep	obip	call address			
5e	MEM_FREE	mem_free		kfree()	/mm/slab.c	obip	call address				
60	Networking	NET_PKTSEND	sending packets	entrance	dev_queue_xmit()	/net/core/dev.c	skb				
61		NET_PKTSENDI	interrupt on sending packets	entrance	net_tx_action()	/net/core/dev.c	h				
62		NET_PKTRECV	receiving packets	entrance	netif_rx()	/net/core/dev.c	skb				
63		NET_PKTRECVI	interrupt on receiving packets	entrance	net_rx_action()	/net/core/dev.c	h				
64	NET_SOCKETIF	socket()	entrance	sys_socketcall	/net/socket.c	call	args	second/third	*ptr	exit is recorded as exit of system call.	
70	SysV IPC	SYSV_IPC	IPC functions	entrance	sys_ipc()	call/first					
80	Locks	LK_SPINLOCK	spin lock	lock	spin_lock()	address where it was called	lock			inline	
81		LK_SPINTRYLOCK	spin lock	try lock (exit)	spin_trylock()	address where it was called	lock	return value		inline	
82		LK_SPINUNLOCK	spin lock	unlock	spin_unlock()	address where it was called	lock			inline	
83		LK_WRLLOCK	read/write lock	write lock	write_lock()	address where it was called	rlock			inline	
84		LK_WRTRYLOCK	read/write lock	write try lock (exit)	write_trylock()	address where it was called	rlock	return value		inline	
85		LK_WRLUNLOCK	read/write lock	write unlock	write_unlock()	address where it was called	rlock			define	
86		LK_RDLOCK	read lock	read lock	read_lock()	address where it was called	rlock			inline	
87		LK_RDUNLOCK	read lock	read unlock	read_unlock()	address where it was called	rlock			define	
a0	Timer	TIMER_RUN	run timer list		run_timer_list()	function address(fn)	argument for the function(data)				
a1		TIMER_ADD	add to timer list		add_timer()	pointer to timer list (timer)	unexpired term (timer->expires)	function address (timer->function)	argument for the function (timer->data)		
a2		TIMER_MOD	modify timer list		mod_timer()	/kernel/timer.c	pointer to timer list (timer)	unexpired term (timer->expires)	function address (timer->function)	argument for the function (timer->data)	
a3		TIMER_DEL	delete from timer list		del_timer()	pointer to timer list (timer)	unexpired term (timer->expires)	function address (timer->function)	argument for the function (timer->data)		
a4		TIMER_DEL_SYNC	delete from timer list with synchronous		del_timer_sync()	pointer to timer list (timer)	unexpired term (timer->expires)	function address (timer->function)	argument for the function (timer->data)		
90	Others	O_PORTIN	io commands	port output	-_OUT() or between _OUT1() and _OUT2()	/include/asm-i386/io.h	port address/byte width	value to output	address where it was called	inline	
91		O_PORTOUT	io commands	port input	tail of _IN()		port address/byte width	value to input	address where it was called	inline	
92		O_PANIC	panic			/kernel/panic.c	address of argument	address where it was called			
93	O_PRINTK	printk			/kernel/printk.c	address of argument	address where it was called				
100	LKST Internal event	LKST_INIT	Progress of LKST initialization process		lkst_init_stage(0-1)	/driver/lkst/lkst.c	initialization status				
108		LKST_MSET_XCHG	LKST switches the masksets		lkst_evhandlerprim_maskset_xchg_inlin	/driver/lkst/lkst.c	old maskset ID	new maskset ID	pointer to old maskset	pointer to new maskset	Recorded 2 times: before/after
110		LKST_BUFF_SHIFT	LKST shifts the buffers		lkst_evhandlerprim_buffer_shift_inlin	/driver/lkst/lkst.c	old buffer ID	pointer to old buffer	pointer to new buffer		Recorded 2 times: before/after
111		LKST_BUFF_OVERFLOW	overflow occurred in the current buffer.		lkst_evhandlerprim_entry_next()	/include/linux/lkst_private.h	pointer to the buffer				Used for automatically shifting buffer. If masked, LKST stops it.
119		LKST_SYNC_UID	Synchronization with UID		sys_*uid(), set_user()	/kernel/timer.c, sys.c	UID		pointer to the process table		for compensation of dropped log data
11a		LKST_SYNC_GID	Synchronization with GID		sys_*gid()	/kernel/timer.c, sys.c	GID		pointer to the process table		for compensation of dropped log data
11b		LKST_SYNC_PGID	Synchronization with PGID		sys_*pgid(), sys_setsid()	/kernel/sys.c	PGID	PGRP	pointer to the process table	session leader flag	for compensation of dropped log data
11c		LKST_SYNC_TID	Synchronization with TID		sys_gettid()	/kernel/timer.c, sys.c	TID(pid)		pointer to the process table		for compensation of dropped log data