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	Date: 24/04/2022	Project - Kernel

Code:-

```
#include <linux/init.h>
#include <linux/module.h>
#include <linux/kernel.h>
#include <linux/sched.h>
#include <linux/sched/signal.h>

struct task_struct *task;
struct list_head *list;

void DFS(struct list_head *list, struct list_head *next)
{
    list_for_each(list, next)
    {
        task = list_entry(list, struct task_struct, sibling);
        printk(KERN_INFO "%ld\t%d\t%s\n", task->state, task->pid, task->comm);
        DFS(list, &task->children);
        // task points to the next child in the list
    }
}

/* This function is called when the module is loaded. */
int simple_init(void)
{
    printk(KERN_INFO "Loading Module\n");
    printk(KERN_INFO "state\tpid\tname\n");
    // 1, 8415, 8416, 9298, 9204, 2, 6, 200, 3028, 3610, 4005

    DFS(list, &init_task.children);
    return 0;
}

/* This function is called when the module is removed. */
void simple_exit(void)
{
    printk(KERN_INFO "Removing Module\n");
}

/* Macros for registering module entry and exit points. */
module_init(simple_init);
module_exit(simple_exit);
```

```
MODULE_LICENSE("GPL");
MODULE_DESCRIPTION("Simple Module");
MODULE_AUTHOR("SGG");
```

Makefile:-

```
obj-m += Simple.o
all:
    make -C /lib/modules/$(shell uname -r)/build M=$(PWD) modules
clean:
    make -C /lib/modules/$(shell uname -r)/build M=$(PWD) clean
```

Output Screenshots:-

```
[ 4399.085487] Loading Module
[ 4399.085489] state   pid   name
[ 4399.085489] 1      1     systemd
[ 4399.085491] 1      360   systemd-journal
[ 4399.085493] 1      384   vmware-vmblock-
[ 4399.085494] 1      397   systemd-udevd
[ 4399.085495] 1      640   systemd-resolve
[ 4399.085496] 1      641   systemd-timesync
[ 4399.085498] 1      699   VGAuthService
[ 4399.085499] 1      702   vmtoolsd
[ 4399.085500] 1      735   accounts-daemon
[ 4399.085501] 1      736   acpid
[ 4399.085502] 1      741   avahi-daemon
[ 4399.085527] 1      788   avahi-daemon
[ 4399.085529] 1      742   bluetoothd
[ 4399.085530] 1      743   cron
[ 4399.085531] 1      744   dbus-daemon
[ 4399.085532] 1      746   NetworkManager
[ 4399.085533] 1      754   irqbalance
[ 4399.085534] 1      758   networkd-dispatcher
[ 4399.085535] 1      759   polkitd
[ 4399.085536] 1      760   power-profiles-service
[ 4399.085537] 1      773   rsyslogd
[ 4399.085538] 1      774   snapd
[ 4399.085539] 1      775   switcheroo-control
[ 4399.085540] 1      780   systemd-logind
[ 4399.085541] 1      783   udisksd
[ 4399.085542] 1      784   wpa_supplicant
[ 4399.085543] 1      836   ModemManager
[ 4399.085544] 1      838   cupsd
[ 4399.085545] 1      854   unattended-upgrade
[ 4399.085547] 1      887   cups-browsed
[ 4399.085547] 1      890   whoopsie
[ 4399.085548] 1      894   kerneloops
[ 4399.085549] 1      903   kerneloops
[ 4399.085550] 1      1268  packagekitd
[ 4399.085552] 1      1546  gdm
[ 4399.085553] 1      1952  gdm-session-worker
[ 4399.085554] 1      2014  gdm-wayland-session
[ 4399.085555] 1      2017  gnome-session-b
[ 4399.085556] 1      1570  rtkit-daemon
[ 4399.085558] 1      1674  upowerd
[ 4399.085559] 1      1827  colord
[ 4399.085560] 1      1965  systemd
[ 4399.085561] 1      1966  (sd-pam)
[ 4399.085563] 1      1972  pipewire
[ 4399.085563] 1      1973  pipewire-media-session
[ 4399.085565] 1      1974  pulseaudio
[ 4399.085566] 1      1982  dbus-daemon
[ 4399.085567] 1      1984  gvfsd
[ 4399.085568] 1      2221  gvfsd-trash
[ 4399.085569] 1      9764  gvfsd-network
[ 4399.085570] 1      9781  gvfsd-dnssd
[ 4399.085571] 1      1989  gvfsd-fuse
[ 4399.085573] 1      2008  tracker-miner-f
[ 4399.085574] 1      2056  gnome-session-client
[ 4399.085575] 1      2072  gvfs-udisks2-volume
[ 4399.085576] 1      2079  gvfs-gphoto2-volume
[ 4399.085577] 1      2083  gvfs-goa-volume
[ 4399.085578] 1      2095  gnome-session-b
[ 4399.085579] 1      2128  at-spi-bus-launcher
```

[4399.085580]	1	2137	dbus-daemon
[4399.085581]	1	2295	evolution-alarm
[4399.085582]	1	2330	gsd-disk-utilit
[4399.085584]	1	2641	update-notifier
[4399.085585]	1	2088	goa-daemon
[4399.085586]	1	2108	goa-identity-se
[4399.085587]	1	2122	gvfs-mtp-volume
[4399.085588]	1	2127	gnome-shell
[4399.085589]	1	2422	Xwayland
[4399.085590]	1	2507	ibus-daemon
[4399.085591]	1	2514	ibus-memconf
[4399.085593]	1	2515	ibus-extension-
[4399.085594]	1	2546	ibus-engine-sim
[4399.085595]	1	8003	snap-store
[4399.085596]	1	8999	gjs
[4399.085597]	1	2138	gvfs-afc-volume
[4399.085598]	1	2162	xdg-permission-
[4399.085599]	1	2177	evolution-sourc
[4399.085600]	1	2181	dconf-service
[4399.085601]	1	2188	evolution-calen
[4399.085602]	1	2167	gnome-shell-cal
[4399.085604]	1	2202	evolution-addre
[4399.085605]	1	2207	gvfsd-metadata
[4399.085606]	1	2229	at-spi2-registr
[4399.085607]	1	2236	gsd-a11y-settin
[4399.085608]	1	2238	gsd-color
[4399.085609]	1	2240	gsd-datetime
[4399.085610]	1	2241	gsd-housekeepin
[4399.085611]	1	2244	gsd-keyboard
[4399.085612]	1	2250	gsd-media-keys
[4399.085613]	1	2253	gsd-power
[4399.085614]	1	2255	gsd-print-notif
[4399.085615]	1	2262	gsd-rfkill
[4399.085616]	1	2267	gsd-screensaver
[4399.085617]	1	2271	gsd-sharing
[4399.085618]	1	2272	gsd-smartcard
[4399.085619]	1	2283	gsd-sound
[4399.085620]	1	2286	gsd-wacom
[4399.085622]	1	2348	vntoolsd
[4399.085623]	1	2367	gsd-printer
[4399.085624]	1	2227	gjs
[4399.085625]	1	2477	gjs
[4399.085626]	1	2512	gsd-xsettings
[4399.085627]	1	2519	ibus-x11
[4399.085628]	1	2524	ibus-portal
[4399.085629]	1	8017	xdg-document-po
[4399.085630]	1	8022	fusermount
[4399.085631]	1	8198	xdg-desktop-por
[4399.085632]	1	8202	xdg-desktop-por
[4399.085633]	1	9317	snap
[4399.085635]	1	10669	gnome-terminal-
[4399.085636]	1	10755	bash
[4399.085637]	1	12185	bash
[4399.085638]	1	12575	sudo
[4399.085639]	8	12580	insmod
[4399.085640]	1	10671	seahorse
[4399.085641]	1	11103	nautilus
[4399.085642]	1	1978	gnome-keyring-d
[4399.085644]	1	8213	fwupd
[4399.085645]	1	8241	gpg-agent
[4399.085646]	1	12576	nm-dispatcher
[4399.085647]	1	2	kthreadd
[4399.085648]	1026	3	rcu_gp

[4399.085649]	1026	4	rcu_par_gp
[4399.085651]	1026	6	kworker/0:0H
[4399.085652]	1026	9	MM_percpu_wq
[4399.085653]	1	10	rcu_tasks_rude_
[4399.085654]	1	11	rcu_tasks_trace
[4399.085655]	1	12	ksoftirqd/0
[4399.085655]	1026	13	rcu_sched
[4399.085657]	1	14	migration/0
[4399.085657]	1	15	idle_inject/0
[4399.085659]	1	16	cpuhp/0
[4399.085660]	1	17	cpuhp/1
[4399.085661]	1	18	idle_inject/1
[4399.085661]	1	19	migration/1
[4399.085663]	1	20	ksoftirqd/1
[4399.085664]	1026	22	kworker/1:0H
[4399.085665]	1	23	kdevtmpfs
[4399.085666]	1026	24	netns
[4399.085667]	1026	25	inet_frag_wq
[4399.085668]	1	26	kaudittd
[4399.085669]	1	28	khungtaskd
[4399.085670]	1	29	oom_reaper
[4399.085671]	1026	30	writeback
[4399.085672]	1	31	kcompactd0
[4399.085673]	1	32	ksmd
[4399.085674]	1	33	khugepaged
[4399.085675]	1026	80	kintegrityd
[4399.085676]	1026	81	kblockd
[4399.085677]	1026	82	blkcg_punt_bio
[4399.085678]	1026	83	tpm_dev_wq
[4399.085679]	1026	84	ata_sff
[4399.085680]	1026	85	md
[4399.085681]	1026	86	edac-poller
[4399.085682]	1026	87	devfreq_wq
[4399.085683]	1	88	watchdogd
[4399.085684]	1026	90	kworker/0:1H
[4399.085685]	1	92	kswapd0
[4399.085686]	1	93	ecryptfs-kthrea
[4399.085687]	1026	95	kthrotld
[4399.085689]	1	96	irq/24-pciehp
[4399.085690]	1	97	irq/25-pciehp
[4399.085691]	1	98	irq/26-pciehp
[4399.085692]	1	99	irq/27-pciehp
[4399.085693]	1	100	irq/28-pciehp
[4399.085694]	1	101	irq/29-pciehp
[4399.085695]	1	102	irq/30-pciehp
[4399.085696]	1	103	irq/31-pciehp
[4399.085697]	1	104	irq/32-pciehp
[4399.085698]	1	105	irq/33-pciehp
[4399.085699]	1	106	irq/34-pciehp
[4399.085700]	1	107	irq/35-pciehp
[4399.085701]	1	108	irq/36-pciehp
[4399.085702]	1	109	irq/37-pciehp
[4399.085703]	1	110	irq/38-pciehp
[4399.085704]	1	111	irq/39-pciehp
[4399.085705]	1	112	irq/40-pciehp
[4399.085706]	1	113	irq/41-pciehp
[4399.085707]	1	114	irq/42-pciehp
[4399.085708]	1	115	irq/43-pciehp
[4399.085709]	1	116	irq/44-pciehp
[4399.085710]	1	117	irq/45-pciehp
[4399.085710]	1	118	irq/46-pciehp
[4399.085712]	1	119	irq/47-pciehp
[4399.085713]	1	120	irq/48-pciehp
[4399.085714]	1	121	irq/49-pciehp
[4399.085714]	1	122	irq/50-pciehp

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[ 4399.085715] 1      123    irq/51-pciehp
[ 4399.085716] 1      124    irq/52-pciehp
[ 4399.085717] 1      125    irq/53-pciehp
[ 4399.085718] 1      126    irq/54-pciehp
[ 4399.085719] 1      127    irq/55-pciehp
[ 4399.085720] 1026   128    acpi_thermal_pm
[ 4399.085721] 1      130    scsi_eh_0
[ 4399.085722] 1026   131    scsi_tmfc_0
[ 4399.085724] 1      132    scsi_eh_1
[ 4399.085724] 1026   133    scsi_tmfc_1
[ 4399.085726] 1026   135    vfio-irqfd-clea
[ 4399.085727] 1026   136    mld
[ 4399.085728] 1026   137    ipv6_addrconf
[ 4399.085729] 1026   148    kstrt
[ 4399.085730] 1026   151    zswap-shrink
[ 4399.085731] 1026   152    kworker/u257:0
[ 4399.085753] 1026   157    charger_manager
[ 4399.085755] 1026   180    kworker/1:1H
[ 4399.085756] 1026   203    mpt_poll_0
[ 4399.085757] 1026   204    mpt/0
[ 4399.085758] 1      205    scsi_eh_2
[ 4399.085759] 1026   206    scsi_tmfc_2
[ 4399.085760] 1      207    scsi_eh_3
[ 4399.085761] 1026   208    scsi_tmfc_3
[ 4399.085762] 1      209    scsi_eh_4
[ 4399.085763] 1026   211    scsi_tmfc_4
[ 4399.085764] 1      212    scsi_eh_5
[ 4399.085765] 1026   213    scsi_tmfc_5
[ 4399.085766] 1      214    scsi_eh_6
[ 4399.085767] 1026   215    scsi_tmfc_6
[ 4399.085768] 1      216    scsi_eh_7
[ 4399.085769] 1026   217    scsi_tmfc_7
[ 4399.085769] 1      218    scsi_eh_8
[ 4399.085770] 1026   219    scsi_tmfc_8
[ 4399.085771] 1      220    scsi_eh_9
[ 4399.085772] 1026   221    scsi_tmfc_9
[ 4399.085773] 1      222    scsi_eh_10
[ 4399.085774] 1026   223    scsi_tmfc_10
[ 4399.085775] 1      224    scsi_eh_11
[ 4399.085776] 1026   225    scsi_tmfc_11
[ 4399.085777] 1      226    scsi_eh_12
[ 4399.085778] 1026   227    scsi_tmfc_12
[ 4399.085779] 1      228    scsi_eh_13
[ 4399.085780] 1026   229    scsi_tmfc_13
[ 4399.085781] 1      230    scsi_eh_14
[ 4399.085782] 1026   231    scsi_tmfc_14
[ 4399.085783] 1      232    scsi_eh_15
[ 4399.085784] 1026   233    scsi_tmfc_15
[ 4399.085785] 1      234    scsi_eh_16
[ 4399.085786] 1026   235    scsi_tmfc_16
[ 4399.085787] 1      236    scsi_eh_17
[ 4399.085788] 1026   237    scsi_tmfc_17
[ 4399.085789] 1      238    scsi_eh_18
[ 4399.085790] 1026   239    scsi_tmfc_18
[ 4399.085790] 1      240    scsi_eh_19
[ 4399.085791] 1026   241    scsi_tmfc_19
[ 4399.085792] 1      242    scsi_eh_20
[ 4399.085793] 1026   243    scsi_tmfc_20
[ 4399.085794] 1      244    scsi_eh_21
[ 4399.085795] 1026   245    scsi_tmfc_21
[ 4399.085796] 1      246    scsi_eh_22
[ 4399.085797] 1026   247    scsi_tmfc_22
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[ 4399.085798] 1      248    scsi_eh_23
[ 4399.085799] 1026   249    scsi_tmf_23
[ 4399.085800] 1      250    scsi_eh_24
[ 4399.085800] 1026   251    scsi_tmf_24
[ 4399.085801] 1      252    scsi_eh_25
[ 4399.085802] 1026   253    scsi_tmf_25
[ 4399.085803] 1      254    scsi_eh_26
[ 4399.085804] 1026   255    scsi_tmf_26
[ 4399.085805] 1      256    scsi_eh_27
[ 4399.085806] 1026   257    scsi_tmf_27
[ 4399.085807] 1      258    scsi_eh_28
[ 4399.085808] 1026   259    scsi_tmf_28
[ 4399.085809] 1      260    scsi_eh_29
[ 4399.085810] 1026   261    scsi_tmf_29
[ 4399.085811] 1      262    scsi_eh_30
[ 4399.085812] 1026   263    scsi_tmf_30
[ 4399.085813] 1      264    scsi_eh_31
[ 4399.085814] 1026   265    scsi_tmf_31
[ 4399.085815] 1      292    scsi_eh_32
[ 4399.085816] 1026   293    scsi_tmf_32
[ 4399.085817] 1      319    jbd2/sda3-8
[ 4399.085818] 1026   320    ext4-rsv-conver
[ 4399.085819] 1      390    loop0
[ 4399.085820] 1026   394    ttm_swap
[ 4399.085821] 1      398    irq/16-vmwgfx
[ 4399.085822] 1      400    loop1
[ 4399.085823] 1      401    card0-crtc0
[ 4399.085824] 1      402    card0-crtc1
[ 4399.085825] 1      403    card0-crtc2
[ 4399.085826] 1      404    card0-crtc3
[ 4399.085827] 1      405    card0-crtc4
[ 4399.085828] 1      406    card0-crtc5
[ 4399.085829] 1      407    card0-crtc6
[ 4399.085830] 1      408    card0-crtc7
[ 4399.085831] 1      409    loop2
[ 4399.085832] 1      410    loop3
[ 4399.085833] 1      411    loop4
[ 4399.085834] 1      413    loop5
[ 4399.085835] 1      415    loop6
[ 4399.085836] 1026   463    kworker/u257:1
[ 4399.085837] 1026   503    cryptd
[ 4399.085838] 1      2006   krftcomm
[ 4399.085839] 1026   8728   kworker/1:0
[ 4399.085840] 1026   9299   kworker/u256:3
[ 4399.085841] 1026   9690   kworker/0:2
[ 4399.085843] 1026   9820   kworker/u256:2
[ 4399.085844] 1026   9821   kworker/0:3
[ 4399.085845] 1026   10634   kworker/u256:4
[ 4399.085846] 1026   10766   kworker/1:2
[ 4399.085847] 1026   11066   kworker/u256:0
[ 4399.085849] 1026   11089   kworker/1:1
[ 4399.085850] 1026   11090   kworker/1:3
[ 4399.085851] 1026   11093   kworker/0:0
[ 4399.085852] 1026   11453   kworker/1:4
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