Linux Kernel Programming

General

- The Linux Kernel documentation (raw)
- The DeviceTree Specification

Style & Documentation

- How to write kernel documentation
- Linux kernel coding style
- Writing kernel-doc comments
- kernel-doc-nano-HOWTO.txt
- How to get printk format specifiers right

RT Linux

- Real-Time Linux Wiki
- Linux Foundation Wiki: BROKEN-LINK:Real-Time LINUXLINK-BROKEN
- Linux Foundation Wiki: BROKEN-LINK:HOWTO setup Linux with PREEMPT_RT properlyLINK-BROKEN
- Linux Foundation Wiki: BROKEN-LINK:HOWTO build a simple RT applicationLINK-BROKEN

Drivers

- J. Corbet, A. Rubini, G. Kroah-Hartman: Linux Device Drivers (LDD3)
- P. J. Salzman, M. Burian, O. Pomerantz: The Linux Kernel Module Programming Guide
- Tariq Shureih (Intel): HOWTO: Linux Device Driver Dos and Don'ts
- Linux Kernel Documentation: Driver Model
- Linux Kernel Documentation: Building External Modules

Network

- PHY Abstraction Layer
- phylink (SFP)

Code/Examples

- ioctl called from within kernel code

Debug

- Embedded Linux Wiki: Debugging by printing
- Stack Overflow: Linux-kernel debug printouts?
- Linux Kernel Documentation: pr_debug()

Hints

- Use `WARN_ON()` and `BUG_ON()` macros for run-time assertions.
- Force a backtrace (programmatically) using `dump_stack()`.
- Use this code in a `Makefile` to enable `pr_debug()`, `dev_dbg()` and friends based output in kernel ring buffer:
  - for a particular source file

    ```
    CFLAGS_<basename>.o := -DDEBUG
    ```

  - or; in whole kernel module

    ```
    ccflags-y += -DDEBUG
    ```

    See this Wiki page how to show such messages.

Locking

- Linux Kernel Documentation: Proper Locking Under a Preemptible Kernel
- Linux Kernel Documentation: Spin locks
- Linux Kernel Documentation: Generic Mutex Subsystem
- Linux Kernel Documentation: RT-mutex implementation design

Hints

- Suppress scheduling by use of function `preempt_disable()`.
- Functions `irqs_disabled()` and `in_interrupt()` are very helpful regarding protection of non-preemptive code (see also the comments at Stack Overflow).
- For use of `[num]delay()`, `usleep()` and friends see timers-howto.txt.

Memory

- Mel Gorman: Understanding the Linux Virtual Memory Manager
- Ulrich Drepper: What every programmer should know about memory
- Server Fault: How is kernel oom score calculated?

Random

- Jake Edge: A system call for random numbers: getrandom()
- ArchWiki: Rng-tools

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