

# Kernel TODO List

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The following lists consists of tasks that require attention within the SH architecture codebase of the Linux Kernel:

## DMA

- Convert DMA API to dmaengine framework. (Patches available on list, development still in-progress).  
Add optional DMA auto-request support to sh-sci and other blocks.

## Timers

- Generic sched\_clock() for drivers/clocksource based clocksources.  
Needs some rework to avoid wrapping, need to investigate interaction with function graph tracer.

## Cache and Memory Management

- sparsemem vmemmap and extreme.
  - highmem.  
highpte on top of this  
Likely restricted to UP given the need to broadcast TLB flushes via software triggered IPIs.  
Support highmem= for testing with an arbitrary lowmem cutoff.
  - Move off of PG\_mapped to PG\_dcache\_dirty, kill off special ptep\_get\_and\_clear(). (in sh/cachetlb)  
Lazy dcache flush needs special handling for both SMP and highmem cases.
  - Bring dynamic PMB support back from the dead, and fold PMB fixed mode in.
  - Support arbitrary VMSPLIT for PMB systems.
  - Killing off MEMORY\_START/MEMORY\_SIZE in favour of a dynamic model.  
This will allow for dynamic sizing based off of mode pins as well as for deriving the highmem watermark.  
Current MEMORY\_OFFSET calculation is 0 for virtually every platform already.  
Boot link offset and zero page offset can be retained for the few platforms that need them.
- Variable page sizes for hugetlb.
- Use large TLBs in ioremap constructed page tables, now that page-table backed ioremap is a common enough operation.  
--Keep this generic, as sparsemem vmemmap will want to use the same mapping strategy.
  - Systematic death of off all PXSEG accessors.

## Performance Counters

- Add SH-4A counter support. (under development)

## Power Management

- Run Time

Clock Framework

- Cpufreq integration

- Drivers:

Modify SuperH Mobile drivers to use the clock framework:

- SCIF driver-- patches posted!
- MMC, FLCTL

UIO:

- Add basic clock framework support to UIO.

Other core code:

- Modify the interrupt controller and DMA code to use the clock framework.

Cpuidle and Sleep Mode, Dynamic Ticks

- Add Cpuidle support plus Sleep Mode. Optimize with Dynamic ticks.
  - ✧ Upstream simple Cpuidle integration
  - ✧ Combine with SDRAM self-refresh to save power

Frequency and Voltage scaling:

- Investigate frequency scaling together with voltage scaling.

- Suspend / Resume

Save / Restore Ram contents:

- Make sure we can save and restore memory contents inside kexec\_jump.

Driver Suspend / Resume support:

- Verify/Modify common subsystem code suspend support
  - ✧ hibernation to mmc is not ok
  - ✧ hibernation to usb status is unknown

R-Standby Mode Support:

- Implement and test R-Standby mode using kexec\_jump.

U-Standby Mode Support:

- Implement and test U-Standby mode using kexec\_jump.

Boot loader resume support:

- Add support for resume from boot loader.

Partial Suspend / Resume

- Allow single drivers to be suspended / resumed for Cpuidle R-Standby Support

## General Kernel Features

- CPU hotplug.
- Relocatable kernel support.
- Rework of hard FPU emulation. Tie in to signal context and reset interface (in-progress patch available).
- Write small FPU and DSP test apps in user space from application note code.
- Support IRQ priority setting through generic hardirq layer.
- Support for dynamic IRQ creation  
Needed for MSI, but can also replace existing hardcoded mux vectors in various platforms.  
After the hardcoded mux sources are allocated dynamically, switch to sparse IRQs unconditionally for everyone.
- Support SMP kernel on UP boot for debugging.
- Systematic death of all I/O routines from the machvec, and subsequent conversion to GENERIC\_IOMAP.
- Proper .eh\_frame generation in vdso
- vsyscall-based gtod / clocksource vread.  
May require vdso twiddling to behave more as a conventional data page.
- Conversion to asm-generic dma-mapping ops.  
This will probably want to be layered on top of the sh/cachetlb branch to handle coherent platforms properly.
- SWIOTLB support needed for PCIe DMA on SH-X3.
- Rework of the thermal subsystem to accommodate the SH-X3 thermal diode. (patch in progress).
- Convert remaining legacy CPG users to new clock framework abstraction.
- clkdev interfacing.
- kexec needs to be hw\_breakpoint aware.

## Drivers

- MFD drivers for SMSC FD37C93xAPM and HD6446x cchips.
- PFC driver updates for upstream GPIO API changes.  
Also need to tie in GPIO IRQs for platforms that need them (primarily SH-2A).