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Linux Kernel Porting:

Porting:

Porting means **making something work on an environment it is not designed for**. **Embedded Linux porting means making Linux work on an embedded platform, for which it was not designed**. Porting is a broader term and when I say embedded Linux porting, it not only involves Linux kernel porting, but also porting a first stage boot loader, a second stage boot loader and, last but not the least, the applications. Porting differs from development. Usually, porting doesn't involve as much of coding as in development. **This means that there is already some code available and it only needs to be fine-tuned to the desired target. There may be a need to change a few lines here and there, before it is up and running. But, the key thing to know is, what needs to be changed and where**.

What Linux kernel porting involves:

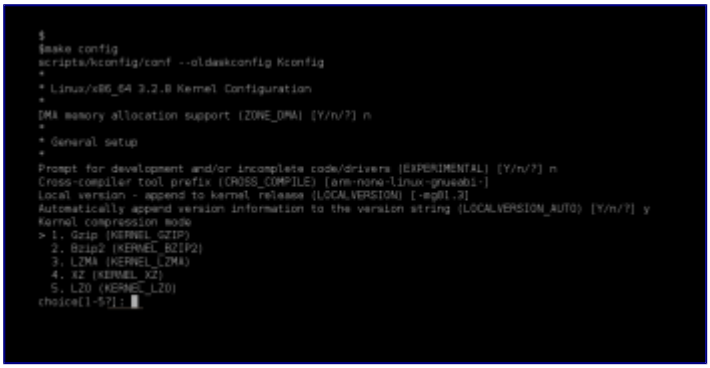
Linux kernel porting involves two things at a higher level: **architecture porting and board porting**. Architecture, in Linux terminology, refers to CPU. So, architecture porting means adapting the Linux **kernel to the target CPU, which may be ARM, Power PC, MIPS**, and so on. **In addition to this, SOC porting can also be considered as part of architecture porting.** As far as the Linux kernel is concerned, most of the times, you don't need to port it for architecture as this would already be supported in Linux. **However, you still need to port Linux for the board and this is where the major focus lies**. Architecture porting entails porting of initial start-up code, interrupt service routines, dispatcher routine, timer routine, memory management, and so on. Whereas board porting involves writing custom drivers and initialization code for devices specific to the board.

Building a Linux kernel for the target platform:

Kernel building is a two-step process: **first, the kernel needs to be configured for the target platform.** There are many ways to configure the kernel, based on the preferred configuration interface. Given below are some of the common methods.

To run the text-based configuration, execute the following command:

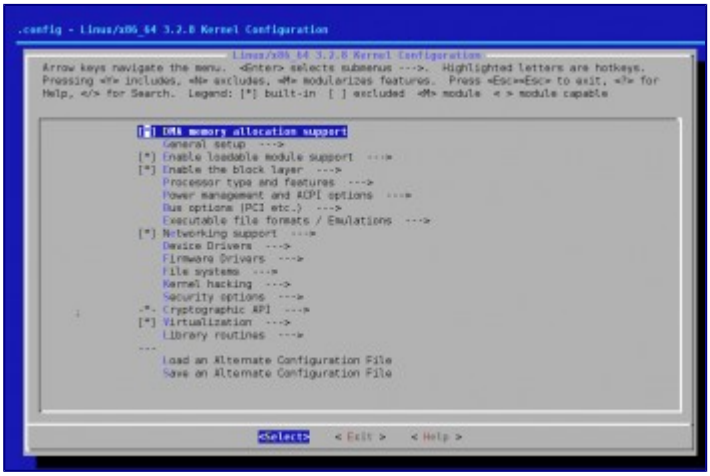
```
make config
```



This will show the configuration options on the console as seen in Figure . It is a little cumbersome to configure the kernel with this, as it prompts every configuration option, in order, and doesn't allow the reversion of changes.

To run the menu-driven configuration, execute the following command:

```
make menuconfig
```



This will show the menu options for configuring the kernel, as seen in Figure . This requires the *ncurses* library to be installed on the system. This is the most popular interface used to configure the kernel.

For details on other options, execute the following command in the kernel top directory:

```
make help
```

Once the kernel is configured, the next step is to build the kernel with the *make* command. A few commonly used commands are given below:

```
make vmlinux Builds the bare kernel
make modules Builds the modules
```

If the above commands are executed as stated, the kernel will be configured and compiled for the host system, which is generally the x86 platform. But, for porting, the intention is to configure and build the kernel for the target platform, which in turn, requires configuration of *makefile*. Two things that need to be changed in the *makefile* are given below:

```
ARCH=<architecture>
CROSS_COMPILE = <toolchain prefix>
```

The first line defines the architecture the kernel needs to be built for, and the second line defines the cross compilation tool chain prefix. So, if the architecture is ARM and the tool chain is say, from CodeSourcery, then it would be:

```
ARCH=arm
CROSS_COMPILE=arm-none-linux-gnueabi-
```

The kernel image generated after the compilation is usually vmlinux, which is in ELF format. This image can’t be used directly with embedded system boot loaders such as u-boot.

The Linux kernel build system:

One of the beautiful things about the Linux kernel is that it is highly configurable and the same code base can be used for a variety of applications, ranging from high end servers to tiny embedded devices. And the infrastructure, which plays an important role in achieving this in an efficient manner, is the kernel build system, also known as *kbuild.* The kernel build system has two main components : **makefile and Kconfig.**

Makefile: Every sub-directory has its own makefile, which is used to compile the files in that directory and generate the object code out of that. The top level makefile percolates recursively into its sub-directories and invokes the corresponding makefile to build the modules and finally, the Linux kernel image. The makefile builds only the files for which the configuration option is enabled through the configuration tool.

Kconfig: As with the makefile, every sub-directory has a Kconfig file. Kconfig is in configuration language and Kconfig files located inside each sub-directory are the programs. Kconfig contains the entries, which are read by configuration targets such as *make menuconfig* to show a menu-like structure.

So we have covered makefile and Kconfig and at present they seem to be pretty much disconnected. For kbuild to work properly, there has to be some link between the Kconfig and makefile. And that link is nothing but the configuration symbols, which generally have a prefix ***CONFIG_*.** These symbols are generated by a configuration target such as *menuconfig,* based on entries defined in the Kconfig file. And based on what the user has selected in the menu, these symbols can have the values 'y’, 'n’, or 'm’.

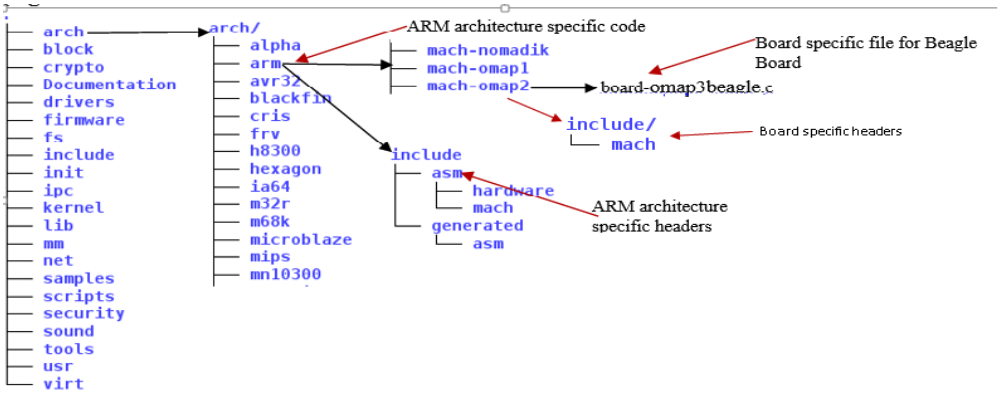
Linux Support Packages (LSP)/Board Support Packages (BSP)

One of the most important and probably the most challenging thing in porting is the development of **Board Support Packages (BSP)**. BSP development is a one-time effort during the product development life cycle and, obviously, the most critical. As we have discussed, porting involves architecture porting and board porting. Board porting involves board-specific initialization code that includes initialization of the various interfaces such as memory, peripherals such as serial, and i2c, which in turn, involves the driver porting.

There are two categories of drivers. One is the standard device driver such as the i2c driver and block driver located at the standard directory location. Another is the custom interface or device driver, which includes the board-specific custom code and needs to be specifically brought in with the kernel. And this collection of board-specific initialization and custom code is referred to as a Board Support Package or, in Linux terminology, a LSP. In simple words, whatever software code you require (which is specific to the target platform) to boot up the target with the operating system can be called LSP.

Components of LSP

As the name itself suggests, BSP is dependent on the things that are specific to the target board. So, it consists of the code which is specific to that particular board, and it applies only to that board. The usual list includes Interrupt Request Numbers (IRQ), which are dependent on how the various devices are connected on the board. Also, some boards have an audio codec and you need to have a driver for that codec. Likewise, there would be switch interfaces, a matrix keypad, external *eeprom*, and so on.



LSP placement

LSP is placed under a specific <*arch*> folder of the kernel's arch folder. For example, architecture-specific code for ARM resides in the *arch/arm* directory. This is about the code, but you also need the headers which are placed under *arch/arm/include/asm*. However, board-specific code is placed at

arch/arm/mach-<board_name> and corresponding headers are placed at *arch/arm/mach-<soc architecture>/include*. For example, LSP for Beagle Board is placed at *arch/arm/mach-omap2/board-omap3beagle.c* and corresponding headers are placed at *arch/arm/mach-omap2/include/mach/*. This is shown in figure.

1	ARM resides in the ***arch/arm*** directory
2	headers which are placed under ***arch/arm/include/asm***
3	board-specific code is placed at ***arch/arm/mach-<board_name>***
4	corresponding headers are placed at ***arch/arm/mach-<soc architecture>/include***
5	LSP for Beagle Board is placed at ***arch/arm/mach-omap2/board-omap3beagle.c***
6	corresponding headers are placed at ***arch/arm/mach-omap2/include/mach/*.**

Machine ID

Every board in the kernel is identified by a machine ID. This helps the kernel maintainers to manage the boards based on ARM architecture in the source tree. This ID is passed to the kernel from the second stage boot loader such as u-boot. For the kernel to boot properly, there has to be a match between the kernel and the second stage boot loader. This information is available in ***arch/arm/tools/mach-types*** and is used to generate the file ***linux/include/generated/mach-types.h*.** The macros defined by mach-types.h are used by the rest of the kernel code. For example, the machine ID for Beagle Board is 1546, and this is the number which the second stage boot loader passes to the kernel.

MACHINE_START

One of the steps involved in kernel porting is to define the initialization functions for the various interfaces on the board, such as serial, Ethernet, Gpio, etc. Once these functions are defined, they need to be linked with the kernel so that it can invoke them during boot-up. For this, the kernel provides the macro **MACHINE_START**. Typically, a MACHINE_START macro looks like what's shown below:

```
MACHINE_START(MY_BOARD, "My Board for Demo")
.atag_offset = 0x100,
.init_early = my_board_early,
.init_irq = my_board_irq,
.init_machine = my_board_init,
MACHINE_END
```

Let's understand this macro. **MY_BOARD is machine ID defined in *arch/arm/tools/mach-types*.** The

second parameter to the macro is a string describing the board. The next few lines specify the various initialization functions, which the kernel has to invoke during boot-up. These include the following:

.atag_offset: Defines the offset in RAM, where the boot parameters will be placed. These parameters are passed from the second stage boot loader, such as u-boot.

my_board_early: Calls the SOC initialization functions. This function will be defined by the SOC vendor, if the kernel is ported for it.

my_board_irq: Initialization related to interrupts is done over here.

my_board_init: All the board-specific initialization is done here. This function should be defined during the board porting. This includes things such as setting up the pin multiplexing, initialization of the serial console, initialization of RAM, initialization of Ethernet, USB and so on.

MACHINE_END ends the macro. This macro is defined in *arch/arm/include/asm/mach/arch.h.*

How to begin with porting

The most common and recommended way to begin with porting is to start with **some reference board**, **which closely resembles yours.** So, if you are porting for a board based on OMAP3 architecture, take Beagle Board as a reference. Also, for porting, you should understand the system very well. Depending on the features available on your board, configure the kernel accordingly. To start with, just enable the minimal set of features required to boot the kernel. This may include but not be limited to initialization of RAM, Gpio subsystems, serial interfaces, and file systems drivers for mounting the root file system. Once the kernel boots up with the minimal configuration, start adding the new features, as required.

So, let us summarize the steps involved in porting:
1. The first step is to register the machine with the kernel maintainer and get the unique ID for your board. While this is not necessary to begin with porting, it needs to be done eventually, if patches are to be submitted to the mainline. Place the machine ID in *arch/arm/tools/mach-types.*

2. Create the board-specific file board-<board_name>' at *arch/arm/mach-<soc>* and define the MACHINE_START for the new board. For example, the board-specific file for the Panda Board resides at *arch/arm/mach-omap2/board-omap4panda.c.*

3. Update the Kconfig file at *arch/arm/mach_<soc>* to add an entry for the new board as shown below:

```
config MACH_MY_BOARD
bool My Board for Demo
depends on ARCH_OMAP3
default y
```

4. Update the corresponding makefile, so that the board-specific file gets compiled. This is shown below:

```
obj-$(CONFIG_MACH_MY_BOARD) += board-my_board.o
```

5. Create a default configuration file for the new board. To begin with, take any .config file as a starting point and customise it for the new board. Place the working *.config* file at *arch/arm/configs/my_board_defconfig*

Reference Board: ST: SPEAR13XX

SPEAr ARM Linux Overview

Introduction

SPEAr (Structured Processor Enhanced Architecture).
weblink : http://www.st.com/spear

The ST Microelectronics SPEAr range of ARM9/CortexA9 System-on-Chip CPUs are supported by the 'spear' platform of ARM Linux. Currently **SPEAr1310**, **SPEAr1340**, SPEAr300, SPEAr310, SPEAr320 and SPEAr600 SOCs are supported.

Hierarchy in SPEAr is as follows:

- SPEAr13XX (13XX SOC series, based on ARM CORTEXA9)
    - SPEAr1310 (SOC)
        - SPEAr1310 Evaluation Board
    - SPEAr1340 (SOC)
        - SPEAr1340 Evaluation Board

Configuration

A generic configuration is provided for each machine, and can be used as the default by
make spear13xx_defconfig

Layout

The common files for multiple machine families (SPEAr3xx, SPEAr6xx and SPEAr13xx) are located

in the platform code contained in **arch/arm/mach-spear/** with headers in **arch/arm/mach-spear/include/**.

```
# Common support
obj-y   := restart.o time.o

smp-$(CONFIG_SMP)             += headsmp.o platsmp.o
smp-$(CONFIG_HOTPLUG_CPU)     += hotplug.o

obj-$(CONFIG_ARCH_SPEAR13XX)   += spear13xx.o $(smp-y)
obj-$(CONFIG_MACH_SPEAR1310)   += spear1310.o
obj-$(CONFIG_MACH_SPEAR1340)   += spear1340.o
```

Following rules to be respected for defining the virtual address:

1. The 20 low weight bits (21 in case LPAE is enabled) must be kept in order to align region size of 1MB (2MB in LPAE is enabled).
2. It must be mapped at the upper address of the vmalloc area, in order to not be overwritten by kernel which is stating from lower addresses: i.e here we select 0x**FE0**xxxxx

```
CONFIG_DEBUG_UART_PHYS: 0x40010000 /* UART4 */
CONFIG_DEBUG_UART_VIRT: 0xFE010000
```

Please find below table for USART/UART of STMP32MP1:

Name	Physical base address	Virtual base address
USART1	5c000000	**FE0**00000
USART2	4000e000	**FE0**0e000
USART3	4000f000	**FE0**0f000
UART4	40010000	**FE0**10000
UART5	40011000	**FE0**11000
USART6	44003000	**FE0**03000
UART7	40018000	**FE0**18000
UART8	40019000	**FE0**19000

Examples - UART_PHYS - UART_VIRT

- **arch/arm/Kconfig.debug**
- **config DEBUG_UART_PHYS**

default 0xe0000000 if DEBUG_SPEAR13XX
default 0x20201000 if DEBUG_BCM2835
default 0x3f201000 if DEBUG_BCM2836
default 0x40100000 if DEBUG_PXA_UART1

- **config DEBUG_UART_VIRT**

  default 0xfd000000 if DEBUG_SPEAR3XX || DEBUG_SPEAR13XX
  default 0xf0201000 if DEBUG_BCM2835 || DEBUG_BCM2836
  default 0xf6200000 if DEBUG_PXA_UART1

- **source code:**
  arch/arm/include/debug/

pl01x.S
bcm63xx.S
at91.S
imx.S
omap2plus.S
samsung.S
sti.S
vexpress.S

- **Typical code:**

```
#ifdef CONFIG_DEBUG_UART_PHYS
            .macro  addruart, rp, rv, tmp
            ldr     \rp, =CONFIG_DEBUG_UART_PHYS
            ldr     \rv, =CONFIG_DEBUG_UART_VIRT
            .endm
#endif

            .macro  senduart,rd,rx
            strb    \rd, [\rx, #UART01x_DR]
            .endm

            .macro  waituart,rd,rx
1001:       ldr     \rd, [\rx, #UART01x_FR]
 ARM_BE8(       rev     \rd, \rd )
            tst     \rd, #UART01x_FR_TXFF
            bne     1001b
            .endm

            .macro  busyuart,rd,rx
1001:       ldr     \rd, [\rx, #UART01x_FR]
 ARM_BE8(       rev     \rd, \rd )
```

```
    tst     \rd, #UART01x_FR_BUSY
    bne     1001b
    .endm
```

Linux Serial Console

setenv bootargs earlyprintk console=ttyAMA0 mem=512M root=/dev/ram0 rw initrd=0x12c00000,16M

To use a serial port as console you need to compile the support into your kernel

drivers/tty/serial/amba-pl011.c

amba-pl011.c	static struct **console amba_console** = {
	.name = "ttyAMA",
	.write = pl011_console_write,
	.device = uart_console_device,
	.setup = pl011_console_setup,
	.match = pl011_console_match,
	.flags = CON_PRINTBUFFER | CON_ANYTIME,
	.index = -1,
	.data = &amba_reg,
	};

amba-pl010.c	**static struct console amba_console = {** **.name = "ttyAM",** .write = pl010_console_write, .device = uart_console_device, .setup = pl010_console_setup, .flags = CON_PRINTBUFFER, .index = -1, .data = &amba_reg, };

Shikhara SoC & Board

Shikhara SoC Features

Following is the summary of Shikhara features:

CPU Platform

- ARM Cortex A9 dual core (800MHz – Processor subsystem), 32KB L1 D-Cache, 32KB L1 I-Cache, 512KB L2 Cache.

Video Processing Unit

- ARC700 (400MHz-Video Sub system)

Internal On chip memories

- 64 KB ROM & 64KB RAM, 512KB L2 Cache RAM
- 64 KB RAM for Video ARC 700

External memory interfaces

- NAND/NOR/SRAM memory, LPDDR2/DDR3 SDRAM, SDMMC and SDIO

Communication & connectivity

- USB 3.0 DRD Controller
- USB3.0 Host Controller
- HDMI 1.4a Tx Controller
- Four UARTs
- Four General purpose input outputs
- One I2S (Master)
- Three I2C
- Two SPI Controllers.
- One MIPI CSI-2 Receiver.
- One MIPI DSI Transmitter

- One CAN Controller.

System functions

- Multiple power domains
- Clock gating
- Power gating
- Two DMA Controllers
- Two Dual Timers
- Watch Dog Timer
- JTAG interface for ARM debug access
- Multi Format video codec provides encoding & decoding of MPEG-4/H.263/H.264 up to 30fps

IP List in Shikhara SoC

The following IPs is integrated in the Shikhara SoC.

No.	IP / Prime Cell	Vendor	Version Number	Number of instances	Remarks
1	CortexA9 MPCORE TSMC 40nm Hard Macro	ARM	r0p0	1	Main house keeping CPU of the SoC. Following are the version numbers of main components inside the Hard Macro: • Cortex-A9 MPCore : r3p0 • CortexA9 NEON : r3p0 • L2CC : r3p2 • PTM-A9 : r1p0 • ATB/APB asynch briges: r0p0

2	Corelink NIC 301	ARM	r2p3	5	The AMBA Network Interconnect is a highly configurable component that enables to createa complete high performance, optimized AMBA-compliant network infrastructure. Thepossible configurations for the AMBA Network Interconnect can range up to a complex infrastructure that consists of up to 128 masters and 64 slaves of a combination of different AMBA protocols. It support advanced QoS features.
3	DMAC (PL330)	ARM	r1p0	2	The DMAC provides an AXI interface to perform the DMA transfers and two APB interfacesthat control its operation. The DMAC implements TrustZone® secure technology with one APBinterface operating in the Secure state and the other operating in the Non-secure state.
4	Video subsyste m (AV417)	Synopsys	1.4	1	The AV417 is a 32-bit microprocessor systemthat provides a powerful package of System-on-Chip (SOC) features to make the modular ARC 700 corecapable of addressing demanding data processing applications and general purpose processing.
5	MALI 400 MP	ARM	r1p1	1	The Mali-400 MP GPU is a hardware accelerator for 2D and 3D graphics systems.The GPU consists of: • one to four Pixel Processors (PPs) • a Geometry Processor (GP) • a Level 2 Cache Controller (L2) • a Memory Management Unit (MMU) for each GP and PP • a Power Management Unit (PMU).
6	USB3.0 DRD	Synopsys	2.50a	1	USB 3.0 DRD Functions either as a device or a Host at a given time providing, SuperSpeed, High-Speed and Full-Speed Low speed operations.
7	USB3.0 HC	Synopsys	2.50a	1	USB3.0 Host Controller supports Super Speed, High-Speed, Full-Speed, and Low-Speed Compatible with the xHCI specification from Intel Corporation. It Supports upto 16 USB 2.0 ports and 16 USB 3.0 ports.

8	LPDDR2/ DDR3 Controller	Synopsys	1.20a	1	The Memory Controller provides means to access the external SDRAM memory. The controller is responsible for all protocols and arbitration and the DDR PHY responsible for the double data rate and strobe domain as well as signal integrity.
9	Trust Zone Address space controller	ARM	r0p1	3	TZASC (Trust zone Address Space Controller) is high-performance, area-optimized address space controller with on-chip AMBA bus interfaces. TZASC can be configured to provide the optimum security address region control functions required for the intended application.
10	HDMI Tx 1.4	Synopsys	1.31a	1	Required for transmitting audio and video information on single cable to the external world
11	MIPI CSI2	Synopsys	1.03a	1	The DWC_mipi_csi2_host is designed to receive data from a CSI-2 compliant camera sensor. A D-PHY configured as a Slave acts as the physical layer.
12	MIPI DSI	Synopsys	1.21a	1	The DesignWare Cores MIPI DSI Host Controller is a digital core that implements all protocol functions defined in the MIPI DSI specification. The DWC_mipi_dsi_host provides an interface between the system and the MIPI D-PHY, allowing the communication with a DSI-compliant display.
13	**LCDC (PL111)**	ARM	r0p2	1	The principal features of the CLCD controller are: • it supports single- and dual-panel mono Super Twisted Nematic (STN) displays with 4 or 8-bit interfaces • it supports single- and dual-panel color STN displays • it supports Thin Film Transistor (TFT) color displays • resolution programmable up to 1024x768 • 15 gray-level mono, 3375 color STN, and 32K color palettized TFT support • 16bpp true-color nonpalettized, for color STN and TFT • 24bpp true-color nonpalettized, for color TFT
14	BT Subsyste m	Mind tree	1.0	1	Refer BT subsystem Section for all internal IP’s

15	**SDMMC**	Synopsys	2.50a	2	It can be configured either as a Multimedia Card-only controller or as a Secure Digital_Multimedia Card controller, which simultaneously supports Secure Digital memory (SD Mem), Secure Digital I/O (SDIO), Multimedia Cards (MMC), and Consumer Electronics Advanced Transport Architecture (CE-ATA).
16	SMC (PL353)	ARM	r2p1	1	It is a high-performance, area-optimized SRAM and NAND memory controller with on-chip bus interfaces that conform to the AMBA Advanced eXtensible Interface (AXI) protocol.
17	EBI	ARM	r0p0	1	ARM Prime Cell EBI (PL 220) is an External Bus Interface Standard to provide arbitration between the Two SMC Memory Interfaces requiring access to data and address bus.
18	AXI2MEM (BP140)	ARM	r0p0	4	Used to convert the AXI signals to Onchip RAM/ROM signals. It is used to connect Onchip RAM, Onchip ROM with Main nic. Other one is used in Video Subsys to connect with Internal NIC301 of VSS. Other is used to connect with Internal NIC301 of BTSS.
19	**SPI Controller**	ARM	r1p3	3	Used to transmit or receive synchronous serial data and it does parallel to serial or serial to parallel conversions.
20	**GPIO (PL061)**	ARM	First release	4	The GPIO Supports the following features: • Eight individually programmable I/O Pins, default to input at reset. • Programmable Interrupt Generation capability from a transition or a level condition on any number of pins. • Bit masking in both read and write operations through address lines.
21	**I2C**	Synopsys	1.10a	3	I2C's are required for ARM sub system and Configuration of Camera and interfacing for any off-chip EEPROM's.
22	I2S	Synopsys	1.04a	1	Configurable number of stereo channels (upto 4) for both tx and rx. Supports audio data resolutions of 12,16,20,24 and 32 bits.

23	CAN	Opencores	TBD	1	Is used for Distributed real time Control with High level of Security
24	CoreSight DK A9	ARM	r2p0	1	The CoreSight architecture provides a system wide solution to real-time debug and trace. It recognizes: • The requirement for multi-core debug and trace. • The requirement to debug and trace the whole system beyond the core, for example buses. • The requirement to share resources, such as pins and trace storage, between debug and trace components, to keep silicon costs down.
25	GNSS	Accord	TBD	1	ACC GNSS DBB IP is silicon proven high performance, fast TTFF, massive correlator architecture GPS/QZSS/SBAS and GLONASS Baseband designed for low power and high performance applications
26	NVM	Synopsys	1.02a	1	The AEONMTP_AF_128R32CEH0P0Q32I32W0X1Y_K2 is a multiple-time-programmable (MTP), 4096-bit nonvolatile memory (NVM) block compatible with the TSMC 40 nm LP CMOS process.
27	**RTC (PL031)**	ARM	First release	1	The RTC can be used to provide a basic alarm function or long time base counter. This is achieved by generating an interrupt signal after counting for a programmed number of cycles of a real-time clock input.
28	WDT	ARM	r1p0	1	The WDT is a 32-bit down counter with a programmable timeout interval that generates an Interrupt output on timeout.
29	**DT(SP804)**	ARM	r1p0	2	The Dual-Timer module consists of two programmable 32/16-bit down counters that can generate interrupts on reaching zero.
30	**UART Controller (PL011)**	ARM	r1p5	8	The UART is an AMBA slave module that connects to the Advanced Peripheral Bus(APB). The UART includes an Infrared Data Association (IrDA) Serial InfraRed (SIR) protocol ENcoder/DECoder (ENDEC).
31	AHB2AXI Bridge	ARM	r0p0	1	Bridge is used for Coresight. Coresight is connected to NIC301 through this bridge.

32	Key board Mouse controller (PL050)	ARM	Third Release	1	Key board mouse interface to the SoC

Device Tree

MP CORE:

Cortex A9 Dual core Processor	SCU	256B	0xD46F_2000	0xD46F_20FF	"arm,cortex-a9-scu"
	GIC-Interface	**256B**	**0xD46F_2100**	**0xD46F_21FF**	"arm,cortex-a9-gic"
	GT	256B	0xD46F_2200	0xD46F_22FF	"arm,cortex-a9-global-timer"
	RESERVED	768B	0xD46F_2300	0xD46F_25FF	
	PT and WDT	256B	0xD46F_2600	0xD46F_26FF	"arm,cortex-a9-twd-wdt"
	RESERVED	2304B	0xD46F_2700	0xD46F_2FFF	
	GIC-Distributor	4KB	**0xD46F_3000**	**0xD46F_3FFF**	"arm,cortex-a9-gic"
	L2CC	4KB	0xD46F_4000	0xD46F_4FFF	"arm,pl310-cache"

IP List in Shikhara SoC – Address Map

IP	**SIZE**	**START-ADDRESS**	**END-ADDRESS**	**Compatible**	**Configuration Tag**
GPIO-0	4KB	0xD457_6000	0xD457_6FFF	arm,pl061", "arm,primecell"	CONFIG_GPIO_PL061=y
GPIO-1	4KB	0xD457_7000	0xD457_7FFF	arm,pl061", "arm,primecell"	CONFIG_GPIO_PL061=y
GPIO-2	4KB	0xD457_8000	0xD457_8FFF	arm,pl061", "arm,primecell"	CONFIG_GPIO_PL061=y
GPIO-3	4KB	0xD457_9000	0xD457_9FFF	arm,pl061", "arm,primecell"	CONFIG_GPIO_PL061=y
UART-0	4KB	0xD457_B000	0xD457_BFFF	"arm,pl011", "arm,primecell"	CONFIG_SERIAL_AMBA_PL011=y CONFIG_SERIAL_AMBA_PL011_CONSOLE=y
UART-1	4KB	0xD457_C000	0xD457_CFFF	"arm,pl011", "arm,primecell"	CONFIG_SERIAL_AMBA_PL011=y

					CONFIG_SERIAL_AMBA_PL011_CONSOLE=y
UART-2	4KB	0xD457_D000	0xD457_DFFF	"arm,pl011", "arm,primecell"	CONFIG_SERIAL_AMBA_PL011=y CONFIG_SERIAL_AMBA_PL011_CONSOLE=y
UART-3	4KB	0xD457_E000	0xD457_EFFF	"arm,pl011", "arm,primecell"	CONFIG_SERIAL_AMBA_PL011=y CONFIG_SERIAL_AMBA_PL011_CONSOLE=y
UART-4	4KB	0xD457_F000	0xD457_FFFF	"arm,pl011", "arm,primecell"	CONFIG_SERIAL_AMBA_PL011=y CONFIG_SERIAL_AMBA_PL011_CONSOLE=y
I2C-0	4KB	0xD458_2000	0xD458_2FFF	"snps,designware-i2c"	CONFIG_I2C_DESIGNWARE_CORE=y CONFIG_I2C_DESIGNWARE_PLATFORM=y
I2C-1	4KB	0xD458_3000	0xD458_3FFF	"snps,designware-i2c"	CONFIG_I2C_DESIGNWARE_CORE=y CONFIG_I2C_DESIGNWARE_PLATFORM=y
I2C-2	4KB	0xD458_4000	0xD458_4FFF	"snps,designware-i2c"	CONFIG_I2C_DESIGNWARE_CORE=y CONFIG_I2C_DESIGNWARE_PLATFORM=y
SPI-0	4KB	0xD457_2000	0xD457_2FFF	"arm,pl022", "arm,primecell"	CONFIG_SPI_PL022=y
SPI-1	4KB	0xD457_3000	0xD457_3FFF	"arm,pl022", "arm,primecell"	CONFIG_SPI_PL022=y
DT-0	4KB	0xD456_E000	0xD456_EFFF	"arm,sp804", "arm,primecell"	CONFIG_ARM_TIMER_SP804=y
DT-1	4KB	0xD456_F000	0xD456_FFFF	"arm,sp804", "arm,primecell"	CONFIG_ARM_TIMER_SP804=y
RTC	4KB	0xD45A_3000	0xD45A_3FFF	"arm,pl030", "arm,primecell"	CONFIG_RTC_DRV_PL030=y CONFIG_RTC_DRV_PL031=y
WDT	4KB	0xD457_1000	0xD457_1FFF	"arm,sp805", "arm,primecell"	CONFIG_ARM_SP805_WATCHDOG=y
CLCD	4KB	0xD455_4000	0xD455_4FFF	"arm,pl111", "arm,primecell"	
SD/MMC	4KB	0xD455_5000	0xD455_5FFF	"snps,dw-mshc"	CONFIG_MMC_DW=y

					CONFIG_MMC_DW_PLTFM=y
SDIO	4KB	0xD455_6000	0xD455_6FFF	"snps,dw-mshc"	CONFIG_MMC_DW=y CONFIG_MMC_DW_PLTFM=y

IRQ LIST

SL.No	IP	Interrupts	Signal Level	GIC[#]	Comment
1	Cortex-A9 MPCore Speed Optimized macrocell	1 (L2CC)	Active High	GIC[0]	
2		1 (SCUEVABORT)	Edge Triggered	GIC[1]	
3	GNSS	1	Active High	GIC[2]	
4	TZASC0	1	Active High	GIC[3]	
5	TZASC1	1	Active High	GIC[4]	
6	TZASC2	1	Active High	GIC[5]	
7	LPDDR2/DDR3	3	Active High	GIC[8:6]	
8	DMA64_M2M	2	Active High	GIC[10:9]	
9	CSI BRIDGE	1		GIC[11]	
10	MIPI CSI2	2	Active High	GIC[13:12]	
11	DSI BRIDGE	1		GIC[14]	
12	MIPI DSI	1	Active High	GIC[15]	
13	CLCD	1	Active High	GIC[16]	CLCD TOUCH_IRQ interrupt

14	HDMI BRIDGE	1		GIC[17]	
15	HDMI TX	2		GIC[19:18]	Need to discuss regarding levels of signals (Active High/Low).
16	USB3.0 Host	1	Active High	GIC[20]	1024 interrupts can be configured (for the worst case) but the decision on # of interrupts is based on the number of interrupts supported by USB Driver.
17	USB3.0 DRD	2	Active High	GIC[22:21]	The two Interrupts available are “bc _interrupt” and ” interrupt”. 1024 interrupts can be configured (for the worst case for host) but the decision on # of interrupts is based on the number of interrupts supported by USB Driver.
18	CLCD Controller	1	Active High	GIC[23]	
19	IPC(AV417)	1	Active High	GIC[24]	.
20	MALI 400MP	11	Active High	GIC[35:25]	
21	DMAC_0	2	Active High	GIC[37:36]	
22	SDMMC	1	Active High.	GIC[38]	
23	SDIO	1	Active High.	GIC[39]	
24	WDT	1	Active High	GIC[40]	
25	DT_0	1	Active High	GIC[41]	
26	DT_1	1	Active High	GIC[42]	
27	SMC	1	Active High	GIC[43]	
28	UART_0	1	Active High	GIC[44]	

29	UART_1	1	Active High	GIC[45]	
30	UART_2	1	Active High	GIC[46]	
31	UART_3	1	Active High	GIC[47]	
32	Cortex-A9 MPCore Speed Optimized macrocell	2 (CTI-IRQ)	Active Low	GIC[49:48]	
33		2 (PUMIRQ)	Active High	GIC[51:50]	
34		2 (COMMRX)	Active High	GIC[53:52]	
35		2 (COMMTX)	Active High	GIC[55:54]	
36	GPIO_0	1	Active High	GIC[56]	
37	GPIO_1	1	Active High	GIC[57]	
38	GPIO_2	1	Active High	GIC[58]	
39	GPIO_3	1	Active High	GIC[59]	
40	I2S	1	Active High	GIC[60]	
41	RTC	1	Active High	GIC[61]	
42	SPI _0	1	Active High	GIC[62]	
43	SPI _1	1	Active High	GIC[63]	
44	KMI	1	Active High	GIC[64]	
45	CAN	1	Active Low	GIC[65]	
46	I2C_0	1	Active High	GIC[66]	
47	I2C_1	1	Active High	GIC[67]	
48	I2C_2	1	Active High	GIC[68]	
49	BTSS	7	Active High	GIC[75:69]	
50	LPDDR2/DDR 3	1	Active High	GIC[76]	SBR_DONE_INTR

51	GNSS	1	Active High	GIC[77]	
52	PMU	1	Active High	GIC[78]	

Mach-shikhara

Step 1: mach-shikhara

arch/arm/Kconfig ---> add the following line

source "arch/arm/mach-shikhara/Kconfig"

create directory: arch/arm/**mach-shikhara**

Patch:

```
diff --git a/arch/arm/Kconfig b/arch/arm/Kconfig
index c0fcab6..3e27646 100644
--- a/arch/arm/Kconfig
+++ b/arch/arm/Kconfig
@@ -808,6 +808,8 @@ source "arch/arm/mach-socfpga/Kconfig"

 source "arch/arm/mach-spear/Kconfig"

+source "arch/arm/mach-shikhara/Kconfig"
+
 source "arch/arm/mach-sti/Kconfig"

 source "arch/arm/mach-stm32/Kconfig"
```

Step 2: UART PHY , UART VIRT

Patch:

```
diff --git a/arch/arm/Kconfig.debug b/arch/arm/Kconfig.debug
index 426d271..afdedfb 100644
--- a/arch/arm/Kconfig.debug
+++ b/arch/arm/Kconfig.debug
@@ -1070,6 +1070,14 @@ choice
                Say Y here if you want kernel low-level debugging support
                on ST SPEAr13xx based platforms.

+       config DEBUG_SHIKHARA
+               bool "Kernel low-level debugging messages via MOSCHIP Shikhara PL011 UART0"
+               depends on ARCH_MOSCHIP
```

```
+             select DEBUG_UART_PL01X
+             help
+               Say Y here if you want kernel low-level debugging support
+               on Moschip Shikhara based platforms.
+
      config STIH41X_DEBUG_ASC2
            bool "Use StiH415/416 ASC2 UART for low-level debug"
            depends on ARCH_STI
@@ -1514,6 +1522,7 @@ config DEBUG_UART_PHYS
      default 0xd4017000 if DEBUG_MMP_UART2
      default 0xd4018000 if DEBUG_MMP_UART3
      default 0xe0000000 if DEBUG_SPEAR13XX
+      default 0xd457b000 if DEBUG_SHIKHARA
      default 0xe4007000 if DEBUG_HIP04_UART
      default 0xe6c40000 if DEBUG_RMOBILE_SCIFA0
      default 0xe6c50000 if DEBUG_RMOBILE_SCIFA1
@@ -1608,6 +1617,7 @@ config DEBUG_UART_VIRT
      default 0xfc705000 if DEBUG_ZTE_ZX
      default 0xfcfe8600 if DEBUG_BCM63XX_UART
      default 0xfd000000 if DEBUG_SPEAR3XX || DEBUG_SPEAR13XX
+      default 0xf457b000 if DEBUG_SHIKHARA
      default 0xfd012000 if DEBUG_MVEBU_UART0_ALTERNATE && ARCH_MV78XX0
      default 0xfd883000 if DEBUG_ALPINE_UART0
      default 0xfde12000 if DEBUG_MVEBU_UART0_ALTERNATE && ARCH_DOVE
```

shikhara_defconfig:

```
CONFIG_DEBUG_LL=y
CONFIG_DEBUG_LL_UART_PL01X=y
CONFIG_DEBUG_LL_INCLUDE="debug/pl01x.S"
CONFIG_DEBUG_UART_PHYS=0xd457b000
CONFIG_DEBUG_UART_VIRT=0xf457b000
CONFIG_DEBUG_UNCOMPRESS=y
CONFIG_UNCOMPRESS_INCLUDE="debug/uncompress.h"
CONFIG_EARLY_PRINTK=y
```

Step 3: Kconfig , Makefile

arch/arm/mach-shikhara/Kconfig

```
menuconfig ARCH_MOSCHIP
      bool "MOSCHIP SHIKHARA family"
      depends on ARCH_MULTI_V7
      select ARM_AMBA
      select ARM_GIC
      select ARM_GLOBAL_TIMER
      select ARM_TIMER_SP804
      select GPIOLIB
```

select **HAVE_ARM_SCU if SMP**
select **HAVE_ARM_TWD if SMP**
select PINCTRL
select **MFD_SYSCON**
help
This option enables support Moschip shikhara EVB

You must boot using a Flattened Device Tree in order to use these platforms. The traditional (ATAGs) boot method is not usable on these boards with this option.

endif

arch/arm/mach-shikhara/Makefile

```
#
# Shikhara Platform specific Makefile
#

ccflags-$(CONFIG_ARCH_MULTIPLATFORM) := -I$(srctree)/$(src)/include


smp-$(CONFIG_SMP)               += headsmp.o platsmp.o
smp-$(CONFIG_HOTPLUG_CPU) += hotplug.o

obj-$(CONFIG_ARCH_SHIKHARA)     += shikhara.o $(smp-y)

CFLAGS_hotplug.o            += -march=armv7-a
```

Step 4: platsmp.c

arch/arm/mach-shikhara/platsmp.c

```
/*
 *  linux/arch/arm/mach-shikhara/platsmp.c
 *
 *  Copyright (C) 2002 ARM Ltd.
 *  All Rights Reserved
 *
 * This program is free software; you can redistribute it and/or modify
 * it under the terms of the GNU General Public License version 2 as
 * published by the Free Software Foundation.
 */
#include <linux/init.h>
#include <linux/errno.h>
#include <linux/smp.h>
#include <linux/io.h>
```

```
#include <linux/of_address.h>
#include <linux/vexpress.h>
#include <asm/mcpm.h>
#include <asm/smp_scu.h>
#include <asm/mach/map.h>
#include "generic.h"


/*
 * Write pen_release in a way that is guaranteed to be visible to all
 * observers, irrespective of whether they're taking part in coherency
 * or not.  This is necessary for the hotplug code to work reliably.
 */
static void write_pen_release(int val)
{
	pen_release = val;
	smp_wmb();
	sync_cache_w(&pen_release);
}

static DEFINE_SPINLOCK(boot_lock);


static void shikhara_secondary_init(unsigned int cpu)
{
	/*
	 * let the primary processor know we're out of the
	 * pen, then head off into the C entry point
	 */
	write_pen_release(-1);

	/*
	 * Synchronise with the boot thread.
	 */
	spin_lock(&boot_lock);
	spin_unlock(&boot_lock);
}

static int shikhara_boot_secondary(unsigned int cpu, struct task_struct *idle)
{
	unsigned long timeout;

	/*
	 * set synchronisation state between this boot processor
	 * and the secondary one
	 */
	spin_lock(&boot_lock);

	/*
```

```
	 * The secondary processor is waiting to be released from
	 * the holding pen - release it, then wait for it to flag
	 * that it has been released by resetting pen_release.
	 *
	 * Note that "pen_release" is the hardware CPU ID, whereas
	 * "cpu" is Linux's internal ID.
	 */
	write_pen_release(cpu);

	timeout = jiffies + (1 * HZ);
	while (time_before(jiffies, timeout)) {
		smp_rmb();
		if (pen_release == -1)
			break;

		udelay(10);
	}

	/*
	 * now the secondary core is starting up let it run its
	 * calibrations, then wait for it to finish
	 */
	spin_unlock(&boot_lock);

	return pen_release != -1 ? -ENOSYS : 0;
}


static const struct of_device_id shikhara_smp_dt_scu_match[] __initconst = {
	{ .compatible = "arm,cortex-a9-scu", },
	{}
};

static void __init shikhara_smp_dt_prepare_cpus(unsigned int max_cpus)
{
	struct device_node *scu = of_find_matching_node(NULL,
			shikhara_smp_dt_scu_match);

	if (scu)
		scu_enable(of_iomap(scu, 0));

	/*
	 * Write the address of secondary startup into the
	 * system-wide flags register. The boot monitor waits
	 * until it receives a soft interrupt, and then the
	 * secondary CPU branches to this address.
	 */
	//__raw_writel(__pa_symbol(shikhara_secondary_startup), SYS_LOCATION);
}
```

```
const struct smp_operations shikhara_smp_dt_ops __initconst = {
        .smp_prepare_cpus     = shikhara_smp_dt_prepare_cpus,
        .smp_secondary_init   = shikhara_secondary_init,
        .smp_boot_secondary = shikhara_boot_secondary,
#ifdef CONFIG_HOTPLUG_CPU
        .cpu_die                    = shikhara_cpu_die,
#endif
};
```

Step 5: hotplug.c

arch/arm/mach-shikhara/hotplug.c

```
/*
 * linux/arch/arm/mach-shikhara/hotplug.c
 *
 * Copyright (C) 2012 ST Microelectronics Ltd.
 * Deepak Sikri <deepak.sikri@st.com>
 *
 * based upon linux/arch/arm/mach-realview/hotplug.c
 *
 * This program is free software; you can redistribute it and/or modify
 * it under the terms of the GNU General Public License version 2 as
 * published by the Free Software Foundation.
 */
#include <linux/kernel.h>
#include <linux/errno.h>
#include <linux/smp.h>
#include <asm/cp15.h>
#include <asm/smp_plat.h>

static inline void cpu_enter_lowpower(void)
{
        unsigned int v;

        asm volatile(
        "       mcr     p15, 0, %1, c7, c5, 0\n"
        "       dsb\n"
        /*
         * Turn off coherency
         */
        "       mrc     p15, 0, %0, c1, c0, 1\n"
        "       bic     %0, %0, #0x20\n"
        "       mcr     p15, 0, %0, c1, c0, 1\n"
        "       mrc     p15, 0, %0, c1, c0, 0\n"
        "       bic     %0, %0, %2\n"
```

```
	"	mcr	p15, 0, %0, c1, c0, 0\n"
	: "=&r" (v)
	: "r" (0), "Ir" (CR_C)
	: "cc", "memory");
}

static inline void cpu_leave_lowpower(void)
{
	unsigned int v;

	asm volatile("mrc	p15, 0, %0, c1, c0, 0\n"
	"	orr	%0, %0, %1\n"
	"	mcr	p15, 0, %0, c1, c0, 0\n"
	"	mrc	p15, 0, %0, c1, c0, 1\n"
	"	orr	%0, %0, #0x20\n"
	"	mcr	p15, 0, %0, c1, c0, 1\n"
	: "=&r" (v)
	: "Ir" (CR_C)
	: "cc");
}

static inline void shikhara_do_lowpower(unsigned int cpu, int *spurious)
{
	for (;;) {
		wfi();

		if (pen_release == cpu) {
			/*
			 * OK, proper wakeup, we're done
			 */
			break;
		}

		/*
		 * Getting here, means that we have come out of WFI without
		 * having been woken up - this shouldn't happen
		 *
		 * Just note it happening - when we're woken, we can report
		 * its occurrence.
		 */
		(*spurious)++;
	}
}

/*
 * platform-specific code to shutdown a CPU
 *
 * Called with IRQs disabled
 */
```

```
void shikhara_cpu_die(unsigned int cpu)
{
	int spurious = 0;

	/*
	 * we're ready for shutdown now, so do it
	 */
	cpu_enter_lowpower();
	shikhara_do_lowpower(cpu, &spurious);

	/*
	 * bring this CPU back into the world of cache
	 * coherency, and then restore interrupts
	 */
	cpu_leave_lowpower();

	if (spurious)
		pr_warn("CPU%u: %u spurious wakeup calls\n", cpu, spurious);
}
```

Step 6: shikhara.c

arch/arm/mach-shikhara/shikhara.c

```
/*
 * shikhara board support using the device tree
 *
 *  Copyright (C) 2010 Secret Lab Technologies Ltd.
 *  Copyright (C) 2009 Jeremy Kerr <jeremy.kerr@canonical.com>
 *  Copyright (C) 2004 ARM Limited
 *  Copyright (C) 2000 Deep Blue Solutions Ltd
 *
 * This program is free software; you can redistribute it and/or modify
 * it under the terms of the GNU General Public License as published by
 * the Free Software Foundation; either version 2 of the License, or
 * (at your option) any later version.
 *
 * This program is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the
 * GNU General Public License for more details.
 *
 * You should have received a copy of the GNU General Public License
 * along with this program; if not, write to the Free Software
 * Foundation, Inc., 59 Temple Place, Suite 330, Boston, MA  02111-1307  USA
 */

#include <linux/init.h>
```

```
#include <linux/io.h>
#include <linux/of.h>
#include <linux/of_address.h>
#include <linux/of_irq.h>
#include <linux/of_platform.h>
#include <linux/slab.h>
#include <linux/amba/bus.h>
#include <linux/amba/mmci.h>
#include <asm/mach-types.h>
#include <asm/mach/arch.h>

static const char *const shikhara_dt_match[] __initconst = {
        "moschip,shikhara-evb",
        "moschip,shikhara",
        NULL,
};

DT_MACHINE_START(MOSCHIP_SHIKHARA,"MOSCHIP-SHIKHARA-EVB")
        .dt_compat      = shikhara_dt_match
MACHINE_END
```

Step 7: generic.h

arch/arm/mach-shikhara/generic.h

```
/*
 * spear machine family generic header file
 *
 * Copyright (C) 2009-2012 ST Microelectronics
 * Rajeev Kumar <rajeev-dlh.kumar@st.com>
 * Viresh Kumar <vireshk@kernel.org>
 *
 * This file is licensed under the terms of the GNU General Public
 * License version 2. This program is licensed "as is" without any
 * warranty of any kind, whether express or implied.
 */

#ifndef __MACH_GENERIC_H
#define __MACH_GENERIC_H

#include <linux/dmaengine.h>
#include <linux/init.h>
#include <linux/reboot.h>
#include <asm/mach/time.h>
```

void shikhara_cpu_die(unsigned int cpu);

```
#endif /* __MACH_GENERIC_H */
```

Step 7: Device Tree

arch/arm/boot/dts/shikhara.dts

```
/*
 *Reference: DTS file for all Shikahara SoCs
*/
/dts-v1/;
/include/ "skeleton.dtsi"

/ {
        model = "shikhara";
        compatible = "moschip,shikhara-evb", "moschip,shikhara";
        interrupt-parent = <&gic>;
        #address-cells = <1>;
        #size-cells = <1>;


          cpus {
                  #address-cells = <1>;
                  #size-cells = <0>;

                  cpu@0 {
                          compatible = "arm,cortex-a9";
                          device_type = "cpu";
                          reg = <0>;
                  };

                  cpu@1 {
                          compatible = "arm,cortex-a9";
                          device_type = "cpu";
                          reg = <1>;
                  };
          };

       mpcore {
                compatible = "simple-bus";
                #address-cells = <1>;
                #size-cells = <1>;
                 scu: snoop-control-unit@d46f2000 {
                    compatible = "arm,cortex-a9-scu";
                        reg = <0xd46f2000 0x100>;
                };
                 timer@d4652200 {
                        compatible = "arm,cortex-a9-global-timer";
                        reg = <0xd4652200 0x100>;
```

```
    };
    watchdog@d46f2600 {
            compatible = "arm,cortex-a9-twd-wdt";
            reg = <0xd46f2600 0x100>;
    };
     gic: interrupt-controller@d46f3000 {
            compatible = "arm,cortex-a9-gic";
            interrupt-controller;
            #interrupt-cells = <3>;
            reg = < 0xd46f3000 0x1000 >,
                            < 0xd46f2100 0x0200 >;
    };
   L2: cache-controller@8000 {
            compatible = "arm,pl310-cache";
            reg = <0x8000 0x1000>;
            cache-unified;
            cache-level = <2>;
            arm,double-linefill-incr = <1>;
            arm,double-linefill-wrap = <0>;
            arm,double-linefill = <1>;
                    prefetch-data = <1>;
    };

};

memory {
            name = "memory";
            device_type = "memory";
            reg = <0x00000000 0x80000000>;
};

chosen {
            bootargs = "console=ttyAMA0,115200";
};

xtal24mhz: xtal24mhz@24M {
            #clock-cells = <0>;
            compatible = "fixed-clock";
            clock-frequency = <24000000>;
};
pclk: pclk@24M {
            #clock-cells = <0>;
            compatible = "fixed-factor-clock";
            clock-div = <1>;
            clock-mult = <1>;
            clocks = <&xtal24mhz>;
};
timclk: timclk@1M {
                    #clock-cells = <0>;
```

```
                compatible = "fixed-factor-clock";
                clock-div = <24>;
                clock-mult = <1>;
                clocks = <&xtal24mhz>;
};

apb {
                #address-cells = <1>;
                #size-cells = <1>;
                compatible = "simple-bus";

                gpio0: gpio@d4576000 {
                        compatible = "arm,pl061", "arm,primecell";
                        reg = <0xd4576000 0x1000>;
                        interrupts = <0 56 0x4>;
                        gpio-controller;
                        #gpio-cells = <2>;
                        interrupt-controller;
                        #interrupt-cells = <2>;
                        status = "disabled";
                };

                gpio1: gpio@d4577000 {
                        compatible = "arm,pl061", "arm,primecell";
                        reg = <0xd4577000 0x1000>;
                        interrupts = <0 57 0x4>;
                        gpio-controller;
                        #gpio-cells = <2>;
                        interrupt-controller;
                        #interrupt-cells = <2>;
                        status = "disabled";
                };
                gpio2: gpio@d4578000 {
                        compatible = "arm,pl061", "arm,primecell";
                        reg = <0xD4578000 0x1000>;
                        interrupts = <0 58 0x4>;
                        gpio-controller;
                        #gpio-cells = <2>;
                        interrupt-controller;
                        #interrupt-cells = <2>;
                        status = "disabled";
                };

                gpio3: gpio@d4579000 {
                        compatible = "arm,pl061", "arm,primecell";
                        reg = <0xd4579000 0x1000>;
                        interrupts = <0 59 0x4>;
                        gpio-controller;
                        #gpio-cells = <2>;
```

```
        interrupt-controller;
        #interrupt-cells = <2>;
        status = "disabled";
    };


    uart0: uart@d457b000 {
            compatible = "arm,pl011", "arm,primecell";
            reg = <0xd457b000 0x1000>;
            interrupts = <0 44 0x4>;
            clocks = <&xtal24mhz>, <&pclk>;
            clock-names = "uartclk", "apb_pclk";
    };

    uart1: uart@d457c000 {
            compatible = "arm,pl011", "arm,primecell";
            reg = <0xd457c000 0x1000>;
            interrupts = <0 45 0x4>;
            clocks = <&xtal24mhz>, <&pclk>;
            clock-names = "uartclk", "apb_pclk";
    };

    uart2: uart@d457d000 {
            compatible = "arm,pl011", "arm,primecell";
            reg = <0xd457c000 0x1000>;
            interrupts = <0 46 0x4>;
            clocks = <&xtal24mhz>, <&pclk>;
            clock-names = "uartclk", "apb_pclk";
    };

    uart3: uart@d457e000 {
        compatible = "arm,pl011", "arm,primecell";
        reg = <0xd457e000 0x1000>;
        interrupts = <0 47 0x4>;
        clocks = <&xtal24mhz>, <&pclk>;
        clock-names = "uartclk", "apb_pclk";
};

    uart4: uart@d457f000 {
        compatible = "arm,pl011", "arm,primecell";
        reg = <0xd457f000 0x1000>;
        interrupts = <0 48 0x4>;
        clocks = <&xtal24mhz>, <&pclk>;
        clock-names = "uartclk", "apb_pclk";
    };

    timer0: timer@d456e000 {
            compatible = "arm,sp804", "arm,primecell";
            reg = <0xd456e000 0x1000>;
```

```
        interrupts = <0 41 0x4>;
        clocks = <&timclk>, <&timclk>, <&pclk>;
        clock-names = "timer0", "timer1", "apb_pclk";
};

timer1: timer@d456f000 {
        compatible = "arm,sp804", "arm,primecell";
        reg = <0xd456f000 0x1000>;
        interrupts = <0 42 0x4>;
        clocks = <&timclk>, <&timclk>, <&pclk>;
        clock-names = "timer0", "timer1", "apb_pclk";
};

watchdog@d4571000 {
        compatible = "arm,sp805", "arm,primecell";
        reg = <0xd4571000 0x1000>;
        interrupts = <0 40 4>;
        clocks = <&timclk>, <&pclk>;
        clock-names = "wdogclk", "apb_pclk";
};

rtc1: rtc@d45a3000 {
        compatible = "arm,pl030", "arm,primecell";
        reg = <0xd45a3000 0x1000>;
        interrupts = <0 61 0x4>;
        clocks = <&pclk>;
        clock-names = "apb_pclk";
};

i2c0: i2c@d4582000 {
        #address-cells = <1>;
        #size-cells = <0>;
        compatible = "snps,designware-i2c";
        reg = <0xd452000 0x1000>;
        interrupts = <0 66 0x4>;
        status = "disabled";
};
i2c1: i2c@d453000 {
        #address-cells = <1>;
        #size-cells = <0>;
        compatible = "snps,designware-i2c";
        reg = <0xd4583000 0x1000>;
        interrupts = <0 67 0x4>;
        status = "disabled";
};
i2c2: i2c@d4584000 {
        #address-cells = <1>;
        #size-cells = <0>;
        compatible = "snps,designware-i2c";
```

```
                reg = <0xd4584000 0x1000>;
                interrupts = <0 68 0x4>;
                status = "disabled";
        };
        spi0: spi@d4572000 {
                compatible = "arm,pl022", "arm,primecell";
                reg = <0xd4572000 0x1000>;
                #address-cells = <1>;
                #size-cells = <0>;
                interrupts = <0 62 0x4>;
                status = "disabled";
        };
        spi1: spi@d4573000 {
                compatible = "arm,pl022", "arm,primecell";
                reg = <0xd4573000 0x1000>;
                #address-cells = <1>;
                #size-cells = <0>;
                interrupts = <0 63 0x4>;
                status = "disabled";
        };
        lcdc: lcd-controller@d4554000 {
                compatible = "arm,pl111", "arm,primecell";
                reg = <0xd4554000 0x1000>;
                interrupts = <0 23 0x4>;
                status = "disabled";
        };

        mmcsd0: mmcsd@d4555000 {
                compatible = "snps,dw-mshc";
                reg = <0xd4555000 0x1000>;
                interrupts = <0 38 0x4>;
                num-slots = <1>;
                status = "disabled";
        };
        mmcsd1: mmcsd@d4556000 {
              compatible = "snps,dw-mshc";
              reg = <0xd4556000 0x1000>;
              interrupts = <0 39 0x4>;
              num-slots = <1>;
              status = "disabled";
        };
    };
};
```

Step 7: shikhara_defconfig

```
#
# Automatically generated file; DO NOT EDIT.
# Linux/arm 4.12.2 Kernel Configuration
#
CONFIG_ARM=y
CONFIG_ARM_HAS_SG_CHAIN=y
CONFIG_MIGHT_HAVE_PCI=y
CONFIG_SYS_SUPPORTS_APM_EMULATION=y
CONFIG_HAVE_PROC_CPU=y
CONFIG_STACKTRACE_SUPPORT=y
CONFIG_LOCKDEP_SUPPORT=y
CONFIG_TRACE_IRQFLAGS_SUPPORT=y
CONFIG_RWSEM_XCHGADD_ALGORITHM=y
CONFIG_FIX_EARLYCON_MEM=y
CONFIG_GENERIC_HWEIGHT=y
CONFIG_GENERIC_CALIBRATE_DELAY=y
CONFIG_NEED_DMA_MAP_STATE=y
CONFIG_ARCH_SUPPORTS_UPROBES=y
CONFIG_VECTORS_BASE=0xffff0000
CONFIG_ARM_PATCH_PHYS_VIRT=y
CONFIG_GENERIC_BUG=y
CONFIG_PGTABLE_LEVELS=2
CONFIG_DEFCONFIG_LIST="/lib/modules/$UNAME_RELEASE/.config"
CONFIG_IRQ_WORK=y
CONFIG_BUILDTIME_EXTABLE_SORT=y

#
# General setup
#
```

```
CONFIG_INIT_ENV_ARG_LIMIT=32
CONFIG_CROSS_COMPILE=""
# CONFIG_COMPILE_TEST is not set
CONFIG_LOCALVERSION=""
CONFIG_LOCALVERSION_AUTO=y
CONFIG_HAVE_KERNEL_GZIP=y
CONFIG_HAVE_KERNEL_LZMA=y
CONFIG_HAVE_KERNEL_XZ=y
CONFIG_HAVE_KERNEL_LZO=y
CONFIG_HAVE_KERNEL_LZ4=y
CONFIG_KERNEL_GZIP=y
# CONFIG_KERNEL_LZMA is not set
# CONFIG_KERNEL_XZ is not set
# CONFIG_KERNEL_LZO is not set
# CONFIG_KERNEL_LZ4 is not set
CONFIG_DEFAULT_HOSTNAME="(none)"
CONFIG_SWAP=y
CONFIG_SYSVIPC=y
CONFIG_SYSVIPC_SYSCTL=y
# CONFIG_POSIX_MQUEUE is not set
CONFIG_CROSS_MEMORY_ATTACH=y
CONFIG_FHANDLE=y
# CONFIG_USELIB is not set
# CONFIG_AUDIT is not set
CONFIG_HAVE_ARCH_AUDITSYSCALL=y

#
# IRQ subsystem
#
```

```
CONFIG_GENERIC_IRQ_PROBE=y
CONFIG_GENERIC_IRQ_SHOW=y
CONFIG_GENERIC_IRQ_SHOW_LEVEL=y
CONFIG_HARDIRQS_SW_RESEND=y
CONFIG_IRQ_DOMAIN=y
CONFIG_IRQ_DOMAIN_HIERARCHY=y
CONFIG_HANDLE_DOMAIN_IRQ=y
# CONFIG_IRQ_DOMAIN_DEBUG is not set
CONFIG_IRQ_FORCED_THREADING=y
CONFIG_SPARSE_IRQ=y
CONFIG_ARCH_CLOCKSOURCE_DATA=y
CONFIG_GENERIC_CLOCKEVENTS=y
CONFIG_ARCH_HAS_TICK_BROADCAST=y
CONFIG_GENERIC_CLOCKEVENTS_BROADCAST=y

#
# Timers subsystem
#
CONFIG_HZ_PERIODIC=y
# CONFIG_NO_HZ_IDLE is not set
# CONFIG_NO_HZ_FULL is not set
# CONFIG_NO_HZ is not set
# CONFIG_HIGH_RES_TIMERS is not set

#
# CPU/Task time and stats accounting
#
CONFIG_TICK_CPU_ACCOUNTING=y
# CONFIG_VIRT_CPU_ACCOUNTING_GEN is not set
```

```
# CONFIG_IRQ_TIME_ACCOUNTING is not set
CONFIG_BSD_PROCESS_ACCT=y
# CONFIG_BSD_PROCESS_ACCT_V3 is not set
# CONFIG_TASKSTATS is not set

#
# RCU Subsystem
#
CONFIG_TREE_RCU=y
# CONFIG_RCU_EXPERT is not set
CONFIG_SRCU=y
CONFIG_TREE_SRCU=y
# CONFIG_TASKS_RCU is not set
CONFIG_RCU_STALL_COMMON=y
CONFIG_RCU_NEED_SEGCBLIST=y
CONFIG_TREE_RCU_TRACE=y
# CONFIG_BUILD_BIN2C is not set
# CONFIG_IKCONFIG is not set
CONFIG_LOG_BUF_SHIFT=17
CONFIG_LOG_CPU_MAX_BUF_SHIFT=12
CONFIG_PRINTK_SAFE_LOG_BUF_SHIFT=13
CONFIG_GENERIC_SCHED_CLOCK=y
# CONFIG_CGROUPS is not set
# CONFIG_CHECKPOINT_RESTORE is not set
CONFIG_NAMESPACES=y
CONFIG_UTS_NS=y
CONFIG_IPC_NS=y
# CONFIG_USER_NS is not set
CONFIG_PID_NS=y
```

CONFIG_NET_NS=y

CONFIG_SCHED_AUTOGROUP is not set

CONFIG_SYSFS_DEPRECATED is not set

CONFIG_RELAY is not set

CONFIG_BLK_DEV_INITRD=y

CONFIG_INITRAMFS_SOURCE=""

CONFIG_RD_GZIP=y

CONFIG_RD_BZIP2=y

CONFIG_RD_LZMA=y

CONFIG_RD_XZ=y

CONFIG_RD_LZO=y

CONFIG_RD_LZ4=y

CONFIG_CC_OPTIMIZE_FOR_PERFORMANCE=y

CONFIG_CC_OPTIMIZE_FOR_SIZE is not set

CONFIG_SYSCTL=y

CONFIG_ANON_INODES=y

CONFIG_HAVE_UID16=y

CONFIG_BPF=y

CONFIG_EXPERT is not set

CONFIG_UID16=y

CONFIG_MULTIUSER=y

CONFIG_SGETMASK_SYSCALL is not set

CONFIG_SYSFS_SYSCALL=y

CONFIG_SYSCTL_SYSCALL is not set

CONFIG_POSIX_TIMERS=y

CONFIG_KALLSYMS=y

CONFIG_KALLSYMS_ALL is not set

CONFIG_KALLSYMS_ABSOLUTE_PERCPU is not set

CONFIG_KALLSYMS_BASE_RELATIVE=y

CONFIG_PRINTK=y

CONFIG_PRINTK_NMI=y

CONFIG_BUG=y

CONFIG_ELF_CORE=y

CONFIG_BASE_FULL=y

CONFIG_FUTEX=y

CONFIG_EPOLL=y

CONFIG_SIGNALFD=y

CONFIG_TIMERFD=y

CONFIG_EVENTFD=y

CONFIG_BPF_SYSCALL is not set

CONFIG_SHMEM=y

CONFIG_AIO=y

CONFIG_ADVISE_SYSCALLS=y

CONFIG_USERFAULTFD is not set

CONFIG_MEMBARRIER=y

CONFIG_EMBEDDED is not set

CONFIG_HAVE_PERF_EVENTS=y

CONFIG_PERF_USE_VMALLOC=y

CONFIG_PC104 is not set

#

Kernel Performance Events And Counters

#

CONFIG_PERF_EVENTS is not set

CONFIG_VM_EVENT_COUNTERS=y

CONFIG_SLUB_DEBUG=y

CONFIG_COMPAT_BRK=y

CONFIG_SLAB is not set

CONFIG_SLUB=y

CONFIG_SLAB_FREELIST_RANDOM is not set

CONFIG_SLUB_CPU_PARTIAL=y

CONFIG_SYSTEM_DATA_VERIFICATION is not set

CONFIG_PROFILING is not set

CONFIG_HAVE_OPROFILE=y

CONFIG_KPROBES is not set

CONFIG_JUMP_LABEL is not set

CONFIG_UPROBES is not set

CONFIG_HAVE_64BIT_ALIGNED_ACCESS is not set

CONFIG_HAVE_EFFICIENT_UNALIGNED_ACCESS=y

CONFIG_ARCH_USE_BUILTIN_BSWAP=y

CONFIG_HAVE_KPROBES=y

CONFIG_HAVE_KRETPROBES=y

CONFIG_HAVE_OPTPROBES=y

CONFIG_HAVE_NMI=y

CONFIG_HAVE_ARCH_TRACEHOOK=y

CONFIG_HAVE_DMA_CONTIGUOUS=y

CONFIG_GENERIC_SMP_IDLE_THREAD=y

CONFIG_GENERIC_IDLE_POLL_SETUP=y

CONFIG_ARCH_HAS_SET_MEMORY=y

CONFIG_HAVE_REGS_AND_STACK_ACCESS_API=y

CONFIG_HAVE_CLK=y

CONFIG_HAVE_DMA_API_DEBUG=y

CONFIG_HAVE_PERF_REGS=y

CONFIG_HAVE_PERF_USER_STACK_DUMP=y

CONFIG_HAVE_ARCH_JUMP_LABEL=y

CONFIG_ARCH_WANT_IPC_PARSE_VERSION=y

CONFIG_HAVE_ARCH_SECCOMP_FILTER=y

CONFIG_HAVE_GCC_PLUGINS=y

CONFIG_GCC_PLUGINS is not set

CONFIG_HAVE_CC_STACKPROTECTOR=y

CONFIG_CC_STACKPROTECTOR is not set

CONFIG_CC_STACKPROTECTOR_NONE=y

CONFIG_CC_STACKPROTECTOR_REGULAR is not set

CONFIG_CC_STACKPROTECTOR_STRONG is not set

CONFIG_HAVE_CONTEXT_TRACKING=y

CONFIG_HAVE_VIRT_CPU_ACCOUNTING_GEN=y

CONFIG_HAVE_IRQ_TIME_ACCOUNTING=y

CONFIG_HAVE_MOD_ARCH_SPECIFIC=y

CONFIG_MODULES_USE_ELF_REL=y

CONFIG_ARCH_HAS_ELF_RANDOMIZE=y

CONFIG_HAVE_ARCH_MMAP_RND_BITS=y

CONFIG_HAVE_EXIT_THREAD=y

CONFIG_ARCH_MMAP_RND_BITS_MIN=8

CONFIG_ARCH_MMAP_RND_BITS_MAX=16

CONFIG_ARCH_MMAP_RND_BITS=8

CONFIG_HAVE_ARCH_HASH is not set

CONFIG_ISA_BUS_API is not set

CONFIG_CLONE_BACKWARDS=y

CONFIG_OLD_SIGSUSPEND3=y

CONFIG_OLD_SIGACTION=y

CONFIG_CPU_NO_EFFICIENT_FFS is not set

CONFIG_HAVE_ARCH_VMAP_STACK is not set

CONFIG_ARCH_OPTIONAL_KERNEL_RWX=y

CONFIG_ARCH_OPTIONAL_KERNEL_RWX_DEFAULT=y

CONFIG_ARCH_HAS_STRICT_KERNEL_RWX=y

CONFIG_STRICT_KERNEL_RWX=y

CONFIG_ARCH_HAS_STRICT_MODULE_RWX=y

CONFIG_STRICT_MODULE_RWX=y

#

GCOV-based kernel profiling

#

CONFIG_GCOV_KERNEL is not set

CONFIG_ARCH_HAS_GCOV_PROFILE_ALL=y

CONFIG_HAVE_GENERIC_DMA_COHERENT=y

CONFIG_SLABINFO=y

CONFIG_RT_MUTEXES=y

CONFIG_BASE_SMALL=0

CONFIG_MODULES=y

CONFIG_MODULE_FORCE_LOAD is not set

CONFIG_MODULE_UNLOAD=y

CONFIG_MODULE_FORCE_UNLOAD is not set

CONFIG_MODVERSIONS=y

CONFIG_MODULE_SRCVERSION_ALL is not set

CONFIG_MODULE_SIG is not set

CONFIG_MODULE_COMPRESS is not set

CONFIG_TRIM_UNUSED_KSYMS is not set

CONFIG_BLOCK=y

CONFIG_LBDAF=y

CONFIG_BLK_SCSI_REQUEST=y

CONFIG_BLK_DEV_BSG=y

CONFIG_BLK_DEV_BSGLIB is not set

CONFIG_BLK_DEV_INTEGRITY is not set

CONFIG_BLK_DEV_ZONED is not set

CONFIG_BLK_CMDLINE_PARSER is not set

```
# CONFIG_BLK_WBT is not set
CONFIG_BLK_DEBUG_FS=y
# CONFIG_BLK_SED_OPAL is not set

#
# Partition Types
#
CONFIG_PARTITION_ADVANCED=y
# CONFIG_ACORN_PARTITION is not set
# CONFIG_AIX_PARTITION is not set
# CONFIG_OSF_PARTITION is not set
# CONFIG_AMIGA_PARTITION is not set
# CONFIG_ATARI_PARTITION is not set
# CONFIG_MAC_PARTITION is not set
CONFIG_MSDOS_PARTITION=y
# CONFIG_BSD_DISKLABEL is not set
# CONFIG_MINIX_SUBPARTITION is not set
# CONFIG_SOLARIS_X86_PARTITION is not set
# CONFIG_UNIXWARE_DISKLABEL is not set
# CONFIG_LDM_PARTITION is not set
# CONFIG_SGI_PARTITION is not set
# CONFIG_ULTRIX_PARTITION is not set
# CONFIG_SUN_PARTITION is not set
# CONFIG_KARMA_PARTITION is not set
CONFIG_EFI_PARTITION=y
# CONFIG_SYSV68_PARTITION is not set
# CONFIG_CMDLINE_PARTITION is not set

#
```

```
# IO Schedulers
#
CONFIG_IOSCHED_NOOP=y
CONFIG_IOSCHED_DEADLINE=y
CONFIG_IOSCHED_CFQ=y
# CONFIG_DEFAULT_DEADLINE is not set
CONFIG_DEFAULT_CFQ=y
# CONFIG_DEFAULT_NOOP is not set
CONFIG_DEFAULT_IOSCHED="cfq"
CONFIG_MQ_IOSCHED_DEADLINE=y
CONFIG_MQ_IOSCHED_KYBER=y
# CONFIG_IOSCHED_BFQ is not set
CONFIG_UNINLINE_SPIN_UNLOCK=y
CONFIG_ARCH_SUPPORTS_ATOMIC_RMW=y
CONFIG_MUTEX_SPIN_ON_OWNER=y
CONFIG_RWSEM_SPIN_ON_OWNER=y
CONFIG_LOCK_SPIN_ON_OWNER=y
CONFIG_FREEZER=y

#
# System Type
#
CONFIG_MMU=y
CONFIG_ARCH_MULTIPLATFORM=y
# CONFIG_ARCH_EBSA110 is not set
# CONFIG_ARCH_EP93XX is not set
# CONFIG_ARCH_FOOTBRIDGE is not set
# CONFIG_ARCH_NETX is not set
# CONFIG_ARCH_IOP13XX is not set
```

```
# CONFIG_ARCH_IOP32X is not set
# CONFIG_ARCH_IOP33X is not set
# CONFIG_ARCH_IXP4XX is not set
# CONFIG_ARCH_DOVE is not set
# CONFIG_ARCH_KS8695 is not set
# CONFIG_ARCH_W90X900 is not set
# CONFIG_ARCH_LPC32XX is not set
# CONFIG_ARCH_PXA is not set
# CONFIG_ARCH_RPC is not set
# CONFIG_ARCH_SA1100 is not set
# CONFIG_ARCH_S3C24XX is not set
# CONFIG_ARCH_DAVINCI is not set
# CONFIG_ARCH_OMAP1 is not set

#
# Multiple platform selection
#


#
# CPU Core family selection
#
# CONFIG_ARCH_MULTI_V6 is not set
CONFIG_ARCH_MULTI_V7=y
CONFIG_ARCH_MULTI_V6_V7=y
# CONFIG_ARCH_MULTI_CPU_AUTO is not set
# CONFIG_ARCH_VIRT is not set
# CONFIG_ARCH_MVEBU is not set
# CONFIG_ARCH_ALPINE is not set
# CONFIG_ARCH_ARTPEC is not set
```

```
# CONFIG_ARCH_AT91 is not set
# CONFIG_ARCH_BCM is not set
# CONFIG_ARCH_BERLIN is not set
# CONFIG_ARCH_DIGICOLOR is not set
# CONFIG_ARCH_HIGHBANK is not set
# CONFIG_ARCH_HISI is not set
# CONFIG_ARCH_KEYSTONE is not set
# CONFIG_ARCH_MESON is not set
# CONFIG_ARCH_MXC is not set
# CONFIG_ARCH_MEDIATEK is not set

#
# TI OMAP/AM/DM/DRA Family
#
# CONFIG_ARCH_OMAP3 is not set
# CONFIG_ARCH_OMAP4 is not set
# CONFIG_SOC_OMAP5 is not set
# CONFIG_SOC_AM33XX is not set
# CONFIG_SOC_AM43XX is not set
# CONFIG_SOC_DRA7XX is not set
# CONFIG_ARCH_MMP is not set
# CONFIG_ARCH_QCOM is not set
# CONFIG_ARCH_REALVIEW is not set
# CONFIG_ARCH_ROCKCHIP is not set
# CONFIG_ARCH_SOCFPGA is not set
# CONFIG_PLAT_SPEAR is not set
CONFIG_ARCH_MOSCHIP=y
# CONFIG_ARCH_STI is not set
# CONFIG_ARCH_S5PV210 is not set
```

```
# CONFIG_ARCH_EXYNOS is not set
# CONFIG_ARCH_RENESAS is not set
# CONFIG_ARCH_SUNXI is not set
# CONFIG_ARCH_SIRF is not set
# CONFIG_ARCH_TANGO is not set
# CONFIG_ARCH_TEGRA is not set
# CONFIG_ARCH_UNIPHIER is not set
# CONFIG_ARCH_U8500 is not set
# CONFIG_ARCH_VEXPRESS is not set
# CONFIG_ARCH_WM8850 is not set
# CONFIG_ARCH_ZX is not set
# CONFIG_ARCH_ZYNQ is not set

#
# Processor Type
#
CONFIG_CPU_V7=y
CONFIG_CPU_THUMB_CAPABLE=y
CONFIG_CPU_32v6K=y
CONFIG_CPU_32v7=y
CONFIG_CPU_ABRT_EV7=y
CONFIG_CPU_PABRT_V7=y
CONFIG_CPU_CACHE_V7=y
CONFIG_CPU_CACHE_VIPT=y
CONFIG_CPU_COPY_V6=y
CONFIG_CPU_TLB_V7=y
CONFIG_CPU_HAS_ASID=y
CONFIG_CPU_CP15=y
CONFIG_CPU_CP15_MMU=y
```

```
#
# Processor Features
#
# CONFIG_ARM_LPAE is not set
# CONFIG_ARCH_PHYS_ADDR_T_64BIT is not set
CONFIG_ARM_THUMB=y
# CONFIG_ARM_THUMBEE is not set
CONFIG_ARM_VIRT_EXT=y
CONFIG_SWP_EMULATE=y
# CONFIG_CPU_ICACHE_DISABLE is not set
# CONFIG_CPU_BPREDICT_DISABLE is not set
CONFIG_KUSER_HELPERS=y
# CONFIG_VDSO is not set
CONFIG_OUTER_CACHE=y
CONFIG_OUTER_CACHE_SYNC=y
CONFIG_MIGHT_HAVE_CACHE_L2X0=y
CONFIG_CACHE_L2X0=y
# CONFIG_PL310_ERRATA_588369 is not set
# CONFIG_PL310_ERRATA_727915 is not set
# CONFIG_PL310_ERRATA_753970 is not set
# CONFIG_PL310_ERRATA_769419 is not set
CONFIG_ARM_L1_CACHE_SHIFT_6=y
CONFIG_ARM_L1_CACHE_SHIFT=6
CONFIG_ARM_DMA_MEM_BUFFERABLE=y
CONFIG_ARM_HEAVY_MB=y
CONFIG_DEBUG_ALIGN_RODATA=y
CONFIG_MULTI_IRQ_HANDLER=y
# CONFIG_ARM_ERRATA_430973 is not set
```

```
CONFIG_ARM_ERRATA_643719=y
# CONFIG_ARM_ERRATA_720789 is not set
# CONFIG_ARM_ERRATA_754322 is not set
# CONFIG_ARM_ERRATA_754327 is not set
# CONFIG_ARM_ERRATA_764369 is not set
# CONFIG_ARM_ERRATA_775420 is not set
# CONFIG_ARM_ERRATA_798181 is not set
# CONFIG_ARM_ERRATA_773022 is not set
# CONFIG_ARM_ERRATA_818325_852422 is not set
# CONFIG_ARM_ERRATA_821420 is not set
# CONFIG_ARM_ERRATA_825619 is not set
# CONFIG_ARM_ERRATA_852421 is not set
# CONFIG_ARM_ERRATA_852423 is not set

#
# Bus support
#
# CONFIG_PCI is not set
# CONFIG_PCI_DOMAINS_GENERIC is not set
# CONFIG_PCI_SYSCALL is not set

#
# DesignWare PCI Core Support
#

#
# PCI Endpoint
#
# CONFIG_PCI_ENDPOINT is not set
```

```
# CONFIG_PCCARD is not set


#
# Kernel Features
#
CONFIG_HAVE_SMP=y
CONFIG_SMP=y
# CONFIG_SMP_ON_UP is not set
# CONFIG_ARM_CPU_TOPOLOGY is not set
CONFIG_HAVE_ARM_SCU=y
# CONFIG_HAVE_ARM_ARCH_TIMER is not set
CONFIG_HAVE_ARM_TWD=y
# CONFIG_MCPM is not set
# CONFIG_BIG_LITTLE is not set
CONFIG_VMSPLIT_3G=y
# CONFIG_VMSPLIT_3G_OPT is not set
# CONFIG_VMSPLIT_2G is not set
# CONFIG_VMSPLIT_1G is not set
CONFIG_PAGE_OFFSET=0xC0000000
CONFIG_NR_CPUS=2
CONFIG_HOTPLUG_CPU=y
# CONFIG_ARM_PSCI is not set
CONFIG_ARCH_NR_GPIO=0
CONFIG_PREEMPT_NONE=y
# CONFIG_PREEMPT_VOLUNTARY is not set
# CONFIG_PREEMPT is not set
CONFIG_HZ_FIXED=0
CONFIG_HZ_100=y
# CONFIG_HZ_200 is not set
```

CONFIG_HZ_250 is not set

CONFIG_HZ_300 is not set

CONFIG_HZ_500 is not set

CONFIG_HZ_1000 is not set

CONFIG_HZ=100

CONFIG_SCHED_HRTICK is not set

CONFIG_THUMB2_KERNEL is not set

CONFIG_ARM_PATCH_IDIV=y

CONFIG_AEABI=y

CONFIG_OABI_COMPAT is not set

CONFIG_ARCH_SPARSEMEM_DEFAULT is not set

CONFIG_ARCH_SELECT_MEMORY_MODEL is not set

CONFIG_HAVE_ARCH_PFN_VALID=y

CONFIG_HIGHMEM is not set

CONFIG_CPU_SW_DOMAIN_PAN=y

CONFIG_ARCH_WANT_GENERAL_HUGETLB=y

CONFIG_ARM_MODULE_PLTS is not set

CONFIG_FLATMEM=y

CONFIG_FLAT_NODE_MEM_MAP=y

CONFIG_HAVE_MEMBLOCK=y

CONFIG_NO_BOOTMEM=y

CONFIG_HAVE_BOOTMEM_INFO_NODE is not set

CONFIG_SPLIT_PTLOCK_CPUS=4

CONFIG_COMPACTION=y

CONFIG_MIGRATION=y

CONFIG_PHYS_ADDR_T_64BIT is not set

CONFIG_KSM is not set

CONFIG_DEFAULT_MMAP_MIN_ADDR=4096

CONFIG_CLEANCACHE is not set

```
# CONFIG_FRONTSWAP is not set
# CONFIG_CMA is not set
# CONFIG_ZPOOL is not set
# CONFIG_ZBUD is not set
# CONFIG_ZSMALLOC is not set
CONFIG_GENERIC_EARLY_IOREMAP=y
# CONFIG_IDLE_PAGE_TRACKING is not set
CONFIG_FORCE_MAX_ZONEORDER=11
CONFIG_ALIGNMENT_TRAP=y
# CONFIG_UACCESS_WITH_MEMCPY is not set
# CONFIG_SECCOMP is not set
CONFIG_SWIOTLB=y
CONFIG_IOMMU_HELPER=y
# CONFIG_PARAVIRT is not set
# CONFIG_PARAVIRT_TIME_ACCOUNTING is not set
# CONFIG_XEN is not set

#
# Boot options
#
CONFIG_USE_OF=y
CONFIG_ATAGS=y
# CONFIG_DEPRECATED_PARAM_STRUCT is not set
CONFIG_ZBOOT_ROM_TEXT=0
CONFIG_ZBOOT_ROM_BSS=0
CONFIG_ARM_APPENDED_DTB=y
CONFIG_ARM_ATAG_DTB_COMPAT=y
CONFIG_ARM_ATAG_DTB_COMPAT_CMDLINE_FROM_BOOTLOADER=y
# CONFIG_ARM_ATAG_DTB_COMPAT_CMDLINE_EXTEND is not set
```

```
CONFIG_CMDLINE=""
# CONFIG_KEXEC is not set
# CONFIG_CRASH_DUMP is not set
CONFIG_AUTO_ZRELADDR=y
# CONFIG_EFI is not set

#
# CPU Power Management
#

#
# CPU Frequency scaling
#
# CONFIG_CPU_FREQ is not set

#
# CPU Idle
#
# CONFIG_CPU_IDLE is not set
# CONFIG_ARCH_NEEDS_CPU_IDLE_COUPLED is not set

#
# Floating point emulation
#

#
# At least one emulation must be selected
#
CONFIG_VFP=y
```

```
CONFIG_VFPv3=y
# CONFIG_NEON is not set

#
# Userspace binary formats
#
CONFIG_BINFMT_ELF=y
CONFIG_ELFCORE=y
CONFIG_CORE_DUMP_DEFAULT_ELF_HEADERS=y
CONFIG_BINFMT_SCRIPT=y
# CONFIG_BINFMT_FLAT is not set
# CONFIG_HAVE_AOUT is not set
CONFIG_BINFMT_MISC=y
CONFIG_COREDUMP=y

#
# Power management options
#
CONFIG_SUSPEND=y
CONFIG_SUSPEND_FREEZER=y
# CONFIG_HIBERNATION is not set
CONFIG_PM_SLEEP=y
CONFIG_PM_SLEEP_SMP=y
# CONFIG_PM_AUTOSLEEP is not set
# CONFIG_PM_WAKELOCKS is not set
CONFIG_PM=y
# CONFIG_PM_DEBUG is not set
# CONFIG_APM_EMULATION is not set
CONFIG_PM_CLK=y
```

```
# CONFIG_WQ_POWER_EFFICIENT_DEFAULT is not set
CONFIG_CPU_PM=y
CONFIG_ARCH_SUSPEND_POSSIBLE=y
CONFIG_ARM_CPU_SUSPEND=y
CONFIG_ARCH_HIBERNATION_POSSIBLE=y
CONFIG_NET=y

#
# Networking options
#
# CONFIG_PACKET is not set
CONFIG_UNIX=y
# CONFIG_UNIX_DIAG is not set
CONFIG_XFRM=y
# CONFIG_XFRM_USER is not set
# CONFIG_XFRM_SUB_POLICY is not set
# CONFIG_XFRM_MIGRATE is not set
# CONFIG_XFRM_STATISTICS is not set
# CONFIG_NET_KEY is not set
CONFIG_INET=y
# CONFIG_IP_MULTICAST is not set
# CONFIG_IP_ADVANCED_ROUTER is not set
CONFIG_IP_PNP=y
CONFIG_IP_PNP_DHCP=y
CONFIG_IP_PNP_BOOTP=y
# CONFIG_IP_PNP_RARP is not set
CONFIG_NET_IPIP=y
# CONFIG_NET_IPGRE_DEMUX is not set
CONFIG_NET_IP_TUNNEL=y
```

```
# CONFIG_SYN_COOKIES is not set
# CONFIG_NET_IPVTI is not set
# CONFIG_NET_UDP_TUNNEL is not set
# CONFIG_NET_FOU is not set
# CONFIG_NET_FOU_IP_TUNNELS is not set
# CONFIG_INET_AH is not set
# CONFIG_INET_ESP is not set
# CONFIG_INET_IPCOMP is not set
# CONFIG_INET_XFRM_TUNNEL is not set
CONFIG_INET_TUNNEL=y
CONFIG_INET_XFRM_MODE_TRANSPORT=y
CONFIG_INET_XFRM_MODE_TUNNEL=y
CONFIG_INET_XFRM_MODE_BEET=y
CONFIG_INET_DIAG=y
CONFIG_INET_TCP_DIAG=y
# CONFIG_INET_UDP_DIAG is not set
# CONFIG_INET_RAW_DIAG is not set
# CONFIG_INET_DIAG_DESTROY is not set
# CONFIG_TCP_CONG_ADVANCED is not set
CONFIG_TCP_CONG_CUBIC=y
CONFIG_DEFAULT_TCP_CONG="cubic"
# CONFIG_TCP_MD5SIG is not set
CONFIG_IPV6=y
# CONFIG_IPV6_ROUTER_PREF is not set
# CONFIG_IPV6_OPTIMISTIC_DAD is not set
# CONFIG_INET6_AH is not set
# CONFIG_INET6_ESP is not set
# CONFIG_INET6_IPCOMP is not set
# CONFIG_IPV6_MIP6 is not set
```

CONFIG_INET6_XFRM_TUNNEL is not set

CONFIG_INET6_TUNNEL is not set

CONFIG_INET6_XFRM_MODE_TRANSPORT=y

CONFIG_INET6_XFRM_MODE_TUNNEL=y

CONFIG_INET6_XFRM_MODE_BEET=y

CONFIG_INET6_XFRM_MODE_ROUTEOPTIMIZATION is not set

CONFIG_IPV6_VTI is not set

CONFIG_IPV6_SIT=y

CONFIG_IPV6_SIT_6RD is not set

CONFIG_IPV6_NDISC_NODETYPE=y

CONFIG_IPV6_TUNNEL is not set

CONFIG_IPV6_FOU is not set

CONFIG_IPV6_FOU_TUNNEL is not set

CONFIG_IPV6_MULTIPLE_TABLES is not set

CONFIG_IPV6_MROUTE is not set

CONFIG_IPV6_SEG6_LWTUNNEL is not set

CONFIG_IPV6_SEG6_HMAC is not set

CONFIG_NETWORK_SECMARK is not set

CONFIG_NET_PTP_CLASSIFY=y

CONFIG_NETWORK_PHY_TIMESTAMPING is not set

CONFIG_NETFILTER is not set

CONFIG_IP_DCCP is not set

CONFIG_IP_SCTP is not set

CONFIG_RDS is not set

CONFIG_TIPC is not set

CONFIG_ATM is not set

CONFIG_L2TP is not set

CONFIG_BRIDGE is not set

CONFIG_VLAN_8021Q is not set

```
# CONFIG_DECNET is not set
# CONFIG_LLC2 is not set
# CONFIG_IPX is not set
# CONFIG_ATALK is not set
# CONFIG_X25 is not set
# CONFIG_LAPB is not set
# CONFIG_PHONET is not set
# CONFIG_6LOWPAN is not set
# CONFIG_IEEE802154 is not set
# CONFIG_NET_SCHED is not set
# CONFIG_DCB is not set
# CONFIG_BATMAN_ADV is not set
# CONFIG_OPENVSWITCH is not set
# CONFIG_VSOCKETS is not set
# CONFIG_NETLINK_DIAG is not set
# CONFIG_MPLS is not set
# CONFIG_HSR is not set
# CONFIG_NET_SWITCHDEV is not set
# CONFIG_NET_L3_MASTER_DEV is not set
# CONFIG_NET_NCSI is not set
CONFIG_RPS=y
CONFIG_RFS_ACCEL=y
CONFIG_XPS=y
CONFIG_NET_RX_BUSY_POLL=y
CONFIG_BQL=y
# CONFIG_BPF_JIT is not set
CONFIG_NET_FLOW_LIMIT=y

#
```

```
# Network testing
#
# CONFIG_NET_PKTGEN is not set
# CONFIG_HAMRADIO is not set
# CONFIG_CAN is not set
# CONFIG_IRDA is not set
# CONFIG_BT is not set
# CONFIG_AF_RXRPC is not set
# CONFIG_AF_KCM is not set
# CONFIG_STREAM_PARSER is not set
CONFIG_WIRELESS=y
# CONFIG_CFG80211 is not set
# CONFIG_LIB80211 is not set

#
# CFG80211 needs to be enabled for MAC80211
#
CONFIG_MAC80211_STA_HASH_MAX_SIZE=0
# CONFIG_WIMAX is not set
# CONFIG_RFKILL is not set
# CONFIG_NET_9P is not set
# CONFIG_CAIF is not set
# CONFIG_CEPH_LIB is not set
# CONFIG_NFC is not set
# CONFIG_PSAMPLE is not set
# CONFIG_NET_IFE is not set
# CONFIG_LWTUNNEL is not set
CONFIG_DST_CACHE=y
CONFIG_GRO_CELLS=y
```

```
# CONFIG_NET_DEVLINK is not set
CONFIG_MAY_USE_DEVLINK=y
CONFIG_HAVE_CBPF_JIT=y

#
# Device Drivers
#
CONFIG_ARM_AMBA=y

#
# Generic Driver Options
#
CONFIG_UEVENT_HELPER=y
CONFIG_UEVENT_HELPER_PATH="/sbin/hotplug"
# CONFIG_DEVTMPFS is not set
CONFIG_STANDALONE=y
CONFIG_PREVENT_FIRMWARE_BUILD=y
CONFIG_FW_LOADER=y
CONFIG_FIRMWARE_IN_KERNEL=y
CONFIG_EXTRA_FIRMWARE=""
# CONFIG_FW_LOADER_USER_HELPER_FALLBACK is not set
CONFIG_ALLOW_DEV_COREDUMP=y
# CONFIG_DEBUG_DRIVER is not set
# CONFIG_DEBUG_DEVRES is not set
# CONFIG_DEBUG_TEST_DRIVER_REMOVE is not set
# CONFIG_TEST_ASYNC_DRIVER_PROBE is not set
# CONFIG_SYS_HYPERVISOR is not set
# CONFIG_GENERIC_CPU_DEVICES is not set
CONFIG_GENERIC_CPU_AUTOPROBE=y
```

CONFIG_REGMAP=y

CONFIG_REGMAP_I2C=y

CONFIG_REGMAP_SPI=y

CONFIG_REGMAP_MMIO=y

CONFIG_DMA_SHARED_BUFFER is not set

#

Bus devices

#

CONFIG_BRCMSTB_GISB_ARB is not set

CONFIG_VEXPRESS_CONFIG is not set

CONFIG_CONNECTOR is not set

CONFIG_MTD=y

CONFIG_MTD_TESTS is not set

CONFIG_MTD_REDBOOT_PARTS is not set

CONFIG_MTD_CMDLINE_PARTS is not set

CONFIG_MTD_AFS_PARTS is not set

CONFIG_MTD_OF_PARTS=y

CONFIG_MTD_AR7_PARTS is not set

#

User Modules And Translation Layers

#

CONFIG_MTD_BLKDEVS=y

CONFIG_MTD_BLOCK=y

CONFIG_FTL is not set

CONFIG_NFTL is not set

CONFIG_INFTL is not set

CONFIG_RFD_FTL is not set

```
# CONFIG_SSFDC is not set
# CONFIG_SM_FTL is not set
# CONFIG_MTD_OOPS is not set
# CONFIG_MTD_SWAP is not set
# CONFIG_MTD_PARTITIONED_MASTER is not set

#
# RAM/ROM/Flash chip drivers
#
# CONFIG_MTD_CFI is not set
# CONFIG_MTD_JEDECPROBE is not set
CONFIG_MTD_MAP_BANK_WIDTH_1=y
CONFIG_MTD_MAP_BANK_WIDTH_2=y
CONFIG_MTD_MAP_BANK_WIDTH_4=y
# CONFIG_MTD_MAP_BANK_WIDTH_8 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_16 is not set
# CONFIG_MTD_MAP_BANK_WIDTH_32 is not set
CONFIG_MTD_CFI_I1=y
CONFIG_MTD_CFI_I2=y
# CONFIG_MTD_CFI_I4 is not set
# CONFIG_MTD_CFI_I8 is not set
# CONFIG_MTD_RAM is not set
# CONFIG_MTD_ROM is not set
# CONFIG_MTD_ABSENT is not set

#
# Mapping drivers for chip access
#
# CONFIG_MTD_COMPLEX_MAPPINGS is not set
```

```
# CONFIG_MTD_PLATRAM is not set

#
# Self-contained MTD device drivers
#
# CONFIG_MTD_DATAFLASH is not set
# CONFIG_MTD_SST25L is not set
# CONFIG_MTD_SLRAM is not set
# CONFIG_MTD_PHRAM is not set
# CONFIG_MTD_MTDRAM is not set
# CONFIG_MTD_BLOCK2MTD is not set

#
# Disk-On-Chip Device Drivers
#
# CONFIG_MTD_DOCG3 is not set
CONFIG_MTD_NAND_ECC=y
# CONFIG_MTD_NAND_ECC_SMC is not set
CONFIG_MTD_NAND=y
# CONFIG_MTD_NAND_ECC_BCH is not set
# CONFIG_MTD_SM_COMMON is not set
# CONFIG_MTD_NAND_DENALI_DT is not set
# CONFIG_MTD_NAND_GPIO is not set
# CONFIG_MTD_NAND_OMAP_BCH_BUILD is not set
# CONFIG_MTD_NAND_DISKONCHIP is not set
# CONFIG_MTD_NAND_DOCG4 is not set
# CONFIG_MTD_NAND_NANDSIM is not set
# CONFIG_MTD_NAND_BRCMNAND is not set
# CONFIG_MTD_NAND_PLATFORM is not set
```

```
# CONFIG_MTD_NAND_HISI504 is not set
# CONFIG_MTD_NAND_MTK is not set
# CONFIG_MTD_ONENAND is not set

#
# LPDDR & LPDDR2 PCM memory drivers
#
# CONFIG_MTD_LPDDR is not set
# CONFIG_MTD_LPDDR2_NVM is not set
# CONFIG_MTD_SPI_NOR is not set
# CONFIG_MTD_UBI is not set
CONFIG_DTC=y
CONFIG_OF=y
# CONFIG_OF_UNITTEST is not set
CONFIG_OF_FLATTREE=y
CONFIG_OF_EARLY_FLATTREE=y
CONFIG_OF_ADDRESS=y
CONFIG_OF_IRQ=y
CONFIG_OF_RESERVED_MEM=y
# CONFIG_OF_OVERLAY is not set
CONFIG_ARCH_MIGHT_HAVE_PC_PARPORT=y
# CONFIG_PARPORT is not set
CONFIG_BLK_DEV=y
# CONFIG_BLK_DEV_NULL_BLK is not set
# CONFIG_BLK_DEV_COW_COMMON is not set
# CONFIG_BLK_DEV_LOOP is not set
# CONFIG_BLK_DEV_DRBD is not set
# CONFIG_BLK_DEV_NBD is not set
CONFIG_BLK_DEV_RAM=y
```

CONFIG_BLK_DEV_RAM_COUNT=16

CONFIG_BLK_DEV_RAM_SIZE=16384

CONFIG_CDROM_PKTCDVD is not set

CONFIG_ATA_OVER_ETH is not set

CONFIG_BLK_DEV_RBD is not set

CONFIG_NVME_FC is not set

#

Misc devices

#

CONFIG_SENSORS_LIS3LV02D is not set

CONFIG_AD525X_DPOT is not set

CONFIG_DUMMY_IRQ is not set

CONFIG_ICS932S401 is not set

CONFIG_ENCLOSURE_SERVICES is not set

CONFIG_APDS9802ALS is not set

CONFIG_ISL29003 is not set

CONFIG_ISL29020 is not set

CONFIG_SENSORS_TSL2550 is not set

CONFIG_SENSORS_BH1770 is not set

CONFIG_SENSORS_APDS990X is not set

CONFIG_HMC6352 is not set

CONFIG_DS1682 is not set

CONFIG_TI_DAC7512 is not set

CONFIG_USB_SWITCH_FSA9480 is not set

CONFIG_LATTICE_ECP3_CONFIG is not set

CONFIG_SRAM is not set

CONFIG_C2PORT is not set

#

EEPROM support

#

CONFIG_EEPROM_AT24 is not set

CONFIG_EEPROM_AT25 is not set

CONFIG_EEPROM_LEGACY is not set

CONFIG_EEPROM_MAX6875 is not set

CONFIG_EEPROM_93CX6 is not set

CONFIG_EEPROM_93XX46 is not set

CONFIG_EEPROM_IDT_89HPESX is not set

#

Texas Instruments shared transport line discipline

#

CONFIG_TI_ST is not set

CONFIG_SENSORS_LIS3_SPI is not set

CONFIG_SENSORS_LIS3_I2C is not set

#

Altera FPGA firmware download module

#

CONFIG_ALTERA_STAPL is not set

#

Intel MIC Bus Driver

#

#

SCIF Bus Driver

#

#
VOP Bus Driver
#

#
Intel MIC Host Driver
#

#
Intel MIC Card Driver
#

#
SCIF Driver
#

#
Intel MIC Coprocessor State Management (COSM) Drivers
#

#
VOP Driver
#
CONFIG_ECHO is not set
CONFIG_CXL_BASE is not set
CONFIG_CXL_AFU_DRIVER_OPS is not set

```
#
# SCSI device support
#
CONFIG_SCSI_MOD=y
# CONFIG_RAID_ATTRS is not set
CONFIG_SCSI=y
CONFIG_SCSI_DMA=y
# CONFIG_SCSI_NETLINK is not set
# CONFIG_SCSI_MQ_DEFAULT is not set
CONFIG_SCSI_PROC_FS=y

#
# SCSI support type (disk, tape, CD-ROM)
#
CONFIG_BLK_DEV_SD=y
# CONFIG_CHR_DEV_ST is not set
# CONFIG_CHR_DEV_OSST is not set
# CONFIG_BLK_DEV_SR is not set
# CONFIG_CHR_DEV_SG is not set
# CONFIG_CHR_DEV_SCH is not set
# CONFIG_SCSI_CONSTANTS is not set
# CONFIG_SCSI_LOGGING is not set
# CONFIG_SCSI_SCAN_ASYNC is not set

#
# SCSI Transports
#
# CONFIG_SCSI_SPI_ATTRS is not set
# CONFIG_SCSI_FC_ATTRS is not set
```

```
# CONFIG_SCSI_ISCSI_ATTRS is not set
# CONFIG_SCSI_SAS_ATTRS is not set
# CONFIG_SCSI_SAS_LIBSAS is not set
# CONFIG_SCSI_SRP_ATTRS is not set
CONFIG_SCSI_LOWLEVEL=y
# CONFIG_ISCSI_TCP is not set
# CONFIG_ISCSI_BOOT_SYSFS is not set
# CONFIG_SCSI_UFSHCD is not set
# CONFIG_SCSI_DEBUG is not set
# CONFIG_SCSI_DH is not set
# CONFIG_SCSI_OSD_INITIATOR is not set
# CONFIG_ATA is not set
# CONFIG_MD is not set
# CONFIG_TARGET_CORE is not set
# CONFIG_NETDEVICES is not set
# CONFIG_NVM is not set

#
# Input device support
#
CONFIG_INPUT=y
CONFIG_INPUT_FF_MEMLESS=y
# CONFIG_INPUT_POLLDEV is not set
# CONFIG_INPUT_SPARSEKMAP is not set
CONFIG_INPUT_MATRIXKMAP=y

#
# Userland interfaces
#
```

```
# CONFIG_INPUT_MOUSEDEV is not set
# CONFIG_INPUT_JOYDEV is not set
# CONFIG_INPUT_EVDEV is not set
# CONFIG_INPUT_EVBUG is not set

#
# Input Device Drivers
#
CONFIG_INPUT_KEYBOARD=y
# CONFIG_KEYBOARD_ADP5588 is not set
# CONFIG_KEYBOARD_ADP5589 is not set
# CONFIG_KEYBOARD_ATKBD is not set
# CONFIG_KEYBOARD_QT1070 is not set
# CONFIG_KEYBOARD_QT2160 is not set
# CONFIG_KEYBOARD_LKKBD is not set
# CONFIG_KEYBOARD_GPIO is not set
# CONFIG_KEYBOARD_GPIO_POLLED is not set
# CONFIG_KEYBOARD_TCA6416 is not set
# CONFIG_KEYBOARD_TCA8418 is not set
# CONFIG_KEYBOARD_MATRIX is not set
# CONFIG_KEYBOARD_LM8333 is not set
# CONFIG_KEYBOARD_MAX7359 is not set
# CONFIG_KEYBOARD_MCS is not set
# CONFIG_KEYBOARD_MPR121 is not set
# CONFIG_KEYBOARD_NEWTON is not set
# CONFIG_KEYBOARD_OPENCORES is not set
# CONFIG_KEYBOARD_SAMSUNG is not set
# CONFIG_KEYBOARD_STOWAWAY is not set
# CONFIG_KEYBOARD_SUNKBD is not set
```

```
# CONFIG_KEYBOARD_OMAP4 is not set
# CONFIG_KEYBOARD_XTKBD is not set
# CONFIG_KEYBOARD_CAP11XX is not set
# CONFIG_KEYBOARD_BCM is not set
# CONFIG_INPUT_MOUSE is not set
# CONFIG_INPUT_JOYSTICK is not set
# CONFIG_INPUT_TABLET is not set
# CONFIG_INPUT_TOUCHSCREEN is not set
# CONFIG_INPUT_MISC is not set
# CONFIG_RMI4_CORE is not set

#
# Hardware I/O ports
#
CONFIG_SERIO=y
CONFIG_SERIO_SERPORT=y
# CONFIG_SERIO_AMBAKMI is not set
# CONFIG_SERIO_LIBPS2 is not set
# CONFIG_SERIO_RAW is not set
# CONFIG_SERIO_ALTERA_PS2 is not set
# CONFIG_SERIO_PS2MULT is not set
# CONFIG_SERIO_ARC_PS2 is not set
# CONFIG_SERIO_APBPS2 is not set
# CONFIG_USERIO is not set
# CONFIG_GAMEPORT is not set

#
# Character devices
#
```

```
CONFIG_TTY=y
CONFIG_VT=y
CONFIG_CONSOLE_TRANSLATIONS=y
CONFIG_VT_CONSOLE=y
CONFIG_VT_CONSOLE_SLEEP=y
CONFIG_HW_CONSOLE=y
# CONFIG_VT_HW_CONSOLE_BINDING is not set
CONFIG_UNIX98_PTYS=y
# CONFIG_LEGACY_PTYS is not set
# CONFIG_SERIAL_NONSTANDARD is not set
# CONFIG_N_GSM is not set
# CONFIG_TRACE_SINK is not set
CONFIG_DEVMEM=y
# CONFIG_DEVKMEM is not set

#
# Serial drivers
#
CONFIG_SERIAL_EARLYCON=y
# CONFIG_SERIAL_8250 is not set

#
# Non-8250 serial port support
#
# CONFIG_SERIAL_AMBA_PL010 is not set
CONFIG_SERIAL_AMBA_PL011=y
CONFIG_SERIAL_AMBA_PL011_CONSOLE=y
# CONFIG_SERIAL_EARLYCON_ARM_SEMIHOST is not set
# CONFIG_SERIAL_MAX3100 is not set
```

```
# CONFIG_SERIAL_MAX310X is not set
# CONFIG_SERIAL_UARTLITE is not set
CONFIG_SERIAL_CORE=y
CONFIG_SERIAL_CORE_CONSOLE=y
# CONFIG_SERIAL_SCCNXP is not set
# CONFIG_SERIAL_SC16IS7XX is not set
# CONFIG_SERIAL_BCM63XX is not set
# CONFIG_SERIAL_ALTERA_JTAGUART is not set
# CONFIG_SERIAL_ALTERA_UART is not set
# CONFIG_SERIAL_IFX6X60 is not set
# CONFIG_SERIAL_XILINX_PS_UART is not set
# CONFIG_SERIAL_ARC is not set
# CONFIG_SERIAL_FSL_LPUART is not set
# CONFIG_SERIAL_CONEXANT_DIGICOLOR is not set
# CONFIG_SERIAL_ST_ASC is not set
# CONFIG_SERIAL_DEV_BUS is not set
# CONFIG_HVC_DCC is not set
# CONFIG_IPMI_HANDLER is not set
# CONFIG_HW_RANDOM is not set
# CONFIG_R3964 is not set
CONFIG_RAW_DRIVER=y
CONFIG_MAX_RAW_DEVS=8192
# CONFIG_TCG_TPM is not set
# CONFIG_XILLYBUS is not set

#
# I2C support
#
CONFIG_I2C=y
```

```
CONFIG_I2C_BOARDINFO=y
CONFIG_I2C_COMPAT=y
# CONFIG_I2C_CHARDEV is not set
# CONFIG_I2C_MUX is not set
CONFIG_I2C_HELPER_AUTO=y

#
# I2C Hardware Bus support
#

#
# I2C system bus drivers (mostly embedded / system-on-chip)
#
# CONFIG_I2C_CBUS_GPIO is not set
CONFIG_I2C_DESIGNWARE_CORE=y
CONFIG_I2C_DESIGNWARE_PLATFORM=y
# CONFIG_I2C_EMEV2 is not set
# CONFIG_I2C_GPIO is not set
# CONFIG_I2C_NOMADIK is not set
# CONFIG_I2C_OCORES is not set
# CONFIG_I2C_PCA_PLATFORM is not set
# CONFIG_I2C_PXA_PCI is not set
# CONFIG_I2C_RK3X is not set
# CONFIG_I2C_SIMTEC is not set
# CONFIG_I2C_XILINX is not set

#
# External I2C/SMBus adapter drivers
#
```

```
# CONFIG_I2C_DIOLAN_U2C is not set
# CONFIG_I2C_PARPORT_LIGHT is not set
# CONFIG_I2C_ROBOTFUZZ_OSIF is not set
# CONFIG_I2C_TAOS_EVM is not set
# CONFIG_I2C_TINY_USB is not set

#
# Other I2C/SMBus bus drivers
#
# CONFIG_I2C_STUB is not set
# CONFIG_I2C_SLAVE is not set
# CONFIG_I2C_DEBUG_CORE is not set
# CONFIG_I2C_DEBUG_ALGO is not set
# CONFIG_I2C_DEBUG_BUS is not set
CONFIG_SPI=y
# CONFIG_SPI_DEBUG is not set
CONFIG_SPI_MASTER=y

#
# SPI Master Controller Drivers
#
# CONFIG_SPI_ALTERA is not set
# CONFIG_SPI_AXI_SPI_ENGINE is not set
# CONFIG_SPI_BITBANG is not set
# CONFIG_SPI_CADENCE is not set
# CONFIG_SPI_DESIGNWARE is not set
# CONFIG_SPI_GPIO is not set
# CONFIG_SPI_FSL_SPI is not set
# CONFIG_SPI_OC_TINY is not set
```

CONFIG_SPI_PL022=y

CONFIG_SPI_PXA2XX_PCI is not set

CONFIG_SPI_ROCKCHIP is not set

CONFIG_SPI_SC18IS602 is not set

CONFIG_SPI_XCOMM is not set

CONFIG_SPI_XILINX is not set

CONFIG_SPI_ZYNQMP_GQSPI is not set

#

SPI Protocol Masters

#

CONFIG_SPI_SPIDEV is not set

CONFIG_SPI_LOOPBACK_TEST is not set

CONFIG_SPI_TLE62X0 is not set

CONFIG_SPMI is not set

CONFIG_HSI is not set

#

PPS support

#

CONFIG_PPS=y

CONFIG_PPS_DEBUG is not set

CONFIG_NTP_PPS is not set

#

PPS clients support

#

CONFIG_PPS_CLIENT_KTIMER is not set

CONFIG_PPS_CLIENT_LDISC is not set

```
# CONFIG_PPS_CLIENT_GPIO is not set

#
# PPS generators support
#

#
# PTP clock support
#
CONFIG_PTP_1588_CLOCK=y

#
# Enable PHYLIB and NETWORK_PHY_TIMESTAMPING to see the additional clocks.
#
CONFIG_PINCTRL=y

#
# Pin controllers
#
# CONFIG_DEBUG_PINCTRL is not set
# CONFIG_PINCTRL_AMD is not set
# CONFIG_PINCTRL_SINGLE is not set
# CONFIG_PINCTRL_SX150X is not set
CONFIG_ARCH_HAVE_CUSTOM_GPIO_H=y
CONFIG_GPIOLIB=y
CONFIG_OF_GPIO=y
CONFIG_GPIOLIB_IRQCHIP=y
# CONFIG_DEBUG_GPIO is not set
CONFIG_GPIO_SYSFS=y
```

```
#
# Memory mapped GPIO drivers
#
# CONFIG_GPIO_74XX_MMIO is not set
# CONFIG_GPIO_ALTERA is not set
# CONFIG_GPIO_DWAPB is not set
# CONFIG_GPIO_FTGPIO010 is not set
# CONFIG_GPIO_GENERIC_PLATFORM is not set
# CONFIG_GPIO_GRGPIO is not set
# CONFIG_GPIO_MOCKUP is not set
# CONFIG_GPIO_MPC8XXX is not set
CONFIG_GPIO_PL061=y
# CONFIG_GPIO_SYSCON is not set
# CONFIG_GPIO_XILINX is not set
# CONFIG_GPIO_ZEVIO is not set

#
# I2C GPIO expanders
#
# CONFIG_GPIO_ADP5588 is not set
# CONFIG_GPIO_ADNP is not set
# CONFIG_GPIO_MAX7300 is not set
# CONFIG_GPIO_MAX732X is not set
# CONFIG_GPIO_PCA953X is not set
# CONFIG_GPIO_PCF857X is not set
# CONFIG_GPIO_SX150X is not set
# CONFIG_GPIO_TPIC2810 is not set
```

```
#
# MFD GPIO expanders
#
# CONFIG_HTC_EGPIO is not set

#
# SPI GPIO expanders
#
# CONFIG_GPIO_74X164 is not set
# CONFIG_GPIO_MAX7301 is not set
# CONFIG_GPIO_MC33880 is not set
# CONFIG_GPIO_PISOSR is not set

#
# SPI or I2C GPIO expanders
#
# CONFIG_GPIO_MCP23S08 is not set

#
# USB GPIO expanders
#
# CONFIG_W1 is not set
# CONFIG_POWER_AVS is not set
# CONFIG_POWER_RESET is not set
# CONFIG_POWER_SUPPLY is not set
# CONFIG_HWMON is not set
# CONFIG_THERMAL is not set
CONFIG_WATCHDOG=y
CONFIG_WATCHDOG_CORE=y
```

```
# CONFIG_WATCHDOG_NOWAYOUT is not set
# CONFIG_WATCHDOG_SYSFS is not set

#
# Watchdog Device Drivers
#
# CONFIG_SOFT_WATCHDOG is not set
# CONFIG_GPIO_WATCHDOG is not set
# CONFIG_XILINX_WATCHDOG is not set
# CONFIG_ZIIRAVE_WATCHDOG is not set
CONFIG_ARM_SP805_WATCHDOG=y
# CONFIG_CADENCE_WATCHDOG is not set
# CONFIG_DW_WATCHDOG is not set
# CONFIG_MAX63XX_WATCHDOG is not set
# CONFIG_MEN_A21_WDT is not set

#
# USB-based Watchdog Cards
#
# CONFIG_USBPCWATCHDOG is not set

#
# Watchdog Pretimeout Governors
#
# CONFIG_WATCHDOG_PRETIMEOUT_GOV is not set
CONFIG_SSB_POSSIBLE=y

#
# Sonics Silicon Backplane
```

```
#
# CONFIG_SSB is not set
CONFIG_BCMA_POSSIBLE=y

#
# Broadcom specific AMBA
#
# CONFIG_BCMA is not set

#
# Multifunction device drivers
#
# CONFIG_MFD_CORE is not set
# CONFIG_MFD_ACT8945A is not set
# CONFIG_MFD_AS3711 is not set
# CONFIG_MFD_AS3722 is not set
# CONFIG_PMIC_ADP5520 is not set
# CONFIG_MFD_AAT2870_CORE is not set
# CONFIG_MFD_ATMEL_FLEXCOM is not set
# CONFIG_MFD_ATMEL_HLCDC is not set
# CONFIG_MFD_BCM590XX is not set
# CONFIG_MFD_AXP20X_I2C is not set
# CONFIG_MFD_CROS_EC is not set
# CONFIG_MFD_ASIC3 is not set
# CONFIG_PMIC_DA903X is not set
# CONFIG_MFD_DA9052_SPI is not set
# CONFIG_MFD_DA9052_I2C is not set
# CONFIG_MFD_DA9055 is not set
# CONFIG_MFD_DA9062 is not set
```

CONFIG_MFD_DA9063 is not set

CONFIG_MFD_DA9150 is not set

CONFIG_MFD_DLN2 is not set

CONFIG_MFD_MC13XXX_SPI is not set

CONFIG_MFD_MC13XXX_I2C is not set

CONFIG_MFD_HI6421_PMIC is not set

CONFIG_HTC_PASIC3 is not set

CONFIG_HTC_I2CPLD is not set

CONFIG_INTEL_SOC_PMIC is not set

CONFIG_MFD_KEMPLD is not set

CONFIG_MFD_88PM800 is not set

CONFIG_MFD_88PM805 is not set

CONFIG_MFD_88PM860X is not set

CONFIG_MFD_MAX14577 is not set

CONFIG_MFD_MAX77620 is not set

CONFIG_MFD_MAX77686 is not set

CONFIG_MFD_MAX77693 is not set

CONFIG_MFD_MAX77843 is not set

CONFIG_MFD_MAX8907 is not set

CONFIG_MFD_MAX8925 is not set

CONFIG_MFD_MAX8997 is not set

CONFIG_MFD_MAX8998 is not set

CONFIG_MFD_MT6397 is not set

CONFIG_MFD_MENF21BMC is not set

CONFIG_EZX_PCAP is not set

CONFIG_MFD_CPCAP is not set

CONFIG_MFD_VIPERBOARD is not set

CONFIG_MFD_RETU is not set

CONFIG_MFD_PCF50633 is not set

CONFIG_MFD_PM8XXX is not set

CONFIG_MFD_RT5033 is not set

CONFIG_MFD_RTSX_USB is not set

CONFIG_MFD_RC5T583 is not set

CONFIG_MFD_RK808 is not set

CONFIG_MFD_RN5T618 is not set

CONFIG_MFD_SEC_CORE is not set

CONFIG_MFD_SI476X_CORE is not set

CONFIG_MFD_SM501 is not set

CONFIG_MFD_SKY81452 is not set

CONFIG_MFD_SMSC is not set

CONFIG_ABX500_CORE is not set

CONFIG_MFD_STMPE is not set

CONFIG_MFD_SYSCON=y

CONFIG_MFD_TI_AM335X_TSCADC is not set

CONFIG_MFD_LP3943 is not set

CONFIG_MFD_LP8788 is not set

CONFIG_MFD_TI_LMU is not set

CONFIG_MFD_PALMAS is not set

CONFIG_TPS6105X is not set

CONFIG_TPS65010 is not set

CONFIG_TPS6507X is not set

CONFIG_MFD_TPS65086 is not set

CONFIG_MFD_TPS65090 is not set

CONFIG_MFD_TPS65217 is not set

CONFIG_MFD_TI_LP873X is not set

CONFIG_MFD_TPS65218 is not set

CONFIG_MFD_TPS6586X is not set

CONFIG_MFD_TPS65910 is not set

CONFIG_MFD_TPS65912_I2C is not set

CONFIG_MFD_TPS65912_SPI is not set

CONFIG_MFD_TPS80031 is not set

CONFIG_TWL4030_CORE is not set

CONFIG_TWL6040_CORE is not set

CONFIG_MFD_WL1273_CORE is not set

CONFIG_MFD_LM3533 is not set

CONFIG_MFD_TC3589X is not set

CONFIG_MFD_TMIO is not set

CONFIG_MFD_T7L66XB is not set

CONFIG_MFD_TC6387XB is not set

CONFIG_MFD_TC6393XB is not set

CONFIG_MFD_ARIZONA_I2C is not set

CONFIG_MFD_ARIZONA_SPI is not set

CONFIG_MFD_WM8400 is not set

CONFIG_MFD_WM831X_I2C is not set

CONFIG_MFD_WM831X_SPI is not set

CONFIG_MFD_WM8350_I2C is not set

CONFIG_MFD_WM8994 is not set

CONFIG_REGULATOR is not set

CONFIG_MEDIA_SUPPORT is not set

#

Graphics support

#

CONFIG_IMX_IPUV3_CORE is not set

CONFIG_DRM is not set

#

```
# ACP (Audio CoProcessor) Configuration
#
# CONFIG_DRM_LIB_RANDOM is not set

#
# Frame buffer Devices
#
# CONFIG_FB is not set
# CONFIG_BACKLIGHT_LCD_SUPPORT is not set
# CONFIG_VGASTATE is not set

#
# Console display driver support
#
CONFIG_DUMMY_CONSOLE=y
# CONFIG_SOUND is not set

#
# HID support
#
CONFIG_HID=y
# CONFIG_HID_BATTERY_STRENGTH is not set
# CONFIG_HIDRAW is not set
# CONFIG_UHID is not set
CONFIG_HID_GENERIC=y

#
# Special HID drivers
#
```

CONFIG_HID_A4TECH=y

CONFIG_HID_ACCUTOUCH is not set

CONFIG_HID_ACRUX is not set

CONFIG_HID_APPLE=y

CONFIG_HID_APPLEIR is not set

CONFIG_HID_AUREAL is not set

CONFIG_HID_BELKIN=y

CONFIG_HID_BETOP_FF is not set

CONFIG_HID_CHERRY=y

CONFIG_HID_CHICONY=y

CONFIG_HID_CMEDIA is not set

CONFIG_HID_CP2112 is not set

CONFIG_HID_CYPRESS=y

CONFIG_HID_DRAGONRISE is not set

CONFIG_HID_EMS_FF is not set

CONFIG_HID_ELECOM is not set

CONFIG_HID_ELO is not set

CONFIG_HID_EZKEY=y

CONFIG_HID_GEMBIRD is not set

CONFIG_HID_GFRM is not set

CONFIG_HID_HOLTEK is not set

CONFIG_HID_KEYTOUCH is not set

CONFIG_HID_KYE is not set

CONFIG_HID_UCLOGIC is not set

CONFIG_HID_WALTOP is not set

CONFIG_HID_GYRATION is not set

CONFIG_HID_ICADE is not set

CONFIG_HID_TWINHAN is not set

CONFIG_HID_KENSINGTON=y

```
# CONFIG_HID_LCPOWER is not set
# CONFIG_HID_LENOVO is not set
CONFIG_HID_LOGITECH=y
# CONFIG_HID_LOGITECH_HIDPP is not set
# CONFIG_LOGITECH_FF is not set
# CONFIG_LOGIRUMBLEPAD2_FF is not set
# CONFIG_LOGIG940_FF is not set
# CONFIG_LOGIWHEELS_FF is not set
# CONFIG_HID_MAGICMOUSE is not set
# CONFIG_HID_MAYFLASH is not set
CONFIG_HID_MICROSOFT=y
CONFIG_HID_MONTEREY=y
# CONFIG_HID_MULTITOUCH is not set
# CONFIG_HID_NTI is not set
# CONFIG_HID_NTRIG is not set
# CONFIG_HID_ORTEK is not set
# CONFIG_HID_PANTHERLORD is not set
# CONFIG_HID_PENMOUNT is not set
# CONFIG_HID_PETALYNX is not set
# CONFIG_HID_PICOLCD is not set
# CONFIG_HID_PLANTRONICS is not set
# CONFIG_HID_PRIMAX is not set
# CONFIG_HID_ROCCAT is not set
# CONFIG_HID_SAITEK is not set
# CONFIG_HID_SAMSUNG is not set
# CONFIG_HID_SPEEDLINK is not set
# CONFIG_HID_STEELSERIES is not set
# CONFIG_HID_SUNPLUS is not set
# CONFIG_HID_RMI is not set
```

```
# CONFIG_HID_GREENASIA is not set
# CONFIG_HID_SMARTJOYPLUS is not set
# CONFIG_HID_TIVO is not set
# CONFIG_HID_TOPSEED is not set
# CONFIG_HID_THRUSTMASTER is not set
# CONFIG_HID_UDRAW_PS3 is not set
# CONFIG_HID_WACOM is not set
# CONFIG_HID_XINMO is not set
# CONFIG_HID_ZEROPLUS is not set
# CONFIG_HID_ZYDACRON is not set
# CONFIG_HID_SENSOR_HUB is not set
# CONFIG_HID_ALPS is not set

#
# USB HID support
#
CONFIG_USB_HID=y
# CONFIG_HID_PID is not set
# CONFIG_USB_HIDDEV is not set

#
# I2C HID support
#
# CONFIG_I2C_HID is not set
CONFIG_USB_OHCI_LITTLE_ENDIAN=y
CONFIG_USB_SUPPORT=y
CONFIG_USB_COMMON=y
CONFIG_USB_ARCH_HAS_HCD=y
CONFIG_USB=y
```

```
# CONFIG_USB_ANNOUNCE_NEW_DEVICES is not set

#
# Miscellaneous USB options
#
CONFIG_USB_DEFAULT_PERSIST=y
# CONFIG_USB_DYNAMIC_MINORS is not set
# CONFIG_USB_OTG is not set
# CONFIG_USB_OTG_WHITELIST is not set
# CONFIG_USB_MON is not set
# CONFIG_USB_WUSB_CBAF is not set

#
# USB Host Controller Drivers
#
# CONFIG_USB_C67X00_HCD is not set
# CONFIG_USB_XHCI_HCD is not set
CONFIG_USB_EHCI_HCD=y
# CONFIG_USB_EHCI_ROOT_HUB_TT is not set
CONFIG_USB_EHCI_TT_NEWSCHED=y
# CONFIG_USB_EHCI_HCD_PLATFORM is not set
# CONFIG_USB_OXU210HP_HCD is not set
# CONFIG_USB_ISP116X_HCD is not set
# CONFIG_USB_ISP1362_HCD is not set
# CONFIG_USB_FOTG210_HCD is not set
# CONFIG_USB_MAX3421_HCD is not set
CONFIG_USB_OHCI_HCD=y
# CONFIG_USB_OHCI_HCD_PLATFORM is not set
# CONFIG_USB_SL811_HCD is not set
```

```
# CONFIG_USB_R8A66597_HCD is not set
# CONFIG_USB_HCD_TEST_MODE is not set

#
# USB Device Class drivers
#
# CONFIG_USB_ACM is not set
# CONFIG_USB_PRINTER is not set
# CONFIG_USB_WDM is not set
# CONFIG_USB_TMC is not set

#
# NOTE: USB_STORAGE depends on SCSI but BLK_DEV_SD may
#

#
# also be needed; see USB_STORAGE Help for more info
#
CONFIG_USB_STORAGE=y
# CONFIG_USB_STORAGE_DEBUG is not set
# CONFIG_USB_STORAGE_REALTEK is not set
# CONFIG_USB_STORAGE_DATAFAB is not set
# CONFIG_USB_STORAGE_FREECOM is not set
# CONFIG_USB_STORAGE_ISD200 is not set
# CONFIG_USB_STORAGE_USBAT is not set
# CONFIG_USB_STORAGE_SDDR09 is not set
# CONFIG_USB_STORAGE_SDDR55 is not set
# CONFIG_USB_STORAGE_JUMPSHOT is not set
# CONFIG_USB_STORAGE_ALAUDA is not set
```

```
# CONFIG_USB_STORAGE_ONETOUCH is not set
# CONFIG_USB_STORAGE_KARMA is not set
# CONFIG_USB_STORAGE_CYPRESS_ATACB is not set
# CONFIG_USB_STORAGE_ENE_UB6250 is not set
# CONFIG_USB_UAS is not set

#
# USB Imaging devices
#
# CONFIG_USB_MDC800 is not set
# CONFIG_USB_MICROTEK is not set
# CONFIG_USBIP_CORE is not set
# CONFIG_USB_MUSB_HDRC is not set
CONFIG_USB_DWC3=y
CONFIG_USB_DWC3_HOST=y

#
# Platform Glue Driver Support
#
CONFIG_USB_DWC3_OF_SIMPLE=y
# CONFIG_USB_DWC2 is not set
# CONFIG_USB_CHIPIDEA is not set
# CONFIG_USB_ISP1760 is not set

#
# USB port drivers
#
# CONFIG_USB_SERIAL is not set
```

#

USB Miscellaneous drivers

#

CONFIG_USB_EMI62 is not set

CONFIG_USB_EMI26 is not set

CONFIG_USB_ADUTUX is not set

CONFIG_USB_SEVSEG is not set

CONFIG_USB_RIO500 is not set

CONFIG_USB_LEGOTOWER is not set

CONFIG_USB_LCD is not set

CONFIG_USB_CYPRESS_CY7C63 is not set

CONFIG_USB_CYTHERM is not set

CONFIG_USB_IDMOUSE is not set

CONFIG_USB_FTDI_ELAN is not set

CONFIG_USB_APPLEDISPLAY is not set

CONFIG_USB_SISUSBVGA is not set

CONFIG_USB_LD is not set

CONFIG_USB_TRANCEVIBRATOR is not set

CONFIG_USB_IOWARRIOR is not set

CONFIG_USB_TEST is not set

CONFIG_USB_EHSET_TEST_FIXTURE is not set

CONFIG_USB_ISIGHTFW is not set

CONFIG_USB_YUREX is not set

CONFIG_USB_EZUSB_FX2 is not set

CONFIG_USB_HUB_USB251XB is not set

CONFIG_USB_HSIC_USB3503 is not set

CONFIG_USB_HSIC_USB4604 is not set

CONFIG_USB_LINK_LAYER_TEST is not set

```
#
# USB Physical Layer drivers
#
# CONFIG_USB_PHY is not set
# CONFIG_NOP_USB_XCEIV is not set
# CONFIG_USB_GPIO_VBUS is not set
# CONFIG_USB_ISP1301 is not set
# CONFIG_USB_ULPI is not set
# CONFIG_USB_GADGET is not set

#
# USB Power Delivery and Type-C drivers
#
# CONFIG_USB_ULPI_BUS is not set
# CONFIG_UWB is not set
CONFIG_MMC=y
# CONFIG_MMC_DEBUG is not set
CONFIG_PWRSEQ_EMMC=y
CONFIG_PWRSEQ_SIMPLE=y
CONFIG_MMC_BLOCK=y
CONFIG_MMC_BLOCK_MINORS=8
CONFIG_MMC_BLOCK_BOUNCE=y
# CONFIG_SDIO_UART is not set
# CONFIG_MMC_TEST is not set

#
# MMC/SD/SDIO Host Controller Drivers
#
# CONFIG_MMC_ARMMMCI is not set
```

```
CONFIG_MMC_SDHCI=y
# CONFIG_MMC_SDHCI_PLTFM is not set
# CONFIG_MMC_SPI is not set
CONFIG_MMC_DW=y
CONFIG_MMC_DW_PLTFM=y
# CONFIG_MMC_DW_EXYNOS is not set
# CONFIG_MMC_DW_K3 is not set
# CONFIG_MMC_VUB300 is not set
# CONFIG_MMC_USHC is not set
# CONFIG_MMC_USDHI6ROL0 is not set
# CONFIG_MMC_MTK is not set
# CONFIG_MEMSTICK is not set
# CONFIG_NEW_LEDS is not set
# CONFIG_ACCESSIBILITY is not set
CONFIG_EDAC_ATOMIC_SCRUB=y
CONFIG_EDAC_SUPPORT=y
# CONFIG_EDAC is not set
CONFIG_RTC_LIB=y
CONFIG_RTC_CLASS=y
CONFIG_RTC_HCTOSYS=y
CONFIG_RTC_HCTOSYS_DEVICE="rtc0"
CONFIG_RTC_SYSTOHC=y
CONFIG_RTC_SYSTOHC_DEVICE="rtc0"
# CONFIG_RTC_DEBUG is not set

#
# RTC interfaces
#
CONFIG_RTC_INTF_SYSFS=y
```

CONFIG_RTC_INTF_PROC=y

CONFIG_RTC_INTF_DEV=y

CONFIG_RTC_INTF_DEV_UIE_EMUL is not set

CONFIG_RTC_DRV_TEST is not set

#

I2C RTC drivers

#

CONFIG_RTC_DRV_ABB5ZES3 is not set

CONFIG_RTC_DRV_ABX80X is not set

CONFIG_RTC_DRV_DS1307 is not set

CONFIG_RTC_DRV_DS1374 is not set

CONFIG_RTC_DRV_DS1672 is not set

CONFIG_RTC_DRV_HYM8563 is not set

CONFIG_RTC_DRV_MAX6900 is not set

CONFIG_RTC_DRV_RS5C372 is not set

CONFIG_RTC_DRV_ISL1208 is not set

CONFIG_RTC_DRV_ISL12022 is not set

CONFIG_RTC_DRV_X1205 is not set

CONFIG_RTC_DRV_PCF8523 is not set

CONFIG_RTC_DRV_PCF85063 is not set

CONFIG_RTC_DRV_PCF8563 is not set

CONFIG_RTC_DRV_PCF8583 is not set

CONFIG_RTC_DRV_M41T80 is not set

CONFIG_RTC_DRV_BQ32K is not set

CONFIG_RTC_DRV_S35390A is not set

CONFIG_RTC_DRV_FM3130 is not set

CONFIG_RTC_DRV_RX8010 is not set

CONFIG_RTC_DRV_RX8581 is not set

```
# CONFIG_RTC_DRV_RX8025 is not set
# CONFIG_RTC_DRV_EM3027 is not set
# CONFIG_RTC_DRV_RV8803 is not set

#
# SPI RTC drivers
#
# CONFIG_RTC_DRV_M41T93 is not set
# CONFIG_RTC_DRV_M41T94 is not set
# CONFIG_RTC_DRV_DS1302 is not set
# CONFIG_RTC_DRV_DS1305 is not set
# CONFIG_RTC_DRV_DS1343 is not set
# CONFIG_RTC_DRV_DS1347 is not set
# CONFIG_RTC_DRV_DS1390 is not set
# CONFIG_RTC_DRV_MAX6916 is not set
# CONFIG_RTC_DRV_R9701 is not set
# CONFIG_RTC_DRV_RX4581 is not set
# CONFIG_RTC_DRV_RX6110 is not set
# CONFIG_RTC_DRV_RS5C348 is not set
# CONFIG_RTC_DRV_MAX6902 is not set
# CONFIG_RTC_DRV_PCF2123 is not set
# CONFIG_RTC_DRV_MCP795 is not set
CONFIG_RTC_I2C_AND_SPI=y

#
# SPI and I2C RTC drivers
#
# CONFIG_RTC_DRV_DS3232 is not set
# CONFIG_RTC_DRV_PCF2127 is not set
```

```
# CONFIG_RTC_DRV_RV3029C2 is not set

#
# Platform RTC drivers
#
# CONFIG_RTC_DRV_CMOS is not set
# CONFIG_RTC_DRV_DS1286 is not set
# CONFIG_RTC_DRV_DS1511 is not set
# CONFIG_RTC_DRV_DS1553 is not set
# CONFIG_RTC_DRV_DS1685_FAMILY is not set
# CONFIG_RTC_DRV_DS1742 is not set
# CONFIG_RTC_DRV_DS2404 is not set
# CONFIG_RTC_DRV_STK17TA8 is not set
# CONFIG_RTC_DRV_M48T86 is not set
# CONFIG_RTC_DRV_M48T35 is not set
# CONFIG_RTC_DRV_M48T59 is not set
# CONFIG_RTC_DRV_MSM6242 is not set
# CONFIG_RTC_DRV_BQ4802 is not set
# CONFIG_RTC_DRV_RP5C01 is not set
# CONFIG_RTC_DRV_V3020 is not set
# CONFIG_RTC_DRV_ZYNQMP is not set

#
# on-CPU RTC drivers
#
CONFIG_RTC_DRV_PL030=y
CONFIG_RTC_DRV_PL031=y
# CONFIG_RTC_DRV_SNVS is not set
# CONFIG_RTC_DRV_R7301 is not set
```

```
#
# HID Sensor RTC drivers
#
# CONFIG_RTC_DRV_HID_SENSOR_TIME is not set
CONFIG_DMADEVICES=y
# CONFIG_DMADEVICES_DEBUG is not set

#
# DMA Devices
#
CONFIG_DMA_ENGINE=y
CONFIG_DMA_OF=y
# CONFIG_AMBA_PL08X is not set
# CONFIG_FSL_EDMA is not set
# CONFIG_INTEL_IDMA64 is not set
# CONFIG_NBPFAXI_DMA is not set
# CONFIG_PL330_DMA is not set
# CONFIG_QCOM_HIDMA_MGMT is not set
# CONFIG_QCOM_HIDMA is not set
CONFIG_DW_DMAC_CORE=y
CONFIG_DW_DMAC=y

#
# DMA Clients
#
# CONFIG_ASYNC_TX_DMA is not set
CONFIG_DMATEST=m
CONFIG_DMA_ENGINE_RAID=y
```

```
#
# DMABUF options
#
# CONFIG_SYNC_FILE is not set
# CONFIG_AUXDISPLAY is not set
# CONFIG_UIO is not set
# CONFIG_VIRT_DRIVERS is not set

#
# Virtio drivers
#
# CONFIG_VIRTIO_MMIO is not set

#
# Microsoft Hyper-V guest support
#
# CONFIG_HYPERV_TSCPAGE is not set
# CONFIG_STAGING is not set
# CONFIG_GOLDFISH is not set
# CONFIG_CHROME_PLATFORMS is not set
CONFIG_CLKDEV_LOOKUP=y
CONFIG_HAVE_CLK_PREPARE=y
CONFIG_COMMON_CLK=y

#
# Common Clock Framework
#
# CONFIG_COMMON_CLK_SI5351 is not set
```

CONFIG_COMMON_CLK_SI514 is not set

CONFIG_COMMON_CLK_SI570 is not set

CONFIG_COMMON_CLK_CDCE706 is not set

CONFIG_COMMON_CLK_CDCE925 is not set

CONFIG_COMMON_CLK_CS2000_CP is not set

CONFIG_CLK_QORIQ is not set

CONFIG_COMMON_CLK_NXP is not set

CONFIG_COMMON_CLK_PXA is not set

CONFIG_COMMON_CLK_PIC32 is not set

CONFIG_COMMON_CLK_VC5 is not set

#

Hardware Spinlock drivers

#

#

Clock Source drivers

#

CONFIG_CLKSRC_OF=y

CONFIG_CLKSRC_PROBE=y

CONFIG_CLKSRC_MMIO=y

CONFIG_ARM_GLOBAL_TIMER=y

CONFIG_ARM_TIMER_SP804=y

CONFIG_CLKSRC_ARM_GLOBAL_TIMER_SCHED_CLOCK=y

CONFIG_ATMEL_PIT is not set

CONFIG_SH_TIMER_CMT is not set

CONFIG_SH_TIMER_MTU2 is not set

CONFIG_SH_TIMER_TMU is not set

CONFIG_EM_TIMER_STI is not set

```
# CONFIG_MAILBOX is not set
CONFIG_IOMMU_SUPPORT=y

#
# Generic IOMMU Pagetable Support
#
# CONFIG_IOMMU_IO_PGTABLE_LPAE is not set
# CONFIG_IOMMU_IO_PGTABLE_ARMV7S is not set
# CONFIG_ARM_SMMU is not set

#
# Remoteproc drivers
#
# CONFIG_REMOTEPROC is not set

#
# Rpmsg drivers
#

#
# SOC (System On Chip) specific Drivers
#

#
# Broadcom SoC drivers
#
# CONFIG_SOC_BRCMSTB is not set

#
```

i.MX SoC drivers

#

CONFIG_SUNXI_SRAM is not set

CONFIG_SOC_TI is not set

CONFIG_SOC_ZTE is not set

CONFIG_PM_DEVFREQ is not set

CONFIG_EXTCON is not set

CONFIG_MEMORY is not set

CONFIG_IIO is not set

CONFIG_PWM is not set

CONFIG_IRQCHIP=y

CONFIG_ARM_GIC=y

CONFIG_ARM_GIC_MAX_NR=1

CONFIG_IPACK_BUS is not set

CONFIG_RESET_CONTROLLER=y

CONFIG_RESET_ATH79 is not set

CONFIG_RESET_BERLIN is not set

CONFIG_RESET_IMX7 is not set

CONFIG_RESET_LPC18XX is not set

CONFIG_RESET_MESON is not set

CONFIG_RESET_PISTACHIO is not set

CONFIG_RESET_SOCFPGA is not set

CONFIG_RESET_STM32 is not set

CONFIG_RESET_SUNXI is not set

CONFIG_TI_SYSCON_RESET is not set

CONFIG_RESET_ZYNQ is not set

CONFIG_RESET_TEGRA_BPMP is not set

CONFIG_FMC is not set

```
#
# PHY Subsystem
#
CONFIG_GENERIC_PHY=y
# CONFIG_PHY_PXA_28NM_HSIC is not set
# CONFIG_PHY_PXA_28NM_USB2 is not set
# CONFIG_BCM_KONA_USB2_PHY is not set
# CONFIG_POWERCAP is not set
# CONFIG_MCB is not set

#
# Performance monitor support
#
CONFIG_RAS=y

#
# Android
#
# CONFIG_ANDROID is not set
# CONFIG_DAX is not set
# CONFIG_NVMEM is not set
# CONFIG_STM is not set
# CONFIG_INTEL_TH is not set

#
# FPGA Configuration Support
#
# CONFIG_FPGA is not set
```

```
#
# FSI support
#
# CONFIG_FSI is not set
# CONFIG_TEE is not set

#
# Firmware Drivers
#
# CONFIG_FIRMWARE_MEMMAP is not set
# CONFIG_FW_CFG_SYSFS is not set
CONFIG_HAVE_ARM_SMCCC=y
# CONFIG_GOOGLE_FIRMWARE is not set

#
# Tegra firmware driver
#

#
# File systems
#
CONFIG_DCACHE_WORD_ACCESS=y
CONFIG_EXT2_FS=y
CONFIG_EXT2_FS_XATTR=y
# CONFIG_EXT2_FS_POSIX_ACL is not set
CONFIG_EXT2_FS_SECURITY=y
CONFIG_EXT3_FS=y
# CONFIG_EXT3_FS_POSIX_ACL is not set
CONFIG_EXT3_FS_SECURITY=y
```

CONFIG_EXT4_FS=y

CONFIG_EXT4_FS_POSIX_ACL is not set

CONFIG_EXT4_FS_SECURITY=y

CONFIG_EXT4_ENCRYPTION is not set

CONFIG_EXT4_DEBUG is not set

CONFIG_JBD2=y

CONFIG_JBD2_DEBUG is not set

CONFIG_FS_MBCACHE=y

CONFIG_REISERFS_FS is not set

CONFIG_JFS_FS is not set

CONFIG_XFS_FS is not set

CONFIG_GFS2_FS is not set

CONFIG_BTRFS_FS is not set

CONFIG_NILFS2_FS is not set

CONFIG_F2FS_FS is not set

CONFIG_FS_POSIX_ACL=y

CONFIG_EXPORTFS=y

CONFIG_EXPORTFS_BLOCK_OPS is not set

CONFIG_FILE_LOCKING=y

CONFIG_MANDATORY_FILE_LOCKING=y

CONFIG_FS_ENCRYPTION is not set

CONFIG_FSNOTIFY=y

CONFIG_DNOTIFY=y

CONFIG_INOTIFY_USER=y

CONFIG_FANOTIFY is not set

CONFIG_QUOTA is not set

CONFIG_QUOTACTL is not set

CONFIG_AUTOFS4_FS=m

CONFIG_FUSE_FS=y

```
# CONFIG_CUSE is not set
# CONFIG_OVERLAY_FS is not set

#
# Caches
#
# CONFIG_FSCACHE is not set

#
# CD-ROM/DVD Filesystems
#
# CONFIG_ISO9660_FS is not set
# CONFIG_UDF_FS is not set

#
# DOS/FAT/NT Filesystems
#
CONFIG_FAT_FS=m
CONFIG_MSDOS_FS=m
CONFIG_VFAT_FS=m
CONFIG_FAT_DEFAULT_CODEPAGE=437
CONFIG_FAT_DEFAULT_IOCHARSET="ascii"
# CONFIG_FAT_DEFAULT_UTF8 is not set
# CONFIG_NTFS_FS is not set

#
# Pseudo filesystems
#
CONFIG_PROC_FS=y
```

CONFIG_PROC_SYSCTL=y

CONFIG_PROC_PAGE_MONITOR=y

CONFIG_PROC_CHILDREN is not set

CONFIG_KERNFS=y

CONFIG_SYSFS=y

CONFIG_TMPFS=y

CONFIG_TMPFS_POSIX_ACL is not set

CONFIG_TMPFS_XATTR is not set

CONFIG_HUGETLB_PAGE is not set

CONFIG_CONFIGFS_FS is not set

CONFIG_MISC_FILESYSTEMS=y

CONFIG_ORANGEFS_FS is not set

CONFIG_ADFS_FS is not set

CONFIG_AFFS_FS is not set

CONFIG_HFS_FS is not set

CONFIG_HFSPLUS_FS is not set

CONFIG_BEFS_FS is not set

CONFIG_BFS_FS is not set

CONFIG_EFS_FS is not set

CONFIG_JFFS2_FS=y

CONFIG_JFFS2_FS_DEBUG=0

CONFIG_JFFS2_FS_WRITEBUFFER=y

CONFIG_JFFS2_FS_WBUF_VERIFY is not set

CONFIG_JFFS2_SUMMARY is not set

CONFIG_JFFS2_FS_XATTR is not set

CONFIG_JFFS2_COMPRESSION_OPTIONS is not set

CONFIG_JFFS2_ZLIB=y

CONFIG_JFFS2_LZO is not set

CONFIG_JFFS2_RTIME=y

```
# CONFIG_JFFS2_RUBIN is not set
# CONFIG_CRAMFS is not set
# CONFIG_SQUASHFS is not set
# CONFIG_VXFS_FS is not set
# CONFIG_MINIX_FS is not set
# CONFIG_OMFS_FS is not set
# CONFIG_HPFS_FS is not set
# CONFIG_QNX4FS_FS is not set
# CONFIG_QNX6FS_FS is not set
# CONFIG_ROMFS_FS is not set
# CONFIG_PSTORE is not set
# CONFIG_SYSV_FS is not set
# CONFIG_UFS_FS is not set
CONFIG_NETWORK_FILESYSTEMS=y
CONFIG_NFS_FS=y
CONFIG_NFS_V2=y
CONFIG_NFS_V3=y
# CONFIG_NFS_V3_ACL is not set
# CONFIG_NFS_V4 is not set
# CONFIG_NFS_SWAP is not set
CONFIG_ROOT_NFS=y
# CONFIG_NFSD is not set
CONFIG_GRACE_PERIOD=y
CONFIG_LOCKD=y
CONFIG_LOCKD_V4=y
CONFIG_NFS_COMMON=y
CONFIG_SUNRPC=y
# CONFIG_SUNRPC_DEBUG is not set
# CONFIG_CEPH_FS is not set
```

```
# CONFIG_CIFS is not set
# CONFIG_NCP_FS is not set
# CONFIG_CODA_FS is not set
# CONFIG_AFS_FS is not set
CONFIG_NLS=y
CONFIG_NLS_DEFAULT="utf8"
CONFIG_NLS_CODEPAGE_437=y
# CONFIG_NLS_CODEPAGE_737 is not set
# CONFIG_NLS_CODEPAGE_775 is not set
# CONFIG_NLS_CODEPAGE_850 is not set
# CONFIG_NLS_CODEPAGE_852 is not set
# CONFIG_NLS_CODEPAGE_855 is not set
# CONFIG_NLS_CODEPAGE_857 is not set
# CONFIG_NLS_CODEPAGE_860 is not set
# CONFIG_NLS_CODEPAGE_861 is not set
# CONFIG_NLS_CODEPAGE_862 is not set
# CONFIG_NLS_CODEPAGE_863 is not set
# CONFIG_NLS_CODEPAGE_864 is not set
# CONFIG_NLS_CODEPAGE_865 is not set
# CONFIG_NLS_CODEPAGE_866 is not set
# CONFIG_NLS_CODEPAGE_869 is not set
# CONFIG_NLS_CODEPAGE_936 is not set
# CONFIG_NLS_CODEPAGE_950 is not set
# CONFIG_NLS_CODEPAGE_932 is not set
# CONFIG_NLS_CODEPAGE_949 is not set
# CONFIG_NLS_CODEPAGE_874 is not set
# CONFIG_NLS_ISO8859_8 is not set
# CONFIG_NLS_CODEPAGE_1250 is not set
# CONFIG_NLS_CODEPAGE_1251 is not set
```

CONFIG_NLS_ASCII=m

CONFIG_NLS_ISO8859_1 is not set

CONFIG_NLS_ISO8859_2 is not set

CONFIG_NLS_ISO8859_3 is not set

CONFIG_NLS_ISO8859_4 is not set

CONFIG_NLS_ISO8859_5 is not set

CONFIG_NLS_ISO8859_6 is not set

CONFIG_NLS_ISO8859_7 is not set

CONFIG_NLS_ISO8859_9 is not set

CONFIG_NLS_ISO8859_13 is not set

CONFIG_NLS_ISO8859_14 is not set

CONFIG_NLS_ISO8859_15 is not set

CONFIG_NLS_KOI8_R is not set

CONFIG_NLS_KOI8_U is not set

CONFIG_NLS_MAC_ROMAN is not set

CONFIG_NLS_MAC_CELTIC is not set

CONFIG_NLS_MAC_CENTEURO is not set

CONFIG_NLS_MAC_CROATIAN is not set

CONFIG_NLS_MAC_CYRILLIC is not set

CONFIG_NLS_MAC_GAELIC is not set

CONFIG_NLS_MAC_GREEK is not set

CONFIG_NLS_MAC_ICELAND is not set

CONFIG_NLS_MAC_INUIT is not set

CONFIG_NLS_MAC_ROMANIAN is not set

CONFIG_NLS_MAC_TURKISH is not set

CONFIG_NLS_UTF8 is not set

#

Kernel hacking

```
#


#
# printk and dmesg options
#
# CONFIG_PRINTK_TIME is not set
CONFIG_CONSOLE_LOGLEVEL_DEFAULT=7
CONFIG_MESSAGE_LOGLEVEL_DEFAULT=4
# CONFIG_BOOT_PRINTK_DELAY is not set
# CONFIG_DYNAMIC_DEBUG is not set

#
# Compile-time checks and compiler options
#
CONFIG_DEBUG_INFO=y
# CONFIG_DEBUG_INFO_REDUCED is not set
# CONFIG_DEBUG_INFO_SPLIT is not set
# CONFIG_DEBUG_INFO_DWARF4 is not set
# CONFIG_GDB_SCRIPTS is not set
CONFIG_ENABLE_WARN_DEPRECATED=y
CONFIG_ENABLE_MUST_CHECK=y
CONFIG_FRAME_WARN=1024
# CONFIG_STRIP_ASM_SYMS is not set
# CONFIG_READABLE_ASM is not set
# CONFIG_UNUSED_SYMBOLS is not set
# CONFIG_PAGE_OWNER is not set
CONFIG_DEBUG_FS=y
# CONFIG_HEADERS_CHECK is not set
# CONFIG_DEBUG_SECTION_MISMATCH is not set
```

CONFIG_SECTION_MISMATCH_WARN_ONLY=y

CONFIG_DEBUG_FORCE_WEAK_PER_CPU is not set

CONFIG_MAGIC_SYSRQ=y

CONFIG_MAGIC_SYSRQ_DEFAULT_ENABLE=0x1

CONFIG_MAGIC_SYSRQ_SERIAL=y

CONFIG_DEBUG_KERNEL=y

#

Memory Debugging

#

CONFIG_PAGE_EXTENSION is not set

CONFIG_DEBUG_PAGEALLOC is not set

CONFIG_PAGE_POISONING is not set

CONFIG_DEBUG_RODATA_TEST is not set

CONFIG_DEBUG_OBJECTS is not set

CONFIG_SLUB_DEBUG_ON is not set

CONFIG_SLUB_STATS is not set

CONFIG_HAVE_DEBUG_KMEMLEAK=y

CONFIG_DEBUG_KMEMLEAK is not set

CONFIG_DEBUG_STACK_USAGE is not set

CONFIG_DEBUG_VM is not set

CONFIG_ARCH_HAS_DEBUG_VIRTUAL=y

CONFIG_DEBUG_VIRTUAL is not set

CONFIG_DEBUG_MEMORY_INIT=y

CONFIG_DEBUG_PER_CPU_MAPS is not set

CONFIG_DEBUG_SHIRQ is not set

#

Debug Lockups and Hangs

```
#
# CONFIG_LOCKUP_DETECTOR is not set
# CONFIG_DETECT_HUNG_TASK is not set
# CONFIG_WQ_WATCHDOG is not set
# CONFIG_PANIC_ON_OOPS is not set
CONFIG_PANIC_ON_OOPS_VALUE=0
CONFIG_PANIC_TIMEOUT=0
CONFIG_SCHED_DEBUG=y
# CONFIG_SCHED_INFO is not set
# CONFIG_SCHEDSTATS is not set
# CONFIG_SCHED_STACK_END_CHECK is not set
# CONFIG_DEBUG_TIMEKEEPING is not set

#
# Lock Debugging (spinlocks, mutexes, etc...)
#
# CONFIG_DEBUG_RT_MUTEXES is not set
CONFIG_DEBUG_SPINLOCK=y
# CONFIG_DEBUG_MUTEXES is not set
# CONFIG_DEBUG_WW_MUTEX_SLOWPATH is not set
# CONFIG_DEBUG_LOCK_ALLOC is not set
# CONFIG_PROVE_LOCKING is not set
# CONFIG_LOCK_STAT is not set
# CONFIG_DEBUG_ATOMIC_SLEEP is not set
# CONFIG_DEBUG_LOCKING_API_SELFTESTS is not set
# CONFIG_LOCK_TORTURE_TEST is not set
# CONFIG_WW_MUTEX_SELFTEST is not set
# CONFIG_STACKTRACE is not set
# CONFIG_DEBUG_KOBJECT is not set
```

CONFIG_DEBUG_BUGVERBOSE=y

CONFIG_DEBUG_LIST is not set

CONFIG_DEBUG_PI_LIST is not set

CONFIG_DEBUG_SG is not set

CONFIG_DEBUG_NOTIFIERS is not set

CONFIG_DEBUG_CREDENTIALS is not set

#

RCU Debugging

#

CONFIG_PROVE_RCU is not set

CONFIG_SPARSE_RCU_POINTER is not set

CONFIG_TORTURE_TEST is not set

CONFIG_RCU_PERF_TEST is not set

CONFIG_RCU_TORTURE_TEST is not set

CONFIG_RCU_CPU_STALL_TIMEOUT=21

CONFIG_RCU_TRACE=y

CONFIG_RCU_EQS_DEBUG is not set

CONFIG_DEBUG_WQ_FORCE_RR_CPU is not set

CONFIG_DEBUG_BLOCK_EXT_DEVT is not set

CONFIG_CPU_HOTPLUG_STATE_CONTROL is not set

CONFIG_NOTIFIER_ERROR_INJECTION is not set

CONFIG_FAULT_INJECTION is not set

CONFIG_LATENCYTOP is not set

CONFIG_HAVE_FUNCTION_TRACER=y

CONFIG_HAVE_FUNCTION_GRAPH_TRACER=y

CONFIG_HAVE_DYNAMIC_FTRACE=y

CONFIG_HAVE_FTRACE_MCOUNT_RECORD=y

CONFIG_HAVE_SYSCALL_TRACEPOINTS=y

CONFIG_HAVE_C_RECORDMCOUNT=y

CONFIG_TRACE_CLOCK=y

CONFIG_TRACING_SUPPORT=y

CONFIG_FTRACE=y

CONFIG_FUNCTION_TRACER is not set

CONFIG_IRQSOFF_TRACER is not set

CONFIG_SCHED_TRACER is not set

CONFIG_HWLAT_TRACER is not set

CONFIG_ENABLE_DEFAULT_TRACERS is not set

CONFIG_FTRACE_SYSCALLS is not set

CONFIG_TRACER_SNAPSHOT is not set

CONFIG_BRANCH_PROFILE_NONE=y

CONFIG_PROFILE_ANNOTATED_BRANCHES is not set

CONFIG_PROFILE_ALL_BRANCHES is not set

CONFIG_STACK_TRACER is not set

CONFIG_BLK_DEV_IO_TRACE is not set

CONFIG_PROBE_EVENTS is not set

CONFIG_TRACEPOINT_BENCHMARK is not set

CONFIG_TRACING_EVENTS_GPIO=y

#

Runtime Testing

#

CONFIG_LKDTM is not set

CONFIG_TEST_LIST_SORT is not set

CONFIG_TEST_SORT is not set

CONFIG_BACKTRACE_SELF_TEST is not set

CONFIG_RBTREE_TEST is not set

CONFIG_INTERVAL_TREE_TEST is not set

CONFIG_PERCPU_TEST is not set

CONFIG_ATOMIC64_SELFTEST is not set

CONFIG_TEST_HEXDUMP is not set

CONFIG_TEST_STRING_HELPERS is not set

CONFIG_TEST_KSTRTOX is not set

CONFIG_TEST_PRINTF is not set

CONFIG_TEST_BITMAP is not set

CONFIG_TEST_UUID is not set

CONFIG_TEST_RHASHTABLE is not set

CONFIG_TEST_HASH is not set

CONFIG_DMA_API_DEBUG is not set

CONFIG_TEST_LKM is not set

CONFIG_TEST_USER_COPY is not set

CONFIG_TEST_BPF is not set

CONFIG_TEST_FIRMWARE is not set

CONFIG_TEST_UDELAY is not set

CONFIG_MEMTEST is not set

CONFIG_TEST_STATIC_KEYS is not set

CONFIG_BUG_ON_DATA_CORRUPTION is not set

CONFIG_SAMPLES is not set

CONFIG_HAVE_ARCH_KGDB=y

CONFIG_KGDB is not set

CONFIG_ARCH_WANTS_UBSAN_NO_NULL is not set

CONFIG_UBSAN is not set

CONFIG_ARCH_HAS_DEVMEM_IS_ALLOWED=y

CONFIG_STRICT_DEVMEM is not set

CONFIG_ARM_PTDUMP is not set

CONFIG_ARM_UNWIND=y

CONFIG_DEBUG_USER is not set

```
CONFIG_DEBUG_LL=y
# CONFIG_DEBUG_SHIKHARA is not set
# CONFIG_DEBUG_ICEDCC is not set
# CONFIG_DEBUG_SEMIHOSTING is not set
# CONFIG_DEBUG_LL_UART_8250 is not set
CONFIG_DEBUG_LL_UART_PL01X=y
CONFIG_DEBUG_LL_INCLUDE="debug/pl01x.S"
# CONFIG_DEBUG_UART_8250 is not set
CONFIG_DEBUG_UART_PHYS=0xd457b000
CONFIG_DEBUG_UART_VIRT=0xf457b000
CONFIG_DEBUG_UNCOMPRESS=y
CONFIG_UNCOMPRESS_INCLUDE="debug/uncompress.h"
CONFIG_EARLY_PRINTK=y
# CONFIG_PID_IN_CONTEXTIDR is not set
# CONFIG_CORESIGHT is not set

#
# Security options
#
# CONFIG_KEYS is not set
# CONFIG_SECURITY_DMESG_RESTRICT is not set
# CONFIG_SECURITY is not set
# CONFIG_SECURITYFS is not set
CONFIG_HAVE_HARDENED_USERCOPY_ALLOCATOR=y
# CONFIG_HARDENED_USERCOPY is not set
# CONFIG_STATIC_USERMODEHELPER is not set
CONFIG_DEFAULT_SECURITY_DAC=y
CONFIG_DEFAULT_SECURITY=""
CONFIG_CRYPTO=y
```

```
#
# Crypto core or helper
#
CONFIG_CRYPTO_ALGAPI=y
CONFIG_CRYPTO_ALGAPI2=y
CONFIG_CRYPTO_AEAD=m
CONFIG_CRYPTO_AEAD2=y
CONFIG_CRYPTO_BLKCIPHER2=y
CONFIG_CRYPTO_HASH=y
CONFIG_CRYPTO_HASH2=y
CONFIG_CRYPTO_RNG=m
CONFIG_CRYPTO_RNG2=y
CONFIG_CRYPTO_RNG_DEFAULT=m
CONFIG_CRYPTO_AKCIPHER2=y
CONFIG_CRYPTO_KPP2=y
CONFIG_CRYPTO_ACOMP2=y
# CONFIG_CRYPTO_RSA is not set
# CONFIG_CRYPTO_DH is not set
# CONFIG_CRYPTO_ECDH is not set
CONFIG_CRYPTO_MANAGER=m
CONFIG_CRYPTO_MANAGER2=y
# CONFIG_CRYPTO_USER is not set
CONFIG_CRYPTO_MANAGER_DISABLE_TESTS=y
# CONFIG_CRYPTO_GF128MUL is not set
CONFIG_CRYPTO_NULL=m
CONFIG_CRYPTO_NULL2=y
# CONFIG_CRYPTO_PCRYPT is not set
CONFIG_CRYPTO_WORKQUEUE=y
```

```
# CONFIG_CRYPTO_CRYPTD is not set
# CONFIG_CRYPTO_MCRYPTD is not set
# CONFIG_CRYPTO_AUTHENC is not set
# CONFIG_CRYPTO_TEST is not set

#
# Authenticated Encryption with Associated Data
#
# CONFIG_CRYPTO_CCM is not set
# CONFIG_CRYPTO_GCM is not set
# CONFIG_CRYPTO_CHACHA20POLY1305 is not set
# CONFIG_CRYPTO_SEQIV is not set
CONFIG_CRYPTO_ECHAINIV=m

#
# Block modes
#
# CONFIG_CRYPTO_CBC is not set
# CONFIG_CRYPTO_CTR is not set
# CONFIG_CRYPTO_CTS is not set
# CONFIG_CRYPTO_ECB is not set
# CONFIG_CRYPTO_LRW is not set
# CONFIG_CRYPTO_PCBC is not set
# CONFIG_CRYPTO_XTS is not set
# CONFIG_CRYPTO_KEYWRAP is not set

#
# Hash modes
#
```

```
# CONFIG_CRYPTO_CMAC is not set
CONFIG_CRYPTO_HMAC=m
# CONFIG_CRYPTO_XCBC is not set
# CONFIG_CRYPTO_VMAC is not set

#
# Digest
#
CONFIG_CRYPTO_CRC32C=y
# CONFIG_CRYPTO_CRC32 is not set
# CONFIG_CRYPTO_CRCT10DIF is not set
# CONFIG_CRYPTO_GHASH is not set
# CONFIG_CRYPTO_POLY1305 is not set
# CONFIG_CRYPTO_MD4 is not set
# CONFIG_CRYPTO_MD5 is not set
# CONFIG_CRYPTO_MICHAEL_MIC is not set
# CONFIG_CRYPTO_RMD128 is not set
# CONFIG_CRYPTO_RMD160 is not set
# CONFIG_CRYPTO_RMD256 is not set
# CONFIG_CRYPTO_RMD320 is not set
# CONFIG_CRYPTO_SHA1 is not set
CONFIG_CRYPTO_SHA256=m
# CONFIG_CRYPTO_SHA512 is not set
# CONFIG_CRYPTO_SHA3 is not set
# CONFIG_CRYPTO_TGR192 is not set
# CONFIG_CRYPTO_WP512 is not set

#
# Ciphers
```

```
#
CONFIG_CRYPTO_AES=y
# CONFIG_CRYPTO_AES_TI is not set
# CONFIG_CRYPTO_ANUBIS is not set
# CONFIG_CRYPTO_ARC4 is not set
# CONFIG_CRYPTO_BLOWFISH is not set
# CONFIG_CRYPTO_CAMELLIA is not set
# CONFIG_CRYPTO_CAST5 is not set
# CONFIG_CRYPTO_CAST6 is not set
# CONFIG_CRYPTO_DES is not set
# CONFIG_CRYPTO_FCRYPT is not set
# CONFIG_CRYPTO_KHAZAD is not set
# CONFIG_CRYPTO_SALSA20 is not set
# CONFIG_CRYPTO_CHACHA20 is not set
# CONFIG_CRYPTO_SEED is not set
# CONFIG_CRYPTO_SERPENT is not set
# CONFIG_CRYPTO_TEA is not set
# CONFIG_CRYPTO_TWOFISH is not set

#
# Compression
#
# CONFIG_CRYPTO_DEFLATE is not set
# CONFIG_CRYPTO_LZO is not set
# CONFIG_CRYPTO_842 is not set
# CONFIG_CRYPTO_LZ4 is not set
# CONFIG_CRYPTO_LZ4HC is not set

#
```

```
# Random Number Generation
#
# CONFIG_CRYPTO_ANSI_CPRNG is not set
CONFIG_CRYPTO_DRBG_MENU=m
CONFIG_CRYPTO_DRBG_HMAC=y
# CONFIG_CRYPTO_DRBG_HASH is not set
CONFIG_CRYPTO_DRBG=m
CONFIG_CRYPTO_JITTERENTROPY=m
# CONFIG_CRYPTO_USER_API_HASH is not set
# CONFIG_CRYPTO_USER_API_SKCIPHER is not set
# CONFIG_CRYPTO_USER_API_RNG is not set
# CONFIG_CRYPTO_USER_API_AEAD is not set
CONFIG_CRYPTO_HW=y
# CONFIG_CRYPTO_DEV_FSL_CAAM_CRYPTO_API_DESC is not set

#
# Certificates for signature checking
#
# CONFIG_ARM_CRYPTO is not set
# CONFIG_BINARY_PRINTF is not set

#
# Library routines
#
CONFIG_BITREVERSE=y
CONFIG_HAVE_ARCH_BITREVERSE=y
CONFIG_RATIONAL=y
CONFIG_GENERIC_STRNCPY_FROM_USER=y
CONFIG_GENERIC_STRNLEN_USER=y
```

CONFIG_GENERIC_NET_UTILS=y

CONFIG_GENERIC_PCI_IOMAP=y

CONFIG_GENERIC_IO=y

CONFIG_ARCH_USE_CMPXCHG_LOCKREF=y

CONFIG_CRC_CCITT is not set

CONFIG_CRC16=y

CONFIG_CRC_T10DIF is not set

CONFIG_CRC_ITU_T is not set

CONFIG_CRC32=y

CONFIG_CRC32_SELFTEST is not set

CONFIG_CRC32_SLICEBY8=y

CONFIG_CRC32_SLICEBY4 is not set

CONFIG_CRC32_SARWATE is not set

CONFIG_CRC32_BIT is not set

CONFIG_CRC7 is not set

CONFIG_LIBCRC32C is not set

CONFIG_CRC8 is not set

CONFIG_AUDIT_ARCH_COMPAT_GENERIC is not set

CONFIG_RANDOM32_SELFTEST is not set

CONFIG_ZLIB_INFLATE=y

CONFIG_ZLIB_DEFLATE=y

CONFIG_LZO_COMPRESS=y

CONFIG_LZO_DECOMPRESS=y

CONFIG_LZ4_DECOMPRESS=y

CONFIG_XZ_DEC=y

CONFIG_XZ_DEC_X86=y

CONFIG_XZ_DEC_POWERPC=y

CONFIG_XZ_DEC_IA64=y

CONFIG_XZ_DEC_ARM=y

CONFIG_XZ_DEC_ARMTHUMB=y

CONFIG_XZ_DEC_SPARC=y

CONFIG_XZ_DEC_BCJ=y

CONFIG_XZ_DEC_TEST is not set

CONFIG_DECOMPRESS_GZIP=y

CONFIG_DECOMPRESS_BZIP2=y

CONFIG_DECOMPRESS_LZMA=y

CONFIG_DECOMPRESS_XZ=y

CONFIG_DECOMPRESS_LZO=y

CONFIG_DECOMPRESS_LZ4=y

CONFIG_GENERIC_ALLOCATOR=y

CONFIG_HAS_IOMEM=y

CONFIG_HAS_IOPORT_MAP=y

CONFIG_HAS_DMA=y

CONFIG_DMA_NOOP_OPS is not set

CONFIG_DMA_VIRT_OPS is not set

CONFIG_CPU_RMAP=y

CONFIG_DQL=y

CONFIG_NLATTR=y

CONFIG_CORDIC is not set

CONFIG_DDR is not set

CONFIG_IRQ_POLL is not set

CONFIG_LIBFDT=y

CONFIG_SG_SPLIT is not set

CONFIG_SG_POOL=y

CONFIG_ARCH_HAS_SG_CHAIN=y

CONFIG_SBITMAP=y

CONFIG_VIRTUALIZATION is not set

Step 8: building

gcc version 4.7.3 (Ubuntu/Linaro 4.7.3-12ubuntu1)

make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi- shikhara_defconfig

make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi- vmlinux

```
  AR      lib/lib.a
  EXPORTS lib/lib-ksyms.o
  LD      lib/built-in.o
  LD      virt/lib/built-in.o
  LD      virt/built-in.o
  GEN     .version
  CHK     include/generated/compile.h
  UPD     include/generated/compile.h
  CC      init/version.o
  LD      init/built-in.o
  LD      vmlinux.o
  MODPOST vmlinux.o
  KSYM    .tmp_kallsyms1.o
  KSYM    .tmp_kallsyms2.o
  LD      vmlinux
  SORTEX  vmlinux
  SYSMAP  System.map
```

make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi- dtbs

```
make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi- dtbs
  CHK     include/config/kernel.release
  CHK     include/generated/uapi/linux/version.h
  CHK     include/generated/utsrelease.h
  CHK     include/generated/bounds.h
  CHK     include/generated/timeconst.h
  CHK     include/generated/asm-offsets.h
  CALL    scripts/checksyscalls.sh
```

CHK scripts/mod/devicetable-offsets.h
DTC **arch/arm/boot/dts/shikhara.dtb**