Linux support package (LSP) v3.2.5 for SPEAr eMPU family

Introduction

This document provides a summary for the contents of a specific Linux support package (LSP) software version for the SPEAr embedded eMPU family.

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1 Release information

Table 1. Release information

LSP version	3.2.5
Delivery date	June 19, 2012
Status	Validated
Reference U-Boot	v2010.03
Reference Linux kernel	2.6.37
Reference GCC	4.6.2 20120301
Reference Binutils	2.20.51.20100809
Reference GDB debugger	7.2. 66
Reference GLIBC libraries	2.10.2
X-Loader repository	git://git.stlinux.com/spear/xloader.git
U-Boot repository	git://git.stlinux.com/spear/u-boot.git
Linux repository	git://git.stlinux.com/spear/linux-2.6.git
Git tag	lsp-3.2.5
Toolchain repository	ftp://ftp.stlinux.com/pub/stlinux/2.4
PC OS supported	Fedora 13

2 Target platforms

The following table reports the hardware platforms and the relevant configurations supported by this LSP version. Each target may consist of one or more physical boards (kit).

Y: supported   N: not supported   -: not applicable

Table 2.   Target platforms

Target	Boards	Supported	Configuration
SPEAr300	EVALSPEAR300	Y	CPUs @ 333 MHz Bus @ 166 MHz DDR3 @ 333 MHz
SPEAr310	EVALSPEAR310	Y	CPUs @ 333 MHz Bus @ 166 MHz DDR3 @ 333 MHz
SPEAr320S	EVALSP320SCPU: SPEAr320S CPU evaluation board	Y	CPUs @ 333 MHz Bus @ 166 MHz DDR3 @ 333 MHz
	EVALSP320SPLC: SPEAr320S evaluation kit for PLC applications, including CPU board	Y	CPUs @ 333 MHz Bus @ 166 MHz DDR3 @ 333 MHz
	EVALSP320SHMI: SPEAr320S HMI evaluation board	Y	CPUs @ 333 MHz Bus @ 166 MHz DDR3 @ 333 MHz
SPEAr600	EVALSPEAR600	Y	CPUs @ 333 MHz Bus @ 166 MHz DDR3 @ 333 MHz
SPEAr1310-C	EVALSP1310CPU: main board (SPEAr1310 Rev. C)	Y	CPUs @ 500 MHz Bus @ 166 MHz DDR3 @ 533 MHz
	EVALBASEXP: Base exp. board for SPEAr1310 Rev.C	Y	CPUs @ 500 MHz Bus @ 166 MHz DDR3 @ 533 MHz
SPEAr1340	EVALSP1340CPU SPEAr1340 CPU evaluation board	Y	CPUs @ 600 MHz Bus @ 166 MHz DDR3 @ 533 MHz

3 Summary of main changes

This LSP version includes the following main changes:

● SOC/board support added/removed

– SPEAr320 replaced by SPEAr320S. Support added for HMI board version 3.1 and PLC board

– Added Support for SPEAr1310-C + SPEAr1300 Base Expansion Board

● Xloader:

– SPEAr 1310 Rev C support added

– Updated default bootargs for all boards

● U-Boot:

– Added support for SPEAr1310-C

– Corrected support for listing devices in imls in NAND

– Added EHCI and FAT file systems support for SPEAr3xx and SPEAr6xx based boards.

– Bug fix for USB pendrive detection which was abnomaly slow when reporting status change or other commands

– imls: Reduced the heap requirement of imls

– Added support for SPI in U-Boot

– Turns off the i2c controller when setting the speed

– Saveenv command modified for usbtty mode

● Linux:

– Added support of SPEAr1310-C and SPEAr320S HMI 3.1 board

– I2C bus recovery hook added in SPEAr1310-C and SPEAr 320S.

– Default defconfig of Separ13xx now contains support for OTG

– Fixed bugs in OTG for hub support

– Fixed issues in I2S. Other enhancements include support of wider sample rate

– Updated MiPhy setting for proper functioning with PCIe

– Several FSMC/NAND enhancements added to improve performance, DMA support optionally available, ready/busy support added by configuring the pad as GPIO.

– FSMC ready/busy feature is now working properly

– Several Power Management enhancements added, such as support for switching off the board on hibernate, disable & flush L2 before L1 D-Cache, shutting off all power domains on suspend.

– Merged with latest stable linux-2.6.37.6

– Updated Mali/UMP driver to version r2p4. These features, if needed, must be enabled using Linux menuconfig tool before rebuilding the kernel source tree.

– Support for Video Encoded added

– In SPEAr1340 clock source for CPU changed. New set of CPU frequencies supported. The new CPU frequency levels are:

166000

200000

250000

300000

400000

500000

600000

Note: 1 *For detailed changes you can also use the following git commands:*

```
git diff lsp-3.2.3..lsp-3.2.5
```

This will give the differences in each file with respect to the earlier release

```
git log lsp-3.2.3..
```

This will give log messages for lsp-3.2.3 up till now.

2 *For SPEAr320SHMI board with lsp-3.2.5, to use the HMI LCD panel properly, it is necessary to select it through the menuconfig, as follows:*

Device Drivers → Graphics Support → Support for Frame Buffer Devices →Arm Primecell PL110 support → LCD Panel → Emerging Display CLCD 5.7" TFT(680X480)

4   Patches

Table 3.   List of available patches

Patch #	Summary	Boards affected	Description of handled issue
1	**net/macb** Move random hwaddr generation from init to open	EVALSP320SHMI	Random MAC address was being written to MACB registers. MAC address passed from uboot was not sent to MACB. See also Table 7: List of known issues ID 176821 "*MAC address from uboot not set to MACB [SPEAr320S]*"
2	**SPEAr1340:clock** Configure pll1 to 1.2GHz before spear13xx_init	EVALSP1340CPU	PLL1 was not configured to 1.2 GHz before init of board was called. This resulted in wrong clock being generated by SD controller. See also Table 7: List of known issues ID 171683 "*Inaccurate clock programmed by Linux*"
3	**i2c/designware** Do not use _interruptible_ variant call for wait	All	With interruption of I2C transfer (through signal) sometimes I2C was moved to unsafe state. This resulted in failed transfers on I2C even on successive tries. This issue was reproduced by killing I2S audio application while it was playing audio. See also Table 7: List of known issues ID 169720 "*I2S kill gives I2C timeout msg [SPEAr1310-C]*"
4	**SPEAr/VENC** Fix encoder driver debug define	EVALSP1340CPU	Enabling debug messages in SPEAr1340 video encoder driver was not working due to a wrong #define, this patch solves the issue. See also Table 7: List of known issues ID 178675 "*Debug messages in video encoder driver not working [SPEAr1340]*"

4.1   Accessing patches

Patches are pushed in a maintenance branch of LSP 3.2.5 named "lsp-3.2.5.y" on the GIT server repository.

To retrieve the patches, perform these steps:

1.   Clone code from GIT repository to the working directory:

```
git clone git://git.bri.st.com/spear/linux-2.6.git
```

2.   Checkout code from maintenance branch into a local branch (e.g. maint):

```
git checkout -b maint origin/lsp-3.2.5.y
```

Now this code contains all the patches pushed in the maintenance branch.

Use the GIT log to see the commit messages of the patches.

5 Features

The following table reports the features supported by this LSP version that have a general scope, not related to specific hardware IPs or external peripherals.

Table 4. Features supported in LSP 3.2.5

Category component	Description	Targets	Remarks
Multiprocessing	Symmetric multiprocessing (SMP) in Linux kernel for dual core platforms	SPEAr1310, SPEAr1340	NA
Power Management	CPU Frequency	All	
	Standby	All	For SPEAr3xx/SPEAr6xx this is with echo mem > /sys/power/state. For others it is echo standby > /sys/power/state. While for others with echo standby > /sys/power/state. SPEAr1310-C not stable after moving from low power state mode. no_console_suspend is not supported in SPEAr3xx/SPEAr6xx
	Suspend to RAM	SPEAr1310-C, Spear1340	SPEAr1310-C not stable after moving from low power state mode
	Hibernation	SPEAr1310-C, Spear1340	SPEAr1310-C not stable after moving from low power state mode
Sound	Support of ALSA framework	SPEAr1310, SPEAr1340	NA
Video	V4L2 framework	SPEAr1340	NA
Camera	V4L2 framework	SPEAr1340	NA
Flashing Tool	USB based Flashing tool	All	NA

6 Clock configuration changes

6.1 CPU clk

CPU is now fed through PLL1.

For 600 MHz cpu clock configuration:

$$\begin{matrix} \text{vco1/pll1} \\ \text{(1200 MHz)} \end{matrix} \rightarrow \text{sys clk} \rightarrow \begin{matrix} \text{cpu clk} \\ \text{(600 MHz)} \end{matrix}$$

For 500, 400 MHz cpu clock configuration:

$$\begin{matrix} \text{vco3/pll3} \\ \text{(1000/800/664 MHz)} \end{matrix} \rightarrow \text{sys clk} \rightarrow \begin{matrix} \text{cpu clk} \\ \text{(500/400 MHz)} \end{matrix}$$

For 300, 250, 166 MHz cpu clock configuration, LSP 3.2.5 switched to sys_synth_clk:

$$\begin{matrix} \text{vco1div2} \\ \text{(600} \\ \text{MHz)} \end{matrix} \rightarrow \begin{matrix} \text{sys\_synth\_clk} \\ \text{(SSCG5)} \end{matrix} \rightarrow \text{sys clk} \rightarrow \begin{matrix} \text{cpu clk} \\ \text{(300/250/166 MHz)} \end{matrix}$$

Note: *1   vco1/pll1 settings at 1.2 GHz are fixed and never changed.*

   2   To remain mostly at synth, the 332 MHz option has been eliminated, since it cannot be generated from synth and instead 300 MHz has been added.

6.2 AMBA (AHB/APB clk)

There is no change in AHB/APB clock configuration except that the source vco1div2 clock is at 600 MHz.

$$\begin{matrix} \text{vco1div2} \\ \text{(600 MHz)} \end{matrix} \rightarrow \begin{matrix} \text{amba\_synth\_clk} \\ \text{(SSCG7)} \end{matrix} \rightarrow \begin{matrix} \text{ahb clk} \\ \text{(166 MHz)} \end{matrix}$$
$$\rightarrow \begin{matrix} \text{apb clk} \\ \text{(83 MHz)} \end{matrix}$$

6.3 SSCG blocks

All SSCG blocks except SSCG5 and SSCG7 (above mentioned sys and amba clk synthesizers) are configured for vco1div4 input.

Given from above description, vco1div4 is fixed at 300 MHz, thus impacting all SSCGs blocks. The rate table has been adapted for each synthesizer in order to adapt to new input clock rate (300 MHz).

6.4 XYSYNT blocks

- I2S_DIV1, I2S_DIV2:   Pad clock is used as source
- C3__CLK_SYNT: vco1div2 is considered as source
- UART0__CLK_SYNT: Currently not used in s/w
- UART1__CLK_SYNT: Currently not used in s/w
- GMAC_CLK_SYNT: PLL2 is used as input clock source
- MCIF_SD__CLK_SYNT: vco1div2 is used as clock source
- MCIF_CFXD__CLK_SYNT: vco1div2 is used as clock source
- ADC_CLK_SYNT: HCLK is used as source

Given from above descriptions

- vco1div2 is now 600 MHz impacting C3CLK_SYNT, UART0/_CLK_SYNT, MCIF_SDCLK_SYNT and MCIF_CFXD__CLK_SYNT

- PLL2 is fixed at 125 MHz

- HCLK is fixed at 166 MHz

As a result, the rate table of all synthesizers has been adapted, taking VCO1DIV2 as input clock.

Note: *The rate table for SSCG and XYSYNT has been updated in arch/arm/mach-spear13xx/spear1340_clock.c.*

7 Linux device drivers for SOC IPs

The following table reports the device drivers supported by this LSP version for functionality provided through software concerned with internal hardware IPs.

Y: supported   N: not supported   -: not applicable

Table 5.   Linux device drivers for SOC IPs

Hardware component	Description	SPEAr 300	SPEAr 310	SPEAr 320S	SPEAr 600	SPEAr 1310-C	SPEAr 1340	Remarks
ADC	A/D converter	Y	Y	Y	Y	Y	Y	
Accelerometer	Motion sensor							
CAN	CAN ports	-	-	Y	-	N	-	
CLCD	CLCD controller	Y	-	Y	Y	Y	Y	
CEC	CEC controller	-	-	-	-	-	Y	Tested in loopback only
Camera	Camera controller	-	-	-	-	-	Y	Tested with only one sensor
DMAC	DMA controller	Y	Y	Y	Y	Y	Y	
EMI	Expansion memory I/F	-	-	Y	-	N	-	PNOR is attached on EMI interface
Ethernet (MAC)	LAN	Y	Y	Y	Y	Y	Y	SPEAr3xx have Fast Ethernet interface all others have also Giga Ethernet
Ethernet MACB SMII/RMII)	LAN	-	Y	Y	-	-	-	
E1/ TDM/HDLC/ RS485	HDLC controller	-	Y	-	-	N	-	
Flash memory NAND	FSMC controller	Y	Y	Y	Y	Y	Y	
Flash memory SNOR	SMI controller	Y	Y	Y	Y	Y	Y	
Gyroscope	Gyroscope controllers	-	-	-	-	-	Y	
GPIO / XGPIO	Standard and extended GPIOs	Y	Y	Y	Y	Y	Y	
GPT	General purpose timers	Y	Y	Y	Y	Y	Y	

Table 5.   Linux device drivers for SOC IPs (continued)

Hardware component	Description	SPEAr 300	SPEAr 310	SPEAr 320S	SPEAr 600	SPEAr 1310-C	SPEAr 1340	Remarks
GPU (MALI 200)	2D/3D graphics	-	-	-	-	-	Y	
Hardware video decoder/ encoder	Video accelerators	-	-	-	-	-	Y	
HDMI TX	HDMI TX controller	-	-	-	-	-	Y	Tested with hdmi tx on TV through HDMI Plug outside LSP
I2C	I2C controller	Y	Y	Y	Y	Y	Y	Slave mode not supported
I2S	I2S controller for audio	N	-	Y	-	Y	Y	Tested with STA529 codec
JPEG	JPEG codec	Y	Y	Y	Y	N	-	
Keypad	Keypad controller	Y	-	-	-	Y	-	
MCIF (SD/MMC)	Memory card I/F	Y	-	Y	-	N	Y	
MCIF (XD/CF/CF+)	Memory card I/F	-	-	-	-	-	-	Not tested
Magnetometer	Motion sensor	-	-	-	-	-	Y	
PCIe	PCIe controller	-	-	-	-	Y	Y	Slave mode not supported
PWM	PWM controller	-	-	-	-	Y	Y	Not validated
RTC	Realtime clock	Y	Y	Y	Y	Y	Y	
SATA	SATA controller	-	-	-	-	Y	Y	
Security Coprocessor (C3)	Crypto accelerator	Y	Y	Y	-	Y	Y	
SPP	Legacy parallel port	-	-	Y	-	-	-	Not validated
SSP	SPI port	Y	Y	Y	Y	Y	Y	Slave mode not supported
SPDIF Out	SPDIF playback controller for audio	-	-	-	-	-	Y	Tested with HDMI tx on TV
SPDIF In	SPDIF recorder for audio	-	-	-	-	-	Y	Tested with loopback with SPDIF out and with sound blaster from Creative

Table 5.   Linux device drivers for SOC IPs (continued)

Hardware component	Description	SPEAr 300	SPEAr 310	SPEAr 320S	SPEAr 600	SPEAr 1310-C	SPEAr 1340	Remarks
Temperature sensor		-	-	-	-	Y	Y	
Touchscreen		Y	-	Y	Y	Y	Y	
UART	Asynchronous serial port	Y	Y	Y	Y	Y	Y	
USB DEVICE	USB device controller	Y	Y	Y	Y	-	-	
USB HOST	USB host controller	Y	Y	Y	Y	Y	Y	
USB OTG	USB OTG controller	-	-	-	-	Y	Y	
WATCHDOG	Watchdog timer	Y	Y	Y	Y	Y	Y	
Video In	Video In controller	-	-	-	-	-	N	

8 Bugs closed in LSP 3.2.5

Table 6. Bugs closed in LSP 3.2.5

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
Acceler-ometer	Input device events are not generated	Accelerometer and Magnetometer data can be read properly through device attributes. But if we read the data from input framework based application, events are not generated. The following behavior is observed: 1. Magnetometer: events are generated once and data is received once for (x,y,z) axis 2.Accelerometer: No events are generated and so data is not read 3. Gyroscope: The same application works fine reading gyroscope data	Normal	SPEAr1340		158086
Camera	Only one pixel format is supported. Not working for other formats	When a camera application was used to capture data for different pixel formats i.e V4L2_PIX_FMT_YUYV V4L2_PIX_FMT_RGB565 V4L2_PIX_FMT_RGB24 V4L2_PIX_FMT_UYVY When the same captured data was played with the respective captured format, good display was not produced. Using mplayer, captured data produced good display only for yuy2 format	Plus	SPEAr1340		156496
Camera	Embedded codes sync not working	Image capture for Embedded codes sync was not working for camera IP	Plus	SPEAr1340		163386

Table 6.   Bugs closed in LSP 3.2.5 (continued)

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
Ethernet	Unable to set the MTU size if interface is up	When performing these steps: ifconfig eth0 mtu 1000 eth0: had to be stopped to change its MTU SIOCSIFMTU: Device or resource busy. MTU field was not set to 1000 it accepted only 1500.	Normal	SPEAr300 SPEAr310 SPEAr320S SPEAr600 SPEAr1310-C SPEAr1340		115905
HDMI	With some resolutions set on CLCD no image is displayed on TV connected to HDMI	This was observed with resolution of 480 X 272	Normal	SPEAR1340	Setting proper resolution solves this. Tests was giving resolution not supported by HDMI	149878
HDMI	HDMI TX - Interrupts Not Received Sometimes	Sometimes interrupts were not received from HDMI device. This resulted in no display on HDMI device	Plus	SPEAR1340		149881
I2C	Input event handler messages in kernel bootlog	Following messages from input event handler were generated for all the input devices (cam, gyro, acc, mag, sta529…) available to SPEAr boards. e.g for magnetometer: evbug.c:Connected device:input5 (magnetometer at unknown)	Normal	SPEAr1340		158078
LCD	Enable DMA only when required	DMA is enabled even if there is no request for display from clcd controller. Current implementation does a memset 0 in such cases. This is effecting bandwidth and power consumption of system.	Normal	SPEAr300 SPEAr320S SPEAr600 SPEAr1340		114451

Table 6. Bugs closed in LSP 3.2.5 (continued)

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
OTG	Board hangs when connected as device (Observed on fedora machine)	On connecting OTG cable's B-type to SoC (making it device) and A-type to Linux PC (OTG host), when board booted up, it hung, giving the following error USB RESET USB RESET zero gadget: high speed config #3: source/sink req 80.06 protocol STALL; err -22	Plus	SPEAr1340		157742
OTG	USB OTG: Kernel crashes when OTG type-A connector detached	Connected Type-A plug on SoC. On detaching this plug then the kernel crashed. No device was connected on Type-B plug.	Plus	SPEAr1340		157811
OTG	USB OTG: Pendrive is not detected when Type-A connector is inserted after B	Connected B-type end of OTG cable to Pendrive (Device) Power up Board Connect A-type to SoC (Soc is now host) Pendrive was NOT detected If Pendrive was removed and inserted again, it was detected.	Normal	SPEAr1340	Reconnect Pendrive and it will work	157824
OTG	Some Pendrives are not working under stress.	Large data copy on Kingston failed (400 MB transfer failed)	Minor	SPEAr1340		146543
SSP	Unable to mount file system on memory	System tested with SPI memory attached to board. This memory is exporting mtd block. When try to mount any file system it was failing.	Minor	SPEAr600	Other SPI memory read write are working	141767
UART	UART1 not working on 320S	No data transfer was taking place on UART1	Plus	SPEAR320S		158628
UART	UART data transfer missing data above 115200	System tested with either external loopback, or data using two ports of same or different UART. UART comparison failed at speeds above 115200.	Minor	SPEAr320S	Flow control should be used in case of data loss	79576

Table 6.   **Bugs closed in LSP 3.2.5 (continued)**

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
USB HOST	S320s CPU + S320s New_HMI: udev exception	If USB was connected on the board and we booted it, a exception was observed: udevadm settle - timeout of 3 seconds reached, the event queue contained: /sys/devices/platform/spear-ohci.0/usb2/2-1/2-1:1.0/host0/target0:0:0/0:0:0:0/block/sda/sda1	Normal	SPEAr320s		156266
USB Utils	Flashing utility on SPEAr 1340 Nand	Flasher did not detect the NAND device on SPEAr1340.	Plus	SPEAr1340		158076
UBOOT	Copy from RAM to unaligned flash addresses does not work.	Copy from RAM to unaligned addresses does not work but at aligned addresses it is fine.	Minor	SPEAr300, SPEAr310, SPEAr320S, SPEAr600, SPEAr1310, SPEAr1340	Normally unaligned copy is not required.	82797
UBOOT	USB boot does not work with some specific Pendrives	A few USB Pendrives were not working for USB boot, e.g. Kingston DT101 G2 (8GiB) Moserbear	Normal	SPEAr1340		139385

Table 6. **Bugs closed in LSP 3.2.5 (continued)**

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
UBOOT	Random Copy to Flash failures	Sometimes copy to Flash generated an error "copy to Flash… flash.c[221] FIXME: rc=-5"	Plus	SPEAr300, SPEAr310, SPEAr320S, SPEAr600, SPEAr1310, SPEAr1340		146182
Xloader	Xloader Bootargs and U-Boot default bootargs	Xloader bootargs and U-Boot default bootargs picked file system from wrong mtdblock. Mtdblock for NOR or NAND fs shifted due to new mtd block created because of SPI memory.	Plus	SPEAr1340		140826

9 Known issues

The following table reports known issues related to this LSP version.

Table 7. List of known issues

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
ADC	Continuous mode not working	While reading ADC channel with continuous mode following error occurs: `Error in reading return value: -1 Errno set to 11(EAGAIN)`	Plus	SPEAr300		71819
Camera	When iomethod is selected, user pointer green line displays.	When iomethod is used, user pointer captures from the camera the green line that is seen at the start of every frame. One extra frame is also captured for this iomethod. When using mmap method, the exact number of frames is captured, with no green line. Both methods are verified using mplayer to display captured data.	Normal	SPEAr1340		156391
	Missing interlaced frame support for CAMIF	This is related to supporting interlaced fields in CAMIF. Presently CAMIF support only progressive mode in CAMIF.	Normal	SPEAr1340		156723
	Extra brightness seen in several resolutions	In following resolutions, extra brightness is observed 1. 640x360 2. 800x600 3. 800x360	Normal	SPEAr1340		168208
CAN	S320S_CPU: CAN skb buffer full issue	While testing CAN for multiple frame transmission at 5 KBPS, sometimes the skb buffer is full and the particular frame transmission gets delayed. This is observed when multiple frame transmission is done in multiple loops.	Normal	SPEAr320S		155976

Table 7. List of known issues (continued)

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
CAN	Issue with bitrate > 125 kHz	CAN interface is not working consistently at the bitrate > 125000 (125KHz)when loopback is off. When loopback is on, its working fine till 1MHz. This should be because there is no significant propagation delay of the signal as its traversing from Tx to Rx pad of CAN on the SoC	Normal	SPEAr320S		164759
CAN	CAN echo off mode not working	In echo off mode data output from CAN is not correct	Normal	SPEAr320S		164757
CEC	CEC not able to communicate with external device	CEC unable to communicate with external devices.Only tested in loop-back case.	Plus	SPEAr1340		159097
Compact Flash	CF cards not detected [SPEAr1310-C]	CF cards are not detected	Plus	SPEAr1310-C		171271
Compilation	Linux kernel compilation displays warning messages	Compiling Linux-2.6 kernel displays many warning messages. Although most warnings are related to unused variables, they were not displayed in previous LSP releases.	Plus	All		157369
Ethernet	NFS server goes down when stressing NFS@10 full [mailto:NFS@10full] or 10 half on SMII2	TCP-Tx performance is low at 10 full/half for SMII-2 which is probably causing NFS to go down while running tests on SMII2.	Minor	SPEAr310		90395
Ethernet	FTP not working on SMII1,2,3,4 for 10/half, 10/full [SPEAr310]	FTP operation fail for configuration 10/full, 10/half on all SMII interface of EVALSPEAR310 board. Only ping command works.	Minor	SPEAr310		90942

Table 7.   List of known issues (continued)

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID

Ethernet	Configuring unused SMII results in junk messages	Configuring the SMII0 which is not connected via Ethernet cable results in junk messages. Configuration is done using the ethtool. See the log below:
		`# ./ethtool.dat -s eth0 autoneg off duplex full speed 100 #  ./ethtool.dat eth0`
		`# # # # Trying 100/HALF Trying 10/FULL Trying 10/HALF Trying 10/HALF`
			Minor	SPEAr310		92208

Ethernet	Ethernet performance for 1000/full is very low	We get much less performance on 1000/full configuration using netperf. Performance results are given below: – For SPEAr1310, SPEAr1340 TCP Tx Perf TCP RX perf 1000/FULL 200.71 Mbps 345.65 Mbps – UDP Tx Perf UDP Rx perf 1000/full 301.04 Mbps 799.64 Mbps – For SPEAr600: TCP-Tx - 72.47 TCP-Rx - 57.17 – UDP-Tx - 211.42 UDP-Rx - 3.53	Plus	SPEAr1340, SPEAr1310-C SPEAr600		102682

Table 7. **List of known issues (continued)**

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
Ethernet	TX performance test for MTU 9000 results in error	At 1000-F unable to take TCP-Tx performance (hangs and need to press control c). At speeds below 1000 we can take TCP Tx/Rx performances. UDP-Rx performance for all speed/duplex settings is zero. Note: All performances are measured using netperf/netserver Listing out performance at 9000 MTU. **Tx** **Rx** 1000-F TCP NA 650.21 1000-F UDP 775.44 0 100-F TCP 99.13 99.10 100-F UDP 100.13 0 100-H TCP 91.36 96.58 100-H UDP 100.12 0 10-F TCP 9.86 9.9 10-F UDP 10.71 0 10-H TCP 9.58 9.46 10-H UDP 10.71 0	Normal	SPEAr1310-C, SPEAr1340	Supported only up to 8192	111097

Table 7.   List of known issues (continued)

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
Ethernet	NFS going up and down under stress	NFS is going up and down while running stress. Following tests were executed concurrently 1) Two instances of memtester (64 MB each) executing 100 loops 2) Infinite DMA memory to memory copy on all 16 channels. Data compared with that copied 3) One instance of netperf/netserv with netserver running on SPEAr board and netperf on Linux machine 4) Two instances of netperf/netserv executing on SPEAr board in loopback mode 5) Continuous display on CLCD with pattern continuously changing 6) Continuos copy of large file from Ethernet to USB pen drive attached on one of USB host ports (alternate copy in both directions) 7) Continuous copy of large file from Ethernet to USB pen drive attached on PCI to USB host converter on one of PCI host port (alternate copy in both directions)	Plus	SPEAr1310-C, SPEAR1340		123761

Table 7. List of known issues (continued)

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
Ethernet	SPEAr1300/10 Ethernet linkup fails for autoneg off on host side	– Ethernet link up fails if host side autoneg is set to off. – If board boots with autoneg on, on host side, then autoneg is set to on, Ethernet links down again. – With autoneg on at host side, no such issue is found. Setting autoneg off on host side (before or after booting the board) leads to Ethernet link down. This is observed with EVALSP1300 and SP1310-C boards.	Normal	SPEAr1340, SPEAr1310-C		150232
Ethernet	Random failures of NFS at multiple boot	Ethernet sometimes fails at multiple reboots	Minor	SPEAr1340	NA	152249
Ethernet	SMII interfaces not working	– S310. Only 2 SMII out of four work (SMII2 & SMII3 on some boards, SMII1 and SMII2 on others) but SMII4 is not working. Seems to be hardware issue as link LED is not glowing. – S1310. 2 SMII and 1 RMII interface. Only SMII interface is working. RMII does not work on any board	Normal	SPEAr310, SPEAr1310-C		146315
Ethernet	Performance issue and MTU size issue [SPEAr320S]	Following issues on performance on eth2 of S320S. – Performance taken only at 100-F & 100-H – Cannot change the MTU sizes. – TCP performance at Tx with 100-F/H is too low at about 10.84	Normal	SPEAr320S		154305

Table 7. List of known issues (continued)

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
Ethernet	MAC address from uboot not set to MACB [SPEAr320S]	Random MAC address was being written to MACB registers. MAC address passed from uboot was not set to MACB.	Normal	SPEAr320S	Separate patch is available to fix this issue (see *Table 3*)	176821
I2C	I2C designware timeout error	I2C timeout occurs with some I2C devices like gyroscope. This can occur with other devices too. This error continues in Linux boot log if board is rebooted again.	Plus	SPEAr1310-C, SPEAr1340	NA	130517
I2S	With aplay command ALSA -l lists capture devices too	Aplay -l should list only playback devices. Current implementation lists capture devices too in aplay -l.	Normal	SPEAr1340	This affects the listing only. Functionality not effected.	149669
I2S	Humming noise is heard at high volume	Noise is heard in audio at high volume	Normal	SPEAr1340		149947
I2S	I2S kill gives I2C timeout msg [SPEAr1310-C]	Killing running I2S with Control + C or with kill command gives timeout messages from I2S. After such messages board need to be rebooted	Normal	SPEAr1310-C	Separate patch is available to fix this issue (see *Table 3*)	169720
JPEG	JPEGCORE not able to encode the YUV data of JPEG image with varied luminance & chrominance value	Not able to encode YUV data for JPEG images that have varied luminance & chrominance part.	Normal	SPEAr300, SPEAr310, SPEAr320S, SPEAr600		92722

Table 7.   List of known issues (continued)

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
JPEG	JPEG tests failing [SPEAR1310-C]	JPEG tests on SPEAr1310-C SoC are failing. Error messages: jpeg-designware: write: sleep timeout. exiting. jpeg-designware jpeg-designware: read: sleep timeout. exiting. jpeg-designware jpeg-designware: jpeg aborted. error no. -62 Error Encountered while jpeg-designware jpeg-designware: jpeg aborted. error no. -62 Reading -1 Error Encountered while writing -1 write failed unmapping read/write buf	Normal	SPEAr1310-C		167316
Kernel	HDMI + Camera TX Linux	Kernel sometimes crashes/hangs when connecting HDMI and Camera together. It seems DDR is not stable with both Camera and HDMI connected	Plus	SPEAr1340		168823
OTG	USB OTG: USB-CV tests failing	All tests except OTG Descriptor Test - Device Configured/ Device Addressed are failing.	Normal	SPEAr1310-C, SPEAr1340		169824
OTG	USB to Ethernet Adaptor not working	USB to Ethernet Adaptor not working on OTG port, while its working on USB Host port	Normal	SPEAr1310-C, SPEAr1340		173933
OTG	USB OTG: Remote Wake Up failing	Remote Wake up is not working	Normal	SPEAr1310-C, SPEAr1340		169824

Table 7. **List of known issues (continued)**

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
OTG	USB OTG: USB to Ethernet Card not working	Ethernet D-link is not working with OTG, but it is working with USB Host. Following error is generated thrown while Ping PING 192.168.1.1 (192.168.1.1) 56(84) bytes of data. asix 1-1:1.0: eth1: asix_rx_fixup() Bad Header Length asix 1-1:1.0: eth1: asix_rx_fixup() Bad RX Length 65475 asix 1-1:1.0: eth1: asix_rx_fixup() Bad Header Length asix 1-1:1.0: eth1: asix_rx_fixup() Bad RX Length 65475 asix 1-1:1.0: eth1: asix_rx_fixup() Bad Header Length asix 1-1:1.0: eth1: asix_rx_fixup() Bad RX Length 65475 From 192.168.1.10 icmp_seq=1 Des192.168.1.10 icmp_seq=2 Destination Host Unreachable	Normal	SPEAr1310-C, SPEAr1340		168225
OTG	USB OTG: Bus powered hub not working	Bus powered hub not working with OTG board. Detailed analysis is as below SPEAr1340: Both 1.0 and 2.0 ports working when self powered. When 1.0 port is connected as bus powered, the hub is detected, but we get over-current message when pendrive is attached. When 2.0 port is connected as bus powered the hub is not detected. SPEAr1310-C: Both 1.0 and 2.0 ports working when self powered. When 1.0 port is connected as bus powered, the hub is detected, pendrives also work properly when attached. When 2.0 port is connected as bus powered the hub is not detected.	Plus	SPEAr1310-C, SPEAr1340		169825

Table 7. **List of known issues (continued)**

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
PCIE	PCIE to SATA card (sil24) does not work	If PCIE to SATA card (sil24) is connected, Linux kernel crashes	Minor	SPEAr1340	This does not work with CPU frequency of 600 MHz. Lower CPU frequency is fine. Card works properly if some delay is inserted in sil24 driver after sil24 controller init.	151578
PCIE	NFS not coming UP from PCIe Ethernet card	Trying to mount NFS over PCIe causes kernel crash. If MSI is disabled, we can mount NFS over PCIe. Temporary workaround is to pass pci=nomsi in bootargs.	Plus	SPEAr1310-C, SPEAr1340		110231
Power Management	Ethernet Link setting switches to maximum supported after wakeup	On wakeup after suspend, the Ethernet link switches to maximum supported speed. (autoneg is kept off). E.g. if the link speed is 100-Full before suspend, it switches to 1000-Full after wakeup.	Plus	SPEAr1340		171523
Power Management	Board does not wake up from suspend via UART even when no_console_suspend is used	Use no_console_suspend in bootargs. After suspending (S2R), press any key on host PC, as it connected to SoC via UART port. Expected behavior: Board should wakeup.	Plus	SPEAr320S		170948
Power Management: Hibernation	Error message of CPU stall on hibernation	On putting system into hibernation following error messages are obtained: `INFO: rcu_sched_state detected stall on CPU0 (t=6000 jiffies)`	Normal	SPEAr1340, SPEAr1310-C	Error message displays but system goes into hibernation and wakes properly	150564

Table 7.   **List of known issues (continued)**

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
Power Management: Suspend to RAM	Random errors from SMI if system is suspended to RAM	Error from SMI controller if system is suspended to RAM and then woken up in loop along with heavy access of NOR connected on SMI controller.	Minor	SPEAr1340, SPEAr1310-C	This random bug does not occur always	150671
Power Management	USB Host: USB node for touchscreen is changed after suspend to RAM	Touchscreen creates an input node, say /dev/input/event1. After suspend to RAM sometimes this node is not created sometimes a node with different name is created. This happens because the device gets re-enumerated.	Normal	SPEAr1340		168691
Power Management: OTG	Board does not wakeup from S2R if device connected over OTG port	SoC does not wakeup from suspend to RAM when the OTG is powered on (either as Host or device) It works fine if standby is used as the wakeup source.	Normal	SPEAr 1340		169831
Power Management: OTG	Port does not enumerate as device after wakeup from standby mode	Attach OTG cable between OTG port of SoC and USB-Host port of SoC, which makes the OTG port be enumerated as device. Now wakeup the device from standby, it stops enumerating the OTG port as device. On once again sending the board to standby and bringing it up again, the port will get detected. This will keep repeating in the same manner. Same behavior observed between OTG port of SoC and Host port of linux PC.	Normal	SPEAr1340		169873
PWM	PWM period cannot be configured for more than 2 seconds	Standard PWM header file [include/linux/pwm.h] takes duty and period as integer, and can support up to 4 sec. The PWM IP supports periods up to 12 sec. This is not configurable using Linux.	Normal	SPEAr320S		81163

Table 7.   List of known issues (continued)

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
SD/MMC	Several kernel standard tests fail	Several standard MMC tests fail (test 15 and test 17), though normal file operations and iozone tests pass. Both the tests correspond to error cases.	Minor	SPEAr300, SPEAr320S, SPEAr1310-C, SPEAr1340	Normal functionality is not affected	103988
SD/MMC	SD card not detected [SPEAr1310-C]	SD cards are not detected on SPEAr1310-C board.	Plus	SPEAr1310-C		167488
SD/MMC	Several SD cards are failing initialization	Some cards (MMC Mobile + Reduced Size) from Kingmax and DNA Gold fail to initialize.	Plus	SPEAr1340		167623
SD/MMC	Inaccurate clock programmed by Linux	Clock programmed for SD is not accurate. (e.g. 57 MHz instead of 48 MHz). Debug information shows wrong value of clock.	Plus	SPEAr1340	Though the clock value is wrong but cards are working. Separate patch is available for this fix (see *Table 3*)	171683
SPDIF/I2S	aplay -L listing not correct	Current listing shows only card information. No information about play back device i2s and SPDIF.	Plus	SPEAr1340	ALSA library should have proper name of device in configuration files. This is not present but does not affect functionality.	149665
SPDIF	SPDIF: IN: SPDIF does not exit on record even after duration of OFF (sampling frequency is 8000).	SPDIF does not exit on record even after duration of OFF. With Creative Sound Blaster, record file size does not increase.	Normal	SPEAr1340		157368

Table 7.   List of known issues (continued)

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
SPDIF	SPDIF: IN: Record failing from Creative device	Recording on SPDIF does not work with external device (Creative USB Sound Blaster).	Plus	SPEAr1340		157838
SPDIF	SPDIF: OUT: First few words are missing	When SPDIF mono standard OS files are played (Rear_Left.wav or Front_Left.wav), the first word Front is not heard properly. This always happens when audio is played.	Plus	SPEAr1340		157839
UART	RAS UART fails with large data transfers	RAS UART: Fail in DMA mode when transfer is in multiples of 200 bytes	Minor	SPEAr320S		145738
USB host	USB speed issue at different ports devices [SPEAr300/ SPEAr320S]	Inserting pen drive on S300/320S boards, on minicom provides following speeds for both USB ports: Upper port: Full speed Lower port: High speed. Both ports should be enumerated as high speed.	Plus	SPEAr300, SPEAr310, SPEAr320S		157631
USB Host	Low Speed/Full Speed devices are not detected (also disables the port) [SPEAr1310-C]	Full speed and Low speed devices are not recognized on SPEAr1310-C. USB port is even disabled. After removing low or full speed device and attaching high speed device, still will not work. Board requires reset.	Plus	SPEAr1310-C		169491
USB utils	Flashing utility with USB hub between PC and SPEAr	When Flashing the EVALSP1340CPU board with USB hub as the interface, the Flasher displays error message: "Firmware could not be uploaded. Restart the board and try again."	Normal	SPEAr1340		157943

Table 7. **List of known issues (continued)**

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
USB device	USB device: interrupt end-point is not working	Interrupt end-point for USB device is not working. Although the device is enumerated properly, data transferred is wrong (always zero). Same behavior for both High/Full speed mode.	Normal	SPEAr320S	Device with single configuration works properly	169072
U-Boot	*USB start* fails after a *USB stop* in U-Boot	This is a limitation of U-Boot which does not support reset of USB	Minor	SPEAr300, SPEAr310, SPEAr320S, SPEAr600, SPEAr1310-C, SPEAr1340		114777
U-Boot	Serial NOR Flash and parallel NOR Flash can not be accessed simultaneously	Not able to use the serial and parallel NOR Flash from U-boot. This is also the root cause for USB utility not supporting the parallel NOR Flashing.	Plus	SPEAr310		82695
U-Boot	imls does not show if rootfs is present on NOR	Running imls command on U-Boot prompt provides no information about rootfs	Normal	SPEAr300, SPEAr310, SPEAr320S, SPEAr600, SPEAr1310-C, SPEAr1340		141247

Table 7. **List of known issues (continued)**

Category / Component	Summary	Description	Severity	Relevant targets	Workaround	ID
U-Boot	Failing to detect devices at U-Boot on full speed USB port	While trying to boot from USB device at U-Boot level, it fails to identify any storage devices on full speed USB port. Restart USB… USB: Register 2112 NbrPorts 2 USB EHCI 1.00 scanning bus for devices… cannot reset port 2!? 1 USB Device(s) found scanning bus for storage devices… 0 Storage Device(s) found But detects on high speed port.	Normal	SPEAr300, SPEAr310, SPEAr320S, SPEAr600,SPEAr1310-C, SPEAr1340	This is limitation of U-Boot, which does not support OHCI	168529
Video encoder	Debug messages in video encoder driver not working [SPEAr1340]	Enabling debug messages in SPEAr1340 video encoder driver was not working due to a wrong #define	Normal	SPEAr1340	Separate patch is available to fix this issue (see *Table 3*)	178675

10 Limitations

The following table reports known limitations related to this LSP version. Note that some limitations reported at software level can actually be caused by hardware constraints.

Table 8. List of known limitations

Category / component	Summary	Severity	Targets
ADC	DMA mode of ADC is not working due to hardware limitation	Plus	SPEAr300
Camera	Cam-0, cam-1, cam-2 not tested as they are unavailable on evaluation board	Minor	SPEAr1340
CAN	Not tested in current release as it is unavailable on 1300 base expansion board.	Minor	SPEAr1310-C
SD/MMC	Many SD/MMC card don't work due to timing issues on board	Plus	SPEAr300
Ethernet (SMII) 1 and 4	Not tested due to board issue	Minor	SPEAr310
Ethernet (GMAC-1, SMII 1/2, RMII)	Not tested in current release as it is unavailable on 1300 base expansion board.	Minor	SPEAr1310-C
HDLC/TDM	Not tested in current release as it is unavailable on 1300 base expansion board.	Minor	SPEAr1310-C
I2C	Controllers i2c-1 to i2c-8 not tested in current release as they are unavailable on 1300 base expansion board.	Minor	SPEAr1310-C
I2C	Controllers i2c-1 and i2c-2 not tested in current release as they are unavailable on SPEAR320SCPU board and application boards	Minor	SPEAr320S
PNOR	Not tested in current release as it is unavailable on 1300 base expansion board.	Minor	SPEAr1310-C
PCIE	Controllers pcie-1 to pcie-3 not tested in current release as they are unavailable on evaluation board.	Minor	SPEAr1310-C
PCIe	Not tested as it is muxed with SATA via MiPHY. Needs hardware changes to test	Minor	SPEAr1340
Power Management: GPIO	GPIO does not work after Suspend to RAM. This is also due to hardware issue. This effects IP's using GPIO e.g. SPI	Plus	Spear1310
RS485	Due to board issue RS485-2 is not working.	Normal	SPEAr310
RTC	RTC does not increment time under battery only condition	High	SPEAr1340

Table 8. List of known limitations

Category / component	Summary	Severity	Targets
SATA	Controllers SATA-1 to SATA-3 not tested in current release as they are unavailable on evaluation board.	Minor	SPEAr1310-C
SSP	Not tested in current release as it is unavailable on SP1300 base expansion board.	Minor	SPEAr1310-C
SSP	Controllers ssp-1 and ssp-2 not tested in current release as they are unavailable on evaluation board.	Minor	SPEAr320S
UART	UART-1 not tested as it is muxed with DDR clock enable and reset.	Minor	SPEAr1340
UART	Controllers UART-1 to UART-6 not tested in current release as it is unavailable on SP1300 base expansion board.	Minor	SPEAr1310-C
UART	Controllers UART-3 to UART-7 not tested in current release as they are unavailable on the evaluation board.	Minor	SPEAr320S

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12 Revision history

Table 9.   Document revision history

Date	Revision	Changes
18-Sep-2012	1	Initial release.