



Linux support package for SPEAr (LSP) v 2.3

1 Introduction

Release Notes are updated for each LSP version incrementation. Further changes to one or more components (RPMs/SRPMs, Windows tools, etc.) are likely to occur after the publication of this release note. Please consult the Changelogs area on <http://www.stlinux.com/drupal/CSD> for details for the status of individual components.

LSP version	2.3
Delivery date	20 May 2010
Supported platforms	EVALSPEAR300, EVALSPEAR310, EVALSPEAR320PLC, EVALSPEAR600
Reference software manuals	UM0844 - Getting started with SPEAr Linux support package (LSP) - Rev 1.0 UM0851 - SPEAr Linux support package (LSP) - Rev 1.0

2 Features

The following table reports all features supported by this LSP version, including flags comparing with respect to the previous release.

Table 1. Features supported in LSP 2.3

Category	Feature	EVALSPEAR300	EVALSPEAR310	EVALSPEAR320PLC	EVALSPEAR600	Description	User space access	Change w. r. t. previous release		
								Same	Enhanced	New
Toolchain	ARM cross-building	X	X	X	X	Based on open source gcc, libgcc, cpp, g++ version 4.2.4			X	
	Binutils	X	X	X	X	Based on open source binutils version 2.18.50			X	
	Debugger	X	X	X	X	Based on open source GDB version 6.8			X	
	C Libraries	X	X	X	X	Based on open source GLIBC version 2.6.1			X	
Kernel	Linux kernel	X	X	X	X	Based on open source Linux kernel 2.6.27, ported to ARM SoCs Patch for YAFFS2 file system support added.			X	
Boot loaders	U-Boot	X	X	X	X	Based on open source U-Boot 1.3.1 Supported hardware: UART, Ethernet, serial NOR Flash, parallel NOR Flash, NAND Flash, I ² C EEPROM			X	
	XLoader	X	X	X	X	Open Source Code under GNU Licence. Initialization of clocks and DDR2 RAM for each supported SPEAR device and board.			X	
Device drivers	ADC	X	X	X	X	Device driver for ADC interface. Kernel API: proprietary. User API: proprietary (char device)	Device IO (char dev)	X		
	C3 - cryptographic coprocessor	X	X	X		Device driver for C3 accelerator. User API: proprietary (char device) + standard libssl	libssl	X		
	CAN			X		Device driver for CAN interface. User API: Socket CAN	Socket CAN framework/ API		X	
	DMA	X	X	X	X	Device driver for DMA controller. Kernel API: compliant to Linux standard DMA framework	X	X		
	E1/RS485/ TDM HDLC		X			Device driver for HDLC controller and interfaces. User API: socket-based + configuration tool	Sockets + config tools	X		

Table 1. Features supported in LSP 2.3 (continued)

Category	Feature	EVALSPEAR300	EVALSPEAR310	EVALSPEAR320PLC	EVALSPEAR600	Description	User space access	Change w. r. t. previous release		
								Same	Enhanced	New
Device drivers	Ethernet	X	X	X	X	Device driver for Ethernet interface(s). Supports options for jumbo frames and CRC offloading. Kernel API: compliant to Linux standard network framework. User API: sockets	Sockets	X		
	NAND Flash Memory	X	X	X	X	Device driver for NAND Flash controller. Supports command line partitioning and optional DMA mode Kernel API: compliant to Linux standard MTD framework (for SPEAr320) Note: Hardware support for NAND Flash is not available on EVALSPEAR320PLC board	File I/O		X	
	Parallel NOR Flash memory		X			Device driver for parallel NOR flash controller (EMI). Kernel API: compliant to Linux standard MTD framework (CFI)	File I/O			X
	Serial NOR Flash memory	X	X	X	X	Device driver for serial NOR Flash controller. Supports command line partitioning. Kernel API: compliant to Linux standard MTD framework	File I/O	X		
	GPIO	X	X	X	X	Device driver for GPIO interfaces. Supports Linux gpiolib and sysfs interface. User API: compliant to Linux standard GPIO framework	GPIO Framework/ API		X	
	GPT	X	X	X	X	Device driver for general-purpose hardware timers. Kernel API: proprietary	X		X	
	I2C	X	X	X	X	Device driver for I2C interface(s). User API: - compliant to Linux standard I2C framework (master mode) - for I2C EEPROM, R/W access is through sysfs	I2C Framework/ API		X	
	JPEG	X	X	X	X	Device driver for JPEG accelerator. Both Decoding and Encoding mode supported. User API: proprietary (char device)	Device IO (char dev)		X	
	Keypad	X				Device driver for Keypad controller. Easily modifiable keypad layout through customizable data. User API: compliant to Linux standard input device framework	Input framework / API Keypad not included in kits	X		

Table 1. Features supported in LSP 2.3 (continued)

Category	Feature	EVALSPEAR300	EVALSPEAR310	EVALSPEAR320PLC	EVALSPEAR600	Description	User space access	Change w. r. t. previous release		
								Same	Enhanced	New
Device drivers	LCD display	X			X	Device driver for Color LCD controller and selected TFT displays. Supported models: 4.2" Sharp, 7" Samsung User API: compliant to Linux standard framebuffer framework (for SPEAr320) Note: Hardware support for LCD is not available on EVALSPEAR320PLC board	Framebuffer framework / API LCD not included in kits			X
	PWM			X		Device driver for PWM interface. Kernel API: compliant to Linux proposed standard for PWM (include/linux/pwm.h)	PWM framework / API			X
	RTC	X	X	X	X	Device driver for real-time clock. User API: compliant to Linux standard RTC framework	RTC framework/ API	X		
	SD/MMC Cards	X		X		Device driver for SD/MMC controller. User API: compliant to Linux standard SD/MMC stack	File I/O		X	
	SPI	X	X	X	X	Device driver for SPI interface(s). Optional DMA support User API: compliant to Linux standard SPI framework (master mode)	SPI framework / API		X	
	SPP			X		Device driver for SPP interface(s) (for SPEAr320) Note: Hardware support for SPP is not available on EVALSPEAR320PLC board	SPP framework / API			
	TDM	X				Device driver for TDM interface. User API: proprietary (configuring and using bufferization and switching)	HAL API's			X
	Touchscreen	X			X	Device driver for touchscreen to be used with supported TFT displays. User API: compliant to Linux standard input device framework (for SPEAr320) Note: Hardware support for touchscreen is not available on EVALSPEAR320PLC board	Input framework / API + calibration tool		X	
	UART	X	X	X	X	Device driver for UART interface(s). User API: compliant to Linux standard serial framework	Serial framework / API	X		

Table 1. Features supported in LSP 2.3 (continued)

Category	Feature	EVALSPEAR300	EVALSPEAR310	EVALSPEAR320PLC	EVALSPEAR600	Description	User space access	Change w. r. t. previous release		
								Same	Enhanced	New
Device drivers	USB Device	X	X	X	X	Device driver for USB Device interface. Includes composite device support. Only zero gadget in default configuration. Kernel API: compliant to Linux standard USB gadget framework	Gadget framework / API Only zero gadget in default configuration	X		
	USB Host	X	X	X	X	Device driver for USB Host interfaces. Supports EHCI and OHCI controllers. Kernel API: compliant to Linux standard USB host stack User API: class-dependent (mass storage in default configuration)	Class dependent Not enabled in default configuration	X		
	Watchdog	X	X	X	X	Device driver for hardware watchdog timer. Kernel API: compliant to Linux standard watchdog framework	X	X		
Target packages & libraries	Busybox	X	X	X	X	Based on open source Busybox version 1.8.2.			X	
	C3 Engine for Open SSL	X	X	X		C3 support for open source Open SSL package		X		
Other	USB Flasher	X	X	X	X	Windows application for writing Flash memories over USB link	TCK/TK based GUI		X	
	Power management	X	X	X	X	CPUfreq support. Compliant with Linux standard PM framework	Access through Sys file system		X	

3 Changes

The following table contains a list of all changes with respect to the previous version of LSP.

Table 2. List of changes

Feature	Tracking ID	EVALSPEAR300	EVALSPEAR310	EVALSPEAR320PLC	EVALSPEAR600	Description	Fix	New feature
CAN	81057				X	Fixed: No buffer space was left on submitting more than 11 frames for TX	X	
CAN	81058				X	Fixed: With "netlink" interface enabled instead of "sysfs" interface, the kernel generated dump on CAN probe and interface up	X	
Ethernet	82685			X		Fixed: Only Ping was working in the RAS MII interface	X	
Ethernet	82689		X			Fixed: SMII interfaces #3 and #4 were not working	X	
GPIO		X	X	X		GPIO driver made uniform across SPEAr3xx		X
Parallel port				X		Driver added for parallel port. Tested with Linux PC		X
Tickless timer		X	X	X	X	Timer tickless feature added		X
USB Device		X	X	X	X	USB device wake-up feature added		X
I2C		X	X	X	X	I2C restart feature added		X
CPU freq		X	X	X	X	CPU freq framework updated for DDR support@PLL-1		X
CLCD				X ⁽¹⁾		Support for CLCD added for SPEAr320. Note: Hardware support for CLCD not available on EVALSPEAR320PLC board		X
Touchscreen				X ⁽¹⁾		Support for Touchscreen added for SPEAr320. Note: Hardware support for touchscreen not available on board		X
NAND Flash memory				X		Support for NAND Flash memory added.		X

1. CLCD and touchscreen support added for SPEAr320 platform, tested with internal test boards (see also limitation in [Table 4.](#))

4 Known issues

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

Table 3. List of known issues

Tracking ID	Category	EVALSPEAR300	EVALSPEAR310	EVALSPEAR320PLC	EVALSPEAR600	Description
63134	LCD Display	X			X	When using a 4.2" Sharp LCD, a fleeting white screen appears for a short time when enabling the display
70457	Touchscreen	X			X	Calibration touch events may sometime fail at display corner positions
73955	USB Device	X	X	X	X	Data read/write fails if the USB device configuration is switched from "Source Sink" to "Loopback" on the fly when tested with Zero Gadget device
75489	MTD	X	X	X	X	Repeated invocation of "insmod" and "rmmod" commands may generate a crash of sysfs with serial NOR and NAND MTD drivers
76503	Ethernet	X	X	X	X	NFS server switches from "up" to "down" state when Ethernet link is working in "10Full" mode
76741	SD/MMC memory card	X				Some specific memory cards may lead to randomly occurring failures during card detection or multibyte write operations. This is because of timing issues in the EVALSPEAR300 board
78347	UART	X	X	X	X	UART transfer fails at baud rate 300 when 100 or more bytes of data are sent in one go
79576	UART		X			UART device driver not working properly for speeds above 115.2 Kbps (although hardware works properly at higher speeds in diagnostic firmware)
79909	Reboot		X			Reboot user-space command not working when using the parallel NOR Flash
81064	CAN			X		REMOTE_FRAME transmission fails if multiple TX objects are being written by the driver in message RAM
81074	SD/MMC memory card			X		Bootstrap fails if a SD/MMC card is already inserted into the slot. This is board-specific issue. The PL_GPIO51 signal is used to select the Boot mode (SW2.1), this signal is also shared with "MicroSDCard_Detect". Consequently, when an SD card is inserted, "MicroSDCard_Detect" is low, which forces the PL_GPIO51 signal to low level, preventing the board from booting
82693	USB Flasher	X	X	X	X	Occasionally, timeout errors occur while burning flash memory images
82695	U-Boot		X			Serial NOR Flash and parallel NOR Flash cannot be accessed simultaneously. Default configuration initializes SMI. For PNOR, U-Boot need to be compiled again.

Table 3. List of known issues (continued)

Tracking ID	Category	EVALSPEAR300	EVALSPEAR310	EVALSPEAR320PLC	EVALSPEAR600	Description
84974	JPEG	X	X	X	X	JPEG sometimes generates sleep timeout errors
90942	Ethernet		X			FTP Not working for SMII 0 and 1. Gives NOT CONNECTED message and disconnects. Performance of SMII 0 and 1 for 10 Mbps Full Duplex and 10 Mbps half duplex is low (less than 1 Mbps for transmission performance)
92416	CAN			X		Error cases cause CAN IP to hang CPU
94876	Ethernet			X		ETH2(MACB) performance test failing for 10/full & 10/half on SPEAr320 (gives error messages)
95434	U-Boot			X		U-boot not able to detect NAND on SPEAr320
96569	USB Host	X	X	X	X	Large file copy between two Pen-Drives connected to the two USB hosts on SPEAr fails and Host starts to reset the device
96646	I2C			X		spear_i2c_probe call' for RAS I2C available in SPEAr320 fails
97101	Uboot		X			Ping not working for MII0 on SPEAr310
TOTAL		10	12	13	9	

5 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 4. List of known limitations

Tracking ID	Category	EVALSPEAR300	EVALSPEAR310	EVALSPEAR320PLC	EVALSPEAR600	Description
71819	ADC	X				DMA transfer mode is supported by the device driver but does not work due to a hardware limitation on the EVALSPEAR300 board
82691	Ethernet			X		MACB SMII is not tested as the SMII hardware is not present on EVALSPEAR320PLC board
81163	PWM			X		Due to a limitation in standard Linux kernel 2.6.27 header file "include/linux/pwm.h" the time maximum time period parameter is 4 seconds. The PWM hardware supports a time period of up to 12 seconds.
96695	Touchscreen			X		Touchscreen is only partially tested.
Total		1	0	3	0	

6 Paths

For each main LSP component delivered as SRPM/RPM file, the following table reports:

- The latest (S)RPM version number at the time of publication of this Release Note
- The path where the component file or subtree is located on user's host Linux PC after first-time installation as well as next incremental online updates (assuming default recommended procedure)

Table 5. Paths of main LSP components

Component	Source	Binary	Latest (S)RPM version	Path
Kernel / BSP	X		3	/opt/STM/STLinux-2.3/devkit/sources/kernel/linux-arm-spear
U-Boot	X		4	/opt/STM/STLinux-2.3/devkit/sources/u-boot/u-boot-arm-spear
XLoader	X		5	/opt/STM/STLinux-2.3/devkit/sources/xloader-spear/xloader-arm-spear

7 Revision history

Table 6. Document revision history

Date	Revision	Changes
28-May-2010	1	Initial release.

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