

In any case, the underlying standard BSP and the corresponding extensive emlix know-how not only ensure that an altogether very cheap solution is found for the respective hardware. The time to market can also be shortened significantly.

Of course, all the customized BSPs are also created in e2 factory, so that they can be reproduced and flexibly extended at any time despite their high specificity.

Further Services

For each of its BSPs, emlix offers training sessions on the corresponding board. These can be adapted specifically to the individual customer.

In the context of projects, the need frequently arises to obtain information on problem solving quickly and easily. For this purpose, we offer you our support services. With our (on-site) support, you have full access to the knowledge of our staff.

With our start-up support (already included in the Base and Professional Edition), we offer you a fixed number of support units with full control of the costs.

In addition to our embedded Linux system platforms, or in the context of an independent project, we offer concept advice, development services and support for the fast realization of your embedded applications or of individual application modules.

Embedded Processor Families

emlix has experience in software development for, among others, the following processor families:

- Atmel: ARM 9, AVR32
- Freescale: ARM 9/11
- NXP: ARM 7/9
- Samsung: ARM 9/11
- Marvell: ARM Xscale
- Texas Instruments: ARM 9
- x86 from any vendor (including AMD, Intel, VIA, AdvanTech)
- Freescale: Power Architecture, Coldfire, i.MX
- Analog Devices: BlackFin
- Altera: NIOSII Softcore
- Raza: MIPS Alchemy
- Stretch: Xtensa
- Hyperstone: e1

emlix Standard-BSPs

An overview of the current standard board support packages can be found at www.emlix.com/board-support-packages.html

Further Informationen

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emlix Board Support for Embedded Systems

Linux is not a clearly defined software package in itself, but consists of a multitude of individual software packages, which are put together to make a software platform. emlix offers its customers carefully compiled board support packages (BSPs) for embedded systems that make the flexibility of Linux useable in an intelligent way and at the same time reliably fulfil the special requirements of the embedded sector.

They systematically help you to make use of the properties of the respective hardware and the special embedded processors with a minimum demand on resources. emlix also places high emphasis on reliability, reproducibility and maintenance of the BSPs over long periods of time, as well as on the possibility of efficient adaptation to product variants (platform strategies). This has to be ensured for professional applications, especially since the open operating system has such a high degree of freedom.

emlix develops embedded Linux board support packages for customer-specific hardware and defined applications as well as for the standard hardware that is widespread in the embedded sector, and also for reference designs. In all of these cases, the emlix software platforms have the following characteristics:

- They are based on e2 factory, the emlix embedded build system. Thus a BSP can be reproduced independently of any individual programmer. It can be maintained throughout its entire life cycle. This also applies when teams of developers working at different locations or in different companies are involved.
- The integrated package management (available from the Professional Edition upwards) allows individual modules to be updated separately.
- e2 factory provides the possibility of documentation of all the relevant licences.
- Since e2 factory does not depend on any particular source code management system, innovations from the open source community can be integrated seamlessly, even during the ongoing development process.
- Prior to delivery, each BSP is tested extensively and in different contexts and is subject to comprehensive quality assurance.



emlix is at your disposal, and not only for the support of our BSPs. With many of our customers we also have a comprehensive development partnership, which often covers the entire life cycle of the product.

The emlix developer team contributes important experience and knowledge to the partnership:

- comprehensive project experience in various sectors of the consumer and investment goods industries
- knowledge and advice regarding a „clean“ separation of open and closed source
- experience with various special CPUs such as MMU-less processors
- extensive knowledge of real-time extensions under Linux (Preempt RT, Xenomai)
- experience in the development and integration of flexible, safe update concepts
- detailed knowledge of hardware-oriented driver development (e.g. USB, WLAN, FPGA modules)
- experience with customer-specific project documentation

In addition, emlix provides the infrastructure for joint development projects as a standard component of its services. Regular status and budget reports complement direct communication. In this way, useful modifications can be coordinated efficiently and in an uncomplicated way, and any arising questions can be clarified.

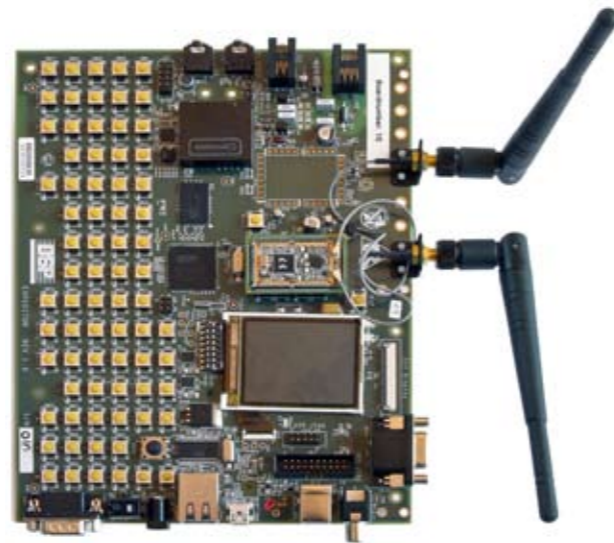
This tool-supported development partnership has already proved its worth in numerous projects, also in an international context.

Expert BSPs: Software Platforms for Customer-Specific Hardware

emlix develops embedded operating system solutions for customer-specific hardware and special application contexts. It is possible to adapt and optimize the system in any technical direction. Frequently, the expert BSPs are the starting point for an extensive development partnership.

Many projects also include the level of the application, for which emlix develops the desired components, often closely related to the operating system. Frequently, expert BSPs and their later integration into the embedded application are created in the context of a distributed development project.

By request emlix provides tools for distributed development teams.



Why Linux?

Embedded systems on the basis of Linux are increasingly prevailing against proprietary solutions for many tasks of operation, control and communication. Technical advantages, but also substantial economic benefits are responsible for this:

- independence from technology monopolies
- saving effects for long-term platform strategies
- access to the largest collaborative software development project in the world.

Considerable savings potential can be realized after market entry: Licence costs which grow proportionally with the number of units produced do not occur. If a follow-up model with new features is to be launched, the manufacturer can usually avail himself of the corresponding modules from the open source community and is not bound to any individual supplier. This has an even greater effect in the case of platform strategies with the corresponding diversity of models.

Everyone who makes use of embedded open source software profits from the largest collaborative software development effort worldwide. Whoever uses this innovation potential for his company is by no means forced to reveal any core know-how. Only enhancements of free software have to be made public. Any self-developed software remains protected.

Technical Competences

emlix has a lot of experience in the creation of BSPs for embedded systems on the basis of Linux. The following technologies are a few examples of the emlix expertise:

- Wireless (ZigBee, GSM/GPRS)
- Real time (Xenomai, Preempt RT)
- Field bus systems (LON, CAN, Pyxos)
- Chip-to-chip bus systems (I2C, SPI, I2S, AC97)
- Box-to-box bus systems (USB, Ethernet)
- Safety concepts (TPM, SSH, Krypto engines)
- WLAN / WiFi (security, roaming, network management)
- FPGA modules (Altera, Xilinx, Lattice)
- Communication protocols (TCP/IP, SOAP, WEB2.0, MMI)
- GUI programming /HMI (Qt, nano-X, GTK+)
- µCLinux /MMU-less CPUs
- Power management
- Production and update concepts

Evaluation & Professional

For the hardware that is common in the embedded sector, as well as for interesting reference designs and evaluation boards, emlix offers standardized BSPs.

Evaluation Editions are created for board manufacturers who want to enable their customers to evaluate their hardware or their reference designs under Linux. Usually, they are offered in a bundle with the hardware. Evaluation Editions support the most important on-board interfaces by default.

For selected boards, emlix also compiles Professional Editions. They provide a comfortable environment for product development and include defined support services. In addition to the functionality included in the Evaluation Editions, they offer the following extra features:

- integrated package management
- extensive software for the support of the development process
- additional interface support

- pre-configured IDE on the basis of eclipse
- debugging
- updates and bug fixes
- Start-up support

Customized BSPs

Once the evaluation of the hardware under Linux has yielded the desired results, the decision to enter production in higher numbers is often taken. In this case, further customer-specific optimization of the utilized standard BSP for the respective requirements and the concrete application is the next logical step.

This is by no means limited to additional modules and features. In some cases, the customizing may also consist of the reduction of the BSP to the functions actually needed in order to reduce even further the requirements on memory and resources.

emlix embedded Board Support Packages	Standard-BSPs		Customer-Specific BSPs	
	Evaluation Edition	Professional Edition	Customized Edition	Expert Edition
Hardware-platform	Standard-single board computers, evaluation boards, reference designs	Standard-single board computers, evaluation boards, reference designs	Hardware analogous to existing standard BSPs possibly slightly modified	customer-specific hardware or hardware platforms
Intended use	Evaluation of hardware and software	Extended evaluation and product development	Standard BSP is optimized according to customer requirements	Product development; parallel development of HW / SW possible
Range of features	BSP	BSP, patches, bug fixes, start-up support via email	BSP, additional services according to customer requirements	BSP, additional services according to customer requirements
Additional offers	Training sessions, application development, (on-site) support	Training sessions, application development, (on-site) support	Training sessions, application development, (on-site) support	Training sessions, application development, (on-site) support, third party support
Supply source	Hardware manufacturer or distributor	emlix GmbH	emlix GmbH	emlix GmbH

Tab. 1 emlix board support package-model – standard editions and customer-specific development