emlix
embedded linux systems

Industrial Android

For the successful porting and functional expansion of Android for use with industrial hardware, emlix offers specialist knowledge of the specific embedded Linux/Android boot loader, kernel and driver development as well as a deep understanding of the Android framework itself.

In the development of industrial products we first analyse the necessary system requirements for the integration of specific hardware. As well as taking care of the implementation, we also offer know-how transfer through seminars, the installation of the repositories and of the Android build system, and the implementation and execution of the necessary compatibility tests.

Our support starts in the earliest phase of product development; we evaluate the feasibility and the risks, and develop suggestions for alternative implementation strategies, for example as part of a requirements workshop.

Industrial hardware integration

The Android Open Source Project (AOSP) contains all the sources as well as the build environment for the development of a customer-specific Android operating system platform. But „AOSP-based“ also means that chip and

board-specific extensions and adaptations are available for the respective target hardware. The volume and quality of all freely available sources (in particular drivers from the hardware manufacturers) forms the basis for emlix‘s developments.

As well as developing concepts for the integration of your own hardware, emlix supports you in setting up the typical Android development environment. As part of Android porting and adaptation we offer the following services:

- Setting up the build environment (AOSP)
- Generating a product or hardware configuration
- Selection, configuration and extension of a boot loader
- Integration of the kernel drivers for the defined hardware components
- Integration of the driver interfaces into Android
- Development of product-specific functionalities
- Integration of native services into the Android framework
- Adaptation of the update functions and recovery mechanisms
- System and compatibility tests (Compatibility Test Suite)
- Service API and AOSP documentation

Because a very large number of different git repositories need to be administered, Android‘s own „repo“ tooling is used for the source code repositories – as is common in Android – for the development and adaptation of the system. To safeguard the development progress, internal repositories on which the results of progress can be saved are introduced at an early stage into the administration system.

Update „Over the Air“

The AOSP already includes several mechanisms for securely updating the entire system via WLAN (OTA, Over the Air). Product development with Android and the integration of additional hardware and interfaces may require an expansion of this update concept - so that additional firmware can be transferred onto the device, for example.

We provide the experience and development services required to modify the existing update functions and the recovery mechanism to meet your needs.

emlix supports you in the analysis of the system design, in the extension and configuration of the BSPs and in the adaptation of the software and the API at all levels. Once the porting and adaptation of the Android system has been completed, the AOSP build environment and the sources are usually handed over to the customer in order to enable the further development and maintenance of the system locally.

emlix GmbH

solutions @ emlix.com
http://www.emlix.com

Phone +49 (0) 551 / 30664-0
Fax +49 (0) 551 / 30664-11

Android Google Test-Suite (CTS)

The certification of Android-based products by Google requires the successful running of a binary Google Compatibility Test Suite (CTS). This certification is required to gain access to Google Mobile Services (GMS) such as a connection to the Google Play Store and to obtain authorization to run certain apps and services like Google Maps or Gmail on the device.

The CTS tests, for example, the public Android API of the device, the platform API, execution formats, the internal data model, the available access permissions of the device and the platform resources. These tests thus check the integrity of the Android framework itself, ensuring that both the system's developers and third-party apps have access to a fully functional and defined environment for their implementation.

emlix provides technical support for the pre-testing and the certification process of Android based products by Google.

Android 8 Oreo – better maintainability and automotive functions

„Project Treble" in Android 8.0 guarantees manufacturers of SoCs and products a significantly better maintainability of their Android adaptations by providing a clearer separation of the native layer – in particular the components of the board manufacturer – and of the Android framework itself.

The improved hardware abstraction means that the new automotive functions are now also more economically useful on a long-term basis: in Android 8, vehicle components are described abstractly through so-called „vehicle properties" and made available to the Car Services (e.g. HVAC Service), so that they can receive specified access to the relevant component information independently of the vehicle's bus system (CAN, LIN, FlexRay).

In addition, the new Exterior View System (EVS) is designed specifically for use in vehicles. This HAL allows cameras and a display to be made available to the driver very early in the boot process. Only the Car Service and the EVS stack need to be started first.

Android 8.0 is the first version that makes it possible to update to a newer Android version without the manufacturer having to adapt the hardware. This should reduce the sometimes arduous porting, extension and maintenance process for adapted Android solutions and simultaneously improve the economic viability. New Android versions will become available to customers more quickly and cheaply.