

2000s

Larger-scale systems on SoCs

~ Integrated Circuit ~

From 2000 onwards, the system scale of mobile phones, digital TVs, car navigation systems and others has increased, and SoC scale has become huge, from 10 million gates to several 10 million gates. Since not only the hardware of SoC but also the software has become huge, and it has become a big issue how to efficiently develop such huge scale systems. As a solution to this problem, a platform-type development method developed.

Although the term of platform development is widely used, in the case of semiconductors, it refers to a platform for developing application systems of set manufacturers and includes the following two development guidelines. The first is standardization of hardware, middleware, and device drivers for improving software development efficiency. The second is standardization of SoC architecture to improve development efficiency of SoC hardware. That is, it is a platform for SoC development.

The basic idea of platform-based development of SoC is to standardize the CPU and bus which form the core of SoC architecture, and to increase common parts by using standard IPs for I/O (input/output interface) part, so that SoC can be developed for different application with minimal changes. In addition, dedicated processors are used for specific applications such as mobile phones, car navigation systems, digital TVs, etc., and they are also made as scalable as possible to improve their response capabilities. It becomes easier to add new functions to the application system by the first and second standardization, and the development period can be shortened.

UniPhier announced by Panasonic (then Matsushita Electric Industrial Co., Ltd.) in 2004 is famous as an integrated platform for digital home appliances. UniPhier consists of a system LSI with CPU and a built-in video codec, and a software platform consisting of OS and middleware. The main goal of UniPhier is to improve software development efficiency. Conventionally, hardware was prepared for each product group such as mobile phone, DVD recorder, home server, digital TV, etc., and microcode, OS, middleware, application, etc. were separately developed on that. By introducing UniPhier, it became possible to develop software specific to each application product on the base hardware, thereby improving software development efficiency.

UniPhier includes high quality AV (integrated technology of high quality image and sound), low power consumption (long time operation of AV equipment), real time processing (smooth operation even with multiple AV processing), secure mechanism (AV contents, personal data protection), and it is possible to select an optimum LSI for each product field, such as the mobile phone field where low power consumption is required, home AV equipment requiring high performance codec processing, and the like.

The future subject of the platform type development is the direction of sharing and standardization of

hardware, middleware and SoC architecture, whether to pursue it within the company or to pursue global standard shared by other companies. There are cases where set makers using SoC purchase SoC for high-end models and for intermediate-level models from different semiconductor makers. In order to satisfy such requirements, it is insufficient to standardize within one company, and a global standard is necessary. For this reason, global standard specifications will be gradually established in the long term, which will expand its influencing power.

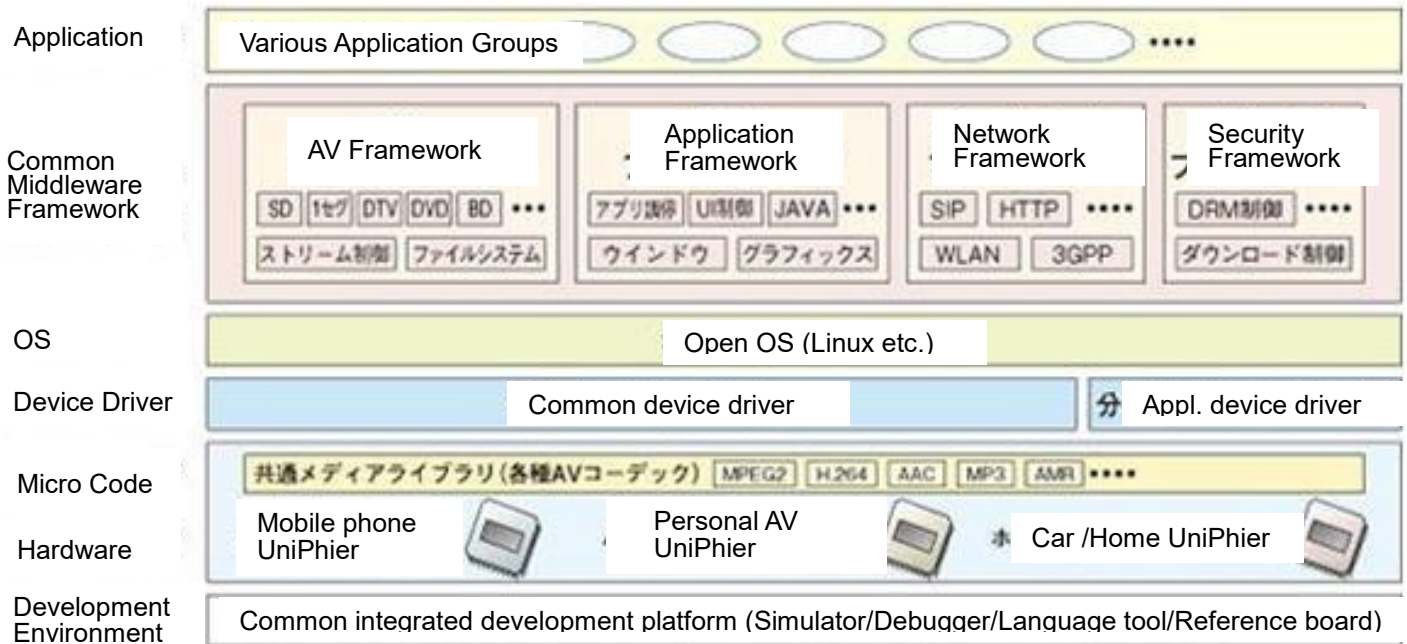
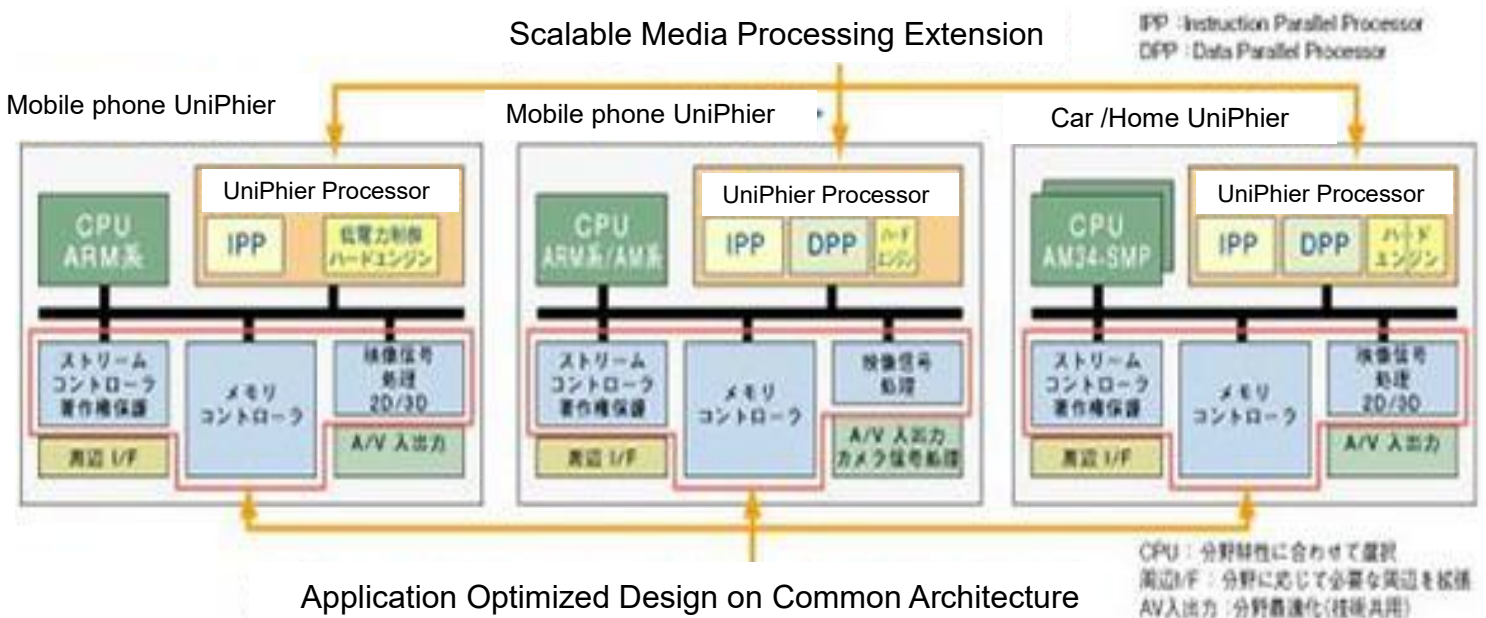


Figure 1: Commonization of software architecture in UniPhier



Application Optimized Design on Common Architecture

Figure 2: Commonization of hardware architecture in UniPhier