

December 13, 2005

Press Release

T-Engine Forum

T-Kernel Installation into Actual Products Started

The T-Engine Forum (Location: Shinagawa, Tokyo, Chair: Ken Sakamura, Professor, the University of Tokyo) has been working on the development and release of T-Engine, a standardized development platform for embedded systems, and T-Kernel, a next generation real-time OS, in order to meet the needs of sophisticated and diversified embedded systems in the 21st century.

In 2005, the T-Engine and the T-Kernel have been put to practical use more, and the T-Engine has been increasingly used in product development and the T-Kernel has been adopted as an OS in many products. Furthermore, the T-Engine Forum has been working towards further improvement and enhancement of the functions and improvement of the environment to and after 2006.

The main topics are introduced below.

Promoting the practical use of T-Kernel

The T-Kernel is a new generation real-time OS that meets the needs of advanced embedded systems in the 21st century. In principle the T-Kernel is provided free of charge as a source code (single source code) that maintains uniformity. Due to the strict standardization realized by the use of a single source code, high portability of programs that run on it can be maintained. Even if the CPU is changed, it is possible to implement programs by simply recompiling them. This can improve distribution of middleware and reusability of software resources, which results in the improvement of software development productivity.

It has been two years since the source code was made available to the public free of charge in January 2004, and the T-Kernel is now used in more and more products and the number of products in which the T-Kernel is put to practical use has been rapidly increasing.

Currently, the T-Kernel is installed in various products, such as car navigation systems (DENSO CORPORATION), portable sim holder, "Ubinet Passes" (Dai Nippon Printing Co., Ltd.) and a component module for embedded systems (NEC Corporation). Additionally, extended and optimized versions of the T-Kernel, such as the eT-Kernel (eSOL Co., Ltd.)

and PMC T-Kernel (Personal Media Corporation) are on sale.

Promoting an extended version of the T-Kernel

The T-Kernel / Standard Extension is a real-time OS that has enhanced T-Kernel functions and supports larger and more sophisticated systems. Next generation mobile phones, car navigation systems and home information appliances are required to have the OSs to function as good as the conventional information-processing computers. On the other hand, hard realtime is also required for device control. The T-Kernel / Standard Extension meets these requirements.

The T-Engine Forum has evaluated and reviewed the T-Kernel / Standard Extension for over one year assuming its commercialization and now it is about to open to public.

Furthermore, a TCP/IP protocol stack that runs on the T-Kernel / Standard Extension is being developed.

At the TRONSHOW2006, a car navigation system developed using the T-Kernel / Standard Extension (by DENSO CORPORATION) will be on exhibit.

Development of μ T-Kernel specializing in applications for lighter embedded systems started

In order to meet requests to use the T-Kernel also for 8-bit or 16-bit micro-processors and single-chip micro-computers, T-Engine Forum has started development of a μ T-Kernel for small embedded systems.

The μ T-Kernel can run with limited resources as well as maintain high compatibility with the T-Kernel, which permits consistent development of programs for 8 bit processors to 32 bit processors.

※ Improvement of the development environment for the T-Kernel

To enhance the efficiency of T-Kernel software development, the T-Engine Forum has been improving integrated development environments using GUI. At the TRONSHOW2006, development environments, such as Eclipse for T-Engine, NetBeans for T-JV and WideStudio for T-Engine will be exhibited.

Additionally, the T-Engine Forum is now working on development of the T-Kernel Test Suite for easy verification of operations of the T-Kernel that have been ported and optimized in products. It will be made open to public after full development.

Milestones for future embedded systems

In order to meet the needs of embedded systems that will become increasingly

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sophisticated and advanced, as the next stage of development, T-Kernel will support multiprocessors.

In a world that uses various embedded systems, various types of processors will be used, such as symmetric multiprocessors, asymmetric multiprocessors and a combination of both. T-Kernel aims to support these processors one by one and eventually will support all multiprocessors. Additionally, in such future development scenarios, compatibility with existing T-Kernel programs will be maintained as much as possible.

Trial/evaluation versions of the T-Kernel that supports multiprocessors are scheduled to release in 2006.

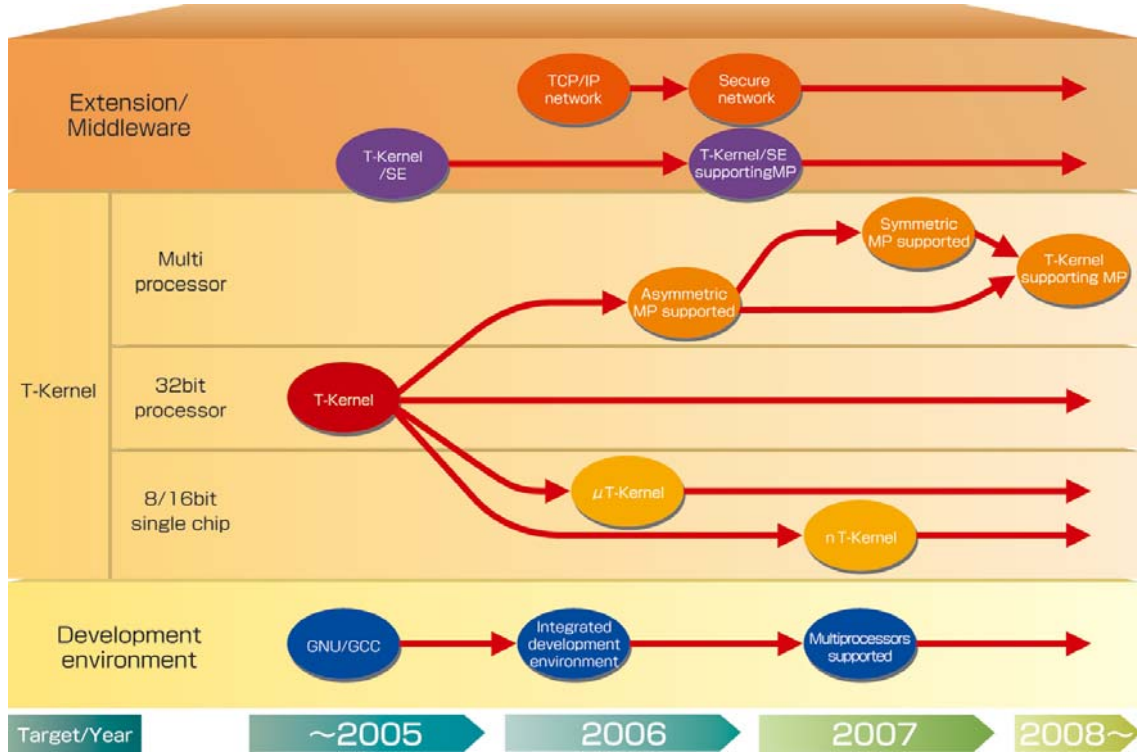
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Appendix 1 T-Kernel Roadmap

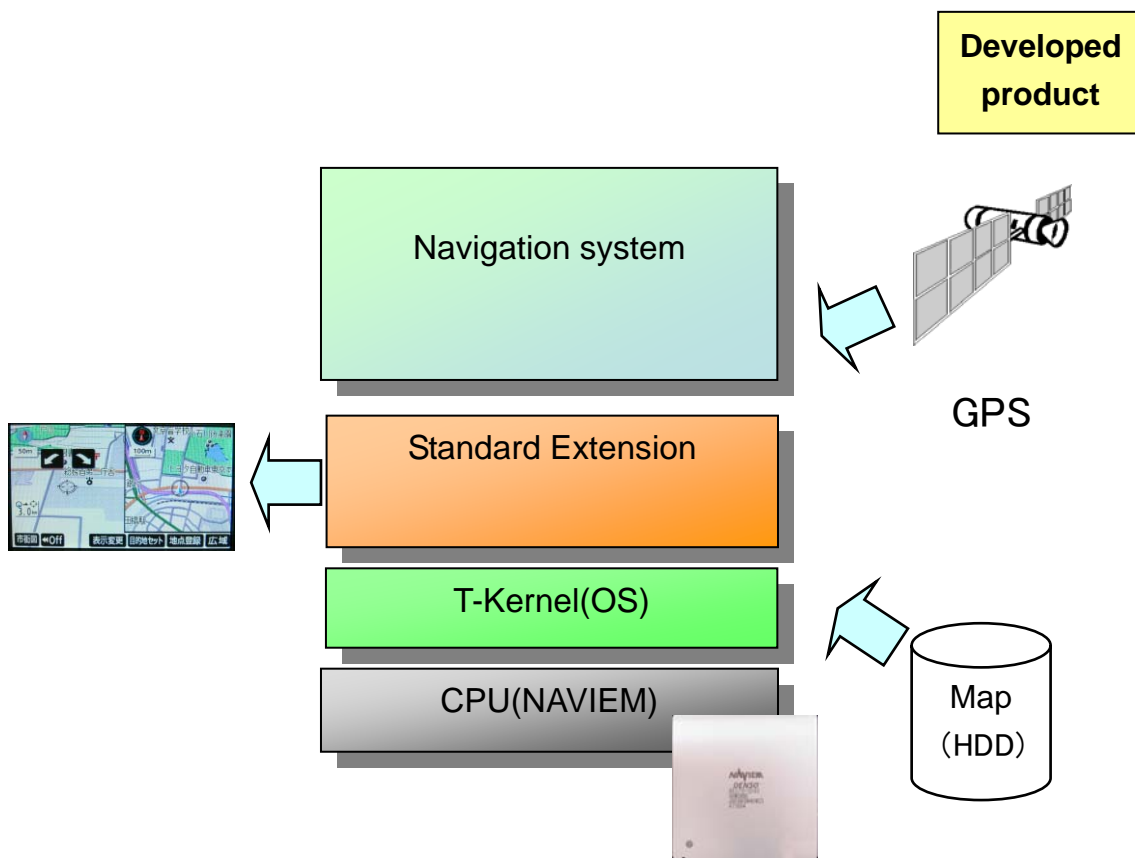


Appendix 3

A car navigation system that utilizes T-Kernel

DENSO CORPORATION is developing a car navigation system using the T-Kernel / Standard Extension with a view to commercialization. At this TRONSHOW2006, the actual system will be on exhibit.

By using the T-Kernel in this system, utilization of the software developed for μ ITRON has become possible. Additionally, the use of a standard interface and a process model (Standard Extension) , etc. will make it possible to embed new software easily.



- ※ This exhibit is a developed product for R& D purposes and will not be on sale.
- ※ It uses the T-Engine (eT-Kernel/Extended) by eSOL, Co., Ltd.
- ※ It uses NAVIEM developed by DENSO CORPORATION for car navigation systems (NAVIEM : 600MHz, 90nm SoC).
- ※ eT-Kernel is a trademark of eSOL, Co., Ltd.
- ※ TRON is an abbreviation of "The Real-time Operating system Nucleus".
- ※ ITRON is an abbreviation of "Industrial TRON".
- ※ μ ITRON is an abbreviation of "Micro Industrial TRON".
- ※ TRON, ITRON, T-Engine and T-Kernel are names of computer specifications and do not refer to a

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specific product or a product line.