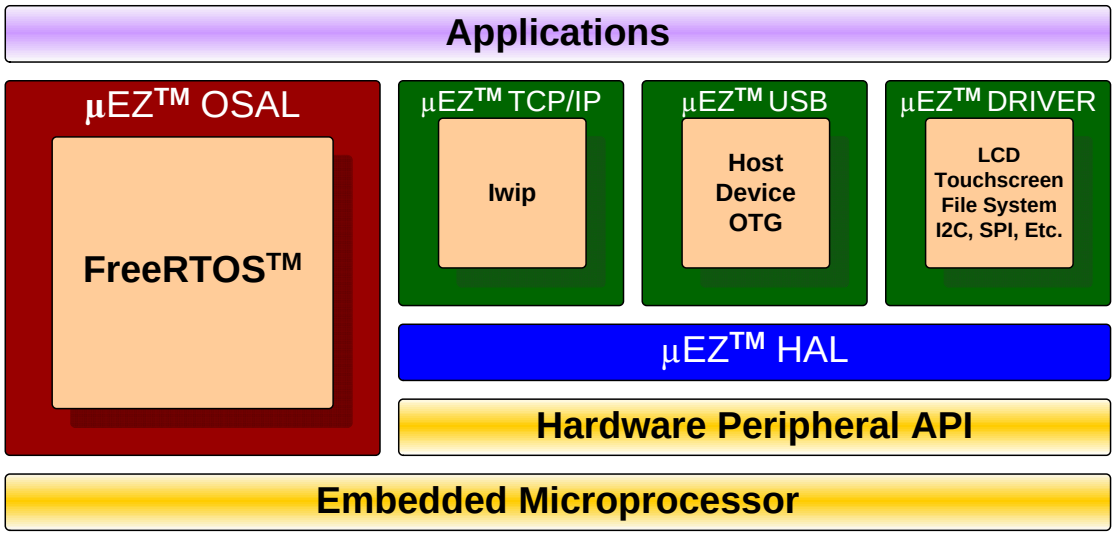
µEZ™ Rapid Development Platform

SMALL * FAST * PORTABLE * AFFORDABLE

µEZ™ takes its name from the Muses of Greek mythology. A Muse was a goddess who inspired the creation process for the arts and sciences. Like its ancient Greek namesake, the **µEZ™** platform inspires rapid development by supplying customers with an extensive library of open source software, drivers, and processor support - all under a common framework. **µEZ™** development works on the premise of "design once, reuse many times". This provides an open source standard for embedded developers to build upon and support. **µEZ™** allows companies to focus on innovation and on their own value-added applications while minimizing development time and maximizing software reuse.

The diagram below shows a typical embedded application stack. **µEZ™** has three primary categories of components that help simplify embedded application development:

1. **Operating System Abstraction Layer (µEZ™ OSAL)**
2. **Sub-system drivers (µEZ™ TCP/IP, µEZ™ USB, µEZ™ Driver)**
3. **Hardware Abstraction Layer (µEZ™ HAL)**



The selection of an RTOS can be one of the most daunting aspects of an embedded system development. With **µEZ™** the primary features of common multi-tasking operating systems are abstracted, thus easing the transition to an open source or low-cost RTOS. The **µEZ™** OSAL provides applications access to the following features in an OS-independent fashion:

- Pre-emptive multitasking
- Stack overflow detection
- Unlimited number of tasks
- Queues
- Semaphores (binary, counting, mutex)

The **µEZ™** sub-system drivers utilize the OSAL functions to provide protected access to the processor peripherals. The sub-system driver API functions are typically protocol layer interfaces (TCP/IP, USB, etc) designed as high-level access routines such as open, close, read, write, etc. where possible.

The HAL functions provide single-threaded unprotected access to the processor peripherals. Customers can use the **µEZ™** HAL routines provided by FDI or they can write their own. The HAL routines provide for RTOS/**µEZ™** independence and allow portability within a family of processors.

µEZ™ is ideally suited for Embedded Systems with standard features such as:

- Processor and Platform BSPs (Board Support Packages)
- Real Time Operating System (RTOS)
- Memory Management
- NAND/NOR Flash
- SDRAM and DDR Memory
- TCP/IP stack
- USB Device/Host Libraries
- Mass Storage Devices
- LCD Displays with Touch Screen
- Input / Output Devices

µEZ™ Frequently Asked Questions

What is µEZ™ and how does it help me?
µEZ™ is a Rapid Development Platform designed to simplify embedded software development. It should help you get your product to market faster and with a lower development cost than other options. When you get right down to it, what's more important than saving time and $$$!

The goal of the **µEZ™** platform is to provide underlying RTOS and processor abstraction, enabling the programmer to focus on the value-added features of their product. **µEZ™** enhances portability of application code to multiple ARM® platforms with high reusability.

Is µEZ™ expensive - what does it cost?
µEZ™ is an open source, middleware platform so there is ***no cost*** to the user. Customers with the necessary engineering resources, a compatible compiler suite, and a little free time can directly integrate **µEZ™** into their embedded application. For customers with time or resource limitations, FDI offers affordable integration services that are customized to your hardware and software requirements. These FDI integration services are full turnkey, can cost as little as $10K, and may require only 4 weeks of schedule time to complete and test on your hardware.

Where do I get µEZ™ and who provides support for the platform?
The **µEZ™** source code and documentation can be downloaded from **www.sourceforge.net/projects/uez .**
Marketing updates and details on technical support are available at **www.teamfdi.com/uez .**

Why not use Linux?
Linux is a powerful OS with a much larger code and memory footprint and requiring a processor with a dedicated MMU (Memory Management Unit). **µEZ™** is designed to work with lower cost processors with smaller memories and, whenever possible, to use only the processor's internal ROM and RAM. A recent study undertaken by FDI reviewed the cost increases likely for a Linux based system over a µEZ™ based system. The study found a potential hardware cost savings of $25 - $40 per unit for the **µEZ™** system. This savings is significant since it might represent 25 – 50% of the total embedded hardware cost.

In addition, setting up a full Linux development system can be a source of frustration for many developers. **µEZ™** uses a single source tree for all its applications and drivers, thus providing a build system compatible with the IDE of choice. Compiling **µEZ™** is as easy as compiling a single application.

I don't need all of the features you listed, can µEZ™ be trimmed down?
µEZ™ was specifically designed and structured to allow developers to pick and choose only the features that are needed for their particular application. Typical code and data memory footprints for **µEZ™** are 300KB code and 50KB data memory (excluding data memory for LCD or display Frame Buffers).

Can we use another RTOS?
All **µEZ™** components are made to connect through the **µEZ™** OSAL (Operating System Abstraction Layer) to the RTOS ensuring compatibility with many different RTOS's. Currently all **µEZ™** development by FDI is being focused on the FreeRTOS™ platform since it satisfies the low cost tool requirement because it is "free". RTOS products from other vendors can also be used with **µEZ™**.

Which compiler suites do you support?
Currently, most **µEZ™** development by FDI has been focused on the low cost Rowley CrossWorks compiler, but we also support the IAR EWARM tool suite. In addition, Keil, ARM RealView, GNU and other compilers can be used with **µEZ™**.

What debug tools are available?
Since **µEZ™** uses the debug tools that are provided in the customers compiler suite, it can be used with any of the tools listed above.

Which processors are supported?
Even though **µEZ™** is processor independent, all of our initial development has been focused on various members of the ARM Family. We currently support the NXP LPC24xx family, and processors like Cortex™-M3, ARM9®, and other variations of ARM7® are being added.

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