ERIKA ENTERPRISE

arm

Grovety Inc.
People and hardware connecting technologies

Porting ERIKA OS to Cortex A9

ORGANIZATION:
The customer specializes in manufacturing equipment for air-traffic controllers and other systems.

INDUSTRY:
embedded systems

COUNTRY:
Germany

CHALLENGE:
The customer planned to upgrade their devices and replace some of ARM Cortex A3 microcontrollers with the Arria10 family of microcontrollers, which have two ARM Cortex A9 processors. The challenge lay in porting RTOS ERIKA v.2 to new hardware. Moreover, the customer needed to support various peripheral devices, including UART, EMAC (Ethernet controller), and QSPI. The new platform was much more complicated than the previous one as it featured secured memory, some processor modes, states, etc., which required a great deal of highly skilled work and an architect being brought on.

SOLUTION:
- The Grovety team consisted of a project manager responsible for communications with the client, an architect, several developers, and a tester. ERIKA is an operating system with open-source code, but the customer had modified it.
- The majority of the code was written in C/C++ and was platform-independent. We had to re-implement hardware-dependent OS parts, such as the planner's core, interrupt handlers, MMU programming, interrupt controllers, and other code providing interaction with peripheral devices.
- Moreover, ERIKA OS describes configurations using OIL, a language processed with a special RT-Druid application (implemented in Java). RT-Druid had to be modified so that it could support the new platform.

RESULTS:
- OS Erika Core was successfully ported to ARM Cortex A9. Both processors are supported.
- RT-Druid was modified and now supports Cortex A9.
- UART, EMAC, and QSPI drivers were implemented.
- A set of integration tests to demonstrate work of OS core and drivers was developed.
- The source code, a set of tests, and architectural solutions are documented in Doxygen format.

BENEFITS:
The customer got software and continued device development on time.

TECHNOLOGIES:
Java, Linux, Doxygen, Eclipse, C++

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