XtratuM - Real Time Nanokernel for Linux

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XtratuM Intro

- hypervisor (virtual machine monitor, VMM) for embedded devices.

- The XtratuM hypervisor is an enabling technology, rather than a technology to solve specific problems. The hypervisor provides a framework to run multiple concurrent operating systems in a robust partitioned environment.

- XtratuM is the replacement for the original RTLinux/GPL HAL - a patent free free-software solution to the infamous FSMLabs patent.

What is XtratuM ?

- Hypervisor - allowing to run RTOS or real-time executives

- Partitioning - XtratuM can be used to build MILS (Multiple Independent Levels of Security) architecture.

- Real Time - Focus was on ensuring deterministic operations of the VMM from the outset.

- XtratuM can be seen as a spatial and temporal isolation layer

Supported Hardware

- X86 32 (2.6.17/2.6.23)

- powerpc 32 (2.6.19)

- mips (2.6.26)

- LEON2 (sparc) (no Linux yet)

XtratuM development is still in an early stage and a consolidated development tree is still not available.

Supported personalities

- partikle

- POSIX

- RTLinux

- native

- ARINC 653 in the works

Components

- Partikle - POSIX/RTLinux personality

- XMFIFO - FIFOs between domains (V3)

- XMSHM - Shared memory between domains (V3)

- XMTRACE - Tracing Core Events (V1)

- XMARINC - ARINC 653 IPC (V1)

- XMDEV - XtratuM Device Model (V1)

Device support
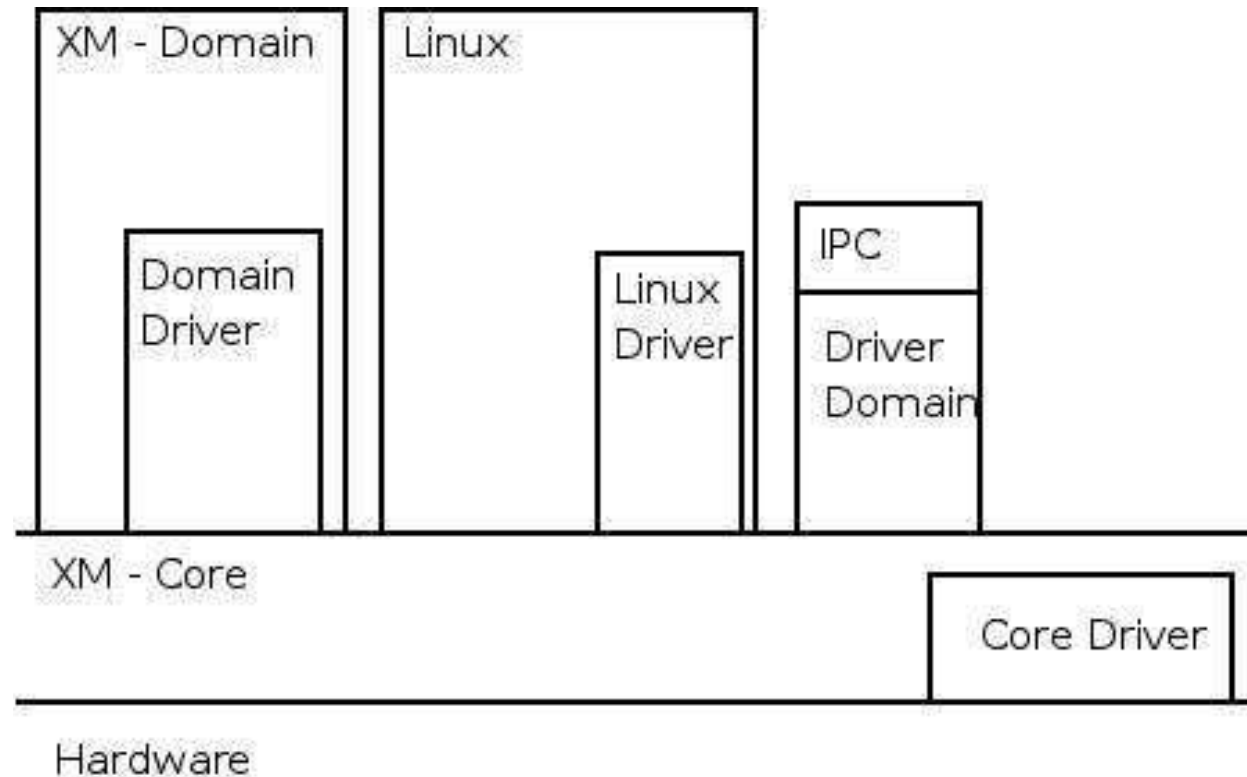
Device driver model still in the works - currently only a proof of concept
- serial port driver - as well as port-I/O based devices are available.

Project History

- XtratuM 0.01 10 May 2004

- XtratuM 0.3 23 September 2005

- XtratuM 1.0 21 October 2006

- XtratuM 2.0 1 July 2008

- XtratuM 2.1.0 9 February 2009

- XtratuM 2.2 X April 2009

User resources

- Maintainer: Miguell Masmano, Ismael Ripoll

- XtratuM Home-Page: http://www.xtratum.org

- Partikle: http://www.e-rtl.org/partikle

- Mailing list: https://listas.upv.es/mailman/listinfo/rtlinuxgpl

- SVN: https://www.gii.upv.es/svn/rtos/trunk/xtratum

Conclusion

- XtratuM is at an early stage

- It is a very small code base lending itself to white-box validation

- The concept is proven - the necessary components are still not complete

- It is a technology worth looking at for future embedded systems