

The Open Source Automation Development Lab (OSADL)
promotes and coordinates the development of
Open Source software for the automation industry.

Carsten Emde

OSADL eG



Did you ever hear this before?

Project Manager: "Here is a purchase order. Please delegate the development of a Linux driver for our new controller."

Purchase Department: "Okay. Assuming standard procedure. NDA - and the sources go into the company's safe?"

Project Manager: "Nope, that's Open Source - the sources go to the Internet."

Purchase Department: "What? The sources go to the Internet? So, why are just **we** paying for the development, while **everybody** can use the sources?"



Let's find a company to act as a "purchase community"

Open Source Development Lab



Open Source **Automation** Development Lab

OSDL



OS**A**DL

Incorporated, Limited, Community, Foundation, Initiative, Cooperative?



What kind of company is best suitable to provide a
"purchase community"?



Robert Owen
(1771 - 1858)



Friedrich Wilhelm Raiffeisen
(1818 - 1888)



Richard M. Stallman
(*1953)

"What is impossible for the individual, many can do."

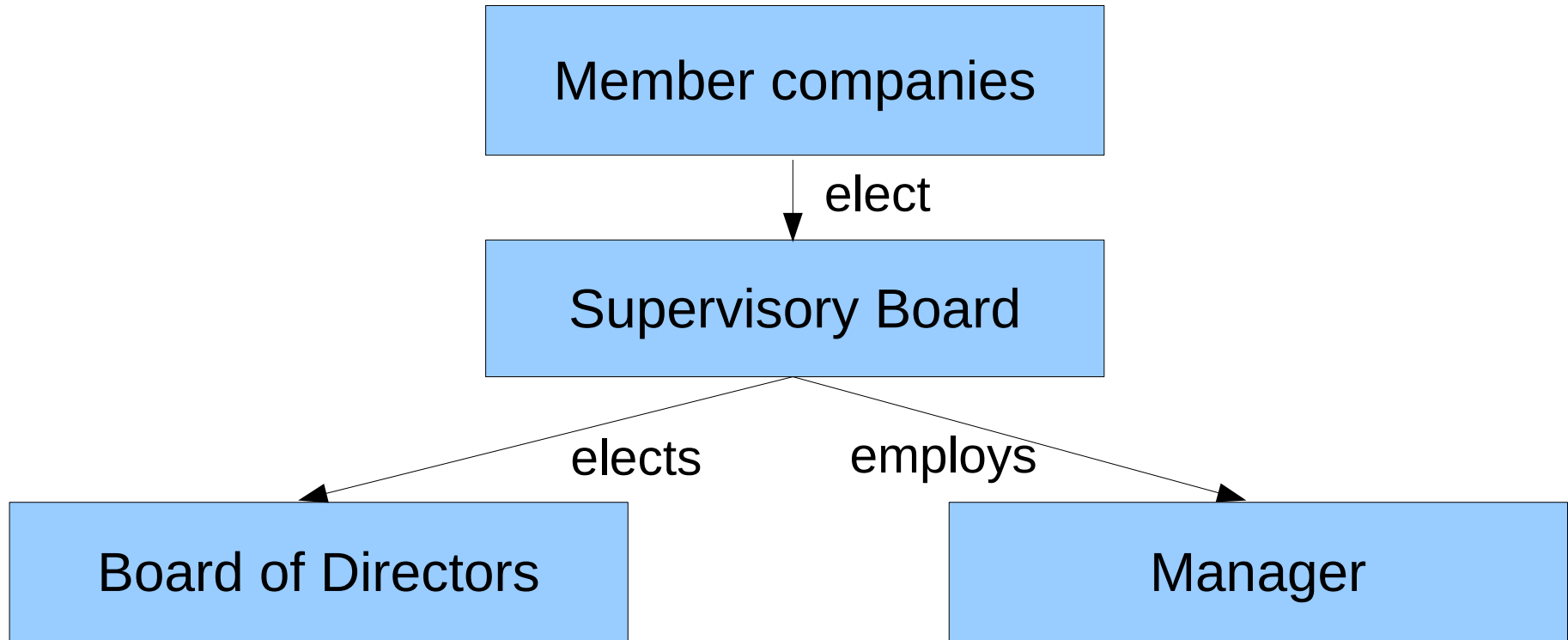


The preamble of the OSADL articles of incorporation

“The automation industry and its suppliers are profiting greatly from open-source operating systems such as Linux since they guarantee long production cycles, rapid troubleshooting and the independence of individual software manufacturers. However, this branch requires specific expansions of the operating system such as real-time capability, the compatibility with these expansions must be certifiable, and standardized software interfaces must be available. The development of these requirements is the goal of the Open Source Automation Development Lab (OSADL).”



The organs of the OSADL cooperative



OSADL Membership Levels

Bronze Member

8,000.00 Euro/year

Silver Member

16,000.00 Euro/year

Gold Member

24,000.00 Euro/year



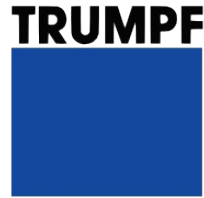
OSADL Regular Members (1)



Open Source Automation Development Lab (OSADL) eG



Gold



Silber

Roche Diagnostics AG

Bronze



- ✓ Machine companies
- ✓ Hardware manufacturers
- ✓ Software manufacturers
- ✓ Software service providers

Chip Manufacturers

Distributors of embedded Linux

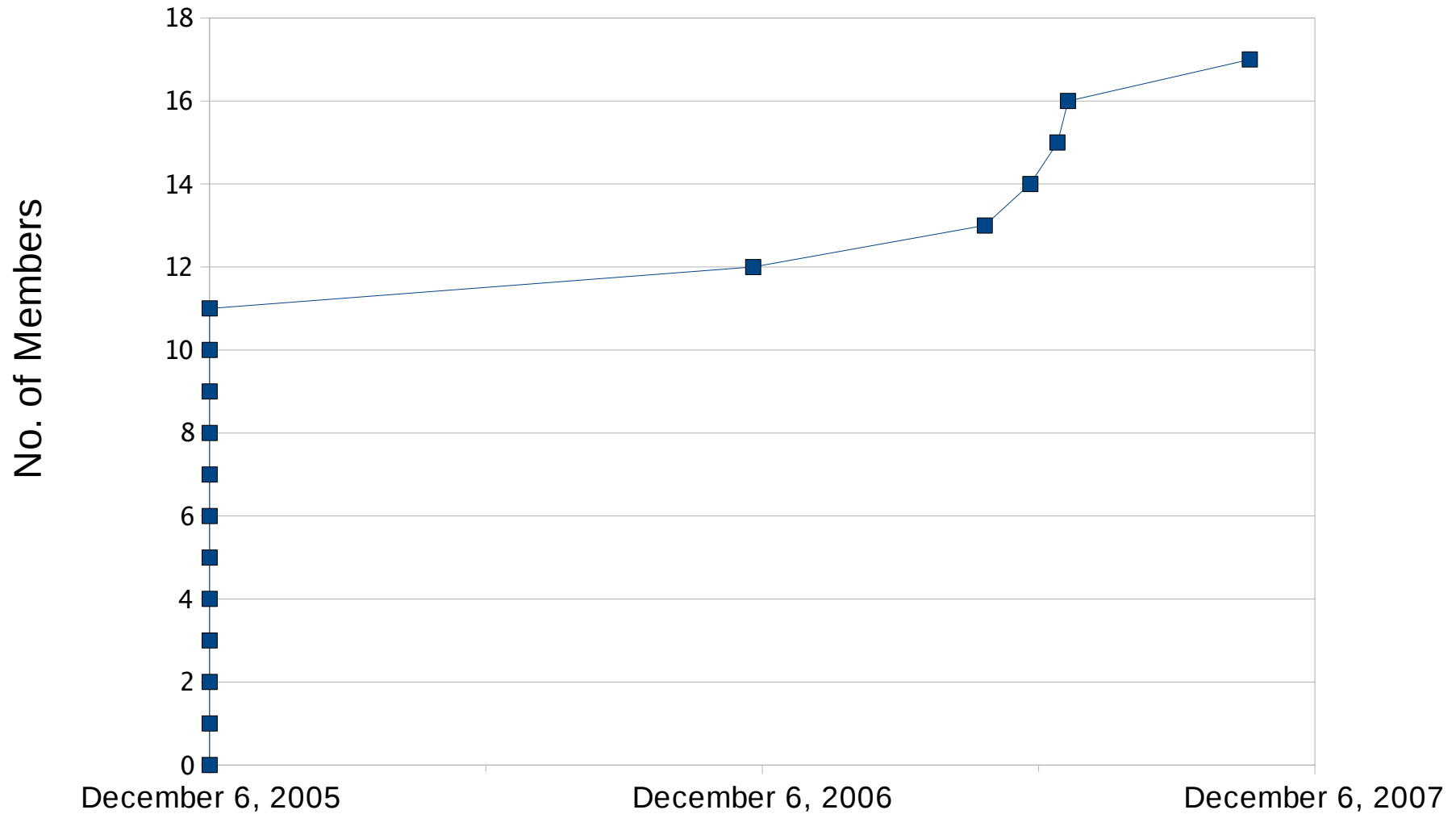


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OSADL Regular Members (2)

OSADL Members



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OSADL Academic Members



Lanzhou University, Lanzhou, P.R. China



ISW, University of Stuttgart, Germany



REDS, University of Vaud, Switzerland



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OSADL Other Types of Membership

- Organizational membership
- Individual membership



OSADL Projects: Realtime Mainline Linux Kernel

- Close collaboration with RT-Preempt co-author Thomas Gleixner who also is OSADL's Software Maintainer
- Development, validation and application of defined test conditions and test suites
- Feedback of bug reports and traces from the OSADL community to the RT-Preempt developers



OSADL Projects: "Latest Stable Realtime Linux Kernel"

Example of "Latest stable" RT-Preempt Linux kernel:

OSADL recommends the RT-Preempt kernel 2.6.21.6-rt21 as latest stable version

Kernel:

www.kernel.org/pub/linux/kernel/v2.6/linux-2.6.21.6.tar.bz2

RT-Preempt Patch:

www.kernel.org/pub/linux/kernel/projects/rt/older/patch-2.6.21.6-rt21

Kernel Virtual Machine (kvm):

<http://downloads.sourceforge.net/kvm/kvm-28.tar.gz>

RT-Preempt Patches for kernel 2.6.21.6-rt21 and kvm-28

[svm.c](#) [vmx.c](#)



OSADL Projects: Safety Critical Linux

- Professor Nicholas Mc Guire was named OSADL's Safety Coordinator.
- Kick-off phase of the OSADL Safety Critical Linux Working Group
- Provide documentation of the Linux development and maintenance strategy, “proven in use” cases and performance data to enable a “facilitated certification”



OSADL Projects: Upstream Submission

Project name	Controller, Patch	Related hardware product	Hardware manufacturer	Current status ¹	Most recent posting	Scheduled mainline kernel
mx6650	Maxim 6650, patch	CPX Base	Kontron Modular Computers, Kaufbeuren, Germany	6	lm_sensors	2.6.22
lm93	National Semiconductor LM93, patch	E400	Eltec Elektronik AG, Mainz, Germany	5	lm_sensors	2.6.23
lm94	National Semiconductor LM94	S5000VSA	Intel	1	lm_sensors	n.a.
RBF file system	patch , script	n.a.	n.a.	1	n.a.	n.a.



OSADL Projects: BSP Conformance Issues of Patches

- Patch against "final" kernel version
- Use canonical patch format
- One patch per topic
- Do not remove unused kernel subtrees
- Specify the patch order
- Specify the patch originator
- Patches must not break other builds



OSADL Projects: BSP Conformance Levels (0 - 2)

Level 0

The BSP does boot on the target architecture but doesn't follow any particular rule of this specification. The patches are neither intended for upstream, nor do they follow the quality standards of this specification. This is the default conformance level of every BSP, even if it did not undergo the OSADL test procedure.

Level 1

The BSP only adds board specific code components and usually does not touch generic files, like source files in the kernel/, lib/ or mm/ directory. The only case where generic files are being touched is to provide generic patches for bugs or extensions.

Level 2

In addition to the level 1 requirements, the patches follow the kernel patch rules and the coding style. The BSP can be compiled with sparse check without warnings. The patches may or may not be reviewed by upstream parties.



OSADL Projects: BSP Conformance Levels (3-4)

OBSPS Patch Level 3

In addition to the level 2 requirements, the patches are continuously integrated with the mainline kernel (at least once per week). The continuous integration has to be documented by automatic protocols which show that the patches do apply to the upstream GIT trees; breakages have to be fixed as they do appear. Patches are actively code reviewed by the Linux community with regard to quality, realtime or security issues.

OBSPS Patch Level 4

The documented functionality of all components of the hardware platform is supported by a particular version and revision (or higher) of a released mainline kernel.

"T" Suffix for Tainted Kernels

In cases where the documented functionality cannot be completely deployed without additional components which are not available as Open Source software (example: proprietary kernel driver for advanced graphic boards or communication protocols), this must be clearly marked with a "T" (tainted), such as " Level 0T".



OSADL Projects: RTDM to RT-Preempt

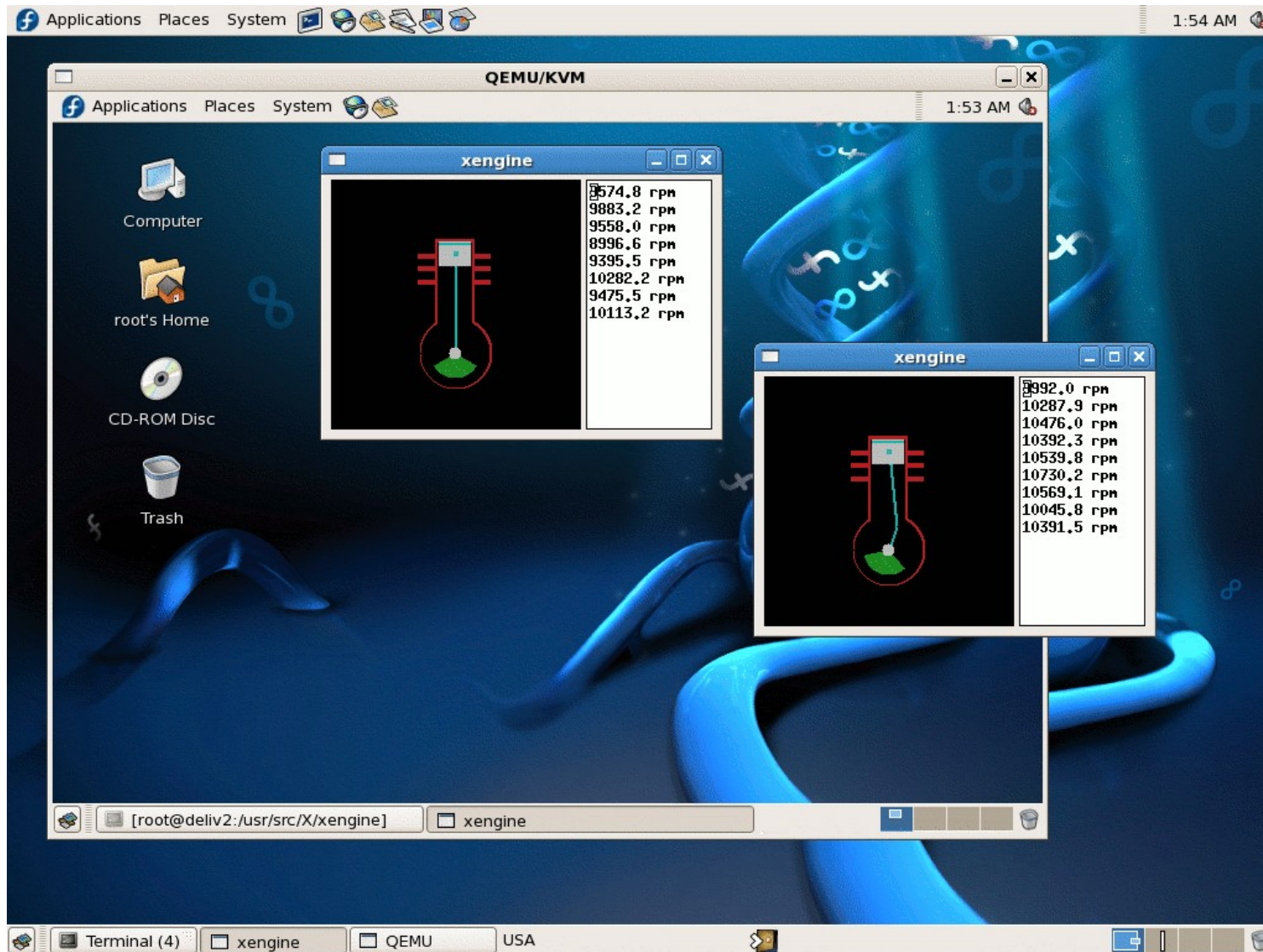
Wolfgang Grandegger (Denx Software Engineering) ported the Real-Time Driver Model (RTDM) to RT-Preempt.

This makes it possible to use existing RTDM-based drivers in a native RT-Preempt kernel.

The project and a HOWTO are available on www.osadl.org for download.



OSADL Projects: Realtime-kvm



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OSADL Projects: More ...

- Migration tools, e.g. OS-9 to Linux, RBF file system for Linux
- Real-time Ethernet
- Coldfire (68knommu) port to Linux RT-Preempt



OSADL at SPS/IPC/Drives and Embedded World



SPS/IPC/DRIVES/
**Elektrische
Automatisierung**
Systeme und Komponenten
Fachmesse & Kongress
27.-29. Nov. 2007
Nürnberg

SPS/IPC/Drives 2007
November 27 to 29, 2007



Embedded World 2008
February 26 to 28, 2008



CELF Embedded Linux Conference Europe 2007
Linz, Austria



All about OSADL

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