



HelenOS annual update  
Jakub Jermář



# Introduction

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Who is Jakub

HelenOS developer since 2001

Solaris kernel engineer between 2006 and 2011

Software engineer at AVAST since 2011

What is HelenOS

Multiserver, multiplatform, nonconformist OS

FOSDEM 2012 & 2013

# Past year in a doughnut

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- Mainline goodies
- HelenOS Coastline
- Out-of-tree branches
- Defended theses
- SOCIS 2013
- HelenOS Camp 2013



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## Mainline goodies





# Networking improvements

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- IPv6 support
- DNS resolver
- DHCP client
- SLIP
- `download` utility



# GUI improvements

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- New widgets and cosmetic changes
- Optimizations and improvements
- RFB (VNC) server

# Audio

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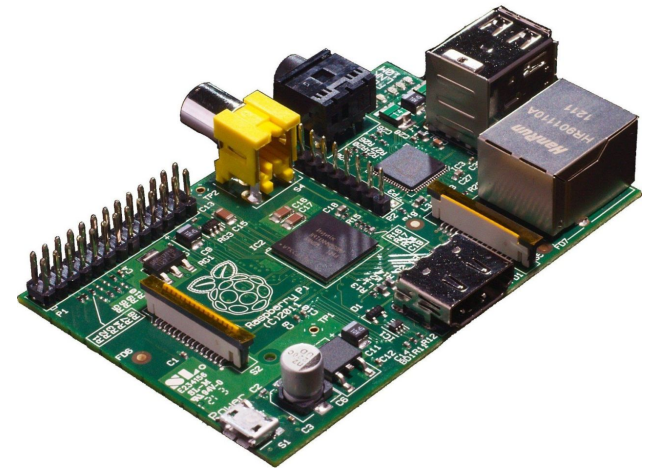


- Hound – HelenOS sound server
- “Compositor for the audio”
- SoundBlaster 16 driver
- Necessitated a new kernel physical memory allocator
  - SB 16 DMA buffers below 16MiB

# ARM boards



- ARMv6
  - Raspberry Pi (Beniamino Galvani)
- ARMv7
  - BeagleBoard XM
  - BeagleBone
- Mostly cache-related support
- Code unification



# SPARC boards & machines



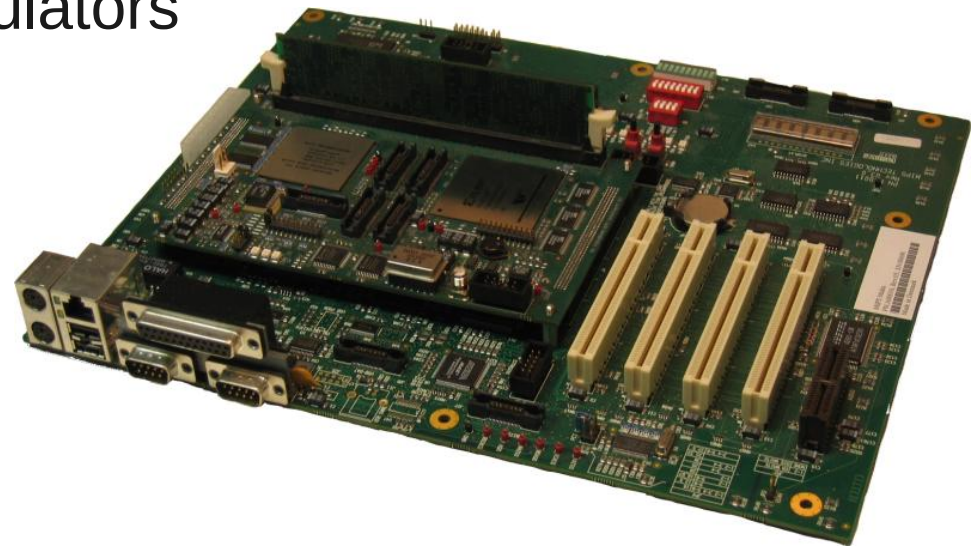
- SPARC V9
  - Revived SunFire T1000 support
- SPARC V8
  - LEON 3 support (Jakub Klama)
  - Surprisingly spartan compared to V9
    - No comfort for kernel developers





# MIPS Malta

- ATX form-factor development boards
- PC with a MIPS CPU and PC-like peripherals
- YAMON instead of BIOS
- Quite expensive and hard to get (\$2000+)
- Supported by a variety of emulators
- Good for driver portability





# Toolchain and tools

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- ew.py
- gcc 4.7.2 -> gcc 4.8.1 (memset and memcpy optimizations)
- gdb 7.5 -> gdb 7.6.1
- clang support revival



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## HelenOS Coastline





# HelenOS Coastline

- HARBOURS and ships
- gcc 4.6.3, binutils 2.21.11
- Python 2.7.6 (Zbigniew Halas)
- <https://github.com/vhotspur/coastline.git>

	zlib 1.2.8	fdlibm 5.3	libgmp 5.1.0	libmpfr 3.1.1	libisl 0.11.1	libmpc 1.0.1	gcc 4.6.3	binutils 2.21.1	msim 1.3.8.1	python2 2.7.6
AMD 64	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>
ARM 32 BeagleBoard-xM	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>
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IA 64 ski	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	FAILED <a href="#">Log</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>
MIPS 32 Malta (BE)	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>
MIPS 32 Malta (LE)	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>
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PowerPC 32	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	FAILED <a href="#">Log</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>
SPARC 64 niagara	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>
SPARC 64 ultra	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>	OK <a href="#">Tarball</a>



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## Out-of-tree branches



# Out-of-tree branches

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USB 2.0 support and refactoring: `lp:~jan.vesely/helenos/usb`

VFS 2: `lp:~zarevucky-jiri/helenos/vfs2`

VFS 2 cherrypick: `lp:~zarevucky-jiri/helenos/vfs2-cherrypick`

Go: `lp:~zarevucky-jiri/helenos/golang`

Go: `lp:~zarevucky-jiri/helenos/golang2`

Testing: `http://ho.st.dcs.fmph.uniba.sk/~mato/bzr/helenos-testing`



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## Defended theses



# Defended theses

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Adam Hraška: Read-Copy-Update for HelenOS, 2013

Antonín Steinhauser: IPv6 for HelenOS, 2013

Martin Sucha: Testing Framework for HelenOS, 2013

Ján Veselý: HelenOS sound subsystem, 2013

Petr Koupý: Graphics stack for HelenOS, 2013

Dominik Tábořský: HelenOS Installer, 2014

Jiří Zárevúcky: Improved VFS design for HelenOS, 2013



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## SOCIS 2013

# SOCIS 2013

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- Summer of Code in Space
  - WOCIS 2013 more fitting
- ESA's inspiration by GSoC
- HelenOS port to LEON3 CPU

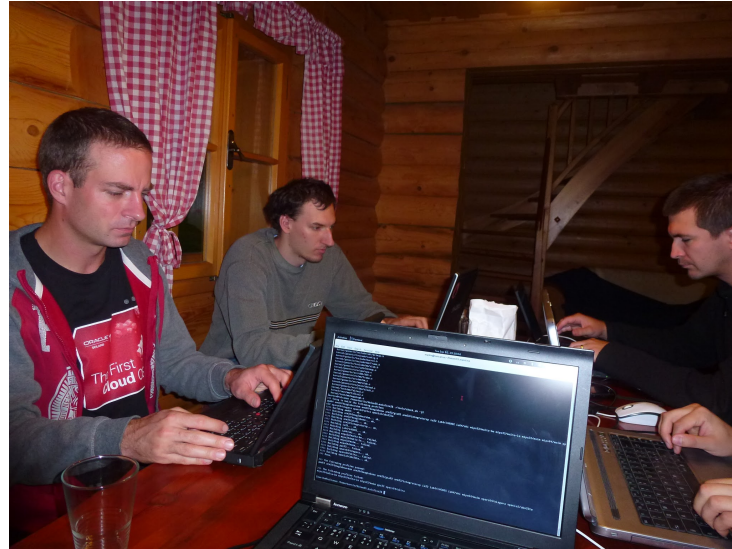
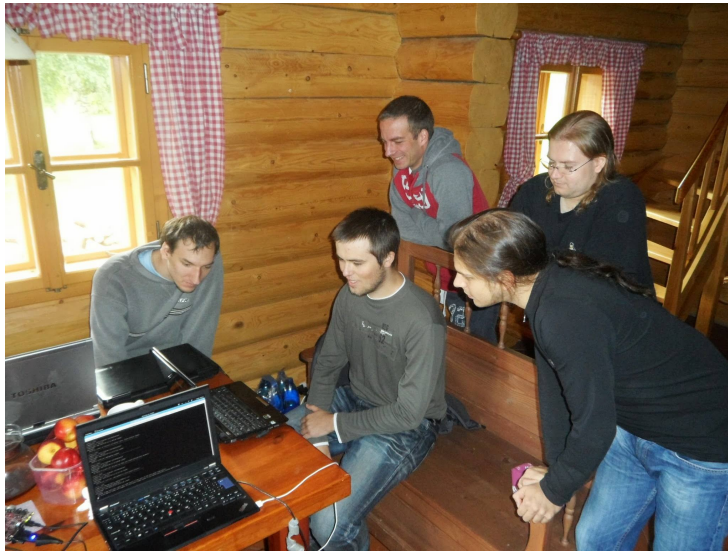


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# HelenOS Camp 2013



# HelenOS Camp 2013



# Thank you!

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<http://www.helenos.org>