



The Haiku Operating System

Scott McCreary and Urias McCullough
September 20th, 2010

What is Haiku?

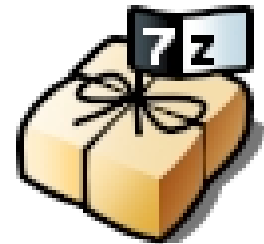
- Haiku is a fast, efficient, easy to use and learn open source operating system inspired by the BeOS that specifically targets personal computing.
- Custom kernel designed for responsiveness
- Unified, cohesive interface integrated
- Best defaults, not maximum configurability
- Open Source (MIT licensed)
- Command line apps, many from BSD and GNU



HAIKU

How does Haiku compare to BeOS?

- Implements entire BeOS R5 public API
- Networking now in the kernel
- File caching integrated with virtual memory
- Vector Icons - HVIF (Haiku Vector Icon Format)
- Support for modern hardware
- Improved POSIX compatibility



History of Haiku

- Started the day Be Inc announced the end of BeOS – August 18, 2001
- Started out as OpenBeOS, later renamed Haiku
- A couple dozen core developers, and dozens of contributors
- Nearly feature complete
- R1 Alpha1 released Sept 2009
- R1 Alpha2 released May 2010
- R1 Alpha3 TDB
- R1 Beta1...2...
- R1!



Goals

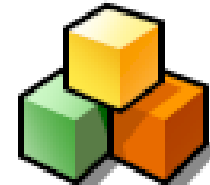
- Same as BeOS R5
- Principles
 - Simplicity is the key
 - Multicore/multiprocessor is ~~the future~~ here now
 - Desktop Focus
 - Small footprint, fast boot
 - Integrated approach brings many benefits
 - Hide as much inner workings as possible
 - Simple, elegant, fast, pick any three

Technical Features

- Kernel
- Modules & Drivers
- OpenBFS
- Queries
- File System Layout
- Kits
- BMessage
- Add-ons
- Replicants
- UI

Kernel

- Fork of the NewOS kernel
- Preemptive Multithreading
- Modular design
- Native IPC
 - Semaphores
 - Ports
 - Areas (shared memory)



Modules & Drivers

- Busses
- Module Hierarchy
 - `get_module("bus/usb/v1", &m)`
- Auto probing
 - `Open("/dev/input/foo/1")` -> rescan input drivers
- If it's supported, it just works!



OpenBFS

- 64 bit
- Journalled
- Built for large files (multimedia)
- Extended Attributes (Meta-Data)
 - Typed
 - Icon
 - Int
 - Float
 - String
 - Mime type
 - ...
 - Indexed = Searchable = Database-like

Queries

- Formula-based search on meta-data
- Live update from file-systems
- Used by applications
- Used in many places
 - Searching for Contacts
 - ((META:email=="*foo*@bar.com"))
 - ((IM:status=="Online"))
 - Mail files
 - ((MAIL:status=="New"))
 - MP3
 - ((Audio.Year>1990)&&(Audio.Artist=="[Ee]nigma"))
 - Finding Replicants
 - GoogleFS: $8 \cdot 10^9$ online bookmarks



File System Layout

- /boot/system

- etc
- bin
- system
 - lib
 - add-ons
 - kernel
 - input_server

- ...

- /boot/apps

- BeAE
- Paladin
- WonderBrush

- /boot/{home|users/*}

- mail, people
- bin
- config
 - lib
 - add-ons
 - ...
 - Settings

- ...

- /boot/common

- bin
- lib
- Include
- ...

Kits

- Clean, Uniform C++ API
- Many Kits
 - Kernel
 - Support
 - Storage
 - Interface
 - Media
 - ...
- Inheritance:
 - BWindow
 - BDirectWindow
 - BView
 - BGLView
 - BTextView
 - ...
 - BEntryList
 - BDirectory
 - BQuery
 - ...

BMessage

- System-wide multi-purpose messaging
 - 'what' code defines the meaning
 - Target and sender
 - Typed, named fields
 - Int
 - Float
 - String
 - BMessage :)
 - ...
- Used everywhere: Drag & Drop, Settings...
- Even the kernel sends them.

Add-ons

- Kernel modules (bus managers, drivers)
- Graphics drivers
- Media
 - Drivers
 - Codecs
 - Nodes
- Translators
 - Pictures
 - Text (html, ...)
- Input Devices
 - Drivers
 - Methods
- ...

UI

- Clean
- Consistent
- Multi-threaded = responsiveness
- Still allows for foreign frameworks
 - SDL
 - NSPR (FireFox aka BeZillaBrowser)
 - Qt
 - WxWidgets port in progress...



Drivers

- Video – ATI, nVidia, Neomagic, Intel, VESA
- Audio – OSS, Creative, Echo, VIA, Maudio, HDA
- Network – Most ethernet chipsets
- Wireless – WEP working, WPA/WPA2 in progress
- USB – support for EHCI, UHCI and OHCI
- USB mice, keyboards and mass storage
- Some USB webcam support
- OpenGL via MESA project



2010 Summer Coding Projects

- Google Summer of Code - 7 Students
 - Network Services Kit
 - IPv6
 - Ext3
 - DVD support for Media Player
 - X86_64 support
 - Taking the Haiku Layout Management Public
 - LKL



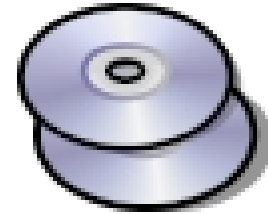
2010 Summer Coding Projects

- Haiku Code Drive - 4 Paid Developers so far this year
 - WebPositive – Webkit base Haiku native browser
 - Locale Kit – Former GsoC student continuing project from summer 2009
 - Networking improvements
 - Stabilisation work prior to Alpha2



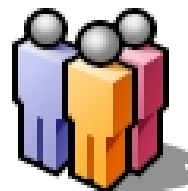
Where can I get it?

- <http://www.haiku-os.org>
- Alpha 2 and Nightly Builds
- Raw hard drive images
- VMWare images
- CD ISO images and AnyBoot images
- Build it yourself



How can you help?

- Try it out, report bugs
- Lots of bugs to fix, mostly C/C++
- Translate into other languages
- Help out with porting open source apps at HaikuPorts
- Write new applications, mostly ready for developer's now
- Donations welcome
- Spread the word



Related Side Projects

- HaikuPorts - <http://ports.haiku-files.org>
 - Mostly covers ports from other operating systems
- OSDrawer.net - <http://www.osdrawer.net>
 - Mostly programs that are native BeOS/Haiku programs
- WebPositive – Native Haiku browser WebKit Port
- Open JDK



Future – R2 and beyond

- True multi-user support
- True Package Manager
- More...
-

Links

- [#haiku](irc.freenode.org)
- <http://www.haiku-os.org>
- Haiku Mailing list
<http://www.freelists.org/list/haiku>
- Haiku Development Mailing list:
<http://www.freelists.org/list/haiku-development>
- NorCal HUG: <http://www.norcal-hug.org/>
<http://www.freelists.org/list/norcal-hug>



That's it!

Questions?

HAIKU

Credits

- Be, Inc. For creating BeOS and the BeBox.
- The Haiku team.
- François Revol for making these slides for a previous talk (I have updated them a lot)
- Jorge Mare for giving me the slides and other materials used for this presentation
- The many Haiku Developers...

