

NetBSD Work-in-Progress

Taylor 'Riastradh' Campbell
riastradh@NetBSD.org

AsiaBSDcon 2015
Tokyo, Japan
March 15, 2015

NetBSD 7

Coming soon to a mirror near you!

(Next month?)

NetBSD 7

Coming soon to a mirror near you!

- ▶ NetBSD 7: The graphics release

(Next month?)

NetBSD 7

Coming soon to a mirror near you!

- ▶ NetBSD 7: The graphics release
- ▶ NetBSD 7: The ARM SoC release

(Next month?)

NetBSD 7

Coming soon to a mirror near you!

- ▶ NetBSD 7: The graphics release
- ▶ NetBSD 7: The ARM SoC release
- ▶ NetBSD 7: The RC4-free release

(Next month?)

Graphics

- ▶ DRM/KMS: Kernel graphics drivers from Linux 3.15

Graphics

- ▶ DRM/KMS: Kernel graphics drivers from Linux 3.15
- ▶ Intel, up through Haswell

Graphics

- ▶ DRM/KMS: Kernel graphics drivers from Linux 3.15
- ▶ Intel, up through Haswell
- ▶ Radeon

Graphics

- ▶ DRM/KMS: Kernel graphics drivers from Linux 3.15
- ▶ Intel, up through Haswell
- ▶ Radeon
- ▶ (Nouveau wedges halfway through boot — workin' on it!)

ARM

- ▶ Multiprocessor ARM!

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:
 - ▶ Raspberry Pi

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:
 - ▶ Raspberry Pi
 - ▶ ... and Raspberry Pi 2

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:
 - ▶ Raspberry Pi
 - ▶ ... and Raspberry Pi 2
 - ▶ TI OMAP, Sitara: Beagleboard, Beaglebone, BB Black

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:
 - ▶ Raspberry Pi
 - ▶ ... and Raspberry Pi 2
 - ▶ TI OMAP, Sitara: Beagleboard, Beaglebone, BB Black
 - ▶ Allwinner A10, A20, A31: Cubieboard, Cubietruck

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:
 - ▶ Raspberry Pi
 - ▶ ... and Raspberry Pi 2
 - ▶ TI OMAP, Sitara: Beagleboard, Beaglebone, BB Black
 - ▶ Allwinner A10, A20, A31: Cubieboard, Cubietruck
 - ▶ Marvell Armada 370: Mirabox

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:
 - ▶ Raspberry Pi
 - ▶ ... and Raspberry Pi 2
 - ▶ TI OMAP, Sitara: Beagleboard, Beaglebone, BB Black
 - ▶ Allwinner A10, A20, A31: Cubieboard, Cubietruck
 - ▶ Marvell Armada 370: Mirabox
 - ▶ Freescale i.MX50, i.MX51, i.MX6: KOBO, Netwalker

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:
 - ▶ Raspberry Pi
 - ▶ ... and Raspberry Pi 2
 - ▶ TI OMAP, Sitara: Beagleboard, Beaglebone, BB Black
 - ▶ Allwinner A10, A20, A31: Cubieboard, Cubietruck
 - ▶ Marvell Armada 370: Mirabox
 - ▶ Freescale i.MX50, i.MX51, i.MX6: KOBO, Netwalker
 - ▶ Xilinx Zynq: Parallela, ZEDBOARD

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:
 - ▶ Raspberry Pi
 - ▶ ... and Raspberry Pi 2
 - ▶ TI OMAP, Sitara: Beagleboard, Beaglebone, BB Black
 - ▶ Allwinner A10, A20, A31: Cubieboard, Cubietruck
 - ▶ Marvell Armada 370: Mirabox
 - ▶ Freescale i.MX50, i.MX51, i.MX6: KOBO, Netwalker
 - ▶ Xilinx Zynq: Parallela, ZEDBOARD
 - ▶ ... and more than I can remember.

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:
 - ▶ Raspberry Pi
 - ▶ ... and Raspberry Pi 2
 - ▶ TI OMAP, Sitara: Beagleboard, Beaglebone, BB Black
 - ▶ Allwinner A10, A20, A31: Cubieboard, Cubietruck
 - ▶ Marvell Armada 370: Mirabox
 - ▶ Freescale i.MX50, i.MX51, i.MX6: KOBO, Netwalker
 - ▶ Xilinx Zynq: Parallela, ZEDBOARD
 - ▶ ... and more than I can remember.
- ▶ EABI (and OABI compat)

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:
 - ▶ Raspberry Pi
 - ▶ ... and Raspberry Pi 2
 - ▶ TI OMAP, Sitara: Beagleboard, Beaglebone, BB Black
 - ▶ Allwinner A10, A20, A31: Cubieboard, Cubietruck
 - ▶ Marvell Armada 370: Mirabox
 - ▶ Freescale i.MX50, i.MX51, i.MX6: KOBO, Netwalker
 - ▶ Xilinx Zynq: Parallela, ZEDBOARD
 - ▶ ... and more than I can remember.
- ▶ EABI (and OABI compat)
- ▶ Hard-float with VFP and NEON

ARM

- ▶ Multiprocessor ARM!
- ▶ ARM SoCs:
 - ▶ Raspberry Pi
 - ▶ ... and Raspberry Pi 2
 - ▶ TI OMAP, Sitara: Beagleboard, Beaglebone, BB Black
 - ▶ Allwinner A10, A20, A31: Cubieboard, Cubietruck
 - ▶ Marvell Armada 370: Mirabox
 - ▶ Freescale i.MX50, i.MX51, i.MX6: KOBO, Netwalker
 - ▶ Xilinx Zynq: Parallela, ZEDBOARD
 - ▶ ... and more than I can remember.
- ▶ EABI (and OABI compat)
- ▶ Hard-float with VFP and NEON
- ▶ ... and wonderful architecture names like `earmv7hf` (earmuffs?).

Toolchain

- ▶ GCC 4.8, including C++11

Toolchain

- ▶ GCC 4.8, including C++11
- ▶ Clang/LLVM on x86, PowerPC, ARM

Toolchain

- ▶ GCC 4.8, including C++11
- ▶ Clang/LLVM on x86, PowerPC, ARM
- ▶ Fully BSD-licensed C/C++ runtime from `compiler_rt`, `libc++`, `libcxxrt`

Miscellaneous 1

- ▶ bpf just-in-time native-code compiler

Miscellaneous 1

- ▶ bpf just-in-time native-code compiler
- ▶ Major improvements to npf, the scalable NetBSD Packet Filter, since its preliminary release in NetBSD 6

Miscellaneous 1

- ▶ bpf just-in-time native-code compiler
- ▶ Major improvements to npf, the scalable NetBSD Packet Filter, since its preliminary release in NetBSD 6
- ▶ npf now uses JIT-compiled bpf programs for filtering decisions

Miscellaneous 1

- ▶ bpf just-in-time native-code compiler
- ▶ Major improvements to npf, the scalable NetBSD Packet Filter, since its preliminary release in NetBSD 6
- ▶ npf now uses JIT-compiled bpf programs for filtering decisions
- ▶ Multiprocessor USB stack

Miscellaneous 2

- ▶ New port: epoc32

Miscellaneous 2

- ▶ New port: epoc32
- ▶ Constant-time comparison and guaranteed zeroing for crypto:
`consttime_memequal`, `explicit_memset`.

Miscellaneous 2

- ▶ New port: `epoc32`
- ▶ Constant-time comparison and guaranteed zeroing for crypto: `consttime_memequal`, `explicit_memset`.
- ▶ No more RC4! `arc4random` now uses ChaCha20.

Miscellaneous 2

- ▶ New port: epoc32
- ▶ Constant-time comparison and guaranteed zeroing for crypto: `consttime_memequal`, `explicit_memset`.
- ▶ No more RC4! `arc4random` now uses ChaCha20.
- ▶ DTrace on ARM, profiler probes and more

Miscellaneous 2

- ▶ New port: epoc32
- ▶ Constant-time comparison and guaranteed zeroing for crypto: `consttime_memequal`, `explicit_memset`.
- ▶ No more RC4! `arc4random` now uses ChaCha20.
- ▶ DTrace on ARM, profiler probes and more
- ▶ Many other improvements, new and improved drivers, updated third-party code.

Work in progress

For 8.0, maybe for 7.1!

Work in progress

For 8.0, maybe for 7.1!

- ▶ DTrace on by default in kernel

Work in progress

For 8.0, maybe for 7.1!

- ▶ DTrace on by default in kernel
- ▶ Multiprocessor network stack

Work in progress

For 8.0, maybe for 7.1!

- ▶ DTrace on by default in kernel
- ▶ Multiprocessor network stack
 - ▶ So far: MP-safe layer-2
 - ▶ bridge(4)
 - ▶ wm(4) (Intel ethernet)
 - ▶ vioif(4)
 - ▶ vmxnet3(4)

Work in progress

For 8.0, maybe for 7.1!

- ▶ DTrace on by default in kernel
- ▶ Multiprocessor network stack
 - ▶ So far: MP-safe layer-2
 - ▶ bridge(4)
 - ▶ wm(4) (Intel ethernet)
 - ▶ vioif(4)
 - ▶ vmxnet3(4)
 - ▶ In progress: layer-2 multiqueue CPU distribution

Work in progress

For 8.0, maybe for 7.1!

- ▶ DTrace on by default in kernel
- ▶ Multiprocessor network stack
 - ▶ So far: MP-safe layer-2
 - ▶ bridge(4)
 - ▶ wm(4) (Intel ethernet)
 - ▶ vioif(4)
 - ▶ vmxnet3(4)
 - ▶ In progress: layer-2 multiqueue CPU distribution
 - ▶ In progress: scalable layer-3 routing

Work in progress

For 8.0, maybe for 7.1!

- ▶ DTrace on by default in kernel
- ▶ Multiprocessor network stack
 - ▶ So far: MP-safe layer-2
 - ▶ `bridge(4)`
 - ▶ `wm(4)` (Intel ethernet)
 - ▶ `vioif(4)`
 - ▶ `vmxnet3(4)`
 - ▶ In progress: layer-2 multiqueue CPU distribution
 - ▶ In progress: scalable layer-3 routing
- ▶ NVIDIA graphics

Work in progress

For 8.0, maybe for 7.1!

- ▶ DTrace on by default in kernel
- ▶ Multiprocessor network stack
 - ▶ So far: MP-safe layer-2
 - ▶ `bridge(4)`
 - ▶ `wm(4)` (Intel ethernet)
 - ▶ `vioif(4)`
 - ▶ `vmxnet3(4)`
 - ▶ In progress: layer-2 multiqueue CPU distribution
 - ▶ In progress: scalable layer-3 routing
- ▶ NVIDIA graphics
- ▶ Newer Intel graphics from Linux 4.0: Broadwell, &c.

Work in progress

For 8.0, maybe for 7.1!

- ▶ DTrace on by default in kernel
- ▶ Multiprocessor network stack
 - ▶ So far: MP-safe layer-2
 - ▶ bridge(4)
 - ▶ wm(4) (Intel ethernet)
 - ▶ vioif(4)
 - ▶ vmxnet3(4)
 - ▶ In progress: layer-2 multiqueue CPU distribution
 - ▶ In progress: scalable layer-3 routing
- ▶ NVIDIA graphics
- ▶ Newer Intel graphics from Linux 4.0: Broadwell, &c.
- ▶ ARMv8 / AArch64: 64-bit ARM