Backporting Linux mainline drivers

Hauke Mehrtens
hauke@hauke-m.de

1. February 2015
Problem

- make Linux driver from recent Linux kernel versions (e.g. 3.19) work on older Linux kernels (e.g. 3.0)
- hardware which is only supported in recent Linux kernel versions
- board support package with an old kernel
- enterprise Linux distributions
Linux drivers backports project

- compat-wireless and compat-drivers named before automatically generate tar with drivers compatible with kernel 3.0 to 3.19
- contains about 700 kernel modules
  - Wireless LAN, ieee802.15.4, NFC, Bluetooth, Media, WWAN and some Ethernet drivers
  - new drivers and subsystems can be added
- support for kernel versions back to 3.0
  - some drivers need a more recent kernel version
using Linux backports tar

- we ship one tar with all drivers from a specific Linux kernel version, which builds against kernel 3.0 to 3.19
  - we generate tars based on latests rc-X kernels from Linus, some Linux stable kernels and Linux-next kernel
- download the version with the version number you want the drivers from
- run make menuconfig or
- run make defconfig-* (see make defconfig-help)
- run make and make install
generating Linux backports tar

generation based on linux-next

- fetch backports git from
  git://git.kernel.org/pub/scm/linux/kernel/git/backports/backports.git

- fetch linux-next git from
  git://git.kernel.org/pub/scm/linux/kernel/git/next/linux-next.git

- run
  ./gentree.py /patch/to/linux-next/ /patch/to/result/
Goals

- make it easy to take new driver code from a recent Linux kernel version
  - driver code gets copied from Linux kernel and then patched
    - semantic patches (Coccinelle)
    - normal patches
  - header files maintained by backports project
    - backports alters the include hierarchy
    - new header files are added
    - new stuff is added to existing header files
      - `backport-include/linux/kernel.h`
        - `
          \#include_next <linux/kernel.h>`

- C-Code for backports layer
**final thoughts**

- upstream your code
- if you cannot use a recent upstream kernel, use backports and get recent upstream drivers
- if you are a driver developer, upstream your code and use backport to provide your customers with a recent mainline driver for legacy kernel versions
Questions?

- Web: https://backports.wiki.kernel.org
- irc: #kernel-backports@irc.freenode.net
- Q & A