Things you need to know to submit a Linux kernel patch

Sayli Karnik
The Linux kernel

• One of the biggest and fastest moving open source project
• 53600 files, >2M Loc
Maintainer Model

15600 coders!

Developer → Maintainer → Maintainer → Maintainer → Maintainer

Developer → Maintainer

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Wouldn’t it be great to have a patch merged into the kernel?!
Contributing to the kernel

• **Step 1**
  • Install Ubuntu/Debian
  • Setup tools:
    Editor (Eg. vim, gedit etc)
    Email client (Eg. Mutt)
    VCS (git)
Contributing to the kernel

• Step 2

Linux kernel code repository

```
git clone -b staging-testing git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/staging.git
```

Copy your current config

```
cp /boot/config-`uname -r`* .config
```

```
intern@ubuntu:~/git/kernels/staging$ ls
COPYING Documentation Kconfig Makefile arch certs drivers fs init kernel mm s
amples security tools virt
CREDITS Kbuild MAINTAINERS README block crypto firmware include ipc lib net s
cripts sound usr
```
Contributing to the kernel

• Step 3
  Build/Install your kernel

  make -jX
  sudo make modules_install install
Contributing to the kernel

Step 4

- Make your branch
  - `git checkout -b first-patch`
- Update your kernel
  - `git fetch origin`
  - `git rebase origin/staging-testing`
- Make changes //TODO (brb!)
- Re-Compile
Contributing to the kernel

- Step 5 - Get, set, go! ~> Commit, patch, email

```bash
git add <file>
git commit -s -v
git format-patch -o /tmp/ HEAD^
```

0001-xyz.patch
staging:  media: davinci_vpfe: Use BIT macro instead of left shifting

This patch replaces left shifts on 1 with the BIT(x) macro, as suggested
by checkpatch.pl.
This was done using coccinelle script:
```c
@@
@constant c;
@@
- (1 << c)
+ BIT(c)
```

Signed-off-by: sayli karnik <karniksayli1995@gmail.com>
Signed-off-by: Greg Kroah-Hartman <gregkh@linuxfoundation.org>

Diffstat
```plaintext
1 files changed, 18 insertions, 18 deletions
```

diff --git a/drivers/staging/media/davinci_vpfe/davinci_vpfe_user.h b/drivers/staging/media/davinci_vpfe/davinci_vpfe_user.h
index f4f35c9..d3f34f9 100644
--- a/drivers/staging/media/davinci_vpfe/davinci_vpfe_user.h
+++ b/drivers/staging/media/davinci_vpfe/davinci_vpfe_user.h
@@ -544,41 +544,41 @@ struct vffe_isif_raw_config {
      /**< IPIPE module configurations */

      /**< IPIPE input configuration */
-#define VPFE_IPIPE_INPUT_CONFIG (1 << 0)
+#define VPFE_IPIPE_INPUT_CONFIG BIT(0)
      /**< LUT based Defect Pixel Correction */
-#define VPFE_IPIPE_LUTDPC (1 << 1)
+#define VPFE_IPIPE_LUTDPC BIT(1)
      /**< On the fly (OTF) Defect Pixel Correction */
Contributing to the kernel

- Step 5..
  Shoot the email

```
mutt -H /tmp/0001--<whatever your filename is>
```

```
$ perl scripts/get_maintainer.pl --separator, --nokeywords --nogit --nogit-fallback --noroles tats --nol -f drivers/staging/most/aim-sound/sound.c
Greg Kroah-Hartman <gregkh@linuxfoundation.org>
```
What can I change in the kernel?

- Starters
  - Code cleanups

```
intern@ubuntu:~/git/kernels/staging$ ls
COPYING  Documentation  Kconfig  Makefile  arch  certs  drivers  fs  init  kernel  mm  s
amples  security  tools  virt
CREDITS  Kbuild   MAINTAINERS  README  block  crypto  firmware  include  ipc  lib  net  s
cripts  sound  usr
```

```
perl scripts/checkpatch.pl -f drivers/staging/android/* | less
```

staging: rtl8192u: ieee80211: Remove typedef to the tx_pending_t structure

Using typedef for a structure type is not suggested in Linux kernel coding style guidelines. So remove typedef from structure tx_pending_t. The typedef name is not used anywhere. All variables of this type are declared using "struct tx_pending_t". Also change the structure name to tx_pending since it is normally only typedefs that have names that end in _t.

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Diffstat
	-fw-r-- drivers/staging/rtl8192u/ieee80211/ieee80211.h 6 6
1 files changed, 3 insertions, 3 deletions

diff --git a/drivers/staging/rtl8192u/ieee80211/ieee80211.h b/drivers/staging/rtl8192u/ieee80211/ieee80211.h
index 0971c70..8699c77e 100644
--- a/drivers/staging/rtl8192u/ieee80211/ieee80211.h
+++ b/drivers/staging/rtl8192u/ieee80211/ieee80211.h
@@ -1456,10 +1456,10 @@ enum ieee80211_state {

-typedef struct tx_pending_t{
+typedef struct tx_pending {
  int frag;
  struct ieee80211_txb *txb;
 }tx_pending_t;
+);

typedef struct _bandwidth_autoswitch {
  long threshold_20Mhzto40Mhz;
@@ -1883,7 +1883,7 @@ struct ieee80211_device {  
    RT_POWER_SAVE_CONTROL PowerSaveControl;
  }
  //} /* used if IEEE_SOFTMAC_TX_QUEUE is set */
-struct tx_pending_t tx_pending;
+-struct tx_pending tx_pending;
staging: lustre: llite: rw26: Remove unused function definition

The patch removes unused function definition ll_get_user_pages().
The use of ll_get_user_pages() was replaced with iov_iter_get_pages_alloc()
in commit 91f79c43db54d71544b18860d81b39bad07dff.

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Diffstat
-rw-r--r-- drivers/staging/lustre/lustre/llite/rw26.c 26

1 files changed, 0 insertions, 26 deletions

diff --git a/drivers/staging/lustre/lustre/llite/rw26.c b/drivers/staging/lustre/lustre/llite/rw26.c
index d89e795..420f296 100644
--- a/drivers/staging/lustre/lustre/llite/rw26.c
+++ b/drivers/staging/lustre/lustre/llite/rw26.c
@@ -156,32 +156,6 @@ static int ll_releasepage(struct page *vmpage, gfp_t gfp_mask)

#define MAX_DIRECTIO_SIZE (2 * 1024 * 1024 * 1024UL)

-static inline int ll_get_user_pages(int rw, unsigned long user_addr,
-    size_t size, struct page ***pages,
-    int *max_pages)
-{
-    int result = -ENOMEM;
-    
-    /* set an arbitrary limit to prevent arithmetic overflow */
-    if (size > MAX_DIRECTIO_SIZE) {
-        *pages = NULL;
-        return -EFBIG;
-    }
What can I change in the kernel?

• Some other coding style rules:
  • Meaningful names: `cntusr()` ⇔ `count_users()`
  • Not more than 80 columns
  • Indentations/spaces/braces
  • Avoid typedefs
  • Standard commenting style
  • Use existing macros
What can I change in the kernel?

• Coccinelle can help!
  (pattern matching and transformation tool)
Example:

```c
@depends on i@
type T; T[] E;
@@
- (sizeof(E)/sizeof(*E))
+ ARRAY_SIZE(E)
```
What can I change in the kernel?...

@ disable isnt_zero @
expression *E;
@@
E !=
  - 0
  + NULL

• TODOs

```
find drivers/staging -name TODO
```
What can I change in the kernel?...

- Read kernel mailing archives
  linux-kernel@vger.kernel.org

- Go through the git log to see commits

```
$ git log --pretty=oneline --abbrev-commit
fc17fe387718 Staging: tidspbridge: Fix split strings in drivers/staging/tidspbridge/core/tiomap3430.c
152cb4232c4f Staging: tidspbridge: Fix split strings in drivers/staging/tidspbridge/core/io_sm.c
4096ec993f10 staging: rts5139: Fix quoted string split across lines
```
Revising your patch

- Do not top-post to ask questions!

Mark,
Lunch tomorrow sounds great! Let’s keep it simple and get a pepperoni pizza.

> On Fri, Apr 26, 2013 at 9:25 AM, Mark wrote:
> Hey John, I had some questions I wanted to ask you:
> 1. Do you want to go out to lunch with me tomorrow?
> 2. What’s your favorite type of pizza?
> 3. You’re paying this time, right?

Mark,
See my answers below…
> On Fri, Apr 26, 2013 at 9:25 AM, Mark wrote:
> Hey John, I had some questions I wanted to ask you:
> 1. Do you want to go out to lunch with me tomorrow?
Lunch tomorrow sounds great!
> 2. What’s your favorite type of pizza?
Let’s keep it simple and get a pepperoni pizza.
> 3. You’re paying this time, right?
You bet! You paid last time so it’s my turn.
Revising your patch

Subject: [PATCH v2 1/2] USB: at91: fix the number of endpoint parameter

In sama5d3 SoC, there are 16 endpoints, which is different with earlier SoCs (only have 7 endpoints). The USBA_NR_ENDPOINTS macro is not suitable for sama5d3. So, get the endpoints number through the udc->num_ep, which get from platform data for non-dt kernel, or parse from dt node.

Signed-off-by: Bo Shen <voice.shen@atmel.com>

---

Changes in v2:
- Make the commit message more clearer.

    drivers/usb/gadget/atmel_usba_udc.c | 2 +-
    1 file changed, 1 insertion(+), 1 deletion(-)

diff --git a/drivers/usb/gadget/atmel_usba_udc.c b/drivers/usb/gadget/atmel_usba_udc.c
May the source be with you 😊

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