



VIA's Experience Merging Driver Into Mainline

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Agenda

- **About VIA**
- **5W to Merge/Submit**
- **Case Study**

About VIA

Chipset Company



Silicon Solutions Company



Platform Solutions Company

Core Logic Chipsets



Power Efficient x86 Processors

Video Display & Encoders

Core Logic Chipsets

Audio Codecs & Controllers

Serial ATA RAID & Super I/O Controllers

Ethernet & Wireless Networking

PCI & PCIe Peripheral Interfaces

Power Efficient PC Motherboards

IEEE1394 & USB2.0 Peripheral Interfaces

Embedded x86 Boards



Why to Merge/Submit

- **There are some advantages to merge your driver into mainline kernel.**
 - Better users' experience
 - Time to market
 - Make the driver quality better
 - Reduce engineering effort

Who to Merge/Submit

- **Hardware Vendors**
 - SW RD
 - SW FAE
 -
- **Community**
 - Anyone who is interested in

What to Merge/Submit

- **Bug fixing**
- **New feature support**
 - Smart 5.1 feature of VIA AC97 Codec
- **New H/W support**
 - New IDE/SATA Controller support
 - Card Reader Controller support
 - Etc.

When to Merge/Submit

- **Anytime**

- It's welcomed to merge/submit your code into mainline kernel anytime when you...
 - Fix a bug
 - Add a new feature
 - Support a new H/W device
 - Etc...

How to Merge/Submit

- **Co-work with community developer**
 - To cooperate with community developers, you have to provide the SPEC and HW basically.
- **Submitted by yourself (Patch)**
 - Coding Style
 - Patch for the latest stable kernel
 - Submit to the correct mailing-list
 - (Don't forget to cc Maintainer)
 - Reply the feedback from community

How to Merge/Submit

- There are useful files in kernel source tree when you want to merge/submit your code into mainline kernel.
 - MAINTAINERS
 - Documentation/CodingStyle
 - Documentation/SubmittingDrivers
 - Documentation/SubmittingPatches
 - scripts/checkpatch.pl
 - Checking the patch is following coding style or not

Coding Style

- **Refer to Documentation/CodingStyle**
 - Indentation
 - Breaking long lines and strings
 - Placing Braces and Spaces
 - Naming
 - Typedefs
 - Functions
 - Commenting
 -

Case Study – SATA Driver

- **VIA have new SATA controller, but it's not supported by the mainline kernel in Jan, 2009**
- **Because the HW architecture are the same between the new and old SATA controllers, only device ID is different. So we just need to add the device ID into the driver.**

Case Study – SATA Driver

- After creating the patch like below,

```

Signed-off-by: Joseph Chan <josephchan@via.com.tw> → Must have
--- a/drivers/ata/sata_via.c      2008-12-25 07:26:37.000000000 +0800
+++ b/drivers/ata/sata_via.c      2009-01-15 21:43:23.000000000 +0800
@@ -92,6 +92,8 @@
     { PCI_VDEVICE(VIA, 0x5372), vt6420 },
     { PCI_VDEVICE(VIA, 0x7372), vt6420 },
     { PCI_VDEVICE(VIA, 0x5287), vt8251 }, /* 2 sata chnls (Master/Slave) */
+    { PCI_VDEVICE(VIA, 0x9000), vt8251 },
+    { PCI_VDEVICE(VIA, 0x9040), vt8251 },
     { } /* terminate list */
};
Generated by "diff -Nur <orig> <modified>"
    
```

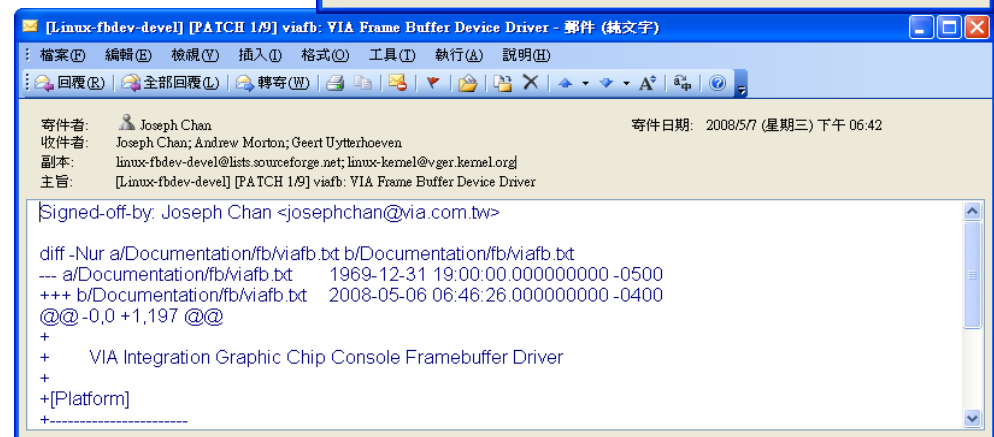
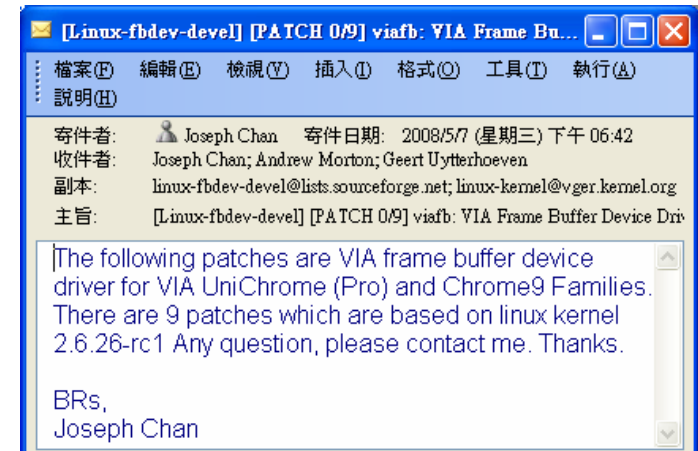
- You have to do a test and check it by “checkpatch.pl” before you submit it to the mailing-list.
- Once everything is OK, submit this patch to “linux-ide@vger.kernel.org” for review.

Case Study – VIAFB





































- There is no VIA Frame buffer device driver support in mainline before 2008. And we would like to submit the driver into mainline at the 2008/B.
- Prerequisite internally
 - Check the coding style
 - It took lots time (2~3 months) for modifying the coding style from VIA's to kernel's rules.
 - Test with mainline (2.6.26-rc1)
 - Create patches for submission

Case Study – VIAFB

- May 7, 2008. 1st viafb submission came out.
 - 9 patches, the 1st patch (PATCH 0/9) described what these patches did.



Case Study – VIAFB

[-] 主旨: [Linux-fbdev-devel] [PATCH 0/9] viafb: VIA Frame Buffer Device Driver (3 項目)				
	FD Cami	Re: [Linux-fbdev-devel] [PATCH 0/9] viafb: VIA Frame Buffer Device Driver	2008/5/8 (星期四) 上午 ...	10 KB 
	FD Cami	Re: [Linux-fbdev-devel] [PATCH 0/9] viafb: VIA Frame Buffer Device Driver	2008/5/8 (星期四) 上午 ...	11 KB 
	Joseph Chan	[Linux-fbdev-devel] [PATCH 0/9] viafb: VIA Frame Buffer Device Driver	2008/5/7 (星期三) 下午 ...	7 KB 
[-] 主旨: [Linux-fbdev-devel] [PATCH 1/9] viafb: VIA Frame Buffer Device Driver (2 項目)				
	Randy Dunlap	Re: [Linux-fbdev-devel] [PATCH 1/9] viafb: VIA Frame Buffer Device Driver	2008/5/7 (星期三) 下午 ...	30 KB 
	Pekka Enberg	Re: [Linux-fbdev-devel] [PATCH 1/9] viafb: VIA Frame Buffer Device Driver	2008/5/7 (星期三) 下午 ...	13 KB 
[-] 主旨: [Linux-fbdev-devel] [PATCH 1/9] viafb: VIA Frame Buffer Device Driver - Resend (6 項目)				
	Pekka Enberg	Re: [Linux-fbdev-devel] [PATCH 1/9] viafb: VIA Frame Buffer Device Driver - ...	2008/5/8 (星期四) 下午 ...	14 KB 
	Geert Uytterhoeven	Re: [Linux-fbdev-devel] [PATCH 1/9] viafb: VIA Frame Buffer Device Driver - ...	2008/5/8 (星期四) 下午 ...	14 KB 
	Ondrej Zajicek	Re: [Linux-fbdev-devel] [PATCH 1/9] viafb: VIA Frame Buffer Device Driver - ...	2008/5/8 (星期四) 下午 ...	13 KB 
	Andrew Morton	Re: [Linux-fbdev-devel] [PATCH 1/9] viafb: VIA Frame Buffer Device Driver - ...	2008/5/8 (星期四) 上午 ...	9 KB 
	Andrew Morton	Re: [Linux-fbdev-devel] [PATCH 1/9] viafb: VIA Frame Buffer Device Driver - ...	2008/5/8 (星期四) 上午 ...	15 KB 
	Krzysztof Helt	Re: [Linux-fbdev-devel] [PATCH 1/9] viafb: VIA Frame Buffer Device Driver - ...	2008/5/8 (星期四) 上午 ...	30 KB 
[-] 主旨: [Linux-fbdev-devel] [PATCH 2/9] viafb: VIA Frame Buffer Device Driver (2 項目)				
	Ondrej Zajicek	Re: [Linux-fbdev-devel] [PATCH 2/9] viafb: VIA Frame Buffer Device Driver	2008/5/8 (星期四) 下午 ...	14 KB 
	Alan Cox	Re: [Linux-fbdev-devel] [PATCH 2/9] viafb: VIA Frame Buffer Device Driver	2008/5/7 (星期三) 下午 ...	12 KB 
[-] 主旨: [Linux-fbdev-devel] [PATCH 3/9] viafb: VIA Frame Buffer Device Driver (1 項目)				
	Alan Cox	Re: [Linux-fbdev-devel] [PATCH 3/9] viafb: VIA Frame Buffer Device Driver	2008/5/7 (星期三) 下午 ...	15 KB 
[-] 主旨: [Linux-fbdev-devel] [PATCH 6/9] viafb: VIA Frame Buffer Device Driver (2 項目)				
	Ondrej Zajicek	Re: [Linux-fbdev-devel] [PATCH 6/9] viafb: VIA Frame Buffer Device Driver	2008/5/8 (星期四) 下午 ...	13 KB 
	Alan Cox	Re: [Linux-fbdev-devel] [PATCH 6/9] viafb: VIA Frame Buffer Device Driver	2008/5/7 (星期三) 下午 ...	13 KB 
[-] 主旨: [Linux-fbdev-devel] [PATCH 7/9] viafb: VIA Frame Buffer Device Driver (2 項目)				
	Ondrej Zajicek	Re: [Linux-fbdev-devel] [PATCH 7/9] viafb: VIA Frame Buffer Device Driver	2008/5/8 (星期四) 下午 ...	16 KB 
	Krzysztof Helt	Re: [Linux-fbdev-devel] [PATCH 7/9] viafb: VIA Frame Buffer Device Driver	2008/5/8 (星期四) 上午 ...	14 KB 

Case Study – VIAFB

yes, that was my first impression. The `_names_` of those variables is a real problem. `lcd_mode`, `DeviceState`, `second_size`, `primary_dev`, etc. The driver is attempting to reserve all those names for itself, kernel-wide.

So at a minimum, going through and prepending `viafb_` onto all those would be needed.

There are a number of layout glitches in there. Such as a strange combination of two styles:

```
void foo(void)
{
|
versus
```

```
void foo(void) {
```

Many of these things can be pinpointed by processing the diff with `scripts/checkpatch.pl`.

Administrative note: all nine patches had the same title "viafb: VIA Frame Buffer Device Driver". Please choose unique and meaningful names for each patch, such as "viafb: add utility header file".

Apart from those fairly easily-fixed things, the driver looks pretty good from a quick scan, given how large it is, and given that it probably has been around for quite a long time..

```
> #ifndef FB_ACCEL_VIA_UNICHROME
> #define FB_ACCEL_VIA_UNICHROME 50
> #endif
```

This is the only place you define `FB_ACCEL_VIA_UNICHROME`. If so you do

```
> +{
> +   parinfo.cursor_start = parinfo.fbmem_free - CURSOR_SIZE;
> +   parinfo.fbmem_free -= CURSOR_SIZE;
```

You can swap these two lines to get shorter code:

```
parinfo.fbmem_free -= CURSOR_SIZE;
parinfo.cursor_start = parinfo.fbmem_free;
```

```
> + case VIAFB_GET_INFO_SIZE:
> +     return put_user(sizeof(viainfo), argp);
> + case VIAFB_GET_INFO:
> +     return ioctl_get_viafb_info(arg);
...
> + case VIAFB_GET_RESOLUTION:
```
























Some of these ioctls looks like they duplicate standard fbdev ioctls. What is a reason for that?

```
> +         if (via_bus_width == 24) {
> +             if (device_lcd_dualedge == 1)
> +                 i2cWriteByte(chip_info,
> +                             tmds_chip_info,
> +                             tmds_chip_slave_addr,
> +                             0x08, 0x3F);
> +             else
> +                 i2cWriteByte(chip_info,
> +                             tmds_chip_info,
> +                             tmds_chip_slave_addr,
> +                             0x08, 0x37);
```

These two branches differs only by the set value. It is shorter to set value inside if-else the call `i2cWriteByte` after.

Case Study – VIAFB

- The 2nd viafb submission came out on June 30, 2008.

	Joseph Chan	[PATCH 13/13] viafb: via_utility.c, via_utility.h, vt1636.c, vt1636.h	2008/6/30 (星期一) 下午 3:54
	Joseph Chan	[PATCH 12/13] viafb: via_i2c.c, via_i2c.h, viamode.c, viamode.c	2008/6/30 (星期一) 下午 3:51
	Joseph Chan	[PATCH 11/13] viafb: viafbdev.c, viafbdev.h	2008/6/30 (星期一) 下午 3:47
	Joseph Chan	[PATCH 10/13] viafb: tb11636.c, tb11636.h, tbIDPASetting.c, tbIDPASetting.h	2008/6/30 (星期一) 下午 3:44
	Joseph Chan	[PATCH 9/13] viafb: Makefile, share.h	2008/6/30 (星期一) 下午 3:39
	Joseph Chan	[PATCH 8/13] viafb: lcd.c, lcd.h, lcdtbl.h	2008/6/30 (星期一) 下午 3:33
	Joseph Chan	[PATCH 7/13] viafb: iface.c, iface.h, ioctl.c, ioctl.h	2008/6/30 (星期一) 下午 3:26
	Joseph Chan	[PATCH 6/13] viafb: hw.c, hw.h	2008/6/30 (星期一) 下午 3:04
	Joseph Chan	[PATCH 5/13] viafb: dvi.c, dvi.h, global.c and global.h	2008/6/30 (星期一) 下午 3:01
	Joseph Chan	[PATCH 4/13] viafb: chip.h, debug.h	2008/6/30 (星期一) 下午 2:50
	Joseph Chan	[PATCH 3/13] viafb: accel.c, accel.h	2008/6/30 (星期一) 下午 2:38
	Joseph Chan	[PATCH 2/13] viafb: Makefile, Kconfig	2008/6/30 (星期一) 下午 2:34
	Joseph Chan	 Alan Cox	Re: [PATCH 7/13] viafb: iface.c, iface.h, ioctl.c, ioctl.h
	Jiri Slaby	Re: [PATCH 11/13] viafb: viafbdev.c, viafbdev.h	2008/7/1 (星期二) 上午 3:58
	Jiri Slaby	Re: [PATCH 7/13] viafb: iface.c, iface.h, ioctl.c, ioctl.h	2008/7/1 (星期二) 上午 3:55
	Jiri Slaby	Re: [PATCH 11/13] viafb: viafbdev.c, viafbdev.h	2008/7/1 (星期二) 上午 3:49
	Geert Uytterhoeven	Re: [PATCH 1/13] viafb: viafb.modes, viafb.txt	2008/7/1 (星期二) 上午 1:10
	Ben Dooks	Re: [PATCH 12/13] viafb: via_i2c.c, via_i2c.h, viamode.c, viamode.c	2008/7/1 (星期二) 上午 12:10
	Alan Cox	Re: [PATCH 7/13] viafb: iface.c, iface.h, ioctl.c, ioctl.h	2008/6/30 (星期一) 下午 7:01
	Bruno Prémont	Re: [Linux-fbdev-devel] [PATCH 1/13] viafb: viafb.modes, viafb.txt	2008/6/30 (星期一) 下午 6:56
	Sam Ravnborg	Re: [PATCH 9/13] viafb: Makefile, share.h	2008/6/30 (星期一) 下午 6:47
	Alan Cox	Re: [PATCH 13/13] viafb: via_utility.c, via_utility.h, vt1636.c, vt1636.h	2008/6/30 (星期一) 下午 6:03

Case Study – VIAFB

- The 3rd viafb submission came out on Aug 8, 2008.

	Geert Uytterhoeven	RE: [PATCH 1/13 v2] viafb: viafb.modes, viafb.txt	2008/8/11 (星期一) 下午 8:15
	krzysztof.h1@pocza.fm	RE: [Linux-fbdev-devel] [PATCH 0/13 v2] viafb: VIA Frame Buffer Device Driver	2008/8/11 (星期一) 下午 5:18
	Joe Perches	Re: [PATCH 13/13 v2] viafb: via_utility.c, via_utility.h, vt1636.c, vt1636.h	2008/8/9 (星期六) 上午 7:28
	Krzysztof Helt	Re: [Linux-fbdev-devel] [PATCH 0/13 v2] viafb: VIA Frame Buffer Device Driver	2008/8/9 (星期六) 上午 12:22
	Geert Uytterhoeven	RE: [PATCH 1/13 v2] viafb: viafb.modes, viafb.txt	2008/8/8 (星期五) 下午 11:25
	Geert Uytterhoeven	Re: [PATCH 1/13 v2] viafb: viafb.modes, viafb.txt	2008/8/8 (星期五) 下午 7:33
	Joseph Chan	[PATCH 13/13 v2] viafb: via_utility.c, via_utility.h, vt1636.c, vt1636.h	2008/8/8 (星期五) 下午 6:20
	Joseph Chan	[PATCH 12/13 v2] viafb: via_i2c.c, via_i2c.h, viamode.c, viamode.h	2008/8/8 (星期五) 下午 6:19
	Joseph Chan	[PATCH 11/13 v2] viafb: viafbdev.c, viafbdev.h	2008/8/8 (星期五) 下午 6:18
	Joseph Chan	 akpm@linux-foundation.org + viafb-viafbmodes-viafbtxt-fix-fix.patch added to -mm tree	2008/8/13 (星期三) 上午 7:11
	Joseph Chan	 akpm@linux-foundation.org + viafb-viafbmodes-viafbtxt-fix.patch added to -mm tree	2008/8/13 (星期三) 上午 7:10
	Joseph Chan	 akpm@linux-foundation.org + viafb-via_utilityc-via_utilityh-vt1636c-vt1636h.patch added to -mm tree	2008/8/12 (星期二) 上午 7:22
	Joseph Chan	 akpm@linux-foundation.org + viafb-viafbdevc-viafbdevh-checkpatch-fixes.patch added to -mm tree	2008/8/12 (星期二) 上午 7:22
	Joseph Chan	 akpm@linux-foundation.org + viafb-tbl1636c-tbl1636h-tblpsettingc-tblpsettingh.patch added to -mm tree	2008/8/12 (星期二) 上午 7:20
	Joseph Chan	 akpm@linux-foundation.org + viafb-makefile-shareh.patch added to -mm tree	2008/8/12 (星期二) 上午 7:16
	Joseph Chan	 akpm@linux-foundation.org + viafb-lcdc-lcdh-lcdtblh.patch added to -mm tree	2008/8/12 (星期二) 上午 7:16
	Joseph Chan	 akpm@linux-foundation.org + viafb-ifacec-ifaceh-ioctlc-ioctlh.patch added to -mm tree	2008/8/12 (星期二) 上午 7:16
	Joseph Chan	 akpm@linux-foundation.org + viafb-hwc-hwh-checkpatch-fixes.patch added to -mm tree	2008/8/12 (星期二) 上午 7:14
	Joseph Chan	 akpm@linux-foundation.org + viafb-hwc-hwh.patch added to -mm tree	2008/8/12 (星期二) 上午 7:13
	Joseph Chan	 akpm@linux-foundation.org + viafb-dvic-dvih-globalc-and-globalh-checkpatch-fixes.patch added to -mm tree	2008/8/12 (星期二) 上午 7:13
	Joseph Chan	 akpm@linux-foundation.org + viafb-dvic-dvih-globalc-and-globalh.patch added to -mm tree	2008/8/12 (星期二) 上午 7:12
	Joseph Chan	 akpm@linux-foundation.org + viafb-chiph-debugh.patch added to -mm tree	2008/8/12 (星期二) 上午 7:12
	Joseph Chan	 akpm@linux-foundation.org + viafb-accelc-accelh.patch added to -mm tree	2008/8/12 (星期二) 上午 7:12
	Joseph Chan	 akpm@linux-foundation.org + viafb-accelc-accelh-checkpatch-fixes.patch added to -mm tree	2008/8/12 (星期二) 上午 7:12
	Joseph Chan	 akpm@linux-foundation.org + viafb-makefile-kconfig.patch added to -mm tree	2008/8/12 (星期二) 上午 7:12
	Joseph Chan	 akpm@linux-foundation.org + viafb-viafbmodes-viafbtxt.patch added to -mm tree	2008/8/12 (星期二) 上午 7:10

Case Study – VIAFB

akpm@linux-foundation.org	+ viafb-viafbdevc-update patch added to -mm tree	2008/8/28 (星期四) 上午 7:27
akpm@linux-foundation.org	+ viafb-accelc-accelh-update patch added to -mm tree	2008/8/28 (星期四) 上午 7:26
Joseph Chan	[PATCH 1/1] MAINTAINERS:	2008/8/27 (星期三) 下午 5:24
Joseph Chan	- viafb-via_utilityc-via_utilityh-vt1636c-vt1636h.patch removed from -mm tree	2008/10/19 (星期日) 上午 7:17
Joseph Chan	- viafb-makefile-shareh.patch removed from -mm tree	2008/10/19 (星期日) 上午 7:17
Joseph Chan	- viafb-tbl1636c-tbl1636h-tblDPAsettingc-tblDPAsettingh.patch removed from -mm tree	2008/10/19 (星期日) 上午 7:17
Joseph Chan	- viafb-lcdc-lcdh-lcdtblh.patch removed from -mm tree	2008/10/19 (星期日) 上午 7:17
akpm@linux-foundation.org	- viafb-hwc-hwh.patch removed from -mm tree	2008/10/19 (星期日) 上午 7:17
akpm@linux-foundation.org	- viafb-maintainers-entry.patch removed from -mm tree	2008/10/19 (星期日) 上午 7:17
akpm@linux-foundation.org	- viafb-ifacec-ifaceh-ioctlc-ioctlh.patch removed from -mm tree	2008/10/19 (星期日) 上午 7:17
akpm@linux-foundation.org	- viafb-viafbdevc-update.patch removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-dvic-dvih-globalc-and-dvib.patch removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-accelc-accelh.patch removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-chiph-debugh.patch removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-viafbmodes-viafbtxt-fifo.c removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-makefile-kconfig.patch removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-viafbdevc-viafbdevh.c removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-hwc-hwh-checkpatch-fifo.c removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-dvic-dvih-globalc-and-dvib.c removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-accelc-accelh-checkpatch-fifo.c removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-viafbmodes-viafbtxt-fifo.c removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-viafbmodes-viafbtxt-fifo.c removed from -mm tree	2008/10/16 (星期四) 上午 7:17
akpm@linux-foundation.org	- viafb-accelc-accelh-update.patch removed from -mm tree	2008/10/16 (星期四) 上午 7:17

[/pub/scm / linux/kernel/git/torvalds/linux-2.6.git / history](#)

[summary](#) | [shortlog](#) | [log](#) | [commit](#) | [commitdiff](#) | [tree](#)

first · prev · next

Linux 2.6.28-rc1

[/linux/kernel/git/torvalds/linux-2.6.git / drivers / video / via /](#)

2008-10-16	Joseph Chan	viafb: via_utility.c, via_utility.h, vt1636.c, vt1636.h	tree commitdiff
2008-10-16	Joseph Chan	viafb: via_i2c.c, via_i2c.h, viamode.c, viamode.h	tree commitdiff
2008-10-16	Joseph Chan	viafb: viafbdev.c (update)	tree commitdiff
2008-10-16	Joseph Chan	viafb: viafbdev.c, viafbdev.h	tree commitdiff
2008-10-16	Joseph Chan	viafb: tbl1636.c, tbl1636.h, tblDPASetting.c, tblDPASet ...	tree commitdiff
2008-10-16	Joseph Chan	viafb: Makefile, share.h	tree commitdiff
2008-10-16	Joseph Chan	viafb: lcd.c, lcd.h, lcdtbl.h	tree commitdiff
2008-10-16	Joseph Chan	viafb: iface.c, iface.h, ioctl.c, ioctl.h	tree commitdiff
2008-10-16	Joseph Chan	viafb: hw.c, hw.h	tree commitdiff

- Finally, the viafb has been merged into mainline on Oct 16, 2008.

Summary

- **Don't be afraid to do submission.**
- **To submit patch/driver is not a problem.**
 - There are some documents available
 - Community developers can help
- **It's a problem that you don't submit**
 - Users' impressions
 - Support effort

Reference

- <http://www.kernel.org>
- <http://marc.info>
 - Linux Group – Mailing List
- **Documents in <kernel source>**
 - MAINTAINER
 - Documentation/CodingStyle
 - Documentation/Submit* and others.

Q & A