

“Patches carved  
into stone tablets”

i.e. why we use email to  
develop the kernel

Greg Kroah-Hartman  
[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)

[github.com/gregkh/presentation-stone-tools](https://github.com/gregkh/presentation-stone-tools)



Because it is faster  
than anything else.

**7-8 changes per hour**

75 maintainers took  
over 364 patches

# Kernel reviewers

Greg Kroah-Hartman	9781
David S. Miller	6658
Mark Brown	2815
Andrew Morton	2444
Ingo Molnar	2332
Daniel Vetter	2223
Mauro Carvalho Chehab	2029
Arnaldo Carvalho de Melo	1697
Kalle Valo	1598
Linus Walleij	1447
Doug Ledford	1307
Rafael J. Wysocki	1273
Thomas Gleixner	1219

“It’s a poor  
craftsman that  
blames his tools.”

“An expert  
craftsman knows  
how to choose  
excellent tools.”

– Jeremy Bowers

<https://news.ycombinator.com/item?id=2380679>

GitHub

Bitbucket

GitLab

etc.

# GitHub - pros

gregkh / **usbutils**

Code Issues 0 Pull requests 1 Projects 0 Wiki Pulse Graphs Settings

USB utilities for Linux, including lsusb <http://www.linux-usb.org> — Edit

341 commits 1 branch 19 releases 38 contributors GPL-2.0

Branch: master ▾ New pull request Create new file Upload files Find file Clone or download ▾

gregkh committed on GitHub Merge pull request #45 from xypron/autogen.sh ... Latest commit 6e43dc7 2 days ago

# GitHub - cons

kubernetes / kubernetes

Watch 1,442 Star 17,057 Fork 5,528

Code Issues 4,114 Pull requests 511 Projects 5 Wiki Pulse Graphs

Production-Grade Container Scheduling and Management <http://kubernetes.io>

36,196 commits 31 branches 165 releases 897 contributors Apache-2.0

Branch: master New pull request Create new file Upload files Find file Clone or download

k8s-merge-robot committed on GitHub Merge pull request #33097 from gmarek/static-ip-creation Latest commit 06a23dd 44 minutes ago

github issue template: remove emoji suggestion 2 months ago

gerrit

reviewboard

etc.

# gerrit - pros

All Projects Documentation

Open Merged Abandoned

status:open

Changes ▾ Search Sign In

ANDROID

open source project

Browse Repositories



Search for status:open

Subject	Status	Owner	Project	Branch	Updated	Size	A	CR	PR	PV	V
Add base for wifi HAL chip implementation		 Mitchell Wills	platform/frameworks/opt/net/wifi	master	6:54 PM	<div style="width: 100px; background-color: red;"></div>					
Switch to <android-base/base/properties.h>.		 Elliott Hughes	platform/bootable/recovery	master	6:53 PM	<div style="width: 50px; background-color: green;"></div>					
meta: add makefile, test runner, skeleton MessageBuffer		 Mukesh Agrawal	platform/system/connectivity/wifilogd	master (message-buffer)	6:51 PM	<div style="width: 20px; background-color: yellow;"></div>					
java.lang.invoke: Add mirror types for MethodHandle / MethodType.		 Narayan Kamath	platform/art	master	6:50 PM	<div style="width: 100px; background-color: red;"></div>					
libadfhwc: Fix adf_hwc_close		 Marissa Wall	platform/system/core	master	6:50 PM	<div style="width: 10px; background-color: green;"></div>					
Get mac address from wificond	Merge Conflict	 Ningyuan Wang	platform/frameworks/opt/net/wifi	master (get_mac_from_wificond)	6:49 PM	<div style="width: 10px; background-color: green;"></div>					
Added async command to ssh connection		 Benny Peake	platform/tools/test/connectivity	master	6:49 PM	<div style="width: 10px; background-color: green;"></div>					
Fix for non-empty a[name] tags			platform/build	master	6:48 PM	<div style="width: 10px; background-color: green;"></div>					

# gerrit - cons

All Projects Documentation

status:open

Changes ▾ Search Sign In

Open Merged Abandoned

ANDROID

open source project

Browse Repositories



Search for status:open

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Switch to <android-base/base/properties.h>.		 Elliott Hughes	platform/bootable/recovery	master	6:53 PM	<div style="width: 50px; background-color: green;"></div>					
meta: add makefile, test runner, skeleton MessageBuffer		 Mukesh Agrawal	platform/system/connectivity/wifilogd	master (message-buffer)	6:51 PM	<div style="width: 20px; background-color: yellow;"></div>					
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libadfhwc: Fix adf_hwc_close		 Marissa Wall	platform/system/core	master	6:50 PM	<div style="width: 10px; background-color: green;"></div>					
Get mac address from wificond	Merge Conflict	 Ningyuan Wang	platform/frameworks/opt/net/wifi	master (get_mac_from_wificond)	6:49 PM	<div style="width: 10px; background-color: green;"></div>					
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Fix for non-empty a[name] tags		 S...	platform/build	master	6:48 PM	<div style="width: 10px; background-color: green;"></div>					

# Plain text email

# email - pros

# email - pros

```
File Edit View Search Terminal Help
q:Quit d:Del u:Undel s:Save m:Mail r:Reply g:Group ?:Help
 1 T Sep 26 Namrata A Shett (0.4K) [PATCH 0/2] staging: vt6656: Fix return values
 2 T Sep 26 Namrata A Shett (1.2K) ↳[PATCH 2/2] staging: vt6656: Make return type changes of func
 3 T Sep 26 Namrata A Shett (2.0K) ↳[PATCH 1/2] staging: vt6656: Remove unnecessary return values
 4 C Sep 26 James Simmons (1.5K) Re: [lustre-devel] [PATCH] staging/lustre/lov: add missing heade
 5 T Sep 26 Martin Alonso (0.9K) [PATCH] staging: vt6656: Add spaces around '+' operator
 6 T Sep 26 Joe Perches (0.9K) ↳
 7 T Sep 26 Ramiro Oliveira (0.8K) [PATCH] Staging: dgnc: Align the * on a block comment
 8 T Sep 26 Bhumika Goyal (1.6K) [PATCH] Staging: most: aim-sound: constify snd_pcm_ops structure
 9 T Sep 26 Sabitha George (2.2K) [PATCH V2] staging: ks7010: Fix warnings on printk() usage
10 T Sep 26 Bryan O'Donoghu (1.4K) [PATCH] staging: greybus/timesync: avoid divide by zero on X86 Q
11 T Sep 26 Grygorii Maistr (1.0K) [PATCH] staging: slicoss: cleaning up codestyle warnings
12 C Sep 26 Mark Rutland (1.0K) [PATCH 0/3] Kill off show_stack() NULL-implies-current idiom
13 C Sep 26 Mark Rutland (1.1K) ↳[PATCH 2/3] drivers/tty: Explicitly pass current to show_stac
14 r T Sep 26 Matias Mucciolo (0.9K) [PATCH] staging: wilc1000: fix symbol 'WILC_DEBUG_LEVEL' was not
15 F Sep 26 To Matias Mucci (0.4K) ↳
16 r T Sep 26 Matias Mucciolo (0.7K) ↳
17 F Sep 26 To Matias Mucci (0.5K) ↳
18 T Sep 26 Matias Mucciolo (0.9K) ↳[PATCH] staging: wilc1000: fix sparse warning: symbol w
19 T Sep 26 David Kershner (1.9K) [PATCH 0/9] staging: unisys: Remove version information
20 T Sep 26 David Kershner (1.3K) ↳[PATCH 2/9] staging: unisys: visorbus: remove driver version
21 T Sep 26 David Kershner (6.0K) ↳[PATCH 8/9] staging: unisys: visorbus: Convert visorchannel_s
22 T Sep 26 David Kershner (6.8K) ↳[PATCH 7/9] staging: unisys: visorbus: Change support functio
23 T Sep 26 David Kershner (7.1K) ↳[PATCH 9/9] staging: unisys: visorbus: Convert visorchannel_s
24 T Sep 26 David Kershner (1.1K) ↳[PATCH 3/9] staging: unisys: visorinput: remove driver versio
25 T Sep 26 David Kershner (2.6K) ↳[PATCH 6/9] staging: unisys: make MODULE_DESCRIPTIONs consist
26 T Sep 26 David Kershner (0.9K) ↳[PATCH 4/9] staging: unisys: visornic: remove driver version
---Mutt: =todo [Msgs:884 Inc:4 8.8M]---(threads/reverse-date-received)-----(2%)---
```

## todo - Evolution

File Edit View Message Folder Search Help



Send / Receive



Reply



Group Reply



Forward



todo

884 total

Show: All Messages

Search:



Subject or Addresses contain



in Current Folder

## On This Computer

Inbox

todo

Drafts

Junk

Outbox

Sent

Templates

Trash

## Search Folders

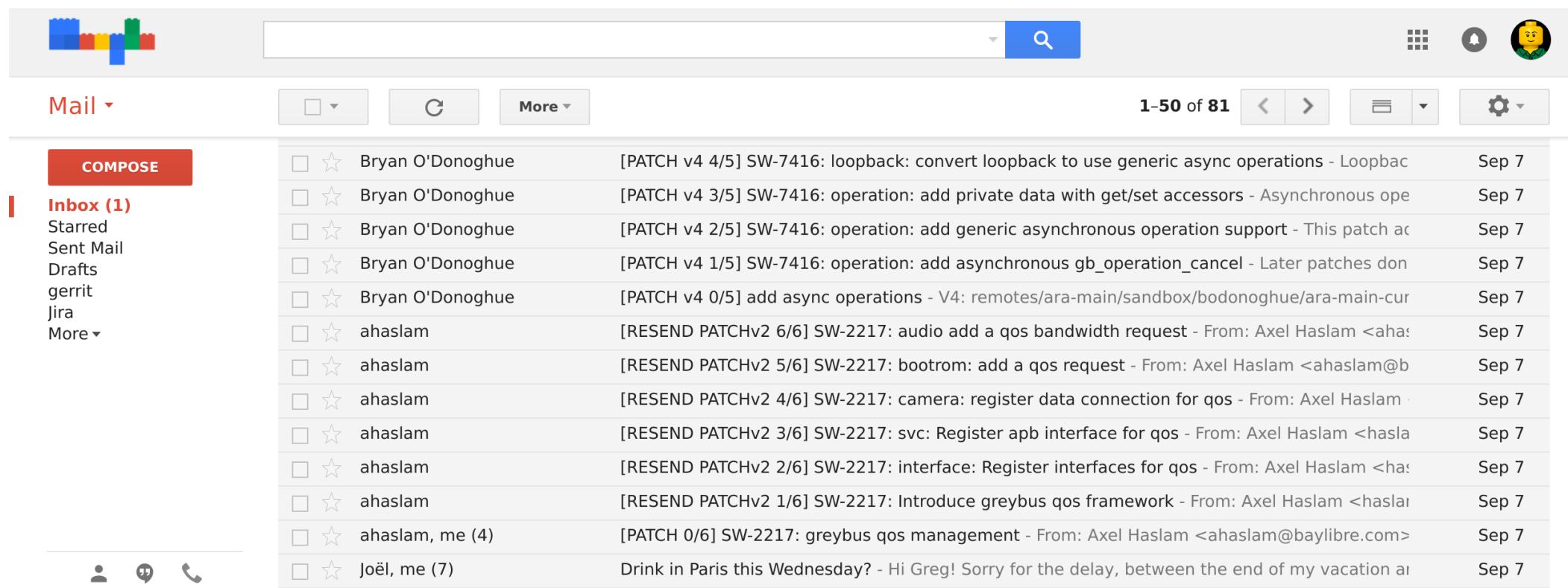
Unmatched

	From	Subject	Date
	Stephen Boyd <stephen.boyd@linaro.org>	▶ [RFC/PATCH] usb: misc: Add a driver for TC7USB40MU	Today 20:59
	Oliver Neukum <oneukum@suse.com>	▶ Re: [Umap2][7/11][160a:3184] NULL pointer dereference	Today 20:32
	Namrata A Shettar <namrataashettar@gmail.c...	▶ [PATCH 0/2] staging: vt6656: Fix return values	Today 20:26
	James Simmons <jsimmons@infradead.org>	Re: [lustre-devel] [PATCH] staging/lustre/lov: add missing header depend...	Today 20:23
	Gonçalo Salazar <glbsalazar@gmail.com>	▶ [PATCH V2] staging: rtl8172: usb_intf.c: Fixed block comment coding st...	Today 01:00
	Larry Finger <Larry.Finger@lwfinger.net>	▶ Re: [PATCH V2] staging: rtl8172: usb_intf.c: Fixed block comment co...	Today 02:53
	Gonçalo Salazar <glbsalazar@gmail.com>	▶ Re: [PATCH V2] staging: rtl8172: usb_intf.c: Fixed block comment ...	Today 13:20
	Larry Finger <Larry.Finger@lwfinger.net>	Re: [PATCH V2] staging: rtl8172: usb_intf.c: Fixed block comme...	Today 20:14
	Martin Alonso <martin.alonso@zoho.com>	▶ [PATCH] staging: vt6656: Add spaces around '+' operator	Today 19:48
	Joe Perches <joe@perches.com>	Re: [PATCH] staging: vt6656: Add spaces around '+' operator	Today 20:02
	Ramiro Oliveira <Ramiro.Oliveira@synopsys.co...	[PATCH] Staging: dgnc: Align the * on a block comment	Today 19:39
	Bhumika Goyal <bhumirks@gmail.com>	[PATCH] Staging: most: aim-sound: constify snd_pcm_ops structures	Today 19:39
	Sabitha George <sabitha.george@gmail.com>	[PATCH V2] staging: ks7010: Fix warnings on printk() usage	Today 19:10
	Martin <martin.alonso@zoho.com>	▶ [PATCH] staging: skein: Remove extra blank lines	Today 16:56

- From: Gonçalo Salazar <[glbsalazar@gmail.com](mailto:glbsalazar@gmail.com)>  
 To: [florian.c.schilhabel@googlemail.com](mailto:florian.c.schilhabel@googlemail.com), [Larry.Finger@lwfinger.net](mailto:Larry.Finger@lwfinger.net), [gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org), [trivial@kernel.org](mailto:trivial@kernel.org), [devel@driverdev.osuosl.org](mailto:devel@driverdev.osuosl.org)  
 Cc: Gonçalo Salazar <[glbsalazar@gmail.com](mailto:glbsalazar@gmail.com)>, [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)  
 Subject: [PATCH V2] staging: rtl8172: usb\_intf.c: Fixed block comment coding style  
 Date: Mon, 26 Sep 2016 00:00:16 +0100 (09/26/2016 01:00:16 AM)

Fixed a block comment indentation in the rtl8172 usb\_intf.c file.  
 Made this as a first commit.  
 Resubmitted with updated subject.

# email - cons



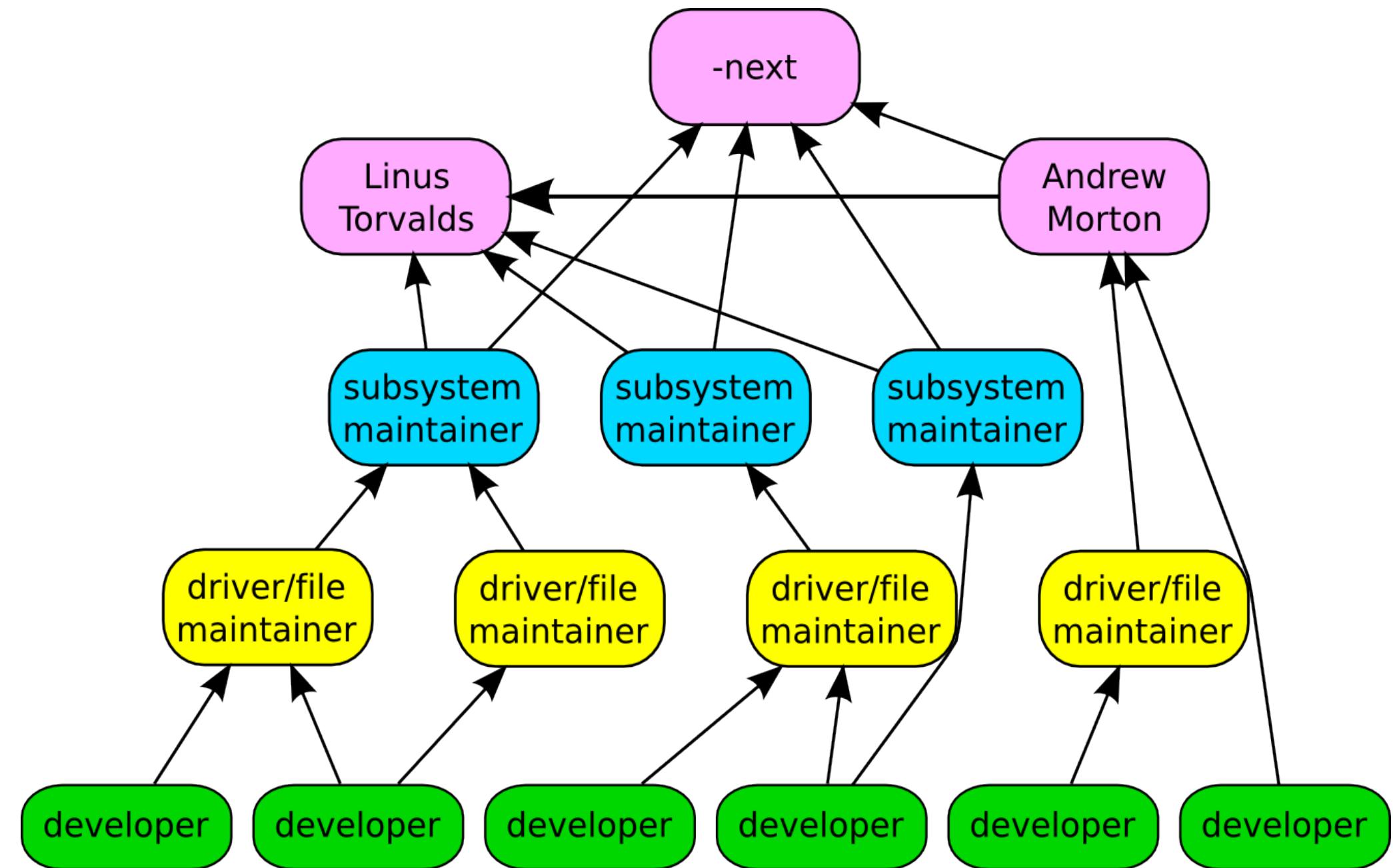
The screenshot shows an email client interface with the following details:

- Header:** Includes a logo (Google-style blocks), a search bar, and a user icon.
- Navigation:** "Mail" dropdown, "Compose" button, "Inbox (1)" (highlighted in red), "Starred", "Sent Mail", "Drafts", "gerrit", "Jira", and "More" dropdown.
- Toolbar:** Includes icons for reply, forward, delete, compose, and search.
- Message List:** Shows 1-50 of 81 messages. The list includes:

  - Bryan O'Donoghue: [PATCH v4 4/5] SW-7416: loopback: convert loopback to use generic async operations - Loopbac
  - Bryan O'Donoghue: [PATCH v4 3/5] SW-7416: operation: add private data with get/set accessors - Asynchronous ope
  - Bryan O'Donoghue: [PATCH v4 2/5] SW-7416: operation: add generic asynchronous operation support - This patch ac
  - Bryan O'Donoghue: [PATCH v4 1/5] SW-7416: operation: add asynchronous gb\_operation\_cancel - Later patches don
  - Bryan O'Donoghue: [PATCH v4 0/5] add async operations - V4: remotes/ara-main/sandbox/bodonoghue/ara-main-cur
  - ahaslam: [RESEND PATCHv2 6/6] SW-2217: audio add a qos bandwidth request - From: Axel Haslam <ahasl
  - ahaslam: [RESEND PATCHv2 5/6] SW-2217: bootrom: add a qos request - From: Axel Haslam <ahaslam@b
  - ahaslam: [RESEND PATCHv2 4/6] SW-2217: camera: register data connection for qos - From: Axel Haslam .
  - ahaslam: [RESEND PATCHv2 3/6] SW-2217: svc: Register apb interface for qos - From: Axel Haslam <hasla
  - ahaslam: [RESEND PATCHv2 2/6] SW-2217: interface: Register interfaces for qos - From: Axel Haslam <hasl
  - ahaslam: [RESEND PATCHv2 1/6] SW-2217: Introduce greybus qos framework - From: Axel Haslam <hasla
  - ahaslam, me (4): [PATCH 0/6] SW-2217: greybus qos management - From: Axel Haslam <ahaslam@baylibre.com>
  - Joël, me (7): Drink in Paris this Wednesday? - Hi Greg! Sorry for the delay, between the end of my vacation ai

- Footer:** Includes icons for user profile, notifications, and phone.

# Documentation/email\_clients.txt



# git + email

git am

# git + email

.muttrc:

```
macro index A ' | git am -s'
```

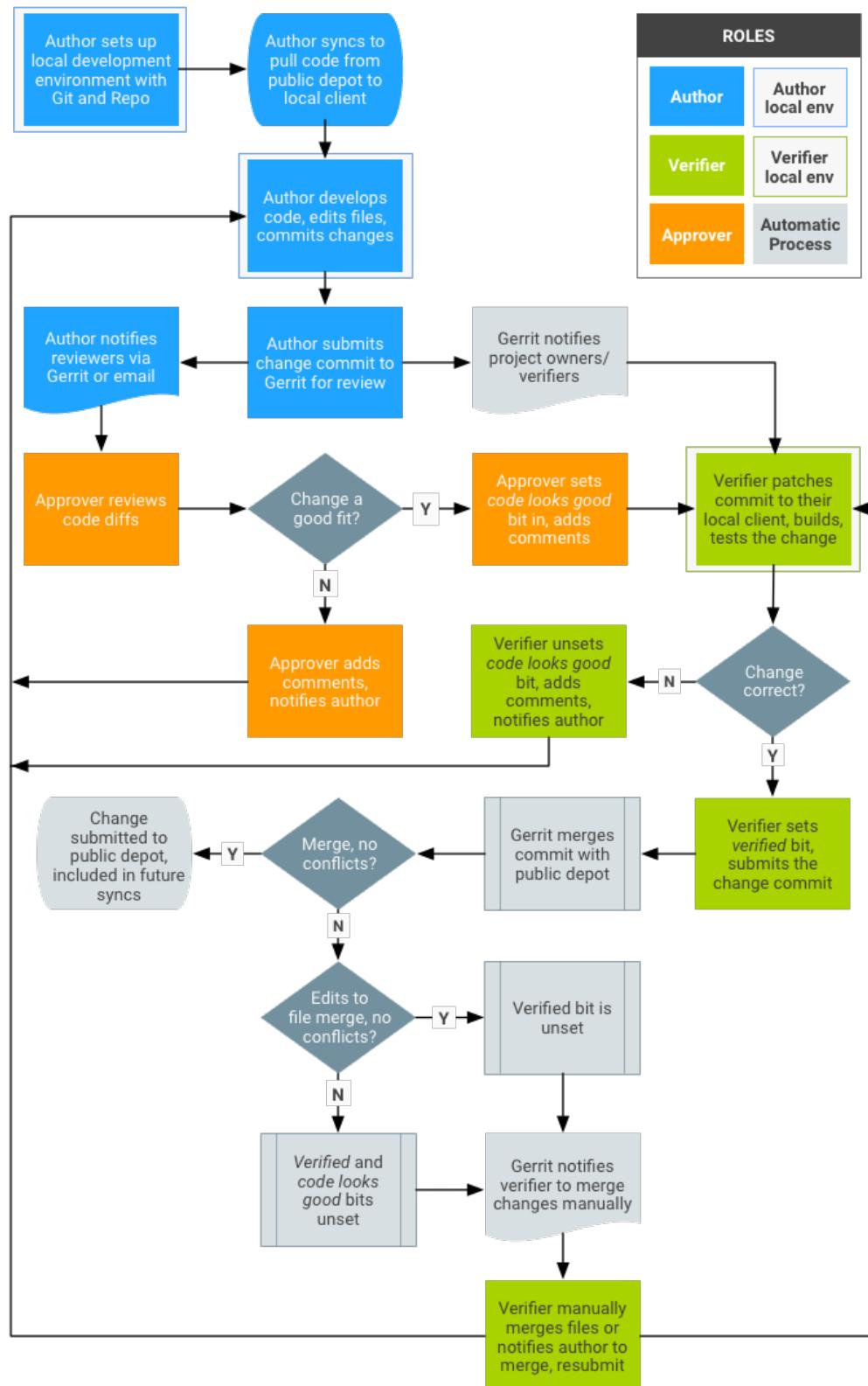
# Patches

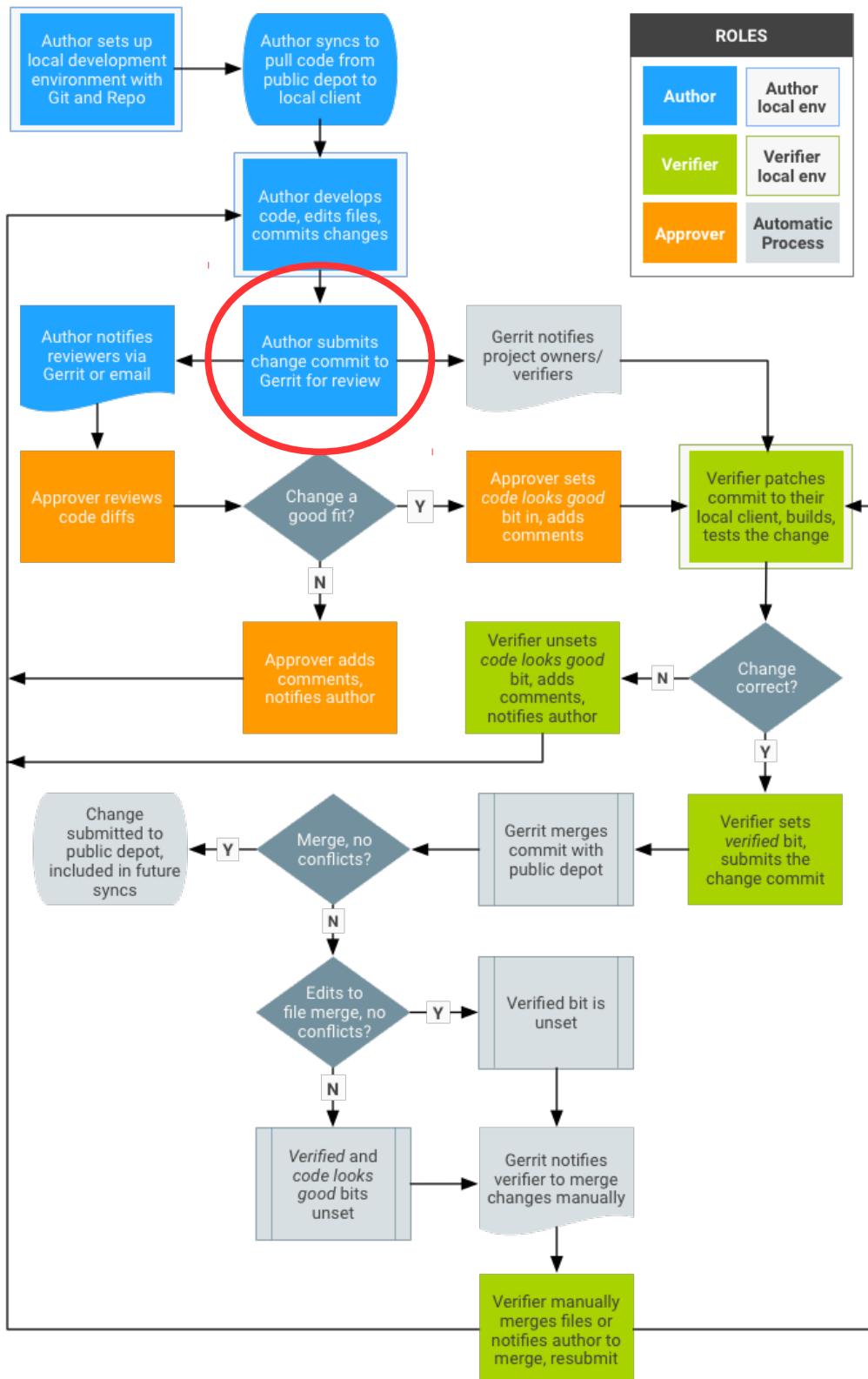
Show patches with: State = **Action Required** | Archived = **No**

## Patch

A/R/T	S/W/F	▲ Date	Submitter	Delegate	State
-------	-------	--------	-----------	----------	-------

<a href="#">[net-next] net/sched: cls_flower: Use a proper mask value for enc key id parameter</a>	---	0 0 0	2016-09-27	Hadar Hen Zion		New
<a href="#">[net-next,V2] net/sched: pkt_cls: change tc actions order to be as the user sets</a>	1 --	0 0 0	2016-09-27	Hadar Hen Zion		New
<a href="#">VSOCK: Don't dec ack backlog twice for rejected connections</a>	- 2 -	0 0 0	2016-09-27	Jorgen Hansen	davem	Under Review
<a href="#">[resend] sh_eth: add R8A7743/5 support</a>	1 --	0 0 0	2016-09-26	Sergei Shtylyov	davem	Under Review
<a href="#">sh_eth: add R8A7743/5 support</a>	---	0 0 0	2016-09-26	Sergei Shtylyov	davem	Under Review
<a href="#">[v2] Net Driver: Add Cypress GX3 VID=04b4 PID=3610.</a>	-- 2	0 0 0	2016-09-26	allan	davem	Under Review
<a href="#">[v3,net-next,3/3] net: bcmgenet: use new api ethtool_{get set}_link_ksettings</a>	---	0 0 0	2016-09-26	Philippe Reynes	davem	Under Review
<a href="#">[v3,net-next,2/3] Revert "net: ethernet: bcmgenet: use phydev from struct net_device"</a>	---	0 0 0	2016-09-26	Philippe Reynes	davem	Under Review
<a href="#">[v3,net-next,1/3] Revert "net: ethernet: bcmgenet: use new api ethtool_{get set}_link_ksettings"</a>	---	0 0 0	2016-09-26	Philippe Reynes	davem	Under Review





# Why email matters

# Why Linux uses email

- Simple
- Widest audience
- Scalable
- Grows the community

# Why Linux uses email

- Simple
- Widest audience
- Scalable
- Grows the community
- No project managers



[github.com/gregkh/presentation-stone-tools](https://github.com/gregkh/presentation-stone-tools)



8.9 changes per hour

4.6 release

# “Patches carved into stone tablets”

## i.e. why we use email to develop the kernel

Greg Kroah-Hartman  
[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)

[github.com/gregkh/presentation-stone-tools](https://github.com/gregkh/presentation-stone-tools)



I'm going to discuss the how fast the kernel is moving, how we do it all, and how you can get involved.

# Because it is faster than anything else.

It's simple.

4000 developers a year  
450+ companies a year

We must be doing something right, right?

There is also another reason why we do this,  
but I'll wait until the end to let you know.

# 7-8 changes per hour

Our average pace, slowly constantly going up.

Faster than any other project out there.

# 75 maintainers took over 364 patches

Kernel releases 4.2.0 – 4.7.0

We review lots and lots of patches

## Kernel reviewers

Greg Kroah-Hartman	9781
David S. Miller	6658
Mark Brown	2815
Andrew Morton	2444
Ingo Molnar	2332
Daniel Vetter	2223
Mauro Carvalho Chehab	2029
Arnaldo Carvalho de Melo	1697
Kalle Valo	1598
Linus Walleij	1447
Doug Ledford	1307
Rafael J. Wysocki	1273
Thomas Gleixner	1219

Kernel releases 4.2.0 – 4.7.0

13 developers reviewed, and accepted, over 1000 patches last year.

I average only accepting 1/3 of the patches sent to me.

**“It’s a poor  
craftsman that  
blames his tools.”**

We review lots and lots of patches

**“An expert  
crafstman knows  
how to choose  
excellent tools.”**

– Jeremy Bowers

<https://news.ycombinator.com/item?id=2380679>

We review lots and lots of patches

**GitHub  
Bitbucket  
GitLab  
etc.**

The most popular ones first

# GitHub - pros

The screenshot shows a GitHub repository page for the project 'usbutils' owned by 'gregkh'. The repository has 341 commits, 1 branch, 19 releases, 38 contributors, and is licensed under GPL-2.0. It has 22 watchers, 87 stars, and 70 forks. The code tab is selected. The repository contains USB utilities for Linux, including lsusb. A recent commit from gregkh is shown.

It's beautiful  
Really beautiful.  
Easy to use, simple interface, unlimited  
bandwidth, great stuff.

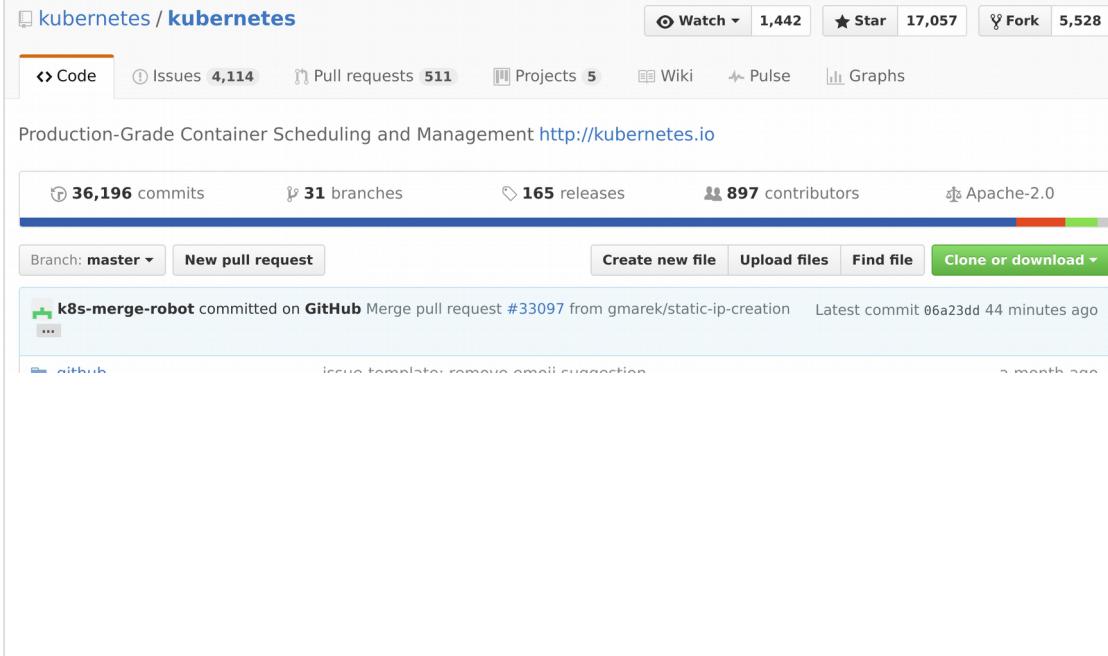
Easy to get drive-by-patches

Use it for small to medium projects.

Good backend testing hooks

Free!!!

# GitHub - cons



Does Not Scale!

Pull requests disjoint from mailing list

Discussion happens in odd threads almost like email, but not quite

Local testing difficult

Issue tracking is a pain in the rear end

Constant merge commits

Requires online access

Delay between patches

gerrit  
reviewboard  
etc.

Company patch review systems

Subject	Status	Owner	Project	Branch	Updated	Size	A	CR	PR	PV	V
Add base for wifi HAL chip implementation	Open	Mitchell Wills	platform/frameworks/opt/net/wifi	master	6:54 PM						
Switch to <android-base/properties.h>, meta: add makefile, test runner, skeleton MessageBuffer	Open	Elliott Hughes	platform/bootable/recovery	master	6:53 PM						
java.lang.invoke: Add mirror types for MethodHandle / MethodType.	Open	Mukesh Agrawal	platform/system/connectivity/wifilogd	master (message-buffer)	6:51 PM						
libadhwfc: Fix adf_hw_close	Open	Narayan Kamath	platform/art	master	6:50 PM						
Get mac address from wificond	Merge Conflict	Marissa Wall	platform/system/core	master	6:50 PM						
Added async command to ssh connection	Open	Ningyuan Wang	platform/frameworks/opt/net/wifi	master (get_mac_from_wificond)	6:49 PM						
Fix for non-empty a[name] tags	Open	Benny Peake	platform/tools/test/connectivity	master	6:49 PM						

Ugh, none..

Project Managers like it

Sometimes can be scripted

Lots of people are used to it.

Horrid horrid horrid

# gerrit - cons

The screenshot shows the Gerrit web interface for the Android project. At the top, there are navigation links for 'All', 'Projects', and 'Documentation', with 'Open' selected. A search bar contains the query 'status:open'. On the right, there are buttons for 'Changes ▾', 'Search', and 'Sign In'. Below the header, the text 'open source project' is displayed next to a green Android robot icon.

Search for status:open

Subject	Status	Owner	Project	Branch	Updated	Size	A	CR	PR	PV	V
Add base for wifi HAL chip implementation	Open	Mitchell Wills	platform/frameworks/opt/net/wifi	master	6:54 PM						
Switch to <android-base/properties.h>, meta: add makefile, test runner, skeleton MessageBuffer	Open	Elliott Hughes	platform/bootable/recovery	master	6:53 PM						
java.lang.invoke: Add mirror types for MethodHandle / MethodType.	Open	Mukesh Agrawal	platform/system/connectivity/wifilogd	master (message-buffer)	6:51 PM						
libadhwfc: Fix adf_hwc_close	Open	Narayan Kamath	platform/art	master	6:50 PM						
Get mac address from wificond	Merge Conflict	Marissa Wall	platform/system/core	master	6:50 PM						
Added async command to ssh connection	Open	Ningyuan Wang	platform/frameworks/opt/net/wifi	master (get_mac_from_wificond)	6:49 PM						
Fix for non-empty a[name] tags	Open	Benny Peake	platform/tools/test/connectivity	master	6:49 PM						

Where to start...

Patch submission difficult

Patch series requires topic branches

Can not see full patch all at once! One click per file!

Delay in seeing individual patches

Local testing difficult

Impossible to set up and admin

# Plain text email

This is what the Linux kernel developers use.

Simple, quaint, been around for forever.

Works really really well.

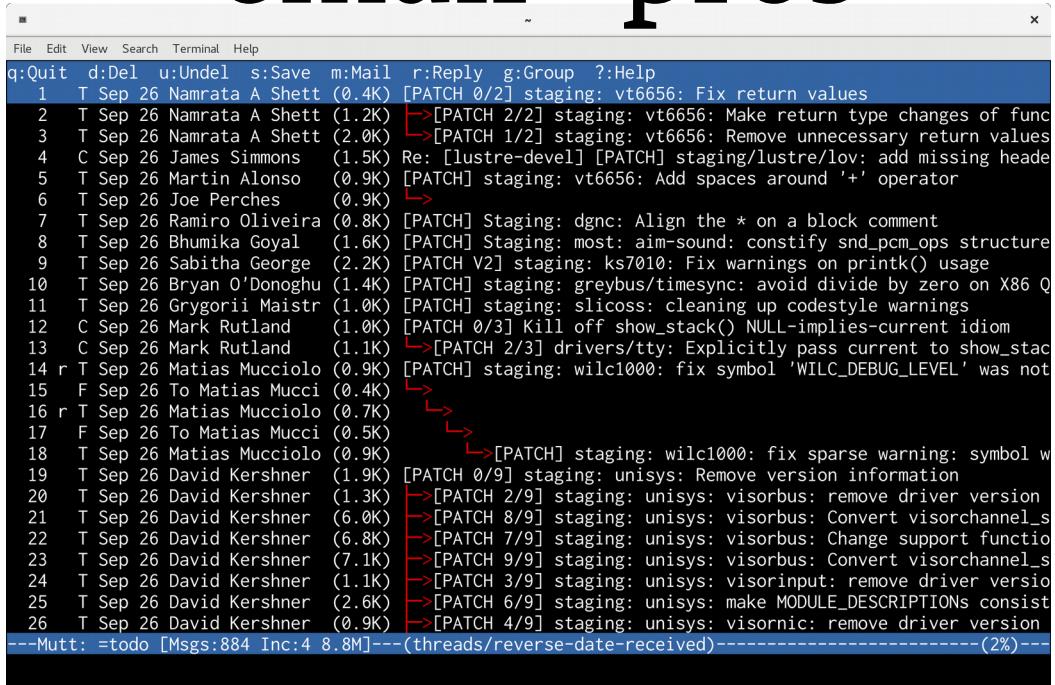
# email - pros

This is what the Linux kernel developers use.

Simple, quaint, been around for forever.

Works really really well.

# email - pros



The screenshot shows the Mutt email client interface. The window title is "email - pros". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The main pane displays a list of 26 emails, each with a subject line related to patches for the Linux kernel. The subjects include "staging: vt6656: Fix return values", "staging: vt6656: Make return type changes of func", "staging: vt6656: Remove unnecessary return values", and "Re: [lustre-devel] [PATCH] staging/lustre/lov: add missing header". Red arrows indicate dependencies between patches, such as "Patch 2/2" pointing to "Patch 0/2". The bottom status bar shows "---Mutt: =todo [Msgs:884 Inc:4 8.8M]---(threads/reverse-date-received)---(2%)---".

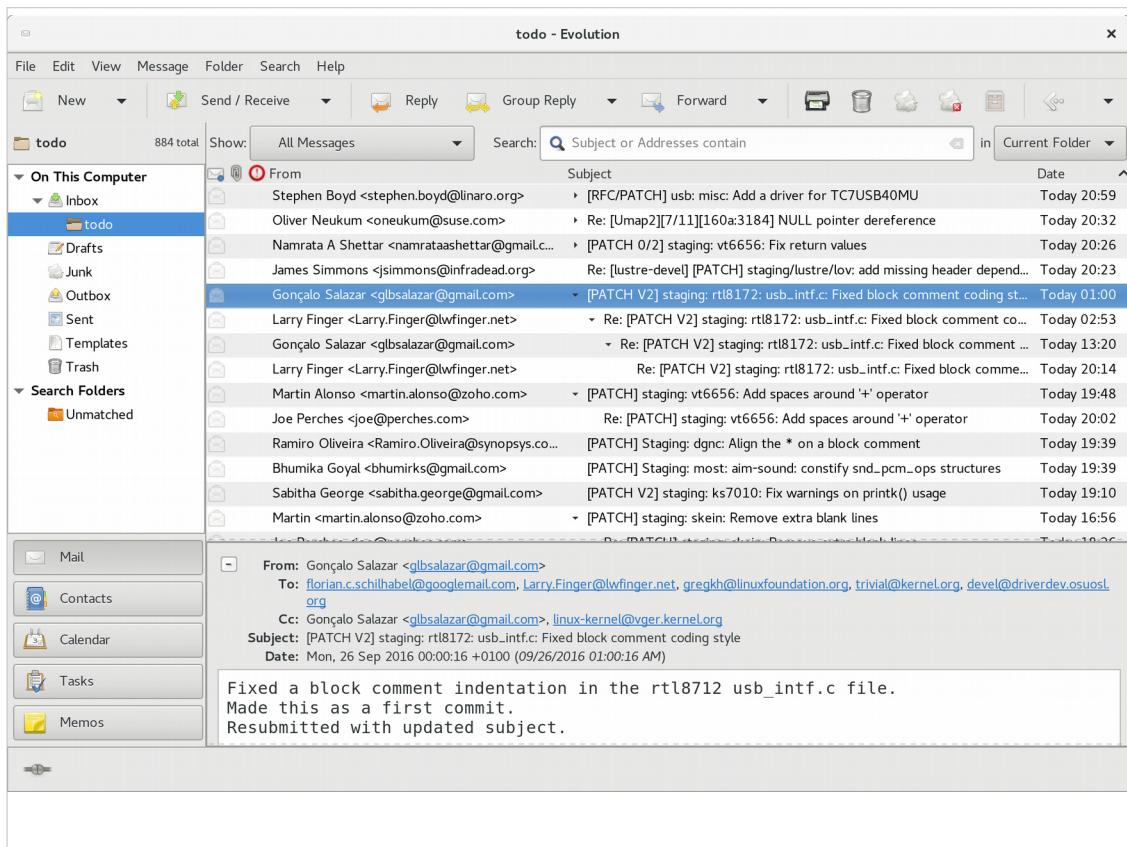
Everyone in the world has it  
Online access not required  
Non-native language supported  
Accessability built-in  
Fast patch review  
Local testing easy  
Remote testing possible

Everyone can see what happens!

Loads of email clients out there that work well

My favorite, mutt.

Other command line clients:  
Pine/alpine



If you like gui's there are loads of them, this is Evolution.

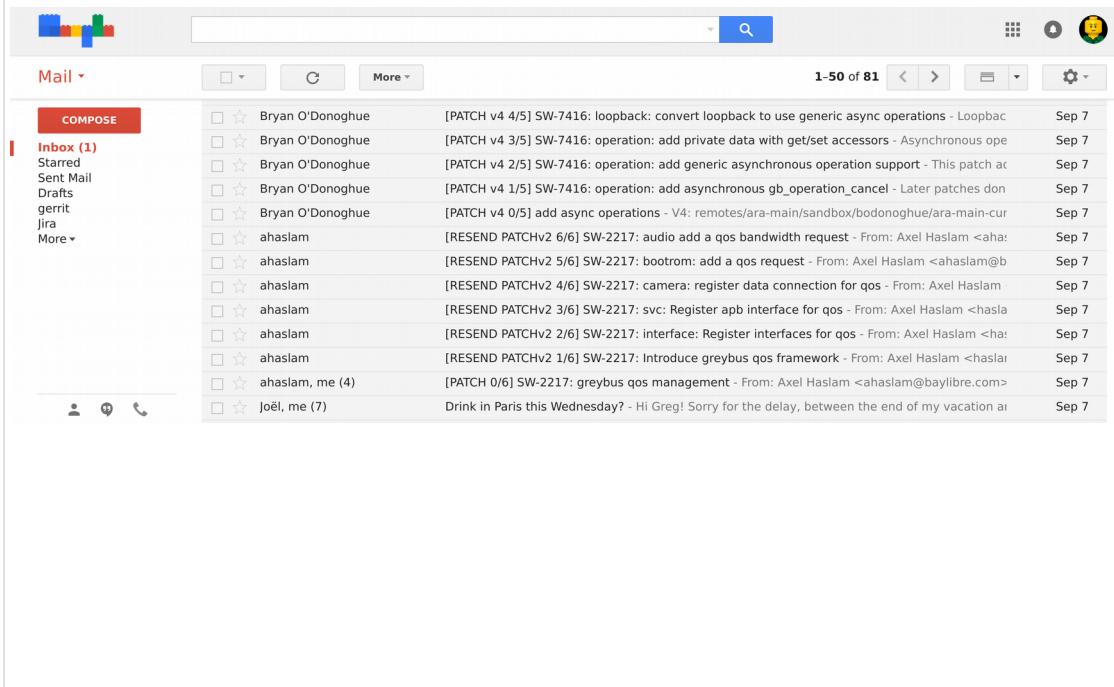
There's also:

kmail  
thunderbird  
claws  
cylpheed  
Tkrat

Loads of them.

Just don't use a web client for patches.

# email - cons



PMs hate it (solution later on...)

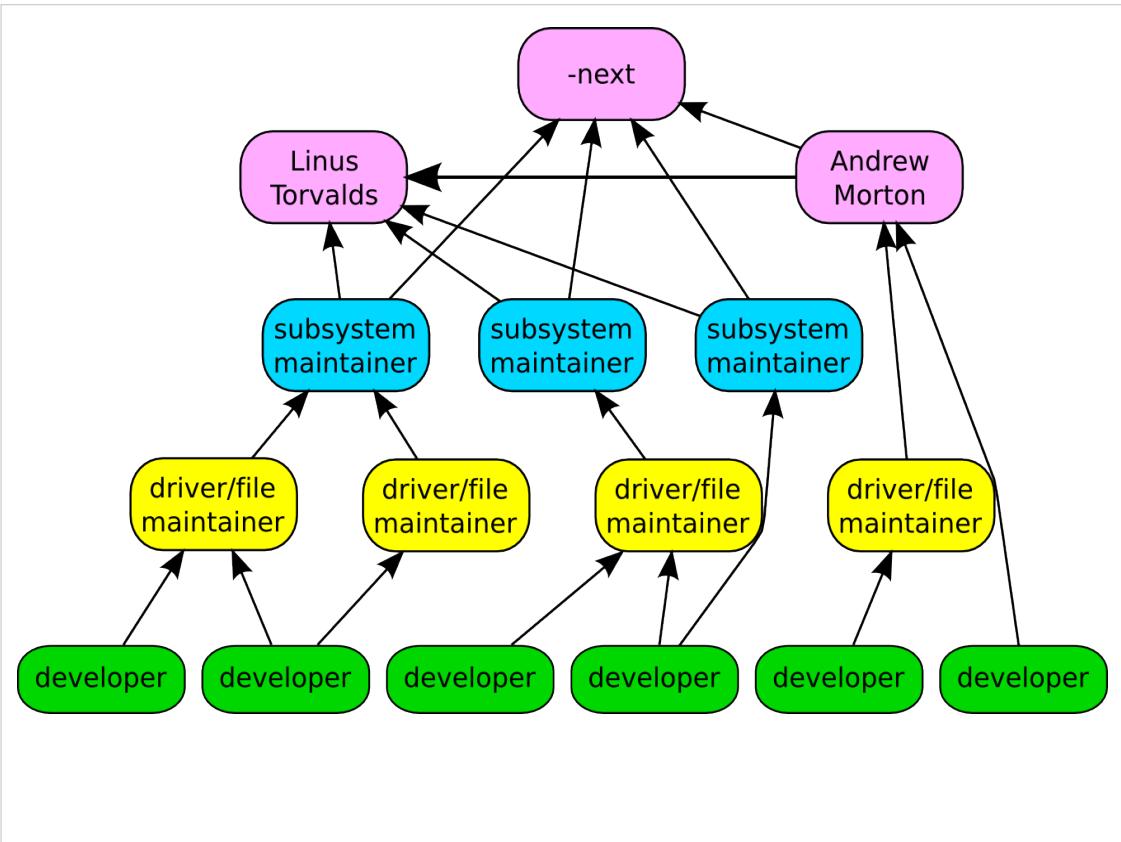
eLots suck:  
Outlook/Exchange  
OS-X Mail  
Groupwise  
Lotus Notes  
Gmail web interface

Almost any web interface

Almost all Linux companies have a box in the corner to send email out without it touching exchange/notes (Intel, IBM, Microsoft, etc.)

## **Documentation/email\_clients.txt**

How to configure a good email client to handle patches properly.



Every 3 months, when the merge window opens up, everything gets sent to Linus from the subsystem maintainers and Andrew Morton.

The merge window is 2 weeks long, and thousands of patches get merged in that short time.

All of the patches merged to Linus should have been in the linux-next release, but that isn't always the case for various reasons.

Linux-next can not just be sent to Linus as there are things in there that sometimes are not good enough to be merged just yet, it is up to the individual subsystem maintainer to decide what to merge.

# git + email

`git am`

People forget that git was built to apply patches from email, that was it's primary goal in the beginning

Email client integration, one keypress to apply a patch to the local repo.

# git + email

.muttrc:

```
macro index A '| git am -s'
```

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Email client integration, one keypress to apply a patch to the local repo.

The screenshot shows the Patchwork Linux network development interface. At the top, there are navigation links: Patches, Bundles, About this project, All projects, and a user profile for gregkh. Below the header, the page title is "Patches". A filter bar below the title says "Show patches with: State = Action Required | Archived = No". The main content is a table of patches:

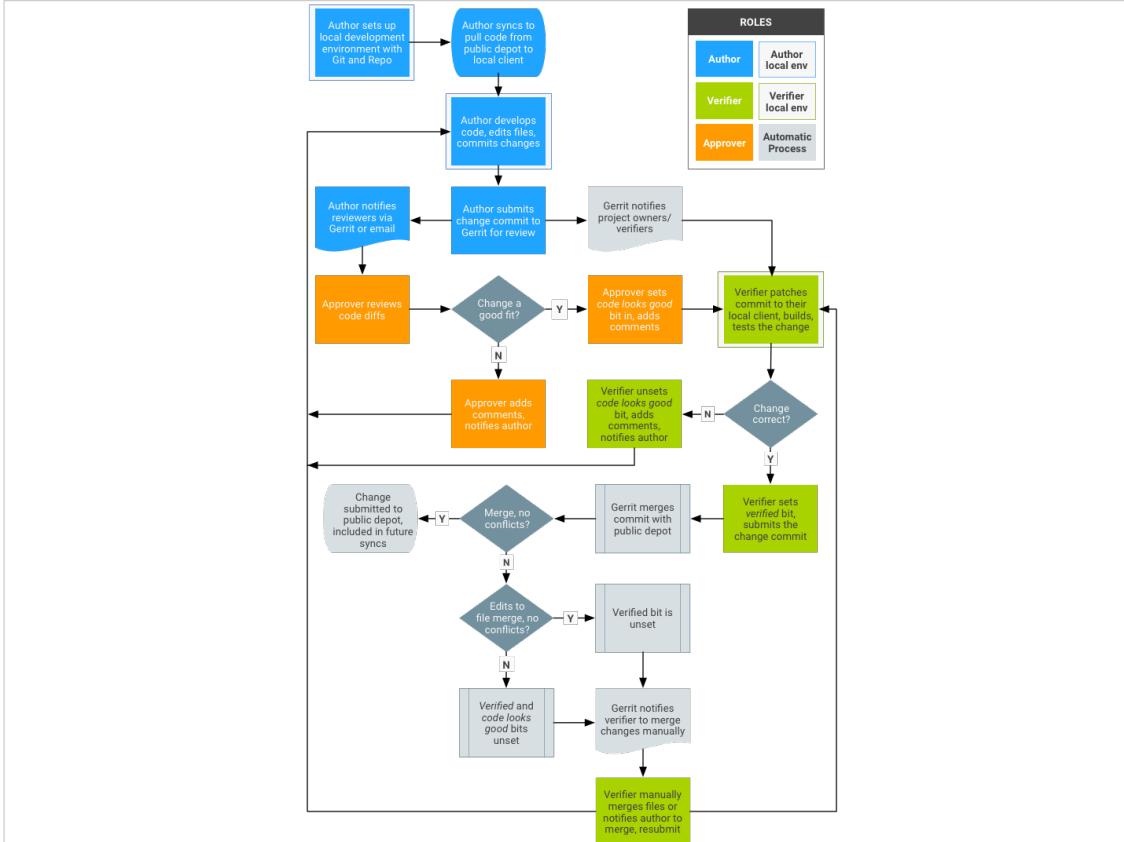
Patch	A/R/T	S/W/F	▲ Date	Submitter	Delegate	State
[net-next] net/sched: cls_flower: Use a proper mask value for enc key id parameter	---	0 0 0	2016-09-27	Hadar Hen Zion		New
[net-next,V2] net/sched: pkt_cls: change tc actions order to be as the user sets	1 --	0 0 0	2016-09-27	Hadar Hen Zion		New
VSOCK: Don't dec ack backlog twice for rejected connections	- 2 -	0 0 0	2016-09-27	Jorgen Hansen	davem	Under Review
[resend] sh_eth: add R8A7743/5 support	1 --	0 0 0	2016-09-26	Sergei Shtylyov	davem	Under Review
sh_eth: add R8A7743/5 support	---	0 0 0	2016-09-26	Sergei Shtylyov	davem	Under Review
[v2] Net Driver: Add Cypress GX3 VID=04b4 PID=3610.	-- 2	0 0 0	2016-09-26	allan	davem	Under Review
[v3.net-next,3/3] net: bcmgenet: use new api ethtool_{get set}_link_ksettings	---	0 0 0	2016-09-26	Philippe Reynes	davem	Under Review
[v3.net-next,2/3] Revert "net: ethernet: bcmgenet: use phydev from struct net_device"	---	0 0 0	2016-09-26	Philippe Reynes	davem	Under Review
[v3.net-next,1/3] Revert "net: ethernet: bcmgenet: use new api ethtool_{get set}_link_ksettings"	---	0 0 0	2016-09-26	Philippe Reynes	davem	Under Review

## Patchwork is great

- suppliments a mailing list does not replace it
- provides current status of all posted patches
- shows who is reviewing it, what is left to be done, etc.
- maintainers can use it to apply and manage patches

Hooks into CI tools, handles patch series, versions, everything!

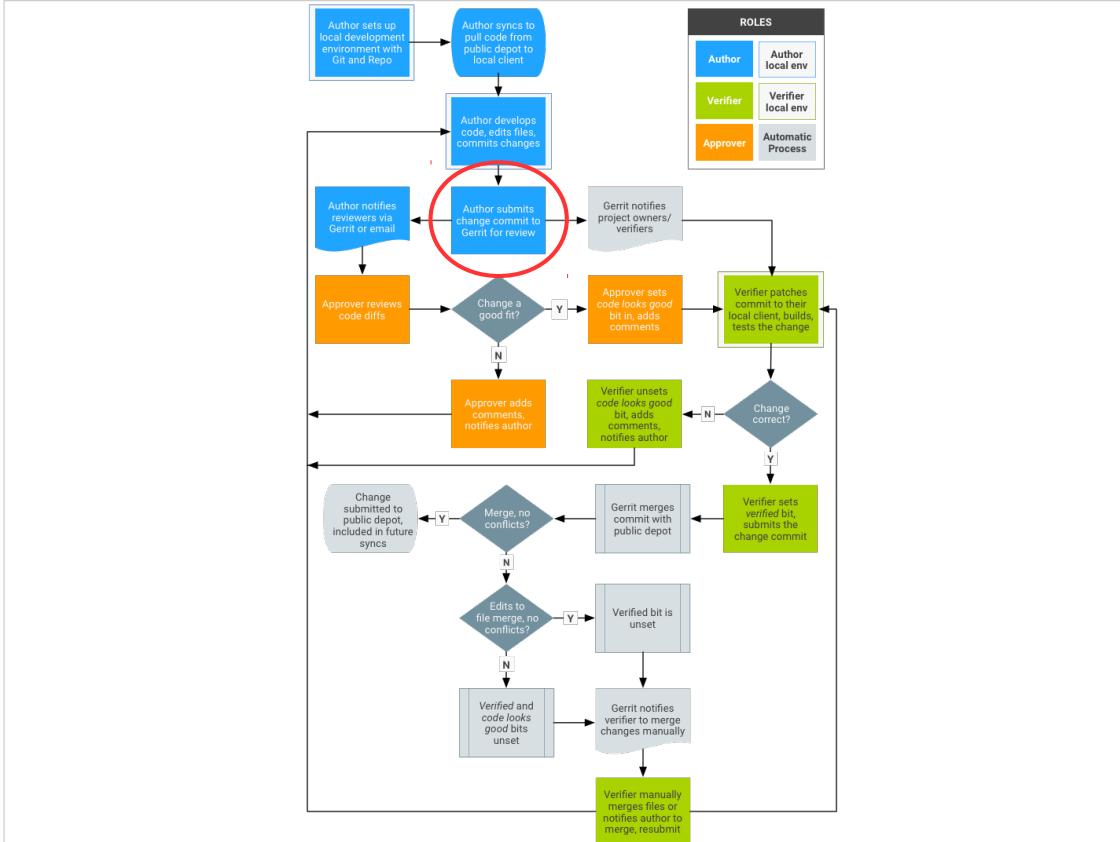
Think of it as gerrit for a mailing list.



Android’s “life of a patch” flowchart

Gerrit is only one tiny part in the middle

Replace that one part with email, and everything still works, and goes faster.



Android's “life of a patch” flowchart

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# Why email matters

# Why Linux uses email

- Simple
- Widest audience
- Scalable
- Grows the community

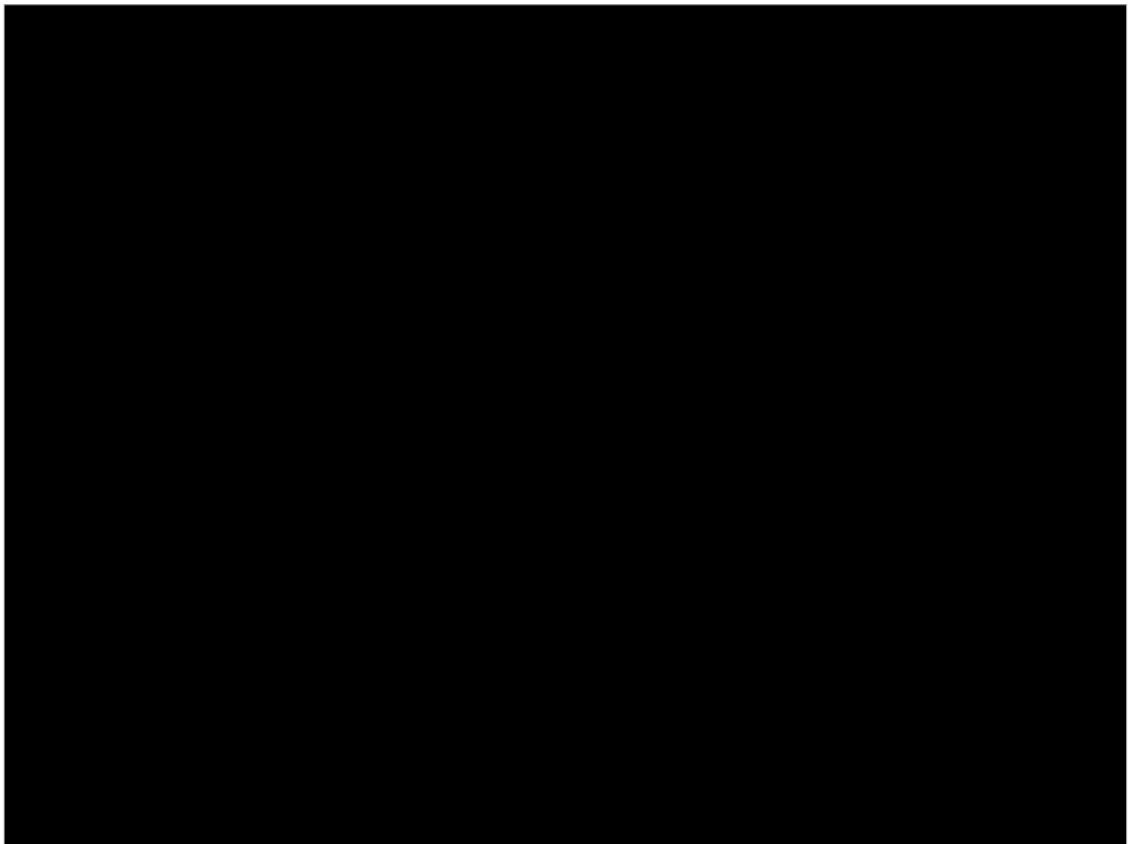
# Why Linux uses email

- Simple
- Widest audience
- Scalable
- Grows the community
- No project managers



[github.com/gregkh/presentation-stone-tools](https://github.com/gregkh/presentation-stone-tools)

## Obligatory Penguin Picture



# 8.9 changes per hour

## 4.6 release

This past 3.16 release was the fastest we have ever created. That number shows just how well the Linux kernel development model is working. We are growing in developers and in how fast we are developing overall.

Now this is just the patches we accepted, not all of the patches that have been submitted, lots of patches are rejected, as anyone who has ever tried to submit a patch can attest to.