Integrating GitLab into the Red Hat kernel workflow

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How to get Linus to accept a Pull Request from GitLab?
Motivation?

- Upstream discussions about using git forges
- Red Hat’s modernization effort led to the migration of its kernel workflow to GitLab
- Red Hat offering to lead this effort
Workflow Issues?

- Maintainer and emails (Patchwork)
  - tracking reviews
  - tracking versions
  - tracking build/test results
  - High volume manual work
Workflow Issues?

- Reviewers struggled to find what to review
- CI was a bolt on
- Business logic not front and center
WHAT WE DID
(Why we transitioned a large development team to GitLab)
● GitLab WebUI is fine but command line is better
● https://github.com/zaquestion/lab
● Red Hat kernel development recommended tool
  ○ Open Source
  ○ Easy to use
Maintainers Scripts and Automation
  - Each have their own scripts
  - Replaced by webhooks
  - [https://gitlab.com/cki-project/kernel-webhooks](https://gitlab.com/cki-project/kernel-webhooks)
  - Checks Signed-off-by:, Bugzilla:, etc.
- GitLab Labels!
- WebUI (right)
- Command line ‘lab mr show’ (below)
• Data tracking
  ○ Not easy to track reviews
  ○ GitLab organizes comments per Merge Request
  ○ Easy to track reviews through Approve button
    ■ ‘lab mr approve’
Who can do a review? Who MUST do a review?

- Upstream uses MAINTAINERS and get_maintainer.pl
- Red Hat uses `owners.yaml` and approvers webhook
- Reviews
  - Required approvers and reviewers
  - Acks:: labels
    - Acks::x86:NeedsReview
    - Acks::pci::OK
● CI
● Many different CI running upstream
  ■ Notifications come late
● GitLab easily integrates CI
  ○ Reporting failures to contributors
  ○ Excluding infrastructure failures
  ○ Test feedback and modifications
  ○ Red Hat CKI
    ■ https://gitlab.com/cki-project
● Easier to do reviews
  ○ RSS NewsReader
  ○ Reviewers now work out of a git repository
  ○ Can comment on commits using `lab`
    ■ `lab mr block --commit <gitCommitID>`

```
[prarit@prarit rhel-8]$ lab mr checkout 1308
Deleted branch 1999550 (was 3dfbafcc49e8).
From gitlab.com:redhat/rhel/src/kernel/rhel-8
  * [new ref] refs/merge-requests/1308/head -> 1999550
Switched to branch '1999550'
[prarit@prarit rhel-8]$ git log --oneline -2
3dfbafcc49e8 (HEAD -> 1999550, prarit/1999550, origin/merge-requests/1308) x86/mce: Delay clearing IA32_MCG_STATUS to
the end of do_machine_check()
09354f626c16 x86/mce: Send #MC singal from task work
[prarit@prarit rhel-8]$
```
- ARK: https://gitlab.com/cki-project/kernel-ark (no BZ required!)
- c9s: https://gitlab.com/redhat/centos-stream/src/kernel/centos-stream-9
- documentation: https://red.ht/kernel_workflow_doc
- lab: https://github.com/zaquestion/lab
GitLab Relationship

- resolved over 15 issues in the last 6 months
- dedicated developer pushing changes (2 accepted contributions) [Lucas Zampieri]
- strategic partnership
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Known Issues

- Chain of trust
- Merge request logs
- Single Point of Failure
  - Bread crumb trail of discussions
  - Mirror of git trees
Thoughts?