envoycon

October 15, 2020 | Virtual Experience

Cats are important part of CS

WIRED STAFF   06.26.12 11:15 AM

Google's Artificial Brain Learns to Find Cat Videos

How much of the Internet is cats?

15 percent

But **cats** are more popular with online audiences. In fact, according to Bloomberg's The Magazine Trying to Bring the Web's **Cat** Obsession Offline, **cats** drive almost 15 percent of all Web traffic. There are also about 30 million Google searches per month for the search term "**cat**".   Feb 26, 2015

About

Cloud-native high-performance edge/middle/service proxy

🔗 **www.envoyproxy.io**

cats   rocket-ships   cars

more-cats   cats-over-dogs

nanoservices   corgis   cncf

When a project have a growing number of contributors, there are procedures that need to be set in place.

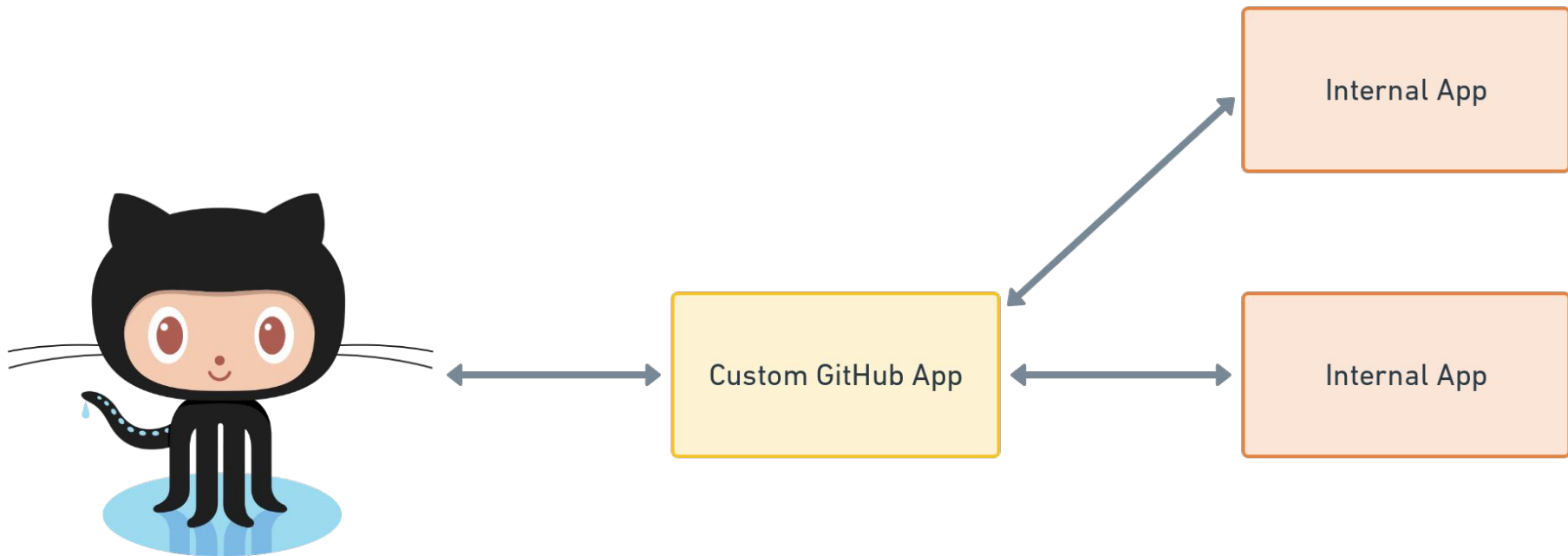These procedures need to be enforced, and better yet, automated if possible.

For contributors, some operations need to be performed under customized constraints, such allowing only some people assign people on issues/PR, informing about various procedures, and more.

For maintainers, automation can help with issue tracking, specialized approval policies, and enforcing various rules.
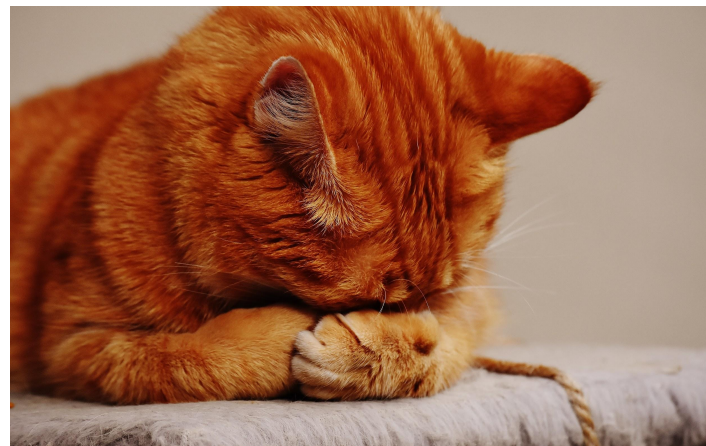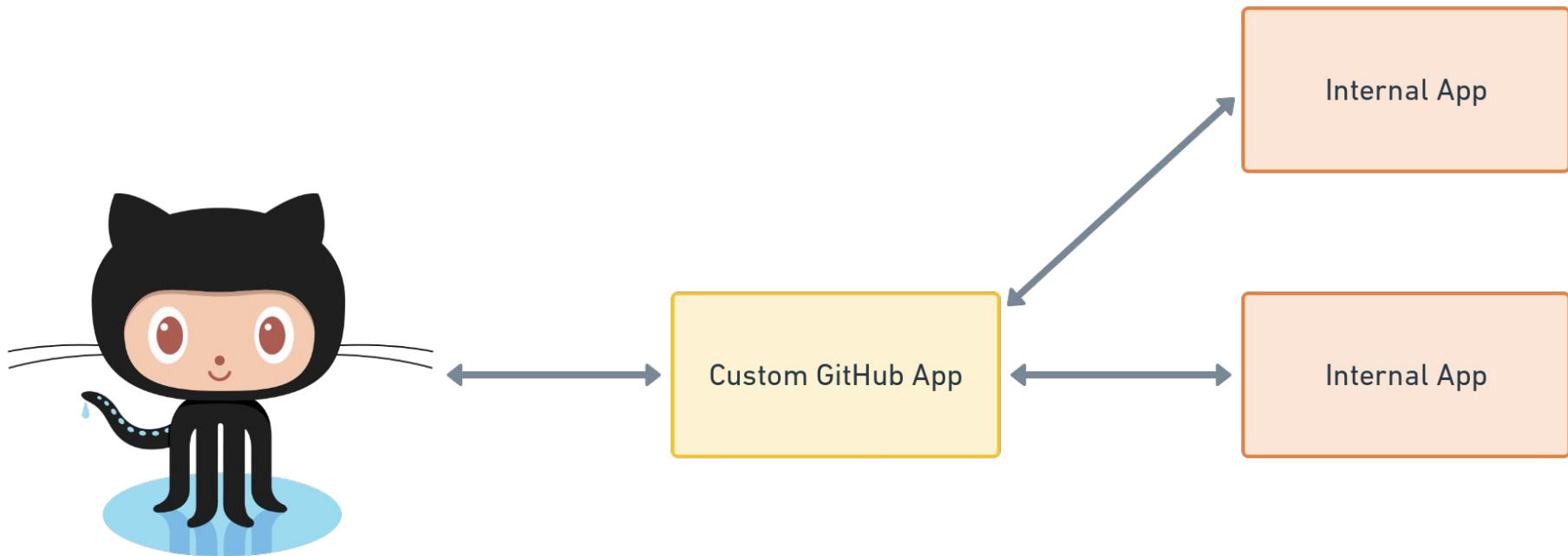
Lots of things to take care of:

- Service maintenance
- Authentication
- Monitoring
- High Availability
- Secrets management
- Adapt to GitHub API changes
- Dealing with GitHub API… oddities.
- Preserving issue context

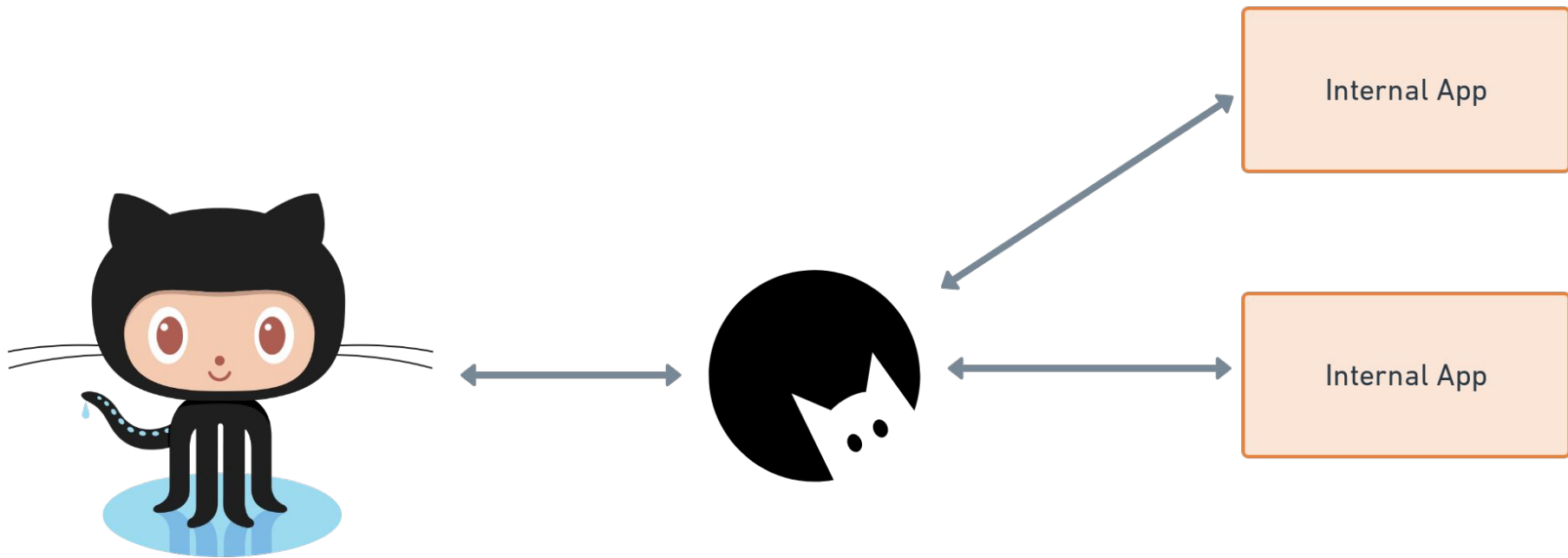Lots of things ~~to take care of~~ included:

- Service maintenance
- Authentication
- Monitoring
- High Availability
- Secrets management
- GitHub API changes
- Dealing with GitHub API… oddities.
- Preserving issue context

The right abstraction

There is no need to worry about intricate non-GitHub events related things. This is already done for you.

You only need to deal with the actual required business logic.

For that, the right abstraction is required.

"*Starlark is a language intended for use as a configuration language. It was designed for the* Bazel *build system, but may be useful for other projects as well*" github.com/bazelbuild/starlark

Starlark allows for **deterministic** evaluation, **hermetic** execution and **parallel** evaluation.

This allows for a "jailed" low-cost/overhead "serverless" architecture where only Starlark code is executed. No containers required!

Starlark is a dialect of Python, with a few differences. These allow it to be deterministic, hermetic and concurrent.

RepoKitteh is using the excellent Starlark Go module: github.com/google/starlark-go.
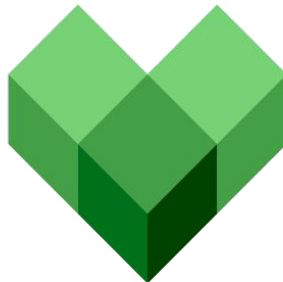
How does it fit in
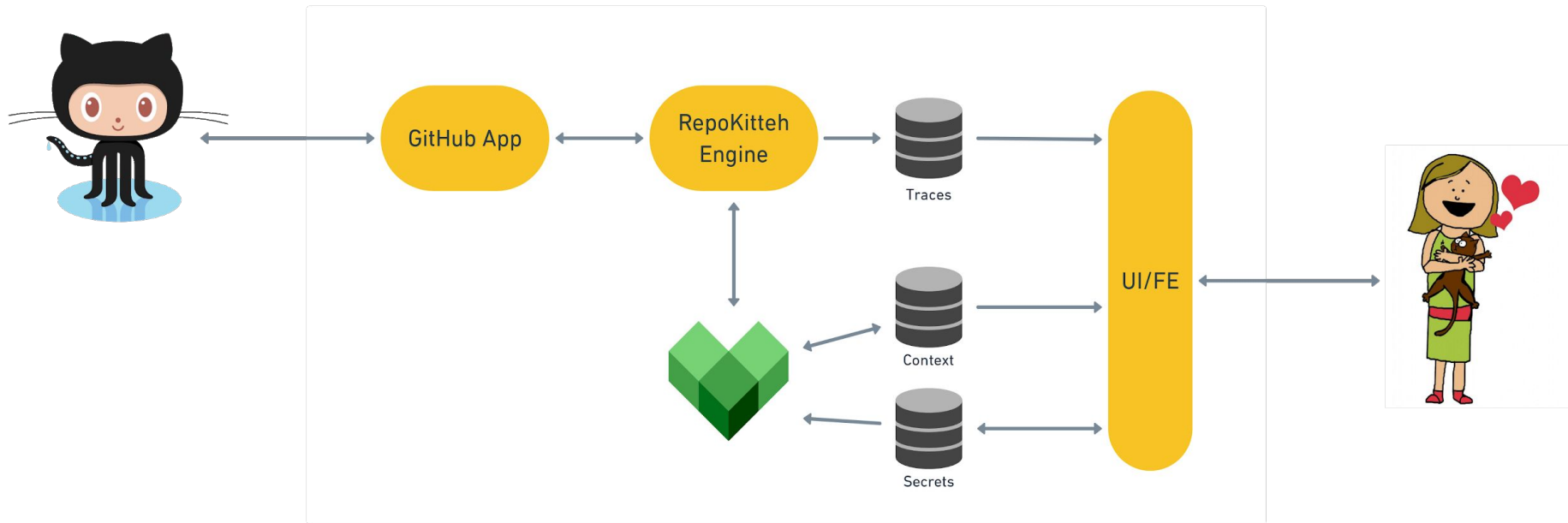
Enforce BUG=NNN annotation in PR body
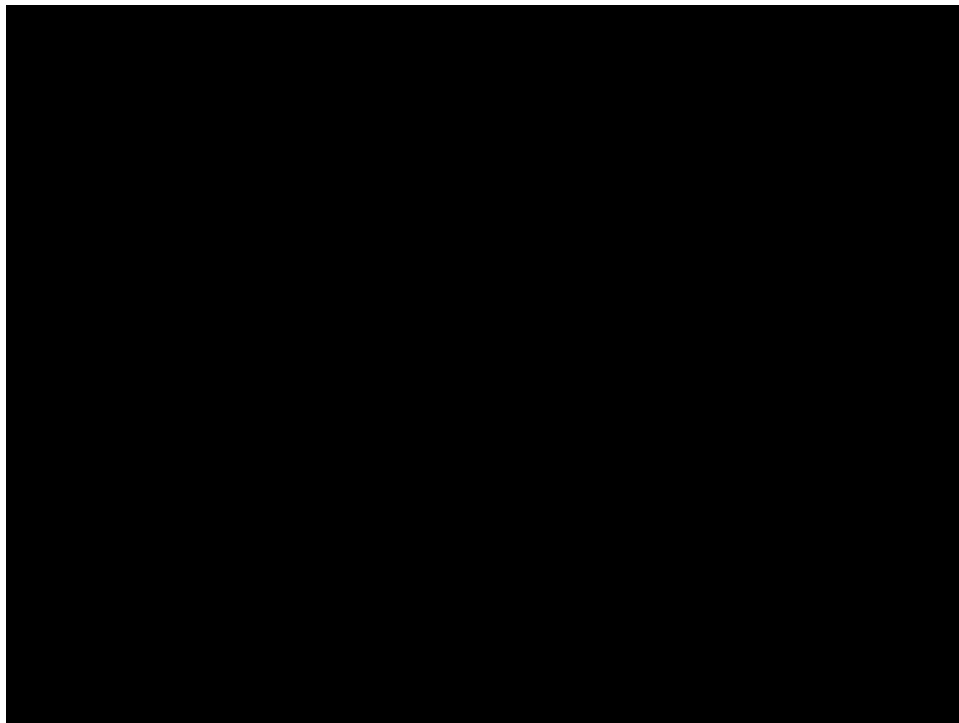
RepoKitteh includes tooling and APIs for frequently needed capabilities:

- Secrets management
- Detailed debug output
- GitHub API access
- Fine grained permission model
- Modules with version pinning
- And more!

Meow World

master ▾   envoy / repokitteh.star

The root module is the entry point to everything repokitteh. The module is evaluated on every event.

Handlers | Commands

```
def _backport():
    github.issue_label('backport/review')


handlers.command(name='backport', func=_backport)
```

`handlers.command` registers a command handler that is executed on /slash-commands.

antoniovicente commented on Jul 27   Member

/backport

🏷 repokitteh bot added the backport/review label on Jul 27

repokitteh.io/docs/ref/modules/#handlers.command
repokitteh.io/docs/ref/modules/#github.issue_label

```
github.issue_label(*labels, repo_owner, repo_name, issue_number):dict ¶
```

Add a label to an issue.

ARGUMENTS

- **`*labels`** : `list(str)`
- **`repo_owner`** : `str` (default=from context) - Must be supplied as a keyword argument.
- **`repo_name`** : `str` (default=from context) - Must be supplied as a keyword argument.
- **`issue_number`** : `int` (default=from context) - Must be supplied as a keyword argument.

RETURNS

- **`dict`** - Same as GitHub API.

REQUIRED PERMISSIONS

- `github_call(method=POST, path=repos/{repo_owner}/{repo_name}/issues/{issue_number}/labels)`

EXAMPLES

```
1  print(github.issue_label('wip', 'pending')[0]['id'])
```

SEE ALSO

- GitHub API Docs: Add labels to an issue

Handlers | Events

github.com/repokitteh/modules/blob/master/wait.star

```
def _pull_request(action, labels):
  if action != 'synchronize':
    return

  if _waiting_push_label in labels:
    github.issue_unlabel(_waiting_push_label)

  if _waiting_any_label in labels:
    github.issue_unlabel(_waiting_any_label)


handlers.issue_comment(func=_issue_comment)


handlers.pull_request(func=_pull_request)
handlers.pull_request_review(func=_issue_comment)
handlers.pull_request_review_comment(func=_issue_comment)
```

repokitteh.io/docs/ref/modules/#handlers.pull_request

Handlers can be registered on virtually any GitHub event. In this (partial) example, which is taken from a RepoKitteh Module, an handler is registered on GitHub's pull-request event, among others.

Handlers receive context when executed, depending on their parameters and type.

```
use(
  "github.com/envoyproxy/envoy/ci/repokitteh/modules/ownerscheck.star",
  paths=[
    {
      "owner": "envoyproxy/api-shepherds!",
      "path":
      "(api/envoy[\w/]*/(v1alpha\d?|v1|v2alpha\d?|v2))|(api/envoy/type/(matcher/)?\w+.proto)",
      "label": "v2-freeze",
      "allow_global_approval": False,
      "github_status_label": "v2 freeze violations",
    },
    {
      "owner": "envoyproxy/api-shepherds!",
      "path": "api/envoy/",
      "label": "api",
      "github_status_label": "any API change",
    },
    {
      "owner": "envoyproxy/api-watchers",
      "path": "api/envoy/",
    },
    {
      "owner": "envoyproxy/dependency-watchers",
      "path":
      "(bazel/repository_locations\.bzl)|(api/bazel/repository_locations\.bzl)|(.*/requirements\.txt)",
    },
  ],
)
```

repokitteh.io/docs/ref/funcs/#use

`use` loads a module and registers its handlers. A module is defined in its own file which can reside in github.

Configuration is supplied to the loaded module by using key-value parameters.

Some generic modules:
github.com/repokitteh/modules

```python
handlers.command(name='checkowners', func=_reconcile)


def _get_specs(config):
  return _get_relevant_specs(config.get('paths', []), github.pr_list_files())


def _reconcile(config, specs=None):
  specs = specs or _get_specs(config)

  if not specs:
    return []
```

```
load('text', 'match')

load("github.com/repokitteh/modules/lib/utils.star", "react")
load("github.com/repokitteh/modules/lib/circleci.star", "retry", "cancel")

m = match(text=target_url, pattern='/([0-9]+)\?')
if m and len(m) == 2:
    failed_builds.append((int(m[1]), target_url, context))
```

`load` is a *Starlark builtin* which brings in functions from other modules.
It can be called from any module.

`use` is a *RepoKitteh function* that registers handlers from other modules.
It can be called only from the root module.

repokitteh.io/docs/ref/modules/#text.match
github.com/google/starlark-go/blob/master/doc/spec.md#load-statements

Issue Context Store

```python
def _store_partial_approval(who, files):
    for f in files:
        store_put('ownerscheck/partial/%s:%s' % (who, f['filename']), f['sha'])


def _is_partially_approved(who, files):
    for f in files:
        sha = store_get('ownerscheck/partial/%s:%s' % (who, f['filename']))
        if sha != f['sha']:
            return False

    return True
```

`store_put` and `store_read` write and read data associates with the issue/PR in context. This can be used to store state for an issue/PR.

repokitteh.io/docs/ref/funcs/#store_get
repokitteh.io/docs/ref/funcs/#store_put

```
use("github.com/repokitteh/modules/circleci.star", secret_token=get_secret('circle_token'))
use("github.com/envoyproxy/envoy/ci/repokitteh/modules/azure_pipelines.star", secret_token=get_secret('azp_token'))

return http(secret_url=url, method='POST')
```

`get_secret` can be called only from the root module.

repokitteh.io/docs/ref/funcs/#get_secret

Context & Tracing

Event Trace

Repository envoyproxy/envoy
Delivery-ID 874b6400-0428-11eb-8994-3d5b9f2dc65d
Event-Type github:pull_request
Reason https://github.com/envoyproxy/envoy/pull/13364 was opened by rebello95. (link)

Ingestion	Evaluation

Version 0.41.4 46d1002d666d36ad2bdb0eb392a4d43a2c1a383b
Receive-Time 2020-10-01 20:56:08.948198023 +0000 UTC
HTTP-Response-Code 202
HTTP-Response-Text

```
processing

https://prod.repokitteh.app/traces/ui/envoyproxy/envoy/874b6400-0428-11eb-8994-3d5b9f2dc65d
```

▼ **Event-Payload**

```
{
    "action": "opened",
    "number": 13364,
    "pull_request": {
        "url": "https://api.github.com/repos/envoyproxy/envoy/pulls/13364",
        "id": 496541591,
        "node_id": "MDExOlB1bGxSZXF1ZXN0NDk2NTQxNTkx",
        "html_url": "https://github.com/envoyproxy/envoy/pull/13364",
        "diff_url": "https://github.com/envoyproxy/envoy/pull/13364.diff",
        "patch_url": "https://github.com/envoyproxy/envoy/pull/13364.patch",
        "issue_url": "https://api.github.com/repos/envoyproxy/envoy/issues/13364",
        "number": 13364,
        "state": "open",
        "locked": false,
        "title": "build: update abseil & enable -Wrange-loop-analysis",
        "user": {
            "login": "rebello95",
            "id": 2643476,
            "node_id": "MDQ6VXNlcjI2NDM0NzY=",
            "avatar_url": "https://avatars1.githubusercontent.com/u/2643476?v=4",
            "gravatar_id": "",
```

Event Trace

Repository	envoyproxy/envoy
Delivery-ID	874b6400-0428-11eb-8994-3d5b9f2dc65d
Event-Type	github:pull_request
Reason	https://github.com/envoyproxy/envoy/pull/13364 was opened by rebello95. (link)

Ingestion	**Evaluation**

Version	0.41.4 46d1002d666d36ad2bdb0eb392a4d43a2c1a383b
Start-Time	2020-10-01 20:56:08.949636468 +0000 UTC
End-Time	2020-10-01 20:56:12.566362588 +0000 UTC

▼ **Console**

```
specs: [struct(allow_global_approval = True, files = [{"additions": 3, "sha": "fc308b6b0689b5342e20eac9dde6dd7daa78174c", "filename": "ba
reviews=[]
approvers: []
team dependency-watchers(4043948) = ["moderation", "asraa", "htuch"]
struct(allow_global_approval = True, files = [{"additions": 3, "sha": "fc308b6b0689b5342e20eac9dde6dd7daa78174c", "filename": "bazel/repo
```

Commands	Empty

▶ **Pinned Refs**

▶ **Modules**

▶ **Calls**

▶ **Perms**

▶ **Context**

▼ **Context**

```
{
    "action": "opened",
    "assignee": null,
    "assignees": [],
    "blessed": false,
    "branches": null,
    "commands": [],
    "comment": null,
    "comment_id": null,
    "context": null,
    "delivery_id": "874b6400-0428-11eb-8994-3d5b9f2dc65d",
    "description": null,
    "draft": true,
    "event_source": "github",
    "event_type": "pull_request",
    "head_repo_name": "envoy",
    "head_repo_owner": "rebello95",
    "is_pr": true,
    "issue_body": "**NOT READY FOR REVIEW, USING CI TO VALIDATE**\r\n\r\nRisk Level: Low\r\nTesting: CI\r\nDocs Changes: N/A\r\n
    "issue_number": 13364,
    "issue_title": "build: update abseil & enable -Wrange-loop-analysis",
    "issue_user": "rebello95",
    "labels": [],
    "merge_commit_sha": null,
    "merged": false,
    "pusher": null,
    "reason": {
        "description": "https://github.com/envoyproxy/envoy/pull/13364 was opened by rebello95.",
        "link": "https://github.com/envoyproxy/envoy/pull/13364"
    },
    "ref": "wrange",
    "ref_or_sha": "wrange",
    "repo_name": "envoy",
    "repo_owner": "envoyproxy",
    "review_commit_id": null,
    "review_id": null,
    "review_state": null,
    "sender": "rebello95",
    "sha": "75b5e65c9a1e728eb7a62d2d7076ccb71125a27b",
    "state": null,
    "target_url": null,
    "trace_id": "envoyproxy/envoy/874b6400-0428-11eb-8994-3d5b9f2dc65d"
}
```

Event Trace

Repository   envoyproxy/envoy
Delivery-ID   874b6400-0428-11eb-8994-3d5b9f2dc65d
Event-Type   github:pull_request
Reason   https://github.com/envoyproxy/envoy/pull/13364 was opened by rebello95. (link)

| Ingestion | **Evaluation** |

Version   0.41.4 46d1002d666d36ad2bdb0eb392a4d43a2c1a383b
Start-Time   2020-10-01 20:56:08.949636468 +0000 UTC
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▼ Console

```
specs: [struct(allow_global_approval = True, files = [{"additions": 3, "sha": "fc308b6b0689b5342e20eac9dde6dd7daa78174c", "filename": "ba
reviews=[]
approvers: []
team dependency-watchers(4043948) = ["moderation", "asraa", "htuch"]
struct(allow_global_approval = True, files = [{"additions": 3, "sha": "fc308b6b0689b5342e20eac9dde6dd7daa78174c", "filename": "bazel/repo
```

Commands   Empty
▶ **Pinned Refs**
▶ **Modules**
▶ **Calls**
▶ **Perms**
▶ **Context**

```
$use(
  "github.com/repokitteh/modules/circleci.star",
  secret_token="redacted",
) -> (
  null,
)
$get_secret(
  "azp_token",
) -> (
  "redacted",
)
$use(
  "github.com/envoyproxy/envoy/ci/repokitteh/modules/azure_pipelines.star",
  secret_token="redacted",
) -> (
  null,
)
$use(
  "github.com/envoyproxy/envoy/ci/repokitteh/modules/ownerscheck.star",
  paths=[{"allow_global_approval":false,"github_status_label":"v2 freeze violations","label":"v2-freeze","owner":"envoyproxy/api-shepherd
) -> (
  null,
)
github_call(
  method="GET",
  path="repos/envoyproxy/envoy/pulls/13364/files?page=1\u0026",
  body=null,
  success_codes=[200,201],
  accept=null,
) -> (
  {"body":"[{\"sha\":\"068b7c6af70bb5419f8dcc71914db0f3a8a11457\",\"filename\":\"bazel/envoy_internal.bzl\",\"status\":\"modified\",\"add
  null,
)
```

Event Trace

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Event-Type github:pull_request
Reason   https://github.com/envoyproxy/envoy/pull/13364 was opened by rebello95. (link)

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▼ **Console**

```
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```

Commands   Empty

▶ **Pinned Refs**
▶ **Modules**
▶ **Calls**
▶ **Perms**
▶ **Context**

▼ **Pinned Refs**

github.com/repokitteh/modules/ -> 4ee2ed0c3622aad7fcddc04cb5dc866e44a541e6

▼ **Modules**

github.com/repokitteh/modules/assign.star (repokitteh/modules#4ee2ed0c3622aad7fcddc04cb5dc866e44a541e6)
github.com/repokitteh/modules/lib/utils.star (repokitteh/modules#4ee2ed0c3622aad7fcddc04cb5dc866e44a541e6)
github.com/repokitteh/modules/review.star (repokitteh/modules#4ee2ed0c3622aad7fcddc04cb5dc866e44a541e6)
github.com/repokitteh/modules/wait.star (repokitteh/modules#4ee2ed0c3622aad7fcddc04cb5dc866e44a541e6)
github.com/repokitteh/modules/circleci.star (repokitteh/modules#4ee2ed0c3622aad7fcddc04cb5dc866e44a541e6)
github.com/repokitteh/modules/lib/circleci.star (repokitteh/modules#4ee2ed0c3622aad7fcddc04cb5dc866e44a541e6)
github.com/envoyproxy/envoy/ci/repokitteh/modules/azure_pipelines.star
github.com/envoyproxy/envoy/ci/repokitteh/modules/ownerscheck.star

Documentation: envoy/source/docs/repokitteh.md

Root module: envoy/repokitteh.star

Envoy specific modules: envoy/ci/repokitteh/modules

Available Commands:
- /assign & /review
- /retest & /retest-circle
- /wait & /wait-any
- /backport

Also custom made ownerscheck.

GitHub Actions essentially supply the same functionality.

The difference is that Actions are more optimized for long running processes, like CI and deployments. They are more resource intensive, and are generally more cumbersome to implement, as they require Docker and containerization, thus resulting in a slower turnaround time.

RepoKitteh is optimized for
short-running actions and enables
much lower latency, faster
turnaround time and lower cost.

RepoKitteh's Future

- GitLab Integration
- On-premise
- Improved UI
- Scripts Testing & GitHub Fake
- More documentation

Looking for more projects! repokitteh.io/waitlist

repokitteh.io (Docs, Support)

Waitlist: repokitteh.io/waitlist

Lab: repokitteh.io/lab