Github Events Data

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Contents

1 Fundamental and Derived Measures

1.1 Terminology

Issue An issue is a generalized form of everything which should be improved on a piece of software, like for instance bug reports or new feature requests.

Commit A commit is the action of submitting new code to the repository. Typically, commits are made **decentralized**, which means that the developer is typing "commit" on his own computer. One or several commits can be uploaded via a push.

Push A push is a the action of uploading committed source code to the repository. It's one of the key features of Git's decentralized environment. During a push event, editing conflicts can emerge and then need to be resolved.

Gist Gists are snippets of code to be shared with others, interdependent of a repository. Can be cloned, forked etc. like a repository, not super important here.

Fork Forks are clones/copies of a repository or Gist into a User's own account. The can be used to parallelize development of the project, the feedback to the original project can be done via *PullRequests*.

PullRequest A user submits his additions/changes and asks the owners of the repository to include his changes into the original project ('*pulling*')

Payload The contents of an action (like the source code itself, the comments itself, all acompanying information but not the meta-data such as timestamps.)

Detailed information on Github's Event API can be found in `http://developer.github.com/v3/activity/events/types/` .

1.2 Users/Actors

1.2.1 General Measures for all Events

- Login Name

- Email

- Gravatar ID

- Type (User/Organization)

- Company (if set)

- Location (if set)

- Blog (if set)

1.2.2 Event-Specific Measures

Event type	Description	Contents	# for all users in example dataset
IssuesEvent	An issues is opened or closed or reopened.	Opened, reopened& closed Issues, Assignee (via API)	29368
CreateEvent	A repository, branch or tag is created.	Type of created object (repo, branch, tag), name	116683
PushEvent	Source code is pushed into repository.	Size, SHA Hash	298729
GistEvent	A Gist (source code fragment) is created or updated.	Action (created, updated), URL, Gist ID	26267
Issue CommentEvent	Comment on an Issue	Issue ID, Comment ID, URL to comment, Comment body (via API)	45166
Commit CommentEvent	Comment on a Commit (inline in source code)	Commit ID, Comment ID, URL, Comment (via API)	7827
ForkEvent	Repository is forked.	Fork URL, Forkee URL	19867
WatchEvent	User is watching a repository for changes	Action (start, stop)	65193
PullRequestEvent	Somebody request the repository to pull his changes into the repository.	Action (opened, closed, synchronize, reopened), PullRequest ID, Contents (files changed, comments, response to issues, etc.), Assginee (via API))	20818
PullRequest ReviewCommentEvent	A pull request is reviewed by another user.	Comment details including body (Comment text itself)	3726
FollowEvent	A user follows another user, watching is actions.	Target (Login)	17049
GollumEvent	Update of Wikipages, such as release notes	Page name (e.g. "Release Notes") , Action (created, edited), URL	11781
DeleteEvent	Either a branch or tag is removed.	Delete Type (Branch or Tag), Name of Deleted Object	3785
MemberEvent	Users can be made collaborators, thereby given advanced "write" permissions to the repository.	Only additions: member(s) added	2764
DownloadEvent	A download is created (not # of downloads.) deprecated (11/2012)! now "release Events".	URL	2576
PublicEvent	A repository is made open-source.	Repository-URL	553
TotalEvents	Counts all of the above.	-	672152

Non-public events: TeamAddEvent, StatusEvent (commits), ReleaseEvent (not yet),

1.2.3   Constructed Measures for Users

Issues_Opened # of issues the user has opened

Issues_Closed # of issues the user has closed

Event_Continuity → TODO

Events_Own Events on user's repository

Events_Active_Involvement Measure how much the user engages in projects of other user or organizations, events on other repositories

Events_Passive_Involvment Measures how much other users engage in projects of the user, events on the user's repository by other users

1.3 Repositories

1.3.1 General Measures

- URL (serves as identifier for repos)

- Name

- Has downloads?

- Has issues?

- Has wiki?

- Creation Date

- Description

- Number of Forks

- Repository is fork?

- Language

- Private yes/no (only have public data)

- Owner

- Parent organization

- Open Issues

- Watchers

- Last Push

1.3.2 Constructed Measures for Repositories

Distinct_Contributing_Users Number of different users contributing via IssuesEvent, CreateEvent, PushEvent, PullRequestEvent

2 Constructed Leadership Measures

2.1 Envisioning and Goal Orientation

$$LS_{\mathrm{milestone}} = \frac{\#\text{ issue directly assigned to a milestone or release}}{\#\text{ total issues opened}} \tag{1}$$

Reasoning: Only the core developers know about the schedules for the project and are by social practices allowed to tag issues directly to milestones and releases.

2.2 Leading People

2.2.1 Open Issue and Assign User/Milestone

Measure:

$$LS_{\mathrm{assign}} = \frac{\#\text{ issue directly assigned to other person}}{\#\text{ total issues opened}} \tag{2}$$

Reasoning: The more people directly assign users to issues, the more they know about the people's capabilities and empower other users to solve this issue.
Control for:

- Total number of issues

- Size of project

Assignee currently only via API from `https://api.github.com/repos/thgersdorf/github-play/issues/1`, see reference.

2.2.2 Taking part in discussions

Measures:

$$LS_{\text{comments}} = c_0 \frac{\# \text{ issue commented (not own)}}{\# \text{ total issues of repo}} + c_1 \frac{\# \text{ PullRequests commented (not own)}}{\# \text{ total PullRequests of repo}} \tag{3}$$

Reasoning: When a user is is actively commenting on a large fraction of issues or pullrequests, he cares about resolving issues and incorporating improvements. Even though not central LS attribute, important activity measure.

2.3 Empowering

Measure:

$$LS_{\text{empowerment}} = \frac{\# \text{ Comments mentioning somebody else}}{\# \text{ All user's comments}} \tag{4}$$

Reasoning: Measuring how much a users refers to other users in comments, interacts with them (e.g. saying "thanks", "great",...) TODO: Comments really all measuring empowering leadership?
Control:

- Number of comments

- Number of different issues for comments

- Number of different projects for comments

2.4 Project Governance

2.4.1 Including people in project

Measure:

$$LS_{\text{governance}} = \frac{\# \text{ members added}}{\# \text{ members in project}} \tag{5}$$

Reasoning:
Control for:

- Project size

2.4.2 Closing issues — Gatekeepers

Measure:

$$LS_{\text{governance}} = c_0 \frac{\# \text{ closed issues without commit}}{\# \text{ total issues of repo}} + c_1 \frac{\# \text{ closed issues with commit}}{\# \text{ total issues of repo}} \tag{6}$$

Reasoning: Gatekeepers decide when an issues is not worth to follow up on, then they close it. Also, they can close an issue by using central
Control for:

3 Performance Measures

All performance measures can only be performed over a time span, e.g. a month. Relative performance improvements or decreases can be measured by comparing two time spans:
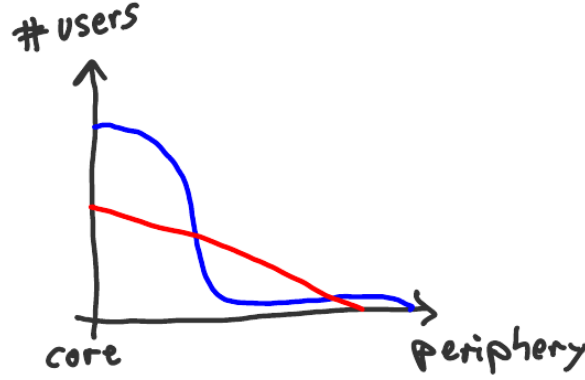
$$\Delta P = P_{\text{Q1/2013}} - P_{\text{Q1/2012}} \tag{7}$$

3.1 Contributors

Number of contributors

$$C = \text{Push Users} + \text{PullRequest Initiators} + c_{\text{Issues}}\text{Issue creators} \tag{8}$$

Contributors/Coreness

3.2 Release, Commits, Issue closures

Contributing actions

$$C = \text{PushEvents} + \text{PullRequests} + c_{\text{Issues}}\text{Issues} \tag{9}$$

$$\text{Issue closing} = \tag{10}$$

Issue User Effectiveness:

$$IUE = \frac{\Delta \frac{\#\ \text{Issues Open}}{\#\ \text{Total Issues}}}{\Delta \#\ \text{User contributing}} \tag{11}$$

3.3 Downloads, Forks, Views etc.

User activity:

$$\text{UA} = c_{\text{Forks}}\text{Forks} + c_{\text{WatchEvents}}\text{WatchEvents} + c_{\text{IssueEvents}}\text{IssueEvents} \tag{12}$$

4 Reference

4.1 Assignee from API

Example URL: `https://api.github.com/repos/thgersdorf/github-play/issues/1`

```
1   {
2     "url": "https://api.github.com/repos/kevans91/Chatters/issues/5",
3     "labels_url": "https://api.github.com/repos/kevans91/Chatters/issues/5/labels{/↵
          name}",
4     "comments_url": "https://api.github.com/repos/kevans91/Chatters/issues/5/comments↵
          ",
5     "events_url": "https://api.github.com/repos/kevans91/Chatters/issues/5/events",
6     "html_url": "https://github.com/kevans91/Chatters/issues/5",
7     "id": 4059710,
8     "number": 5,
9     "title": "Locked Menu Entries",
10    "user": {
11      "login": "kevans91",
12      "id": 646318,
13      "avatar_url": "https://gravatar.com/avatar/8d4c2928fe43bb196970867f59ab6b93?d=↵
            https%3A%2F%2Fidenticons.github.com%2F5b22ea77797a2c6e6e0859b128be4d94.png&↵
            r=x",
```

```json
14        "gravatar_id": "8d4c2928fe43bb196970867f59ab6b93",
15        "url": "https://api.github.com/users/kevans91",
16        "html_url": "https://github.com/kevans91",
17        "followers_url": "https://api.github.com/users/kevans91/followers",
18        "following_url": "https://api.github.com/users/kevans91/following{/other_user}"←
              ,
19        "gists_url": "https://api.github.com/users/kevans91/gists{/gist_id}",
20        "starred_url": "https://api.github.com/users/kevans91/starred{/owner}{/repo}",
21        "subscriptions_url": "https://api.github.com/users/kevans91/subscriptions",
22        "organizations_url": "https://api.github.com/users/kevans91/orgs",
23        "repos_url": "https://api.github.com/users/kevans91/repos",
24        "events_url": "https://api.github.com/users/kevans91/events{/privacy}",
25        "received_events_url": "https://api.github.com/users/kevans91/received_events",
26        "type": "User",
27        "site_admin": false
28      },
29      "labels": [
30        {
31          "url": "https://api.github.com/repos/kevans91/Chatters/labels/enhancement",
32          "name": "enhancement",
33          "color": "84b6eb"
34        }
35      ],
36      "state": "open",
37      "assignee": null,
38      "milestone": null,
39      "comments": 0,
40      "created_at": "2012-04-11T06:43:08Z",
41      "updated_at": "2012-04-11T06:43:08Z",
42      "closed_at": null,
43      "pull_request": {
44        "html_url": null,
45        "diff_url": null,
46        "patch_url": null
47      },
48      "body": "Locked menu entries currently clutter up the menus at the top pretty ←
              badly. They either need to be removed or used.",
49      "closed_by": null
50  }
```

4.2 Raw JSONs

4.2.1 IssuesEvent

```json
1   "repository":{"homepage":"http://tdurand.github.com/mapafortaleza",
2  "has_downloads":true,"has_issues":true,"master_branch":"gh-pages","forks":5,"←
      language":"JavaScript","fork":false,"has_wiki":true,"url":"https://github.com/←
      tdurand/mapafortaleza","created_at":"2011/09/29 03:27:42 -0700","size":132,"←
      private":false,"name":"mapafortaleza","description":"Mapa de Fortaleza","owner"←
      :"tdurand","open_issues":9,"watchers":13,"pushed_at":"2012/02/29 16:43:30 -0800←
      "},
3  "actor_attributes":{"name":"Thibault Durand","company":"@tibbb","gravatar_id":"←
      cedb88f236afaeed4caea39917ebd0a7","blog":"http://www.thibault-durand.fr","type"←
      :"User","login":"tdurand"}
4  ,"created_at":"2012/04/11 16:01:27 -0700","public":true,"actor":"tdurand","payload"←
      :{"number":12,"action":"opened","issue":4075341},"url":"https://github.com/←
      tdurand/mapafortaleza/issues/12","type":"
5  IssuesEvent"}
```

4.2.2 CreateEvent

```json
1  {"repository":{"homepage":"http://www.omegahat.org/CodeDepends","has_downloads":←
      true,"has_issues":true,"forks":1,"fork":false,"has_wiki":true,"url":"https://←
      github.com/duncantl/CodeDepends","created_at":"2012/04/11 15:17:31 -0700","size←
```

```
   ":0,"private":false,"name":"CodeDepends","description":"Analysis of R code for ←
   reproducible research and code view","owner":"duncantl","
open_issues":0,"watchers":1,"pushed_at":"2012/04/11 15:20:10 -0700"},"←
   actor_attributes":{"name":"Duncan Temple Lang","gravatar_id":"←
   be39cb3e7dc5b8133eba71370eeec525","location":"Bay Area","blog":"http://www.←
   omegahat.org","type":"User","login":"duncantl"},"created_at":"2012/04/11 ←
   15:20:11 -0700","public":true,"actor":"duncantl","payload":{"master_branch":"←
   master","description":"Analysis of R code for reproducible research and code ←
   view","ref_type":"branch","ref":"master"},"url":"https://github.com/duncantl/←
   CodeDepends/compare/master","type":"CreateEvent"}
```

4.2.3 PushEvent

```
{"repository":{"homepage":"","has_downloads":true,"has_issues":true,"
forks":1,"fork":false,"has_wiki":true,"url":"https://github.com/brunolopesjn/←
   JConvexHull","created_at":"2012/04/10 18:37:34 -0700","size":208,"private":←
   false,"name":"JConvexHull","description":"Programa Java Swing que resolve o ←
   problema do caixeiro viajante (TSP) utilizando o Convexo de Hull","owner":"←
   brunolopesjn","open_issues":0,"watchers":1,"pushed_at":"2012/04/11 15:01:36 ←
   -0700"},"actor_attributes":{"name":"Bruno Lopes Alcantara Batista","gravatar_id←
   ":"854bf813e2a302dcc4a059b89c502424","blog":"kariridev.blogspot.com","type":"←
   User","login":"brunolopesjn","email":"brunolopesjn@gmail.com"},"created_at":"←
   2012/04/11 15:01:37 -0700","public":true,"actor":"brunolopesjn","payload":{"←
   head":"8469f67ff919f2a776336bfe61f5ae7f40e76c72","size":1,"shas":[["8469←
   f67ff919f2a776336bfe61f5ae7f40e76c72","brunolopesjn@gmail.com","Criado a ←
   interface grafica base, de desenho dos pontos, o desenho\ndo plano cartesiano e←
    a ica de abertura de arquivos.","Bruno Lopes Alcantara Batista",true]],"ref":"←
   refs/heads/master"},"
url":"https://github.com/brunolopesjn/JConvexHull/compare/ea77edbd70...8469f67ff9",←
   "type":"PushEvent"}
```

4.2.4 GistEvent

```
{"actor_attributes":{"name":"Javi Loureiro","gravatar_id":"9←
   cc006c8171d7af9f171cf5b2db15299","location":"Madrid","blog":"http://←
   javiloureiro.com","type":"User","login":"sieyin"},"created_at":"2012/04/11 ←
   15:54:31 -0700","public":true,"actor":"sieyin","payload":{"name":"gist: 2363301←
   ","action":"update","url":"https://gist.github.com/2363301","id":2363301,"desc"←
   :"About Javi Loureiro"},"url":"https://gist.github.com/2363301","type":"←
   GistEvent"
```

4.2.5 IssueCommentEvent

```
{"repository":{"homepage":"","has_
downloads":true,"has_issues":true,"forks":1,"language":"JavaScript","fork":false,"←
   has_wiki":true,"url":"https://github.com/sruecker/SET","created_at":"2012/03/14←
    15:59:17 -0700","size":118976,"private":false,"name":"SET","description":"←
   Simulated Environment for Theatre, Phase I","owner":"sruecker","open_issues"←
   :36,"watchers":3,"pushed_at":"2012/04/11 15:35:27 -0700"},"actor_attributes":{"←
   name":"Omar Rodriguez-Arenas","gravatar_id":"97f7a591e4a3160a24347bb83091d627",←
   "location":"Edmonton, AB","blog":"http://www.omarrodriguez.org/","type":"User",←
   "login":"lagoan"},"created_at":"2012/04/11 15:54:29 -0700","public":true,"actor←
   ":"lagoan","payload":{"issue_id":3880583,"comment_id":5081038},"url":"https://←
   github.com/sruecker/SET/issues/52#issuecomment-5081038","type":"←
   IssueCommentEvent"}
```

4.2.6 CommitCommentEvent

```
{"repository":{"homepage":"","has_downloads":true,"has_issues":true,"forks":2,"←
   language":"Java","fork":false,"has_wiki":true,"url":"https://github.com/mju/←
   nextgenforreal","created_at":"2012/03/29 08:23:00 -0700","size":136,"private":←
```

```
      false,"name":"nextgenforreal","description":"Next Gen For Real","owner":"mju","↩
      open_issues":0,"watchers":2,"pushed_at":"2012/03/30 05:12:13 -0700"},"↩
      actor_attributes":{"gravatar_id":"00c27eb39df73548f57a7e229962eefb","type":"↩
      User","login":"nadirabid"},"created_at":"2012/04/11 15:56:48 -0700","public":↩
      true,"actor":"nadirabid","payload":{"commit":"4390↩
      c06468a07594b7a08595be501ee56e737f1b","comment_id":1199860},"url":"
  2  https://github.com/mju/nextgenforreal/commit/4390↩
      c06468a07594b7a08595be501ee56e737f1b#war/SecLookup/lookup.html-P5","type":"↩
      CommitCommentEvent"}
```

4.2.7 ForkEvent

```
  1  {"actor_attributes":{"name":"Kevin","type":"User","gravatar_id":"↩
      fa71428356c78bcb7c32a01fa353657f","login":"kmet31"},"created_at":"2012/04/11 ↩
      15:57:57 -0700","actor":"kmet31","public":true,"type":"ForkEvent","repository"↩
      :{"has_wiki":true,"language":"JavaScript","owner":"justinpincar","open_issues"↩
      :0,"url":"https://github.com/justinpincar/monocle","watchers":2,"pushed_at":"↩
      2012/04/07 21:48:09 -0700","description":"","fork":false,"size":636,"↩
      has_downloads":true,"name":"monocle","has_issues":true,"homepage":"","forks":2,↩
      "private":false,"created_at":"2012/04/06 15:29:30 -0700"},"url":"https://github↩
      .com/kmet31/monocle","payload":{}}
```

4.2.8 PullRequestEvent

```
  1  {"repository":{"homepage":"https://github.com/mozilla-services/tokenserver","↩
      has_wiki":true,"open_issues":1,"language":"Python","watchers":6,"fork":false,"↩
      pushed_at":"2012/04/11 15:57:09 -0700","url":"https://github.com/mozilla-↩
      services/tokenserver","created_at":"2011/12/
  2  23 07:39:35 -0800","size":216,"private":false,"organization":"mozilla-services","↩
      name":"tokenserver","description":"Token Server","owner":"mozilla-services","↩
      has_downloads":true,"has_issues":true,"forks":3},"actor_attributes":{"name":"↩
      Ryan Kelly","company":"Mozilla","gravatar_id":"7ad57e27678b3a70d05e9c3fb1af123e↩
      ","location":"Melbourne, Australia","blog":"http://www.rfk.id.au/","type":"User↩
      ","login":"rfk","email":"ryan@rfk.id.au"},"created_at":"2012/04/11 15:58:49 ↩
      -0700","public":true,"actor":"rfk","payload":{"number":2,"pull_request":{"↩
      issue_url":"https://github.com/mozilla-services/tokenserver/issues/2","head":{"↩
      repo":{"name":"tokenserver","created_at":"2011-12-23T15:39:35Z","size":216,"↩
      has_wiki":true,"clone_url":"https://github.com/mozilla-services/tokenserver.git↩
      ","watchers":6,"updated_at":"2012-04-11T22:57:10Z","private":false,"url":"https↩
      ://api.github.com/repos/mozilla-services/tokenserver","ssh_url":"git@github.com↩
      :mozilla-services/tokenserver.git","fork":false,"git_url":"git://github.com/↩
      mozilla-
  3  services/tokenserver.git","language":"Python","id":3040874,"pushed_at":"2012-04-11↩
      T22:57:09Z","svn_url":"https://github.com/mozilla-services/tokenserver","↩
      mirror_url":null,"open_issues":1,"has_downloads":true,"has_issues":true,"↩
      homepage":"https://github.com/mozilla-services/tokenserver","description":"↩
      Token Server","forks":3,"html_url":"https://github.com/mozilla-services/↩
      tokenserver","owner":{"gravatar_id":"a41a81f9188770933a4b54382c29cae4","↩
      avatar_url":"https://secure.gravatar.com/avatar/↩
      a41a81f9188770933a4b54382c29cae4?d=https://a248.e.akamai.net/assets.github.com↩
      %2Fimages%2Fgravatars%2Fgravatar-orgs.png","url":"https://api.github.com/users/↩
      mozilla-services","id":1066228,"login":"mozilla-services"}},"label":"mozilla-↩
      services:rfk/ttl-dict-fix","sha":"53e767319cda6b2569c362273eb12b2377944add","↩
      ref":"rfk/ttl-dict-fix","user":{"gravatar_id":"a41a81f9188770933a4b54382c29cae4↩
      ","avatar_url":"https://secure.gravatar.com/avatar/↩
      a41a81f9188770933a4b54382c29cae4?d=https://a248.e.akamai.net/assets.github.com↩
      %2Fimages%
  4  2Fgravatars%2Fgravatar-orgs.png","url":"https://api.github.com/users/mozilla-↩
      services","id":1066228,"login":"mozilla-services"}},"number":2,"created_at":"↩
      2012-04-11T22:58:48Z","merged":false,"changed_files":1,"merged_by":null,"body":↩
      "","title":"Make TTLedDict.__contains__ return False for expired items.","↩
      comments":0,"diff_url":"https://github.com/mozilla-services/tokenserver/pull/2.↩
      diff","updated_at":"2012-04-11T22:58:48Z","additions":8,"url":"https://api.↩
      github.com/repos/mozilla-services/tokenserver/pulls/2","_links":{"html":{"href"↩
```

```
   :"https://github.com/mozilla-services/tokenserver/pull/2"},"self":{"href":"←
   https://api.github.com/repos/mozilla-services/tokenserver/pulls/2"},"comments"←
   :{"href":"https://api.github.com/repos/mozilla-services/tokenserver/issues/2/←
   comments"},"review_comments":{"href":"https://api.github.com/repos/mozilla-←
   services/tokenserver/pulls/2/comments"}},"id":1147626,"patch_url":"https://←
   github.com/mozilla-services/tokenserver/pull/2.patch","mergeable":null,"←
   closed_at":null,"commits":1,"
5  merged_at":null,"review_comments":0,"html_url":"https://github.com/mozilla-services←
   /tokenserver/pull/2","user":{"gravatar_id":"7ad57e27678b3a70d05e9c3fb1af123e","←
   avatar_url":"https://secure.gravatar.com/avatar/7←
   ad57e27678b3a70d05e9c3fb1af123e?d=https://a248.e.akamai.net/assets.github.com%2←
   Fimages%2Fgravatars%2Fgravatar-140.png","url":"https://api.github.com/users/rfk←
   ","id":34695,"login":"rfk"},"deletions":0,"base":{"repo":{"name":"tokenserver",←
   "created_at":"2011-12-23T15:39:35Z","size":216,"has_wiki":true,"clone_url":"←
   https://github.com/mozilla-services/tokenserver.git","watchers":6,"updated_at":←
   "2012-04-11T22:57:10Z","private":false,"url":"https://api.github.com/repos/←
   mozilla-services/tokenserver","ssh_url":"git@github.com:mozilla-services/←
   tokenserver.git","fork":false,"git_url":"git://github.com/mozilla-services/←
   tokenserver.git","language":"Python","id":3040874,"pushed_at":"2012-04-11T22←
   :57:09Z","svn_url":"https://github.com/mozilla-services/tokenserver","←
   mirror_url":null,"open_issues":1,"has_downloads":
6  true,"has_issues":true,"homepage":"https://github.com/mozilla-services/tokenserver"←
   ,"description":"Token Server","forks":3,"html_url":"https://github.com/mozilla-←
   services/tokenserver","owner":{"gravatar_id":"a41a81f9188770933a4b54382c29cae4"←
   ,"avatar_url":"https://secure.gravatar.com/avatar/←
   a41a81f9188770933a4b54382c29cae4?d=https://a248.e.akamai.net/assets.github.com←
   %2Fimages%2Fgravatars%2Fgravatar-orgs.png","url":"https://api.github.com/users/←
   mozilla-services","id":1066228,"login":"mozilla-services"}},"label":"mozilla-←
   services:master","sha":"2ef48e3d3e57030597175149703a362ed9794335","ref":"master←
   ","user":{"gravatar_id":"a41a81f9188770933a4b54382c29cae4","avatar_url":"https←
   ://secure.gravatar.com/avatar/a41a81f9188770933a4b54382c29cae4?d=https://a248.e←
   .akamai.net/assets.github.com%2Fimages%2Fgravatars%2Fgravatar-orgs.png","url":"←
   https://api.github.com/users/mozilla-services","id":1066228,"login":"mozilla-←
   services"}},"state":"open"},"action":"opened"},"url":"https://github.com/←
   mozilla-services/tokenserver/pull/
7  2","type":"PullRequestEvent"
```

4.2.9   PullRequestReviewCommentEvent

```
1  {"repository":{"homepage":"","has_downloads":true,"has_issues":true,"
2  forks":6,"language":"Python","fork":false,"has_wiki":true,"organization":"pinax","←
   url":"https://github.com/pinax/django-user-accounts","created_at":"2012/03/10 ←
   13:41:14 -0800","size":172,"private":false,"name":"django-user-accounts","←
   description":"User accounts for Django","owner":"pinax","open_issues":2,"←
   watchers":13,"pushed_at":"2012/04/11 15:34:45 -0700"},"actor_attributes":{"name←
   ":"Brian Rosner","company":"Eldarion, Inc.","gravatar_id":"←
   b7472bc7aa45c70641c299e9408b78ab","location":"Denver, CO","blog":"http://←
   brosner.com/","type":"User","login":"brosner","email":"brosner@gmail.com"},"←
   created_at":"2012/04/11 15:59:05 -0700","public":true,"actor":"brosner","←
   payload":{"comment":{"position":13,"created_at":"2012-04-11T22:59:05Z","←
   original_commit_id":"9fcdbf959760964592fb8537551cd1a95eed5a58","body":"The code←
   you have in ``conf.py`` is correct. This line is incorrect because ``appconf``←
   prefixes what you add in the conf with ``ACCOUNT``.","original_position":13,"←
   commit_id":"
3  9fcdbf959760964592fb8537551cd1a95eed5a58","updated_at":"2012-04-11T22:59:05Z","url"←
   :"https://api.github.com/repos/pinax/django-user-accounts/pulls/comments/673911←
   ","id":673911,"path":"account/fields.py","user":{"gravatar_id":"←
   b7472bc7aa45c70641c299e9408b78ab","avatar_url":"https://secure.gravatar.com/←
   avatar/b7472bc7aa45c70641c299e9408b78ab?d=https://a248.e.akamai.net/assets.←
   github.com%2Fimages%2Fgravatars%2Fgravatar-140.png","url":"https://api.github.←
   com/users/brosner","id":124,"login":"brosner"}}},"url":"https://github.com/←
   pinax/django-user-accounts/pull/11#discussion-diff-673911","type":"←
   PullRequestReviewCommentEvent"
```

4.2.10 WatchEvent

```
{"repository":{"homepage":"www.meteor.com","has_downloads":true,"has_issues":true,"
    forks":54,"language":"JavaScript","fork":false,"has_wiki":true,"organization":"
    meteor","url":"https://github.com/meteor/meteor","
created_at":"2012/01/18 17:58:17 -0800","size":292,"private":false,"name":"meteor",
    "description":"Meteor, an ultra-simple, database-everywhere, data-on-the-wire,
    pure-Javascript web framework.","owner":"meteor","open_issues":18,"watchers"
    :1322,"pushed_at":"2012/04/11 14:20:18 -0700"},"actor_attributes":{"name":"
    Christian Giordano","gravatar_id":"c36cef01195c0a581ece67aa81ee40a8","location"
    :"London","blog":"http://nuthinking.com","type":"User","login":"nuthinking","
    email":"christian@nuthinking.com"},"created_at":"2012/04/11 15:58:11 -0700","
    public":true,"actor":"nuthinking","payload":{"action":"started"},"url":"https
    ://github.com/meteor/meteor","type":"WatchEvent"
```

4.2.11 FollowEvent

```
{"actor_attributes":{"name":"David A. Dalrymple","company":"MIT","gravatar_id":"
    d6a774b6c841325abf20e8c2b1cfb43b","location":"Cambridge, MA","blog":"http://
    davidad.net","type":"User","login":"davidad","email":"davidad@alum.mit.edu"},"
    created_at":"2012/04/11 15:58:41 -0700","public":true,"actor":"davidad","
    payload":{"target":{"gravatar_id":"237338834f2f8948e862e91392a8c1b4","followers
    ":9,"id":40273,"repos":17,"login":"saizai"}},"url":"https://github.com/saizai",
    "type":"FollowEvent"}
```

4.2.12 GollumEvent

```
{"repository":{"homepage":"http://www.sisodb.com","has_downloads":true,"has_issues"
    :true,"forks":4,"language":"C#","fork":false,"has_wiki":true,"url":"https://
    github.com/
danielwertheim/SisoDb-Provider","created_at":"2011/01/31 05:33:16 -0800","size"
    :3472,"private":false,"name":"SisoDb-Provider","description":"SisoDb - Simple
    Structure Oriented Db","owner":"danielwertheim","open_issues":0,"watchers":52,"
    pushed_at":"2012/04/11 14:52:42 -0700"},"actor_attributes":{"name":"Daniel
    Wertheim","gravatar_id":"274ce0291206c9d27635a865ac48b5c4","location":"Sweden",
    "blog":"http://daniel.wertheim.se","type":"User","login":"danielwertheim"},"
    created_at":"2012/04/11 15:01:37 -0700","public":true,"actor":"danielwertheim",
    "payload":{"pages":[{"sha":"909e1049863468ad462655505441bf7bf39dc739","title":"
    Release notes","action":"edited","page_name":"Release notes","summary":null,"
    html_url":"https://github.com/danielwertheim/SisoDb-Provider/wiki/Release-notes
    "}]},"url":"https://github.com/danielwertheim/SisoDb-Provider/wiki/Release-
    notes","type":"GollumEvent"}
```

4.2.13 DeleteEvent

```
{"repository":{"homepage":"","has_downloads":true,"has_issues":false,"master_branch
    ":"master","forks":0,"language":"Shell","fork":true,"has_wiki":true,"url":"
    https://github.com/travp624/android_device_moto_shadow","created_at":"
    2012/04/03 01:32:24 -0700","size":6060,"private":false,"name":"
    android_device_moto_shadow","description":"","owner":"travp624","open_issues"
    :0,"watchers":1,"pushed_at":"2012/04/11 15:02:07 -0700"},"actor_attributes":{"
    name":"teamicemods","gravatar_id":"1eb4d77c7c79eccde05a7047fbae4195","location"
    :"wisconsin home of cheese baby","blog":"","type":"User","login":"travp624","
    email":"travp624@gmail.com"},"created_at":"2012/04/11 15:02:07 -0700","public":
    true,"actor":"travp624","payload":{"ref_type":"branch","ref":"ics"},"url":"
    https://github.com/","type":"DeleteEvent"}
```

4.2.14 MemberEvent

```
1  {"repository":{"homepage":"","has_downloads":true,"has_issues":true,"forks":1,"←
       language":"Python","fork":false,"has_wiki":true,"url":"https://github.com/←
       olleicua/Py4colorReduction","created_at":"2012/04/11 12:58:45 -0700","size":92,←
       "private":false,"name":"Py4colorReduction","description":"A project to reduce ←
       graph configurations as part of the four color theorem proof in Python","owner"←
       :"olleicua","open_issues":0,"watchers":1,"pushed_at":"2012/04/11 15:14:51 -0700←
       "},"actor_attributes":{"gravatar_id":"a6b8d1d40e9a7f8689c796755412638d","type":←
       "User","login":"olleicua"},"created_at":"2012/04/11 15:54:06 -0700","public":←
       true,"actor":"olleicua","payload":{"member":{"avatar_url":"https://secure.←
       gravatar.com/avatar/
2  8a5e72675540095c6ca3d7825d2c2451?d=https://a248.e.akamai.net/assets.github.com%2←
       Fimages%2Fgravatars%2Fgravatar-140.png","gravatar_id":"8←
       a5e72675540095c6ca3d7825d2c2451","url":"https://api.github.com/users/emzeidan",←
       "id":1634836,"login":"emzeidan"},"action":"added"},"url":"https://github.com/←
       olleicua/Py4colorReduction","type":"MemberEvent"}
```

4.2.15 DownloadEvent

```
1  {"repository":{"homepage":"","has_downloads":true,"has_issues":true,"forks":0,"←
       language":"Java","fork":true,"has_wiki":false,"organization":"disy","url":"←
       https://github.com/disy/jax-rx","created_at":"2011/09/13 06:02:16 -0700","size"←
       :212,"private":false,"name":"jax-rx","description":"JAX-RX (REST) Interface, ←
       REST on XML easy made","owner":"disy","open_issues":0,"watchers":2,"pushed_at":←
       "2012/04/06 23:31:00 -0700"},"actor_attributes":{"name":"Sebastian Graf","←
       company":"University of Konstanz","gravatar_id":"0409←
       cd1da7452f896e86b7a6ebd9b85a","location":"Konstanz, Germany","blog":"http://www←
       .informatik.uni-konstanz.de/arbeitsgruppen/disy/members/sebastian-graf/","type"←
       :"User","login":"sebastiangraf","email":"sebastian.graf@uni-konstanz.de"},"
2  created_at":"2012/04/11 15:52:20 -0700","public":true,"actor":"sebastiangraf","←
       payload":{"url":"https://github.com/downloads/disy/jax-rx/jax-rx-1.3.3-SNAPSHOT←
       .jar","id":218663},"url":"https://github.com/downloads/disy/jax-rx/jax-rx←
       -1.3.3-SNAPSHOT.jar","type":"DownloadEvent"}
```

4.2.16 PublicEvent

```
1  {"repository":{"homepage":"","has_downloads":true,"has_issues":true,"forks":1,"←
       language":"C++","fork":false,"has_wiki":true,"url":"https://github.com/←
       brendonjustin/trees","created_at":"2012/04/11 15:20:22 -0700","size":124,"
2  private":false,"name":"trees","description":"","owner":"brendonjustin","open_issues←
       ":0,"watchers":1,"pushed_at":"2012/04/11 15:21:13 -0700"},"actor_attributes":{"←
       name":"Brendon Justin","gravatar_id":"d0593bd249a5194e00483ac594128566","type":←
       "User","login":"brendonjustin"},"created_at":"2012/04/11 15:22:25 -0700","←
       public":true,"actor":"brendonjustin","url":"https://github.com/brendonjustin/←
       trees","type":"PublicEvent"}
```

4.3 SQL Queries Temp

4.3.1 Generic Event Queries

```
1   # total events involvements:
2   SELECT * FROM `events` WHERE `actor` = 'mitar' AND `repository_owner` != 'mitar'
3  SELECT * FROM `events` WHERE `actor` = 'mitar' AND `repository_owner` = 'mitar'
4
5   # specific Issues properties
6   SELECT payload_number, payload_action, payload_issue from events where type  = '←
       IssuesEvent' LIMIT 30;
7
8
9  # user profiling
10 INSERT INTO eng_users (user, TotalEvents, IssuesEvent , CreateEvent , PushEvent , ←
       GistEvent , IssueCommentEvent , CommitCommentEvent , ForkEvent , WatchEvent , ←
       PullRequestEvent , PullRequestReviewCommentEvent , FollowEvent , GollumEvent , ←
       DeleteEvent , MemberEvent , DownloadEvent , PublicEvent, Issues_Opened, ←
```

```
    Issues_Closed, Events_Own, Events_Active_Involvement, Events_Passive_Involvment↩
    ) SELECT '" + user_i[0] +"' , COUNT(*), SUM(Type = 'IssuesEvent'), SUM(Type ↩
    = 'CreateEvent'), SUM(Type = 'PushEvent'), SUM(Type = 'GistEvent'), SUM(Type = ↩
    'IssueCommentEvent'),SUM(Type = 'CommitCommentEvent'),SUM(Type = 'ForkEvent'),↩
    SUM(Type = 'WatchEvent'),SUM(Type = 'PullRequestEvent'),SUM(Type = '↩
    PullRequestReviewCommentEvent'),SUM(Type = 'FollowEvent'),SUM(Type = '↩
    GollumEvent'),   SUM(Type = 'DeleteEvent'), SUM(Type = 'MemberEvent'), SUM(Type↩
     = 'DownloadEvent'), SUM(Type = 'PublicEvent'), SUM(type = 'IssuesEvent' AND ↩
    payload_action='opened'), SUM(type = 'IssuesEvent' AND payload_action='closed')↩
    ,   SUM(actor = '" +
11  user_i[0] +"' AND `repository_owner` = '" + user_i[0] +"'),  SUM(actor = '" + ↩
    user_i[0] +"' AND `repository_owner` != '" + user_i[0] +"') , SUM( actor != '" ↩
    + user_i[0] +"' AND `repository_owner` = '" + user_i[0] +"'   )  FROM events ↩
    WHERE actor_attributes_type = 'User' AND actor_attributes_login = '" + user_i↩
    [0] +"' ON DUPLICATE KEY UPDATE user = '" + user_i[0] +"' ;
12  # passive involvement:
13  UPDATE eng_users SET Events_Passive_Involvment = ( SELECT COUNT( * )  FROM  `events↩
    `  WHERE  `repository_organization` IS NULL  AND  `repository_owner` =  '↩
    torvalds' AND actor !=  'torvalds' )  WHERE eng_users.user =  'torvalds'
```

5   SQL Database Performance Optimization

Lessons learned:

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