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Learning To Love The DAG For Fun And Profit

Jonathan "Duke" Leto
@dukeleto
letolabs.com
duke@leto.net

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@pdxgit A Bit About Me

- PDX Git Together
- Git consulting
- Parrot Virtual Machine
- Google Summer of Code
- BrewPony
- ...
- Too many things...

What *is* Git, exactly?

- A DAG (Directed Acyclic Graph)
- A content tracker
- A diverse community with a common bond
- A collection of implementations

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What *is* Git, exactly?

DAG = Directed Acyclic Graph

- a "Tree of Arrows"
- You can't be your own Grandpa
- Graph = nodes + vertices

What *is* Git, exactly?

A content tracker

- Originally "an information manager from hell"
- Track changes in content, storing the diffs
- An empty directory has no content

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What *is* Git, exactly?

A diverse community with a common bond

- Started with Linus in kernel-land and then spread quickly
- Now: web app developers, UI designers, scientists, professors...

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What *is* Git, exactly?

A Collection of Implementations

- "official" Git 1.x
- JGit - Git 1.x server in Java
- libgit2 - "fresh start" linkable library in C
- js-git - Very alpha implementation in Javascript

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What *is* Git, exactly?

Git 1.x

- /bin/sh
- C
- Perl (git svn, git add -i)
- Some optional optimized assembly

What *is* Git, exactly?

JGit

- Git server written in Java
- Eclipse
- Gerrit Code Review
- various commercial products

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What *is* Git, exactly?

libgit2.github.com

- No dependencies
- ANSI 89 C for max(portability)
- Linkable, re-entrant C library
- Designed for multi-threading
- Funded by: Github + Microsoft

Using libgit2 from Perl 5

- use Git::Raw;
- Low-level access to Git objects
- Plumbing, not porcelain

What *is* Git, exactly?

Git::Raw example

```perl
use Git::Raw;

my $url  = 'git://github.com/git/git.git';
my $repo = Git::Raw::Repository->clone($url,
            'git', { bare => 0 });
# print all the tags of the repository
for my $tag (@{ $repo -> tags }) {
    say $tag -> name;
}
```

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Using Git from Perl 5

use Git::Repository;

- Shells out to normal git binary
- Implements plumbing + porcelain

What *is* Git, exactly?

Git::Repository example

```
use Git::Repository;

my $url = 'git://github.com/git/git.git';
my $dir = 'git';
Git::Repository->run( clone => $url => $dir );

my $r = Git::Repository->new( $dir );

# run an arbitrary Git command
my $command   = "stash";
my @arguments = '';
my $options   = {};

$r->run( $command => @arguments, $options );
```

What *is* Git, exactly?

github.com/creationix/js-git

- Git in Pure JavaScript
- Currently only read-only support
- Funded on bountysource.com
- Large donations from Mozilla + Adobe

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Git + Perl community similarities

- Perl 5 $\sim$ Git 1.x
- Perl 6 $\sim$ libgit2

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Using Git

Git - The command line isn't the only way

- git gui
- Github for Mac/Windows
- GitX-dev
- Atalassian SourceTree

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Recent Features: 1.8.4

git clean -i
"interactive cleaning"

Useful Features

git checkout -
"checkout the last branch I was on"

Useful Features

git merge -
"merge the last branch I was on"

Useful Features

```
git blame -L 20,50 foo.txt # lines 20-50
git blame -L 10,+10 foo.txt # lines 10-20
git blame -L 50,-10 foo.txt # lines 40-50
```

Coming Soon! in 1.8.5

git log HEAD <=> git log @

Coming Soon! in 1.8.5

git -C foo/ status $\sim$ make -C foo/

Interesting Git Use Case

The Open Tree of Life
github.com/opentreeoflife

- Digital representation of the Tree Of Life
- Storing JSON files in Git
- Version control for evolution!
- Currently implementing a web API around Git repo

Extra Credit

```
# Read the first Git commit by Linus himself
# Thu Apr 7 15:13:13 2005
$ git clone git://github.com/git/git.git
$ git show e83c5163
```

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How I Can Help You

Git It Together

- Educating stakeholders on the value of Git
- On-site Training
- Implementing Git at your organization
  - Converting from cvs|svn|? → Git
  - Continuous Integration
  - Deployment from Git
  - Custom workflow creation + documentation
- letolabs.com

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git merge -s=social

- @dukeleto
- 209.691.DUKE
- letolabs.com
- duke@leto.net
- linkedin.leto.net
- IRC: dukeleto on Freenode, Mozilla, Perl

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Mahalo!