Opening The Black Box

DrupalCamp Cornell 10/20/2017

Howdy!
I'm an engineer at
Acquia

Dustin Younse
@milsyobtaf

https://github.com/milsyobtaf/prez

What Is Debugging?

Glitch

@glitch

Follow

My code once took down a client's Intranet mid-demo. Tell us your coding screw-ups, so we can show new coders #weallmakemistakes

> **Glitch** @glitch
> This Junior Dev nuked the prod db on 1st day of new job:
> reddit.com/r/cscareerques…

Retweets 330 **Likes** 617

5:02 AM - 13 Jun 2017

335 330 617

Zach Holman
@holman

Follow

Replying to @glitch

i shipped github to production in development mode, that was neat

Retweets	Likes
9	85

6:46 AM - 13 Jun 2017

2 9 85

jennosaur js 🏔🏔🏔
@jennschiffer

Follow

i miiiight have also taken down the china nba site for a few min while switching the nets from nj to brooklyn (long after they moved fyi)

Likes
26

6:24 AM - 13 Jun 2017

1 26

K Cravens
@CakeRavens

Follow

Replying to @glitch

My first client patch caused all their W2's to print with the "deceased" box checked. It was a nunnery. I KILLED AN ENTIRE NUNNERY.

Retweets 30 **Likes** 155

5:10 AM - 13 Jun 2017

3 30 155

Dustin Younse
@milsyobtaf

Follow

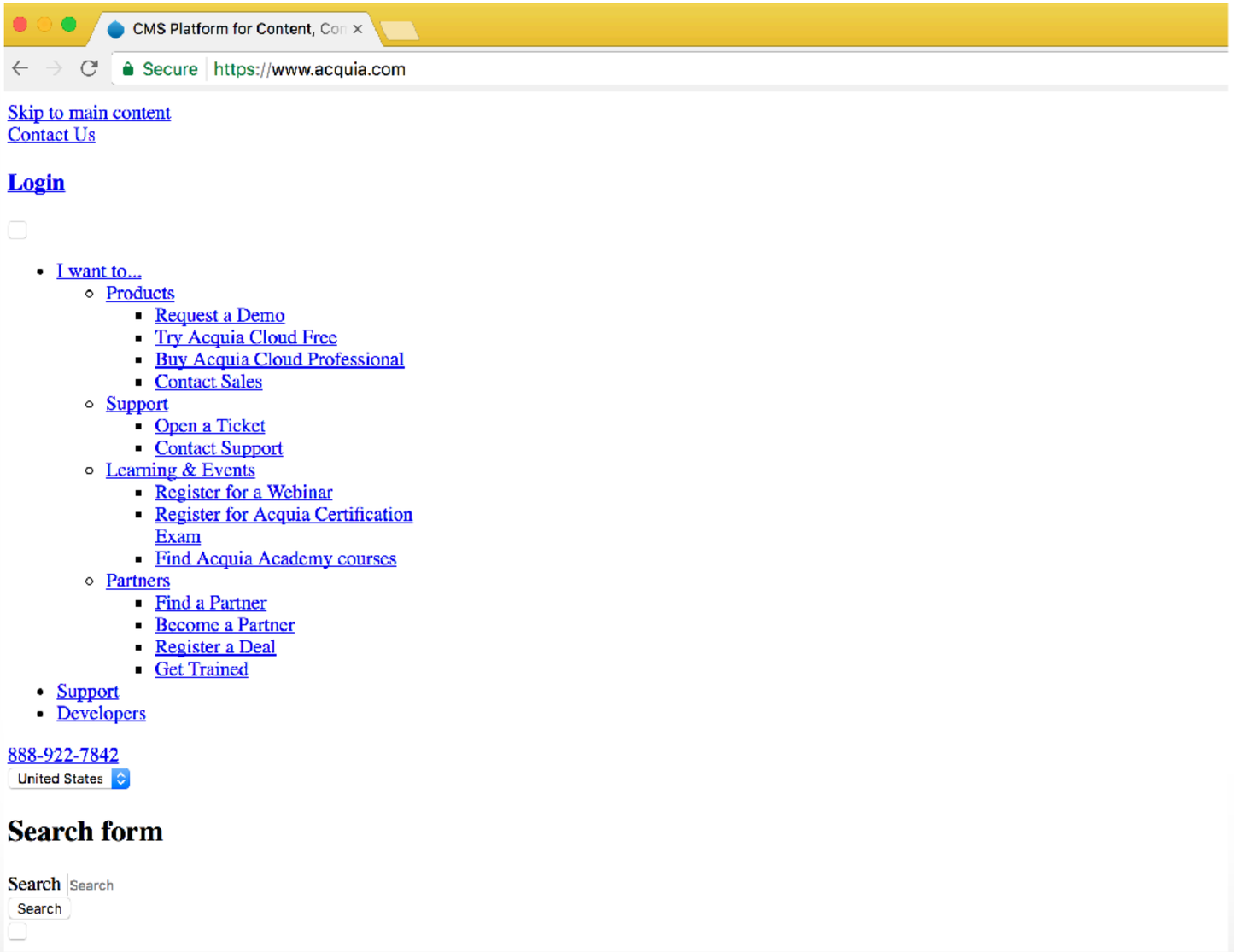
Replying to @glitch

I took down a university library on the 1st day of the semester with a botched FTP transfer of .htaccess. Better than Finals Week I suppose.

10:21 AM - 14 Jun 2017

What Is Debugging?

Nothing But Text?



Nothing But Text?

- CSS aggregated but not cached
- JS blocked in the browser
- File permissions in sites/default/files

Debugging vs Troubleshooting

- Mostly a semantic difference
- 5 minutes vs 5 hours?
- “Fixed” vs understood and corrected

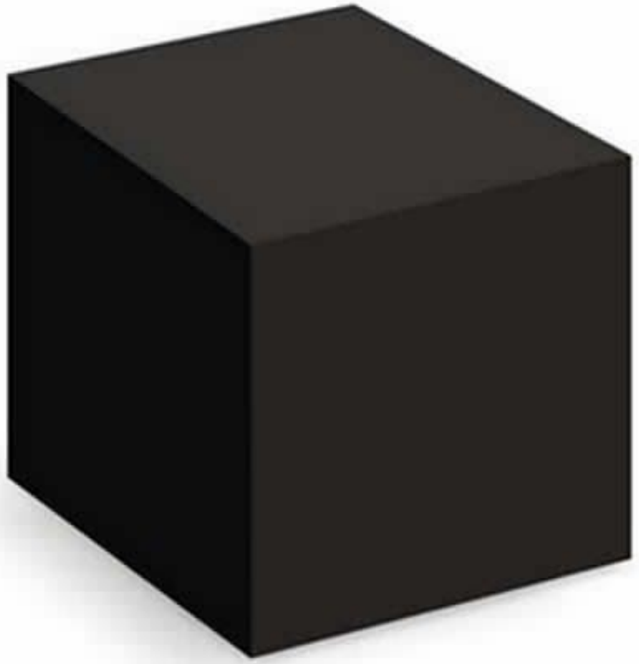
What Is The Black Box?

A Familiar Story?

- Non-technical education
- Self taught web skills
- Above average Googling abilities
- Late nights staring at error messages

What Is Drupal?

Mental Model of Drupal



Mental Model of Drupal

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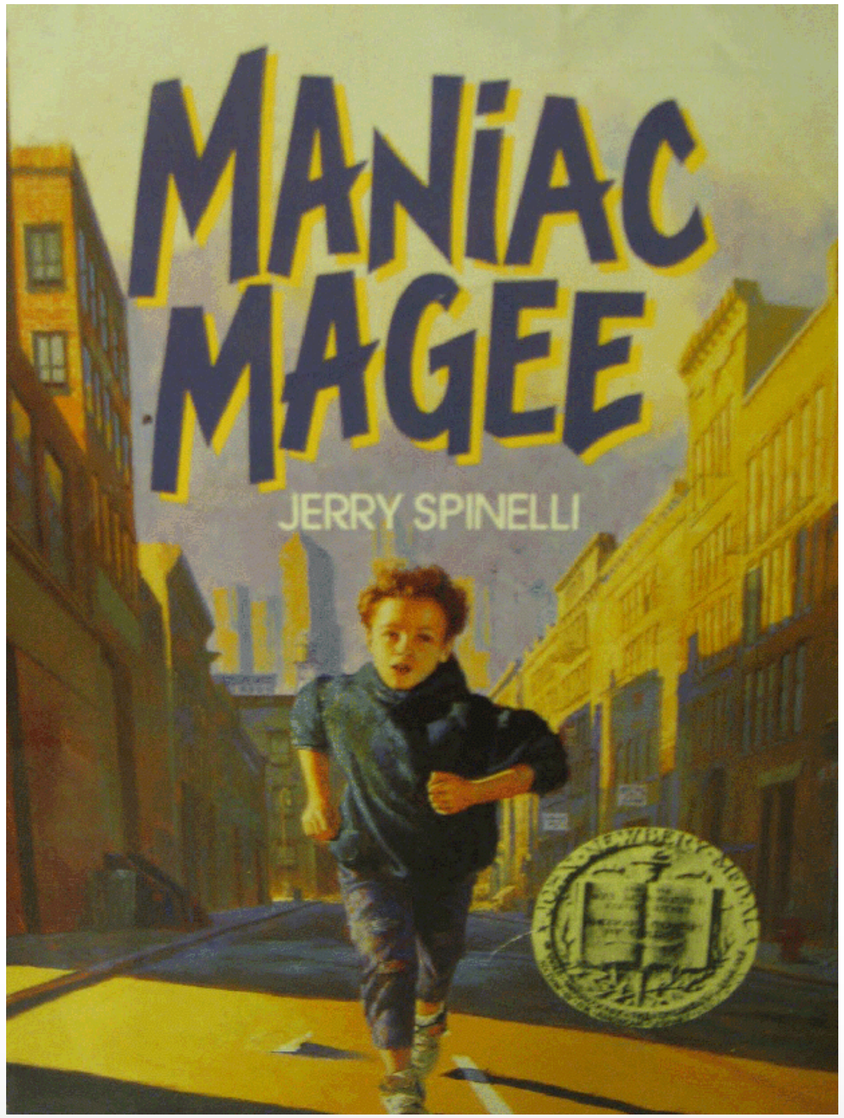

Mental Model of Drupal

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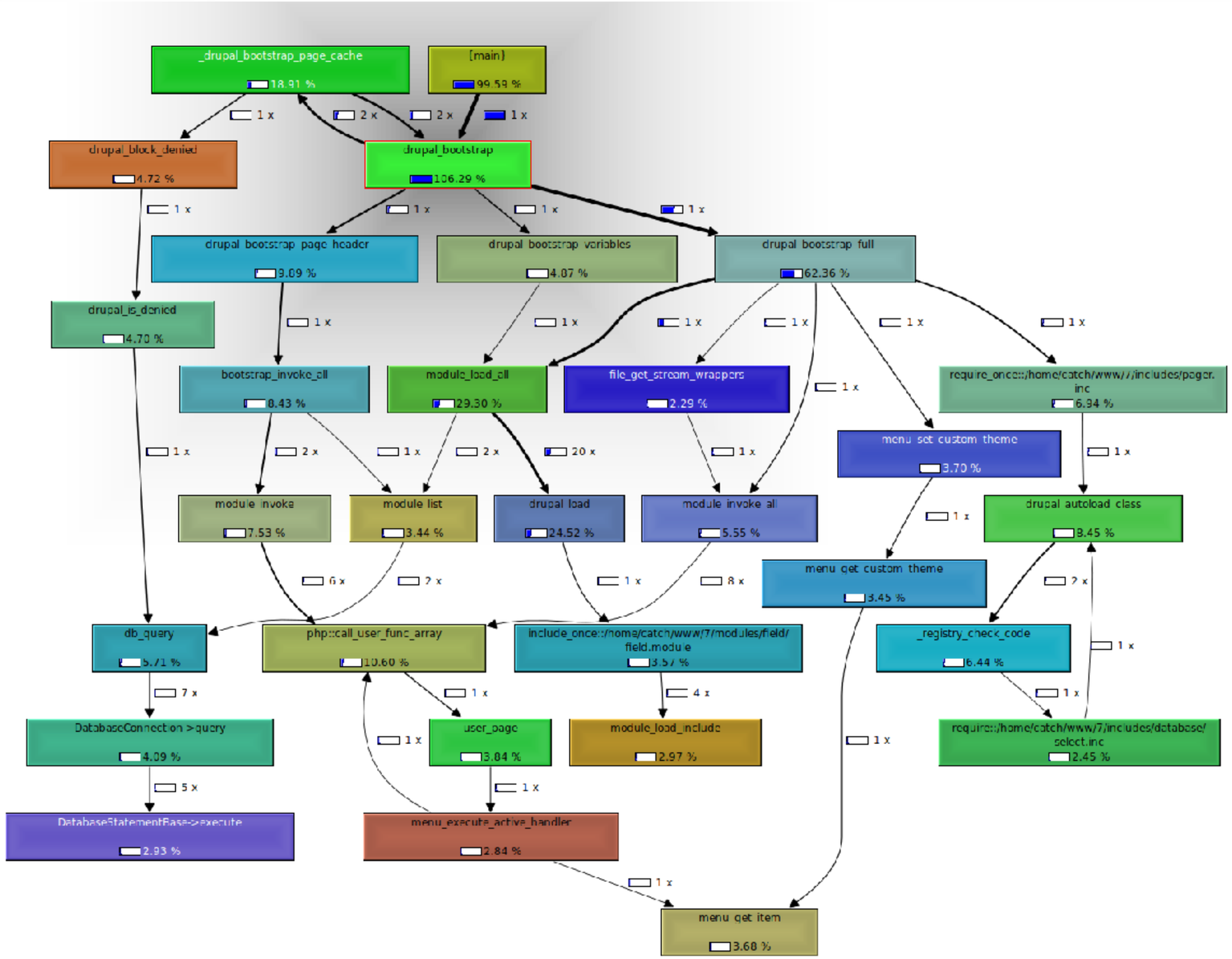
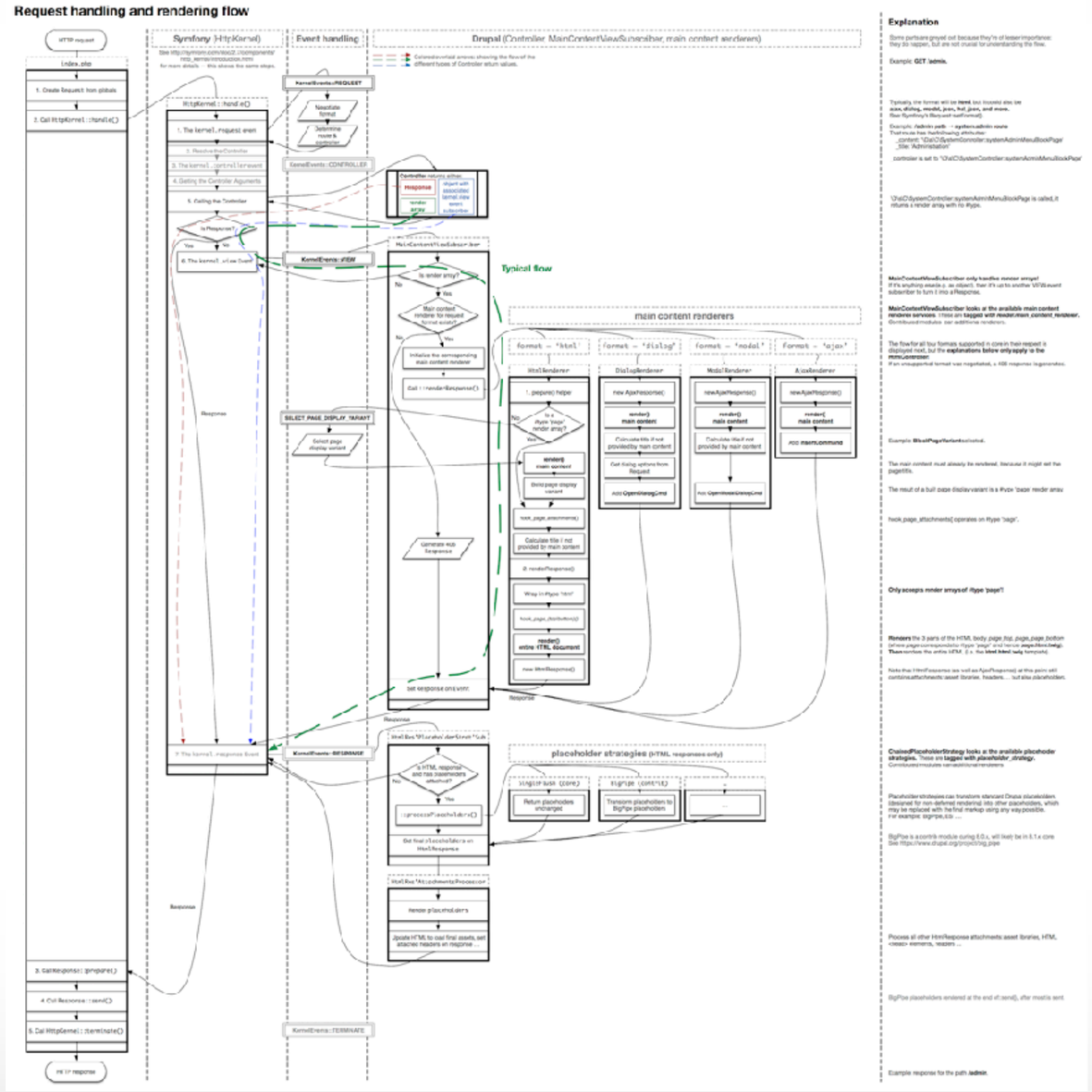


Mental Model of Drupal



Start At The Beginning

When All You Have Is A Hammer

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Text Editors

- “Text Editors”
- Text Editors
- IDEs

“Text Editors”

- Notepad (Windows)
- Text Edit (Mac)
- Nano (Linux / Mac)

Text Editors

- Notepad++ (Windows)
- Dreamweaver (Mac / Windows)
- Sublime Text (Mac / Linux / Windows)
- Atom (Mac / Linux / Windows)
- vim (Mac / Linux)

Integrated Development Environments

- PHPStorm (Mac / Linux / Windows)
- Eclipse (Mac / Linux / Windows)
- Komodo (Mac / Linux / Windows)

Operating Systems With Built In Text Editors

- emacs (Mac / Linux / Unix / Everything else)

Development Environments

- On your server
- On your machine
- On your machine, but it acts like the server

Development Environments

- FTP Development
  - “Cowboy coding”
- Local Environments
  - MAMP / LAMP / Vagrant
- Next generation
  - Kalabox / Lando CLI
  - DrupalVM

FTP Development

- FTP Development
  - “Cowboy coding”
  - No version control up front
  - Little debugging visibility
    - Log files (maybe), debug statements
    - Watchdog logs (maybe)

Debug Statements in Code

- print_r()
  - Raw dump of a variable or context, no formatting
  - print_r($node);
    - <pre><?php print_r($node); ?></pre>
  - dsm() / kint()
    - Formatted dump of a variable or context
    - dsm($node);

Local Development

- MAMP / Dev Desktop / Native LAMP
  - Code runs entirely locally
  - Added bonus of offline work, no internet required
- print_r(), dsm(), kint(), but also more
- xdebug

Local Development: The Next Generation

- Kalabox / Lando with Pantheon / Acquia integration
- DrupalVM and other custom Vagrant boxes
- print_r(), dsm(), kint(), xdebug
- Very accurate performance profiling
  - XHProf
  - Blackfire
  - Tidewater

What's xdebug?

xdebug: Step Through Debugging

- Hitting pause on code execution
- Inspecting the current state of “the stack”
- Modifying values *live*

Something Is Broken!

Relax.

DHH
@dhh

Unless you're making software for rockets, self-driving cars, or pacemakers, ease off on the "mission critical" bullshit, yeah?

RETWEETS	LIKES
353	968

7:22 AM - 15 Feb 2017

50 353 968

Relax.

Remember Cobble's Knot

What's Broken?

- Is something not showing up?
  - New content - is it published?
  - Old content - are permissions set properly?
- Is something showing up that shouldn't?
  - Raw HTML and Javascript in a WYSIWYG field?

Work From The Bottom Up

- Log Files
  - You should learn how to find your log files before you need your log files
- multitail
  - Linux / Mac utility to easily view logs with more options than tail

Where Is It Broken?

- Custom Module
- template.php / .theme file
- Theme Template

The Scientific Method

Finally, Debugging

- Change ***one*** thing at a time
- Test that change
- Repeat

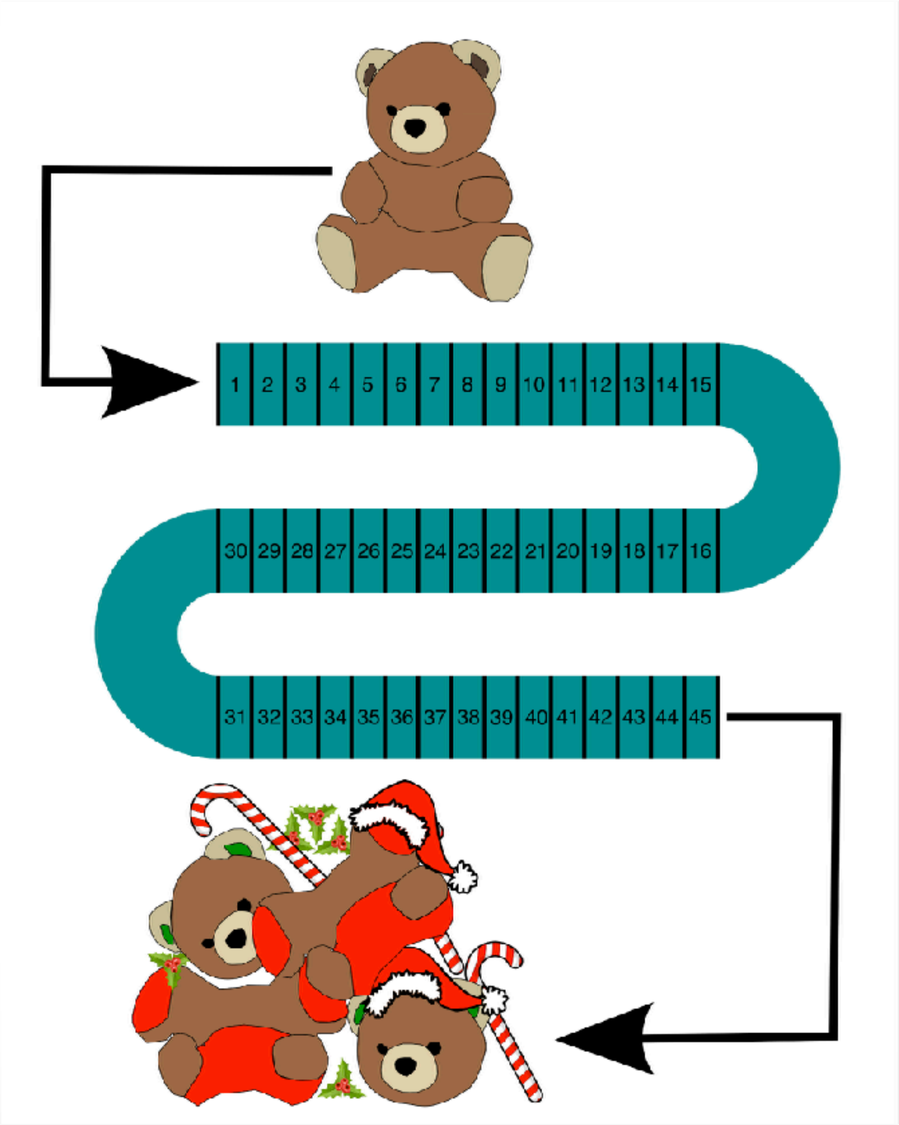
git Is Your Friend

- Save your progress as you work
  - Recreate your Features or config yml
- Makes rabbit holes manageable

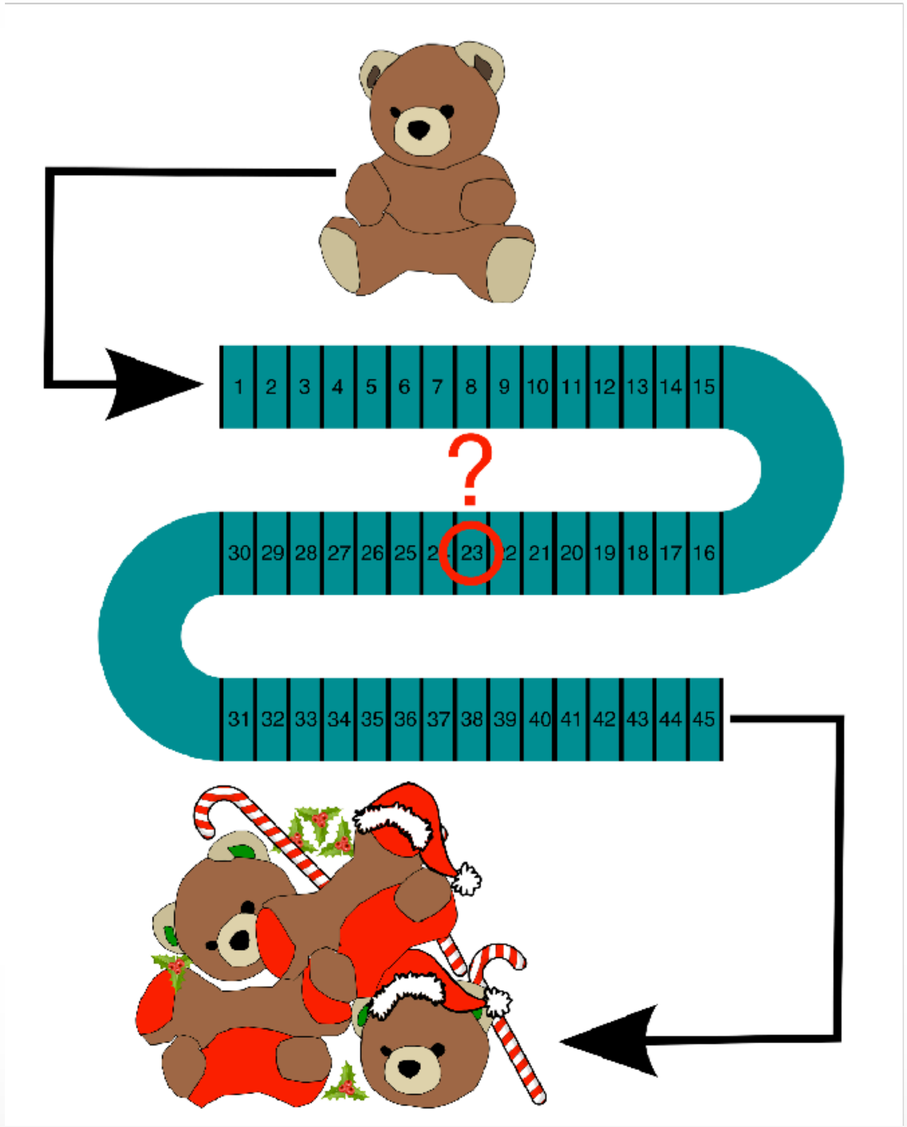
git bisect Is Your Friend

- Let's you isolate changes between commits

git bisect Is Your Friend



git bisect Is Your Friend



git diff Is Your Friend

- Remove your debug statements
- Ensure you only changed **as much** as you needed to change
- You only commit **dsm('Butts')**; to master ***once***

git blame Finds Your Enemies

git blame ~~Finds Your Enemies~~

git ~~blame~~ Is *Your* Friend

git annotate Is *Your* Friend

- Can help you track down who wrote the offending code
  - This ***should not*** be a witch hunt
  - This ***should*** be a chance to find context for the issue

Other Debugging Methods

Debugging Techniques

- Walk away. Seriously.
- Talk to a coworker.
  - Talk to a rubber duck.
- Write it down. By hand.

Make The Future Easier

Proactive Debugging

- watchdog() (D7)
- \Drupal::logger() (D8)
- syslog Module
  - https://www.elastic.co/blog/heya-elastic-stack-and-x-pack
  - https://loggly.com
  - https://www.sumologic.com
- Write a test!
  - Simpletest
  - Behat

Further Reading

- **The Art of Troubleshooting** by Jason Maxham
  - https://artoftroubleshooting.com/book/
- **Debugging: The 9 Indispensable Rules for Finding Even the Most Elusive Software and Hardware Problems** by David Agans
  - http://debuggingrules.com
- **Debugging During Development in Drupal 8** by Allie Jones
  - https://www.gitbook.com/book/zivtech/debug-tools-for-drupal8/
- **Using the PhpStorm Debugger** by JetBrains
  - https://confluence.jetbrains.com/x/_idqAw
- **Maniac Magee** by Jerry Spinelli
  - https://www.worldcat.org/oclc/20422223

Thanks!
Questions?
War stories?

@milsyobtaf

https://github.com/milsyobtaf/prez