

Opening The Black Box

Howdy!
I'm an engineer at
Acquia

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What Is Debugging?

Nothing But Text?

CMS Platform for Content, Con x

← → ↻

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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

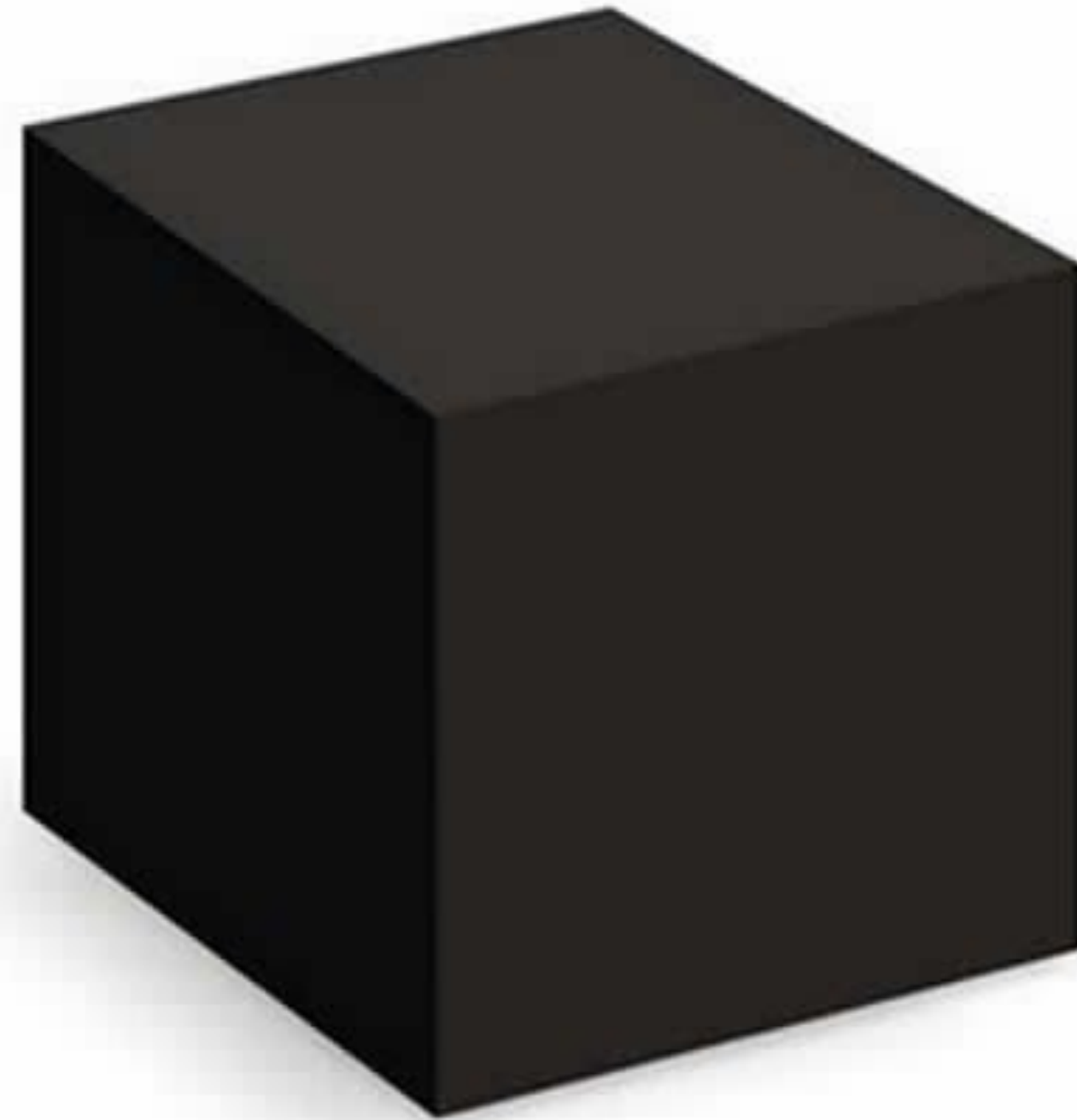
What Is The Black Box?

A Familiar Story?

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

What Is Drupal?

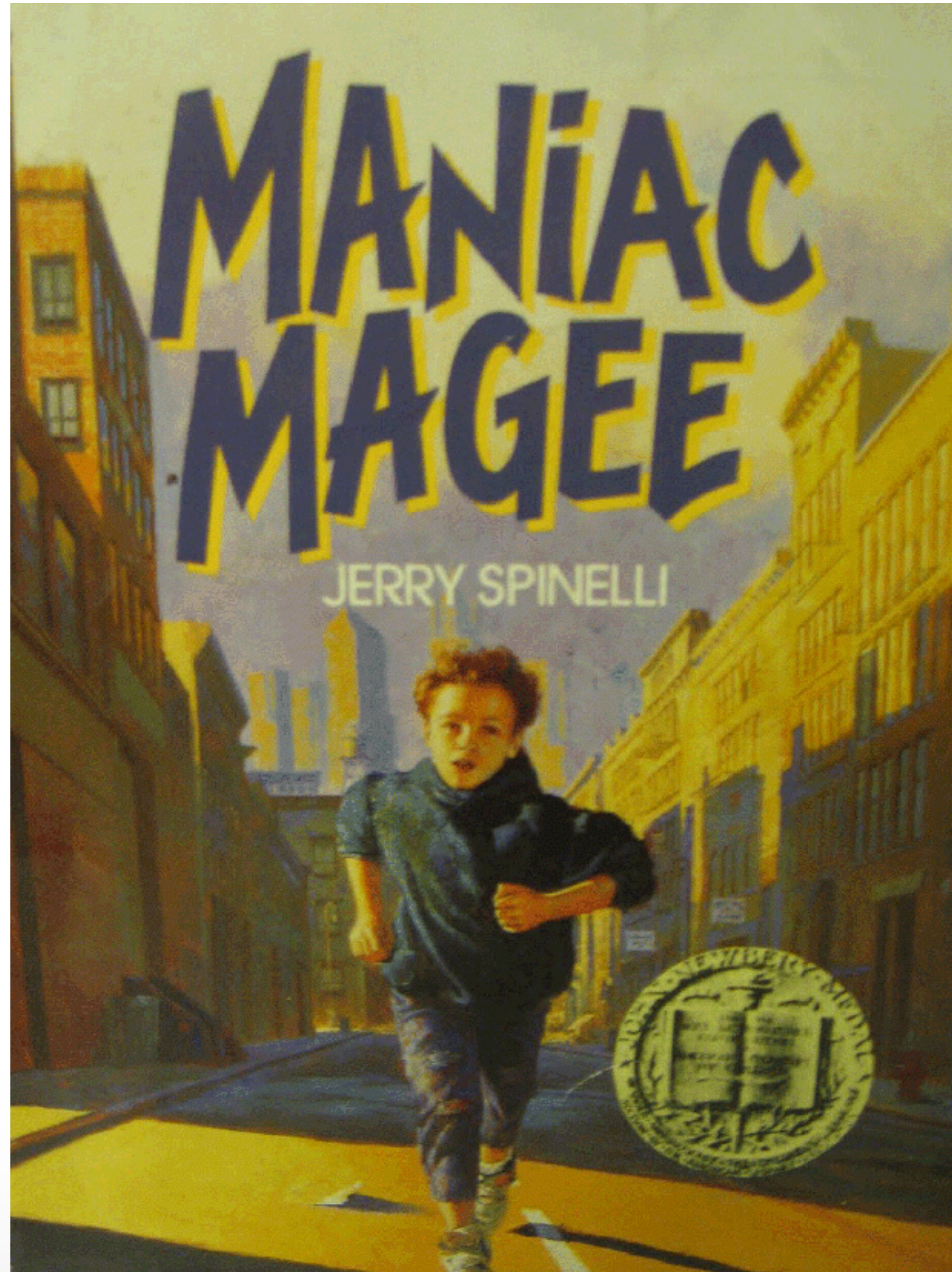
Mental Model of Drupal



Mental Model of Drupal



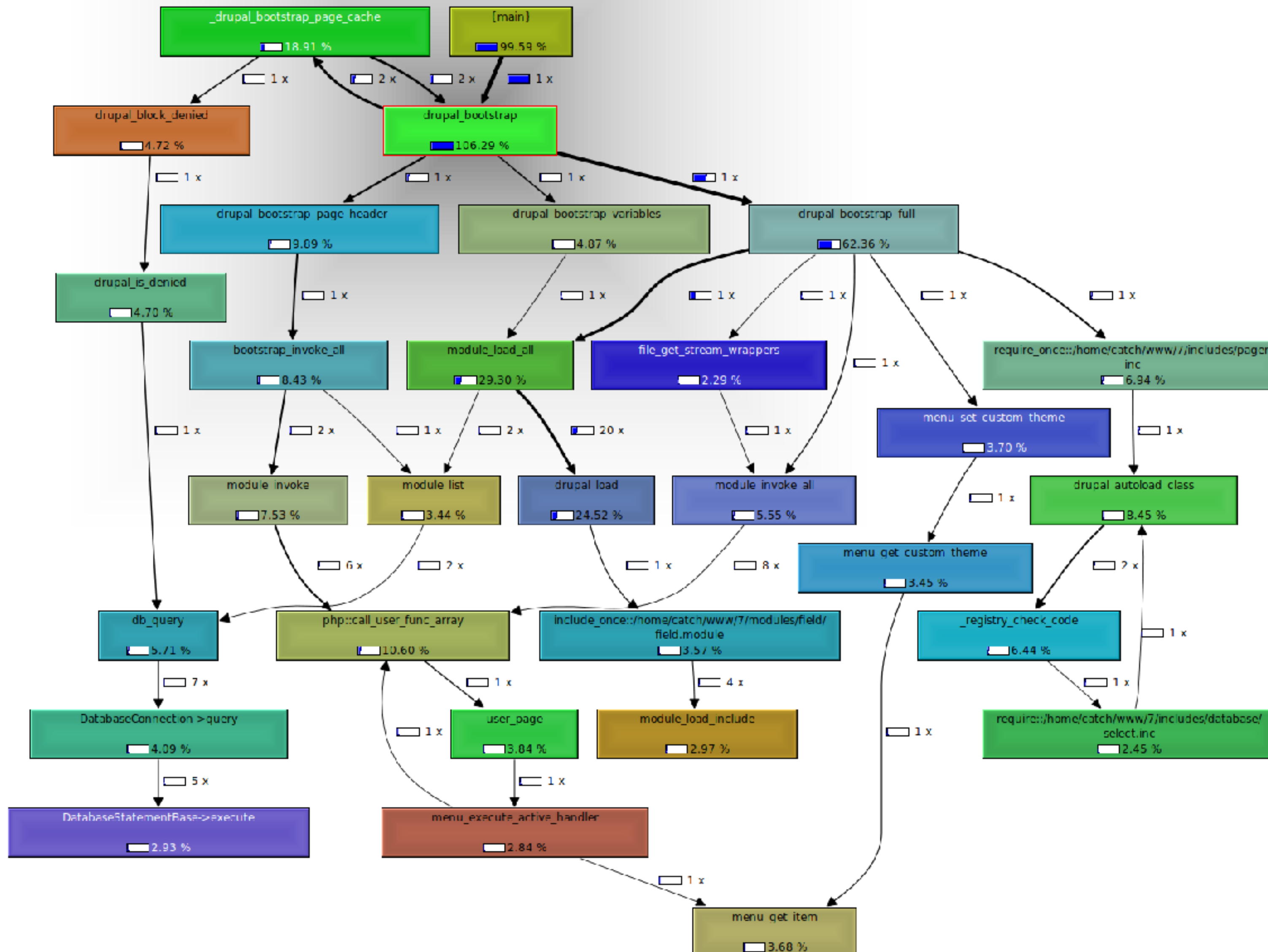
Mental Model of Drupal



Mental Model of Drupal



Mental Model of Drupal



Start At The Beginning

When All You Have Is A Hammer



Text Editors

- “Text Editors”
- Text Editors
- IDEs

“Text Editors”

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

Text Editors

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

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
 - 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 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.

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
- multital
 - 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

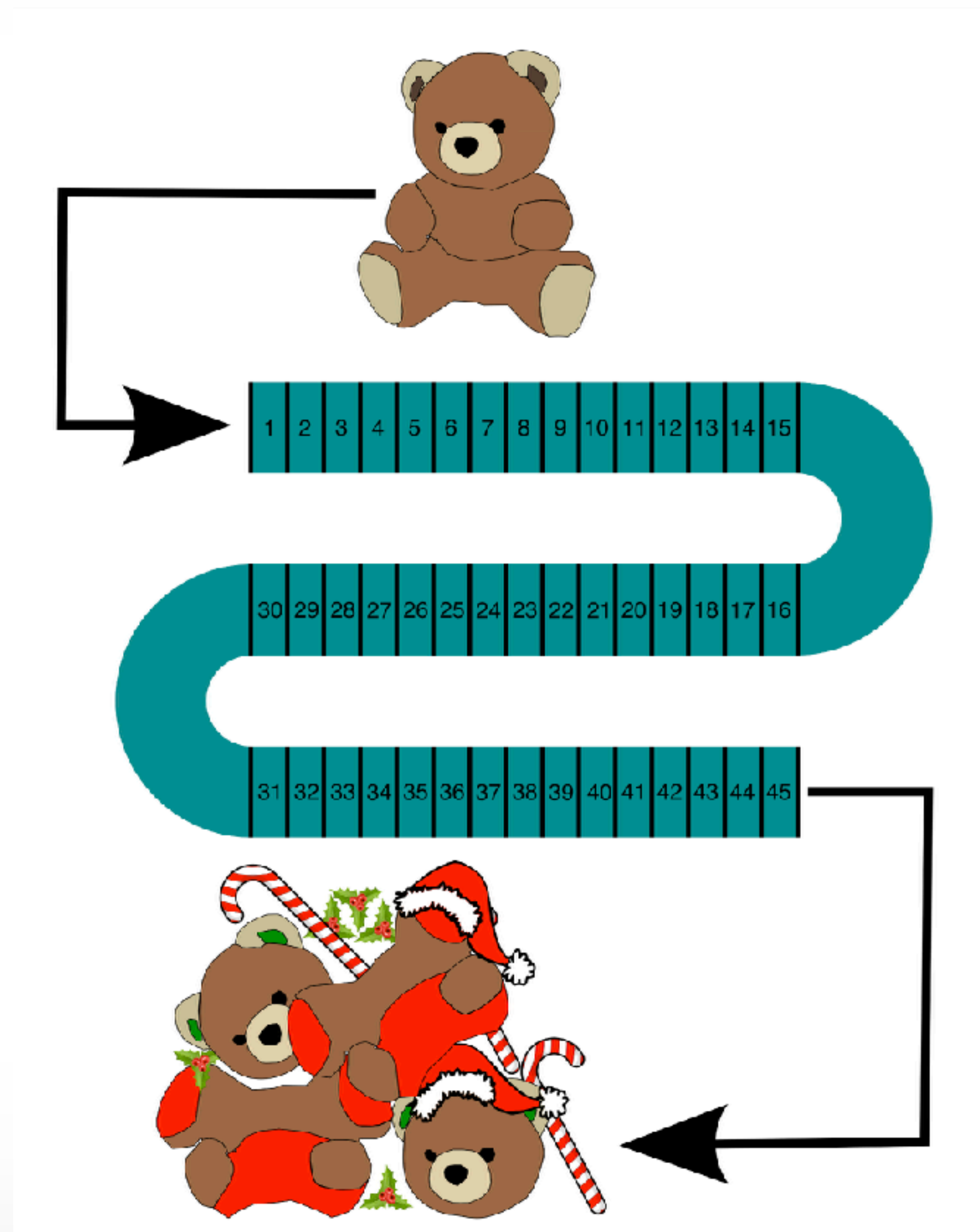
git Is Your Friend

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

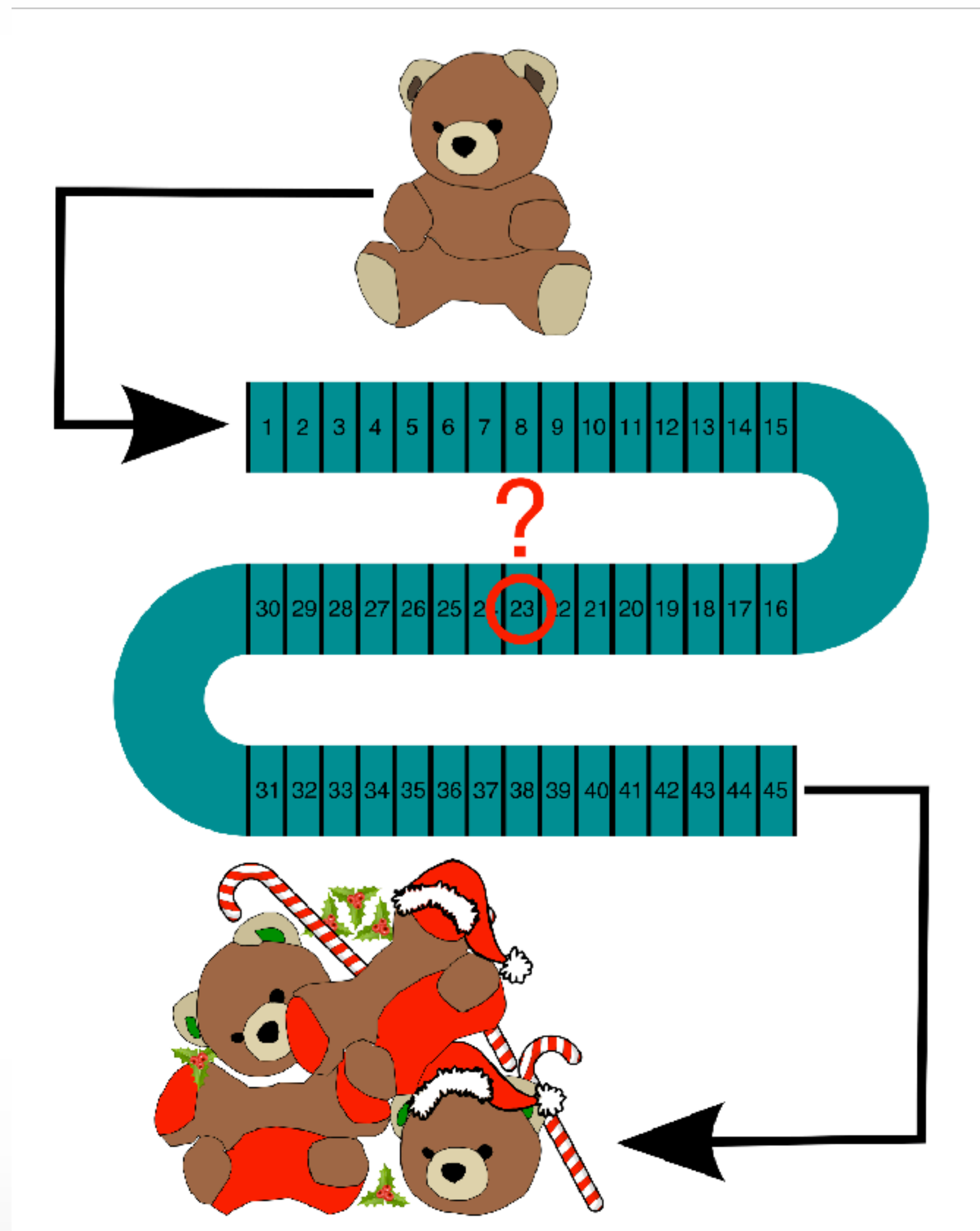
git bisect Is Your Friend

- 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

- 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

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://loggly.com>
 - <https://www.elastic.co/blog/heya-elastic-stack-and-x-pack>
 - <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>
- **Maniac Magee** by Jerry Spinelli
 - <https://www.worldcat.org/oclc/20422223>

Thanks!
Questions?
War stories?

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