Debugging Node.js Applications

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Sample Code

Download and play along:

https://github.com/NeoPhi/debugging

Slides indicate example code, if any, at bottom.

Debugging Mindset

Debugging is just problem solving!

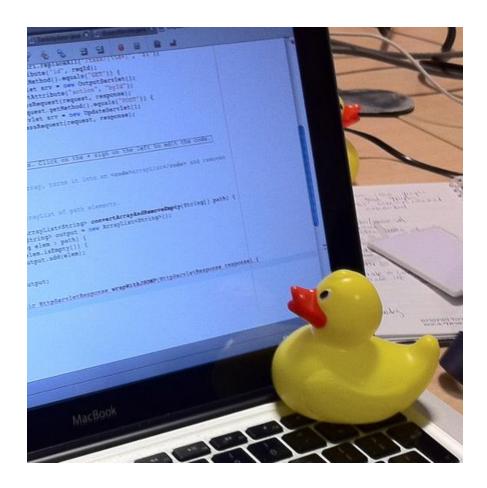
Fix the problem, not the blame.

Don't assume it - prove it!

The system probably isn't at fault.

Source: The Pragmatic Programmer (pages 90-98)

Rubber Ducks



Source: http://en.wikipedia.org/wiki/Rubber_duck_debugging

console.*

What is going on?

- console.log / console.info
- console.error / console.warn
- console.dir
- console.trace
- console.assert

Beyond console

If it was handy once why not keep it around?

- https://github.com/visionmedia/debug
 - Small debugging utility
- https://github.com/flatiron/winston
 - Multi-transport async logging library
- https://github.com/trentm/node-bunyan
 - JSON logger library

Interactive Debugging

Getting at the stack and state.

- node debug program.js
 - Command line debugger
- https://github.com/dannycoates/nodeinspector
 - Web Inspector based debugger
 - npm install -g node-inspector@0.1.10
- node --debug / node --debug-brk
 - debugger
 - kill -USR1 PID

Example: server.js

Profiling for Speed

Why is it taking so long?

- console.time / console.timeEnd
 - Quick and simple
- https://github.com/sivy/node-statsd
 - Client for Etsy StatsD server
- https://github.com/sidorares/node-tick
 - Runnable v8.log processor

Example: time.js

Profiling for Size

Why is it using so much memory?

- https://github.com/lloyd/node-memwatch
 - Library to keep an eye on your memory usage, and discover and isolate leaks
- https://github.com/dannycoates/v8-profiler
 - Doesn't work with newer node.js versions

Example: heap.js & leak.js

Maybe it is a Module?

Sanity checking modules.

- npm rebuild
 - Handy after changing node.js versions
- npm outdated / npm ls / npm update
 - Handy after updating package.json
- https://github.com/pksunkara/npm-police
 - Handy to check for module bug fixes

Other Resources

I've not used these but you might want to:

- https://github.com/nodetime/nodetime
 - Performance Profiler and Monitor
- https://github.com/newrelic/node-newrelic/
 - New Relic agent code base
- https://github.com/chrisa/node-dtrace-provider
 - Native DTrace probes
- http://www.jetbrains.com/webstorm/
 - JavaScript IDE with debugging support