Why the Sysadmin Hates Your Software

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Because we're cranky?

Sympathy for the Devel_{opers}

- We want similar things
  - Simplicity
  - Modularity
  - Robustness
  - Functionality
- Complexity is hard, but we have to cope anyway
- We want people to use our software and systems

Sysadmins work at a different level

- Sysadmins
  - Software and configurations
  - Hosts
  - Networks
  - Services
  - User experience of whole systems
- Developers
  - Programming languages
  - Libraries
  - APIs
  - Build systems
  - User experience of particular product

Sysadmins interact with software differently

- Installation
- Maintenance
- Troubleshooting
- Maintaining many, many items of software
- Sysadmins are often **not** users of the software they're maintaining
- Sysadmins help make your software available to users

System administration is changing

- Larger, more complicated systems
- Many more hosts and networked systems
- Need for replication
- Increasing use of automation
- Less time for elaborate hand-crafting of software

Tools of the modern sysadmin

- Version control for system configuration
- Configuration management systems
  - Examples: Puppet, cfengine
- Automated installation systems
  - Examples: Kickstart, Jumpstart
- Virtual machines
- Sometimes tools like CMS or VMs are used to prop up poor software

What do configuration management systems do?

- Specify intended state of system resources
- Continually inspect system state, modify to match specification
- Configuration management is almost always closely integrated with version control
- Essentially using software to manage other software through the entire process of installation, configuration, and operation

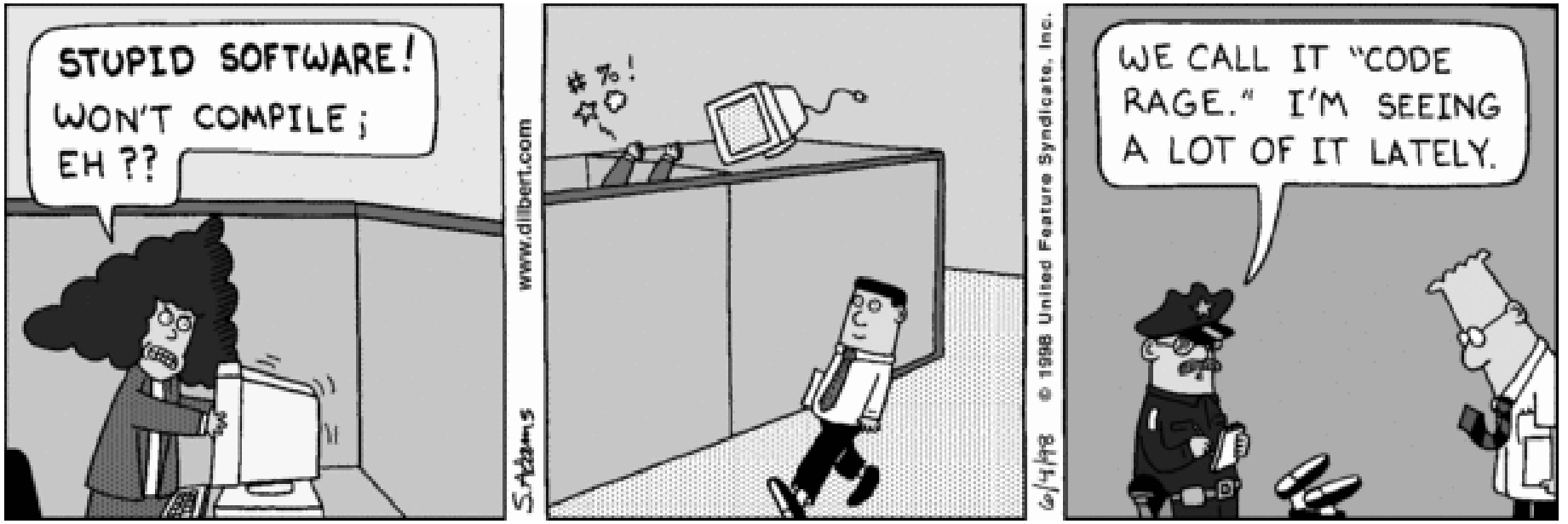
Puppet configuration example

```
package { "sendmail":
  ensure => installed,
}

file { "/etc/mail/sendmail.cf":
  owner  => root,
  group  => root,
  mode   => 444,
  source => "puppet:///sendmail/sendmail.cf",
}

service { "sendmail":
  enable     => true,
  ensure     => running,
  hasrestart => true,
  hasstatus  => true,
  require    => [ File["/etc/mail/sendmail.cf"], Package["sendmail"] ],
  subscribe  => File["/etc/mail/sendmail.cf"],
}
```

So, why does your software suck?

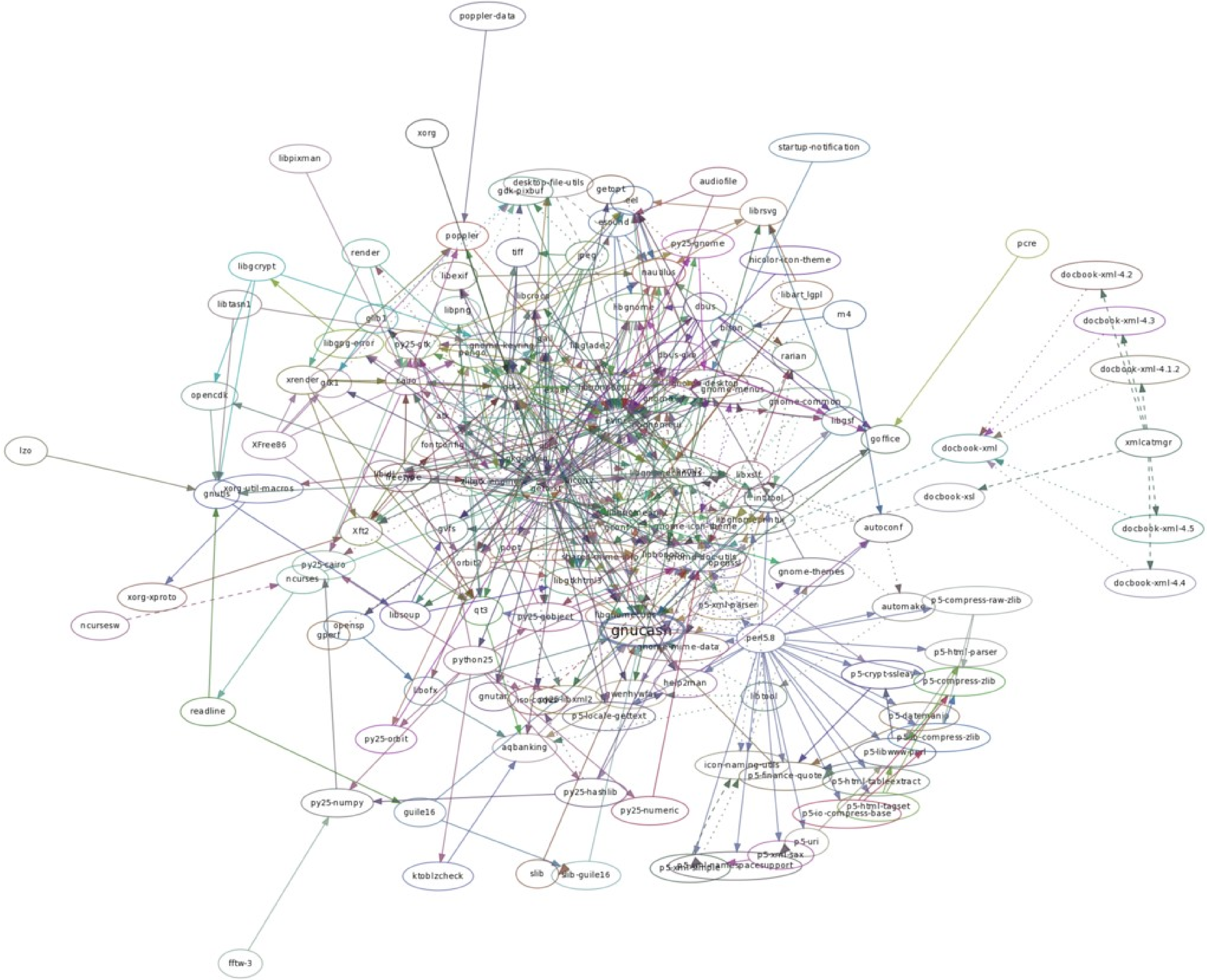


Labor-intensive manual installation

- “Just specify these 37 simple configuration items in our GUI/browser interface/install script”
  - Aaarrrggg. Kill me now.
- “Copy this file there, copy that file over there, run this, edit that”
  - Yuck.
  - But it may be easier to automate.
- What we want is automated installation **and** uninstallation, as well as ways to automate configuration and customization

Better approaches to installation

- `./configure; make; make install`
  - Less manual effort
  - Not always easy to uninstall or upgrade
  - At least maybe I can build my own package
- `dpkg -i foo_1.2.3_i386.deb`
  - Least manual effort for sysadmin (or end user) to install
  - Easy to uninstall (`dpkg -r`)
  - **If** package dependencies have been specified properly and package was built to standards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readline
p5-locale-gettext
p5-datemanip
p5-io-compress-zlib
py25-orbit
aqbanking
p5-libwww-perl
icon-naming-utils
p5-finance-quote
p5-html-tableextract
py25-hashlib
py25-numpy
guile16
py25-numeric
p5-html-tagset
p5-io-compress-base
p5-uri
p5-xml-sax
ktoblzcheck
slib
slib-guile16
p5-xml-simple
fftw-3

Dependency hell

- “ . . . lives high on the software food chain”
- Reusing modular components is (usually) good
- Increased installation footprint and management complexity is bad
- Try not to bundle specific library versions, use system libraries as much as possible
- Put careful thought into library APIs for portability, backward compatibility

Horrible error messages

- “Invalid Database Collation”
- Tell me what you want, not that something went wrong
- Have messages that are of some help to end users
- Java tracebacks are not useful error messages

Why sysadmins hate browser-based configuration interfaces

- “You can't grep a web page”
- Replication of configuration is tedious
- Version control is nearly impossible
- Automated configuration management is nearly impossible

Why sysadmins love config files

- Ideally, encapsulate configuration state in one object
- Easy to search and compare
- Easy to distribute and replicate
- Lots of tools for automated editing
- Easy to put in version control
- Easy to directly manage with configuration management systems

Fighting over config files

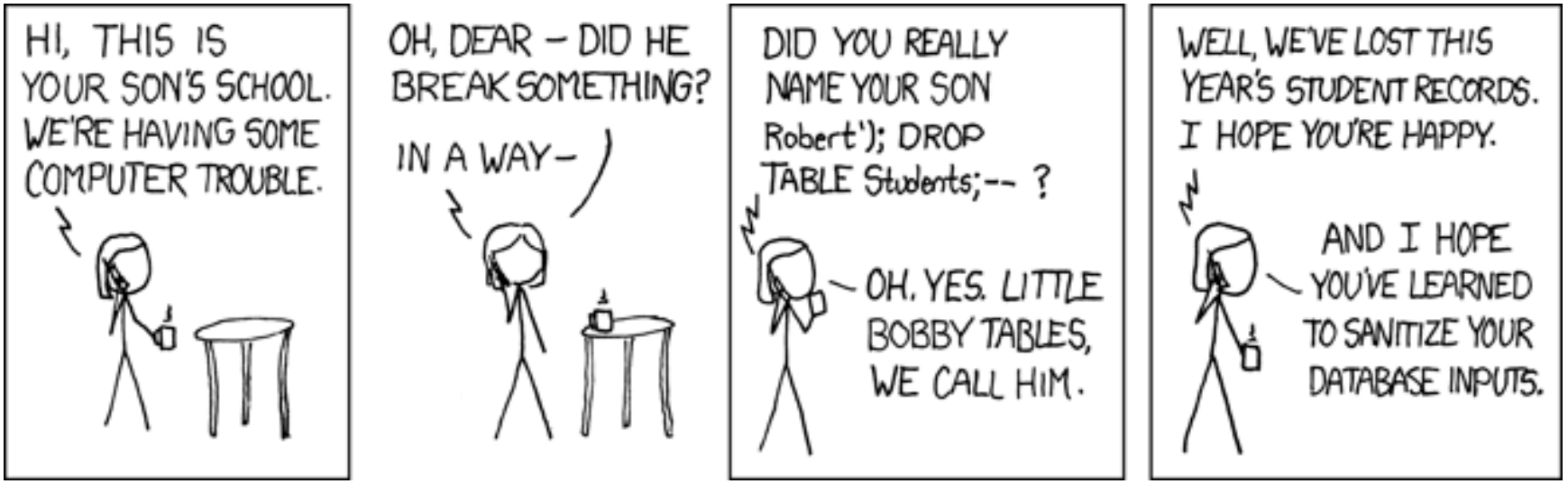
- Software writes its own config files (usually from GUI/browser-based interface)
- Sysadmin cheats and grabs underlying config files to put in configuration management
- Software rewrites its config file
- Configuration management system sees different config file contents, reinstalls its own file
- Software freaks out over unexpected change

Making everyone happy

- Casual users tend to prefer GUI or browser-based interfaces for configuration
- Sysadmins want easy ways to automate and replicate configuration
- Can you provide a low-level interface that is more satisfactory to sysadmins?
- But please, not yet another database or binary format that requires special editing tools

Bad security choices

- Naively ship with (or require) world-writable files, administrator or superuser privileges
- Default passwords or unrestricted access
- Please not another separate authentication database
- Poor input validation leading to security exploits



Documentation

- At least try to explain what your software does
- Highlight unusual installation requirements
- Have error messages that line up with documentation

Summary

- Be good at doing things you're supposed to be doing anyway
  - Modular, flexible design
  - Software that fits well into its intended environment
  - Helpful documentation and diagnostics
- What sysadmins want is different from what users want
  - Automation of all aspects of software management