

ACHIEVING ZEN THROUGH BUNDLING APPLICATIONS WITH DOCKER



ADRIAN MOUAT
Container Solutions

SO WHAT IS DOCKER?

CONTAINERIZATION

A Docker container is a *portable* store for a *single component* and its *dependencies*

SIMILAR TO A LIGHTWEIGHT VM

- Both provide *isolated environments*
- Docker is much more efficient
- 64-bit Linux only (currently)

DOCKER IMAGES

- Like a stopped VM
- Built from Dockerfiles
- List of repeatable steps
- [Mongo Dockerfile](#)


BUT DOCKER IS MORE THAN THIS

- Aims to be an "open platform"
- Key to this is the Docker Hub



Official Repositories



ubuntu  The Official Ubuntu base image



WordPress is a free and open source blogging tool and a content management system



Popular open-source relational database management system



Document-oriented NoSQL database



Official CentOS base image



High performance reverse proxy server



Relational database management system



Node.js is a platform for scalable server-side and networking applications

Top Contributors



clue

~Aachen, Germany



cpuguy83

Florida



radial

Los Angeles



pinterb

 158

 153

 126

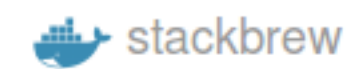
 116

Popular Repositories

ubuntu

Official Ubuntu base image

 877



centos

The official build of CentOS.

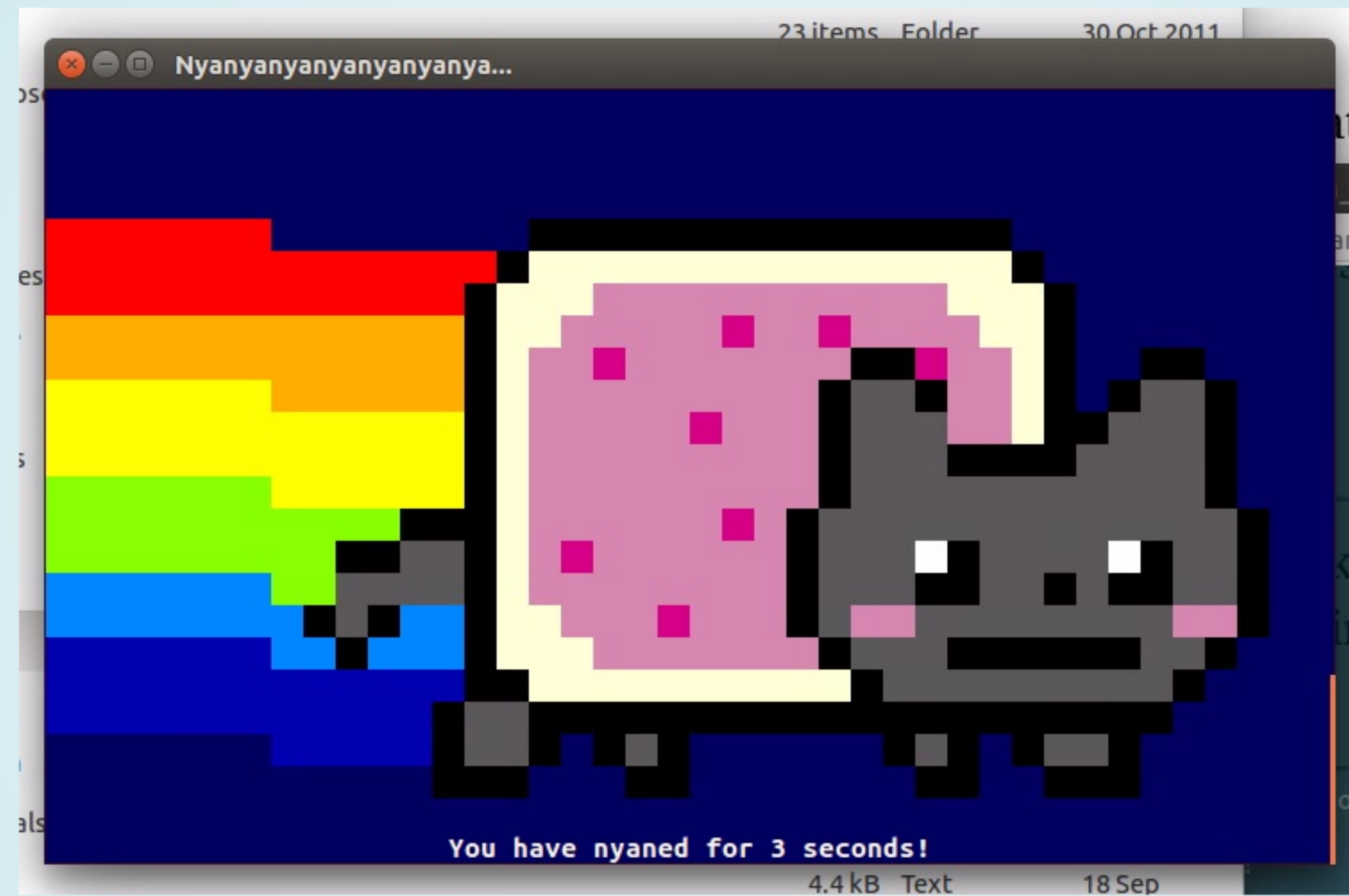
 569



USE CASES

- Continuous Delivery
 - Reduces difference between dev and production
- Microservice Architectures
 - Rapid Provisioning
 - Rapid Deployment
 - Devops
- Wrapping Applications

THE MOMENT OF EPIPHANY!



SO? WHAT'S THE BIG DEAL?

IT'S JUST A CAT WITH A
POP-TART BODY FLYING
THROUGH SPACE WITH
RAINBOWS COMING OUT
ITS REAR END!

- Easy Install
- (Relatively) Safe
- Portable
- Easy to Throw Away

EASY INSTALL

BUT IT'S IN THE PACKAGE MANAGER!

- But what if it wasn't?
- Or it's not in my package manager?
- Build from source?
 - Runtime dependencies
 - Build dependencies

RELATIVELY
SAFE

WHEN WAS THE LAST TIME YOU BLINDLY TRUSTED SOFTWARE?

- Everyday we download and run random software
- Could potentially steal data
- Delete things
- Accidentally or intentionally

SUBUSER

- <http://subuser.org>
- Secure package manager
- Uses Docker to isolate software packages
- Config file for permissions
 - Access to x11
 - Access to devices
 - Access to folders
- Installs for common software

PORTABLE

- Should run identically everywhere
- Doesn't need a package manager
- Won't be different on Ubuntu and Fedora
- Less testing with different versions of libs
- Can run on a remote machine
 - Docker Hub

EASY TO
THROW AWAY

- Uninstallation is a snap
- Dependencies gone too
- No files left lying about

USE CASES

The screenshot shows the Eclipse IDE interface. The top toolbar contains various icons for file operations and development tools. The left sidebar displays the 'Navigator' view with a tree structure of the project files. The main editor area shows the 'validate.java' file, which contains Java code for validating XML files against an XSD schema. The code includes imports for SchemaFactory, File, StreamSource, and SAXException. The main method 'main' takes an array of arguments and performs the validation logic, including parsing arguments, creating a schema factory, loading the XSD and XML files, and validating the XML against the schema. Error handling is implemented using try-catch blocks for SAXException and IOException. The bottom status bar shows the current file path: 'xsd-validator/src/xsdvalidator/validate.java'.

Navigator View:

- .project
- .tags
- build.xml
- diffxml_install.sh
- diffxml.cmd
- diffxml.sh
- INSTALL.bin
- INSTALL.src
- patchxml_install.sh
- patchxml.cmd
- patchxml.sh
- README.txt
- test1a.xml
- test2a.xml
- land_of_lisp
- Squashie
- tryagain
- xpathgen
- xsd-validator
 - .settings
 - build
 - lib
 - src
 - xsdvalidator
 - validate.java
- .classpath
- .project
- build.xml
- test.xml
- test.xsd

validate.java Code:

```
public static void main(String[] args) {  
  
    parseArgs(args);  
    SchemaFactory factory = SchemaFactory.newInstance(  
        "http://www.w3.org/2001/XMLSchema");  
  
    File XSDFile = new File(mXSDFileName);  
    File XMLFile = new File(mXMLFileName);  
  
    try {  
        Schema schema = factory.newSchema(XSDFile);  
        Validator validator = schema.newValidator();  
  
        Source source = new StreamSource(XMLFile);  
  
        try {  
            validator.validate(source);  
            System.out.println(mXMLFileName + " validates.");  
        }  
        catch (SAXException ex) {  
            System.out.println(mXMLFileName + " fails to validate because: \n");  
            System.out.println(ex.getMessage());  
            System.out.println();  
        }  
        catch (IOException io) {  
            System.err.println("Error reading XML source: " + mXMLFileName);  
            System.err.println(io.getMessage());  
            System.exit(1);  
        }  
    } catch (SAXException sch) {  
        System.err.println("Error reading XML Schema: " + mXSDFileName);  
        System.exit(1);  
    }  
}  
  
/**  
 * Checks and interprets the command line arguments.
```

DEVELOPMENT ENVIRONMENTS

- Share pre-configured set-up
- Plug-ins, source repositories, coding standards
- Also Vagrant

SPECIALIZED SOFTWARE & CONFIGURATIONS

- Sound/Video Editing
- Mail Servers
- Industry/Device Specific
- Stacks

LEGACY SOFTWARE

- Bit rot
- Pin everything to specific version
- Still difficult
 - Docker moving target
 - Kernel
 - Package Repositories

EXAMPLES

ERR, THIS?

- Fit of rage at Powerpoint
- Decided to try reveal.js
- Hard to install
 - Node, NPM, Grunt...

[Browse Repos](#)[Documentation](#)[Community](#)[Help](#)[amouat](#) [Repositories \(7\)](#)[Users \(5\)](#)[Organizations \(0\)](#)

Show:

All

Sort by:

Relevance

**amouat/revealjs**

3 days ago

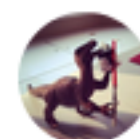
Dockerized version of the RevealJS presentation software.



4



6

**parente/revealjs**

6 months ago

reveal.js base image with ONBUILD delayed content inclusion.



1



158

**michaelsauter/revealjs**

8 months ago



0



5

**antonlindstrom/revealjselks...**

6 months ago



0



65

**antonlindstrom/revealjstest**

6 months ago



0



10

**balibali/revealjs**

4 months ago



0



1

**antonlindstrom/revealjspupp...**

6 months ago



0



12

SIMPLE TO RUN

```
docker run -d -p 8000:8000 -v  
/home/adrian/presentations/zen_thru_docker/./revealjs  
amouat/revealjs
```

LINKS

- <https://registry.hub.docker.com/u/amouat/revealjs/>
- RevealJS Dockerfile

WHY IS THIS COOL?

- Runs anywhere Docker runs
- Can easily host on web server
- Or easily distribute via Hub

SO WHAT WAS THAT ABOUT ZEN?

- Currently writing a book on Docker
- Wanted a "distraction free" writing environment
 - Think WriteRoom, Ommwriter
 - Zen mode for Github
- Decided to use Vim

MAKING DIM

- Had to analyse *dozens* of plug-ins and articles
- Try out various things
- Without breaking existing Vim
- Docker helped!

```
[[container_arch]]  
.3 containers running on a single host  
image::images/container_arch_clipped.png[scale="25"]  
****
```

=== Docker and Containers

Containers are an old concept. For decades, UNIX systems have had the chroot command which provides a simple form of filesystem isolation. FreeBSD has had the jail utility since 1998, which extended chroot sandboxing to processes. SolarisZones, LXC and OpenVZ continued to build on the concept, coming closer to creating completely isolated and self-sufficient environments similar to those provided by VMs. However, it wasn't until Docker appeared on the scene in 2013 that containers became mainstream.

Docker took the existing Linux container technology added various missing pieces to create a complete and user-friendly solution for creating and distributing containers. The Docker platform has two distinct components; the Docker Engine, which is responsible for creating and running containers and the Docker Hub, a cloud service for distributing containers.

//Need to bring in concept of docker containers and docker infra here

*//Perhaps the most significant of these pieces is the use of Union
//file systems, Docker registries and the Docker API.*

*//Not sure about this bit
//Union file systems enable the layering and caching model used in Docker. This
//model is central to the fast start-up time and dependency sharing provided by*

DIM ADVANTAGES

- Quick install
- Doesn't interfere with existing Vim
- Nice to have separate program

DOCKERIZE ALL APPS!

- Easy to distribute & install
- Controlled dependencies
- Safer for users
- Portable

- Chief Scientist @ Container Solutions
- Writing O'Reilly book on Docker
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