



Backing up your app

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What should you back up?



Everything



Everything

- Data



Everything

- Data
- Code



Everything

- Data
- Code
- User created content



Everything

- Data
- Code
- User created content
- Your server configuration



General backup principles

Automate it



General backup principles

Test Recovery



General backup principles

Automate Recovery



General backup principles

Save Everything



General backup principles

DO IT!



Where should I backup to?



Where should I backup to?

- Off-site



Where should I backup to?

- Off-site
- Secure



Where should I backup to?

- Off-site
- Secure
- Price



Amazon S3



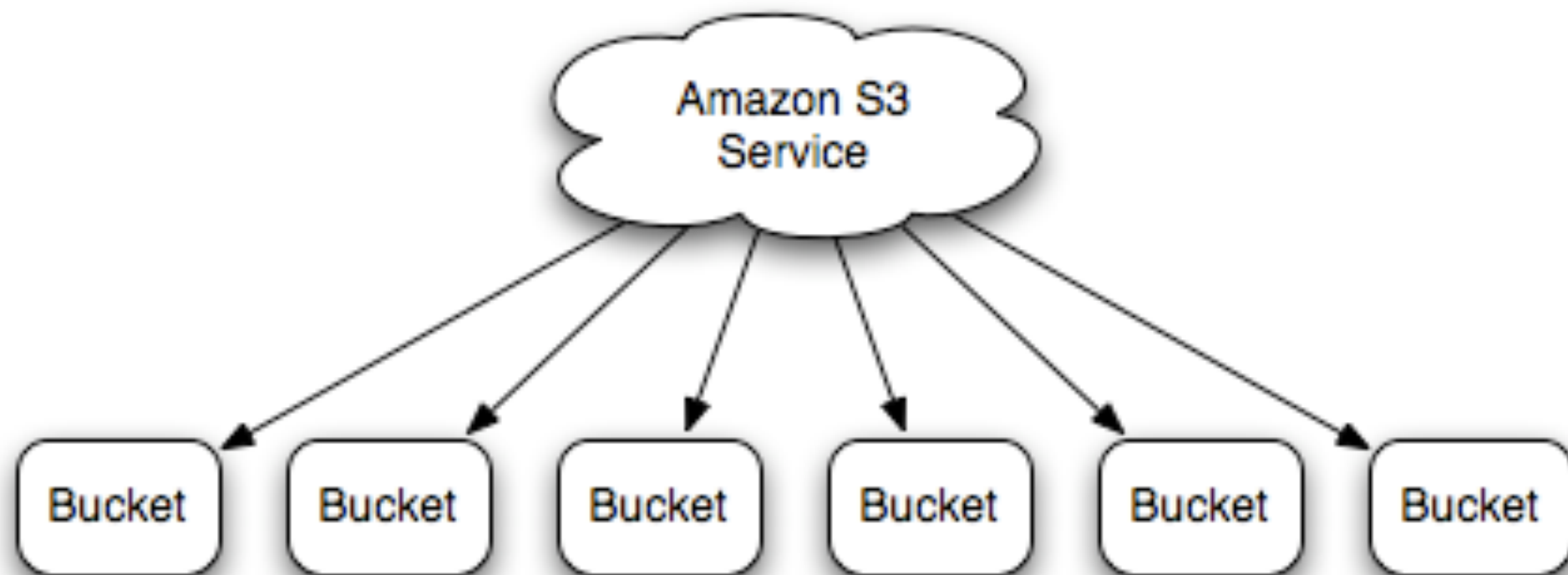
A Confession

The S3 Cookbook.

<http://groups.google.com/group/thes3cookbook>

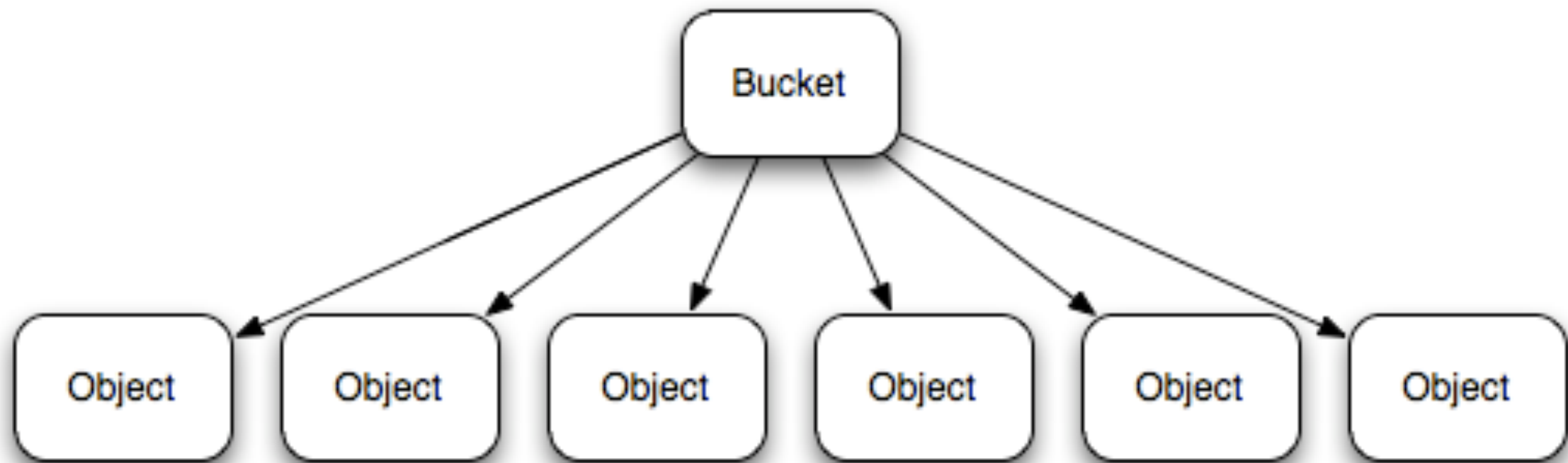


S3's Architecture





S3's Architecture





S3 is RESTful

`http://s3.amazonaws.com/<bucket_name>/<object_key>`

`http://s3.amazonaws.com/socialbandwagon/logo.png`



Getting Started with S3

```
sudo gem install aws-s3
```




Getting Started with S3

set up two environment variables:

`AMAZON_ACCESS_KEY_ID`

and

`AMAZON_SECRET_ACCESS_KEY`



Getting Started with S3

```
#!/usr/bin/env ruby

require 'rubygems'
require 'aws/s3'
include AWS::S3

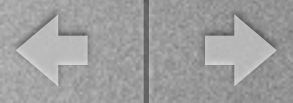
AWS::S3::Base.establish_connection!(
  :access_key_id      => ENV['AMAZON_ACCESS_KEY_ID'],
  :secret_access_key => ENV['AMAZON_SECRET_ACCESS_KEY']
)

bucket = ARGV[0]
file = ARGV[1]

Bucket.create(bucket)
S3Object.store(file, File.open(file), bucket)
```






Backing up your DB



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JournalSpace Drama: All Data Lost Without Backup, Company Deadpooled

by Robin Wauters on January 3, 2009

139 Comments 



Solution #1

I. Use ec2-on-rails



Solution #1

1. Use ec2-on-rails
2. Go have a beer



Solution #1

1. Use ec2-on-rails
2. Go have a beer

<http://github.com/pauldowman/ec2onrails>

<http://pauldowman.com>



Solution #2

Roll your own



Solution #2

Roll your own
(i.e. borrow Paul's code)



Full MySQL Backup

mysqldump



Full Backup

```
mysqldump --quick --single-transaction --create-options  
-u<username> --flush-logs --master-data=2  
--delete-master-logs -p'<mysql password>' <database name>  
| gzip > <dump file>
```



perhaps we should
automate that



Full backup script

```
#!/usr/bin/env ruby
require "common"
begin
  FileUtils.mkdir_p @temp_dir
  # assumes the bucket is empty
  dump_file = "#{@temp_dir}/dump.sql.gz"
  cmd = "mysqldump --quick --single-transaction --create-options " +
    "-u#{@mysql_user} --flush-logs --master-data=2 " +
    "--delete-master-logs"
  cmd += " -p'#{@mysql_password}'" unless @mysql_password.nil?
  cmd += " #{@mysql_database} | gzip > #{dump_file}"
  run(cmd)
  AWS::S3::S3Object.store(File.basename(dump_file),
open(dump_file), @s3_bucket)
ensure
  FileUtils.rm_rf(@temp_dir)
end
```



Incremental MySQL backups

- MySQL creates something called Binary Logs



Incremental MySQL backups

- MySQL creates something called Binary Logs
- To backup, you just copy the binary logs somewhere.



Setting up binary logging

Put this line in my.cnf:

```
log_bin = /var/db/mysql/binlog/mysql-bin
```




Setting up binary logging

Give the user RELOAD and SUPER privileges:

```
GRANT RELOAD ON *.* TO 'user_name'@'%'  
IDENTIFIED BY 'password';
```

```
GRANT SUPER ON *.* TO 'user_name'@'%'  
IDENTIFIED BY 'password';
```



Incremental backup script

```
#!/usr/bin/env ruby
require "common"
begin
  FileUtils.mkdir_p @temp_dir
  execute_sql "flush logs"
  logs = Dir.glob("#{@mysql_bin_log_dir}/mysql-bin.[0-9]*").sort
  logs_to_archive = logs[0..-2] # all logs except the last
  logs_to_archive.each do |log|
    # The following executes once for each filename in logs_to_archive
    AWS::S3::S3Object.store(File.basename(log), open(log), @s3_bucket)
  end
  execute_sql "purge master logs to '#{File.basename(logs[-1])}'"
ensure
  FileUtils.rm_rf(@temp_dir)
end
```




Stick it in your cron

```
# Incremental backup every 10 minutes
*/10 * * * * root /usr/local/bin/incremental_backup.rb
# Full backup every day at 05:01
1 5 * * * root /usr/local/bin/full_backup.rb
```



Backing up your code



Backing up your code

== backing up your repository



Version Control Survey

What are people using?



Solution #1

- Use GitHub



Solution #1

- Use GitHub
- Go have a beer



Solution #1

- Use GitHub
- Go have a beer
- Have another. GitHub is awesome.



Solution #2

Backup SVN to S3



Full and incremental backups

- Once again, there are full and incremental backups



Full and incremental backups

- Once again, there are full and incremental backups
- Full backups give you a complete snapshot of your repository. They can get huge



Full and incremental backups

- Once again, there are full and incremental backups
- Full backups give you a complete snapshot of your repository. They can get huge
- Incremental backups give you a diff of a single commit



Backup SVN to S3

Full dump:

```
svnadmin dump <repo path> \  
--revision 0:<last_revision> > filename
```




Backup SVN to S3

Incremental dump:

```
svnadmin dump <repo path> \  
--revision <revision> --incremental \  
> filename
```



Backup SVN to S3

```
def create_full_dump
  puts "Creating full dump for revision #{@rev}"
  STDOUT.flush
  cmd = "/usr/local/bin/svnadmin dump '#{@repos}' --revision " +
        "'0:#{@rev}' > #{filename_with_path}"
  `#{cmd}`
  if @zip_full
    `gzip #{filename_with_path}`
  end
end
```




Backup SVN to S3

```
def create_incremental_dump
  cmd = "/usr/local/bin/svnadmin dump '#{@repos}' --revision " +
        "'#{@rev}' --incremental > '#{filename_with_path}'"
  `#{cmd}`
  if @zip_incremental
    `gzip #{filename_with_path}`
  end
end
```



Backup SVN to S3

- Put it in a post-commit hook or a cron job
- Don't just backup the latest commit.



Backing up user contributed content



Backing up user contributed content

Grab all of the files and put them on S3



S3Sync

- Ruby script to back up a directory to an S3 bucket
- <http://s3sync.net>
- rsync-like syntax



The S3 Cookbook recipe

Get the code:

<http://github.com/spatten/backing-up-your-app>

get everything in `code/sync_directory`



configure it

Create a YAML file that looks something like this:

```
avatars:  
  directory: /mnt/app/shared/images/avatars  
  bucket: socialbandwagon_avatars_backup  
  
pictures:  
  directory: /mnt/app/shared/images/pictures  
  bucket: socialbandwagon_pictures_backup
```



run it

```
$> sync_multiple_directories.rb multi_sync.yml
```




stick it in your cron

```
15 4 * * * /mnt/app/current/script/sync_multiple_directories.rb \  
/mnt/app/current/config/multi_sync.yml _>> \  
/mnt/app/current/log/s3backup.log 2>&1
```



Bonus tip:

**Serve the files directly
from S3**



Backing up your server configuration



Backing up your server configuration

Poll: Does anyone do this?



Creating an AMI on EC2



Creating an AMI on EC2

Create an image (AMI)

```
$> ec2-bundle-vol -d /mnt -k <key file> -c \  
<cert file> -u <aws user id> -r i386
```




Creating an AMI on EC2

upload the image to S3

```
$> ec2-upload-bundle -b <your-s3-bucket> \  
-m /mnt/image.manifest.xml \  
-a <aws-access-key-id> \  
-s <aws-secret-access-key>
```



Creating an AMI on EC2

Register the AMI

```
ec2-register <your-s3-bucket>/image.manifest.xml
```




Creating an AMI on EC2

Create a new instance using the AMI:

```
$> ec2-run-instances ami-c9bc58a0 -k <ssh_key>
```



Creating an AMI on EC2

[http://docs.amazonwebservices.com/AWSEC2/2007-08-29/
GettingStartedGuide/creating-an-image.html](http://docs.amazonwebservices.com/AWSEC2/2007-08-29/GettingStartedGuide/creating-an-image.html)



VMWare and Xen

- The AMI packaging tool is a wrapper around the Xen packaging tool.
- You can do the same thing with VMware
- Any other solutions out there?



Thanks!

<http://groups.google.com/group/thes3cookbook>

<http://spattendesign.com>

<http://github.com/spatten/backing-up-your-app>