# Mat X

Many years in VFX up late at night with large SAN storage systems working on movies such as the Masters of Horror and District 9 has made Mat X a very paranoid IT nerd.

More storage. More backups. More happy. :)

Always looking for better ways of doing things. The way forward is DevOps. Learn from others. Try new things. Don't be afraid to fail. Always have the beginner's mind.

MacDevOps. Do more things more better.



# Backing up:

# The DevOps Methodology

# What are we going to cover?

- Servers and Storage in the Cloud need backup
- Paranoia and best practices
- What types of backups?
  - DIY or Commercial solutions
  - Servers, data, server with data
  - DevOps

# Build vs. Buy

- Roll your own vs. …
  - Sync software (e.g., Synchronize Pro, CCC)
  - Time Machine
  - CrashPlan, BackBlaze (and others)
- Who supports it?
- What would DevOps do?

# Roll your own

How hard could it be?

# rsync in OS X

- Default OS X version old and deprecated: 2.6.9
- Current rsync version is 3.1.2
- As of 10.11 El Capitan, /usr/bin/rsync cannot be replaced or modified (due to SIP)
  - … and it's still 2.6.9

# Obtaining Updated rsync

- Download new rsync to /usr/local/bin/rsync:

```
curl -O http://rsync.samba.org/ftp/rsync/
rsync-3.1.2.tar.gz
tar -xzvf rsync-3.1.2.tar.gz
rm rsync-3.1.2.tar.gz
cd rsync-3.1.2
./prepare-source
./configure
make
sudo make install
```

- Compare:

```
/usr/local/bin/rsync --version
/usr/bin/rsync --version
```

# Automation vs. User Interaction

- Choose the level of automation vs. user interaction
  - Automatic: Cron/launchd
  - Convenient: Password-less SSH
- Open source
  - write your own rsync script
  - pros and cons

Great! Let's do it.

# Additional Considerations

- Outcome / confirmation and documentation of a script's completion
- Add logging?
- Do you want to append a date/time stamped summary line to a fixed-path log file?
- Add reporting or notification?
- Do you want the script to email you?

Too many questions

# Scripting the Total Solution

- Automating rsync and mysql
- Scheduling
- Logs
- Notifications and issues
- Email a report

# Password not required

- Use ssh-keygen
- Copy key to other server

```
cat ~/.ssh/id_dsa.pub | ssh user@remotehost
'cat >> ~/.ssh/authorized_keys'
```

# Launchd

```
<dict>
    <key>Label</key>
    <string>com.matx.rsyncXSAN</string>
    <key>ProgramArguments</key>
    <array>
        <string>/bin/sh</string>
        <string>/Library/Scripts/rsync-xsan.sh</string>
    </array>
    <key>StartCalendarInterval</key>
    <dict>
        <key>Hour</key>
        <integer>19</integer>
        <key>Minute</key>
        <integer>15</integer>
    </dict>
</dict>
</plist>
```

# Bash

```
#!/bin/sh -

# simple XSAN rsync script

PATH=/bin:/usr/bin:/sbin:/usr/sbin:/usr/local/bin
log=/var/log/rsync-xsan.log.`date -u ''+%y-%m-%d''`

date > $log

echo "START rsync Xsan" >> $log
/usr/bin/rsync -avPh --exclude=".DS_Store" --delete --stats /Volum
```

# Thank you

# We're done

# Automation vs. User Interaction

- Automation comes with increased risk of…
  - Simple mistakes having dire side effects
  - Not noticing a problem
- User interaction has risk of people not doing what they committed to do
- Lesser of two evils; choose and manage

# What could go wrong?

```
Tue 29 Dec 2011 22:44:00 PST
START rsync Big-san1 to Small-san2
building file list ...
 0 files...
 100 files...
 235400 files...
235413 files to consider
OMG this rsync script is really DELETING all my files. This
mistake!! ....  super cool awesome video??/Scene 5 v4 MASTE
OMG this rsync script is really DELETING all my files. This
mistake!! ....  super cool awesome video??/Scene 4 v5 MASTE
OMG this rsync script is really DELETING all my files. This
```

# Rsync

I did it

Yes, I backed up the database

We're good

My server crashed

# Rsync!

# Where did I rsync to?

I don’t remember



It’s OK, I got it. Rsync FTW!

Oh, the database is corrupt!



login to the p5 telnet interface:
telnet localhost 9000
user: nsadmin
passwd: matx

Then execute

```
DatabaseGroup dg
set pp [dg mount Default-Archive]
$pp ResolveDups
$pp ConnectPaths
$pp destroy
exit
```

```
echo .dump |  /usr/local/aw/bin/
sqlite3 addrs.db | /usr/local/aw/
bin/sqlite3 addrs_new.db
```

# Is there a better way?



# What would DevOps do?

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# DevOps Principles

- Automate
  - Don't do it manually if it can be automated
  - The results should be the same
- Version control
  - Use GitHub to work on code with team
  - Test versions, check in, check out,  peer review
- Documentation
  - Document for you, for your team, for sanity

```
matxnetworkconsultants:Plugins xavier$
  [Restored Apr 5, 2016, 2:15:56 PM]
Last login: Tue Apr  5 14:15:46 on ttys002
Restored session: Tue 5 Apr 2016 12:05:21 PDT
matxnetworkconsultants:Plugins xavier$ pwd
/Users/xavier/GitHub/archiware/Plugins
matxnetworkconsultants:Plugins xavier$ git status
On branch wades-changes
Your branch is behind 'origin/wades-changes' by 7 commits, and can be fast-forwarded.
  (use "git pull" to update your local branch)
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   ../.DS_Store

no changes added to commit (use "git add" and/or "git commit -a")
matxnetworkconsultants:Plugins xavier$ git pull
remote: Counting objects: 45, done.
remote: Compressing objects: 100% (45/45), done.
remote: Total 45 (delta 25), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (45/45), done.
From https://github.com/watchmanmonitoring/archiware
   59c3241..903c721  wades-changes -> origin/wades-changes
 * [new branch]      v2-beta    -> origin/v2-beta
Updating e0024a2..903c721
error: Your local changes to the following files would be overwritten by merge:
        .DS_Store
Please, commit your changes or stash them before you can merge.
Aborting
matxnetworkconsultants:Plugins xavier$ git stash
Saved working directory and index state WIP on wades-changes: e0024a2 Math
HEAD is now at e0024a2 Math
matxnetworkconsultants:Plugins xavier$ git status
On branch wades-changes
Your branch is behind 'origin/wades-changes' by 12 commits, and can be fast-forwarded.
  (use "git pull" to update your local branch)
nothing to commit, working directory clean
matxnetworkconsultants:Plugins xavier$ git pull
Updating e0024a2..903c721
Fast-forward
 .DS_Store                                          | Bin 10244 -> 0 bytes
 .gitignore                                         |   1 -
 Modules/check_p5.py                                |  40 ++++--------------------
 Plugins/check_p5_b2g.plist                         |   2 +-
 Plugins/check_p5_b2g.plugin                        |  10 +++---
 Plugins/check_p5_devices.plist                     |   2 +-
 Plugins/check_p5_devices.plugin                    |  50 ++++++++++++----------
 Plugins/check_p5_info.plist                        |   2 +-
 Plugins/check_p5_info.plugin                       | 188 ++++++++++++
```

# git, huh?!

- Check in code
- Work on a branch
- Test, check in, check out
- repeat

# Git it?

- Git status
- Git pull
- Test

# Git status

```
macdevops$ git status
On branch wades-changes
Your branch is behind 'origin/
wades-changes' by 7 commits,
and can be fast-forwarded.
```

# Git pull

```
macdevops$ git pull
Updating e0024a2..903c721
Fast-forward
 .DS_Store                                                | Bin 10244 -> 0 bytes
 .gitignore                                               |    1 -
 Modules/check_p5.py                                      |   40 ++++--------------
 Plugins/check_p5_b2g.plist                               |    2 +-
 Plugins/check_p5_b2g.plugin                              |   10 +++---
 Plugins/check_p5_devices.plist                           |    2 +-
 Plugins/check_p5_devices.plugin                          |   50 ++++++++++----------
 Plugins/check_p5_info.plist                              |    2 +-
 Plugins/check_p5_info.plugin                             | 188 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+----------------------------------------
 Plugins/check_p5_jobs.plist                              |    2 +-
 Plugins/check_p5_jobs.plugin                             | 108 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 Plugins/{check_p5_pool.plist => check_p5_pools.plist}    |    0
 Plugins/{check_p5_pool.plugin => check_p5_pools.plugin}  |   32 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 Plugins/old/check_p5_drives.plugin                       |   51 ++++++++++++++++++++++++++++++++++++++
```

# Testing

# Package it!

# Munki-pkg

```
$ munkipkg P5-Watchman-plugins/
```

```
pkgbuild: Wrote package to P5-
Watchman-plugins/build/P5-Watchman-
plugins.pkg
```

# Test

Fix

Check in

# Peer review

Everything is awesome



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  - Continuous integration, deployment, testing
- Documentation
  - Document for you, for your team, for sanity

# Work smarter

Learn:

Puppet
Chef
Ansible
Salt



Do:

vagrant

docker



# Community

*Cutting corners to meet arbitrary management deadlines*



*Essential*

# Copying and Pasting from Stack Overflow

O'REILLY®

*The Practical Developer*
*@ThePracticalDev*

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# www

- https://macvfx.wordpress.com
- https://github.com/macvfx
- https://www.macdevops.ca

# Questions?



Mat X
MacDevOps.ca

Special Thanks to:
Sean Costello
Background Backup

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# Rsync

# Choices

- When choosing how to best protect the source data, consider the behaviour of it.
- How fast does it change, vs. how long do you need it to stay still?
- It's not about backup, it's about restore
  - Is the restore accurate and useable

# Real Examples

- MySQL / PostgreSQL is a good example of this “blur”
- Live log files are another example
- Backups like CrashPlan, Time Machine, or sync applications won’t handle properly

# MySQL: Backing it up

Backup every day, keep for a week

```
#!/bin/bash

# Clean up older backups, anything older than 7 days
find /Users/backup/ -mtime +7 -delete

# Get all databases
DUMPNAME=/Users/backup/fulldump-`date "+%Y%m%d"`.sql
/usr/bin/mysqldump -u root --
password="paswordgoeshere" --all-databases > $
{DUMPNAME}
ln -sf ${DUMPNAME} /Users/backup/latest-fulldump.sql
```

# And, the rest of the site?

```
# Get the site
SITENAME=/Users/backup/www_site-`date "+%Y%m
%d"`.tar.gz
tar czvf ${SITENAME} /Library/WebServer/Documents/
db.companydomain.com
ln -sf ${SITENAME} /Users/backup/latest-site.tar.gz

# Get local configs
USRLOCALNAME=/backup/usr_local-`date "+%Y%m%d"`.tar.gz
tar czvf ${USRLOCALNAME} /usr/local
ln -sf ${USRLOCALNAME} /backup/latest-usrlocal.tar.gz
```

# Behaviour at Both Ends

- Identifying the desired behaviour at the source … and the target
  - Example: Move the daily backups to a weekly set
- Use pattern (regex) matching and how to select the right source data
- Beware of the rogue loop with the best of intentions but the simplest of syntax errors
- Test regex filter syntax in a non-destructive way

# Moving Data

- You may want to script moving data at source, or destination
  - Example: Move some data in a source path, while leaving others (move out files older than 30 days)
- Do you want to MOVE files (remove from source) vs. COPY (leave at source)?
- Do you want to segregate or notate files at the source, if choosing to leave them on the volume (move into a ‘processed’ folder, or change filename)?

# Example: Moving Older Files

Moving files that are more than 180 days (only) from one location to another.

```
# Create list of affected files -- find all the
files that are 180 days ago or more
$ find . -type f -ctime +180 -print > ${TMPLIST}

# Sync to the other box (need to define variables)
#   {EXCH_USER}  ${EXCH_HOST}   ${TARGET_DIR}
$ rsync -avz --files-from=${TMPLIST} ./ $
{EXCH_USER}@${EXCH_HOST}:${TARGET_DIR}/

# Delete after successful sync
# Dangerous -- be careful
$ cat ${TMPLIST}|xargs rm -f
```

# Questions?



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