

Developing and Managing Linux SOE Environments

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About Me

Work:

Senior Computing Support Officer

Student Computing Team

Linux World:

Ubuntu Member

Board Member on a few Ubuntu Community projects

I have used:

Fedora, Mandrake/Mandriva, SUSE, Debian, Ubuntu, Red Hat, and one or two others.



What this is not...

- 🌀 Build your own SOE in 20 min
- 🌀 Discussion time...
- 🌀 How to use LTSP to build a thin client SOE

What this is...

- 🌀 An idea of how to start working on your own SOE
- 🌀 Lessons I have learned developing SOE environments
- 🌀 Some useful ideas on how to solve problems
- 🌀 A discussion primer for the BOF session to discuss Linux SOE Environments



The Griffith Environment

Griffith University has 36000 Students from 146 Countries
4500 student use computers across 5 campuses
350+ Linux machines on Nathan and Gold Coast campuses

The number of Linux machines is expected to rise significantly over the next 3 years

Standard Operating Environment for teaching students from:

-  Information Technology
-  Engineering
-  Micro Electronic Engineering



The Griffith Environment

Our image is based on Ubuntu 8.10

Network based home directories for students

Centrally authenticated login via PAM

Currently configured to authenticate to Active Directory

Historically configured to authenticate to Novell Directory Service

In a nutshell:

Fat centrally authenticated clients with networked homes



What we will cover

- Briefly cover how to configure Networked Home directories
- How to lock down changes to the Gnome GUI
- Managing changes to large environments
- WUBI, what it is, and how it can be useful for Debian based dual boot images
- Imaging and deployment issues

We will not cover how to configure central authentication due to the time and volume of information involved. Further details on all these topics are covered in the documentation in my website.



Networked Homes

Homes are mounted through NFS or SNFS of a server called Chimera
/home is an automount from Chimera's alias as homes.griffith.edu.au/export/homes/

The /home mount folder also contains a pseudo passwd file that contains the user attributes for all the home directories.

The passwd file is copied across to the local machine on boot by a copy_accounts script that is executed on startup.

Homes are created on Chimera by a script that takes in a spreadsheet exported from our Peoplesoft system. It updates the passwd file with the new users and creates home folders of the pre-created skeleton.

There are two steps to implementing this on the client side:

- 🌀 Move the local administrator account
- 🌀 Reconfigure /home to be an NFS mount



Locking Down Gnome

- 🌀 Locking down gnome can be done using a command line tool, gconftool-2, or using a GUI application gconf-editor.
- 🌀 All entries can have three states, user, default, or mandatory.
- 🌀 You can get access to a complete list of keys by using: `gconftool-2 -R / > /tmp/gconf-tree`

We can quickly check the value of `trash_icon_visible` by running `get` instead of `set`

```
gconftool-2 --get /apps/nautilus/desktop/trash_icon_visible
```

We can also unset the key (effectively disabling it without changing the value)

```
gconftool-2 --unset /apps/nautilus/desktop/trash_icon_visible
```

We can make the setting mandatory for all users

```
sudo gconftool-2 --direct --config-source  
xml:readwrite:/etc/gconf/gconf.xml.mandatory --type string --set  
/apps/nautilus/desktop/trash_icon_visible --type bool true
```

Or we can make the setting the default for new users

```
sudo gconftool-2 --direct --config-source  
xml:readwrite:/etc/gconf/gconf.xml.default --type string --set  
/apps/nautilus/desktop/trash_icon_visible --type bool true
```



Locking Down Gnome

Here are some settings I recommend you look at:

/desktop/gnome/background/

picture_filename

primary_color

/apps/panel/global

locked_down

disable_lock_screen

disable_log_out

disabled_applets type=string value=OAFIID:GNOME_FastUserSwitchApplet

disable_user_switching

disable_lock_screen

/apps/gnome-power-manager/general

can_hibernate

can_suspend



Managing and Implementing Change

Cluster SSH

What is this useful for?

-  Applying quick changes to active sessions
-  Reacting to threats to your environment
-  Scaring the hell out of naughty students trying to hack the servers

A group of machines is remotely activated through Wake-on-Lan then connected to through cluster SSH to make changes to a group of IDENTICALLY configured machines.



Managing and Implementing Change

Cluster SSH

You arrange groups of machines into defined clusters:

```
clusters = lab1 lab2 lab3 lab4 lab5
```

Then you specify what machines you want in your clusters:

```
lab1 = username@pc1.griffith.edu.au username@pc2.griffith.edu.au  
lab2 = username@pc3.griffith.edu.au username@pc4.griffith.edu.au  
lab3 = username@pc5.griffith.edu.au username@pc6.griffith.edu.au  
lab4 = username@pc7.griffith.edu.au username@pc8.griffith.edu.au
```

Lastly you can also group 'like' labs into clusters:

```
lab5 = lab1 lab2
```

When you are done you access the clusters by the following command:

```
cssh -T "Lab 1 - Programming" lab1
```



Managing and Implementing Change

Boot Scripts

We use a combination of boot scripts to manage the lab environments including adding new users, modifying settings, and installing or removing applications that were required after the lab was deployed.

A few key points:

Lab machine use automounter to mount `/source` to `mage.griffith.edu.au/source`, `/home` to `homes.griffith.edu.au/home`, and `/export` to `homes.griffith.edu.au/export`. This allows us to access files located on these servers as if they were local to the machine.

The key file in this situation is `rc.local`.

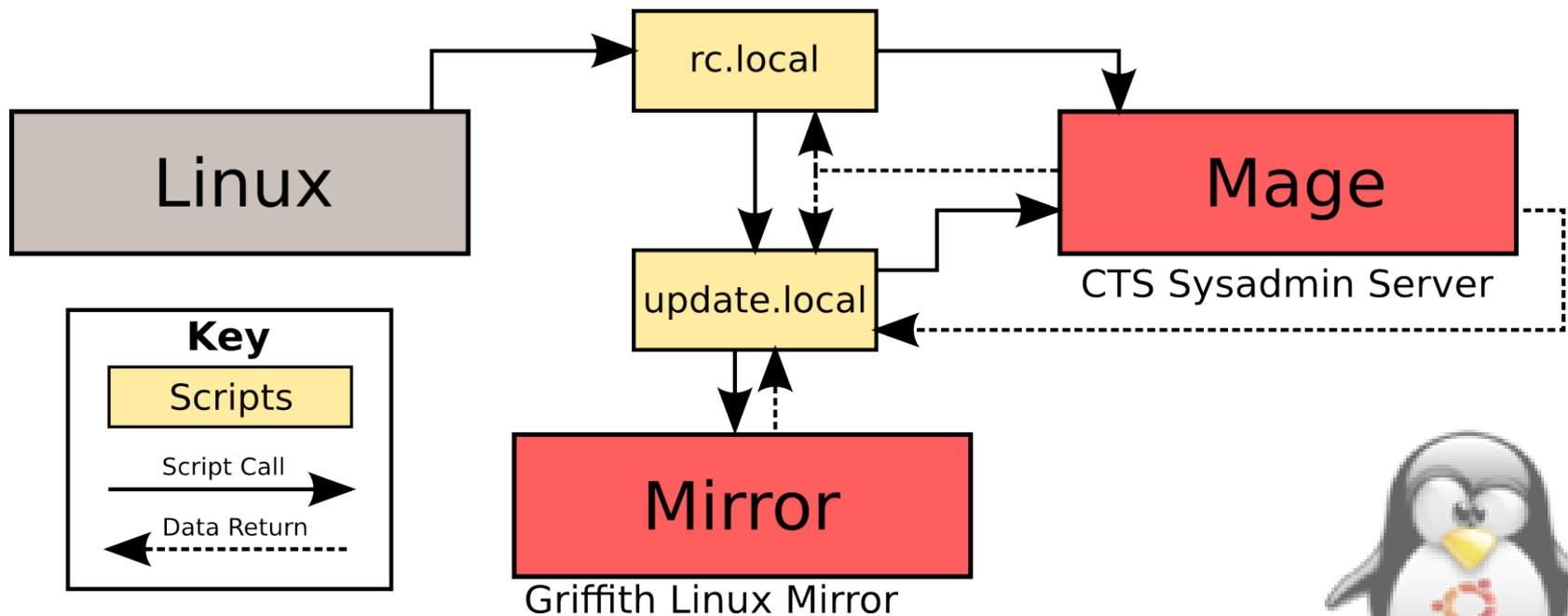


Managing and Implementing Change

Boot Scripts

How it works:

- rc.local runs on boot and updates itself and other key scripts
- rc.local updates the update.local script
- rc.local runs the update.local script and exits



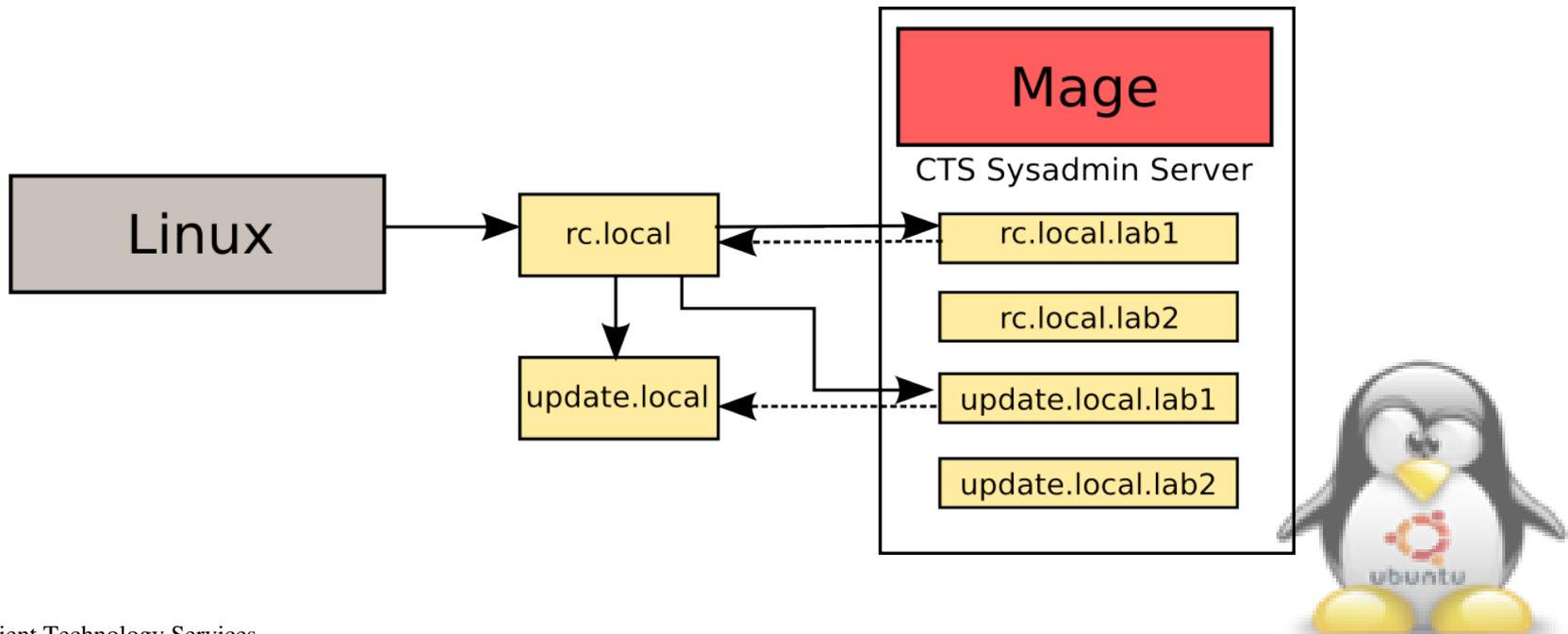
Managing and Implementing Change

Boot Scripts

What does that all mean?...

This allows us to make any change that can be scripted to a machine before it loads the login screen. Done on a local connection with a local mirror this can allow large programs and packages to be installed in seconds.

It makes managing large scale deployments easy, and here is why:



Managing and Implementing Change

Sample Script for Generic RC.Local:

```
exec >/tmp/rc.local.log 2>&1

# Wait for the automount directory to
appear
i=30 # loop wait limit (in seconds)
while [ $i -gt 0 ]; do
    [ -d /source/linux_extras ] && break
    i=`expr $i - 1`
    sleep 1
done

# Update various files (if needed and
available)
if [ -d /source/linux_extras ]; then

    # System Configuration Update
    rsync -t
/source/linux_extras/update/rc.local
/etc/rc.local
```

Boot Scripts

```
rsync -t
/source/linux_extras/update/copy_accounts
/etc/init.d

rsync -t
/source/linux_extras/update/update
/etc/update.local
fi

# Reset the password file to latest user
list...
/etc/init.d/copy_accounts

# Run the idle shutdown service script
/opt/bin/idleshutdown &

# Run the update script
/opt/bin/update.local
```



Wubi – Ubuntu under Windows



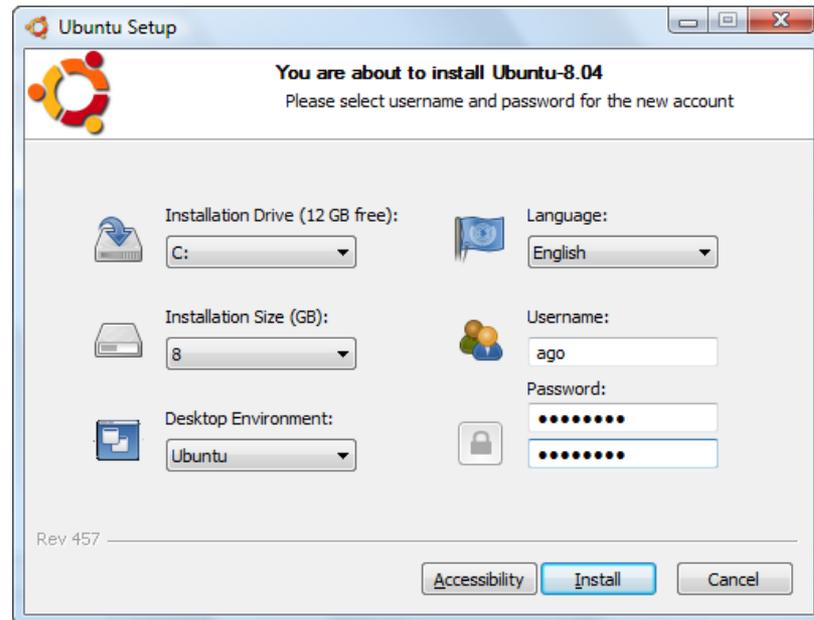
What is Wubi?

- Self contained Ubuntu install under Windows NTFS
- Is not virtualised
- Is bootable

Avoid bootloader issues

Simplified deployment

Downside... no standalone image



Where can I get it:

- On any Ubuntu Disk
- From Launchpad: <http://launchpad.net/wubi>
- From the website: <http://wubi-installer.org>



Imaging and Deployment

The 256bit inode problem:

Most imaging solutions cannot handle 256 bit inode sizes in anything but RAW mode.

Symantec Ghost – If you update to the latest patches on Ghost 11.5 it can handle 256 bit inode sizes but does struggle with more than one bootloader unless you use a -id tag.

Clonezilla – FOSS solution that supports all drive format and multicasting of images.



I dun getz it

can has qu3stion?

Contact Details

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Email Contact: m.lye@griffith.edu.au

My Website: www.matthewlye.com

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Presentation Slides:

<http://www.matthewlye.com/index.php/lca2010/70-lca2010-presentation>

Further Discussion:

Thursday 13:30 - 14:15 BOF Session in Civic Suite 3

