UKLUG: The Ultimate IBM and Lotus on Linux Workshop for Windows Admins

Presenter: Bill Malchisky Jr.
Company: Effective Software Solutions, LLC

Today's Topics of Interest

- Introduction
- Basic Theory and Installation
- Commands to Improve Your Life
- Editing Files with vi
- Scripting Primer
- Package Management Techniques
- Lotus Application Introduction
- Review
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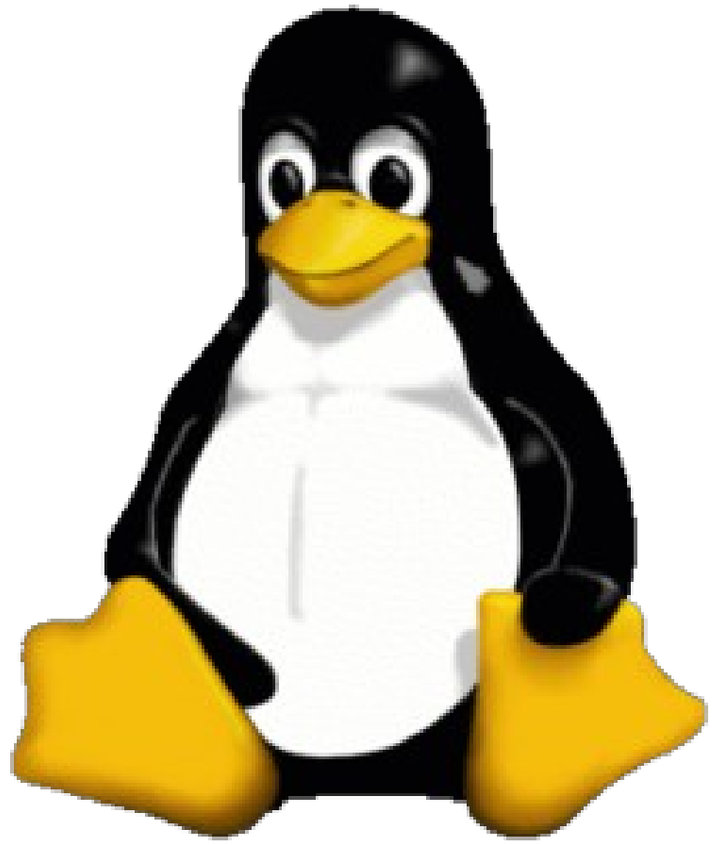

A Little Bit About Your Speaker...

- Regulatory compliance expert in the field
- Written multiple articles on compliance and eDiscovery
- Speaker at 20+ Lotus® related conferences/LUGs
- Co-authored two IBM® Redbooks on Linux®
- Designed disclosure response solutions for Fortune® 100, medium-sized, and small established regulated firms
- Domino specialty project experience
- IBM Champion for Collaboration Solutions
- Linux aficionado

Quick Survey

What's your Linux experience?

Setting Workshop Expectations

- Course will cover as much information as possible in the time allotted
- More demos and live code than static content
- Attendees are encouraged to ask questions
- Take copious notes
- Session is designed to build confidence, rather than create experts...
  - You should have a significantly higher level of understanding of environment
  - Be proficient in many aspects
  - Comfortable enough to try Linux in your work place, or at home

Your Moment of Zen...

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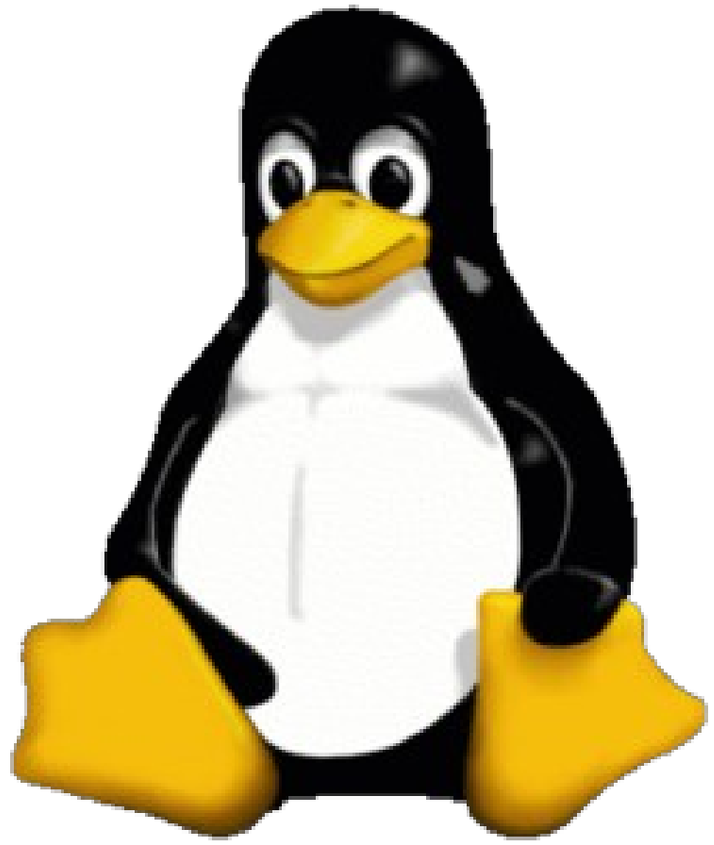

Linux Directory Pieces

- Never need to worry about drive letters
- Can mount most every subdirectory anywhere
  - Path remains the same
- Common top-level directories
  - opt - option programs
  - var - variable files (e.g. log files)
  - home - user directories and writable space
  - tmp - temporary files written here
  - root - administrator's (root's) secure space
  - usr - "everything else"; user accessible files, exe
  - etc - configuration files
  - boot – boot loader

Additional Directories

- Bin - Essential command binaries
- Dev – Device files
- Lib - Essential shared libraries and kernel modules
- Media - Contains mount points for replaceable media
  - Primarily on desktop systems
- Mnt - Mount point for mounting a file system temporarily
- Proc - Virtual directory for system information (2.4 and 2.6+ kernels)
- Sbin - Essential system binaries
- Sys - Virtual directory for system information (2.6+ kernels)
- Srv - Data for services provided by the system

To BASH Is Proper

- Bourne Again SHell
- Most common shell on servers and desktops
  - Easiest to use, with great additions
- Learn some of the features to make things easy
  - Auto-fill; command and file completion
  - Configuration files
    - Store customized short cuts
    - Functions
    - Shell settings
- File structure
  - Displaying hidden files -- “ls -a” | “ls -al”
  - Navigation -- view application specific configuration files

Identifying Devices

- Disk drives are stored differently than Windows
  - No drive letters required, nor will you miss them
- Structure is intuitive
  - SCSI - /dev/sda, /dev/sdb
  - IDE - /dev/hda, /dev/sdb
- Partitions appended numerically
  - /dev/hda1, /dev/sda1, /dev/sda2
- Commands
  - mount, df -h
  - less /etc/fstab
- Tools: partman, cfdisk

Installation Tips

- To setup multiple partitions on your desktop, acquire the Ubuntu alternate installer
- Creating an LVM? Absolutely enter a value for label
  - Ensure it is descriptive, covering what the data will be there later
    - E.G. volgrp01-home, volgrp02-vmware
    - *You will thank me for this one tip later*
  - Red Hat's Disk Druid is much better with LVMs
  - Adjust *typical usage* for each partition
    - Standard = one inode per 1kB block
    - news = one inode per 4kB block
    - largefile = one inode per 1MB block
    - largefile4 = one inode per 4MB block

Partition Considerations

- /boot = 200MB
- Create an LVM or two for the rest
- Use multiple swap partitions
- Tip: Always keep the filesystems >=10% to avoid fragmentation, else drive performance will degrade

Networking

- All NICs are mapped to a device, prefaced with type
  - e.g. eth0, wlan0
- Main files
  - Ubuntu
    - /etc/network/interfaces
  - Red Hat
    - /etc/network/<x>
- DNS is stored in the resolver
  - /etc/resolv.conf
- /etc/hosts
- Advanced Tool: route
  - RTFM before use

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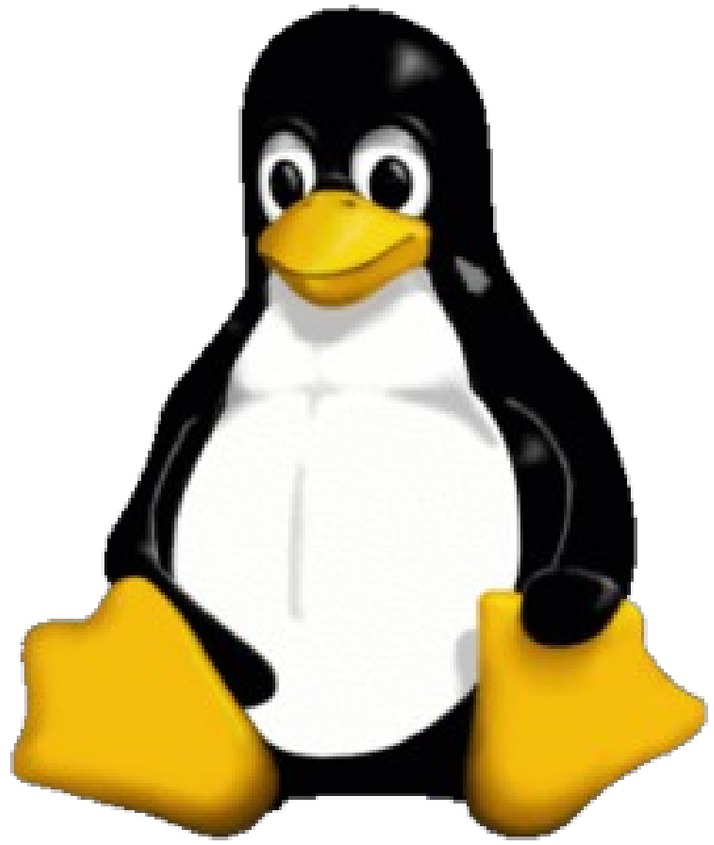

Many Useful Linux Tools Abound

- Includes a plethora of free tools, many are useful
- Administration privleges: `sudo` or `su -` and use root
- What is my partition block size?
  - `#tune2fs -l /dev/sda1 | grep -i 'block size'`
- Abridged list of my most frequently used commands

less	top	tar
ifconfig	rpm	ssh/scp
cp	mv	man
chmod	chown	rm

Additional Packages to Consider

- Some additional applications that may be valuable, or assist with learning

Package Names		
iostat (not installed by default)	vmstat	pmap
uptime	mpstat	cal
netstat	iptraf	grep
whatis	which	gzip

Miscellaneous Tool Notations

- ImageMagick: converts any image file to any format
  - `$man imagemagick` to get list of tool names
- Webmin is a great all-around administration portal
  - http://webmin.com
  - More challenging on Ubuntu 12, but not necessary for a desktop
  - Use primarily on servers
- To convert text files that do not wrap properly
  - `$sudo apt-get install dos2unix`

Command Notations

- Getting help
  - `$man <command>`
  - `$whatis <command>`
  - `$which <command>`
- Tar is very unforgiving; be certain you type the syntax correctly
  - This is your only warning
  - First argument **must** be either: [a, c, t, x]

User Management Options			
Scope	Create	Remove	Profile Edits
User	#useradd	#userdel	#usermod
Group	#groupadd	#groupdel	#groupmod

What Filesystems are Available?

- Mount displays the connected filsesystems, and attachment (mount) point

```
malchw@sicilia: ~
/dev/sda1 on /boot type ext4 (rw)
/dev/mapper/vol--grp--01-vol3--free on /free type ext4 (rw)
/dev/mapper/vol--grp--01-vol2 on /home type ext4 (rw)
/dev/mapper/vol--grp--02-vol5--vmware on /home/vmware type ext4 (rw)
/dev/mapper/vol--grp--01-vol1 on /opt type ext4 (rw)
binfmt_misc on /proc/sys/fs/binfmt_misc type binfmt_misc (rw,noexec,nosuid,nodev
)
vmware-vmblock on /run/vmblock-fuse type fuse.vmware-vmblock (rw,nosuid,nodev,de
fault_permissions,allow_other)
gvfs-fuse-daemon on /home/malchw/.gvfs type fuse.gvfs-fuse-daemon (rw,nosuid,nod
ev,user=malchw)
```

Checking the Swap Partitions

- Swapon allows you to check the status, and enable swap partitions

```
malchw@sicilia: ~

malchw@sicilia:~$ !swap
swapon -s -v
Filename                                Type            Size    Used    Priority
/dev/sda5                               partition       31249404        0       -1
/dev/sda6                               partition       15624188        0       -2
malchw@sicilia:~$
```

How Much Free Space Exists?

- Disk free (df) is a useful and powerful tool

```
malchw@sicilia: ~

malchw@sicilia:~$ df -h
Filesystem                                 Size  Used Avail Use% Mounted on
/dev/mapper/vol--grp--01-vol4--root         80G  5.4G   70G   8% /
udev                                        16G  4.0K   16G   1% /dev
tmpfs                                      6.3G  916K  6.3G   1% /run
none                                       5.0M     0  5.0M   0% /run/lock
none                                        16G  156K   16G   1% /run/shm
/dev/sda1                                  188M   57M  123M  32% /boot
/dev/mapper/vol--grp--01-vol3--free        4.7G  197M  4.3G   5% /free
/dev/mapper/vol--grp--01-vol2               66G   36G   27G  57% /home
/dev/mapper/vol--grp--02-vol5--vmware      258G  109G  137G  45% /home/vmware
/dev/mapper/vol--grp--01-vol1               14G  339M   13G   3% /opt
malchw@sicilia:~$
```

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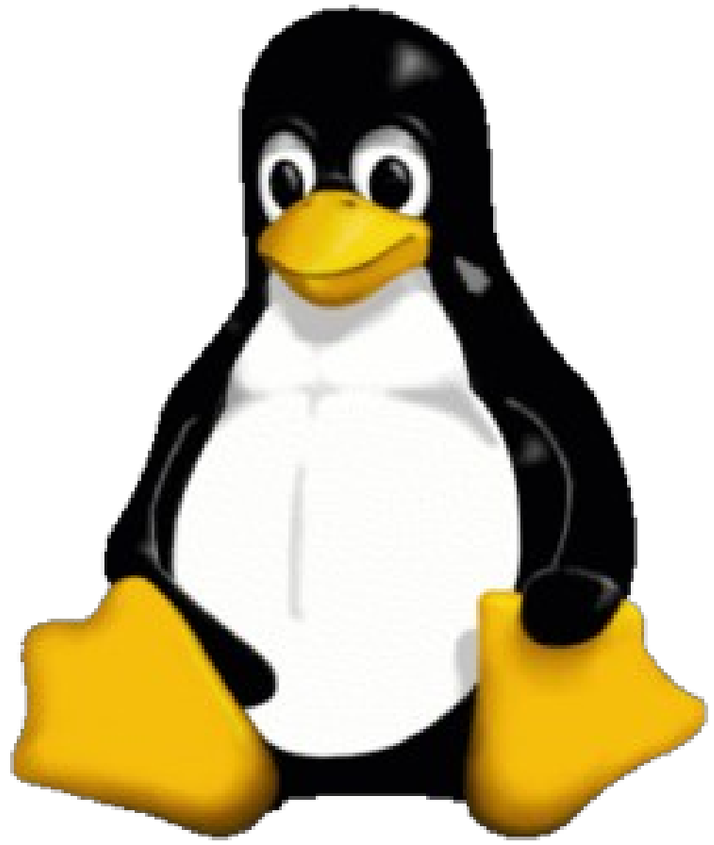
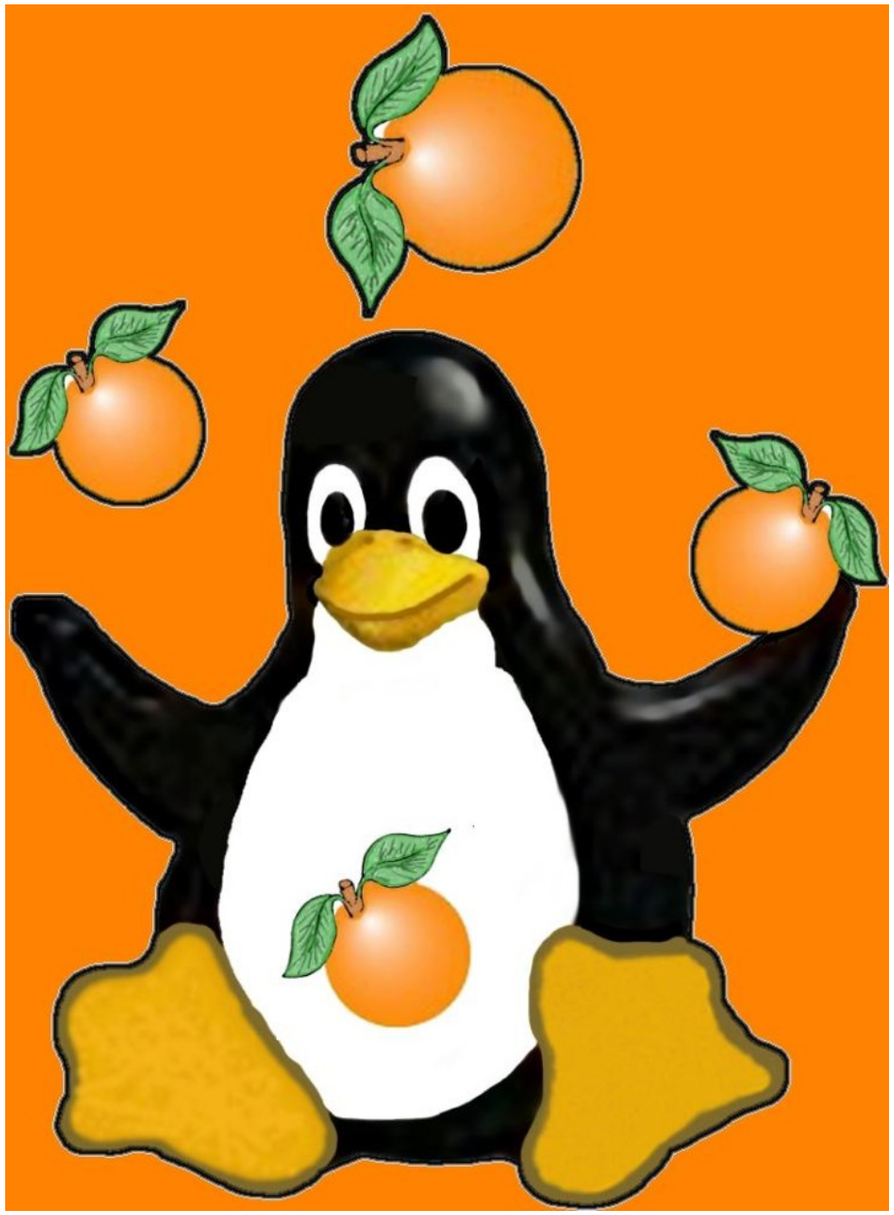


The Most Awesome Editor is vi

- Excellent for shell scripting, modifying INI files
  - Avoid updating your resume with it
- Most distros map vi to vim (vi Improved)
- Two modes: edit (insert) and navigate
- Safe learning available `$vimtutor`
- Leaving insert mode: depress Esc
- Entering insert mode: depress i
- When you leave insert mode, the same keys navigate
- Useful features: ., <n>x, <n>Shift-G, dd, dw, :wq

vi Demo



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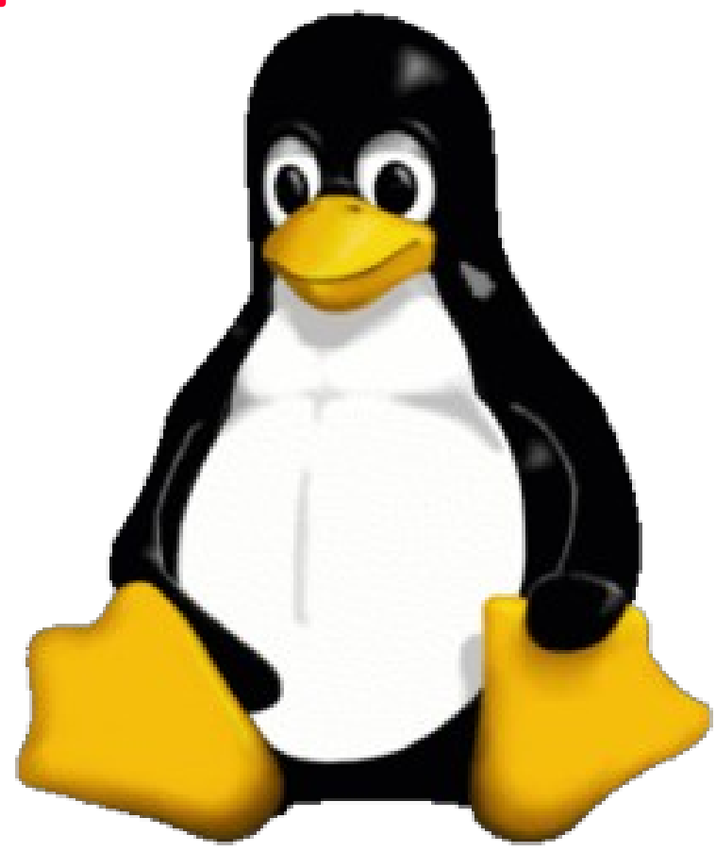

Scripting Introduction

- For BASH scripts, must include `#! /bin/sh` on first line
- Use vi (or your other favorite editor) to create
- Set to executable status with chmod when done
- Append “.sh” to easily identify the script
- Use # in first column to create comments after row one in the file

Scripting Introduction

- Example to make a quick backup of files

```
#! /bin/sh
# Create a tar file from home, dump to USB HD along with a TOC for the archive
# ------------------------------------
tar cvzf /media/WD_1.5TB_EXT4/t60p/backups/09.mar.2010.home.tgz  /home/bill
tar tvzf /media/WD_1.5TB_EXT4/t60p/backups/09.mar.2010.home.tgz >
/media/WD_1.5TB_EXT4/t60p/backups/09.mar.2010.home.toc
```

Scripting Introduction

- Examples to mount and unmount filesystems located on a second HD

```
#! /bin/sh
# Mount the pieces of SDB
# sudo -i
mount /dev/LVM/home /home/sdb.home/
mount /dev/LVM/local /local
mount /dev/LVM/opt.ibm /opt/sdb.ibm/
# mount -t ext3 /dev/sdb1 /sdb/boot/
# mount -t ext3 /dev/sdb1 boot/
# mount -r -n -t ext3 /dev/sdb1 boot
# mount -r -n -t ext3 /dev/sdb2 boot
# mount -r -n -t ext3 /dev/sdb5 boot
# mount -r -n -t ext3 /dev/sdb6 boot
# mount -r -n -t ext3 /dev/sdb6 root
# mount -r -n -t ext3 /dev/sdb7 boot
mount -r  -t ext3 /dev/sdb7 /sdb/boot
mount -r  -t ext3 /dev/sdb6 /sdb/root
```

```
#! /bin/sh
# Umount the pieces of SDB
# sudo -i
umount /dev/mapper/LVM-home
umount /dev/mapper/LVM-local
umount /dev/mapper/LVM-opt.ibm
umount /dev/sdb7
umount /dev/sdb6
```

Combining Skills – Part I

Scripting with scp is easy to do

- Edit *.bashrc* or *.bash_profile*
- Create an *alias* to save time accessing servers

```
#alias la='ls -A'
#alias l='ls -CF'
alias ll='ls -l'
alias sshess='ssh -p 12345 FooGetsInNotYou@roma.testdomain.com'
alias sshtest='ssh bill@server2.test.com'
```

Combining Skills – Part II: The Query

Alias takes static commands, as it uses a literal

How do you pass an argument to an alias in your *.bashrc* file?

Combining Skills – Part II: The Answer

Use a function in your initialization file

```
function scpess () { scp -P 12345 $1
FooGetsInNotYou@roma.testdomain.com:/dl/domino85 ; }
```

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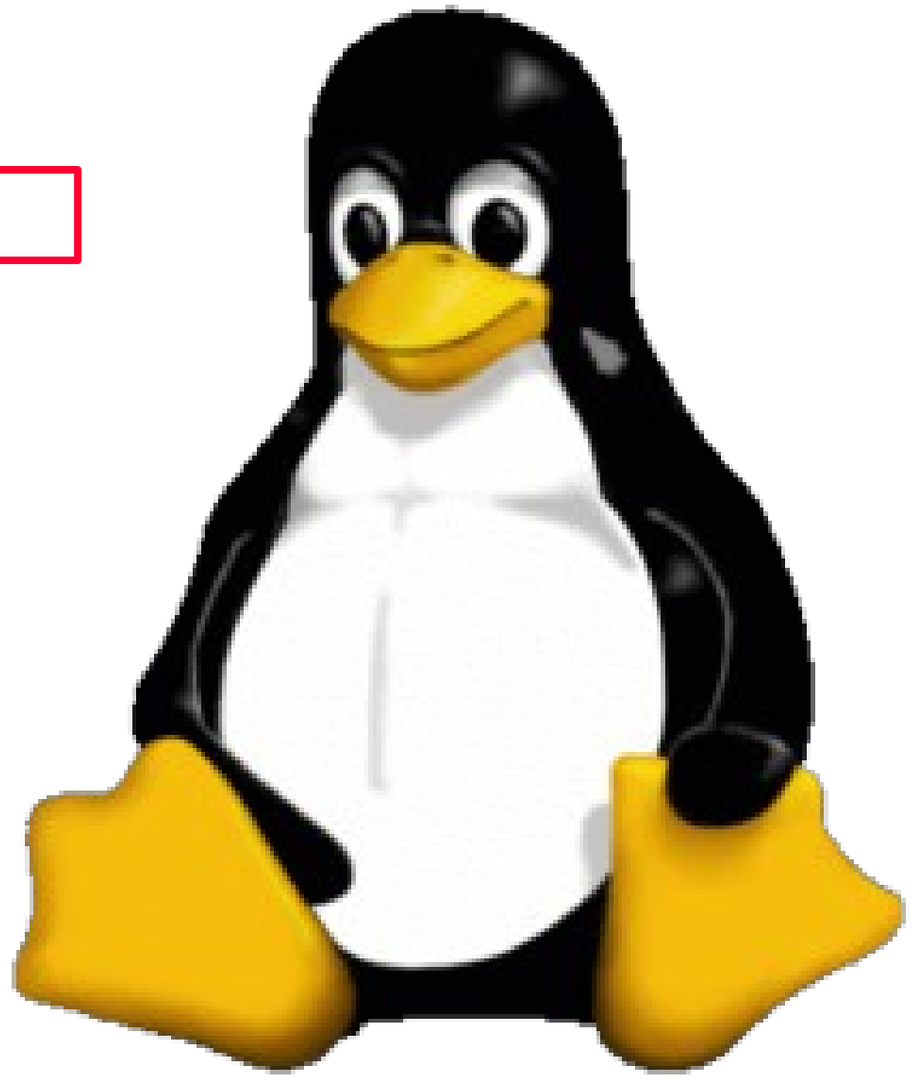

Ways to Install Packages – Red Hat

- Red Hat – RPM – The industry standard
  - Installs local tools, helps manage them
  - Red Hat Package Manager
  - Rpm -qa
  - Rpm -qi <package_name>
  - Rpm -ivh <package_name>.rpm
  - Use wildcards to precisely install multiple files
  - Rpm – e <package_name>
- Remote Management
  - Yum – Yellowdog
    - Update applications, pull down from server
  - RHN – Red Hat Network

Ways to Install Packages – Ubuntu

- Ubuntu – Debian based package management
  - Dpkg
  - Local packages
  - `$ sudo dpkg -i <package_file>`
  - `$ dpkg-deb or dpkg -I <package_file>`
- Remote management
  - Apt-get
    - `$ sudo apt-get remove –purge 2.6.27-7-*`
- If new, then the GUI for desktop can be beneficial
  - Just point and click to install
  - Use the Ubuntu Software Center to remove

Ubuntu Applications of Interest

- GParted Partition Editor
- Dropbox
- Ubuntu restricted extras
- GIMP Image Editor
- Secure shell (SSH) server (if needed to put files locally from other areas)
- The Network Mapper – utility for network exploration or security auditing

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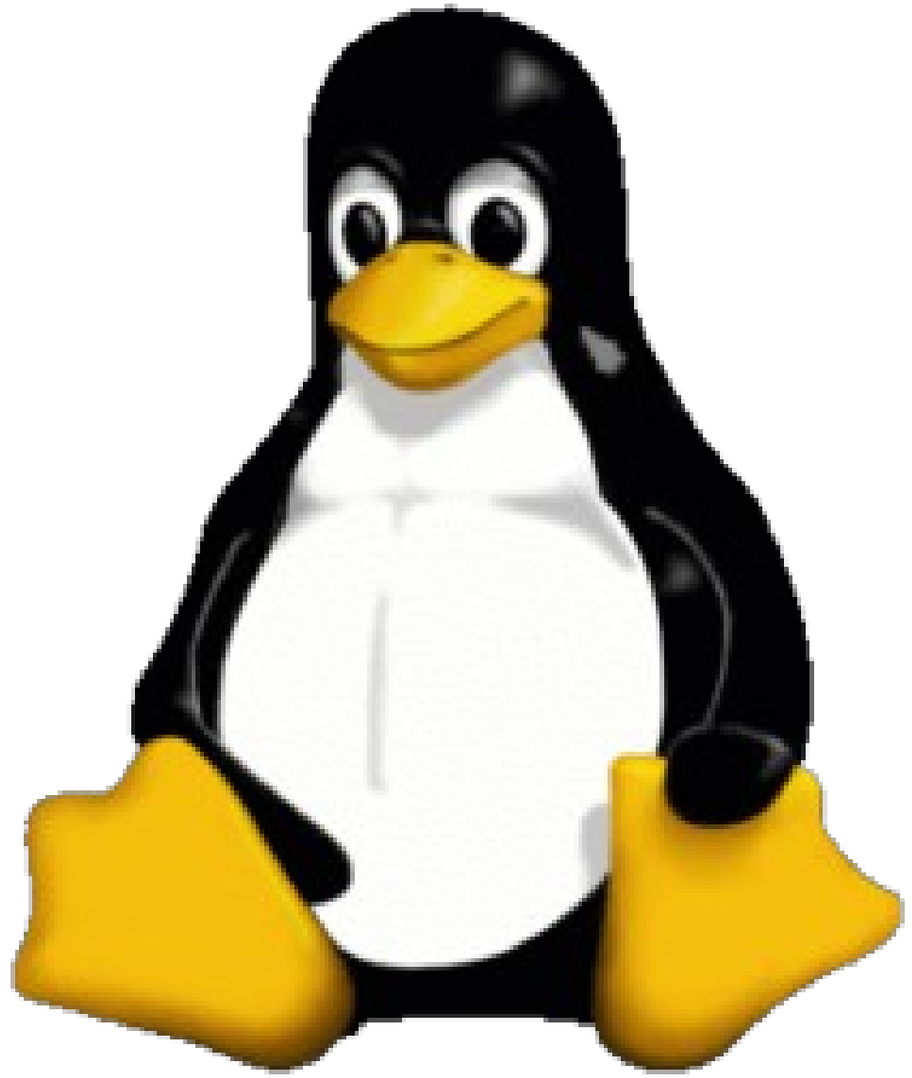

What You Need To Know

- Lotus application installation uses the tools we discussed in this session
  - Tar
  - Ssh
  - Gunzip
  - Rpm
  - Vi
- The rest is easy... just tab and type
- All the IBM software programs, when installed on Linux use most of these basic tools to get started
  - Even if the installation requires a browser

Lotus Domino on x64

- Suggest RHEL 5
- Ensure that you have all of the correct library files install
- Absolutely critical to disable XGL and SELinux
- Install GDB

Red Hat Enterprise Linux (RHEL) 5 Advanced Platform x86-32 and future OS fix packs	Bitness: 32 Bit Deployment Role: Server Hardware platform: x86-32	• XGL and SELinux must be disabled
Red Hat Enterprise Linux (RHEL) 5 Advanced Platform x86-64 and future OS fix packs	Bitness: 32 Bit Deployment Role: Server Hardware platform: x86-64	• XGL and SELinux must be disabled
Red Hat Enterprise Linux (RHEL) 5 x86-64 and future OS fix packs	Bitness: 32 Bit Deployment Role: Server Hardware platform: x86-64	• XGL and SELinux must be disabled
Red Hat Enterprise Linux (RHEL) Server 6 System z and future OS fix packs	Bitness: 64 Bit Exploit Deployment Role: Server Hardware platform: System z	• XGL and SELinux must be disabled • NSFDB2 not supported
Red Hat Enterprise Linux (RHEL) Server 6 x86-32 and future OS fix packs	Bitness: 32 Bit Deployment Role: Server Hardware platform: x86-32	• XGL and SELinux must be disabled
Red Hat Enterprise Linux (RHEL) Server 6 x86-64 and future OS fix packs	Bitness: 32 Bit Deployment Role: Server Hardware platform: x86-64	• XGL and SELinux must be disabled

Let's Get Moving!

Demo Time

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Team Exercise

Quiz Time...

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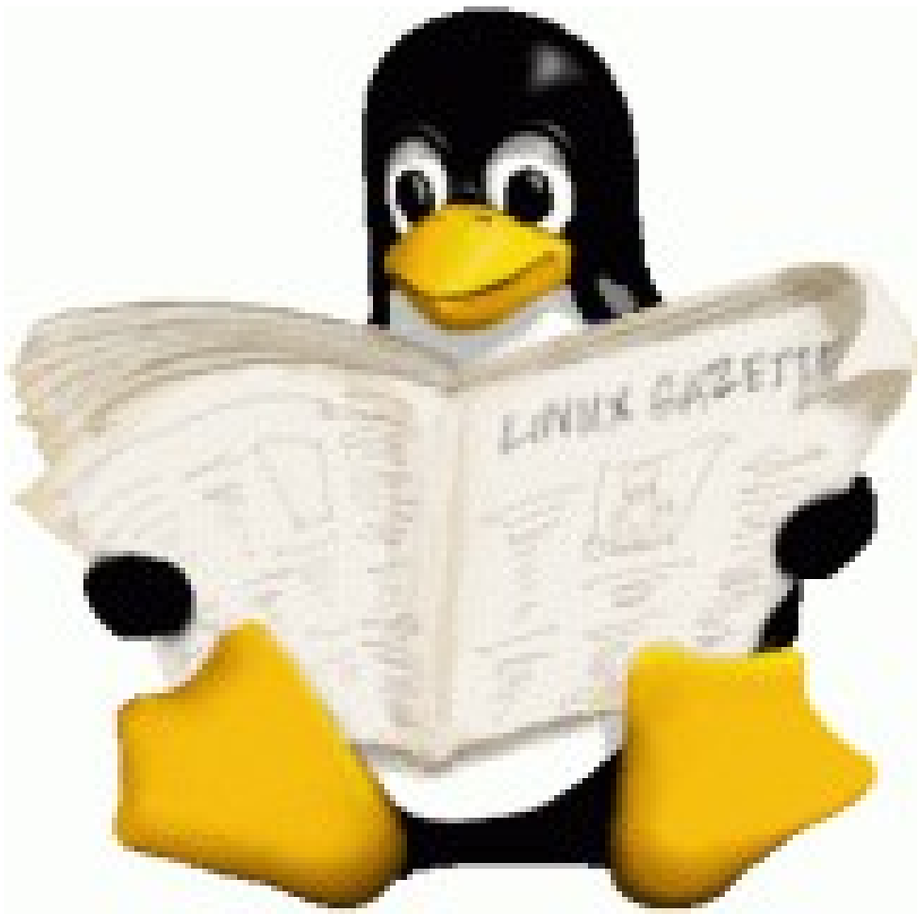
Light Reading



Linux Resources

- Bill Mal's Linux Section -- http://www.billmal.com/billmal/billmal.nsf/dx/linux-links.html
- IBM's Linux Portal: http://ibm.com/linux
- Linux: The Era of Open Innovation
  - http://www-03.ibm.com/ibm/history/ibm100/us/en/icons/linux/
- TCO IBM/Linux versus Microsoft
  - ftp://ftp.software.ibm.com/pub/lotusweb/competitive/Linux-Windows_TCO_Presentation.pdf
- Fun -- Tux in Kernel Code http://www.100mb.nl/

Technical Notes of Interest

- Red Hat Versus Free Linux Cost Analysis

http://tinyurl.com/8le8ewo

- Installing VMware Workstation 8.x on Ubuntu 12.04

http://askubuntu.com/questions/116565/unable-to-install-vmware-workstation-v8

- Manually uninstalling VMware

http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displa

- Installing Lotus Notes on Ubuntu 12.04

http://usablesoftware.wordpress.com/2012/05/04/install-lotus-notes-8-5-3-on-ubuntu-1

- Problems launching VMware on Ubuntu, post reboot?

http://raywoodcockslatest.blogspot.com/2010/05/resuming-vmware-virtual-machine-co

Bonus Material

- Running Linux inside of Windows, natively

Cygwin Installation

- Get the files: http://cygwin.net/
- Install the base first,
  - Then go back to the same server and install additional files
  - Timeouts are tricky and you can waste time otherwise
- Base install, then the following programs
- Admin -> cron
- Archive -> unzip, zip
- Devel -> bashdb (optional, but select if you want to try BASH scripting at some point, as it can help with debugging)

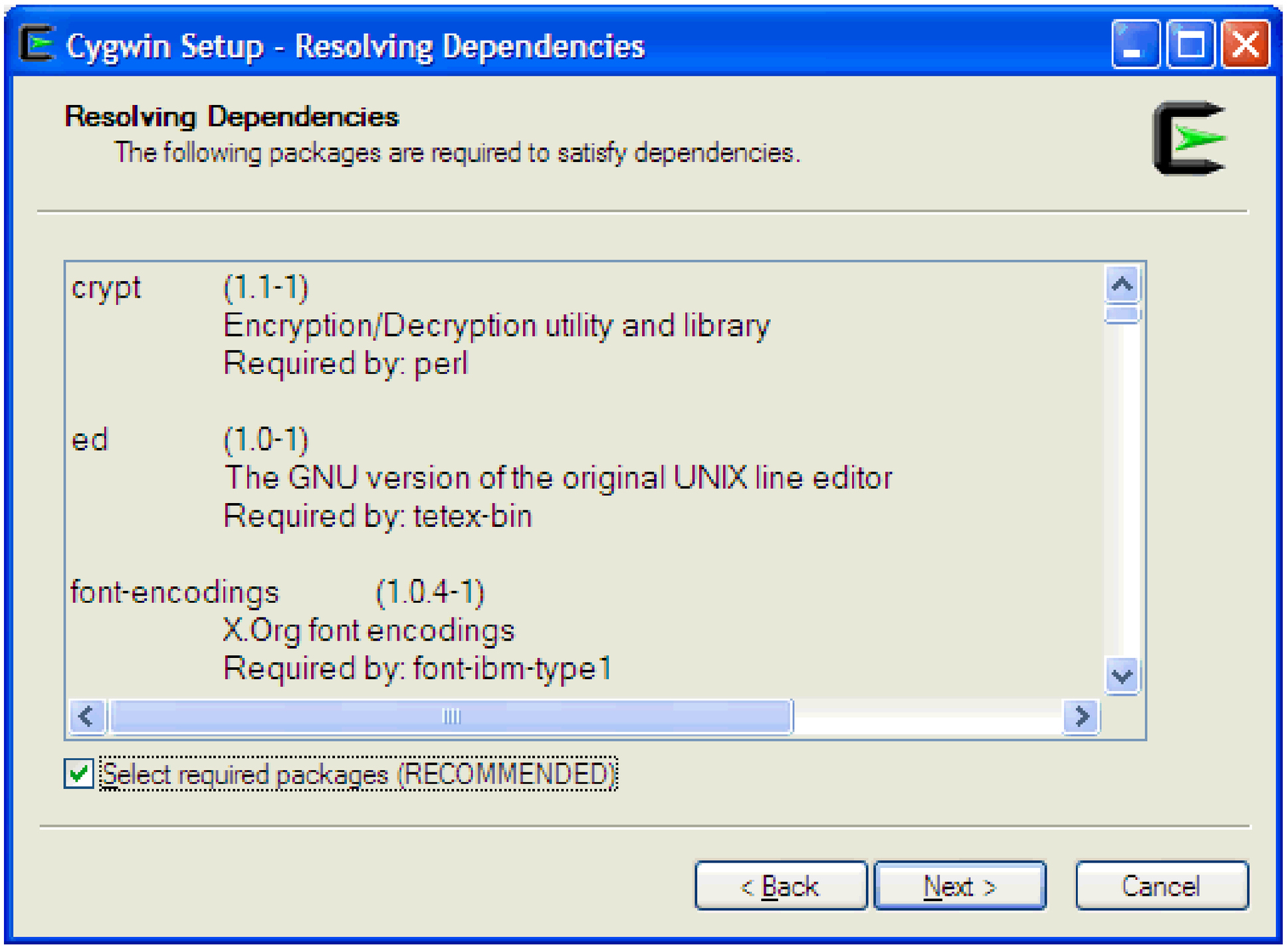
Cygwin Installation – Part II

- Editors -> vim, vim-common, xxd, and if you want to edit binary files, try bvi
- Graphics -> GraphicsMagick, ImageMagick, bmp2png
- System -> ping, util-linux
- Text -> a2ps, enscript (one of my favorite programs)
- Utils -> hdparm (only use in read mode, but provides useful info on your local HD), xtail

Cygwin Installation – Post-Install Tips

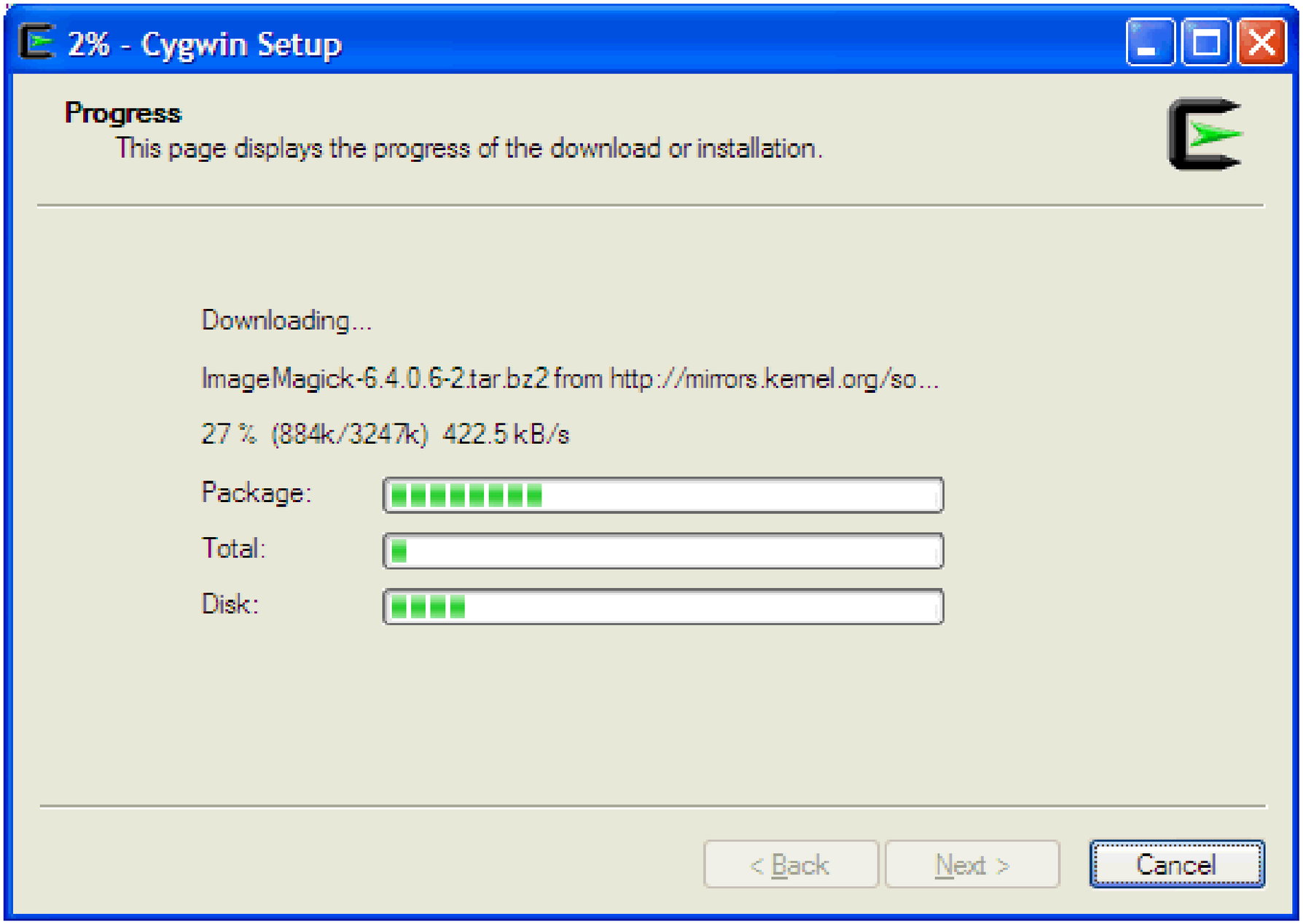
- If you encounter an installation program which requires an X Window environment,
  - Go back and install the X11 environment with Gnome or KDE
  - Otherwise, keep it simple.
- The nice thing about the installation program, is that once you run the first install, if your selected options require additional files that you omitted, you will be prompted accordingly: <next slide>
- Then it will install the newly selected files.

Cygwin Installation – Post-Install Tips

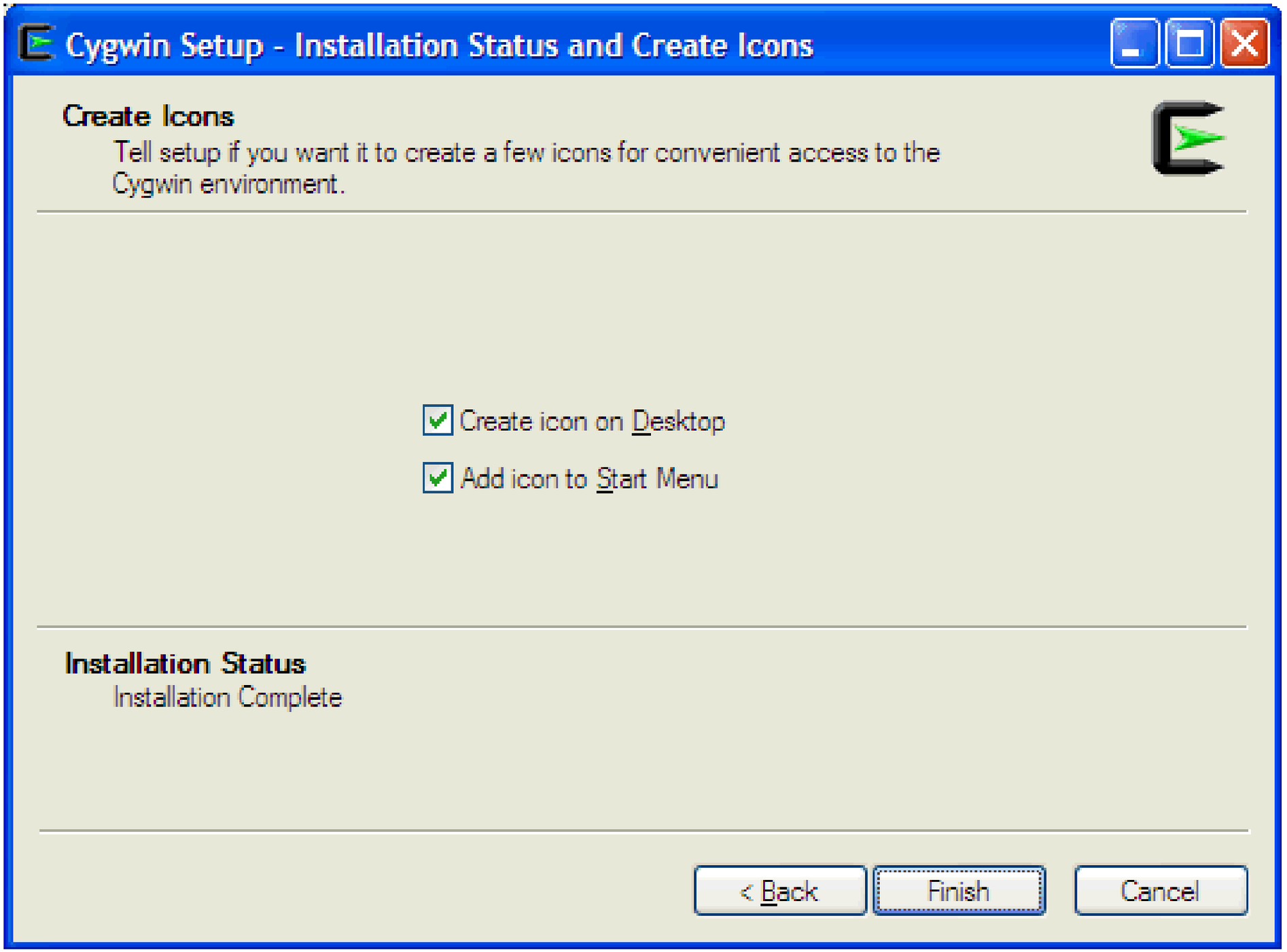


Cygwin Installation – Post-Install Tips

- And unlike Windows, the histograms are actually accurate.



Cygwin Install – Post-Install Tips



Questions

- How can I help you?

Contact Information

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  - Twitter: billmalchisky

- My Website: http://www.effectivesoftware.com
- My Blog: http://www.BillMal.com