Linux Basics Tutorial version 3.0

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for
Western PA Linux Users Group

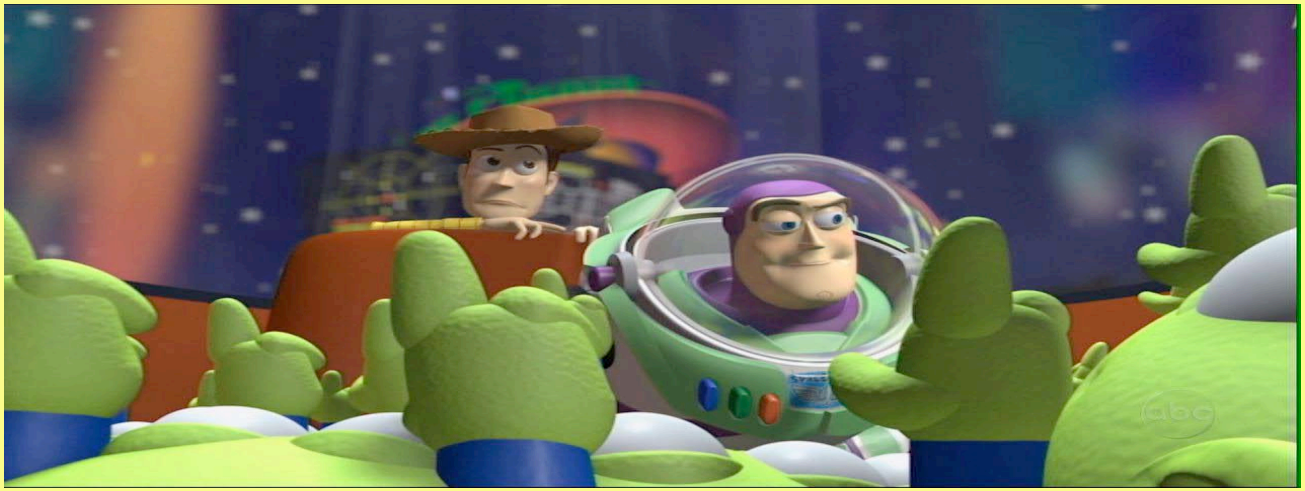
About this tutorial

Yet Another Linux Basics tutorial...

- Red Hat does it in four 8 hour days, the compressed version is one 8 hour day
- Novell does it in 5 hours
- This is the attempt to teach you THE BASICS in 2.5 hours without vendor bias

This is a work in progress.
If this is too slow or fast let me know!

Alien but civilized

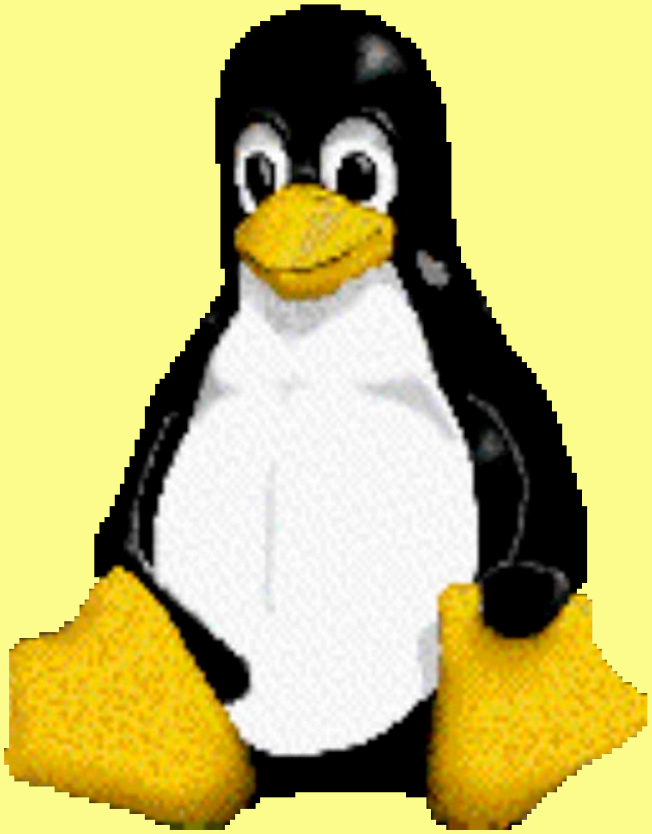


- If you find a concept unfamiliar, know that there is a good reason for it to be that way- a wise and traditional approach.
- Based on a dominate computing system since 1968!

What is Linux?

- Software for the people by the people
- A Fully-Functional Multi-User Multi-Process Unix-like Open Source Operating System comprised of Linus Torvalds' kernel, many GNU tools, and software from many many more contributors worldwide

Linux is contentment

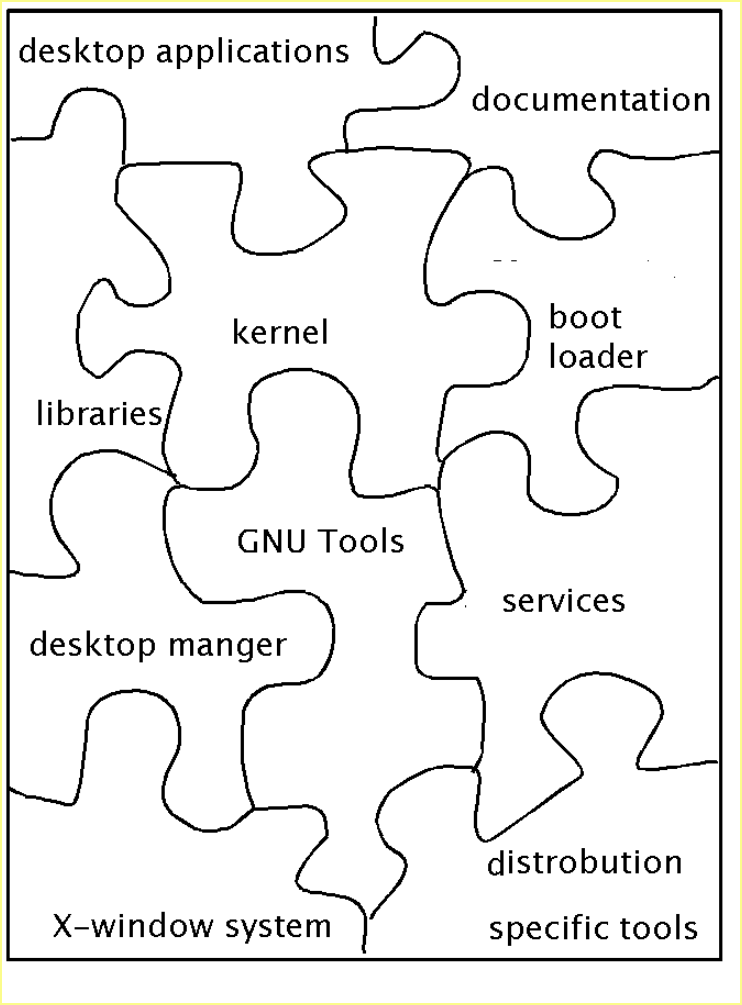


- Pleasantly surprised with community support
- Improvements and enhancements
- Stability, freedom,choice, portability - Linux delivers

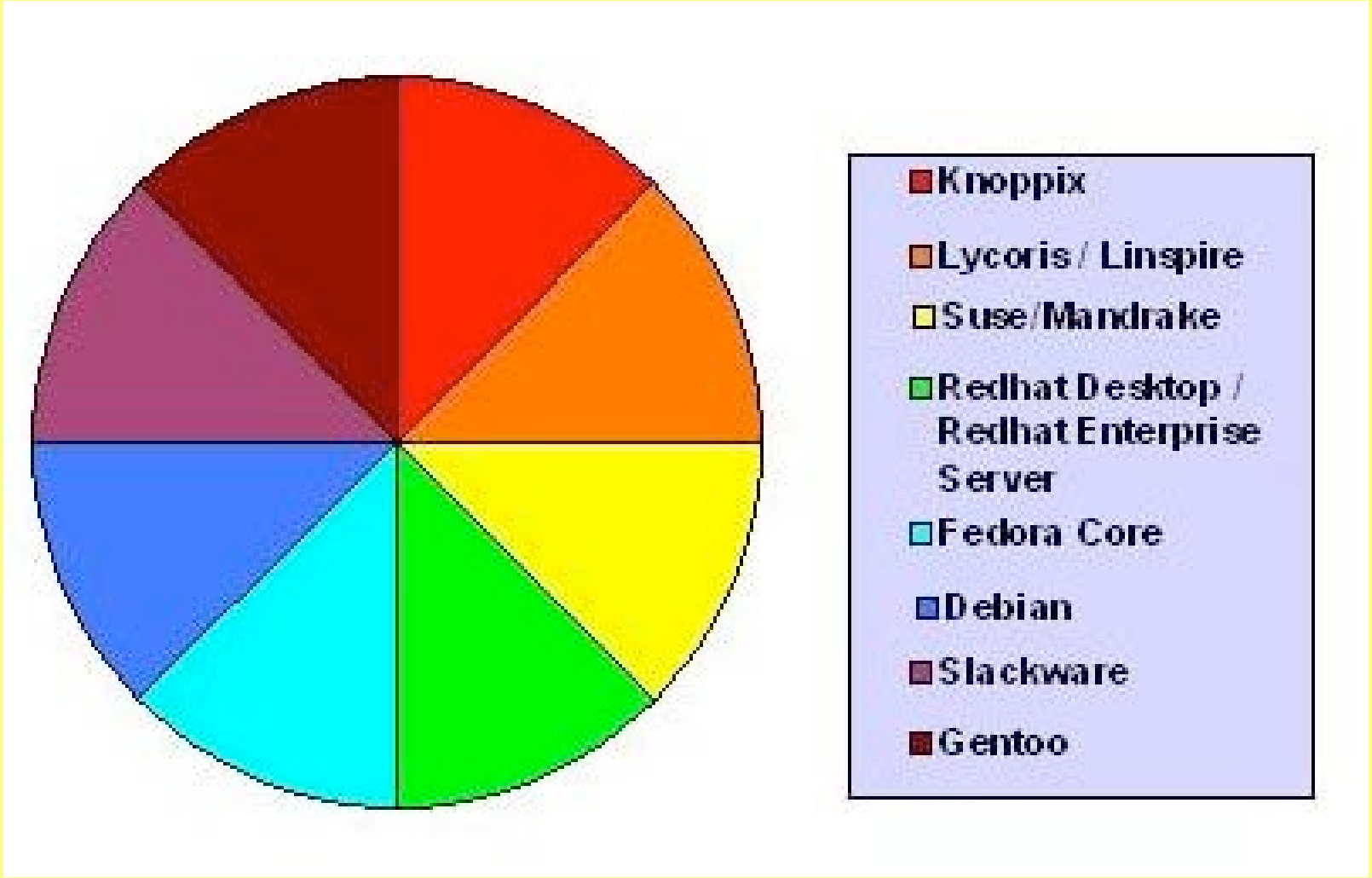
The myths

You have to be a programmer to use Linux.
Linux is only for servers.
There's no software for Linux.
You can't use Windows software anymore.
Windows is everywhere and Linux is nowhere.
Linux is something new – it's not going to last.

The typical Linux desktop



Wheel of Distros



High-Tech Friendly and User Friendly Distros

Grabbing your distro...

- distrowatch.com Boasts that there are 304 Linux distros in their database
- Online and local retailers like amazon.com will sell Linux distros still in the box and books that include a copy of the author's favourite distro
- Once you've made a choice you can download the cdrom image or install floppies from the distributor's website or a mirror
- Don't have a cdrw? cheapbytes Can help you out.

What's my version of Linux?

- uname -r is the version of the Linux kernel
- Popular kernel versions: 2.4 and 2.6 both still in development
- distro version numbers never match

Shameless plug...

LUGs are another great way to get started with Linux.

http://www.wplug.org

Installfests, General Users Meetings, Tutorials such as this, Mailing Lists, and more!

Books you should read

For Sysadmins:

- **Linux Administration Handbook aka "The Green Book"**

by Evi Nemeth, Garth Snyder, Trent Hein, Trent R. Hein

- **Linux Companion for System Administrators**

second ed
Jochen Hein

- **RHCE Linux Exam Cram**

second ed
Kara J. Pritchard

For those new to Unix/Linux:

- **Linux for Windows Addicts: A Twelve Step Program for Habitual Windows Users. (Paperback)**

by Michael Joseph Miller

- **What You Need To Know: when you can't find your UNIX system administrator (What You Need to Know)**

- **Knowing Knoppix**

By Phil Jones

Get it online for free

http://db.ilugbom.org.in/Documentation/knowing-knoppix_2004-12-30.pdf

Yet another shameless plug

- The Open Pitt is an excellent resource for Linux tips for all skill levers
- Frequent book reviews
- “Who’s Supporting You” January 2005 by Vance Kochenderfer
- “So many Distros So Little Time” June 2005
- “Who is Linux’s Spokesperson” May 2005 by Beth Lynn Eicher

Root and Users

- Linux is a multi-user operating system that uses accounts to keep track of who has permissions
- One user a is in control of the system
- The other users are just in control of the own space or “home directory”
- Root is much like the “administrator” account

Demo of Knoppix

We will take a look at Knoppix Linux which boots from any modern Intel-based PC with a cdrom without installing anything on your hard drive

Desktop Usuage

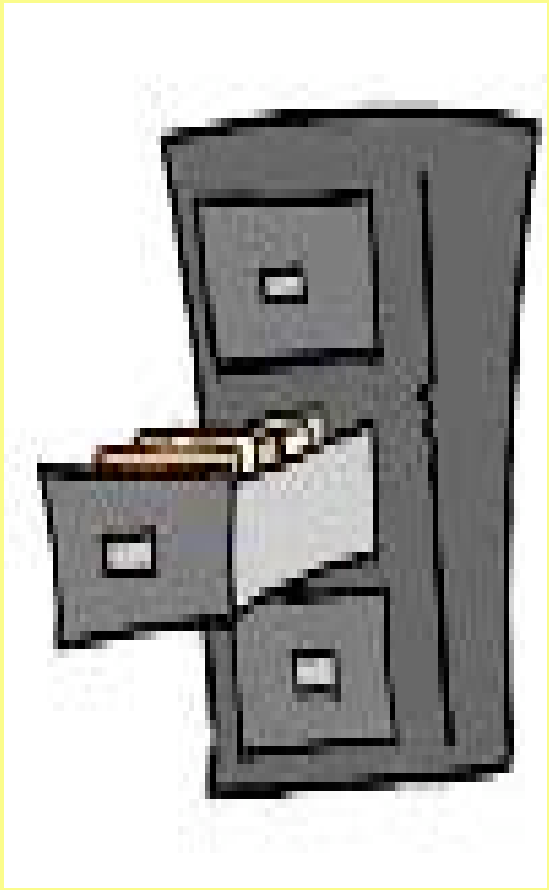
Why pay $$$ for software when you could be using

http://www.openoffice.org

http://www.mozilla.org

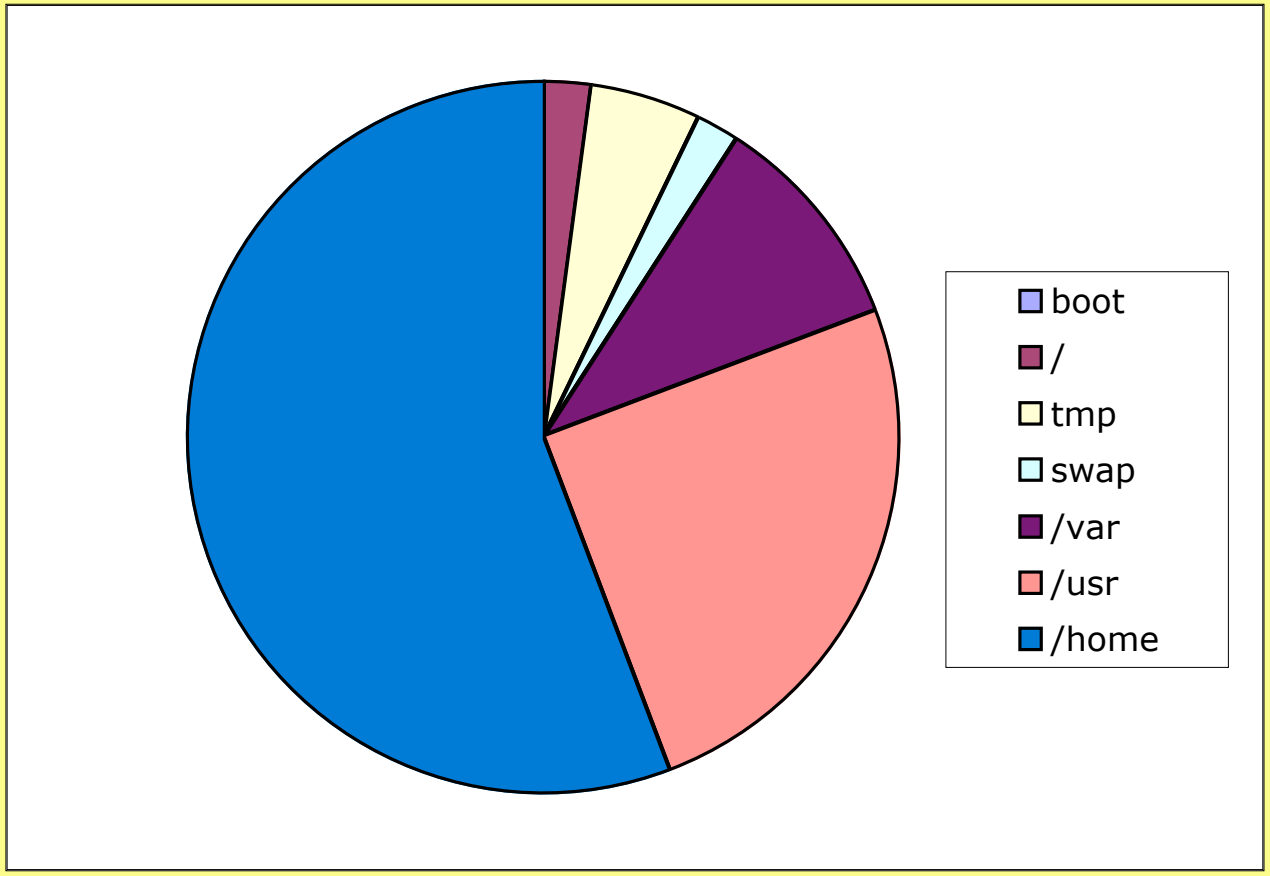
http://www.gimp.org

It all starts with /



/bin
/boot
/dev
/etc
/home
/lib
/mnt
/opt
/proc
/root
/sbin
/tmp
/usr
/var

Partitioning a 100gig disk



Boot 100mb
/ 2gigs
/tmp 5 gig
<swap> 2gig
/var 10 gig
/usr 25 gig
/home 55.9gig

Introduction to the Command Line

- Useful and powerful
- Might be one word or a whole line of options and inputs to do a task
- Sometimes you may want two commands to interact together
- When you have more than just a few commands it’s time for a script.

Good commands that you need to memorize, today!

File Commands: ls, cd, cp, mv, rm, mkdir, rmdir

text reading: cat, more, less

text tools: awk, grep, sed

text editors: vi, emacs, pico, gedit

time: date, cal, uptime

More commands...

Location: find, locate, which, whereis

file extraction: tar, unzip, gunzip

Processes: top, ps, lsof, kill, fg, bg

User tools: passwd, w, who, finger, talk

environment: printenv, setenv, echo

More commands...

Internet: lynx, pine, whois, finger

Service control: chkconfig, init.d, service

Printing: lpr, lpq

Networking: ifconfig, route, traceroute, dig, ping

And some more commands

disk usage: du, df, quota

partitions: fdisk, fsck, mkfs, tune2fs, mount

Shutting down and Rebooting

/etc/shutdown -h now

/etc/poweroff

/etc/shutdown -t60 -r

/sbin/reboot

Output redirection

The > creates a new file and starts writing
The >> appends a file at the end of the file

```
Linux% echo “this” > foo
Linux% echo “that” >> foo
Linux% cat foo
this
that
```

Pipes and More

The pipe |
cat /etc/passwd | grep bethlynn

The semicolon ;
mkfs /dev/hdb1 ; mkfs /dev/hdb2

The double ampersand &&
Mkdir /tmp/files && touch /tmp/files/blankfile

The slashdot ./
./myscript

Getting Help

commands:man, info, {cmd} –help, apropos

Some distros have additional online documentation in html form

http://ldp.wplug.org

Installing software

Software you install often lands in /usr/bin /usr/local/bin or /opt

Don't look in the “Start menu” because chances are, it ain't there!!!

rpm -aq

Whereis which or locate will help you find your software.

Installing Packages

Debian Packages - dpkg

Red Hat Packages – rpm
rpm -Uvh package.rpm
rpm -ivh package.rpm
rpm -aq | grep package
rpm -e package

Tar files

To extract a tar.gz file: tar -zxvf {filename}
To extract a .tar file: tar -xvf foo.tar
To create a .tar file: tar -cvf /foodir.tar foo

once you've extracted the tar file look for a readme.
Perhaps there's an executable installation file
Or a Makefile
Perhaps it's source you need to compile yourself

Security starts with you and your users!

Don't login as root, su instead.
No account or password sharing
logout or use xlock
Select GOOD passwords
Npasswd will help you pick good ones, respect it!
Protect your /etc/shadow

John the Ripper or crack will tell you if your passwords are good enough!

You can implement kerbeos and secure cards.

File permissions

To check the permissions use “ls -l”

Read Write Execute Rights for Owner, Group, and other Users

Permissions - utilize groups

chown {username} {filename}

chown :{groupname} {filename}

Changing file permissions

chmod to change permissions

chmod a+rwx {filename} - full rights to everyone

chmod u+r {filename} - grant user

chmod o-x {filename}

chmod 700 {filename}

Start with a minimal configuration!

Don't install all the whistles and bells.
Only install what you need now.

Educate yourself about the services you are running!

No one should use telnet or ftp, use ssh/scp instead

Use chkconfig –list

check http://www.cert.org for vulnerabilities

turn off any services that are vulnerabilities until you can update or patch!

Update your packages!

Up2date from RHN for Red Hat Enterprise only
Use apt-get or yum instead
SUSE YOU – YAST Updater

Whole presentations on Linux security can and have been done

http://www.wplug.org/meetings/one-meeting?wp_meeting_id=3001

How to stay out of trouble

_Always shut down safely
_Do not do everything as root
_Put your files in /home
_Take the time to understand what you are doing
_Backups!

Files you never want to rm

- anything in /dev
- anything in /proc
- don't get tempted by /proc/kcore
- anything in /boot
- /lib/kernel/modules/{the kernel you want to use}
- contents of /etc, /bin, /usr/bin, /usr/lib
- you may remove the contents of /tmp but not /tmp itself!

Get into trouble
Things you can try...

It won't boot!

Get out yout Knoppix CD

This process seems hung

ctrl+C or ctrl+Z, failing that try to kill it

See if you can jump to another a virtual console

ctrl+alt+f2

Exit the GUI by Alt+Backspace

Today's Handouts

Linux command line
http://www.satlug.org/present/presentation-03.00.html

What is Linux?

http://web.mit.edu/jonas/www/faim/whatislinux.pdf

Special Thanks

Bobbie Lynn Eicher
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Michael P O'Connor
David Ostroske

OK this is really the end

yup, that's all folks