

# Across the Great Divide: Linux for Windows Administrators

---

Dan York, CISSP, LPIC2, (former MCSE)  
dan\_york@mitel.com  
dyork@Lodestar2.com

---

# Before We Begin

---

✦ Have you already deployed Linux?

✦ If so, how are you using it?

- ◆ File / print server?

- ◆ Web server?

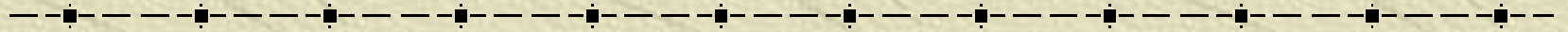
- ◆ E-mail server?

- ◆ DNS server?

- ◆ Desktop?

- ◆ Other?

# Overview



- ✦ Linux Basics
- ✦ Interoperating Between Windows and Linux
- ✦ Strengths and Weaknesses
- ✦ Taking a First Step
- ✦ Questions

# Linux Basics

---

- ✦ It's all about choice
- ✦ No single company or entity controls it all
- ✦ Linus Torvalds and kernel development team create the “kernel” in the middle
- ✦ Packaged into “distributions” – Red Hat, Mandrake, SuSE... many, MANY more!

# Getting Started

---

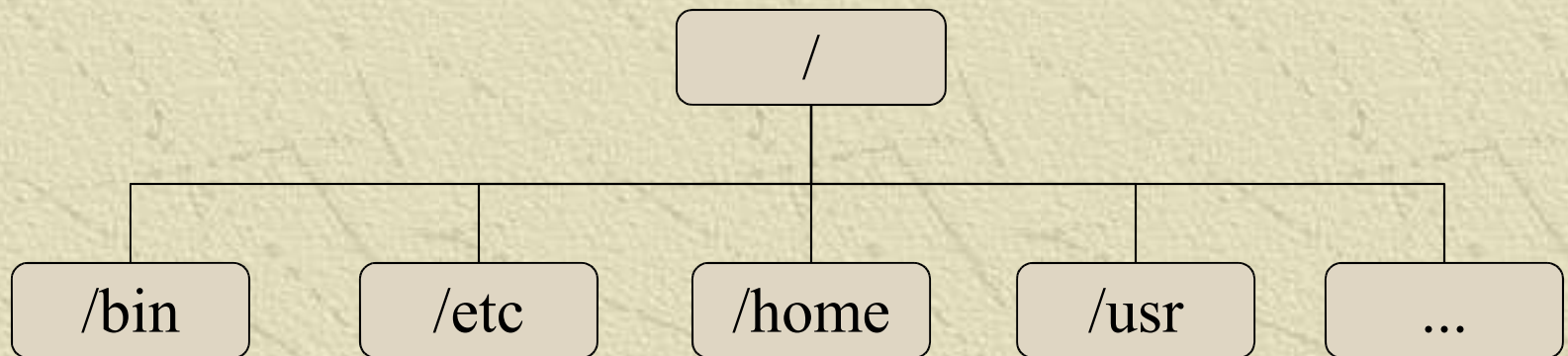
- ✦ Find an old machine
- ✦ Download or purchase a Linux distribution
- ✦ Install from CD
- ✦ Start playing!

# The Linux File System:

## A fundamental difference

---

- ✦ Instead of different disks, all united under “root” directory known as “/”



- ✦ New disks are “mounted” onto a location

# Standard Directories

/bin	“binary” executable files
/boot	files needed for initial system startup
/dev	“files” for all devices connected to system
/etc	primary location for configuration files
/home	usual location for user home directories
/lib	system and program libraries (think of Linux equiv of DLLs)
/opt	frequent location for commercial applications (“optional”)
/proc	special directory showing you system information
/root	home directory for ‘root’ superuser (/home may be a separate disk)
/sbin	special directory of executable files for system administrators
/tmp	temporary files
/usr	files that should be available to all users

# Administering a Linux System

---

- ✦ Many graphical clients available today
- ✦ Some provide nearly exact duplicates of Windows admin tools
- ✦ Web-based admin interfaces provide rich capabilities using a standard browser
  
- ✦ And then... the command line!

# Basic Commands

<b>Linux</b>	<b>Windows</b>
cd	cd
ls	dir
mv	move
cp	copy
rm	del
cat	type
less (or 'more')	more
mkdir	mkdir

# Other interesting commands

---

✦ du

✦ df (esp. 'df -k')

✦ find

✦ locate

✦ which

✦ ln (esp. 'ln -s')

✦ grep

✦ wc

✦ su

✦ date

✦ dmesg

✦ last

✦ who

✦ w

✦ uptime

✦ head (and 'tail')

# Stringing commands together

---

## ✦ Piping output

```
dmesg | grep mem | mail -s "mem" dan@x.com  
cat /etc/passwd | less  
rpm -qa | grep mail | sort | less
```

## ✦ Redirecting output

```
ls -l /home/dan > /tmp/listing.txt
```

## ✦ Appending to a file

```
ls -l /home/mark >> /tmp/listing.txt
```

## ✦ Redirecting input

```
mail -s "config file" < /etc/syslog.conf
```

# Getting Help

---

✦ ‘man’ command (as in “manual” page)

✦ ‘info’ command

✦ The Linux Documentation Project (LDP)

- ◆ <http://www.tldp.org/>

- ◆ lists of “HOWTO” documents and guides

✦ And, of course... the web!

# Editing Files

---

- ✦ A zillion different editors to choose from
- ✦ Most graphical environments have Notepad equivalents
- ✦ For powerful editing, two main camps:
  - ◆ ViM, “VI iMproved”, <http://www.vim.org/>
  - ◆ Emacs, <http://www.gnu.org/software/emacs/>
  - ◆ Graphical versions available for both
  - ◆ Both have powerful macro languages and extensibility

# Working with processes

---

- ✦ Each task is a “process” with a “process id” (pid)
- ✦ “ps” command shows you what’s running
- ✦ “kill” command with pid can terminate processes
  - ◆ “kill -9 <pid>” the ultimate form of death

# Installing Software

---

✦ Packages – generally either RPM (from Red Hat) or dpkg (from Debian)

✦ Graphical installers available

✦ Command line:

```
rpm -ivh foo.rpm
```

```
rpm -Uvh foo.rpm
```

```
rpm -qa
```

```
rpm -e foo
```

# User Accounts

---

- ✦ Each user has unique account / password
- ✦ User has home directory (usually under /home) where only they can write
- ✦ Graphical tools or command line:
  - ◆ useradd dan
  - ◆ usermod
  - ◆ userdel
- ✦ Maintained in /etc/passwd (which may not contain the actual passwords!)

# Group Accounts

---

- ✦ Used for group permissions for files and directories
- ✦ Users can be added to a group on creation:
  - ◆ `useradd -g staff fred`
- ✦ Graphical tools or command line:
  - ◆ `groupadd`
  - ◆ `groupmod`
  - ◆ `groupdel`
- ✦ Maintained in `/etc/group`

# File Permissions

---

## ✦ Three types of permissions

- ◆ Read
- ◆ Write
- ◆ Execute

## ✦ Three levels of permission:

- ◆ User
- ◆ Group
- ◆ Other (world)

# Viewing Permissions

✳ “ls -l” or “ls -al”

```
bash-2.05a$ ls -al mydir
total 24
drwxr-xr-x   2 dyork   dyork   4096 Mar 14 07:31 .
drwx----- 10 dyork   dyork   4096 Mar 14 07:22 ..
-rw-rw-rw-   1 dyork   dyork   1056 Mar 14 07:28 foo-public.txt
-rw-----   1 dyork   dyork   1484 Mar 14 07:29 foo-secret.txt
-rw-rw-r--   1 dyork   staff   2490 Mar 14 07:22 foo.txt
-rwxrwxrwx   1 dyork   dyork   1070 Mar 14 07:30 makefoo
lrwxrwxrwx   1 dyork   dyork     7 Mar 14 07:31 otherfoo.txt -> foo.txt
```

# Modifying Permissions

---

## ✦ chmod

✦ `chmod a-w foo.txt`

✦ `chmod u+w,g+w,a-r foo.txt`

✦ `chmod 664 foo.txt`

## ✦ chown

## ✦ chgrp

# What about a GUI?

---

- ✦ You don't NEED a GUI!
- ✦ If you want one, there are many choices
- ✦ All based on "X Windows System"
- ✦ Separates windowing system from apps
- ✦ Very easy networking – apps can open up windows on X displays across network

# The Linux GUI

---

- ✦ Base “X Windows Systems”

- ✦ “window manager” on top

- ✦ “graphical environment” above that

  - ◆ GNOME – <http://www.gnome.org/>

  - ◆ KDE – <http://www.kde.org/>

# Server Services

---

- ✦ Web (Apache)
- ✦ DNS (BIND, djbdns, ...)
- ✦ E-mail (sendmail, qmail, postfix, ...)
- ✦ DHCP
- ✦ FTP
- ✦ LDAP (OpenLDAP)
- ✦ IPSEC (FreeS/WAN)
- ✦ Instant Messaging (Jabber)

# Commercial Linux Apps?

---

- ✦ What about commercial apps?
- ✦ Many products today now include Linux versions

# Interoperating with Windows

---

## ✦ File/print services

- ◆ Samba – SMB/CIFS

- ◆ <http://www.samba.org/>

## ✦ Emulation

- ◆ Wine – <http://www.winehq.com/>

## ✦ Virtual machines

- ◆ VmWare – <http://www.vmware.com/>

## ✦ Dual-boot systems

# Directory/Domain Integration

---

- ✦ Samba allows Linux servers to be a PDC or a member server
- ✦ Samba also includes *winbind* which will allow integration with Active Directory
- ✦ Documentation online includes “*Using Samba*” from O’Reilly & Associates
- ✦ Samba 3.0 supports AD authentication using LDAP/Kerberos and client/svr SMB signing
- ✦ <http://www.samba.org/>

# Linux Strengths

---

## ✦ CONTROL!

✦ Multiple vendors

✦ “Use the Source, Luke!”

- ✦ Ability to fix issues quickly – yourself or by anyone you can contract

✦ Licensing – usually free and simple

✦ Remote control – ssh, X, VNC, more

✦ Robust, stable, secure

✦ Admin tasks can be easily scripted

# Linux Weaknesses

---

- ✦ It's getting better, but not all brand new hardware is supported (and consumer gadgets)
- ✦ Permissions model not as granular
- ✦ And, of course... Microsoft integration!

# Taking a First Step

---

✦ Choose a small task using a Linux server

- ◆ Web server (perhaps for intranet)
- ◆ DNS server
- ◆ Extra file or print server
- ◆ Mail server (perhaps as an extra layer)
- ◆ Inexpensive firewall/router

# Learning More

---

## ✦ General info

- ✦ LDP – <http://www.tldp.org/>
- ✦ Windows integration – <http://www.samba.org/>

## ✦ Linux News

- ✦ Linux Weekly News – <http://lwn.net/>
- ✦ Linux Today – <http://www.linuxtoday.com/>

## ✦ Linux Training/Certification

- ✦ Linux Professional Institute – <http://www.lpi.org/>
- ✦ LinTraining – <http://www.lintraining.com/>

# Finding Software

---

## ✦ General software

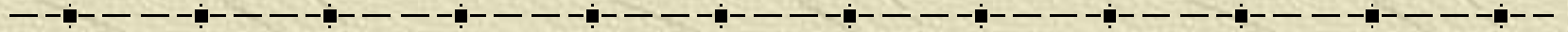
- ✦ Freshmeat - [www.freshmeat.net](http://www.freshmeat.net)
- ✦ SourceForge - [www.sourceforge.net](http://www.sourceforge.net)

## ✦ Linux distributions

- ✦ Fedora – <http://fedora.redhat.com/>
- ✦ SuSE – <http://www.suse.com/>
- ✦ Debian – <http://www.debian.org/>
- ✦ Mandrake – <http://www.mandrakesoft.com/>

# Questions?

# Thank you!



✦ Dan York, CISSP, LPIC2, (former MCSE)

✦ dan\_york@mitel.com

✦ dyork@Lodestar2.com

✦ This talk will be available at:

<http://www.danyork.com/presos.html>