Maintaining Windows in an Open Multi-User Laboratory Environment

Or how to compensate for Windows' shortfalls

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Why does Windows need help?

- No filesystem security, users are root
- Not as stable as UNIX
- Need a simple solution for Help Desk

Where Did It Come From?

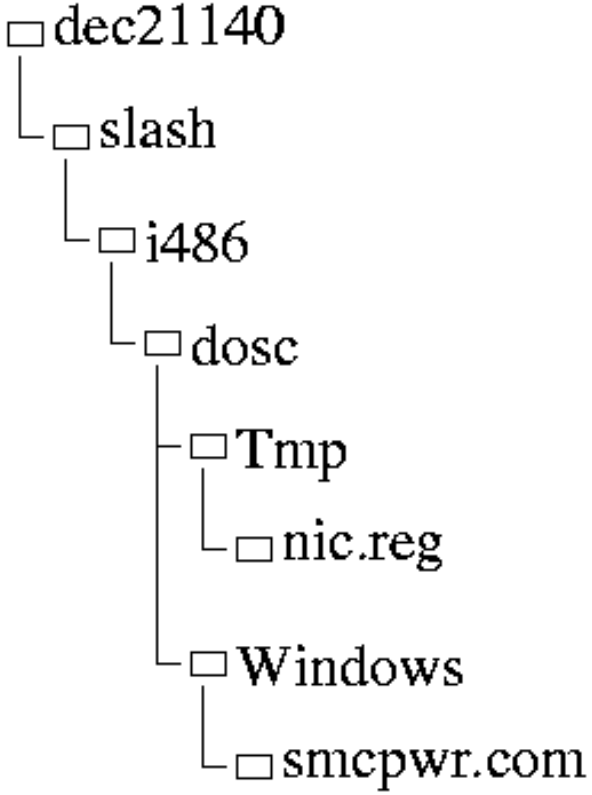
- Designed by Michael Fisk
- Packagelink built /usr/local
- Originally created for UNIX
- Adopted for Windows95

Concepts

- OS is a collection of files
- Software grouped into distinct packages
- OS, Packages, and Config
- Machdb, Packagelink, and Gutinteg

What is a package?

- A package is just a directory structure
- with all files needed for one software package
- Registry file
- Stored on NFS drive



How do I create a package?

- RegView compares before and after INI, registry, filesystem
- Wholewheat turns RegView output into a registry file
- Windows is a package with a registry (486, 586, 686, …)
- Windows doesn’t check registry against hardware

A database of machines (Machdb)

- A series of class definitions
- A class for each machine
- Other classes define packages and other information
- A machine class can inherit from multiple classes

Machdb Syntax

Class: inherited-classes

Variable=Value	Assign
Variable+=Value	List Concat
Variable+=-Value	List Remove

Machdb Example

- A class for a room
- A class for a network
- A class for a NIC
- A class for a machine

```
Speare9: dot4 dec21140
    PRINTER=speare9
dot4:
    DOMAIN=nmt.edu
    GATEWAY=1.2.4.254
    NAMESERVER=1.2.4.1
dec21140:
    PACKAGES+=dec21140
jupiter: speare9
    IP=1.2.4.110
```

How to write package (Packagelink)

- Installs packages according to Machdb
- compare-before-copy method
- Replace token in `.plprocess` files
- ##VARIBLE## with value from Machdb

.plprocess Example

Registry file from the dec21140

```
"Domain"="##DOMAIN##"
"DefaultGateway"="##GATEWAY##"
"IPAddress"="##IP##"
"NameServer"="##NAMESERVER##"
```

Putting it all together (Gutinteg)

- Program run by the user
- Gets information from Machdb
- dosemu to format Windows partition
- Run Packagelink with Machdb information

But wait, there's more...

- Windows is the first package installed
- Run LILO to boot into Windows
- Update the Windows registry

Building the registry

- Autoexec.bat runs bootup.bat once
- regedit the system registry then each package

```
@echo off
cd \Tmp
regedit /L:\Windows\system.dat /C ##CPU##.reg
for %%x in (*.reg) do regedit %%x
```

Down the Road
Building the Registry

- Building the registry in Windows is slow, better methods could be...
  - Regutils (Michael Rendell)
  - dosemu (Hans Lermen)
- Both would build the registry in Linux and are faster then Windows

Down the Road
Building Packages

- Packages are still very hand crafted
- TCC is developing a combination of RegView and Wholewheat
- Decrease the time and errors in making a package

Down the Road
dos-cache

- Snapshots the Windows partition and stores it on the Linux partition
- Rebuilds the Windows partition from snapshot
- dos-cache can be run automatically or as needed
- No network traffic, Linux filesystem security

Conclusions

- Proven useful in maintaining ~200 machines, but still room for improvement
- Gave great insight into the workings of Windows
- Proves a large installation of Windows machines can be maintained with freely available solutions