

# **Systems Programmer, Heal Thy PC Part 2: Tune-Up Time**

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# Do-It-Yourself PC Tune-Up

- Why do it yourself?
  - Personal privacy
  - Can't live without your computer
  - Sense of accomplishment
  - Second career?
  - The Geek Squad™ wants to charge what!?
- What do you need?
  - A plan
  - A toolkit full of free tools

# Simple 15-Step Process

- Boot to Windows
- Shutdown Windows
- Evaluate hard drive health
- Backup Windows partition
- Virus review and removal
- Correct file system errors
- Windows System File Checker
- Uninstall unnecessary programs
- Remove unneeded programs from startup
- Remove Internet Explorer toolbars
- Remove temporary files
- Defragment Windows partition
- Update system BIOS
- Update programs
- Install anti-virus software

# Boot and Shutdown

- Computer must not be Suspended or Hibernating
  - Likelihood of corrupting your file system
- Benchmark startup time
  - So you can compare when you're done
- Shutdown to insure a clean file system close
  - Save yourself from problems later

# Evaluate Hard Drive Health

- Boot SystemRescueCD
  - Download the live Linux cd [www.sysresccd.org](http://www.sysresccd.org)
  - Burn with [isorecorder.alexfeinman.com](http://isorecorder.alexfeinman.com)
- Review hard drive SMART statistics
  - `smartctl -a /dev/sda`
- Run SMART self test
  - `smartctl -t short /dev/sda`
  - `smartctl -l selftest /dev/sda`

# SMART Statistics

- smartctl -a /dev/sda

```
Model Family:      Western Digital Scorpio family
Device Model:     WDC WD800BEVE-00UYT0
Serial Number:    WD-WXE408L96343
Firmware Version: 01.04A01
User Capacity:    80,026,361,856 bytes
...
```

SMART Attributes Data Structure revision number: 16

Vendor Specific SMART Attributes with Thresholds:

ID#	ATTRIBUTE_NAME	FLAG	VALUE	WORST	THRESH	TYPE	UPDATED	WHEN_FAILED	RAW_VALUE
...									
5	Reallocated_Sector_Ct	0x0033	200	200	140	Pre-fail	Always	-	0
...									
9	Power_On_Hours	0x0032	095	095	000	Old_age	Always	-	3670
...									
194	Temperature_Celsius	0x0022	111	100	000	Old_age	Always	-	32
196	Reallocated_Event_Count	0x0032	200	200	000	Old_age	Always	-	0
197	Current_Pending_Sector	0x0012	200	200	000	Old_age	Always	-	0
...									

SMART Error Log Version: 1

No Errors Logged

# SMART Self Test Results

- `smartctl -t short /dev/sda` – run the test
- `smartctl -l selftest /dev/sda` – view the results

```
smartctl version 5.38 [i486-pc-linux-gnu] Copyright (C) 2002-8 Bruce Allen  
Home page is http://smartmontools.sourceforge.net/
```

```
=== START OF READ SMART DATA SECTION ===
```

```
SMART Self-test log structure revision number 1
```

Num	Test_Description	Status	Remaining	LifeTime(hours)	LBA_of_first_error
# 1	Short offline	Completed without error	00%	3655	-
# 2	Short offline	Completed without error	00%	1783	-

# Backup Windows Partition

- Still in Linux
  - Back up the MBR
    - `dd if=/dev/sda of=mbr.bin bs=512 count=1`
  - Back up the contents of the boot partition
    - `partimage` (NTFS and FAT)
    - `ntfsclone` (NTFS only)  
`ntfsclone --save-image -o backup.image /dev/sda1`
- Best practice – regular backups
  - System backup software
    - DriveImage XML (local)
    - Comodo Backup (cloud)
    - IDrive (local and cloud)
  - Registry backup
    - `Regedit->File->Export`
    - Windows System Restore
    - Camtech RegKey Backup



# Next Three Steps

- Virus review and removal
  - Download the handouts from Tuesday's Session 10255
- Boot to Windows and...
  - Correct file system errors: `CHKDSK C: /F`
  - Check Windows System File consistency: `SFC /SCANNOW`

# Uninstall Unnecessary Programs

- Windows Control Panel Add/Remove Programs
  - Start->Run->appwiz.cpl
  - Uninstall one application at a time
- PC Decrapifier at [pcdecrapifier.com](http://pcdecrapifier.com) and CCleaner from [www.piriform.com](http://www.piriform.com)
  - Bulk uninstallers – select applications from a list
- If you're unsure about the safety of uninstalling a particular program, Google it!

# Clean Up Startup and Browser Toolbars

- Start->Run->msconfig
  - Enable/disable startup programs and services
- Start->Run->inetcpl.cpl->Programs->Manage add-ons
- Autoruns from Sysinternals – [live.sysinternals.com/autoruns.exe](http://live.sysinternals.com/autoruns.exe)
  - Enable/disable/delete
    - Startup programs
    - Services
    - Browser Helper Objects and Toolbars
- Firefox: Tools->Add-ons->Extensions – Remove
- Chrome: (wrench)->Tools->Extensions – Uninstall

# Remove Temporary Files

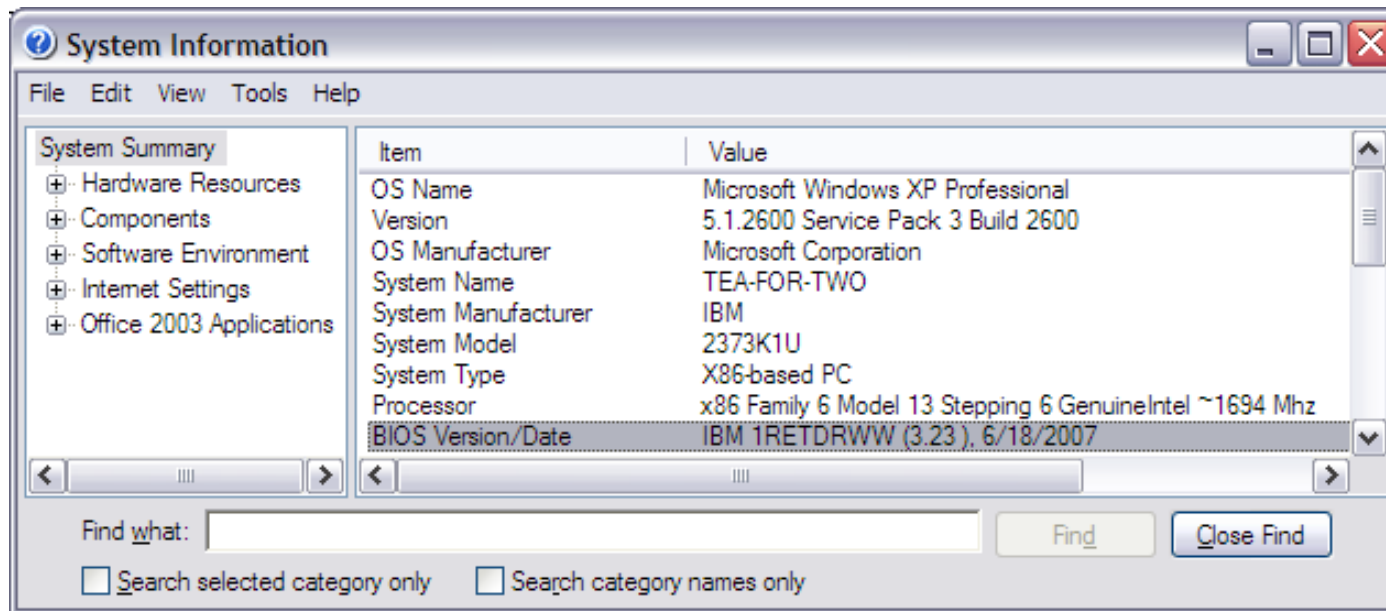
- Windows Disk Cleanup
  - Doesn't delete Temporary Internet Files on XP
  - Let Microsoft delete them for you:  
<http://support.microsoft.com/kb/260897>
- CCleaner from Piriform.com
  - Also removes browser and application-related temporary files
  - Includes registry cleaner (use at own risk)
    - Useful to clean up registry after virus removal
  - Includes bulk application uninstaller, startup manager, restore point manager, and hard drive wiper

# Defragment Windows Partition

- Windows Vista and 7 defragment automatically in the middle of the night – providing your computer is on!
- Minimize computer activity
  - Start->Run->MSCONFIG
    - Deselect all Startup and all non-Microsoft services
  - Reboot
  - Start->Run->defrag
  - MSCONFIG
    - Re-enable all Startup and services
  - Reboot

# Update System BIOS

- Check current BIOS – msinfo32.exe



- Get new BIOS from system/motherboard manufacturer
- Plug into a battery backup
- Install according to manufacturer's instructions

# Update Programs

- Apply any Service Packs
- Apply all subsequent Windows updates
- Update Internet Explorer to 8 or 9
  
- Common programs
  - Adobe Reader
  - Adobe Flash Player
  - Java runtime environment
  - Alternate browsers (Firefox, Chrome, Opera...)

# Install a Lighter-Weight Antivirus

- If you're paying for an antivirus program, discontinue it
- Our recommendations – free for individual use
  - AVG AntiVirus Free Edition – [free.avg.com](http://free.avg.com)
  - Microsoft Security Essentials – [windows.microsoft.com/mse](http://windows.microsoft.com/mse)  
(also free for up to 15 business computers)
- It's good to have a second opinion
  - Malwarebytes Anti-Malware
  - Spybot Search and Destroy
- Uninstall your old antivirus program first
  - Windows uninstall, plus...
  - Vendor-provided removal tool



# Useful FREE Tools

- Secure shell client: putty, psftp, Bitvise Tunnelier
- Create PDFs: PDFCreator, CutePDF
- Firewalls: Comodo, ZoneAlarm
- Office suite: LibreOffice (branch from OpenOffice)
- Audio editor: Audacity
- Duplicate file finder: DUFF
- REXX interpreter: Regina
- Find wireless networks: NetStumbler, InSSIDer
- Everything at [www.systinternals.com](http://www.systinternals.com)
- Everything at [www.piriform.com](http://www.piriform.com)
- Everything at [www.nirsoft.net](http://www.nirsoft.net)
- Everything at [www.portableapps.com](http://www.portableapps.com)

# Thank You!

- Contact us
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  - Victor Freyer – [victor@lemonbaycomputerservice.com](mailto:victor@lemonbaycomputerservice.com)
- Practice Safe Computing!