

A+ Guide to Managing and Maintaining Your PC, 7e

Chapter 14 Optimizing Windows

Thursday, 10 October 2013

Objectives

- Learn about Windows utilities and tools you can use to solve problems with Windows
- Learn how to optimize Windows to improve performance

Windows Utilities and Tools to Support the OS

- Tools covered
 - Task Manager
 - System Configuration Utility (MSconfig)
 - Services console
 - Computer Management console
 - Microsoft Management Console (MMC)
 - Event Viewer
 - Reliability and Performance Monitor
 - Registry Editor

Task Manager

• Taskmgr.exe displays applications and processes

- trations	-		en la faite de la faite des la faite					
ppecasions	Processes	Services	Performance	Networking	Users			
Task				Stat	us			
1 Syste	m			Runn	ning			
Trend	Micro AntiVie	rus plus An	tSpyware	Runn	ning			

Figure 14-1 The Applications tab in Task Manager shows the status of active applications Courtesy: Course Technology/Cengage Learning

- Accessing task manager
 - Press Ctrl+Alt+Delete
 - Right-click taskbar blank area
 - Press Ctrl+Shift+Esc
 - Vista Start Search box or XP Run dialog box
 - Enter taskmgr.exe
- Applications tab
 - States: running or not responding
 - End task button at bottom of the window
 - Attempts a normal shutdown

- Processes tab
 - Lists system services and other processes, CPU time, and memory use
 - Identifies applications slowing down a system
- Showing all processes running under current user
 - System, Local Service, and Network Service accounts
 - Cannot display dialog box on-screen or interact with user
- Stopping a process
 - Click End Process
- Recommendation: use Applications tab first

catons Proof	sses Service	e Per	formance 14e	tworking Users
nagetürne	User Name	CPU	Henory (Description
arss.exe		01	1,048 K	
tom.exe	Jean A	00	916 K	Desktop
xplorer.exe	Jean A	03	13,400 K	Windows
ISASCui.exe	Jean A	00	3,628 K	Windows
taskengexe	Jean A	00	2,528 K	Task Sche
taskingrexe	Jean A	24	1,600 K	Windows
sinlagon.exe		00	1,592 K	
iusudt.exe	Jean A	00	1,025 K	Windows
Show proce	sses from all us	83		End Process

Figure 14-3 Processes running under the current user for a new Vista installation Courtesy: Course Technology/ Cengage Learning

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plications Proces	ses Services	Per	formance N	etworking Use	15
Image Name	User Name	CPU	Memory (Description	
audiodg.exe	LOCAL	00	620 K	Windows	
csrss.exe	SYSTEM	00	1.060 K	Client Ser	11
csrss.exe	SYSTEM	04	1.048 K	Client Ser	
dvm.exe	Jean A	00	916 K	Desktop	
explorer.exe	Jean A	04	13,348 K	Windows	
isass.exe	SYSTEM	00	924 K	Local Sec	1
lsm.exe	SYSTEM	00	1.068 K	Local Ses	11
MSASCul.exe	Jean A	00	3.628 K	Windows	
SearchFilterH	SYSTEM	00	1,568 K	Microsoft	
SearchIndexe	SYSTEM	00	4,748 K	Microsoft	
SearchProtoc	SYSTEM	00	2,584 K	Microsoft	
services.exe	SYSTEM	00	1,656 K	Services	-
S.svc.exe	NETWO	00	3.912 K	Microsoft	
smss.exe	SYSTEM	00	184 K	Windows	
spoolsv.exe	SYSTEM	00	2,652 K	Spooler S	
sychost.exe	SYSTEM	00	1,584 K	Host Proc	
sychost.exe	SYSTEM	00	400 K	Host Proc	
sychost.exe	NETWO	00	2,032 K	Host Proc	
sychost.exe	SYSTEM	01	14,040 K	Host Proc	
sychost.exe	SYSTEM	00	16,240 K	Host Proc	
eurhort ava	NETINO	00	1 160 /	Host Dros	-
Show processes	from all users			End Duntan	

Figure 14-4 Vista processes for all users Courtesy: Course Technology/ Cengage Learning

- Viewing running application processes
 - Select application listed on Applications tab
 - Right-click it and select Go To Process
 - End the process and all related processes
 - Right-click the process and select End Process Tree
 - Do not end Windows critical process
- Process priority level
 - Determines position CPU resources queue
 - Use Task Manager to change priority level

- Services tab
 - Lists currently installed services with status

plications Proc	esses	Services	Perfor	mance	Networking	Users
Name	PID	Descript	ion	Status	Group	Ŀ
SamSs	556	Security	Ac	Runn		1
ProtectedSt	556	Protects	ed	Runn		
NetTopPort		Net.Tcp	Po	Stop		
Netlogon		Netlogor	n	Stop		
Keylso		CNG Ker	y Is	Stop		
idsvc		Window	s C	Stop		
PlugPlay	724	Plug and	Play	Runn	DcomLaur	h
DcomLaunch	724	DCOM S	er	Runn	DcomLaur	h
WinHttpAut	1640	WINHTT	P	Runn	LocalServi	ice
WebClient	1640	WebClie	nt	Runn	LocalServi	ice
woncsvc		Window	s C	Stop	LocalServi	ice
W32Time	1640	Window	s Ti	Runn	LocalServi	ce
uprphost	1640	UPhP De	nic	Runn	LocalServi	ce
THREADOR		Thread	0r	Stop	LocalServi	ce
TBS		TPM Bas	ie	Stop	LocalServi	ice -
					Serv	ices

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Figure 14-7 This Services tab of Windows Vista Task Manager gives the current status of all installed services Courtesy: Course Technology/Cengage Learning

- Performance tab
 - Identifies applications, processes using most CPU time

18 Windows Task N	Aanager	
File Options Vi	ear Help	
Applications Proce	sses Services	Performance Networking Users
CPU Usage	CPU Usage H	Natury .
0.8		
Memory	Physical Her	kery Usage History
K. 14 GA		
Physical Henery	(94)	System
Total	2637	Handes 24464
Free	1906	Processes 90
Kernel Henory Total Paged Norpaged	(HE) 288 135 82	Lip Time 2:30:34 Page File 3523H / 4333H
Processes 90 C	PUUsage 12%	Physical Memory: 57%

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Figure 14-8 The Performance tab window shows details about how system resources are being used

Courtesy: Course Technology/ Cengage Learning

- Networking tab
 - Displays how heavily network being used by a computer



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Figure 14-9 Use the Networking tab of Task Manager to monitor network activity Courtesy: Course Technology/ Cengage Learning

- Users tab
 - Shows all users currently logged on
 - Log off user to improve performance

pications Proc	nsses	Servio	es Performance Netw	oring Users	
User "	10	Statu	a Clert Name	Session	
2 Jean An Day Dark	1 2	Active	r wected	Console	
			Windows Task Mana	ger 👘	
			If you log off a be lost.	user, their unsaved	data might
			Do you want to con	tinue!	
			Do you want to con	Cirue!	Cancel

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System Configuration Utility (MSconfig)

- Msconfig.exe •
 - Temporary fix to disable program or service from loading

Service	Manufacturer	Status	Date Disabled		
Adobe LM Service	Adobe Systems	Stopped			
Application Experience	Microsoft Corporation	Running			
Application Layer Gateway Service	Microsoft Corporation	Stopped			
Apple Mobile Device	Apple, Inc.	Running			
Vindows Audio Endpoint Builder	Microsoft Corporation	Running			
Windows Audio	Microsoft Corporation	Running			
Base Filtering Engine	Microsoft Corporation	Running			
Background Intelligent Transfer	Microsoft Corporation	Running			
Computer Browser	Microsoft Corporation	Running			Figure 14-14
Certificate Propagation	Microsoft Corporation	Stopped			
Microsoft .NET Framework NGEN	Microsoft Corporation	Stopped			view and contr
COM+ System Application	Microsoft Corporation	Stopped		*	launchod at at
Note that some secure Microsoft services	s may not be disabled.	Enable	al Disable	al	Course Techn

se MSconfig to l services rtup. Courtesy: ogy/Cengage

Services Console

- Launching the services console
 - Vista Start Search box or XP Run dialog box
 - Enter Services.msc

	File Action View dx eb I III II II	Help Refi∎ moj > ■ = =					To Contra	
	Services (Local)	Second (2008)	Name	Description	(betus	Stattup Tupe	Leg Ce As	
		Into the service Install the service Description Recipion attack applications the fluxes and their to attack respiration working on the box network, respira fluxes evolution on the box network, respirations evolution into applies of any applications evolution into applies to any applications evolution into applies to any applications evolution into applies to any applications evolution.	Adobe LM Service Apple Mobile Dexi. Apple Mobile Dexi. Application Expert. Application Layer Application Layer Background Intell. Base Filtering Engl.	AdobeLM 5 Prevides th Processes a Facilitates 1 Provides zw Transfers H The Base FL	Darted Statud Stated Stated Stated	Menuel Automatic Automatic Manuel Manuel Automatic (D., Automatic	Lecel Syste Lecel Syste Lecel Syste Lecel Syste Lecel Service Lecel Syste Lecel Service	5
àives descriptions		ing names and a name applicity against an t of fairs part	Catificate Propag. CND Key Bulletion CDM+ Event Syst. CDM+ System Ap., Computer Brower	Propagator The Chillika Supports Sys- Maintains a	Statud Statud Statud	Manual Manual Automatic Manual Automatic	Lacal Syste Local Syste Local Syste Local Syste Local Syste	

Figure 14-18 The Services window is used to manage Windows services Courtesy: Course Technology/Cengage Learning

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Services Console (cont'd.)

- Selecting Properties
 - Provides more information about a service
 - Allows stopping or starting a service
- Service startup types
 - Automatic (Delayed Start): starts shortly after startup, after the user logs on
 - Automatic: starts when Windows loads
 - Manual: starts as needed
 - Disabled: cannot be started
- Useful when cleaning up a Windows system

Computer Management

- Consolidates several Windows administrative tools
 - Use to manage local PC and other network computers
 - Administrator authority required
 - Viewing may allow lesser privileges
- Accessing Computer Management in Vista
 - Enter compmgmt.msc in Vista Start Search box
 - Click Start, right-click Computer, and select Manage
 - Control Panel
 - Click System and Maintenance, click Administrative Tools, and double-click Computer Management



Figure 14-20 Windows Computer Management combines several administrative tools into a single easy-toaccess window Courtesy: Course Technology/Cengage Learning



Figure 14-21 Use the Taskbar and Start Menu Properties window to change items on the Start menu Courtesy: Course Technology/Cengage Learning

Microsoft Management Console (MMC)

- Program file: mmc.exe
 - Windows utility to build customized console windows
 - Console is a single window containing one or more administrative tools
 - Snap-ins are individual tools in a console



Figure 14-22 An empty console. Courtesy: Course Technology/Cengage Learning

Event Viewer

- Eventvwr.msc
 - Tool for troubleshooting problems with Windows, applications, and hardware
 - Also a Computer Management snap-in
- Manages logs of events
 - Three most important views of logs
 - Application log
 - Security log
 - System log

Event Viewer (cont'd.)

- Logs new to Windows Vista
 - Custom Views
 - The Setup log
 - The Forwarded Events
 - The Applications and Services Logs
 - The Subscriptions log
- System log: most important log other than security
 - Records three error event types
 - Information, warning, and error events

Event Viewer (cont'd.)

- Click log to view
- Save time reviewing logs by using filters
 - To view most significant events when troubleshooting check Critical and Error under Event level
- Avoid ballooning log file
 - Set size limit
 - Specify what happens when log reaches this limit
- Event viewer is most useful in solving intermittent hardware problems

Reliability and Performance Monitor

- Perfmon.msc (another MMC snap-in)
- Collects, records, and displays events (i.e., Data Collector Sets)
- Windows XP
- Monitor called Performance Monitor or System Monitor
- Starting the monitor
- Use Administrative Tool applet in Control Panel
- Open Computer Management Console
- Enter perfmon.msc in Vista Start Search box or XP Run box

Reliability and Performance Monitor (cont'd.)

- Contains three monitoring tools
 - Performance Monitor provides real-time view of Windows performance counters
 - Reliability Monitor provides historical data showing stability
 - Data Collector Sets utility collects data about the system
- Viewing system diagnostics data as a report
 - Right-click System Diagnostics and select Latest Report from shortcut menu

The Registry Editor

- Difficult problems might require editing or removal of a registry key
- Registry organization
 - Registry
 - Database designed with a treelike structure (i.e., hierarchical database)
 - Contains configuration information for Windows, users, software applications, and installed hardware devices
 - Registry built in memory at startup
 - Windows uses current hardware configuration and information taken from files

The Registry Editor (cont'd.)

- Registry organized into five treelike structures
 - Each segment called a key
 - Each key can have subkeys
 - Subkeys can have more subkeys and can be assigned one or more values
 - Data is organized in hive files
 - Different from organization in registry keys


Figure 14-36 The Windows registry is logically organized in an upside-down tree structure of keys, subkeys, and values Courtesy: Course Technology/Cengage Learning



Figure 14-37 The relationship between registry subtrees (keys) and hives Courtesy: Course Technology/ Cengage Learning

The Registry Editor (cont'd.)

- Five keys:
 - HKEY_LOCAL_MACHINE (HKLM)
 - HKEY_CURRENT_CONFIG (HKCC)
 - HKEY_CLASSES_ROOT (HKCR)
 - HKEY_USERS (HKU)
 - HKEY_CURRENT_USER (HKCU)

The Registry Editor (cont'd.)

- Before editing the registry
 - Back up registry
 - Use System Protection to create a restore point
 - Back up a single registry key just before editing the key
 - Make an extra copy of the C:\Windows \System32\config folder
 - For Windows XP, back up the system state
 - Back up and restore individual keys
- Edit the registry with Registry Editor (regedit.exe)

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Improving Windows Performance

- Assuming Windows is starting with no errors
 - Use 11 step-by-step procedures
 - Search for problems affecting performance
 - Clean up Windows startup process
- Trouble starting windows
 - Address those errors first before addressing performance
 - See Chapters 15 and 16

- Step 1: Perform routine maintenance
 - Verify critical Windows settings
 - Clean up and defrag hard drive
 - Check hard drive for errors
 - Disable and remove unwanted startup programs
 - Back up data
- Step 2: Check if hardware support the OS
 - Vista Windows Experience Index
 - Vista Upgrade Advisor: checks compatibility
 - Run System Information Utility (msinfo32.exe)





Figure 14-41 Use the Windows Experience Index to get a snapshot of a computer's performance and identify potential bottlenecks Courtesy: Course Technology/Cengage Learning **Figure 14-43** The Performance monitor tracking CPU performance Courtesy: Course Technology/Cengage Learning

- Step 3: Check for performance warnings
 - View warnings in Windows Experience Index window
 - Advanced tools
 - Clicking an issue
 - Displays dialog box describing the issue
 - Gives suggestions to resolve it
 - Investigate each issue one at a time
 - Tools to assist in troubleshooting are listed in Advanced Tools window



Figure 14-44 Vista provides these warnings and tools to improve Vista performance Courtesy: Course Technology/Cengage Learning

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Figure 14-45 Windows reports four issues that are affecting performance Courtesy: Course Technology/Cengage Learning

- Step 4: Check the reliability monitor
 - Determine if a problem with hardware or software installation is affecting performance
 - Determine when time problem started



Monitor to search for when a problem began Courtesy: Course Technology/ Cengage Learning

Figure 14-48 Use Reliability

- Step 5: Disable the indexer for Windows search
 May cause problems
- Step 6: Disable the Vista Aero interface
 - Uses memory and computing power
 - May require memory or video card upgrade or leaving interface disabled
- Step 7: Disable the Vista Sidebar
 - Might see slight performance improvement

- Step 8: Plug up any memory leaks
 - Use Reliability and Performance Monitor
 - Click down arrow on the Memory bar
 - Use Task Manager Processes tab
 - Click View and Select Columns
 - Verify Memory Private Working Set, Handles, and Threads columns are checked
 - Watch values over time for increases
 - Solving memory leak
 - Obtain update or patch from program manufacturer's Web site

- Step 9: Consider disabling the Vista UAC box
 - Might slightly improve performance
 - Disabling not recommended
- Step 10: Consider using Vista ReadyBoost
 - Flash drive or secure digital (SD) memory card used to boost hard drive performance
 - Acts as a buffer to speed up access time
 - Best for hard drive less than 7200 RPM
 - Windows automatically tests device qualifications
 - 256 MB to 4 GB, 256 MB free space, 2 MB/sec of throughput

- Step 11: Clean windows startup
 - Verify startup programs kept to a minimum
 - Check startup folders in Windows XP
 - Check Software Explorer in Windows Vista
 - Cleaning Windows startup
 - Use Safe Mode and MSconfig to find out more about the problem
 - Disable or uninstall programs causing problems

- Step 11: Clean windows startup (cont'd.)
 - Observe performance in Safe Mode
 - Improvement indicates nonessential program issue
 - Time a normal startup and a Safe Mode boot
 - Significant difference: reduce Windows startup to essentials
 - No improvement indicates problem with hardware device, critical driver, or Windows component

- Step 11: Clean Windows startup (cont'd.)
 - Use MSconfig to find startup program affecting performance
 - Recommended strategy: half-again search
 - Disable or uninstall background processes and startup programs
 - Permanently manage a service
 - Use services console or Windows component responsible for the service
 - Investigate service with good search engine
 - Reboot and test



Figure 14-60 Strategy to identify the program(s) causing the problem Courtesy: Course Technology/Cengage Learning

- Step 11: Clean Windows Startup (cont'd.)
 - Check for unwanted scheduled tasks
 - Verify Task Scheduler contents
 - Review details of all scheduled tasks
 - Look for hidden tasks
 - Disable suspect tasks, test, and delete as necessary

How To Manually Remove Software

- Manually uninstall
 - Programs refusing to uninstall or giving errors when uninstalling
 - Use as a last resort
 - Try program's uninstall routine
 - Manually delete program's files
 - Manually delete registry entries
 - Remove program from All Programs menu
 - Restart PC and watch for errors
 - Fix orphaned entry (as necessary)

- Keys causing an entry to run only once at startup
 - HKLM\Software\Microsoft\Windows\CurrentVersion \RunOnce
 - HKLM\Software\Microsoft\Windows\CurrentVersion
 \RunServiceOnce
 - HKLM\Software\Microsoft\Windows\CurrentVersion \RunServicesOnce
 - HKCU\Software\Microsoft\Windows\CurrentVersion
 \RunOnce

- Group Policy keys affecting startup
 - HKCU\Software\Microsoft\Windows\CurrentVersion
 \Policies\Explorer\Run
 - HKLM\Software\Microsoft\Windows\CurrentVersion
 \Policies\Explorer\Run
- DLL programs key
 - Normal: do not delete unless positive
 - HKLM\Software\Microsoft\Windows\CurrentVersion \ShellServiceObjectDelayLoad

- Keys applying to all users and hold legitimate startup entries
 - Do not delete unless you suspect it to be bad
 - HKLM\Software\Microsoft\Windows\CurrentVersion \Run
 - HKCU\Software\Microsoft\Windows NT\CurrentVersion \Windows
 - HKCU\Software\Microsoft\Windows NT\CurrentVersion \Windows\Run
 - HKCU\Software\Microsoft\Windows\CurrentVersion \Run

- Entries pertaining to background services
 - HKLM\Software\Microsoft\Windows\CurrentVersion
 \RunService
 - HKLM\Software\Microsoft\Windows\CurrentVersion
 \RunServices
- Key containing value named BootExecute
 - Normally set to autochk
 - Causes system to run a type of Chkdsk program
 - HKLM\System\CurrentControlSet\Control\Session
 Manager
- Several others cause various problems at startup

Monitor the Startup Process

- Third-party tools monitoring startup changes
 - WinPatrol by BillP Studios (free)
 - Runs in background
 - Monitors registry changes, startup processes, IE settings, and system files
 - Antivirus software

WinPetr	ol New Program Alert			8
	A new outo Stortup Program has been detected. This program will run each time you login or restart your machine.			
	Press YES if this progra	um is expected and a	cceptable.	Pr.
۲	Adobe Update Mana	iger		
C.Pro	gram Files\Adobe\Acrobe	st 7.8%crobst/Adobe	UpdateManag	er.exe AcStd7_0
Adobe 5)	vitems incorporated	Version	3.0	
PLUS Into			Vec	No

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Figure 14-72 WinPatrol by BillP Studios alerts you when the startup process is about to be altered Courtesy: Course Technology/ Cengage Learning

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- Answer: ReadyBoost

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Summary

- Tools to optimize Windows
 - Task Manager
 - System Configuration Utility (MSconfig)
 - Services console
 - Computer Management console
 - Microsoft Management Console (MMC)
 - Event Viewer
 - Reliability and Performance Monitor
- Registry is organized into five treelike structures

 Registry Editor

Summary (cont'd.)

- To troubleshoot a sluggish Windows system
 Follow 11 steps
- Manually remove software
 - Try program's uninstall routine
 - Manually delete the program's files
 - Manually delete registry entries
 - Remove the program from All Programs menu
 - Restart PC and watch for errors
 - Fix orphaned entry (as necessary)
- Use third-party tools monitoring startup changes