

Performance Hardware User's Guide

### How To Optimize your SSD Boot Drive



A guide showing a few simple steps to optimize the performance of your SSD boot drive.



### Introduction

SSDs are the fastest drives available for desktop and portable computers. However, modern operating systems, programs, and games can quickly take up a huge amount of storage. One very popular set-up these days is for users to use an SSD for their boot drive and use standard hard drives for data storage space. Therefore, it's wise to optimize the SSD space that you have when using an SSD as your boot drive.

There are a few simple things you can do to get the most performance out of any SSD. Outlined in this guide are the steps we took to achieve maximum results without impacting performance while also saving on disk space. Our guide was assembled using the Force series F40 SSD and the information here applies to all of the SSDs in our lineup.





### **Disable Hibernation**

If your system isn't a laptop or netbook then you probably won't ever need hibernation. While hibernation is turned on your system keeps a file on the root of your drive where it saves information about what you're currently doing on your computer. Disabling hibernation is easily accomplished with a simple command line and will save you several GB's of space. On our F40 we found that disabling Hibernation saved us roughly 8GB of space (20%)!

Here are the steps we followed:

- 1. Click on the "Start" button (Window's logo icon in the lower left hand corner of your desktop) and type "command" into the search field.
- 2. Right click on "Command Prompt" at the top of your search results and choose "Run as Administrator".
- 3. In the DOS window enter the following command: **powercfg -h** off
- 4. Close the command window.







### **Change your Page File Settings**

The primary purpose of your page file is to act as virtual memory. Windows 7 primarily uses it for a couple of things; first off it acts as a staging area for information the OS thinks it might need next (think cache) and as a backup in case you don't have enough physical memory (DRAM). Additionally some applications are written to utilize the page file and may refuse to work correctly without one being present.

Here are the steps we followed in Windows 7 to change the page file settings:

- 1. Click on the Start button then right click on "My Computer" and choose "Properties".
- 2. In the left pane, click "Advanced" then click on "Settings" under "Performance".







### **Change your Page File Settings**

The steps continued:

- 3. Select the "Advanced" tab and click on "Change" in the "Virtual Memory" section.
- 4. Uncheck the box at the top and select your SSD.
- 5. Click on "No paging file" then click on "Set". Ignore any warnings, we're simply relocating the pagefile.

Drive [Volume Label]			
	Pag	jing File Size	e (MB)
C: [F40] D: [WD 500 Mobil	e	None System r	nanaged
		ŧ	1000 C
Selected drive.	C: [E40]		
Space available:	25247 MB	_	
Custom size:		5	
Initial size (MB):		$\sim$	
Maximum size (MB):	/	٦ N	
Custom managed	/		
No paging fla	ze	0	
V No baging file			Set
Total paging file size f	or all drives		
Total paging file size f Minimum allowed:	or all drives		
Total paging file size f Minimum allowed: Recommended:	or all drives 16 MB 18418 MB		

With so much system memory in today's computers you might think that you could get away just turning off your page file. However, we have experimented with various page file settings and found that you get better performance by relocating the page file to a storage drive and believe this option is the best solution. In our testing the performance difference using this solution was barely measureable.





### **Change your Page File Settings**

The steps continued:

- 6. Select your secondary drive and click on "System managed size".
- 7. Click on "Set" then "OK".
- 8. Reboot your computer and confirm that everything is where it should be. The pagefile.sys is a system file so you won't be able to see it till you've changed your file view properties.

Paging hie size for eac	h drive	
Drive [Volume Label]	Paging File Size (I	MB)
C: [F40] D: [WD 500 Mobil	e) None System ma	naged
Selected drive: Space available: © <u>C</u> ustom size:	6 D: [VID 500 Mobile] 252011 MB	
Maximum size (MB): System managed : No paging file	ize (	Set
Total paging file size f	or all drives	+
	16 MB	
Minimum allowed:		
Minimum allowed: Recommended:	18418 MB	17

The nature of the page file means that your OS is going to be constantly writing to it and while we don't need to worry about fragmentation on an SSD like we would on a traditional hard drive we do need to take into consideration the impact constant writes to the page file will have on the life-span of your SSD.

Feel free to experiment with different settings; what works best on your system might be different, and you can always go back to an earlier setting.



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### Turn off Indexing

Indexing is a trick Windows uses to speed up the search for information on your hard drive. This helps on rotating media (HDD's) but doesn't provide any benefit on an SSD, and only increases CPU overhead. Indexing can be disabled in Windows Services.

Services						- 0 <b>-</b> X
File Action View	Help					
(+ +) 🛅 🖸 G	🔒 🛛 🖬 🖡 🕨 💷 🕪					
🧟 Services (Local)	Services (Local)					
	Windows Search	Name	Description	Status	Startup Type	Log On As
	Description: Provides content indexing, property caching, and search results for files, e- mail, and other content.	Zune Wireless Co Zune Network Sha WWAN AutoConfig Workstation WIL Performance WILAN AutoConfig Wired AutoConfig Wired AutoConfig WinHTTP Web Pr Windows Update	Configures Shares Zune This service Creates and Provides pe The WLANS The WIRE WinHTTP i Enables the	Started Started Started Started	Manual Manual Automatic Manual Automatic Manual Manual Automatic (D.,.	Local Syste. ; Network S Local Servic Network S Local Syste. Local Syste. Local Syste. Local Syste. Local Servic Local Syste.
	2	Windows Starch Windows Search Windows Remote Windows Presenta Windows Media P Windows Media C Windows Media C Windows Media C Windows Manage Windows Manage Windows Installer Windows Installer Windows Installer	Maintains d.,. Provides co.,. Windows R.,. Optimizes p.,. Enables inst.,. Shares Win.,. Starts and st.,. Windows M.,. Provides a c.,. Adds, modi.,. Provides im.,.	Started Started Started	Manual Disabled Manual Manual Manual Manual Automatic Manual Manual Manual	Local Servic Local Syste Network S Local Servic Local Syste. Network S Network S Local Syste. Local Syste. Local Syste. Local Servic
		4	1	1		,



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### **Turn off Indexing**

Here are the steps we followed to turn it off:

- 1. Click on the "Start" button and type "services" into the search field then click on the "Services" program in the results field.
- 2. Double-click on "Windows Search". (tip: sort by name)
- 3. Change "Startup type" to "Disabled" and click on "Stop" to turn off the service currently running.

General	Log On	Recovery	Depende	ncies	
Service	e name:	WSearch			
Display	name:	Windows S	Search		
Descrip	tion:	Provides c search res	ontent inde ults for files	xing, property c , e-mail, and oth	aching, and recontent.
Path to C:\Win	executabl dows\syst	e: em32\Searc	hIndexer.e	xe /Embedding	
Startup	type: (	Disabled	)		•
Help m	e configure	e service sta	tup option	>3	
Service	e status:	Stopped	_		
	Start	Stop		Pause	Resume
You ca	n specify t re.	he start para	meters that	apply when you	u start the service
	re.				



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#### Modify Windows System Restore

While you could turn this function off entirely we feel that it's worth keeping around. After all, as good as Windows 7 is, it still occasionally encounters problems, and being able to roll back your OS to an earlier version could save you the headache of having to reinstall everything from scratch. By default, System Restore will reserve between three and five percent of your drive, which means that your system is setting aside at least 1GB.

Here are the steps we followed to modify System Restore:

- 1. Click on the Start button then right click on "My Computer" and choose "Properties".
- 2. In the left pane, click "System protection".
- 3. Under "Protection Settings", click on your SSD then click "Configure"

omputer Name	Hardware	Advanced	System Protection	Remote
Use sy restore	stem protecti previous ver	ion to undo u rsions of files.	nwanted system cha What is system prot	nges and ection?
System Restore				
You can undo	system chan	ges by revert	ing System	Restore
	ives		Protection	-
Available Dr			<b>Z</b>	
F100	(System)		3 Off On	E
F100 F40 (C:) F256	(System)		3 Off On Off	II.





### Modify Windows System Restore

The steps continued:

4. Under "Disk Space Usage" move the slider all the way to the left.

Restore Settings -			
System Protection versions of files.	n can keep copies of syste Select what you would like	m settings and previ to be able to restor	ious e:
Restore sy	stem settings and previou	s versions of files	
Only restor	re previous versions of file	s	
🔘 Turn off sy	stem protection		
Disk Space Usage You can adjust th	ne maximum disk space use er restore points will be de	d for system protec	tion. As
ones. Current Usage:	0 bytes	14	ior new
space mis up, oid ones. Current Usage: Max Usage:	0 bytes	4 .60 MB)	

According to Microsoft you'll need to allow the system to reserve at least 300MB (<u>http://windows.microsoft.com/en-US/windows7/How-much-disk-space-does-System-Restore-require</u>). Fortunately, you control the percentage of reserved space with a slider bar, so it's impossible to go below that barrier.



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# Game and Program Files and the Completed Installation

While installing and running your games and programs on your SSD will be quickest, you'll want to determine on a case by case basis which ones are important enough to reside on your SSD. Programs such as Outlook rely on a database file and really benefit from the increased IO of an SSD while most other programs aren't going to see the same level of benefit and basically just take up space.

Today's games usually run 5GB or more (Starcraft II takes 10.5GB!). So you're not going to be able to install many games on your boot drive at the same time if you are using a smaller SSD such as the F40 used here.

Security	Previo	us Versions	Quota	
General	Tools	Hardware	Sharing	
<b>E</b>	0			
Type: Loc	al Disk			
File system: NT	FS			
Used space:	14,176	,202,752 bytes	13.2 GB	
Free space:	25,732	,853,760 bytes	23.9 GB	
Capacity:	39,909	,056,512 bytes	37.1 GB	
			2	
	D	in C.	Disk Cleanup	

Our Windows 7 Ultimate 64bit installation after using this guide takes up 10.4GB. And once you've installed Outlook 2010 (all files and programs run from disk) your total installation is 13.2GB. This leaves you with 23.9GB of super-fast SSD to get your game on with!



## Resources

Corsair SSD Product Page: http://www.corsair.com/products/ssd\_home.aspx

Corsair Blog, SSD section: http://blog.corsair.com/?cat=7

**Corsair Support and Discussion Forums**: http://forum.corsair.com/v3/index.php

Microsoft Knowledge Base, System Restore: http://windows.microsoft.com/en-US/windows7/How-muchdisk-space-does-System-Restore-require



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