

SECURE CODING CSE2010

19BCN7034

Working with memory vulnerabilities

TASK

Download and install visual studio (recent edition)

Write a C++ code of your own to build an executable and run the same.

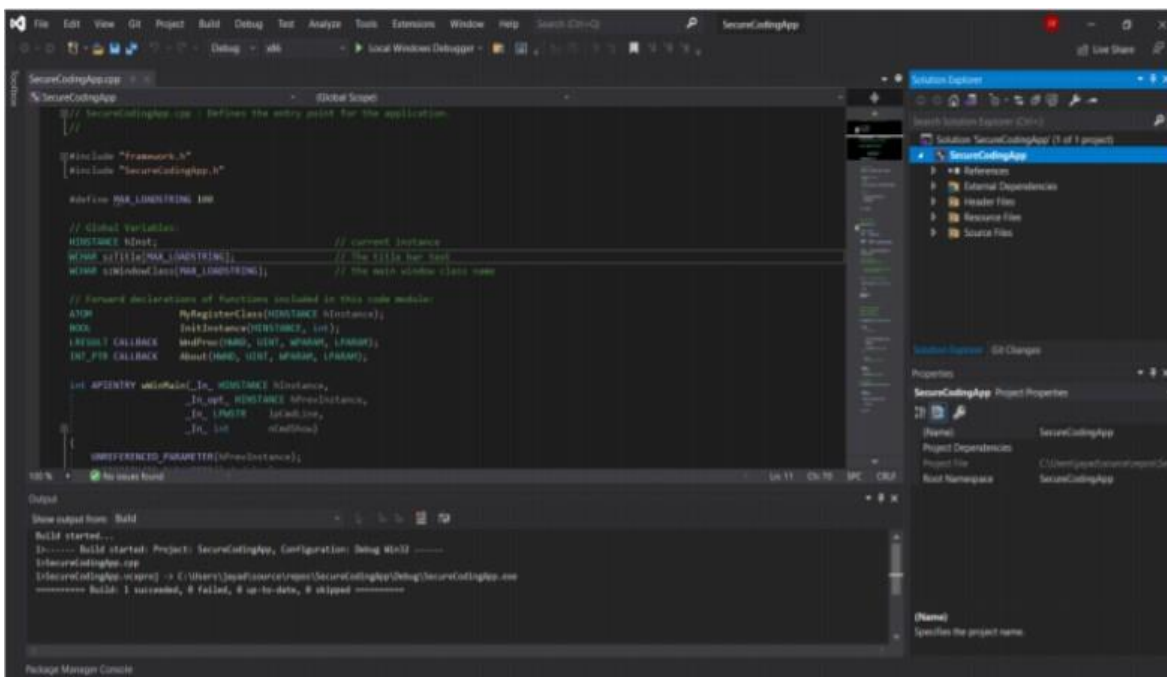
Download process explorer and verify the DEP & ASLR status

Enable software DEP, ASLR and SEH in the visual studio and rebuild the same executable

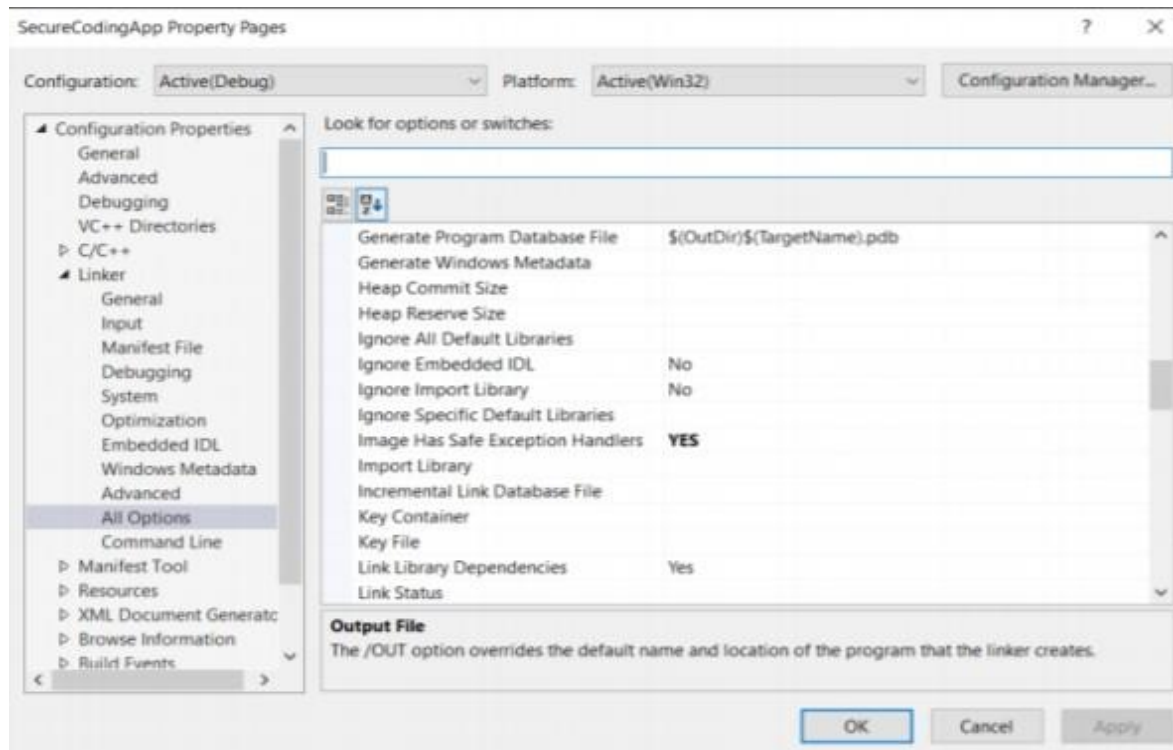
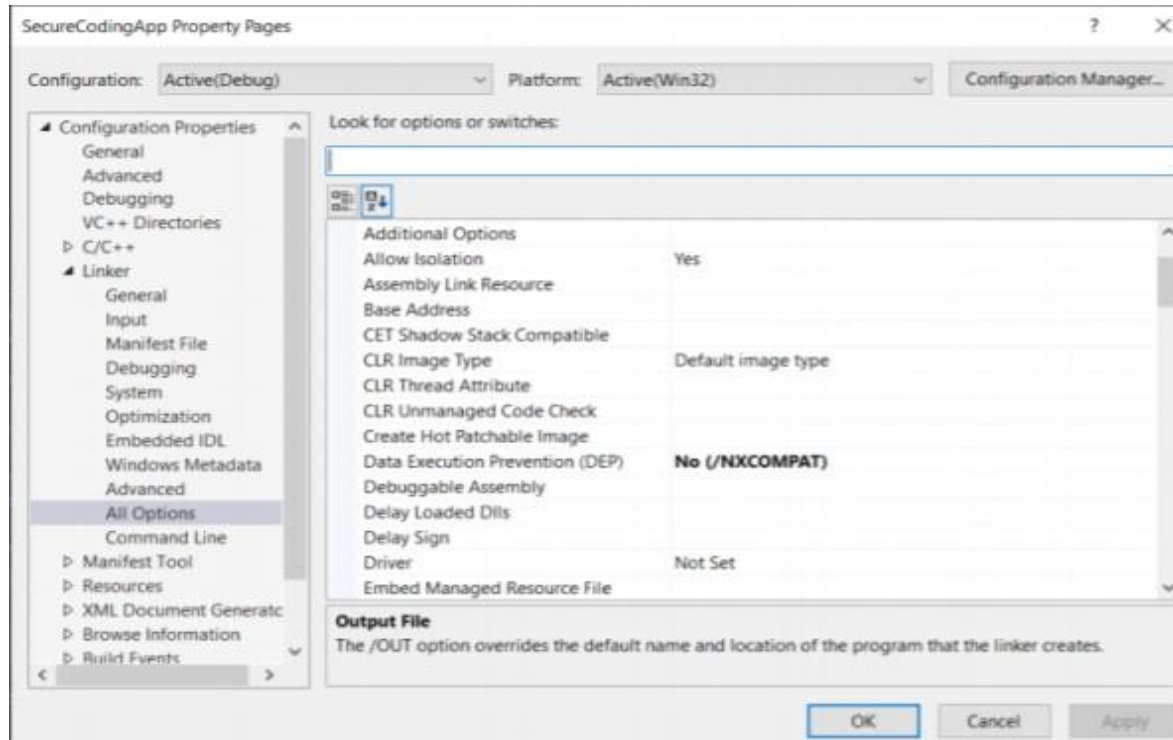
Again, verify the DEP & ASLR status in the process explorer

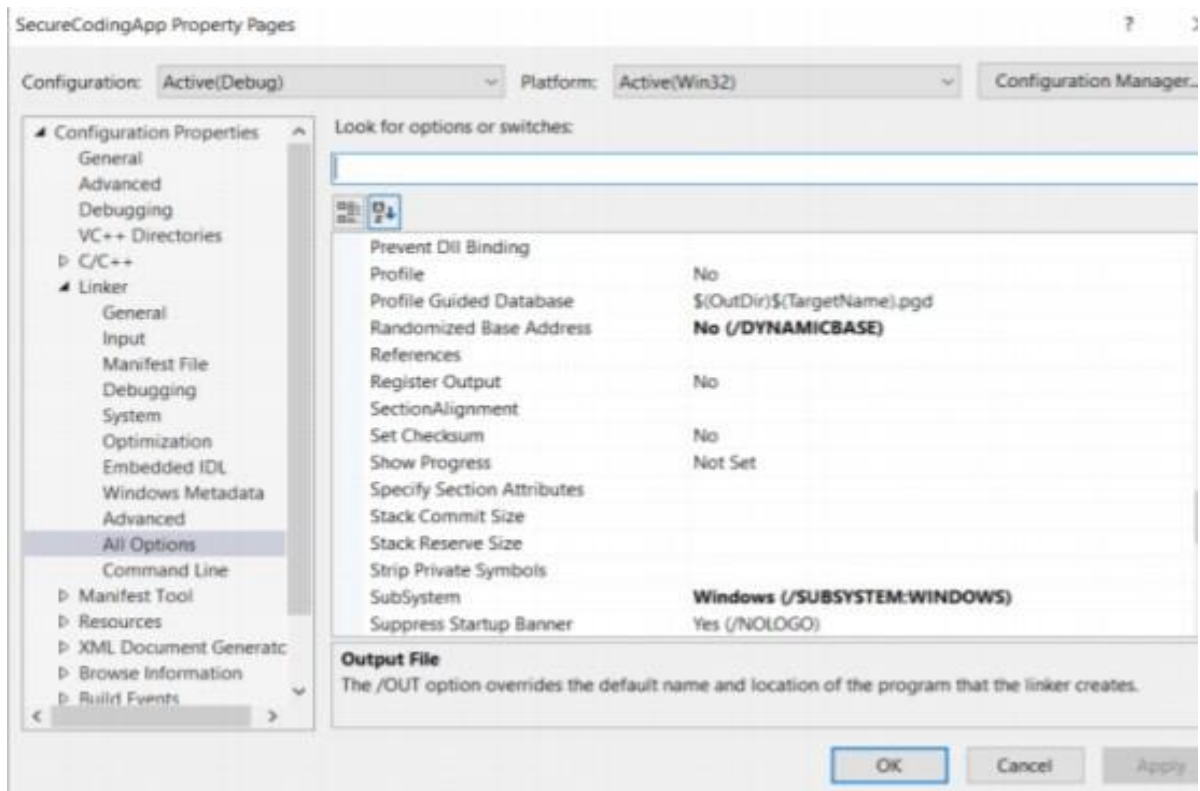
Report the same with separate screenshot - before and after enabling DEP & ASLR.

Building the executable

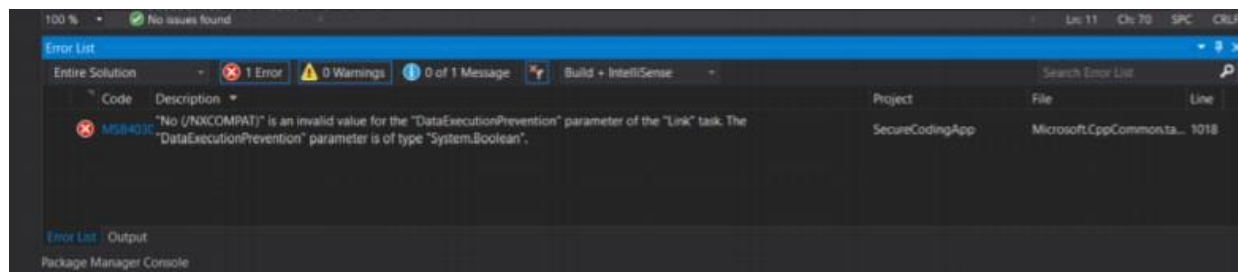


Disabling DEP and ASLR

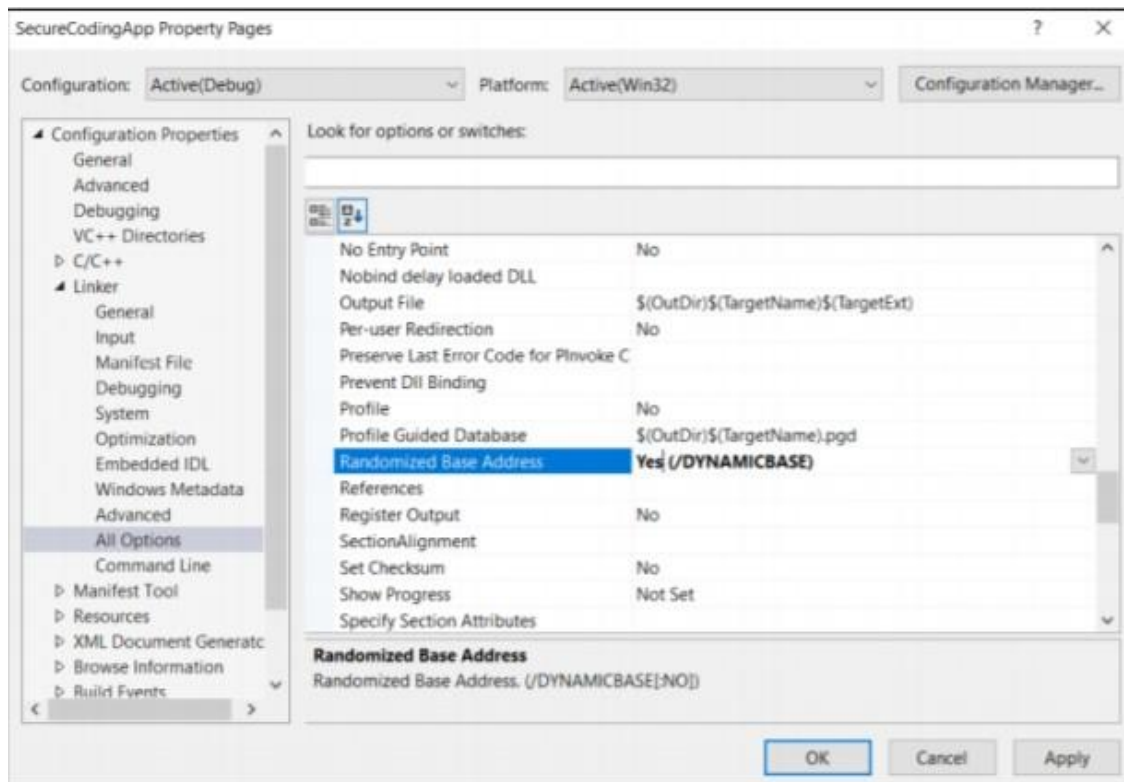
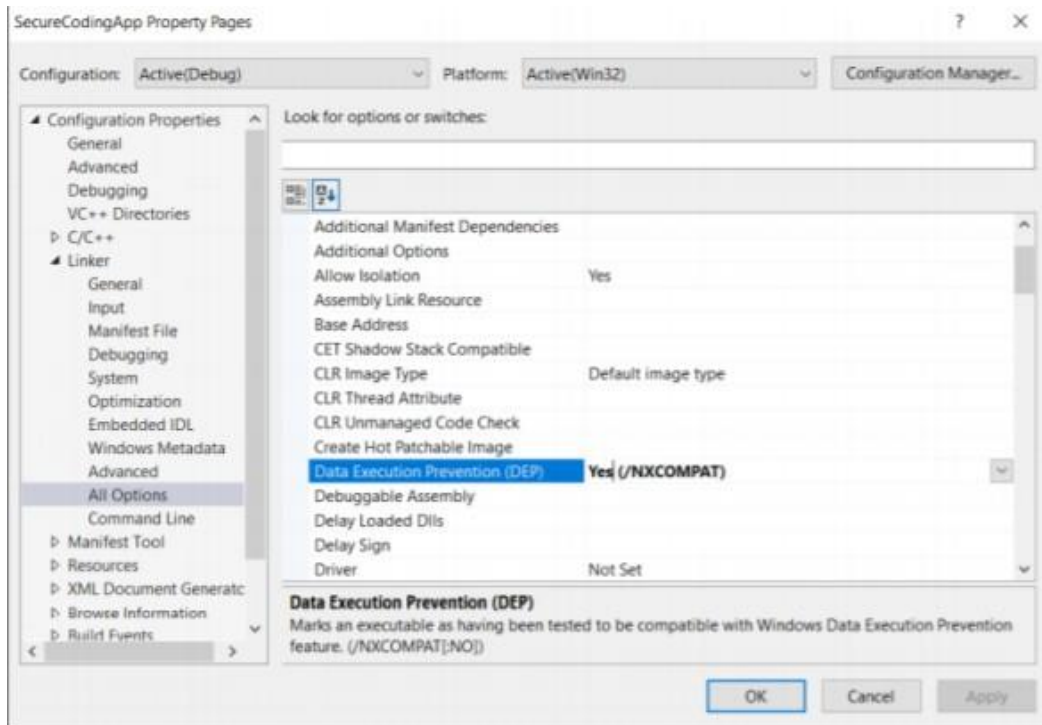


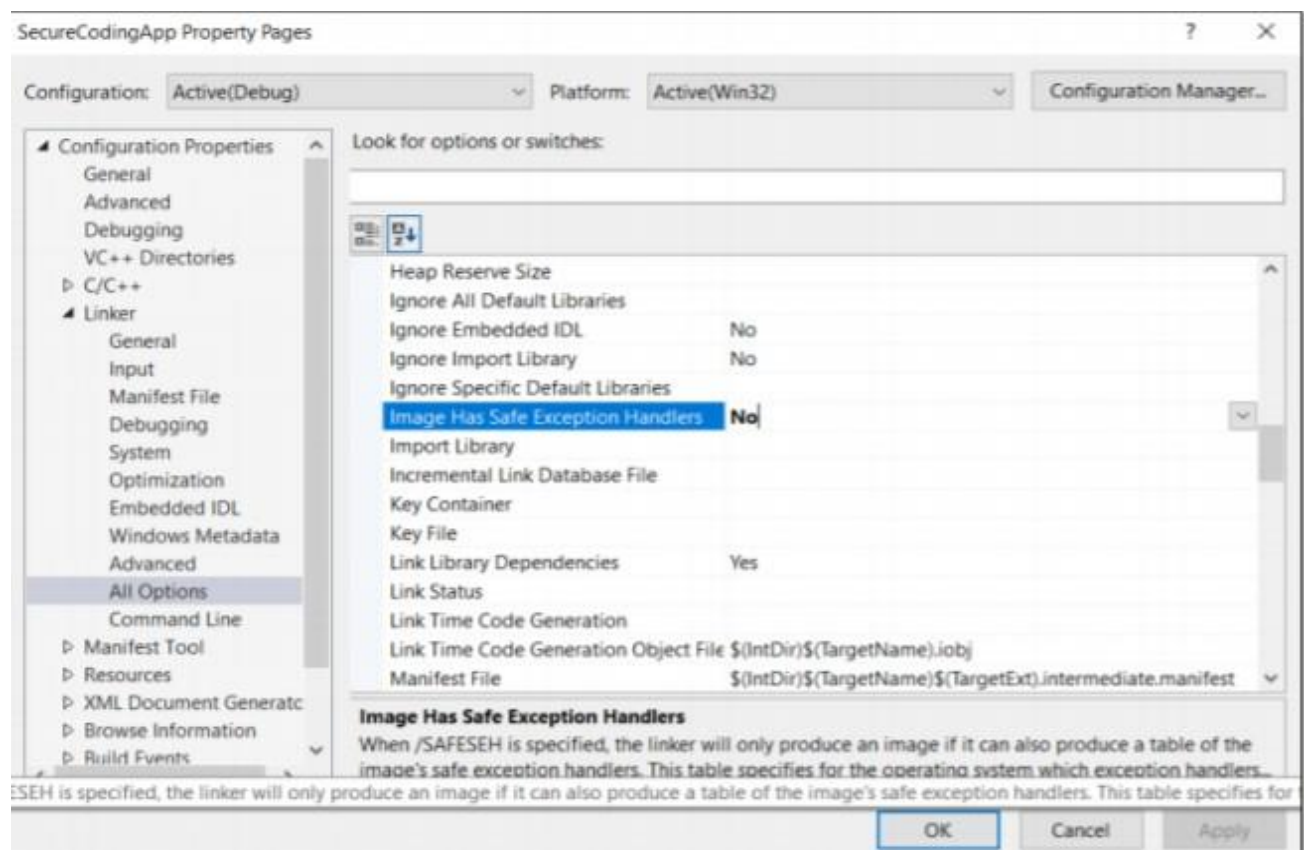


Build failed, exe not generated



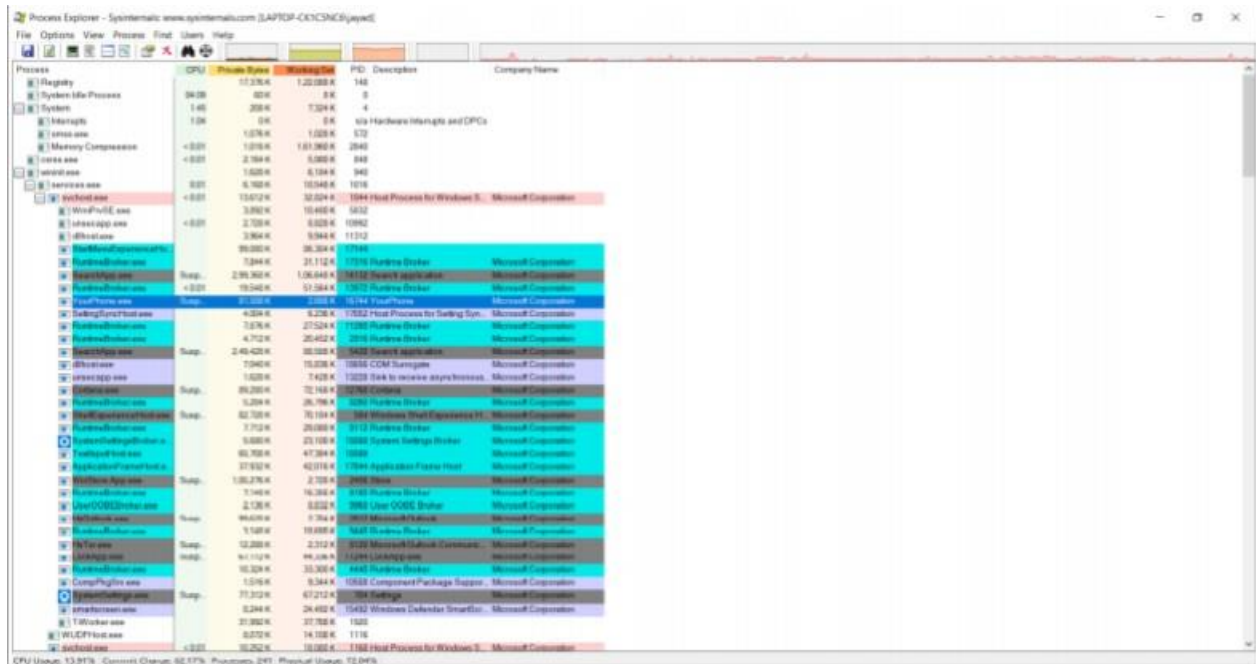
Enable DEP and ASLR and re run the APP





It works as supposed to

Process explorer



This screenshot shows the Windows Task Manager interface with the 'Processes' tab selected. The list of processes is sorted by CPU usage in descending order. The status bar at the bottom indicates CPU usage at 13.91%, memory usage at 62.47%, and 241 processes running.

Process	CPU	Private Bytes	Working Set	PID	Description	Company Name
System Idle Process	0.00%	0 K	0 K	0		
System	0.00%	208 K	1,204 K	4		
smss.exe	0.00%	1,076 K	1,008 K	572		
Memory Compression	<0.01%	1,016 K	1,81,360 K	2840		
csrss.exe	<0.01%	2,184 K	5,380 K	848		
svchost.exe	0.01%	1,008 K	6,194 K	940		
services.exe	0.01%	6,160 K	10,548 K	1016		
svchost.exe	<0.01%	1,567 K	32,024 K	1044	Host Process for Windows S...	Microsoft Corporation
Winlogon.exe	<0.01%	3,880 K	10,460 K	5612		
lsass.exe	<0.01%	2,708 K	6,020 K	10962		
lsass.exe	<0.01%	3,964 K	9,944 K	11312		
cmd.exe	0.00%	99,000 K	38,304 K	17144		
cmd.exe	0.00%	7,844 K	21,112 K	17176	Windows Explorer	Microsoft Corporation
cmd.exe	0.00%	2,96,360 K	1,06,644 K	18152	Search application	Microsoft Corporation
cmd.exe	<0.01%	10,164 K	12,072 K	18172	Runtime Broker	Microsoft Corporation
cmd.exe	<0.01%	2,012 K	5,212 K	18184	PowerShell Application Host	Microsoft Corporation
cmd.exe	<0.01%	4,304 K	6,208 K	17632	Host Process for Setting Up...	Microsoft Corporation
cmd.exe	<0.01%	7,676 K	27,524 K	17188	Runtime Broker	Microsoft Corporation
cmd.exe	<0.01%	4,712 K	20,412 K	17176	Runtime Broker	Microsoft Corporation
cmd.exe	<0.01%	2,46,428 K	80,184 K	18152	Search application	Microsoft Corporation
cmd.exe	<0.01%	2,040 K	10,008 K	18056	CDM Settings	Microsoft Corporation
cmd.exe	<0.01%	1,020 K	7,428 K	17232	Task to receive async process...	Microsoft Corporation
cmd.exe	<0.01%	86,200 K	72,148 K	17188	Content	Microsoft Corporation
cmd.exe	<0.01%	5,284 K	26,796 K	17188	Runtime Broker	Microsoft Corporation
cmd.exe	<0.01%	82,768 K	70,184 K	17188	Windows Host Services (H...	Microsoft Corporation
cmd.exe	<0.01%	3,712 K	20,080 K	17172	Runtime Broker	Microsoft Corporation
cmd.exe	<0.01%	5,880 K	23,108 K	17080	System Settings Broker	Microsoft Corporation
cmd.exe	<0.01%	60,708 K	47,384 K	1688		
cmd.exe	<0.01%	37,912 K	42,016 K	17096	Application Frame Host	Microsoft Corporation
cmd.exe	<0.01%	1,82,764 K	2,788 K	18152	Search application	Microsoft Corporation
cmd.exe	<0.01%	3,148 K	16,464 K	17188	Runtime Broker	Microsoft Corporation
cmd.exe	<0.01%	2,136 K	8,032 K	17080	User OOB Broker	Microsoft Corporation
cmd.exe	<0.01%	94,616 K	9,764 K	1688	Microsoft Photos	Microsoft Corporation
cmd.exe	<0.01%	1,584 K	19,888 K	16472	Windows Explorer	Microsoft Corporation
cmd.exe	<0.01%	52,280 K	2,512 K	18152	Microsoft Windows Defender	Microsoft Corporation
cmd.exe	<0.01%	94,112 K	94,112 K	18152	Microsoft Windows Defender	Microsoft Corporation
cmd.exe	<0.01%	10,328 K	33,308 K	16472	Runtime Broker	Microsoft Corporation
cmd.exe	<0.01%	1,516 K	9,344 K	1688	Component Package Support...	Microsoft Corporation
cmd.exe	<0.01%	77,312 K	67,212 K	17080	Settings	Microsoft Corporation
cmd.exe	<0.01%	8,244 K	24,408 K	16472	Windows Defender SmartSc...	Microsoft Corporation
cmd.exe	<0.01%	37,968 K	27,768 K	1688		
cmd.exe	<0.01%	6,072 K	14,108 K	17176		
cmd.exe	<0.01%	10,292 K	18,088 K	17188	Host Process for Windows S...	Microsoft Corporation

Process Explorer - Sysinternals www.sysinternals.com [LAPTOP-CKY5CNC6] (jayed)

File Options View Process first Users Help

Process

	CPU	Private Bytes	Working Set	PID	Description	Company Name
SearchProtocolHost.exe	1.304 K	6,380 K	12,076 K	1088	Microsoft Windows Search Ph...	Microsoft Corporation
svchost.exe	0.01	10,028 K	20,176 K	11082	Host Process for Windows S...	Microsoft Corporation
SecurityHealthService.exe	0.01	3,672 K	13,648 K	9772	Windows Security Health Ser...	Microsoft Corporation
svchost.exe	0.01	2,464 K	10,072 K	11724	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	1,440 K	5,672 K	12016	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	4,720 K	10,164 K	12088	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	2,160 K	11,148 K	4088	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	2,332 K	13,404 K	12404	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	6,304 K	20,236 K	17328	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	3,052 K	11,776 K	13848	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	1,944 K	7,432 K	9472	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	5,300 K	17,628 K	632	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	6,036 K	22,632 K	13852	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	3,400 K	15,184 K	13884	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	3,000 K	12,104 K	16352	Host Process for Windows S...	Microsoft Corporation
System Idle Process	0.00	0 K	0 K	0	System Idle Process	Microsoft Corporation
System	0.00	4 K	4 K	4	System	Microsoft Corporation
smss.exe	0.00	4 K	4 K	4	System	Microsoft Corporation
svchost.exe	0.01	2,808 K	11,572 K	5240	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	5,080 K	22,012 K	13640	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	3,356 K	11,348 K	2216	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	4,320 K	15,316 K	12864	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	1,704 K	7,788 K	3804	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	1,000 K	11,612 K	22228	Host Process for Windows S...	Microsoft Corporation
svchost.exe	0.01	9,044 K	22,072 K	1016	Local Security Authority Pro...	Microsoft Corporation
svchost.exe	0.01	1,460 K	2,576 K	1036		
svchost.exe	0.01	2,600 K	11,668 K	1196		
svchost.exe	0.01	4,224 K	7,076 K	1292		
svchost.exe	0.01	1,24,136 K	67,082 K	1360		
svchost.exe	0.01	2,71,424 K	2,31,028 K	7992	Windows Explorer	Microsoft Corporation
svchost.exe	0.01	1,304 K	9,208 K	1536	Windows Security notification...	Microsoft Corporation
svchost.exe	0.01	2,340 K	10,144 K	2208	Realtek HD Audio Universal...	Realtek Semiconductor
svchost.exe	0.01	1,340 K	6,492 K	4388	Vanguard Tray Notification	Vanguard Games, Inc.
svchost.exe	0.01	41,264 K	90,888 K	12396	Microsoft OneDrive	Microsoft Corporation
svchost.exe	0.01	3,392 K	13,352 K	15654	This utility controls special h...	Lenovo Group Ltd.
svchost.exe	0.01	1,32,316 K	1,38,888 K	2528	Microsoft Word	Microsoft Corporation
svchost.exe	0.01	1,36,296 K	1,32,372 K	2734	Microsoft Word	Microsoft Corporation
svchost.exe	0.01	42,524 K	69,704 K	11292	Microsoft Word - Reader 2016	Microsoft Corporation
svchost.exe	0.01	42,960 K	92,976 K	3624	Microsoft ServiceHub Control...	Microsoft
svchost.exe	0.01	75,132 K	63,008 K	13432	ServiceHub IdentityHost.exe	Microsoft
svchost.exe	0.01	1,43,324 K	76,012 K	13744	ServiceHub VSODataSvcHost.exe	Microsoft
svchost.exe	0.01	1,51,612 K	1,85,912 K	17728	ServiceHub SettingsHost.exe	Microsoft
svchost.exe	0.01	86,744 K	161,188 K	ServiceHub Host CLS UI	Microsoft	
svchost.exe	0.01	90,324 K	81,328 K	6732	ServiceHub ThreadedWidG...	Microsoft
svchost.exe	0.01	1,85,880 K	63,028 K	6884	ServiceHub Host CLS UI	Microsoft
svchost.exe	0.01	92,640 K	73,420 K	884	ServiceHub ThreadedWidG...	Microsoft

CPU Usage: 11.72% Commit Charge: 62.07% Processes: 234 Physical Memory: 71.29%

