

SECURE CODING CSE2010

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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.

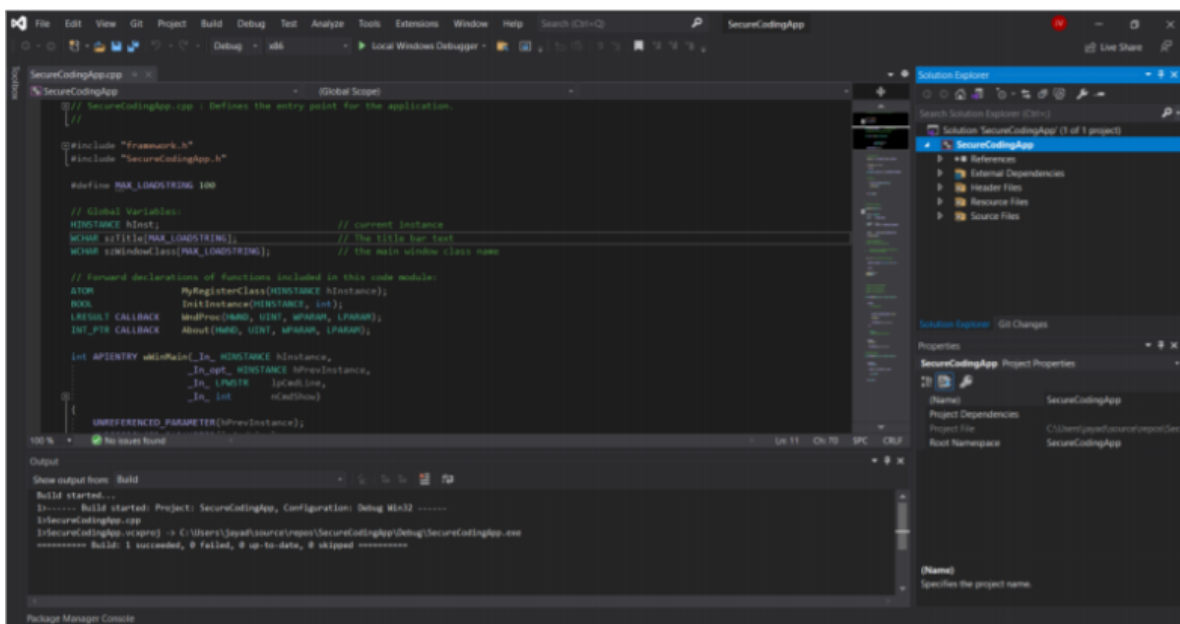
Download process explorer and verify the DEP & ASLR status

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

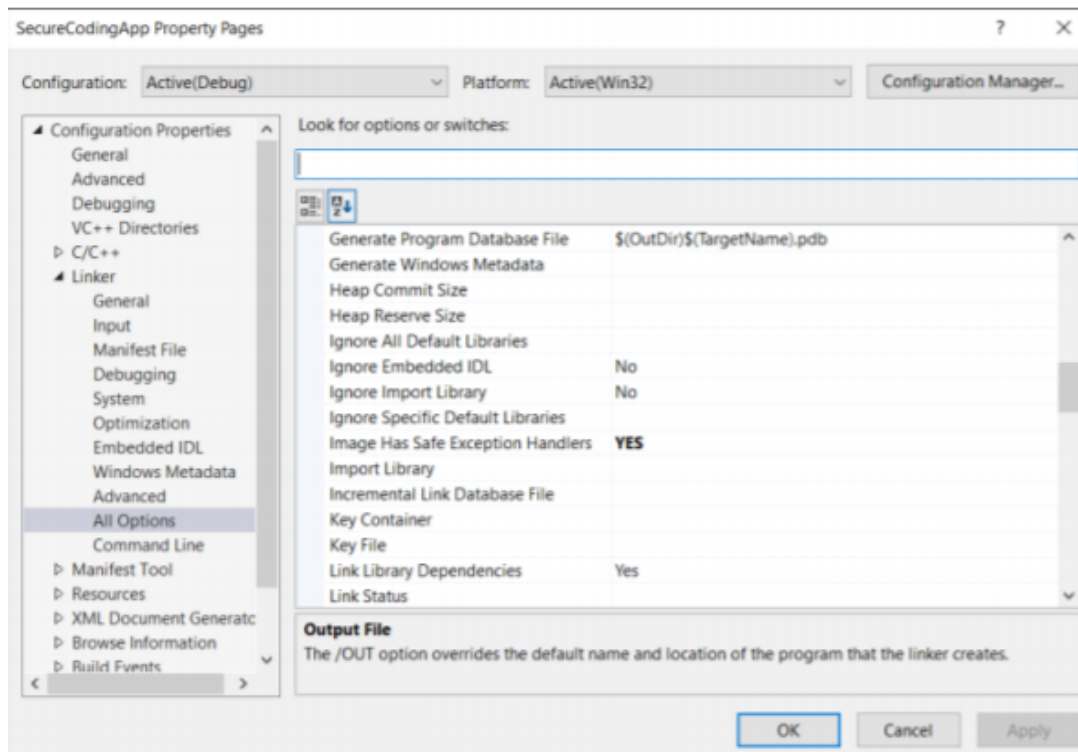
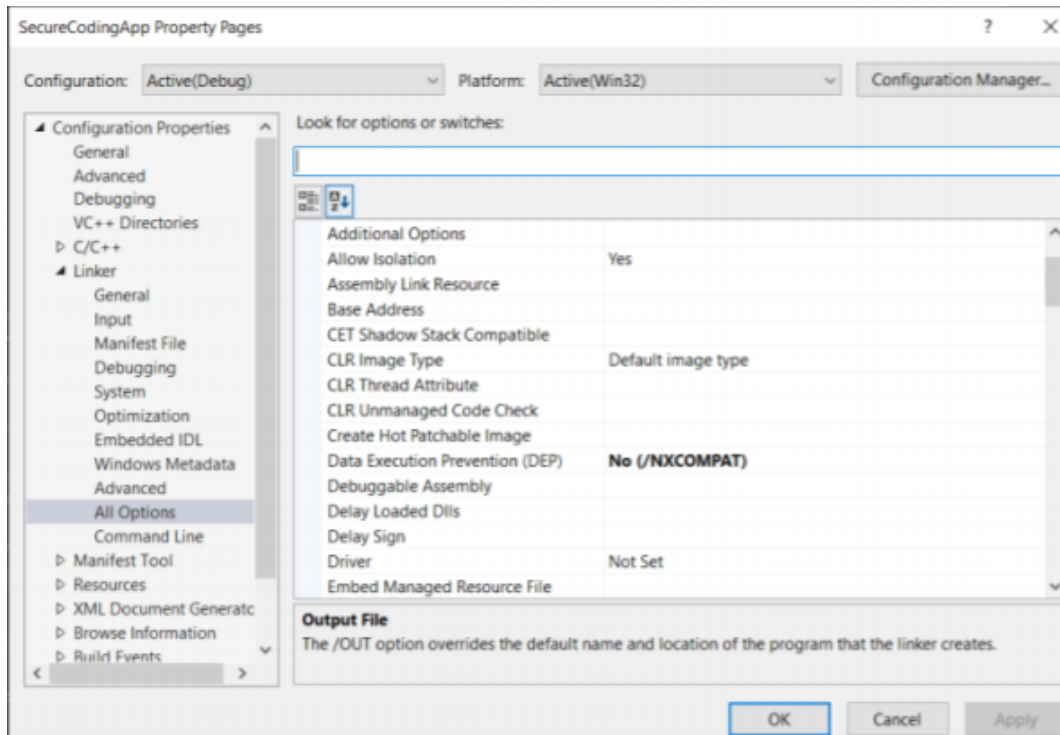
Again, verify the DEP & ASLR status in the process explorer

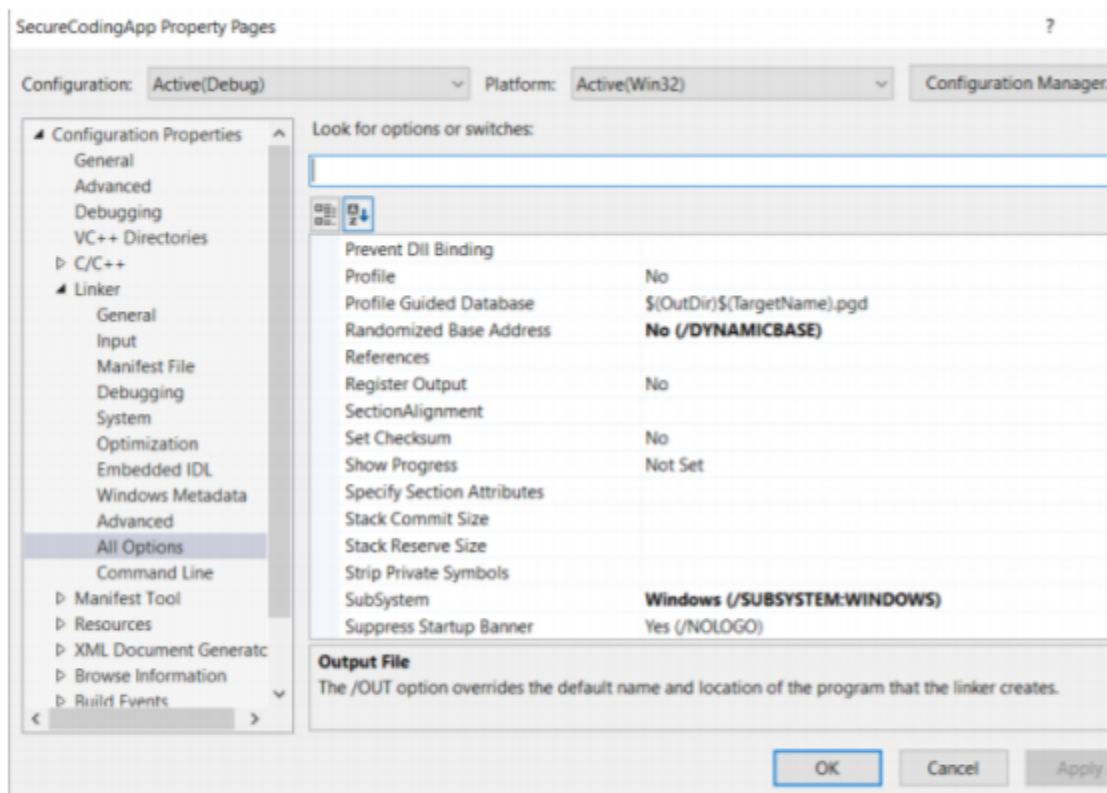
Report the same with separate screenshot - before and after enabling DEP & ASLR.

Building the executable

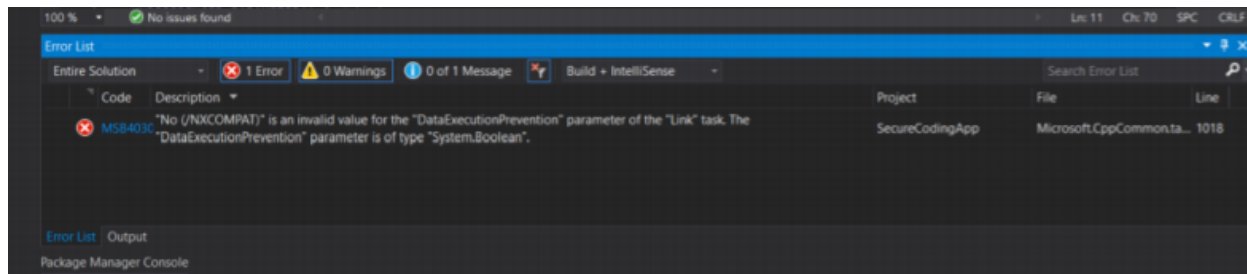


Disabling DEP and ASLR

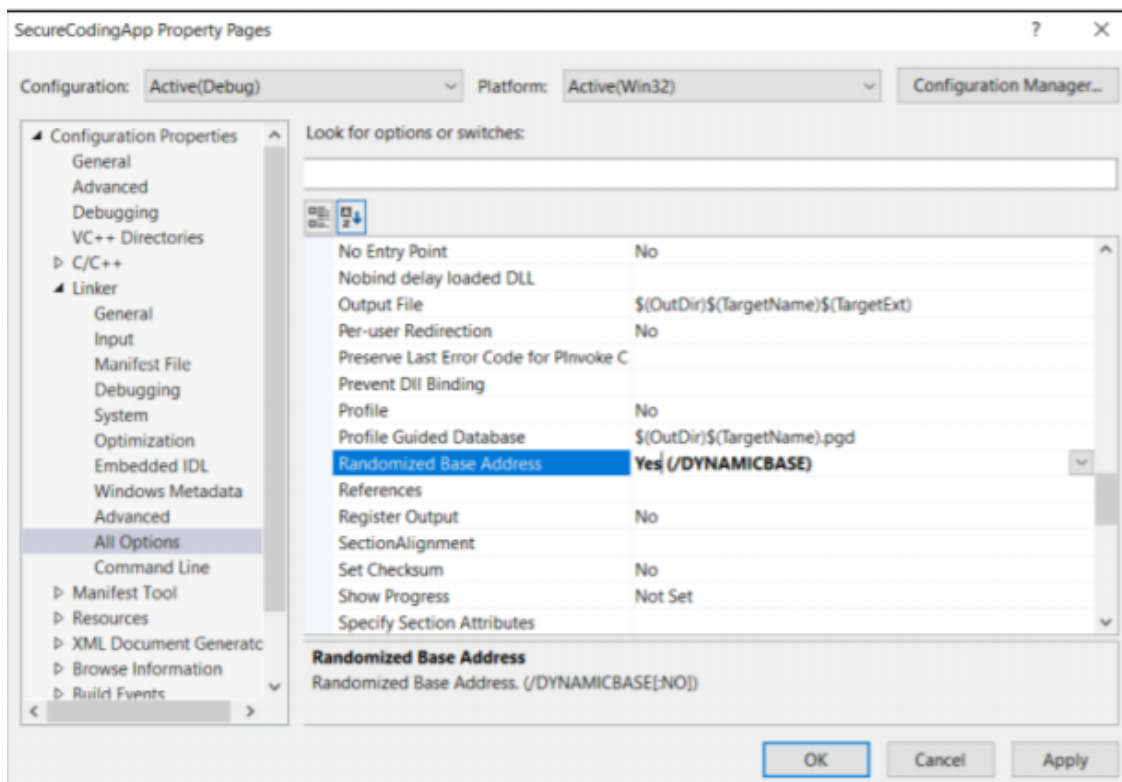
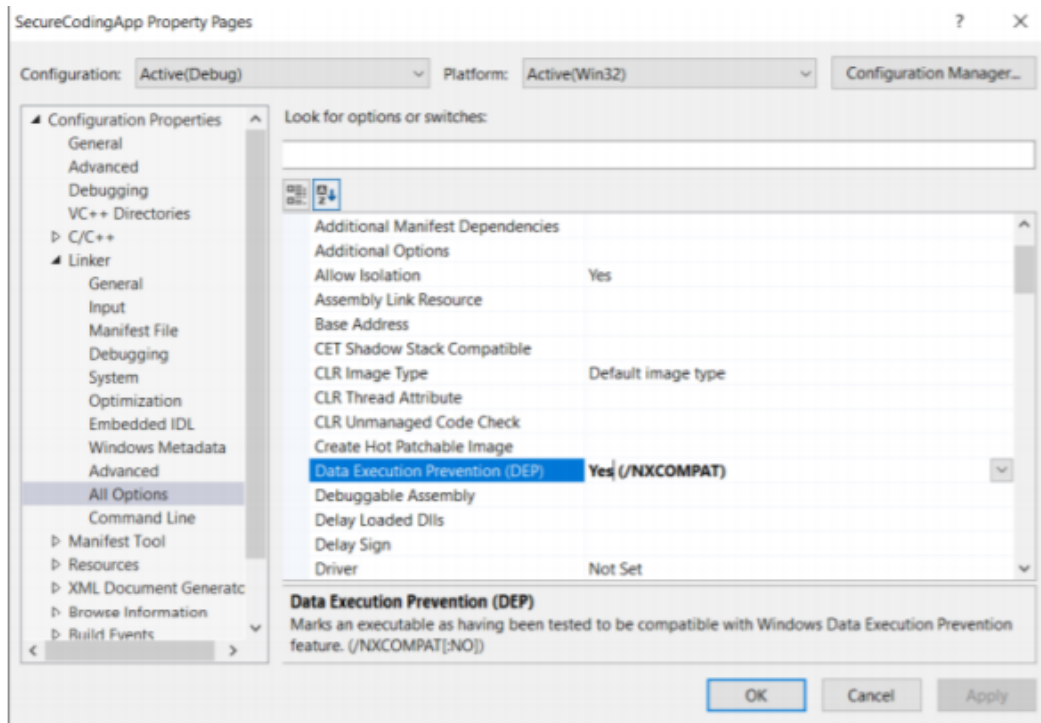


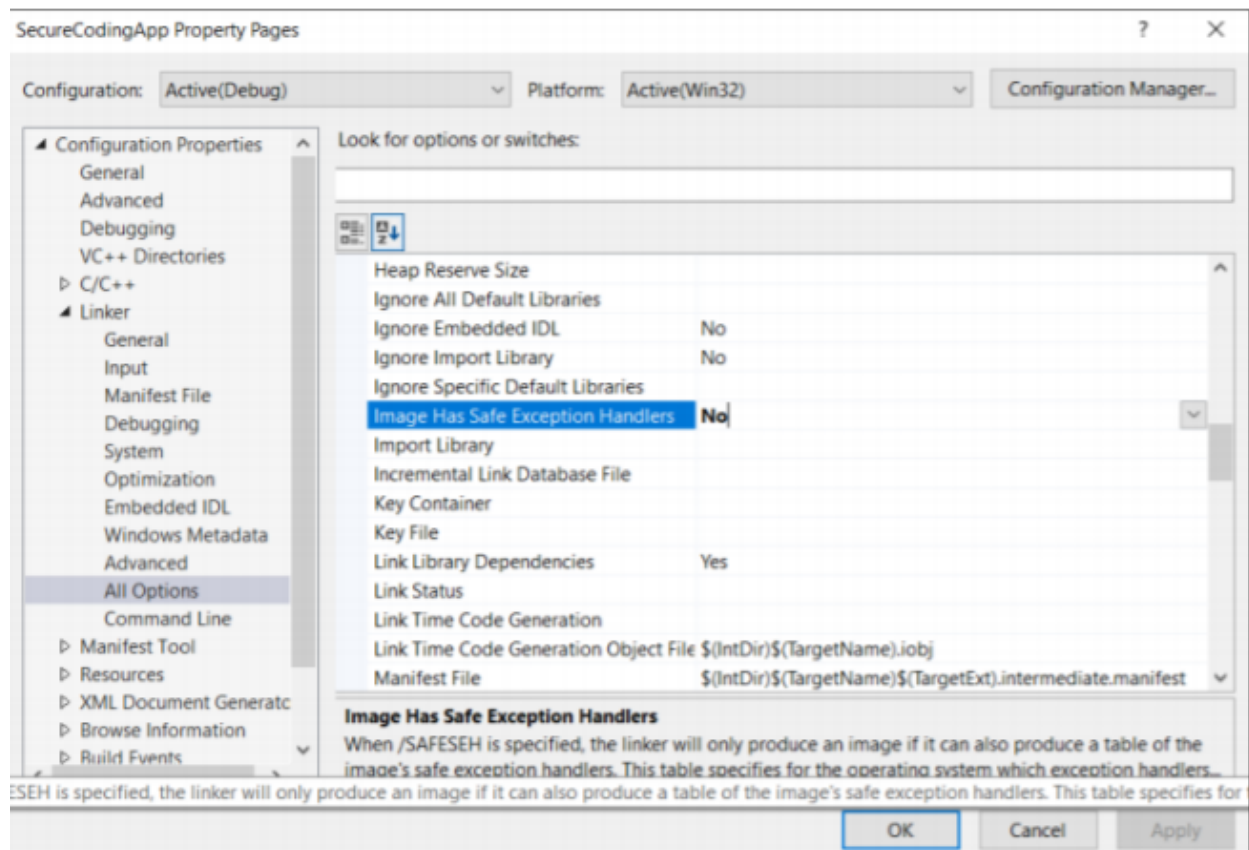


Build failed, exe not generated



Enable DEP and ASLR and re run the APP





It works as supposed to

Process explorer

Process Explorer - Sysinternals.com [LAPTOP-CKCSNCRJAYED]

File Options View Process Find Users Help

Process	CPU	Private Bytes	Working Set	PID	Description	Company Name
Regedit		17,376 K	1,220,880 K	148		
System Idle Process	0.00%	0 K	0 K	0		
System	1.45%	208 K	7,324 K	4		
smss.exe	1.04%	0 K	0 K	4	ntls Hardware Interrupts and DPCs	
smss.exe	1.07%	1,076 K	1,028 K	572		
Memory Compression	+ 0.01%	1,016 K	1,81,960 K	2840		
csrss.exe	+ 0.01%	2,164 K	5,992 K	840		
svchost.exe	1.620%	1,620 K	1,136 K	840		
services.exe	0.01%	6,160 K	10,948 K	1016		
svchost.exe	+ 0.01%	13,612 K	32,024 K	1044	Host Process for Windows S.	Microsoft Corporation
WinPcapE.exe	3.892%	10,488 K	5832			
svchost.exe	+ 0.01%	2,720 K	5,028 K	1092		
services.exe	0.01%	5,944 K	11,112			
SearchProtocolHost.exe	36,000 K	86,304 K	175,944			
SearchIndexer.exe	7,844 K	31,112 K	175,944		Microsoft Search application	Microsoft Corporation
SearchApp.exe	Supg...	2,39,360 K	1,06,648 K	18132	Search application	Microsoft Corporation
SearchIndexer.exe	Supg...	19,540 K	51,584 K	18132	Search application	Microsoft Corporation
SearchIndexer.exe	Supg...	18,112 K	51,584 K	18132	Search application	Microsoft Corporation
SearchIndexer.exe	Supg...	4,524 K	5,228 K	17552	Host Process for Search Syn.	Microsoft Corporation
SearchIndexer.exe	Supg...	7,876 K	27,524 K	11280	Host Process for Search Syn.	Microsoft Corporation
SearchIndexer.exe	Supg...	4,712 K	20,452 K	2016	Host Process for Search Syn.	Microsoft Corporation
SearchIndexer.exe	Supg...	2,49,420 K	88,128 K	18132	Search application	Microsoft Corporation
svchost.exe	1.240%	10,228 K	18,656 K	1044	CCM Surrogate	Microsoft Corporation
svchost.exe	1.620%	7,420 K	13,228 K	13228	Task to receive asynchronous	Microsoft Corporation
svchost.exe	Supg...	86,200 K	72,168 K	13228	Content	Microsoft Corporation
svchost.exe	Supg...	5,204 K	26,796 K	1092	Host Process for Windows S.	Microsoft Corporation
svchost.exe	Supg...	62,720 K	70,104 K	1044	Host Process for Windows S.	Microsoft Corporation
svchost.exe	Supg...	20,080 K	91,112 K	1044	Host Process for Windows S.	Microsoft Corporation
SystemSettingsBroker.exe	5,680 K	25,108 K	10,036 K	10036	System Settings Broker	Microsoft Corporation
TaskHost.exe	65,788 K	47,384 K	10,036 K			
ApplicationFrameHost.exe	37,832 K	42,016 K	17,664 K	17664	Application Frame Host	Microsoft Corporation
svchost.exe	Supg...	1,86,276 K	2,728 K	2840	State	Microsoft Corporation
svchost.exe	Supg...	1,148 K	16,364 K	9112	Host Process for Windows S.	Microsoft Corporation
UserOOBService.exe	2,136 K	6,032 K	3,960 K	3960	User OOB Service	Microsoft Corporation
svchost.exe	Supg...	94,036 K	9,784 K	1044	Host Process for Windows S.	Microsoft Corporation
svchost.exe	Supg...	1,148 K	18,688 K	1044	Host Process for Windows S.	Microsoft Corporation
svchost.exe	Supg...	12,288 K	2,312 K	8132	Microsoft Outlook Connecti...	Microsoft Corporation
svchost.exe	Supg...	46,116 K	1,048 K	1044	Host Process for Windows S.	Microsoft Corporation
svchost.exe	Supg...	10,324 K	33,308 K	8440	Host Process for Windows S.	Microsoft Corporation
svchost.exe	Supg...	1,516 K	9,344 K	10560	Component Package Support	Microsoft Corporation
SystemSettingsBroker.exe	Supg...	77,312 K	67,212 K	704	Settings	Microsoft Corporation
svchost.exe	Supg...	8,244 K	24,492 K	15432	Windows Defender SmartSc...	Microsoft Corporation
svchost.exe	Supg...	31,392 K	37,768 K	1500		
svchost.exe	Supg...	6,072 K	14,108 K	1116		
svchost.exe	+ 0.01%	10,252 K	10,080 K	1168	Host Process for Windows S.	Microsoft Corporation

CPU Usage: 13.91% - Commit Charge: 82.17% - Processes: 241 - Physical Memory: 79.04%

Process Explorer - Sysinternals.com [LAPTOP-CKCSNCRJAYED]

File Options View Process Find Users Help

Process	CPU	Private Bytes	Working Set	PID	Description	Company Name
SearchProtocolHost.exe	1,804 K	8,380 K	15876	Microsoft Windows Search Pr...	Microsoft Corporation	
svchost.exe	10,600 K	20,176 K	11960	Host Process for Windows S.	Microsoft Corporation	
SecurityHealthService.exe	3,872 K	12,544 K	9772	Windows Security Health Ser...	Microsoft Corporation	
svchost.exe	2,456 K	10,072 K	11724	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	1,440 K	5,672 K	12616	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	4,772 K	10,164 K	12688	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	2,180 K	11,140 K	4980	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	2,332 K	12,404 K	12404	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	6,364 K	20,228 K	13228	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	3,092 K	11,776 K	13640	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	1,844 K	7,432 K	9172	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	5,300 K	17,624 K	632	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	6,076 K	22,532 K	13652	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	3,400 K	15,104 K	13684	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	3,000 K	12,104 K	16352	Host Process for Windows S.	Microsoft Corporation	
SystemGuard.exe	6,372 K	6,332 K	14536	System Guard Runtime Monit...	Microsoft Corporation	
svchost.exe	2,800 K	11,572 K	5340	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	5,080 K	22,012 K	13680	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	3,364 K	11,348 K	2216	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	4,120 K	15,316 K	12684	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	1,784 K	7,760 K	8804	Host Process for Windows S.	Microsoft Corporation	
svchost.exe	3,500 K	11,672 K	22308	Host Process for Windows S.	Microsoft Corporation	
lsass.exe	9,044 K	22,072 K	1816	Local Security Authority Proc...	Microsoft Corporation	
svchost.exe	1,460 K	2,576 K	1036			
winlogon.exe	2,680 K	11,656 K	1196			
svchost.exe	4,224 K	7,076 K	1292			
svchost.exe	67,652 K	1360				
svchost.exe	2,71,424 K	2,31,028 K	1656	Windows Explorer	Microsoft Corporation	
SecurityHealthTray.exe	1,304 K	6,256 K	1588	Windows Security notification	Microsoft Corporation	
RealtekAudioService4.exe	2,340 K	10,144 K	2058	Realtek HD Audio Universal	Realtek Semiconductor	
vghtray.exe	1,340 K	6,492 K	4388	VanguardTray notification	Riot Games, Inc.	
OneDrive.exe	41,260 K	50,800 K	12368	Microsoft OneDrive	Microsoft Corporation	
utility.exe	3,392 K	13,352 K	13656	This utility controls special ha...	Lenovo Group Ltd	
WINWORD.EXE	1,32,916 K	1,38,360 K	2652	Microsoft Word	Microsoft Corporation	
WINWORD.EXE	0.01	1,26,206 K	1,12,372 K	2724	Microsoft Word	Microsoft Corporation
svchost.exe	0.01	5,15,116 K	5,50,652 K	1044	Microsoft Visual Studio 2019	Microsoft Corporation
svchost.exe	0.02	40,336 K	69,764 K	11292	PerfMon2.exe	Microsoft Corporation
Microsoft ServiceHub Cont...	42,560 K	57,576 K	2624	Microsoft ServiceHub Control...	Microsoft	
ServiceHub IdentityProte...	75,112 K	83,820 K	13432	ServiceHub IdentityProte...	Microsoft	
ServiceHub VSDetectedPro...	1,43,924 K	76,512 K	13744	ServiceHub VSDetectedPro...	Microsoft	
ServiceHub SettingsProte...	1,51,612 K	1,05,912 K	17728	ServiceHub SettingsProte...	Microsoft	
ServiceHub Host CLR ad...	78,456 K	65,744 K	16156	ServiceHub Host CLR ad...	Microsoft	
ServiceHub ThreadedRF...	95,324 K	91,528 K	6732	ServiceHub ThreadedRF ad...	Microsoft	
ServiceHub Host CLR ad...	1,85,380 K	83,028 K	6896	ServiceHub Host CLR ad...	Microsoft	
ServiceHub TestWindo...	+ 0.01	62,940 K	73,420 K	364	ServiceHub TestWindo...	Microsoft

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

