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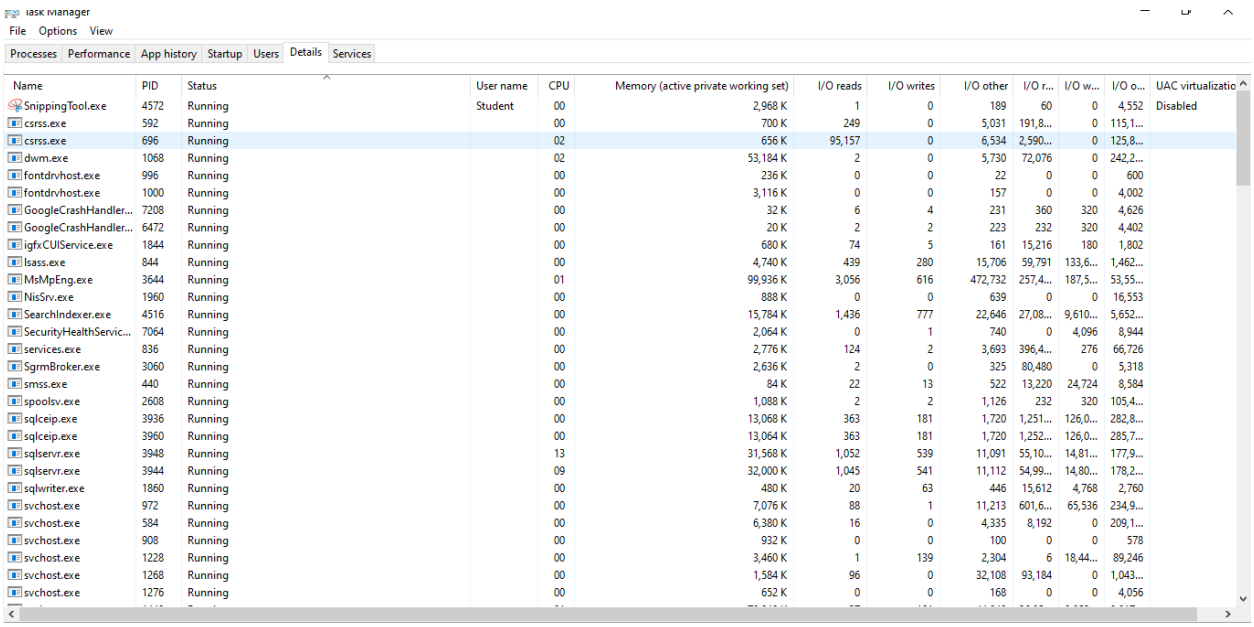
BSIT-301



Name	PID	Status	User name	CPU	Memory (active private working set)	I/O reads	I/O writes	I/O other	I/O r...	I/O w...	I/O o...	UAC virtualizatio
SnippingTool.exe	4572	Running	Student	00	2,968 K	1	0	189	60	0	4,552	Disabled
csrss.exe	592	Running		00	700 K	249	0	5,031	191,8...	0	115,1...	
csrss.exe	696	Running		02	656 K	95,157	0	6,534	2,590...	0	125,8...	
dwm.exe	1068	Running		02	53,184 K	2	0	5,730	72,076	0	242,2...	
fontdrvhost.exe	996	Running		00	236 K	0	0	22	0	0	600	
fontdrvhost.exe	1000	Running		00	3,116 K	0	0	157	0	0	4,002	
GoogleCrashHandler...	7208	Running		00	32 K	6	4	231	360	320	4,626	
GoogleCrashHandler...	6472	Running		00	20 K	2	2	223	232	320	4,402	
igfxCUIService.exe	1844	Running		00	680 K	74	5	161	15,216	180	1,802	
lsass.exe	844	Running		00	4,740 K	439	280	15,706	59,791	133,6...	1,462...	
MsMpEng.exe	3644	Running		01	99,936 K	3,056	616	472,732	257,4...	187,5...	53,55...	
NisSrv.exe	1960	Running		00	888 K	0	0	639	0	0	16,553	
SearchIndexer.exe	4516	Running		00	15,784 K	1,436	777	22,646	27,08...	9,610...	5,652...	
SecurityHealthServic...	7064	Running		00	2,064 K	0	1	740	0	4,096	8,944	
services.exe	836	Running		00	2,776 K	124	2	3,693	396,4...	276	66,726	
SgrmBroker.exe	3060	Running		00	2,636 K	2	0	325	80,480	0	5,318	
smss.exe	440	Running		00	84 K	22	13	522	13,220	24,724	8,584	
spoolsv.exe	2608	Running		00	1,088 K	2	2	1,126	232	320	105,4...	
sqlceip.exe	3936	Running		00	13,068 K	363	181	1,720	1,251...	126,0...	282,8...	
sqlceip.exe	3960	Running		00	13,064 K	363	181	1,720	1,252...	126,0...	285,7...	
sqlservr.exe	3948	Running		13	31,568 K	1,052	539	11,091	55,10...	14,81...	177,9...	
sqlservr.exe	3944	Running		09	32,000 K	1,045	541	11,112	54,99...	14,80...	178,2...	
sqlwriter.exe	1860	Running		00	480 K	20	63	446	15,612	4,768	2,760	
svchost.exe	972	Running		00	7,076 K	88	1	11,213	601,6...	65,536	234,9...	
svchost.exe	584	Running		00	6,380 K	16	0	4,335	8,192	0	209,1...	
svchost.exe	908	Running		00	932 K	0	0	100	0	0	578	
svchost.exe	1228	Running		00	3,460 K	1	139	2,304	6	18,44...	89,246	
svchost.exe	1268	Running		00	1,584 K	96	0	32,108	93,184	0	1,043...	
svchost.exe	1276	Running		00	652 K	0	0	168	0	0	4,056	

a. Which process has the greatest number of read I/O operations since it started?

-NetBeans

b. Which process has the least number of write I/O operations since it started?

-Snipping tool

c. Is the total number of I/O bytes read by a process always equal to the total number of I/O bytes written by the same process?

- No, In Task Manager there are columns called "I/O Reads", "I/O Writes", "I/O Read Bytes" and "I/O Write Bytes". In Process Explorer I see a number of processes which have zero "Disk Read Bytes" and "Network Receive Bytes", but a non-zero "I/O Read Bytes". And conversely, some processes have a "Disk Read Bytes" value larger than "I/O Read Bytes".

d. Would you agree that suspended processes will always hold a zero (0) value for both read and write I/O operations?

- Yes, it will always be zero for both read and write I/O operations.

e. Is the number of threads directly proportional to the number of bytes written by the process in I/O operation?

- No. A program's thread count is determined by the programmer and constrained by the operating system's capabilities. The number of threads and the amount of data written by a process during I/O operations are unrelated.

After analyzing the I/O details of the running processes in your computer, would you agree that your computer implements I/O buffering? Why or why not? (5 points)

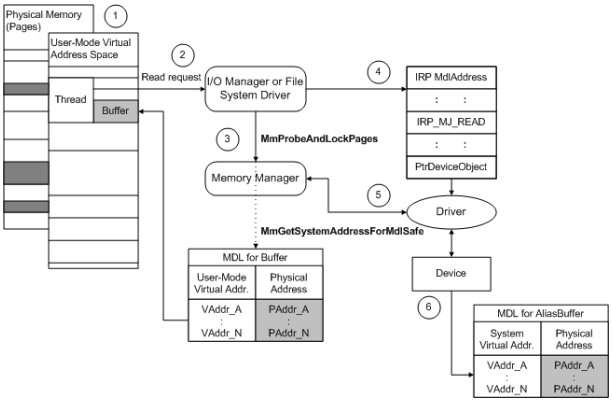
- Yes, probably every single computer that does I/O implements buffering. It's possible to imagine a computer that didn't, but it would have to be doing something very simple.

Search for relevant and up-to-date literatures and studies about the Windows I/O Manager. Then, answer or provide the following:

a. Describe the overall structure of the Windows I/O manager.

- The I/O manager has two subcomponents: The Plug and Play manager and power manager. They manage the I/O functionality for the technologies of Plug and Play and power management.

b. Illustrate the structure of the Windows I/O manager based on your understanding.



c. Differentiate the asynchronous and synchronous mode of operation of Windows I/O.

- While you wait, synchronous input/output (I/O) takes place. Applications processing must wait till the I/O operation is finished before moving on. Asynchronous I/O (AIO) activities, in contrast, take place in the background and do not impede user applications.

d. Does the Windows I/O manager support any RAID configuration? Rationalize your answer.

- Yes, you can provision a file system with a better level of performance on a RAID 0 array than you can on a single Amazon EBS disk. RAID 0 should be used when I/O performance is crucial. I/O is striped across the volumes when using RAID 0.

e. In your opinion, what other kernel components work closely with the Windows I/O manager? Elaborate on your answer.

- Plug and Play manager, because this device recognition and enumeration during boot up are two PnP-related operations that are carried out by the Plug and Play (PnP) manager, which supports PnP functionality in Windows.

f. In your perspective, what is the most significant part of the Windows I/O model and why?

- For me device drivers, because this model offers the operating system's software interface for connecting devices. I/O is crucial to the device driver writer because of this. The communication between applications and the interfaces offered by device drivers is managed by the Windows kernel-mode I/O manager.

Properly cite all your references. (5 points)

Windows Kernel-Mode I/O Manager - Windows drivers | Microsoft Learn