



The University of the West Indies, St. Augustine
INFO 2603 Platform Technologies 1
2018/2019 Semester 1
Lab 2 - 19th, 20th September 2018

Introduction to Windows Task Manager

Microsoft Windows provides a tool called the Task Manager. It is a useful tool for monitoring system activity, terminating misbehaving processes, and performing some high-level performance analysis. It runs at a higher priority than normal applications, and it has sufficient privilege to view and control the system's running processes.

Learning Objectives

- Use Windows Task Manager to monitor system activity
- Learn how to manage processes using the Task Manager
- Examine system resource allocations using the Task Manager
- Create a system summary.

Activities

Part 1: Explore the Task Manager

Name	PID	83% CPU	65% Memory	6% Disk	0% Network	3% GPU
COM Surrogate	8836	0%	1.3 MB	0 MB/s	0 Mbps	0%
Host Process for Windows Tasks	2896	0.5%	1.2 MB	0 MB/s	0 Mbps	0%
> Snipping Tool	12688	0%	2.9 MB	0 MB/s	0 Mbps	0%
Windows Defender SmartScreen	13576	1.0%	5.5 MB	0 MB/s	0 Mbps	0%
> Service Host: Microsoft Account Sign-in ...	2520	0.3%	3.3 MB	0.1 MB/s	0 Mbps	0%
COM Surrogate	12952	0%	1.9 MB	0.1 MB/s	0 Mbps	0%
COM Surrogate	6096	0%	1.1 MB	0 MB/s	0 Mbps	0%
> Task Manager	5376	1.4%	22.0 MB	0.1 MB/s	0 Mbps	0%
> Google Chrome (41)		16.1%	4,279.4 MB	0.1 MB/s	0.1 Mbps	1.8%
Desktop Window Manager	1128	3.4%	55.0 MB	0.1 MB/s	0 Mbps	1.0%
Client Server Runtime Process	636	0.3%	1.2 MB	0 MB/s	0 Mbps	0.2%
System	4	3.0%	0.1 MB	0.8 MB/s	0 Mbps	0%
> WD Drive Service (32 bit)	4240	0%	7.3 MB	0 MB/s	0 Mbps	0%
> Antimalware Service Executable	4288	2.8%	80.6 MB	0.1 MB/s	0 Mbps	0%
> Service Host: Local Service (No Network)...	1576	0%	7.1 MB	0 MB/s	0 Mbps	0%
Windows Explorer	4504	5.5%	27.7 MB	0.2 MB/s	0 Mbps	0%

Figure 1. Task Manager Window

There are a couple of ways to invoke the Task Manager: either right-click the task bar and choose "Start Task Manager" from the Context menu, or press Ctrl+Shift+Esc. Either way, Windows displays the Task Manager as shown in Figure 1.

Notice that there are six tabs: **Processes**, **Performance**, **App History**, **Startup**, **Users**, **Details** and **Services**. The tab that initially gets the focus is the tab that had the focus the last time the Task Manager was used.

The **Processes** tab provides details about all of the processes running on the system.

By pulling down the View menu you can configure what columns should be shown in the display.

Effective use of the information provided with each process lets you find those that might be exhibiting memory leaks or consuming an inordinate amount of CPU time.

You can also terminate processes from this tab.

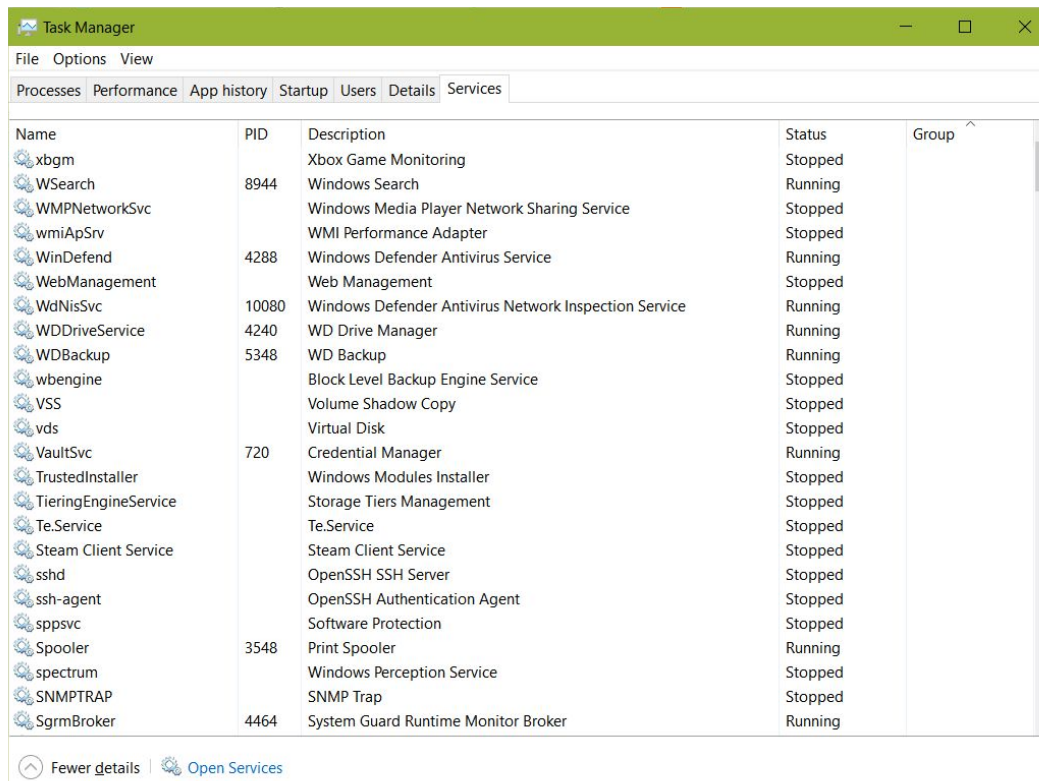


Figure 2. The Services tab of the Windows Task

The **Services** tab displays information about the Windows services installed on your system. (See Figure 2.)

By right-clicking on a service, you can start a stopped service, stop a running service, or immediately go to the process using a service.

By clicking the Services button you can bring up the Services application, where you have full control over your services.

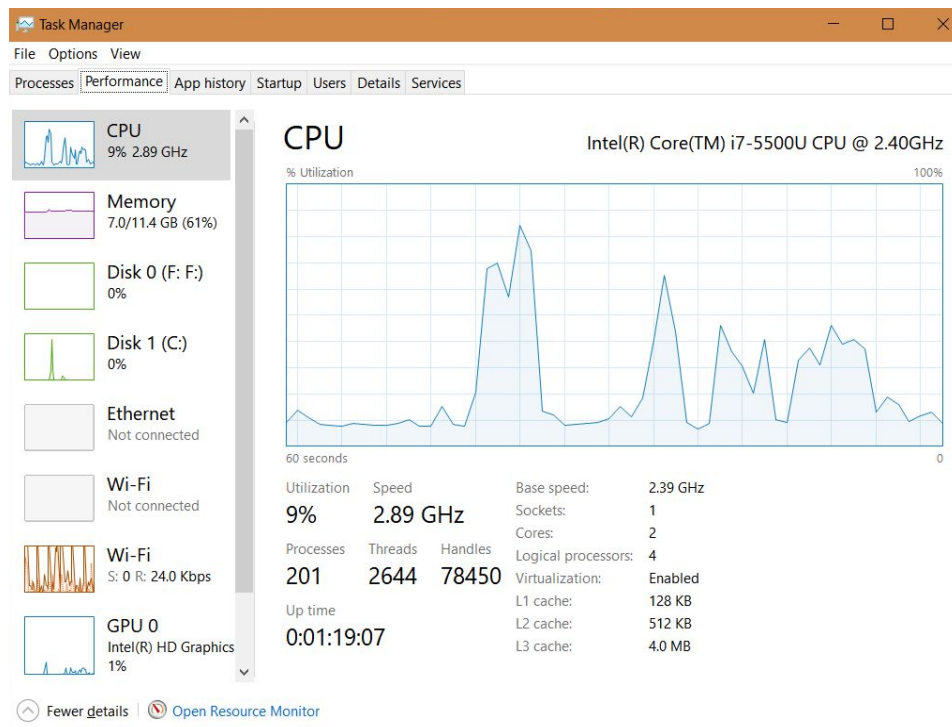


Figure 3. The Performance Tab

The **Performance** tab shown in Figure 3 displays some graphs and some numbers. The top two graphs show CPU usage over time and range between 0% (an idle system) and 100% (a very busy system). Important numbers here are for **Handles**, **Threads**, and **Processes**. A process is an instance of an executable program. Each process can be multi-threaded across the CPUs, and each thread can have multiple I/O handles open to system resources.

The **CPU Usage History** graph can display one graph for all CPUs (as in Figure X), or a separate graph for each CPU core. The **Memory** graphs show the amount of physical memory in use and range between something greater than 0 and the amount of installed memory. If you're consistently seeing high numbers here, then you could probably benefit from adding more memory.

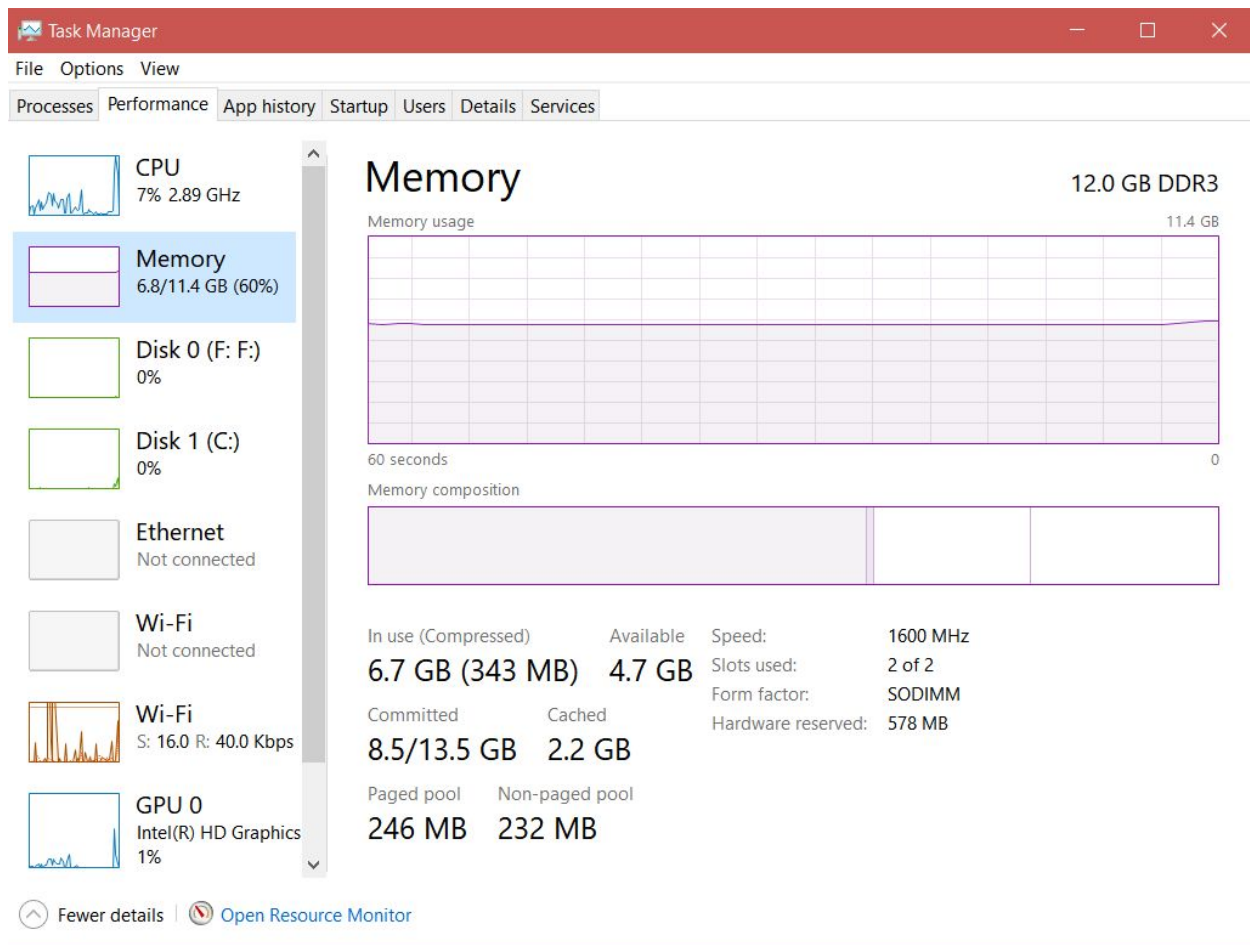


Figure 4. Memory details of the performance tab

Clicking on **Memory** reveals more details about the system's memory, there are two important numbers: the total amount of memory installed on the system (13.5 GB in my case), and how much is available for use (~4700 MB). If the amount of available memory is low, the system will use the disk as virtual memory and performance will suffer.

A process is an instance of an executable program. Each process can be multi-threaded across the CPUs, and each thread can have multiple I/O handles open to system resources.

The Kernel Memory group simply indicates how much physical memory is being used by system-level processes and device drivers.

Clicking the Resource Monitor button brings up a utility that provides much more detail about the CPU, Disk, Network, and Memory.

The **Networking** tab is one of the least interesting and least useful displays of Task Manager. (See Figure 5.)

The graph shows network activity as a percentage of network utilization, and on a dormant client node, this doesn't give much to look at.

You can see more information by pulling down the View menu and selecting additional columns to be shown in the display—perhaps Bytes Sent and Bytes Received.

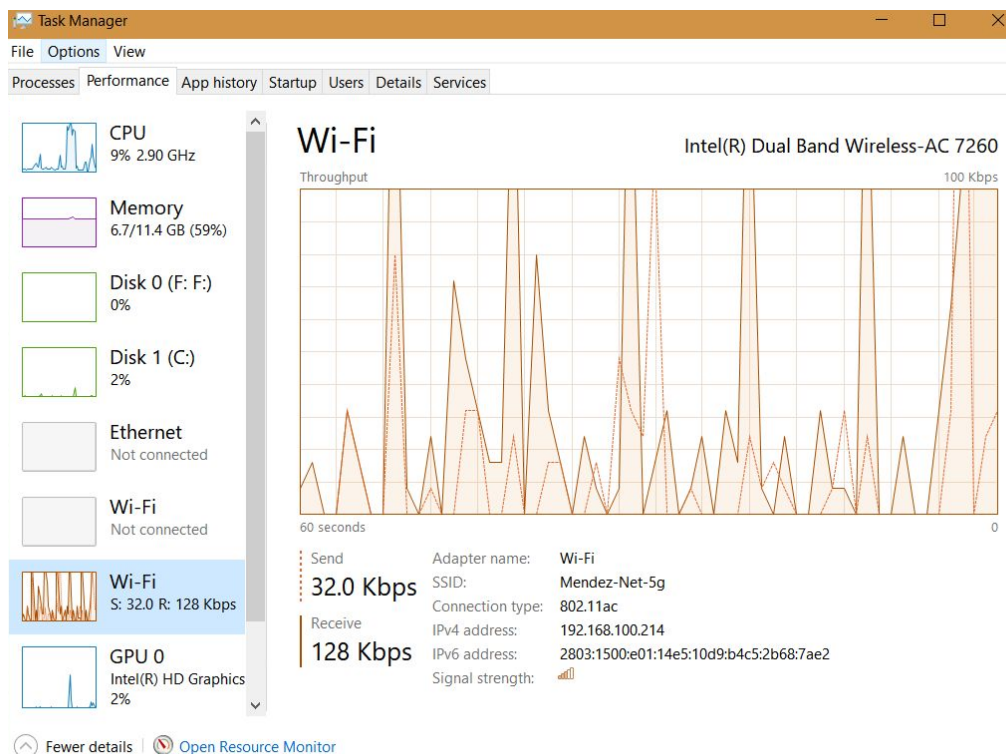


Figure 5. Networking details of the Performance tab

The screenshot shows the Windows Task Manager window with the 'Users' tab selected. The window title is 'Task Manager'. The menu bar includes 'File', 'Options', and 'View'. The tab bar shows 'Processes', 'Performance', 'App history', 'Startup', 'Users', 'Details', and 'Services'. The 'Users' tab displays a list of users and their resource usage. The user 'outlook.com (91)' is expanded, showing a list of applications. The resource usage is shown in columns: CPU, Memory, Disk, Network, GPU, and GPU Engine. The 'Disconnect' button is visible at the bottom right.

User	Status	10% CPU	59% Memory	0% Disk	0% Network	2% GPU	GPU Engine
outlook.com (91)		6.9%	3,953.3 MB	0.1 MB/s	0 Mbps	0%	GPU 0 - 3D
ASUS Smart Gesture Center		0.2%	1.7 MB	0 MB/s	0 Mbps	0%	
ASUS Smart Gesture Helper		0%	0.4 MB	0 MB/s	0 Mbps	0%	
ASUS Smart Gesture Loader		0%	0.3 MB	0 MB/s	0 Mbps	0%	
ATK Media (32 bit)		0%	0.4 MB	0 MB/s	0 Mbps	0%	
ATKOSD2 (32 bit)		0%	0.7 MB	0 MB/s	0 Mbps	0%	
Client Server Runtime Pr...		0.2%	1.1 MB	0 MB/s	0 Mbps	0.3%	GPU 0 - 3D
COM Surrogate		0%	1.6 MB	0 MB/s	0 Mbps	0%	
Console Window Host		0%	0.3 MB	0 MB/s	0 Mbps	0%	
CTF Loader		1.5%	3.2 MB	0 MB/s	0 Mbps	0%	
Desktop Window Manager		1.3%	61.8 MB	0 MB/s	0 Mbps	0.8%	GPU 0 - 3D
DisplayLinkUI Sys-Tray App...		0%	0.5 MB	0 MB/s	0 Mbps	0%	
Dropbox (32 bit)		0%	0.1 MB	0 MB/s	0 Mbps	0%	
Dropbox (32 bit)		0%	0.6 MB	0 MB/s	0 Mbps	0%	
Dropbox (32 bit)		0%	46.8 MB	0 MB/s	0 Mbps	0%	
Google Chrome		0%	7.6 MB	0 MB/s	0 Mbps	0%	
Google Chrome		0%	116.3 MB	0 MB/s	0 Mbps	0%	
Google Chrome		0%	13.8 MB	0 MB/s	0 Mbps	0%	
Google Chrome		0%	38.1 MB	0 MB/s	0 Mbps	0%	

At the bottom left, there is a 'Fewer details' button. At the bottom right, there is a 'Disconnect' button.

Figure 6. The Users tab of the Windows Task Manager.

The **Users** tab simply provides a list of users who are currently logged in. By selecting a user (other than yourself), you can send that user a message. Additionally, you can disconnect or log the user off the system.

Activities

Task Manager						
File Options View						
Processes Performance App history Startup Users Details Services						
Name	PID	20% CPU	61% Memory	0% Disk	0% Network	0% GPU
COM Surrogate	11364	0%	1.3 MB	0 MB/s	0 Mbps	0%
Host Process for Windows Tasks	16948	0%	1.3 MB	0 MB/s	0 Mbps	0%
wsappx	10720	0%	2.7 MB	0 MB/s	0 Mbps	0%
Paint	16664	0%	99.3 MB	0 MB/s	0 Mbps	0%
Untitled						
Windows	7076	0%	5.5 MB	0 MB/s	0 Mbps	0%
Settings		0%	0.4 MB	0 MB/s	0 Mbps	0%
Microsoft		0%	3.8 MB	0 MB/s	0 Mbps	0%
Application Frame Host	9448	0%	7.3 MB	0 MB/s	0 Mbps	0%
Runtime Broker		0%	2.1 MB	0 MB/s	0 Mbps	0%
Photos		0%	70.2 MB	0 MB/s	0 Mbps	0%
Service Host: Windows Connect Now - C...	12340	0%	0.8 MB	0 MB/s	0 Mbps	0%
Snipping Tool	13116	0%	5.0 MB	0 MB/s	0 Mbps	0%

Figure 7. Active Applications View

Part 2: Explore the Task Manager and Manage Applications from within it.

- Open a browser (Firefox, Internet Explorer, or Chrome).
- Open a folder on your lab machine using Windows Explorer.
- Start the Task Manager (Press Ctrl-Alt-Delete).
- Select the open browser from the task list, and then click the **Switch To** button.
- **Question 1:** What happened to the browser? Why did this happen?
- Navigate back to the Task Manager.

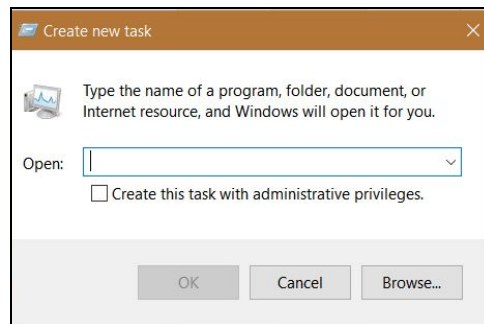
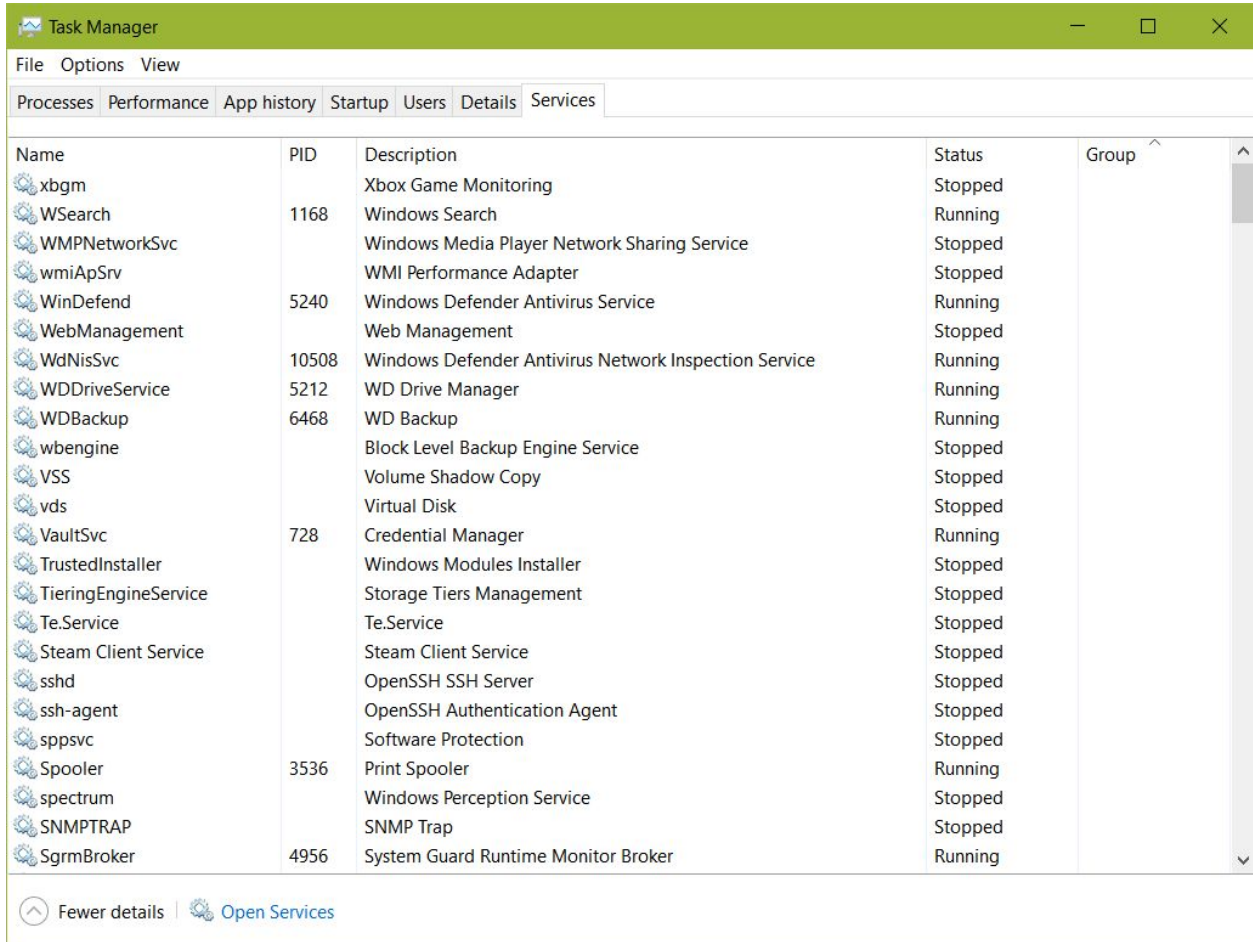


Figure 8. New Task Creation

- Click File then click **New Task**.
- The “Create New Task” window opens. In the Open field, type **Notepad** and then click the **OK** button.
- **Question 2:** What happens? Why did this happen?
- Navigate back to the Task Manager.
- Select **Notepad** and then click **End Task**.
- **Question 3:** What happens? Why did this happen?
- **Question 4:** How many active applications are open in the Task Manager at this point?

Part 3: Explore the Services.

A screenshot of the Windows Task Manager application, specifically the 'Services' tab. The window has a green title bar with 'Task Manager' and standard window controls. Below the title bar is a menu bar with 'File', 'Options', and 'View'. A tab bar at the top shows 'Processes', 'Performance', 'App history', 'Startup', 'Users', 'Details', and 'Services', with 'Services' being the active tab. The main area contains a table of services. The table has five columns: 'Name', 'PID', 'Description', 'Status', and 'Group'. The 'Group' column has a small upward arrow icon. The table lists 25 services, including 'xbgm', 'WSearch', 'WMPNetworkSvc', 'wmiApSrv', 'WinDefend', 'WebManagement', 'WdNisSvc', 'WDDriveService', 'WDBackup', 'wbengine', 'VSS', 'vds', 'VaultSvc', 'TrustedInstaller', 'TieringEngineService', 'Te.Service', 'Steam Client Service', 'sshd', 'ssh-agent', 'sppsvc', 'Spooler', 'spectrum', 'SNMPTRAP', and 'SgrmBroker'. The status of each service is indicated in the 'Status' column, with values like 'Stopped', 'Running', and 'Stopped'. At the bottom of the window, there is a 'Fewer details' button with an upward arrow and an 'Open Services' button with a gear icon.

Name	PID	Description	Status	Group
xbgm		Xbox Game Monitoring	Stopped	
WSearch	1168	Windows Search	Running	
WMPNetworkSvc		Windows Media Player Network Sharing Service	Stopped	
wmiApSrv		WMI Performance Adapter	Stopped	
WinDefend	5240	Windows Defender Antivirus Service	Running	
WebManagement		Web Management	Stopped	
WdNisSvc	10508	Windows Defender Antivirus Network Inspection Service	Running	
WDDriveService	5212	WD Drive Manager	Running	
WDBackup	6468	WD Backup	Running	
wbengine		Block Level Backup Engine Service	Stopped	
VSS		Volume Shadow Copy	Stopped	
vds		Virtual Disk	Stopped	
VaultSvc	728	Credential Manager	Running	
TrustedInstaller		Windows Modules Installer	Stopped	
TieringEngineService		Storage Tiers Management	Stopped	
Te.Service		Te.Service	Stopped	
Steam Client Service		Steam Client Service	Stopped	
sshd		OpenSSH SSH Server	Stopped	
ssh-agent		OpenSSH Authentication Agent	Stopped	
sppsvc		Software Protection	Stopped	
Spooler	3536	Print Spooler	Running	
spectrum		Windows Perception Service	Stopped	
SNMPTRAP		SNMP Trap	Stopped	
SgrmBroker	4956	System Guard Runtime Monitor Broker	Running	

Figure 9. Services View

- Click on the **Services** tab.
- **Question 5:** What values are given to the status of the services shown?

Part 4: Explore the System's Performance.

- Click on the **Performance** tab.
- **Question 6:** How many Processes are running?
- **Question 7:** How many Threads are running?
- **Question 8:** What is the Total Physical Memory (MB) of the system?

- **Question 9:** What is the Available Physical Memory (MB) of the system?
- **Question 10:** How much Physical Memory is being used by the system?

Part 5: Explore the Network Performance.

- Click on the **Networking** tab.
- **Question 11:** What is the state and Link Speed for all of the connections listed?

Part 6: Explore the System Users.

- Click on the **Users** tab to list all users and their status.
- **Question 12:** What actions can you perform on the user's profile from the Task Manager?

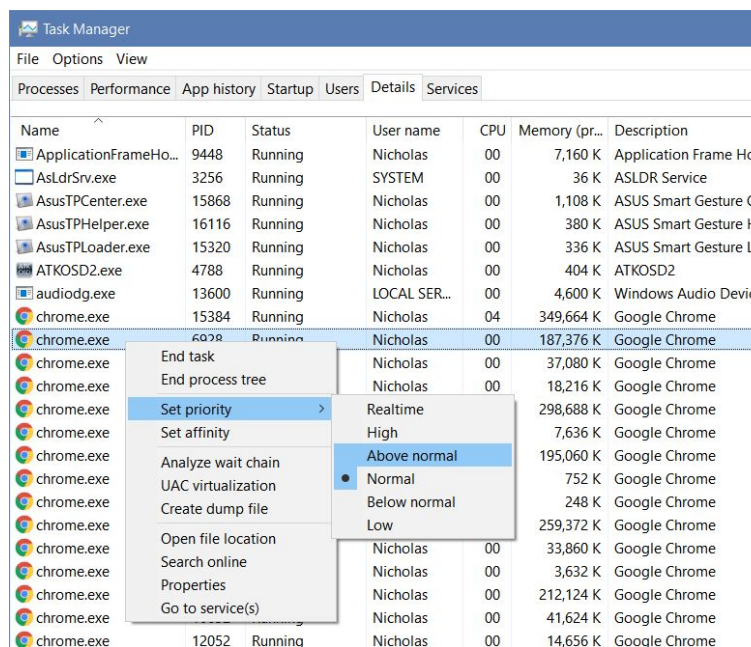


Figure 10. Changing a Process Priority

Part 7: Explore the Details Tab.

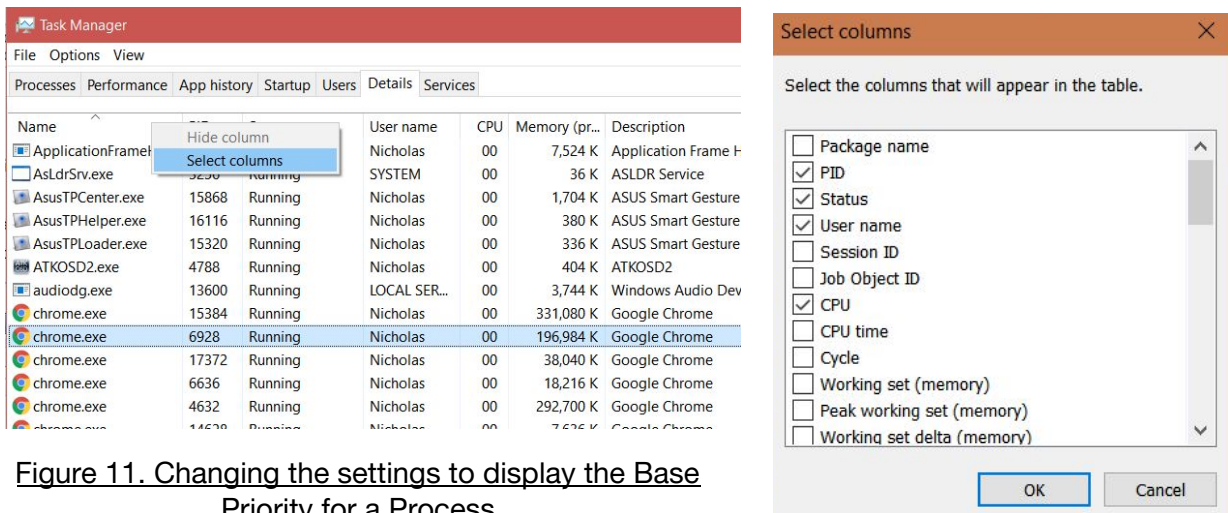
- Click on the **Details** tab.
- Double-click the border around the tabs. The Task Manager view switches to *compact mode*
- Click on the **Name** column header.
- **Question 13:** Click on the **Name** header again. What effect does this have on the column listings?
- **Question 14:** Click on the **Memory** column header. What effect does this have on the column listings?
- Double-click on the outside border to return to the *tabs mode* view of the Task

Manager.

- Locate the process associated with the open browser from step #1 using the descriptions.

Right-click on the process name (e.g. firefox.exe for FireFox).

- Select **Set Priority** from the menu.
 - Question 15:** What is the default priority for the browser?
 - Set the priority to **Above Normal**.
 - Click the **Change Priority** button when the Task Manager alert box pops up.
- Right Click the header row of the details view and then **Select Columns**.
 - The “Select Process Page Columns” window appears.
 - Place a checkmark next to **Base Priority**. Click the **OK** button.



Expand the width of the “Windows Task Manager” so that the Base Priority column is visible

- Click on the **Base Priority** column header.
- **Question 16:** Which image name has a base priority of N/A?
- **Question 17:** List the image name that has a base priority of Above Normal?
- Reset the browser process base priority to normal.
 - Right-click image name > Set Priority > Normal > Change priority.
 - Click View from the main menu > Select Columns > uncheck Base Priority > OK.

Task Manager							
File Options View							
Processes Performance App history Startup Users Details Services							
Name	PID	Status	User name	CPU	Memory (pr...	Base priority	Description
ApplicationFrameHo...	9448	Running	Nicholas	00	7,716 K	Normal	Application Frame Host
AsLdrSrv.exe	3256	Running	SYSTEM	00	36 K	Normal	ASLDR Service
AsusTPCenter.exe	15868	Running	Nicholas	00	1,724 K	Below normal	ASUS Smart Gesture Center
AsusTPHelper.exe	16116	Running	Nicholas	00	380 K	Below normal	ASUS Smart Gesture Helper
AsusTPLoader.exe	15320	Running	Nicholas	00	336 K	Below normal	ASUS Smart Gesture Loader
ATKOSD2.exe	4788	Running	Nicholas	00	404 K	Normal	ATKOSD2
chrome.exe	15384	Running	Nicholas	00	317,560 K	Normal	Google Chrome
chrome.exe	6928	Running	Nicholas	00	185,416 K	Normal	Google Chrome
chrome.exe	17372	Running	Nicholas	00	37,496 K	Normal	Google Chrome
chrome.exe	6636	Running	Nicholas	00	18,216 K	Normal	Google Chrome
chrome.exe	4632	Running	Nicholas	00	305,688 K	Low	Google Chrome
chrome.exe	14628	Running	Nicholas	00	7,636 K	Low	Google Chrome
chrome.exe	9996	Running	Nicholas	00	190,928 K	Normal	Google Chrome
chrome.exe	10084	Running	Nicholas	00	752 K	Normal	Google Chrome
chrome.exe	3412	Running	Nicholas	00	248 K	Normal	Google Chrome
chrome.exe	1948	Running	Nicholas	00	252,032 K	Normal	Google Chrome
chrome.exe	10312	Running	Nicholas	00	36,076 K	Normal	Google Chrome
chrome.exe	10320	Running	Nicholas	00	3,532 K	Normal	Google Chrome
chrome.exe	10520	Running	Nicholas	00	211,704 K	Normal	Google Chrome
chrome.exe	10632	Running	Nicholas	00	40,500 K	Normal	Google Chrome
chrome.exe	12052	Running	Nicholas	00	15,068 K	Low	Google Chrome
chrome.exe	1580	Running	Nicholas	00	30,520 K	Low	Google Chrome
chrome.exe	1408	Running	Nicholas	00	219,476 K	Low	Google Chrome
chrome.exe	12028	Running	Nicholas	00	45,788 K	Low	Google Chrome

^ Fewer details
End task

Figure 12. Expanded Task Manager view showing additional process column - Base Priority

- Close the browser window.
- **Question 18:** Is the browser still listed as process in the Task Manager?
- Close all open windows.

Windows Task Manager Lab: Answer Sheet

Student Name:		Student #:	
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Question:	Answers:
Question 1:	
Question 2:	
Question 3:	
Question 4:	
Question 5:	
Question 6:	
Question 7:	
Question 8:	
Question 9:	
Question 10:	
Question 11:	
Question 12:	
Question 13:	
Question 14:	
Question 15:	
Question 16:	
Question 17:	
Question 18:	