Microsoft Windows Security Configuration

Unit 6

A STEM Program of the Air & Space Forces Association

AFA

Learning Objectives

- Edit File-level permissions on Windows systems
  - Purpose, use, and types
  - Permission inheritance and parent/child relationships
  - Customization
- Backup function and best-practice backup strategies
  - Availability and integrity
  - Major backup techniques and types
  - Configuration
- Audit logging and system monitoring
  - Audit logging purpose and configuration
  - Performance monitoring purpose and configuration

Windows File Protections

Section 1

The CIA Triad (Review)

- 3 Goals of information security:
  - Maintain information **confidentiality**
    - Making sure only approved users have access to data
  - Maintain information **integrity**
    - Data Integrity: assurance that information has not been tampered with or corrupted between the source and the end user
    - Source Integrity: assurance that the sender of the information is who it is supposed to be
  - Maintain information **availability**
    - Ensuring data is accessible by approved users when needed

Source: http://www.techrepublic.com/blog/it-security/the-cia-triad/

File Permissions

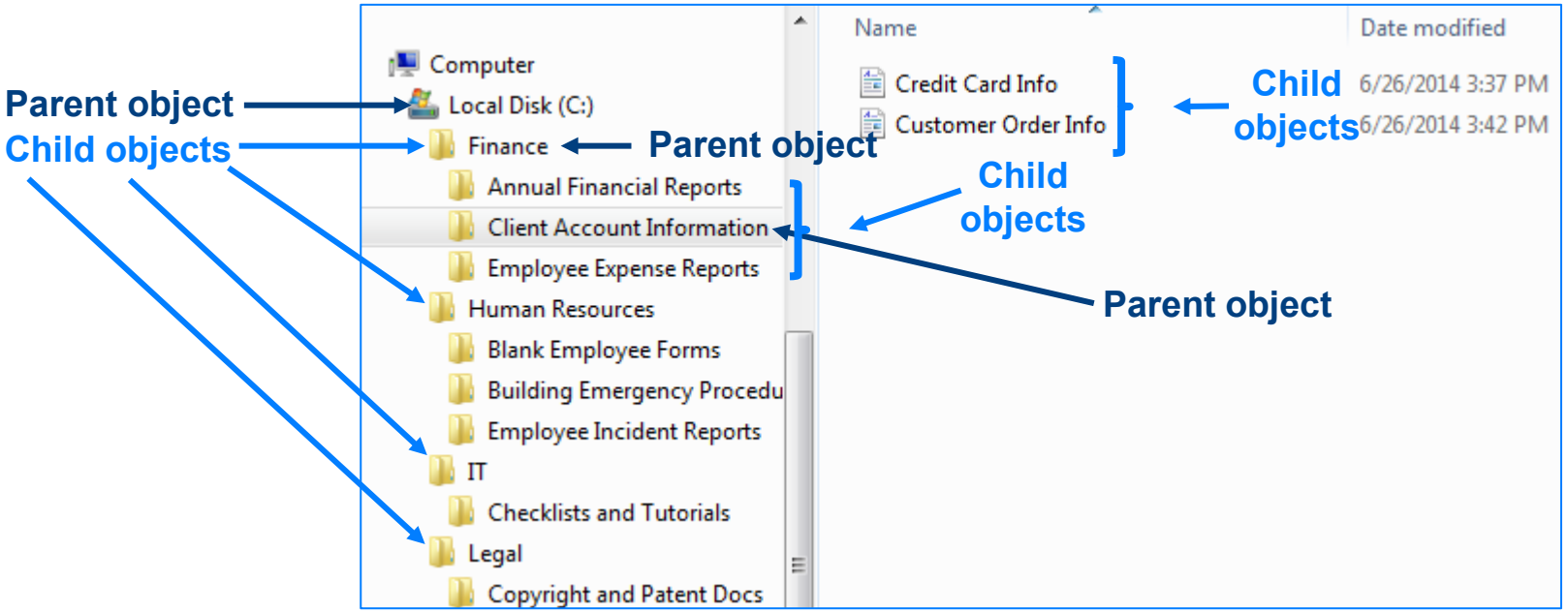
- Important tool for ensuring data integrity and confidentiality
- More customizable than the blanket set of permissions given to users by adding them to either the Users or Administrators group
- Use to restrict access or editing rights to specific data on shared resources
- Can be customized by individual user or by user group

Types of File Permissions

- **Full Control**
  - Administrator level access
  - Users can make every possible change to a selected file or the contents of a selected folder
- **Modify**
  - Allows users to change a file's content, but not its ownership
  - Users cannot delete the file
- **Read & Execute**
  - Allows users to open and run programs
- **List Folder Contents**
  - Allows users to view the names of files stored in the selected folder
- **Write**
  - Allows users to make changes to a file and overwrite existing content
- **Read**
  - Allows users to view the attributes of a file or folder, but not edit it

Parent and Child Objects

- Use inheritable permissions to apply the same security settings to all of the files (child objects) in a folder (parent object)

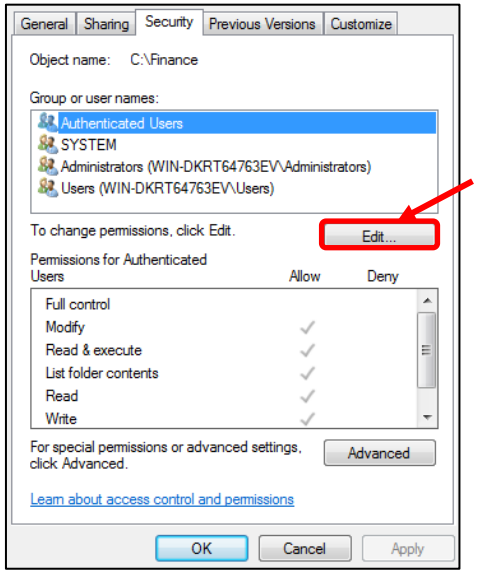


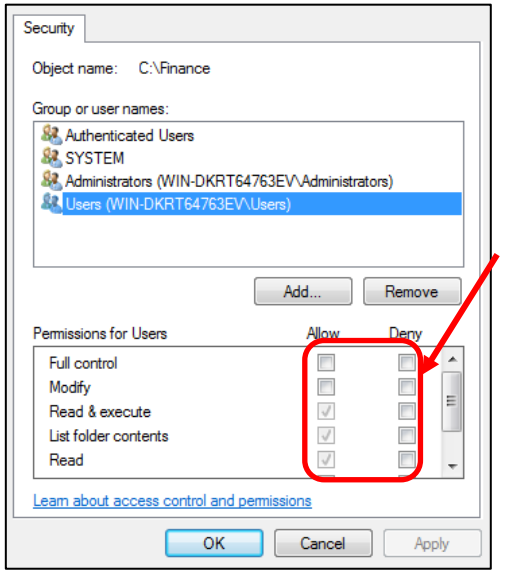
Inheritable Permissions

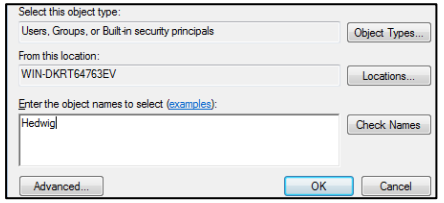
- By default, objects within a folder (known as child objects) inherit permission settings from their containing folder (known as the parent object)
- You can turn off inheritable permissions and customize who gets what kind of access to certain folders, subfolders, or documents
- Depending on how many users need access to a sensitive file or folder and how many of the files in a folder need to be restricted, there are several ways to apply permissions
  - E.g. If you want certain users or groups to be denied access to *all but a few* files within a folder, it is quickest to apply a restrictive permission setting to the parent object (folder). Once you have denied those users' access to all of the files in the folder, you can go to the individual files you do want them to have access to and override the permissions those files inherited from the parent folder.

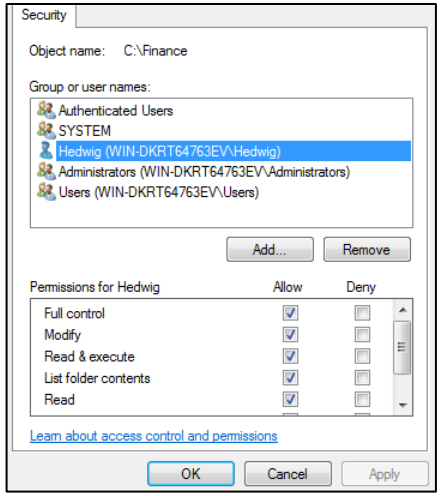
Customizing Permissions

- To apply the same permissions to all of the contents of a folder, Right-click the folder → Select Properties → Click the Security tab
- Edit the permissions of an entire group by highlighting it and checking the appropriate boxes
- Edit the permissions of a specific user (or subgroups you have created) by using the “Add…” button to add him/her to the Group or Usernames box and then checking the appropriate boxes



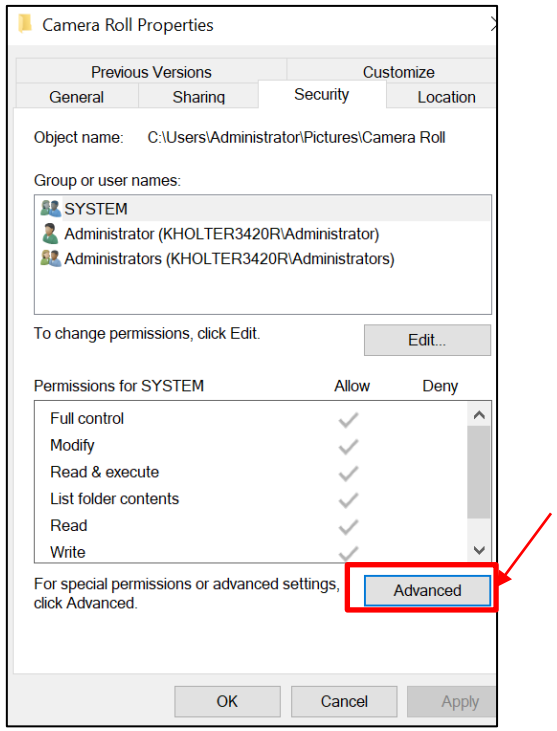


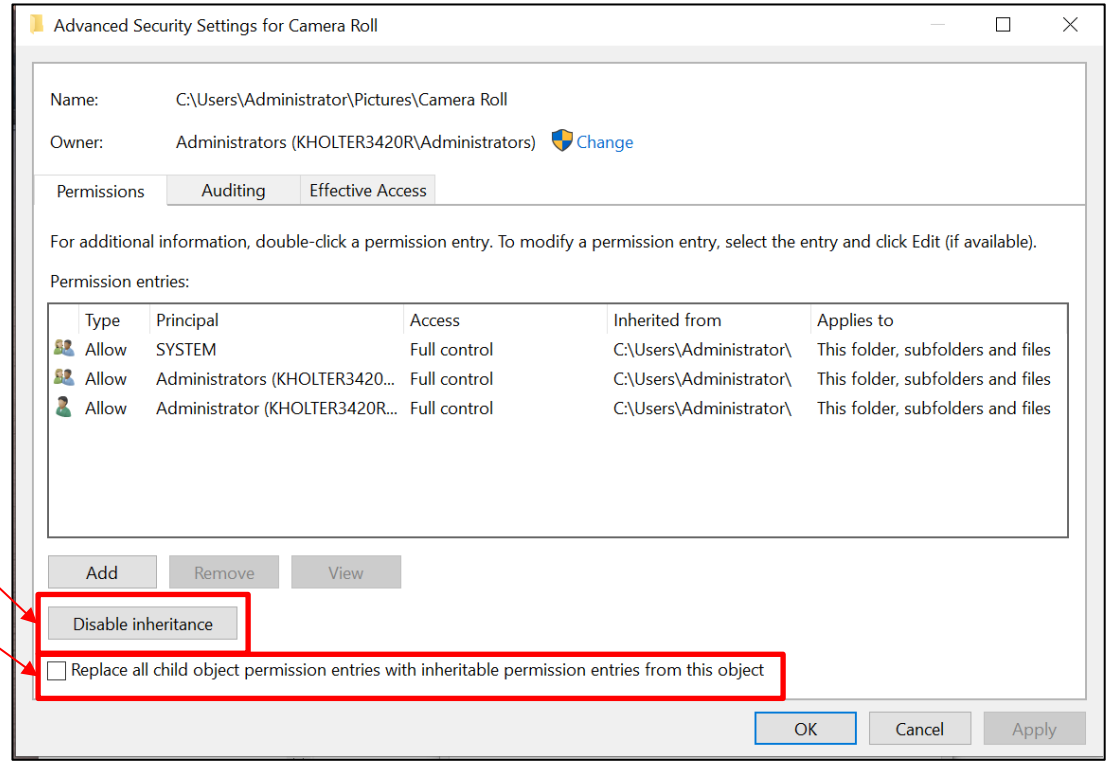




Customizing Permissions

- To remove permissions inherited from a parent and create custom settings, Click the “Advanced” button from the Security tab → Click Change Permissions → Uncheck the “Include inheritable permissions…” box
- Customize permissions for individual users and/or groups using the “Add…” button.
- To extend your new settings to all of the child object or to extend permissions to the child objects in a folder, check the “Replace all child objects….” button



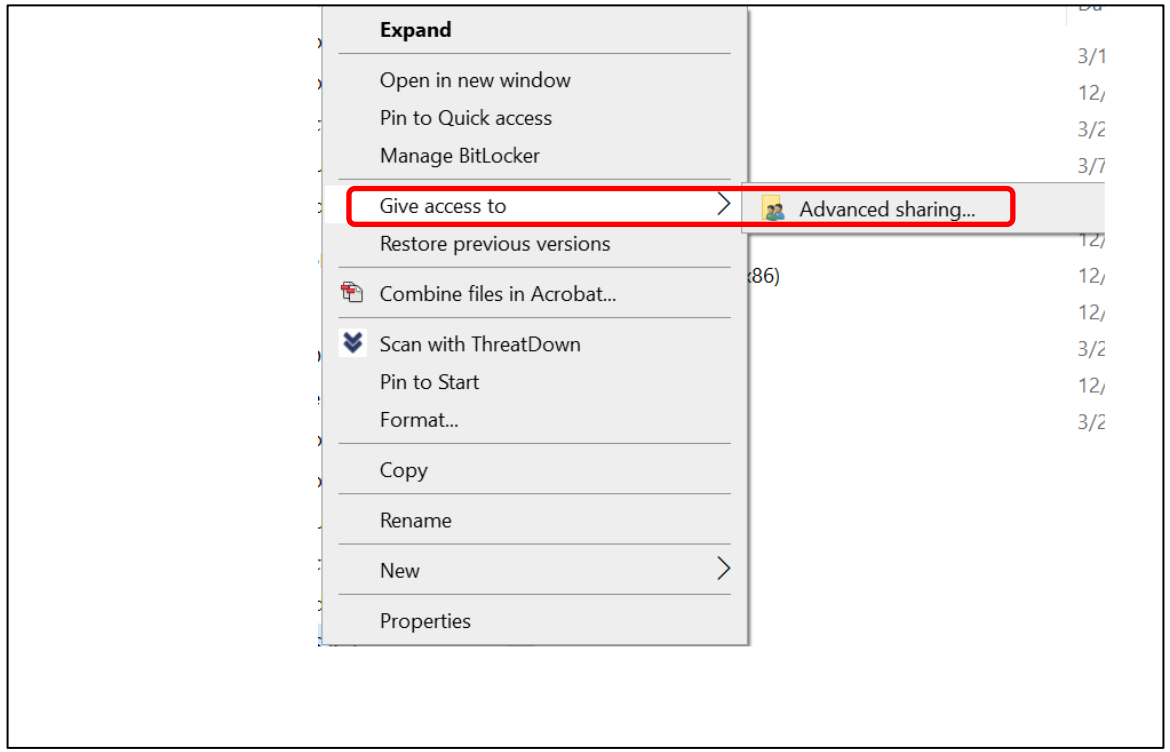


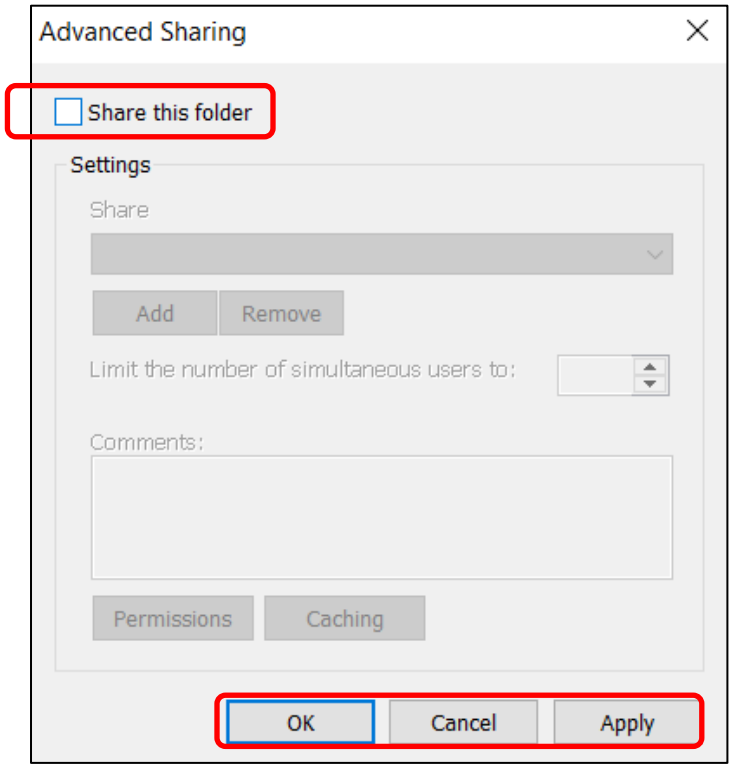
File Permissions

- Restrict access or editing rights to data on shared resources
- Types of permissions:
  1. Full Control
  2. Modify
  3. Read & Execute
  4. List Folder Contents
  5. Write
  6. Read

Sharing Drives

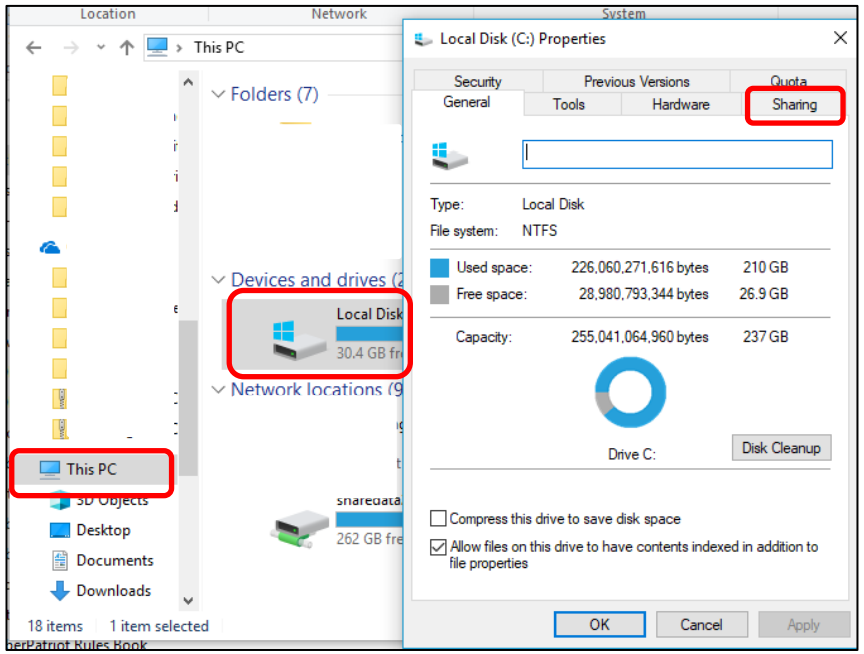
- You can share an entire network's files by sharing its drives
- Generally, not a good idea – Anyone could see or modify your files
- To turn off Sharing Drives: Open File Explorer → Click This PC → Right Click the Local Disk Drive → Share with → Advanced Sharing → Uncheck Share this folder → Click OK

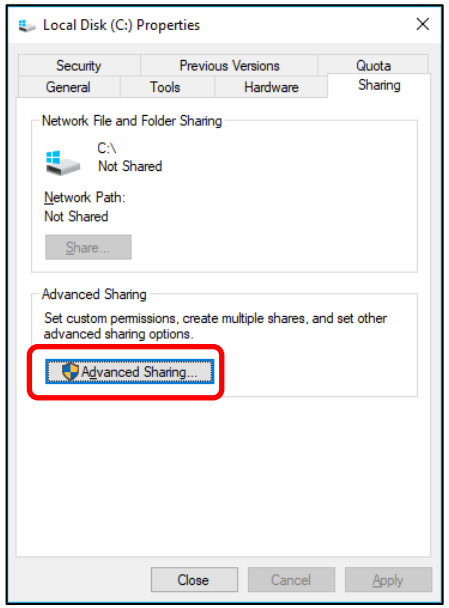


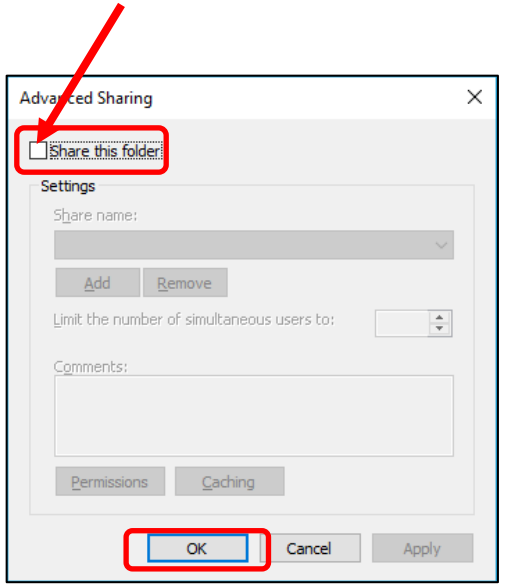


Sharing Drives

- Alternate Method
- To turn off Sharing Drives: Open File Explorer → Click This PC → Right Click the Local Disk Drive → Properties → Sharing → Advanced Sharing → Uncheck Share this folder → Click OK



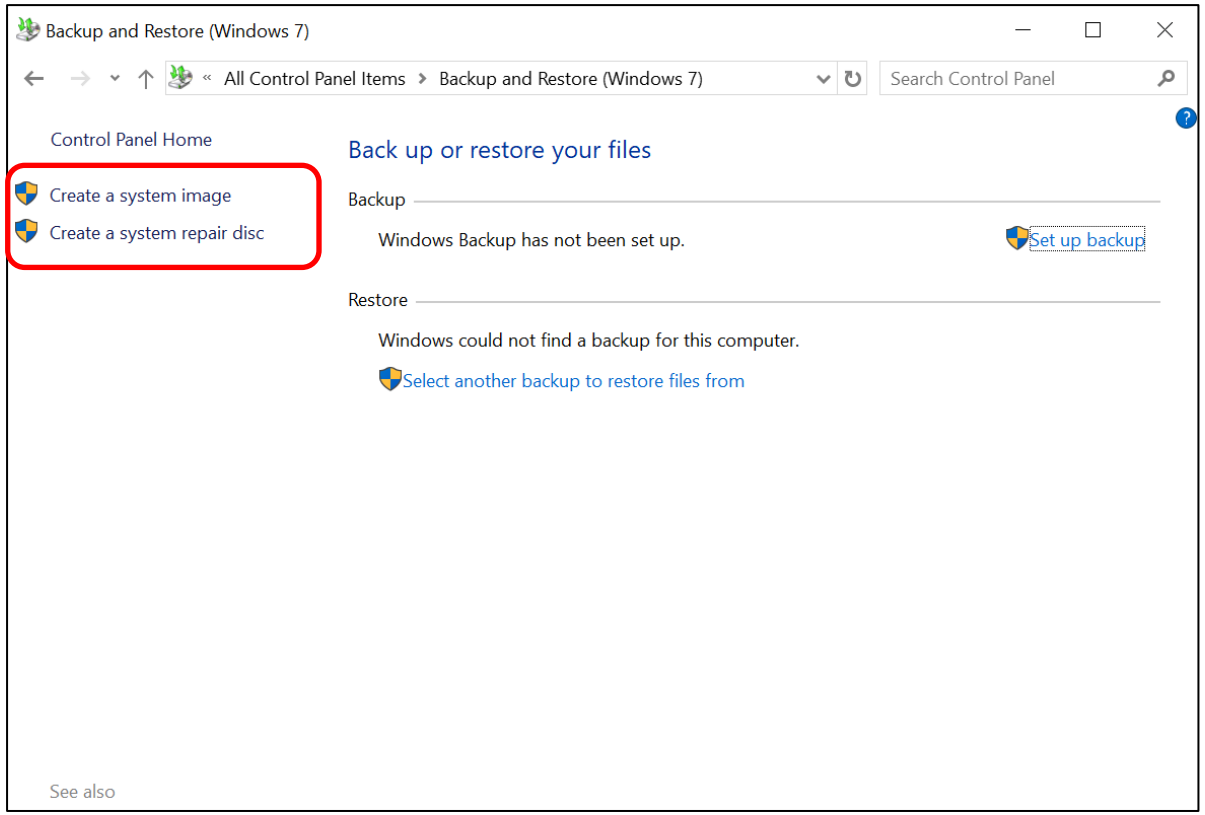




Creating Backups

- Control Panel → System and Security → Backup and restore

  - **System image:** Contains files, programs, system files, and settings
  - **Create a System repair disc:** Contains necessary system files



Windows Auditing and Monitoring

Section 2

Event Viewer

- Displays logs of events occurring on the Windows operating system

Windows 10

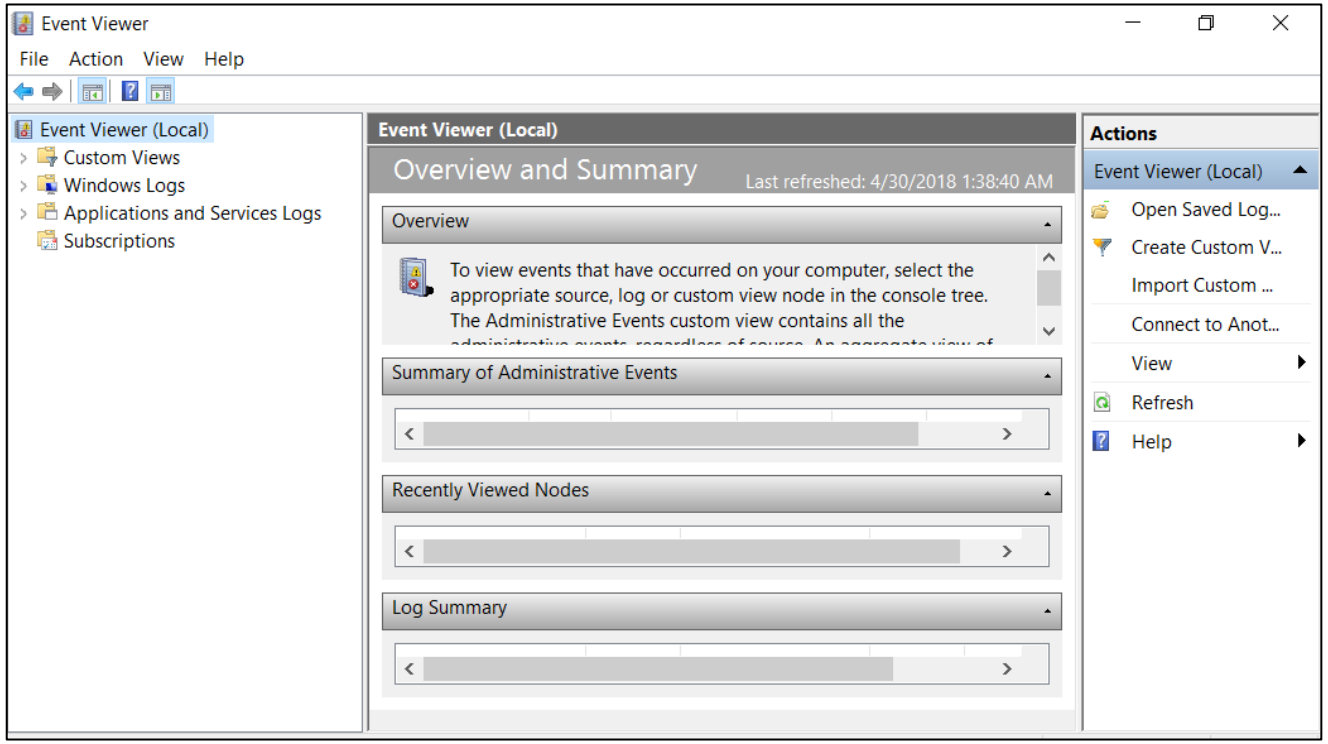
Control Panel → Administrative Tools → Event Viewer

OR Search → Event Viewer

Windows 11

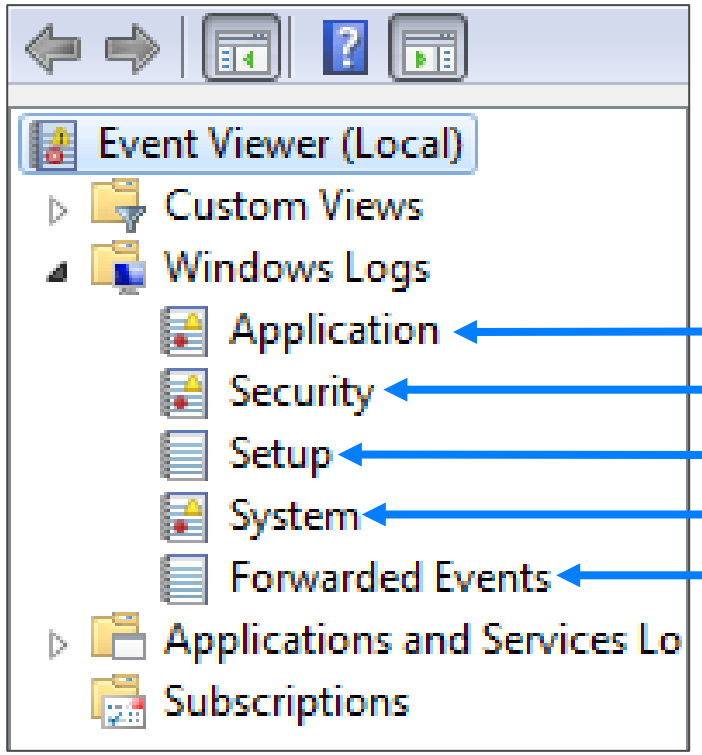
Control Panel → System and Security → Windows Tools → View event logs

OR Search → Event Viewer



Windows Logs

- Customize what security logs are kept by setting **Audit Policies**
- Security logs can be a useful last defense against attacks and a tool for forensics investigations into the source of a past attack or unauthorized entry



Events logged by programs

Any successful or unsuccessful logon attempts

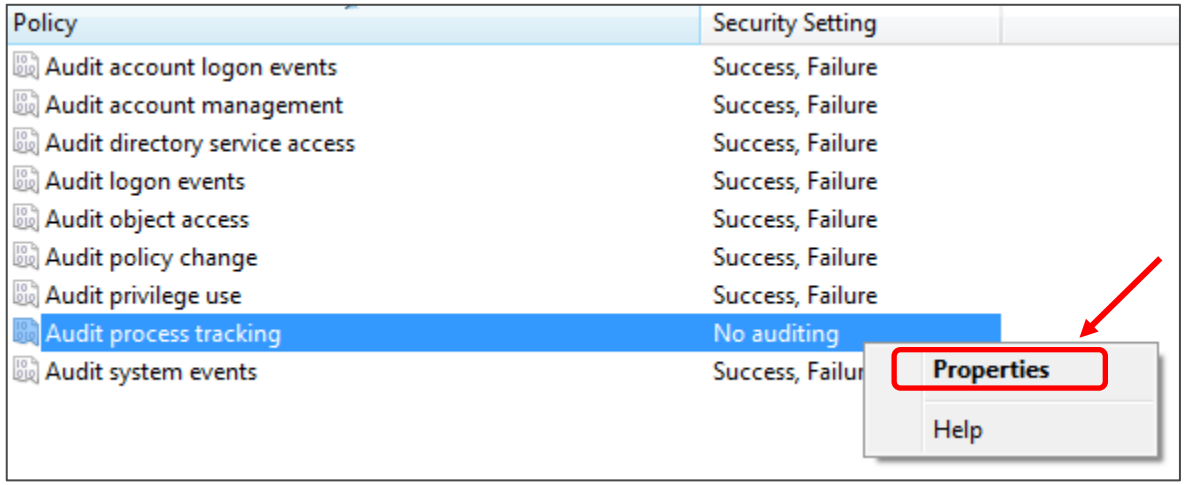
Events that occurred during installation

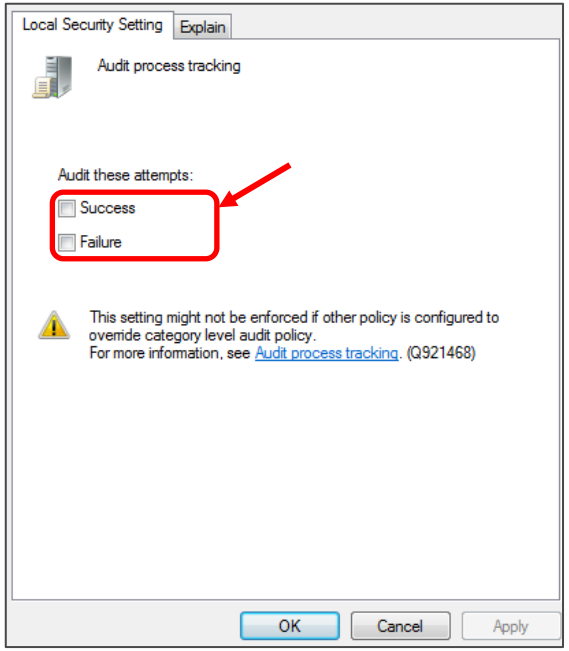
Events logged by system components

Events forwarded from other computers

Audit Policy Settings

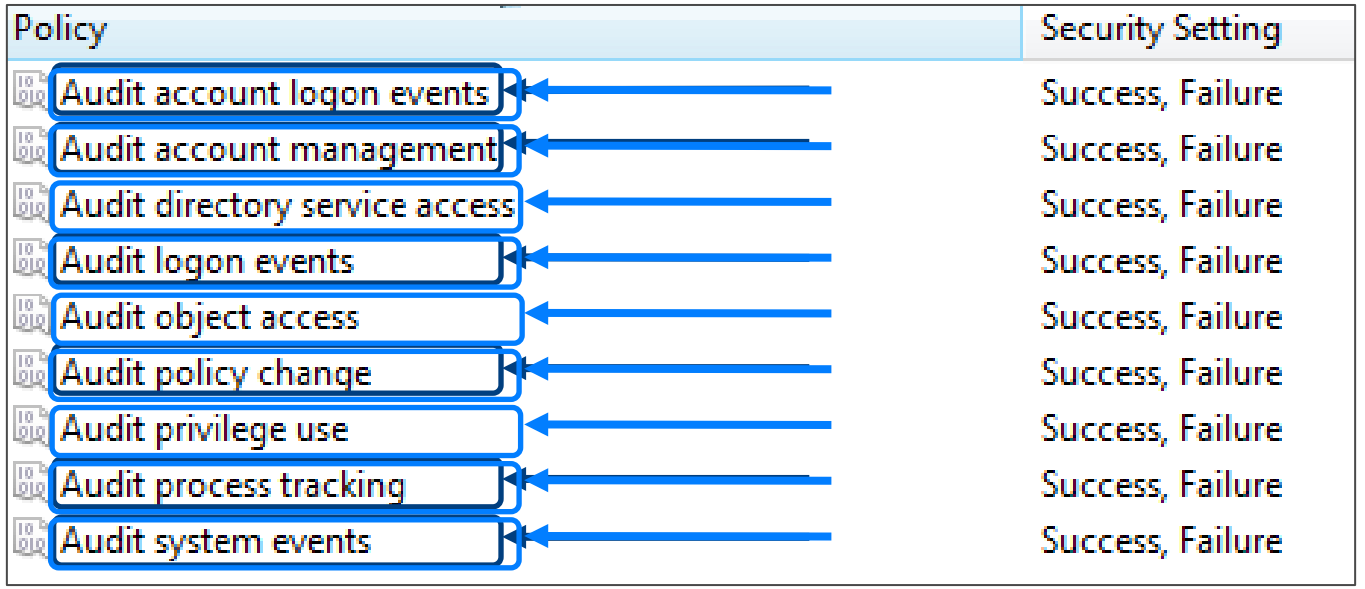
- **Windows 10:** Control Panel → Administrative Tools → Local Security Policy → Local Policies → Audit Policy
- **Windows 11:** Control Panel → System and Security → Windows Tools → Local Security Policy → Local Policies → Audit Policy
  - Success: generates an event when the requested action succeeds
  - Failure: generates an event when the requested action fails
  - No Auditing: does not generate an event for the action
- Right click the Security Setting column → Properties → Success, Failure





Audit Policy

- Must be set and enabled for logs to be available in the Event Viewer

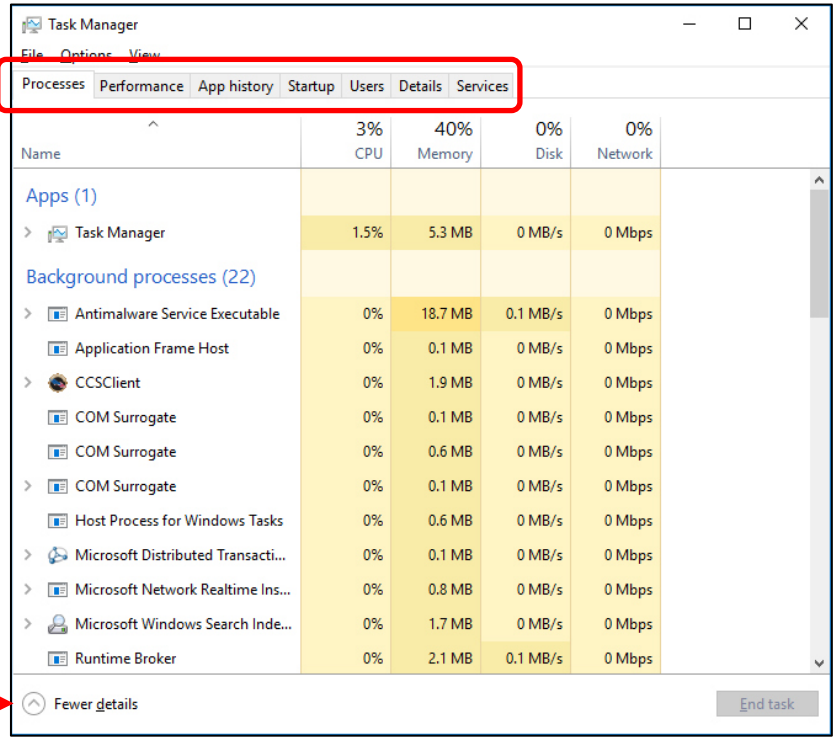


Recommended for Windows 10 users

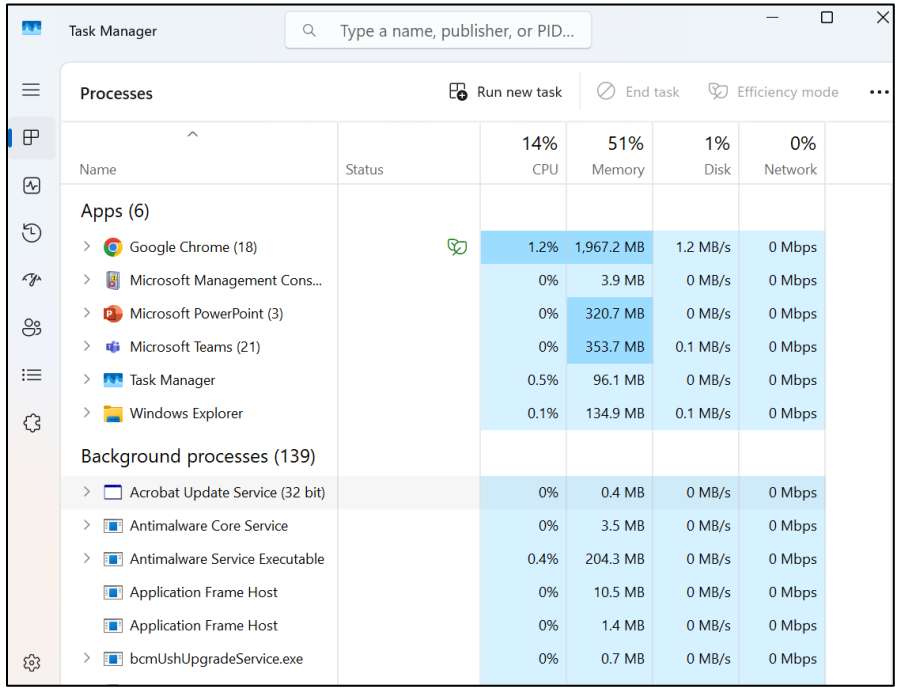
Task Manager

- Shows programs, services, and processes currently running
- Shows network activity and resource utilization
- Search → Task Manager

Windows 10



Windows 11

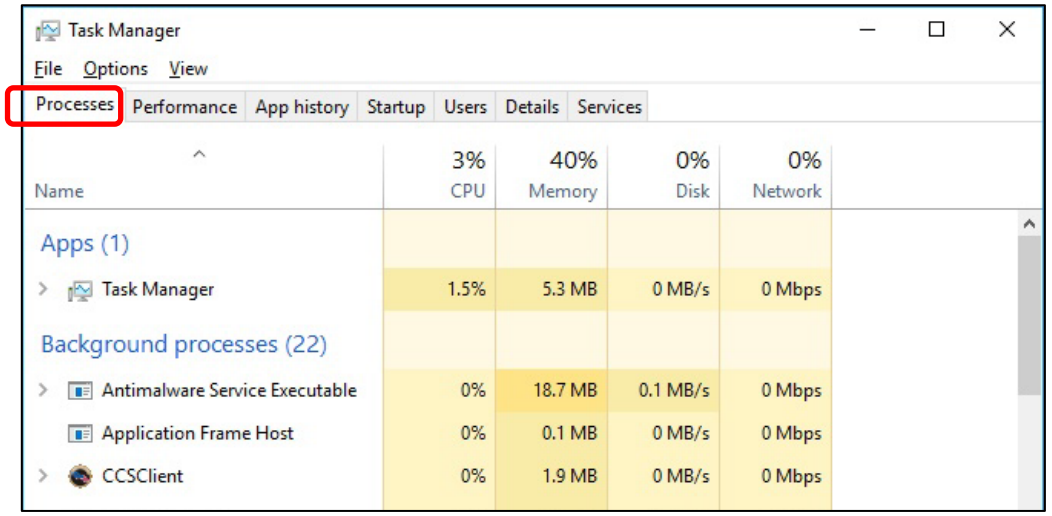


Note: If the Task Manager is showing few details, then click "**More details**" here

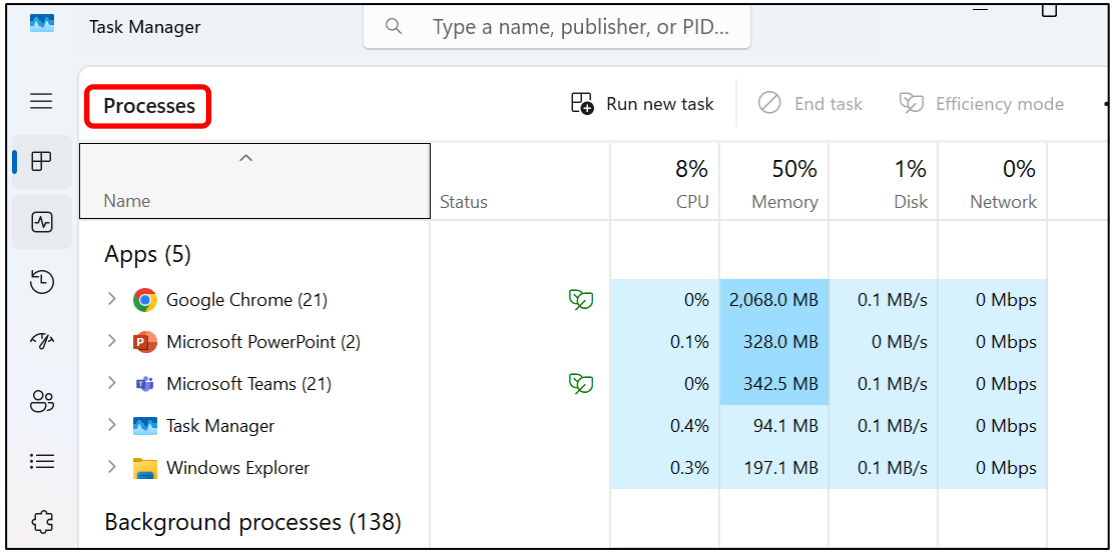
Task Manager: Processes

- Three tasks:
  - Close programs that are not responding
  - Determine if an unnecessary piece of software is running
  - Find the process that is associated with certain software

Windows 10



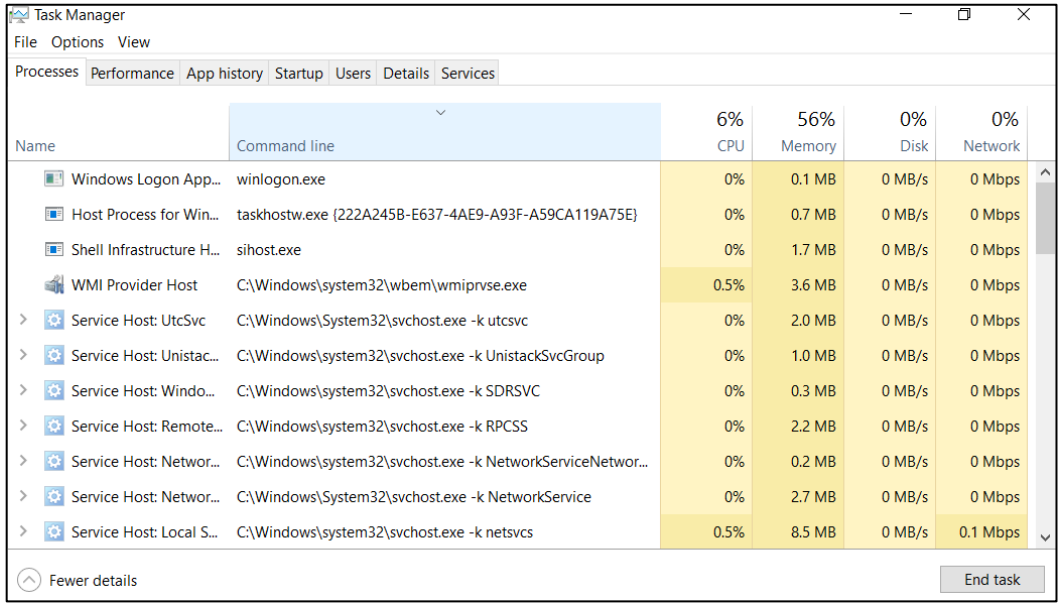
Windows 11



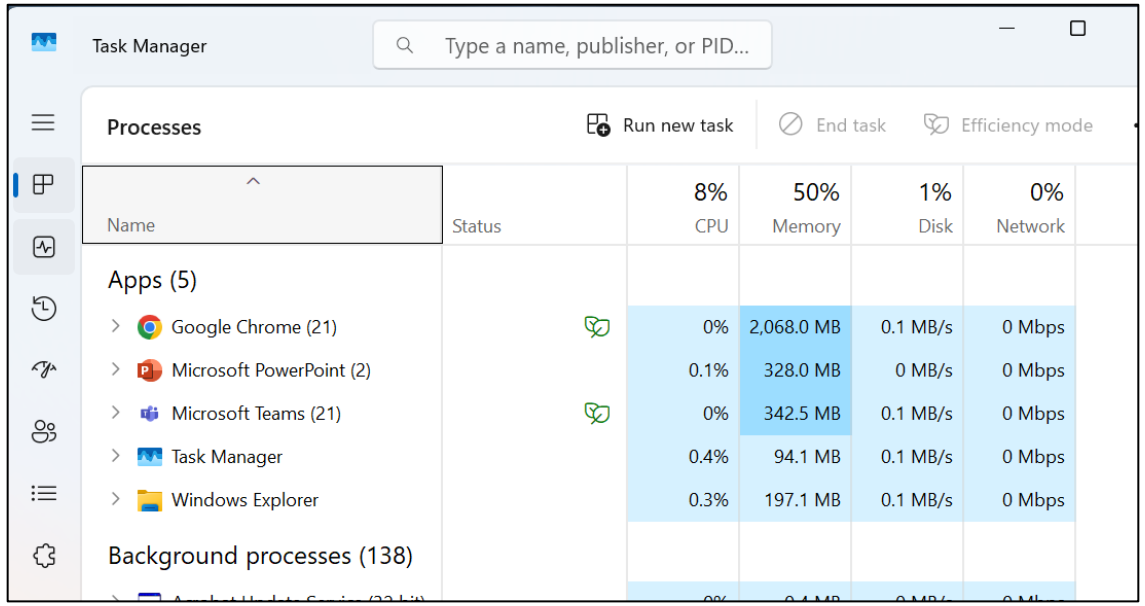
Task Manager: Processes

- Some processes are essential for Windows
- Some malware can only be ended here

Windows 10



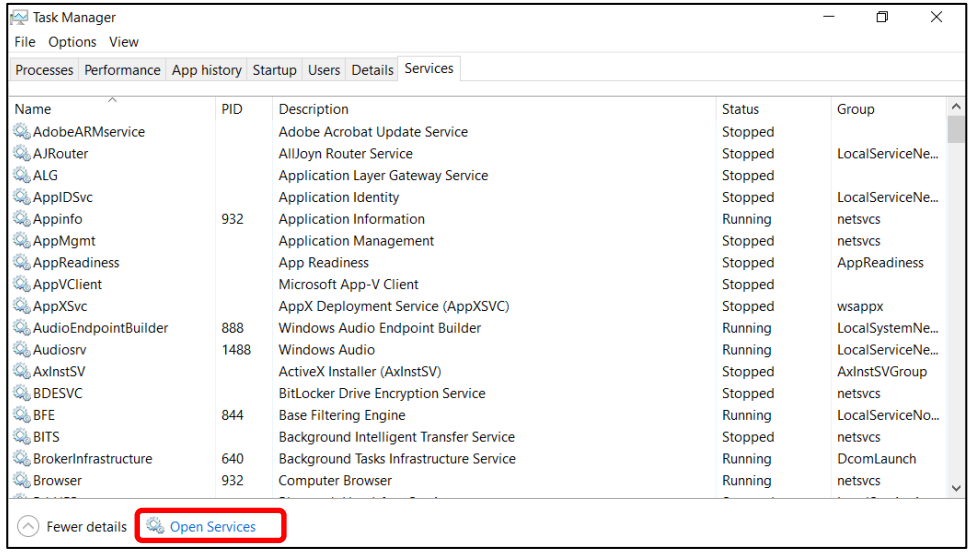
Windows 11



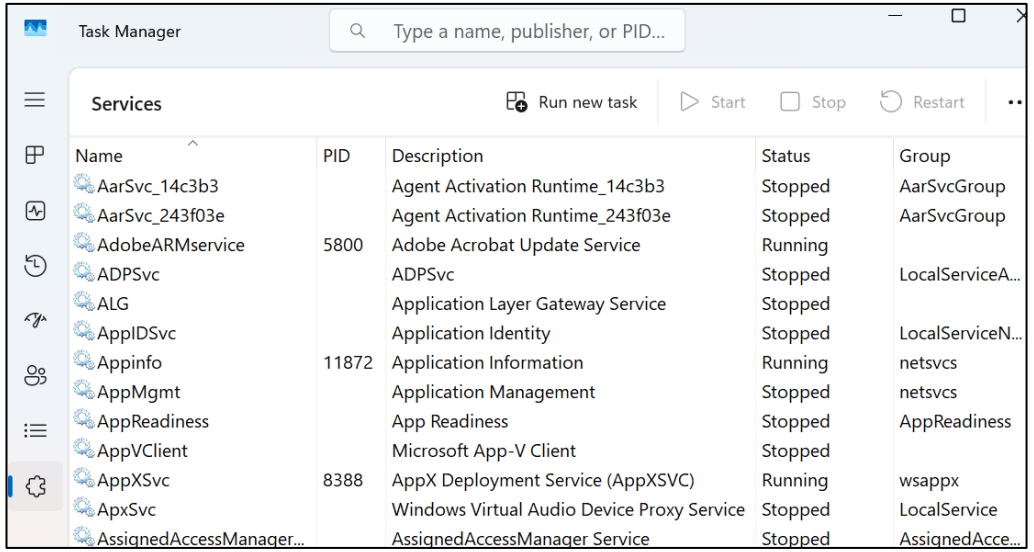
Task Manager: Services

- List of processes running in the background
- If a service is suspect, details may be found on the internet
- To Stop an unwanted service: Click Open Services → Right Click the service → Click Stop

Windows 10



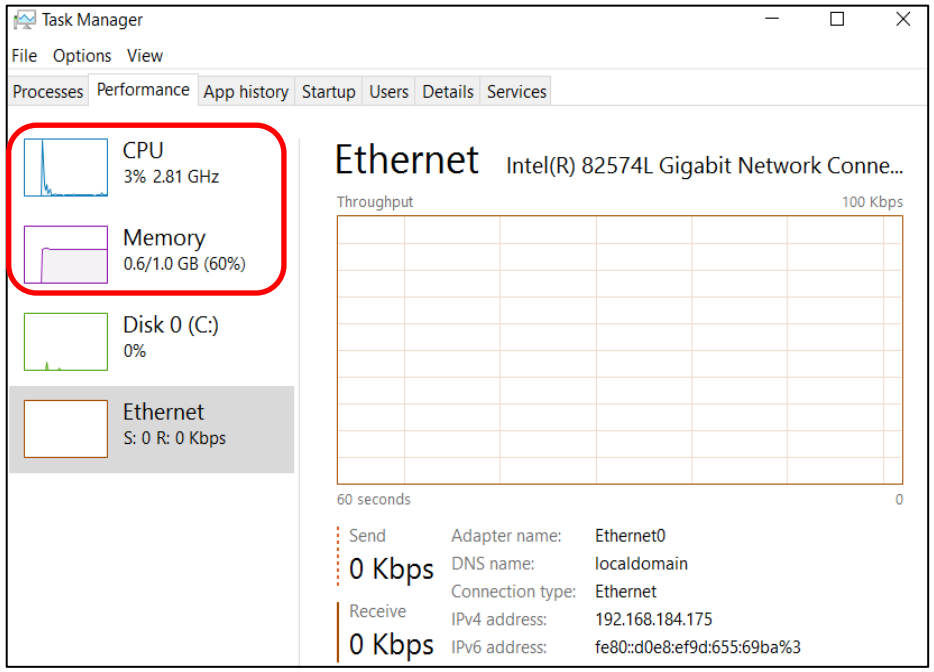
Windows 11



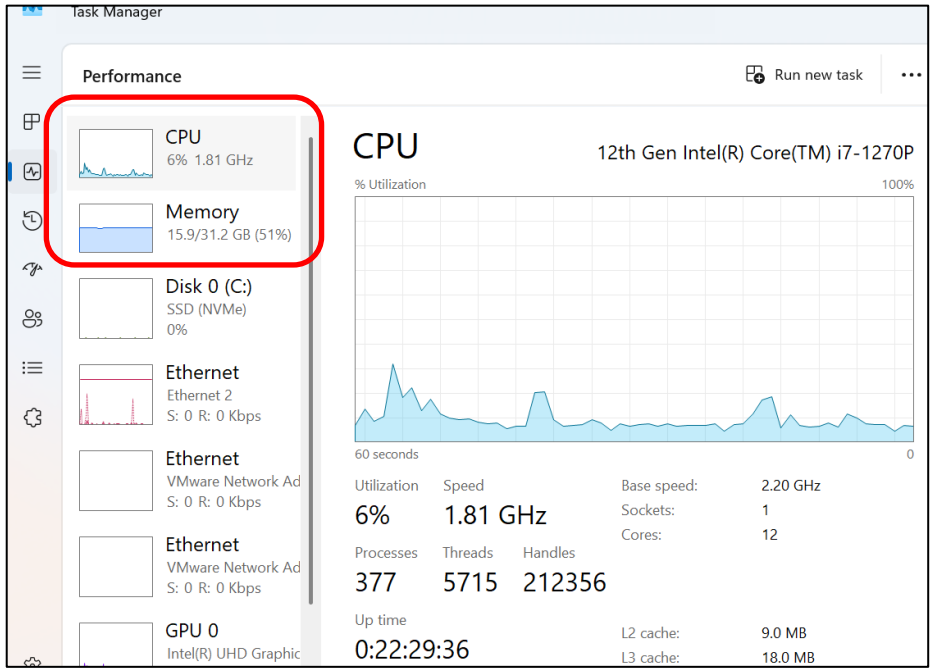
Task Manager: Performance

- CPU: Monitors current and past resource use
- CPU usage by core
- Multi-core Processors

Windows 10



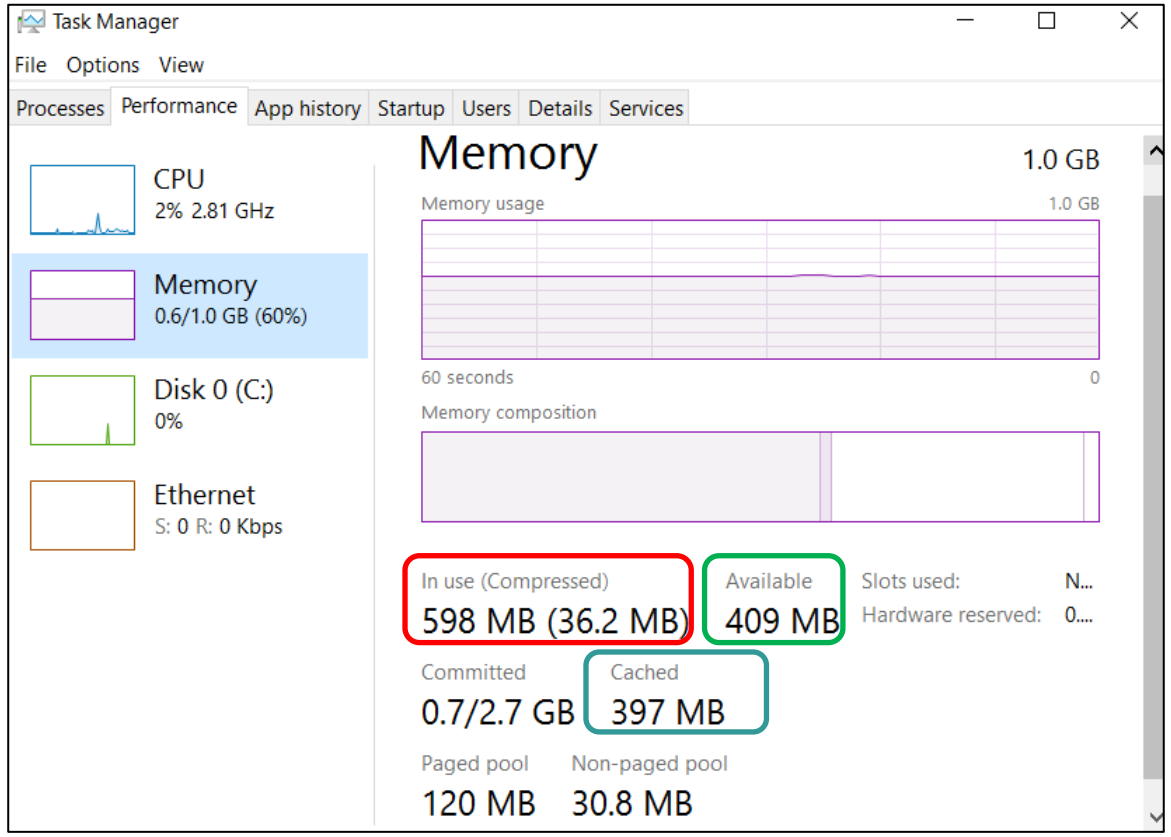
Windows 11



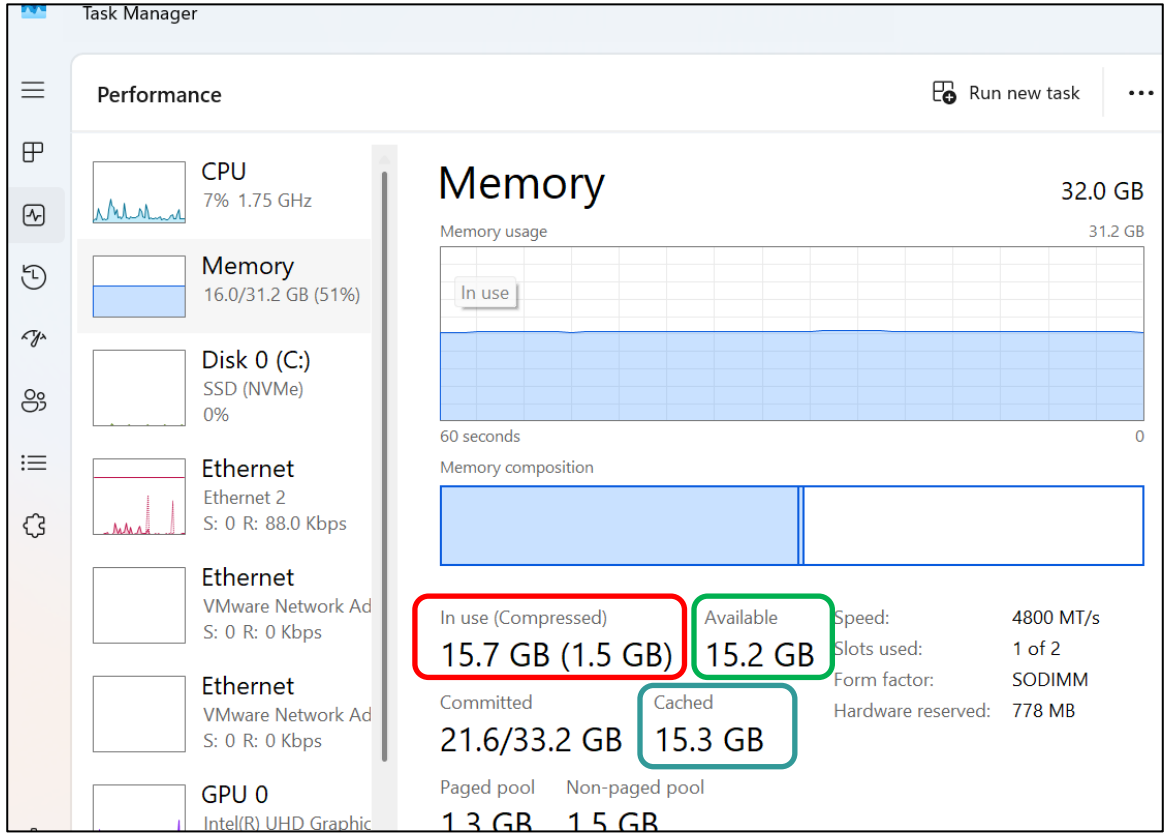
Task Manager: Performance (cont.)

Memory usage

Windows 10



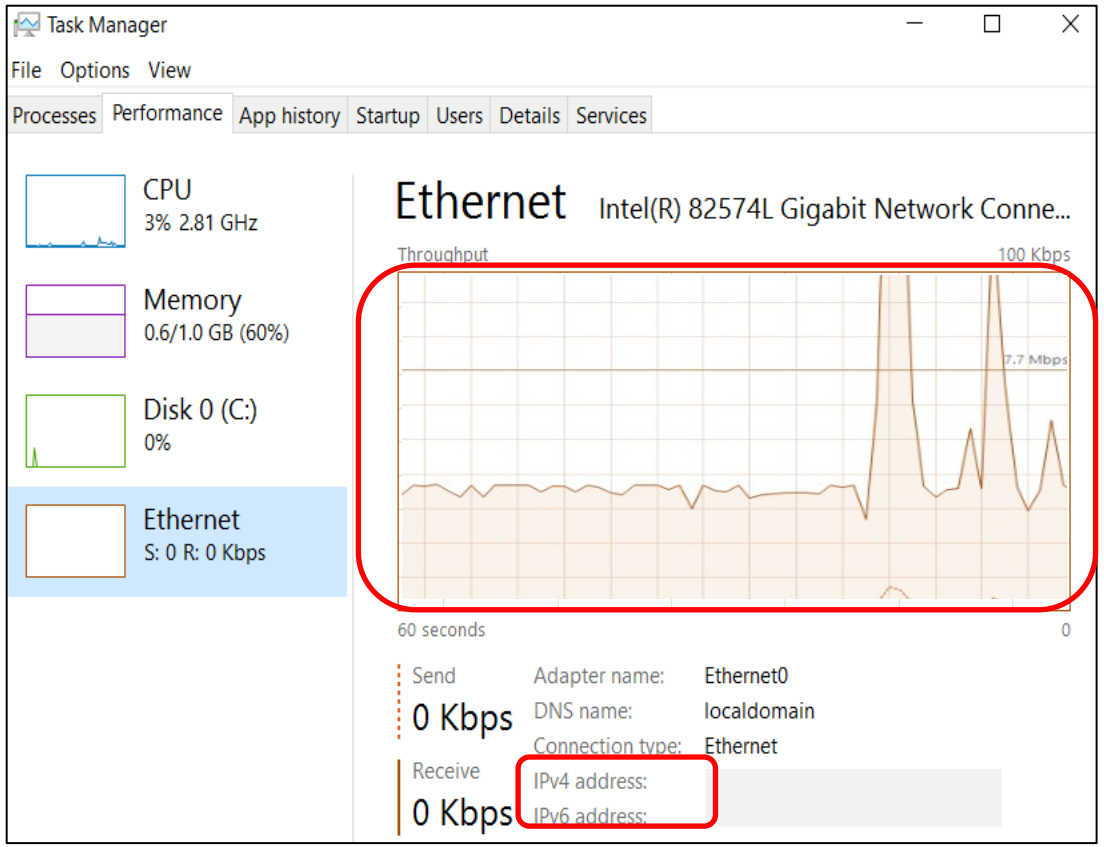
Windows 11



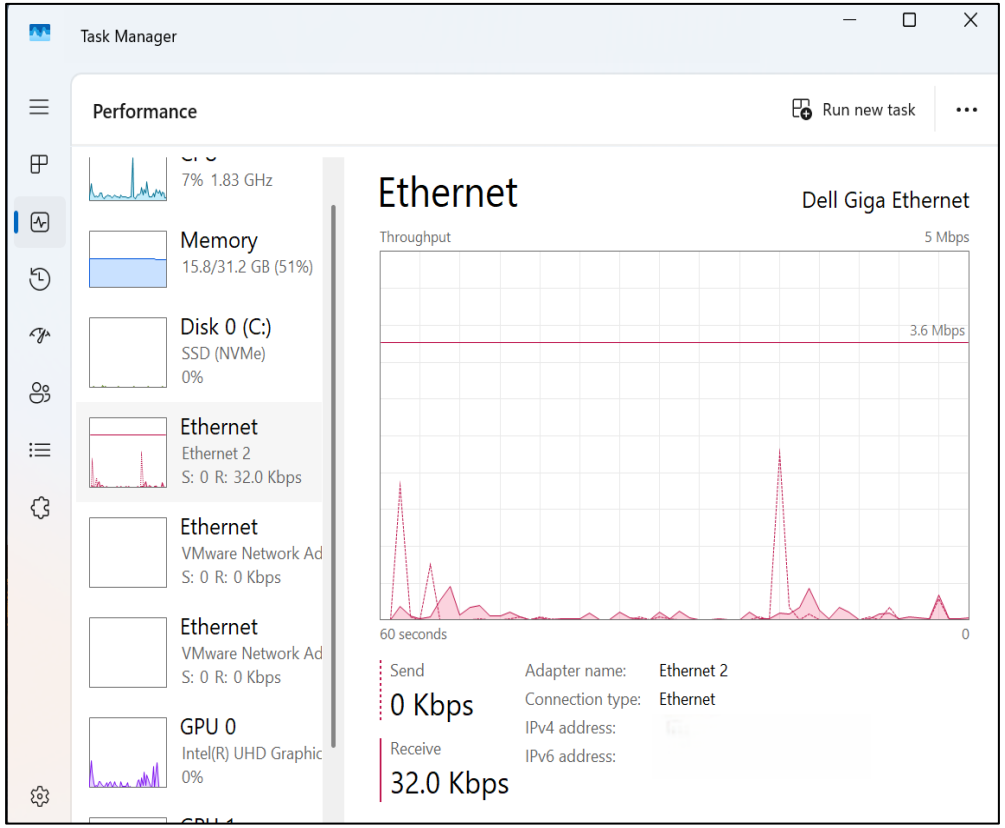
Task Manager: Ethernet

Graph of network usage

Windows 10

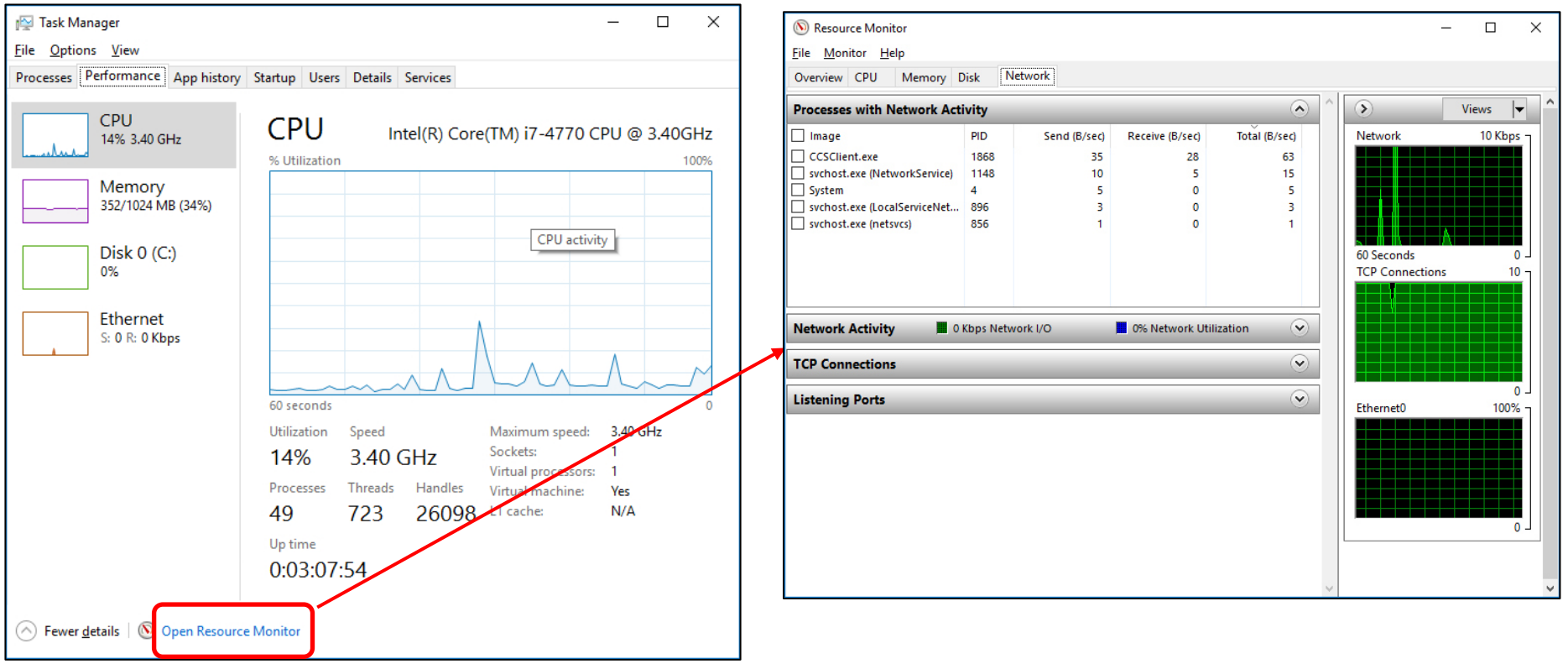


Windows 11



Task Manager: Performance Tab

- Performance problems can arise from a broken router, switch, or cable, or from the computer itself
- To see resource utilization details: Click Open Resource Monitor

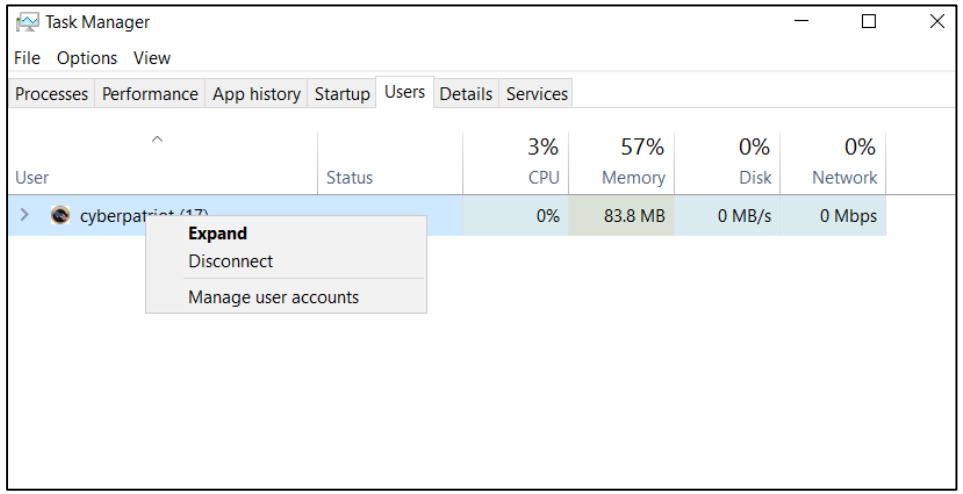


Source: http://www.bleepingcomputer.com/tutorials/how-to-use-the-windows-task-manager/#networking

Task Manager: Users

- List of logged-in users
  - Disconnect
  - Logoff

Windows 10



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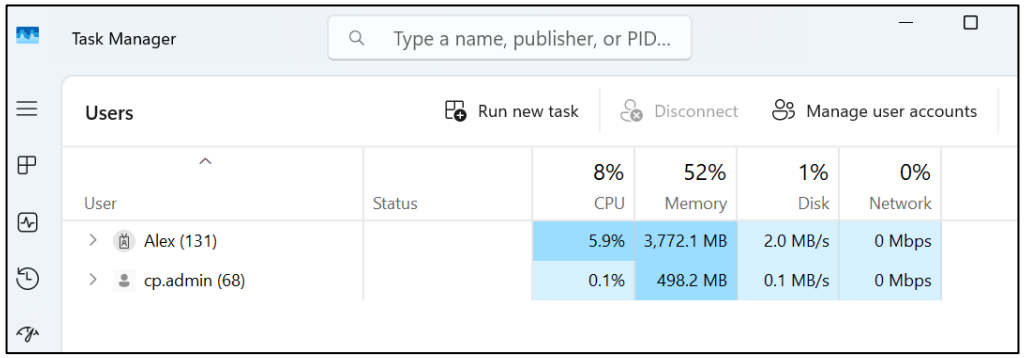
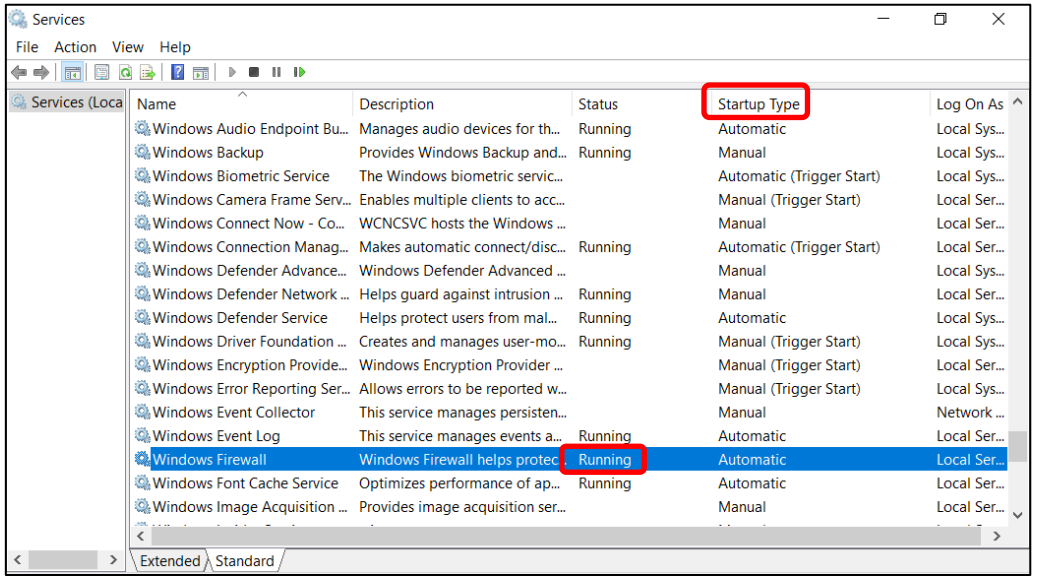


Services – Not In Task Manager

- Search → Services.msc
- Programs that run invisibly and automatically in the background
- Running vs. Stopped Services
- Startup Type:
  - Automatic
  - Manual
  - Disabled



Services – Not In Task Manager

- Two reasons to disable services:
  - Unnecessary for your organization
  - Insecure
- The most insecure services are those that allow remote connections
- Example: Remote Desktop Protocol

Search → Services.msc