COMP 7024

**1.    Introduction:**

Windows and macOS are two of the most popular commercial operating systems (OS) in use today. OS security has become more crucial as computer technology has advanced in order to safeguard user data from unauthorised parties. In this report, we'll examine the security capabilities of Windows file systems with a particular emphasis on recent updates that have improved the security capabilities of the OS and its file system.

**2.    OS Support:**

A variety of security mechanisms on Windows file systems shield user data from nefarious intruders. To further improve the security of the file systems, Windows OS recently added a number of additional security features. Moreover, Windows has additional security measures and offers a higher level of protection when compared to other OSes like MacOS.

**a.     File System Security in Windows:**

Windows and NTFS (New Technology File System) have a number of security features including:

**Access control:** This enables an administrator or file user to monitor who can access and alter files upon a system file. User accounts, password protection, and file permissions are used to achieve this [1].

**Encryption:** Using encryption methods such as BitLocker and EFS, data is transformed into an unintelligible format [2]. Confidential material on the file system can be protected by encryption, which can be applied to certain files, directories, or the complete file system.

**Auditing and logging:** With Windows File Audit enabled, the system keeps track of all file system activities, such as requests, changes, and alterations. This aids in identifying and looking into security lapses [3].

**Integrity protection:** This makes sure the information on the file system is unaltered and undamaged. File checksums, file system journaling, and virtualisation based protection methods are employed to achieve this [4].

Security on NTFS is provided via Access control lists (ACLs), discretionary access control (DAC), and obligatory access controls. Based on user or group permissions, administrators can grant or prohibit access to files and directories using ACLs [5].

 Users have the option to grant or prohibit access to files and directories using DAC at their own will. Moreover, Windows offers the Encrypting File System for file and folder encryption (EFS) [6].