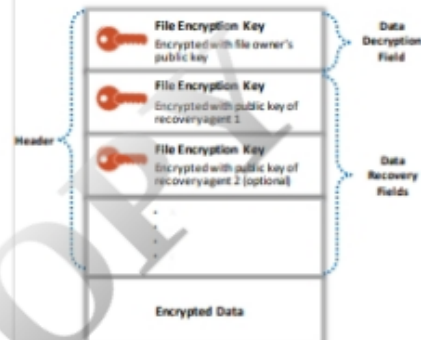


## Windows File Systems: Encrypting File Systems (EFS)

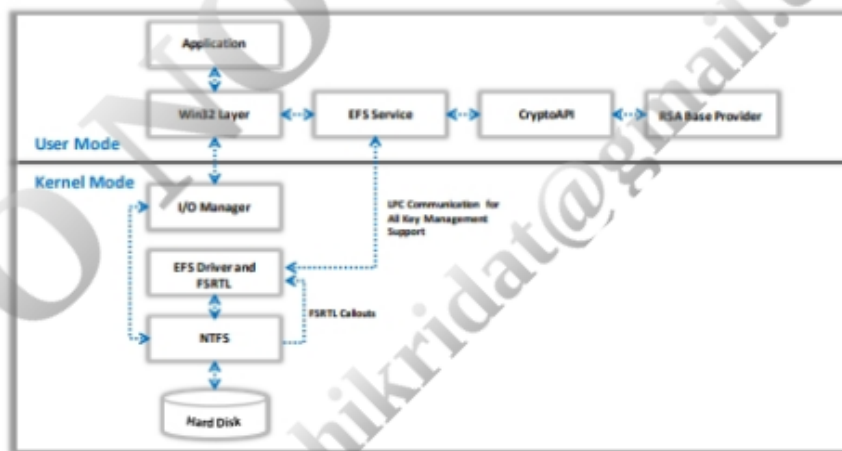


- The Encrypting File System (EFS) was first introduced in version 3.0 of NTFS, which offers filesystem-level encryption
- This encryption technology maintains a **level of transparency** to the user who encrypted the file, which implies that there is no need for users to decrypt the file and access it for making changes
- After a user is done with the file, the **encryption policy** is automatically restored
- When any unauthorized user tries to access an **encrypted file**, they are **denied access**
- To enable the encryption and decryption facilities, a user has to set the **encryption attributes** of the files and folders that the user wants to encrypt or decrypt



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## Windows File Systems: Components of EFS



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**Notes:** \_\_\_\_\_  
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## Windows File Systems: Sparse Files



■ Sparse files provide a method of **saving disk space** for files by allowing the I/O subsystem to allocate only meaningful (nonzero) data



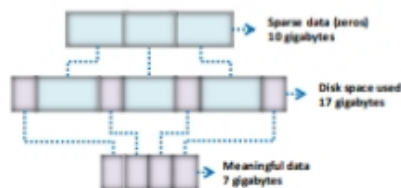
■ If an NTFS file is marked as sparse, it assigns a **hard disk cluster** only for the data defined by the application



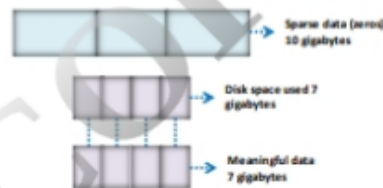
■ The non-defined data of the file are represented by **non-allocated space** on the disk



### Without Sparse File Attribute Set

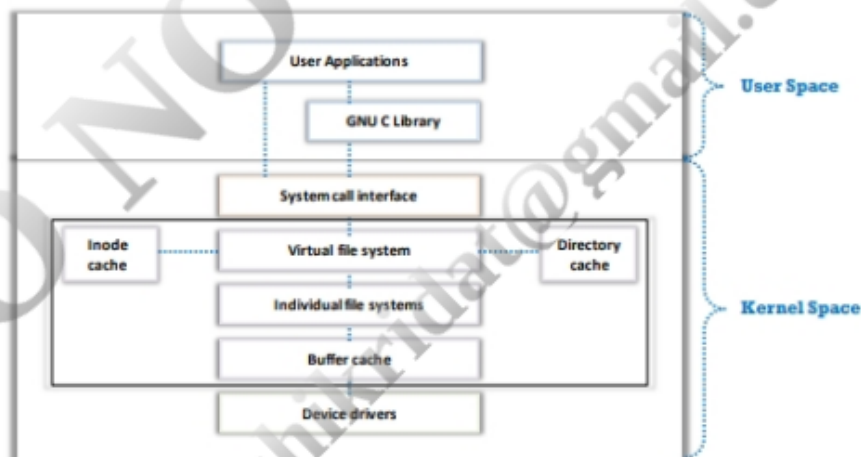


### With Sparse File Attribute Set



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## Linux File Systems: Linux File System Architecture



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