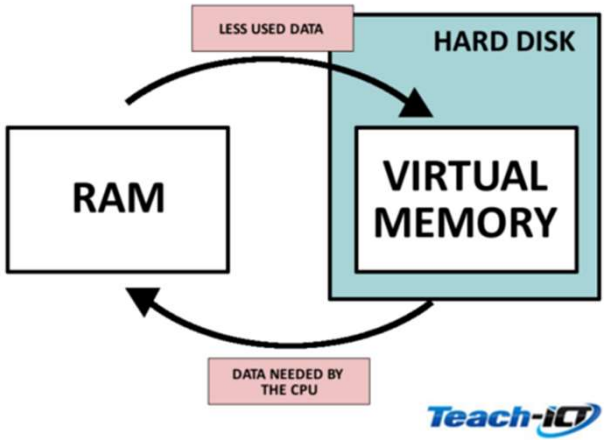
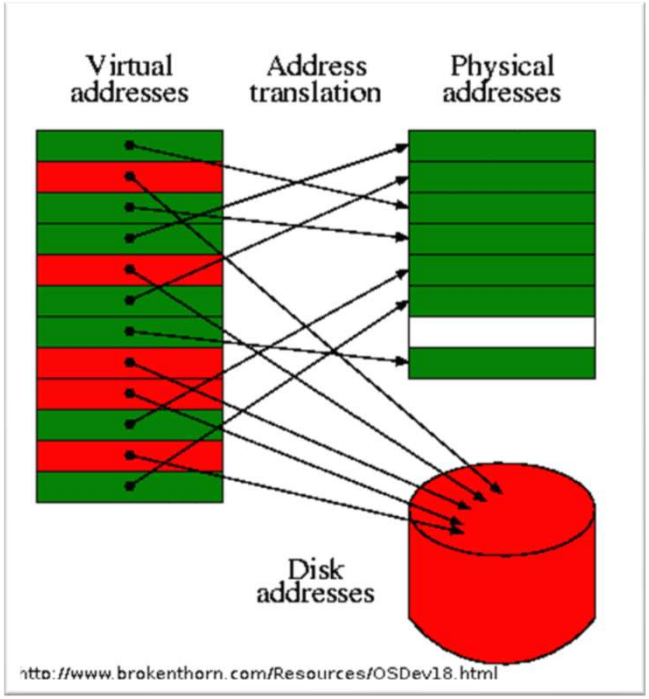
VIRTUAL MEMORY

- What happens when RAM is full?
  - The OS will try to load the data into RAM
  - But OS must remove non-active data in RAM first
  - These processes are repeated when RAM is full which is bad because when loading data into RAM, it requires to seek data in the secondary memory (seek time)
- Virtual memory
  - It creates a space in secondary memories (HDD/SDD)
  - VM is used as temporary memory
  - Instructions and data that is not currently being used is moved to the VM in order to free up the space in RAM
  - When the instructions and data in VM are needed again, they are transferred to RAM (no seek time)



VIRTUAL MEMORY

- benefits
  - allow OS to be able to run more applications
  - not all pages (from paged memory management) are not required to be in the main memory
  - the active pages only loaded into the main memory while not very active stay in virtual memory
- drawbacks
  - it takes time to load pages in virtual memory back to main memory
  - Disk thrashing: a very high rate of hard disk access



CLOUD STORAGE

- Cloud storage is a method of data storage where data is stored on remote servers
- Cloud storage are often belonging to a third party (iCloud, Google drive, Dropbox)
- Cloud storage can be accessed via the internet
- The providers are responsible for maintenance and backup data
- Users need to pay for monthly fee

Google Drive

iCloud

CLOUD STORAGE

- Type of cloud storages
  - Public cloud – this is a storage environment where the customer/client and cloud storage provider are different companies
  - Private cloud – this is storage provided by a dedicated environment behind a company firewall; customer/client and cloud storage provider are integrated and operate as a single entity
  - Hybrid cloud – this is a combination of the two above environments; some data resides in the private cloud and less sensitive/less commercial data can be accessed from a public cloud storage provider.

Google Drive

iCloud

CLOUD STORAGE

- Benefits
  - you can access the data from anywhere on many devices connected to the internet.
  - users can work on documents at the same time which is good for collaboration
  - the data is securely backed up by the company providing the storage service.
  - size of storage can be upgraded easily by upgrading account, but it will cost more
  - you don't need to transfer your data if you get a new computer.
- Drawbacks
  - it requires internet access
  - extra cost for more space or upload/download limit
  - risk of being hacked because the data is stored on the remote servers

QUESTION

- The computers also use virtual memory. Describe how virtual memory is created and used. (4 marks)

- Draw a diagram to represent how virtual memory is created and used.

QUESTION

- A finance company uses cloud storage to archive their accounts. Describe what is meant by cloud storage. (2 marks)