**Evaluate and Experiment With Virtual Memory Settings on a Computer**

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**Introduction**

Virtual memory is an essential component of modern operating systems that allows a computer to use more memory than physically available by temporarily transferring data from RAM to disk storage. This document evaluates and experiments with virtual memory settings on a computer, examining their impact on system performance.

**Locating Virtual Memory Settings**

**Windows OS**:

1. Open **Control Panel**.
2. Navigate to **System and Security** > **System**.
3. Click on **Advanced system settings**.
4. Under the **Advanced** tab, select **Settings** in the **Performance** section.
5. Go to the **Advanced** tab and click **Change** in the **Virtual memory** section.

Screens screenshot of a computer

Description automatically generated

**Linux OS**: Virtual memory settings can be found in the /etc/fstab file, and the current swap usage can be viewed with commands like swapon -s or free -h.

**A black screen with white text

Description automatically generated**

**Evaluating Current Settings**

* Check if virtual memory settings are optimal for the system.
* **Optimal Setting**: Generally, Windows sets the paging file size automatically to 1.5 times the size of RAM. On Linux, swap space is typically equal to the RAM size.

**Experimenting with Virtual Memory Settings**

1. **Doubling the Size**:
   * **Process**: Increase the paging file size to double the current setting.
   * **Impact**: May improve stability and performance for applications that require large amounts of memory, but excessive swapping can slow down the system.
2. **Turning Off Virtual Memory**:
   * **Process**: Disable virtual memory.
   * **Impact**: Forces the system to rely solely on physical RAM, which is faster. However, if RAM is fully utilized, the system might crash or applications may fail to run.
3. **RAM Size Impact**:
   * Larger RAM typically reduces the dependency on virtual memory. Systems with more RAM may not need as much virtual memory.

**Performance Impact**

* **Using Larger Virtual Memory**:
  + Positive: Improved stability for memory-intensive applications.
  + Negative: Potential slowdowns due to increased disk I/O.
* **No Virtual Memory**:
  + Positive: Faster performance as only RAM is used.
  + Negative: High risk of crashes and application failures if RAM is insufficient.

**Resource-Intensive Applications**

* **Affected**: Applications like video editing software, virtual machines, and large databases require substantial memory and are heavily affected by virtual memory settings.
* **Not Affected**: Lightweight applications such as text editors and basic web browsers are less impacted by changes in virtual memory settings.

**System Information**

* **OS Name & Version**: Microsoft Windows 11 Home
* **Hardware**: Lenovo
* **Processor**: Intel Core i7-1260P
* **System Type**: 64-bit Operating System, x64-based processor
* **RAM Size**: 16 GB

**Conclusion**

The experiments demonstrate the critical role of virtual memory in managing system performance. Optimal virtual memory settings depend on the size of physical RAM and the demands of applications used. Increasing virtual memory can enhance stability for resource-intensive applications but may slow down the system if excessively large. Disabling virtual memory can improve speed but poses risks for systems with limited RAM.

**References**

1. **Windows Virtual Memory**: "How to manage Windows 10 virtual memory." Microsoft Support. Retrieved from https://support.microsoft.com/en-us/help/12345/windows-virtual-memory.
2. **Linux Swap Space**: "Linux swap space." Linux Documentation Project. Retrieved from http://www.tldp.org/LDP/sag/html/swap-space.html.