A Survey on Improvised File system For Efficient Storage and Access.

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Abstract

The file management system is used to maintain file maintenance operations. A file management system is made to manage individual or group files, such as unique office records and documents, however, it has limited functionality. This paper emphasizes on study of various existing file system. Here, the file system of OS uses a balanced tree file system in which it will implement various priority systems like arranging file system on a scale of 1 to 5 where 1 has the most priority. File system is very important for every operating system. It is used to systematically store the information in the secondary memory. File name is very important part as it helps in distinguish easily our from other files and access the information from secondary memory easily. There are basically two parts of file naming first is name and other is part is the extension which is separated by ".". Some types of extensions are.doc,.exe,.jpg,.c,.java, etc. Various operations can be performed on file system, some of the operations are like creating a file for this operation there should be free space available in the secondary memory.

Keywords- File System, OS, Priority, Balanced Tree, Performance, Files, Secondary Memory

I.   INTRODUCTION

Every computer has a complicated hierarchical file system made up of directories and the subdirectories that lie beneath them for storing data. In these directories, files are stored, typically adhering to predetermined hierarchical arrangements specified by a program's commands. File system is very important for every operating system. It is used to systematically store the information in the secondary memory. File name is very important part as it helps in distinguish easily our from other files and access the information from secondary memory easily. There are

basically two parts of file naming first is name and other is part is the Proposed system extension which is separated by ".". Some types of extensions are.doc,.exe,.jpg,.c,.java, etc. Various operations can be performed on file system, some of the operations are like creating a file, for this operation there should be free space available in the secondary memory. Second is reading a file, it requires defining of file name. Third is writing a file, it requires name of the file and the content which needs to be written. Fourth is deleting the file, file name is required and the space associated with that file is cleaned in the secondary memory. Fifth is truncating a file, this operation only deletes the content of the file without deleting of changing the attributes of that file. This paper put emphasis on improving the existing file management system. Paper discusses about algorithms like balanced tree file system and how it performs various operations as discussed above i.e., creating, deleting, truncating, etc.

II. LITERATURE REVIEW

To study the literature review we have gone through several research papers which gave us the broad overview of the problem and highlighting the capabilities and limitations of the file system.

[1] Due to the newly improving virtualization technologies the performance of virtual machines is increasing. Technologies are categorized into hardware based and software-based approaches. This paper focuses on what causes suffering of performance in case of Software based approaches and the solution to improve it. The main reason for this is excessive I/O stacks as host and many guests have different OS and along with that for each OS its own IO stacks. The system comprises of para-virtualized file system, and I/O-dedicated thread and a shared queue. To avoid and reduce the number of guest I/O stacks, para-virtualized file system is used and with the help of shared queue interaction between guests and host. The suggested system is implemented on the FUSE and ext2 file system is used. The overall mechanism of both system is same except in modified fuse-ext2 system I/O requests are sent to shared queue whereas in case of original it was sent to block layer guest kernel.

[2] Currently multi-core processors are used in smartphones to meet new performance requirements of users. To enhance it more Yi-Hsien Lu and Cheng-Fu Chou suggests a new strategy in which the operating system scheduler will use Branch Bound strategy. This helps in better process scheduling. Nowadays the processors are developed following some kind standard specification which results in same performance ability. So, by applying proposed strategy we can reduce the number of idle cores which improves efficiency, which can be validated by the rule.

[3] The windows are used as normal desktop system or as servers on networks. But in order to use Microsoft windows in real time processes mechanism should be modified. The research in [3] suggested a policy using which required aim can be achieved. The policy uses process affinity along with the clock interrupt. Using which the running period of process can be reduced below 8 ms and also reduces the switching time which can be limited to 200 us. In this policy using affinity all the real time processes will run on 1 designated core, which is designed for real time processes only and remaining n-1 cores are used to run the non-real time processes. Usually clock interrupt is

10 ms but it is changed to 100 us to execute specific services.

[4]This paper explains the HDFS architecture and report of experience of Yahoo which is using HDFS for managing their data. The Hadoop has two major components HDFS and Map Reduce. Map reduce acts as processing element. Hadoop is used to handle very large data. It splits the data and computations over thousands of hosts and also replication is used to avoid data loss if any node crashes.

[5] This research shows the implementation of FAT (File Allocation Table) file system on ASIX operating system. Asix OS is provided by ASIC Engineering Center. This paper shows how FAT enhances the performance and provides better solution over current file system of embedded operating systems, as FAT has excellent file management features.

III.   COMPARITIVE ANALYSIS

Sr. No.	Authors	Year	Approach	Remark &Conclusion
1	Kihong Lee, Dongwoo Lee, Young Ik Eom [1]	2014	The system comprises of para-virtualized file system, an I/O-dedicated thread and a shared queue. To avoid and reduce the number of guest I/O stacks para-virtualized file system is used and with the help of shared queue interaction between guests and host. The suggested system is implemented on the FUSE and ext2 file system.	The overall mechanism of both system is same except in modified fuse-ext2 system I/O requests are sent to shared queue whereas in case of original it was sent to block layer guest kernel. The proposed system improves performance by 20% to 40%.
2	Yi-Hsien Lu and Cheng-Fu Chou[2]	2020	Applying the Branch and Bound strategy to scheduler of OS which in result reduces the idle cores.	By applying proposed strategy, IT can reduce the number of idle cores which improves efficiency, which can be validated by the rule.
3	Lifang Wang, XingShe Zhou, ZeJun Jiang,	2012	In this policy using affinity all the real time processes will run on 1 designated core, which is designed for real time processes only and	The policy uses process affinity along with the clock interrupt. Using which the running period of process can be reduced below 8 ms and also

	Aihua Zhang[3]		remaining n-1 cores are used to run the non-real time processes. Usually clock interrupt is 10 ms but it is changed to 100 us to execute specific services.	reduces the switching time which can be limited be within 200 us. Using this policy, the windows can be used for real time processes.
4	Hayatunnufus, Mardhani ,Riasetiawan, Ahmad Ashari[4]	2020	The performance of both algorithm is compared on two operating systems for landslide data.	Round Robin and FIFO scheduling are analyzed by considering the two parameters, waiting time and response time. The performance on Arch Linux and Raspbian operating system is compared. It is found that FIFO is preferable in case of Raspbian operating system.
5	Konstantin shvachko, Hairong Kuang, Sanjay Radia, Robert Chansler	2010	Hadoop is used to handle very large data. It splits the data and computations over thousands of hosts and also replication is used to avoid data loss if any node crashes.	This paper explains the HDFS architecture and report of experience of Yahoo which is using HDFS for managing their data. The Hadoop has two major components HDFS and Map reduce.
6	Yangzhuo[5]	2010	FAT file system is implemented on ASIX OS.	This paper shows the implementation FAT file system on ASIX operating system. Also shows how FAT improves performance and gives better solution over current file system.

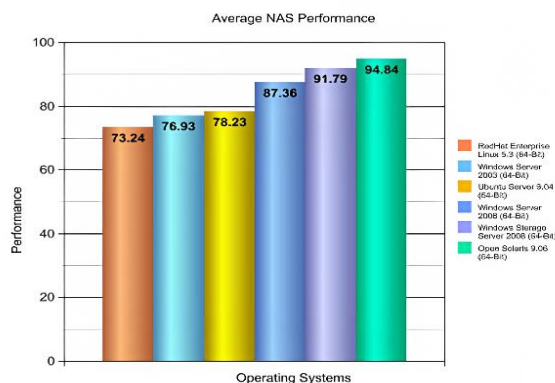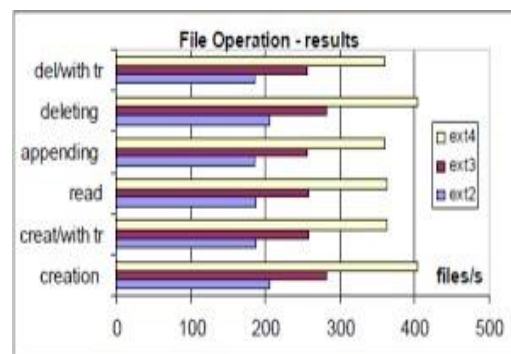## IV.   GRAPH OF COMPARISON

Figure 1: Shows the NAS Comparison

Figure 2: Comparison between various file operations.

between different Operating system

V.   SCOPE OF IMPLEMENTATION

The main aim of this paper is to give a more improvised version of the existing file system. This paper includes the implementation of various techniques like balances tree in the file system and it can do various operations like appending, deleting, etc. The file system is very important for any operating system, the good file system can reduce a lot of work, and time and increase the user experience. So, there is scope of improvement in creating efficient file system which can reduce access time and improves performance while performing operations

VI.   CONCLUSION

This paper emphasizes on file system. Here, the file system of OS uses a balanced tree file system in which it will implement various priority systems like arranging file system on a scale of 1 to 5 where 1 has the most priority. File system is very important for every operating system. It is used to systematically store the information in the secondary memory. File name is very important part as it helps in distinguish easily our from other files and access the information from secondary memory easily.

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