Project Proposal: Automated Swap File Management System for NetBSD

Overview:
The goal of this project is to create an automated swap file management system for NetBSD. When a system needs more memory but has free disk space, the system will automatically create and delete swap files according to configurable thresholds and limits. The system will be designed to avoid thrashing, handle disk space usage in a sane way, and allow for encryption of swap files.

Deliverables:

Design and implementation of the automated swap file management system as a userland tool
Configurable thresholds for swap file creation
Min/max limits to avoid filling up the disk entirely
Encryption settings for swap files
Documentation on how to use and configure the system

Milestones and Schedule:

Research and planning: Review relevant NetBSD kernel interfaces and file I/O libraries, and design the architecture of the system. (2 weeks)
Implementation of basic functionality: Develop the code to automatically create and delete swap files based on configurable thresholds and limits. (4 weeks)
Encryption and disk space management: Add encryption settings for swap files and implement disk space management to handle disk space usage in a sane way. (4 weeks)
Testing and debugging: Test the system thoroughly and debug any issues. (2 weeks)
Documentation: Create documentation on how to use and configure the system. (2 weeks)
Total project duration: 14 weeks

Similar software:
While similar software exists for Linux and other BSD systems, there is currently no such system available for NetBSD.

Rewrite or port:
This project will be a rewrite for NetBSD.

Integration into NetBSD:
The system will be integrated into NetBSD as a userland tool.

Interfaces in NetBSD:
The system will use interfaces in the NetBSD kernel related to file I/O and memory management. Relevant modules and file names include the virtual memory system, vnode layer, and swap management.

Knowledge required:

Operating system concepts related to memory management and file I/O
System programming using C or C++ for NetBSD
Disk management and encryption techniques
Familiarity with NetBSD kernel interfaces related to memory management and file I/O
Hardware:
No specific hardware is required for this project.

Conclusion:
The automated swap file management system for NetBSD will provide a useful feature for NetBSD users, making their systems more efficient and usable, while also contributing to the development of the NetBSD operating system. The project will provide an opportunity for contributors to gain expertise in system programming and operating system concepts, while also contributing to the open source community.

About Me:
I'm a passionate computer science graduate student and an experienced software developer with over 4 years of experience in the industry. My expertise includes working with a variety of programming languages, tools, and technologies, such as Python, Java, and C++, as well as developing complex software applications for various industries. Although I'm new to open source contributions, I'm excited to learn and contribute to this project. I'm particularly interested in this project as it aligns with my research interests and offers a unique opportunity to collaborate with a diverse community of developers. I'm confident that my strong technical skills, quick learning ability, and dedication to producing quality work will make me a valuable addition to the project team.

My Linkedin: https://www.linkedin.com/in/tusharendrakoka/
Email: tusharendra.k@gmail.com
Phone No: 980-899-4305