

**Tribhuvan University
Institute of Science and Technology**

**ANALYSIS AND PERFORMANCE EVALUATION OF REAL TIME DISK
SCHEDULING ALGORITHMS**

A Dissertation

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Recommendation

We hereby recommend that the dissertation prepared under my supervision by **Mr. Dipendra Kumar Jha** entitled “**Analysis and Performance Evaluation of Real Time Disk Scheduling Algorithms**” be accepted as fulfilling in part requirements for the degree of Masters of Science. In my best knowledge this is an original work in computer science.

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We certify that we have read this dissertation work and in our opinion it is satisfactory in the scope and quality as a dissertation in the partial fulfillment for the requirement of **Master of Science in Computer Science and Information Technology**.

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ABSTRACT

Real Time Disk Scheduling (RTDS) is an important for time critical (digital control, multimedia, signal processing and Telecommunication) applications. Traditionally, disks have used seek optimization technique such as SCAN or SSTF for minimizing arm movement in serving I/O requests. Even though these techniques utilize the arm efficiently, they may not be suitable for real time environments since they do not have notion of time or deadline in making a scheduling decision.

In this dissertation, real-time disk scheduling algorithms SCAN-EDF, EDF and CSCAN are analyzed in terms of disk track accessed, track traversed, track traversed order, and the average seek length for the particular task set.

A simulation model is developed which is coded in java programming language to assess the performance of the SCAN-EDF algorithm with comparison to EDF and CSCAN algorithms. The simulation results demonstrate that the proposed algorithm is superior to other existing algorithms.

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ABBREVIATIONS

AET	Average Execution Time
AT	Arrival Time
AWT	Abstract Window Tool
CSCAN	Circular SCAN
DM-SCAN	Deadline Modification SCAN
D-SCAN	Deadline SCAN
EDF	Earliest Deadline First
FD-SCAN	Feasible Deadline SCAN
FIFO	First in First Out
GSS	Group Sweeping Scheduling
I/O	Input Output
IEEE	Institute of Electrical and Electronics Engineers
IPC	Inter-process Communication
ITTC	Information and Telecommunication Technology Center
JVM	Java Virtual Machine
KURT	KU Real Time Linux
OS	Operating System
PASC	Portable Application Standards Committee
POSIX	Portable Operating System Interface
QOS	Quality of Service
RG-SCAN	Reschedule Group Scan

RR	Round Robin
RTDS	Real Time Disk Scheduling
RTOS	Real Time Operating System
SCAN-EDF	SCAN-Earliest Deadline First
SEDF	SCAN-Earliest Deadline First
SSTF	Shortest Seek Time First