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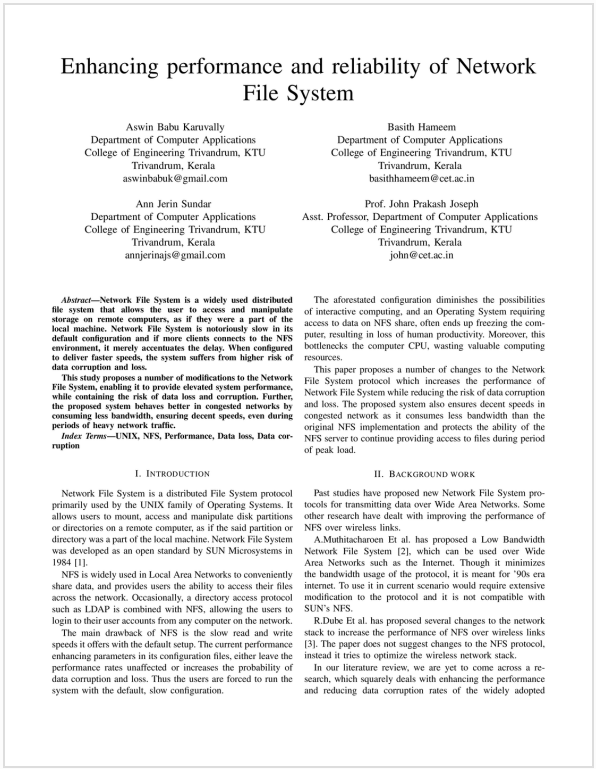

Enhancing performance and reliability of Network File System

Aswin Babu Karuvally
Department of Computer Applications
College of Engineering Trivandrum, KTU
Trivandrum, Kerala
aswinbabuk@gmail.com

Basith Hameem
Department of Computer Applications
College of Engineering Trivandrum, KTU
Trivandrum, Kerala
basithhameem@cet.ac.in

Ann Jerin Sundar
Department of Computer Applications
College of Engineering Trivandrum, KTU
Trivandrum, Kerala
annjerinajs@gmail.com

Prof. John Prakash Joseph
Asst. Professor, Department of Computer Applications
College of Engineering Trivandrum, KTU
Trivandrum, Kerala
john@cet.ac.in

***Abstract*—Network File System is a widely used distributed file system that allows the user to access and manipulate storage on remote computers, as if they were a part of the local machine. Network File System is notoriously slow in its default configuration and if more clients connects to the NFS environment, it merely accentuates the delay. When configured to deliver faster speeds, the system suffers from higher risk of data corruption and loss.**

This study proposes a number of modifications to the Network File System, enabling it to provide elevated system performance, while containing the risk of data loss and corruption. Further, the proposed system behaves better in congested networks by consuming less bandwidth, ensuring decent speeds, even during periods of heavy network traffic.

***Index Terms*—UNIX, NFS, Performance, Data loss, Data corruption**

I. Introduction

Network File System is a distributed File System protocol primarily used by the UNIX family of Operating Systems. It allows users to mount, access and manipulate disk partitions or directories on a remote computer, as if the said partition or directory was a part of the local machine. Network File System was developed as an open standard by SUN Microsystems in 1984 [1].

NFS is widely used in Local Area Networks to conveniently share data, and provides users the ability to access their files across the network. Occasionally, a directory access protocol such as LDAP is combined with NFS, allowing the users to login to their user accounts from any computer on the network.

The main drawback of NFS is the slow read and write speeds it offers with the default setup. The current performance enhancing parameters in its configuration files, either leave the performance rates unaffected or increases the probability of data corruption and loss. Thus the users are forced to run the system with the default, slow configuration.

The aforestated configuration diminishes the possibilities of interactive computing, and an Operating System requiring access to data on NFS share, often ends up freezing the computer, resulting in loss of human productivity. Moreover, this bottlenecks the computer CPU, wasting valuable computing resources.

This paper proposes a number of changes to the Network File System protocol which increases the performance of Network File System while reducing the risk of data corruption and loss. The proposed system also ensures decent speeds in congested network as it consumes less bandwidth than the original NFS implementation and protects the ability of the NFS server to continue providing access to files during period of peak load.

II. Background work

Past studies have proposed new Network File System protocols for transmitting data over Wide Area Networks. Some other research have dealt with improving the performance of NFS over wireless links.

A.Muthitacharoen Et al. has proposed a Low Bandwidth Network File System [2], which can be used over Wide Area Networks such as the Internet. Though it minimizes the bandwidth usage of the protocol, it is meant for '90s era internet. To use it in current scenario would require extensive modification to the protocol and it is not compatible with SUN's NFS.

R.Dube Et al. has proposed several changes to the network stack to increase the performance of NFS over wireless links [3]. The paper does not suggest changes to the NFS protocol, instead it tries to optimize the wireless network stack.

In our literature review, we are yet to come across a research, which squarely deals with enhancing the performance and reducing data corruption rates of the widely adopted

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