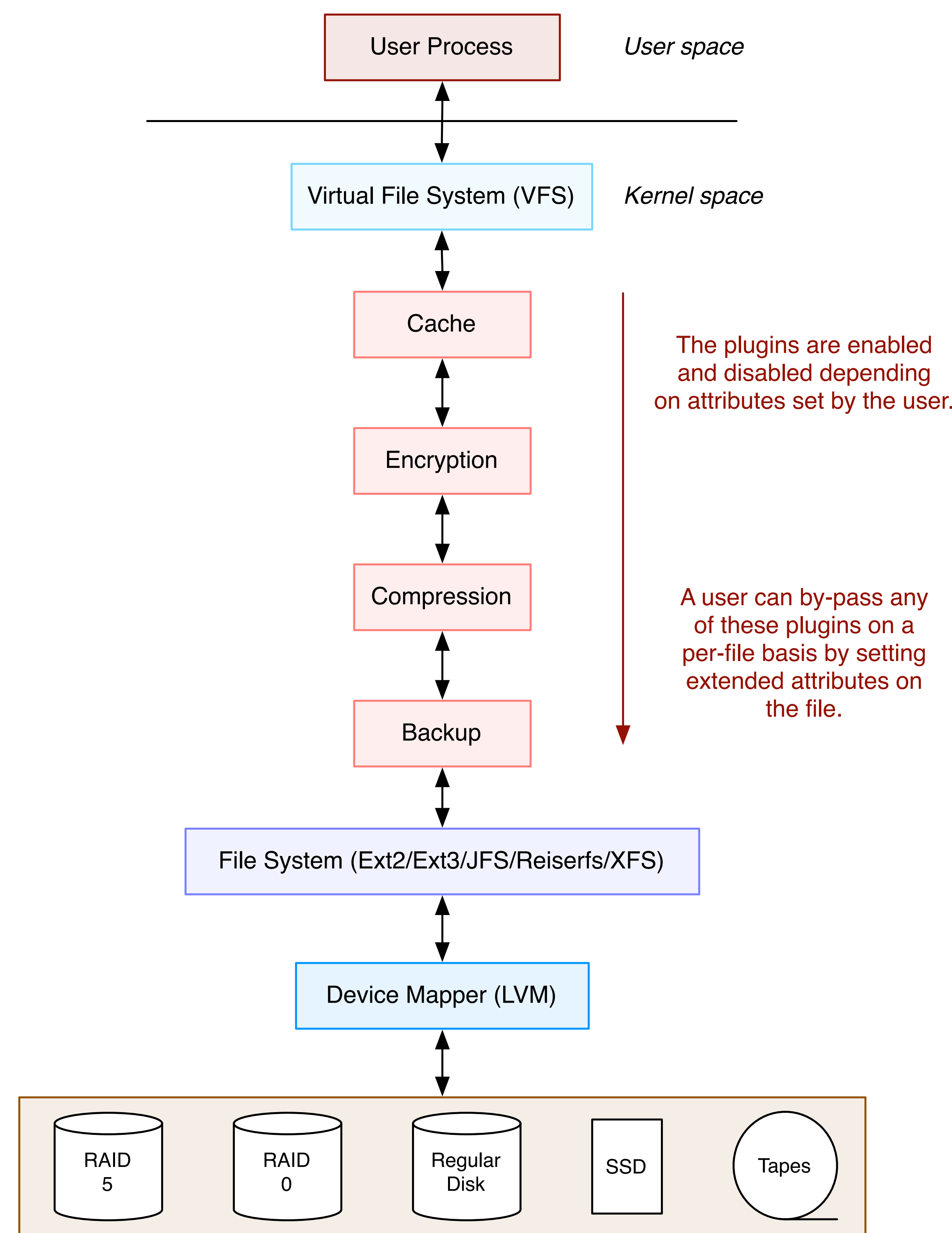


Sumit Narayan (sumit.narayan@uconn.edu)

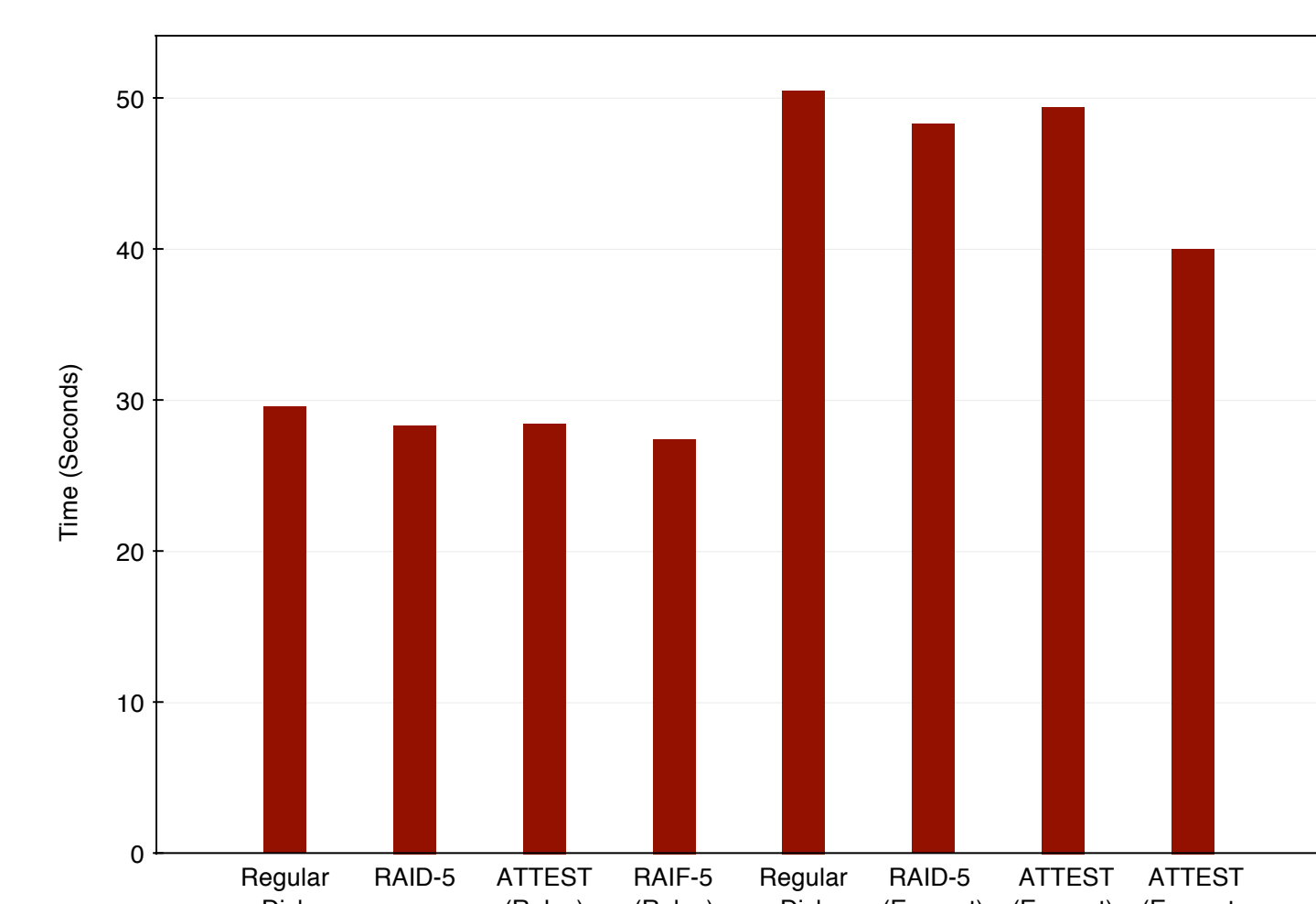
Advisor: John A. Chandy (john.chandy@uconn.edu)

Department of Electrical and Computer Engineering, University of Connecticut, Storrs, CT 06269

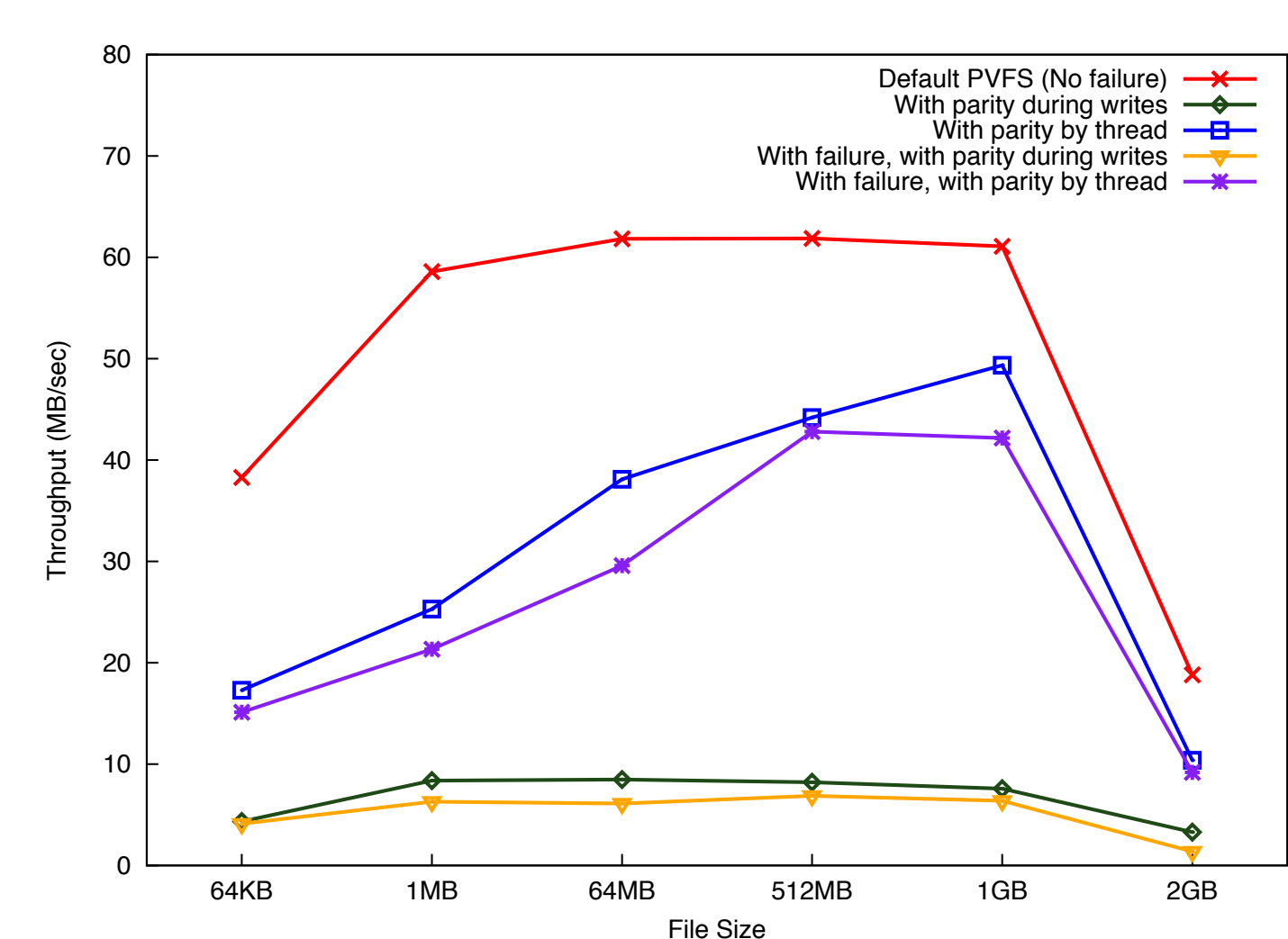


ATTEST architecture with cache, encryption, compression, backup plug-ins and RAID-5, RAID-0, regular disk, SSD and tape devices on a single server.

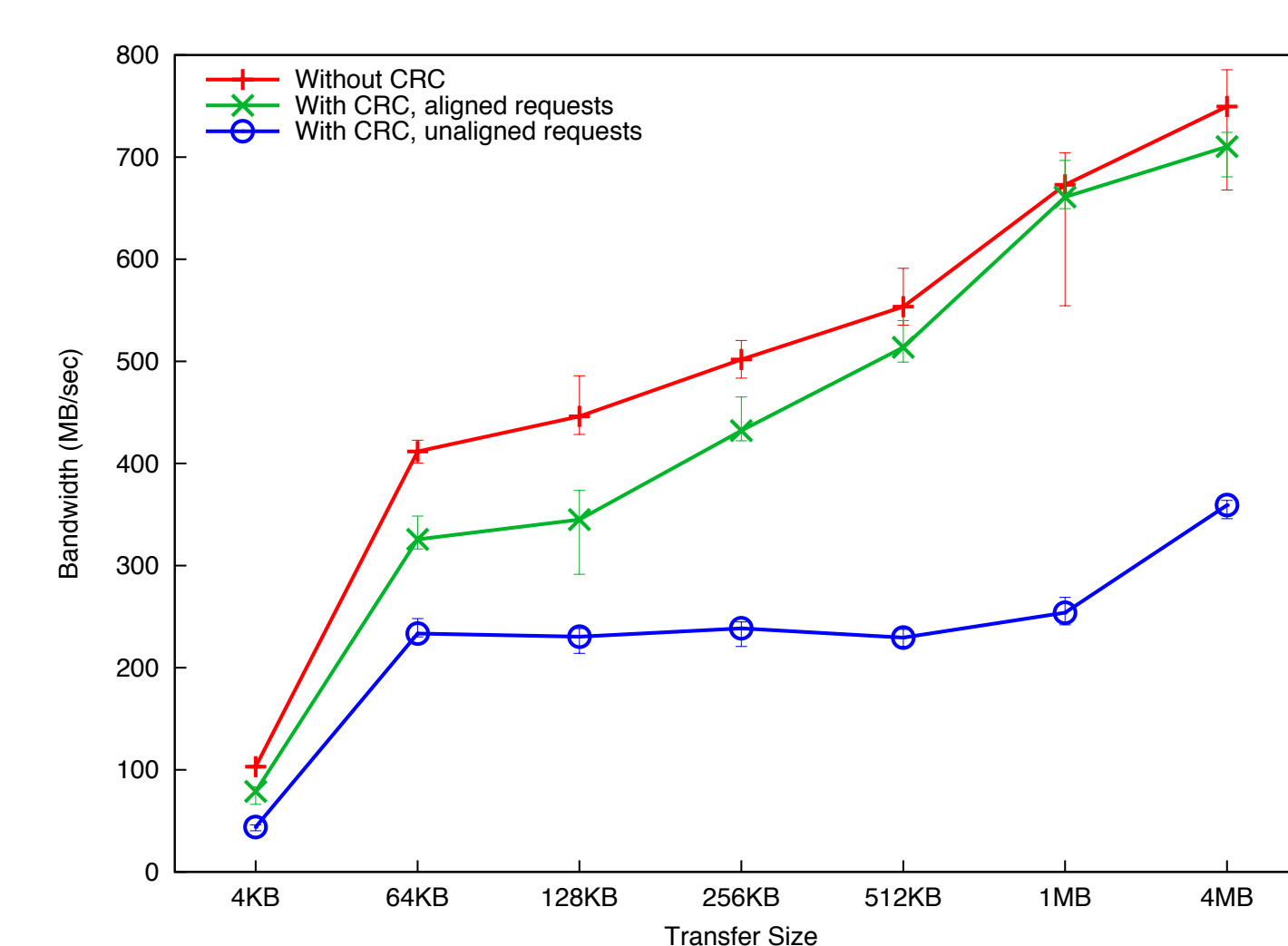
Based on the extended attributes or rules set by the user, plug-ins are enabled in the stack and storage device is selected at the storage layer.



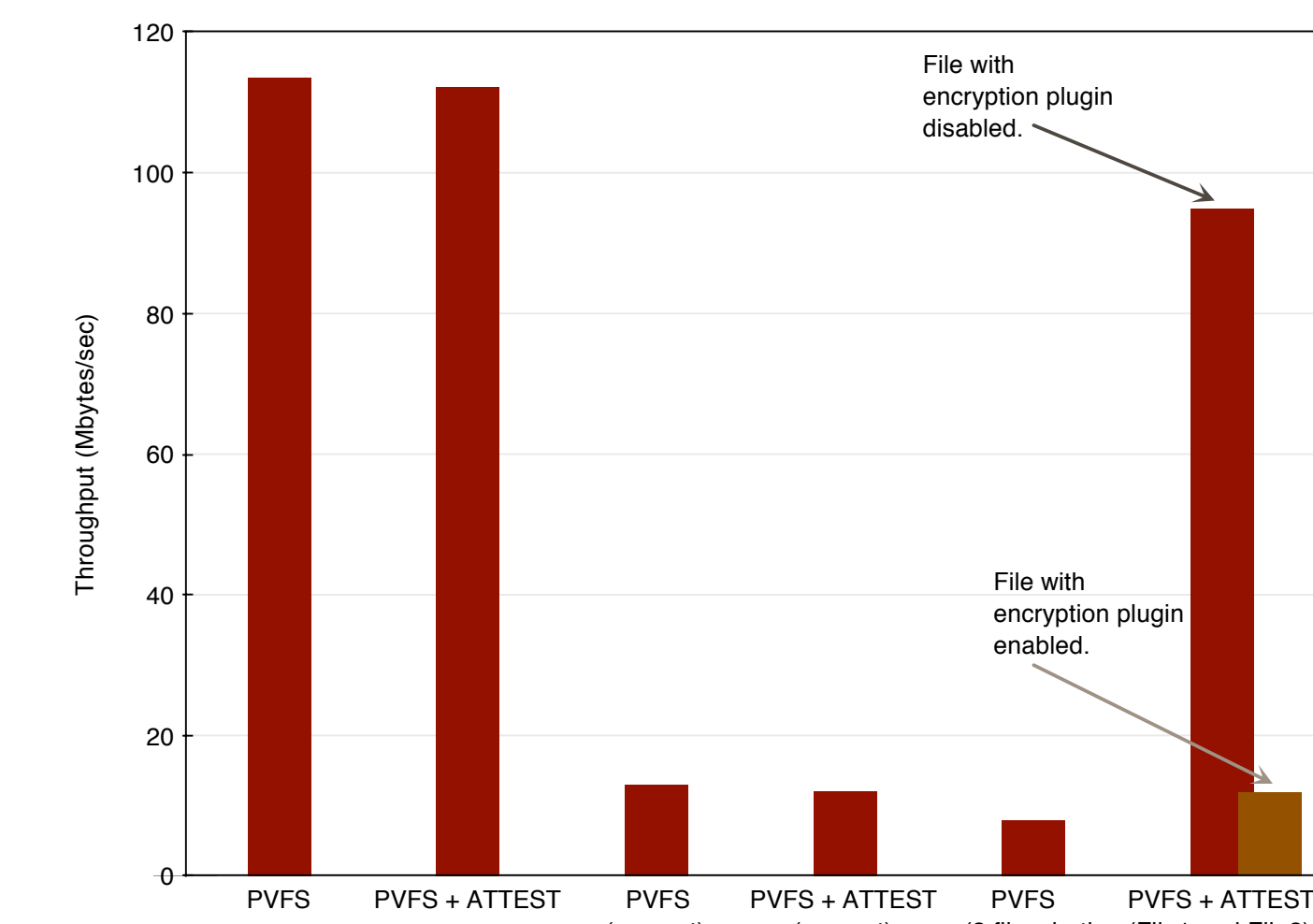
Comparison of time to compile am-utils on a single machine with different RAID, RAID and ATTEST configurations.



Comparison of write throughput on PVFS with and without redundancy enabled for varying file sizes using IOR benchmarking tool.



Comparison of write throughput on PVFS with and without data integrity on 8 clients with 8GB file size using IOR benchmarking tool.



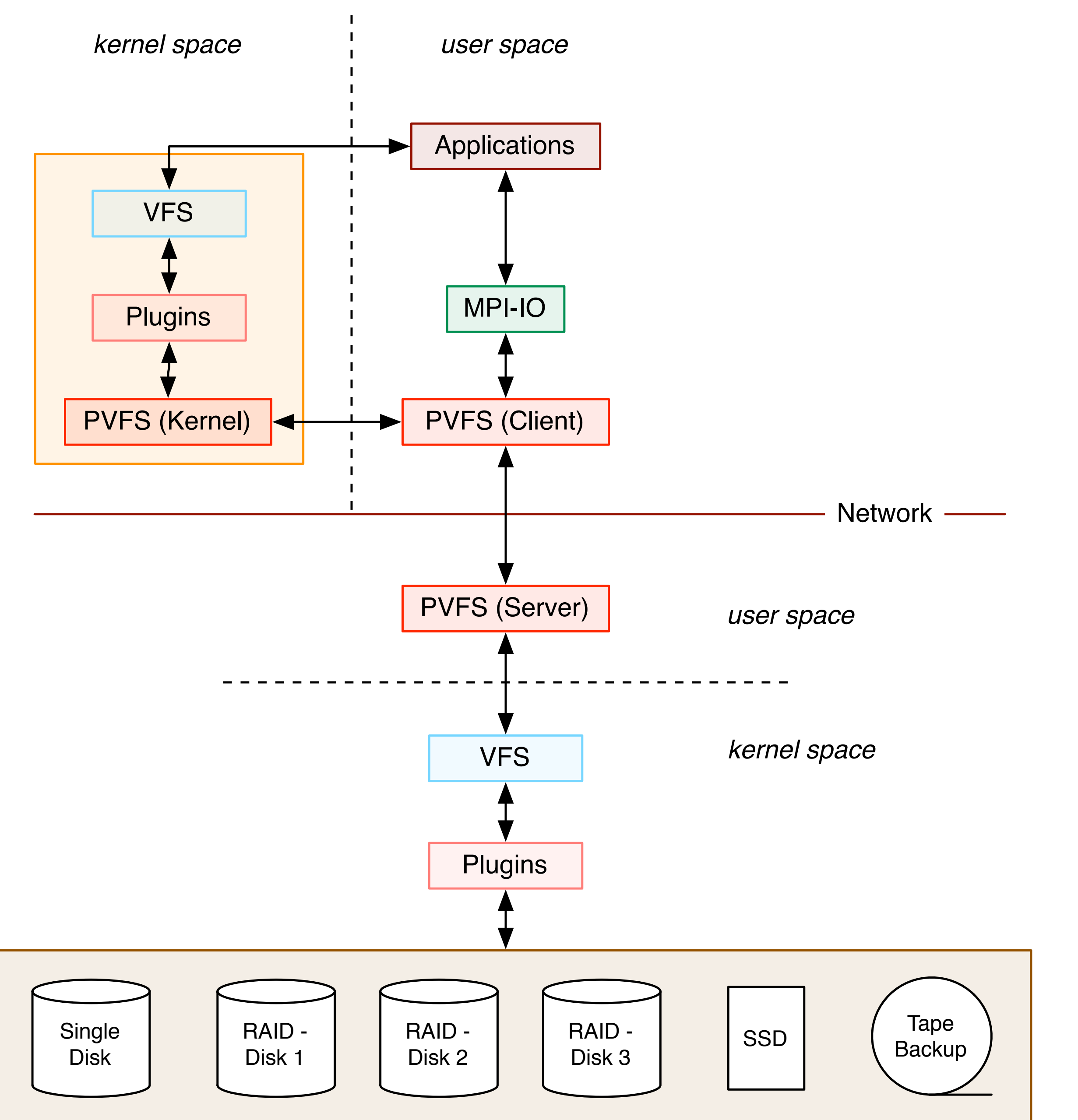
Comparison of write throughput using IOZONE on PVFS with ATTEST setup compared to default PVFS setup.

Motivation

- ✓ Amount of information stored on disks constantly increasing
 - ✓ Demand for more speed, reliability and security.
 - ✓ Different files have different storage requirements
 - ✓ "One system fits all" design – features set for all files in the system
 - ✓ Large granularity results in loss of efficiency and performance
- ### ATTEST : ATtribute-based Extendable Storage
- ✓ Enable plug-ins based on rules, or extended attributes
 - ✓ Select devices based on rules, or extended attributes
 - ✓ Rules or attributes can be set on per-file, or per-directory basis by the user
 - ✓ Plug-ins – encryption, compression, integrity, backup, etc.

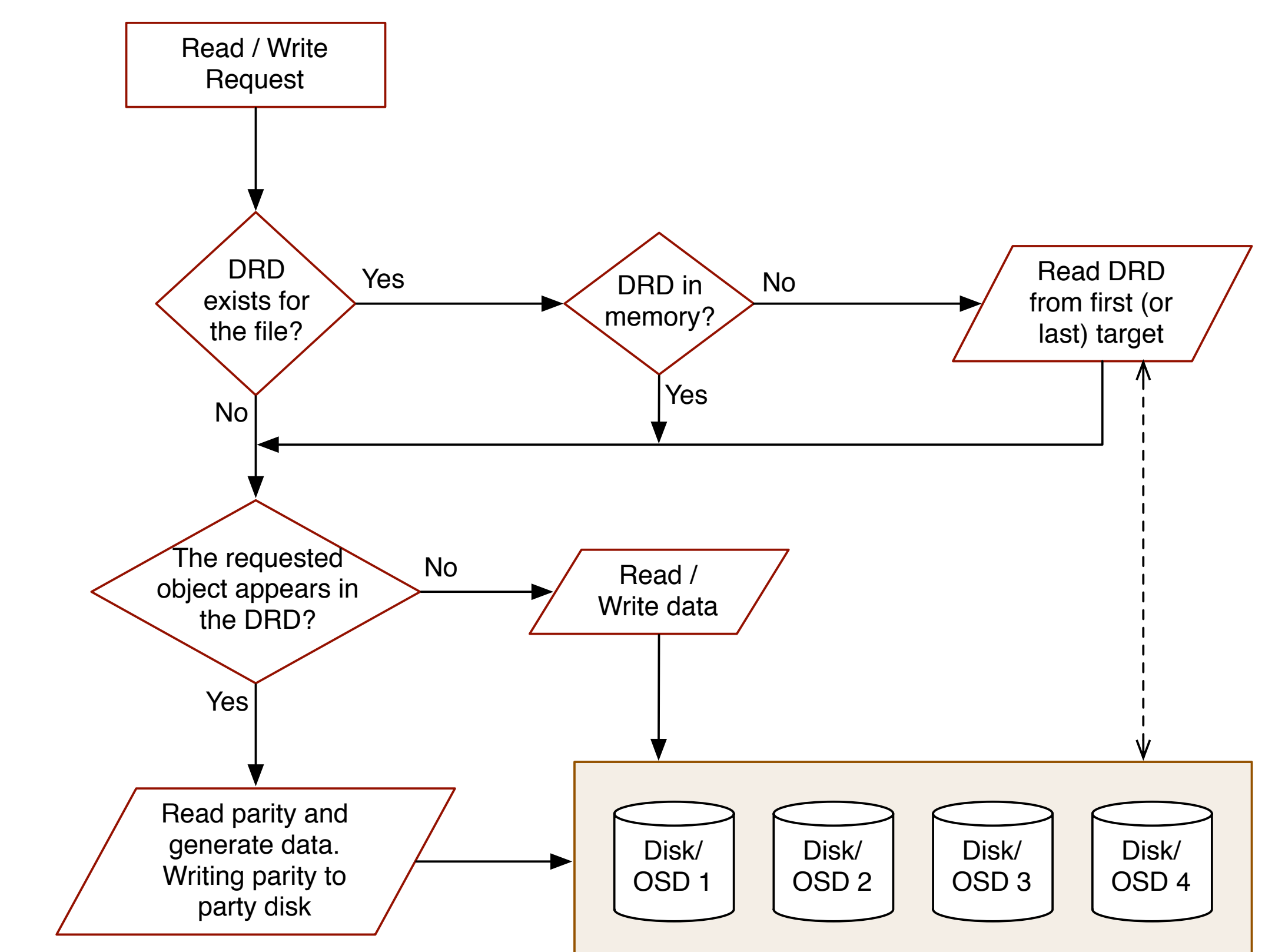
Related Publications

- ✦ ATTEST: ATtribute-based Extendable Storage, S. Narayan and J. A. Chandy, Journal of Systems and Software, 83(4):548-556, April 2010.
- ✦ Uncovering Errors: The Cost of Detecting Silent Data Corruption, S. Narayan, J. A. Chandy, S. Lang, P. Carns, and R. Ross, 4th Petascale Data Storage Workshop (PDSW) 2009, in conjunction with the ACM/IEEE Supercomputing 2009.
- ✦ Parity Redundancy in Clustered Storage System, S. Narayan and J. A. Chandy, in IEEE International Workshop on Storage Network Architecture and Parallel I/Os (SNAPI), in conjunction with IEEE MSST 2007.



ATTEST framework incorporated within the Parallel Virtual File System (PVFS) architecture.

In a clustered environment, ATTEST architecture can be used to enable/disable variety of features like redundancy, data integrity, encryption, compression on a per-file or per-directory basis.



Handling of read/write operations in a clustered storage system using the dirty region database (DRD).