NFS Client Benchmarking

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File System Benchmarks

Overview

High Level Requirements

- ## Fair

  - Not Highlighting Vendor X's Latest Feature

  - Developed by Industry Groups

- ## Work on Unix and Windows

- ## System vs Component

  - End Users want Solution Benchmarks

  - Developers want Component Benchmarks

  - Mixture of EU/VAR/Developers In-Between

Definitions

- ## System Level Benchmark
    - Applications Running on Computers
    - Synthetic - Can Use Derived Workloads

- ## Component Level Benchmark
    - Computer/Clients
        - Ext3, NFS Client, CIFS Client, ...
    - Servers
        - Protocol Specific Benchmarks

System Level Benchmark

- ## Protocol Independence

  – Can Compare Performance Over NFS, CIFS, SAN File System, …

- ## OS Independence

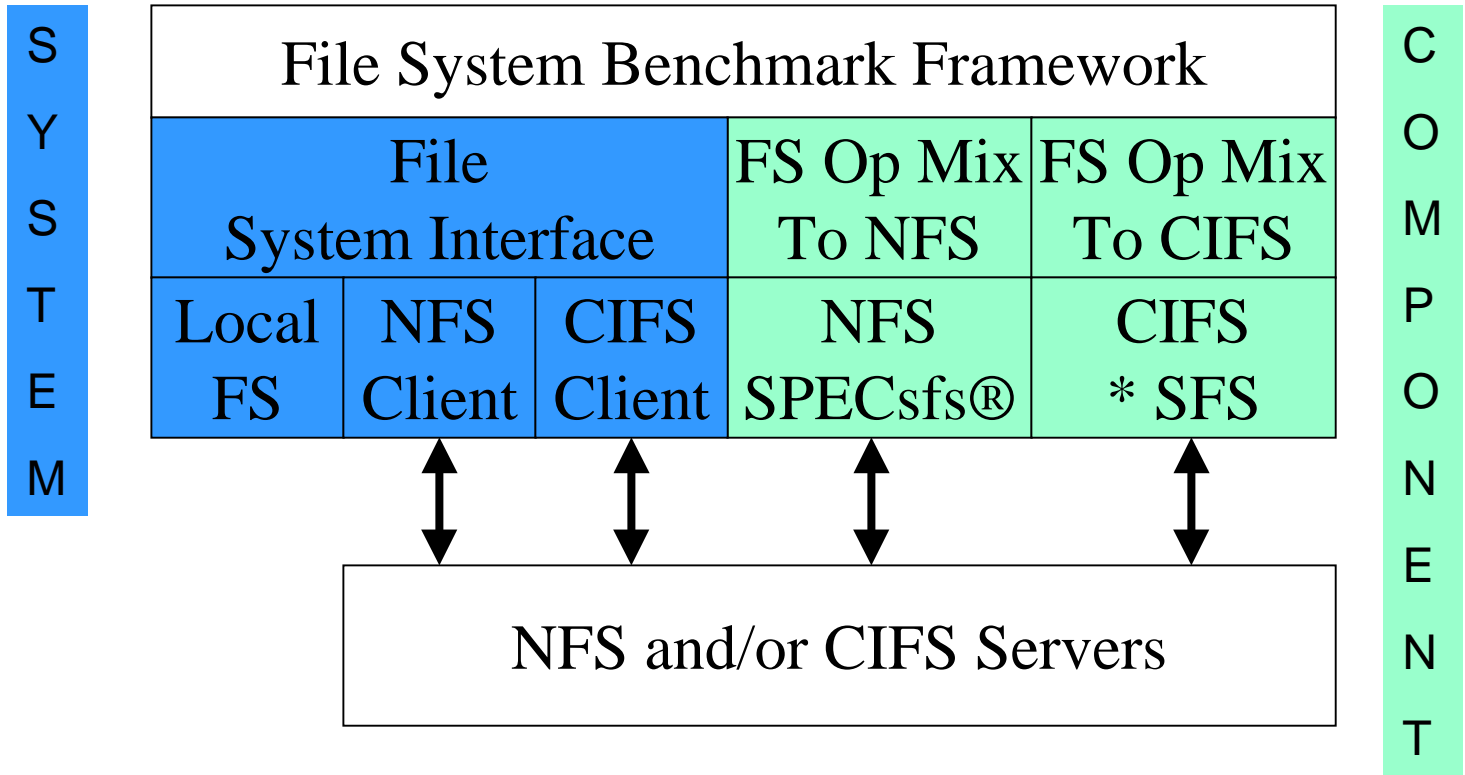 – Work on Unix and Windows

- ## Scalable

Component Level

- ## Protocol Dependent

  – One for NFS, One for CIFS, …

- ## Scalable

- ## Compare Component Performance

  – NFS Client Implementations

  – NFS Server Implementations

Benchmark Architecture

File System Benchmark Framework				
File System Interface			FS Op Mix To NFS	FS Op Mix To CIFS
Local FS	NFS Client	CIFS Client	NFS SPECsfs®	CIFS * SFS

S Y S T E M

C O M P O N E N T

NFS and/or CIFS Servers

NFS Client Benchmark

Work
In
Progress

Requirements

- ## OS Independent

- ## Minimal Code Running on Client

- ## Free of Server-side Effects

  - Client Needs to Send Requests to Server

  - Server on Other Side of Wire

  - Results Independent of Server

- ## Minimal HW Resources

Requirements (cont.)

- Lots of Workload Knobs
    - Listen to Research Community
    - Let the Committees Set the Values
- Validation
    - O_SYNC & Attribute Caching
- Measure NFSOP Efficiency

Implementation

- Single Client / Multiple Servers

- Data Driven User Interface

- Dummy NFS Server
  - TmpFS Requires Too Much Memory
  - Memory-based Metadata Only File System
  - Kernel-Level Implementation
  - Run at Interrupt Level

Next Step

- Finish White Paper
    - Will be Published on our Website

- NFS V4 Support

- Get Industry Support
    - Need Vendor Support
    - Propose Benchmark Architecture To Industry Groups

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