



Developing File Systems, Storage Managers & Backup Solutions



BUSINESS NEED

ALLEN Calsoft Labs needed to do the following.

- ⦿ Develop ONCplus (NFS for HP-UX)
- ⦿ Productize Samba and FLOSS on NonStop
- ⦿ Reduce space for WAFL clone files
- ⦿ Enhance performance of EXT3 files system for large files
- ⦿ Develop Key-Value Store (KVS)
- ⦿ Develop DiskXtender Unix/Linux Storage Manager
- ⦿ Sustain NonStop file system
- ⦿ Develop Avamar AVDB2 Plug-in



SOLUTION DELIVERED

The expert team of ALLEN Calsoft Labs also did the following to achieve successful on-time previously defined service delivery.

- ⦿ **Development of ONCplus (NFS for HP-UX):**
 - Provided Network file system advanced technology support
 - Network File System (NFS) is a distributed file system protocol built on the Open Network Computing Remote Procedure Call (ONC RPC) system
- ⦿ **Productization of Samba and FLOSS on NonStop:**
 - Porting and Productization of open source Samba to NonStop
 - HP NonStop operating system contains a Unix/POSIX compatible layer called Open System Services. This layer supports most of POSIX API and commands.
- ⦿ **Reduction of space for WAFL clone files:**
 - Reduced disk space for WAFL file system that supports file-cloning functionality
 - ALLEN Calsoft Labs provided design, implementation and support for front-end and back-end clone operations
 - Cloning over file-copy is done in constant time and doesn't require additional disk space
- ⦿ **Enhancement of performance of EXT3 files system for large files:**
 - Reduce the file system external fragmentation and improve the read/write performance of the EXT3 files system
 - Reduction in slow bitmap block reading from disk, time required to search for a free block inside the bitmap block
 - Increase the efficiency of the disk I/O scheduler (elevator algorithm for 2.4.x kernel)
 - Implementation is similar to block pre-allocation method introduced later (in 2.4.x Linux kernels)
- ⦿ **Development of Key-Value Store (KVS):**
 - Developed KVS protocol for highly available multi-site mostly-consistent object store
 - Allows consistency between data centers while still providing availability in adverse circumstances (e.g., disk failures, node failures, network partitions, and whole-site failures)
 - System is composed of many components viz. key-value library, fragment server, fragment store, key-lookup server, key-info store, fragment placement server and a browser

◎ **Development of DiskXtender Unix/Linux Storage Manager:**

- A scalable hierarchical storage system that manages data movement between various levels of storage hierarchy transparently
- Provides FTP and NFS standard interfaces
- File systems span multiple volumes and media types
- Automatic management (backup & archival) of storage media
- Basically unlimited storage capacity and unlimited file system size with no restrictions on number of files

◎ **Sustenance of NonStop file system:**

- HP NonStop Operating system is a distributed fault tolerant operating system which is used as transaction backend
- NonStop file system has two flavours - Enscribe File System and Open System Services (OSS)
- The OSS layer is on top of Enscribe File System & emulates POSIX like functionality

◎ **Development of Avamar AVDB2 Plug-in:**

- A disk-based backup product that dramatically reduces backend storage requirements by using de-duplication
- Backup clients run as normal “user land” applications and server uses “Content Addressed Storage” (CAS) to automatically eliminate redundant data
- Supports various plug-ins to backup databases and other data



BUSINESS BENEFITS

- ◎ Increased scalability and flexibility
- ◎ Enhanced Productivity

ABOUT ALTEN CALSOFT LABS

ALTEN Calsoft Labs is a next gen digital transformation, enterprise IT and product engineering services provider. The company enables clients innovate, integrate, and transform their business by leveraging disruptive technologies like mobility, big data, analytics, cloud, IoT and software-defined networking (SDN/NFV). ALTEN Calsoft Labs provides concept to market offerings for industry verticals like education, healthcare, networking & telecom, hi-tech, ISV and retail. Headquartered in Bangalore, India, the company has offices in US, Europe and Singapore. ALTEN Calsoft Labs is a part of ALTEN group, a leader in technology consulting and engineering services.

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