Scalable Reliable NAS Storage

R-Cube SNAS

A Rapid, Reliable and Non-Repudiational Scalable NAS based on DFS

Research Goal

- Enhance scalability of traditional NAS
- Speed up file transferring performance
- Make NAS runnable on commodity hardware without software modification
- Support fast data transferring protocol
- Provide Fault Tolerant & Self-Healing for NAS
- Keep file modification log data safe and secret

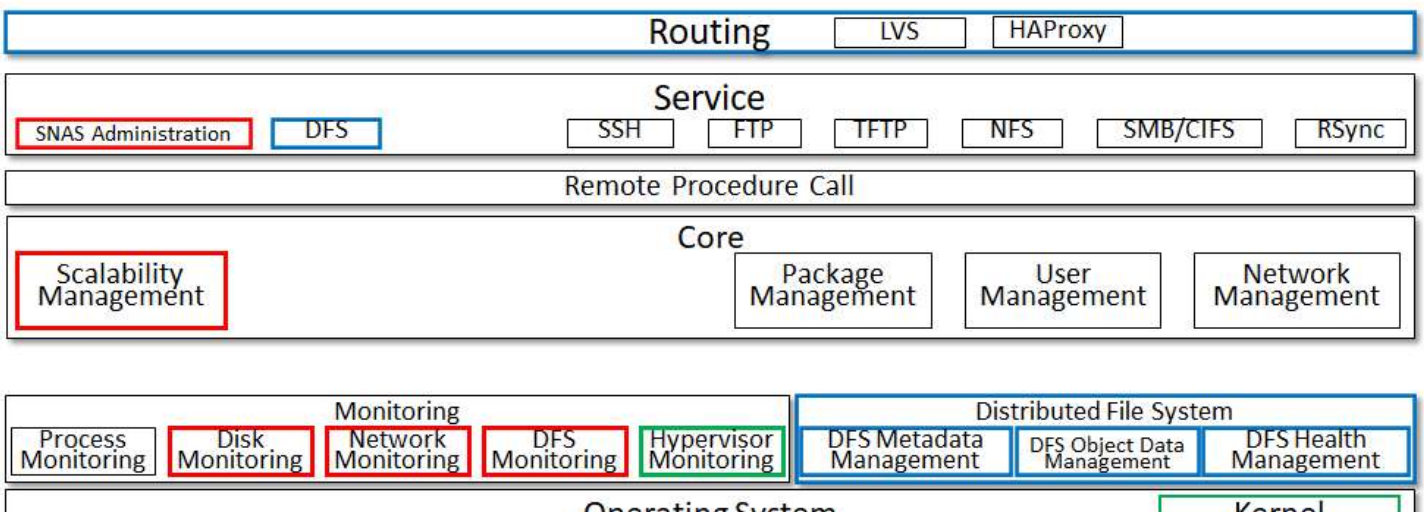
Proposed Approach

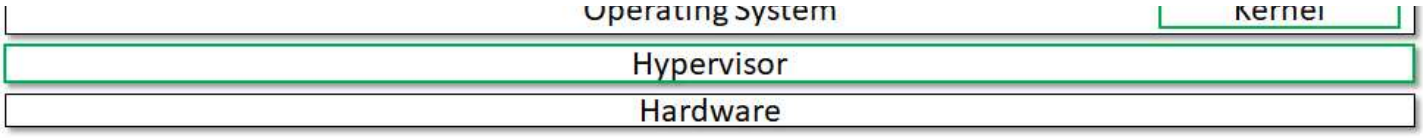
- SNAS
  - Limited scalability => Auto Scaling
  - No support for parallel data access => Distributed File System
  - Only works on specific hardware => NAS Virtualization
- R-Cube
  - Data transferring performance is relay on network protocol => Enhanced Network Data Transferring Protocol
  - Limited reliability => Fault Tolerant & Self-Healing
  - Weak security => Persist File Modification Log

SNAS Goals

- Enhance scalability of traditional NAS
- Speed up file transferring performance(Parallel Access)
- Make NAS runnable on commodity hardware without software modification

SNAS Architecture





R-Cube Goals

- Fast Data Transferring(FDT) Protocol for High Bandwidth Delay Product Network
- R-Cube Continuous Availability Framework(R-CAF)
- NAS Non-Repudiation based on Blockchain

R-Cube Continues Availability Framework(R-CAF)

- Fault Isolation => NAS Virtualization
- Fault Estimation => Dynamic Fault Tree Analysis
- Fault Tolerance => Active-Standby, Active-Active
- Self-healing => Feature Model based NAS VM/Software Recovery