



Vault

A SHARED DISTRIBUTED AND REDUNDANT STORAGE
SOLUTION

Progress so far...

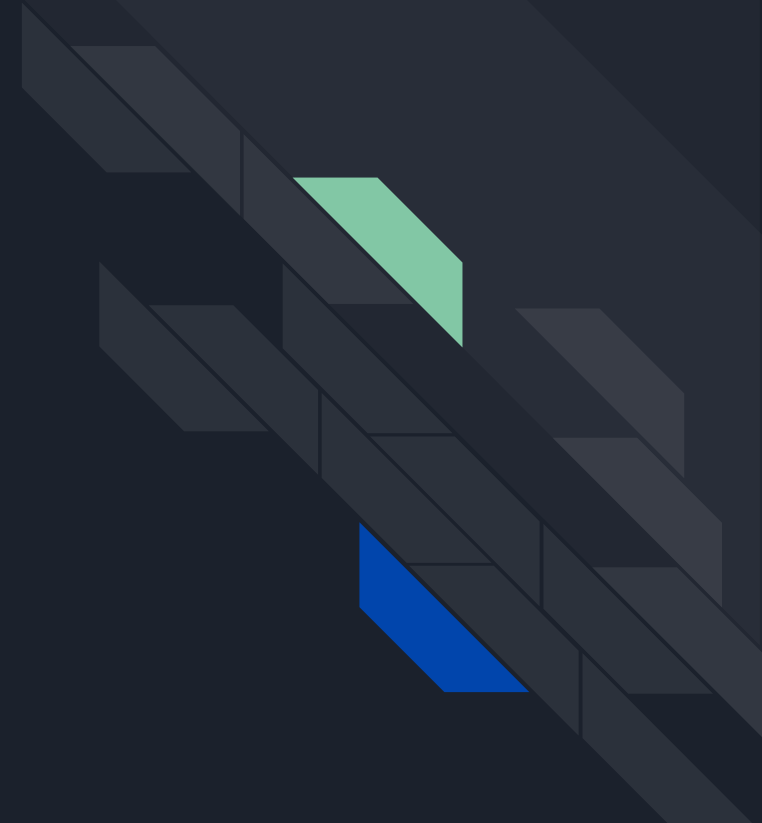
Group

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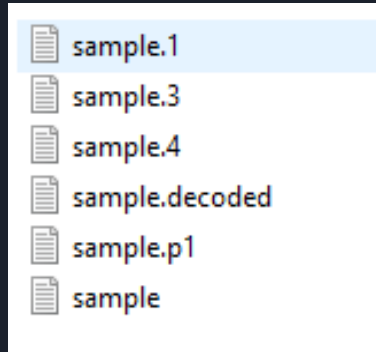


Node Authentication, encryption and File Sharing module (BA Ganegoda)

- Encryption and decryption functions in progress(symmetric encryption) (50%)
- Sharing part was broken down into two parts as Public and private sharing and not yet started
- User authentication in progress(50%)
- Node authentication and integrity validation not yet started.
- Content based search algorithm for faster file search is in mind.



File Redundancy and Disk Health Monitoring (TRNR Peiris)



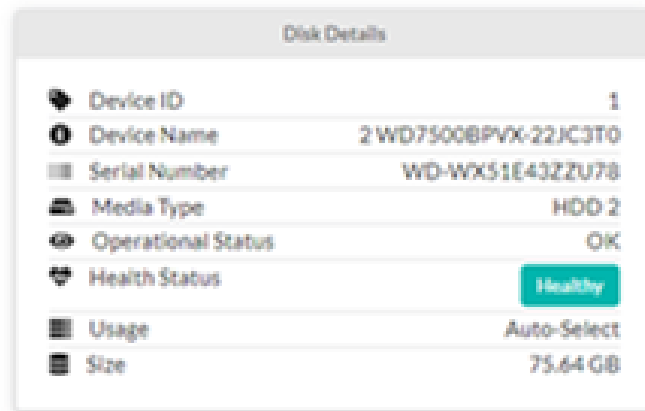
- One file scattered into 4 data shards - Completed
- Generating parity shards - Completed
- Regenerating file from any 4 out of 6 shards available at the time - Completed
- Reducing the amount of space required for a parity shard - In progress
 - Size of a parity shard = size of a shard + size of a shard / 8 Completed
 - Size of a parity shard = size of a shard - In Progress
- Performance optimization - In progress

Disk Health Identification

Modern hard drives have
“S.M.A.R.T..” It’s a feature that
allows operating systems

(like Linux, Mac, and Windows)

to verify the integrity and
health of the hard drives.



- Widows - Tested
- Linux - Tested
- MacOS - Scheduled
- Frontend - Completed



Blockchain based DHT and Messaging Protocol

(KVA Sachintha)

```
let Block = thinky.createModel("blockchain", {
  id: type.string(),
  index: type.number().integer(),
  previousHash: type.string(),
  hash: type.string(), // hash of block, timestamp and prev hash
  timestamp: type.date(),
  block: {
    filename: type.string(),
    filehash: type.string(),
    filesize: type.string(),
    fragment_count: type.number().integer(),
  },
  metadata: {
    owner: type.string(),
    deleted: type.boolean(),
    enc_key: type.string(),
  }
});
Block.ensureIndex('index');
```

- Blockchain core logic complete.
- Block Verification complete.
- Functions for calculating Merkle root in progress.
- Blocks are currently persisted to a NoSQL database.
- Advantages of using an RDBMS is still in mind.
- Currently designing the API that is eventually going to be exposed

Messenger Module

```
client.js
1  "use strict";
2  const io = require('socket.io-client');
3  const portscanner = require('portscanner');
4
5  let ipArr = [];
6  let sockArr = [];
7  const protocol = 'http://';
8  const port = ':3000';
9
10
11  let addSocket = function (ip) {
12    ipArr.push(ip);
13    let sockAddr = protocol + ipArr[ipArr.length - 1] + port;
14    let socket = io.connect(sockAddr);
15    sockArr.push(socket);
16  };
17
18
19  module.exports = {
20    addSocket,
21    sockArr
22  };
```

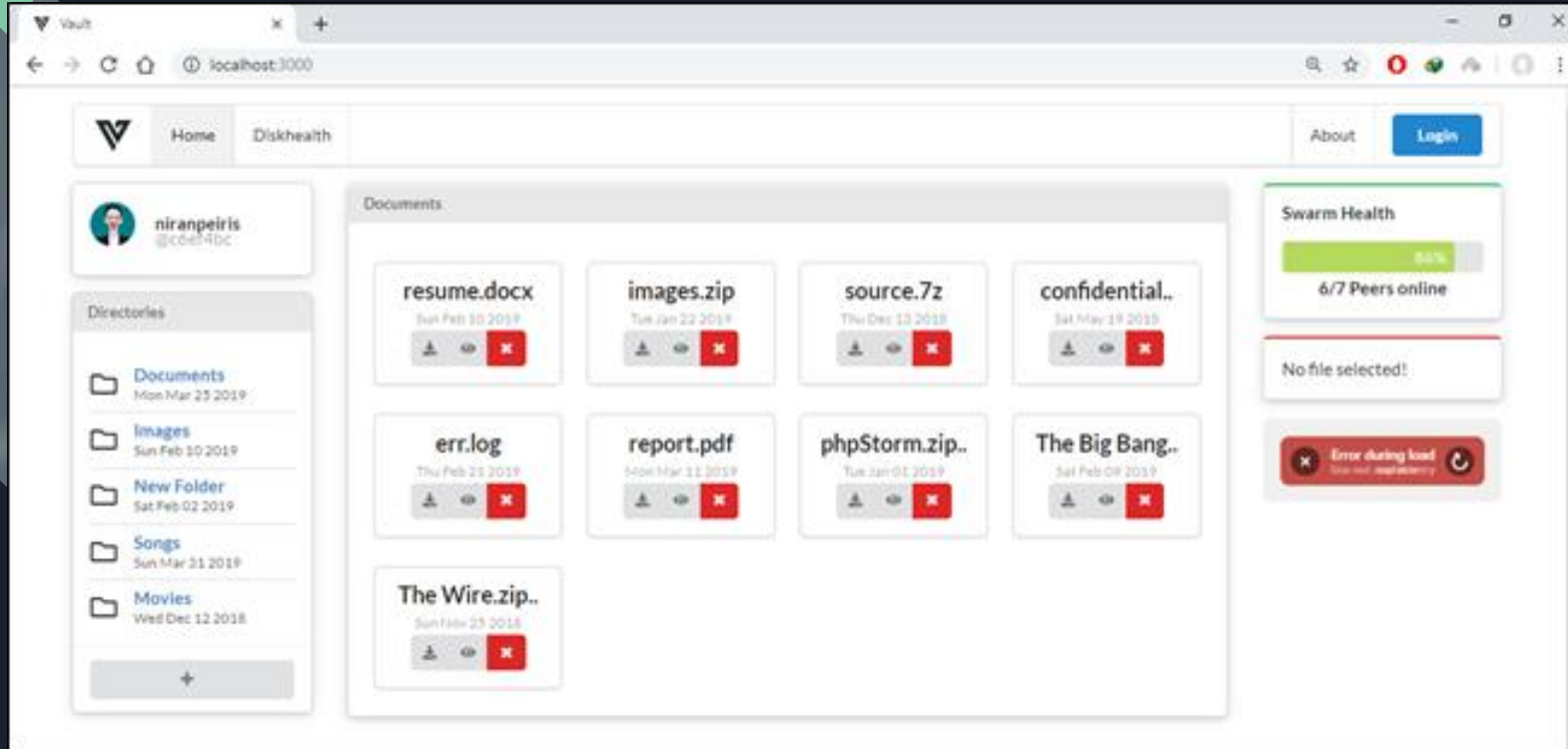
- Uses Socket.io transport for websocket based 2 way communication
- Uses 2 channels
 - For Blockchain updates
 - For Configuration updates
- Currently testing automatic detection of messenger service via portscan.
- Currently formulating a Consistent Messenger API for external modules to use.
- Currently testing various heartbeat intervals vs performance degradations.



Static and Dynamic Disk Space Allocation methodology (WMUKMT Bandara)

- Virtual hard disk creations.
 - create virtual disk vmalloc() function. (in progress)
 - Location initialized to 0 memset(). (in progress)
- Develop a device driver for virtual hard disk. (not yet implement)
- Device files operations
 - Read / write is implemented using memcpy() API. (Not yet implement)
- Block operation. (in progress)
 - The request function to process the requests in the request queue.
 - The spin lock associated with the request queue to protect concurrent access.
- Disk status monitoring. (front end complete)

Main UI - Normal Users Interface



Main UI - Disk Health

The screenshot displays the 'Vault' web interface for disk health monitoring. The browser address bar shows 'localhost:3000/diskhealth'. The interface includes a navigation bar with 'Home', 'Diskhealth', 'About', and a 'Login' button. The main content area is divided into three sections: 'Disk List', 'Overall Status', and 'Disk Details'.

Disk List

ID	Device Name	Size	Health Status
1	WDC WD7500BPVX-22JC3T0..	450.23 GB	Warning
2	WD7500BPVX..	75.64 GB	Healthy
3	WDC WD7500BPVX-22JC3T0..	450.23 GB	Unknown
4	WDC WD7500..	698.64 GB	Healthy
5	WDC WD7500..	698.64 GB	Healthy
6	WDC WD7500..	698.64 GB	Healthy

Overall Status

84%

Metric	Count
Total Disk Count	69
Healthy Disk Count	58
Not-Healthy Disk Count	11

Disk Details

Device ID	1
Device Name	2 WD7500BPVX-22JC3T0
Serial Number	WD-WX51E43ZU78
Media Type	HDD 2
Operational Status	OK
Health Status	Healthy
Usage	Auto-Select
Size	75.64 GB

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Thank you!

