

MetalCloud: Wireless and Battery Operated Handheld Storage Drive

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Abstract: Recent advances in Internet-of-Thing's technology have opened the doors to new scenarios for biosensor applications. Flexibility, portability, and remote control and access are of utmost importance to move these devices to people's homes or enterprises. More external hard drives and pen drives appearing, more issues are reported by users. Also, many users reported that their external hard drive keeps disconnecting in Windows 10. Some specific models also have issues. In case some important data that has been affected by infected files, viruses or malware, surely it will need a good protection. Protect from file loss, malware, hardware failure. In this project, an innovative wireless handheld storage device named Metal Cloud is a wireless flash disk is presented. Metal Cloud Model include machine learning workloads, query-intensive data warehouses, and ingestion and processing of IoT sensor data. When connected with power supply, can be used as wireless storage. Backup phone contacts and photos. It can back up data to cloud storage providers with the Dashboard software. With that program, one can access their files on the hard drive via the web. No longer have to connect their drive to PCs to transfer data, since the device also supports both Android and iOS. Then users can also transfer files between other cloud services. attach, detach, swap, and edit volumes can be used. The hard drives gives remote file access, extra cloud storage and have handy web backup options. Adding many accounts is used, including multiple accounts of the same service. To keep accounts and files safe, the program has a master password feature. Enable it to keep unauthorized users out and encrypt data with a key before uploading.

I. INTRODUCTION

EXTERNAL STORAGE

An external storage device, also referred to as auxiliary storage and secondary storage, is a device that contains all the addressable data storage that is not inside a computer's main storage or memory. An external storage device can be removable or non-removable, temporary or permanent, and accessible over a wired or wireless network. External storage enables users to store data separately from a computer's main or primary storage and memory at a relatively low cost. It increases storage capacity without having to open up a system. External storage is often used to store information that's accessed less frequently by applications running on a desktop, laptop, server or mobile device, such as an Android or iOS smartphone or tablet. For PCs, an external storage device often consists of stationary or portable hard disk drives (HDDs), or solid-state drives (SSDs) attached via a USB or FireWire connection, or wirelessly. For enterprises, an external storage device can serve as primary storage connected to servers through Ethernet or Fibre Channel switches, or as secondary storage for backup and archiving purposes. External storage offers HDD, all-flash and hybrid storage arrays for block-based, file-based or object storage, or a mix of these three protocols known as unified storage. examples of external storage. Another common use case for an external storage device is to transport data between on-site and off-site computer systems. When moving large amounts of data to the cloud, providers will often use external storage devices in a practice known as cloud seeding. Because moving tens of terabytes of data over a network can take hours or days, customers place their data on an external storage device and then send the device to their chosen provider to copy locally. After the initial seeding, only changed data will move across the network to the cloud for backup, archiving or disaster recovery (DR) purposes.

II LITERATURE SURVEY

DESIGN AND IMPLEMENTATION OF VIRTUAL STREAM MANAGEMENT FOR NAND FLASH-BASED STORAGE

METHODOLOGY

In this article, the author presents the design and implementation of a virtual stream management architecture, called vStream-FTL. The vStream-FTL groups multiple virtual streams into a single physical stream dynamically according to the lifetime of each stream, while offering a sufficient number of (virtual) streams for application developers.

FORENSICS AND ANTI-FORENSICS OF A NAND FLASH MEMORY: FROM A COPY-BACK PROGRAM PERSPECTIVE**METHODOLOGY**

In particular, it proposes an anti-forensic technique based on a copy-back program operation, which is a major copy-back program among these background operations. As NAND flash memories are increasingly integrated, data reliability problems continue to arise.

COINPURSE: A DEVICE-ASSISTED FILE SYSTEM WITH DUAL INTERFACES**METHODOLOGY**

The author present CoinPurse to enable fast and safe writes via a combination of two interfaces, block and byte addressable I/O, with device assistance. Design and implement a set of techniques, including threshold-based filtering, lazy invalidation and transaction-style format, to provide high performance with the consistency guarantee.

LOFFS: A LOW-OVERHEAD FILE SYSTEM FOR LARGE FLASH MEMORY ON EMBEDDED DEVICES**METHODOLOGY**

This section introduces the design and implementation of LOFFS. The author first gives the layout of LOFFS. LOFFS builds a path tree to take over the path lookup routine. The author utilizes an array, named D-index, to collect the page offsets of a directory file. Instead of hierarchically searching dentries within the path, the path tree smoothly conducts the search down process and sprightly obtains the target D-index.

DEEPPREFETCHER: A DEEP LEARNING FRAMEWORK FOR DATA PREFETCHING IN FLASH STORAGE DEVICES**METHODOLOGY**

This work proposes a deep learning way to tackle the learning complexity problem by providing new features that is vital to reduce the variance degree of training data so that the learning-based prefetchers potential can be unleashed even in the storage devices.

III EXISTING SYSTEM**COMPACT DISK**

compact disc (CD), a moulded plastic disc containing digital data that is scanned by a laser beam for the reproduction of recorded sound and other information

THUMB DRIVE OR PEN DRIVE

Universal Serial Bus (USB) is a kind of flash memory that stores information's so that it can be displayed on personal computers. A thumb drive, also called a USB drive or flash drive, is a small solid-state drive that connects to a device through a USB port.

MICRO SD

The microSD card is the smallest consumer-focused flash memory card in use today. It's a variation of the standard SD card (short for Secure Digital) and uses a similar set of electrical connections

EXTERNAL HARD DISK

An external hard drive is a storage device located outside of a computer that is connected through a USB cable or wireless connection. An external hard drive is usually used to store media that a user needs to be portable, for backups, and when the internal drive of the computer is already at its full memory capacity.

CLOUD STORAGE

Cloud storage allows you to save data and files in an off-site location that you access either through the public internet or a dedicated private network connection. Data that you transfer off-site for storage becomes the responsibility of a third-party cloud provider.

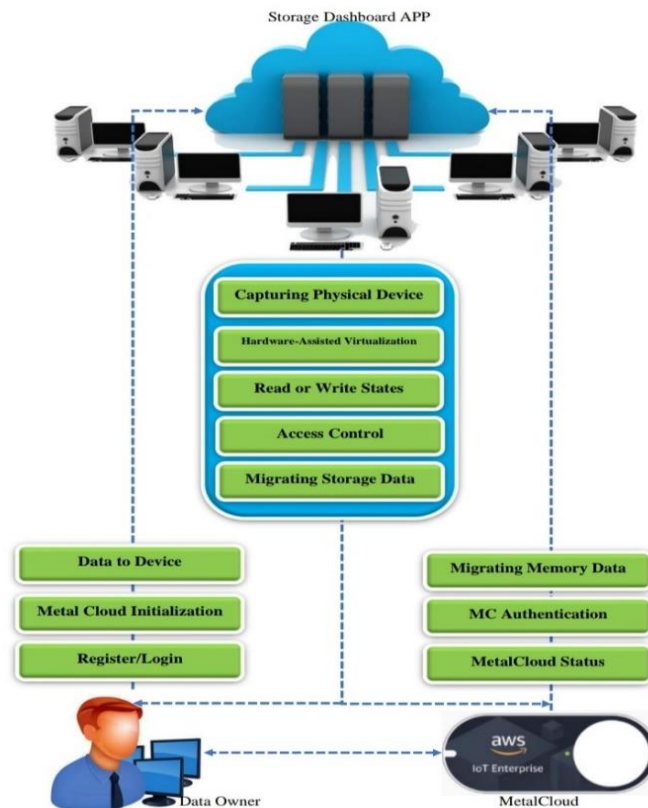
IV PROPOSED SYSTEM

In this project, an innovative wireless handheld storage device named Metal Cloud is proposed. MetalCloud, a wireless, portable storage solution, allows users to expand the number of documents, images, music and video files they can access remotely from any devices. The combination of this storage expansion, file sharing and a rugged portable form factor makes it a perfect companion device. Metal Cloud device include machine learning workloads, query-intensive data warehouses, and ingestion and processing of data with IoT. It can store, transfer and back up data to cloud storage providers and metal cloud with the Dashboard software. With that dashboard, one can access their files on the hard drive via the web. MetalCloud allows users to stream videos, access music or share files with other through web link. The distinctively designed, pocket-sized MetalCloud utilizes Flash-based technology to store data from PCs or Mobile. These files are then easily retrieved via Metal Cloud’s built-in wireless signal without requiring cables. More number of users can work simultaneously with different file types from a single MetalCloud without any performance disruption. MetalCloud allows device owners to wirelessly manage document and media files, and choose to share them with others, while on the go for work or pleasure. This unique functionality, combined with the durability of a Flash-based device, will satisfy both casual users and the most discerning technophiles.

MQTT PROTOCOL

MQTT stands for Message Queuing Telemetry Transport. MQTT is a machine-to-machine internet of things connectivity protocol. It is an extremely lightweight and publish-subscribe messaging transport protocol. This protocol is useful for the connection with the remote location where the bandwidth is a premium. These characteristics make it useful in various situations, including constant environment such as for communication machine to machine and internet of things contexts. It is a publish and subscribe system where we can publish and receive the messages as a client. It makes it easy for communication between multiple devices. It is a simple messaging protocol designed for the constrained devices and with low bandwidth, so it's a perfect solution for the internet of things applications.

V SYSTEM ARCHITECTURE



VI MODULE DESCRIPTION

METALCLOUD SERVICE PROVIDER

The MCSP provides professional data storage service and data sharing service for clients. A cloud service provider, or MCSP, is a company that offers some component of cloud computing typically infrastructure as a service (IaaS), software as a service (SaaS) or platform as a service (PaaS) to other businesses or individuals.

IAAS MODEL

The cloud service provider delivers infrastructure components that would otherwise exist in an on-premises data centre. These components could consist of servers, storage and networking as well as the virtualization layer, which the IaaS provider hosts in its own data centre

SAAS PROVIDERS

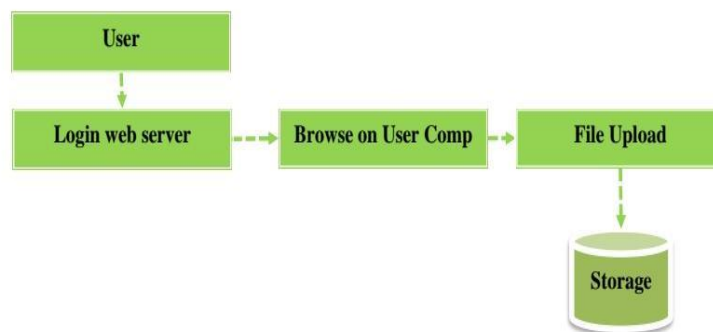
SaaS vendors currently offer a wide array of business technologies, such as productivity suites, customer relationship management (CRM) software and human resources management (HRM) software, all of which the SaaS vendor hosts and provides over the internet. Many traditional software vendors now sell cloud-based options of their on-premises software products.

PAAS PROVIDERS

The third type of cloud service provider, PaaS vendors, offers cloud infrastructure and services that users can access to perform various functions. PaaS products are commonly used in software development.

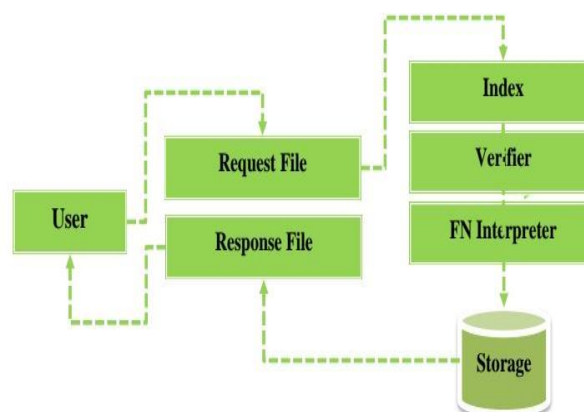
TRANSMIT LAYOUT

In Transmit (and most other FTP programs), there are two 'sides' of the application window. The left side is your computer. The right side is the web server.



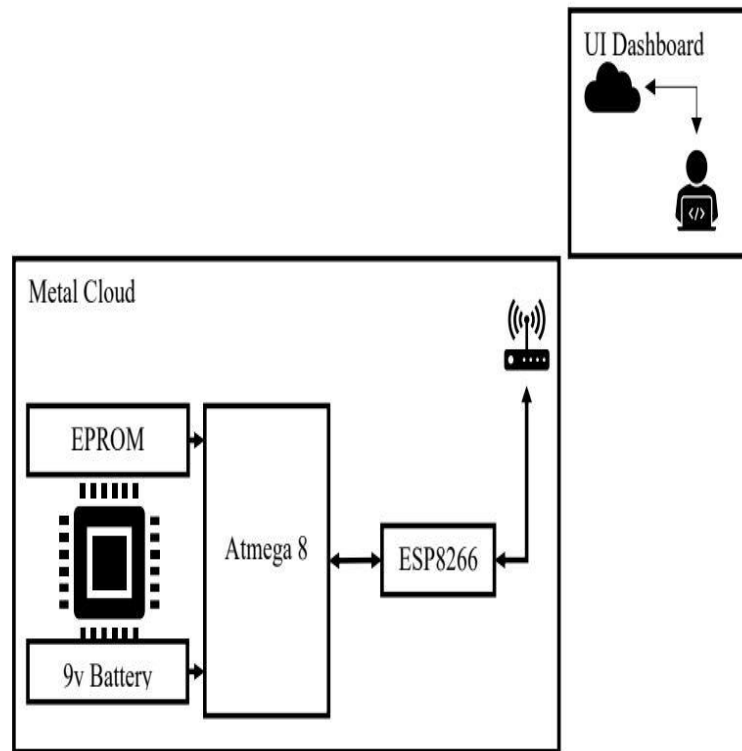
RESPONSE MODULE

In this module the user received the desired file from the webservice based upon the request made. Servers are computer software or hardware that processes requests and deliver data to a client over a network.



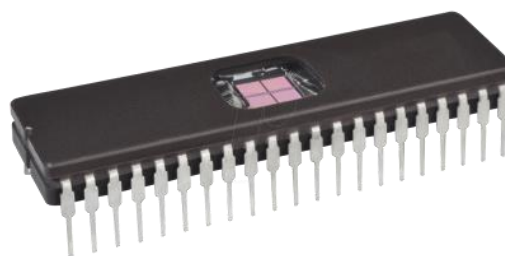
BLOCK DIAGRAM

Block Diagram



VII METALCLOUD HARDWAREDESCRIPTION

EPROM 27C320



The Erasable Programmable Read Only Memory is a memory chip that does not lose data even when the power is switched off. This is a non-volatile memory type i.e.; it retains data even when the power is switched off

OLED

OLED (Organic Light Emitting Diodes) is a flat light emitting technology, made by placing a series of organic thin films between two conductors. When electrical current is applied, a bright light is emitted.

ESP8266 WI-FI MODULE

The ESP8266 is a System on a Chip (SoC), manufactured by the Chinese company Espressif. It consists of a Tensilica L106 32-bit micro controller unit (MCU) and a Wi-Fi transceiver. .



ESP8266-01 WI-FI MODULE

ARDUINO UNO R3

The Arduino Uno R3 is a microcontroller board based on a removable, dual-inline-package (DIP) ATmega328 AVR microcontroller. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs).



VIII EXPERIMENTAL RESULT

After the establishment of reliable mesh network, the proposed model motivates the research on lightweight virtualization environment, and it is possible to apply MetalCloud into the pre-deployment process of the existing cloud environment. We conducted extensive experiments to evaluate MetalCloud in terms of response time, network bandwidth consumption, application performance and the overall system overhead on several popular devices under different virtualization and network environments.



IX CONCLUSION

This project proposed a model to convert the fat system into a slim-system called MetalCloud. This project's main contribution is the use of analysis techniques consisting of static and dynamic for extracting the application data and generating hardware profiles. The motivation behind live MetalCloud data migration is - load balancing, proactive fault

tolerance, power management, resource sharing, and online system maintenance. We identify the types of contents that need to be migrated during migration which are CPU state, memory content, and storage content.

X FUTURE ENHANCEMENT

In our future work, we will propose a novel approach which would be able to reduce service downtime and total migration time. We will also optimize the migration technique in the hypervisor to improve the performance of the live VM migration

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