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Affordable Cloud: Essential Free Cloud Services

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Abstract - The increasing cost of cloud services has created a barrier for small developers and students who lack the resources to access essential cloud resources. Cloud service providers have become so expensive and small developers and students are not able to afford the services. However, the costs associated with accessing these services, coupled with the requirement to share sensitive information such as credit card details, especially for those with limited financial resources. To even try a free service, they have to link their Credit Card, and many of the students do not have credit cards. To address this challenge, our project introduces "Affordable Cloud: Essential free cloud services", a free cloud platform designed to provide access to essential cloud services without the need for personal information. The project leverages an infrastructure and implements an automation process on a type-1 hypervisor to provide a seamless user experience. some basic and essential cloud services to small developers and students for free without any personal information like credit card details. The primary objective of Affordable Cloud is to establish a user-friendly, secure, and that grants students and small developers to access cloud resources. These resources include virtual machines (VMs), Docker containers, and storage.

Key Words: Cloud Services, Type-1 Hypervisor, Docker Container, Virtual Machine, Privacy Constraint, Tech Community.

1. INTRODUCTION

The evolution of cloud computing has undeniably transformed the way businesses and individuals manage, store, and access data and applications. Cloud services offered by renowned providers have become an integral part of modern technological landscapes, facilitating scalability, flexibility, and accessibility. However, the recurring costs associated with these services have led many individuals and organizations to seek alternative solutions that offer both functionality and cost efficiency.

One compelling alternative gaining traction is the concept of deploying cloud services on self-hosted bare metal servers. Unlike traditional cloud infrastructures where services are provided by external providers and accessed through the internet, bare metal servers allow individuals and organizations to own and manage their hardware resources directly. Leveraging this approach, they can replicate essential cloud functionalities by deploying open-source software and tools while reducing ongoing subscription costs.

This paper embarks on an exploration of the potential, advantages, challenges, and practical implications of harnessing free cloud services on self-hosted bare metal servers. It aims to shed light on how individuals and organizations can achieve the benefits of cloud computing while maintaining autonomy and reducing dependency on external cloud service providers.

Throughout this exploration, key aspects such as cost efficiency, control and customization, performance and scalability, security, and the inherent challenges of managing bare metal infrastructure will be examined. Understanding these facets is crucial in evaluating the viability and practicality of adopting self-hosted bare metal servers as an alternative means to access and deploy cloud services.

By delving into this paradigm shift, this paper intends to provide valuable insights for decision-makers, IT professionals, and individuals seeking a balance between the advantages of cloud services and the desire for greater autonomy, cost savings, and customization offered by self-hosted bare metal infrastructures. This investigation aims to equip readers with the knowledge necessary to make informed choices regarding their cloud service deployment strategies in an ever-evolving technological landscape.

2. LITERATURE SURVEY

P. Nagendra Babu, M.Chaitanya Kumari and S. Venkat Mohan perfume A Literature Survey on Cloud Computing.. They found that from past decade onwards Cloud Computing plays a vital role. Cloud computing is a computation, software, data access, and storage services that do not require end-user knowledge of the physical location and configuration of the system that delivers the services. Cloud computing is the fastest new paradigm for delivering on demand services over internet and can be described as internet centric software. [1].

The paper "A Survey Of Open Source Cloud Computing Software" authored by Mr. Isaac Lartey, Mr. Felix Bentil explores Cloud computing is a service-oriented architecture that offers a high level of flexibility and on-demand self service,powered by existing technologies like virtualization and the internet. Open source software (OSS) is a type of computer software in which the source code is made publicly available under a license that allows users to review, modify, and distribute. Open Source Cloud Computing is, therefore, any cloud solution developed with open-source software. This paper examines current trends in cloud computing and open-source software and serves as a road map for future research. This research aims to provide a detailed overview of the two open cloud computing solutions, Xen Cloud Platform (XCP) and OpenStack [2].

Andrew R. Riddle, Soon M. Chung paper, " A Survey on the Security of Hypervisors in Cloud Computing " explores This survey paper focuses on the security of hypervisors in the cloud. Topics covered in this paper include attacks that allow a malicious virtual machine (VM) to compromise the hypervisor, as well as techniques used by malicious VMs to steal more than their allocated share of physical resources, and ways to bypass the isolation between the VMs by using side-channels to steal data. Also discussed are the security requirements and architectures for hypervisors to successfully defend against such attacks. [3].

The paper " Issues in Cloud Computing: Performance Evaluation of Type-1 Hypervisors " by Borislav Đorđević , Valentina Timčenko , Nemanja Maček exmine the Quality of Service of Cloud Computing virtual environment, considering specific hypervisor performance evaluation. Particular emphasis is put on the bare-metal hypervisors, commonly known as type1 hypervisors. The comparison is based on two widespread representatives, XEN and KVM. We started from the analytical model of a single disk based on M/G/1 queue model and hypervisor's overhead analytical model. Three workload types have been defined, consisting mostly of relatively small objects, and the tests were run in Postmark benchmark environment. All obtained benchmark results were interpreted based on a specified mathematical model [4].

In the work titled "A Review Of Existing Cloud Automation Tools " by Prassanna J, Anjali R Pawar, Neelanarayanan V, Many enterprises are running distributed applications on their on-premise servers. However, if load on those servers changes unexpectedly, then it becomes tedious to scale the resources and requires skilled human power to manage such situations. It may increase the capital expenditure. Hence, many companies have started to migrate their on-premise applications to the cloud. This migration of the applications to the cloud is one of the major challenges. To setup and manage the growing complex infrastructure, after migrating these applications to the cloud are really a time-consuming and tedious process which results in downtime [5].

3. PROPOSED SYSTEM

The proposed system of the "Affordable Cloud: Essential Free Cloud Services" project aims to create an inclusive and empowering environment for users to harness the benefits of cloud computing without the traditional barriers. It blends user-friendly design with essential functionalities, emphasizing accessibility, security, and collaborative learning within the realm of cloud technology:

The system will include the following components:

a) User Registration and Authentication:

Users can register on the platform without the need for personal financial information. Authentication mechanisms ensure secure access to the cloud services.

b) Dashboard and User Interface:

A user-friendly dashboard provides an intuitive interface for users to manage and monitor their cloud resources. Key information, such as resource usage and available services, is presented in an easily comprehensible manner.

c) Essential Cloud Services:

The platform offers a suite of essential cloud services, including but not limited to Docker containers, facilitating diverse applications and development scenarios.

d) Resource Allocation and Management:

Implements a fair resource allocation system to prevent misuse and ensure equitable distribution among users. Users can dynamically manage their allocated resources through the platform's interface.

e) Automation with Type-1 Hypervisor:

Utilizes a type-1 hypervisor for efficient automation processes, streamlining the deployment and management of virtualized environments.

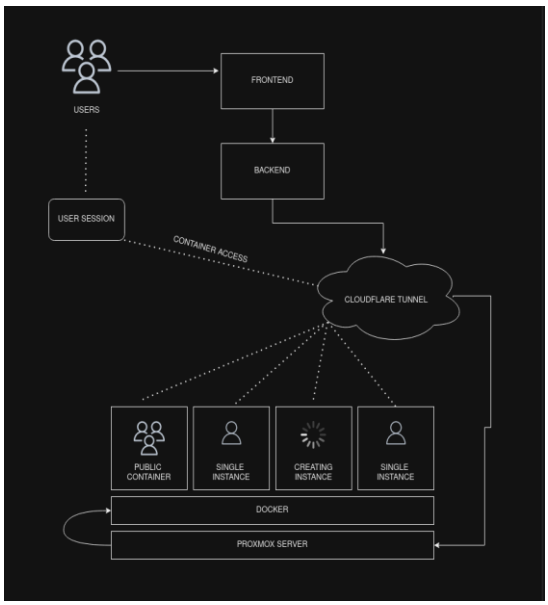

Fig.1 System Breakdown Structure

4. METHODOLOGY

1. ***Identifying the Problem:***
Recognizing the cost barrier and privacy issues faced by small developers and students when accessing cloud services.

2. ***Conceptualization:***
Designing the concept of "Affordable Cloud" to provide free access to essential cloud services without requiring personal information such as credit card details.

3. ***Infrastructure Development:***
Leveraging a type-1 hypervisor to build the infrastructure necessary for the Affordable Cloud platform.

4. ***Automation Implementation:***
Implementing automation processes within the hypervisor to ensure a seamless user experience when accessing cloud resources.

5. ***User-Friendly Interface:***
Developing a user-friendly interface to enhance accessibility and ease of use for small developers and students.

6. ***Security Measures:***
Incorporating security measures to safeguard user data and ensure a secure environment for accessing cloud resources.

7. ***Resource Provisioning:***
Offering free access to basic cloud services, including virtual machines (VMs), Docker containers, and storage, to meet the needs of small developers and students.

8. ***Testing and Iteration:***
Conducting testing to validate the functionality and security of the Affordable Cloud platform and iterating based on feedback to enhance performance.

9. ***Documentation:***
Creating comprehensive documentation to guide users on how to utilize the Affordable Cloud platform effectively.

10. ***Deployment:***
Deploying the Affordable Cloud platform to make it accessible to the target audience of small developers and students
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5. CONCLUSION

The "Affordable Cloud: Free Essential Cloud Services" project redefines accessibility in cloud computing. By eliminating financial barriers, offering a user-friendly interface, and promoting community collaboration, it empowers small developers and students. The platform, featuring essential services and security measures, fosters a culture of innovation and learning. While acknowledging limitations, the project's commitment to inclusivity propels it towards a transformative future, democratizing technology for the next generation

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