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Security Based Optimizing Design To Migrate Cloud

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Abstract: The on-demand use, high scalability, and low maintenance cost nature of cloud computing have attracted more and more enterprises to migrate their legacy applications to the cloud environment. Although the cloud platform itself promises high reliability, ensuring high quality of service is still one of the major concerns, since the enterprise applications are usually complicated and consist of a large number of distributed components. Thus, improving the reliability of an application during cloud migration is a challenging and critical research problem. A reliability-based optimization framework, named RO Cloud, to improve the application reliability by fault tolerance. RO Cloud includes two ranking algorithms. The first algorithm ranks components for the applications that all their components will be migrated to the cloud. The second algorithm ranks components for hybrid applications that only part of their components are migrated to the cloud. Both algorithms employ the application structure information as well as the historical reliability information for component ranking. Based on the ranking result, optimal fault-tolerant strategy will be selected automatically for the most significant components with respect to their predefined constraints. The experimental results show that by refactoring a small number of error-prone components and tolerating faults of the most significant components, the reliability of the application can be greatly improved.

Keywords: Cloud Computing, Reliable Cloud Architecture, Migration over Cloud, Application Migration

Introduction: "A Cloud may be a kind of parallel and distributed system consisting of a group of interconnected and virtualized computers that are dynamically provisioned and bestowed united or additional unified computing resources supported service-level agreements established through negotiation between the service supplier and shoppers." Cloud computing is changing into a buzz word in industry and everybody is wanting to associate in a way or different with this fresh idea. Cloud computing may be a terribly current topic and therefore the term has gained plenty of traction being sported on advertisements everywhere internet from web house hosting suppliers, through

knowledge centers to virtualization computer code suppliers [1]. CLOUD computing allows convenient, on-demand network access to a shared pool of configurable computing resources. Within the cloud computing surroundings, the computing resources (e.g., networks, servers, storage, etc.) will be provisioned to user's on demand, just like the electricity grid [5], [11]. Startup firms will deploy their fresh developed net services to the cloud while not the priority of direct capital or operator expense [5]. In ancient computer code dependability engineering, there are four major approaches to boost system reliability: fault bar, fault removal, fault tolerance, and fault prediction. Once turning to the cloud surroundings, since the applications deployed within the cloud are typically difficult and accommodates an outsized range of elements, solely using fault bar techniques and fault removal techniques don't seem to be comfortable. Another approach for building reliable systems is computer code fault tolerance that is to use functionally equivalent elements to tolerate faults [6]. Computer code fault tolerance approach takes advantage of the redundant resources within the cloud surroundings, and makes the system additional strong by masking faults rather than removing them.

Optimization Challenges in Cloud Migration: First, we tend to use a remarkable example to point out the difficult issues of this paper. The cloud computing technology satisfies these necessities. Enterprise A decides to migrate its bequest applications to Associate in Nursing IaaS cloud, as shown in Fig. 1. The bequest application consists of variety of distributed elements. Making certain dependability of the applying is one among the most important considerations for creating the migration. To enhance the system dependability, the style needs to optimize the first design of bequest application by providing fault tolerance mechanisms for its elements with replication techniques. Once planning fault tolerance mechanisms for the elements, the designer

has to take into account the subsequent problems: 1. Some elements of the bequest application are also enforced by out-of-date technology and suffer from high failure rates. These elements will have nice impact on system dependability. Replication techniques don't seem to be enough to boost

the dependability. For example, providing one replication for an element with failure rate fifty ps and can be solely scale back the failure rate to twenty five ps which is unacceptable. A better approach is refactoring, that's to adopt new technology to rewrite the element and add fault bar logic (e.g., exception handling), which might dramatically scale back the component's failure rate. Trade-offs got to be created once considering that elements ought to be re-factored attributable to value constraints. 2. The bequest application might accommodate an outsized range of elements. It's too costly to deploy various replicas for all the elements, since there are prices for mistreatment cloud resources (e.g., the virtual machines). To create tradeoffs between prices and dependability, the designer chooses to tolerate faults of the foremost vital elements, whose failures have nice impact on the total system. However, it's tough to spot that elements have larger impact on system dependability, because: • The dependability properties of every element are also terribly completely different. Some elements might have already got fault bar logic (e.g., error checking, exception handling, etc.) and therefore are additional reliable than others. • Failures of completely different elements will have different impacts on the system. Elements fulfilling important tasks (e.g., payment) are taken as important elements, whereas different elements accomplishing non-critical tasks (e.g., providing ornamental photos on internet pages) are taken as non-critical ones [48]. Failures of important elements have larger impact on the system than failures of non-critical elements. These 2 characteristics ought to be thought of together. A failure prone non-critical element might have very little impact on overall system dependability, whereas an element for important task is also rigorously designed and have already got low enough failure rates. The simple approach to solely take into account elements with high failure rates or fulfilling important tasks as vital elements might not cause Associate in Nursing best answer. 3. Some applications are restricted by enterprise security polices and solely a part of their elements will be migrated to the cloud. For these hybrid applications, the elements that are unbroken within the non-public knowledge center are probably vital elements and that they will

solely use resources within the non-public knowledge center for fault tolerance.

Existing System: Cloud computing is setting off nice changes within the IT trade. There are additional and additional researches on cloud computing. And this paper focuses on cloud computing too. At the start this paper describes the characteristics and definitions of cloud computing, then introduced its services patterns (including SaaS, PaaS and IaaS) and preparation patterns (including public cloud, non-public cloud and hybrid cloud), at the tip lists the cloud security challenges that cloud computing faces [4]. Security issues baby-faced by the cloud system concerning within the following 5 aspects: • First, face additional security attacks: attributable to the huge amounts of user knowledge hold on within the cloud system, for attackers there have larger attract. If the wrongdoer in a way with success attack cloud systems, it'll bring devastating disaster for each cloud suppliers and users; on the opposite hand, so as to make sure flexibility and flexibility services of the cloud, cloud systems give users with additional open access interfaces, which additionally bring larger security threats. • Second, virtualization technology: it not solely brings cloud computing platform flexibly resources organized, however additionally brings new security challenges. There's a requirement to unravel the matter that secure preparation of cloud platform supported the virtual machine design. In a much virtualized surroundings, the server is sort of a file that is withdrawn simply, that the risk of revelation will increase. Once several virtual machines running on physical servers, the administrator's work typically goes over the management of the virtual network surroundings. In this case, the administrators' privileges increase; therefore it's necessary to control the administrator's privileges [5]. The introduction of the virtualization platform has become new security vulnerabilities. Once be hacked, all the virtual machines running on the virtualization platform are in check of attackers. By that point, the cloud suppliers and users can suffer huge loss. • Third, guarantee continuity of the cloud platform services and high handiness of user knowledge and business: Amazon knowledge center period event, Google's Gmail failing to use event so on are related to cloud computing handiness. To an

explicit extent, the events on top of discourage the keenness of the enterprise to use public cloud. Cloud computing service got to give a fault tolerant mechanism to backup user knowledge to cut back the impact in application once the first knowledge is destroyed. Additionally, the computer code itself might have loopholes and an outsized range of malicious attacks happen; of these on top of greatly increase the likelihood of service interruption. A way to defend the high handiness of computer code services and user application and the way to supply convenience security management to the thin-client user became one among the most important challenges of cloud security [6].

Proposed Algorithm: Cloud computing offers several advantages, however it is also liable to threats. Because the uses of cloud computing increase, it's extremely doubtless that additional criminals can attempt to notice new ways that to take advantage of vulnerabilities within the system. There are several underlying challenges and risks in cloud computing that increase the threat of knowledge being compromised. to assist mitigate the threat, cloud computing stakeholders ought to invest heavily in risk assessment to make sure that the system encrypts to shield data; establishes sure foundation to secure the platform and infrastructure; and builds higher assurance into auditing to strengthen compliance. Security considerations should be addressed so as to determine trust in cloud computing technology. This work proposes to boost the dependability primarily based style optimization by considering the on top of issues. it'll use priorities of the applications supported the historical data for deciding the Ranking of the System in situ of evaluating it solely dynamically. it'll be appropriate for all kinds of applications. The lanned work shall even be considering the subsequent factors for Ranking:

• Time Taken in Migration
• Structure of the Applications
• Data Transfer Rate
• Latency of application transfer
• Cost incurred in Migration of applications
• Memory needed
• Number of elements concerned within the Application
• Available Resources

The planned rule will be named as EFTAMFC (Efficient & Fault Tolerant Application Migration Framework for

Cloud). The planned framework shall be enforced in following steps:

Step 1: A New Web Application Shall is created for the purpose of migration and execution of he proposed system.

Step 2: Application shall be consisting of various utilities such as sorting, searching, calculator etc.

Step 3: Each utility application will take some migration time, memory etc.. The complete application will be considered for structure of application, rate of transfer of data, latency, cost, number of components and available resources. All of these shall be used to decide the ranking of the application components.

Step 4: Ranking system will be decided by the reliability of the migration of the application.

Step 5: Based on ranking each application shall have a fault tolerant mechanism dedicated during its migration.

Step 6: System testing shall be done by adding faults in the system by application of faults such as missing file, increased time taken in migration by sleep etc.

Step 7: System shall be calculating the various parameters component wise such as Resources Taken, Component Failure Impacts, and Performance using various threshold values as in base paper work.

Step 8: Base paper outputs shall be used to compare the above calculated parameters and impact of each of these shall be discussed.

Conclusion and Future Work: Cloud Computing is facilitating users round the world for the most effective of the services obtainable across the planet on their machines through internet. It's helpful for each the service suppliers (they get huge clientele) and shoppers (they get all obtainable services). Virtual Machine and application migration are one among the basic challenges. This proposed work design can give a reliable design for the applying application migrations which might be changed for virtual machine migration in future also. The proposed work is found to provide high performance with security and dependability and additionally it's progressing to be providing the stable and rigid system for the users of cloud.

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