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A Multiple Determination Support for Web Application Clusters to Hybrid Clouds using cloudmigration

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***Abstract*—** One of the key problems in migrating multi-component enterprise applications to Clouds is selecting the best mix of VM images and Cloud infrastructure services. A migration process has to ensure that Quality of Service (QoS) requirements are met, while satisfying conflicting selection criteria, e.g. throughput and cost. When selecting Cloud services, application engineers must consider heterogeneous sets of criteria and complex dependencies across multiple layers impossible to resolve manually. To overcome this challenge, we present the generic recommender framework CloudGenius and an implementation that leverage well known multi-criteria decision making technique Analytic Hierarchy Process to automate the selection process based on a model, factors, and QoS requirements related to enterprise applications. In particular, we introduce a structured migration process for multi-component enterprise applications, clearly identify the most important criteria relevant to the selection problem and present a multi-criteriabased selection algorithm. Web applications to virtualized Cloud services is selecting the best and compatible mix of software images (e.g., Web server image) and infrastructure services to ensure that Quality of Service (QoS) targets of an application are achieved. The fact that, when selecting Cloud services, engineers must consider heterogeneous sets of criteria and complex dependencies between infrastructure services and software images, which are impossible to resolve manually, is a critical issue. To overcome these challenges, we present a framework (called CloudGenius) which automates the decision-making process based on a model and factors specifically for Web server migration to the Cloud. CloudGenius leverages a well known multi-criteria decision making technique, called Analytic Hierarchy Process, to automate the selection process based on a model, factors, and QoS parameters related to an application

Keywords: *Cloud migration, migration process, selection problem, criteria set, decision-making, decision support, Cloud Service Selection, Multi-dimensional Trust Evidence, Trust and Reputation Evaluation, Evidential Reasoning*.

1. INTRODUCTION

Internet applications have been prosperous in the era of cloud computing, which are usually hosted in virtual machines in geographically distributed data centers. Live migration of Internet applications across data centers is important for different scenarios including load management, power saving, routine server maintenance and quality-of-service [9]. Additionally, Internet applications tend to have dynamically varying workloads that contain long-term variations such as time-of-day effects in different regions. It is desirable to move the interactive/web application to the data center that has better network performance to users for lower response time. Also, workloads can be migrated across different data centers to exploit time-varying electricity pricing. The recent advance of VM live migration techniques is able to relocate a single VM across data centers with acceptable migration cost. Typical Internet applications employ a multi-tier architecture, with each tier providing

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certain functionality. Specific to multi-tier applications, we need to migrate several tightly-coupled VMs in multitiers, instead of a single VM. Previous studies have demonstrated the potential performance penalty of multi-tier applications during migration. In this paper, we investigate whether and how we can reduce the migration cost without suffering application performance degradation. A typical multi-tier web application consists of three tiers: presentation layer (web tier), business logic layer (App tier) and data access layer (DB tier). Different layers usually run on different VMs and have different memory access patterns. VMs are correlated because only when all VMs of the multi-tiers are migrated to another data center, they can completely and efficiently serve requests in that data center. We call this problem correlated VM migrations. Correlated VM migrations can cause significant performance penalty to multi-tier applications. Consider the following scenario: if the middle tier is first migrated, then the other two tiers must redirect the communication and data access traffic to another data center and wait for the processing results to be sent back. Moreover, because the multi-tier application and migration processes share the same link for data transferring, given the data-intensive nature of multi-tier applications and limited network bandwidth between two data centers, network bandwidth contention may cause significant performance degradation for both applications and VM migrations. While live migration of VMs provides the ability to relocate running VMs from one physical host to another without perceivable service downtime the state-of-theart VM migration techniques mainly target a single VM. These techniques cannot fundamentally solve the correlated VM migrations problem. We need effective and efficient mechanisms to coordinate correlated VM migrations across distributed data centers.

2. **LITERATURE** SURVEY

1. **A Data Outsourcing Architecture Combining Cryptography and Access Control** From this paper we ReferThe paper explored many important issues that arise when enforcing access control in a scenario where data are stored and ordered to clients by an external server. We then presented a novel data outsourcing access control architecture for supporting flexible applications, preserving privacy and empowering the user. We also described an approach forpolicy evolution that takes into account the main features ofthe scenario and is able to guarantee in most cases confidentiality of the information in the presence of signicant policy updates, clearly identifying the exposure to collusion when this risk may arise. Other issues to be investigated include the integration with the Web paradigm, and the efficient execution of queries.

2. **Achieving Secure Role-Based Access Control on Encrypted Data in Cloud Storage** From this paper we ReferWith the rapid developments occurring in cloud computing and services, there has been a growing trend to use the cloud for large-scale data storage. This has raised the important security issue of how to control and prevent unauthorized access to data stored in the cloud. One well known access control model is the role based access control (RBAC), which provides flexible controls and management by having two mappings, users to roles and roles to privileges on data objects. In this paper, we propose a role-based encryption (RBE) scheme that integrates the cryptographic techniques with RBAC. Our RBE scheme allows RBAC policies to be enforced for the encrypted data stored in public clouds. Based on the proposed scheme, we present a secure RBE-based hybrid cloud storage architecture that allows an organization to store data securely in a public cloud, while maintaining the sensitive information related to the organization's structure in a private cloud. We describe a practical implementation of the proposed RBE-based architecture and discuss the performance results. We demonstrate that users only need to keep a single key for decryption, and system operations are efficient regardless of the complexity of the role hierarchy and user membership in the system.

3. Trust-Based Access Control Model for Pervasive Computing Applications From this paper we ReferWith the rapid growth in wireless networks and sensor and mobile devices, we are moving towards an era of pervasive computing. Access control is

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challenging in these environments. In this work, we propose a trust based approach for access control for pervasive computing systems. Our previously proposed belief based trust model is used to evaluate the trustworthiness of users. Fine-grained access control is achieved depending on the trust levels of users. We develop a class of trust-based access control models having very formal semantics, expressed in graph theory. The models differ with respect to the features they provide, and the types of the trust constraints that they can support.

4. Methods Migration from On-premise to Cloud

From this paper we ReferCloud computing is evolving as a key computing platform for sharing resources that include infrastructures, software, applications, and business. An increasing number of companies are expected to migrate their applications to cloud environment. So when planning to move a legacy style application to the cloud various challenges arise. The potential size and complexity of such a project might especially discourage small or medium companies trying to benefit from the advantages the cloud promises. By analyzing the research achievements and application status, we divide the existing migration methods into three strategies according to the cloud service models integrally. Different processes need to be considered for different migration strategies, and different tasks will be involved accordingly. Moreover, we have also observed that there is hardly any guidance available for migrating existing systems to cloud computing in terms of software engineering aspects. In this paper, we propose an architecture that describes the cloud migration process, starting by understand application architecture, Choice of type of cloud environment and Identification and categorization of the various types of application migration to the Cloud and solutions for migrating architectural components

Problem Statement

Cloud service provider's offers computational services and Virtual Machine (VM) images for information systems. Throughput and cost factors are considered in the service selection process. CloudGenius framework is constructed to handle process migration from web applications into public cloud resources. CloudGenius provides migration support for multicomponent web applications. Evolutionary migration process for web application clusters is distributed over multiple locations. A multi-criteria-based selection algorithm on Analytic Hierarchy Process (AHP) is employed in CloudGenius model. Parallel Genetic Algorithm (PGA) is applied to select migration solutions. CumulusGenius is an implementation support for CloudGenius framework. The following drawbacks are identified from the existing system. • Hybrid cloud architecture is not supported • Migration cycles delay is high • Provider Customization is not supported • Control and data flow dependencies are not considered

3 EXISTING SYSTEM

- In the existing web application and its execution platform, i.e., a web/application server, a load balancer, and a database, are transferred from the local data center to the selected cloud infrastructure service.
  - Existing system images vary in many aspects, such as underlying operating system, software inside the software stack, or software versions to fault of variation errors.
  - It is often unachievable to convert an existing web application and its server directly to a VM image format compatible with a certain cloud infrastructure service.
  - The cloud infrastructure services are no detailed comprehensive cost, as well as performance or feature comparison of cloud services exists.

Disadvantages:

- ✓ Cloud computing being a disruptive technology an adoption brings along risks and obstacles.
- ✓ The existing Web application and its platform, i.e., a Web server, are transferred from the local data center to the selected Cloud infrastructure service.
- ✓ Therefore, the Web application and server must be converted into a format expected by a Cloud infrastructure service.

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- ✓ Typically, in this step the whole Web application is bundled as a virtual machine (VM) image. Since it is often unachievable to convert
- ✓ VM image can be chosen for a certain Cloud infrastructure service only
- ✓ In previous systems Clouds does not depends on users. Quality of Service is less effective.
- ✓ There is no security.

PROPOSED SYSTEM

- Typically, in the web application is bundled as a VM image that consists of a software stack, from operating system and software platforms to the software containing the business logic.
- To generate a better local search, the substitution strategy should take advantage of the fact that network traffic is commonly free or cheap when staying within a provider's network.
- A hybrid decision making technique is proposed that combines multi-criteria decision making (AHP) and evolutionary optimization techniques (genetic algorithms (GAs)) for selecting best compute service and comparison VM image.

4.IMPLEMENTATION

Service Providers: Cloud computing is the delivery of computing resources on demand with reduced management effort. It delivers infrastructure, platform and software as services (e.g., Amazon web services) is provided to the user. The application interface accesses the virtual servers and storage hosted by the cloud. PaaS in the cloud is a set of application or software which is hosted in the cloud. The users execute the application in the platforms hosted by the cloud provider through the platform or application program interface. Finally, SaaS model provides both hardware and software infrastructure to the user.A migration from an organization-owned data center to a cloud infrastructure service implies more than service providers.

Cloud Migration: Cloud computing is a disruptive technology and an adoption brings along risks and migration. Such a decision depends on many factors, from risks and costs to security issues, service level and QoS expectations. Clouds provide an infrastructure optimally selected and allocated that can match ICT cost with workload patterns in real-time.

Workload Patterns:

The interface of the cloud to the users through web browsers and computing terminals the ability of cloud resources within few minutes allows matching resources to workload much more efficiently. However, uncertain traffic periods and unexpected variations in workload patterns may result in low utilization rates of expensive hardware the traditional approach of provisioning for peak workloads leads to unused or wasted computing cycles when traffic is low. With the advent of cloud computing, it is expected that more and more web applications will be hosted using cloud-based, virtualized services.

UserCluster: Therefore, clustering models introduced the Analytic Network Process (ANP), which is a generalization of the AHP and represents a network structure of nodes, clusters and loops. It represents the actual implementation of the system and handles all communication and interaction between user and DSS. Using clouds, users are able to access and deploy applications from anywhere in the world at competitive costs depending on user cluster QoS (Quality of Service) requirements. Resource usage can be monitored, controlled, and reported providing transparency for both the provider and the user.

Quality of Services: Cloud Genius is based on a compatible mix of software images to ensure that Quality of Service (QoS) targets of an application are achieved. Also, an automated decision-making process is presented. The framework employs the well known multi-criteria decision making technique, called Analytic Hierarchy Process, to automate the selection process based on the ranking and QoS parameters related to the application.

5. SYSTEM MODEL

Enterprise applications (e.g. customer relationship management, employee payroll, and supply chain management) can typically be decomposed into three software resource layers: i) front-end web servers to handle end-user requests and application presentation; ii) business

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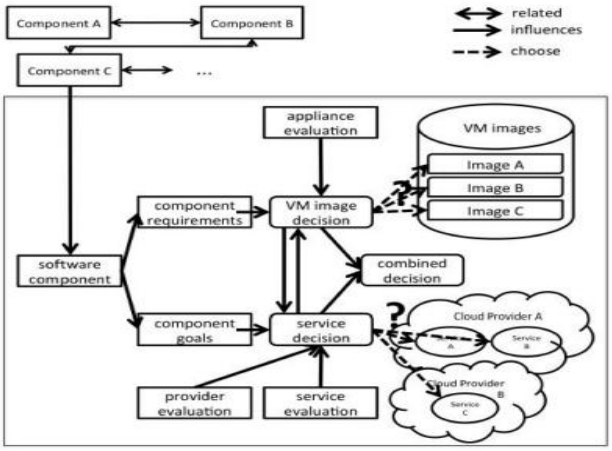
logic to perform specialized application logic; and iii) back-end database servers. The flow of requests between these layers is often complex. Each layer may instantiate multiple software resources; each software resource may need to be replicated on multiple compute resources, while load-balancers distribute requests across each instance of VM images. This creates an enterprise application consisting of multiple components: an IT system formation. Optimal application QoS demands bespoke configuration both at software and IaaS layer, yet no detailed, comprehensive cost, performance or feature comparison of Cloud services exists. The key problem in mapping applications in form of multi-component IT system formations to Cloud resources is selecting the best size and mix of software and hardware resources to ensure that application QoS targets are met, while satisfying conflicting selection criteria [21] related to software (e.g. virtualization format, operating system, etc.) and hardware (e.g. maximizing throughput, minimizing cost) resources. For instance, before mapping a Bitnami's Web server appliance [2] to a Amazon EC2[1] virtual machine instance resource, one needs to consider whether they are compatible in terms of virtualization format(e.g., VMWare, AMI, etc.) and other system-level constraints (e.g., Unix or Windows operating system). Figure 1 depicts the selection problem of migrating multi-component enterprise applications, IT system formations, to Cloud infrastructure services.



6. CONCLUSION AND FUTURE WORK

Cloud services are deployed to provide resources and service components. CloudGenius framework is adapted to handle workload migration for web applications. CloudGenius is enhanced to support migration under hybrid cloud environment. Component dependency analysis, customization and middleware service integration features are added to the system. The web application migration scheme is adapted for the public and private cloud environment. Control flow and data dependencies are analyzed in the migration process. Customization features are adapted in the CloudGenius framework. Workload performances are increased with minimum cost and time

7. REFERENCES:

1. Michael Menzel "CloudGenius: Automated Decision Support forMigrating Multi-Component Enterprise Applications to Clouds" Information Engineering Lab, CSIRO ICT Center Canberra, Australia rajiv.ranjan@csiro.au February 7, 2012
2. 2. Sabrina De Capitani di Vimercati "A Data Outsourcing Architecture Combining Cryptography and Access Control" ACM, (2007). Fairfax, Virginia, USA, November 2, 2007http://doi.acm.org/10.1145/1314466.1314477.
3. 3. Lan Zhou "Achieving Secure Role-Based Access Control on Encrypted Data in Cloud Storage" IEEE TRANSACTIONS ON INFORMATION FORENSICS AND SECURITY, VOL. 8, NO. 12, DECEMBER 2013
4. 4. ManachaiToahchoodee, "A Trust-Based Access Control Model for Pervasive Computing Applications" Department of Computer Science Colorado State University Fort Collins CO 80523-1873
5. 5. Fan, Wenjuan "A Multi-dimensional trust-aware cloud service selection mechanism based on Evidential Reasoning Approach" International Journal of Automation and Computing 2013.