A SURVEY ON HANDLING BIG DATA ISSUES BY IMPROVING PERFORMANCE OF HYBRID CLOUD MANAGEMENT THROUGH AGENT BASED CLOUD COMPUTING FRAMEWORK

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ABSTRACT

Big data is defined as large amount of data which requires advanced technologies and architectures to extract result of analysis process. Big data due to its various properties like volume, velocity, variety, variability, value and complexity put forward many challenges. To handle the Big data issues Scientific Data Infrastructure (SDI) can be naturally implemented using modern cloud based infrastructure services provisioning model. Since the Big data involves some of the sensitive data of users security issues are important. By improving performance of cloud management can be handle Big data issues. Cloud computing yet to solve security challenges.Agent-based cloud computing is concerned with the design and development of software agents for bolstering cloud service discovery, service negotiation, and service composition. To improve performance of cloud computing we need to manage security key issues.

I. INTRODUCTION

1.1 Cloud Computing

Cloud computing is internet (cloud) based development and use of computer technology (computing) whereby dynamically scalable and often virtualized resources are provided as a service over the internet.Whereas many existing works in cloud computing focus on the development of infrastructures and tools for pooling together computational resources, this work

Complements and supplements existing works in cloud computing by introducing "agent-based cloud computing"— applying

Agent-based approaches to managing cloud computing infrastructures.

1.2 Big Data

Big data is a notion covering several aspects by one term, ranging from a technology base to a set of economic models. In this white paper,the following definition of big data will be applied:

"Big data" is a term encompassing the use of techniques to capture, process, analyze and visualize potentially large datasets in a reasonable timeframe not accessible to standard it technologies. By extension, the platform, tools and software used for this purpose are collectively called "big data technologies".

1.3 Agent-based Cloud Computing

An agent is an independent computer system that cans take autonomous decisions on the actions to be performed to fulfill its design goals. In agent-based cloud computing software agents bolster the cloud service discovery, service negotiation, and service composition.

1.4 Cloud Service Discovery

An agent-based cloud search engine module called Cloudle is devised to help in the service discovery by querying against the database of cloud services registered in the search engine. TheCloudle consists of a service discovery agent (SDA) and a set of cloud crawlers. The SDA composed of

1) Query processor, extracts essential keywords in the consumer's requirements

2) Service reasoning module, find the degree of matching between consumer and provider service specification.

3) Price and time slot matching module, determine the rate of matching between customer and provider specification on the price incurred and time schedule.

4) Service rating module, rates the services to be provided by different providers relative to the service specifications of the consumer

SDA refers to the cloud ontology to reason about the similarities of the customer's requirements submitted and the provider's specifications. The cloud ontology maintains the available cloud services for the customers by storing a set of cloud concepts. The cloud crawlers gather information about cloud service providers by visiting web pages serially. Thus the SDA gives out a list of services of providers ordered in terms of the service rates.

II. AGENT-BASED CLOUD SERVICE COMPOSITION

Service composition in multi-cloud environments must coordinate self-interested participants, automate service selection, (re)configure distributed services, and deal with incomplete information about cloud providers and their services. This work proposes an agent-based approach to compose services in multi-cloud environments for different types of cloud services: one-time virtualized services, e.g., processing a rendering job, persistent virtualized services, e.g., infrastructure-as-a-service scenarios, vertical services, e.g., integrating homogenous services, and horizontal services, e.g., integrating heterogeneous services. Agents are endowed with a semi-recursive contract net protocol and service capability tables (information catalogs about cloud participants) to compose services based on consumer requirements. Empirical results obtained from an agent-based testbed show that agents in this work can: successfully compose services to satisfy service requirements, autonomously select services based on dynamic fees, effectively cope with constantly changing consumers' service needs that trigger updates, and compose services in multiple clouds even with incomplete information about cloud participants.

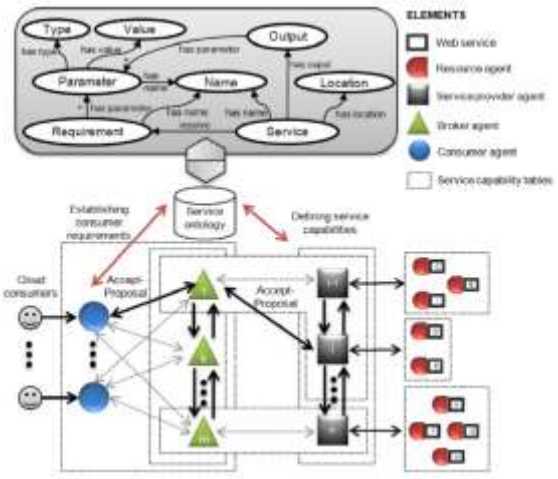

Fig 1: Agent-Based Cloud Service Composition Architecture

The agent-based architecture (Fig.1) is composed of six elements: service ontology, web services, resource agents (RAS), service provider agents (spas), broker agents (bas) and consumer agents (CAS). (1) Web services are interfaces to remote-accessible software or (cloud) resources. (2) The service ontology (fig. 1) provides the service specification that describes the functionality, input and output of services. A web service is described by the requirement it resolves, and the parameters of the requirement correspond to the input of the service. The service output is a set of parameters that results from resolving the requirement. The locations of web services are expressed as URL addresses. The following is an example of a web service definition (3) resource agents orchestrate web services and control the access to them. RAS receive requests to resolve requirements from service providers. Then, RAS handle the requests via their associated web service, returning the output to the service provider. In addition, RAS are used to orchestrate web services and control the access to them to adopt w3c's standpoint that in [54] states that web services should be implemented by agents. (4) Service provider agents manage cloud providers' resources by controlling and organizing RAS. this function is divided into: (i) offering for leasing cloud resources to brokers, (ii) allocating/releasing cloud resources whenever transactions are agreed, (iii) directing and delegating brokers' requirements to appropriate RAS, (iv) keeping track of available resources, (v) synchronizing the execution of concurrent and parallel RAS, and (vi) establishing service contracts with brokers. In addition, spas' functions are designed to endow spas with capabilities to act on behalf of cloud providers. (5) Broker agents compose and provide a single virtualized service to cloud consumers. this is achieved through: (i) receiving consumer requirements, (ii) selecting and contacting a set of possibly heterogeneous service providers, (iii) managing parallel agent conversation contexts that have effect on one or more service contracts (service-level agreements), and (iv) handling consumers' update requests of persistent service compositions. In addition, since cloud service composition can be carried out in multi-cloud environments, bas act as an intermediary between cloud consumers and spas to compose and provide a single virtualized service to cloud consumers from multiple cloud providers. (6) Consumer agents' functions are: (i) receiving and mapping consumer requirements to available cloud resource types, (ii) submitting service composition requests to bas, (iii) selecting the best (cheapest),(iv) receiving and handling the single virtualized service provided by bas to cloud consumers, and (v) submitting update requests of persistent service compositions to contracted bas. In addition, CAS' functions are designed to endow CASwith capabilities to act on behalf of cloud consumers.

III. CHALLENGES AND ISSUES OF BIG DATA

Handling huge amount of data efficiently for arriving at a decision is called big data management. The exact definition of big data can be given using its properties.

i) Volume – the amount of data is characterized by volume.

ii) Velocity – it represents the speed of data coming from various sources.

iii) variety- different categories of data like traditional, structured, semi structured and unstructured data from web pages, sensors, social media, etc. are be handled in big data.

iv) Variability – it refers to the inconsistency of the data flow.

v) Value – efficient handling and filtering of data for a query adds value to the business.

vi) Complexity – it measures the difficulties in linking, matching, transforming, correlating relationships and hierarchies of the data coming from various sources.

IV. CONCLUSION

Agent based cloud computing system enhances the entire functioning of the cloud system. Since the consumer and the provider cannot look over the exact matching of their service specifications, some entity (Agents) can do these things, so that overhead of the consumer and provider will be reduced.

This is necessary for the applications involving the Big data. A dedicated architecture SDI for handling Big data can be much useful in the cloud environment. Since the Big data may involve sensitive information about a company or customer, authorized access to the Big data is more essential. As the user once enters the data into the cloud system, he/she does not have control over the data. A data security confirmation should be offered to the customer who pays for the cloud usage.

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