

Review on Agent based Cloud Computing

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ABSTRACT

Now-a-days cloud computing is the latest technology, which make human life easier by providing different types of essential on demand, affordable services as per the requirements. It provides a different service models. Agent based cloud is related to the design and development of software agent. Software agent providing cloud services like discovery, cloud service composition and service negotiation. The agent is acting as a negotiator between service provider and service consumer.

The owner of documents is motivated to outsource their document to the cloud because cloud provide more flexibility for storage. Cloud support to the E-commerce to gets high security, high performance, affordable low-cost solution, hosted/upgraded by E-commerce provider, easily scalable and it become easily customizable. Agents have maintained a user's details and their requirements for a selected product. According to user's requirements, agents negotiate on some issues like duration, price, volume, quality etc. Once negotiation process is completed, agents provide feedback to the user about whether or not negotiation is successful. According to the requirements of consumer, agents best services of provider to consumer. The agent has adopted focused selection contract net protocol for dynamically selecting the services and service capability tables keep the information about the agent and their services. This paper gives the review on agent based cloud computing, by applying agent based approaches for managing cloud computing infrastructure.

General Terms

Similarity reasoning, Compatibility reasoning, Numerical reasoning.

Keywords

Cloud computing, multi agent systems, software agent, service discovery, service composition, negotiation, resource management ,Cloud Ontology, Cloud crawler, Service discovery agent, Agent based Negotiation.

1. INTRODUCTION

Cloud computing is a new approach that brought revolution in delivering IT Services to meet ever increasing demand for computing resources and to reduce operational costs. Agent based computing is used to developed the infrastructure of the cloud. This review paper consist of Concepts of Cloud

Computing [1], Agent-Based Cloud Computing[1] , Cloud Crawler[5], Cloud Ontology[3][5], Concept of agent based Negotiation[2][8][10][11][12], Agent based Service composition[4][6].

1.1 Agent based computing

In Agent based cloud computing, there are many types of approaches are used to managing the cloud computing infrastructure. The services provided by agent based cloud computing Are:

1) Developed Cloudle - Discovery which dynamically selects the best service by adopting focused selection, contract net protocol (FSCNP) and use service capability tables which store the list of service information about the agent.

Clouds consist of cloud crawler, cloud ontology which related to service discovery agent and three reasoning factors:

- Similarity Reasoning: It is used to determine the similarity between two concepts of counting common reachable nodes.
- Compatible Reasoning: It is used to determine the compatibility between two different softwares.
- Numerical Reasoning: It is used to determine the similarity between two numeric concepts based on labelvalues.

2) An agent based negotiation mechanism can be adopted for cloud commerce.

3) Agent based cooperative problem solving techniques are present in Agent based Cloud service Composition.

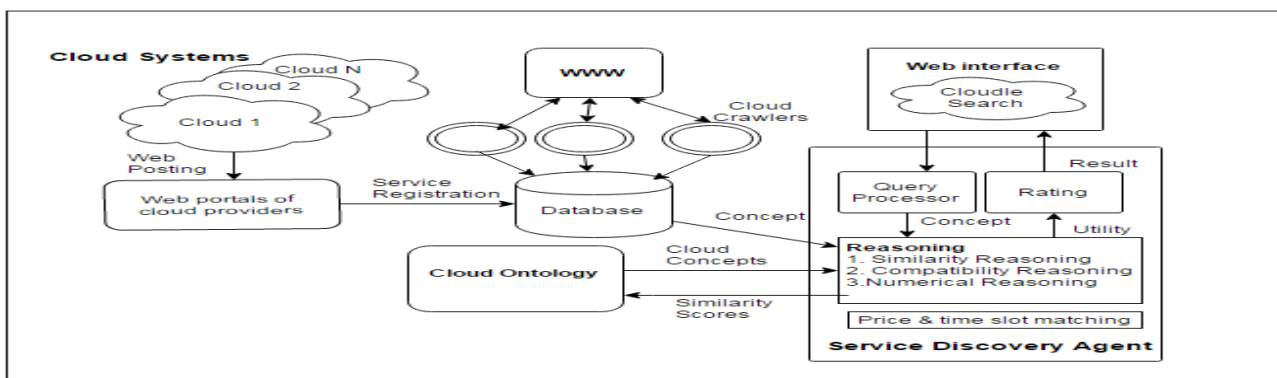
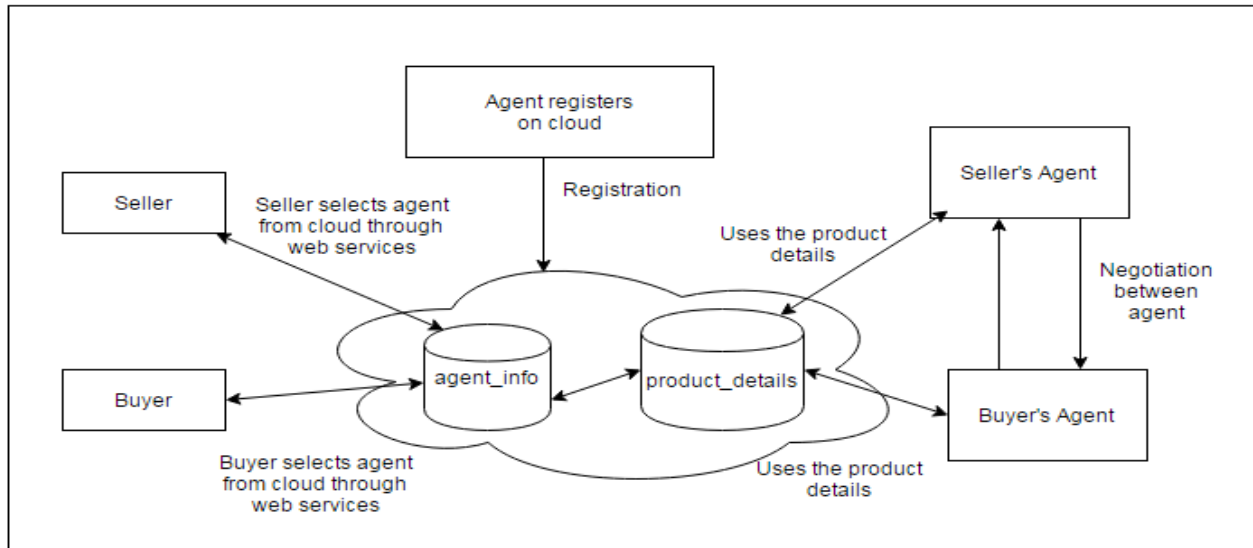


Figure 1: Cloudle Architecture



2. AGENT BASED SEARCH ENGINE

Consumer gives the requirements and on the basis of the consumer requirements search engine gives the best results to the consumer.

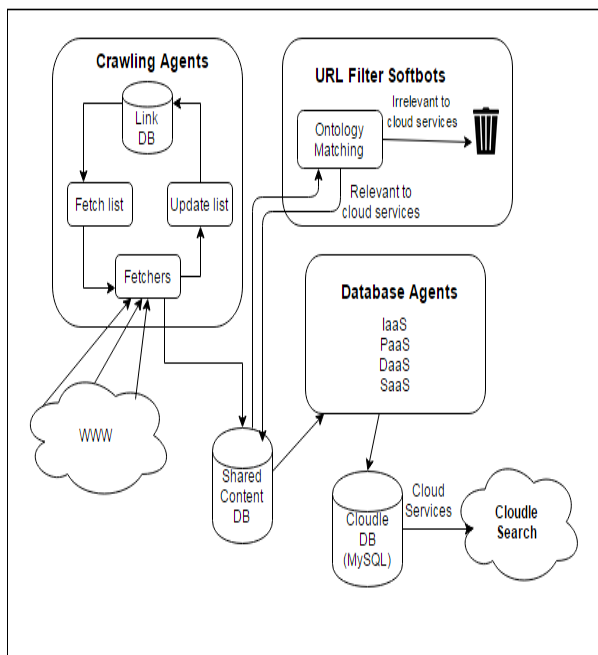


Figure 2. Architecture of Cloud crawler

A cloud crawler is a program which visits websites, scans their web pages and other information and in turn creates entries for a search engine index. Index is speed up the searching process. Here cloud ontology mechanism is used to automate an environment by which software agent discover and consume the services by using FSCNP. Focused selection contract net protocol (FSCNP) is a task-sharing protocol.

3. AGENT BASED NEGOTIATION

In agent based system, agents are act as negotiator. The negotiation process is done by agents through cloud. Cloud is used to store all details of product and agent details. If sometimes buyers is available for doing negotiation but sellers

are busy with their work .In this situation buyer is wait for seller .Hence communication cost gets increases .

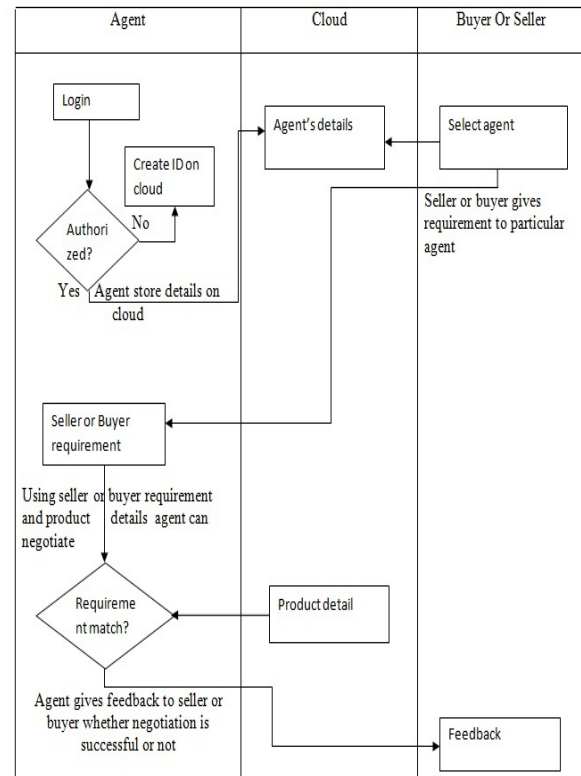


Figure 3. Flow Chart of Agent based negotiation system

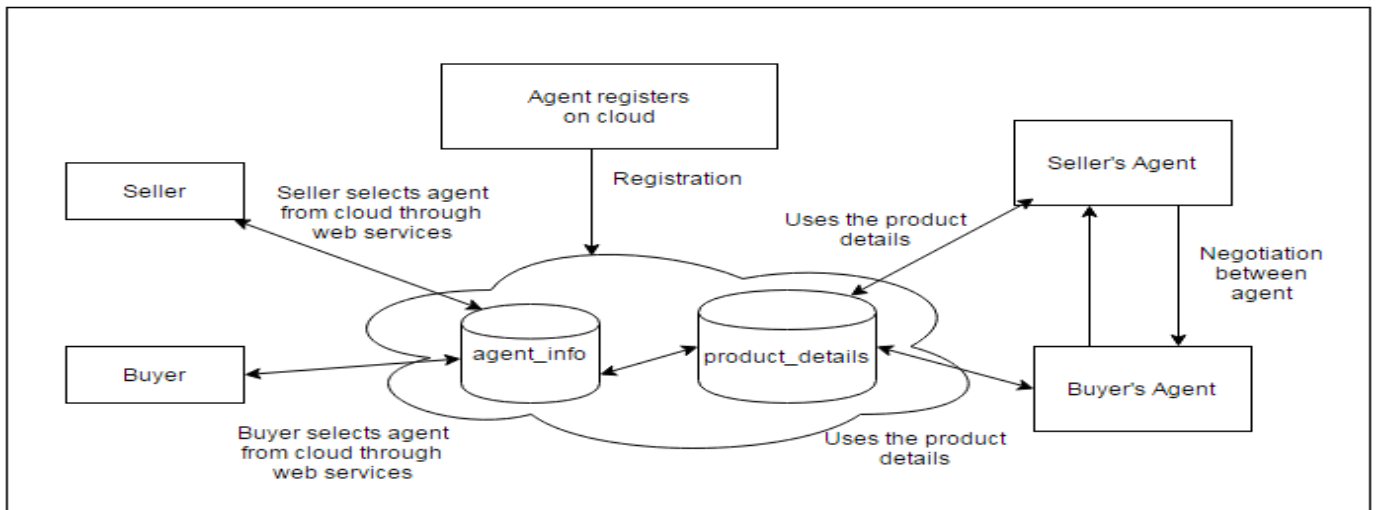


Figure 4. Architecture of Agent based negotiation system

4. AGENT BASED CLOUD SERVICE COMPOSITION

4.1 Types of agents and their functionalities

4.1.1 Consumer agent (CA):

- To submit service composition call-for-proposals to BA.
- To submit requests for incremental updates
- To submit requests for subtractive updates
- To receive expired contracts notifications

4.1.2 Broker Agent (BA):

- To handle consumers service composition requests either from CAs or other BA.
- To submit call-for-proposals to resolve requirements to SPA and service composition requests to other BA
- To virtualizes the service composition
- To submit requests for subtractive updates
- To receive expired contracts' notifications

4.1.3 Service Provider agent (SPA):

- To handle BA and/or other SPA service requests
- To assign requirements to RA
- To handle requests to resolve requirements from RA
- To submit call-for-proposals to resolve requirements to SPA
- To receive results from both RAs and contracted SPA
- To carry out subtractive updates

4.1.4 Resource agent (RA):

- To resolve requirements by orchestrating a web service
- To request external requirements to SPAs

- To release Cloud resources

4.2 Service Capability Table (SCT)

Service capability table holds the information related to the agents and their services. Cloud maintains the table in which it kept the information about cloud participation, agent status. (Like available, unreachable, fail and busy), status of interacting agents and added and deleted agents. When new agent configured with the cloud network, then all information about it are added into SCT.

The services of agents are represented by the consumer requirements they resolve. Thus, the records of SCTs are composed of:

1. Agents addresses,
2. Requirements that agents can resolve
3. Last known status of the service

4.3 Focused selection contract net protocol (FSCNP)

Focused selection Contract Net Protocol (FSCNP) is a task-sharing protocol in multi agent system. The system consists of a collection of nodes or software agents that form the contract net. Manager construct different task for different node. When any composite task assign to node (or for any reason cannot solve the present task) it breaks the problem down into sub-tasks and announces the sub-task to the contract net acting as a manager. Bids are then received from potential contractors and the winning contractor is awarded the job.

4.4 Empirical Results

The empirical results show through the agent collaboration and self-organization, Cloud service compositions can be efficiently achieved and evolved based on constantly changing consumers' requirements, even in Cloud-computing environments where services fees vary based on a supply-and-demand basis, and where no complete information about distributed Cloud participants is available. In agent based Cloud service composition, we focus on demonstrating the effectiveness of adopting agent-based techniques for Cloud

service composition by showing the desirable property that our agents can autonomously and successfully deal with changing service requirements through self organization and collaboration.

5. DISCUSSION AND CONCLUSION

According to this review paper contributes to the field of cloud resource management for facilitating cloud service discovery, service negotiation, and service composition. From the perspective of multi agent systems, this paper gives the review for the application of cooperative problem solving paradigms to automating cloud service composition, complex and concurrent negotiations to cloud commerce, and software agents to building a cloud search engine. To enhance the idea for future work is multi agent system which

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