

## **THE GLOBAL CLOUD OPERATION SYSTEM MODEL**

*The article describes new approach to resolve the problem of distribution the parallel application among multiple cloud services. This new approach is creating new special program level between user applications and cloud services, which task is control and distribution cloud resources.*

**Keywords:** *parallel cloud computing, cloud systems, measured services.*

### **Introduction**

The problems of effective resources distribution are important in parallel cloud computing because of these demands in time and memory resources and because of possible asynchronous subtasks, which are processed within one main task and required time-flexible resources distribution.

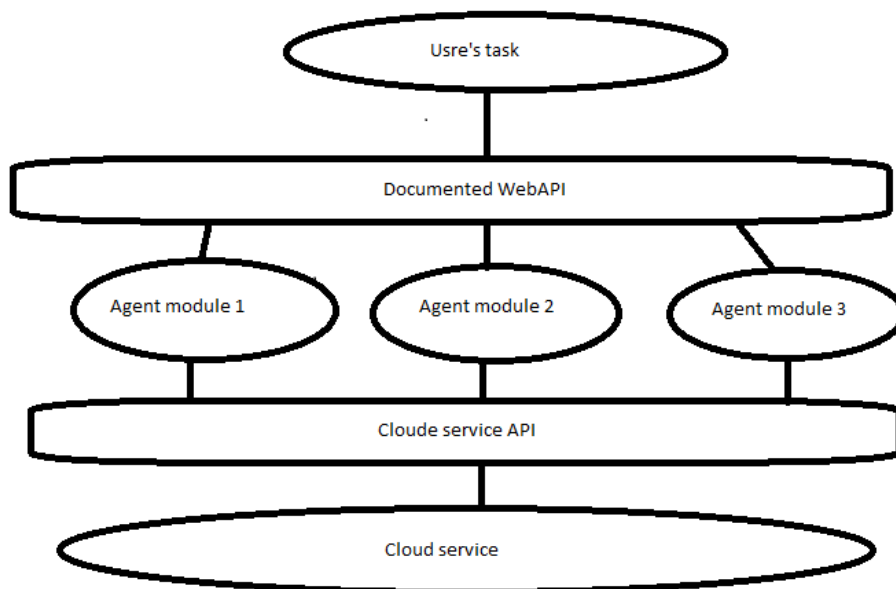
### **The global cloud operation system**

Now the main responsibility of numeric resources measurement, control and monitoring lay on measured services of cloud systems. Cloud systems can use these services for inner resources optimization and distribution.

It is proposed to create a system of control and distribution of resources, regardless of the particular cloud system or technology. It's task is monitoring all existing cloud systems and distribution of resources between user's tasks.

Conceptually it is similar to the operation system on local computer, but globally in scale of the internet. If consider local computer system, than cloud services would be represented as hardware or devices drivers, and user's tasks would be represented as applications on local computer. According to this model, there have to be some middleware like global operation system, which is responsible for distribution all cloud services between user's tasks.

Such global cloud operation system will consist of separated agent modules for measurement, monitoring, analyze and resource distribution. This global cloud operation system will also have it's own API for communication with user tasks (Img1).



*Img1. The global cloud operation system*

### **The agent modules**

The measurement agent modules are built as extensions of measured services and have to detect all available resources of the services.

The monitoring agent modules duty is requesting measurement agent modules on demand and collecting resources statistics.

The analyze agent modules responsible for evaluating amount of resources, needed by user's tasks, and choosing them from cloud services. The analyze agent modules use information about user's tasks demands and about resources statistics, collected by the monitoring agent modules.

The resource distribution agent modules use cloud services API to deploy or stop user's tasks on cloud services, distribute parallel user's tasks between the variety of cloud services.

The analyze and resource distribution agent modules will be used for following duties:

1. Building list of services (or resources pools) available
2. Analysis parallel application parameters and requirements
3. Analysis services (or resources pools) parameters
4. Choose the most proper services (or resources pools) for application from the

list

Distribution and deployment application efficiently between services (or resources pools) were chosen from the list

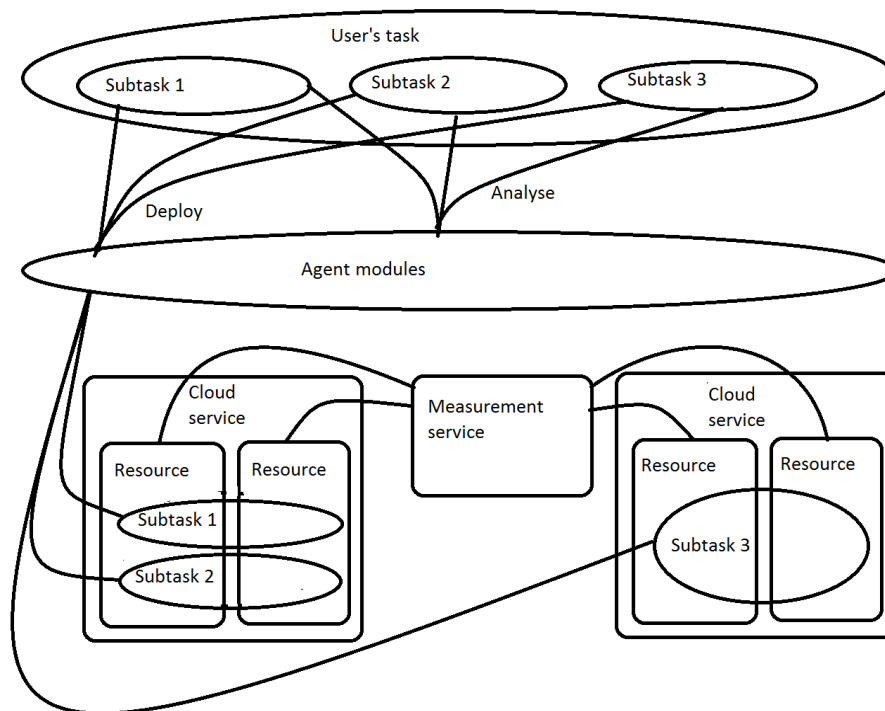
The agent modules in the global cloud operation system will play such role as tasks planner on local computer.

The agent modules in the global cloud operation system could be built on ASP.NET platform as WebAPI services with standardized and documented API, which would allow them to communicate each other through standard HTTP requests and take HTTP or (more often) AJAX responses with standardized response format.

### Deploying user's task

Deploying user's task on cloud services is shown on img 2.

As we can see, user's task was distributed between two different cloud services and used more than one different resources.



*Img2. Deploying user's task*

## **Conclusion**

Finally, the conclusion is that we will have global internet operation system for manipulating all cloud resources and provide them to all applications

### *Sources*

- 1. Gerald Kaefer "Corporate, research and technologies", Munich, Germany, 20<sup>th</sup> May 2010*
- 2. Sun Microsystems "Introduction to cloud computing architecture", June 2009*
- 3. Gerd Breiter "Cloud Computing Architecture" August 2010*
- 4. Jaliya Ekanayake , Xiaohong Qiu, Thilina Gunarathne, Scott Beason, Geoffrey Fox  
Pervasive Technology Institute, School of Informatics and Computing, Indiana University  
"High Performance Parallel Computing with Cloud and Cloud Technologies"*