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DISTRIBUTED COMPUTING SYSTEM BASED ON MOBILE PROGRAM CODE

Distributed computation [1] presents one of the most efficient data processing and storage methods. Examples of applications and development of distributed computing can be mentioned as Cloud Computing [2] and Big Data [3], which offer a set of services and computing applications, access to information and data storage.

Objectives of the paper: The research aims to develop a distributed data processing method for data located on a set of servers using mobile program codes that are teleported from Users (Agents) to the Server, where large amounts of data are stored (Big Data), to extract the necessary information or knowledge.

Solving of the objectives. Let's define a set of Agents $A = \{a_1, a_2, \dots, a_N\}$ which activates in the environment $E(X) \in R^K$, where K is the dimension of space and $X = \{x_1, x_2, \dots, x_K\}$ - the state of the activity environment. For each Agent a_i is defined the strategy $S_i = \bigcup_{j=1}^{J_i} (O_{i,j})$, $i = 1, \dots, N$, where

$O_{i,j}$, $j = 1, \dots, J_i$ is the set of Objects (programs) that solve the strategy S_i , and $\bigcap_{i=1}^N (S_i) \neq \emptyset$. In the space

E is also defined the set of Servers $C = \{c_1, c_2, \dots, c_L\}$ that have sufficient computing resources and data storage $D = \{d_1, d_2, \dots, d_L\}$, where $d_l = f_l(X)$ is the quantity of data stored on the Server c_l that determines the state of interest of services offered by server to the activity environment E . Each Server c_l , $l = \overline{1, L}$ is ready to host at necessity, Objects $O_{i,j}$, $i = 1, \dots, N$, $j = 1, \dots, J_i$, to execute and to return the result to Agent which are transmitted (submitted) to the Object to execution.

Functionally, the system for distributed data processing on mobile program codes consists of three sets of Objects: Agent Objects, Server Objects and Result Objects:

- An Agent Object $O_{i,j}(D_A, M_A)$ consists of D_A - the Agent data set (keywords) and M_A - the set of methods for processing data stored on the Server;

- A Server Object $C_l(D_S, M_S)$ consists of $D_S \subset D$ - the set of data stored on the Server and M_S - the set of methods for hosting, executing, formatting and returning the result to the Agent;

- A Result Object $R_{i,j}(D_R, M_R)$ consists of D_R - the result of processing data on the Server based on the methods M_A and M_R - the set of methods for processing the data D_R returned to the Agent.

The functionality of the system is determined by the following relationships between sets of Objects:

- $M_A : D_S \xrightarrow{D_A} D_R$ - the set of methods M_A processes the data set D_S and generates the set of data D_R using as criterion the processing D_A set;

- $M_S : M_A \xrightarrow{D_S} M_R$ - the set of methods M_S processes the set of methods M_A and generates the set of methods M_R using the structure and content of the data D_S .

Conclusions: The distributed data processing method based on the mobile program code will be used to solve the problem of searching in large amount of information (Cloud Storage Systems, Big Data Systems) for automatic extraction of summaries of the texts.

List of references

1. Ghosh, Sukumar. Distributed systems: an algorithmic approach. University of Iowa, Chapman & Hall/CRC, 390p., ISBN:1-58488-564-5.

2. Lewis, Grace. Basics About Cloud Computing.

<http://www.sei.cmu.edu/library/abstracts/whitepapers/cloudcomputingbasics.cfm> (2010).

3. Mark A. Beyer and Douglas Laney. The Importance of 'Big Data': A Definition. Gartner, (2012).