

DATA CENTERS IN THE SCIENTIFIC INFORMATION INFRASTRUCTURE

E.A. Isaev^{1,2,4,5}, M.B. Amzarkov^{2,3}, V.D. Pugachev^{1,2,5}, V.A. Samodurov^{1,2}, R.R. Sukhov^{2,3},
N.A. Kobylka^{2,4}, Yu.A. Tarasova², E.Yu. Assur⁵

¹ Pushchino Radio Astronomy Observatory ASC LPI, Pushchino, Russia, *is@itaec.ru*

² National research university Higher school of economics, Moscow, Russia

³ Uptime Technology INO, Moscow, Russia

⁴ Stack Group, Moscow, Russia

⁵ Itaec, Pushchino, Russia

ABSTRACT. There is a multiple increase of the volume of scientific data obtained in the course of research each year. Due to this there is a need for continuous improvement, such as data transmission channels and systems for handling and storage of scientific data. For example, data centers show current centers and storage of scientific data and advanced technology in this area, in particular the "cloud" technology. Particular attention is paid to the information infrastructure for data centers storing scientific information.

Key words: Data center.

Due to the multiple increase every year volumes of scientific data collected during the research, there is need for continuous improvement of channels for the transmission of such data as centers of scientific data.

The structure of a typical data center consists of:

1. Information infrastructure that includes server hardware and provides the core functionality of the data center - data processing and storage.
2. Telecommunications infrastructure for the interconnection of elements of the data center, as well as transfer of data between the data center and users.
3. Engineering infrastructure for the proper functioning of the main systems of the data center.

Classification of data centers:

- a) in size;
- b) the reliability;
- c) for other purposes.

In more detail a typical example of a scientific-buffered data center data center space project "Radioastron"

on PRAO ASC LPI (www.prao.ru). Data center is located in the building of an international test site project space radio telescope "Radioastron." For the placement of the data center has been allocated a special room where the server onto your mounted, uninterrupted power supply and cooling system. Data center PRAM has two storage servers with a capacity of 24 and 48 terabytes.

The next example of a modern data center is a parallel computing system (cluster) Pushchino Research Center (PSC), RAS, which was established in 2000 by the Institute of Mathematical Problems. The necessity of his appearance dictated by the demand solutions to many demanding computing tasks assigned research and educational groups PSC RAS.

Then move on to a modern network of commercial data centers Stack Data Network (SDN), which is Russia's first fault-tolerant network of data centers, in the design and development of which international best practice and experience of DC-outsourcing in Russia are reflected. Network uptime data centers SDN ensure geographical remoteness of its nodes and highly redundant core engineering systems (according to a N+1). One of the five data centers is located in the city of science SDN Pushchino. Pushchino and institutions have Sciences Centre's start to use these computing resources.

As an overseas data center is a typical example of the Harvard-MIT Data Center (HMDC, www.hmhc.harvard.edu), who is a member of the Institute IQSS. It was created in the early 1960s as a data center for Political and Social Sciences at Harvard University. Over the years into a HMDC information service and technology provider for social research and education for many departments, centers and research projects at the Faculty of Arts and Sciences and other schools at Harvard.