DATACENTERS ON MOON

ABSTRACT

Data is a crucial part of the present world; users save the data either in their physical devices or on the cloud. The cloud data will be stored in the data centers and these data centers are present in the unknown location and thus, the users believe that the data present in the data canter is secured. The location of the data centers is usually not revealed so that the location is unidentified, and the data will be safe. The supercomputers are used in this data center. The data center occupies a large space to store all the servers and other data storage capacities, this will emit a large amount of heat and which uses more effects of the environment and humans also. What if the data centers are present on the lunar surface or on the process of which the space on Earth and the heat are reduced? My paper is about building the data centers on the moon. The moon is 384,400kms away from Earth, the satellites are present on the space the communication will not be a problem in this state. Since we get the communication through the satellites this will be easy to get in the process of building the data centers on the moon. The moon's surface will be helpful to make the simple data centers and can be useful in having the data stored with the help of satellites that are in communication with the moon and the ground station on the earth. Through that, the communication will not be blacked out. The data center servers are to be remotely accessed.

INTRODUCTION

Data centers are simply centralized locations where computing and networking equipment is concentrated to collect, store, processing, distributing or allowing access to large amounts of data. They have existed in one form or another since the advent of computers.

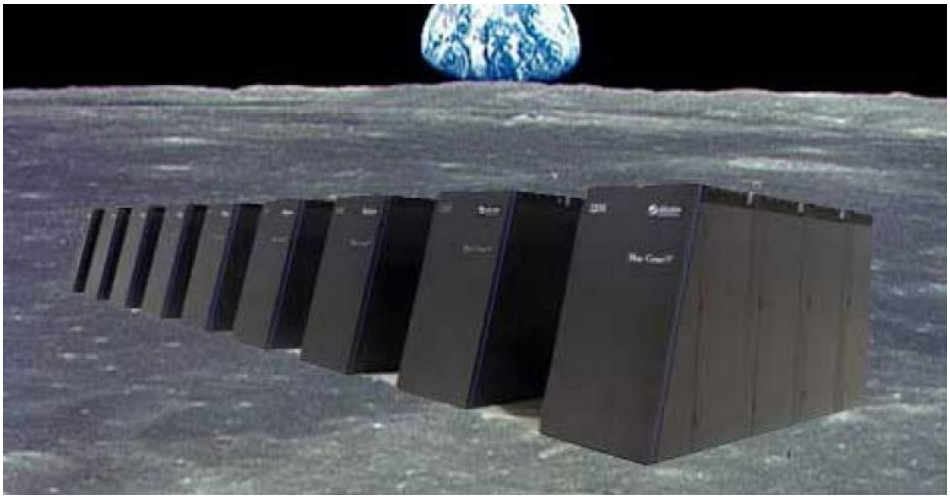

FIG-1. IMAGINARY DATA CENTER ON THE MOON

In the days of the room-sized behemoths that were our early computers, a data center might have had one supercomputer. As equipment got smaller and cheaper, and data processing needs began to increase -- and they have increased exponentially we started networking multiple servers (the industrial counterparts to our home computers) together to increase processing power. We connect them to communication networks so that people can access them, or the information on them, remotely. Large numbers of these clustered servers and related equipment can be

housed in a room, an entire building or groups of buildings. Today's data center is likely to have thousands of very powerful and very small servers running 24/7.

Because of their high concentrations of servers, often stacked in racks that are placed in rows, data centers are sometimes referred to as a **server farm**. They provide important services such as data storage, backup and recovery, data management and networking. These centers can store and serve up Web sites, run e-mail and instant messaging (IM) services, provide cloud storage and applications, enable e-commerce transactions, power online gaming communities and do a host of other things that require the wholesale crunching of zeroes and ones.

The data centers usually consume large space covered and since the population of the world is enormous and each and everyone has a smart-devices and the data that is stored is also huge. The data centers are the places where they store the data and these data will be used on the devices and nobody wonders where the data is stored or in which data centers the data is stored. This data can also be stored is a compressed and less amount of storage is involved by storing them as the radio signals and what if the data centers are located on the lunar surface or in the space?

The temperature of the moon is 127 degrees heat and 173 degrees cold this is a massive temperature the servers have to withstand the heat in which the servers need to be made with the satellite’s materials or the servers need to be made using the plastic combined with composite fiber and aluminum in which the servers will be light-weight and can withstand the pressure of the temperature.

The communication of the data centers and the satellite is made using the routers that can catch the signals of the satellite and the satellite to catch the servers

signals. The connectors can be of copper wires or the fiber optics inside the servers to communicate.

Another reason that might be useful to throw a Data Center on the moon would be as a test for building and operating complicated electronics in places that are not shielded by magnetic fields. Bit Rot could become a serious issue on the moon and developing techniques to fix those isn't something that can be easily simulated on earth.

The power source for these data centers is the solar panel. Unlike Earth, the moon will get the sun rays even night using this solar ray the electricity can be built and the rays will help give the power source to the data centers.

The working model of this data center is, the data will be sent through the radio signals and these radio signals will go to the ground station where the ground station makes this data into the radio signals to receive from the ground station to the satellite. Then, the satellite will send these radio signals to the ground station present on the moon and this ground station will be connected to the data centers to store the collected information on either way that is from the data center to the user and user to the data center.

The advantages are as follows:

- The Earth's forests and other resources will be saved.
- The pollution will be free from the heat that comes from the servers will be cooled down with the moon's temperature.
- The data must come from the satellite where the routers must take the position of the satellite and must get the data, the data will be sent to the nearby satellite and satellite will be sending the data to the devices.

- The backup systems will be present on the moon and thus, if any problem occurs then the data will not be lost.

The challenges faced are as follows:

- Deploying IT equipment on the moon is the weight. A large-scale system would have to be designed with lightweight, energy-efficient components, as each additional pound of payload requires additional fuel to be launched into space
- The moon’s gravity is very low which leads to attracting any object or the meteoroid that is passing on the moon, hence damaging the infrastructure that is built.
- The oxygen level on the moon is low hence, without the space suite the operators cannot go out of the shuttle.

LITERATURE SURVEY:

John Rath looks at a unique engineering challenge about placing the supercomputers on the moon.

EXISTING SYSTEM:

There are no data centers that are present on the moon. The only breakthrough is that the data center can be on the moon where the temperature can also be taken care by the atmosphere.

PROBLEM STATEMENT:

The only problem is that we do not know if there is water on the surface of the moon if there is water then that water can be used to cool the servers, if there is no water then the roofs has to be opened up and since the lunar gravity is less it has the tendency to pull out the meteoroids that are passing in the gravity of the moon

ARCHITECTURE:

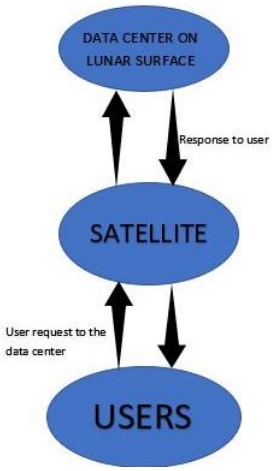

Fig-2 architecture

USERS:

The users are the end-users where the data will be updated by them. The users will have to select the data and upload it to the data centers. The transfer data used here are through radio signals, where the satellite can communicate to the users and helps in connecting the users to the data.

SATELLITE:

This is the main communication system where the data will be transmitted to the data centers and the respective devices. This transmission is taken care of radio signals, where the satellites can also act as a data fetching mechanism.

LUNAR DATA CENTERS

This is the final stage of the data centers where the data will be stored. These data centers will have a transmitter to change the radio signals to the digital signals to view the data.

ER- DIAGRAM:

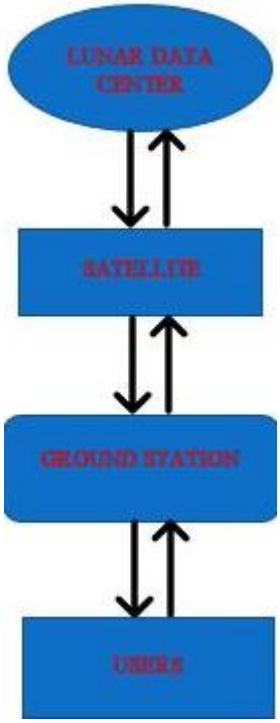

Fig-3 ER model

REQUIREMENTS:

Routers: A satellite router is an Indoor Unit (IDU) that contains a modulator and a demodulator and is one of the essential components of a VSAT.

Switches: multi switches

Storage systems, servers, and application delivery controllers.

IMPLEMENTATION:

Datacenter components:

- routers,
- switches,
- firewalls,
- storage systems,
- servers, and
- application delivery controllers.

These components are built on the moon using the self-healing cloth. The first synthetic ionic conductor – a transparent, self-healing, highly stretchable material that allows ions to flow through it which can be used as the transmitting medium to the users. Due to which if any meteoroid strikes also it can self-heal itself back to the normal position. There must be a miniaturized ground station where the data will be transmitted to the data center. Similarly, the ground station will be inbuilt in all the devices nowadays can be helpful to read all the signals that come to the data.

There must be a backup system that is to be placed on the Earth. So that the data will less interrupted and will have less downtime.

RESULT:

Once the data center is fixed or placed on the lunar surface then the data transmission will be taken place by satellites and thus the communication will be there without any interruption. The data will be stored in the form of binary digits and the servers can run with lesser downtime and will be available all the time. This can be helpful to improve the earth by not destroying the forests and helpful in building a new eco-friendly environment, the pollution rates will go down by some percentage. This also can help in growing trees in the place where the data centers are located.

CONCLUSION:

Finally, I conclude that this thesis will b helpful in taking the data centers to the moon and placing them in the lunar surface. Which helps the environment to heal and thus any data that is present will be safe and can be monitored. Thus, it reduces pollution and helps in making the files to an easy approach.

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