ISSN 2348-1196 (print)
International Journal of Computer Science and Information Technology Research ISSN 2348-120X (online)
Vol. 8, Issue 3, pp: (282-283), Month: July - September 2020, Available at: www.researchpublish.com

Toward Green data Centers for large enterprises

Hani Alsulaiman

Saudi Aramco, Dhahran, Saudi Arabia

Abstract: **Demanding for more computing services in our communities and enterprises has become a necessity with the continuous growth and expansion of organizational data and information, which had led to exponential growth of cloud and storage services. That causes significant increase in power consumption to meet all demands, and further in resulting an environmental impact and increasing pressure on energy sources due to inefficiency. For all of these reasons, it becomes mandatory for Computing Data Centers to follow a green policy and to be extremely conscious of the carbon footprints of their managed services and hosted facilities. This article highlights the importance of achieving green data centers and best practices to green up.**

Keywords: **green data centers, computing services, communities, power consumption, green policy.**

I. INTRODUCTION

Carbon emission, Energy inefficiency and environmental impact are all core factors contributing negatively to any computing data center due to the huge amount of running facilities to process all kind of critical data to enterprises. The continuous growth and expansions of computing hardware trend is directly impacting the initiative of green data center considered by enterprises that are always after reducing energy high bills and carbon footprint. Proper Design, alternative energy approaches and materials used are all factors towards a green data center.

II. WHAT IS GREEN DATA CENTER

A design of server facility with an efficient energy and a minimum impact on environment can well define green data center term. Having said that makes riding on green technology is essential in operating any data center. With the higher demand of storing data and operating systems to execute different business needs, there is a requirement to sufficiently operate the servers infrastructure with large amount of energy including high power consumption and carbon emissions due to utilizing computing facilities such as monitors and consoles in addition to the fans and cooling systems to efficiently run all around the clock.

III. STRATEGIES TO BECOME A GREEN DATA CENTER

The ultimate goal of following all best practices to green up data centers is to reduce energy consumption, which is the main impact on environment as well as enterprise finances. Therefore, ongoing efforts to achieve a noticeable Energy costs savings is always present in different ways. This section of the article highlights main aspects to achieving green data centers.

- **Replacing Obsolete devices:**

Obsolete devices such as servers, storage appliances and network devices are all degrading as time passes by and that causes in an inefficiency energy consumption due to requirement for more energy to keep up operating. Replacing old devices with new ones would lead not only to achieving more capability but also more efficiency in power consuming.

Expansion and upgrade projects result in allocating adequate locations and further in creating dead space for obsolete devices, which would draw more power and cooling units. Another good practice that comes along with replacing the obsolete devices is the cables housekeeping practice. Unfortunately, many projects upgrades end up having tons of cables

laying down under the floor or on top of ceiling cable trays. Network patch panels would still be allocated and would deliver the message of still-being-used, which may result in adding up more network appliances to take the extra load. That would also introduce an overhead to the energy inefficiency factor. It is highly recommended therefore to perform a periodical cable cleanup activity to rid off the excessive amount of non-used and obsolete mesh that lowers energy consumption, and the overall related costs.

- **Periodical Baseline Audit for Energy**

Conducting Baseline Audit for Energy efficiency in a regular basis is one of the best practices to achieving a green data center. This initiative shall assist in better efficiency of running devices and further in providing an excellent overview of the future capacity planning. Thorough investigation and analysis should target each and every aspect of the deployed systems, in individual basis, as there are many systems servicing multiple organizations. That would help in being proactive in detecting possible inefficiencies and fixing resulted factors of degradations.

- **Riding on Cloud Services:**

Cloud services enable running multiple applications that used to run in dozen servers on top of one server instead. This will reduce the number of running facilities and allocated space for devices, resulting in major reduction in cost and wise usage of energy deriving utilities.

- **Power Usage Reduction**

Power use is the main driver of cost for data centers, given all running facilities 24/7 operations. According to Gartner, 10 percent of steady yearly increase of ongoing power cost is due to the high mandate to powerful high end servers, which draws in more cost per kilowatt-hour. 'Currently, the report states, power costs comprise 10 percent of data center's OpEx, and they are projected to increase to 15 percent within five years.' [2]

Usage of power can be reduced by lowering the amount of energy demands to operating all data center devices and facilities. Majority of the percentage of payload power goes to servers operation. It is the job of data center facilities managers to decrease this power drain by upgrading running services through replacing obsolete servers with newer models. Also they should consolidate and virtualize workloads and servers.

Cooling Optimization is another main factor behind draining power sources in data center. It's been always a challenging task to find alternatives cooling sources that would contribute to more efficient data center operational cost as it is significantly impacting the power use.

IV. CONCLUSION

The IT industry has always looked into various ways to green up data centers through adopting more efficient energy equipment and via reducing environmental impact factors in the past few decades. More importantly, organizations that embrace "greening up" data centers are able to create less expensive infrastructure, as well as wiser energy consumption methods, creating a greener environment for everyone.

REFERENCES

[1] The future of data centers is green: February 26, 2019, from https://www.datacenterdynamics.com/en/opinions/future-data-centers-green/

[2] 5 Steps to a Green Data Center: February 16, 2018, from https://www.facilitiesnet.com/datacenters/contributed/5-Steps-to-a-Green-Data-Center--40635

[3] Seven steps to a green data center: Apr 21, 2007, from https://www.computerworld.com/article/2544831/seven-steps-to-a-green-data-center.html