The Future of Data Centers

Why We Need Data Centers

Data is growing exponentially and we have to keep up. This phenomenal growth rate is partly due to the increasing number of internet users and their media consumption habits. In the United States alone, 70 percent of consumers binge-watch TV. Half of them subscribe to streaming media services, which use up a lot of bandwidth. Video-sharing sites are also extremely popular. People are uploading their own clips high resolution. Traditional modes of delivery are being challenged and everyone is gearing up to compete in this new frontier.

The Millennials are leading the charge in the realm of social media. They value interactions in this medium as much as in-person communication. The level of activity in this space is incredible, especially when compared to other forms of online exchange. For example, Gmail gets about a billion active users every month while Facebook serves roughly 1.23 billion active users every single day. With 88 percent of US adults using the internet and 73 percent having broadband service at home, the amount of data will only continue to rise. It is estimated that there will be 44 trillion gigabytes and 30 billion devices connected by 2020.

The Need for Data Centers Rises

The number of data centers in the US has breached the 3 million mark. That's roughly one for every 100 people in the country. Google is at the forefront of this technology with a decade of experience building its own centers. It used to rely on others but the business outpaced the capabilities of traditional equipment. The search giant turned inward for solutions and changed the game in the process. The company pushed the boundaries of performance and came up with a network design that is 100x faster than the previous generation.

Getting Help from the Cloud

Cloud computing is a major driving force in the advancement of data centers. This industry will continue to have a profound influence on how the technology will evolve over the years. Note that most data centers are located within small and medium-sized businesses. Cloud providers own some of the largest ones but these make up less than 10 percent of the entire server market. Their share is projected to surge in the coming years as more companies shift to the cloud for their storage and computing needs. In fact, increasing cloud adoption may double the size of the data center industry early in the next decade.

Experts predict that 92 percent of workloads will be processed in cloud servers by 2020. About 68 percent of these will be in public data centers. There are many reasons for these optimistic forecasts. Many believe that cloud computing is the future because of its numerous benefits. It provides broad network access, resource pooling, on-demand self-service, rapid elasticity, and measured service. A business that is experiencing rapid growth will have no problems keeping up with the demand. They can expand their resources quickly as the infrastructure is ready and waiting. They could also reduce utilization during lean times just as easily.

The Smart Use of Power

Power is a vital issue in the industry. Data centers feature row upon row of servers that run 24/7. Since they generate a massive amount of heat, round-the-clock cooling is necessary to prevent breakdowns. They also need lighting throughout the facilities for monitoring and maintenance purposes. Peripheral support systems have to be considered as well. Add these up and you begin to realize the staggering amount of power required to keep our modern world going. In 2013, US-based server facilities consumed about 100 billion kWh in total. This is roughly 2 percent of the electricity consumption in the country for the whole year.

It is equivalent to the generating capacity of 34 large coal-fired power plants. That is enough energy to provide the electricity needs of all household in New York City for two years. The federal government is a substantial contributor to this total as well. Roughly 10 percent of its overall electricity consumption can be attributed to its own data centers. This is a problem that both the public and private sectors are trying to solve, particularly given the expected growth over the coming decades. There is a strong drive to improve efficiency and reduce wasted energy. Around 30 percent of servers are considered functionally dead because they get energy despite delivering no useful information. Eliminating waste would dramatically decrease power consumption across the board.

The Road to Efficiency

Just a 20 percent boost in efficiency will allow the US to save 20 billion kWh of power or an equivalent of $2 billion each year. Various initiatives have been launched to encourage efficiency upgrades like the Better Building Challenge of the Department of Energy. Partners have completed upgrades in 9,000 facilities and these have resulted in aggregate savings of $300 million. Similar programs exist throughout the country with varying focus points, costs and outcomes. There is no shortage of solutions for those that are willing to face the problem head on.

Companies that manage these facilities are also encouraged to implement other proven methods for enhancing efficiency. These include the smart management of air flow, the use of data center micro-grids, the separation of aisles based on operating temperature, and the implementation of power proportionality methods. Some advocate raising the indoor temperature while staying within the recommended range. Just a single degree of adjustment could result in major annual savings. For new buildings, the design can be improved to depend more on outside air for cooling rather than air conditioners. Managers should study the feasibility of each method for their businesses.

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