Essay Final Project

CS325

Granit Rozhaja

In this essay I have been asked to cover a topic that is relevant to “distributed applications” and when I actually started searching about topics I saw that a lot of departments in our day to day life are done through distributed applications. First of all, a distributed application is a program that can run in more than one computer and can communicate through a network with different devices **(Indiana University,2019).** In this essay I have decided to discuss about distributed applications through Network Applications where we can find the most resemblance in our day to day life.

Any network-connected device may provide services to another network-connected device using peer-to-peer (P2P) technology. A computer in a P2P network can provide access to any resource it has, whether it's documents, storage space, processing power, or other resources. It has its own individual operator, too. In a peer-to-peer network, the interface may be anything from a computer to a smartphone. From super computer to PDA. P2P technology is a strong and impressive extension of the Internet's ideology of decentralization and robustness **(Sharma, 2010).** The key benefit of P2P networks is that they share the responsibility for providing services to all peers on the network, eliminating service outages caused by a single point of failure and allowing for a more flexible solution for providing services. Furthermore, P2P networks take advantage of available bandwidth across the entire network by using a number of communication channels and filling ban bandwidth up to the brim of the Internet. Unlike conventional client/server communications, which can cause particular routes to common destinations to become overburdened (for example, the path to google.com), P2P allows connectivity over a range of network routes, minimizing network congestion **(Sharma,2010).**

Being as complicated as it is, a distributed system, obtains various functions such as resource sharing whether it is software, hardware or data as other computer systems. What is more, consistency is another factor attained by these systems, which can be observed by the above-mentioned example with the databases, where, multiple machines can process the same function simultaneously **(Distributed Systems - The Complete Guide, 2020)**. This process can be done through horizontal scaling, a feature of distributed systems, which means adding more units, opposite to vertical scaling which tries to upgrade each unit. However, the problem with scaling vertically is that the number of items streaming through the system is substantial for each unit to work perfectly even after being upgraded **(Kozlovski, 2018)**. Another function that cannot be overlooked is fault tolerance by which the server continues to work, even in cases when, and other parts of the systems are faulty. Thus, failures in the system can be easily inferred and recovered **(Distributed Systems - The Complete Guide, 2020)**.

The World Wide Web (WWWW) is an effort to describe a user-friendly interface to all of the various Internet resources that can be used by people with no prior knowledge of computers. Furthermore, regardless of the type of device, operating system, or service requested, this interface should be universal **(Heylighen, 1994).**Tim Berners-Lee, of CERN, created the World Wide Web in 1989. (the European Centre for High-Energy Physics in Geneva). Initially conceived as a communication tool for elementary particle physicists who needed to send large quantities of data across countries and continents, the WWW soon proved to be useful for all forms of networked communication. After a slow start in which the basic protocols were defined and tested in a few specialized computer centers, the use of the World Wide Web skyrocketed in 1993. This was largely due to NCSA's implementation of the widely used Mosaic client program (the US National Center for Supercomputing Applications). In 1993, the growth rate of WWW-traffic hit an all-time high of 340,000 percent, or magnitudes higher. The growth rate of WWW-traffic in 1993 was an astounding 340,000 percent, which is orders of magnitude higher than any other Internet service! More and more people tend to assume that the WWW will replace all other Internet networking networks, thus becoming the global network's GUI **(Heylighen, 1994).**

In conclusion, distributed systems and applications, have a vast usage in every area of our lives, from peer-to-peer networks to the WORLD WIDE WEB. Their ability to divide into a large number of networks, thus decreasing the complexity of a process by having each network with their own way of giving and receiving data, is what makes such systems needed in these sectors. With the only significant disadvantage being the communication between the various methods, researchers and scientists continue to conduct several applications in order for distributed systems to work in the utmost optimal way.

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