Network Attached Storage

Kashif Shaikh[1], Samarth Soni[2], Vansh Shah[3], Karan Thakkar[4], Ketaki Belwalkar[5]

[1]Professor, Dept. of Computer Engineering, Thakur Polytechnic, Maharashtra, India
[2,3,4,5]Student, Dept. of Computer Engineering, Thakur Polytechnic, Maharashtra, India

---***---

Abstract- *In the IT world storage becomes a serious issue. Data storage systems are the bedrock on that a modern company rests. Knowledge must be accessible to whoever wishes it, whenever they have it, from wherever they will be. As a result, emphasis is starting to shift from a processor central world towards a storage central one. It's the data that holds the important value, the processor just exposes it. Realizing this, model needs a storage system which will give continuous, secured accessibility to doubtless. Vast quantities of shared data, with protection against each malicious attack and accidental failures, and quality across an outsized vary of capability and performance needs. Network based storage, combined with good storage management, will give it. This paper focuses on the tested approaches in network attached storage and their future use.*

Keywords: **Intel Pentium g2020 processor; EasyNAS; Hard disk 1.5 TB Raid 0 array; 6 GB DDR3 RAM; 32 GB Bootable Pendrive.**

1. INTRODUCTION

Computing is based on information. Information is the underlying resource on which all computing processes are based on. Information is stored on storage media and is accessed to all applications executing on a server. Often the information is a unique company asset or quality. Information is created and acquired every second of a day. Information is like a currency of business. To ensure that any business delivers the expected results or expected products, they must have access to accurate information, and without any delay. The management and protection of business information is important as well. Fortunately" Network Attached Storage" is becoming a common way to defeat this problem. A network attached storage system helps to organize and save critical and confidential information created on a computer in an efficient and accessible manner to valid persons.

2. EXISTING SYSTEM

Network-attached storage (NAS) is an IP-based file-sharing device attached to a LAN (Local Area Network). NAS serves as a clients and as well as a servers over an IP network. A NAS device uses its own operating system and integrated hardware and software components to meet a variety to meet user's needs. Network attached storage (NAS) enables server merging by eliminating the need for multiple file servers and storage link through file-level data access and sharing. NAS typically uses multiple protocols to perform all storage functions. This include TCP/IP for data transfer; SMB and NFS for remote service; and NFS, SMB and FTP for data sharing.

NAS enables users to come together and share data more effectively and securely, particularly work teams which are remotely located or in different time zones. A NAS connects to a wireless router, making it easy for distributed work environments to access files, data and folders from any device connected to the network. Organizations or companies commonly use NAS environment as the foundation for a personal or private cloud.

3. PROPOSED SYSTEM

A NAS is usually not cheaper in the market. The cost of the NAS device you choose is based on the features you need as per your requirements. NAS devices comes in a varied set of configurations, and the costs vary according to your configuration. NAS will at least cost you around 30000 rupees. The feature set or functionalities that you can chose ranges from a single external hard drive in a network connection enclosure to a disc array consisting of several redundant. So we made a NAS using an old CPU with Intel Pentium g2020 processor, 6GB DDR3 RAM, 1.5 TB Raid 0 array and a 32 GB pendrive as a boot-drive. We are proposing a very pocket-friendly NAS system with the same functionality and security using a software called EasyNAS.

4 .WHY TO USE NAS?

The key benefit of using network-attached storage (NAS) is the speed and convenience. While hard drives will be the most common choice when it comes to storage, you may find that you are restricted with their use – as such devices are often limited in use due to the type of computer which it is connected to. Instead of a hard drive or any other storage device connecting to your

computer, NAS connects to your wireless router – enabling multiple users from multiple devices to access the files and data on the network. So, if you're at home and have a number of computers and printers, this provides the fastest and most efficient way for everyone to get access and share the files or data in an efficient and effective way.

5. HARDWARE

5.1 Intel Pentium g2020 processor

Intel Pentium G2020 is a processor of the Ivy Bridge series with two cores which are clocked at 2.9GHz. It also have an integrated Intel HD Graphics card with a base frequency of 650MHz. This processor also offers an impressively low power input, while sustaining a power output values which are similar to 3GHz processors of the Sandy Bridge generation. The G2020 is also incredibly cheap in price, for the stellar performance it offers, and is capable of sustaining at most three monitors and playing newer generation games with zero lag, making it perfect for enthusiast and pro gamers who are looking for an inexpensive, but fast and smooth processor.

Fig.1. Intel Pentium g2020 processor

5.2 Hard disk 1.5 TB

The terabyte is a multiple unit bytes for digital information. The prefix "tera" represents the fourth power of 1000, and means 10^{12} in the International System of Units (SI), and therefore one terabyte is one trillion bytes. The unit symbol for the terabyte is TB.

1 TB = 1000000000000bytes = 10^{12}bytes = 1000gigabytes.

Fig.2. 1.5 TB Hard disk

5.3 6GB DDR3 RAM

DDR3 stands for "Double Data Rate Type 3." DDR3 is a type of a SDRAM that is used for system memory. It is available in both form factor i.e. DIMM and SO-DIMM.

DDR3 RAM is similar to DDR2 RAM, but it uses roughly 30% less power and can also transfer data twice as fast. While DDR2 memory can only transfer data at up to 3200 MBps (megabytes per second), DDR3 memory also supports maximum data transfer rates of 6400 MBps. This means computers with DDR3 memory can transfer data to and from the CPU much faster than computers with DDR2 RAM. The faster memory speed prevents bottlenecks, especially when processing data is large. Therefore, if two computers have the same processor clock speed, but different types of memory, then the computer with DDR3 memory may perform faster than the computer with DDR2 memory.

Fig.3. DDR3 RAM

5.4 32GB Bootable Pendrive

Booting is the process of starting or launching an Operating System on a computer. The BIOS/UEFI of a computer which is the bare metal code that exists on the motherboard does some procedures to reach a point where it can start launching an operating system from a bootable media. Usually that media is your hard drive, which has your operating system installed in it. But you can also make a pendrive/flashdrive bootable, which will allow you to boot up your computer from the pendrive, without involving your hard drive at all. A bootable pendrive is just a pendrive which has been marked as a bootable device, and hence the BIOS/UEFI can boot from it. Creating a bootable pendrive of the operating system we want, plug it in to the computer, and set the BIOS/UEFI to prefer USB over HDD (Hard Disk Drive) and then you can easily install your preferred OS.

6. Software

6.1 EasyNAS

EasyNAS is a storage management system mainly used for home or small office.

It is openuse and it is the award winning file system. EasyNAS also includes advanced features like: file system compression, Snapshots, copy on write, online increase or decrease file system, online balancing data between hard drives and online file system check.

Fig.4. EasyNAS Software logo

7 WHAT IS NAS?

NAS stands for network attached storage. So by its name we know that it is a storage technique over a network. It is a self-contained computer that connects to a home, or business/workplace network. It is rapidly growing choice for data storage as it provides data access to different users on a network. A NAS consists of a hard disk storage which includes a multi disk raid system. NAS removes the burden of file saving from other servers on the same network. A full featured operating system is not needed on a NAS, as the functions are not needed in this. It is a convenient way of sharing files or data between multiple computers, the benefits of doing this is users get faster access to data, as well as easier

administration and simple to configuration and security. A NAS can be used at home, or big companies or workplace. In the home, NAS generally used for multimedia storage, (family photos + videos) or to provide a central storage for smart TV's, or CCTV files and other components throughout in the home. In a company or workplace, a NAS array is used as a backup and archiving appliance, as well as disaster recovery. For small scale businesses, it can be functioned as an email, multimedia or database server. Most of the NAS appliances can hold enough disks to support a RAID, for better backup and disaster recovery. RAID is where multiple hard disks are turned into one logical unit so it can easily provide better performance, higher availability and less redundancy.
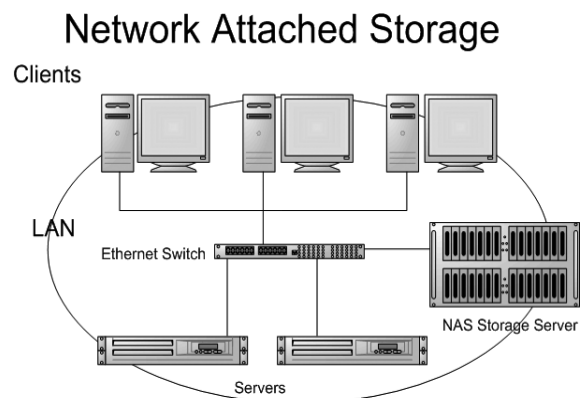

Fig.5. Working of Network Attached Storage

8. FUTURE SCOPE

NAS (Network Attached Storage) is the most rapidly evolving categories in the storage technology world, and already offers huge benefits to consumers looking to simplify, secure, and speed up data access in the household and workplaces. But it's now shifting, from a position as an oft-forgotten utility to an essential player in the high-tech home and big companies and workplace. Hard drive crashes and they are a frightening reality that can easily happen to anyone, yet many still refuse to back up their data. NAS system shields you from data loss, as well as redundancy, RAID-configured hard drives and automated backup systems ensure every photo, video, and document on the network gets immediately backed up for safety. NAS is inherently safer than data stored on individual hard drives or any other storing device, where an accidental drop can render the device and it will be of no use. With a RAID solution on a NAS, there is nothing worry about data abruptly or accidently vanishing. In the event of hardware failure, it can be easily and quickly replaced with zero downtime. Fast speed networks are around the corner; data and video files are growing

larger and more complex, and both wired and wireless. As standards evolve, NAS devices will work with the acceleration of Internet connections, helps you to stream high-definition (HD) video to and from your network, and share large data sets with greater speed than ever before.

9. CONCLUSION

By means of this paper we tend to intent to reduce the cost of NAS. This NAS has all the functionalities of a regular NAS which you will get in the market. This makes simple for the client or consumer to afford a fully functional NAS in a pocket-friendly price. Understanding all the new companies who have just started and cannot afford a high priced NAS. One can easily do all the work or operations on this NAS which you do on a regular NAS. The system proposed is highly dependable, authentic, trustworthy and time-effective. There will be reduction in the price for buying a NAS system. Also, the system is very time-efficient. This will take the storage technology to a special level.

10. REFERENCES

1) P. Borrill, J. Theus, "An Advanced Communications Protocol for the Proposed IEEE 896 FutureBus", IEEE Micro, pp. 25-37, August 1984.

2) A. Chervenak, R. H. Katz, "Performance Measurements of a Disk Array Prototype", ACM SIGMETRICS Conference, 1990-May.

3) D. Clark, V. Jacobson, J. Romkey, H. Salwen, "An Analysis of TCP Processing Overhead", IEEE Communications Magazine, pp. 23-29, June 1989.

4) S. Heatly, D. Stokesberry, "Analysis of Transport Measurements Over a Local Area Network", IEEE Communications Magazine, pp. 16-22, June 1989.

5) H. Kanakia, D. Cheriton, "The VMP Network Adaptor Board (NAB): High-Performance Network Communication for Multiprocessors", Proc. ACM Sig-Comm '88 Symposium, pp. 175-187, 1988-August.

6) R. Katz, G. Gibson, D. Patterson, "Disk System Architectures for High Performance Computing", Proceedings of the IEEE, December 1989.

7) S. W. Miller, "A Reference Model for Mass Storage Systems", Advances in Computers, vol. 27, pp. 157-210, 1988.

8) M. Schroeder, A. D. Birrell, M. Burrows, H. Murray, R. M. Needham, T. L. Rodeheffer, E. H. Satterthwaite, C. P. Thacker, Autonet: A High-Speed Self-configuring Local Area Network Using Point-to-Point Links, April 1990.

9) https://i.ebayimg.com/images/g/RTAAAOSw MVdYFefn/s-l640.jpg

10) http://demo.easynas.org/wpcontent/uploads /2017/06/logo_2a.png

11) https://whitehatsme.com/wp-content/uploads/2015/05/NAS.gif

12) http://www.pureoverclock.com/wp-content/uploads/images/review/memory/cruci al_pc310600tri/crucial_pc310600tri_5.jpg

13) https://images-na.ssl-images-amazon.com/images/I/91Id75cLkCL._SY355_.jpg