

A Study Paper on Storage Area Network Problem-Solving Issues

Priyanka Malviya

Department of Computer Science and Engineering
Bharati Vidyapeeth College of Engineering
Pune -India

ABSTRACT

Storage Area Network (SAN) switches and Storage Arrays have used for many time; they have become more ability of fault tolerance. These often involve some degree of redundancy. However, there are still issues that can occur and take some time to resolve that problem come in the Storage area network applications. The number of Storage Protocols and Storage Interfaces rapidly increased in a Networking technology field, it avoids the Bottleneck of data centers. This paper focuses on few guidelines that may help to understand some of the design issues involved in SAN. Those Problems that are abstract and cannot solve on SAN infrastructure and application run on SAN can solve after understanding all the parameters. Fibre channels also, make some concern that is not solvable and creates issues. This paper discusses some of the common problem related to SAN to prevent the issues.

Keywords:- Storage Arrays, Problems, Problem-solving issues, Fibre Channel, Storage, Performance, Network, Storage Area network, Network Attached Storage.

I. INTRODUCTION

Both the Storage area network (SAN) and the (NAS) architectures having the designing challenges and the variety of reasons which include the workload and causes the problems when developing the new applications or tools. Some of the common problems are caught and perform some troubleshooting in them step by step. First to check an issue in the SAN or NAS architecture, The behavior of SAN and NAS when performing various operations, After entire problem solve possibly performance problem reproduced, Check the functioning is correct or something failed on it, What are the changes come in the SAN or NAS since was it started? How many and what type of applications are running on SAN or NAS .If we do quick scan On SAN or NAS, it shows environment response or not, If any problems come, check it is local or remote performance problem, You need outside help to correct the problem or not, Learn from the incident occur and correct it.

II. LITERATURE REVIEW

About Storage Area Network (SAN):-

A storage area network is a network technology which gives you the access to make stronger storage, block level data storage. SAN is a truly high-speed network or sub-network that is connected to each other and present in the

multiple servers of shared pool of storage devices. SANs are mainly used to enhance storage devices, such as hard disks, arrays tapes, and junk storage, accessible to servers so that the devices appear to the operating system as locally attached devices. SAN work same as a Server in a different way. Data stored in a disk array, and it is useful for getting server backup.

Why Storage Area Network (SAN) Needed:-

SAN need because a single server can manage and provide the Hard drives Storages to Multiple Machines, and as the device computation increases the more storage require a single server can provide that. SAN help the each standard user it moves the storage resources to the freeway by the high-speed network. SAN allows each system to access directly as a shared storage devices do.

How to Access Storage Area Network (SAN):-

When the host wants to access a storage device on SAN, it sends the request to the Storage appliance. That access called as the block-based access request. The storage area network is designed using the three components: Host bus adapters (HBAs), cabling and switches. Each of the storage systems interconnected in the SAN and the physical interconnections can provide the higher bandwidth levels that

can handle the data storage activities, e.g., There is a large business system may have several of terabytes of data, that needs to be accessible by multiple devices on a local area network (LAN). Another efficient way to increase network storage, only one hard Drive need to be added to the computer system by Installing SAN setup in the server.

Understanding the advantages of a SAN: -

The benefits of utilizing a SAN are numerous because a SAN, for the most part, has an exceptional yield on the venture, makes the aggregate expense of responsibility for less, and has a compensation back period situated in months rather than years.

- Taking after is a rundown of only a portion of the ways you can anticipate that a SAN will be valuable.
- Evaluates the separation furthest reaches of SCSI-associated circles: The most extreme length of a SCSI transport is around 25 meters. Fiber Channel SANs permit you to interface your circles to your servers over much more noteworthy separations.
- More prominent execution: Fiber Channel SANs allow association with plates at up to 200 megabytes for every second today, with velocities of up to 1 gigabyte for every second soon.
- Expanded circle usage: SAN empowers more than one server to get to the same physical plate, which gives you a chance to distribute the free space on those circles all the more viable.
- Higher accessibility to capacity by utilization of access different ways: A SAN takes into consideration numerous physical associations with plates from a single or various servers.
- Conceded circle acquisition: Because you can utilize plate space all the more adequately, no space goes to waste, in this way you don't have to purchase plates as frequently as you used to.
- Lessened server farm rack/floor space: Because you don't have to buy large servers with space for heaps of plates, you can purchase less, littler servers, which consumes up less space.

- New calamity recuperation abilities: This is a unique advantage. SAN gadgets can reflect the information on the plates to another area. It can make your information safe if a fiasco happens.
- Online recuperation: By utilizing online mirrors of your information in a SAN gadget, you can in a split second recoup your information if it gets to be degenerate.

III. STUDY ON ISSUES IN STORAGE AREA NETWORK (SAN)

The millions of the thing go wrong while running any technology as the compound storage system have. So we check the each area and try to resolve some problems each failures type can group in the following sectors:-

Issues by Compatibility in the SAN:-

In the network storage technology, the compatibility issues are more tricky and complicated to establish. There are some of the things you should consider when integrating the new technology into the network. Check the vendors network work properly and adjustable to the storage device, and operating system complains the application of these type of storage or not. Ask the vendor for everything and listen to the suppliers' instruction accurately what they want from that storage device, everything you do writing on it and make a proper documentation on each and every aspect, Check how compatible first just ask things to do anything which you need.

The FC SAN are present around for 15 years, and not all the devices are working well. It is very common for all the storage area network technologies that give the incorrect result sometimes. All the storage vendors provide some of the matrices which are used to solve the issues in the SAN.

Increase the capacity Limits of the storage area network: -

In the storage area network client wants to increase the capacity limits of their storage area network, but how to do that it is a big question for everyone this depends on the some of the storage networking factors. To expand the Fibre Channel and IP storage is the complex and costly tasks.

The network storage provider first needs to know that what the client and how much data want to store and how they spent for that storage system. ie. First Qualifying your

customer's Qualifying your customer's class (like business customer home network, infrastructure based storage client). Use three tier architecture for Ethernet SAN and two tier design for FC SAN.

Marking the incorrect configuration of SAN network: -

These also called as the Zoning; it is the logical traffic separation between the host and resources. Zoning in a SAN provide the administration tools and the security. Zoning can do in several ways. Plan available in device level or LUN level. Zoning can do in two ways (Soft and hard) soft zoning having the server database and hard zoning having the routing table.

To do the wrong plan is the causes the problem in storage area network. The changing of zoning every time is tough because it contains the 16 bits of Hexadecimal code in common Worldwide Names (WWNs) networks.

Issues in the connection and cable in Storage area network:-

The storage area network contains the Fiber cables for the connections of networks to each other. But the fiber cables also seem to be having a lot of problems, and it may fail. That may give the slow network, Painful waiting to the storage device and intermittent death of network. To overcome this problem the new connection or cables are needed provide the maintenance to this regard by every time changing it. So we use the Flakey connections and cables to overcome the problems issues in Storage area network.

Storage array problem in storage area network: -

Each storage devices are having the different types of technologies to store the data. Logical unit numbers are the terms used to provide the storage, and it is a very fundamental issue in the SAN. The LUN is not the matter to create the volumes. LUN created and assigned to the host bus adapter (HBAs) by through the front –end SAN port. Problems arise when a typo is a configuration the array by the storage administrator.

Host Bus Adapter (HBAs) configuration issues in storage area network: -

Host Bus Adaptor is used by the devices to access the Storage area network. The host bus adapter is function same as the network adapter present in the networking field, and it

provides the access to the machine to a local area network (LAN) or the wide area network (WAN).

Host bus adapters contain different configuration settings and options are as follows:-

- SAN topology
- FC Link Speed
- Fibre channel tape support enabled

A lot of the things go wrong to the storage server. The server contains a large number of stack components of storage, having the volume manager, operating system, HBA driver Multi-pathing software components, HBA Hardware. Each of the components specified by the vendors, and there may be many troubles and issues facing them.

SAN hardware failures issues: -

The hardware is the most important task in any of the devices so more focus given on it, May causes the less no of issues. Because if the device failed in any of the storage devices means you will lose your whole work. So backup and redundancy come first while considering the hardware issues. SAN hardware is very reliable than the other storage technologies, but it may be failing. The SAN hardware common failures that can affect the pacing of a host are SPF Port failures, port card failure, and complete switch failure.

SAN boot Issues: -

There is the booting issue presents in the Storage area network, this issue called the" boot for an issue," it becomes Windows limitation issue when storage comes for the configuration. Booting problems from the local drives make server easier to manage and usually faster to restore the room. The booting of SAN has involved in Windows operating System. The boot also requires the HBA drivers in the Windows OS.

SAN Connectivity Issues: -

The SAN connectivity issues are also known as the SAN-based backup it creates the biggest problems in the storage area network. The shared drives also disconnect the connectivity when the backup is interrupted. Because of this we have to replace all the components but the symptoms, not changes, the connectivity include some of the setups as follows:-

- Qualstar library using OEM Chapparel SCSI bridges
- Legato Networker
- Emulex HBAs
- McData switches

Problem determination On SAN: -

To understand the issues in storage area network, so it requires first knowledge about each and every term involve in a particular storage system. The System contain each configuration and expected behaviors, So when issues come into the system, then it formalized and learned each component and able to solve the particular set of challenges, and eliminates the part which is not properly work in essential areas as SAN, host and storage devices.

Check the Performance support metrics: -

Issues on the performance can be measured as regularly check Logs, storage matrices, checking the configuration of the ports, network, and other devices that support SAN. These types of manufacturers find the new bugs and get filled by the new code generated. Keep your configuration always update, and supportable. So it may provide a lot of support to avoid issues.

Make Documentation of SAN: -

These are the huge problem in the SAN to create the documentation of each and every term. It necessary when the troubleshooting problem come and you do not have anything to do. To read this documentation clearly, you can understand the structure and design of SAN. You have to make sure that the each component (Hosts, HBAs, and WWNs) in the SAN having documentation record and the connection logs and at the definitive, the SAN documentation must describe the ISLs, FC, Zoning, and Zone members.

Determine the SAN Performance: -

Instead of record every point every day. It's hard to determine that using port is creating the problem or not. It always makes the problem in baseline performance issue in SAN.

Plan for the change: -

When you implemented the sophisticated technologies, issues come on it always expect to change. These methods avoid the help of administration or the outage help. Use the SAN documentation to the changes before it happens. Every time documentation not perfect to do changes, when you are executing the changes it will be going wrong.

Configuration Backup Problem solves:-

After every day of changes, to store switch configuration create the backup safely(Like logs).It is the right way when any failure occur you can easily rollback the changes and started again without any errors, So you will not mess up during the changes. It is a good idea to take a backup every time.

IV. STUDY FINDING ON PROBLEM SOLVE ISSUES IN SAN

Solving Congestion Problems in Storage Area Network: -

This incredible development puts the considerable weight on Storage Area Networks (SANs), which must have the capacity to handle the blossoming activity loads between the processes and function layers. To keep up top effectiveness, Storage managers should have the ability to distinguish rapidly and resolve moderate channel and other typical SAN clog issues. If not tended to in a convenient manner, these can have a falling impact, notwithstanding corrupting the execution of utterly remote applications.

Storage Problem in Storage Area Network: -

The Storage Area Network Provide the pliability to amalgamate and match Storage System suppliers, furthermore sanctioning storage to be robust and secure.

Using storage area networks to reduce congestion and increase performance: -

In the Storage area network substantial amount of data in terabytes are Incrementing numbers, and it obstructs in subsisting networks.

V. CONCLUSIONS

Every technology is having some issues which can solve after understanding complete knowledge. The SAN is the high-end storage technology. If you see that SAN changes occur recently, Check the SAN Logs and compare the running configuration and the previously created documentation. If the SAN component fails, to look for the faulty port and log-out from it. The storage in SAN creates a question how it reports for errors if any changes occur. So after initialization on SAN is always having design Issues at some conditions which we discuss in this paper. So the SAN issues can become non-issues when you follow the instruction which shows in this

article (documentation, Compatibility). It is the best practice to prevent massive issues when something goes wrong.

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