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Management of Backup in Enterprise Data Centre

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Abstract: Netvault backup is a prominent method to backup data in cloud. The data is backed up for both data centre and disaster recovery site. But the paper is not only limited to backing up the data but also the scope lies to the restoration of data and the normal issues faced during the data backup. The version used is Quest Netvault 12.4. The data backup is either done on tapes or via phases (phase 1 or phase 2) . Netvault backup is entirely dependent upon the Vmware for taking snapshots of virtual machines and Nutanix for storage virtualization. The aim of the paper is to emphasize on the backup process in cloud and issues faced for the same.
Keywords: Backup, Quest Netvault, Nutanix, Snapshots, VMware
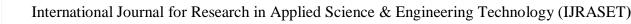
I. INTRODUCTION

Cloud Computing is widely used in the enterprise sectors and are hosted services that are used over internet. The services that are sold over cloud are completely different than the normal web services. Here the customer has the access to use limited space of data and are managed by the cloud service providers. Additionally, there are two types of cloud services public and private. Public cloud refers to the local internet where all the services can be downloaded and sold. In private cloud there is limited access to the users such as AWS (Amazon Web Services) or Azure by Microsoft. Private cloud has benefits such as data security and fault tolerance from disaster occurrences. Cloud backup or remote backup has a strategy to back up the files or folders in a secondary virtualized storage area in different offsite location in case of any catastrophe strikes. The secondary server and storage are usually hosted from a third-party service provider who charges a favourable amount of fee for respective storage and bandwidth required for the backup. Implementing cloud backup system can bolster IT services of any organization by protecting the data. It is an essential component of data centre, where the copied data is stored in a different offsite server and the backup of data from primary to secondary location can occur depending upon schedule and the amount of data to backed up. Quest Netvault software is widely used in the large enterprise organization it can efficiently create and manage new backup. The data stored in the DC and DR (data centre and disaster recovery) sites in some fixed size containers. The ip address of these sites is proportional to the cloud software, depending upon those ip address and data inside the virtual machine's backup occurs at its respective schedule.

II. METHODOLOGY

For a large-scale datacentre having approximately over 1000 virtual machines there is an imminent need to backup all the data from the tape library. In a large-scale environment, a large amount of data needs to be modified, reused and restored. Netvault provides a platform to virtualize and manage backup. The backup and storage of data must be maintained. There are two types of backup depending upon time period one is incremental and another is full backup. Full backup defines every minute detail of VM will be saved since the VM was created. But in incremental backup it will store or backup only that data in which the daily changes were made and if the changes are not made in the data of the particular virtual machine then it won't take the backup of that data. There's another category where the backup is categorized in terms of storage. Storage backup is classified into snapshot and file system backup. In snapshot-based backup, a snapshot of that VM will be created by Netvault and minute detail in the VM will be captured by Netvault also it will be stored but in file system backup only particular file of the VM is selected and backup is created. On depending upon the size and requirements of the client the backup comprises of phase 1, phase 2, direct tape backup or dc-dr backup (where dc – data center and dr-disaster recovery). Phase 1:In this type of backup the of the data is taken by taking the snapshot of the virtual machines and then it is stored in the appliance. At this period a snapshot is taken from the VM by Netvault and this snapshot is deleted automatically after successful completion of the backup. Phase 2: Now the data that is stored in the appliance is now transferred to physical tapes which are present in the slots inside the datacentre. Direct tape backup: The snapshot of the VM is taken by Netvault and data is stored in the virtual machines.

Properties in Quest Netvault backup:

1) Creation of new backup job
2) Tape Export
3) Restoration of data by creating a new restore job

A. Creation of new Backup Jobs

For the creation of new backup job firstly one must decide whether to create full backup or file system backup job. On the basis of that the selection set (it is an uniquely identified number for a backup job) is chosen .For a file system backup first you need to install the Netvault client. Depending upon the server whether it is windows or Linux, first the software is installed in the server. After installation of the Netvault client then the client is added in the Netvault software by specifying the password then while creating a new backup job you can create a file system backup job by choosing the virtual machine and its appropriate files that are needed to be backed up. The schedule for specified backup job is set whether the data needs to be backed up daily, monthly or weekly also specifying the time duration. Now, in the plugin options you need to choose whether it is a incremental or full backup. Then the option of save and submit must be selected, so in this way the new data is ready for the backup.

B. Tape Export

The data that is stored it is finally saved in the tapes whether the backup is through phase 1 or phase 2 or directly on tapes. There are three terms related to tape export: drives, slots and ports. Tapes are needed to be exported due to the utilization issues of memory in the tapes. When the tapes are inserted they are stored in ports, it's a kind of physical tray where the tapes are removed or inserted. Then the tapes are randomly picked depending upon their schedule then it gets transferred to the drives where the data writing takes place, when it is completely full and the status of the tapes are 100% full then the tapes are then transferred to the slots where it is kept. The opening of the door of the port is controlled from the Quest Netvault software.

C. Restoration of Jobs

Depending upon request of the organization restoration data is needed. There is a deviation between the backup of data and restoration of data. In backup of data, the current data is stored but, in the restoration, any previous data can be restored maybe a week, month or a year old. For restoration first it is needed to find the saveset of the backup job after checking the saveset then check whether the drive is online or not and simultaneously check the drives whether it is empty at least 2 drives must be empty. After checking the above norms then select the files you want to restore along with the path where you want to restore, then give a restore name as per the naming conventions. Press save and submit in this way the data is ready for restoration.
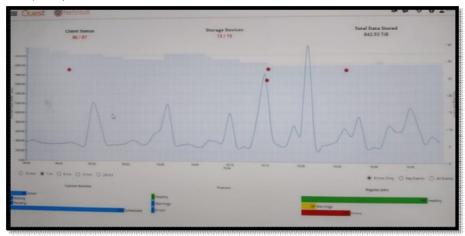
D. Management of Jobs (Data) in Cloud

Fig. 1 Management of backup job graph

The above is a graph represents the backup job status of each and every virtual machine in cloud at data centre throughout the day. It also depicts whether the backup of data is in running state, successful or in waiting state. In the x axis it represents time and in y axis it represents the backup rate (baud rate) of the data. If more backup jobs are in waiting state then there can arise a case where there is loss of data. To resolve such situations the only solution is to abort such jobs which persists high disk storage. It doesn't matter whether the data from the virtual machines are transferred to backup appliance or directly into tapes. The graph also explains the amount of data that is stored in Netvault and the storage space available. The peaks of the graph is not constant it varies every instant throughout the day depending upon the backup / restoration of data.

III. CASE STUDY

A. Failed to open virtual disk error

This is the most common error faced in the backup jobs during incremental or full backup but both the issues for the same error is handled differently. In the case of incremental backup if this error is found during backup then there are chances that the error will rectify in its next scheduled backup or if not then the rebooting of the server removes the error. If the same error is there in the full backup then the storage motion(SV motion) and the changing of datastore will eliminate this error.

B. Index Conflict Error

The word "index conflict "occurs when phase 2 is running but it is not completed then as per schedule phase 1 starts running due to this there is an error and phase 1 gets failed due to index conflict.

C. Increase of backups aligned in "waiting for media"

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D. Increase of backups aligned in "waiting for media"

In some certain critical situations some backup jobs (phase 1 or phase 2 or maybe both) gets aligned under "waiting for media" tab. It hampers the normal scheduling of the jobs and creates a queue in running process. In such scenarios the backup of data doesn't happen and is not managed by servers hence implies that the data is lost. To avoid the loss of data and security measures some new jobs are aborted and the virtual machines are booted which results an ease with virtual storage area and backup

E. Failed to rely on backup stream

In this case when data backup from virtual machines phase 1 (backup from VM to the appliance) when connected to phase 2 (data transferred to the tapes) there is a shift in network results in the error "Failed to rely on backup stream". The resolution for this type of error is to check the network adapter of the virtual machines and also to check whether Netvault service is running or not.

IV. CONCLUSIONS

The paper concludes the management of Netvault Backup in large corporate enterprise. The Netvault has the capability to manage backup of data disaster and recovery sites. It also emphasizes on various aspects like tape exportation, creation of jobs and restoration of data. It focuses on the issue of some major case studies which impacts the production environment of the enterprise.

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