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Proven strategies for data centers to minimize the backup failure rate

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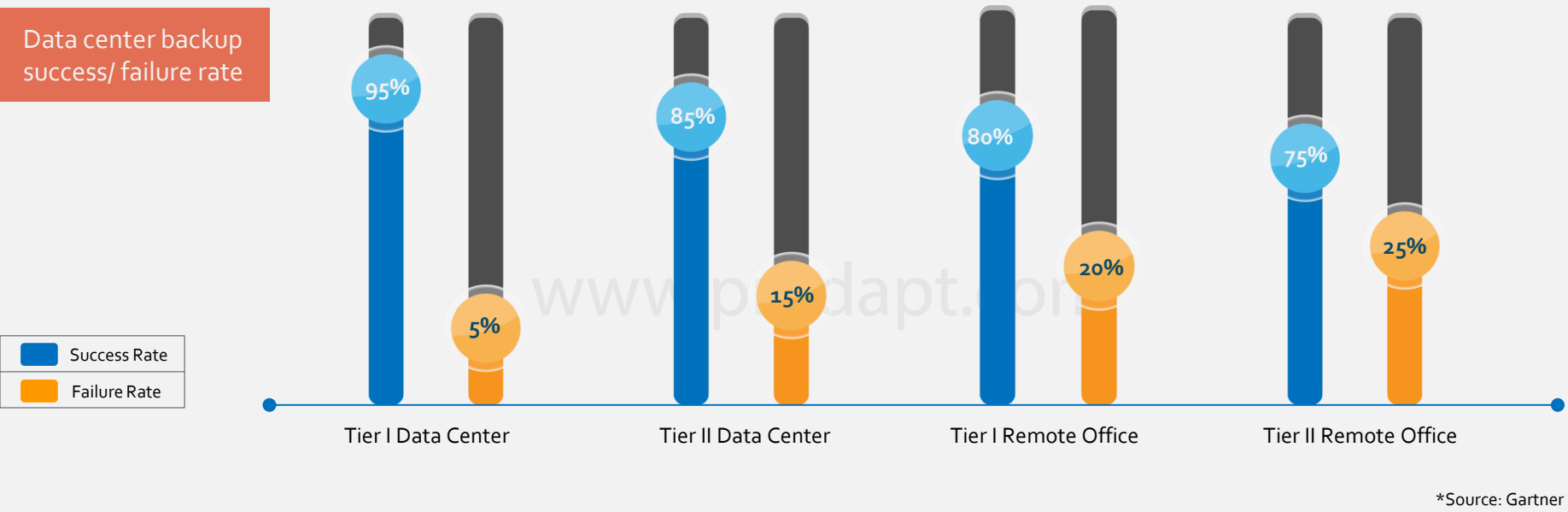
Current landscape: Significant amount of backup jobs are failing

Data center backup success/ failure rate



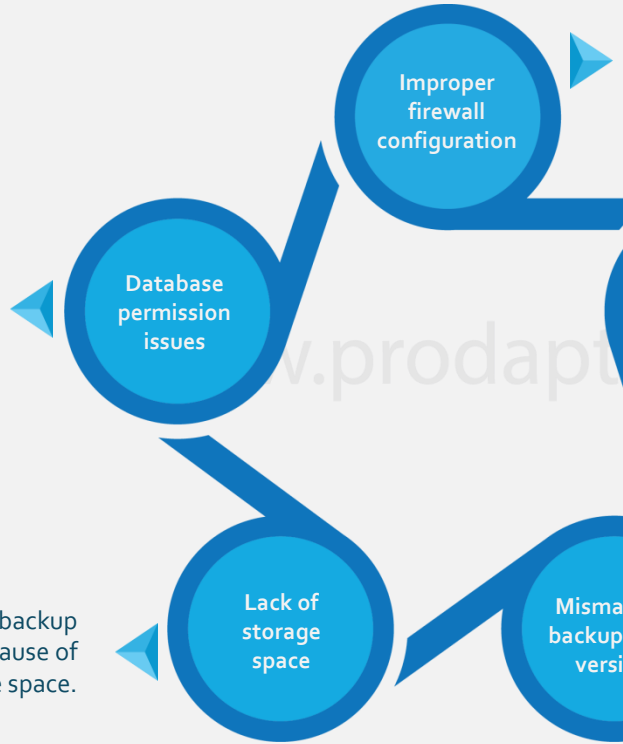
*Source: Gartner

A significant amount of backup jobs fail (ranging from **5% - 25%**)

Backup failure costs data centers in the form of revenue loss or SLA-based penalties

Backup failure has been a big challenge for data centers. It causes loss of important data and deteriorates customer experience leading to low net promoter scores for data centers.

Top reasons for backup failures



Required IP subnets and ports are not configured in the firewall for bidirectional communication, which results in unsuccessful backup jobs.

One high-volume job running longer affects other jobs in queue.

Agent version mismatch on source and destination servers leads to backup failure.

A significant number of backup jobs fail midway because of insufficient storage space.

The account used for running backups doesn't have the required privileges (SA/root access, read/write access), leading to unsuccessful backup jobs.

This insight focuses on recommendations to minimize backup failures.

Proven approaches to minimize backup failure rate

Backup Audit Tool

- Audit tool helps analyse the environment better by conducting periodic audits of target systems and backup servers
- Automated periodic audits help in avoiding repeated failures

Operations Dashboard

Operations dashboard helps in monitoring and analysing backup issues such as

- SLA vs actual failure comparison
- Identifying hosts which are failing frequently
- Frequency and types of tickets raised

Proactive Capacity Management

- A lot of backup jobs fail because of insufficient storage available for backup
- Arranging a new storage device takes time due to budgeting and approval requirements
- It is recommended to track data growth & available capacity in storage devices and configure alarms at certain levels to manage or expand storage proactively before failure situation

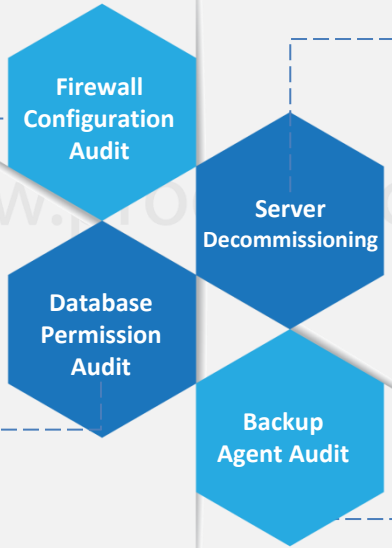
Parallel Processing of Backup Jobs

- A lot of backup jobs remain in queue and end up as failing because of linear/sequential processing
- Parallel processing enables faster completion of backup jobs with less waiting time for queued jobs
- Parallel processing also helps track data growth in environment making it easier to estimate the available storage capacity

Key considerations for choosing an audit tool

Automated audit tool should have below mentioned features

Audit tool runs a script on regular interval to test accessibility of the selected range of IP subnets and ports, target systems and backup servers. If it finds any issue in establishing bidirectional communication, a ticket gets generated and sent to the concerned team automatically.



For servers that give repeated “inaccessible” error message leading to a backup failure, the audit tool can automatically check with relevant internal application for contractual information. If the application responds with “contract expiry” message, the tool will initiate ticket for decommissioning, disable further backups on that server and release the attached backup resources.

Before running backup jobs, audit tool checks for access permission levels for the target system. If tool identifies any gap, a ticket gets triggered to the admin team to get required permission from the customer for mentioned target system.

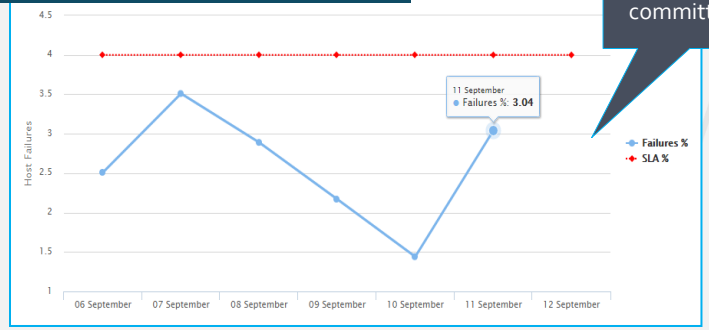
Audit tool runs a script (Windows)/Cron (Linux) jobs on target systems and backup servers periodically to check if there is any mismatch in agent versions. If it finds any mismatch, a ticket gets generated and sent to the admin team automatically for customer approvals.

Key considerations for choosing an operations dashboard

Operations dashboard should cover below mentioned fields

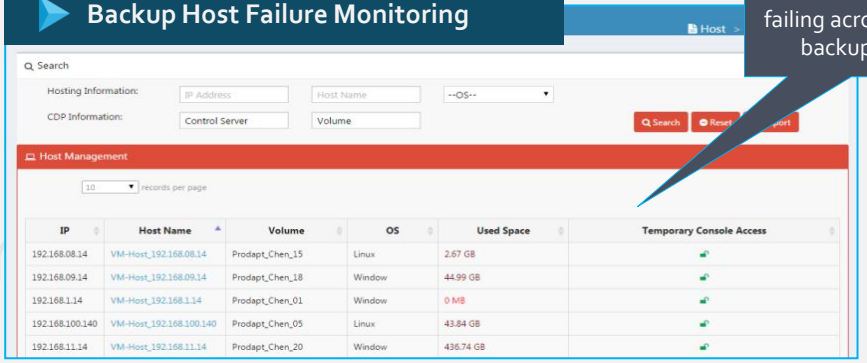
SLA Vs Failure Rate

Dashboard to measure failure rate against the committed SLA



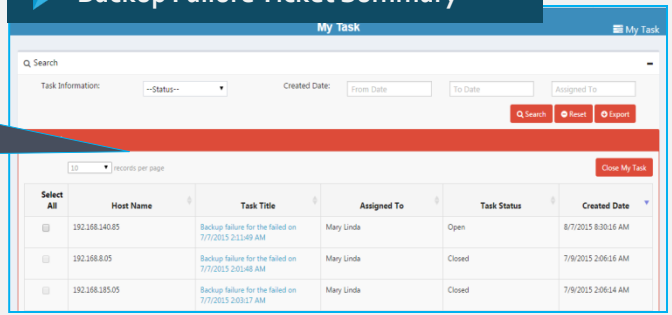
Backup Host Failure Monitoring

Dashboard to monitor the hosts which are failing across different backup servers



Backup Failure Ticket Summary

Detailed analysis of a backup failure incident



Proactive capacity management

Proactive capacity management to solve storage-related issues


Location


Libraries


Media


Storage Information

In order to manage capacity effectively, data centers need to focus on key areas to track and analyze parameters like location, libraries, media used and storage related information.

Real-time monitoring tool to analyze storage

Mount Path	Capacity (TB)	Space Left (TB)	Space Occupied (TB)	Percentage Used
NAK-CXXYZ2	15.93	0.02	15.33	96
ecu-cvnax09	9.84	0.01	9.63	98
Folder_09.10.2014_20.50	11.88	0.01	11.71	99
cw10la-nas10-temp	10.53	2.47	5.61	53
commnxtce10_backups_ebu	14.89	2.84	12.05	81

Archival strategy for backup data

- Primary storages are expensive as storage arrays are required to produce a sufficient level of IOPS, to meet operational requirements for user read/write activity. The data archives serve as an effective way of reducing primary storage consumption and related costs.
- Cloud storage is one possible archival solution as it is less expensive and offers desired flexibility with ongoing investment option. Solutions like Amazon Glacier, Microsoft StorSimple, Google Drive etc. can be considered.

Recommended Archival Strategy

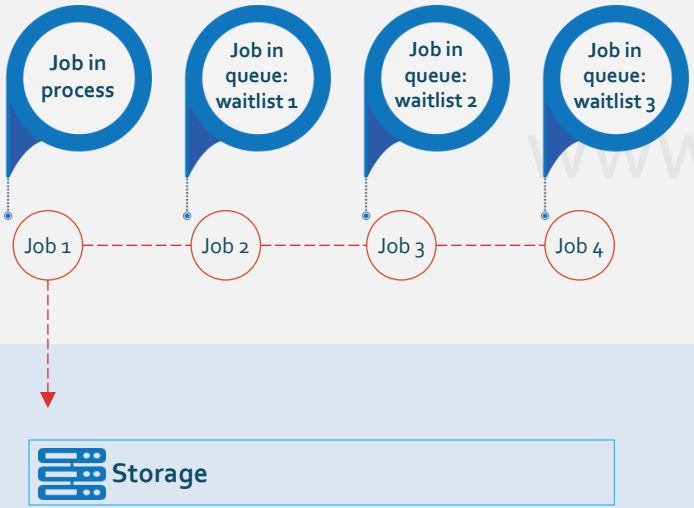
- **Data classification:** Classify data that carry most potential for exposure to regulatory or legal risk and update archival policy on a regular basis in order to comply with legal/regulatory norms.
- **Well-defined retention policy:** Align archival policy with requirements of different departments (finance, admin, quality and sales) and business units to retain different information for varying lengths of time.
- **Tools for structuring the data:** Use automated tools to structure data effectively e.g. indexing, auto classification, text and content analytics help in extracting more value from data and storing it efficiently.

Data centers can reduce approximately 25% of their storage costs by implementing effective archival strategy. For example, focusing on applications that accumulate unstructured data like audio/video, images etc., and archiving them into the cloud will reduce the load on primary storage.

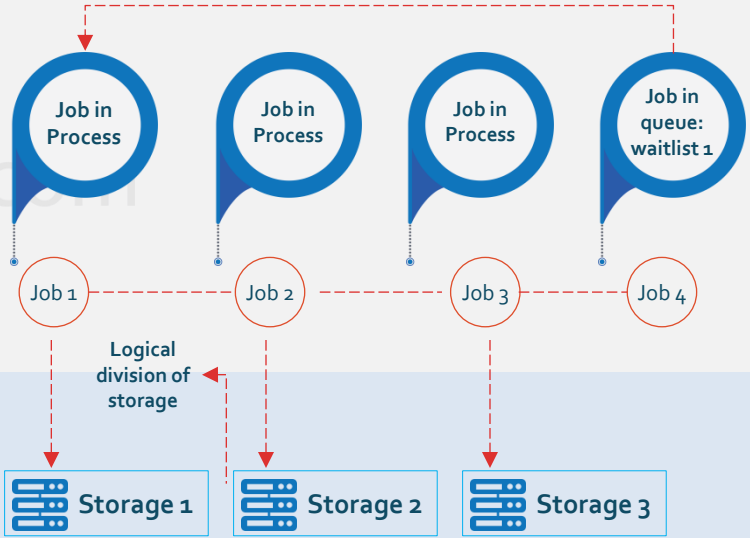
Parallel processing of backup jobs

Parallel processing of backup jobs to make them faster

Linear Processing:
Jobs waiting in the queue



Parallel Processing:
Jobs running in parallel



Same storage can be logically divided into different instances to enable parallel processing of backup jobs

Key takeaways

These recommendations helped one of the leading tier II cloud service provider minimize backup failure from **14%** to **1.4%** (better than best in class average)

A leading cloud service provider experienced an improvement of approximately **50%** in its NPS as a result of improved backup success

Periodic audits recently helped a leading data center in decommissioning more than **400** clients and clearing more than **5%** storage which were used in new backups

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THANK YOU!

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