WHITE PAPER

The 3-2-1 Backup Strategy

Safe & Efficient Data Protection

May 1, 2020

Abstract

Alongside employees, business data is one of the most important assets of a company. Data protection and business continuity is essential for organizations to continue operations after a catastrophic data loss event. Data loss could mean the loss of information which can never be recovered or rebuilt.

There are endless reasons for data loss or a partial data loss:

- Local disasters could destroy the backup on your local device
- Ransomware attacks could lock your data
- A user could accidentally or purposely delete data that is important to continue with your business
- Hardware and/or software solutions and updates can cause data loss or delay in business continuity

This White Paper describes effective methods for how data should be protected to minimize business downtime and outage cost in case of a data loss incident. It shows best practices for small, medium and enterprise environments for implementing a disaster recovery strategy.

Background

Data loss incidents can happen at any time. Whether hardware errors, human errors or viruses and malware attacks or local disasters, businesses must be prepared to establish business continuity and data availability. The following statements show a selection of possible causes and effects of data loss.

Product and technology challenges:

- 21% of all data loss is caused by hardware failures
- 1 out of 3 laptops fail within three years
- A disk drive fails every 15 seconds
- 390,000+ malware programs are discovered every day
- Ransomware attacks cause an average of 16.2 days of downtime
- 43% of cyber attacks are aimed at small business, only 14% are prepared to defend themselves

A business shutdown due to data loss faces a number of consequences. There is a risk of lost sales that affect the balance sheets. Financial obligations can no longer be met, which means higher interest rates and claims for damages by third parties. Employees can no longer carry out their tasks and are therefore in default.

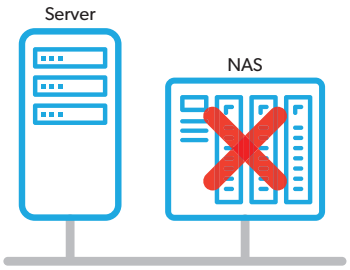
It can also damage your reputation. Delays in assisting clients may cause them to switch to the competition. The temporary liquidity shortage annoys suppliers and banks and limits creditworthiness.

Here are some financial and economic challenges:

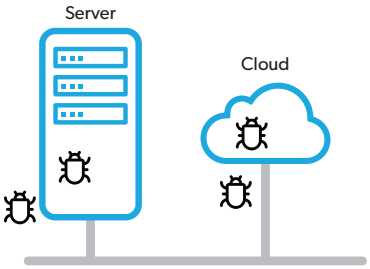
- Small businesses suffer especially hard. 98% are closing after being hacked
- 93% of companies without a disaster recovery plan had closed within one year of a data attack
- 60% of companies close within 6 months of a data loss
- 1 hour of downtime costs:
  - $8,000 for a small company
  - $74,000 for a medium company
  - $700,000 for a large enterprise

The Problem

Many businesses are not prepared to ensure business continuity. Backups are usually performed on one storage device such as local disks devices or network attached storage (NAS) systems or Cloud. This is a viable solution but fails to take into consideration local disasters or virus and ransomware attacks.



Local disasters could also destroy the backup on the local device. Virus and ransomware attacks can infect backup sets regardless of their location either on the computer or network or Cloud.



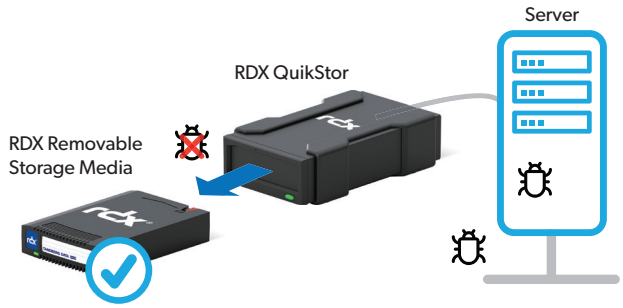
In both cases, it might be impossible to restore the data and recover from these incidents. Perhaps some data can be reconstructed from letters, invoices, or other paper documents. Maybe customers can help to provide lost information, but most of the information is lost.

In case of a ransomware attack, there may be no other choice other than paying the ransom to have the data decrypted. However, businesses will suffer in terms of revenue, investments, reputation, trust and loss of customers.

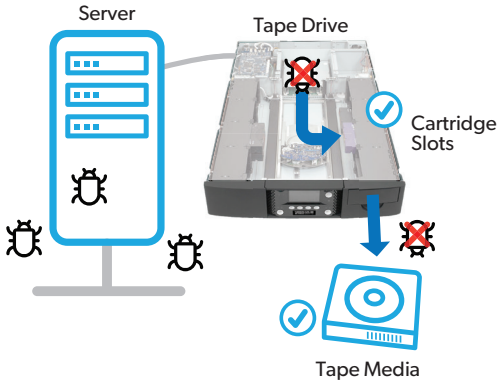
The Solution – Building the Air Gap

When storage devices are no longer connected to the network, the backup data is safe and cannot be threatened by malware attacks. Therefore, businesses should utilise removable storage media. Removable disk systems can detach the storage media from the network to ensure data accessibility after a local disaster or a ransomware attack.

This can be done either by setting the storage device off-line or removing the storage media and transporting it to a safe location outside the campus (off-site). Eject operations can be configured or scripted with most backup software.



The same applies for the data stored on tape. It is protected against virus and ransomware attacks. As the tape format is not a file system, crypto lockers and viruses do not have a chance to infect the data, even if a tape media is in the drive. However, local disasters should also be taken into consideration, where tapes will be destroyed as well. Therefore, tapes should also be stored off-site outside the datacentre. When tape libraries with hundreds or thousands of tape media are used, they should be located in a separate datacentre.

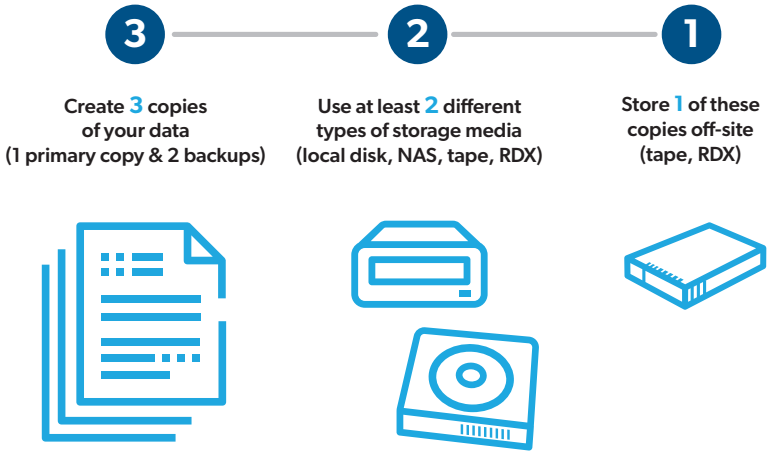


The 3-2-1 Backup Strategy

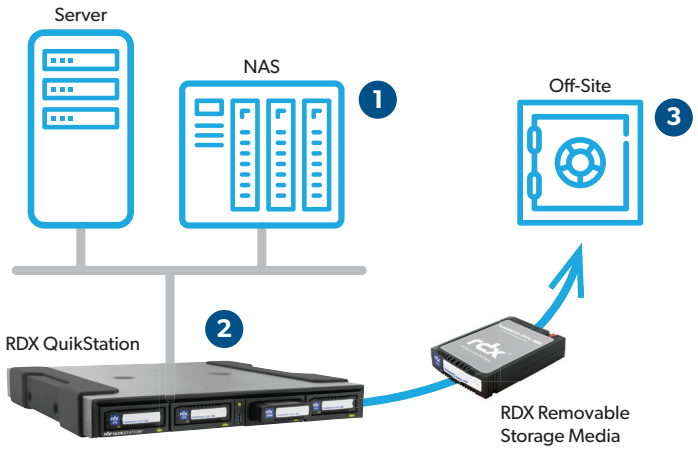
Whether your business is in the SMB environment or your company is a large enterprise, you should implement the 3-2-1 backup strategy, which means to keep three copies of your data on two different media and store one copy off-site.

Almost all backup applications enable you to perform a copy job of the backup after the primary backup job is finished. Larger companies should use disk, either NAS, DAS or SAN as a primary backup target. This ensures fast restore in case of a data loss. It provides short downtime and fast return to business.

For the secondary backup target, a storage system with removable storage media should be implemented. If the primary media – disk in our case – fails, the other media is still available for recovery tasks. Depending on the amount of data, tape or RDX should be used. If companies have to backup a large amount of data, tape autoloader or tape libraries are best practice. They allow full automation and media handling. In addition they provide lowest storage cost and a 30-year archival life. Therefore, they can be used for long-term archiving of unfrequently used data.



The RDX QuikStation is an iSCSI attached removable disk appliance designed to provide a flexible platform for hybrid cloud data protection and off-site disaster recovery for physical or virtual environments. It provides multiple configurations from single disk targets, disk autoloader to tape autoloader and tape library emulations and logical volumes across all RDX targets with RAID 5 or RAID 6 fault tolerance. As RDX QuikStation includes hard-disk based media, it offers the same performance advantages as the primary backup target on the secondary side.



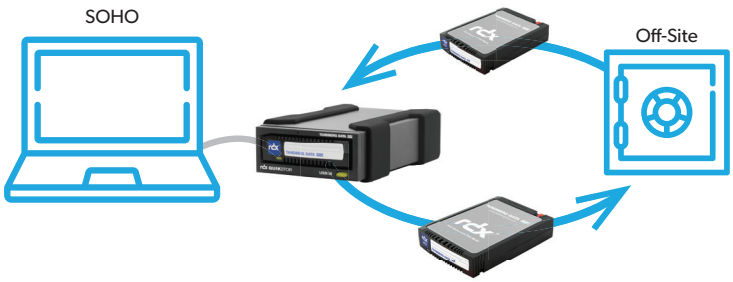
Both secondary backup devices are able to fulfil the last step of the 3-2-1 backup strategy. RDX QuikStation as well as tape offer the possibility to take data off-line to build the Air-Gap for malware protection or off-site for protection against local disasters. In tape automation products, data is set off-line by pulling the tape cassette out of the drive and transporting it into a media slot with the help of a robotic. In addition, so called I/O-slots are available to eject the tape media to place it off-site at a safe location.

RDX QuikStation also allows setting RDX media off-line or off-site. In disk autoloader mode or tape automation emulation modes, the media is logically disconnected from the network so backup data cannot be reached by virus or malware-attacks. In fixed disk, RDX and logical volume mode, media is physically ejected and can be placed off-site for local disaster protection.

In addition, another copy should be stored on a removable media to place this copy off-site. This ensures the ability to perform a full data recovery in case of a disaster at the business site.

For smaller environments, with single server infrastructure, laptop users or single NAS implementations which cannot afford multiple storage systems, a media rotation scheme with RDX QuikStor and three RDX media is the best solution. This depicts the 3-2-1 backup strategy in a simple way:

- One media is in the office, ready for the next backup job
- A second media is off-site at a safe location
- The third one is in transit to or from the off-site location



Using media rotation enables you to alternate the media after the backup has finished. For media rotation it is very convenient if the media is ejected after the backup job is completed. For that, most backup software offer a built-in media eject or allow integration of pre- and post-scripts commands during the configuration of backup jobs, which initiate a media eject.

Conclusion

Ensuring Business Continuity is the most important task for companies of any size. Data loss and business downtime results in financial loss and even leads to business closure.

The 3-2-1 backup concept has established itself as one of the safest and most proven backup methods to be protected against hardware failures and malware intrusion. If your company is a SOHO or small SMB, media rotation is a necessity.

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