



CUSP Backup Procedure

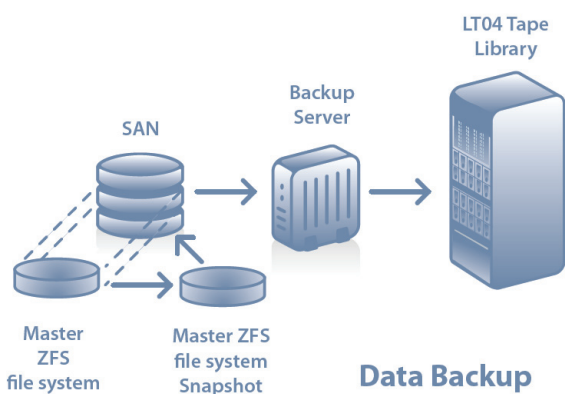


The backup copy is the last line of defense against data loss, and so a stringent policy governing the management of backups is fundamental if business continuity is to be guaranteed. CUSP's Secure Data Centers, all either ISO 27001 or SAS 70 Type II certified, make use of the latest backup techniques in conjunction with Server Area Network (SAN) technologies to avoid the complexity and disruption normally associated with this vital procedure. This datasheet gives an overview of the strategy, systems and storage media that power PaperTrail's industry-leading data backup facility.

The ZFS file system

PaperTrail utilizes a unique feature of SUN Microsystems' ZFS file system technology to provide a rapid, low-impact means of creating complete system backups. ZFS file system allows 'snapshot' backups to be taken in order to generate an independent, read-only, bit-for-bit copy of the storage system as of an point in time. As the data composing this snapshot is already stored, the process is extremely quick, and the independence of the snapshots from the live data minimizes impact on the live system.

The hardware and software infrastructure underpinning the solution is designed for optimum availability, security and resilience. The ZFS file system constantly checks file integrity by checksum/data comparisons, and uses "copy-on-write" technology, so that existing data is not overwritten until the new data write has been completed in full.



SAN backup

Once created, the snapshot data is streamed directly to an array of high-speed LTO4 tape drives for archiving. This approach eliminates any impact that the backup process might have on live services.

The advantages of SAN backup systems

The backing up of file systems through their attached host server, as practised in traditional backup systems, brings with it a number of performance problems. These issues can be avoided by performing the backup directly at the SAN, disk array level, independently of host servers.

SAN snapshots bring the following benefits:

- Snapshot backups are made on a point-in-time copy of the data
- The live data is not affected by the snapshot, ensuring data consistency
- There are no service outages - applications and servers do not need to be quiesced and may run constantly for the duration of the backup
- Backup data corruption is avoided, as snapshots are read-only
- Backup windows are no longer required as the application runs independently of the backup process

Media storage

The backup media is stored offsite at a certified secure location, ensuring that, in the event of a disaster at the Data Center, customer data is recoverable. All backup media is fully encrypted before being transferred to offsite storage.

info@cusppoint.com

www.cusppoint.com

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Secure infrastructure

Our entire infrastructure is set-up in such a way that there can be no single point of failure. In the unlikely event of a hardware failure there are strict agreements in place with our hardware vendors to ensure that remedial action is taken without disruption to the service. Under the terms of these agreements a support engineer will be present onsite to replace any faulty equipment within two hours of a problem being reported.

Backup policies and retention periods

The default backup policies and their associated retention periods are as follows:

- File versions for each day can be recovered up to four weeks in the past
- File versions for each week can be recovered up to 13 weeks in the past
- File versions for each month can be recovered up to 1 year in the past

Backup Policy	Retention Period
Daily - Incremental	Rotate on 4-week cycle
End-of-week - Full (i.e. Friday night)	Rotate on 13-week cycle
End-of-month - Full (Calendar end)	1 year

The default backup and retention policies can be modified to suit a customer's operational or regulatory requirements. There may be an associated charge for this service, depending on the extent of the changes required.

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