

With a stand-alone system, a single cluster is installed. If the site at which that system is installed is destroyed, the data that is associated with the TS7700 might be lost unless COPY EXPORT was used and the tapes were removed from the site. If the cluster goes out of service because of failures, whether the data is recoverable depends on the failure type.

The recovery process assumes that the only elements that are available for recovery are the stacked volumes that are produced by COPY EXPORT and removed from the site or in the case of TS7700C access to the object store in the cloud. It further assumes that only a subset of the volumes is undamaged after the event. If the physical cartridges are destroyed or irreparably damaged, recovery is not possible, as with any other cartridge types. It is important that you integrate the TS7700 recovery procedure into your current DR procedures.

**Remember:** The DR process is a joint exercise that requires your involvement and that of your IBM SSR to make it as comprehensive as possible.

For many clients, the potential data loss or the recovery time that is required with a stand-alone TS7700 is not acceptable because the COPY EXPORT method or recovery from the object store in the cloud might take considerable time to complete. For those clients, the TS7700 grid provides a near-zero data loss and expedited recovery-time solution when implemented properly.

With a multi-cluster grid configuration, up to eight clusters are installed, typically at two or three sites, and interconnected so that data is replicated among them. The way that the sites are used then differs, depending on your requirements.

In a two-cluster grid, one potential use case is that one of the sites is the local production center and the other site is a backup or DR center, which is separated by a distance that is dictated by your company's requirements for DR. Depending on the physical distance between the sites, it might be possible to have two clusters be both a high availability and DR solution. Also, if the two clusters are TS7700C, they can share access to the cloud object store.

In a three-cluster grid, the typical use is that two sites are connected to a host and the workload is spread evenly between them. The third site is strictly for DR and it is likely that no connections exist from the production host to the third site. Another use for a three-cluster grid might consist of three production sites, which are all interconnected and holding the backups of each other. Also, two or more of the production clusters can share access to the cloud object store as the DR host.

In a four or more cluster grid, DR and high availability can be achieved. The high availability is achieved with two local clusters that keep RUN or SYNC volume copies, with both clusters attached to the host and optionally to a cloud object store. The third and fourth (or more) remote clusters can hold deferred volume copies for DR and optionally have those copies in a cloud object store shared with the production clusters. This design can be configured in a crossed way, which means that you can run two production data centers, with each production data center serving as a backup for the other.

With the addition of the TS7700C, the option to off load data to the cloud adds possibilities for recovery if a disaster occurs such that any of the clusters in the grid that are cloud-capable models can access the cloud object store.

The only connection between the production sites and the DR site is the grid interconnection. Normally, no host connectivity exists between the production hosts and the DR site's TS7700. When client data is created at the production sites, it is replicated to the DR site as defined through Outboard policy management definitions and storage management subsystem (SMS) settings or is made available in the cloud object store.