

5.1.2 Deferred Copy Queue

Besides a copy policy of No Copy, a Deferred Copy policy has the least impact to the applications that are running on the host. Immediately after the volume is closed, device end is passed back to the application and a copy is then queued to be made later. These copies are put on the Deferred Copy Queue.

With the standard settings, host application I/O always has a higher priority than the Deferred Copy Queue. It is normally expected that the configuration and capacity of the grid is such that the entire queue has the copies completed each day; otherwise, the incoming copies cause the Deferred Copy Queue to grow continually and the RPO might not be fulfilled.

When a cluster becomes unavailable due to broken grid links, error, or disaster, the incoming copy queue might not be complete, and the data might not be available on other clusters in the grid. You can use BVIR to analyze the incoming copy queue, but the possibility exists that volumes are not available. For backups, this might be acceptable, but for primary data, it might be preferable to use a Synch copy policy rather than Deferred.

5.1.3 Volume ownership

If a logical volume is written on one of the clusters in the grid configuration and copied to another cluster, the copy can be accessed through either the original cluster or the other cluster.

At any time however, a logical volume is owned by a single cluster. We call this the *owning cluster*. The owning cluster has control over access to the volume and changes to the attributes that are associated with the volume (such as category or storage constructs). The cluster that has ownership of a logical volume can surrender it dynamically to another cluster in the grid configuration that is requesting a mount of the volume.

When a mount request is received on a virtual device address, the cluster for that virtual device must have ownership of the volume to be mounted, or must obtain the ownership from the cluster that owns it. If the clusters in a grid configuration and the communication paths between them are operational (*grid network*), the change of ownership and the processing of logical volume-related commands are transparent to the operation of the TS7700.

However, if a cluster that owns a volume is unable to respond to requests from other clusters, the operation against that volume fails, unless more direction is given. Clusters will not automatically assume or take over ownership of a logical volume without being directed.

This is done to prevent the failure of the grid network communication paths between the clusters, resulting in both clusters thinking that they have ownership of the volume. If more than one cluster has ownership of a volume, that might result in the volume's data or attributes being changed differently on each cluster, resulting in a data integrity issue with the volume.

If a cluster fails, is known to be unavailable (for example, a power fault in the IT center), or must be serviced, its ownership of logical volumes is transferred to the other cluster through one of the following modes.