3. A third write is run to update the database log, which indicates that the database update completed successfully.

The database ensures the correct ordering of these writes by waiting for each step to complete before the next step is started. However, if the database log (updates 1 and 3) and the database (update 2) are on separate volumes, it is possible for the FlashCopy of the database volume to occur before the FlashCopy of the database log. This sequence can result in the target volumes seeing writes 1 and 3 but not 2 because the FlashCopy of the database volume occurred before the write was completed.

In this case, if the database was restarted by using the backup that was made from the FlashCopy target volumes, the database log indicates that the transaction completed successfully. In fact, it did not complete successfully because the FlashCopy of the volume with the database file was started (the bitmap was created) before the write completed to the volume. Therefore, the transaction is lost and the integrity of the database is in question.

To overcome the issue of dependent writes across volumes and to create a consistent image of the client data, a FlashCopy operation must be performed on multiple volumes as an atomic operation. To accomplish this method, the IBM Spectrum Virtualize supports the concept of *Consistency Groups*.

FlashCopy commands can then be issued to the FlashCopy Consistency Group and, therefore, simultaneously for all of the FlashCopy mappings that are defined in the Consistency Group.

For example, when a FlashCopy `start` command is issued to the Consistency Group, all of the FlashCopy mappings in the Consistency Group are started at the same time. This simultaneous start results in a point-in-time copy that is consistent across all of the FlashCopy mappings that are contained in the Consistency Group.

Consistency Group with Multiple Target FlashCopy

A Consistency Group aggregates FlashCopy mappings, not volumes. Therefore, where a source volume has multiple FlashCopy mappings, they can be in the same or separate Consistency Groups.

If a particular volume is the source volume for multiple FlashCopy mappings, you might want to create separate Consistency Groups to separate each mapping of the same source volume. Regardless of whether the source volume with multiple target volumes is in the same consistency group or in separate consistency groups, the resulting FlashCopy produces multiple identical copies of the source data.

Maximum configurations

Table 10-1 lists the FlashCopy properties and maximum configurations.

Table 10-1   FlashCopy properties and maximum configurations

FlashCopy property	Maximum	Comment
FlashCopy targets per source	256	This maximum is the number of FlashCopy mappings that can exist with the same source volume.
FlashCopy mappings per system	4096	The number of mappings is no longer limited by the number of volumes in the system, so the FlashCopy component limit applies.
FlashCopy Consistency Groups per system	255	This maximum is an arbitrary limit that is policed by the software.