XactCopy™

Immediate Disaster Recovery

OTM™ White Paper

What is OTM™

OTM is an enabling technology that presents a stable, coherent, point-in-time snapshot view of one or more volumes or physical drives to a backup disk, without impacting system performance.

Why is OTM Needed

OTM allows you to back up a server with all files and databases open and active. Oracle databases, SQL Servers, Lotus Notes, E-Mail servers, etc. while the server is live. OTM corrects the tragedy of lost data that is only evident after restoring a group of related files that were indeed properly backed up, but lacked relational integrity (see timestamp problem below).

Open File Agents & Managers vs OTM

In simpler times, Open-File Agents & Managers solved the problem of open file backup by simply ensuring that all files were backed-up intact and not skipped because they were open. However, as applications and operating systems became more complex, data loss is once again a major problem facing network administrators. This is due to the lack of relational integrity while using Open-File Agents & Managers.

The Timestamp Problem (Relational Integrity)

Most of today's applications have multiple associated files that are all updated together. When a backup is done while running an application, the backup copies file 'A' to the backup device. Then, an application subsequently updates file 'A' and another associated file 'B' that must match each other for the dataset to load properly. The backup operation then backs up file 'B' to the backup device, which no longer matches file 'A' on the backup device. Everything looks good to the administrator, until the files are restored. Convinced that the file restore must have gone awry, the administrator tries again, but it just won't load the data after 'restoring'. With OTM, all files are timestamped concurrently and precisely match those from when the backup commenced.

Disappearing Backup Window Problem

Most of today's critical applications such as email, web-servers and transaction-servers, can no longer be shut down for backup and are running 24x7. This makes backup integrity a virtual impossibility when utilizing open file agents or managers. With the OTM version of XactCopy, these applications are no longer improperly backed up; there is no need to shut down the server to do a "clean backup."

Because of XactCopy's unique ability to perform a full system backup incrementally, the entire full-system backup operation typically takes under three minutes to accomplish.

How XactCopy and OTM work Together

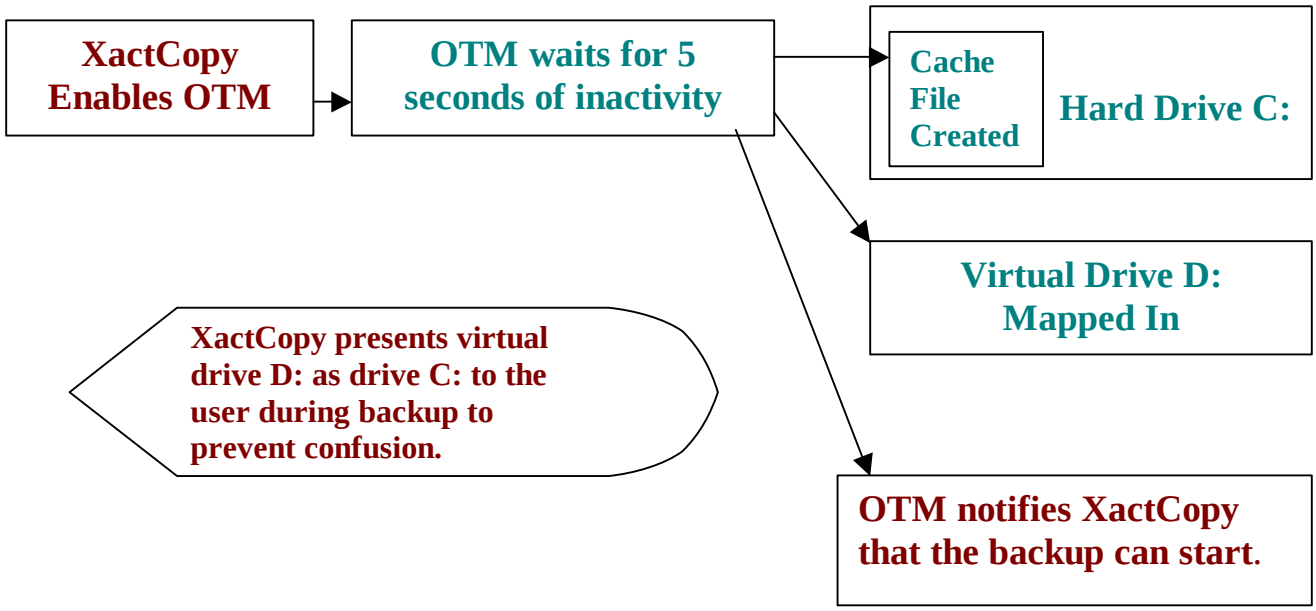
OTM presents a stable, non-changeable picture-in-time of any system hard drive to your backup drive by creating an alternate "virtual drive," or static copy of the drive to be backed up. When OTM is started by XactCopy, it waits for a short period of inactivity (5 seconds) where no writes are occurring to any of the volumes or drives that have been selected for backup. Once this quiescent period is obtained, OTM is enabled and maps-in a virtual drive letter for each volume selected to be backed up. XactCopy accesses this static virtual volume, instead of the original volume, which is changing during the backup.

When a write command occurs on the original volume, OTM pauses it and copies the old corresponding data to its cache file and immediately sends the original write data to the system drive. This action keeps the system drive current and unaffected at all times during the backup. Read requests from all applications except the backup are passed directly to the system drive with no intervention. Read requests from XactCopy are passed to the OTM filter driver, which determines if the requested data is already in cache. If data is in cache, OTM passes the cached data to the backup drive. If not, the data is passed directly from the system drive. Since OTM only needs to preserve the original data, additional writes to the same sector are not cached and are passed directly to the system drive.

Initialization flow chart

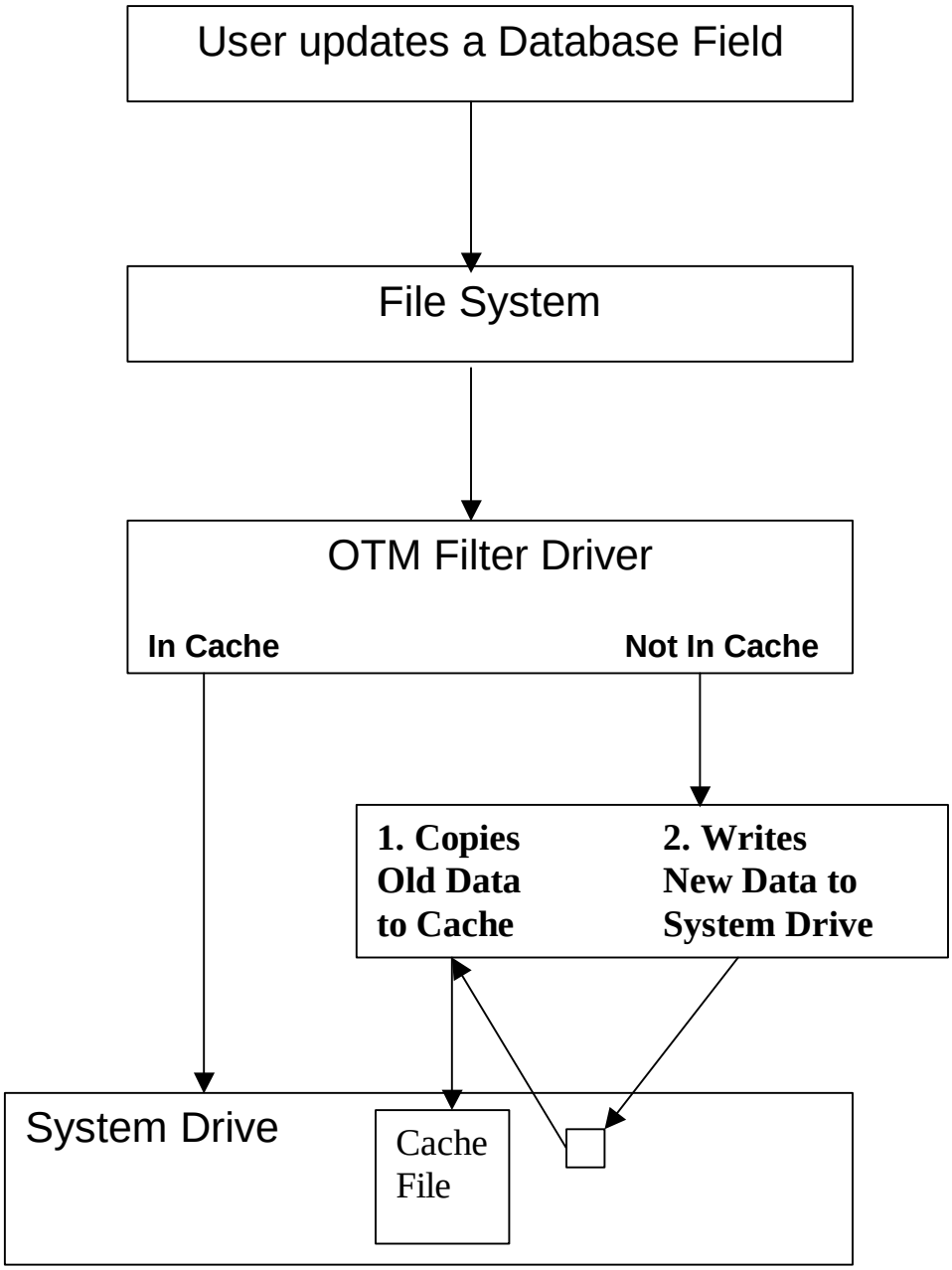
Backup of physical drive C selected (no other drives present in system)

Figure 1



OTM data path during backup when ANY write activity occurs

Figure 2

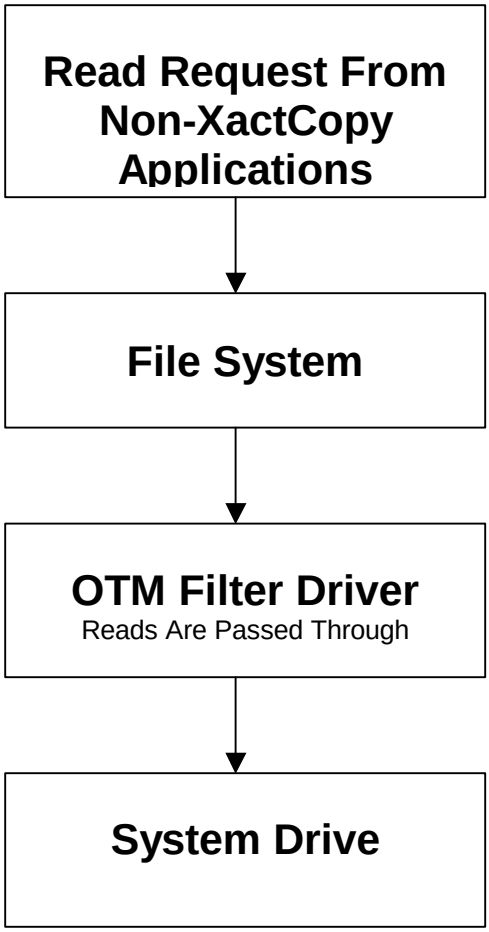


OTM data path on non-backup reads

Open Transaction Manager and XactCopy work at the "SECTOR" level. No file or sector interception or interpretation is necessary.

Data Path On Non-Backup Reads

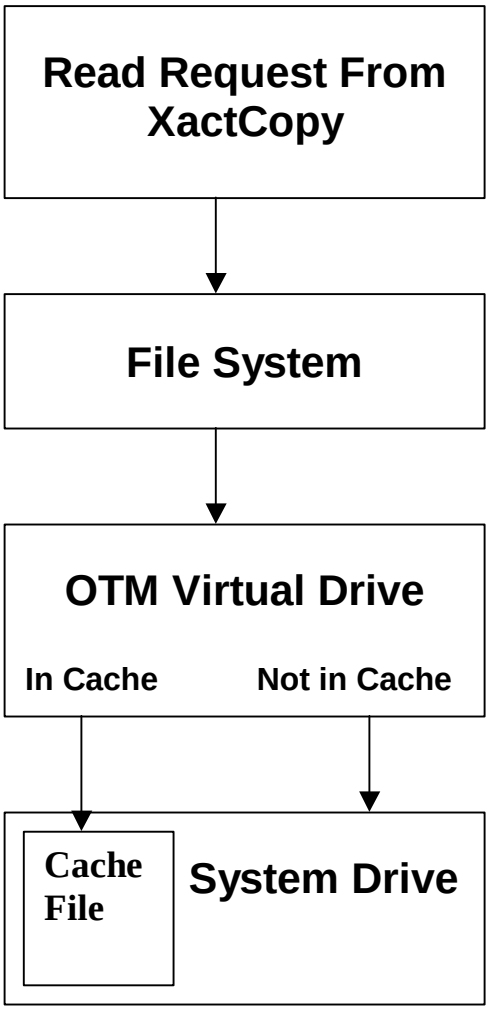
Figure 3



OTM data path on XactCopy backup reads

Read Request from XactCopy

Figure 4



Why the Integration of these Solutions?

Fast system recovery, which XactCopy affords, is only half of the system downtime equation; data loss is also a critical component. With the speed of XactCopy's full-system backups and OTM's ability to provide a "clean backup," system administrators can increase backup frequency without degrading system performance. This results in minimal data loss when failures occur and overall productivity is significantly enhanced.