

Case Study: Work with Locked Files for Backup Systems with VisionWorks Solutions (Canada)

VisionWorks Solutions: Client Profile

VisionWorks Solutions Inc. (VWSolutions), founded in 2003, offers proven and cost-effective backup and related technologies. VWSolutions' target markets include businesses of all sizes with a special emphasis on small-to-medium sized business in all industries.

Deployed on over 200,000 computers worldwide, the company delivers innovative backup solutions that encompass ease-of-use, value and performance to thousands of customers including several Fortune 500 companies. With over 20 OEM backup companies using its technology, VWSolutions is the choice for robust open file management and laptop security tools.

The Situation:

VWSolutions was working on deployment of its backup solution for a big customer and got the request for the functionality that was not yet implemented: to guarantee the valid backup of the files, which are currently opened with exclusive access rights.

Besides this deployment, VWSolutions considered that the functionality of working with exclusively locked files in terms of backup systems could be a great competitive addition to their existent solutions as these features are rather rare ones.

The Problem:

Usually, a file is exclusively locked when a set of operations applied to it can cause the situation when an intermediate resulting file is invalid (e.g. adding a record to database: when in process, some fields are recorded already and some fields no, as a result the integrity of the intermediate file is broken).

Here, there are two obvious strategies of the backup system behavior. The first is to create a backup version of this file assuming the risk of that the file will be impossible to open after restore because of its invalidity. The second way is to skip exclusively locked files at this backup session relying on the older copy if present. It's obvious that both strategies are rather risky.

VWSolutions, inspired by its client, decided to try the third way that would provide the most reliable and up-to-date backup. This small solution was to be installed together with the backup system and control all operations with exclusively locked files. When a working session with such access was started, this solution created a copy of the initial file and then monitored performed operations, "saving" the most recent valid intermediate file version. If a backup application was trying to access the exclusively locked file, the solution provided it with the last valid file version.

It was decided to create a stand-alone application that would require less time to develop as against the existing backup system rework, and also it would be more promising for independent sales.

To create such solution, the specific knowledge was required: expertise of work with file systems on low level, file system driver development. At that time, VWSolutions team did not have enough qualified resources to implement this project. So it was decided to outsource this task to the professionals with expertise in the corresponding scopes.

Apriorit was ready to get this task with the eminently suitable profile of driver, disk, and file system interaction projects.

The Solution:

The preliminary research discovered some technical peculiarities of the project:

- 1) Antivirus compatibility was not an easy task as the solution work was qualified as a suspicious file activity.
- 2) Smooth work with the application that established exclusive file access was to be provided.
- 3) There was a task to monitor all locked file operations and qualify their result (if a file is valid or no).

The first customer-oriented solution was successfully developed as fixed cost project and took 7 man-days of development and 3 man-days of testing with a strong accent on compatibility check.

On the basis of this solution, the project of development of COTS product to manage file access was started.

The universal solution required more flexible architecture and large-scale multifactor testing using detailed test plans, autotests, custom utilities specially developed by the team to emulate all possible activity with exclusively locked files.

Besides, deep research discovered additional technical difficulties with NTFS system, where poorly documented technology of streams is used.

The full-functional release version of the product was prepared in 4 man-months. After the first release, the product was being improved and maintained.

The new functionality requirements as well as growing compatibility lists forced the team to constantly conduct new research and make architecture refactoring twice. At the same time, technical customer support was performed.

After 2 years, Apriorit development team proposed the draft of the new product version with completely new architecture that would allow to resolve the majority of the compatibility

problems; it was file system mini filter driver architecture. VWSolutions agreed with this plan and in 4 man-months the new product version was developed. It included file operation tracking, improved work with large files, change cashing, full operation log, work with files under network access, and other features.

The Impact:

Having started with the customer-oriented solution, which allowed VWSolutions company to successfully close the sale, project team created file access management product for backup systems, which being offered to the market became bestseller and leading product of the client.

Next product versions were also successful on the market that allowed VWSolutions to increase significantly its customer base and market share.

Some other complex VMSolutions products were created on the basis of the developed technology thus continuing its long-term beneficial partnership with Apriorit.

What's next?

Get the **free estimation** of time and effort for your project! After initial research, we'll provide you with the basic task dropdown and estimates indicating approaches and tools we can use to save your budget.

All we need is a brief project description sent to the info@apriorit.com with "RFP" mentioned in the subject.

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The logo for Apriorit Inc. features the word "apriorit" in a lowercase, italicized sans-serif font. The letters "a", "p", "i", "o", and "r" are green, while the letters "i", "o", "r", "i", and "t" are orange. The "i" and "o" in the second half of the word are slightly taller than the others.