SALIENT SYSTEMS WHITE PAPER

Modular vs. Database Dependent Design

Understanding benefits and drawbacks of recording architectures commonly employed by Digital Video Management Systems

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Database Dependent Design

Modern databases are powerful storage mediums. Coupled with powerful search capabilities, video management system (VMS) architects see the performance gains offered from incorporating database functionality into their designs as a "no-brainer." In fact, a common design trend in video management is to use the database as the sole storage medium (Figure 1). This provides a very rich solution where meta-data from video can be stored alongside the video itself, often in the same table, where it can then be combined and retrieved in very useful ways. That is after all, the nature of a database.

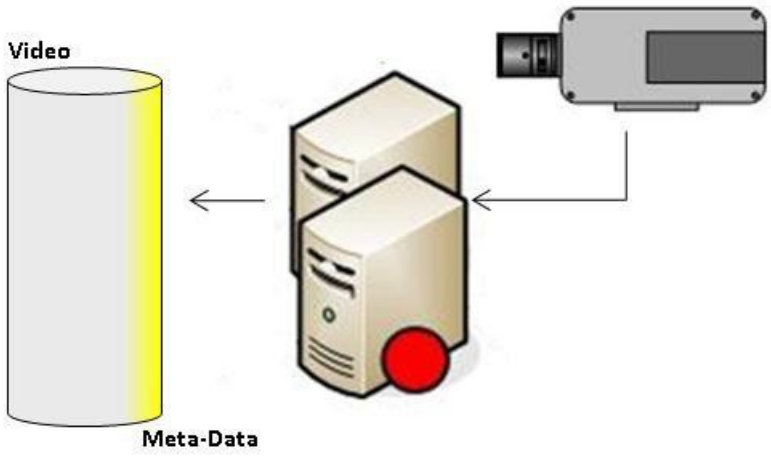

Figure 1: Video and meta-data are stored together in a database.

However, this is not without some drawbacks and other considerations unfortunately come into play. Though video and databases do work well together, and nearly any VMS design would benefit from the inclusion of a database, the nature of the two technologies also has its drawbacks. Namely, databases are not infallible creatures, and unfortunately even the best of them can and do fail. This opens the very real possibility for video loss due to database corruption.

The two largest factors that contribute to database corruption are the size of the database, and the frequency of which it is accessed. Keeping this in mind, let's consider video itself - large streams of data running for potentially long periods of time. This means the database is going to grow large rather quickly. It also means the database is going to be accessed many, many times every second. This creates an environment where a database is likely to become corrupt due to any number of external causes. Add 30 or more cameras to the system and it now becomes question of "when" not "if" the database will fail.

So how do end-users deal with potential database failure in a video management solution? Ideally, most database dependent VMS vendors recommend you keep your cameras databases small by managing frame rates, bandwidth, and performing regular archiving. This reduces the risk of corruption and mitigates loss should a database become corrupt beyond repair.

NOTE: Most database solutions also provide tools that will attempt to reconstruct a corrupt database. However, two problems may occur from this:

1. The repair process is resource intensive, and the Video Management System may not be able to record new video when repairing the existing database.
2. The repair process may fail, in which case the affected video data will be completely lost!

In many applications, video capture needs a higher rate of guarantee. The high potential for total video loss is unacceptable and a more robust storage solution is required. In these cases, reliance on database dependent storage of video is not recommended. Complete View's hybrid storage system will be more appropriate for these environments as it leverages the benefits of a database without the high degree of risk associated with large video databases.

Hybrid Architecture

By moving beyond the more common design of relying solely on a database for video storage, CompleteView separates the actual video storage from the required meta-data (Figure 2). This side-steps the potential for video loss in the event of database corruption, and makes CompleteView's video recording architecture uniquely modular and highly robust. With this design, a standard SQL database is used only to optimize access to video data, but never places video information at risk. In fact, a complete database failure can occur separately and pose no threat to the recorded video itself. The data is always kept separately. Even if the smaller database fails or becomes corrupt, it can be readily rebuilt at runtime by CompleteView and requires no restart.

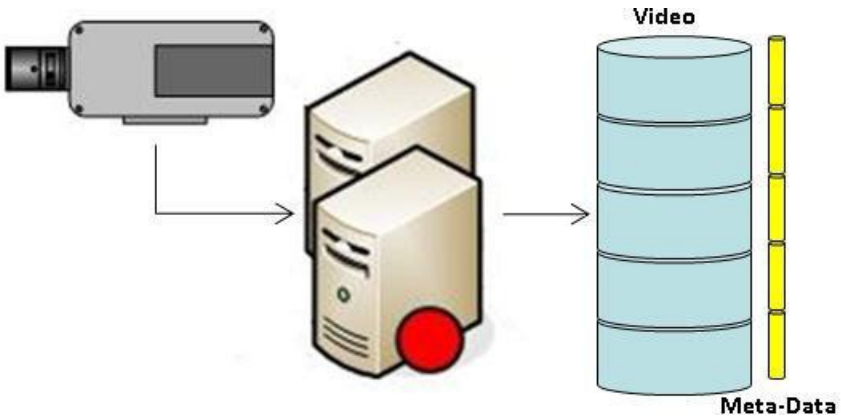

Figure 2: A database is used for meta-data, but video is stored separately.

In addition, a modular, hybrid approach means that even if video is moved between storage volumes, CompleteView's *Dynamic File Processing* algorithm is able to find the missing file and update the associated database record(s) transparently. This is a boon to end-users because there is never an interruption in data access. Archiving or storage maintenance can occur at any time without interruption to standard business operations.

Conclusion

Video and databases are powerful tools for security management. While they work very well together, their very nature creates additional considerations when choosing a VMS solution. For the most reliable storage, dependency between the two technologies is not the best solution. A modular approach that decouples video from the potential volatility creates a more robust video storage system, and is more desirable in situations where the high risk of video loss is unacceptable.

ABOUT SALIENT SYSTEMS

Salient Systems offers network friendly, comprehensive IP and analog video surveillance management systems (VMS) built on open architecture. As the recognized transition leader from analog to digital video, Salient Systems' VMS, CompleteView™, is scalable and provides everything needed to manage a multi-server enterprise from a single desktop. Salient delivers simple and scalable security today…and tomorrow. For more information about Salient Systems and CompleteView, visit www.salientsys.com.

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