Video Surveillance Feature Focus

SmartBoost Technologies

Predictive Playback

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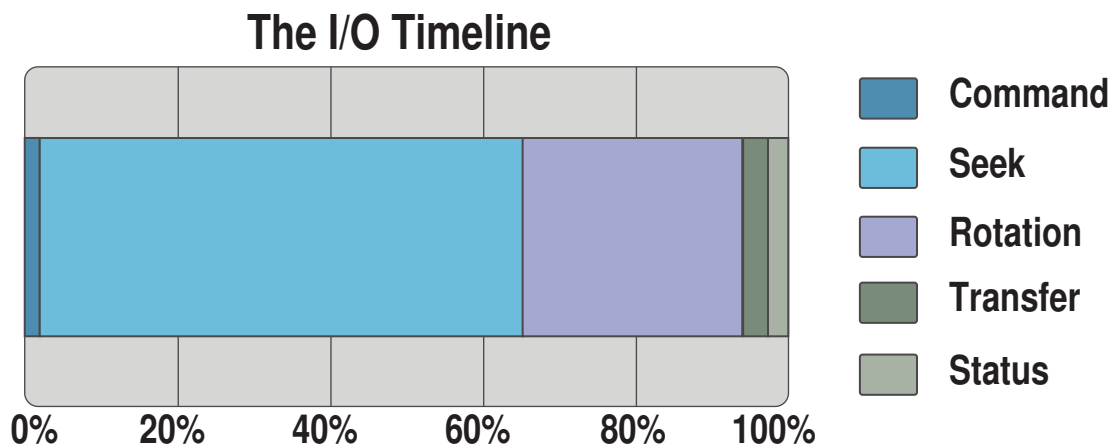
SmartBoost Technologies - Predictive Playback

The Feature

The Promise Vess A-Series is not like other IT servers that the competition sells in video surveillance. Vess is customized for the write intensive environments of video surveillance and includes a collection of unique SmartBoost Technologies designed to overcome performance bottlenecks which allow Vess NVRs to handle a much higher number of IP cameras than competing solutions.

Predictive Playback helps to reduce the time the system requires to seek the data that needs to be played back as it is already preloaded in the cache. Additionally, smoother playback can be experienced since the hard disk drives are not competing with the workload of the system.

The Challenge

When data needs to be played back, how quickly the system plays the video depends heavily on two factors: seek time and rotational latency. Seek time is the time it takes for a hard drive's read/write heads to position itself over the track being read or written. Rotational latency is the time it takes for the sector of the disk being accessed to rotate into position under a read/write head.

The I/O Timeline

Legend:
- Command
- Seek
- Rotation
- Transfer
- Status

(X-axis: 0%, 20%, 40%, 60%, 80%, 100%)

The challenge to deliver optimized performance increases when the surveillance system needs to record and playback data at the same time which places a heavy load on the hard disk drives, especially from random playback requests and different use cases that affect performance. This means that live view or playback might not be available to user requests in time to make timely risk assessments or react to alert events. The difficulty increases greatly when high resolution video needs to be played back as the size of a full HD or 4K frame is very large and the user needs to wait longer for the data to be ready.

The Fix

The Vess A-Series 'Predictive Playback' cache buffer feature monitors the read behavior and observes regular behaviors. Vess A-Series preloads data in the cache buffer and when the request is made to playback that data it reduces the data seeking time so the video can be played back almost 50% faster:

	Standard NVR	With Predictive Playback
Sampling READ counts	100	100
Total Read response time (ms)	226	134
Average Read response time (ms)	2.26	1.34

Note: The test was configured with one hard disk drive in a Vess A2200 NVR storage server.

Since this feature predicts where playback will be needed, the workload of the system is not competing with the hard disk drives which means that playback is significantly smoother when streaming.

The advantage of Predictive Playback is showcased below. In Figure 1, each time a playback request is initiated the seek and latency time must be considered before the data is streamed. Figure 2 showcases how with the Vess A-Series with Predictive Playback, data is continuously preloaded into the cache so the seek time can be reduced when playing back sequential data.
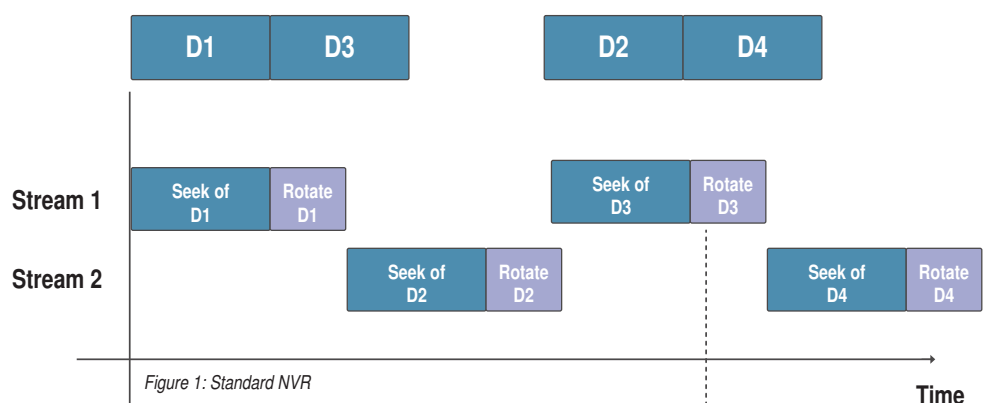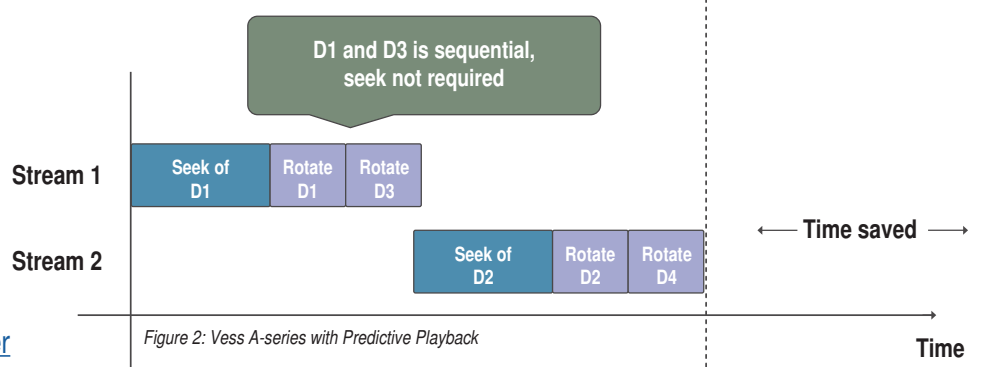
Figure 1: Standard NVR

Figure 2: Vess A-series with Predictive Playback

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Promise Video Surveillance Solutions

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