

Video Surveillance Must Modernize In Storage, Recording And On-Demand Access

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Dollars spent by video surveillance customers must go towards ensuring high-availability capture, storage and on-demand access to live and archived video. Reaching this goal mandates high-availability of independent components – camera, network, storage (edge, external), internet connectivity, display, all Video Management Software (VMS) components and an architecture that can take advantage of this. In this note, we focus on seeing our way through to a video surveillance architecture, that provides high availability storage, access to live and stored video content.

Edge Recording

Of all options available to store recorded video, edge recording is the only one that is unaffected by network failure. This makes edge storage a must-have. But, this has some limitations at present:

- Edge storage capacity is limited.
- Edge media has a short lifetime, rated only for thousands of hours of continuous recording.
- Most cameras are not secure and physical damage to the camera could lead to catastrophic loss of edge stored content.

As storage and compression technology evolve, the constraints imposed by (1) and (2) could go away. However, securing cameras will continue to be a barrier for most installations.

Secure External Storage

It is thus imperative to also store video in secure external storage. Such an architecture uses edge storage to fill in content gaps created by network, external storage outages. As edge storage technology improves, larger gaps can be filled in, but one will always need external storage.

By our definition, 'external storage' is a solution stack that includes storage media and all software (including VMS) that provide access to this storage.

Access To Live And Archived Video



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Access to live video can either be met by external storage or directly by the camera

Every surveillance solution needs to provide access to live and archived video. Access to live video can either be met by external storage or (and) directly by the camera. All things being equal, having the camera directly provide live video access, is a higher-availability solution. There is dependence on fewer components in the chain.

Solutions in the market use one of the above two approaches for access to live video.

Due to limited capacity and low physical security of edge storage, it makes sense at present, to have external storage meet all requests for archive video. Thus, we are led to an architecture that has heavy dependence on external storage.

Dual-Recording

For high-availability, external storage must be architected with redundancy. Ideally, independent components that make up external storage – storage media, associated hardware and software (including VMS components), should be individually redundant and have smart interconnectivity.

However, solutions in the market rigidly tie these components together. Failure of a single component causes failure of external storage. For e.g. hardware failure of a server causes VMS component failure AND storage failure.

For these solutions in the market, high-availability is achieved by having additional external storage units that step-in during outages of primary units.



DR provides a smart way to

If these additional units continuously duplicate primary units, access gaps are minimized, and archive access is un-affected

during primary unit outages. This is the idea behind Dual-Recording (DR). To meet cost budgets, these additional units can be configured to store subsampled (framerate, resolution) video content. A small number of additional units can support concurrent outages of all primary units. A few-to-many redundancy.

provide high-availability for external storage

Rising Need For Dual-Recording

Most cameras cannot be physically secured, and video content produced by a camera must be stored externally. Many VMS solutions use external storage to service live video access requests. Edge storage limitations impose restrictions on edge archive access at present. So, external storage is used to service requests for archive access too.

Thus, a surveillance system ends up being over-dependent on external storage. DR provides a smart way to provide high-availability for external storage. As edge storage improves, it will be able to service archive access requests. VMS software will need to evolve, to use this capability smartly.

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