Successful Body Camera Deployment Requires Robust Digital Storage Solution

Software-defined storage solutions provide scalability and value for police departments
For the past several years, police departments across the country have been rapidly adopting body-worn video cameras. About one in three of the 18,000 U.S. police departments now use body cameras, and the rate is even higher among major-city police departments where 42 of 68 have instituted body-worn camera programs.\(^1,2\) One of the more vexing challenges for departments when implementing these programs is determining how to securely and affordably store the massive amounts of data the cameras generate.

The two most commonly considered storage options are traditional and software-defined storage. With each, departments are looking for the best possible combination of value, security, flexibility, scalability, and ease of use. In this paper, the experiences of the Orchard Park Police Department—which evaluated a variety of storage options before implementing a successful body camera program in 2016—will be used to highlight best practices and a viable path forward.

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\(^1\) [http://wnetv.com/2015/02/04/police-body-cameras-in-action](http://wnetv.com/2015/02/04/police-body-cameras-in-action)
\(^2\) [www.bwcscorecard.org](http://www.bwcscorecard.org)
Police departments may be able to pay for body cameras and docking stations with the help of funding from the U.S. Department of Justice and other grant sources. But those costs are only the beginning. The far greater challenge is how to pay for the IT infrastructure upgrades and changes necessary to store the massive amounts of video data generated by body cameras.

**Storage Demands Pose Obstacle to Body Camera Adoption**

Body-worn cameras have been in limited use since the early 2000s, but momentum toward adoption of the cameras in the United States has surged with recent high-profile police shootings. It is widely believed that body cameras benefit both police and citizens by providing increased transparency, greater accountability on both sides, and faster resolution of some disputes. In addition, deploying body-worn cameras has the potential of helping police departments build and restore trust with the communities they serve.

Grants would cover the costs of the new physical cameras and docking stations, but the department also needed to build out its IT infrastructure to accommodate the rapidly growing pool of stored videos.

In addition to finding an affordable solution that could provide the necessary amount of storage, the Orchard Park Police Department needed to overcome several other challenges common to similar deployments:

- **Security**: Citizen and officer privacy is of the utmost concern, so all video data must be properly and securely stored using the latest security protocols and protections.
- **Access**: All video must be available for immediate retrieval by authorized individuals.
- **Reliability**: Downtime must be avoided, with failsafe measures in place such that even if one drive were to go down, the entire system would not.
- **Scalability**: Whatever the current storage demands may be, they will grow, so the solution must be highly scalable.
- **Flexibility**: Vendor lock-in must be avoided so that as needs change and new technologies emerge, the department can shift accordingly, using the best available solutions.

The Orchard Park Police Department in Erie County, New York, provides an example of these challenges. The department, which serves a town with a population of about 30,000, planned to issue body-worn cameras to its 35 officers in addition to handling video feeds from about 30 surveillance cameras. Grants would cover the costs of the new physical cameras and docking stations, but the department also needed to build out its IT infrastructure to provide 80 terabytes (TB) of storage.
The traditional storage model has been around for decades and can, at least initially, provide the massive amounts of block storage that body-worn camera programs demand. There are several drawbacks however, since departments typically need to purchase costly purpose-built storage systems from a single vendor. Along with the high upfront investment, this locks the department in with one provider, no matter how storage needs change or what improved storage technologies emerge in the future. In addition, traditional storage arrays require many weeks or even months to scale, and even then they offer only limited scalability to meet growing demand.

Software-defined storage has emerged in recent years as an alternative to the traditional storage model. Instead of depending on custom-made hardware, software-defined storage relies on far less expensive off-the-shelf hardware. The software used to control storage-related tasks is decoupled from the physical storage hardware, making it easier to manage, adjust, and scale or reduce storage resources—often in just minutes—to adapt to changing needs.

A 2017 analysis comparing three traditional SAN storage solutions from EMC, IBM, and NetApp with five software-defined storage solutions from DataCore, Red Hat, Scality, SUSE, and VMware highlights the potential benefits of software-defined storage solutions. The analysis compared the cost of hardware, software, and support for 250 TB of storage, growing 25 percent per year, used to store infrequently accessed data in an online archive.

Results showed that SUSE’s software-defined storage solution deployed on industry-standard servers provided the lowest-cost solution. Conclusions drawn from the study include that “the future is software-defined storage” and “traditional enterprise storage is under tremendous price pressure from software-defined storage available from vendors like SUSE.”

### Key Benefits of Software-Defined Storage

- **Agility:** Easily manage across locations and classes of storage
- **Flexibility:** Select the hardware platforms and hypervisors to meet your needs
- **Decoupled hardware and software:** Increase innovation in every layer as needs shift
- **Lower capital and operating expenses:** Reduce ongoing hardware maintenance costs and software support costs

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Deploying body-worn cameras has the potential of helping police departments build and restore trust with the communities they serve.
Finding the Right Storage Solution and Partner

The Orchard Park Police Department considered both traditional and multiple software-defined storage solutions before ultimately investing in SUSE Enterprise Storage. With the help of SUSE Professional Services, in less than a week the department implemented SUSE Enterprise Storage, powered by Ceph, on HPE general-purpose ProLiant servers. Specifically, the deployment included four object storage device storage nodes on four HPE ProLiant DL380 series servers, one administrative server (HP DL360), two HPE Flex Fabric switches, and three HPE ProLiant DL360 monitor servers.

SUSE Enterprise Storage provides the department with the limitless storage capacity it needs to store large-data file applications such as video surveillance. The solution also simplifies Orchard Park’s overall storage environment, so the department can automatically optimize and upgrade storage as its needs change. The department already anticipates adding more surveillance cameras, and if the department eventually exceeds its current need for 80 TB of data, the software-defined storage solution can quickly and easily scale to meet those increased demands.

Lessons from Orchard Park’s storage dilemma

Orchard Park’s experience highlights the key features police departments should look for in a software-defined data storage solution, including:

- **Cost-effective** long-term (hardware and software costs)
- **Limitless** storage capacity
- **No vendor** lock-in
- **Advanced** security features
- **Simplified** management, with object, block, and file system storage combined
- **Ease of implementation**

In addition, departments should make sure that the storage solution they choose has been tested and proven in similar deployments involving unstructured large-data files. Advanced features—such as erasure coding for resilience and remote replication to ensure business continuity—should be built in. And, finally, software-defined storage solutions should be truly open and flexible, allowing departments to select the hardware platform and hypervisor they want to minimize costs and optimize performance.
As more police departments move toward adoption of body-worn cameras, the need for cost-effective, secure, and highly scalable data storage is rising. Compared to traditional storage solutions, software-defined storage can deliver significant advantages, including no vendor lock-in, lower upfront costs with commodity off-the-shelf hardware, and limitless storage capacity. SUSE Enterprise Storage, powered by Ceph, on HPE general-purpose ProLiant servers provides a powerful solution proven by the Orchard Park Police Department to deliver the performance, security, and value police departments need.

A Proven Solution to Meet Your Needs Now and In the Future

SUSE Enterprise Storage

SUSE Enterprise Storage is a fully featured, self-healing, self-managing, distributed software-defined storage solution that enables enterprise IT organizations to use commodity off-the-shelf servers and disk drives to build cost-efficient pools of storage.

Key Benefits:

- Highly scalable and resilient storage environment
- Consolidates block, object, and file storage requirements
- Uses commodity off-the-shelf hardware
- Highly secure, with data encrypted at rest
- Open source; no vendor lock-in
For more information, contact your local SUSE Solutions Provider, visit us online or call SUSE at:

1-800-796-3700 (U.S. and Canada) or 1-801-861-4500 (worldwide).

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