

The Greening of Surveillance

Responsible, Economical Operations



PRODUCT BRIEF

Overview

In just one year, Pivot3 *High-Definition Storage™* has become the surveillance industry's platform of choice for large scale video surveillance deployments. By combining affordability, scalable bandwidth, continuous availability and flexible capacity expansion through an industry standard TCP/IP-based architecture, Pivot3 excels in addressing the unique requirements of video surveillance.

Less well-known, but equally important, are the dramatic "Green" benefits that Pivot3 storage brings to power and space sensitive environments. *Pivot3's storage architecture provides reductions in: 1) needed power, 2) heat generation, 3) cooling, 4) data-center space and 5) infrastructure management expense. This results in dramatic savings for ongoing operational and acquisition expense.*

This product briefing provides an overview of the architectural elements that enable the conservation of these resources along with an example of how these benefits are realized in a real world video surveillance deployment.

Pivot3 Architectural innovation delivers "Green" benefits

There are three key architectural differentiators of Pivot3 High Definition storage that generate "green" benefits over traditional direct attached storage (DAS) alternatives:

1. **Storage consolidation**

Pivot3 distributed RAID and patent-pending Hyper-pathing™ consolidate isolated DAS storage islands into a centralized storage pool. This central storage pool presents a highly efficient storage profile that *reduces power, cooling and rack space needs by eliminating underutilized DAS boxes, by minimizing the percentage of capacity required for parity overhead and by consolidating DAS failover storage into the central array.*

2. **Storage virtualization**

Pivot3's distributed RAID virtualizes physical drives, network connections and RAID controllers so that performance, bandwidth and availability features are provided using parallel processes. As a result, Pivot3 HD Storage *eliminates many physical spare drives through virtual distributed sparing, replaces low capacity power-hungry 15,000 rpm disk drives with high-capacity 7200 rpm drives accessed in parallel, scales bandwidth using aggregated power-effective Gigabit Ethernet network links in place of high-power 10GE or Fibre Channel networks and reduces dedicated RAID controllers by providing redundancy across nodes in the array.*

3. **"Power-as-you-grow" storage**

Pivot3 minimizes power and cooling requirements by providing a seamless "power-as-you-grow" model. On initial installation, customers deploy needed capacity using fully-populated Databanks with power supplies exactly matched to desired capacity. On expansion, customers introduce additional fully-optimized Databanks. This expansion strategy *eliminates the waste involved in future-proofing installations using over-spec power supplies in partially-filled DAS boxes that may never be filled.*

Benefits of Pivot3 “Green” Storage in a 400 TB gaming environment

Pivot3 recently compared the use of Pivot3 HD Storage with traditional DAS storage for a 400TB casino environment. By consolidating storage in a central pool, Pivot3 replaced 60 DAS arrays with 40 Pivot3 Databanks configured in five Arrays as shown below:

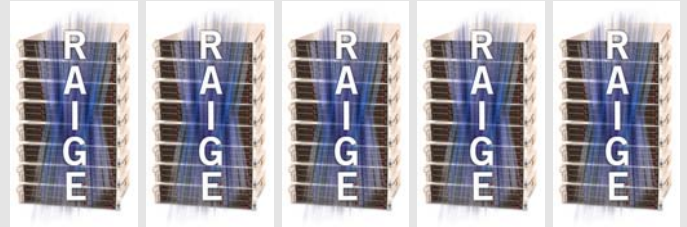
By consolidating storage into a central storage model, Pivot3 introduced the following benefits:

- **33% reduction in power supplies dedicated to storage**
- **38% reduction in disk drives**
- **24% reduction in rack units dedicated to storage or 1.5 racks**

As a result, the installation stood to benefit from the following “green” operational savings by moving to Pivot3 central storage:

- **\$50K reduction in power and cooling over 3 years**
- **\$63K reduction in data center maintenance spending over 3 years**

Source: “In the data center, power and cooling costs more than the IT equipment it supports”, by Christian L. Belady, P.E., Hewlett-Packard



Five Pivot3 Arrays replace 60 DAS arrays

Summary

Pivot3 introduces “green” benefits into video surveillance architectures through a unique architecture. The key “green” benefits of Pivot3 distributed RAID and Hyper-pathing™ are:

1. Storage consolidation

- Distributed RAID consolidates DAS boxes
- Minimizes percentage of capacity required for parity overhead
- Consolidates DAS failover storage into the central array

2. Storage virtualization

- Eliminates many physical spare drives through virtual distributed sparing
- Replaces power-hungry 15,000 rpm disk drives with 7200 rpm drives
- Scales bandwidth using aggregated, power-effective Gigabit Ethernet
- Reduces RAID controllers by providing redundancy across controllers in the array

3. Power-as-you-grow storage

- Eliminates use of fully-powered, partially-filled DAS arrays
- Power supplies optimally match fully populated boxes
- Power for additional capacity is added only when capacity is needed.



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