Lightbits Powers One of the Worlds Largest eCommerce Platforms

eCommerce is big business in economies undergoing massive digital transformation and when it comes to Big Data Analytics the stakes are high. One of the biggest challenges for enabling successful eCommerce is the architecture of the IT infrastructure. While scale is an important consideration in infrastructure architecture decisions (deployments are often petabytes in scale), the more important factors are data formats and collection speeds, the accessibility to use the data for operations and predictive buyer analysis, customer service improvements, and growing revenues. To move fast and make wise decisions, IT organizations supporting eCommerce must consider the speed of data entering the system and how fast it can be processed to gain advantage in this competitive market. The masters of Big Data Analytics for eCommerce implement an IT infrastructure that supports the volume, variety, velocity, and veracity of the data. Lightbits offers a disaggregated, software-defined architecture that leverages the NVMe/TCP protocol to deliver a scale-out data platform with the efficiency, flexibility, and agility that IT organizations require to enable Big Data Analytics for eCommerce.

ONE OF ASIA'S LARGEST ECOMMERCE PLATFORMS IS POWERED BY LIGHTBITS

This massive online retailer, with multi-millions of products in as many different categories, powers its eCommerce business with the Lightbits fast and flexible cloud data platform. The multi-billion dollar company, commands the largest share of the market in their region. The platform currently services millions of registered users, millions of daily visits, and delivers millions of shipments per month – and those numbers are increasing rapidly. To support their massive growth, reach new heights, and compete on a global scale, the company was looking to modernize their internal cloud platform.

THE CHALLENGE: MODERNIZING IT INFRASTRUCTURE FOR FLEXIBILITY, AGILITY AND EFFICIENCY

To modernize and simplify their operations, while reducing costs, this organization was looking to move from their JBOD (Just a Bunch of Disks) and JBOF (Just a Bunch of Flash) design to a fully disaggregated, software-defined solution. In addition, they needed a platform to support their Kubernetes (K8s) environment that consists of thousands of worker nodes on bare metal across multiple data centers. In their K8s environment, they run many high-performance database applications including MySQL, MongoDB, Kafka, Cassandra, Aerospike, Hbase, Redis, ElasticSearch, and others. Many business and technical challenges triggered this IT organization to look for a more modern and efficient solution:

- With thousands of drives in use across multiple application servers, they had efficiency and utilization issues from using SSDs as direct-attached or JBOD storage devices.
- They couldn't scale storage independently from compute.
- They required a solution capable of delivering high performance and consistent latency for their IO-intense database workloads in a highly dense K8s environment.
- They needed a dynamic solution that could keep pace with their growing business.

Industry
eCommerce

Environment & Workloads
Linux KVM and Kubernetes
High-Performance Databases

Business Requirements
- Software-defined architecture to simplify operations and reduce costs
- NVMe and persistent storage for Kubernetes
- Scalable (scale up, scale out)
- Flexible, to leverage the most cost-efficient hardware configurations
- Easy to use and manage with automated provisioning
- Agile, to "lift and shift" workloads to any cloud and allocate storage on an as needed basis
- Tenant-based QoS and volumes allocations

Solution
Lightbits Cloud Data Platform on Lenovo ThinkSystem chassis' with Intel 3rd Gen Xeon Scalable Processors and Micron NVMe SSDs

Business Benefits
- Flexibility. The system runs on any cloud or hardware configuration enabling the most cost-efficient configurations with seamless K8s integration via CSI plugin.
- Independent Scaling: The ability to scale in any direction.
- Efficiency. Resilient storage at local flash performance.
- Agility. To move, shift, and allocate storage on an as needed basis and lift and shift workloads to any cloud.

THE SOLUTION: LIGHTBITS CLOUD DATA PLATFORM

This organization was looking for a scalable, high performance, low latency, highly available software-defined and disaggregated storage solution that was architected to leverage NVMe to power their database workloads while simplifying operations and reducing costs. They found their solution with Lightbits, inventors of the NVMe® over TCP (NVMe/TCP) standard. This organization sees NVMe/TCP as a way to accelerate their workloads while simplifying operations. The Lightbits Cloud Data Platform forms the ideal combination to provide disaggregated, and composable storage and integrate natively with their Kubernetes environments.

The implementation consists of tens of clusters of 16 dual instance, high-performance nodes per datacenter–two instances of Lightbits are run on the same physical machine. This allows Lightbits to get 25-30% higher performance out of a single machine. Each Lightbits node consists of Lenovo ThinkSystem SR650 V2 servers with high-performance Intel® 3rd Gen Xeon® Scalable Processors, Intel® Optane™ Pmem, and Intel® Ethernet Adapters, and Micron NVMe SSDs. This implementation schema delivers performance and data replication advantages. This organization can leverage different replication scenarios for different workloads.
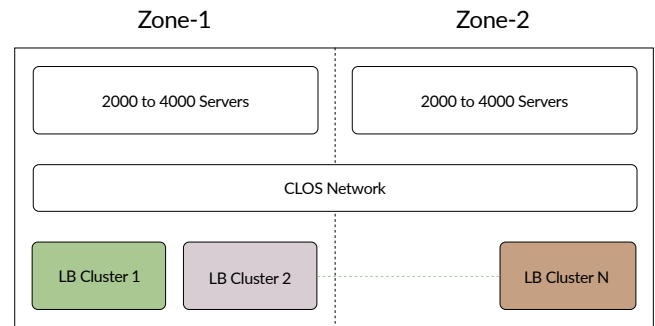
eCommerce organization's data center design

THE ADVANTAGES OF USING LIGHTBITS

Lightbits offers a flexible, agile, and efficient storage solution that makes it possible to enjoy the advantage of K8s portability without compromising on storage performance or scalability. Lightbits provides low-latency and high performance that is as close as possible to local flash. The NVMe/TCP software-defined storage solution can support hundreds of K8s clusters from a single Lightbits storage cluster without inhibiting K8s container portability model.

By moving away from their JBOD/JBOF architecture to a disaggregated persistent storage solution based on Lightbits, they enable mobility for their K8s workloads across the entire cluster. When worker nodes fail, the workload can easily start on a different one, thus reducing impact from hardware failures and increasing uptime and availability overall. If a K8s pod moves to a new physical server, the same Lightbits persistent volume will be attached to that new machine and remain available to the pod. Additionally, in contrast to other K8s storage solutions, a single Lightbits cluster can support multiple container orchestration platforms, including Red Hat OpenShift Container Platform (OCP), VMware Tanzu, OpenStack, and VMware vSphere, as well as bare-metal applications.

This IT organization also liked the rich data services supported by Lightbits. By utilizing thin-provisioning and compression, the organization was able to improve its utilization and efficiency enormously compared to its legacy DAS architecture. The Lightbits platform also allows for automated deployment of Lightbits storage servers and, by using snapshots and clones, easily create new compute environments or a clone of their production data for testing and development purposes based on 'golden images'.

Additional business and technical benefits realized by this eCommerce company:

- Flexibility. The system runs on any cloud or hardware configuration enabling the most cost-efficient configurations.
- Scalability. The ability to scale up and scale out.
- Efficiency. The system is easy to use with fully automated provisioning.
- Agility. To move, shift, and allocate storage on an as needed basis and lift and shift workloads to any cloud.

Storage has the potential to be a drag on K8s potential value. Local Flash or DAS invariably leads to poor storage resource utilization and high costs and threatens to impede K8s portability, which is one of the technology's most compelling benefits. The most effective solution is the Lightbits software-defined storage solution. This solution offers the levels of performance required by popular apps running on K8s, while preserving K8s portability and agility.

For more information go to www.lightbitslabs.com.
To get started using Lightbits contact info@lightbitslabs.com.