



# Mellanox Partners with Enmotech to Create an Industry Leading, High Performance, Open Architecture, All-in-One Machine

Nowadays with big data and cloud-based applications being widely used, the speed of the Internet is increasingly influential to almost every business and is leading to a revolutionary change in the traditional database sector. In terms of supporting platforms for databases, the original ones were composed mainly of midrange computers which now need to be upgraded to x86 systems. Meanwhile, the optimized data platform that was designed to combine the software and hardware is being employed more and more. Continuing this trend, Enmotech's zData distributed storage solution prevails while InfiniBand is undoubtedly becoming one of the core components of its data platform. The partnership between Mellanox and Enmotech should definitely make a significant contribution to the development of big data based technologies.

With the wide usage of cloud-based technologies and big data, massive amounts of data is being produced in almost every sector, which represents a great challenge to the enterprises' IT system to process the data in terms of performance, stability and scalability. Determining how to resolve these challenges as well embrace the industry trends brought about by big data and cloud-based applications are urgent concerns of most enterprises.

In the data-driven era, the IT system is always the core factor of competitiveness. However traditional databases are faced with the following difficulties:

- **High Cost:** Centralized storage is increasingly becoming the bottleneck of I/O accesses and its scaling is very costly.
- **Difficulty to Scale:** Midrange computers equipped with high-end storage are expensive yet this combination is relatively closed and with poor scalability.
- **Sophisticated Management:** Complex systems require extensive resources for their deployment, operation and maintenance, as well as management.

## zDATA DISTRIBUTED STORAGE SOLUTIONS

To better ensure the safety of enterprise data, data consistency and business continuity, while maintaining the cost efficiency and flexibility in scaling and changing, and to help enterprises transfer to cloud-based system, the experts from Enmotech have created a comprehensive, industry leading, distributed storage solution – zData – based on their rich experience in data services. This solution employs the Mellanox InfiniBand high-speed network as a core component and uses x86 servers as the system platform. Furthermore, it is equipped with flash cards and an InfiniBand switch to provide exceptional handling capacity for Oracle databases and huge I/O throughput.

Due to the adoption of the open architecture of the x86 system and InfiniBand network which features high bandwidth and low latency, zData is empowered with non-disruptive upgrade and expansion of its storage capacity, storage nodes and database nodes as needed at any time. After the capacity increase, linear enhancements in system performance and processing capacity can be seen clearly.

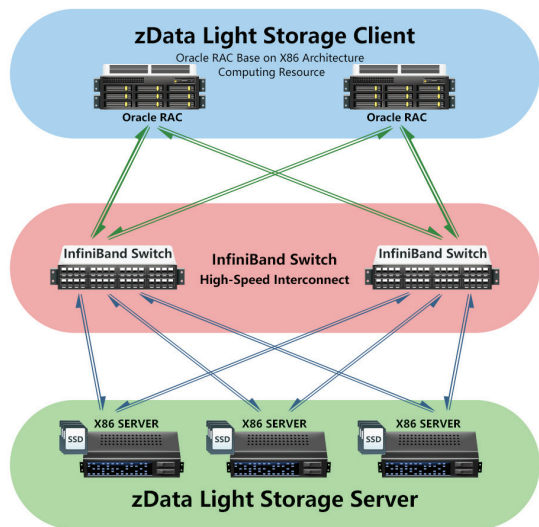
## KEY BENEFITS

- **Multi-dimensional Dynamic Expansion:** Computing nodes and storage nodes can be dynamically expanded as needed with a linear increase of capacity and performance gained accordingly
- **Pool and Cloud Resources:** Computing and storage resources have been pooled and cloudified which facilitates the centralized management and on-demand expansion
- **High Performance:** x86 servers are adopted as the basic system, flash cards, InfiniBand switches are employed, gaining super processing capacity and I/O throughput
- **Reliable:** All components have redundancy and storage is mirrored automatically, so should a failure occur, a sound reconstruction will be triggered without manual intervention nor interruption to online business.

*"During the evolution of the Oracle database migration to cloud-based and centralized technologies, the integration of hardware and software has become a trend of development. Enmotech's zData solution is designed to embrace this trend and aims to meet the challenges presented by modern enterprises' business needs. Employing Mellanox's industry-leading, advanced, end-to-end, high-speed solution, which has been recognized for its outstanding performance, I/O throughput, and stability, has helped us empower our zData All-in-One a solution with exceptionally high data processing and speed."*

Eygle Gai, Founder of Enmotech, Oracle ACE Director

Figure 1: Enmotech zData Architecture



### zDATA SUPERIOR PERFORMANCE METRICS

The storage software for zData solution – zData Light Storage – supports thousands of storage nodes and computing nodes with only one resource pool, and the maximum capacity can reach over 20PB. It also supports multiple resource pools comprised of different storage media. The standard configuration (3 storage nodes and 2 computing nodes) can support over one million IOPS, as well as more than 20GB/s throughput.

### DISTRIBUTED STORAGE MANAGEMENT SOFTWARE – zDATA LIGHT STORAGE

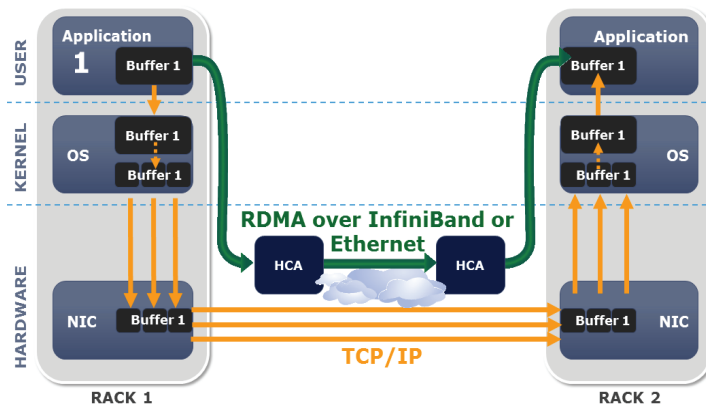
zData Light Storage leverages the x86 server-based internal direct storage to create a virtual scalable SAN which performs far better than the traditional external fiber channel SAN. This significantly reduces costs and complexity. The zData software supports the RDMA protocol for InfiniBand which can significantly reduce the utilization of the CPU as well the latency in I/O accesses, bringing unparalleled performance advantages (Figure 2). RDMA enables the network adapter to access the application buffer directly, bypassing the kernel, CPU, and the protocol stack, so that the CPU can perform more important tasks during I/O transmission. Leading to improved performance of the server and the application workload can be efficiently extended in a high-bandwidth network.

In the tests for basic functionalities, the zData architecture with its three storage nodes, under the block size of 8K, can achieve over one million IOPS, as well as a throughput of more than 20GB/s.

### zDATA DATABASE ALL-IN-ONE

zData Database All-in-One is a hyper-converged solution developed by Enmotech. This solution employs a high-bandwidth, low-latency InfiniBand interconnection as a core component. Equipped with a high-performance x86 server node and flash memory as a main part of the distributed storage, resource pooling, dynamic allocation and linear expansion of performance are all easily achieved. Operating with database software with multiple tenants, the solution can provide centralized management for multiple tenants, and provide the high-availability and scalable cloud-based database service to enterprises, helping them resolve the current challenges in system performance. zData also provides the opportunity for expanding the resource flexibly in the future. Additionally, not only providing the management of enterprises, but the user experience can be greatly improved.

Figure 2: RDMA Theory

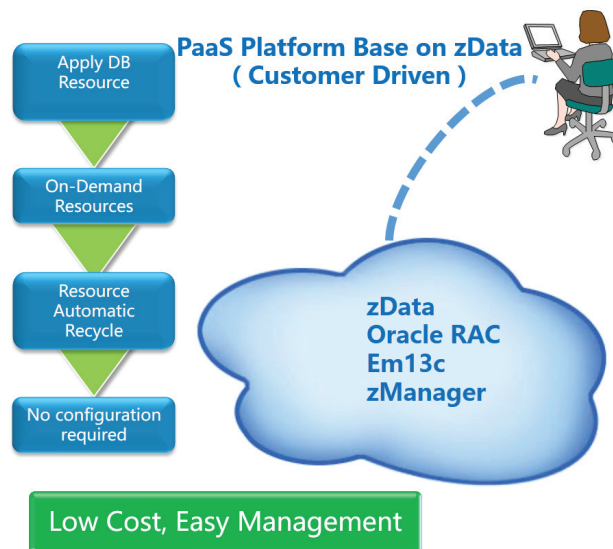


With the high-performance needs of enterprises perfectly met, the zData database all-in-one provides one-stop delivery, one-click deployment and automatic operation and maintenance, allowing less skilled IT personnel to operate it successfully. This saves the user in both purchase price and management costs. zData perfectly addresses the negative results brought about by traditional IT architectures. In addition, with the zData solution, multi-dimensional dynamic development of computing and storage resources can be easily achieved as businesses change. Furthermore, the need for linear growth of performance and addition of disks or storage nodes can be easily met.

### RAPID DEPLOYMENT AND DYNAMIC EXPANSION WITH RESOURCE POOLING

In general, it is costly to upgrade a traditional IT system due to the long time and high labor costs for tasks like hardware selection, purchase, database installation, and more. Now, as the zData PaaS platform is available, the deployment, operation, maintenance and expansion of databases can all be done in a cost-effective and efficient way. In addition, the zData distributed storage management software will pool the resources, realizing features like allocating resources on-demand and recovering them flexibly.

Figure 3: zData Business Flow



## CONCLUSION

zData is an industry leading, high-performance, open architecture solution. The zData solution has a robust distributed storage architecture featuring outstanding performance in capacity, I/O throughput, availability, and scalability. It is ideal for meeting the challenges of high IO requirements. zData has been highly recognized and widely adopted in many sectors by many customers.

## SELECT VIP ACCOUNTS

### Guizhou Traffic Police

Following the adoption of zData All-in-One by the Guizhou traffic police, the public's overall user experience has been greatly improved. The improved submission and handling of cases has been praised by the public.

- Overall performance increased by 18 times
- I/O response is 1000 times faster than before
- SQL performance increased by 117 times

### TianAn Life

The Enmotech zData architecture successfully resolved the challenges in supporting a vast number of concurrent transactions which required a powerful processing capacity to handle massive IOPS. Furthermore, in this kind of processing, the reporting needs for the data input/output, database and other similar applications exposed a huge challenge to the IT architecture. zData not only met these challenges, but helped TianAn Life to reduce its costs on time and other resources on time. This use case is regarded as a benchmark for IT architecture in the insurance industry.

- I/O throughput increased by 10 times
- Database time improved by 5 times
- Logical reads increased by 8 times
- Report processing rate increased by 20 times

### QingHai Mobile

QingHai Mobile has gradually migrated original Oracle databases residing on midrange computers and stored centralized to x86 servers and zData distributed storage. The database integration is achieved through Oracle 12C multi-tenants and the first step to working in the cloud has been successfully achieved.

- Overall storage performance enhanced by 10 times
- System latency reduced by 91-96%
- Preparation time for online database reduced by 90%
- CPU utilization reduced by 40%
- Cost of expanding storage reduced by 50%



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