IBM Power Systems and Zettaset Big Data Encryption Suite

The ideal data-centric security solution for protecting distributed systems

Highlights

- Together, IBM Power Systems and Zettaset Big Data Encryption Suite help organizations address the unique challenges of protecting big data stores in distributed Hadoop, NoSQL, and relational computing environments

- IBM POWER8 provides industry-leading levels of performance, scalability, reliability, and security features, making it the ideal platform to support Zettaset solutions in the cloud, or on premises

- Zettaset BDEncrypt and BDEncrypt Plus running on Power Systems provide two targeted solutions designed specifically to protect big data in distributed environments

- Zettaset Big Data Encryption Suite also includes a software-based KMIP-compliant Virtual Key Manager and PKCS#11-compliant Virtual Hardware Security Module, reducing the need for additional hardware and simplifying deployment

- Based on comprehensive interoperability testing, Zettaset Big Data Encryption Suite is proven to work well with Power Systems and IBM Open Platform with Apache Hadoop or Hortonworks Data Platform

While the dawn of the big data era has certainly been beneficial for many organizations around the globe, it has also created new challenges. In particular, being able to keep valuable business data safe from theft or manipulation by malicious hackers has proven to be a growing concern for data center administrators.

In addition, a variety of new factors have arisen to exacerbate this situation. For instance, while distributed big data stores such as Hadoop and NoSQL offer important performance, scalability and capacity benefits, they also lack advanced security capabilities, making them inherently unsafe for enterprise deployment. Their open and distributed nature also makes them very vulnerable to attack, which is a particular concern for industry verticals that have strict regulatory compliance requirements for data protection and privacy, such as financial services, healthcare and retail.

At the same time, growth in the adoption rates for cloud services has motivated many organizations to rethink their approach to security. The traditional security environment, with a corporate firewall circling the perimeter of an organization's systems and data, is no longer sufficient in an architecture where systems and data are everywhere, and there is no perimeter. Organizations must now adjust their focus to securing the data itself, no matter where it may reside.

This critical shift to a data-centric security approach demands technology that is designed specifically for the challenges of big data scalability and performance. Encryption is a proven data-centric security technology, and Big Data Encryption Suite from IBM Business Partner Zettaset provides a purpose-built solution specifically designed to address data protection requirements in dynamic, high-volume data stores residing in distributed computing environments. Comprised of the latest generation of encryption software, integrated KMIP-compliant Virtual Key Manager and PKCS#11-compliant Virtual Hardware Security Module (HSM), the Zettaset solution meets enterprise requirements for interoperability with existing standards-based encryption security infrastructure.
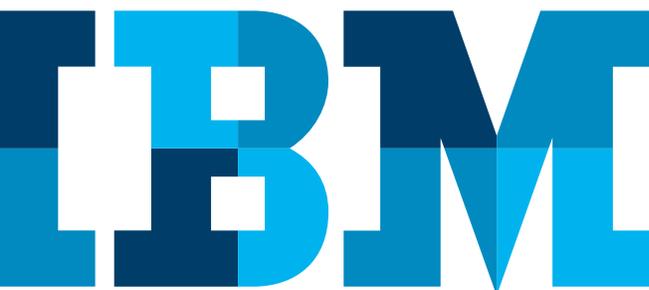
In order to make the most of the capabilities offered by Zettaset Big Data Encryption Suite, organizations must choose the optimal platform. Like the Zettaset solution, IBM® Power Systems™ offerings are designed specifically with the needs of big data and distributed environments in mind, delivering the ideal blend of performance, reliability, and advanced security features to complement Zettaset Big Data Encryption Suite.

Finally, IBM and Zettaset have closely collaborated to ensure that Big Data Encryption Suite and Power Systems provide proven interoperability. A recent integration test performed by Zettaset demonstrated that Big Data Encryption Suite and IBM Open Platform v4.1 were able to run together successfully on IBM Power Systems.

Performance and scalability

IBM Power Systems offerings are designed to perform well in a scale-out mode, which makes them perfectly suited to support distributed environments such as Hadoop, NoSQL, and relational databases. As an organization begins to add new servers to its existing clusters in order to keep up with data growth, they can be certain that Zettaset software-based solutions running on Power Systems will scale right along with them, preventing any gaps in security coverage.

In addition, using IBM POWER8® to support Zettaset Big Data Encryption Suite solutions enables an organization to capitalize on the many performance advantages that Power provides over competing systems. For instance, when compared with x86 systems, POWER8 servers are able to offer four times more threads per core, up to four times the memory bandwidth, and as much as four times the cache space. Together, these benefits ensure that Power Systems offerings can provide performance levels that meet or exceed those required by distributed environments, where data loads can vary minute-by-minute.

Reliability

While solutions like Zettaset's offer critical capabilities that can be instrumental in helping to secure distributed data environments, those capabilities will only benefit an organization while the software is operational. This is why it's important to deploy mission-critical solutions like Zettaset Big Data Encryption Suite on a platform that offers maximum levels of uptime.

IBM Power Systems has a long history of using virtualization and partitions to optimize reliability, availability and serviceability (RAS); this means that the platform is capable of minimizing the occurrence of system failures, maintaining application operations even in the aftermath of a failure, and remedying failures quickly and without disruption. When taken together, these factors contribute to maximum uptime for an application like Zettaset Big Data Encryption Suite.

IBM also offers a number of special optimized configurations for distributed systems, essentially allowing organizations to do more with less and consolidate their physical infrastructures significantly. In addition to providing greater simplicity and efficiency, a smaller infrastructure also has fewer potential points of failure, helping to provide a more reliable experience overall.

Security

IBM Power Systems offers built-in security and privacy measures that competing platforms simply can't match. When paired with the big data-specific security capabilities found in Big Data Encryption Suite, Power offers the ideal platform to address security challenges of distributed systems.

With support for real-time data encryption, sophisticated application isolation, and built-in compliance alerts and reporting, Power Systems can help ensure that your organization has the level of security that today's distributed big data environments require. In addition to integrating with Big Data Encryption Suite to make sure that sensitive data is protected, Power Systems' security features also help remove manual security tasks, freeing up team members to engage in more high-value work. In addition, simplifying and automating compliance with important industry standards can help save time and money, while also protecting the company reputation and preventing legal vulnerabilities.

Zettaset Big Data Encryption Suite: Big data encryption solutions to meet the needs of distributed environments

By building upon the performance, reliability and security features of the IBM Power Systems environment, Zettaset Big Data Encryption Suite offers enterprise-grade encryption solutions that can meet the needs of even the largest big data environments. Zettaset's data-centric approach to security, with advanced encryption technology that is built upon the 256-bit Advanced Encryption Standard (AES), delivers proven protection both in the cloud and on premises.

Zettaset Big Data Encryption Suite can be used as part of a strategic IT initiative to bring Hadoop, NoSQL and relational data stores into compliance with industry regulations such as Sarbanes-Oxley, HIPAA, HITECH and PCI. For organizations operating in heavily regulated industries, Zettaset Big Data Encryption Suite running on IBM Power Systems provides a new level of confidence and simplicity when it comes to ensuring compliance and keeping sensitive personal information safe from unauthorized access.

Zettaset Big Data Encryption Suite is comprised of two database-specific encryption system software solutions, as well as a software-based Virtual Key Manager and Virtual Hardware Security Module (HSM). This all-software-based approach simplifies integration with the Power Systems platform, reduces additional hardware requirements, and shares the elasticity of virtual machines and cloud computing.

Zettaset Virtual Key Manager and Hardware Security Module (HSM)

All components of Zettaset Big Data Encryption Suite are compliant with industry standards for enterprise interoperability, including the Key Management Interoperability Protocol (KMIP) for key managers and Public Key Cryptography Standard (PKCS) #11 for hardware security modules (HSMs). This ensures interoperability with similarly compliant third-party key managers and HSMs for investment protection. Customers have the option of using their existing key management and HSM infrastructure, deploying the software-based Zettaset key manager and HSM, or a combination of the two.

Zettaset BDEncrypt

With Zettaset BDEncrypt, organizations can take advantage of a high-performance, partition-level solution that is ideal for bulk encryption purposes.

BDEncrypt offers the following security benefits:

- Designed from the ground up for optimal performance and scalability in a broad range of distributed big data stores, including relational, NoSQL and Hadoop environments
- Provides performance-optimized results for both data at rest and data in motion
- Encrypts all existing data regardless of media and avoids premium self-encrypting disk expenses

Zettaset BDEncrypt Plus

Zettaset BDEncrypt Plus offers many of the same security capabilities found in BDEncrypt—including performance optimization for distributed systems and interoperability with Zettaset and third-party key managers and hardware security modules—but is specifically designed for selective file-level encryption in Hadoop data stores.

A unique feature of BDEncrypt Plus is the ability to protect data integrity. In addition to standard read-based data protection, BDEncrypt Plus also provides special protection against write attacks, such as an attacker erasing data or modifying cipher text. This protection comes in the form of authenticated encryption using associated data and cryptographic protection for access control lists.

BDEncrypt Plus offers the following security benefits:

- Protects data integrity by detecting unauthorized modifications to encrypted data
- Secures access control lists to prevent attackers from using them to gain access to data
- Ensures optimal performance using advanced Galois/ Counter encryption mode
- Works on any HDFS distribution that supports extended attributes
- Supports granular crypto keys for greater protection, with the ability to assign unique keys to specific zones, directories or files

About the IBM/Zettaset partnership

As two of the leading providers of scalable, high-performance security solutions for big data, IBM and Zettaset are working together to drive better results for organizations that need to protect big data in distributed environments.

Together, IBM Power Systems and Zettaset Big Data Encryption Suite solutions are able to help organizations manage multiple workloads with a single platform that can offer all the protection, performance and scalability they would ever need. In doing so, IBM and Zettaset are removing security as one of the major barriers to enterprise adoption of newer open source data stores and database technology like NoSQL and Hadoop, thereby redefining what organizations can hope to accomplish with big data.

For more information

To learn more about IBM Power Systems for the needs of your distributed big data environments, contact your IBM representative or IBM Business Partner, or visit ibm.com/power/solutions/bigdata-analytics.

To learn more about big data encryption solutions from Zettaset, visit zettaset.com/index.php/products/big-data-encryption-suite.