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HPE Vertica – Big Data Platform HPE Security – Data Security

February 2016

Data Security Impacts Design and Delivery of Big Data Projects

- Data Security frequently is a leading obstacle to effective and timely implementation of Big Data projects
- Multiple stakeholders are affected by security considerations
- -Data Security must be built-in

Role	Security Impacts
Architect	Performance, operations
Analyst/Data Scientist	Access to data, analytical performance
Business Owner	Ability to extract Big Data value – customer insights, product innovations, etc.
Security	De-risk data breach exposure, drive regulatory and privacy compliance
C-level	Build and protect Brand, reputation, market share



Why is it More Difficult to Secure Data Today?

Big Data today touches many:

- Systems premise or cloud
- Technologies Hadoop or Vertica
- Data Sources with real-time feeds
- Data Types and Formats
- Business Environments with varying analytic needs





HPE Vertica – Big Data SQL Analytics Platform





HPE Vertica – Big Data SQL Analytics Platform

Core Vertica SQL Engin

- Advanced Analytics
- Open ANSI SQL Standards ++
- R, Python, Java, Scala

HPE Vertica OnDemand

Get up and running quickly in the cloud HP Helion or Amazon AWS



- Native support for ORC, Parquet
- Supports all distributions

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• No helper node or single point of failure



HPE Vertica Enterprise Edition

- Columnar storage and advanced compression
- Maximum performance and scalability
- Flex Zone for schema-on-read

HPE Vertica Database Security



- ✓ Authentication via LDAP, GSS/Kerberos, others
- Client/Server Communication via OpenSSL
- ✓ Flexible User/Role Construct
- ✓ Fine Grained and Separation of Control
- ✓ Column Level Access Control

Built-in Database Encryption

BEST to augment these with "data-centric" protection of data in use, in motion and at rest



Best Way to Protect Data

- At creation, in motion and at rest
- De-identifying the data as close to its source
- Offload need for in-database Encryption
- Enhance existing security methods

HPE SecureData Protects Data at Any Point in the Data Flow



Introducing "Data-centric" security



HPE SecureData provides this protection



HPE SecureData

– Stateless Key Management

- No key database to store or manage
- High performance, unlimited scalability

- Both encryption and tokenization technologies

- Customize solution to meet exact requirements

Broad platform support

- On-premise / Cloud / Big Data
- Structured / Unstructured
- HPE Vertica, Linux, Hadoop, Windows, AWS, IBM z/OS, etc.

- Quick time-to-value

- Complete end-to-end protection within a common platform
- Format-preservation dramatically reduces implementation effort





HPE Format-Preserving Encryption (FPE)

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Та	x ID

934-72-2356



First Name: Gunther Last Name: Robertson SSN: 934-72-2356 DOB: 20-07-1966

FPE	253- 67 -2356	First Name: Uywjlqo Last Name: Muwruwwbp SSN: 253- 67-2356 DOB: 18-06-1972
AES	8juYE%Uks&dDFa2345^WFLERG	lja&3k24kQotugDF2390^32_0OWioNu2(*872weW Oiuqwriuweuwr%oIUOw1@

- Supports data of any format: name, address, dates, numbers, etc.
- Preserves referential integrity
- Only applications that need the original value need change
- Used for production protection and data masking
- Currently in the NIST standardization process

HPE Secure Stateless Tokenization (SST)

	Credit Card	Tax ID	
	1234 5678 8765 4321	934-72-2356	
ST	8736 5533 4678 9453	347-98-8309	
artial SST	1234 56 33 4678 4321	347-98 -2356	
bvious SST	1234 56 <mark>AZ UYTZ</mark> 4321	AZS-UX-2356	

- Tokenization for PCI scope reduction
- Replaces token database with a smaller token mapping table
- Token values mapped using random numbers
- Numerous advantages over traditional tokenization
 - No database hardware, software, replication problems, etc.

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HPE Vertica's Integration with HPE SecureData

- Implemented via User Defined Extensions (UDF)
 - Encrypts data in parallel on each node in the cluster
- UDF available at HPE Big Data Marketplace Sample Data and Scripts



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Options for Securing Data



Sample Implementation



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Hundreds of Customers Rely on HPE Vertica for Big Data Analytics



Use case 1: Financial Services Company

Need

- Establish a one-stop-shop for business intelligence across multiple products and lines of business at a global financial firm
- Analyze historical data on 20 billion transactions
- Develop comprehensive customer needs analysis
- Data contains Account Numbers and customer PII (Address, SSN, emails) information
- Data stored in Hadoop infrastructure

Solution

- Integrated HPE SecureData into ingestion workflow
- Sensitive account and PII information protected using HPE SecureData Format-Preserving Encryption
- Data Scientist team analyze directly on protected encrypted data
- Marketing teams analyze on protected data and decrypt only upon access/retrieval of customer information for targeted campaigns
- Data stored on Hadoop infrastructure in encrypted form



Use case 2: Global telecommunications company

Need

- Analyze several hundred million customer records for analytic patterns, retail optimization, business intelligence
- Records contain personal customer data, log data, activity data, location information, buying information etc.
- 17 fields are deemed to be sensitive
- Typically ingest 300 million customer records in
 > 1.5 minutes. SLAs should not be significantly affected

Solution

- Integrated HPE SecureData into ingestion workflow
- Sensitive data in 17 fields is protected using HPE Format-Preserving Encryption
- Almost all analytics performed on protected data
- HPE SecureData tools integrate into the Big Data platforms if results are to be re-identified
- HPE SecureData added 90 seconds to the ingestion process
- Data that is protected by HPE SecureData tools at source (z/OS, Oracle, etc.) can directly flow into Big Data platforms



Use case 3: Health care insurance company

Need

- Better health analysis to customers: One of their use cases for Big Data is to provide better analysis of health status to customers on their web site
- Catch prescription fraud: Fraudsters collect prescriptions from 5-6 doctors and get them filled by 5-6 pharmacies. The manual process takes several weeks to track. Big Data will enable them to do this almost instantly
- Reverse claim overpayment: Often times claims are overpaid based on errors and mistakes. They hope to catch this as it happens with Big Data
- Developer hackathons: Open the system up to their Hadoop developers as a sandbox, enabling innovation, discovery and competitive advantage – without risk

Solution

- Utilized the massive un-tapped data sets for analysis that were hampered by compliance and risk
- Integrated HPE SecureData in the ingestion process so data is de-identified as it is copied from databases
- Currently investigating the use of HPE
 SecureData enterprise wide for open
 systems and mainframe platforms
- Enabling innovation through data access without risk with HIPAA/HITECH regulated data sets



Conclusion

- Big Data environments create greater risk of exposure to enterprises and require new data protection methods
- -Big data platforms provide core capabilities for authentication, authorization and auditing
- HPE SecureData brings the data-centric security across data stores including Hadoop and HPE Vertica —protecting data at rest, in motion and in use, and maintain the value of the data for analytics
- Together enabling comprehensive security for the enterprise, and rapid and successful Big Data implementations!



References

- <u>http://www8.hp.com/us/en/software-solutions/voltage-data-encryption-security/</u>
- https://community.dev.hp.com/t5/tkb/articleprintpage/tkb-id/bigdata_wiki_vertica/article-id/15
- <u>https://saas.hpe.com/marketplace/haven/hpe-secure-data</u>

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