VirtuCrypt

A FUTUREX COMPANY

VirtuCrypt: Hardened Enterprise Security Cloud Service

Virtucrypt, Futurex's Hardened Enterprise Security Cloud Service, is breaking the mold of traditional cloud computing, providing a fresh approach by combining the convenience of cloud-based services with the robust physical and logical security of FIPS 140-2 Level 3 validated Secure Cryptographic Devices. Organizations of all sizes can benefit from the VirtuCrypt solution suite, with Futurex's Hardened Enterprise Security Platform offering cloud-based features such as offsite disaster recovery and redundancy; hosted core cryptographic infrastructures; secure data storage, processing, and validation; and more, all from within a TR-39 and PCI PIN-certified secure facility.

Defining the Cloud

The cloud is a ubiquitous term that seems to pop up in most data security conversations, but what exactly does the phrase mean?

The National Institute of Standards and Technology defines cloud computing in its most fundamental form as "a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."[1] Essentially, cloud computing is a method by which organizations can access shared information virtually, instead of using a local server.

Benefits of the Cloud

The cloud offers many benefits not available using traditional self-hosted data storage and processing models. From easy access of information to N^{th} degree scalability, the cloud is an enterprise-level method for virtual data processing and storage.
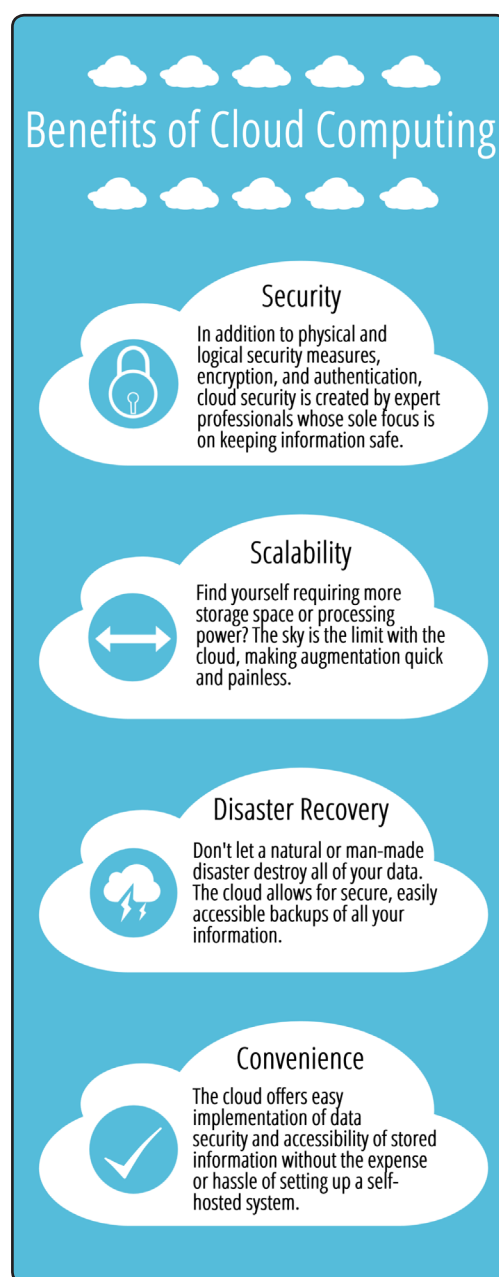
Ensuring data is kept secure is a complex process, far beyond simply purchasing validated cryptographic hardware. Expert data security professionals sustain cloud security by implementing regular audits, maintaining organizational policies and procedures, staying abreast of current regulations and data security trends, and more.

With the increasing globalization of data, having an IT infrastructure that supports access to information from anywhere in the world is a necessity. The cloud achieves this accessibility, avoiding data silos and promoting clear communication and employee efficiency.

Localized servers are associated with risks such as loss of data due to a disaster. With the cloud, information storage can be distributed and redundant, keeping it secure and accessible in the event of a disaster.

The virtually limitless scalability of the cloud sets its potential far above other means. Should an organization need an increase in processing power or storage size, the cloud allows for rapid augmentation with little effort or inconvenience.

1   National Institute of Standards and Technology. "The NIST Definition of Cloud Computing." http://www.nist.gov/itl/cloud/

Benefits of Cloud Computing

Security
In addition to physical and logical security measures, encryption, and authentication, cloud security is created by expert professionals whose sole focus is on keeping information safe.

Scalability
Find yourself requiring more storage space or processing power? The sky is the limit with the cloud, making augmentation quick and painless.

Disaster Recovery
Don't let a natural or man-made disaster destroy all of your data. The cloud allows for secure, easily accessible backups of all your information.

Convenience
The cloud offers easy implementation of data security and accessibility of stored information without the expense or hassle of setting up a self-hosted system.

About VirtuCrypt

Futurex's Hardened Enterprise Security Platform, a collection of advanced data security solutions, has been implemented by Tier 1 organizations across the globe. Futurex's commitment to quality solutions and technological innovation has combined to form the VirtuCrypt Hardened Enterprise Security Cloud, providing the robust security of physical hardware with the convenience of the cloud.

The global success of Futurex's Hardened Enterprise Security Platform among Tier 1 organizations has been the driving force behind its expansion to include a service-based offering. This offering marks the culmination of years of research and development and is revolutionizing the manner in which Futurex customers and partners secure their sensitive data.

A cloud-based hardened enterprise security service based in compliant, secure data centers, VirtuCrypt provides all of the critical elements of a world class hosting service without the overhead or effort associated with building, maintaining, and certifying a data facility. VirtuCrypt supplies the scalability and redundancy required for 24x7x365 operation.

Security concerns about the cloud are usually based around the idea that the sensitive data being transferred or stored within the cloud may be viewed by unauthorized individuals. However, Futurex's innovative approach to the cloud alleviates these concerns, with all sensitive data being encrypted, decrypted, and authenticated in FIPS 140-2 Level 3 validated Secure Cryptographic Devices located within SSAE 16 (SOC 1, 2, and 3), PCI, TIA-942 Tier 4, and HIPAA-compliant data centers.

VirtuCrypt represents the best-in-class for organizations of every size and industry by offering secure, versatile, and scalable hosted data security solutions designed to meet current and emerging security and compliance standards. VirtuCrypt's services are designed to meet the exact needs for organizations' core cryptographic infrastructures, with the unique capability for customers to perform their own remote administration and key management via hardened, FIPS 140-2 Level 3 remote tablets.

VirtuCrypt offers features applicable to a wide range of organization types:

- Enterprises requiring secure, remotely accessible, offsite redundancy of their primary Hardened Enterprise Security Platform hosted in-house

- Businesses without the resources or desire to implement, certify, and maintain their own Hardened Enterprise Security Platform and/or secure facilities

- Enterprises wishing to enhance their existing cryptographic infrastructure with additional cloud-based functionality

- Any organization interested in implementing a secure, offsite backup facility without carrying the burden of meeting compliance mandates or audits

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Main Service Offerings

VirtuCrypt's far-reaching functionality is separated into multiple levels of service, differing based on the environments into which it will be implemented. VirtuCrypt's three chief offerings — VirtuCrypt Enterprise Services, VirtuCrypt Elements, and VirtuCrypt Plus — are designed to provide organizations with exactly the technology they need in a format most conducive to their total system.

Enterprise Services

For organizations desiring to utilize the cloud for their entire core cryptographic infrastructure, VirtuCrypt's Enterprise Services provide access to all the functionality inherent within Futurex's Hardened Enterprise Security Platform for one low cost monthly fee. VirtuCrypt's Enterprise Services offer complete management of all components, including everything from load balancing to disaster recovery.

VirtuCrypt's Enterprise services facilitate a full scale implementation of VirtuCrypt's innovative solutions using environments dedicated to individual customers.

For businesses seeking a completely customized solution, Enterprise Services offer the flexibility and opportunity for custom architecture to be designed entirely so that VirtuCrypt can fully meet the needs of your infrastructure.

VirtuCrypt Elements

Businesses seeking to enhance their existing cryptographic infrastructure with additional cloud-based technology can take advantage of VirtuCrypt Elements. For tasks such as tokenizing data, verifying transactions, remotely loading keys, and more, VirtuCrypt offers specific functionality on a per transaction basis.

This service option is ideal for organizations who do not have the resources or need for an entire cryptographic platform in the cloud. Rather, they seek to add technology into their system in order to fulfill a distinct need, such as P2PE or tokenization.

Simple and cost-effective, VirtuCrypt Elements offers packages ranging in number of transactions; instead of having to pay a higher fee for unlimited use of the functionality, organizations can purchase an allocated number of transactions within one monthly package.

VirtuCrypt Plus

Customers who have already integrated Futurex's Hardened Enterprise Security Platform into their core cryptographic infrastructures can utilize the cloud through VirtuCrypt Plus. Designed to complement Futurex's solution suite, VirtuCrypt Plus offerings include ways for organizations to add cloud-based backups or monitoring and alerting of their Futurex devices.

VirtuCrypt's Hosted Monitoring and Alerting Service enhances visibility of an organization's core cryptographic infrastructure by providing alerts for system issues and fulfilling selected PCI DSS compliance requirements.

Using VirtuCrypt's Hosted Backup Service, organizations can use the Hardened Enterprise Security Cloud as an off-site backup of their core cryptographic infrastructure, ensuring redundancy in the event of a disaster or loss of connectivity.

Data Center Site #1
Austin, Texas

Data Center Site #2
Dallas, Texas

FUTUREX

Corporate Headquarters and Secure Facility
Bulverde, Texas

Data Center Security

VirtuCrypt's data centers were carefully chosen with security in mind. The data centers enforce physical security, dual control, and biometrics with multitiered identity verification mechanisms. The facilities are SSAE 16 (SOC 1, 2, and 3), PCI, TIA-942 Tier 4, and HIPAA-compliant, meeting regulatory requirements for security. VirtuCrypt data centers undergo rigorous external audit processes on a regular basis, ensuring organizations do not have to worry about the cost and logistical burden of preparing for and passing audits.

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Individual Services

Beyond VirtuCrypt's main three service offerings, VirtuCrypt's functionality extends to cover a variety of services that can be combined in a customizable mix for your organization. Many of these services are available regardless of deployment model or main service offering chosen.

Key Management Services

Enterprise Key Management

VirtuCrypt's Enterprise Key Management service is a scalable, versatile, and secure solution for managing large volumes of keys, certificates, and other cryptographic objects. With this service comes support for all major key types, algorithms, and protocols.

Organizing keys and certificates is accomplished via object grouping and custom attributes, a robust search engine allows millions of objects to be easily managed, and automatic expiration rules can remove and replace keys on a user-defined schedule.

Remote Key Management

Through VirtuCrypt's Remote Key Management service, organizations can perform a broad range of encryption key management functions including key generation, injection, deletion, tracking, and certificate hierarchies.

Flawless integration with the host application that drives your organization's POS terminals or ATMs allows you to securely and remotely distribute encryption keys over a secured IP network, which eliminates the costly and cumbersome process of having to physically input keys.

Key Agent

Due to the high cost of establishing and maintaining a TR-39 compliant key loading process, VirtuCrypt offers a key agent service that generates and loads keys on behalf of customers. VirtuCrypt's key handling procedures are audited annually for compliance with TR-39, and each key component is treated with the utmost care to avoid exposure.

Ownership of encryption keys remains with the customer, not VirtuCrypt. Through this service, VirtuCrypt customers have the peace of mind knowing their encryption keys are secure and obtainable whenever needed.

Monitoring and Alerting Services

Customer-Controlled Monitoring and Alerting

Through the Customer-Controlled Alerting and Monitoring Service, VirtuCrypt customers can utilize multiple types of technology for customizable, real-time alerting. This "Build Your Own Alert System" essentially enables you to be alerted about your cloud system in a variety of ways. Customers configure all monitoring settings via the Securus remote access tablet, then monitoring of the VirtuCrypt cloud services will occur automatically.

VirtuCrypt-Hosted Monitoring and Alerting

The VirtuCrypt-Hosted Monitoring and Alerting Service offers a more structured approach to monitoring and alerting, available to customers who own physical devices within the Hardened Enterprise Security Platform. This service allows customers to leverage the convenience of the cloud by having VirtuCrypt monitor the activities conducted by the customer-owned HSMs.

The Technology Behind the Alerts

VirtuCrypt utilizes several different technologies that combine together to form a comprehensive monitoring and alerting system:

- **Syslog**

- **SMS (Short Message Service)**

- **SMTP (Simple Mail Transport Protocol)**

- **SNMP (Simple Network Management Protocol)**

Backup Services

Load Balancing

VirtuCrypt's Load Balancing service gives the ability for an organization to actively balance transactions. In the instance that an organization's primary service is unable to perform a task, VirtuCrypt will transfer ensure the task is accomplished by transferring the responsibility to another device within that data center.

Disaster Recovery

With VirtuCrypt's Disaster Recovery service, the risks associated with natural or man-made disasters such as bad weather or power sabotage are eliminated. organizations can utilize an additional HSM at a second data center. Using a second IP address, VirtuCrypt will automatically route all processes from an organization's primary hardware to a device at another geographically separated data center.

Active Services Backup

Using VirtuCrypt's Active Services Backup, organizations can ensure 24x7x365 reliability against downtime. Should the hardware in control of their services become unresponsive, VirtuCrypt will automatically transfer all processes to another device at the same data center as the primary's location. This service provides additional failover and is available for monthly backup testing and any instance when the primary service goes offline.

High Availability

The VirtuCrypt disaster recovery service with the most assurance of uptime and functionality, the High Availability service provides active services backup, load balancing, and disaster recovery, with full access to all resources at each data center location. High Availability can be utilized at one or more data centers.

Automated Configuration Backup

The Automated Configuration Backup service is used to synchronize data between services. Organizations without a load balancing service or those utilizing the Active HSM Services Backup can take advantage of the Automated Configuration Backup service to automatically replicate all configuration settings between chosen services or functionality.

HSM Services

Financial HSM Applications

VirtuCrypt's Hardened Enterprise Security Cloud utilizes robust, physically secure hardware security modules to perform its customers' data encryption. VirtuCrypt supports numerous cryptographic algorithms and APIs. These algorithms include DES, Triple-DES, Master/Session, AES, EMV, RSA, PKCS #11, DUKPT, Master/Session, TR-31, and AKB.

With customizable TPS ratings and an included Development and Testing HSM, VirtuCrypt's Financial HSM Applications are ideal for organizations seeking an all-inclusive, compliant, and cost-effective method for performing data encryption tasks such as PIN validation, EMV preparation and issuance, tokenization, and more.

The Technology

The VirtuCrypt Hardened Enterprise Security Cloud incorporates hardware-based cryptographic devices capable of operating together as part of this scalable, secure, and versatile technology platform. VirtuCrypt's services are based around the following technologies:

Remote and Centralized Access

VirtuCrypt's remote access and central management functionality are provided through two devices: the Guardian9000 secure management server and the Securus remote access tablet.

The Guardian9000 provides centralized management of VirtuCrypt's entire cloud infrastructure through customized, real-time alerting and monitoring as well as automatic synchronization of keys, certificates, and configuration settings across multiple client groups.

The Securus tablet provides an unprecedented level of security to cloud remote access. The FIPS 140-2 Level 3-validated touchscreen tablet allows the management of organizations' entire IT infrastructures, including loading Master Keys and updating firmware, from virtually anywhere.

Hardware Security Modules

VirtuCrypt's services are provided through FIPS 140-2 Level 3-validated Hardware Security Modules, enhancing your cloud through robust physical security. The functionality for VirtuCrypt HSMs is far reaching, with support for emerging payment trends and technologies such as mobile payments, P2PE, EMV card issuance, and international transaction standards. The HSMs offer industry-leading speeds, GUI-based configuration applications, and a robust programming API. Algorithms, technologies, and features available include RSA, AES, EMV, 3DES, PKCS #11, and more.

Secure SSL/TLS Gateway

Using the Kryptos TLS Server, VirtuCrypt offers encrypted connections between multiple sites and data centers, ensuring point-to-point encryption of all data. This solution protects both site-to-site connections and connections with individual external devices such as ATMs and Point of Sale terminals, resulting in significant reductions in regulatory compliance scope and cost.

Certificate Authority

Futurex's KMES Series has been integrated in some of the largest enterprise-class environments around the world. Using this versatile platform, organizations can authenticate individual devices, applications, files, and more using hardware-based cryptographic technology.

Using this same technology in Futurex's TR-39 and PCI PIN-validated secure facility, all devices in the VirtuCrypt Cloud are mutually authenticated. This ensures all communication, both to other Hardened Enterprise Security Platform solutions as well as to external host applications and client devices, is secure and authenticated.

Secure Attached Storage

The SAS9000 Secure Attached Storage server is a high volume, hardware-based data storage and access solution that is able to extend key, device, and certificate storage capacity and redundancy for VirtuCrypt solutions to a virtually limitless extent.

Future functionality will include the ability for the SAS9000 to serve as a network-attached storage server, a fully redundant database server, and a tokenization vault. With this solution, the typical storage limitations of self-hosted core cryptographic infrastructures can be eliminated without requiring a large, upfront investment.

Secure USB Tokens

VirtuCrypt Secure USB Tokens house the certificate and private key necessary to authenticate the connection between host applications and the VirtuCrypt cloud. These tamper evident, FIPS 140-2 Level 3-validated tokens provide physical and logical protection of the sensitive information stored inside, ensuring a chain of trust throughout the VirtuCrypt cloud, from the authenticated VirtuCrypt cloud to the host application. The result is a core cryptographic infrastructure that is scalable, redundant, and secure.

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Deployment Models

Speed of deployment is an essential feature in the cloud, so VirtuCrypt offers five basic cloud models to help organizations zero in on the platform perfect for their needs: Fully VirtuCrypt-Hosted, Fully VirtuCrypt-Managed, Partially VirtuCrypt-Hosted, Redundant Backup, or Full Enterprise Solution.

Fully VirtuCrypt-Hosted

For those without the resources or desire to implement and maintain their own data center, VirtuCrypt offers an all-inclusive solution that eliminates the high cost associated with facility upkeep, the worry of ensuring redundancy, the necessity of maintaining security, and the hassle of meeting compliance mandates. VirtuCrypt takes on the burden of audits, security and facility maintenance, and redundant backup so that your organization doesn't have to.

Fully VirtuCrypt-Managed

For businesses that already owns Futurex HSMs or wish to purchase HSMs while still utilizing the VirtuCrypt cloud, the Fully VirtuCrypt-Managed cloud model enables those HSMs to be placed within VirtuCrypt data centers. VirtuCrypt personnel will manage the organization's HSMs through the same process as the VirtuCrypt-owned devices.

Partially VirtuCrypt-Hosted

Organizations with existing cryptographic infrastructures can leverage VirtuCrypt's cloud for extra functionality or security. VirtuCrypt's services are able to integrate into already established systems with ease. Through the host application, communication can occur between the VirtuCrypt cloud and the original infrastructure.

Redundant Backup

Data loss, by natural disaster or malicious attack, can cost an organization beyond measure. Establishing a redundant backup of data acts as insurance against such an occurrence, keeping company data safe and secure. VirtuCrypt's facilities are fully redundant across multiple secure SSAE 16 (SOC 1, 2, and 3), PCI DSS, and HIPAA-compliant hosting facilities. Your existing infrastructure will function as normal while VirtuCrypt replicates the data and securely stores it as a failsafe.

Deployment Spotlight: Full Enterprise Solution

A full scale custom development of Futurex's Hardened Enterprise Security Platform is available for enterprises desiring an entire cryptographic infrastructure standardized around one vendor. Futurex will perform a thorough system analysis and design, develop a custom-built infrastructure, and deploy that infrastructure into VirtuCrypt's cloud, providing 24x7x365 Xceptional Support and seamless enhancements in the future.

Secure Data Center #1   Secure Data Center #N

VirtuCrypt Cloud   **VirtuCrypt Cloud**

Distributed Clients and Endpoint Devices

Host Application (Customer Site)

Securus Remote Access Device

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Want to find out more about VirtuCrypt? Our Solutions Architects can help design a custom cloud solution perfect for your organization. Contact us today!

TF + 800.251.5112   P + 1 830.980.9782   F + 1 830.438.8782   info@virtucrypt.com