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DipJar: Securing Payments in the Cloud

DipJar, creator of the world's first electronic tip jar and donation box, sought a way to secure payment transactions using the cloud. Through the VirtuCrypt Elements Point-to-Point Encryption service, DipJar procured a complete solution for hardened data security, providing further confirmation of the New York-based company's reputation for innovation and customer-centric data protection.

A Cloud-Based Solution

Across virtually every industry, organizations have embraced the convenience and affordability of the cloud. Especially when combined with hardware-based security solutions, the cloud can provide a robust, nimble infrastructure.

Within a point of sale (POS) environment where payment cards are used for transactions, several processes ensure sensitive cardholder data is protected. The POS device is equipped with a card reader that immediately encrypts the cardholder data as soon as the card is used. The device then sends that data to a hardware security module (HSM) via a host application, where it is safely decrypted for verification as an authentic transaction.

For some organizations, managing HSMs in-house proves very rewarding. If an organization already has a fully staffed data center and must complete compliance audits such as Payment Card Industry Data Security Standard (PCI DSS), hosting HSMs on-premises might be an ideal option. For others, this solution isn't feasible because they do not have a compliant data center environment, or they would prefer to focus on the core competencies and outsource IT server management. VirtuCrypt Elements combines the best of both worlds.

About DipJar

DipJar is the innovative provider of the electronic tips solution of the same name, which provides a vehicle for consumers to demonstrate their generosity.
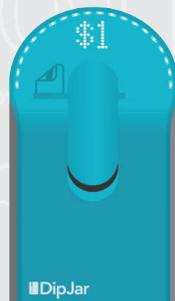
The Business Case

DipJar, a New York City-based electronic payments company specializing in a hardware solutions for card-based tipping and donations, approached VirtuCrypt looking for a scalable, PCI DSS compliant method to perform point-to-point encryption between its deployed DipJars and the payment processor authenticating each transaction.

Although HSMs can be used for a wide range of purposes, DipJar initially only needed point-to-point encryption, so it didn't necessarily require an on-premises hardware security solution for its current environment.

DipJar's market research showed high estimated implementation costs for on-premises hardware, data center resources, training, and compliance audits. Facing this, they decided to search for something that provided simple, turnkey deployment capabilities yet only encompassed the technology necessary to run its environment at a cost less than implementing an on-premises hosting solution.

Maintaining compliance was a priority for DipJar. It wanted a solution that met the requirements set out by the PCI DSS for the secure processing of cardholder data and simplified the process of preparing for and executing audits.

Being an agile, forward-thinking company with successful prior experiences using cloud services, DipJar felt comfortable with a hosted solution. Nonetheless, it still needed a way to access its HSMs securely for configuration changes and monitoring.

Although DipJar's functionality was limited to only card-based payments, its commitment to advancing with future technologies meant it needed a scalable system, one wherein additional features could be easily introduced. Both sudden spikes in point-to-point encryption transactions and planned expansions of additional functionality had to be available, with upgrades facilitated by a secure, efficient, and seamless process.

"We expect rapid growth," said Jordan Bar Am, DipJar's VP of Business Development. "As we grow, we will need to maintain a focus on enterprise-grade security resources for protecting the sensitive data of our customers and merchants."

DipJar's Requirements

DipJar's business needed the following items in order to build a fully functional, efficient, and compliant system:

- Point-to-Point Encryption Functionality
- Key Management Support
- Cloud Access for Easy Configuration
- PCI DSS Compliance
- Capacity for Future Growth

The Solution

DipJar found its answer in VirtuCrypt Elements, a cloud-based service designed to provide technology for individual tasks such as point-to-point encryption, remote key loading, or object signing. By choosing VirtuCrypt Elements, DipJar received a turnkey package that encompassed everything it needed for facilitating secure and efficient payment transactions, including the following:

Compliance
Using VirtuCrypt Elements, DipJar was able to significantly reduce the scope of its PCI DSS compliance, with cardholder data encryption happening directly at the device level. Much of the compliance responsibility was placed on VirtuCrypt instead, leaving the task in the hands of Solutions Architects with years of expertise.

Security
DipJar's transaction processing is kept secure at multiple levels: the physical devices, the data centers where the devices are stored, and the TLS gateway connection used to transfer data. The devices running DipJar's environment are validated as FIPS 140-2 Level 3 Secure Cryptographic Devices, which uphold extensive physical and logical security measures and tamper-responsive zeroization mechanisms.

VirtuCrypt's data centers enforce security through extensive access restrictions, biometrics, and dual control, ensuring that only authorized individuals will ever be in the presence of the devices. At the transaction level, data is encrypted and transferred across mutually authenticated connections.

Disaster Recovery and Redundancy
Through VirtuCrypt Elements, DipJar gained access to a fully redundant infrastructure. Geographically separated data centers house the HSMs processing transactions, with backups in place to provide automatic failover in the event of a disaster.

Moreover, the devices themselves have integrated redundancy; VirtuCrypt uses Futurex HSMs, which incorporate redundant power supplies and Ethernet ports, allowing for redundancy in both physical hardware and power source, maintaining functionality in the unlikely event that either source should fail.
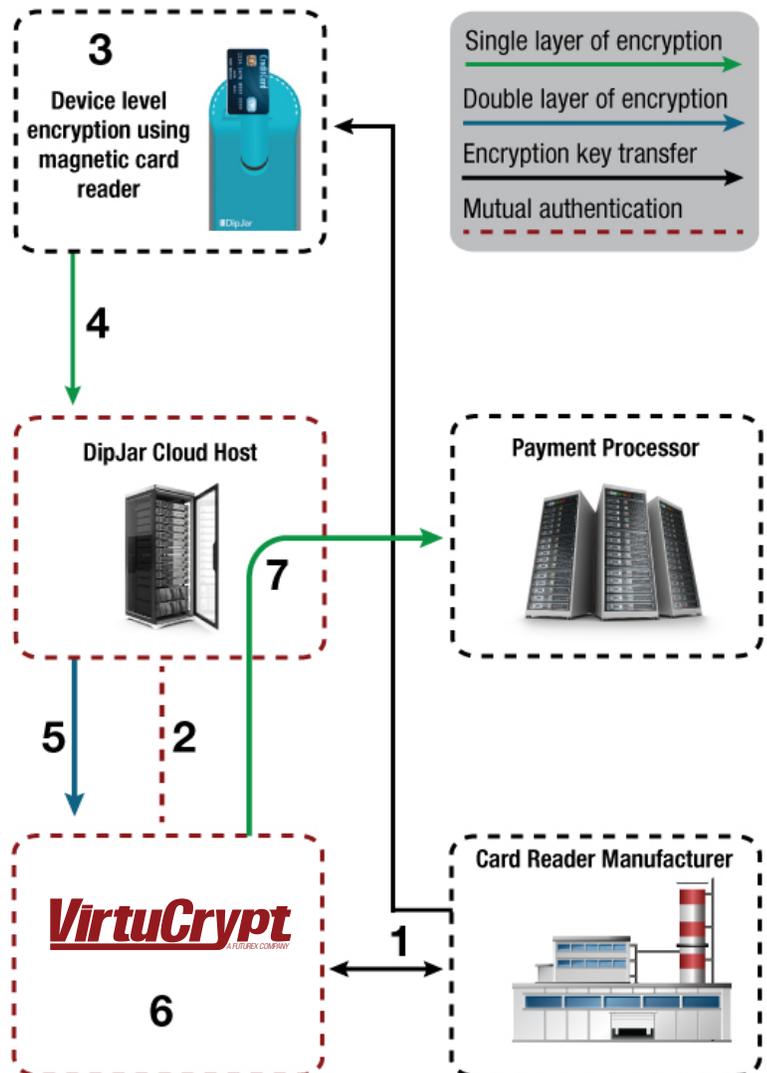
Key Management

DipJar chose to take advantage of VirtuCrypt's Key Agent service, which provides full management of cryptographic keys on it behalf.

The ownership of all cryptographic keys stays with DipJar, but VirtuCrypt's CTGA-accredited Solutions Architects are responsible for the proper handling and secure storage of the keys, following appropriate regulatory compliance requirements and security procedures.

The VirtuCrypt Intelligence Portal Dashboard

The VirtuCrypt Intelligence Portal is the online site through which DipJar can easily access information about its cloud environment, account, and billing, as well as operational controls for the service itself.

A customizable dashboard allows DipJar to set up the information and options that are most useful to it, with granular control for organizing service groups to simplify the process of service management and generating detailed reports and analytics.

How It Works

DipJar's environment was set up through collaboration between several entities and business units: DipJar's cloud host, the payment processor, VirtuCrypt, and DipJar's Boston-based manufacturing plant.

1. Before getting to the transactional level, the environment was prepared by creating strong, secure encryption keys. The card reader within the DipJar was injected with the encryption keys, which VirtuCrypt and DipJar then shared to facilitate easy validation of cardholder information once encrypted.

2. Both the cloud host and DipJar's VirtuCrypt environment use signed certificates to establish and use a mutually authenticated connection for secure communication.

3. At the transactional level, all cardholder data is encrypted the moment it enters the DipJar, using the encrypting card reader within it.

4. The encrypted data is passed along a secure TLS channel to the DipJar cloud host.

5. That encrypted value is encrypted a second time for transfer from the host to VirtuCrypt, ensuring an extra layer of security.

6. Once within VirtuCrypt's secure boundary, the data is decrypted and then re-encrypted under the processor's key.

7. That encrypted data is sent to the payment processor for authentication and validation.

3
Device level encryption using magnetic card reader

Single layer of encryption
Double layer of encryption
Encryption key transfer
Mutual authentication

4

DipJar Cloud Host

Payment Processor

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Card Reader Manufacturer

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The Results

DipJar's product launch was a resounding success, selling the entirety of its initial manufacturing run during the pre-order phase. Along with this, its transaction processing environment underwent a successful deployment, with more phases planned to add new functionality as its business grows. Through VirtuCrypt Elements, DipJar was able to create a cloud infrastructure that was customized specifically to its needs, with easy monitoring, alerting, and configuration available through the VIP Dashboard.

By selecting VirtuCrypt Elements for point-to-point encryption, DipJar has already saved both time and money in labor costs that would have accompanied hosting its own on-premises solution.

Because VirtuCrypt handles the payment processing, DipJar can focus on continuing to enhance its product with new technologies for its customers. DipJar's product offering is already seeing success, with reports from many customers that tipping and donation engagement through card-based payment methods has already surpassed cash.

"We are proud of our efforts to protect sensitive consumer data," said Bar Am. "We strive to make our customer's experience as easy and enjoyable as possible, and are pleased to be working with a technology provider that shares those same ideals"

About VirtuCrypt

The VirtuCrypt Hardened Enterprise Security Cloud provides the robust security of physical hardware with the convenience of the cloud. VirtuCrypt offers all of the critical elements of a world class hosting service with a focus on high availability and maximizing predictability while significantly lowering up front capital expenditures.

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. Service options are designed around organizational need, from Enterprise class infrastructures to individual technology uses.

NETWORK OPERATIONS CENTER
7301 Metropolis Drive, Building #6
Austin, Texas 78744 USA
WWW.VIRTUCRYPT.COM

VirtuCrypt
A FUTUREX COMPANY

TF 800.251.5112
P +1 830.980.9782
INFO@VIRTUCRYPT.COM