

EMCDPO - Digital Proof of Ownership Overview

EMCDPO

Decentralized digital proof of ownership for physical and digital goods

Emercoin International Development Group

<http://Emercoin.com>

This document is an introduction to EMCDPO - Emercoin Digital Proof of Ownership. A decentralized solution for the validation of ownership through the Emercoin blockchain for physical and digital goods and services.

Digital Proof of Ownership solves many real world problems related to the validation and authenticity of numerous products and services available today. By outsourcing the factor of trust to the Emercoin blockchain, physical and digital goods can now be assigned immutable proof of ownership to their respective owners. Currently there exists a myriad of problems with the validation of ownership in key areas of economic activity such as software licenses and subscriptions, land titles and deeds, music, artwork, diamonds, vehicle registrations and much more.

The costs to validate and authenticate ownership in several of these industries is burdensome, opening up the possibility of fraud, counterfeiting and even theft. Currently, in the physical world the common solution for ownership assignment is done via database entry or written record. With digital asset ownership, the solution is almost exclusively a database entry relating back to an ownership identifier (license key, product number, etc). In both cases the possibility of mismanagement and/or corruptibility of these records is high.

EMCDPO offers a solution to this problem by utilizing the power of blockchain technology. One of the many innovative Emercoin blockchain services is the NVS (Name-Value Storage), which allows for the safe storage of relevant ownership information via Name-Value key pairs. The Emercoin blockchain provides a universal service in this respect, allowing for the storage and maintenance of Name-Value pairs without imposing a narrow set of specializations and limitations. Because of this flexibility, the NVS service is the ideal solution for the validation of recorded ownership of virtually any product or service. The NVS service is extremely extensible and allows for numerous types of data to be stored such as DNS records, SSL and SSH certificates, business contacts and much more. For a more detailed walk-through of the NVS service please see: http://emercoin.com/EMCDNS_and_NVS.

How it works

On the Emercoin blockchain, each NVS record (Name-Value pair) has a unique owner assigned to it along with a respective payment address. The owner of an NVS record will be in control of this data by virtue of holding the related private key. This forms the basis of securing these records on the Emercoin blockchain and removes the possibility of altering the underlying information contained in the record itself by a 3rd party.

The management of NVS records can be administered through the Emercoin wallet GUI interface, console commands accessed via the debug window of the wallet or through the use of JSON API interface. This facilitates the creation, updating and deletion of all NVS records, offering full management capability to the owner of each record. As the owner of an NVS record where the data reflects digital proof of ownership, full control is maintained by the backing of the decentralized Emercoin blockchain. Due to the Emercoin blockchain's protection from unauthorized modification, this serves as the ideal solution for maintaining digital proof of ownership records. To illustrate the power of EMCDPO, we can look at an example of how both a physical and digital item can be assigned secure, digital ownership:

Example of Physical Item: Resolution of Land Title disputes

1. The local land registry office maintains all title and deed information for physical land in their applicable regions. An NVS record exists for each land title, which contains pertinent information on the land itself such as size, topology, identifier zone and current and past ownership details. In the past, these records were maintained on a physical piece of paper and/or through a centralized database system in the form of a simple entry which can be queried.
2. The current owner of the land maintains the deed, along with a corresponding NVS record that contains all pertinent owner information on the land itself. The current owner is approached by a prospective buyer who offers to purchase said land from them. An offer is made and accepted.
3. Real estate lawyers for both buyer and seller are contacted. Each lawyer performs their due diligence by conducting a land title search, maintained by the local land registry office. This is performed through the Emercoin blockchain. If all information appears to be proper, the buyer's lawyer will contact the owner of the land and ask for validation of the deed of ownership.

Actions taken:

The lawyer generates a random long-string number, requesting the listed owner to cryptographically sign a message with the same exact long-string number against the corresponding Emercoin wallet address listed with the NVS record.

In the Manage Names tab within the Emercoin wallet, the owner performs the 'name_show' command, retrieving the Name-Value pair and transaction info for the requested NVS record. Then the 'signmessage' action is performed and the requested long-string number is signed against the Emercoin wallet address associated with the NVS record containing the ownership details of the land title in question.

4. The owner then completes their portion of the request by sending the signed message containing the long-string number to the lawyer for validation.

Actions taken:

The lawyer, upon receiving the signed message performs the same 'name_show' command via the Emercoin wallet, retrieving the wallet address info (Name-Value pair and transaction information). Then the 'verifymessage' action is performed to verify the owner's signature against that wallet address. In the event that the 'verifymessage' action is successful, the owner will have cryptographically proven to the lawyer they are in control of the private key linked to the NVS record in question. A digital proof of ownership has just been performed at little to no cost and in a secure and timely manner requiring little overhead.

5. The lawyer, having cryptographically verified that the listed owner is indeed in control of the wallet address associated with the NVS record containing all land title ownership information, completes his part of the sale. His client (the buyer) is informed a digital proof of ownership has taken place and the seller (current owner) along with all land title information is accurate and in good standing.

Actions taken:

Upon completion of sale of the land, and at the request of the lawyer, the associated NVS record is transferred from the seller's Emercoin wallet to the buyer's Emercoin wallet. The seller sends the NVS record from their wallet in the form of a transaction to the buyer's wallet. Upon confirmation of the transaction, the buyer becomes the new owner of the land and maintains a digital proof of ownership with the land title on the Emercoin blockchain. The lawyer notifies the land title registry of the change in ownership. The buyer is now listed as the proper owner of the land on title with the registry office.

Example of Digital item: Validation of Product Key ownership

1. An anti-virus subscription is purchased by a customer who downloads and installs the software. Upon the completion of sale the customer requests the company send them the associated NVS record containing the product key information required to activate the subscription. In the past, these records were maintained on a physical piece of paper sent with the software package (CD) and/or through a centralized database system in the form of a simple entry which can be queried. Product keys could be emailed or printed on a screen acting as a receipt of purchase.

2. The company requests a receiving address from the customer to send the NVS record containing the product key information. Using the Emercoin wallet, the anti-virus company creates a transaction and upon confirmation, the customer receives the NVS record into their chosen wallet address and now becomes the true owner of the anti-virus subscription. A digital change of ownership has just been successfully performed on the Emercoin blockchain. In this example the NVS record contains the key: "dpo:NORT-10-001" (product identifier) and the value: <<the product license key>>.

3. Several months later, the customer of the anti-virus software requires customer support or a program renewal from the company. The company asks the customer for their anti-virus product key, which is provided to the company.

Actions taken:

The anti-virus company generates a random long-string number, requesting the customer to cryptographically sign a message with the same exact long-string number against the corresponding Emercoin wallet address listed with the NVS record.

Using the Emercoin wallet, the owner performs the 'name_show' command, retrieving the Name-Value pair and transaction info for the requested NVS record. Then the 'signmessage' action is performed and the requested long-string number is signed against the Emercoin wallet address associated with the NVS record containing the product key in question.

4. The owner then completes their portion of the request by sending the signed message containing the long-string number to the anti-virus company for validation.

Actions taken:

The anti-virus company, upon receiving the signed message performs the same 'name_show' command via the Emercoin wallet, retrieving the wallet address info (Name-Value pair and transaction information). Then the 'verifymessage' action is performed to verify the owner's signature against that wallet address. In the event that the 'verifymessage' action is successful, the owner will have cryptographically proven to the anti-virus company they are in control of the private key linked to the NVS record in question. A digital proof of ownership has just been performed at little to no cost and in a secure and timely manner requiring little overhead.

5. The anti-virus company, having cryptographically verified that the owner is indeed in control of the wallet address associated with the NVS record containing the product license key, begins providing the requested customer support. The anti-virus company can also validate requests for software upgrades and various other services by using EMCDPO on the Emercoin blockchain.

Note: All listed steps can be fully automated as a process to streamline the experience for all relevant parties down to a matter of seconds. When taking into account the cost savings and additional storage and security offered, the Emercoin blockchain and EMCDPO represent a superior choice for ownership validation.

How to get started

All software is distributed free of charge and the Emercoin wallet itself is opensource. To start utilizing the power of the Emercoin blockchain and it's many innovative services like Digital Proof of Ownership (EMCDPO), download and install the Emercoin wallet software. For information on the Emercoin wallet, the Emercoin blockchain and much more, please visit us at <http://Emercoin.com>.