Enigio's trace:original and BAFT's Distributed Ledger Payment Commitment (DLPC)

WORKING IN HARMONY | Creating freely negotiable digital payment commitments

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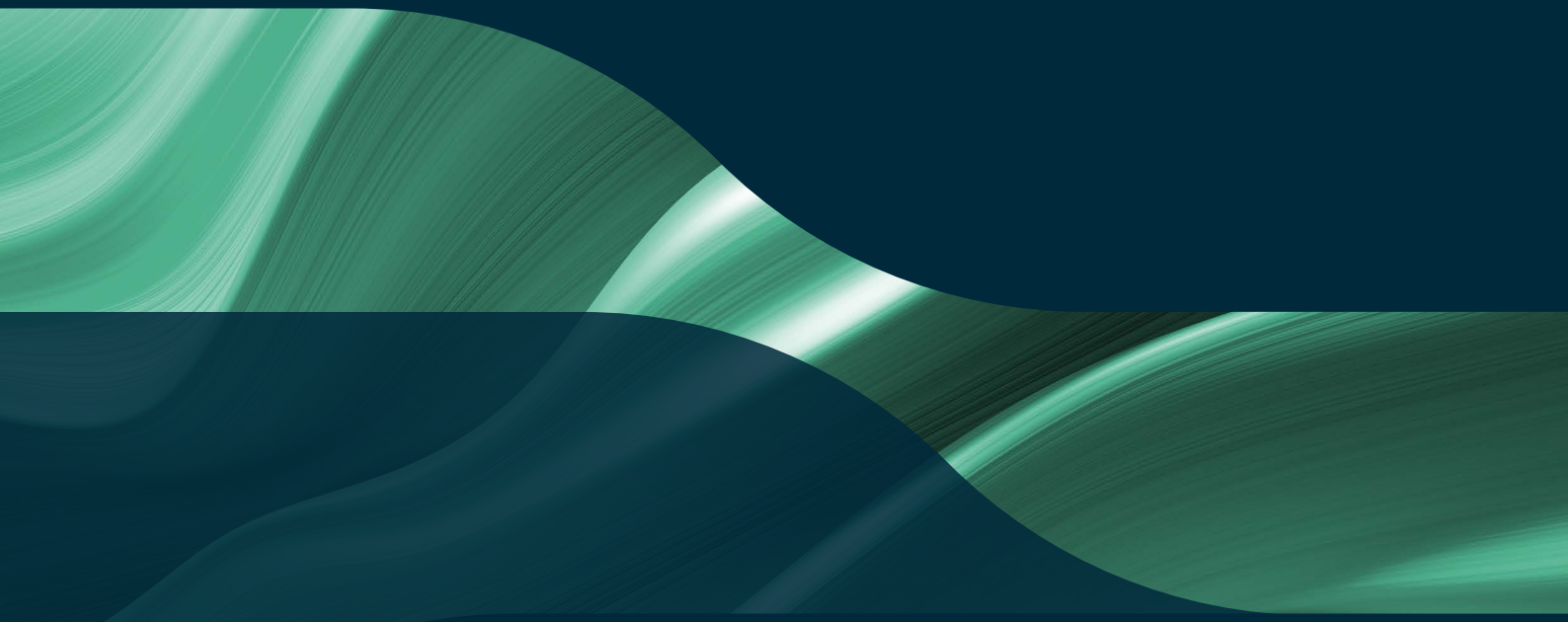

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Context

In this white paper, we discuss two approaches to a common problem that arises as the industry attempts to migrate from paper-based trade finance to a more efficient, digital operating model.

Limitations of paper

Negotiable payment instruments and documents of title have been key to the provision of cross-border finance for centuries and are, unsurprisingly given their long history, still predominantly paper-based. For the purposes of this white paper, we are focusing on payment instruments.

Examples of negotiable payment instruments used in trade finance include bills of exchange and promissory notes. Though the former is issued by the exporter and the latter by the importer, they share certain characteristics which make them especially useful with regard to the finance of trade.

In recent years, use of letters of credit has declined, and an increasing proportion of international trade is settled on open account terms. In essence, the trend towards open account settlement has shown that exporters are prepared to sacrifice the benefits of these trade instruments, which include easier access to finance coupled with effective risk mitigation, in exchange for enhanced operating efficiency.

The root of the relative inefficiency of the traditional payment instrument is its inherent nature as a paper document. As we know, paper documents, though universally 'readable', recognised in law and capable of being transferred by delivery from one party to another, suffer from significant disadvantages. Paper documents are susceptible to fraud, error and delay and are expensive to produce, process, store and transport. Every action involving paper also has a negative environmental impact. The dependence on paper documents has been thrown into even sharper focus in recent months as a consequence of the global pandemic; couriers have struggled to deliver key documents and banks have struggled to process them as so many of their staff have been forced to work from home.

Certain documents, such as invoices, are easy to digitise and a simple electronic record containing the required data serves the required purpose quite effectively. Where a document confers title or other rights upon the holder and is transferable by delivery (i.e., is negotiable), however, a simple electronic record is not sufficient under the current laws of almost all jurisdictions. The functionality and legal enforceability of a payment instrument cannot, therefore, be replicated in a simple electronic record.

Limitations of closed systems

In pursuit of a digital solution that addresses the finance and risk mitigation needs of trading companies without the inefficiencies associated with paper documents, we have seen the emergence of numerous trading platforms and consortia. These are closed ecosystems where members can record transactions and payment undertakings digitally, most often using a permissioned blockchain.
The proliferation of platforms and consortia has, however, given rise to two new challenges. First, the benefits can only be realised by those prepared to subscribe to a platform or join a consortium (for a fee) and sign its rulebook. The electronic records are, consequently, subject to contract law and have no legal validity beyond the platform or consortium membership. Given the complexity of global supply chains and the number and diversity of parties involved, the need for all parties to be members of the same platform or consortium is likely to inhibit adoption. Second, there is a clear need for interoperability between platforms and consortia to replicate in digital form the 'free negotiability' of traditional trade instruments.

The two approaches discussed in this white paper are conceptually quite different but are, in fact, potentially highly complementary. The two approaches are driven by a common goal which is the removal of paper to increase efficiency, security and simplicity whilst also lowering risks of error and fraud associated with handling traditional paper documentation.

Distributed Ledger Payment Commitment (DLPC) - developed by BAFT (Bankers Association for Finance and Trade)

DLPC defines best practices and identifies industry-wide specifications facilitating interoperability for distributed ledger payment commitments usable in a wide variety of trade transactions.

trace:original – developed by Enigio

trace:original is a technical solution through which a digital original document can be created and freely transferred between parties using distributed ledger technology solely for the purposes of validation, verification and recording ownership.

Our analysis has revealed that, although each solution is perfectly workable on a stand-alone basis (as intended by their respective creators), the opportunity exists to leverage the integration of the trace:original technical solution with the DLPC framework. This combination would remove the need for business data to be stored directly on a distributed ledger, while still providing the benefits of the DLPC industry standardisation.

DLPC and trace:original – in detail

trace:original

trace:original is a technical solution that enables the essential properties of an original paper document to be replicated in the digital world. In the context of a transferable payment undertaking, the essential properties are:

- the ability to distinguish between an original and a copy;
- the concept of 'possession' (i.e., the original is held by a specific holder); and,
- the ability to transfer possession by delivery.

The above-mentioned properties are created in a trace:original document through the use of a private key linked to the corresponding public key found in the digital document and on a public ledger. The solution was devised and constructed to comply with applicable law, where the law governing payment instruments is technologically neutral as is the case in Sweden [1]. The trace:original solution itself is agnostic regarding the document content and choice of electronic signature, allowing the creator of each document to ensure that legal requirements in relevant jurisdictions are complied with.

Use of a trace:original document does not require membership of a closed ecosystem and users are not required to sign an associated up-front agreement or 'rulebook' (as is the case with the various platforms and consortia that have emerged in recent years). As such any user can manage an unequivocally original document. The original document creator requires a trace:original license but the resulting digital original document itself is then freely transferable without the need for a license or special software. The only requirement for a party to receive and subsequently transfer a trace:original document is access to a computer and an internet connection.

The inherent interoperability of the trace:original technical solution is a key enabler for widescale adoption in an international context and is an essential characteristic regarding negotiable instruments. Amongst SMEs in particular, where the appetite to invest in costly platforms or join fee-based closed ecosystems is very low, trace:original's inherent interoperability and minimal investment hurdle are significant contributors to their financial inclusion.

Regarding platforms and consortia, it will be appreciated that members of the respective closed ecosystem have the ability to create, receive, manage and transfer an electronic record created within the system's technology infrastructure. A payment undertaking created in a closed ecosystem has no legal enforceability beyond its membership. These limitations are completely avoided with trace:original and the DLPC.

Distributed Ledger Payment Commitment (DLPC)

The DLPC is a solution that allows companies to register digital representations of payment commitments on a distributed ledger. As such, DLPC seeks to address the challenge of interoperability across multiple closed ecosystem-based platform solutions.

The DLPC specifications include 13 data fields detailing in the ledger the parties, amount due and other terms regarding a promise to pay, with only the permissioned parties having access and the potential to alter the instrument's state. In this way each party will have an additional source of trusted data to complement internal data silos within their respective systems. This construction is further supported by a set of business and technical 'best practices' published by BAFT, providing industry standards to be used across any distributed ledger that utilises DLPCs. The main objective as set out in the Business Best Practices is to reduce the reliance on paper found in international trade by creating a legally viable alternative.

[1] See the renowned Collector-judgment NJA 2017 s. 769 on the topic of technologically neutral legislation. If it is ensured that all safety mechanisms are provided for the electronic equivalent should be valid.

The legal aspect of DLPC is key, as the construction does not attempt to fit into differing national legislations but rather uses a specific set of laws to ensure that each payment instrument is fully compliant. The DLPC is constructed with the addition of an agreement to incorporate the law of Delaware in the United States as the law governing the payment commitment (as a Note under the Uniform Commercial Code of Delaware) and as the residual governing law. In this way the parties agree to be bound by the instrument as legally enforceable under the law of Delaware. It is expected that the DLPC will satisfy the requirements of the Delaware legislation and benefit from its statutory protections including negotiability of the Note [2].

The element of legal security and the best practices provides a second layer of security for corporates and financiers interested in utilising digital payment undertakings. BAFT's open sourced and publicly available guidelines for a legally valid DLPC (https://baft.org/docs/default-source/2020/06/baft-dlpc-business-bps-final.pdf) allows trade to take place with mutual understanding and recognition of the payment obligation as a negotiable instrument. Furthermore, as the DLPC acts as a standardised solution for digital representations of payment commitments it will allow a large number of industry participants to adopt the model quickly and harmoniously.

DLPC and trace:original – a comparison

trace:original – Digital original documents

Enigio's trace:original solution offers the ability to create a true digital original document that replicates the essential properties of a wet signature paper document without the latter's well-known disadvantages. The solution is designed to work within existing operating models with minimal disruption to standard processes. As such, trace:original documents can easily be used where trading parties are not members of a network or are members of different networks. Similar to a paper document, a trace:original document is inherently interoperable and can be read without specialised technology by anyone given access to it. Unlike a paper document, however, a trace:original document can be read by both human and machine, facilitating easy integration into digitalized processes as is increasingly required.

In a legislative framework which is neutral towards technology, a digital original that operates with functional equivalence relative to a wet-signature paper is equally enforceable in law [3].

DLPC – Definition of structured payment commitments

The DLPC, on the other hand, is not a technical solution but defines structured payment commitments applicable to a large variety of instruments associated with payment undertakings. As noted previously, the DLPC is a highly innovative and effective solution where trade transactions and resulting payment commitments are evidenced on digital networks, providing a degree of interoperability across networks and a standardised legal framework ensuring enforceability.

The chosen legal jurisdiction, the law of Delaware, is appropriate due to its statutory acceptance in the Delaware Uniform Electronic Transactions Act (UETA) of electronic Notes as negotiable payment instruments and therefore ideally suited to trade finance transactions.

DLPC and trace:original adopt different approaches to ensuring legal validity but attempt to achieve a similar goal; to create a legally enforceable negotiable instrument that can be traded internationally without the drawbacks of paper.

[2] If a particular DLPC would be deemed not to satisfy the statutory requirements, third parties may not be bound in the same fashion. They may well assert claims or rights based on the DLPC not being a negotiable instrument or not having been properly transferred (which would become relevant in cases of insolvency). The original contracting parties would naturally still be bound by contract law.

[3] The UNCITRAL Model Law on Electronic Transferable Records uses this principal of functional equivalence to motivate acceptance and promote security regarding digital negotiable instruments and documents of title.

Transferability

The transferability of each solution has been a priority; both the DLPC and trace:original aim to avoid the negative consequences of 'digital islands' which permeate trade finance today. The DLPC when initiated will be agreed on by the committer and committee as valid, and it may when created be integrated into any distributed ledger solution which is beneficial to the relevant parties so long as the 13 primary data fields are represented in some form. The standardisation provides for legal security, and the flexibility regarding how this standardised instrument is recorded across ledgers will provide for the interoperability between distributed ledger networks.

The corresponding strength regarding transferability of trace:originals as mentioned is the lack of any required contractual connectivity between parties, they do not need to be connected to the same DL infrastructure to transfer the instrument between them. Indeed, trace:original works perfectly well when either or both parties prefer to operate outside of a distributed ledger network.

With trace:original, a distributed ledger is used for one purpose only; to act as the notary service to verify the validity of the trace:original's contents, ownership and signature. The documents themselves are not stored on the distributed ledger but are transferred between parties through whichever system they choose including SWIFT, a trade finance platform or regular secure e-mail.

By using digital ledger technology in combination with advanced document technology it is possible to build a bridge between any type of trade or financial software without having to re-engineer the transaction process itself. This enables exporters, importers, logistics companies and financial institutions to cost-effectively digitise trade documents and use them in parallel with current paper-based processes. The issuer of the document simply must choose trace:original as a digital output instead of printing the content onto a piece of paper, in both cases a document will be created.

Integration

In essence, by using the DLPC 13 data points in a trace:original document its applicability can be extended beyond a distributed ledger to a much broader market. In order to evaluate the DLPC standard and its applicability using trace:original we have looked at the possibility of using DLPC's defined 13 data fields when creating a trace:original document.

The following table sets out the similarities and differences between the standard DLPC and the trace:original digital document.

The 13 Data Fields of a DLPC, used in a trace:original document

	DLPC on a consortium	trace:original
Create	A unique transaction ID is created on a blockchain. It is globally unique and is part of the record exchanged between the parties having access to the record. The ID can be used to link other documentation and external processes. The platform chooses how to use it for integration and user can use it to sync back end.	A unique document with a unique document ID is assigned/ inserted into the document. The ID (not the document) is registered in the trace:original ledger
Singularity	Maintained by only allowing members of the transition platform to access and manage the data records of the DLPC that the parties are pre-authorized to access based on platform rules and notaries	Maintained by publishing the public key of a cryptographic key-pair where the holder of the corresponding private key has possession of the original
Populating the 13 data fields	The DLPC Record data fields are part of the transaction information recorded on the ledger. The ledger provides immutability, linage and current state	The 13 data fields are written as content to the document. The data fields can also be inserted as a structured schema increasing the possibility of STP and machine reading.
Possession, control over the asset/undertaking	Control is obtained through access right to the platform. The platform establishes the rules for access to the platform as well as rules governing access between private parties	Control is obtained through possession of the latest version of the document and a cryptographic key controlled/possessed by the holder. The private key corresponds to the public key inserted into the document and the public ledger
Change status	The status change at one point needs to be performed by the authorised party. Status changes are governed by edit rules and the most current status as well as history is available via authorised access to the ledger transactions containing the DLPC records and their changes of the life cycle	The authorised party is the holder of the original. Changes of the status by making an addition in the document. If needed an electronic signature is added to ensure that the addition is performed by an authorised person.

	DLPC on a consortium	trace:original
Verifying control, possession and authenticity	Control is verified through access to the system or testimony from both transacting parties. (The above, provided that the supplier of the infrastructure does not have access to the transaction data base and encryption keys). The DLPC standard specifies the edit rules as to who can make what changes to a transaction during states of the life cycle and if the change has to be acknowledged by another party. The platform would control these rules and edit validations.	Control is verified through presentation of the latest version of the document (original) and a verifiable proof of holder (proving possession of the correct private key). Alternatively, the document can be transferred to the custody of collection authority/agent or a court. Proof of authenticity is obtained by comparing the cryptographic fingerprints of the original (or a copy) with the document's cryptographic evidence on the trace:original distributed ledger.
Confidentiality	Dependent on access rights on the platform.	Dependent on access to the holder's storage medium
Change of ownership	Changing the beneficiary can only be done within the closed blockchain network that is used to record the DLPC Record thru its life cycle.	The change of beneficiary is done by transferring the original document to the new holder, with or without endorsement in the document. The document may be managed by a fiduciary if required.
Connectivity	The Distributed Ledgers/Consortia are responsible for access mechanisms to each individual ledger and are responsible for ensuring that all members with access rights to the specific DLPC also have real-time access to the DPLC state.	Designed to be managed, transferred and stored: • In traditional Trade Finance systems • In DLT Consortia and • Manually, without any specific software besides a computer, internet connection and a modern web browser.
Identity and signatures	Each member organisation is responsible for correct authorisation of systems and/or staff to populate and sign required data fields. The member vouches that the transactions are initiated and signed in an authorised way. Attestation is via the members node and the certificates assigned by that node. Attestation is at the node owner level.	• Designed to carry electronic signatures for individuals and electronic stamps for organisations. • Chains of signed powers of attorney issued from authorised signatories proving authority can be added to the document or by adding secure references to these documents.
Legal validity and governance	Is governed by the DLPC rules and the rule book of each DLT network under the commercial law of the State of Delaware. Also, the fields within the DLPC record have the ability to define a different jurisdiction and rule book for the exchange.	Full legal validity for negotiable instruments and documents of title in countries where the legislation is technology neutral. Fulfils all requirement in the MLETR and the Geneva convention. In countries where common law allows for possession of an intangible, a trace:original is enforceable under the relevant Bills of Exchange act.

From a technical perspective the incorporation of the 13 data fields into a trace:original document is not complicated. A trace:original document can be created in three different ways when the first content (13 data fields) of the new document is added:

1. It can be created as free text with no defined or required structure
2. It can be created as both structured data and free text
3. It can be created as structured data only

With the trace:original solution, business data is not stored directly in the distributed ledger. Instead, a document (a digital file) is created. This file can have structured data or any other free format content which is secured on the ledger with cryptographic proofs, revealing nothing about the content in actual document, its data or its agreement parties as described above.

All the text in the document is readable by both machine and human regardless of whether it is structured or not.

[4] JSON is an open standard file format, and data interchange format, that uses human-readable text to store and transmit data objects consisting of attribute–value pairs and array data types. It is a very common data format, with a diverse range of applications. (Wikipedia)

For a good structure, a JSON[4] (JavaScript Object Notation) schema can be created and agreed upon between parties exchanging trace:original documents. This will greatly enhance the possibility of automated creation and processing by all parties involved.

Want to know more?

trace:original is ready to use by anyone at any time. Once a trace:original document is created it can be received stored managed by anyone, anywhere who has access to a computer and internet.

If you want to know more or simply try and see how it works, please get in touch:

- Gunnar Collin: gunnar.collin@enigio.com +46 761 139 500
- Lars Hansén: lars.hansen@enigio.com +46 730 898 780

enigio

ENIGIO TIME AB
Drottningholmsvägen 10
112 42 Stockholm, Sweden

Enigio offer solutions that ensure integrity and traceability of all your information to enable true and complete digital processes.

For more information, whitepapers and ways to contact us, please visit www.enigio.com.