DisLedger®

Whitepaper describing the token launch, background, and purpose of DisLedger's Distributed Concurrence Ledger technology

Symbol: DCL

Ethereum Address: 0x0cFf2ed2f99cd3c889ED19d3BC9c5d8a934A9a17

Token Launch Price: $30.00

Token List Price on Distribution Date: $70.00

End Date: 31 October, 2017

Telegram: DisLedger_Launch

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Background of DisLedger®

DisLedger® is a non-blockchain, distributed ledger technology designed for high-volume transaction processing such as payments and capital markets clearing. DisLedger's patent pending Distributed Concurrence Ledger technology provides a solution for permissioned networks that handle high volumes of transactions, require low-latency, and must maintain data privacy. It is a different approach to the way the data is distributed, more akin to sharding or striping than the massively redundant replication of all data copied to all nodes. DisLedger doesn't compete with permissionless, completely transparent networks like Bitcoin and Ethereum but offers an alternative where the use-case calls for speed and privacy.

What it does

DisLedger creates a private ledger between the counterparties to a trade. DisLedger doesn't mix every company's transactions into one common chain, but keeps each counterparty's transaction in its own distributed ledger called a Counterparty Ledger. This way DisLedger provides the cryptographic benefits of blockchain but also maintains complete privacy of all transactions; allows for net or gross settlement; processes hundreds of thousands of transactions per second; and does not suffer from latency issues.

The architecture provides the Golden Record of transactions, reduces clearing time to free up collateral, and supports large-scale, low-value payments such as Internet Of Things (IOT) micropayments. DisLedger provides definitive final settlement for capital markets; processes hundreds of thousands of transactions per second; and supports the regulatory required central clearing parties in the financial market infrastructure.

- DisLedger is scalable for definitive, final settlement of hundreds of thousands of transactions per second. Whereas latency, lag and a lack of finality are noted deficiencies in blockchain, DisLedger can keep pace with the fastest markets.
- Cyber security is greatly enhanced by DisLedger because the network is closed and isolated from the internet; transaction data is only shared between counterparties, no third-parties are involved; and the simple governance model makes it easy to upgrade to new encryption standards including future quantum resistant encryption.

- The transactions are shared with the counterparty directly and are completely private, so competitors will never see the trades. Leakage of business intelligence, the negative consequence of full transparency, is a significant issue in blockchain but is avoided in DisLedger.
- Business continuity is assured as transactions are processed only by the parties to the trade, so third-party competitors can't block or delay trades in the system.
- The inherently private design of the Counterparty Ledgers supports compliance with data privacy regulations.

Details on Token Launch

End Time	31 October 2017 – 7:00PM EDT(UTC-4)/ 11:00PM UTC
Token Supply	30 million DCL tokens, distributed in 1,000 IP licenses per token. Provides 30 billion transactions, one year's estimated usage of the DisLedger architecture.
Supply Issued	4.5 million token cap representing 4.5 billion IP licenses at launch. Distribution is expected to occur between 5-8 November.
Launch Price	$30.00 per token at launch equal to $0.03 per-transaction
Registration	Buyers must register for AML check at www.DisLedger.com
Token Rights	Token is a per-transaction, intellectual property license to utilize the DisLedger architecture. No security interest is offered or implied.
Token Type	ERC20
Decimal Places	3 digits; each DCL token represents 1,000 transactions; e.g. 0.001 DCLs provides the license for one transaction on a DisLedger system
Purchase Agreement	Token Purchase Agreement - click here to read the legal agreement covering the token sale
Demonstration	A public system is available at Demonstration source code GitHub
Company	DisLedger Ltd., British Virgin Islands

DisLedger's DCL token is not a security, and nothing in this document should be construed as an offering of a security interest. The DCL token is an intellectual property license to utilize DisLedger's proprietary technology for a single transaction. The terms of the license are incorporated into the token and documented in the Token Purchase

Agreement Exhibit A: DisLedger License Agreement. The token is for sale to users that will implement the DisLedger architecture.

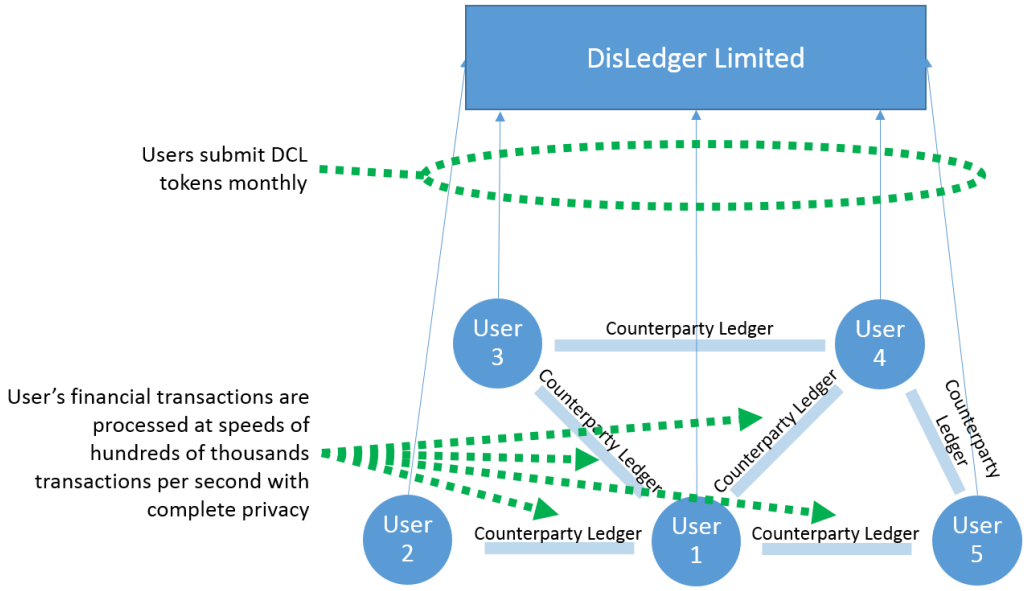
No Claim, Loan or Ownership Interest. The purchase of DCL tokens: (a) does not provide Buyer with rights of any form with respect to the Company or its revenues or assets, including, but not limited to, any voting, distribution, redemption, liquidation, proprietary (including all forms of intellectual property), or other financial or legal rights; (b) is not a loan to Company; and (c) does not provide Buyer with any ownership or other interest in Company.

Token Launch:

DisLedger is offering licenses for its Intellectual Property to users that want to prototype and build their own production DisLedger systems. Instead of requiring users to purchase an up-front enterprise license, the technology is available to license on a per-transaction basis. This way organizations do not require a large capital commitment to build and deploy their DisLedger system and will pay only for their actual usage over time. DisLedger provides a fast, private, cost effective solution for high volume transaction processing.

The per-transaction, IP licenses will be issued as ERC20 standard tokens named ‘DCL’ that can be purchased via the Ethereum network. This is a new use of the ERC20 standard as DisLedger is not offering what most organizations have so far: a coin, ownership in a company, voting rights to a foundation, or security interest. In this case what is being tokenized is a license to use the existing DisLedger technology based on a license agreement that is incorporated within the ERC20 token.

Figure 1 - DisLedger and Ethereum Hybrid

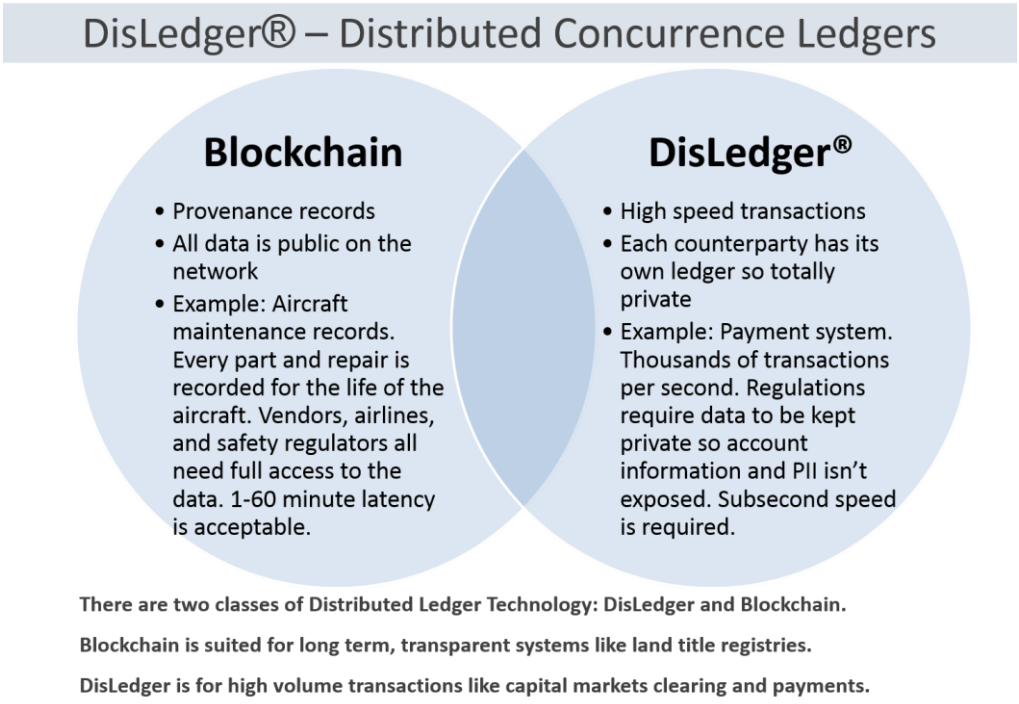


Per-transaction technology licensing is a common practice, and tokenization is used in numerous other types of systems. This approach creates a hybrid system where users process their transactions using DisLedger's high-speed and private technology, and their licenses to use the technology are processed on the Ethereum network. This pragmatic approach capitalizes on the strengths of the public, global Ethereum system as well as the private DisLedger system. The users benefit as they'll be able to acquire the rights to use DisLedger's IP easily and with little up-front cost. DisLedger benefits as it simplifies the management of the licenses; eliminates an enterprise license cost which is a barrier to adoption; and broadens the user community to maximize the network effect. Users will register with DisLedger, be verified, then be given instructions how to purchase DisLedger IP tokens during the soft launch/pre-sale and launch. On a monthly basis users will count the number of transactions they processed and submit that number of DCL tokens to DisLedger on Ethereum.

Market Opportunity

Distributed Ledger Technology is a rapidly growing field of information technology. The technology is used or planned to be used in wide ranging projects from identity management to medical records to payments. There are thousands of organizations researching and building DLT systems globally and most of these projects are based on the blockchain architecture.

Figure 2 - DisLedger and Bitcoin Comparison



However there are well-documented shortcomings with the blockchain architecture that are proving difficult to overcome:

- Latency
- Privacy
- Governance

DisLedger focuses on use cases that require very fast transaction processing and total privacy and are arranged as permissioned networks. At present the most developed industries that have these requirements are in the financial markets: capital markets clearing and settlement, and in payments processing.

Founder

Figure 3- Founder, Dan Conner

DisLedger was created by Dan Conner LinkedIn. Dan develops advanced technology to solve challenging problems including addressing the scalability and privacy issues in distributed ledger technology. Dan created the DisLedger technology to fill the capability gaps in the existing blockchain architecture. Prior to DisLedger, Dan's previous technology design projects include an Internet Of Things radio system for beyond line of sight data connectivity, and an Active Electrically Steered Array (AESA) antenna design for a commercial satellite constellation.

Dan served in the U.S. Army Special Forces (AKA "Green Berets") with tours in Afghanistan and Iraq as an Engineer Sergeant specializing in explosives and demolitions. His prior experience includes executive positions in business development, and technical project management for defense and information technology companies.

Dan received his B.S. in Commerce, and a M.S. in Management Information Systems from the University of Virginia.

Sales Channel Development

DisLedger has been in development since early 2016. Over that time we have engaged with numerous potential clients to be incorporated into their operations to create demand. Originally the business model centered around enterprise licensing of the intellectual property, but as the token market has evolved it makes sense to adopt a per-transaction fee/license to generate revenue. As a small company DisLedger's focus is on developing partnerships with larger organizations to utilize their reach and salesforce to penetrate new markets. We also have used business development consultants with expertise and connections in key markets or targeted

customers. As such we are involved in projects globally, with the ability to support massive transaction volumes, while maintaining a small footprint.

Below is a partial list of projects that are evaluating DisLedger and an estimate of the maximum volume of transactions per second the systems could generate:

- Fortune 500 global credit card network considering DisLedger for IOT micropayments, cross-border payments and capital markets settlement (estimated volume 10,000tps)
- Consortium of a global card network, and two Dow Jones Industrials (a software company, and a chip manufacturer) considering DisLedger for a payments rail for Smart Cities (1,000tps)
- Large business software company considering DisLedger for an interest rate swaps trade repository (<1,000tps)
- Large software company and North American Investment Bank partnering to support capital markets clearinghouses globally (1,000tps)
- Cross-border payments company in the Middle East – Asia corridor for remittances project (<100tps)
- High-frequency trading and market maker for foreign exchange and derivatives (1,000tps).

*One 1,000tps system will process 31.5 billion transactions annually and use up the entire supply of DCL tokens created.

We look forward to the active participation of more developers from around the world that use the tokens to build prototype systems and then move into production. The thousands of professionals that will be exposed to the technology because of the publicity surrounding the token launch will add new projects to the pipeline.

Supporting Team

To date we have relied on outsourced, contract coders for development. The architecture is simple enough to only require a few telecons to explain the details of the process, and then minimal coding time. Currently the architecture has been reviewed by many large financial institutions and technology companies, and implemented in numerous proof of concepts. We also

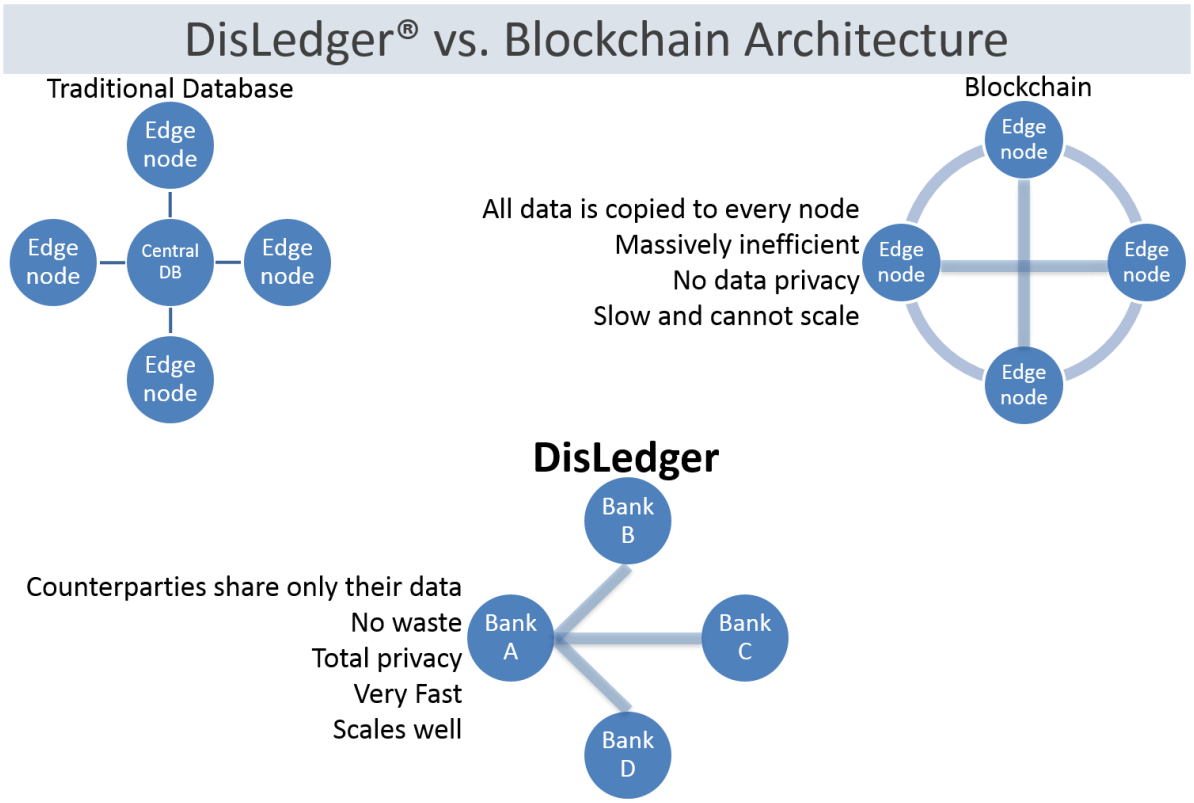
utilize two globally-recognized law firms for legal support on patent and intellectual property work, and regulatory issues related to the token launch. The team is small, focused, and provides highly-specialized talent.

DisLedger's Distributed Concurrence Ledger Architecture

In current blockchains every transaction conducted by all of the members of a network are batched together and recorded in a single ledger. Other members on the system (not the actual parties to a transaction) must provide their approval for the transaction to be added to the ledger. Because numerous unrelated members have to give consent for a transaction, this type of architecture is called a consensus system. There are a few different protocols that blockchains use for consensus, but at the highest level they have the same effect. Parties that aren't involved in the transaction, and who are often one's direct competitors, must give their consent for you to conduct your transactions.

The blockchain and consensus protocols are artifacts of the Bitcoin system where their use made sense, but their continued use will keep blockchains from being implemented in some applications. Issues with consensus protocols center on four main areas: an organization is forced to rely on its direct competitors to process every business transaction; it is expensive to prove the non-repudiability of the system during a legal dispute; transaction processing times can't be guaranteed and the order of transactions can vary unpredictably due to system usage; and intelligence about the organization's business dealings are provided to its competitors in the network. Distributed concurrence ledgers are designed for situations where these issues aren't acceptable.

Figure 4- Comparison of Distributed Ledger Architectures



DisLedger® is a distributed concurrence ledger that provides more secure, faster and more scalable transaction processing than consensus blockchain systems. The same benefits of immutable records, and regulatory transparency are provided, however the transactions are processed only by the actual counterparties involved and not by a consensus of the crowd.

Reliance on Competitors

Currently many organizations use clearinghouses or other services to assist in processing transactions but in these cases the outside parties are always trusted, impartial, and independent. Consensus based blockchains eliminate these impartial organizations and instead rely on a network of peers to validate and process transactions. One would expect the members of the blockchain network would all be direct competitors within an industry or asset class. An organization participating in a blockchain is forced to rely completely on its competitors to process its transactions in good faith without any manipulation, in order without frontrunning, and immediately without any delay. When transactions of such high values in such competitive industries are at stake, placing all of one's business deals in the hands of your competitors is unnecessarily risky.

In a distributed concurrence ledger the transaction processing is handled privately between only the actual counterparties to the transaction which eliminates any reliance on competitors.

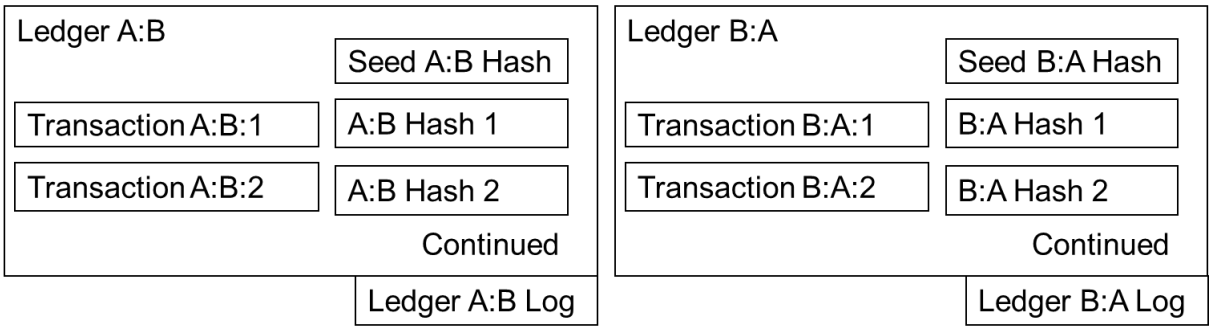
Non-Repudiable

The consensus protocols are both complex and imperfect, and can be manipulated causing improper processing, or the misordering and delaying of transactions. Because they are subject to attack and are processed completely outside of the control of the actual parties to a transaction they cannot be called irrefutable. When a dispute arises regarding a transaction in a blockchain one of the first defenses will be to argue the system was manipulated and that the transaction is not actually valid. Having a real world (off-chain asset) transaction represented on a blockchain does not guarantee meeting a burden of proof in informal dispute resolution, arbitration or litigation. It will be an unenviable position having to refute and prove that the incredibly complex system with no oversight or controlling body, that runs open source code, that was made up of competing organizations joining and leaving the network over time, and with different organizations actively validating or going inactive on a second by second basis, was not being manipulated at the time of the transaction and that the transaction was processed accurately. They will also have to prove that from the time of the transaction to the current date the system has not been manipulated in any way, that every subsequent change to the blockchain was accurate, and that the record of the transaction has not been altered. While it may be possible to prove eventually, due to the complexity of the system proving all of this will be very costly for every disputed transaction. Significant cost will be expended by the parties to the transaction as well as all of the other members of the blockchain whose transactions are intermingled and were part of the consensus protocol. Validity of the consensus protocols and of transactions conducted using these protocols has not been challenged in court. But they certainly will be challenged at great expense to all involved including all of the unrelated parties in the network that will be embroiled in each dispute or litigation in the future.

In a distributed concurrence ledger transactions between counterparties are recorded with proof of the parties' agreement that each transaction is accurate, complete and valid; and that the entire ledger is accurate every time a ledger is updated with a new transaction. The evidence that the parties agree is documented repeatedly, cryptographically secured, and validated continuously. A shared counterparty ledger that is private and accessible only by the parties involved is created.

The counterparty ledger holds each individual transaction that occurs between those counterparties.

Figure 5- Counterparty ledgers held by corresponding organizations A & B



As the ledger is held and accessible only by the counterparties, only the parties can add to the ledger, and identical updates must be executed by each party keeping the counterparty ledgers perfectly equal. This allows rapid processing of individual transactions, each cryptographically secured and immutable, while still providing transparency for auditing and regulatory compliance access as required. No third parties are involved in the transaction, it is processed solely under the control of the parties involved, and a clear simple, evidentiary trail of the transactions is provided for dispute resolution. The non-repudiable ledgers provide a clear chain of title, which is easily proven with built-in documentary evidence.

Processing Speed and Order

Blockchains utilize a single ledger that is replicated and redundantly processed by all the members of a network. This single ledger batches all of the transactions from all the members within the network into one block. Consequently over time the file of every transaction can become large and unwieldy to transmit and process. Transactions are aggregated into blocks of unrelated transactions gathered from all members of the system for periodic processing which also delays execution and transaction settlement. The massive, but unnecessary, redundancy requires computer processing and data storage of large amounts of transactions to which the organization is not a party with direct impact on IT, electrical and cooling expenses.

In distributed concurrence ledgers the parties only process and store the transactions in which they are involved and do so rapidly and in sequential order without chance for frontrunning.

Business Intelligence

Information, such as which counterparties are conducting transactions, at what volume, with what frequency, etc., is sensitive and the sharing of it in blockchain systems provides valuable intelligence to one's competitors.

Distributed concurrence ledgers hold transactions between counterparties privately in a counterparty ledger not shared in monolithic blockchain. There is a counterparty ledger within the organization's Prime Ledger for each party with whom the account may conduct transactions.

The counterparty ledger is small, efficient, and records each individual transaction separately so no outside party gains insight into deal flow. This allows for rapid, deterministic processing at the individual transaction level as opposed to periodic processing of commingled transactions in a blockchain system. The ability to manage, partition and archive counterparty ledgers are simple tools to keep the system sustainable over time that aren't available to monolithic blockchains. Transparency is still provided for compliance, however it can be tailored to provide access to only the appropriate counterparty ledgers under the regulator's purview and not offer universal access to the organization's entire workings.

Overview of Concurrence Ledger Processing

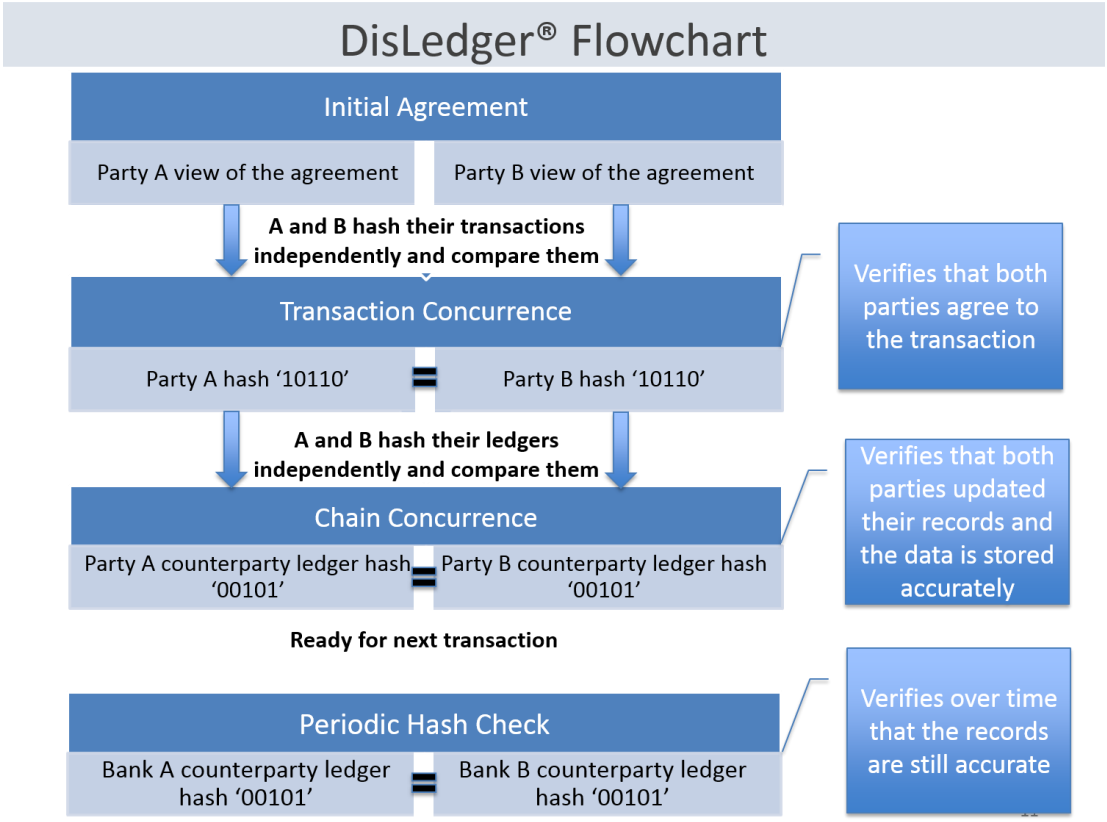
In any distributed ledger transactions can come from any traditional business function and in any asset class. It isn't critical to the ledger whether they are system generated, or manually entered, all digital or electronic scans of paper transactions. Using concurrence multiparty transactions are handled by the same process but for simplicity this description uses just two parties and skips some trivial details.

When the parties want to process a transaction they each conduct their own cryptographic hash on the contents of their version of the transaction data which results in a transaction hash. If the parties both are using complete and accurate data to conduct the hash operation then the resulting transaction hash calculated by one party will be the same as the transaction hash arrived at independently by the other party. By comparing the transaction hashes the two parties agree that the data concerning the transaction is identical. So at the time of the transaction both parties

provide digitally signed Transaction Concurrence that the other party's record of the individual transaction is accurate and agreement has been reached. If the transaction hashes are not equal then there is a problem with one of the counterparty's version of the data that is immediately recognized; agreement between the parties does not take place; no contractual obligation or other transaction progress occurs; and the transaction cannot be processed until appropriate remedies are made to bring the two versions of the transaction data into alignment.

Upon agreement that the individual transaction record is correct by both parties a hash of the counterparty ledger updated with that latest transaction is conducted by each party. This counterparty ledger hash is then provided to the other party for comparison. If accurate records have been kept and the transaction is updated properly, both counterparties will have an identical counterparty ledger and the cryptographic hash of one party's ledger will be identical to a cryptographic hash of the other party's ledger. If both counterparty ledger hashes are equal then this second concurrence, Chain Concurrence, irrefutably proves that not only is the latest transaction accurate but that the chain of all of the records on the counterparty ledger dating from the creation of the ledger to the latest transaction are accurate. Chain Concurrence provides non-repudiable proof of accurate recordkeeping also known as a clear chain of title. If the counterparty ledger hashes are not equal then there is a problem with updating one of the counterparty's ledgers and the problem can be resolved. Since the update to the counterparty ledgers wasn't successful; agreement between the parties did not take place; no contractual obligation is created and effectively the transaction fails.

Figure 6 - DisLedger Flowchart

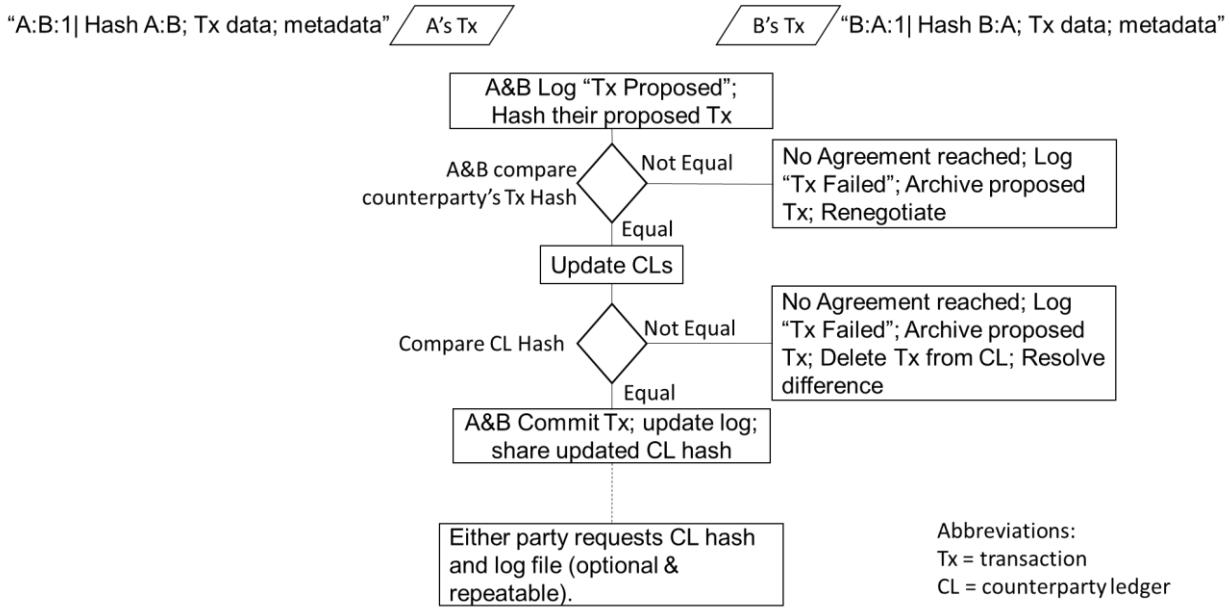


These two concurrences ensure that the ledgers between counterparties are kept identical because the current transaction being processed and the historical chain of transactions from the beginning of the system must be identical or a transaction cannot be processed and the ledger cannot be altered. However each time a transaction is processed successfully and the counterparty ledger is updated a new counterparty ledger hash is agreed to by the parties. When the next transaction is conducted the hash of the counterparty ledger becomes part of the transaction to be processed which creates the chain of title.

A log of these sequential counterparty ledger hashes and all transactions attempted is maintained by both parties. At any time a party can request that their counterparty verify the corresponding counterparty hash. This periodic check provides ongoing proof of concurrence between the parties of the entire chain of transactions between them. Hashes can be repeatedly verified and the continued concurrence documented over time as evidence of the accuracy of the ledger. If in the future a counterparty ledger is claimed to have been altered by one party without concurrence

by the other party the log will provide evidence of which system was correct and disputes can easily be resolved.

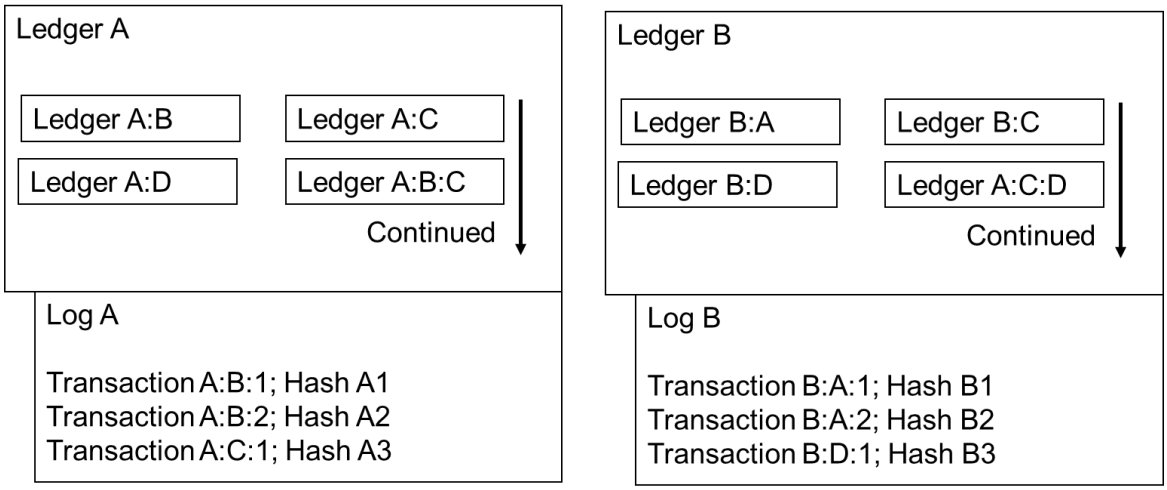
Figure 7- Concurrence ledger processing



Aggregation into the Prime Ledger

DisLedger® counterparty ledgers maintain the record of transactions with a single trading partner. To provide an accounting of the entire asset base of the organization each counterparty ledger is added to the Prime Ledger. By aggregating all of the positions from each counterparty ledger the organization maintains a real time view of its assets; settlement can occur on a gross basis or it can netted with support for ad hoc, intraday, and daily netting. The Prime Ledger allows for a separation of the high speed trading with counterparties from the holistic reporting on the organization's total asset base. The aggregation of positions provides the ability to use the assets in the underlying transactions for lending and collateral as is required in capital markets.

Figure 8- Prime ledgers for A & B holding multiple counterparty ledgers



Takeaway

The concurrence architecture will have a significant impact on the future of distributed ledgers. It is not a solution for every problem but organizations considering activity in the blockchain space should review this approach to see if it might be a better fit for their problems.

Blockchain is best suited for provenance type systems (land title, artwork, etc.) where providing visibility is a main goal and the long latency of transaction processing is not important. DisLedger® is tailored for high speed, transactional systems (capital markets settlement and payments processing) where privacy is important and transaction speed is critical.

For more information on the architecture refer to the Overview Slides and the full Technical Whitepaper.

More Information

For official releases from DisLedger please refer to our website www.DisLedger.com, and Telegram channel: DisLedger_Official.

Email us with any questions Info@DisLedger.com