BUILDING TRUST AMONGST KEY STAKEHOLDERS USING DISTRIBUTED LEDGER TECHNOLOGY ON AWS

ABOUT GUILDONE

For more than two decades, GuildOne Inc. (GuildOne) has supplied advanced database solutions and business intelligence to the oil and gas industry so they can better understand and use data to enhance business performance. Starting in 2016, GuildOne has invested time and resources in the research of emerging technologies such as blockchain, machine learning, and artificial intelligence, culminating in the release of its Royalty Ledger, the first successfully executed smart contract using blockchain technology outside of the financial sector and cryptocurrency markets.
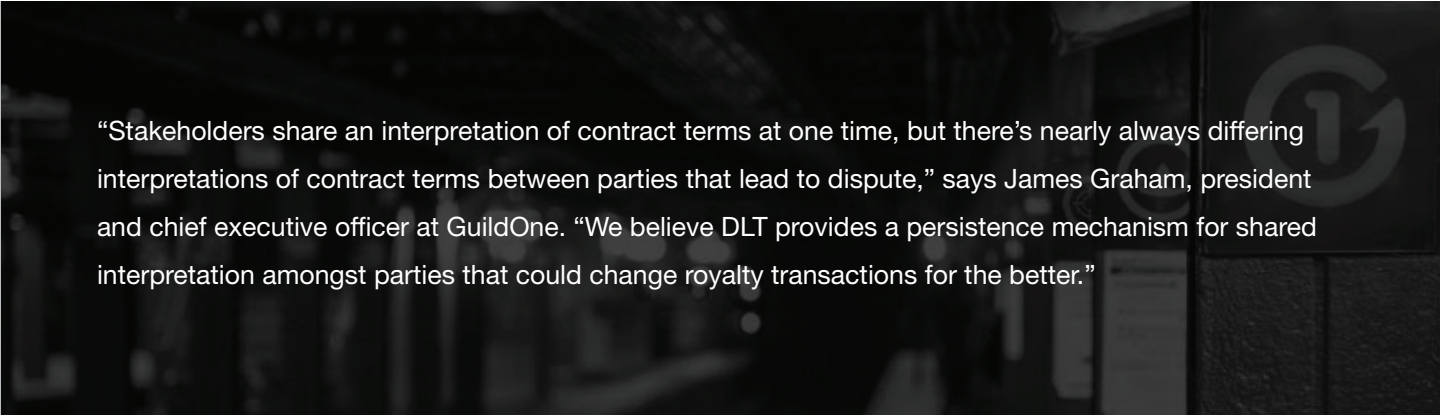
WHEN CONTRACT DISPUTES BECOME STANDARD PRACTICE, EVERYBODY LOSES

Oil and gas products are omnipresent in powering our everyday lives, so it's easy to take for granted the many steps and interactions involved in moving them from resource exploration, extraction, and production to consumption. Many stakeholders, including landowners, governments, oil and gas company operators, surveyors, and financial institutions must work with one another and within their organizations to successfully move resources along the oil and gas supply chain.

One critical interaction takes place between resource producers and royalty owners who are entitled to a part of the total production. To calculate and check oil and gas royalty transaction payments, stakeholders must agree to contract terms upfront. Those terms may be interpreted differently depending on the systems each stakeholder uses, the human resources available to confirm accuracy, and the data available. Successfully executing a royalty transaction requires a lot of general and administrative (G&A) costs for the parties involved—and they often are disputed.

What if there was a more efficient, secure, and cost-effective way for companies to execute a royalty contract transaction? How would a paradigm shift in the way things work change the course of the oil and gas industry and drive benefits to end consumers? How could companies in other industries benefit from a new way to transact and interact?

For GuildOne, an Alberta-based company focused on supplying advanced database solutions and business intelligence to the Western Canadian oil and gas industry, the way to simplify, automate, and reduce complexities in royalty contract transactions begins with the cloud and distributed ledger technology (DLT).

"Stakeholders share an interpretation of contract terms at one time, but there's nearly always differing interpretations of contract terms between parties that lead to dispute," says James Graham, president and chief executive officer at GuildOne. "We believe DLT provides a persistence mechanism for shared interpretation amongst parties that could change royalty transactions for the better."

ENABLING STAKEHOLDERS TO DRIVE EFFICIENCIES AND CUT G&A COSTS

GuildOne's mission is to help oil and gas industry players use technology to simplify processes, drive better interactions, motivate organizational change, and explore new insights.

"Three and a half years ago, we started focusing on the fact that oil and gas company operators were looking to increase their G&A efficiency to drive down costs by eliminating disputes," says Graham. "We'd been paying close attention to the emergence of blockchain and believed that royalty transactions were a perfect use case for DLT. We asked ourselves, 'What if companies could express contract terms on a distributed ledger, and replicate and reach consensus on the terms between parties?' To achieve that state would mitigate the possibility of dispute going forward and eliminate a large chunk of the G&A going into contract administration."

To build its royalty ledger and to meet the stringent privacy and security needs of its stakeholders, GuildOne chose to execute a Proof of Concept (PoC) using R3's Corda on Amazon Web Services (AWS).

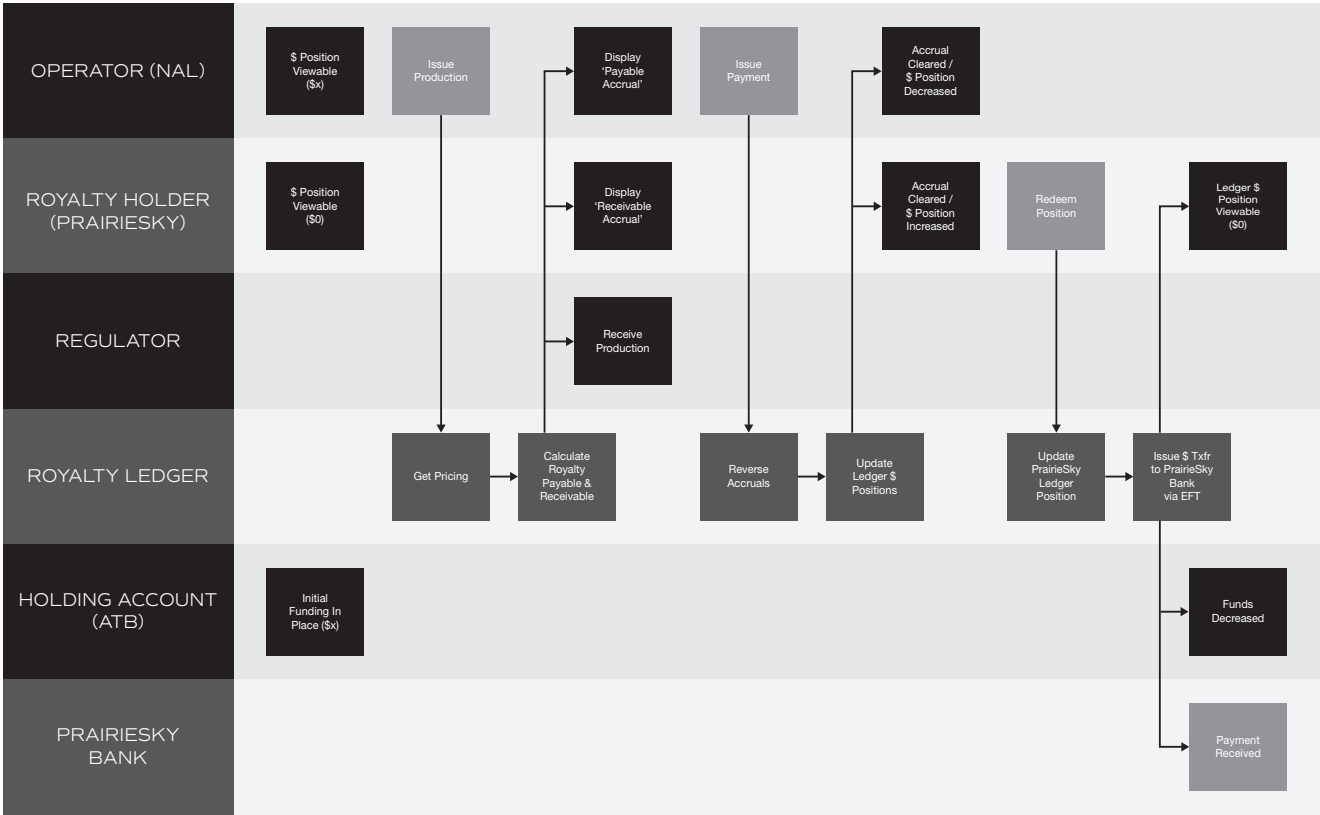## BUILDING TRUST AMONGST KEY STAKEHOLDERS USING DISTRIBUTED LEDGER TECHNOLOGY ON AWS

R3, an enterprise software firm and Advanced AWS Technology Partner, built its Corda blockchain platform in close collaboration with global financial institutions to meet the stringent demands of the financial industry. As Corda was designed to meet the highest standards of one of the most complex and highly regulated industries in the world, it can be applied seamlessly to all other areas of commerce. Knowing the strict standards R3 used to build its platform was a key differentiator to the GuildOne team as they chose a platform on which to build the royalty ledger.

"We were looking for a product that would provide the confidentiality, privacy, and security mechanisms we needed to meet oil and gas industry standards," says Mike Gee, chief operating officer at GuildOne. "Corda is also Java VM-based, which is where our development expertise is strongest. We felt the ease of adoption and privacy and security capabilities we'd gain using Corda would be key to enabling rapid adoption of the royalty ledger solution in the oil and gas industry."

Working with stakeholders, including NAL Resources Management Limited, PrairieSky Royalty, and ATB Financial, GuildOne designed a PoC to settle its first royalty contract and payment transaction. The team chose to represent seven business nodes on the distributed ledger and used AWS to stand up seven DLT environments using R3's Corda. GuildOne used Amazon Elastic Compute Cloud (Amazon EC2) as the application servers running Linux, Amazon Relational Database Service (RDS) as the database for each of the nodes, EBS Storage Volumes for the servers, Amazon Virtual Private Cloud (VPC) for network privacy and security, Amazon CloudWatch for monitoring, and AWS Lambda for scripting.

LEDGER FUNDED → ISSUE PRODUCTION → ISSUE PAYMENT → REDEEM FROM LEDGER
ROYALTY LEDGER

OPERATOR (NAL)	$ Position Viewable ($x)	Issue Production		Display 'Payable Accrual'	Issue Payment		Accrual Cleared / $ Position Decreased		
ROYALTY HOLDER (PRAIRIESKY)	$ Position Viewable ($0)			Display 'Receivable Accrual'			Accrual Cleared / $ Position Increased	Redeem Position	Ledger $ Position Viewable ($0)
REGULATOR				Receive Production					
ROYALTY LEDGER			Get Pricing	Calculate Royalty Payable & Receivable	Reverse Accruals	Update Ledger $ Positions		Update PrairieSky Ledger Position	Issue $ Txfr to PrairieSky Bank via EFT
HOLDING ACCOUNT (ATB)	Initial Funding In Place ($x)								Funds Decreased
PRAIRIESKY BANK									Payment Received

"The PoC took three weeks of orchestration and coordination between the parties involved, and it was over in about 30 seconds," says Gee. "When we were ready to execute the transaction, all parties were represented. We conducted the transaction from the NAL boardroom. ATB Financial, the bank represented on the ledger, had already done the banking transaction, meaning they'd put cash on-deposit and issued their on-ledger position, so they had money to spend on the ledger. We then negotiated the contract and got that to consensus within a few minutes, and we issued the production volume for the previous month and computed the royalty. We then went ahead and settled the contract, which subsequently resulted in an EFT to the payee's bank account. They confirmed when the money arrived so that we could be confident in the success of the transaction on the ledger."

CREATE A SMART CONTRACT ON THE ROYALTY LEDGER
ROYALTY LEDGER

GuildOne

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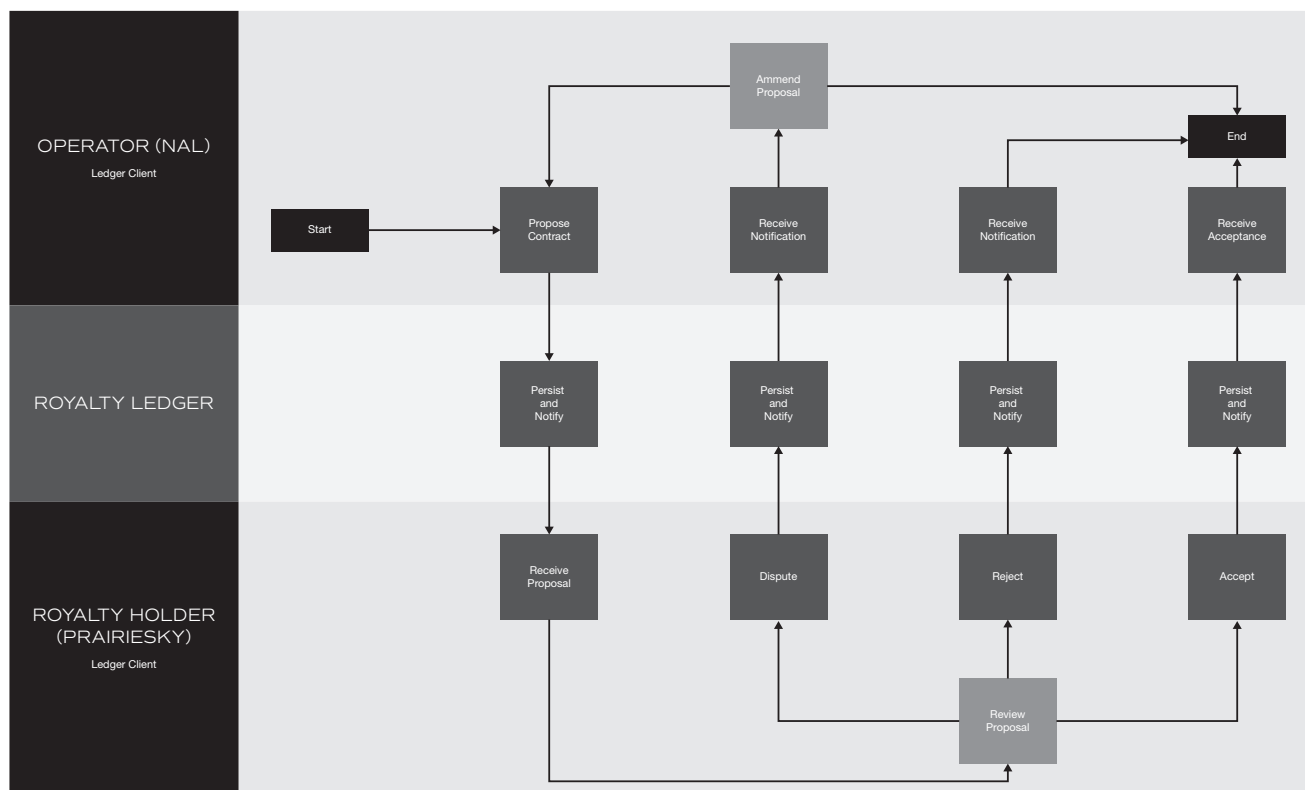
IMAGINING A FUTURE POWERED BY SMART CONTRACTS

For GuildOne, the successful execution of the world's first royalty ledger is just the beginning. "The PoC was exciting as it showed what we could do," says Gee. "We have a large development plan underway to build an enterprise-class version of the royalty ledger." Gee advises companies looking to take advantage of blockchain smart contracts to drive efficiencies that embrace automation best practices and cloud technologies.

A big question for us when onboarding a new enterprise is, 'What's the digital readiness of the enterprise wanting to join the ledger?' Very little of this process is going to be manual, and there's a substantial automation and integration task ahead of companies wanting to join the network," explains Gee.

The transformative nature of the technology drives the GuildOne team to seek new ways to mature its solution and incorporate technologies such as machine learning to drive better insights and processes. "We see the seedlings of a truly frictionless, dispute-free transactional mode," says Graham. "If we're able to get to a dispute-free state of interaction, we believe we can drive revenue completeness for all parties involved in the oil and gas industry, regardless of the resources they may have at their disposal to complete transactions and settle contracts. And we feel it's a platform that has a lot of legs with the potential to transform other industries."

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