

The background features large, abstract, organic shapes in a light yellow color. One shape is in the top-left corner, and another is in the bottom-left corner, both partially cut off by the page edges. The rest of the page is white.

**THE BENEFIT OF BLOCKCHAIN TECHNOLOGY IN CASINO
GAMING**

WHITE PAPER

April 22, 2019

Introduction

In 2018, The Gaming Standards Association (GSA) held its first Technology Summit. This event was focused on Blockchain technology. Based on feedback received by both attendees and speakers it was a resounding success. The speakers were dynamic, informative, provocative, and fully met the goal of providing attendees with a glimpse of what is being achieved with this technology both in the gaming industry; but more importantly in the world at large.

Following the event, GSA took on the responsibility of identifying how this technology could potentially be used in the gaming industry, focusing on use cases that would benefit Regulators and Operators. GSA prepared four use cases that align with real-world applications described during the Technical Summit.

GSA will share these use cases with leading technology companies active in the blockchain space, to identify existing solutions that might be applied. The result of the collaborative discussion between GSA and these technology companies is a white paper that GSA will then use to educate Regulators and Casino Operators on what can be achieved. It is not GSA's intent to represent these technology companies in any way, or to recommend one solution over another, but rather to educate the industry as described in our mission statement.

Four use cases are presented. Examples of blockchain technology use cases in multiple marketplaces are discussed.

The use cases included in this document are:

- Use Case 1
 - Slot Machine Tracking
 - Parallel non-gaming industry solution 1 – IBM Supply Chain Visibility
 - Parallel non-gaming industry solution 2 – Oracle Cargo Smart
- Use Case 2
 - Financial Data Reporting
 - Parallel non-gaming industry solution – Oracle blockchain enabled Document Exchange
- Use Case 3
 - Slot Machine Software Validation
 - Parallel non-gaming industry solution – Intel Trusted Supply Chain Process
- Use Case 4
 - Responsible Gaming
 - Potential Solutions – Dominode, Qgen Group

Use Case 1: Slot Machines Tracking

According to the American Gaming Association's (AGA) 2019 State of the States survey, there are over 900,000 electronic gaming devices in casinos, bars, taverns and truck stops nationwide. Even assuming a conservative 5% refresh rate, and not accounting for any expansions, that means 45,000 units were shipped to some of the over 16,000 venues licensed to have electronic gaming devices. A study conducted by Mr. David O. Stewart, Ropes & Gray LLP, on behalf of the AGA identified that there are more than 365 different sets of electronic gaming device shipping regulations across North America and that those regulations vary considerably.

In North America, slot machines being transported from the manufacturing plant for installation at casino sites must adhere to a strict transportation protocol as prescribed by the various regulatory bodies. One common requirement is that slot machines must be transported in a sealed truck. The truck's seal must remain intact until the slot machines arrive at the designated casino's receiving dock, where regulatory agents verify its integrity and verify each slot machine's tag information against a manifest list that details the expected delivery.

The Problem

The use of sealed trucks sometimes using two-person driver teams, is more expensive than regular freight. Since the seal cannot be broken, the trucks go to a single destination. Therefore, any unused space within that truck is wasted capacity and therefore has a cost. Some regulators have started to waive this requirement, either requiring that each machine be individually sealed or that the truck be resealed after each delivery. Regardless, per Mr. Stewart's report, five of the largest slot machine manufacturers have over 29 people employed to handle shipping requirements, generating some 61,000 shipping filings in a 12-month period.

The rationale behind the use of sealed trucks is to ensure the integrity of the slot machines. This is the case even though many jurisdictions require that the software, Operating System and Game Theme, be either shipped separately or, in some jurisdictions on the same truck but in a separate box and not within the slot machines. These regulations do not seem to take into consideration the fact that slot machines today are computers and that the physical slot machine has absolutely no part to play in the determination of game outcome. Perhaps the thinking is that the slot machine's mother board, absent any software, could be manipulated to affect the Operating System and Game Theme software when installed. However, it is the software program that controls the outcome and, in some jurisdictions, that software is shipped separately and differently.

To uniquely identify them, slot machines are required by most, if not all, gaming jurisdictions to have a permeant tag affixed to them. The tag must contain information specified by regulation to include, at a minimum, manufacturer, serial number, model number, manufacturing date and safety certifications, such as CE (European Union

Standards) and UL (United States Standards). This tag tracks the slot machine's 'life' from manufacture through sale, potential re-sale and ultimate destruction.

The core goal of these regulations is to provide regulators the assurance that slot machines leaving the manufacturing plant have not been tampered with and are the same ones arriving at the casino. This process was like some of the supply chain examples presented at GSA's 2018 Technology Summit.

Enter Blockchain

What if the slot machines and the software shipping boxes had IoT (internet of Things) sensors that provided real-time tracking of their geographic location to regulators? The slot machine sensors could potentially provide attitude information (upright versus angled), in addition to a map depicting travel route, precise time in any one location, etc. That information could be stored on a blockchain to which regulators have access. The data can then be transmitted and available to them in real-time and cannot be tampered with. The transparency provided by such a solution is significantly greater than some truck crossing the US with a seal.

Benefits

GSA believes that such a solution would benefit Manufacturers by reducing shipping costs. It would benefit Operators who would get product faster and at less cost. It would benefit Regulators by providing greater transparency and enable them to better ensure the integrity of both the slot machines and the software.

An additional benefit of this use case relates to how slot machines are tracked on casino floors. In many jurisdictions, before slot machines can be moved; either to another location on the same casino floor, to a warehouse for temporary storage, or for sale or final destruction, casino operators must inform and receive approval from regulators, in some cases several days or even weeks in advance. The idea of having an IoT sensor that can track and relay geographic position, potentially even power state (on and off and when the state changed), could help eliminate the need for some of these processes.

Use Case 1: Parallel Non-Gaming Industry Solution 1 – IBM Supply Chain Visibility

The Problem

The product purchasing and delivery process is complicated and froth with potential disruptions that, using existing technologies, is difficult for sellers and buyers to become aware of and react to. The shipping portion of a product order and delivery lifecycle is comprised of pick-up, loading, transit, delivery, unloading, and acceptance of the goods being shipped. At any point in that process, unforeseen delays can occur which disrupt the seamless flow of goods and potentially negatively impact the recipient.

Enter Blockchain

To address these issues, IBM has developed a Supply Chain Visibility system that uses the power of block-chain to collect and share real-time information, smart contracts to execute tasks based on the real-time data and cognitive block-chain to empower data analytics. At key points in the shipping lifecycle, information about a shipment is entered into the system by the entity currently in charge of, or able to act upon, the shipment.

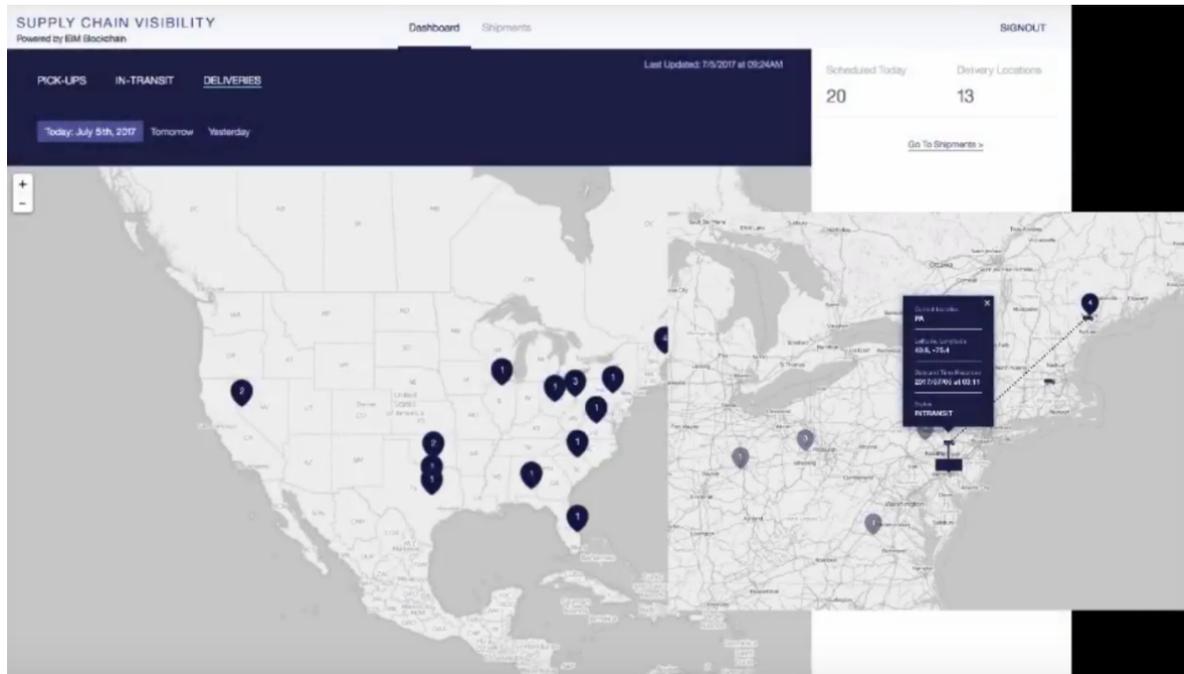


Benefits

This data is immediately available to all other parties as well as smart contracts which may act on it based on the situation. Authorized users can drill down into the details of the shipment, pulling up information on a specific shipment, the purchase orders that are part of that shipment and the specific items and quantities that are part of those purchase orders. This gives the receiving business full transparency and the ability to react immediately based on the real-time information.

Users can also visually see the status of the shipment using real-time GPS location tracking data that is stored on the block-chain. Users can view all shipments currently in

route and can then drill down into a specific delivery. In the illustration below information is displayed by truck, to determine exactly when it left a factory or warehouse, where it currently is and expected arrival times.



GSA believes that the IBM Supply Chain Visibility system can be potentially used in the gaming industry to modernize the product notification and shipment process. The real-time, fully transparent and secure data can improve overall efficiency and reduce the costs incurred by suppliers and operators today.

Use Case 1: Parallel non-gaming industry solution 2 – Oracle Cargo Smart

The Problem

Maritime shipping is a complicated business involving logistics at multiple levels across continents. The process requires tracking of cargo from a factory being transported by trucks to a port where the cargo is loaded into a container which is then loaded onto a ship. That container and ship needs to be tracked to the destination port, where the container is offloaded, the cargo placed on another truck, and then finally delivered to its destination. Ensuring that the cargo has not been tampered with, understanding where geographically the cargo is, and when it was delivered requires a great deal of trust. This process lacks transparency, can be bogged down by delays, which results in disputes and higher costs.

Enter Blockchain

Oracle's Cargo Smart solution leverages the functionality of Hyperledger and couples it with Oracle's vast array of capabilities – Oracle's Genes – which include performance at scale, operational resilience, security and confidentiality, supportability and operations, and enterprise integration. This combination of capabilities, based on the Hyperledger blockchain platform, was used to create a solution that:

- Brings visibility to cargo tracking which engenders trust;
- Provides real-time information to all required parties – one data set available to all;
- Increases shipping information and manifest accuracy;
- Reduces cargo inspections, turn-around times and delays;
- Reduces the potential for disputes.

Benefits

The Cargo Smart solution is based on each participating party being a node on the blockchain. Data entered by each party is immediately available to the other parties. As the cargo moves from factory to destination, information about it is entered by the party that is handling the cargo. That information is verified by the other parties (via node access) to ensure accuracy.

Thus consensus is achieved, and the tracking record becomes permanent. At any point in time along the cargo's journey, interested parties with node access to the Cargo Smart blockchain can see exactly where the cargo has been, where it is, and where it is due to be, thereby providing access to data for planning purposes and providing full transparency.

GSA believes that the Cargo Smart solution may have direct applicability to the gaming industry and bring much needed efficiency, transparency and cost reduction to the slot machine tracking and shipping processes.



Use Case 2: Financial Data Reporting

As with any business, casinos must pay Federal, State and Local taxes as applicable. The amount of tax owed is based on a calculation of Gross Gaming Revenue (GGR) which at its simplest level is Money In less Money Out. Each gaming jurisdiction has its own regulations on how GGR must be calculated and the amount of tax that each casino must remit.

The Problem

One of the responsibilities that falls to casino accounting department's is to accurately track and report on revenues. These departments follow Generally Accepted Accounting Principles (GAAP) and internally developed Standard Operating Processes (SOPs). Casinos also have Internal Audit groups that ensure compliance with GAAP and the SOPs, as well as providing a secondary as to the accuracy and validity of the accounting data reported. However, casino companies also employ outside auditors, such as firms as, Deloitte, E&Y, etc. to audit what the internal auditors have already audited. These external auditors provide an independent review and verification that all the financial data being reported was arrived at using the correct processes, in compliance with applicable laws and regulations, and is accurate.

Once the data has been compiled, verified, and submitted to the regulatory agencies, it is once again vetted. This time this is performed by the regulatory agency auditors who ensure that in fact what the accounting department created, what the internal auditors reviewed, and what the external auditors verified, was all accurate. All the auditing, and re-auditing seems to be a direct consequence of the trust but verify methodology because there is a lack of trust in the ability of each of these groups to faithfully follow the principles and process and to generate error free reporting. Another reason why all the re-auditing is in place, is perhaps attributable to the "unsecure" nature of the financial data being reported.

The financial reports generated by the casinos are based on data that is generated by each revenue center; Casino (slots and table games), Food & Beverage, Entertainment, etc. The revenue and expense numbers are consolidated first into unaudited numbers (Raw) and then finally, into audited numbers (Final) which may reflect adjustments made due to various operational actions. Reports are then sent to the regulators on a prescribed frequency and format.

Consider that the regulators are more focused on ensuring GAAP are being followed than the internal and potentially unique casino's SOPs. One could even surmise that regulators really want to ensure the accurate reporting of the Money In less Money Out, any allowed deductions which further reduce revenue and the calculated casino's tax obligation.

Enter Blockchain

Utilizing a blockchain-based process may not only result in significantly streamlining the above process, but also improve accuracy, transparency, and timing. One can envision a blockchain-based process where the raw data coming from the various source systems is time-stamped, hashed using a predefined algorithm and stored on a private permission chain on which the regulators have a node. Further what if all adjustments made were likewise captured, time-stamped and hashed as were the Final numbers once the accounting department was done.

The Benefits

The regulators would have immediate access to the revenue numbers and know that those numbers cannot be changed. If the regulators wished access to the underlying reports to see the detail, they could request that information from the casino. They could then verify that those reports had not been altered by hashing their values and comparing the result with the original Raw or Final numbers posted. Any deviation could then be investigated.

This process, especially with the use of smart contracts to notify regulators of specific actions, would provide much more transparency in a timelier manner. Ultimately it may allow the regulators more time to ensure financial reporting and tax remittance accuracy than the process being used today.

GSA believes that similar processes and potential solutions may have already been developed given the significant blockchain activity in the Financial Technology sector.

Use Case 2: Parallel non-gaming industry solution – Oracle blockchain enabled Document Exchange

In working to deliver a better shipping solution via the Smart Cargo system, Oracle identified that having a secure, transparent and trusted document sharing solution was going to be critical. In the shipping world, these documents are things such as the Booking Confirmation, Certificate of Origin, Bill of Lading, among others. In the analog world, these documents are created, shared, updated, shared again, and are used by multiple parties all of whom have a vested interest in the shipping of goods.

The Problem

These multiple touch points, and multiple document sharing needs, introduced the possibility of error, delays, and inaccurate information due, in some cases, to time spent. That is, the document was a snapshot in time which by the time the next party received it, was already out of date.

Enter Blockchain

The Document Exchange solution eliminated these issues. Documents created are immediately placed on the blockchain with a date and timestamp. All parties needing to view the documents have immediate access. Any modifications to the documents, such as approvals, or amendments, are made and likewise data and timestamped and shared with all the other parties. In this way, the information being viewed is the most current and there is an immutable record of every transaction from when the first version of a document was published to the current version.

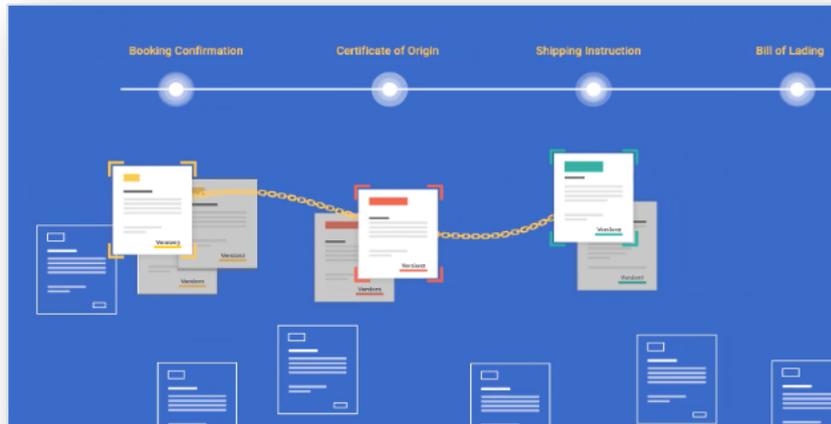
Use Case 2 describes a gaming industry process that is somewhat similar and could potentially benefit from the blockchain-based Document Sharing solution. Documents, which in this case may be system generated reports, are date and timestamped, hashed and put on the shared blockchain.

Tamper-proof Audit Trail



The Benefits

Regulators would have access to the raw data as generated by the various source systems, and to the subsequent adjustments, if any, resulting from the casino's Accounting Department's adjustments.



Traceable Documents

Likewise, those adjustments would be stored on the blockchain creating the same tamper-proof audit trail of source documents, adjustments and final version. Not only will such a solution increase transparency and trust, but it will also eliminate the time delays inherent to today's processes. The reports put on the blockchain would be immediately available to the Regulators, making questions they might ask potentially easier to answer since the data and the activity are still recent that and fresh.

This may even decrease the amount of effort needed to audit these reports and agree on their accuracy. Furthermore, the potential use for smart contract-based programming



**Context-based Documentation
Validation and Collaboration**

within this solution may also facilitate the identification of potential missing data, or data that may be inconsistent generating proactive alerts that can be acted upon in a much timelier manner.

Use Case 3: Slot Machine Software Validation

A core gaming regulator responsibility is to ensure that the games being provided to players are fair, accurate and meet the level of integrity that is specified within the regulations of each jurisdiction. Gaming regulators around the world have either set up their own or have certified third-party laboratories to test and certify the slot machine software against that criteria. Once tested and approved, a hash signature of the software is produced and printed on Approval Letters issued by the labs and the regulatory agencies. Using the same hashing algorithm and either a purpose-built device or a laptop computer, gaming agents can test, validate and verify that the software in a slot machine on a casino floor matches the approved version.

The Problem

The manual software validation process is time consuming, disrupts game play, and requires either a significant number of gaming agents or a lot of time to test each slot machine across multiple casinos. To minimize the number of times they must perform this manual software validation, some regulators rely on tamper-proof tape or “seals”. These seals are put on the Secure Digital cards, Hard Disc Drives, or Universal Serial Bus sticks that the software is executed from within the slot machine. While on the surface this sounds like a good solution, there are two problems with the use of tamper-proof tape. The first is that the only way to verify that the software has not been changed is to physically open each slot machine and inspect the tape – still regulatory agent and time intensive making it impractical. The second is that in some cases, the tamper-proof tape glue dries, the tape becomes brittle and falls off. The result is that today the only way for a regulator to know that the software in each slot machine is the genuine approved version, they must physically open and inspect each slot machine.

The Evolution of Solutions

GSA has sought to improve the overall validation process by taking over and updating the SAS protocol-based Game Authentication Terminal (GAT) protocol. This protocol is much more efficient in calculating the software hash values however, it still requires physically opening each slot machine and connecting a laptop.

GSA next sought to solve, and indeed has solved the problem of having to open every slot machine to validate the software. The solution was to incorporate its Game Authentication Terminal (GAT) software validation protocol into the network-ready Game to System (G2S) communication protocol. The result is that using G2S, a regulatory agent using a laptop from their office, can send a GAT request over a network to one or more slot machines and receive back the hash value of the software. While this sounds like the right solution, there are several obstacles preventing it from being widely used. The first is that there are still many casinos that do not have a high-speed broadband network on their casino floor. The second is that not every slot machine manufacturer has implemented the G2S protocol.

GSA, observing the connectivity and remote communication capabilities of Internet of Things (IoT) devices believe that a solution that marries IoT with blockchain may be best suited for the software validation task.

Enter Blockchain

Specifically, an IoT device could be placed within each slot machine connected to the slot machine's motherboard using an existing unused or shareable communications connection. The IoT device would, on a periodic bases, execute the GAT protocol (either the SAS-based or the G2S-based version). The IoT device then timestamps and hashes the value and using GPRS communication, puts it on the blockchain. The regulators, and operators, have a node on the blockchain and gain access to the hash values. An application can look at each value coming in, compare it to the approved hash value for that specific slot machine software, and in the case of a mismatch, generate an alert. Alternatively, the regulators can spot-audit the hashes manually.

The Benefits

GSA believes that this provides benefits to both operators and regulators. Operators no longer need worry that they may be fined because of tamper-proof tape issues and can be assured that the software they are running is the approved version. Regulators can better ensure the integrity of slot machine software and devote their limited human resources to other tasks that cannot easily be automated.

GSA believes that blockchain based solutions for similar use cases, i.e. the periodic validation of some discreet value, storing it for an immutable historical record, and using the value to determine validity, has probably already been developed. Perhaps such a solution has applicability to the gaming industry.

Use Case 3: Parallel non-gaming industry solution – Intel Trusted Supply Chain Process

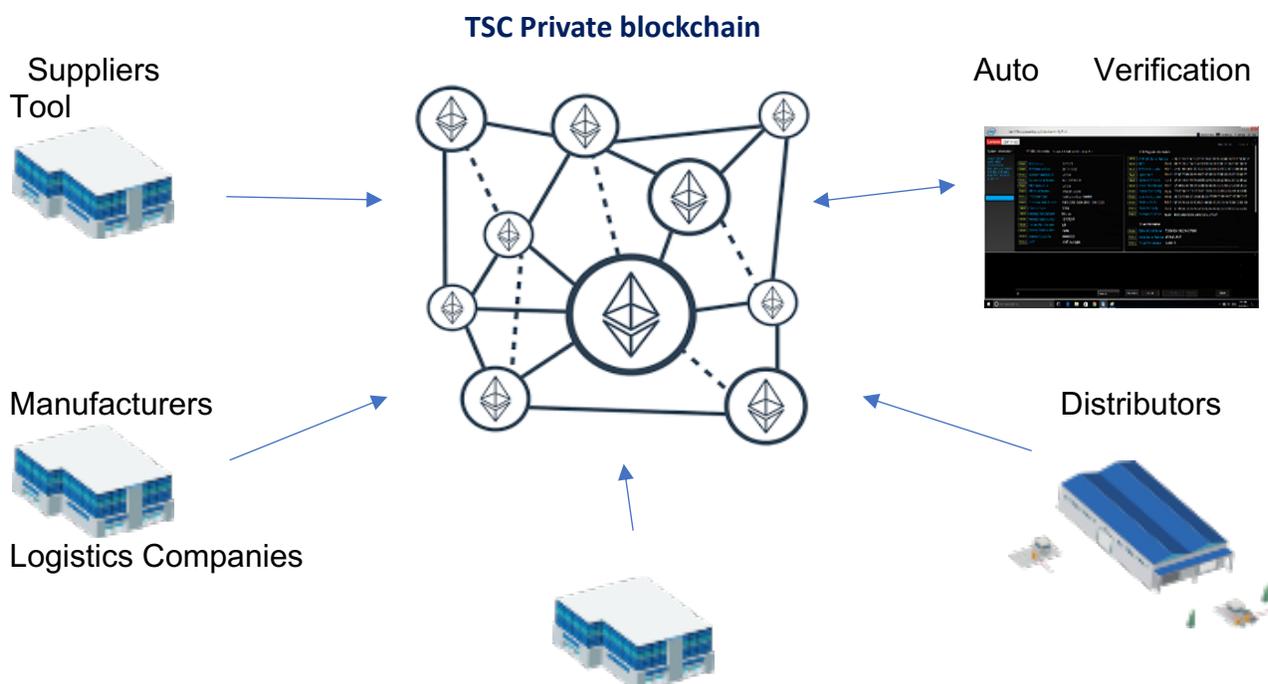
In October of 2018, Bloomberg Business Week reporting on what they called “The Big Hack”. It was a story detailing how China used an incredibly tiny computer chip to infiltrate large US companies such as Amazon and Apple, among others. This rogue chip was introduced into the supply chain being used to develop the computers that large companies use to run their business. The Pentagon also issued a warning that computer products sold by China’s Lenovo could also possibly be used for cyber-spying purposes.

The Problem

The discovery of this chip was evidence of just how vulnerable the computer industry supply chain was for the insertion of counterfeit or additional electronic parts. Intel worked on a solution to provide for a Trusted Supply Chain Process that built on top of existing Root of Trust processes. Intel further leveraged the immutability, real-time communication, and trust that comes with a blockchain-based solution.

Enter Blockchain

The blockchain-based Trusted Supply Chain Process is decentralized, meaning that data from the various supply chain steps is independently provided to and stored on the blockchain. This ensures comparability between the data provided in step 1 and the data provided in step 2, and so on. The final step in the process is the use of an automated verification tool to ensure that what was supposed to be built and the components that were to be used is exactly what was delivered with no deviation in the build of that product.



In the gaming industry version of a Trusted Supply Chain (TSC) for software, the software version and hash value could be placed on the TSC blockchain by the developer. When the software is tested and approved by a regulatory agency or independent third-party lab, the software version and approval information can be hashed and put on the TSC blockchain as well. The IoT device can then run the GAT protocol, calculate the hash and send the data to the same TSC blockchain. The Auto Verification Tool would then look up the data on the TSC blockchain pertaining to the software version and compare the initial hash value, with the tested / approved value and the currently calculated value to determine authentication.

The Benefits

This multi-step comparison and validation process delivers a high degree of trustworthiness given that data about the same piece of software from three separate entities, 1 – Manufacturer, 2 – Testing Laboratory and 3 – Slot Machine, are being compared to ensure sameness.

Use Case 4: Responsible Gaming

The Gaming Industry has, some may argue, done more to promote the responsible consumption of the service it provides, gaming entertainment, than other industries goods or services may be open to misuse by their consumer. The term Responsible Gaming encompasses all activities related to Knowing Your Customer (KYC) and Player Protection.

KYC processes are designed to ensure that the person engaging in gaming activity meets the regulatory criteria specified by each jurisdiction. The most basic of KYC verifications is the person's age.

In land-based venues, age verification is simple in that casino personnel, such as Surveillance, Security, Dealers, Cage personnel, etc. are tasked with evaluating a person's age and if in question, they can ask to see identification such as a driver's license. Much more data must be provided by a potential player if they wish to avail themselves of other casino services such as a line of credit.

In on-line gaming, age verification is part of a more complicated player registration process. The amount of data that must be provided by potential players goes well beyond age or date of birth. The data that potential players must supply varies jurisdiction to jurisdiction but in general includes things such as date, city, state/province and country of birth, current address, valid identification number (this could be a national ID number – such as Social Security Number – bank ID, driver's license, Passport, etc.) and phone number. This data is being collected and stored by multiple Operators and numerous databases. Even in Europe, where the amount of data collected, used and stored, by both Operators and Regulators is governed by the General Data Protection Regulation (GDPR), this data is still required.

The Problem

The potential for data breaches leaking all this Personally Identifiable Information (PII) increases with the number of times it exists. As we've all heard in several news stories, regardless of encryption and security practices, hackers have been able to exploit faults and access this data.

Player Protection processes seek to minimize the potential harmful effects of addictive gaming behavior to those at risk. This is done through a combination of play Limits, Exclusions and behavioral analysis that may lead to counseling and the creation of Limits and/or Exclusions.

Limits are player, operator or regulator (and in some jurisdictions family and friends) imposed restrictions such as:

- Play – including the amount of time a player can spend wagering or even just logged on to an on-line casino site, the days of week, time period in a day, and the amount of money, that a player can wager;
- Loss Limit – the amount of money a player can lose within a time period;
- Deposit Limit – the amount money a player can deposit to their account;

Exclusion are also player, operator or regulator (and in some jurisdictions family and friends) imposed, but rather than being restrictions, exclusions prevent players from activities such as:

- Play – players cannot wager on all or some types of games. For example, a player may be excluded from place Sports Bets, but can still play casino games.
- Site Access – players cannot physically enter a casino (some jurisdictions treat a violation of this exclusion as a form of Trespassing punishable by applicable trespass laws) or cannot log onto an online casino site.
- Marketing – players cannot be sent any promotional content related to gaming and cannot redeem any promotional content.

Both Limits and Exclusions can be time-bound, and those time periods can be as short as one hour and as long as the player's lifetime.

Behavioral analysis uses player historical play patterns to identify deviations. Those deviations, if for example they are in wagering frequency, wagered amounts, or excessive losses, may point to a player that is in trouble. The use of Artificial Intelligence and accompanying algorithms play a significant role in the analysis of this data and the identification of 'red flag' players. In some jurisdictions, players identified as 'red flag' candidates may be called by a counselor or be sent Responsible Gaming materials. Depending on the severity, the player may have Limits or Exclusions imposed.

Enter Blockchain

GSA believes that block-chain based KYC systems provide the Operators and Regulators the information they need to verify a potential player while respecting that player as being the owner of his or her PII and significantly reducing potential data breaches and subsequent stolen identify issues.

GSA believes that the use of block-chain based solutions can provide a significant benefit to Player Protection exercises. These solutions are envisioned to work with the KYC blockchain providing access to just the hashed values needed to take appropriate action.

With regards to Limits and Exclusions, the information related to that action along with a date and time stamp, can be stored on a block-chain and shared with multiple Regulators and Operators with nodes on the chain. This is especially beneficial for on-line gaming where players can access sites operated from different countries and overseen by different regulatory bodies.

With regards to Behavioral Analysis, players are not identified other than by using the hash value of their KYC block-chain persona. Only when a player is identified as a 'red flag' will the required PII be provided to the appropriate entity to assist the player.

GSA believes that block-chain based systems will reduce Operators' risk of regulatory fines, Player's risk of stolen identities and improving the level of service and protection that Regulators and Operators both want to provide.

Potential solutions – Dominode, Qgen Group

Know Your Customer

There are several companies innovating in the area of block-chain based digital identity management. Dominode based out of the US and Qgen Group based out of Malta, are two such companies.

Both have adopted the philosophy that the consumer, a natural person, should own their data and manage it. They accomplish this via a mobile device application that allows the consumer to create an account and to provide the information required for them to be verified.



This data is entered into the mobile application and remains resident on their own device.

A copy of the data is used for verification purposes and is verified either through trusted third parties, in Dominode's case by Lexis Nexis, and in QGen's case using their own time-proven in-house systems. Once verified, a hash value is created over segments of that data, for example age, address, name, or full (age, address, name, etc.). That hash value is stored on a block-chain.

The hash value corresponding to the data segment that a requestor is seeking to verify, is made available to requestors who are participating in the system.

In the gaming industry, the Requestors would be Operators, Payment Processors, Regulators, etc. who would subscribe to Dominode's or QGen's service (Service Provider).

Benefits

If an Operator wanted to verify a potential player's age, the potential player, who is also one of the Service Provider's customers, would provide the Hash value for the verified age data segment. This is much less data intrusive than providing a Driver's License which has much more data than just Date of Birth. The Operator then sends the Hash value to the Service Provider and is told whether the Hash is valid or not.

If a Regulator wanted to know a Player's current address, the player, who is also one of the Service Provider's customers, would provide the Hash value for address verification. This is much less data intrusive than providing other forms of address verification documents. The Regulator then sends the Hash value to the Service Provider and is told whether the Hash is valid or not.

Service Provider's have mechanisms in place to ensure that the data provided by their customers is current and still accurate.

The Gaming Standards Association (GSA) will continue to hold Technical Summits on key technologies that appear to have applications of benefit to the gaming industry. Visit gamingstandards.com for information on our educational events.