TECHPAY

WHITEPAPER

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1.0 TECHPAY

Blockchain technology has made it possible to maintain consensus across all nodes with no central authority. However, fundamental issues like a lack of real-time transaction settlement and scalability remain daunting obstacles for blockchain implementation in everyday life despite improved algorithms that reduce transactional delay when updating records on ledgers. Public blockchains are slow, but there's hope for the future of blockchain technology. It could be used more widely in everyday life through smart contract platforms that offer faster confirmation times than current public Distributed Ledgers do.

The major obstacle standing between us and wide spread use? The lack-lustre speed at which these new ledgers operate; while they're great when you need something trustworthy assuredly verified.

In light of the recent issues with scalability, a new model, TechPay, was developed based on Direct Acyclic Graphs (DAG). This platform seeks to solve persistent problems in existing public distributed ledger technologies and distinguish itself from traditional block-based storage infrastructure by employing an improved version of DAG protocols. The TechPay platform has adopted a new protocol to maintain consensus. The Sirius Protocol will be integrated into the framework of TechPay Chain and is intended for use by all applications built on top of it, including instant transactions with near-zero transaction costs for everyone involved in each exchange or trade. The mission of TechPay is to provide compatibility between all transaction bodies around the world, and create a network that allows real-time transactions.

2.0 WHY ARE WE MAKING TECHPAY?

In the future, transactions will be seamless and fast. Imagine a world where you can make purchases from your computer at home or work without having to wait for them in line at checkout - that's what TechPay is trying to create! TechPay has developed DAG technology,so these days' monetary bodies are compatible worldwide with one another through its use and creatingnew infrastructures with high reliability.

TechPay is a new cryptocurrency that aims to be used on an industrial level. The intention of this venture was for it to operate in various industries like telecommunications, finance and logistics, among others, with plans of creating their own Smart Contract based ecosystem, which would then provide access from all partner companies around the world as well. The next generation of distributed ledger technologies is about to be led by the TechPay Foundation. They aim for high accuracy and reliability in their transactions, which will make them a key player at the forefront global finance scene.

The Decentraland platform is designed for creativity and collaboration. It is hosted on the blockchain as an open-source space where users can create decentralized applications (DApps).

2.1 ISSUES WITH BLOCKCHAIN

The world's financial system requires an upgrade. Blockchain is the answer to all your money woes and will do wonders when it comesonline this year.

The future just got brighter, which has been proven repeatedly as one promising solution among many others for fixing some serious problems with today's outdated economic model. TechPay believes that for blockchain technology to be truly widely applicable, it needs an implementation with these three characteristics: easily transferable, irreversible and fee-less. The current technologies have limitations due to slow confirmation times or potentially high transaction fees, which meansthey can't meet this criterion just yet.

Issues of scalability

All nodes verifyand store a single block in existingblockchains, leading to longer production times. Limitations in size prevent the chain from being expandedinfinitely. That leads to one bottleneck after another on performance. More transactions are processed by network bottlenecks that become worse with each passing second until you reach some sort of breakthrough such as TechPay's parallel approach.

Fees

The fees on the blockchain are a major component of what makes it so lucrative. Thereare transaction confirmation fees paid to block miners. The block reward itself incentivizes consensus participants and security against attacks such as DDOS or staking ones with their protection system in place [1]www.mdpi .com/2071-1050/9.

TechPay believes that these high fees for a scalable blockchain with thriving users will discourage innovation, so it is looking into lowering them or creatingother solutions as soon as possible.

History data

Blockchain is a highly-secure and innovative technology used in many industries. However, blockchain only stores information within blocks - it cannot obtain any data from outside sources for verification purposes. That means we must develop some other function or process by which historical transactions are also stored alongside those contained inside existing blockchains if they're going to have real-world application."

TechPay believes this additional layer could includefunctions such as maintaining accounting records accessible at all times withoutresorting back to old versions.

2.2 SOLUTION OFFERED BY TECHPAY

The TechPay Foundation, an organization dedicated to building the world's first blockchain solution on a new implementation of Direct Acyclic Graphs (DAG), has released its latest whitepaper. This project aims to create infinite scalability and process hundreds of thousands of transactions per second with large numbers participating in its network—all without compromising any aspect or feature currently available within current blockchains today. The TechPay Chain is an evolution of blockchain technology. Each validating node in the network has access to transaction history and can independently verify if a new transaction is included. That will allow for high scalability with low fees at nearly zero cost.

The Sirius Protocol adds another layer: transactions are verified without miner approval asynchronously through event blocks that reference previous ones creating what we call "smart chains". Thus, the increased transactional load will not lead to delayed approval or bottleneck effects. It intends to also manage historical information independently without being assisted by external databases. Such as Oracle Database and event blocks that store transactions arising within this system include multiple data packages; one may contain Smart Contracts while others consist entirely of reputation management rewards-based activities.

The TechPay Chain is a blockchain that has been specifically designed to improve the processing infrastructure in our society. With fast and safe methods based on DAG independent management of historical information through Story Data stored on an individual node's computer memory and Smart Contracts enabled for various industries across many different sectors; The Sirius protocol will become more expansive than ever before.

3.0 TECHNICAL OVERVIEW

3.1 Introduction

With its advanced technology, TechPay's platform (TechPay coin) can solve the scalability issues that blockchain currently faces. The new type of distributed Infrastructure called TechPay will process data in real-time by sending and receiving transactions while also allowing STORIES on the chain at an efficient rate with no delays or spamming. The revolutionizing aspect of this innovation. Story roots are the only way to go back and find out what happened in a transaction. By storing information about how stories evolved, we can see that they have various properties, not just as regular transactions do but also with the inheritance of those same item types on top of their uniqueones.

TechPay Chain is a high level Scala-based functional programming language that compiles smart contract bytecode on the TechPay Network. The three layers of this network consist of 1)The Core Layer, which processes transactions at scale; 2)TechPay ware layer supporting Smart Contracts and other functionality such as nodes storage etc.; 3). And lastly comes up with its application interface for third-party developers to create their applications using those available features.

The core layer is responsible for operating reliable transactions in the TechPay ecosystem and being a technological backbone of information exchange. This small yet important part plays an integral role by processing up to 300,000 TPS (Transactions Per Second).

3.2 TECHPAY CHAIN

3.2.1 The Techpay Consensus Algorithm

In addition to using a new consensus algorithm based on DAG-based distributed ledger technology, the TechPay Chain will implement the Consensus Algorithm (CA) to improve performance and security. This CA-based technology seeks to be a Byzantine Fault Tolerant (BFT) technology, which ensures the same level of consensus as existing blockchains. TechPay Chain is a next-generation public blockchain that uses the power of cryptography to enhance security and scale transaction processing up to 300,000TPS. Unlike other networks which delegate this task solely between nodes or users on their computers (and in some cases both), TechPay employs functional programming languages for smart contracts with full supportfrom node communications.

The TechPay DAG is a powerful and creative way to store information that cannot change. This protocol creates links between event blocks, which form an interconnected system storing arbitrary data in smart contracts or stories with past events' values at their core. An event in the TechPay DAG is connected with central authority manipulating how events and blocks are structured. Events from previous rounds achieve more verifications as future ones come up.

The LCA aims to be fully asynchronous and, when two identical transactions are requested (i.e., the double-spending issue), only one is validated at a time. The order between these tasks rests on top of an algorithm known as "The Main Chain" list, which helps arrange for more precision invalidation by using help from other nodes across the network.

3.2.1.2 Components Event Blocks

Stored Data:

Multiple data packages might contain within an Event Block. As stated above, there are different kinds of data packages, depending on their functions, such as transactions, smart contracts, history information, reputation management, compensation, etc.

Signature:

Each Event Block is signed by its creator, and the user's account or address accompanies this signature.

More Than hashvalues of the previous eventblock:

To facilitate linking between Event Blocks, this is included. The new Event Block verifies only its parent, an extremely lightweight block. As with other Blockchain technologies like Bitcoin and Ethereum, where a single transaction can be verified by many computer nodes as well as miners working together in groups known as "transaction clusters," each event has the potential for verification all around it. A new event block will be created, connected to its parent through the hash and all hashes derived from it. Resultantly, no data or blocks within that tree structure (i.e., Event ID) can change without affecting every other node below them in some way. Whether by modification date/time stamping, etc. Everything has been linked together with one sole purpose forever.

Flag Table

The Flag Table is a data structure that could save the connection of specific event blocks (Clotho). The information included in this table includes:

- **Clotho Index:** Provides index information about each Clotho.
- **Connectivity:** Indicates how Clotho is connected with other Clotho applications.

Clotho

A Clotho is an event block that can see the supra-majority of blocks created in its path. The first candidate to be appointed as a Clotho and responsible for appointment decisions on Atropos or consensus amongst other events will become knowns by everyone else through this intuitive design.

Atropos

Atropos is the first of three chains in Demeter. It's a special event block, and when it finishes validation on your clothes based on what Clotho tells you about that particular stage, then Atropos will be finished with its job.

Main Chain

The Main Chain contains Atropos and related event blocks. The main purpose of this chain is to be used for validation, maintenance, and updating the entire network structure.

The TechPay technology is a new system for securely storing data. This innovative solution can be used on top of Bitcoin or Ethereum, as long as you have some cryptocurrency to invest in!

The functionality includes payment processing and smart contracts, among other things; it also will give us all access to what's happening within your company. With the addition of a new stateful block to the creative flow. The event is created by connecting it with its parent and intended for high speed through Sirius protocol.

All of the blocks in this protocol are connected. There is a chain that could be connected through some set pieces, and it's called "The Main Chain."

3.2.1.3 HOW IT WORKS

The Main Chain is the backbone of any blockchain system. It allows events to be validated and confirmed over time while also protecting against double-spending or malicious attacks by generating incorrect blocks to maintain its validity. The Mainchain influences the ordering between event blocks that occur asynchronously. The Main Chain helps earlier-occurring events have more priority in sequence, and at its core are Atropos and Chronos for this service."

The TechPay is a system of interconnected blocks where each block has an associated Clotho. The connection between two Clotho can be broken down into three categories: supramajority (more than half but less than two thirds), shared majority and minority connections with other sets on their respective tables. When designing a pBFT, the information provided by Flag Table is used to determine which Atropos will be designated. This design process of selecting an Atropyon through consensus reached among event blocks within Clotho set-up and execution speeds are considered when deciding what should happen next.

The Atropos Event Block is a key component of the Clotho series, and it generates information for connecting existing Main Chain event blocks. This small but important block sits at an important location in any path to completion with one function: checking round validity by verifying parent nodes' information before moving forward onto new blocks or confirming connections between them. The algorithm designates Atropos and Clotho can be found in the event block itself. As well as all of its ancestors. TechPay Chain would complete our Main Chain synchronously when a new block is generated but asynchronous on descendant blocks. Because they cannot be linked together like parents would have been able to do without limitations imposed by this programing model's system architecture. Which prevents mutation or deletion from occurring within chains at any point during the transaction.

$$Clotho(i) = \sum_{j=0}^{n-1} \frac{(N-1)}{d_G(i,j)} \quad , i \neq j$$

Once the Atropos is determined and the Main Chain created, all events can be agreed upon through consensus. Each event block's creation will also become known with this system in place because it relies on timing management to come together correctly. Each event block is assigned an Atropos timestamp to be properly tracked. The time between events doesn't matter as long as they all have the same consensus, which will use whichever event has the latest metropolis height - and no one else.

3.2.1.4 PROCEDURE

```
Consensus Algorithm
loop
parallel procedure 1
          create a new block on each Node
parallel procedure 2
          Find_Atropos(all_block, atropos, clotho)
          Main_Chain(MC, atropos, clotho)
end loop
```

The TechPay Algorithm is a blockchain technology created to be very clear and simple. Each node in this Ethereum-based system can freely create new events simultaneously, as opposed to other blockchains like Bitcoin, where every user participates in consensus. Such a simple messaging protocol is enough to implement BFFs. When each node sends and receives messages, it always keeps the order of event blocks by connecting new ones after previous events have happened or been verified. As complete at that particular spot in time-- no matter where on earth they are going up against one another

```
procedure Find_Atropos (all_block, atropos, clotho)
          atropos[]
          heap clotho
          heap lookup
          for each clotho c
                    traverse flagtable c
                    if find atropos_path then
                              atropos[c]++
end procedure
```

"The algorithm to find the Atropos event block is simple and quick. First, use Clotho of a specific time for you to identify what type of events are going on at that given moment."

```
procedure Main_Chain (MC, atropos, clotho)
        heap MC
        heap clotho
        heap MC.last_block
        traverse lookup
        // optimistic MC_path between former and atropos
                if find MC_path then
                        MC append set of list
end procedure
```

The TechPay Algorithm is an improved method for creating a secure Main Chain to validate the block. Finding Atropos and Clotho are important components in improving speed, though finding them both can be difficult at times. The completed TechPay chain will be more reliable than ever by ensuring blocks stay within their allotted time frames, thus preventing fork-attacks from happening on either side.

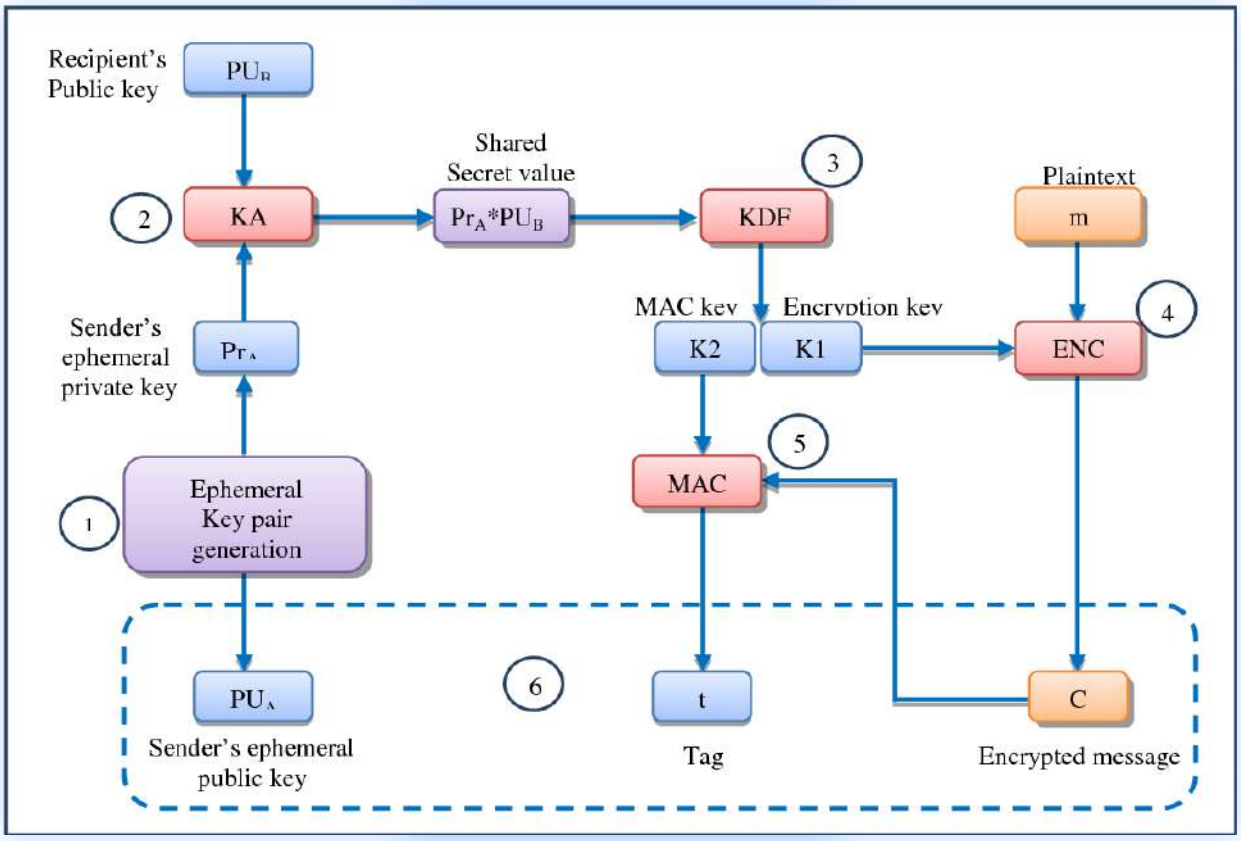
3.2.1.5 ELLIPTIC CURVE ENCRYPTION TECHNOLOG

One of the intended features of TechPay's technology is safety. The company's ECC cryptosystem will be used to ensure data security when transmitting between signatures and nodes with a short key size that also allows high-speed computations for signing." The Application of ECC's most efficient algorithms to cryptography

Output:

Using elliptic curve encryption, you can make your data secure in just minutes. With RSA 1024-bit keys and a 160-bit key length for exchanging information securely with equal levels of protection and being easier on hardware or software implementation than other systems like it, there are many benefits available when choosing the right Cryptography option.

TechPay's new algorithm will make it possible to use hardware and software wallets, enhance security features for current users of ECC codes, and provide more options in choosing what type of code they want.



3.2.1.6 RESPONSE TO ATTACKS

The TechPay Protocol will likely be subject to attacks by malicious groups who aim to gain financial profit or damage the system. Here we explain a few possible attack scenarios and how they intend on preparing for them.

SYBIL ATTACK

PARASITE CHAIN ATTACK

TRANSACTION FLOODING

SYBIL ATTACK

An attacker may try to take over the TechPay network by creating hundreds of nodes. However, as with Delegated Proof Of Stake (DPOS) and POS systems in general, there is no way for an outside force or group of hackers who operate maliciously within your computer system/server space to affect how many votes you have. This attack would not be possible because each node only has one vote, which must align correctly with every other member's delegation before validating transactions.

PARASITE CHAIN ATTACK

TechPay is a protocol that uses DAGs to create an immune system for cryptocurrency. Atropos and Clotho designed it, with the help of TechPay' sister goddesses' thread (or "cloth") in mythology - all three Goddesses work together as one unit on this task! The Main Chain's job when it comes to being created at 1st birthdays under MtGox trading platform GMB WhalePrice Auction lots is to verify each event block, so no double-spending takes place while they're doing their job ensure everything goes smoothly.

TRANSACTION FLOODING

The TechPay chain plans to impose a minimal transaction fee in order to prevent malicious users from performing attacks. Since there is also an expense, TechPay can no longer continue these actions and, as such, will create issues for technical teams working on it throughout onward. Decentralized autonomous organizations are built to empower the nodes that make them up. Those who contribute to this ecosystem are successful, like running transactions or acting as mentors but receive continual rewards. It would require a tremendous cost from an attacker trying anything malicious towards its networked structure, making such attacks increasingly difficult if not impossible over time.

3.2.2 FUNCTIONAL LANGUAGE

Scala is a programming language that has been gaining popularity in recent years. It combines the benefits of object-oriented and functional programming to create an ecosystem for writing effective, reusable code with minimal boilerplate. The classless nature makes it easy to write scalable applications without sacrificing readability or maintainability.

You know that feeling when you're reading code, and it just feels like there's much stuff happening? That is not a painful or bad experience, but rather the opposite. Reading clean lines in any programming language helps us programmers focus on what our job entails - developing quality software for people who will use them! So instead of having Java which can get verbose at times with its semi-colons. Fusing object-oriented and functional coding paradigms to be more concise, the best thing about Scala is that it provides you with two methods of strength. Developers can use each paradigm appropriately depending on what they are trying to do without losing efficiency or readability in their code because of its comprehensive documentation, which will make them feel right at home from day one.

Testing and development are convenient, with Scala doing the same work as Java using smaller coding lines. While Java also has several methods for reducing code length such deviations from standard style make it harder on developers' eyes than necessary. While still leading to reduced productivity partly because tests don't run nearly as quickly or produce useful output when completed, which leaves a lot of room leftover after conversion time is done running out but not anymore. Testing and development are a breeze with Scala. It can do the same work as Java using smaller coding lines while also having several methods for reducing code length that doesn't deviate from standard style. Leading to reduced productivity when compared against other languages such as C# or Python, where less is more.

Scala is not just a programming language. It's an ecosystem with rich libraries and frameworks, including the popular Play web app framework that has been used to successfully build on numerous IT platforms such as Amazon Web Services (AWS). The strengths of Scala have already proven themselves through practical Applications in the industry. It was developed by mathematicians after all! Haskell may be excellent when you need real mathematical power. However, users lack compared to what can be achieved using only functional features like those found exclusively within this programming system.

Scala is an easy-to-learn, popular language with a large community of users. Development is facilitated since it also supports object-oriented programming and has all the strengths of being well designed. Programming Language By removing "Side Effects," many coding errors and any changeable aspects can be identified beforehand, allowing easy transferability to distributed environments.

Scala is a programming language that can help you write more efficiently and with fewer errors. It has stringent coding techniques for compilation, which helps ensure your programs have high quality. Formal verification in mathematics provides the accuracy of computer code by proving its bug-free nature through rigorous mathematical reasoning to achieve this goal. Formal verification is an excellent way to make your Smart Contract code more secure. For example, it can be used on the Ethereum blockchain and stop any malicious activity in its tracks!

As you see above, this Scala expression could never cause errors because no uninitialized variables or values are being used, which would give room for hackers to get their hands into.

3.2.3 TECHPAY VIRTUAL MACHINE

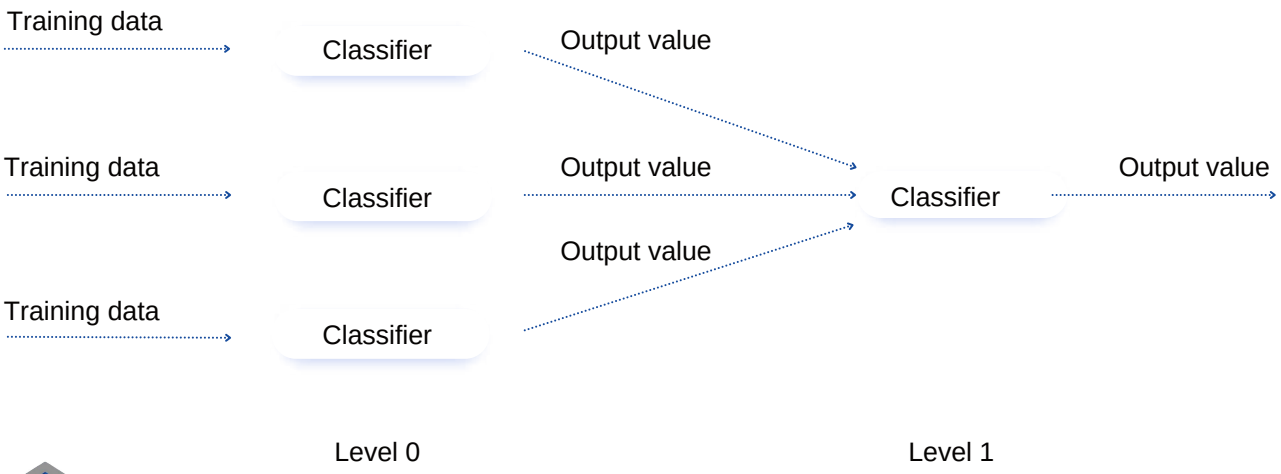
3.2.3.1 Register Based VM

Virtual machines (VMs) used by existing cryptocurrency platforms are mostly stack-based, such as the Ethereum Virtual Machine (EVM) of Ethereum. Stack-based VMs can easily execute instructions using the stack data structure, making it faster and more efficient than a register-based machine because they don't have all this extra memory that would take up space on your computer's RAM. As a solution to machine Storage in DAG, event blocks are expensive. The TechPay Virtual Machine (TVM) intends to extensively reduce capacity and increase processing speed by providing register-based virtual machines that can save up 50% on OPCODE execution costs per publication. With this reduction, it improves performance and increases its power, reducing code size while increasing processor capabilities for faster graphics.

3.2.3.2 Stack-based model

The Stack is a basic data structure. A stack-based virtual machine uses the stack to perform operations quickly and efficiently, so much that it can even run on limited memory like those found in smartphones or tablets! To do this, we need only four command lines: two for pushing values onto our stacks (POP) as well as removing them by popping off an entire topmost level of stacking orders. The stack-based model of computer memory is by far the most popular. The advantage to this type of machine is that you don't need to send any information about your operands; they are implicitly processed as soon as they enter into a function, at which point we can calculate what's still leftover on top! In simpler terms: calling POP provides us with another piece while calculating and pushing gives back performance results like floating Point calculations do in some cases, For example:

- **LOAD A:** Store Local Variable A to Stack
- **LOAD B:** Store Local Variable B to Stack
- **ADD:** Add the two values
- **STORE C:** Store operation result to Local Variable C



3.2.3.3 Register-based model

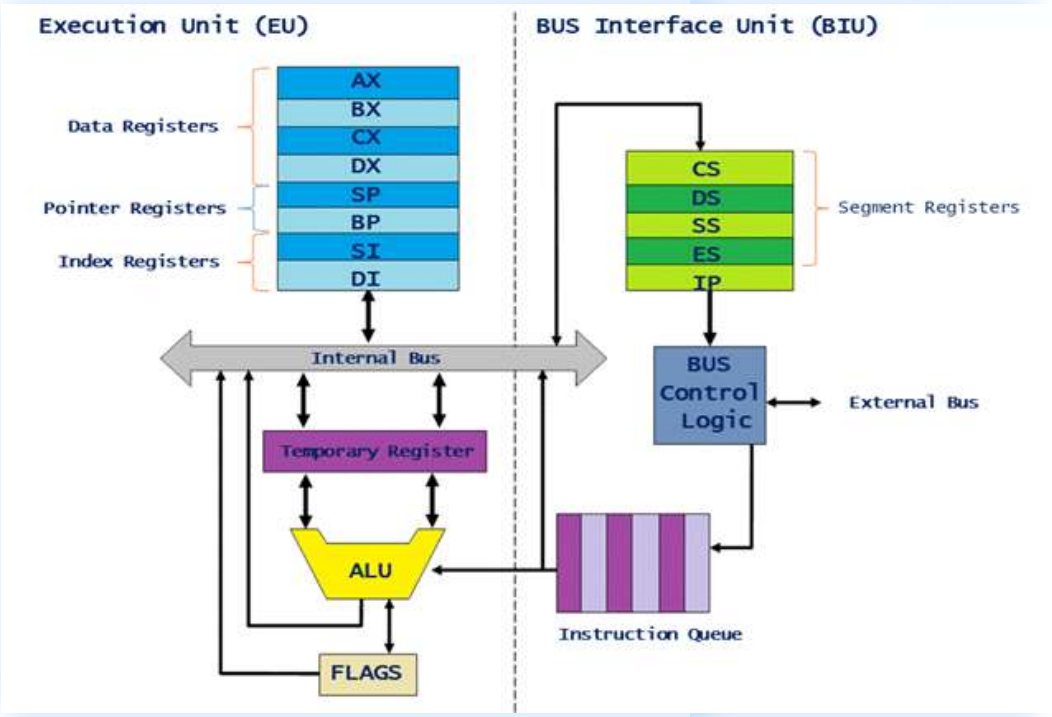
In addition to the traditional stack-based machine, register-based virtual machines are also used. There is no PUSH or POP instruction, but instead, the command must include operand for a specific ADD operation as follows:

You can see that this code is shorter than before because it does not have any long chains of instructions that need memory access from above like when using stacks do.

ADD AX, BX, CX; Adds AX with BX and stores to CX.

Unlike a stack, the addresses of operands such as AX, BX and CX must be explicitly stated when using register-based virtual machines. In addition to no overhead from pushes or pops in this type of machine code (which are necessary for stacks), it is also faster because there's just one line instead of many lines like with other types.

Register-based models enable performance optimization, which is impossible in a stackbased approach. For example, suppose you perform the same calculation twice with a register model code. In that case, it can optimize out and store just one value to reuse later, making for faster execution speed overall. Register-based VM models are more complex than stack-based ones because they require a location for the operand in OPCODE. The size difference between these two virtual machines allows you to reduce your codebase, thus making it much easier when trying out different ideas or features without having any bugs slip through onto production servers.



3.2.3.4 Secure, Powerful VM with Turing-completeness

Turing Completeness is the key to success for any DApp. Providing it inevitably leads us into decision impossibility. So Ethereum introduced gas to avoid this problem and unlock the potential of smart contracts. That can be Turing complete with no limitations or restrictions on their ability to process transactions like Bitcoin does now because they have faster speeds when processing them through its blockchain network.

The Ethereum Virtual Machine (EVM) can execute contracts, but it currently relies on hard-coded gas prices into the code. That is a major issue because changing these flexibly requires an irreversible fork in the blockchain and doesn't allow for inexpensive programs like simple scripts. Which may or may not carry out operations without fail depending on whether they have been paid to do so - this means even though you're executing your transaction successfully at home with no problems.

Failing to consider the flexibility of TechPay's design would risk disrupting its profitability. With a limited authority node and easy-to-use instruction sets that can execute on every machine, TVM offers endless possibilities for attacking nodes but isn't so impactful on execution costs or what could happen if an attack is made against one part in particular.

Mostly, people are under the impression that blockchain is only good for banking, but they don't know what else it can do. One of its most popular uses today would have to be in digital security and verification - which means you'll never need to worry about your data being hacked again!

The issues with verifying smart contracts on an EVM aren't just limited to this – many projects (such as Bitcoin) mitigate these limitations by removing Turing completeness or providing large numbers templates allowing formal validation. However, without outcome functionality makes DApp implementation is difficult.

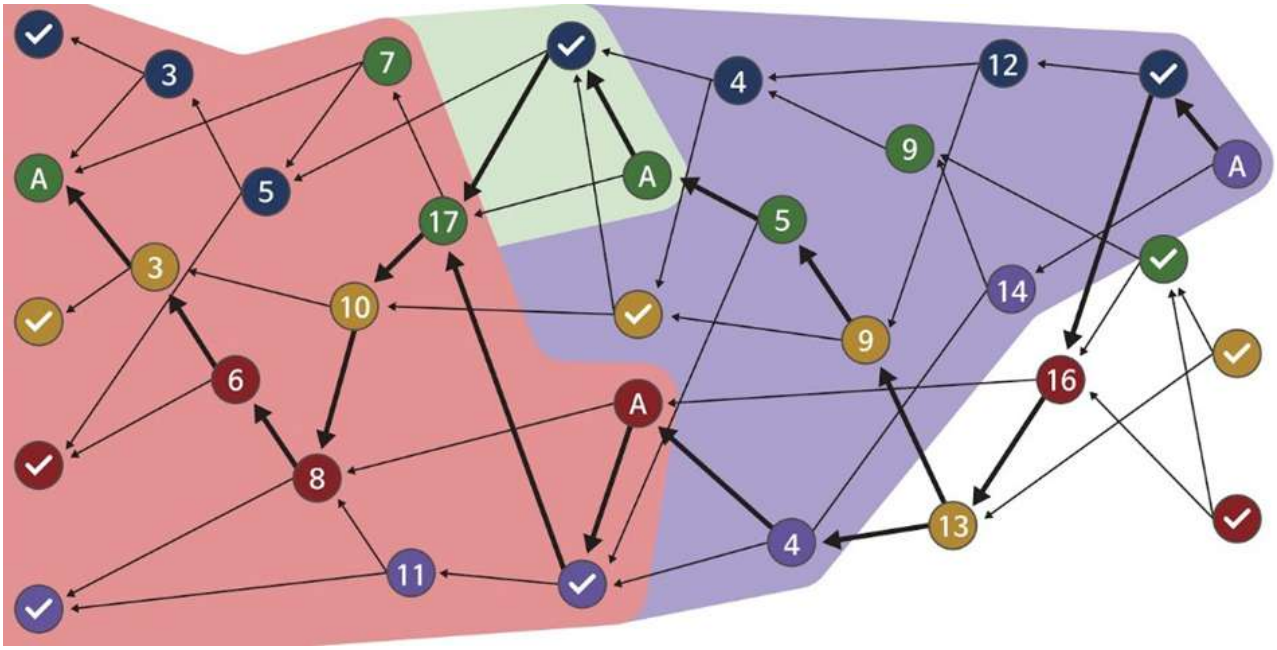
The TVM is a comprehensive solution looking to provide security and Turing completeness. With its core functions, such as external code linking and library, that allow developers complete freedom while they are developing their Applications on Ethereum, it's no wonder why this platform will be integral in establishing an ecosystem for DApps! The TechPay Virtual Machine can work either alone or together with other contracts functioning as components within the Smart Contract infrastructure of tomorrow.

3.2.4 STRUCTURE OF TECHPAY CHAIN

TechPay Chain is a new type of blockchain structure, including data like hash and signatures. One unique component of TechPay's design are stories--interactive pieces that can store information such as smart contracts or indexing services for smart contracts on other blockchains (such as Bitcoin).

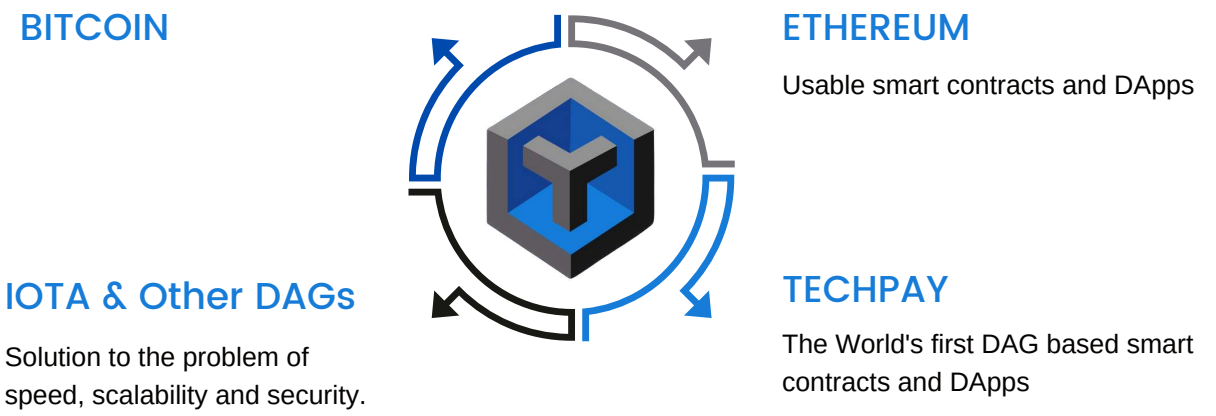
The previous block value is represented by a hash in the event block data structure of the TechPay chain. Transactions, or values filled with each one, constitute the list of blocks of transactions. Information about the Smart Contract created by the account is contained in the Smart Contract.

The Story is a data structure that keeps track of the distribution history for any object. The information stored in it changes constantly, and so does its value, which we call "Story." The Story has been expanded to include inheritance properties, too; this means there can be duplicate storage because our algorithm prevents such activities from happening by itself. It is under your control over what goes into each event block with your keys.



You might have heard the term "TechPay chain" before. It's an innovative revolutionary way to keep your cryptocurrency safe by utilizing encryption and smart contracts for maximum security in conjunction with a three-tiered architecture. That includes externally owned accounts (controlled by private keys) and contract codes that hold control code/story information on them - all while securing themselves against theft through this extra layer.

You can divide accounts into two categories: externally owned and contract. Externallyowned accounts possess a public address controlled by their private key that can make approved transactions for transaction-level tokens to other addresses. In contrast, Contract Account is executed according to the preprogrammed order if needed with another contracted account called via an external party but cannot call any other without being first called themselves. A Smart Contract is a preprogrammed set of conditions that must be met for the smart contract to execute. Once these requirements have been satisfied automatic execution will occur and create transactions on behalf of users who are also manually approved by Operators. According to their criteria and store certain data related both with Story creation (elements like a timestamp) necessary for storage purposes within its own story space.

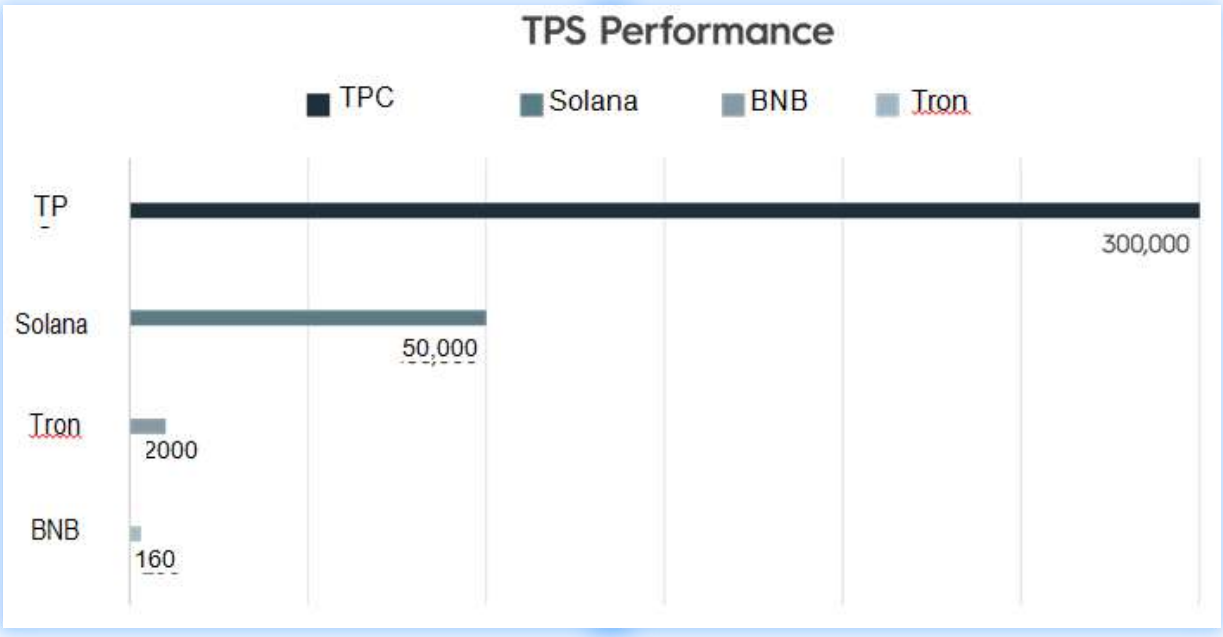


A distributed application is an app that operates across the nodes of the TechPay Chain. Using resources from TechPay Network, a Dapp can provide reliability and safety in its operation thanks to security features like encryption via Transaction Verification Code (TVC). It also provides functions for running contract code stored on top-rated browsers such as Firefox or Chrome with ease while adhering strictly within W3C standards, so you don't have any compatibility problems due to going off script! By supporting free web ecosystem development through transparency provided by blockchain technology along with this hyperconnected environment, we'll be able to create new infrastructures together.

Also, AI can trigger efficient changes in business processes by working as a broker or central control authority. It will provide services beyond national borders to help you grow your company's revenue streams. The TechPay Chain is designed to solve the problem of scalability. The chain stores data if a new block is created and when an account's status changes, all within this tamper-proof structure that uses Merkle trees for efficiency in space conservation and rapid transaction processing speed because every part has been optimized down to 'atoms '. In TechPay NETWORK, TechPay provides environments that can be used by Smart Contracts while conducting transactions on Stories information - saving headnotes into their respective root Story each time blocks are generated.

3.2.5 PERFORMANCE OF TECHPAY CHAIN

The Operational Research for Optimization algorithm in TechPay Chain is designed to solve the issue of scalability by increasing block speed. While third-generation blockchain technology might improve performance compared to previous implementations, creating blocks can still be very slow. TechPay Chain is a third-generation blockchain technology that we can utilize on a large scale across many domains and industries. With high reliability, scalability, and speed in transactions up to 300 thousand per second. TechPay creates an environment for data security with STORAGE STREAMS where certified partners such as TechPay work together under one umbrella, providing services tailored specifically towards operators like yourself, including Story or historical records depending upon your preference which ensures reliable performance.



The new TechPay Chain is the ultimate solution for those who want to process transactions quickly and securely. With this innovative blockchain technology, nodes will verify multiple verifications simultaneously while also checking out transaction validity in just seconds! As each node works together with other networks across all platforms, including TechPay-based ones like Bitcoin or Ethereum, they should provide excellent speeds during processing time. The TechPay Protocol has been designed to process and verify blocks asynchronously. This new algorithm will allow for more efficient use of network resources by allowing verification tasks to be executed on separate nodes across the globe without having them know about one another's work activities or results.

TechPay believes the faster propagation of blocks will allow each event block to be expanded to 100KB, enough to process each event block processed by the LCA. Taking the 260 Byte transaction size as an example, one event block can include 440 transactions. Each node can create seven to ten event blocks per second if it takes 0.1 seconds to create an event block. Suppose 100 nodes were participating and the number of transactions per second was infinite; each node would create seven to ten event blocks asynchronously and simultaneously. The TechPay protocol adds and verifies another Main Chain whenever 2/3 of all participating nodes reach an equal number of event blocks. The number of event blocks created and verified should approximate 700~1000 per second if 100 nodes are available.

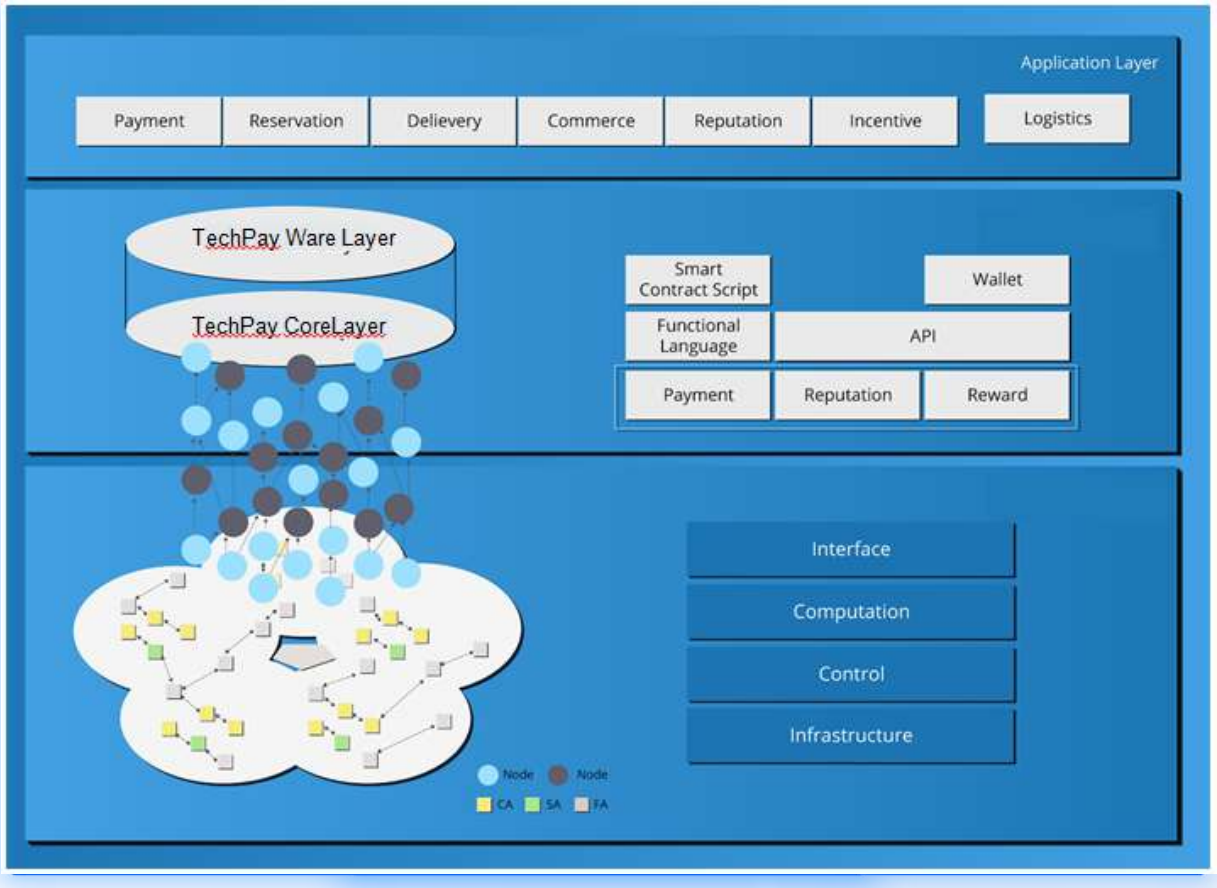
Over 300,000 TPS can be achieved when processing approximately 700 to 1000 event blocks. The latency of the network may decrease the TPS, however.

It is believed that O(N log(N)) is a much faster performance speed than the TechPay algorithm due to its time complexity. As shown below, the performance speed will be affected by both the time complexity O(N2) and the time complexity O(N log(N)) (where n refers to the number of nodes).

n square = n * n
n Log N = n * log(n)
n*n vs n * log(n)
n vs log(n)

If n=10, nlog(n) ~ 2.3
If n=100, nlog(n) ~ 4.6
If n=1,000, nlog(n) ~ 6.9
If n=10,000, nlog(n) ~ 9.21
If n=100,000, nlog(n) ~ 11.6
If n=1,000,000, nlog(n) ~ 13.8

4.0 MULTIPLE LAYERS OF TECHPAY



Using TechPay, TechPay offers a dual-layer chain, the TechPay Ware Layer, which supports various application types. The TechPay Core Layer processes payment, Payment, Reservation, Delivery, Commerce, and Reputation. The TechPay core layer is also where the core chain technologies for the TechPay ecosystem are deployed, ensuring reliable transaction and information exchange.

4.1 TECHPAY CORE LAYER

4.1.1 Infrastructure

TechPay's blockchain is the critical Infrastructure for this ecosystem. It should provide more functionality compared to other blockchains, using TechPay Chain. This distributed environment captures and settles data on blockchain transactions to help with everything we do every day, like paying bills or booking flights.

TechPay's Infrastructure layer maps and stores information on transactions, Smart Contracts, and a history of transactions (history) in various application areas, including Payments, Reservations, Deliveries, Commerce, and Reputation, as well as the output of the computation layer, which includes the values depicting the previous event blocks at the computation layer. TechPay uses an infrastructure layer in which data about transactions and Smart Contracts are stored in data blocks. These blocks represent a history of events that have been executed and reputation points that affect future interactions with other users of this system.

Eventual Values (EV) or outsized gains can be seen from renting out resources like parking spaces at your business if you're aware of what happens behind the scenes when potential customers interact online. The Main Chain of events is created and stored to form an index. Event blocks within each Application are also indexed by their relationship status, which includes being a direct or indirectly connected block from the main chain's event list in this novel architecture design flaw developed on top blockchain technology with ease-of-use products such as watches.

The infrastructure layer ensures a smooth and reliable data transfer between entities above it. It provides operational means to do the things that need doing, like transferring event blocks or verifying that physical equipment isn't falsified, so they can fix any errors accurately. The Video Transmission and Receiving System can check for errors by verifying data transfer speed and a few other things. It also provides flow control to prevent frame loss while transmitting video frames across the internet or between two locations with poor connection speeds (using TCP). Additionally, it handles collisions that may occur during transmission, allowing you not only to see what was sent but how your message looked on their screen.

TechPay should guarantee conversion to a commission-free network while maintaining the strengths of its photon chain system, such as high uptime and quick response times.

4.1.2 Control

The control layer is where the magic happens. It takes all of that data compiled by our Infrastructure and turns it into something useful.

The control layer is a crucial component of the Smart Contract. It ensures that certain operations for a given transaction, such as calculations and reliability calculations, are accurate with reliable information before recording all details required when writing out your smart contract code in future steps. It also verifies other things done by both layers.

The control layer serves many functions to keep data moving smoothly across networks. It assigns routes for transferring information between systems, makes sure that only one copy of any given piece of information travels through each segment in transit (i.e. controls flow) and terminates connections. When they're no longer necessary or required by protocols at either end while preventing congestion from arising due to the transfer process.

In addition, event block data is divided into packets and are reunited after being transferred. To determine the optimal route for communication between sender (sender)and receiver(receiver), a routing algorithm assigns logical addresses so that they can be delivered from one another smoothly with as minimal lag time as possible.

4.1.3 Computation

The work of the TechPay layer is to receive transactions, smart contracts and historical data from apps. This process is done by analyzing traffic received by classifying what service each block holds in terms of services such as transaction or Reward management while using TCP/UDP protocols with other parts like interfaces between different components within this architecture.

The layers of the computational system work together to ensure accuracy and order in transferring data. The multiple communications that distinguish trustworthy transfers from non-trustworthy ones assure impartial operational processing, optimize overall network efficiency while providing scalability for your business needs. The first level checks errors by ensuring all relevant information gets sent before moving onto lower levels. They organize event records into batches according to their type so brokers can easily access them.

4.1.4 Interface

By creating an interface layer, applications can access the TechPay Chain. Management and supervision of accounts participate in this network and limit or certify the authority of nodes, so transactions are properly verified before being executed by participating networks such as wallet addresses with TechPay Coin.

The TechPay Core and its ware layers in the TechPay Chain communicate through various interfaces, including TCP/IP channels. They also send transaction data over DBMS-oriented connections on Linux Kernel environments for verification purposes only. This secondary layer manages all applications' interactions while mapping out their verified information to be sent by way of an operation's computational workflows at last place.

The Interface layer is where the control structure for each of our layered systems are maintained and synchronized. The interface provides the means to combine data from event blocks, make necessary adjustments in dialogue channels between application units (including termination), and manage account settings required by ware layers being operated by different nodes with one goal: ease-of4transitioning information flow through all levels seamlessly as possible

4.2 TECHPAY WARE LAYER

The TechPay Ware layer provides open-source APIs, Smart Contract scripts, and more for various dApps. The operated TechPay token is a fundamental component of transacting with its core functionality that allows you to pay and get paid based on reputation score or transaction record in each participant (consumers firms & producers).

4.2.1 Middleware

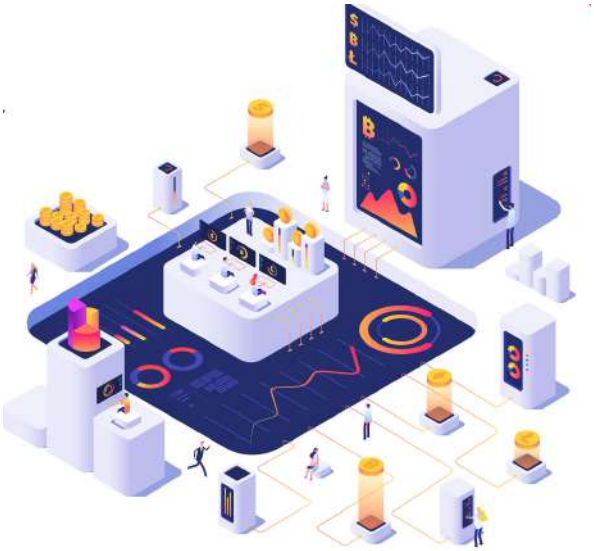
The Middleware of TechPay's chain consists of protocols and APIs that link DApps consisting primarily of Smart Contracts, the functional language Scala. E-Wallets with payment support for both local currencies and international payments through credit cards or bank transfer systems (a la Paypal) reputation management on a Blockchain network where users can rate each other based on their past interactions allowing them to explore new opportunities. Before they happen while also earning reward points.

TechPay Middleware platform's architecture comprises module layers for major services. This modular design allows easy modification, expansion, and integration with new Smart Contract-related modules developed in future updates to this software. Also, to provide a seamless experience with existing payment services such as PG's to conveniently utilize TechPay service offerings. A native/web client SDK similar to other types is made available, seamlessly integrating into any environment. TechPay offers an array of products designed and developed by our team at its very core.

The TechPay Middleware platform is a powerful tool that integrates with other services to create an ecosystem for rewards. This way, you can gain more opportunities on top of what your payment provider offers!

The TechPay chain provides various reward programs, which may lead to alliances or partnerships between different companies to provide even better-integrated service offerings through cooperation agreements among themselves.

Platform framework was developed with international expansion in mind. The common layer manages accounts, certifications, and messaging to enable easy access for DApp users and those on native web browsers or via e-wallet apps, which is perfect since we want everyone worldwide to use this service. The security of your company's data is a major concern, which can only meet by adopting strict encryption methods and implementing stringent internal controls. Our service uses OAuth 2.0 for account information such as sensitive customer details protected with all available means - we don't allow even managers access! The Figure below shows how this process protects you from any unwanted intrusions. Our company presents various payment services that are easy to use and accessible for people with any device. Whether you're searching for a substitute way to send messages, make payments through your phone bill directly from work or school accounts - no matter what type of customer! Output: We believe in providing solutions to make life easier; we understand how difficult it can be to try out new technologies so as not to get lost or left behind.



The client layer comprises the DApp, e-Wallet and Native Web clients. Next to development environments like TVM (Fantastic Future), which provides a service environment for integrating additional information services on top with existing ones to provide better support. During runtime and an easy way forward when developing new projects using TechPay Coin's blockchain technology - future updates will also bring us closer to achieving unparalleled convenience. Reward/Reputation services, the major characteristics of TechPay Wares, will also be provided. That includes a comprehensive list that highlights their unique features, such as providing rewards or reputation management in both existing service environments with Native clientele and Web clients paying by credit card on websites like Amazon where they sell products from other sellers just like themselves.

The development language layer, consisting of TechPay's high-level functional programming language and other languages, should allow easy SmartContract service development. That is planned to be available in a subsequent stage with an integrated environment where users can create their smart contracts or translate them from existing bytecode compilations into TechPay Script if they prefer not to handle source code files themselves.

The service layer consists of payment, reputation and reward services. In the first development stage clients can use an SDK that exposes external modules for IOS or Android devices to communicate with each other securely thanks to TechPay development language and TVM provided by the next stages.

The TechPay API layer provides the base infrastructure where our service application developed in a TechPay environment operates. This independent level allows connection and expansion with other coins, facilitating additional areas for us to explore!

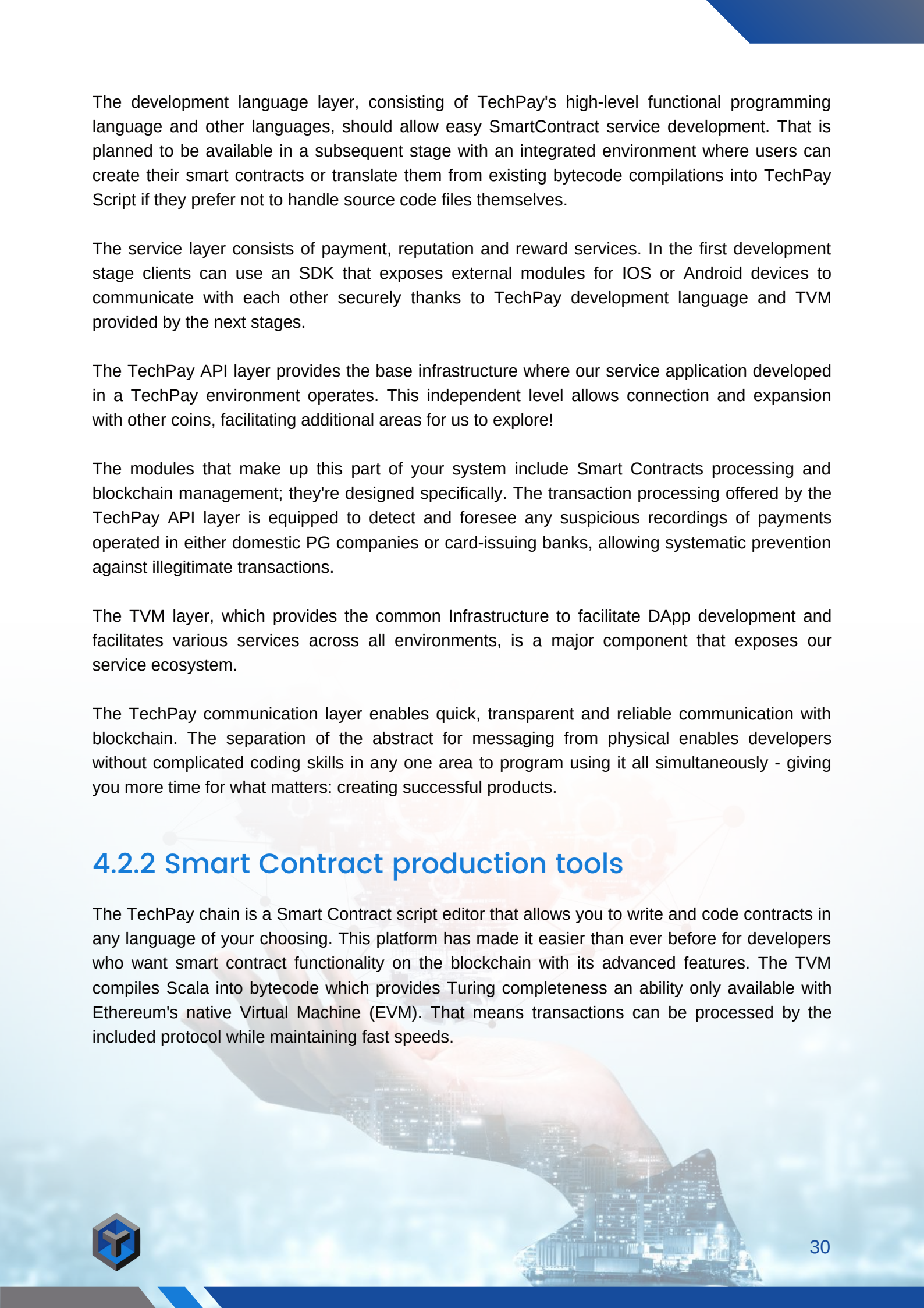
The modules that make up this part of your system include Smart Contracts processing and blockchain management; they're designed specifically. The transaction processing offered by the TechPay API layer is equipped to detect and foresee any suspicious recordings of payments operated in either domestic PG companies or card-issuing banks, allowing systematic prevention against illegitimate transactions.

The TVM layer, which provides the common Infrastructure to facilitate DApp development and facilitates various services across all environments, is a major component that exposes our service ecosystem.

The TechPay communication layer enables quick, transparent and reliable communication with blockchain. The separation of the abstract for messaging from physical enables developers without complicated coding skills in any one area to program using it all simultaneously - giving you more time for what matters: creating successful products.

4.2.2 Smart Contract production tools

The TechPay chain is a Smart Contract script editor that allows you to write and code contracts in any language of your choosing. This platform has made it easier than ever before for developers who want smart contract functionality on the blockchain with its advanced features. The TVM compiles Scala into bytecode which provides Turing completeness an ability only available with Ethereum's native Virtual Machine (EVM). That means transactions can be processed by the included protocol while maintaining fast speeds.



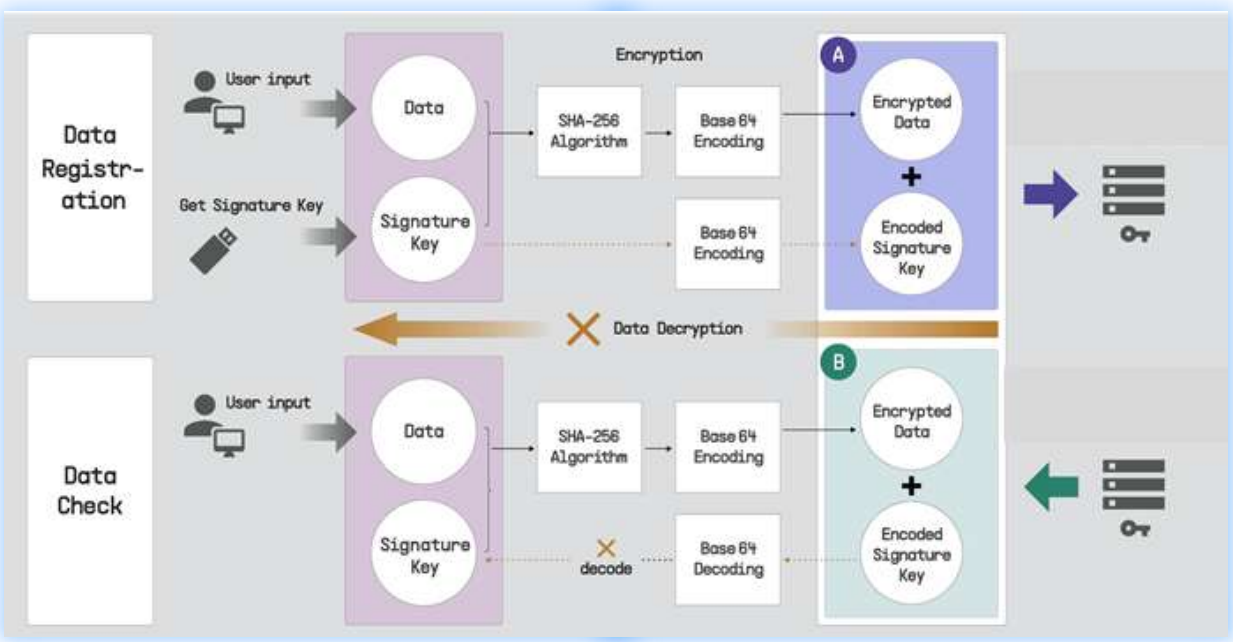
4.2.3 TechPay wallet

The TechPay Wallet is the first of its kind, providing a decentralized blockchain based e-wallet solution for all users. Using this revolutionary platform, you can store your coins and manage multiple accounts in one place, which makes transactions easy as pie! The native client works with web browsers while also supporting smartphones, no matter what device you use to access the internet. Various options will be able to seamlessly integrate into every aspect of life from payment processing at home or work through shopping online. The wallet management component is a revolutionary new way for businesses to easily and securely integrate their e-Commerce system with any blockchain. The service provides services that scan QR codes, instantly enter transactions once quantities have been entered into the app in one place regardless of whether it's an iOS or Android native platform, and Web methods available.

The multi-address management component of this e-wallet service ensures your money is safe with the many prechecks and protections in place. Rest assured, You may know that even if one account has been compromised, it won't affect any other parts or operations for you. It is important to know the type of account an individual has regarding security. For example, if someone wants to use a money transfer service for their transaction only and does not want any other information about themself revealed by that process, then they would just provide deposit info in order 'to receive funds.' That way even though your e-Wallet may leak or compromise at one point on its journey through our networks.

The address verification component verifies the address of an e-Wallet by linking information about owners. Such a process may make falsification difficult and allow modification according to changes in the service environment. Encryption/Decryption methods are used for encryption & decryption services that come with it on wallet addresses.

The transaction component allows users to send and receive other cryptocurrencies on top of the TechPay network.



4.3 TECHPAY WARE PROTOCOL

Transactions, Smart Contracts, Stories, Reputation, and Reward protocols are used in TechPayWare.

4.3.1 Transaction protocol

The transaction protocol of the TechPay Chain can be used in the food delivery industry. Participants provide appropriate goods or services to consumers, and they do so with a guarantee that their orders are always delivered quickly by connecting this process through blockchain technology. After changing it from a friendly explanation, the output tone should now sound more like a professional advertisement. In addition, I changed some words such as "electrical" to just "power".

Example Application: Food Delivery

The TechPay Chain is a revolutionary new project that will forever change how we think about online ordering. After you place your order with one of our partners, all transactions are handled by smart contracts - this means there's no need for any human intervention! The best part? Overcharging is never an issue because both parties get charged exactly what they want and nothing more.

The use of smart contracts in food delivery will allow consumers to receive their compensation or a refund when the product they've purchased isn't delivered properly. A well-designed TechPay payment protocol has been designed so restaurants can make these refunds with just one click.

Blockchain-based tracking of the distribution process for food delivery might sound like a futuristic dream, but it is already happening. Using an app called "Seamless" or similar, customers can order from participating restaurants, who will then deliver their meal straight home in exchange for cryptocurrency at competitive rates up to 40% off! There's no need to wait around on delivery trucks anymore.

4.3.2 Smart Contract protocol

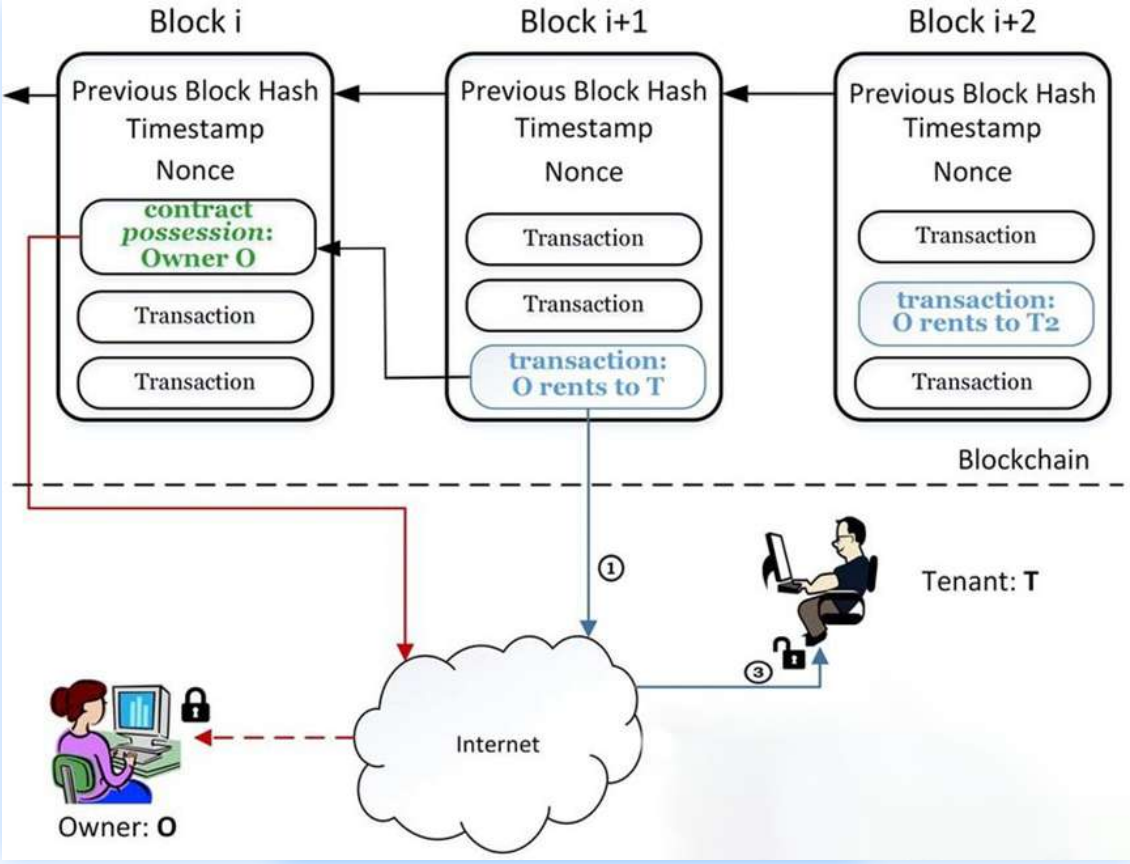
The Smart Contract is a revolutionary new way of doing business. It's the code that facilitates, verifies or executes all contract requirements online without any need for physical documents and third-party intervention! A smart contract reproduces every detail from logic in an agreement, so there's no room left up to interpretation which means better outcomes at much lower costs than traditional methods.

The benefits of using Smart Contracts are that they allow for the exchange and secure transfer in any value without third-party intervention. There is no need to involve brokers, attorneys or notary publics with your transactions because it happens directly on a distributed ledger which eliminates most delays typically found when doing business this way before now.

The vending machine is a great idea for the future of business. This technology can compare to how an automatic teller machine (ATM) works, which provides its output once certain conditions are met and can also run automatically according to preprogrammed rules with no human intervention needed. The machine will work like a vending machine, but with the difference that by inputting some money into it and selecting what you want from an onboard menu or touchscreen display (depending on model), TechPay coins are sent to one side of this transaction-ready contract. The other party can then collect their purchase in return for putting up collateral against any possible default risk--which never happens.

The TechPay Chain is a smart contract protocol that processes transactions between participants according to the conditions and requirements of each industry.

The TechPay Contango is an investment opportunity that allows you to invest in the future of cryptocurrency. The CONTROL Smart Contract not only stores your funds but also records every transaction and contract fulfilled, making it possible for us at STORIES TO SELL YOU THE STORY OF YOUR LIFE! Trade securely with any device or app through our seamless integration into major trading platforms.



4.3.3 Story protocol

The Reputation protocol is a way to measure the trustworthiness of each participant in TechPay's ecosystem. The data and responses from all participants are fed into criteria for rewarding appropriate people with more money or power based on what they do well at, like delivering packages quickly.

Math Formula

- Participants in each industry determine A as the evaluation criterion by real numbers between 0 and 100.
- α is the weighted value of each evaluation criterion calculated by A's value.
- n is the number of evaluation criteria.

The reputation score is determined by taking each evaluation criterion and weighted value, dividing them with n to calculate an average.

TechPay's reputation protocol will enable the chain to have a stable, reliable and accurate measure of each participant's reputation. That could be called upon whenever necessary by either party to feel more at ease doing business with one another.

Up until now, it has been pretty hard to determine what kind of reliability a company has. Yet, with the assistance of new technology, we can now measure how reliable each business is by their reputation score! A scale from A-D defines different levels in terms. However, there's also weightings given so that important criteria will be weighted higher than less valuable ones. When calculating an updated value for your evaluation criterion, weighted values and importance are divided according to the corresponding level (A being most sensitive).

4.3.5 Reward protocol

With TechPay, you can earn tokens for your evaluations. All participants will be incentives to engage in valuable behaviour on the platform and create a reliable ecosystem that rewards those who provide honest feedback while excluding any malicious actors or touts! Smart Contracts are established once there is an activity with our Reward protocol based upon how many transactions occur within it.

For example, let's say you're a restaurant owner and want to get your customers hooked on ordering from the same place. You could reward them with discounts for being loyal users of your service. This way, they know where their food comes from without having any association between customer and another looking around at different options.

With the conditions for using Reward established, Smart Contract holders will be awarded tokens. Rewards may include experience points or giving priority to search ranking. For example, transaction tokens are designed so that users in TechPay can earn them by generating high amounts of orders and reviews within their ecosystem. Imagine a world where restaurants are rewarded for their high reputation. That works because certain protocols would allow them to pay advertisement costs with transaction tokens, which can be had from transactions made at these establishments or by purchasing goods and services directly through the application host's website.

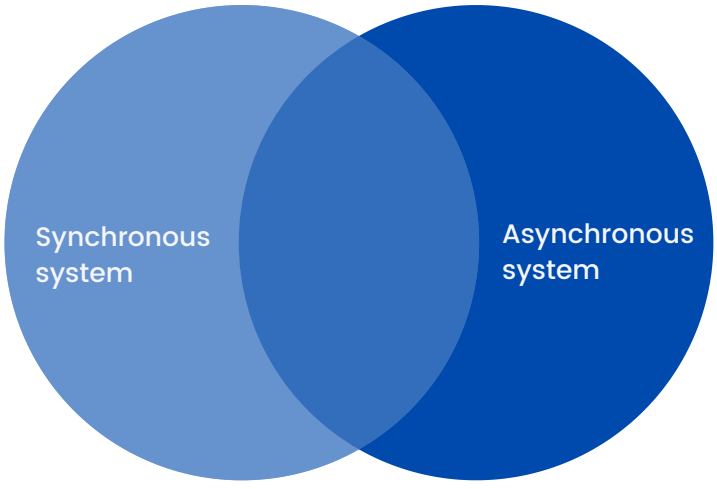
In this specific example, it is intended that consumers will receive transaction tokens under a reward contract if they write quality reviews or achieve high numbers of orders and spending threshold.

PRACTICAL BYZANTINE FAULT TOLERANCE(PBFT)

The Practical Byzantine Fault Tolerance algorithm has been a consensus system around since the 90s. It works efficiently in asynchronous systems, with an upper bound on when you can expect your request to be fulfilled! pBFT was designed for low overhead time, and application areas include distributed computing and blockchain technology. That means it's perfect if we have any questions about how these blockchains work or what they're used for.

pBFT Async Sync Environment Circle Diagram

What is Byzantine Fault Tolerance? Byzantine Fault Tolerance (BFT) is the feature of a distributed network to reach consensus even when some nodes fail. By employing collective decision making, both correct and faulty ones are reduced in influence so that system failures can be safeguarded against BFT mechanisms derived from Byzantium Generals' Problem or otherwise known as "The Byzantine General's Problem".



GeeksforGeeks Courses

The Reputation protocol is a way to measure the trustworthiness of each participant in TechPay's ecosystem. The data and responses from all participants are fed into criteria for rewarding appropriate people with more money or power based on what they do well at, like delivering packages quickly.

Byzantine Generals' Problem

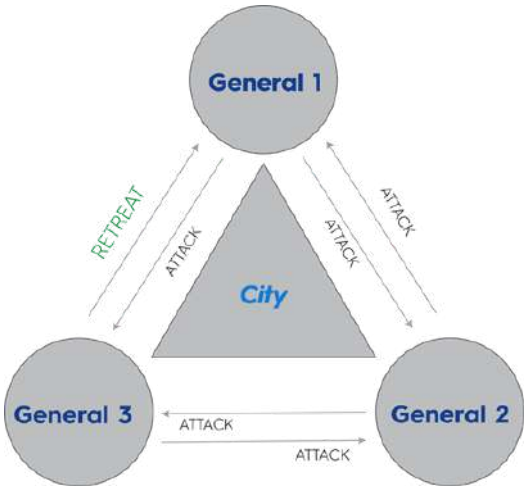
The problem was explained aptly in a paper by LESLIE LAMPORT, ROBERT SHOSTAK, and MARSHALL PEASE at Microsoft Research in 1982:

Imagine that several divisions of the Byzantine army are camped outside an enemy city, each division commanded by its general. They can only communicate by messenger and observe their adversary before coming to a common plan of action. Some generals may be traitors trying to prevent loyal ones from agreeing on when to attack. But they need a strong majority for this decision-making process to go through successfully; otherwise, it will result in a disaster.

The generals must implement an algorithm to ensure that (a) all loyal generals decide on the same course of action, and (b) a small number of traitors cannot influence the generals' decision-making. There will be a loyal general who will do what the algorithm says he or she should, but the traitor will do what they wish. Regardless of how the traitors act, condition (a) is a must. The loyal generals should draft a reasonable plan in addition to reaching an agreement.

Byzantine fault tolerance is achieved if the correctly working nodes in a network reach an agreement on their values. A default vote value can be given to missing messages. It will assume that any message from one of these "faulty" sources could not reach its recipient within some time limit; furthermore- we assign responses for when majority votes match what's expected out there.

Leslie Lamport proved that if we have 3m+1 correctly working processor, a consensus (agreement on the same state) can reach with almost m faulty ones, which means that more than two-thirds of the total number must agree.



Types of Byzantine Failures

There are two categories of failures: fail-stop and arbitrary. Fail stop nodes will shut down when they reach a certain point, while an arbitrary system failure can happen for various reasons like power interruption or human error.

- An error occurred when the result was not reflective.
- Provide the wrong answer
- The response that intentionally misleads
- Give different results based on what part of the system you are interacting with

Advantages of pBFT

Energy efficiency:

Zilliqa is a new blockchain protocol that uses pBFT to achieve consensus more efficiently. PoW-like calculations round every 100th block, making it faster than other protocols like Ethereum and Bitcoin while still being secure enough for commercial use.

Transaction finality:

The transactions do not require multiple confirmations, which is advantageous over Bitcoin's PoW mechanism. There is no need for individual nodes to verify every transaction before adding it to the blockchain. This system will work on an agreed-upon set of rules and be finalized immediately after they're verified by one party only.

Low reward variance:

Every node in the network takes part to respond by the client, and hence each can be incentivized, leading to low variance rewarding nodes that help decision making.

How pBFT works?

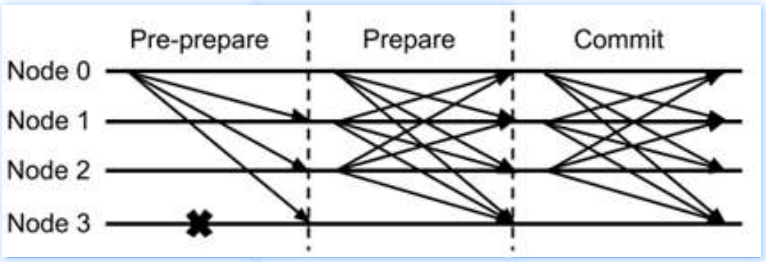
To make the Byzantine generals' problem manageable, pBFT tries its best at providing a practical solution. Nodes in this system are sequentially ordered, with one node being considered primary and others referred to as secondary or backup nodes. Any eligible member can transition from second-tier status into a leading position if an administrator is Malfunctioning on your end. Distributed systems are a lot more complicated than they may seem. To ensure that the system continues to operate correctly and for transactions to be processed, Majority rules, not just one-third of nodes, can sign off on new data. Which will cause it to become permanently history if someone tries changing something with malicious intent within their community's version (or representation)of reality - but this number decreases considerably when lots are going on!

A practical Byzantine Fault Tolerant System functions best when no greater fraudulent participants exist in any given region.

There are four phases in the pBFT consensus rounds (refer to the image below):

The client sends a request to reach the primary(leader) node.
All secondary(backup) nodes receive the request from the primary(leader) node. The nodes (primary and secondary) respond to the request by sending a response back to the client.
Whenever a client receives 'm+1' replies with the same answer from different nodes in the network, where m is the maximum number of faulty nodes allowed, the request has been successfully served.

Leadership of the consensus protocol is passed from node to node every 24 hours. A backup can step in and take over if their predecessor doesn't broadcast a request for two weeks without fail, or majority vote by honest network members acting as part-time leaders. Who volunteer their time on behalf of others looking for an answer about truth preservation technology's future direction.



pBFT— Understanding the Consensus Algorithm

Why use pBFT?

In enterprise consortiums in which corporate members are partly trusted, pBFT (Practical Byzantine Fault Tolerance) is a powerful consensus algorithm. This approach to security makes the network resilient. It protects against malicious collusion among nodes in different areas of responsibility resulting from misconfigured software or human error. Still, it also means some parties must hold more knowledge than others about what's going on with their local copy of a project being worked on by all participants together as one team which can lead them to feel less confident sharing sensitive information due to uncertainty over whether another party might misuse whatever insights were revealed during a discussion between those closely collaborating peers.

Why so many messages?

Message heavy algorithms are caused by the number of multicast messages required for each phase of a three-phase protocol multiplied by each replica.

Why so many replicas?

To ensure a replica set has enough non-faulty members, we need at least 3f + 1 replica, with f being the total number of faulty ones. That will help us discover any crashes or Byzantine failures in R since it's guaranteed there will be some leftover when all other nodes are functioning perfectly. In the following formula, |R| is a replica set with the maximum number of replicas that can be defective:

|R| = 3f + 1

We will have a minimum of 71 (1+6+24+35+5) messages for a single request when we use 7 replicas. If we want just one replica, more replicas that can be faulty, this number increases. For one request with 10 replicas, the minimum number of messages is 142.

Would you like up to 4 nodes to be faulty? For a single request, the minimum message count will climb to 237 if you just use 13 replicas.

Consequently, pBFT does not scale like other consensus algorithms.

Due to the added messages, adding more replicas than you need is not recommended compared to load-balancing your EC2 instances.

Optimizations to pBFT

The main problem with PBFT is that it cannot be reduced to a single message. That means there's no way for us, as we only have one transaction and required proof like signatures from each side of the said deal, a total counterpart amounting up against BTCs. MAC Codes are ordered more CPU intensive than RSA digital Signatures, making them ideal candidates when considering how much easier they could potentially make things on both ends.

RSA digital signatures are only used for view changes and new views, promoting a backup replica into the primary. View updates cannot happen until after either one of these two states has occurred: there is no longer any operational primaries in use, or all requests have been processed, whichever comes first! All other messages require MACs like SHA256 authentication instead.

Researchers from the Massachusetts Institute of Technology, Miguel Castro and Barbara Lisk, found that three-dimensional computing MACs is three times faster than computing digital signatures even if they compared MD5 and RSA 1024 bits, which we now have SHA256 and 2048 bits.

SUPPLY

Max Supply - 5,999,999,998.00 TPC (Close To 6 Billion) | It Would Take Decades For Max Supply To Be in Circulation | Ecosystem Would Dwell on The Native Token TPC as The Gas Fees.

Proof-of-Stake Consensus: Validators of the Chain Are Rewarded With Newly-Generated TPC.

Burning Mechanism: 30% of the Sum of Transaction Fees in each block is verifiably burnt while 70% is Rewarded to the Validators of the chain.

Total Suppy - 1,99,99,99,998 TPC (Close To 2 Billion)

Distribution Solely Depends on The Demand; We Can't Push Supply Which Market Doesn't Need.

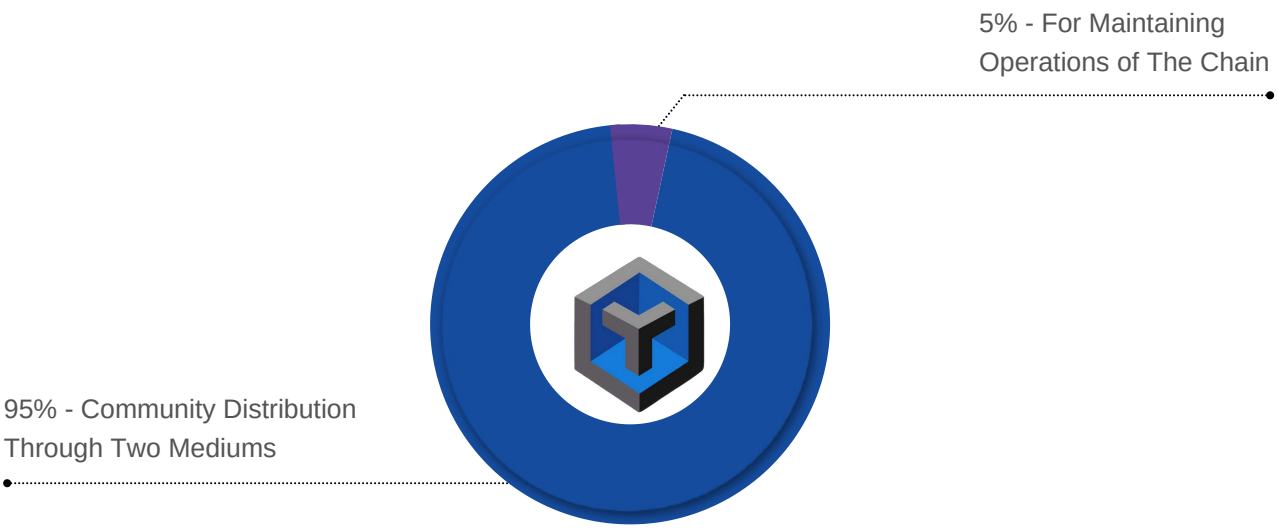
TOKENOMICS

Tokenomics of The Native Token of The Photon Chain, TPC:

95% - Community Distribution Through Two Mediums

- Liquidity for Centralized Exchanges.
- Liquidity Pools on Decentralized Exchanges (Bridges with other prominent Chains).

5% - For Maintaining Operations of The Chain 60 Million TPC Are Staked On The Chain To Keep it Running Initially) | Etherscan Exporer EaaS.



TechPay Staking Model

TechPay

March 1, 2022

1 Staking

1.1 Common constants

Symbol	Description	Value	Formulae
s_d	Seconds per day	86400	24 * 60 * 60
e	Epoch length in seconds		
s_y	Number of seconds in a year	31536000	

Symbol	Description	Value	Formulae
p_{min}	Minimum lockup period (14 days)	14 days	14 * s_d
p_{max}	Minimum lockup period (365 days)	365 days	s_y

1.2 Staking and Rewards

Symbol	Description	Value	Formulae
r_d	Daily rewards TPC	534,247	
r_s	Rewards TPC Per Second	6.183414352	r_d/s_d
p_{base}	% of rewards earned for staking, regardless of a lockup or not	30.00%	
$r_{s_{base}}$	rewards earned for staking per second, regardless of a lockup or not	1.855024306	$r_s * p_{base}$
$r_{s_{lock}}$	rewards earned for staking per second, locking up tokens	4.328390046	r_s - $r_{s_{base}}$
S	Estimated Current Staking	6000000	
pa	Annualized % Network Estimated Staking Rewards	14.01%	$r_d * 365/S$
pa_{base}	Annualized Base % rewards (no lockup)	4%	$pa * p_{base}$
pa_{lock}	Annualized Max reward % (12 months)	9.81%	pa - pa_{base}
pa_{total}	Total annualized % rewards 14%	$pa_{base} + pa_{lock}$	equal to pa
pa_{diff}	Difference between Max reward % (12 months) and Base rewards	9.81%	$pa_{diff} = pa_{lock}$

Symbol	Description	Value	Formulae
ps	Per second rate of change of annualized rewards	0.0000004442556459441%	pa_{total}/s_y
ps_{lock}	% additional rewards per second lockup (12 months)	0.0000003109789521609%	pa_{lock}/s_y
ps_{base}	Base % rewards per second (no lockup)	0.0000001332766938%	pa_{base}/s_y

Variable lockup period

Symbol	Description	Value	Formulae
$pa_{lock}(t)$	Estimated staking rewards per annum for t seconds lockup		$pa/s_y * t$
$pa(t)$	Total estimated staking rewards per annum for t seconds lockup		$pa/s_y * t + pa_{base}$
$ps_{lock}(t)$	Per second rate of change of annualized rewards		$pa_{lock}(t)/s_y$
$ps(t)$	Per second rate of change of annualized rewards		$pa(t)/s_y$

Symbol	Description	Formulae
$ps(t)$	Total % rewards per second for t second lockup	
st	number of tokens staked	
t	Staked seconds (total staking time in seconds)	
e	Epoch length in seconds	
r_{lock}	Total reward (lockup) earned so far:	$ps_{lock}(t) \times st \times t$
r_{lock_e}	Reward (lockup) per epoch:	$ps_{lock}(t)t \times st \times e$
r_{base}	Total reward (base) earned so far:	$ps_{base}(t) \times st \times t$
r_{base_e}	Reward (base) per epoch:	$ps_{base}(t) \times st \times e$
r_{all}	Total reward (base+ lockup) earned so far:	$[ps_{base}(t) + ps_{lock}(t)] \times st \times t = ps(t) \times st \times t$
r_{all_e}	Total reward (base+lockup) per epoch:	$[ps_{base}(t) + ps_{lock}(t)] \times st \times e = ps(t) \times st \times e$

1.3 Penalty

Penalty: Slashed rewards are calculated based on number of TPC withdrawn, such that base reward earned by that staking is half of the base % rewards rate.

Symbol	Description	Formulae
ws	Number of TPC to withdraw	
r_{lock}	Total TPC rewards earned so far through lockup yield	
r_{base}	Total TPC rewards earned so far through base yield	
r_w	ratio of withdrawal amount over the total staked (ws/st)	
$pe(t)$	Penalty for withdrawing while still locked	$ws/st \times (r_{lock} + r_{base}/2) = ws/st \times pe_s(t)$
$pe_s(t)$	Penalty per TPC per second	$ps_{lock}(t) + ps_{base}/2$
e	Earnings after withdrawal S penalty:	$r_{all} - pe$

3 Months

Successfully Build Bridges to offer Cross-Chain Interoperability.

Decentralized Exchange Listing of The Native Token of the Chain (TPC)

Top 20 Centralized Exchange Listing of the Native Token (Acc. To CMC Rankings)

Decentralized Exchange Based on TechPay Chain.

Early 2023

Disrupt The Space With Blockchain-based payment gateway Featuring Real-Time Transactions & Minimal Gas Fees

Blockchain internet of Things IoT Blockchain-based IoT managed devices for a fast & security word.

NFT marketplace based upon Tech Pay Chain/Photon NFTs deployed upon TechPay's network will offer Stabiity and Efficiency at a fraction of Transaction Fees.

Tech Pay Exchange Relaunch

Roadmap v2.0

7 Months

Creator Funding Program to encourage developers to build Smart Contracts, dApps & NFTs on TechPay Coin's Permissionless & Performant Network.

TPC Enters Top 1000 In Coinmarketcap Cryptocurrency Rankings after Verifying Market Cap.

Top 10 Centralized Exchange Listing (Acc. To CMC Rankings)

Place TechPay as the leader in Smart Contract Development Firm, Offering Bridged Tokens Between ERC, BEP & TPC Chain. Fueling the adoption of TechPay Chain.

OUR TEAM

With help from our teams, contributors and investors these are the milestones we are looking forward to achieve.

Co-founder

Sumit Sharma, Co-founder at TechPay.

Sumit Sharma, is a guy of many talents.

Sumit Sharma has consulting chief management in over 20+ large companies worldwide in the financial sector, telecommunication, aviation, medical, and energy.

He has almost 10 years of experience in professional strategy and leading technology.

In the fields of IT and internet strategy, transactions and economic distribution networks, business intelligence, and organizational performance, he is a seasoned operator and regular presenter.

Co-founder

Vishal Garg, Co-founder at TechPay.

Vishal Garg is an Indian-based business magnate, an experienced Systems Architect and Blockchain expert.
He is well known due to his expertise in the IT industry. Being an expert in Architecture, Blockchain, Data Science, Cyber Security and Cyber Law.

Mr.Vishal is having multiple patents in Blockchain and Artificial Intelligence thus making it possible to rise the glorious heights in IT industry.

These accreditations show his strong skills and expertise in the industry. Mr. Vishal is well known for his accreditations and strong repute in Information Technology industry.

CONCLUSION

TechPay has been working on the leaderless, decentralized blockchain platform which is EVM compatible and also scalable and secure at the same time breaking blockchain trilemma. TechPay has introduced a new protocol for the blockchain platform which is named as Sirius and works for distributed networks achieving Byzantine Fault Tolerance practically. Every node in the Sirius protocol operates their own local block DAG (Directed Acyclic Graphs) which helps in reducing the time to finality (TTF) for every transaction. The Proof of Stake (PoS) model with DAG in Sirius protocol helps improve performance and security at the same time. The trust less system leverages participants' stake as their validating power. Sirius protocol uses layers of graph and concurrent knowledge to guarantee a consistent order of event blocks and transactions. Sirius protocol optimizes DAG storage and processing time through splitting local history into checkpoints called epochs. Sirius protocol based Photon is the secure, leaderless, scalable, open source, Byzantine Fault Tolerance, Layer-1 blockchain platform with very low transaction finality. The Sirius protocol is developed for distributed ledgers with logical time ordering instead of blockchains.