Blockchain Platform

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Chapter I. Executive Summary

1.1. Company

EGAAS S.A. is a Luxembourg based software development company with two subsidiaries in Dubai and Moscow, a partner software company in India and more than 30 core IT developers globally. The company has developed an original Apla blockchain protocol and a number of proof-of-concepts for various use cases of the blockchain technology for clients in Luxembourg, the UAE, India and Russia. This includes land and vehicle registries, marketplaces for the sale of copyrights and other assets, issue of securities, and many others.

1.2. Mission statement

Our mission is to facilitate the mass adoption of blockchain technology by small and medium sized enterprises ("SMEs") that will drive innovation, better use of human capital and positive changes in society.

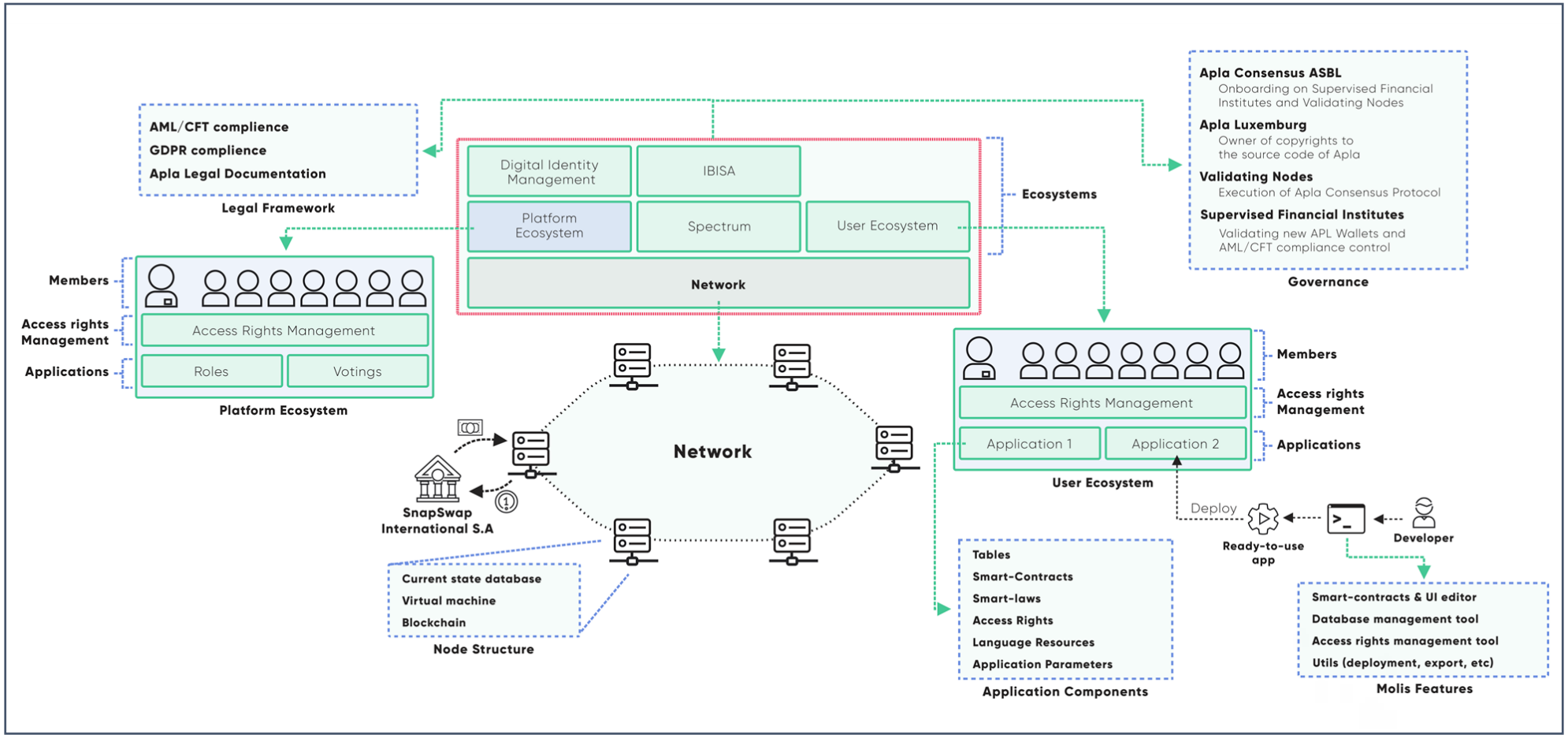
1.3. Apla Blockchain

Apla blockchain is a secure, simple and compliant blockchain infrastructure for a fastgrowing global collaborative economy segment. SMEs will benefit from reducing operational costs and go-to-market time, fundraising solutions at an early development stage, automation of business processes, integrated settlement system, AML/CFT compliant infrastructure, trustless cooperation, business scalability and global reach of their products and services to end customers.

Simple

Compliant

Secure



Original

Ready to Go

Fast

Scalable

1.4. Collaboration projects on Apla

Apla Blockchain is a collaborative effort of the **EGAAS** team and the other contributors, including **SnapSwap International S.A.**, the Luxembourg company licensed as an electronic money institution by the European regulator, **ChristmannSchmitt**, the Luxembourg law firm, **Grant Thornton Luxembourg**, the tax and IT advisory firm, the **Luxembourg House of Financial Technology**, the Luxembourg's dedicated Fintech center, and **IPE LAB**, the Moscow based project engineering firm. EGAAS S.A. is partnering with a number of companies to implement the following use cases on Apla Blockchain after the platform launch:

IBISA project

(https://www.ibisa.network)

IBISA is a risk sharing service targeting 500 million small farmers worldwide. The project is based on the blockchain and Earth Observation technology to reduce costs typically incurred by traditional insurer-centric paradigms. Spectrum project "Spectrum allows users to simultaneously create, publish and manage rights and revenue distribution in one place, drastically simplifying the process and giving control back to the digital artist. More specifically, it is a decentralized digital asset catalogue based on blockchain technology."

Digital Luxembourg

(https://digital-luxembourg.public.lu/news/spectrumcollaborative-digital-asset-creation-backed-blockchain)

EGAAS & SnapSwap collaboration projects:

Decentralized marketplace for APL token exchange into EUR

The liquidity of the APL tokens (internal tokens of Apla Blockchain) will be supported by a decentralized marketplace where users can buy and sell the tokens in exchange for EUR through SnapSwap accounts.

Crowdfunding platform for blockchain startups

Blockchain startups will be able to create their own ecosystems on Apla Blockchain and issue their own tokens. The investments can be received in APL tokens to ensure convertibility of the obtained funding into EUR through the accounts at SnapSwap.

Digital identity management project

At the launch of Apla Blockchain, SnapSwap will perform the KYC ("Know Your Customer") of the users prior to validating APL Wallets. The KYC files of the users will be kept by SnapSwap. The access to the personal data of each user may be shared by SnapSwap with the other financial institutions upon the receipt of an instruction or permission of the data owner through Apla Blockchain. This will speed up the onboarding process and access of Apla users to the services of the other financial institutions in or outside of Apla Blockchain.

SNAPSWAP

EGAAS
ELECTRONIC GOVERNMENT AS A SERVICE

1.5. Problem solving by Apla

There is currently a number of obstacles that prevent blockchain technology from being widely adopted by enterprises. Apla Blockchain offers a turn-key solution to those problems as defined the table below.

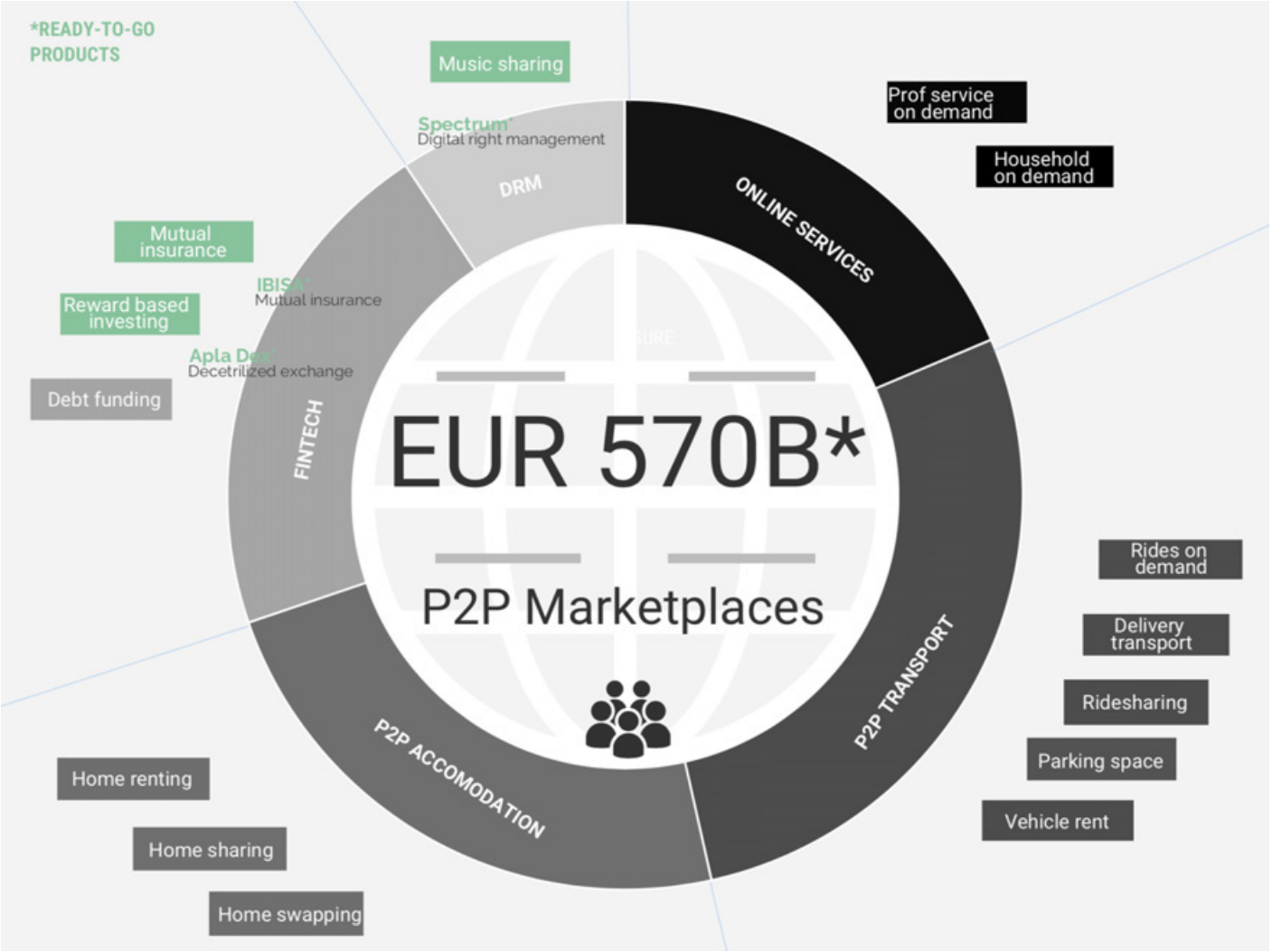
№	Problem Description	Apla Blockchain Solution
1	Blockchain startups are cut off from access to banking services. Banking institutions globally are not supporting fiat/crypto exchange transactions of their clients	At launch of Apla, the users (companies and individuals) will be able to open accounts in EUR currency with SnapSwap, a licensed electronic money institution in Luxembourg. SnapSwap accounts will have IBAN numbers. The account owners can send EUR to those accounts from their bank accounts outside of SnapSwap and back. The SnapSwap accounts may be used for processing of exchange transactions with APL tokens (platform token of Apla), i.e., debiting and crediting fiat currency as a result of buying and selling of APL tokens. New proprietary tokens issued on Apla Blockchain in any of the ecosystem may be exchanged into EUR through APL tokens.
2	Poor liquidity of cryptocurrencies	APL tokens are used as a payment for platform resources and royalties. The liquidity of APL tokens will be supported by a decentralized marketplace on Apla. The marketplace will be used by APL wallet holders for buying and selling APL Tokens with a link to the SnapSwap accounts of the Apla users in EUR.

№	Problem Description	Apla Blockchain Solution
4	Concerns of public enforcement agencies and regulators due to the lack of AML/CFT compliance monitoring of transactions in the blockchain	Apla Blockchain is designed to meet AML/CFT ("antimoney laundering - combating the financing of terrorism") regulatory requirements. Creation of new wallets and transfer of APL tokens between the wallets will be controlled by Supervised Financial Institutions through the Apla original AML filtering smart contract. Special governance procedures are implemented to comply with data protection requirements.
5	Security constraints of blockchain protocols may lead to account thefts and loss of funds	Apla offers enterprise grade security of the network. The validating nodes of Apla Blockchain are certified data centers that must adhere to minimum IT system standards compliant with ISO/IEC 27001. Apla deploys an original data vulnerability risk management mechanism to remedy negative results of system failures, human errors or cybersecurity attacks without the necessity of creating a fork.
6	Substantial development costs of blockchain solutions create a burden for startups	Apla offers ready-to-use integrated development environment and business management tools for creating applications on the platform. There is no need to use third party software products for that. Smart Contract creation no longer requires deep knowledge of coding and learning of blockchain technology. Users can work in an intuitive and easy smart contract editor environment. Original core platform programming language is called Simvolio. It is simple and similar to JavaScript. Blockchain developers will be able to offer white label applications for specific use cases on Apla that can be accessed by enterprises and their customers from any of the ecosystem without a need of creating a new software solution. All these measures will help with cutting the development costs down and ensure a fast go-to-market access with a new business.

Chapter 2. Apla Market

Although Apla can be deployed by any enterprise regardless of its size for a vast variety of uses cases, we believe that blockchain technology at this stage of its development adds great value and is ready to be widely accepted by SMEs to facilitate the needs of the fastgrowing collaborative economy segment.

PwC projects a 20-fold increase between 2016 and 2025 – reaching €570 B – in five key sectors of the collaborative economy: collaborative finance, peer-topeer accommodation, peer-topeer transportation, on-demand household services and ondemand professional services, through which approximately 28 billion transactions will be processed (PwC, 2016).



** according to the PWC research and excluding DRM.*

The concept of the collaborative economics has been around for a long time, but recent developments of blockchain technology makes this form of trade much more widespread by lowering costs, increasing ease and access, and providing an infrastructure for a trustless collaboration.

The following key elements of the blockchain technology are specifically critical to foster the growth of a collaborative business in the digital space:

- Data Provenance (the origin/earliest known history);
- Data Immutability (once added to the blockchain, the data cannot be erased);
- Transaction Automation and Finality (no intermediaries are required for transaction settlement);
- Transparency (community members can verify the accuracy of the data stored on the blockchain without relying on a central authority).

Furthermore, Apla offers a low-cost solution for this market and a growing number of DApps to automate the business activities. The transaction processing cost on Apla will be a negligible value of 0,0009 APL token per transaction (around €0,01 if calculated based on the initial token sale price), excluding the AML compliance fees. This may lower the fees for services similar to Airbnb or Uber that charge client 15 % the transaction price on average.

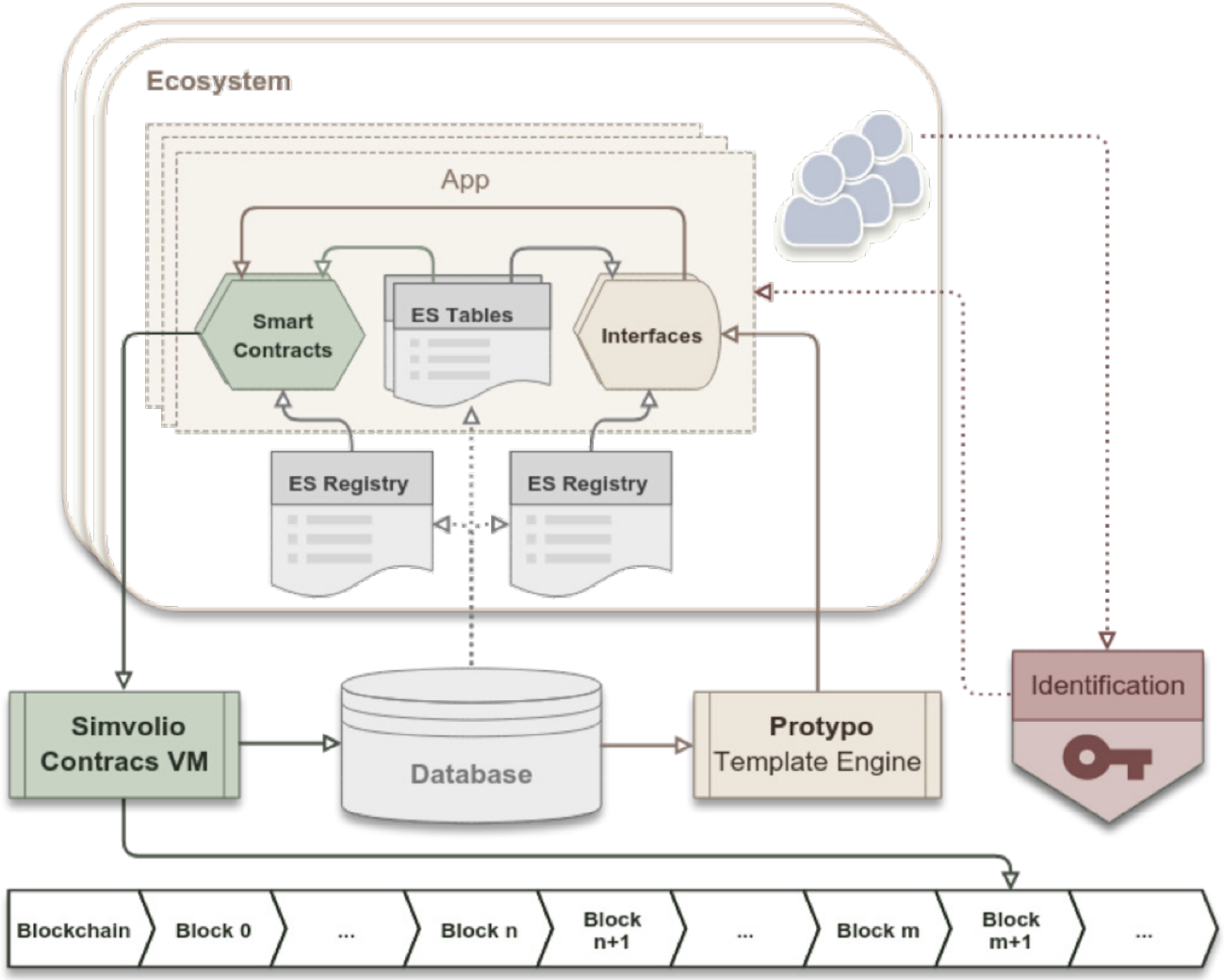
By 2023 we expect 5000 decentralized applications to be developed and started operating on Apla, each processing on average 12,5 M monetary and nonmonetary transactions per annum.

Economy segment	Number of Dapps	Transactions/Dapps	Transaction fee*
Transport	1500	5 000 000	0,01
Accommodation	1000	4 000 000	0,01
Finance	2000	20 000 000	0,01
Online professional services	500	22 000 000	0,01

*in EUR, taking into account 0,0009APL fee per validated transaction multiply by €15, price per APL token initial token sale

Chapter 3. Apla for Enterprises

3.1. Apla architecture – Ecosystem model



Network

Apla Blockchain is based on a peer-to-peer network. Full nodes of the network store an up-to-date version of the blockchain and a database, in which the current state of the platform is recorded. After having been verified, transactions are recorded in a new block, and the data is simultaneously updated in the database.

Ecosystems

All business activities are conducted through the Apla Ecosystems (quasi-autonomous clusters) created by enterprises. The Apla ecosystems are relatively closed programming environments, which include large numbers of applications and users who create and/or use these applications.

There are two categories of ecosystems in Apla Blockchain: the platform ecosystem and users' ecosystems.

The parameters and smart laws of the platform ecosystem are defined by the stakeholders providing the infrastructure services to the users (i.e., Validating Nodes, Supervised Financial Institutions, Apla Consensus ASBL and Apla Luxembourg). Please refer to Chapter 4 for more details. The platform ecosystem has APL wallets, DApps store and other applications that may be accessed to and used by the members of the other ecosystems.

Only a member of the platform ecosystem (i.e., a holder of an APL Wallet) is eligible to create an user ecosystem on Apla. By default, ecosystem founders hold a complete set of rights for controlling the ecosystem – creating and editing applications, modifying ecosystem parameters, etc. The procedure for acceptance of new members in an ecosystem is defined by its founder. Upon the initiative of the ecosystem founder and in cooperation with its members, a set of rules (smart laws) can be created to control access rights to the ecosystem's resources, and to establish the rules for modification o f t hese r ights and other regulations. A user can be a member of multiple ecosystems.

Database

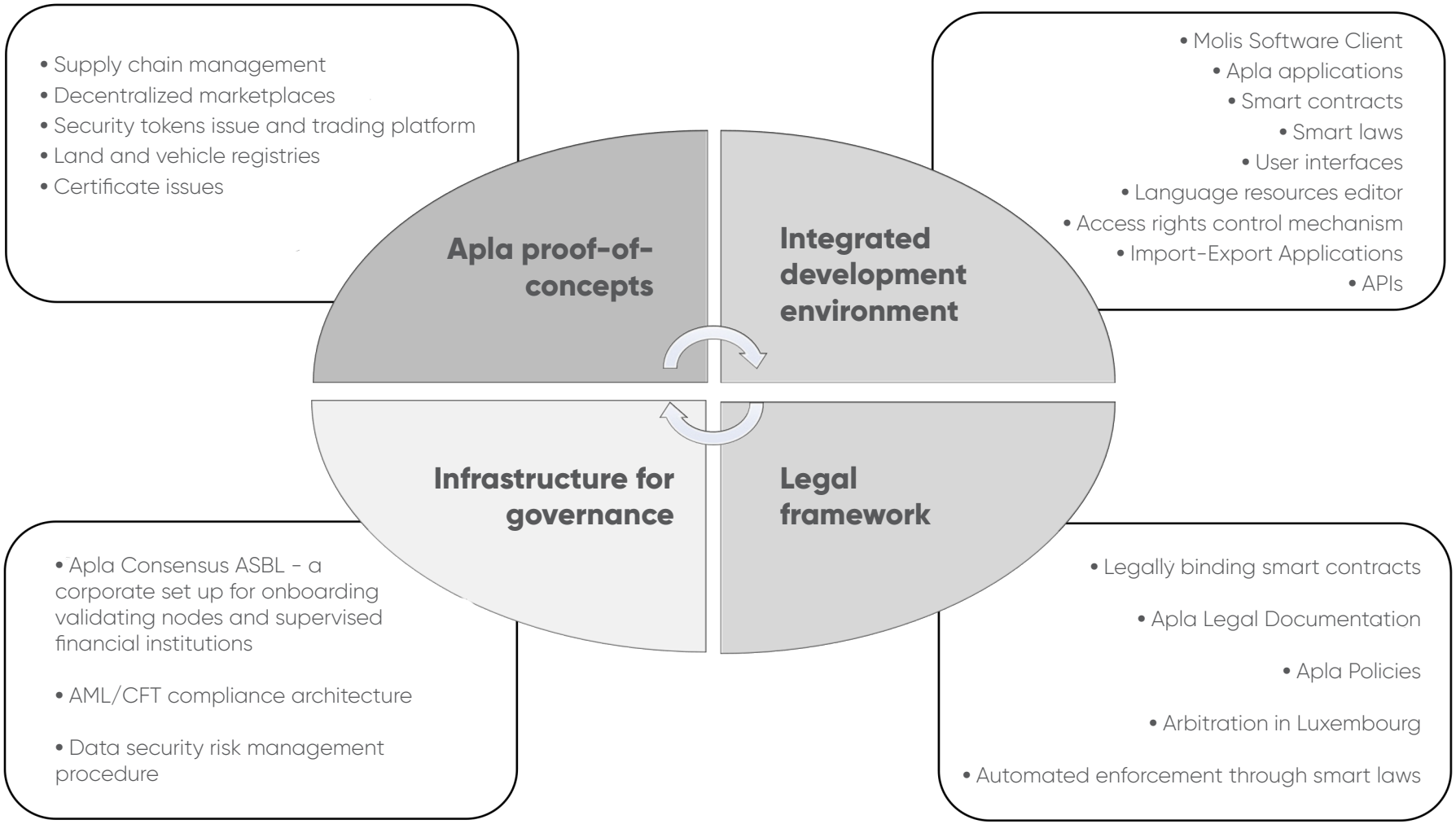
In order for contracts and interfaces to quickly search and obtain data, a common database is used for the whole platform, copies of which are stored on all full nodes of the network. Transactions that are broadcast to the network by contracts, are in essence, table entries in the database. During the creation of a block and its subsequent addition to the blockchain, the database is simultaneously updated on all full nodes of the platform. In this way, the database holds the current (most up-to-date) state of the blockchain.

Each ecosystem creates its own set of tables;however, this does not preclude the ability for a contract to access other ecosystems' tables. The tables are not linked to any specific contracts, and can be used by any and all applications.

Tables can be created and edited in a special section of the Molis client, which also allows for the addition of new columns with different data types, and the ability to set up indexes. The Molis client allows to configure access rights for adding columns, adding entries, and editing columns.

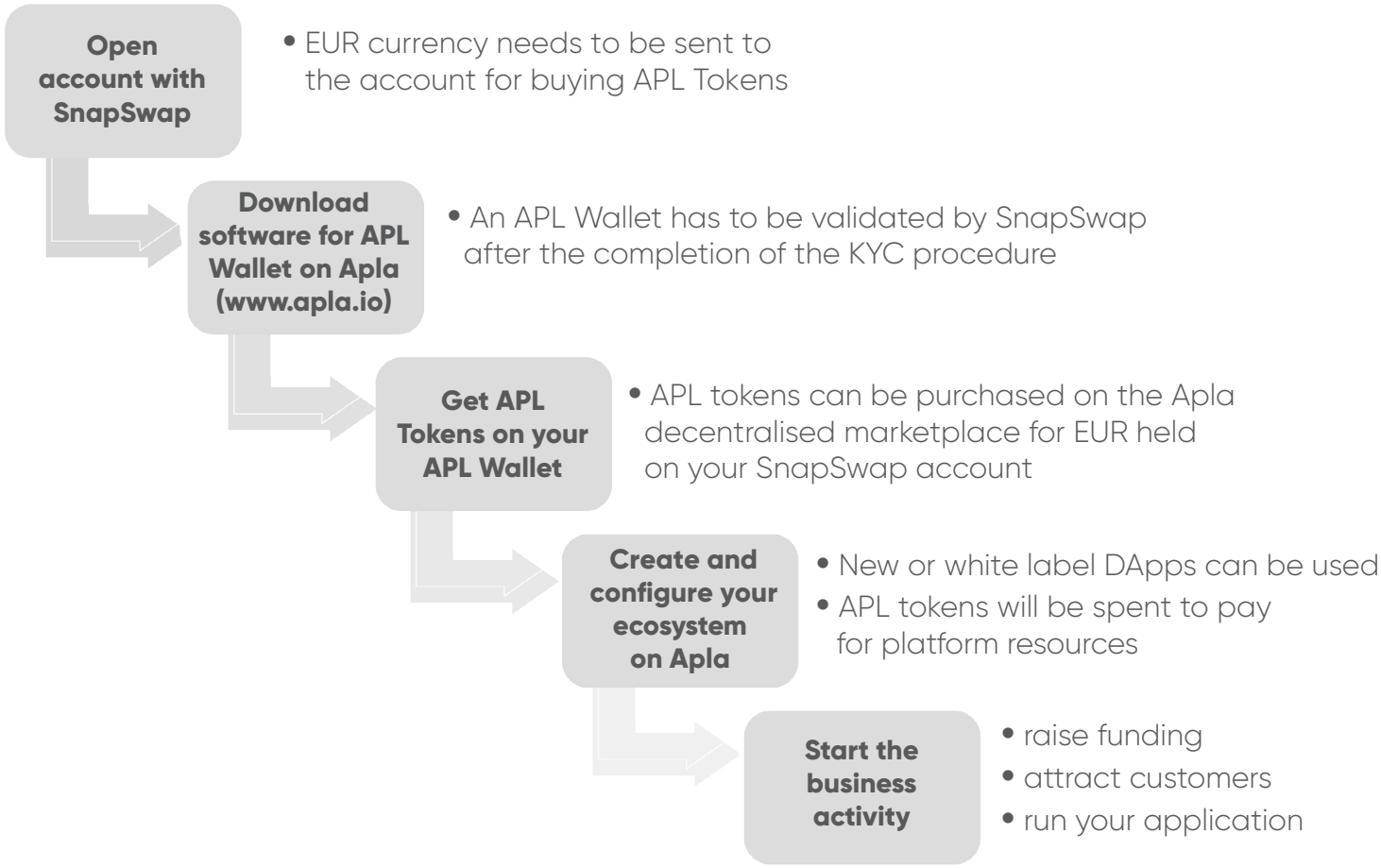
3.2. Available platform resources

The following resources are available to enterprises at the launch of Apla:



3.3. Set up a business activity

In order to set up a business activity on Apla, an enterprise should follow a simple 5 step process:



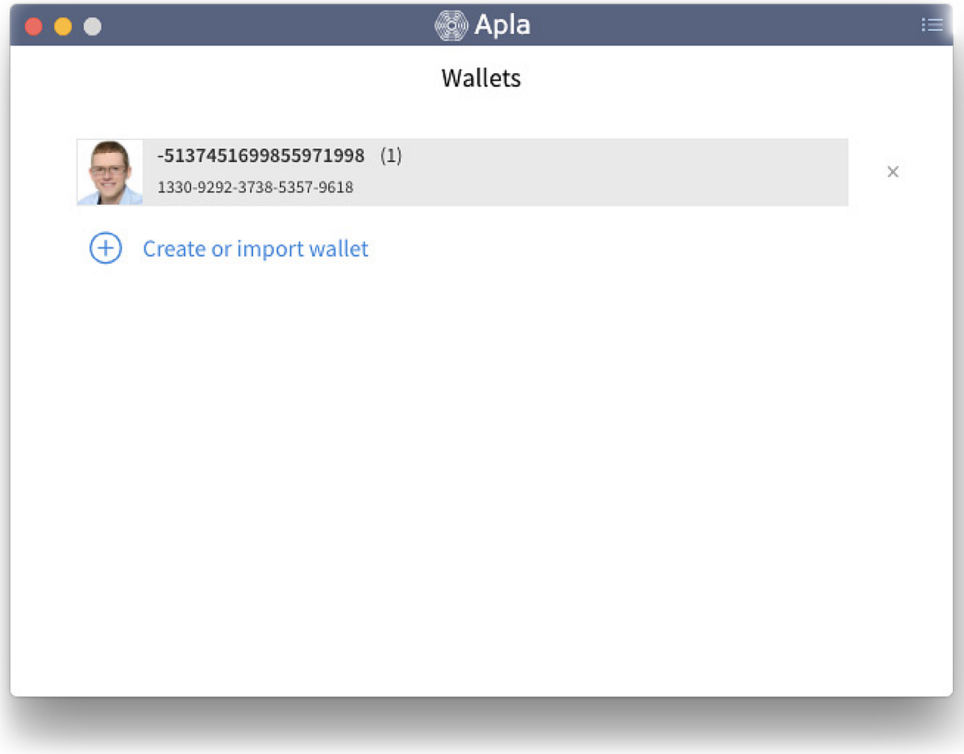
Enterprises are free to define the rules of functioning their ecosystems (smart laws) and establish their own monetization model pertaining to the ecosystems they create. The fee settlement can be automated through the acceptance of APL tokens.

Chapter 4. Apla for Developers

4.1. Integrated Application Development Environment

• *Molis Software Client*

The Apla platform includes an Integrated Development Environment, which allows for the creation of inter-cooperating applications in the platform's software client (Molis) without resorting to any other software product. Molis includes a contract editor (with the Simvolio proprietary language), an interface editor (proprietary template processor language Protypo), instruments for work with database tables, as well as a language resource customizer, application import/export mechanism, and other useful functions.



• *Apla Applications*

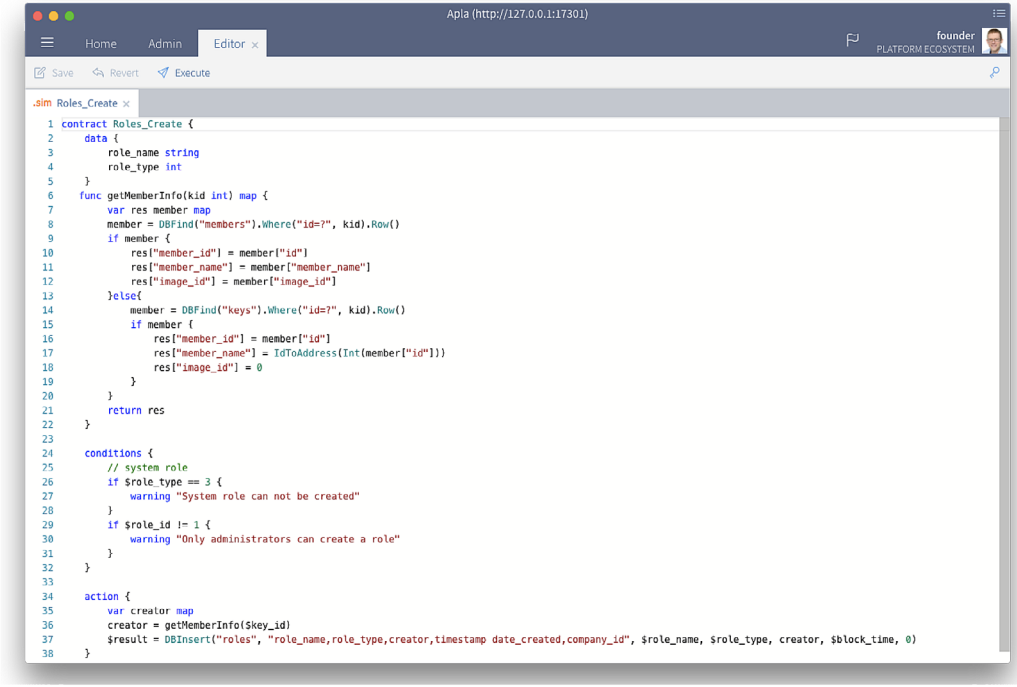
An application built on Apla is a system of tables, contracts, and interfaces with pre-configured permissions. Applications are built to perform a certain function or provide a dedicated service. An application does not require the presence of a unifying, coordinating contract (master contract); contracts are executed by user activities, and the results of their work are recorded in tables. To initialize user events, a special notification system is used, which can send messages to ecosystem members (or roles) with an invitation to proceed to

a certain interface page and perform a required action (sign a contract, confirm data, etc.) This mechanism of application development allows, on the one hand, to model complex activities, and on the other, to simplify and speed up the creation and modification of applications.

• *Smart Contracts*

Smart contracts are the basic elements in the implementation of algorithms in applications on the Apla platform. Contracts are final portions of code that perform the following functions: (1) receipt of information from the user interface or other contracts ("data" section), (2) analysis of data correctness ("conditions" section), and (3) execution of the required transactions – database records ("actions").

Apla contracts are written using a proprietary Turing-complete scripting language called Simvolio. The language includes the required set of functions to create data processing algorithms and conduct operations with database values. The contracts are created and modified with a specialized editor in the Molis software client. Operations involving data in the blockchain are performed by the current (most recent) versions of contracts. The entire history of changes made to contracts is saved in the blockchain and is available from the software client.

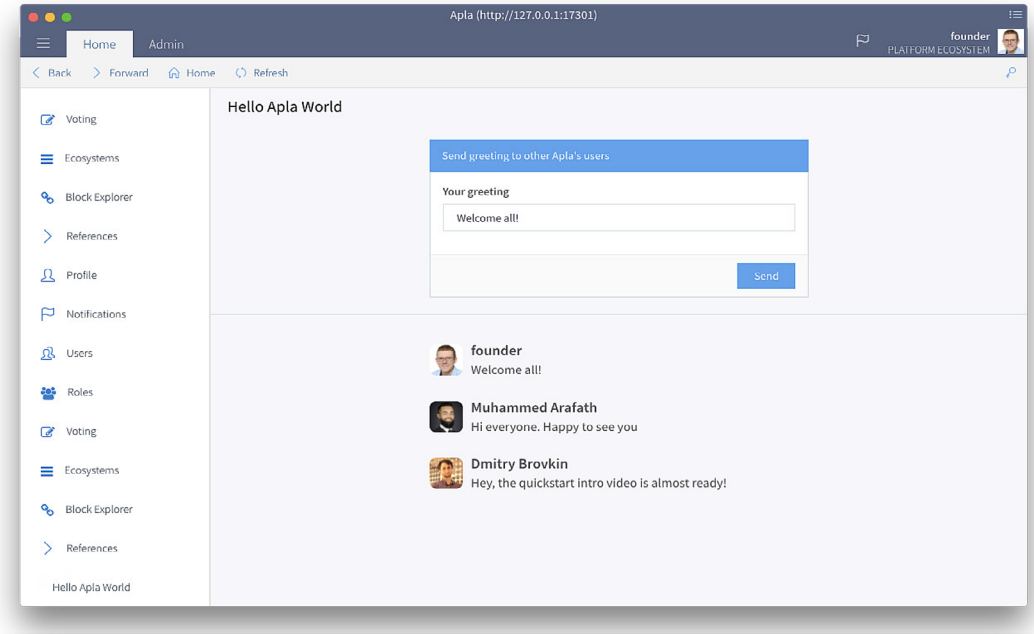


• *Smart Laws*

The ecosystems on the Apla platform are created to perform social or economic activities by platform users with the help of applications built on smart contracts. An essential part in the organization of any activity is the establishment of rules, norms and restrictions which regulate the permissions for execution of certain actions. This set of norms and restrictions is codified within smart laws, the aggregate of which forms the legal system. Unlike smart contracts, smart laws are defined before the beginning of activity in the ecosystem, and are subject to change when needed through the consensus of ecosystem members. The rules for reaching consensus are established in related smart laws.

• *User Interfaces*

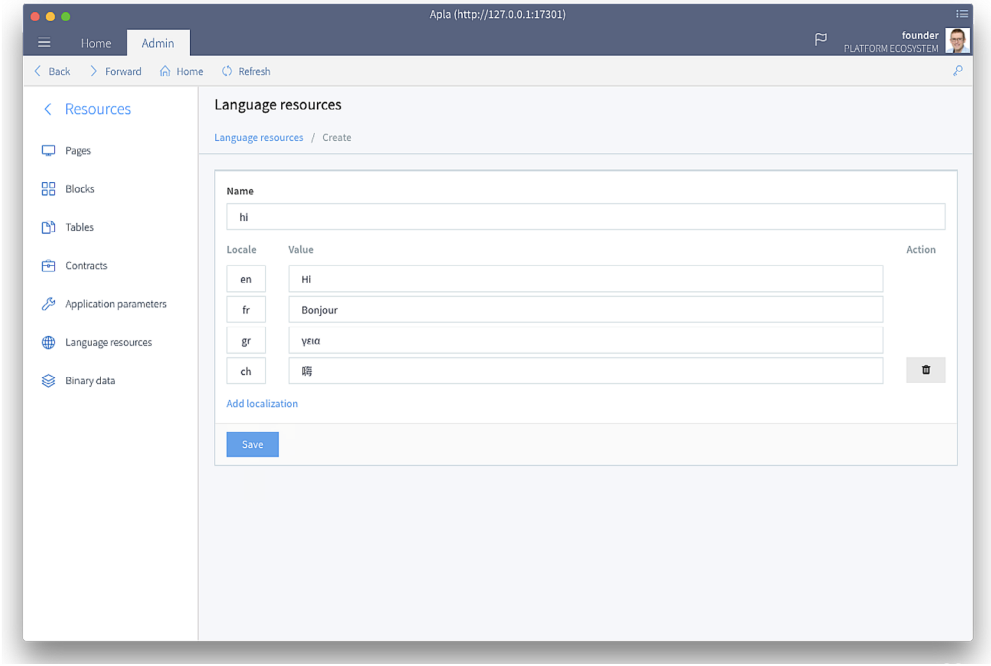
The Integrated Development Environment of the Molis software client includes an editor and visual designer for application interfaces. A specialized template engine language called Protypo is used for description of the structure of interface pages and for data processing. The functionality of the language allows for retrieving data from database tables and processing it, creating program loops and conditional statements, creating form elements, multi-level menus, as well as executing contracts, and passing user inputs to them. In order to display data in the form of tables and diagrams, special widgets are used in Protypo. In many cases, the visual interface designer allows for the creation of interface pages



without resorting to the source code. Both contracts and interface pages are stored in the blockchain, which ensures their protection from being tampered with on the client side. The complete history of changes made to interface pages is available from the interface designer of the software client. Permissions for creating and editing pages and menus can be configured from the software client as well. User interfaces of applications in Apla are by default optimizedfor work on mobile devices. Application developers can design interfaces without using the Molis software client and Protypo template language, by working directly through the Apla API instead.

- *Language Resource Editor*

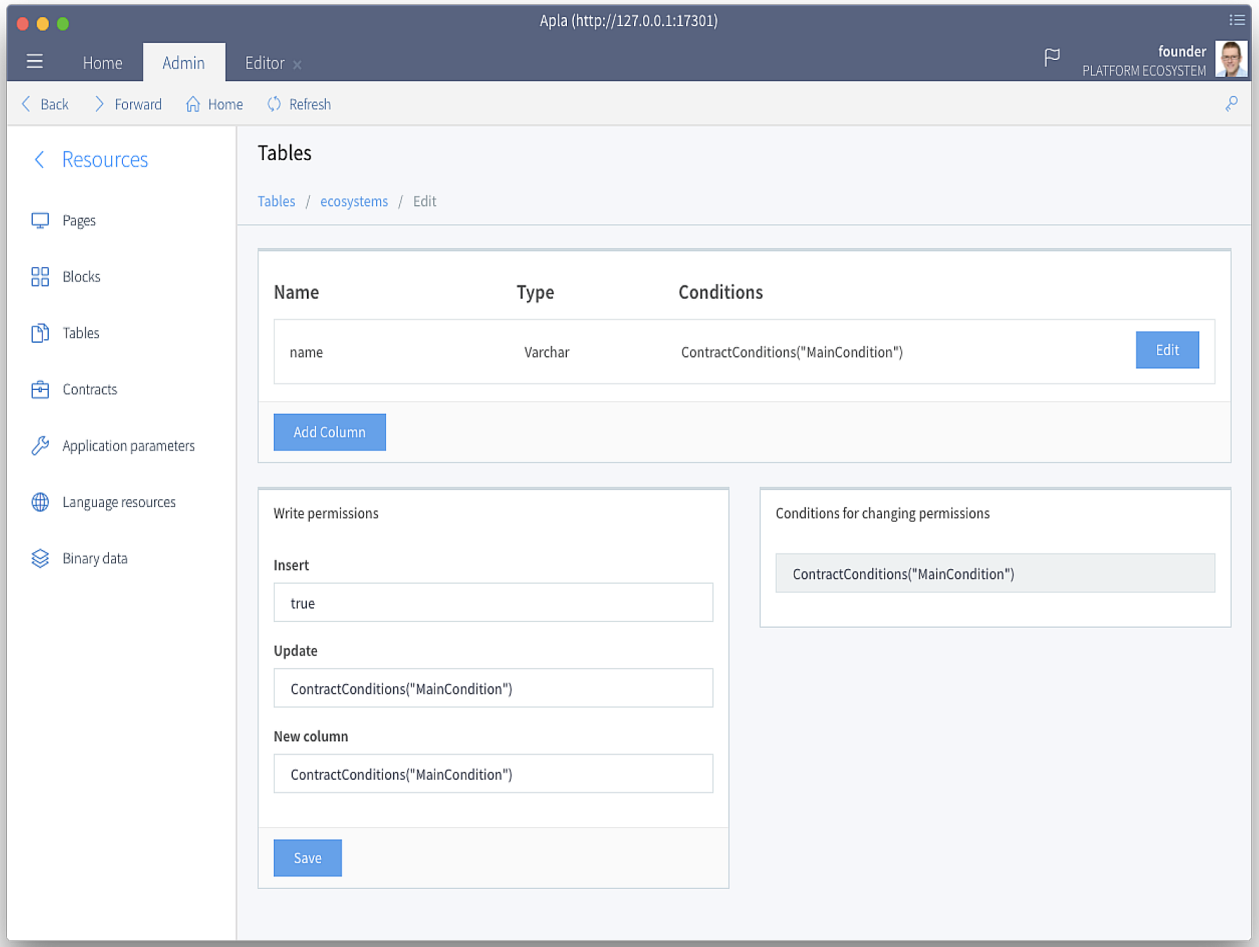
Molis software client employs a mechanism for interface localization by utilizing a special Protypo template language function that translates labels in the user interface with corresponding values of a dedicated language resource table in accordance with the language selected by the user. All UI translations in different languages are stored in a dedicated language resource table.



• *Access Rights Control Mechanism*

Apla has a multi-level access rights management system. Access rights can be configured to create and change any element of an application: contracts, database tables, pages, and menus. Permissions to change access rights can be configured as well. Access rights can be provided to specific members of an ecosystem (network users), or determined by algorithms set out in specialized contracts – smart laws. Additionally, there is an option to provide specific contracts with exclusive rights to change values in any number of single columns in a database table.

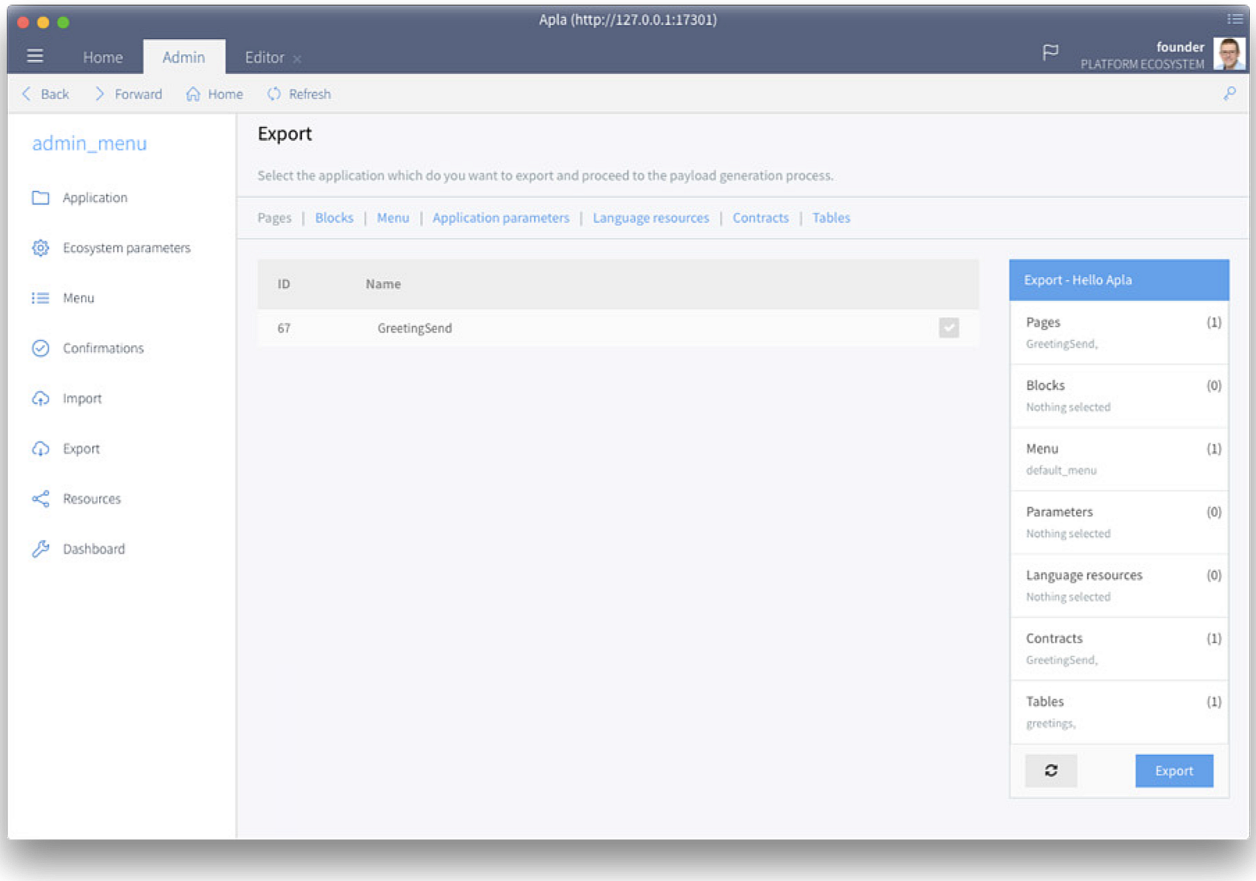
By default, all rights in Apla ecosystem are managed by its founder. However, after specialized smart laws are created, access rights control can be transferred to all ecosystem members or a group of such members.



• *Import and Export of Applications*

Molis software client allows application elements (tables, contracts, pages, and language resources) to be exported to a file, which can then be imported into another ecosystem. Both the structure and the contents of the tables can be exported using the tables export feature.

Import and Export features can be used to exchange applications between ecosystems, but its primary function is to transfer applications that were developed on local computers or dedicated ecosystems to operating ecosystems.



• *API*

All functions available in the Molis software client, including user authentication, obtaining ecosystems' parameters data, error handling, operating with database tables, interface pages and contracts are available through REST API of Apla. Therefore, developers can access all of the platform's functions though REST API, without using the Molis software client.

4.2. DApps Store

Apla has a decentralized DApps store where the developers can offer a software license to distribute their Apla applications to the other users for a fee or on the free of charge basis at their choice. The fees can be payable in APL Tokens.

The functioning of the DApps Store is based on the following principles:

• *Diversity*

The application development is initiated, managed and executed by the Apla developers who have different skill sets, cultures and nationalities (crowdsourcing model).

• *Finality*

Negotiating of, trading with, development of applications and fees settlement are all done on Apla.

• *Accountability*

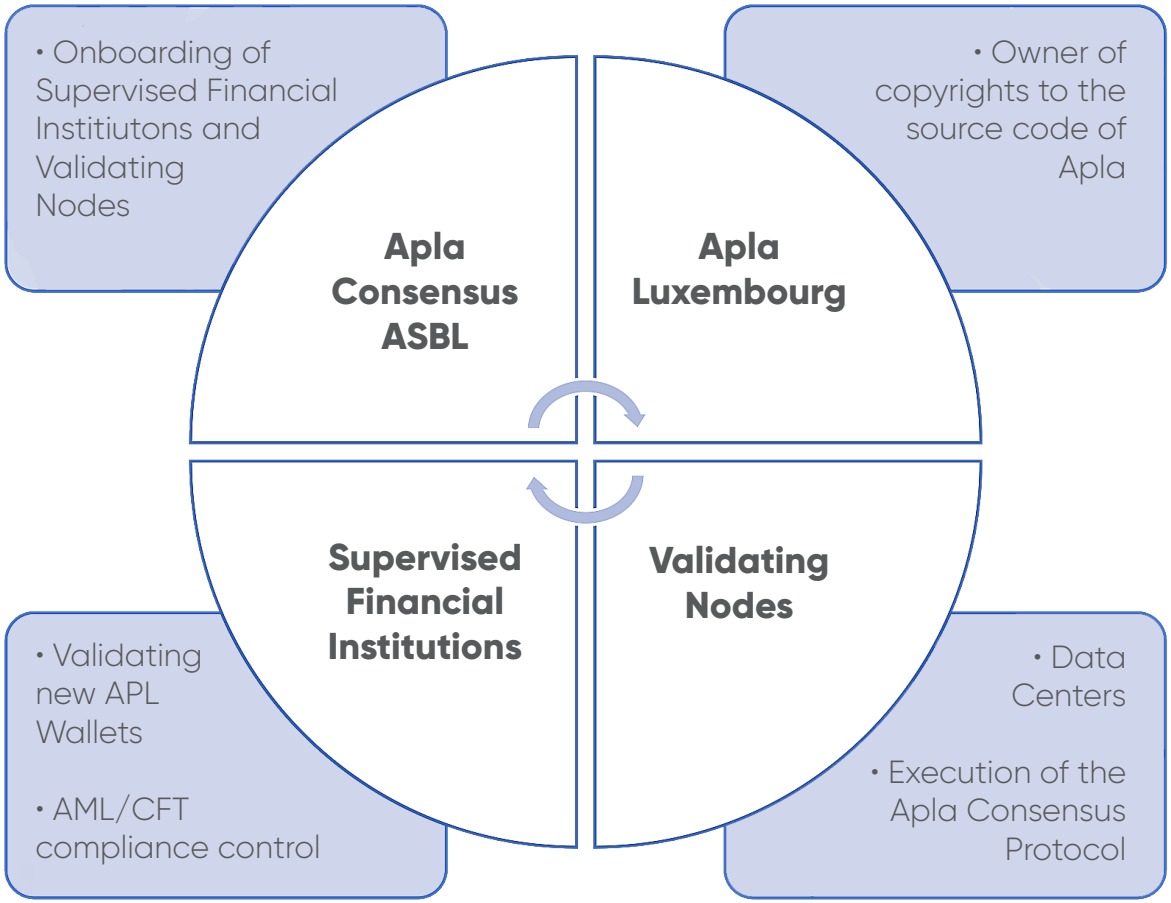
Developers are fully responsible for the quality of developed applications. The Apla company makes no prior verification of the applications and takes no responsibility to the Apla users for any omissions or failures of the said applications. The process of uploading an application to the DApps Store is defined in the Apla Technical Documentation.

Chapter 5. Infrastructure for Governance

An infrastructure for governance is established at the level of the Apla platform ecosystem to ensure regulatory compliance and addressing cybersecurity issues across the Apla network.

5.1. Apla Consensus ASBL

Apla Consensus ASBL is a non-profit organization established in Luxembourg on the 2nd of March 2018 (RCS Number F11724) at 45 rue Laurent Ménager, 2143 Luxembourg. The association was created for the purposes of onboarding supervised financial institutions and validating nodes in the Apla platform ecosystem as well as defining AML/ CFT compliance standards across the network. The latter become the members of the association in accordance with the admission rules defined by the association. Each member has one vote in the decision making. The articles of association of Apla Consensus ASBL can be found on the www.apla.io website.



5.2. Supervised Financial Institutions

A Supervised Financial Institution can be either (i) an entity that is licensed or otherwise authorized by the financial market regulator in the country of its establishment to be engaged in payment services or (ii) an international, national or intergovernmental body or institution that engages in payment services, including central banks.

Apla blockchain stores a list of Supervised Financial Institutions in a specialized database table. This data base table is administrated by Apla Consensus ASBL. All Supervised Financial Institutions become the members of this non-profit organization. Apla Policies set forth the detailed admission criteria and procedures for onboarding of Supervised Financial Institutions in the Apla Blockchain.

Supervised Financial Institutions are engaged in the following activities: onboarding of new members of the Apla platform ecosystem and ongoing AML/CFT compliance[1] control of the transactions with APL tokens.

1. http://www.fatfgafi. org/publications/fatfgeneral/documents/guidance-rba-virtualcurrencies. html

Onboarding of new members

To ensure conformity with FATF ("Financial Action Task Force") recommendations on AML/CFT compliance1, an Apla user (owner of a private key) of the Apla platform ecosystem needs to complete the KYC procedure and be verified in order to obtain an APL Wallet. The requirement of KYC verification for the purpose of onboarding and creation of an APL Wallet is a

licensed practice in most jurisdictions. As regards the requirement of KYC verification of the members of the Apla users' ecosystems, it is the responsibility of the founders of such ecosystems to assess the applicable regulatory rules and comply with the Apla Compliance Policy (please refer to the Apla Compliance Policy for more guidance).

Ongoing AML/CFT compliance

Although it is not required by the applicable laws, by way of self-regulation we established the requirement of Supervised Financial Institutions to apply a riskbased approach ("RBA") to ongoing monitoring of transactions with APL tokens between the wallets of the members of the Apla platform ecosystem. The

level of control may depend on a number of factors, including user category, the country risk (i.e., country membership in FATF), type of the transaction with tokens and applicable sanctions.

The RBA is automated through the application of the original Apla AML Filter. It may be adjusted by each Financial Institution to the regulatory requirements of the country where the institution is licensed to do the business. Before the APL tokens are credited to the wallet of the recipient, the transaction will be processed through the AML filters administrated by the sender's and recipient's financial institutions. The latter will inquire additional justification for each transaction blocked by the AML filter. In the end, the level of compliance control in the Apla system will be the same as applicable for transactions with fiat currencies.

5.3. Validating Nodes

A Validating Node can either be (i) an entity that is licensed or otherwise authorized in the country of its establishment to offer data center services to third parties or (ii) an entity that has a valid agreement for data storage and other processing services with the entity indicated in point (i) above.

A candidate must become a member of Apla Consensus ASBL prior to obtaining a status of Validating Node. The list of Validating Nodes on Apla Platform is administrated by Apla Consensus ASBL.

Validating Nodes must adhere to minimum IT system standards compliant with ISO/IEC 27001.

The Validating Nodes engage in execution of the AEN Consensus Protocol for the benefit of all Apla users.

5.4. Apla Luxembourg

The developer of the source code of Apla blockchian and copyright owner of the platform design and architecture is EGAAS S.A. (the registered trade name is Apla). It is registered in the Grand Duchy of Luxembourg at the address: 20 Rue de Bitbourg, L-1273 Luxembourg. Registration number in RCS Luxembourg: B 216 352.

Contact information:
Email: **hello@apla.io**
Website: **www.apla.io**

Chapter 6. Legal Framework and Software License Terms

6.1. Apla Contractual Documentation

A set of contractual rules will be offered to the Apla users for acceptance prior to onboarding to the Apla platform. This is to ensure a legally binding nature of smart contracts and to define roles and responsibilities of the Apla users in relation to each other and stakeholders that provide infrastructure services (Apla Consensus ASBL, Apla Luxembourg, Supervised Financial Institutions, Validating Nodes).

The contractual rules including the terms and conditions and policies are published on the www.apla.io website: Admission Policy, Compliance Policy, Data Protection Policy, Information Security Incidents Procedure, Consensus Protocol, Technical Paper as amended or added from time to time.

6.2. Software license terms

The Apla Software includes an integrated development environment with a multi-level system for the management of access rights to data, interfaces, and smart contracts. The technical characteristics of the Apla Software are indicated in the Apla Technical Paper.

Apla users are granted by Apla Luxembourg a permission to deal in the Apla Software without restrictions, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of Apla Software, and to permit persons to whom Apla Software is furnished to do so, subject to the following conditions:

- the copyright notice of GenesisKernel and EGAAS S.A.and this permission notice shall be included in all copies or substantial portions of the software;

- a result of the dealing in Apla Software cannot be implemented outside of the Apla environment.

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Chapter 7. Consensus Protocol

Apla is built based on a peer-to-peer network. Full nodes of the network (i.e., Validating Nodes) store the up-todate version of the Apla blockchain and the database, in which the current state of the platform is recorded. The network users receive data by requesting it from databases of Validating Nodes using the software client (or REST AP commands). New data is sent to the network in the form of transactions signed by Apla users. Such transactions are in essence commands for modification of information in the database. Transactions are aggregated in blocks, which are then added to the blockchain on the network nodes. After a new block is added to the blockchain, each supervised financial institution processes the transactions in this block, thus making changes to data in its database accordingly.

Validating Nodes have the right to generate new blocks. The number of Validating Nodes is limited to 101.

Validating nodes form and sign blocks subsequently one after another in accordance with a sequence list, in time intervals (one second, by default). If a validating node was not able to create a block in the allotted time, the right to sign a new block is passed to the next validating node in the list.

Chapter 8. Cybersecurity

8.1. General information

Apla network structure provides for maximum performance capacity, which is necessary for the smooth operation of applications in digital ecosystems. Security rules require to place the servers of Validating Nodes in certified data centers that adhere to minimum IT system standards compliant with ISO/IEC 27001.

The penetration test has been performed by Grant Thornton in Luxembourg. The result of the penetration test can be seen on the www.apla.io website.

8.2. Security and defense against attacks

A blockchain is an informational system which by its own architecture is able to offer high- level security from falsification and loss of data. However, there are different ways in which hackers can launch attacks which crash nodes or the system as a whole.

•51% attack

Apla deploys the original proof-of-elapsed activity consensus mechanism. The 51 % attack may theoretically work only in case of someone taking a full control over the 51 % of the validating nodes in the system. The chances that it may happen in practice are very low in the Apla environment and they will further be reduced with a growing number of validating nodes. It is also worth noting that placing Apla network nodes in certified data centers serves as additional protection against someone taking control of the network.

Remote attack

The building of an alternative chain is eliminated by introducing a parameter that determines the maximum depth of branching the blockchain. If a blockchain node breaks from the other nodes for over a specified number of blocks, it will not be accepted as valid.

DDoS attacks

Protection from attacks which work by sending a large amount of unwanted transactions is secured by the introduction of payment for transactions in network APL tokens. A fully-fledged attack would be financially ruinous for the initiator. Moreover, the network places limits on the number of transactions per block signed by each user. Protection from DDoS attacks which execute data reading (interface calls) is facilitated by standard methods for servers. (Nodes which aren't able to withstand DDoS attacks will be excluded from the list of validating nodes where they are unable to process transactions within a set period of time.)

Sybil attacks

The blocking of a separate node by connecting it only to the nodes of the hacker is practically impossible since the number of the Apla network nodes is fixed and the full list of such nodes is stored on each individual node.

Exploiting hash function crypto-algorithms

Transactions are signed using ECDSA algorithm. ECDSA uses elliptic-curve cryptography (ECC), an approach to public key cryptography based on algebraic structure of elliptic curves over finite fields. It is currently considered as the most secure.

Private key theft

At present, the private key is held in the programming client via AES encrypted algorithm. In future versions, additional functions for private key security will be added.

Database falsification on a single validating node

The most serious threat to the platform is the possibility that the database of one of the validating nodes could be falsified. In this situation, interfaces formed and sent in the programming client are able to contain data which do not correspond to the blockchain and tables on other nodes. To combat this situation, the Apla programming client makes a request to receive the page immediately on at least three network nodes and receives hashes of the pages formed. Where all hashes do not

correspond, a repeat attempt to receive the page from other nodes is made. Where at least two of the hashes correspond, the page from the server with the lowest response time is loaded. If the hash of one of the nodes differs from the rest, a notification is sent to warn that there has been a falsification of the node's database. (It is not possible to automatically exclude a node from the set of validating nodes since an error could take place as a result of the lag in processing the previous block.)

It is impossible to determine that the node database has been falsified when receiving data from the tables during contract execution due to the fact that they can be launched on the same node that the hacker has control of, and all verification will be blocked. However, this situation in which corrupted information is sent from the database to the contract, there is no risk for the network since the remaining nodes will send valid data to the contract and the database content will not be false. The corruption of data on the attacked node will be revealed through the interface request.

Wrongful use of contract code exploitation

Where there is a wrongful use of contract code exploits which leads to a breach of the platform's data integrity (in particular, unsanctioned transfer of tokens), validating nodes retain the right to launch a preinstalled contract (smart law), which temporarily shuts down access to the contract and accounts which are affected during the attack. This smart law then launches a vote amongst validating nodes. Following a check of the situation, there will be a choice to vote for one or several of the solutions below:

- resume the wallets functioning without making any changes;

- make changes to the source code in which the exploit was found;

- restore the blockchain platform to the way that it was (in terms of the number of tokens held on the wallets) at the time there was a wrongful exploitation of the code.

The community of the platform's users (representatives with

roles within the platform ecosystem) can initiate and accept a set of other smart laws which are able to eliminate the negative consequences of the wrongful actions of users via a vote and without having to hard fork.

8.3. Data Protection and GDPR Compliance

The Apla Data Protection Policy prohibits the storage of personal data of living natural persons in the blockchain if they are not secured with the use of anonymizing technologies. If, nevertheless, personal data has been sent to the blockchain, it must be erased by the Validating Nodes upon a request of the data owner with the use of predetermined procedures and techniques. The erasure of data does not compromise the operation of the blockchain itself and integrity of the remaining data stored in the blockchain. A special governance procedure is applied in this case to create and recover full nodes in the system.

As a possible solution for using the Apla systems for the processing of personal data, Apla source code allows for the creation of Virtual Dedicated Ecosystems (VDE), which have the full set of functions of standard ecosystems, but work outside the blockchain.

Chapter 9. Pricing

Fees for Onboarding New APL Wallet Owners

Supervised Financial Institutions are entitled to charge fees for rendering onboarding and other services to the APL Wallets Owners. The fees are to be specified in contracts between Supervised Financial Institutions and their clients. During the initial sale of APL tokens, such fees will be covered by the seller.

License Fee

Supervised Financial Institutions shall pay a license fee to Apla Luxembourg (the software copyright holder) for the use of the platform software resources by Supervised Financial Institutions and their clients (i.e., by APL Wallet Owners). Specifically, the license fee is paid for the following activities: execution of smart contracts, creation of tables, and adding new columns and rows to them. The license fee rate is set in conventional units, called Fuel but it is to be paid in APL Tokens. The exchange rate of Fuel to APL Tokens can be configured in the parameters of the platform ecosystem and is set by voting of the Supervised Financial Institutions in the system (simple majority voting).
The Platform Configuration Ecosystem has a parameter to set the maximum amount of Fuel that one transaction can cost (max_fuel_tx), and the maximum amount of Fuel that can be spent for the creation of one block (max_fuel_block).

Fees for Use of Networks Resources

Validating Nodes provide services to all users of the Apla platform such as storing the full version of the blockchain, maintaining the up-to-date state of the database, executing smart contracts, protecting personal data of APL Wallet Owners in accordance with applicable regulatory requirements, validating transactions, and forming new blocks.

40% of the license fees collected by Apla Luxembourg shall be equally shared by the latter between the Validating Nodes as a payment for the maintenance of the IT infrastructure by the Validating Nodes necessary for carrying out transaction validation services.

Chapter 10. History and Roadmap

Apla Luxembourg will continue the development of the Apla Software and platform infrastructure. The following activities are included in the Apla platform roadmap to be executed in the medium term.

Single semantic environment

To create a universal platform system of registers and independent data-consistent applications, the Apla team has begun to develop a unified semantic dictionary of objects, attributes and relations, in addition to tools for building and editing it. The building of a semantic core also allows for effective platform integration with the internet of things.

Visual digital agreement editor

Apla smart contracts, just as those on other blockchain

October 2016

Symvolio and Prototypo programminglanguages and the Molis software client

December 2016

Language resources, export-import of applications

June 2017

Basic applications for ecosystems

October 2017

Visual Interface Designer

February 2018

Completion of the platform source code development, technical audit, and AML/FT compliance verification

platforms, are basically program controllers which are designed to process user data in order to form transactions within the blockchain network. They poorly adapt to compiling agreements between parties in relation to the fulfilment of certain obligations. Moreover, a significant hindrance to the secure use of smart contracts in business agreements is the fact that they are written on Turing complete languages.

Business logic builder

A large amount of blockchain applications allow to add, edit and display objects, role representatives changing object status, confirming actions with objects, and more. Work has begun on standardizing business processes and for using a special editor for adding, setting and editing them. This allows to significantly bring down the time needed to create applications, in addition to the opportunity to adjust and personalize business processes without needing qualified programmers.

Confidentiality

Data in public blockchain platforms is traditionally open. However, the majority of business processes require confidentiality. Apla has begun developing cryptographic mechanisms to limit data access:

1. transaction encryption (the protocol checks the transaction validity - the right to alter a certain value - but also hides the key of the transaction signee);

2. confidential token transfers;

3. data encryption (occurs at client-side, data is encrypted and stored, with decryption taking place in the interface using the corresponding key);

4. mechanism for holding secret ballots.

Process of scaling

For full realization of a decentralized business platform, not only are special tools required, but also a freely scalable network with high latency. Apla plans to develop and implement a set of innovational solutions for improving the network specifications in the near future.

Parallel transaction processing

In the majority of cases, transactions from the ecosystem are not linked to the data of other ecosystems. This means that after a check of whether there are such missing links, the sequence of transactions from different ecosystems may be processed in parallel, being embedded in a block one after another (the sequence the transactions from different ecosystems within a single block is of no value). The verification of these sequences on other validating nodes will also take place via parallel flows.

Hierarchical network structure

The total transaction flow in a blockchain network can be separated into several levels in accordance with various criteria, separating them from: the daily work to the most important transactions, recording legally valid contractual relations; transactions which should be recorded across the network instantaneously to those which can wait to be validated over the course of dozens of minutes. Various types of transactions require different consensus algorithms and different storage methods, therefore it is a good idea to delineate the network into hierarchical segments which process different types of transactions, yet are connected via key events (the result of certain actions). On the one hand, this allows to increase platform productivity, whilst, on the other, it ensures horizontal scaling.

Big data storage

To increase system speed, Apla plans to introduce several solutions which allow for a reduction in the volume of data within the database, whilst ensuring its integrity and validity:

1. Deleting daily work data from the database table. Processed alerts, ballot transactions and other entries, which are not important for the current state of the system shall be deleted from the working tables and saved on the reserve servers for analysis, with the possibility of checking their validity via requests to the blockchain;

2. Saving files on special nodes, storing only their hashes on the blockchain.

Chapter 11. Team

Oleg Strelenko

Founder/CTO

Oleg is an expert in computer sciences with more than 10 years of professional experience in programming and managing IT projects. He was leading the team to develop the new coding languages for the blockchain platform called «Symvolio» & «Ptotypo». The team of Apla programmers under the Oleg's leadership is ready to launch the original blockchain platform after 6 years of hard work. Oleg studied at the Saint - Petersburg State Marine Technical University. He is known in the blockchain community as one of the leading IT professionals.

Vitaly Bondar

CEO/Legal

Vitaly specializes in e-commerce and private international law matters. Over the past 15 years, he has held senior positions at large international law firms and industrial companies with a focus on cross-border mergers and acquisitions, and transaction structuring. Vitaly holds a postgraduate diploma (L.L.M) in International Banking and Commercial Law in 2001 from Queen Mary University in London.

Jesus Pena-Garcia

COO

Jesus is a blockchain enthusiast, serial entrepreneur and cybersecurity expert with more than 10 years of experience in the IT field. He is heading the Grant Thornton Technology HUB in Luxembourg and Founder/CEO of Bitvalley SARL. Jesus worked for the Spanish Ministry of Defence and homeland security as a cybersecurity expert in the Centro Nacional de Inteligencia (Spanish National Intelligence Service). He holds a BSC in Computer Sciences and BTS diploma in Electronics Engineering.

Chris Bruck

CMO

Chris can be described as a Media Entrepreneur and Global Top 100 Brand-Image Marketing Executive, Innovator, and his interest is International Business Development. As a top digital strategist and innovator, he initiated and led the Global Digital Initiative of Rolex from 2005 to 2009. Chris holds a Ph.D. in Business and Commerce as well as a J.D in International Law.

Fouad Rathle

Head of government relation

Fouad Rathle, Head of government relation Fouad has 30 years of experience in working in management positions. Before joining the team of Apla Blockchain, he held the position of Branch Manager at Garanti Bank Luxembourg. In addition, he has been a Board member of The Association of Bankers & Banks of мLuxembourg for 15 years, and a member of the ABBL negotiation committee for 10 years, and president of the Banking Academy (IFBL) 12 years.

Muhammed Arafath

Sales Director

A graduate of Southern Cross University in Australia, Muhammed is a certified Blockchain business analyst and has 10+ years of experience working with diverse verticals, industries and international markets. He is currently exploring the intersection between artificial intelligence, blockchains, and the internet of things. He actively works with governmental and private organizations to help them adopt blockchain technology.

Denis Bondar

CFO

Over 15 years of business support and finance experience with multinational market leaders and fintech startups. Denis has also been engaged in the development of Online Fintech Academy. Denis holds a Master of Business Administration from Webster University and has completed the Global Fintech Program at Saïd Business School (University of Oxford) this year.

Michael Aprossine

Business Development Director

Previously, he held the position of Business Development Director at SlotLogic. Michael has finished Kazan State University and among his competitive advantages are high skills at the gaming industry, management and strategic planning.

Boldachev Alexandr

System Architect

Alexander is a philosopher, analyst, and member of the Association of Russian Futurologists. His primary areas of interest and research are: global evolutionism, temporal ontology, philosophy of artificial intelligence, and futurology. In recent years, he has worked on the creation of a subject-event approach to complex systems modeling.

Chapter 12. Legal Disclaimer Notice

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