

Stamp.Africa
A token in the African DNS ecosystem
White Paper
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Introduction

The domain name system of the internet has enabled users of the internet identify resources by a name instead of by a more detailed internet infrastructure number resource identity, an IP. These domain names have been organized around name registries for particular strings including name registries associated with countries and territories

Until recently the only name registries in Africa were country code top level domain names, ccTLDs, however recent introduction of .africa a regional TLD and other .city registries have expanded the domain name industry in Africa significantly

Africa has a population of 1.2 billion, a internet user penetration of 31.2% while world internet user penetration of 51.7% showing a huge potential for growth in internet and information resources in Africa.

There are a total of 4.9 million domain names in use in Africa with 3.5 million registered in ccTLDs and 1.4 million in generic TLDs. Industry reports assess the industry at \$55 million and poised to grow rapidly as user population increases

There are observed different frictions impeding accelerated growth of names in registries in Africa. Paramount among the obstacles are the non uniform payment solutions across the different countries and the predominance of high fees for transfers of small payments which slow down growth of registered names and e-commerce on the Internet in Africa. The emerging internet economy in Africa while developing operational and technical capacities is able to leapfrog payments infrastructure to better serve the needs of the DNS industry

We propose a new token, Stamp.Africa, for the DNS ecosystem in Africa as a novel experiment that will explore new uses of tokens and domain names. Additionally it will enhance payments by skipping traditional payments infrastructure altogether by adopting crypto currencies and online payments

Domain Name System industry

The domain name system enable users to access resources by name on the internet. The names are organized according to delegated strings known as top level domain (TLD), a name registry. The well known TLDs include .com, .org, .net however there are 54 country code TLDs in Africa and more recently .africa and 3 .city registries have been delegated into the Africa region

There are also registrars who are accredited to register names into generic registries including 11 globally accredited registrars in Africa. The registrars interface with the registrants and register chosen names into the TLDs. The ccTLDs sometimes work with locally accredited registrars or resellers. Globally accredited registrars also often appoint resellers

The registrant would use the obtained domainname.TLD to set up a website with a technical service provider and create an information resource to serve a community of users or for a purpose

The DNS security extension technology (DNSSEC) provides a very effective means of technology establishing a chain of trust from the root down to the Registry string and to the domain name provided all have signed their zones

In this manner we would have confidence that the records associated with a domain have not been tampered with and devoid of potential man in the middle attacks. We will promote the use of DNSSEC in the domain name system in a unique way

The community of Registries, Registrars, Registrants, Hosting providers, Developers and Users form the core of the DNS ecosystem in Africa. This community exchange services, interact and make payments among them. Dominant payment methods are wire transfers, credit/debit cards and cash. The wire transfer are cumbersome and take long while builds credit at the receiver in order to access services. Credit card payments have their usual challenges of authentication and varies by issuing country and provider. Cash works only when in physical location of provider. Amidst the diversity of Africa and the varied economies of countries these payment methods don't scale well online. Mobile payments are yet to be a factor in payments in the DNS industry and while mobile payments online function in national networks, they lack cross country regional reach

We propose to first build trust among the African DNS ecosystem and to provide a token called Stamp.Africa to facilitate interactions among parties in the ecosystem and serve the DNS industry in Africa. The Stamp.Africa will present a platform for innovative applications to be developed by the community

Blockchain and smart contracts

The blockchain technology has some properties that help emerging internet communities who are constrained by limited disposable incomes, often mobile and in difficult economic, social, policy and technology infrastructure environments. Blockchain promises to improve cyber economies with electronic recordings of value and exchanges in transparent way with low fees. In the end it's the indelible, immutable and permanent features that is attracting system designers the most

The blockchain promises to enhance integrity and transparency in numerous applications that have the potential of helping the users with lower fees, reducing waste and abuse in services across many sectors

In our opinion, there are five computing science techniques used in the blockchain technology all working together. These are broadcast network, public key cryptography, state consensus, electronic ledger and smart contracts

The blockchain is enabled by the internet and exploits network technologies. Typically nodes, that contain full copy of the blockchain use the network to distribute copies of blocks to other nodes on the network. The discovery of nodes willing to share block information and the distribution of blocks is fundamental to creating the immutable properties ensuring full copies are widely spread among users

Public key cryptography and hashing are key technical tools used to create the ledger. The public key is used to determine if addresses are valid and owned by the signatory of a transaction. Much of these are verified during script execution of the internal stack machine of the blockchain. Additionally a digest implemented as a hash of previous block is included in the next block for integrity of the blockchain. This makes the blockchain tamper evident

In a way the state of the blockchain is determined by consensus process employed in the design of the blockchain. In general transactions modify state of variables and thus determine the next state. Depending on the blockchain technology this would include proof of work, proof of stake or for private blockchain will reduce to a commit function

Electronic ledger, the blockchain proper is a linked stack with the top element as the last block in the chain. This last block contains the hash of the previous block and the next block to be added on the stack will include the hash of this last block

In the event that the blockchain contains a software program then it presents an autonomous application that responds to function invocations. This is a smart contract which lives on the blockchain with an address and knows about money

The Stamp.Africa

The concept is to unite two trust architectures of domain name system, DNSSEC, and blockchain to address online challenges faced by the newest emerging cyber communities in Africa. The community of interest is the domain name ecosystem which is wide and includes all users of domain names in ccTLD registries and regional and city registries, registrars, technical service providers, web hosting providers, developers and e-commerce providers

A crypto currency token account address is associated with a domain by having resource records in the DNS. Trust is established in a DNSSEC signed domain that the account or token address is authorized and eliminates several vulnerabilities of falsified or wrong addresses or identities considering wide ranging applications

With the global rise in use of crypto currencies and blockchain Africa would not be left out. The inclusion of Africa in the global crypto currency industry would bring benefits of low fees, micro

payments, identification and would enable development of new token based applications by Africans. Stamp.Africa proposes that this engagement with crypto currencies are done in a more trusted manner on the Internet

In the meantime stamp.africa is addressing real payments issues in the domain name ecosystem in Africa of small cross border payments needing low fees

Stamp.Africa proposes to provide incentive for domain names that contribute to building trust in African Internet by storing their stamp token account addresses in DNS as resource records. A reward is added to the token account address on successfully resolving access to resource records containing account addresses. The domain contributes DNS service to build trust in African domain name ecosystem

The road map is to develop the DNS economy infrastructure by providing basic facilities needed for Stamp.Africa operation and to stimulate developers, registrants, registrars and registries to adopt the stamp and innovate with it

The initial work is the binding of domain names and token addresses. Other projects envisaged include:

Interface with registries and registrars, seamless payments for micro payments, payments, redemption of stamps and stamp exchanges in regional communities and countries to facilitate token market value, other applications based on the stamp.africa token. Stamps are at all times backed up by cost of domain in Africa and the Stamp.Africa token would be an economic measure of online business in Africa

Token sales and options

There is planned a pilot phase where participating African registrars for African registries (TLDs) would give rebate (discounts) to registrants in stamps to develop solutions and interest. The registrants in turn contribute software applications using stamps on their domains

Thereafter, there shall be three phases in obtaining stamps. There will be an application registration period when interested parties commit. This is followed by a pre sale period in which applicants redeem their lot of stamps at 40% discount. The final step is sales. The Stamp.Africa token is priced to purchase a domain in Africa initially at \$25.00

The duration of phases shall be publicly communicated in 2018