PHILCOIN WHITEPAPER

Version 2022-09-06

ABSTRACT

Philcoin aims to democratize access to WEB3 services by providing a secure, decentralized, low-bandwidth accessible digital ecosystem that enables multimedia communications and commerce for communities who lack access to affordable broadband.

DISCLAIMER

The Philcoin token should not be considered an investment, and it should not be used or purchased for speculative reasons. The Philcoin token does not give its holder any right to profits, and it does not represent any ownership interest. The Philcoin token is a digital asset that has value and utility solely within the Philcoin ecosystem.

PHILCOIN: A SECURE, DECENTRALIZED, LOW-BANDWIDTH ACCESSIBLE, DIGITAL ECOSYSTEM FOR MULTI-MEDIA COMMUNICATIONS AND COMMERCE

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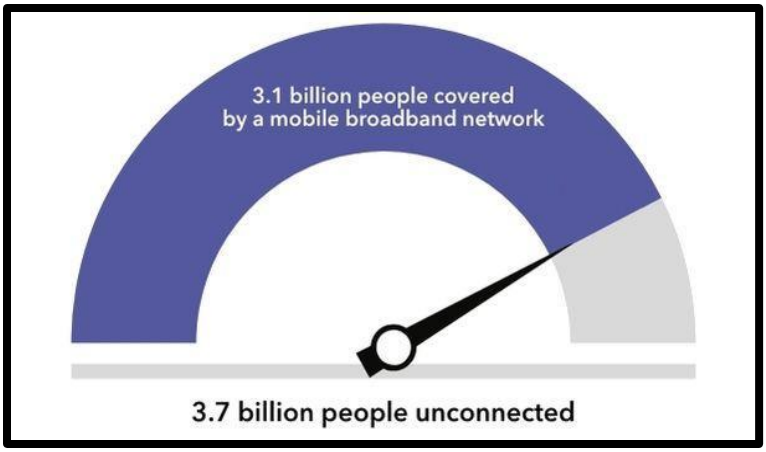
MISSION STATEMENT

PHL FOUNDATION INC. is a not-for-profit corporation dedicated to providing charitable relief of the poor and underprivileged who suffer general hardships due to insufficient access to network connectivity and bandwidth. The corporation aims to achieve this primarily through the design and delivery of a low-bandwidth accessible digital platform for multi-media communications and commerce at lower bandwidths than conventional networks, while preserving the security and integrity of user identity and network data.

THE OPPORTUNITY – BRIDGING THE DIGITAL DIVIDE

The economic disruption caused by WEB3 has been accelerated by COVID-19, and this is particularly relevant as the role of internet connectivity has shifted from luxury to lifeline. At the start of 2022, the global population reached nearly eight billion with over half living in urban areas.[1] Although more than half of the world has obtained internet access, nearly three billion remain unconnected.[2] This growing digital divide risks exacerbating exclusion, unequal concentrations of power and wealth, access to educational resources, and economic opportunities. Now, governments and the private sector are cooperating worldwide to develop digital infrastructure and access solutions that traverse gaps in connectivity.



The biggest barriers to broadband access today are coverage, cost, and security. Hosted by the World Wide Web Foundation, the Alliance for Affordable Internet (A4AI) has determined that meaningful internet connectivity requires daily access to 4G speeds where 1GB of data is priced at 2% or less of

[1]ENDNOTES

Kemp, S. (2022). *Digital 2022: Global Overview Report*. DataReportal – Global Digital Insights. Retrieved 13 August 2022, from https://datareportal.com/reports/digital-2022-global-overview-report.

[2] *The Digital Economy: Digital Infrastructure for All*. Intelligence.weforum.org. (2022). Retrieved 13 August 2022, from https://intelligence.weforum.org/topics/a1Gb0000001SH21EAG/key-issues/a1Gb0000001T5I7EAK.

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average monthly income.[3] Yet, according to the State of Mobile Internet Connectivity 2021 report from GSMA Intelligence, hundreds of millions of people may still not know the internet even exists. Nonetheless, progress is advancing to close coverage gaps and expand the impact of broadband. Although some form of coverage reaches nearly every person either via terrestrial or satellite networks, further effort is required to densify network coverage, increase capacity, improve affordability, and provide quality content.[4] To further facilitate this transition, the ITU/UNESCO Broadband Commission for Sustainable Development has identified Seven Broadband Advocacy Targets for achieving universal connectivity by 2025.

[3] *A4AI Policy & Regulatory Good Practices*. Alliance for Affordable Internet. (2022). Retrieved 13 August 2022, from https://a4ai.org/good-practices/.

[4] *State of Broadband Report 2021: Geneva: International Telecommunication Union and United Nations Educational, Scientific and Cultural Organization, 2021. License: CC BY-NC-SA 3.0 IGO.* Retrieved 13 August 2022, from https://www.itu.int/itu-d/reports/broadbandcommission/2021/09/13/executive-summary/.

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Costs for broadband connectivity extend beyond infrastructure development to access. In developed markets, high-speed broadband subscriptions increased significantly during the pandemic and 4G compatible mobile devices became more affordable. In developing economies, however, broadband streaming and 4G devices are still prohibitively expensive. Even when average prices for 1GB of mobile data at the national level fell below 2% of monthly GDP per capita as set out by the Commission, the lowest income groups in these countries often remain excluded.[5] For example, stories have emerged of the difficult choice these people have to make between food and internet data, "including that of a mother in the Philippines who has to choose between two kilos of rice for her family or one week of data to support distance education."[6]

While coverage and cost are of paramount importance, ensuring trust, security and confidence online is likewise necessary to encourage users to join the digital economy. In particular, the increase of cybersecurity incidents grows more concerning and requires more attention, such as large-scale attacks on critical infrastructure and issues of targeted misinformation that undermine public trust and civility. Likewise, engendering trust in digital ecosystems requires assurance that digital identity solutions preserve an individual's right to privacy and control over their own information while preserving access to data-driven solutions.

Blockchain is a core internet backbone technology that supports a more transparent and accountable network, and it has the power to radically expand the bandwidth sharing economy. Traditionally, bandwidth sharing occurs in the ISP business model where a certain amount of bandwidth is bought and resold a few times to the end-user. To bring down the cost, this model relies on the purchaser not using all of their bandwidth, leaving margin for others to be shared. Nonetheless, even this model can be too expensive, and it introduces concerns around privacy and security. As further explained below, PHL Foundation Inc. aims to resolve these problems. by democratizing access to WEB3 services for communication, commerce, DeFi, education, and entertainment.

[5] *Ibid.* at 23.

[6] *Ibid.*

THE SOLUTION - PHILCOIN ECOSYSTEM

PHL Foundation Inc., called "**Philcoin**", uses proprietary technology to create a peer-to-peer shared mesh network for broadband infrastructure that will democratize access to WEB3 services for communication, commerce, DeFi, education, and entertainment. With philanthropy as a core value, Philcoin intends to stimulate sustainable economic development by facilitating the online dissemination of relevant trades and skills within communities of interest. What makes Philcoin truly extraordinary, however, is that it is designed to drive philanthropy through the development of **a vibrant digital economy of giving**; hence, the name *Phil-coin.* Philcoin encourages giving through three primary channels: earning, giving, and the Donor Advised fund. Users can earn Philcoins by engaging in identified common activities available within the growing ecosystem such as online chat and e-commerce. But, for users to unlock the Philcoins they have earned, they must first give away half of those Philcoins to someone else. Hence, Philcoin naturally encourages philanthropy. Moreover, this Philcoin has committed to contribute 1 Philcoin for every transaction greater than 100 PHL to a Donor Advised Fund (DAF) established in support of the UN Sustainable Development Goals (SDG). For this reason, Philcoin has been selected as the first digital asset in partnership with the SDG Impact fund to further such charitable efforts.

The Philcoin ecosystem is a scalable network that integrates international development standards as a matter of core purpose. Conceived with inclusivity in mind, this ecosystem is comprised of four primary components: PHILCoin , PHILApp, PHILChat, and PHILMesh.

PHILAPP

PHILApp is intended to be a ground-breaking, all-in-one portal for accessing internet-delivered communications, commerce, education, financial services, media, entertainment, and more. The PHILApp will offer incentives for all users which utilize the ecosystem services, or help to maintain the network by providing resources. As its community of active users grows into its functionality, its purpose will be brought to bear through a number of DAF-backed philanthropic initiatives.

PHILApp is a decentralized application (dApp) built on the Binance Smart Chain (BSC), accessible only via mobile application available on Google Play and the App Store. BSC empowers users to build dApps and digital assets on one blockchain. Philcoin selected BSC because it is compatible with Ethereum Virtual Machine (EVM), uses PoS consensus authority, provides easy cross-chain transfers with BNB, and boasts block times of ≈ 3 seconds. In addition to efficiency of transaction reconciliation, the cost of transactions performed on the BSC is radically cheaper than Ethereum.

Because Philcoin is its own unique ecosystem, it requires its own token protocol with specially programmed functions to enable users to access Philcoin services as contemplated for its purpose. Philcoin's proprietary technology supports function at low bandwidth over both cellular and Wi-Fi, and so is specifically designed for developing economies and rural areas.

PHILCOIN TOKEN

The native cryptographically secure fungible protocol token of the Philcoin network (**Philcoin**) is a transferable representation of attributed utility functions specified in the protocol/code of the Philcoin network, and which is designed to be used solely as an interoperable utility token thereon. Philcoin is a functional multi-utility token compatible with the ERC-720 protocol that facilitates user transactions on-network. The goal of introducing Philcoin is to provide a convenient and secure mode of transaction between participants who interact P2P within the ecosystem on the Philcoin network without any intermediaries such as centralized third party entity.

Philcoin is not, and is not intended to be, a medium of exchange accepted by the public (or a section of the public) as payment for goods or services or for the discharge of a debt; nor is it designed or intended to be used by any person as payment for any goods or services whatsoever that are not exclusively provided within the ecosystem. Philcoin does not in any way represent any shareholding, participation, right, title, or interest in PHL Foundation Inc., its respective affiliates, or any other company, enterprise or undertaking, nor will Philcoin entitle token holders to any promise of fees, dividends, revenue, profits or investment returns, and is not intended to constitute securities in any jurisdiction. Philcoin may only be utilized on the Philcoin network, and holders of Philcoin carry no rights, express or implied, other than the right to use Philcoin as a means to enable usage of and interaction within the growing Philcoin ecosystem. Any secondary market availability of Philcoin is not dependent on the efforts of the Philcoin development team, and there is no token functionality or scheme designed to control or manipulate such secondary pricing.

Philcoin provides incentives to encourage users to exert efforts towards contribution and participation in the ecosystem on the network, thereby creating a mutually beneficial system where every participant is compensated for its efforts and contributions. Philcoin is an integral and indispensable part of the Philcoin ecosystem because, without Philcoin, there would be no incentive for users to expend resources to participate in activities or provide services for the benefit of other users on the platform. Because additional Philcoin will be awarded to a user based only on that user's actual usage, activity and efforts made on the Philcoin network are proportionate to the frequency and volume of transactions. Conversely, users of the Philcoin network and/or holders of Philcoin who do not actively participate or contribute will not receive Philcoin incentives.

As the native unit of account on the network, Philcoin will be utilized for all services and transactions within the ecosystem. Users may earn rewards for utilizing services and for providing resources that maintain the integrity of the PHILMesh network. For instance, as users engage each other with PHILChat, users may simultaneously stake Philcoins to maintain and reinforce the network. In the initial stages of ecosystem development, Philcoin rewards will be given to the early adopters who participate and help to promote the ecosystem. Those who utilize Philcoin's suite of services and who stake to maintain the network will be further rewarded with Philcoin. As the Philcoin community grows and transactions increase, the more utility functions will be developed and deployed within the Philcoin ecosystem.

PHILCHAT

PHILChat is essential to the overall ecosystem as the synergies it offers facilitate growth and uptake of the platform, and it could offer an avenue for effective deployment of philanthropic outputs. However, it is also essential that this function offers a pristine user experience for its role as a catalyst to be effectively fulfilled. For this reason, PHILChat was designed with several features that place it in a strong position in a competitive communications market.

For instance, PHILChat allows for high quality chat with a reduced strain on telecom resources – a definite advantage in developing communities. The decentralised nature of PHILChat will deliver a host of additional features – addressing privacy and security concerns, for instance. These elements would further encourage its world-wide adoption as they are of global appeal. Another facet of PHILChat is the potential to stake tokens while utilizing the services normally, thereby earning rewards for utilizing services and for providing resources to maintain network integrity. For instance, as users engage each other with PHILChat, they may simultaneously stake to maintain and reinforce the network. The communication platform is a core element of the Philcoin ecosystem as it facilitates an increase in transactions which results in greater utility and philanthropic efforts. It could also prove to be a vital tool in the actual deployment of eventual DAF-backed initiatives that are intended as a result of these philanthropic efforts.

PHILChat Features Overview

As further described herein, PHILChat incorporates several impressive features.

- *Protection from 3rd party interception:* PHILChat encrypts the entire transmission of your content and metadata, from start to finish, and during transport.
- *Information Security:* PHILChat servers carry no user communications, and there is no scope for collection or access to your personal data, thus eliminating the possibility of monitoring, intruder entry, or backdoors leading to data theft or abuse.
- *Security from server hacking:* The app refuses to collect big data and doesn't keep any user data on any servers.
- *Low data usage:* Optimizing bandwidth usage on transport level SCP delivers crystal clear voice quality even on 10kbps networks. Thanks to the lost packet recovery smart algorithm, PHILChat operates well even with fluctuating and unstable internet connectivity. Another advantage of SCP is that it consumes 6x times less data than conventional messaging systems.
- *Fast messaging:* Send messages, record voice and video messages, share photos, videos or any other files with ease – no need for Wi-Fi or high bandwidth.

Streaming Control Protocol (SCP)

PHILChat is powered with Streaming Control Protocol (SCP) – a new data transport protocol developed by PHILChat engineers. SCP powers the application with the fastest encrypted messaging and file transfer in the market, high quality audio and video streaming at low bandwidth consumption rates. SCP is an innovation in data transfer technology built around the concept of 5G and has several conceptual differences compared to other data transfer protocols.

- SCP has reduced supplementary transport data packets by about 25%. It can be compared to a truck with a lighter trailer. If your truck can transfer 40 tons of cargo and your trailer weighs 10 tons, then you can transfer 30 tons. But if you're using a trailer with lighter materials that weighs only 7 tons, you can carry 3 tons more cargo. A similar concept applies to SCP.
- Unlike TCP protocol, SCP does not need to wait for acknowledgement of each sequential data packet. Instead, it uses its own lost packet recovery smart algorithm.
- SCP uses smart Internet channel for data transmission.
- Fast and smart recovery for lost packages.
- Internet Channel Quality-Adaptive system.
- Fully codec-independent platform.

Security and Encryption

Leveraging SCP technology advantages, PHILChat encrypts the entire transmission of user content and metadata, from start to finish, and during transport without compromising transfer speeds or privacy. PHILChat architecture utilizes the Zero Trust Security concept: no sensitive data is stored on PhilChat servers; rather, all user messages and files are stored only on the user's devices. If the peer is offline and the system has to temporarily store the message or file for later delivery, such data is stored in unreadable format. All encrypted data packets will be assembled and decrypted only when the packets arrive at their destination, upon which all temporary stored components are cleared from server nodes to eliminate the risk of unauthorized monitoring, intruder entry, or backdoors that could lead to discovery of personally identifiable information.

- *Transfer Security:* With no central intermediary servers, all encryption and decryption, as well as file dividing and rejoining, happen directly on the devices, not on any servers, without any third party interception.
- *Encrypted proprietary handshaking mechanism:* Used for encrypting authorization and session key exchange (encryption algorithms: RSA-2048).
- *Dynamic channel encryption:* Used for encrypting each session between the client apps and the server ensuring the security of data transport (encryption algorithms: RSA-2048, RC4+)
- *End-to-End encryption.* All files are End-to-End Encrypted on the sender's device, and only the receiver has the decryption key for the file. PHILChat never has the decryption keys. Encryption algorithms: AES-256, Curve25519, ECDH, HMAC-SHA256).
- *File Division for Added Security:* For stronger security, transferred files are broken down into multiple pieces, randomized, and all separately End-to-End Encrypted.
- *No Copies Saved on Servers:* When you send a file on PHILChat, your file goes through a temporary repository, and when it reaches the receiver, it is auto-deleted from the temporary depository forever.
- *One-time Secure Paths:* All files being uploaded to the temporary repository are sent via one-time secure paths. And when downloaded, they're transferred once again with new one-time secure paths.

- *Transfer Speed & Fault-Tolerant Architecture:* Due to SCP conceptual architecture, file transfer speed is at least 2x faster than any other messenger solution in the market, and the lost data packet recovery smart algorithm ensures that temporary interruption of connectivity does not cause file transfer failure. Rather, the transfer resumes once the connectivity is restored.
- *No File or Size Limitations, Flexibility of Compression:* The technology does not limit the file transfer size nor the format. Depending on configuration settings, files might be compressed at a given rate or sent without any compression.

Serverless Audio and Video Streaming

PHILChat streaming is powered with PHILChat SCP protocol to ensure serverless streaming architecture, low bandwidth consumption, lost packet smart recovery algorithm, and adaptive audio/video codec. When a call is initiated, the signaling system authorizes the session establishment between peers via Signaling and Media gateway servers hosted on the user's data centers. When user B accepts the call, the streaming goes from user A App to user B directly and without any server interception. The session between two users is always encrypted, as well as the session from PHILChat for Signaling and media gateway and back during call initialization.

- *Voice Calling Bandwidth:* Minimum download/upload speed 10kpbs with recommended download/upload speed 50kbps
- *Video Calling Bandwidth:* Minimum download/upload speed 70kpbs with recommended download/upload speed 1000/kbps

Platform Components

In addition to the above features included with PHILChat, additional platform components of interest will include:

- *Server instances can be set up:* On a user's servers - on premises hosted or on a rented cloud; or on the PHILChat private cloud cluster, referring to the user domain URL in all visible queries.
- *3rd party integrations via RestAPIs:* The platform supports RestAPIs in JSON format which can be used to exchange authentication data (Single Sign on), send bulk notifications to system users from a 3rd party system, add/deduct balance of the user/users, assign groups, switch on/off some functionality for the user etc.
- *Backoffice / Business Management console accessible through the web:* Stats dashboard, Broadcast notifications to users from different system profiles, user management, broadcast groups, stickers upload, billing, as well as off-net calls management such as unlimited number of VoIP (SIP) gateway setup and routing, rates upload, retail rates markup setup, sales and expenses monitoring, off-net calls CDRs.
- *Configurable for 3rd party services:* Off-net calls, off-net IM, payment systems, OTP providers and other 3rd party services are configured during the initial setup. The users decide which provider to choose, based on their own business decision and preferences, bearing the full responsibility for the whole communication with 3rd service providers and further monitoring, billing and settlement of all 3rd party services. Available as an IOS, Android and Desktop application.

- *Encrypted Voice and Video Calls:* App-to-App calls including low data usage mode for data and WiFi and out-calls: App to mobile/landline over SIP configurable for 3rd party SIP gateways managed by user.
- *Encrypted Messaging:* Text messages for p2p chat with edit, reply, delete for everyone, forward, draft options. Voice message with auto recording in near- ear position, lock on recording.
- *Encrypted Files Transfer:* Any type and size of file transfer, view, download, share to external systems. PHILChat uses its own file transfer technology which works similar to streaming - dividing the transfer object into parts and sending in parallel tranches, which increases the speed at least 2x, compared to any available competitor in the market.
- *P2P Group Chat (for up to 1000 users):* Based on p2p technology. History is not stored on servers, seen and delivery statuses are available.
- *Sticker Store:* Customers can upload their own sticker packs from Console, and those will appear in the App Settings->Stickers section for users to download and use in chat.
- *In-App purchases setup for credit top-up:* Both iOS and Android platforms have in-app purchases which can be plugged into the apps to add credit to the user's account.
- *Stripe, PayPal, Braintree Payment Gateways integration:* While Credit top-up in iOS for out-calls (app to mobile/landline) is restricted to In-app purchases only by Apple policy, Android apps can add other payment gateways. We have standardised Stripe, PayPal, Braintree payment gateway integrations for Android platform.
- *Registration and Verification via email skipping SMS:* While the standard verification is through SMS, this feature will allow users to register providing only email, with the possibility to add and verify their phone number later. The feature will also allow sending the verification code via email for already registered users.
- *Animated GIFs:* Animated GIFs - add even more emotions and fun to your chat by sending and receiving animated GIFs. Tap the “smile” icon inside the chat and select the “GIF” section. You will see the trending GIFs. Just type and search GIFs by keywords, preview and send them. You can also save GIFs to send later.
- *Sign up and Verification via email and/or Appel/Google Single Sign On:* This feature allows users to sign-up with email or their Google or Apple account. Email sign up verification is done via One-Time-Password (OTP) sent to the corresponding email. After successful verification, the user can set their own password from their profile and use it for further authentication. Forgotten password recovery is done via OTP sent to the email, after which the user can set a new password. The module has an optional extension - add and verify a valid mobile number to make off-net calls. The number will not be visible in the contacts section and will be used only for App to mobile/landline calls. This module required a 3rd party Email OTP delivery service account, which should be provided by the customer.

Supporting Operating Systems and Technologies

- iOS supported from iOS 10+
- Android supported from Android 6+
- Web version supports browsers that support WebRTC, HTML5, CSS3
- Desktop version supports Windows 8+, MacO
- Applications’ features extended list

  - Audio calls (App-to-App) with adaptive codec
  - Video calls(App-to-App) with adaptive codec
  - Low Data Usage Mode for Data and Wifi
  - Adaptive audio codec
  - HD Audio/Video codec
  - Instant Messaging with custom emoticons and stickers
  - Animated Gif support (comes as an extra paid feature)
  - Edit/Delete/Delete for everyone sent Messages
  - Reply/Draft messages
  - Group Chat
  - Photo and Video files transfer
  - Any type of Files and Documents transfer without
  - Voice Messages
  - Sticker Store
  - Getting photos and videos from iCloud (only in iOS)
  - Transfer files from Google Drive (only in Android)
- Delete history after signing out
- Send and view locations
- Send and share contacts
- Search messages by contact and date
- Share from outside PHILChat app using iOS share mechanism (only in iOS)
- Voice message with the ability to lock the recording
- Bring the device to your ear and automatically record a voice message
- “Data Storage” settings and “Clear Cache” feature
- Pin the conversation on the Chats screen
- Mute notifications for both one-to-one and group chats
- Contacts integration (optional)
- Contacts synchronization (optional)
- Contacts blocking
- Local numbers recognition
- User Profile integration with Facebook
- User online status
- Balance view with multi-currency
- Referral/Virtual Networks(grouping) with user management control panel code
- Promo code - vouchers for credit top-up (only in Android)
- Change the UI language of the app
- Change the UI text size
- Change chat background
- Orientation for left-handed users
- Mute Notifications
- Display Bandwidth Consumption of Recent Calls
- Off-net Voice Out Calls over SIP with calling line identification (CLID) (for Telco
- configuration only)
- Off-net Callback Calls over SIP (for Telco configuration only)
- Off-net IM over RestAPI (for Telco configuration only)