



AMBROSUS

ROADMAP

Summary

In 2020, the Ambrosus team made massive and significant upgrades to its decentralized infrastructure and open-source network. The year also marked the completion of the token swap to the network's native coin \$AMB, signifying that Ambrosus will continue to operate independently as one of the world's most efficient Layer One Protocols, designed and built for the Internet of Things (IoT). In tandem, the momentum of awareness and adoption of Ambrosus across the industry has picked up at pace, despite these unprecedented times and accompanying challenges across the globe. In spite of these global challenges and unprecedented times, the team at Ambrosus remains committed to providing innovative and decentralized solutions at the intersection of blockchain and IoT, in a flexible and rapid fashion. The roadmap below provides a high-level overview of the ecosystem expansion and growth trajectory according to the previously outlined vision.

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Introduction:

The main Ambrosus Network - AMB-NET - has matured into an extremely efficient and cost-effective Layer One Protocol focused on IoT, industrial services and physical assets. AMB-NET is interoperable with Ethereum while it does not encounter high gas fees (something currently plaguing most Ethereum applications). A full suite of tools is available for developers or entrepreneurs on Ambrosus, including REST API, Software Development Kits (SDKs), AMB.to, and the hundreds of validator and storage nodes on the network. Meanwhile, the Ambrosus team continues to prepare a roadmap of steps and products to achieve decentralization amongst different aspects of the ecosystem, including a decentralized and open governance structure.

2021 in particular, is going to be an exciting and promising year for the expansion of the Ambrosus ecosystem, especially since the COVID-19 outbreak has caused a tumultuous year for enterprises of all sizes, and people across the globe. In fact, due to the enormous impact of COVID-19 on the world economy, some processes have not grown as rapidly as initially planned (consider for example oil price volatility in 2020). In response to these challenges, the Ambrosus team has adapted accordingly and put in a collective effort to continue its operations and maintain a significant footprint in line with other major industry disruptors. Looking back at the previous year and business development exclusively, we can conclude that Ambrosus predominantly worked with businesses from the food industry. Such industry related products include beef, honey, vanilla, mint, dairy products and coffee.

Technical Development:

In 2020, the technical team made significant progress on the core technology, including the Ambrosus Explorer “AmberEx”, AMB-NET, and its three types of masternodes: Hermes, Apollo and Atlas. New features were added, fixes were implemented and the user interface was improved. Moreover, additional fixes were implemented throughout the year as community members proactively recommended improvements. The technical team welcomes and supports the involvement of community members sharing their expertise and recommendations, which is facilitated on the Ambrosus [GitHub](#).

AMB-NET:

The Ambrosus Network (AMB-NET) has grown into a robust, fast and efficient layer 1 protocol. AMB-NET originally started off on Ethereum. After careful testing and iterations, the initial network of Ambrosus masternodes moved from the test environment to the native chain, already effectively using native \$AMB. Later, the rest of the ecosystem followed: 2020 marks the fully completed swap to the native token. In the coming year, the development team will continue to implement improvements. Suggestions and feedback from the community continue to be welcomed to further enhance the user experience.

Uniquely, Ambrosus' AMB-NET offers secure data storage in a decentralized network by efficiently collecting data input—assets and events—and storing them in a bundle. A bundle may contain up to 16,384 inputs, meaning the network's bandwidth is of grand scale: the amount of transactions per second is 10, which is a considerably low number compared to other protocols. However, due to the nature of AMB-NET's architecture—the bundle mechanism—it is an immensely scalable and decentralized network. A block on AMB-NET can contain up to 50 bundles. This means $50 \times 16,384 = 819,200$ assets and events per block. Importantly, a new block is generated each five seconds, effectively leading to a high throughput despite the aforementioned relatively low TPS.

AmberEX:

[AmberEx](#), Ambrosus' native blockchain explorer, has rapidly evolved into a full-fledged tool allowing users to quickly and easily navigate the Ambrosus Ecosystem. Additionally, Ambrosus masternode operators may use the explorer to straightforwardly view and pull data from any masternode using the corresponding public address. In light of maintaining and growing the network, the developer team also created the Ambrosus Whale Area. This online environment provides masternode operators with tools to work with their masternodes and ultimately have a say in the further development through means of governance tokens. The Whale Area and its preliminary governance structure will be released in Q2 of 2021.

2020: A Year In Review

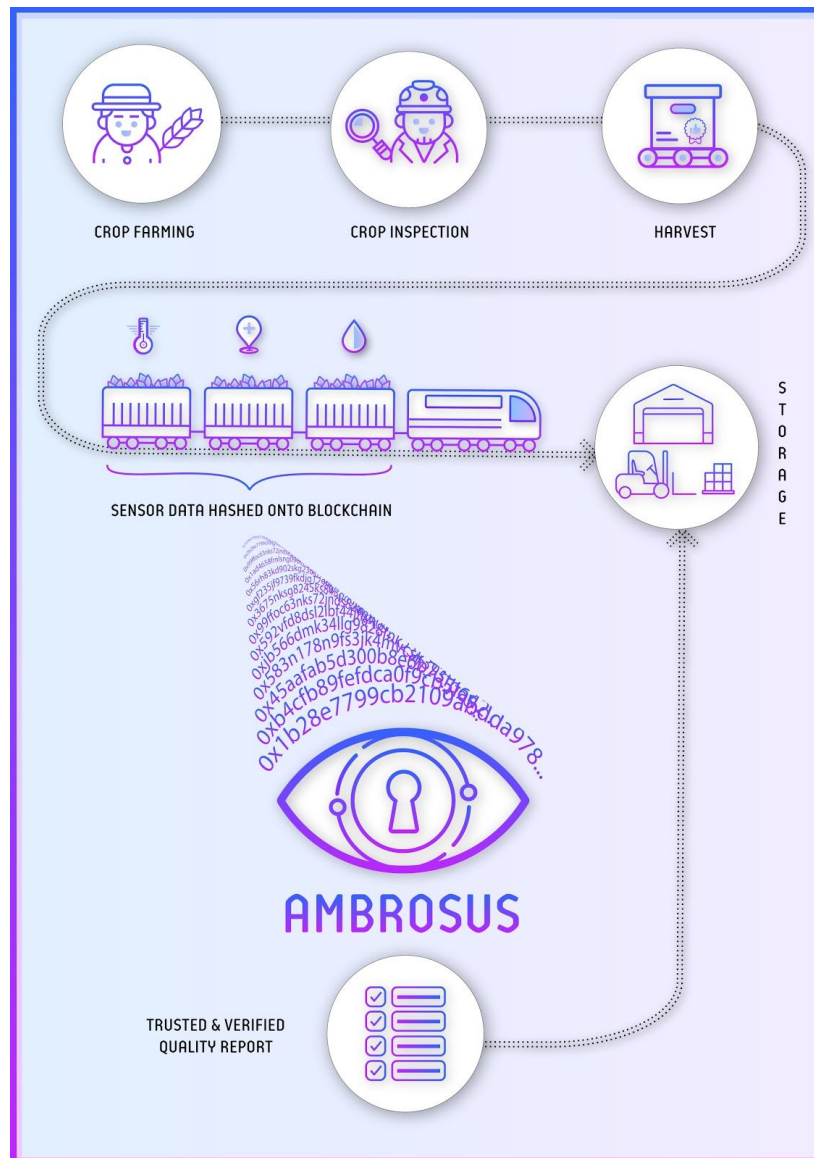
As previously mentioned, among other events, the major successes of 2020 revolved around the continued development and enhancement of the Ambrosus Network: Ambrosus launched several Hermes masternodes and clients started uploading data onto main-net. AMB-NET now provides secure storage and validation of data uploaded as a sophisticated enterprise blockchain service which will continue into 2021. Clients currently involved on main-net are surveyor companies uploading inspection reports and imagery of physical commodities and documents according to their business needs. Furthermore, there is activity from the coffee industry which will continue to develop in 2021. These operations run in parallel with other aspects of business development: Negotiations and pilot projects. As mentioned in the roadmap for the previous year, the Ambrosus team negotiated with Singapore and the United Arab Emirates regarding initiating sales and tender participation, as well as continuation of operations in Asia and expansion to the middle-east. The business partner from the UAE was impacted by business recession and oil price volatility as a result of the pandemic. This ultimately led them to change their strategy and started to attract investors globally. However, the negotiations with certain Singaporean entities continue. Furthermore, new LTE-M/NB-IOT + GPS sensors underwent rigorous field testing as a further line of development undergirding the Ambrosus Ecosystem.

Next, research from the business development team has evidently shown that Ambrosus' CRM and ERP solutions are of relevant and of high interest amongst other companies in this competitive industry. In order to maintain the advantage for both Ambrosus and (prospective) partners involved, it has been determined to refrain from mentioning partner names where ought to be necessary going forward. The following section will briefly shed light on activities that are in different stages.

This year, the head of business development, [Sergey Grygoriev](#) , will continue to work with pharmaceutical companies to integrate blockchain-based verification on Near-Infrared spectrometers so as to better control and guarantee the authenticity of raw materials and food products, using a number of different approaches including the prediction of quantified values such as protein, fat, pH, as well as Machine Learning to define the composition of a final product.

Ambrosus provides Chemometric Brain with the tools to consolidate testing parameters of different spectrometers across all manufacturers in a specific network. All data obtained from the spectrometers are processed through Chemometric Brain and stored on the Ambrosus Blockchain.

In addition to this, new opportunities are being explored with a large producer and exporter of crops. This project mainly revolves around paperwork automation between the respective company and their corresponding banks. Finally, a mutual project has been launched focussing on commodity levels measurement at silos. This project involves the development of a dApp and AMB-TRAC to ensure traceability for any type of goods.



Ambrosus remains open for partnerships with freight forwarding companies, marine container liners, quality control laboratories, and traders and farmers who tend to innovate their business

This continuous development comes at the heels of three public announcements during the course of the 2020 year: First with [Chemometric Brain](#), as explained above. Second, with [Avada Media](#). Third, [with QSS global](#). While QSS continues to utilize AMB-NET for inspection data uploads, Avada Media onboarded as the first CRM company on AMB-NET. With this initial partnerships proceeding smoothly, Ambrosus is excited to look ahead to the 2021 year and expand its services into further verticals.

Ambrosus is officially open for partnerships with freight forwarding companies, marine container lines, quality control laboratories, traders and farmers who tend to innovate their business, ensure quality and to automate processes with Blockchain technology. Ambrosus will continue to bring the burgeoning crypto-revolution to industrial processes and IoT starting points around the globe.

2021: A Look Ahead

From a high level overview, the main focus areas for 2021 revolve around quality assurance enterprises, data management tools and the continuation of cooperation with Surveyor companies. Looking ahead, there are four general directions for Ambrosus business development:

1. Cooperation with measurement equipment (sensors and IoT) manufacturers and service providers/decentralized data storage on AMB-NET.
2. Supply chain conditions traceability and proof of origin of goods.
3. CRM-, ERP-systems decentralization with AMB-NET.
4. All types of business ledgers transition to AMB-NET.

For all of these partners it is important to emphasize that AMB-NET is already fully developed and prepared to onboard *any of these companies, from anywhere in the world*. As such, growing out the Ambrosus Network is largely predicated upon effectively communicating the value proposition of the Ambrosus Network as a revolutionary emerging technology of the Fourth Industrial Revolution.

Cooperation with Measurement Hardware (Sensors and IoT) Manufacturers and Service Providers/decentralized data storage on AMB-NET

Several companies—IoT companies, sensor manufacturers, and measurement hardware manufacturers have suffered lower incomes and business targets as a result of the pandemic. As such, competitive maneuvers, and innovative product development has gotten more complicated and there appears to be a need for new types of solutions. The previous year was risky for strategic investments and Research and Development expenses for new hardware. The opportunity lies in synergy, combining the hardware from manufacturers with Ambrosus' software—AMB-NET, the Layer One Protocols - as a cost-effective and simple medium for IoT devices and applications.

Supply Chain Conditions, Traceability, and Proof of Origin of Goods

Ambrosus' unique selling proposition led to the development of a new project which functions as a sidechain of AMB-NET: Emerald Circuit. Emerald Circuit will lead the transition for sensing, intelligence and computing capabilities embedded into edge devices. Such devices currently lack robust security features. With Emerald Circuit, a strict methodology and standardization process is implemented for IoT devices. This sets a new trajectory for how data from the edge transmits information between devices in a secure and trusted manner. Ultimately, Emerald Circuit aspires to normalize and industrially scale how physical devices interact with clouds and IT platforms which support this specific IoT Standard.

Furthermore, the team will continue to unite all supply chain actors on AMB-NET. The idea is to provide complex supply chain automation service for large businesses and SMEs with decentralized validation and storage of all data on AMB-NET. As the mother-chain, AMB-NET will soon support the most cutting edge IoT focused ecosystem in all of crypto. Emerald Circuit will play a fundamental role in fostering the transition to secure, fully encrypted IoT devices.

CRM-, ERP-systems and Decentralization with AMB-NET

As a result of the pandemic, the total purchasing power of the global market has fallen. At the same time, businesses have been forced to reduce costs and optimize their operations. The moment now presents itself where the actuality of business process automation became a crucial operational element. Ambrosus partner Avada Media is one of the leading CRM-system integrators. This case study is a small sample of the opportunity available for Ambrosus: Any type of CRM, ERP, mobile app, or desktop application can seamlessly connect to AMB-NET for a better future in decentralized data management. Leveraging this partnership with Avada Media, their customers can find mutual blockchain services on the [website](#), with AMB-NET being the main protocol offered.

Overall, the benefits of digitization and decentralization have become even more apparent during challenging times especially as it relates to enterprise resource management, and product distribution. Not only has data submission and storage become more robust; but companies are also looking to save money as fewer working hours are required.

All Types of Business Ledgers Transition to AMB-NET

This is a new and emerging opportunity for AMB-NET. With banks increasingly interested in the crypto industry, some have already started developing their own blockchain solutions. As such the need and demand for distributed ledger ecosystems grow by the day. In parallel, (local) governments have also been exploring and considering opportunities to connect their data to a distributed ledger.

Events:

The business landscape seems to have shifted more towards digitalization and developed a need for digitization at the same time. In context of such developments, the Ambrosus business development team is searching for online events to attend. Aside from attending and presenting at private business seminars, the team also kindly invites you to suggest events you believe that matter. You can leave your suggestions at info@ambrosus.com or connect with us on [Telegram](#).

Entrepreneurs and AMBassadors:

In the previous year the Ambrosus team initiated the Ambrosus entrepreneurs and ambassadors program. This program is a rolling initiative where the team continues to engage with the community to explore and leverage business opportunities and community action points. In the coming months, Ambrosus looks to ramp up these efforts in parallel with its long-planned [Deploy 2021 strategy](#).

Website:

The Ambrosus team will be migrating Ambrosus to a new, enterprise oriented website. This decision was made by the Ambrosus core team in an attempt to better position Ambrosus for business engagement in the long term. These design changes are the result of testing and feedback from the business team, and in response to client partners and possible partners in the past year.

Overall, the Ambrosus business strategy for 2021 is to create a foundation for developing decentralized applications across enterprise, IoT, emerging technology, and native crypto solutions. With support from the Ambrosus community, an enterprise friendly website, and the further development of Ambrosus IoT solutions, it is the hope of the Ambrosus Team that AMB-NET can become a home for decentralized data management solutions.

Ambrosus Technical Roadmap:

The following roadmap outlines a technical development plan for the Ambrosus Ecosystem that promises to make it both more user-friendly and decentralized. These technical developments are the foundation for a robust development and integration strategy of the Ambrosus Network with and beyond the crypto-sphere. Notably, the proposed technical roadmap of the Ambrosus Ecosystem is all-encompassing and touches upon significant updates to the different nodes on the Ambrosus Network, the future of Governance on AMB-NET, and the integration of Ambrosus with Ethereum's DeFi marketplace.

Part 1: General Updates

Amongst the updates to come this year, there are a few general updates to be mentioned before we dive deeper into more specific segments of updates. First, a security update will be implemented. This includes an encrypted private key password for an additional layer of security for masternode operators. Furthermore, amb.to, the asset explorer application will be revamped with a brand new UX/UI design. Next, a new Hermes client will be onboarding. This includes the set-up of the Hermes node, development and set-up of the client dashboard and a custom API to allow the Hermes to connect with the client's middleware for seamless data transfers. Additionally, as was introduced previously, users will be able to connect their ledger wallets to metamask for additional means of communicating with AMB-NET. Finally, Ambrosus masternode operators will receive additional tools as well. Upon request, users may soon be able to use the masternode operator area and node monitoring and owner notification service. This allows for an even more efficient way of monitoring and managing Ambrosus masternodes.

Part 2: Masternode Enhancements Within the Ambrosus Ecosystem

Ambrosus is an open-source and permissionless network, that incorporates three types of nodes into its network: Apollo masternodes, which function to validate blocks on the Ambrosus blockchain, Atlas Masternodes, which validate storage data uploaded onto the network, and

Hermes masternodes which function as a means for enterprises and individuals to upload data onto the network.

Apollo Masternode Planning: The Ambrosus Team intends to update Apollo nodes from its original and older Parity version, to a more recent and robust OpenEthereum Version. This version is faster, lighter, more stable, and better secured.

Atlas Masternode Planning: Two important updates are planned for the functionality of Atlas Masternodes:

(1) First, a *Bundle Integrity Check* will be added into Atlas functionality. This integrity check allows for any user to ensure that the data contained within the bundle remains intact. From a larger perspective, this update is essential for guaranteeing data immutability on AMB-NET, as currently bundle contents can hypothetically be changed in their respective off-chain databases.

(2) Second, a *Bundle Contents Restore* function is scheduled to be built into Atlas nodes. This will allow Atlas Masternodes to automatically request missing data from other Atlas masternodes sheltering the same bundle, if an integrity check has ensued and it is found that certain contents of that bundle are missing. As a result of this upgrade, an Atlas masternode will be able to restore the integrity of data in a particular bundle to its respective database.

Combined, these two upgrades hold the promise of bringing added security, decentralization, and transparency to data handled on the Ambrosus Network.

Hermes Masternode Planning: Hermes Masternodes were open-sourced this past year, in order to bolster access to uploading data onto the Ambrosus Network. In the coming months, The Ambrosus team will further develop the Hermes masternode by building in *documentation on all components that have been updated*. From its original design in 2016, many components and functions of the Hermes masternode have become outdated, poorly outlined, or missing. The Ambrosus team intends to review and supplement these facets, to enhance the current node state for enterprises and entrepreneurs alike.

Part 3: Engagement and Integration of AMB-NET With The Crypto-Verse

The second set of planned upgrades from the Ambrosus Team revolve around embedding the Ambrosus Network into larger developments in the crypto-verse. This specifically refers to: (1) Making the Ambrosus Explorer more advanced, easier to use and more efficient to navigate. (2) Creating an Amber token replica for DeFi applications on Ethereum, known as *Synthetic Amber*. (3) Moving to implement an open-source and token denominated governance structure of AMB-NET.

A Usable and Accessible Explorer: AmberEX. A number of enhancements have been planned into the Ambrosus Explorer in the coming year, with the hope of making the network more user-friendly and accessible to anyone. Planned upgrades include:

(1) A revision of Transaction Database Indices for View from within the Explorer: Existing indices will be reviewed, with unnecessary ones being removed. This is in large part due to storage limits on Mongo Databases. While they are limited to 32 indices, the Ambrosus Team has currently used 28, and expects to quickly reach that limit. In addition, for the best performance of Mongo Databases, it is recommended to only use half of the total capacity (15 - 16 Indices). For that reason, the Ambrosus team will seek to optimize transaction Database requests so as to open up more storage and make the entire functionality of the database more fluid.

(2) A Display of Internal Transactions: Currently, some parts of transactions visible on the Ambrosus Explorer contain data that is not visible to the general public. This data may relate to costs and rewards on the network to different stakeholders or operators. As an update, the Ambrosus team intends to *segregate* and *make visible* such transactions for added transparency to the entire network.

(3) Smart Contract Code Uploads: In order to allow network users to have quicker and easier access to Ambrosus Smart contract code, the Ambrosus team intends to convert contract creation code into contract source code. This will make contracts (1) More readable to any developer or user on the network, (2) More accessible for anyone interested in getting an

overview of the various contract functions. This will be done by assembling a ‘database’ of smart contracts uploaded and synchronized to the explorer.

Overall, these adjustments and improvements to AmberEx will make the explorer optimal for faster result requests, platform engagement, and network transparency.

Bringing Synthetic Amber Across Chains: Synthetic Amber is the ERC20 equivalent of native Amber. Synthetic Amber is planned on being implemented and capable of being transferred across the AMB-ETH Bridge in order to allow Ambrosus Users to utilize Amber in different DeFi functions and protocols currently live on Ethereum. This upgrade has the potential of not only bringing Amber to the world of DeFi, but it also provides a basis for creating native Amber DeFi solutions as well, on top of AMB-NET.

A New Era of Governance on AMB-NET: A final planned upgrade for the Ambrosus Ecosystem is to effectively decentralized governance over the Ambrosus network to the larger Ambrosus community of token holders and node operators. This governance structure will be mirrored off of other governance structures in crypto (i.e. Uniswap, etc.) and will be primarily denominated according to the amount of Ambrosus coins (\$AMB) held by users.

A New Year With Many Upgrades in Store

This year the Ambrosus Team will continue to iterate and position Ambrosus as a premier blockchain-IoT network. With multiple advancements planned for it’s core distributed infrastructure, the intention of the team is to make the network more transparent, efficient, accessible, and ultimately integrated with larger crypto trends.

Conclusion:

Ambrosus has continued to develop at the intersection of blockchain and IoT. In spite of a tumultuous and unreliable year due to the COVID-19 crisis, the Ambrosus team has continued to build Ambrosus into the future of industrial product management: As a solution for CRM, ERP, and IoT solutions. In addition to these developments, the Ambrosus Ambassador and Entrepreneur program launched and the Ambrosus community remains strong with hundreds

of nodes on the network. Looking to the future, Emerald Circuit is positioned for launch bringing the first side-chain network to AMB-NET, while the technical team remains highly committed to growing and improving the Ambrosus Network across the different masternodes involved.