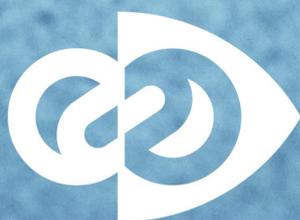


# WHITE PAPER



**etherna**  
EYES WIDE OPEN

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## 1 Abstract

Ethernal is an access bridge to decentralized multimedia contents, based onto web 3.0 technologies.

Ethernal is a visual creativity oasis for those who believe in freedom of expression in all its form.

Ethernal main scope is to offer a simple, scalable and accessible, open decentralized video platform to everyone.

Open video platform means that the company adopt open source by default, but also an open data philosophy. The source codes, but also the databases, will be accessible to everyone, and this is possible with adoption of Swarm technologies.

Ethernal is a place for everyone who wants to be far from the advertising dynamics supported by algorithms.

Ethernal offers a service in which users are users and not products. Because if you do not pay for a service, YOU are the product.

Information on Ethernal is free from any manipulation or indirect management. Users' data won't ever be sold, possibly even not collected.

Users and creators are valued and respected from Ethernal as people.

In this paper the author provides an overview of what Ethernal platform will be, and how the team intend to develop a new kind of video platform based on concepts of Web3.0.

In this paper, also the main Ethernal architecture is described as main design decisions behind it.

## 2 Introduction

In the past century the information, the culture and the art were somehow defined by medium communication instruments. Except for government supported media, almost all producers of media contents were dependent by sells of contents and/or advertising.

The new century began with internet, a new way to distribute information and the feeling of freedom for many kinds of content expression stroked the people like a tsunami.

Computer networks could finally put people in direct communication with each other, they could exchange ideas and above all they could draw on different, discordant opinions. They could compare them and make their own opinion. Blogs existed, chats existed, the first hacker philosophies and manifestos were born.

The web 1.0 moved to social era and the "free internet" concept quickly became fuzzy: the meanings of free and gratis had been confused.

To deepen the confusion, it is known the common saying according to which in the web 2.0 costs of storage of information and bandwidth are managed by service providers. Service providers business model considers capitalizing huge numbers of web visitors selling tracked advertising. Thus, people using Internet are not users but products.

Last sentence means that the web is no longer built to meet the needs of the user people, it is modeled to maximize the conversion to purchase a product. In fact, some arguments, such as "politics" or "covid" to use topic examples, are not very popular with advertisers, who do not like to be associated with contexts that trigger "negative" feelings in the minds of visitors. Consequently, it happens that these contents will not have paying advertisers and will not be remunerative for platforms. Moreover, advertisers don't even like to be represented alongside content that talks about these topics, therefore they will push for the platforms themselves to adapt to their will, penalizing anyone who publishes unwanted material.

If a service is not paid by money by us, somebody else is doing that somehow. Once identified how a service is paid, we just need to know if the cost, our personnel cost, has the right relationship with the value of the service.

Bigger centralized media containers are also taking us back to the situation we had when televisions and newspapers were dominating the scene. Current information is influenced by the same interest as in past, except that content is now much better integrated on us.

In few words: advertising interest drives information over internet.

To define a solution of advertising influence it is necessary to begin to understand that nothing is for free, even online.

The awareness of a problem often gets grow up various ways to deal with it.

Privacy knowledge is evolving the consciousness about personal data value and many countries in the world is defining laws for privacy protection.

In the meantime, communities of developers are working onto the blockchain technology in which people get used to pay for services with network transaction fees.

Moreover, people are becoming very annoyed by advertising excess; indeed, more than 65 million people downloaded ad-block software in 2020. It is a number in constant growth during years. According to PageFair<sup>1</sup> and Adobe in 2015 there were about 198 million users worldwide who were already blocking ads. In 2016, the number grew by 41% globally, while the growth rate in the United States was 48%. In 2020 In the US, an estimated 40% of adults block online ads on PCs or phones.

To definitely rid information and art from advertising influence the only way is to let people directly pay for them.

Big entertainment service companies already understood that, and they ask a periodic fee to see films without advertising interruption. It works, people appreciate it. Moreover, people are understanding the value of data.

Information is today mostly multimedia based. The solution currently missing into the market is a multimedia platform free from every other kind of indirect information management. A solution in which users are users and not products.

Ethernal solves these needs basing the proposal onto the Swarm<sup>2</sup> protocol, based on Ethereum blockchain, giving to the user a transparent service. The users will pay the storage and bandwidth cost plus a margin for creators and the margin for the service platform.

## 2.1 Project origin

Ethernal started trying to solve two big issues. One related to most part of creators that was demonetized and obscured. The other one, at list as important as the first one is the preservation of personal data.

Moreover a third advantage was added to the project: the greatest transparency to guarantee impartiality of results.

Ethernal offer a multimedia platform that is not based on advertising, but on the paid use of content without those constraints that hinder the free creativity of those who create, and the desires of those who want to have full faculty of what they choose to see, without having to submit to an algorithm of convenience of others.

Ethernal is a new video platform, a platform free from the slavery of advertising and all its restrictions. A more transparent platform for its users. A platform in which every artist, every independent journalist and why not, companies can feel valued their creation.

Ethernal will manage videos uploading them into web3.0. Technically, there is a decentralized network, called Swarm, which receive content data. Ethernal cannot censor any uploaded video content because it is hosted in the Swarm p2p network. It means that knowing direct link/hash on contents, they will be always reachable. Anyway, the dApp will propose a default index of content to offer legal stuff discoverability.

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<sup>1</sup> <https://marchewebmarketing.it/wp-content/uploads/2019/10/PageFair-2017-Adblock-Report.pdf>

<sup>2</sup> <https://www.ethswarm.org/>

Moreover, there is no advertisement on content. The company does not want to sell to anybody any kind of collateral product. There are no incentives to manipulate weights on results, and in any moment, everybody will be able to inspect our index database, and be sure that Ethernal is not cheating.

And, last but not least, if anyone is not happy with our index... he will be able to open his own totally independent instance. Code will be open source! On web application, there will be an option for switch our default index with another totally different, and out of our control. No problem, go and build your own index. This is freedom!

So yes, creators will be able to release their creativity and offer it to the world and final users will decide if a creator deserve to be paid.

Moreover, for the same number of views, creators may gain more with Ethernal than with other platforms.

It may be considered as an aim of the project, the opportunity that with our service every people will be able to learn the real value of information.

## 2.2 Data value

Into a world context where privacy is always more important, if not vital in some cases, Ethernal does not want to collect any private user data. Ethernal will never makes business over them. With transparency Ethernal will never be able to manipulate results, or to practice censorship with shadow ban of contents. But, aside of this, Ethernal also understands the importance of a moderated platform, where anyone can be safe to navigate without risk to being exposed to unwanted contents. Trying to conciliate these two "apparently irreconcilable concepts" of censorship resilience and content moderation was developed the idea of composable Indexes, which will see more in depth after.

The team knows that blockchain technologies are difficult to be understood by "common people", and that these have currently severe issues of scalability. Keeping the service totally oriented to web3.0, we have designed our architecture for be accessible to everyone, even by users coming from web2.0, and for avoid any dependency on blockchain tx throughput, basing instead our scalability on the Swarm platform, which involves totally different concepts.

Ethernal believes that data is a direct product of an individual's labour and as such has direct economic value. Its owner must be fairly compensated for the use of this value if the individual chooses to sell his/her data.

The amount of compensation should be based on a free agreement by both sides and a transparent, comparable pricing system that doesn't seek to exploit the other side. This creates benefits for everyone involved in the process. Recognizing data as labour is also a prerequisite for a balanced influence.

There will always be the possibility to maintain the privacy of personal data.

Ethernal aim is to keep minimal user's personal data, possibly no one. The value of the service will not be paid with data but directly by user as in money as in other services.

Thus, the service users can improve the awareness of the value of their personal data as of the service.

## 2.3 Towards the Web3.0

Internet has acquired a fundamental role in the life of the individual. With the Internet people learn news, form ideas, buy products, share thoughts, work, enjoy entertainment.

Internet somehow affects everyone. The hyper-connection to which we are subjected assists us in the various tasks in our day's life. It helps to easily have an answer just clicking away. On the other side it means that with the progress of time we become more and more dependent on the contents of this great global network.

Large multinationals have been great innovators in the technology sector over the decades, they actually established themselves as market leaders. Big black boxes, often closed by not very transparent policies, are now able to analyze citizens' data and influence their habits.

The web has gone through various evolutions since its creation:

- Web 1.0: information for everyone. A search engine allows to find any needed information. Blogs born on any topic. Having a blog is complicated. To be able to publish it is necessary to have technical skills. Communication takes place anyway from a few to many
- Web 2.0: everyone create information. The dynamic web spreads. Large collectors of information generated by third parties born. Anyone can be a publisher. Communication becomes being many to many. However, the information is always controlled by the few collectors. Thanks to technological advancement, the web becomes more multimedia. Information is distributed in a different form from the text
- Web 3.0: everybody hold information. The limits of web 2.0 consist in the impossibility of directly expressing consensus on the rules that govern information collectors. With web 3.0 everyone becomes responsible of data maintenance and applications. There are no longer just a few centralized points defining the rules.

Using blockchain it is possible to guarantee a secure layer of consensus organization. Upon it is buildable a new Internet. Transparency, decentralization, and interoperability are the new pillars that govern information.

A change is not only desirable, but it is necessary. The blockchain from 2008 to today has given a first shake. Much more is arising. The culture of privacy is still scarce, but slowly it is also expanding. Tools for the decentralization of data distribution are evolving, and within a few years it will probably appear normal to use them. These new tools and implementation paradigms will define the founding principles of the upcoming evolution in the Web3.0.

### 3 Creator's Issues

- Creators are looking for a space where it is possible to express their creativity. Artists need the possibility of a place of expression that does not hide works not appreciated by the platform. This is regardless of the possibility of monetizing the views.
- Creators and free information providers are looking for a platform that truly gratifies their work in create contents, always and in any case, regardless of whether its content appeals to unspecified third parties.

Platforms based on ADS need to be as attractive as possible to its customers. These customers are not the users of the service (as we might instinctively believe) but the advertisers. They are interested in associating their brand to a certain type of video and target of user. Thus is a correct companies' policy the direct/indirect choice of creators. Only the ones which are always attractive for advertisers are interesting. The others are only a cost, for storage and bandwidth.

Tools such as big internet service providers (social networks, search engines, media contents distributors) are huge information aggregators. To be used "free of charge" they exploit the data of their users to make up their turnover.

It is always a valid rule that "if you don't pay for a service, you are the product".

These portals operate according to rules determined necessarily by the economic convenience of the stakeholders. The data of their users are often exploited to induce them to purchase, to influence their habits. Information is often manipulated for these purposes, acting not so much on the contents created but rather in a less evident way on the indices that affect its accessibility.

The idea of privacy is now weak concept. Users are willing to fill the web with their data to obtain a service provision. Companies' policies for the processing and retention of personal data are often not so respectful of what should remain private.

Advertising covers the web everywhere. Free services are everywhere, and to get positive revenues they are forced by filling their interfaces with unsolicited material, just to push the user into action.

More and more users install software such as AdBlock, to avoid being flooded with ads or tracked in navigation. However, this is penalizing especially small suppliers who have no way of surviving without advertising.

Current information is mostly distributed using videos. YouTube is today the most popular service for the enjoyment of online user-generated videos. It has a very important role in modern society hosting content of all kinds, aimed at all audiences.

Its business model involves the insertion of commercials within the uploaded videos. From these it derives its main profit. Its algorithms for selecting video proposals are calibrated in such a way as to maximize the time spent on the platform maximizing the advertising absorption time.

Unfortunately, more and more often we hear about services removing videos, shutting down entire channels, demonetization, shadow bans and other unpleasant situations.

"Demonetization" is the term which indicates that the creator will not receive any financial return from advertising while playing their video. It can also be considered as a kind of shadow ban.

The platform performs active checks on the content of the videos, removing the monetization of the videos whose contents are not appreciated by advertisers. Demonetization actually leverages the lifeblood of content creators. More and more creators are forced to self-censor their content, for fear of falling into demonetization, effectively limiting creative expressiveness.

The algorithms of selection of the welcome content operate in a non-transparent way. Sometimes channels are penalized with a total demonetization, with the removal of the video, or even with the closure of the channel.

Even videos containing only lawful material can be penalized in various ways because they have content that is unwelcome to the platform, e.g. when content talks about other platforms.

This creates the paradoxical situation in which a creator, to have his work recognized, must reformulate and reshape his contents, often at the expense of quality.

A continuous race for the "monetizable video", that is the one modeled on measure so as not to break any of the invisible rules of this perverse game and in which the real content takes a back seat, in favor of the saleability of its advertising spaces.

Political or opinion videos are not welcome by advertisers or third-party lenders, sometimes "hidden", who needs to sell products or ideas to everyone. This kind of information can be condemned to penalization, thus effectively implementing censorship that represents the opposite of a free web.

An indirect form of information censorship and control, which for us of Ethernal is inadmissible.

In Ethernal vision, what content platforms lack is the transparency on the management of the indexes of contents.

## 4 Ethernal Solution

Let's start an analysis of possible solutions to the problem of the influence of advertising. We start from the concept that we must forget that what we find on the web is free. It is never free. If you don't pay for a service monetarily directly, it is clear that you are paying for it in some other way, or that someone is paying for it for us. In the particular case of non-profit organizations that produce open-source code for the community, it is possible that the funders are benevolent users who decide to donate money to a just cause, even if this is not necessarily the case in every case. Once you have identified how you are paying for a service, the next step is to ask yourself whether the real total cost is worth the service you are using.

Ethernal believes that the evolution of personal awareness in terms of privacy can be a good lever in this direction. From the world of blockchain, where everybody is used to pay with transaction fees for the maintenance of the network, an excellent culture can emerge.

Distrust about the impartiality of any result having advertising in its inside and let us realize that a free society cannot allow the economic system, represented by advertisers, to determine the evolution of the conscience and education of individuals.

Users will return to being the only real customers of the platforms. To do this they need to understand, step by step, that to have a free service it is necessary to pay for it. Not necessarily that much, just enough to cover the value they would have paid individually in hidden costs, losing bits of personal freedom.

To solve the problem of advertising influences, the services must be paid for out of their own pockets by users, who in turn must decide to prefer the use of services that do not subject them to unsolicited advertising for the purpose of monetization.

The second problem, that's about the container's influence on the contents presented, can only be solved in one way: using the utmost transparency on the method of selecting content towards the end user. Here the question can be broadened a lot, and there are also important implications on the design of the business plans of the various companies. A future-oriented approach should aim as much as possible to open the details of its functioning to the outside world, at least in the most sensitive components. Much can also be done from a technological point of view, by encouraging the evolution and use of open and downloadable database systems, directly on raw data or through open API that allow them to query with a sufficient degree of implementation detail exposed.

People should learn to demand an openness of companies in this sense as much as possible and prefer services that guarantee a higher degree of transparency. The companies, on the other hand, should invest in the innovation of these technologies, prefer business plans that embrace the open-source mentality as much as possible. Thus ensure the absence of any alterability of the results for unknown purposes, facilitating the possibility of performing independent analysis on the same results as thorough as possible.

Another interesting problem that we are trying to solve with this attitude is about fake news propagation on the net. Currently on main networks they are managed with the imposition of the *ipse dixit* methodology, invoking arbitrary fact checkers imposing their opinion as global truth.

The Ethernal way to solve that issue is to ensure that everybody:

- can always have access to a plurality of free opinion,
- have tools that help the individual carry out personal research, that help to increase the understanding of the domain of the problem,
- is allowed to discuss insights and ideas with the rest of the community.

To ensure that the right to this plurality of opinion is respected, it is strongly recommended, if not necessary, to impose to the company a technical non-censurability of data.

This means that the tools must be able to evolve in such a way that, even if they want, no one will be able to physically eliminate data permanently. Not even the company that manages the service. The data must therefore always be able to be downloaded by the user, who, if he deems it, must be free to reload them as needed.

Obviously, the legal responsibility for uploading the data must be discharged by the company, which at this point will lose any responsibility for them. The user will learn to be the only real responsible for the action carried out.

The data must therefore never be hidden from the service. Only in this way we can discharge the company from responsibility, and above all from the possibility, of deciding for us what is questionable and what is not.

Everything must pass through a community screening, facilitated by powerful tools and respectful of the imposed regulations, so that everyone can develop their own personal awareness, within known limits a priori.

The welfarism that society is unfortunately witnessing in this period, useful to justify the witch hunt against fake news, will only have the effect of producing populations unable to think on their own. The exact opposite action must be taken.

What emerges is that, beyond the specific technical solutions that can be used for any proposed problem, the common thread that unites each of them is to improve the degree of transparency offered. Be it economic, algorithmic or on data. This is the fundamental principle, which ultimately does nothing but shifting the responsibility for assessing the quality of the data from companies and governments to the end user himself, and therefore globally to the community. A decentralized verification process is therefore necessary for everything else to apply, which is why decentralization of services is so important.

Obviously Ethernal will try to adopt these types of principles as much as possible in the development of its solutions, and there is much more to be said about them in the future.

Web 3.0 and technologies such as Blockchain, smart contract and DAPP (Decentralized APPLication) aid to solve these problems. They offer solutions capable of moving data and incentives in an automatic, transparent, and unalterable way. They are able to manage complex systems, with different and sometimes conflicting interests. Their execution is reliable and unstoppable. Their work is the direct result of the expression of the consent of each user.

To the occasional user, however, accessing our service must not appear different from accessing any other website. This is to reduce adoption friction as much as possible.

## 4.1 Protocol as a service

With our solution we will use these technologies, and we will offer a platform on which users will be able to operate independently. The burden of directly dealing with any content will not oversee Ethernal. The videos will in fact be uploaded autonomously by the creators and kept by Swarm users in a pure peer2peer system. No created content will be uniquely stored in company's server. In this every video will be independent from us, and any other information can still be treated in a decentralized manner.

In fact, the only way to avoid having to respond directly to the responsibility of the uploaded content is to lose all direct or indirect control over them. We cannot actually be responsible for a content, if that content has never passed through our system, and we have never had any power to remove it.

Possibly, we will be able to offer optional services on content, useful for the user experience.

Ethernal company will take care of maintaining a transparent index of the uploaded videos. It will be consultable as a public database, which will be used by default by the platform, as better described below. However, due to that everything will be free, transparent and modular, the platform itself will allow users to change the index used. Every user should be able as to replace the index independently as to compose his own list of active indexes.

We know that any system is corruptible. We will not be different from others in this, and we declare it right away. We will also be forced, in order not to incur legal action, to operate where necessary censorship actions on our index. Also, if nothing else, to safeguard our audience from obscene and certainly unethical content.

However, since we know that this removal tool will be forcibly abused, in the final step we will offer the possibility for users to go beyond our own limits. And it will not be possible to do otherwise, because in practice we are providing first of all just a protocol, and only secondly a service. This will make our application decomposable and replaceable in every single part, and therefore completely free.

Changing the video index freely will allow the user to choose the source that he deems freer. The users and the community can maintain personal and independent indexes, freeing the company from the responsibility of maintaining links to any content that is not allowed.

The index is an external server, with its own web address. Each user will be able to add it into his own list to use it. It will be usable by that user as a personalized experience.

Ethernal is a tool, not a publisher.

## 4.2 Economic independence

The only way to avoid having to respond to the economic rules of advertisers is to choose to be able to offer the service without advertising on the platform. Ethernal business model does not consider the advertisement as a source of income.

Based on primarily the values that web 3.0 brings on, Ethernal refuses to consider the end user as a commodity.

The service users will back being the real last customer. The rules of the service will be laid down by users themselves.

The final judge on the validity of the content must be the end user, and not an advertiser. The user will therefore be able to independently rediscover what quality entertainment is for him, and it will no longer be an algorithm incentivized by sponsorship to determine which videos are to be offered more, and which less.

#### 4.2.1 Creator's financing

The sponsorship of the creators will be made directly by the final viewers. A defined percentage of the bandwidth value recognized by the users watching a video will be repaid directly to the creator.

In addition to this, Ethernal will use a reward system, offering various integrated contribution formulas, and encouraging creators to use them. The payment of such contributions will be voluntary or bound by agreements with the creator.

Within the video pages, services will be integrated to directly reward the creator of the content. Later a cryptocurrency layer will be used for the transfer of money. Anyway, the service will be usable in various ways, including using integrated external exchanges that accept other means of payment.

### 4.3 Ethernal as an alternative to limited information

Economic independence means that every creator should be rewarded from his first video in a clear and transparent way, to encourage him to produce quality videos and not forcing him to hustle with external sponsorships or to take refuge in direct contribution platforms too.

Ethernal believes that the combination creator/user is fundamental for the healthiness of the environment. By encouraging freedom of expression and creativity it will be allowed to increase professional and well-finished contents, and on the other hand towards an increasingly informed and interested user.

#### 4.3.1 A clear and clean environment

For Ethernal, transparency is the watchword. We believe in so as the source code and the index databases will be public. Anyone will be able to analyze them and look for the flaw in our good faith.

#### 4.3.2 The value of the Community

The growth of the project is community based. Since there are no addresses dictated by advertisers, users will decide the value and success of each individual content

Even the spreading of fake news will be naturally flighted not censoring but encouraging correct source citation. A news credibility is based also in credibility of sources, and the quality of references.

A vote system based on community can express how much a source is well reported and used, and article's "Reliability score" is influenced recursively both downside that upside on citation chain. Quality of sources are subjected to vote with a Content score, and we are developing algorithm also for the Reliability score. Also, when an article will receive economic credits, a percentage of these can go to sources.

The community is for Ethernal a strength and a guarantee of transparency: the continuous surveillance of an active and responsible community leads to a cleaner and tidier place. The dialogue leads to the implementation of new functions and the synergy that is created is a guarantee of consensus in our project.

Ethernal trust in community and with his community wants to grow and define the path of his future.

Some company choices will necessarily be defined by the company itself. For sure, all the choices that imply compliance with regulations and the choices useful to generate the necessary economic turnover that allows the company to survive and possibly prosper will oversee the company itself.

However, the community is the top of Ethernal's value's pyramid. The community will lead the path end the rules.

The difference between a set of rules determined by consensus and a set imposed by regulation is fundamental.

In the case of a regulation, which can be laws imposed by a government, or rules for the use of a service, someone must decide what a community of individuals can do or not. Everyone can agree or not on the single points and usually few are asked to choose directly and in real time on them.

In the case of an expression of direct consent, this must be granted and earned at any time on every single point, therefore it must be expressed directly, and it is free.

For example, if the main team of a blockchain project wanted to force even a single controversial point, the network could decide to shift its consensus on a (hard) fork.

Therefore, having an imposed regulation means taking advantage in the last resort of a tool that does not require consent to be used, on the contrary, most of the time it completely excludes it from the accounts, referring (in the best case) to cumulative requests for trust.

What can give value to the individual is the possibility of choosing and directing the choices of the community to which he belongs. Furthermore, it must be able to do so directly or by transparent and withdrawable delegation.

## 5 Architecture

Following we will see principal components that compose Ethernal services ecosystem, with their principal working logics.

### 5.1 Decentralized data storage

The peer2peer Swarm service will be used as main data storage. It is a decentralized storage service, based on Ethereum blockchain, that incentivize the retention of data with third parties, paying a fee for the service performed.

The maintenance of online content in the Swarm network is strictly related to number of people that are using it. The peer2peer Swarm network protocol rewards nodes that keep data proportionally to the data requests that they can serve to the network. Each node is incentivized to keep data generating more requests and to remove data that is less used or not used at all. The more interesting a video is to the community, the more it will be distributed and maintained. Conversely, less used contents can be kept online directly by the creator of the same, with a direct contribution.

This relieves Ethernal from the economic and legal burden of maintaining data.

Furthermore, this solution helps to discourage spamming of low-quality content, as it would be a direct cost to the creator's pocket.

Once the video has been uploaded on Swarm, the owner will be free to publish his content on all the indexes willing to accept it, according to the internal policies of each index.

### 5.2 Index

Ethernal Index is the component that contains references to content published on Ethernal platform. It permits to organize and enrich the platform with community contribution. This is a critical component, which can determinate if, when and how a content is discoverable, and so reachable. Because of this index's database must be opened for transparency.

The index is responsible for what users can find on platform. Because of this it must be moderated. This is useful to provide a safe default experience for everybody (advanced users will be able to go over this), and to help having an internal organization of contents.

The main scopes of index are to maintain topic categories, and inside these maintain a weighted list of videos. Contents will be ordered by quality and timing parameters and organized through the community interaction. The index also maintains content's valuations, proposed by users, community contributions like comments, and eventually cross-content references.

Ethernal will publish two different indexes, and each index will have specific rules for allowed content. A common rule shared between all our indexes is that only legal content (for Switzerland, the hosting country of Ethernal) will be admitted.

Indexes can implement different rules; some of them could be imposed by local laws, but others may be totally arbitrary. Some users could not be comfortable with some imposed index rules, and imposition is always against decentralization. Because of this, and because Ethernal wants to stay as decentralized as possible, we will permit to have several indexes accessible in Dapp and active at time, included external indexes managed by third parties, totally unrelated from the company. We don't want to force users with any imposed rule.

Our two managed indexes are so composed:

- The First Index will be occupied by all those more conventional "family friendly" contents
- Instead on the Open Index will be possible to come across videos and content of a more explicit nature.

This subdivision will allow not to apply a real censorship to the contents, but simply to keep the contents loaded in the most appropriate sections so that the user is always in front of content of his taste, without running into unpleasant encounters. As better explained before more defined indexes and frames can be built up following community's interests.

Index database will be maintained on a private MongoDB instance, but its content will be published in real time on Swarm with the tool MDBee, which is better describer below.

## 5.2.1 Frames

The videos within the platform will be organized into "frames". A frame is ideologically related to arguments, with autonomous and self-managed communities able to manage the content and perform a first level of moderation.

Any frame community will be able to independently elect moderators, and to set internal regulations independent from the rest of the platform. Anyone can decide to open a new frame and autonomously become a manager of it.

Uploaded content can be published simultaneously in zero or multiple frames, without any prefixed limitation.

The subdivision of index into autonomous frames is beneficial to:

- organize contents by interests, making them easily accessible by users;
- implement a self-contained moderation system which can help in removing content that is not suitable for the index;
- help communities to grow, offering internal organization and sustenance tools.

If a video violates the internal rules of a frame, it can be removed by the administrators of the frame itself. However, removing content in one frame does not imply removing it from each of other frames, which will still be free to host it.

If a content is illegal for the full index, its existence can be reported to index maintainers, and they will be able to remove from all frames.

User generated contents, like votes or comments, will be bound to the video and the containing frame. Each video can have several contexts for each frame that host it. This, for example, because each community can better receive and evaluate different aspects of the content.

## 5.2.2 Moderation

Each frame can internally organize to delegate moderations to several community members. Out of frames the index owner can perform a "super-moderation" over frames, contents, and users. In fact, it will always be the last responsible person in the hierarchical chain, but this structure permits to reduce complexity from its moderator role.

This hierarchical chain of moderation is the only way to implement an effective moderation system, that doesn't involve imperfect, opaque and unconscious algorithms. Ethernal always prefer to implement a community-oriented control system in place of any automatic corresponding.

Videos may be reported at any time to the maintainers of an index or frame. The maintainers of the index will be able, if they deem it, to delete a video from the entire index. The maintainers of a frame, on the other hand, can at least remove it from the managed frame.

Deleting a video from an index will not preclude being able to access the uploaded video, if the address of the video is known, and video is stored into Swarm. It won't be possible to stop the direct sharing of any content uploaded directly on the p2p network.

## 5.3 Gateway

Gateway is the second fundamental component of Ethernal. It provides access to contents uploaded on Swarm network and manage the economics. Through this service it is possible to deduct the cost of the access to contents from the users' account and pay creators for contents provided.

This is a fundamental component, it can determinate if a content is downloadable or not. Because of this, we don't want to restrict users on our gateway implementation: it will be switchable with any other Swarm-compatible in the dapp interface.

### 5.3.1 Creators rewarding

The success of the platform will be primarily conferred by creators who use it. To get as more interest as possible, we will give the opportunity to liberate the whole creativity as well creators need. To let creators earn the right income from their productions the revenue of creators will be regulated by an algorithm built on consensus.

We think that an attractive and fair economic reward to creators can be chosen by the community itself. We will provide a voting system, where paying users of Ethernal are able to choose by themselves how much recognize economically to creators per downloaded GB on our gateway. Details are elaborated below.

Gateway manage economics and it imposes a Fee cost (**F**) for consumed resources on it. This cost is composed by our Service Fee (**SF**), covering our internal costs, and the Creator Fee (**CF**), that implement the monetization for the author for the downloaded content.

$$F = SF + CF$$

**SF** is a value arbitrarily chosen by the service provider Ethernal, currently evaluated 0.22-0,28 CHF/GB.

**CF** is a global evolving variable on the gateway, and it will change daily (not more that 1% as better explained in formulas), based on direct consensus expressed by the community.

A valid Creator Fee Vote (**CFV**) is expressed optionally and independently by each platform user as a not negative value  $[0, +\infty[$ .

Each day, all expressed **CFV** are collected and evaluated. A weighted average is calculated with them, with weight based on **SF** spent on platform for the last 30 days, and this will compose the daily Creator Target Fee (**CTF**).

We define:

- **CTF** is the daily Creator Target Fee
- **CSV<sub>i</sub>** is the Creator Fee Vote expressed by user **i**
- **n** is the number of users that have a valid **CFV** expressed on a day
- **S<sub>i</sub>** is the amount of **SF** spent from user **i** in the last 30 days

We can express the Creator Target Fee as:

$$CTF = \frac{\sum_{i=0}^n CFV_i * S_i}{\sum_{i=0}^n S_i}$$

A new **CTF** is calculated globally for the gateway each day, but it is not the effective Creator Fee. The **CF** is calculated each day from the **CF** of the previous day, pointing to approach the **CTF**, but changing at max for 1% from the value of **CF** of the previous day. So, if:

- **CF<sub>i</sub>** is the Creator Fee for day **i**
- **CTF** is the Creator Target Fee
- **Min(x,y)** choose the minimum value between **x** and **y**
- **Max(x,y)** choose the maximum value between **x** and **y**

We have three cases:

- If **CTF=CF<sub>i</sub>**, then **CF<sub>i+1</sub>=CF<sub>i</sub>**
- If **CTF>CF<sub>i</sub>**, then **CF<sub>i+1</sub>=Min(CF<sub>i</sub>\*1.01,CTF)**
- If **CTF<CF<sub>i</sub>**, then **CF<sub>i+1</sub>=Max(CF<sub>i</sub>\*0.99,CTF)**

We expect that users will vote in a gaussian-like distribution around an average price that express the maximum community consensus on a specific price. The choose to ponder the average with the expend-

ed **SF** on the platform permits to protect from Sybil attacks, and choose to change at max the **CF** of 1% up or down per day permits to protect the system from excessive price volatility.

At day 0 an initial arbitrary price for **CF** is chosen, and full price history will be always accessible.

This permits to balance the two opposite community desires of having cheaper prices, to spend as less as possible, and having higher prices, to incentivize more content creators to participate into the platform. This average, as a direct consensus expression, can maximize at every moment users' satisfaction on the platform.

## 5.4 MDBee

This is a tool developed internally by Ethernal to publish MongoDB databases onto Swarm network. We will use this tool to open our most sensible databases, first the databases related to indexes.

Open data, like open source, is one of our first-class principles. We want to make as simple as possible to access data, explore it and use it for any possible scope. Between these, we can cite for example scopes of data analysis, verification of integrity, direct access from applications, data forking, etc.

We will not open instead databases that contains private personal information, like for example database containing personal email addresses.

More information about this project can be found on its GitHub page<sup>3</sup>.

## 5.5 SSO Server

Users must be authenticated to operate on the platform, because interactions can have a cost, and because any content creation has to be associated to an account. Anyway, we are not interested in users' data, and we will never require more of the strictly necessary. Even to provide an email address is optional. To offer the authentication service across all platform components, we developed a SSO Server (Single Sign-On Server).

Our SSO solution is made to permit users to access to the same services in two ways:

- a web2 legacy mode, for all users that are not familiar with new web3 concepts and who don't own a private managed wallet;
- a web3 mode, for all users that prefer to have their address keys, managed on their owned wallet.

On our SSO service every user is identified by an Ethereum address. If a new user creates a native web3 account, his login process will be managed signing a specific message on the platform. Instead, if a user prefers a "classic" login process, he can create a web2 account providing a password, or accessing with a third external service, like a social network. At any time, a web2 user will be able to upgrade its account to a native web3 account.

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<sup>3</sup> <https://github.com/Ethernal/mdbee>

A web3 account manages its own private key for its Ethereum address. A web2 user that doesn't own a wallet must access a private key created on our service. This is an invisible process to the user, but privacy and independency is a key value of web3 accounts. In any case, the key generated by us will never be used to manage contents or values outside of Ethernal, and users can't easily access to it to use with other scopes. This is for security reasons. Anyway, if possible, the use of a web3 account is recommended.

The SSO Server will provide cookies to access to all other service areas protected by authentication.

The Ethereum private key, directly managed by user's wallet or provided by us, will be used to publish contents on Swarm network with features that require authentication, like for example to publish a content on a creator's channel.

## 5.6 The Dapp

The DAPP (Decentralized APPLICATION) will be the access portal to the service and will be accessible from any browser. It will provide access to the set of services offered and will constitute the main interaction interface. It will talk with all the Ethernal services ecosystem.

It will offer instrument for both video creators and normal users.

It will permit also to compose active indexes, and active Swarm gateway.

## 5.7 Content Feeds on Swarm

Each creator will have his own channel published directly on Swarm with Swarm feeds. Swarm feeds are natively managed by the network and does not require any permission to upload contents. Each user is in fact associated with an Ethereum address, managed by himself if needed. The uploaded videos will contain a manifest with some descriptive metadata such as a name, a description, and graphics. This permits to access to video content and related metadata without need of any active index in dapp, simply with a direct link to it.

The channels will be freely visitable by users and will not be censored in any absolute way since they will not reside on our servers.

## 6 Promises

Ethernal believes in a web free from censorship and algorithms that obey those who buy advertising space.

We want to connect the brightest content creators to those audiences who want to see the content they choose, without the pollution of advertising that uses privacy as a bargaining chip.

Those who choose Ethernal know that they will have a video platform in which to express themselves freely and enjoy the contents they CHOOSE in the first person, through micro payments. All this in a controlled and secure environment: the user's privacy will always be respected, never sold to third parties for advertising purposes.

Ethernal's promises are to offer itself to the world wide web as a free and non-censurable platform, which implements a payment policy free from ADS. The calculated valued is in the order of one hundredth each 10 mins of video contents: this means that users will "pay" for the service based on the time spent on the platform. Basically, he will be paying for bandwidth and storage of contents.

And he will not pay with personal data, but with gains from the platform itself, or direct money/crypto payments.

As mentioned, Ethernal promotes itself as being free from any kind of censorship, to allow creators to upload any type of video content.

This is possible thanks to the fact that Ethernal was created on top of decentralizing technologies which, unlike conventional servers, allows you to operate without being censored, or be blocked by third parties.

Ethernal will release software open source, completely available and visible to everyone, so that anyone can contribute to expand and improve the project, even creating their own, thus freeing the creators from the heavy hand of censorship and the obligatory presence of advertising.

Some promises we want to do:

- **To be Free**  
A freedom of thought and opinions, argued in a workmanlike manner. An open approach to all forms of creativity, to the new and its evolutions.
- **To be Transparent**  
No subterfuge, no hidden clauses or disguised pitfalls. Ethernal puts everything on the plate, in the sunlight.
- **To be safe**  
Ethernal is free and unconventional, but it would never endanger or uncomfortable her audience. Therefore, it guarantees a safe environment for sharing ethical and clean content, in which privacy is respected.
- **To be Reliable**  
For any need, Ethernal is ready to respond promptly and personally, putting its face to it.

## 7 Disclaimer

This paper is for general information purposes only. It does not constitute investment advice or a recommendation or solicitation to buy or sell any investment and should not be used in the evaluation of the merits of making any investment decision. It should not be relied upon for accounting, legal or tax advice or investment recommendations.

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