



Why Decentralized Storage Based on Web3 Technology Will Ultimately Replace Many Public Cloud-Based Storage Services

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IDC Opinion

For most of today’s organizations (which include enterprises and other corporate, public, and nonprofit entities), public cloud storage technology has become a mainstream part of information technology (IT) infrastructure. Most of these public cloud storage solutions are based on Web2 technology.

While organizations appreciate many of the aspects of the “public cloud experience,” they have noted a number of challenges with it. These challenges include security, availability, unexpectedly high costs around data mobility, cloud provider lock-in, and compliance and regulatory obstacles.

Web3-based storage technologies have emerged and are in broad use in a number of areas for certain types of data that are traditionally stored with Web2 public cloud providers. The largest Web3-based storage network, Filecoin, is currently storing over 200PiB of production data across a variety of use cases including research institutions, digital archives, healthcare, surveillance, higher education, and many other verticals that require “enterprise-grade” storage capacity. Interestingly, Filecoin is an open source protocol that is not owned by any vendor and is instead supported by an ecosystem of collaborative contributors. Web3 offers significant advantages over Web2 technology for storing data in the digital era like better security, data integrity, data resiliency, higher availability, and an ability to meet regulatory and governance requirements that Web2-based public cloud providers cannot. Furthermore, and possibly the most important of all for organizations, it does this at a cost up to 95% less than the cost of today’s hyperscaler-based Web2 public clouds.

Enterprise IT managers should familiarize themselves with Web3 technology such as Filecoin and the benefits both offer for organizations that want to store data in a public cloud-like environment. In this era of increasing importance of IT services in achieving technical objectives, heightened concerns about data privacy, ransomware attacks, the need for flexibility in meeting compliance, regulatory environments, and budget pressures, Web3 technologies like Filecoin offer a compelling value proposition for many workloads. As mentioned previously, Filecoin is an open source protocol that is not owned by any vendor but offers “enterprise grade” storage capabilities of which IT managers need to be aware. This white paper provides an introduction to Web3 technology, the Filecoin network, and reasons why both should be considered as an option for organizations that are using Web2 public cloud storage today.

Situation Overview

The internet is dominated by entities that provide services in exchange for personal data with the intent to monetize that data by selling it. Well-known examples include vendors like Meta (Facebook), Twitter, and Google that exercise significant control over what information, content, and data gets distributed.

This “centralized” model is referred to as Web2 and is characterized by vendors controlling access to web-based resources, services, and data storage. Web3 offers a new approach that has emerged over the past several years that uses a more “decentralized” model that allows anyone to use internet-based services without exposing their personal data to companies that sell it, effectively putting control in the hands of data owners. Web3 storage solutions do not rely on trusting a handful of private entities to act in the public’s best interests—they leverage blockchain technology to allow data owners to quickly, reliably, and securely store their information in an unprecedented way. The differences between Web2 and Web3 storage solutions are shown in **Figure 1**.

FIGURE 1

Web2 and Web3: Differentiating Characteristics

Web2 Storage Solutions	Web3 Storage Solutions
Centralized providers (AWS, Microsoft, Google, Meta, Twitter, etc.)	Decentralized providers running an open source stack; no vendor lock-in
Immutability achieved through add-on services	Data natively immutable
Relies on vendor ability to meet SLAs	Trustless blockchain transactions (collateralized daily verification)
Expensive monthly charges and egress fees	95% less expensive and sometimes free
Regular and impactful downtime	Beyond “eight-nines” (99.999999%) uptime and daily availability checks
Key-driven data addressing prone to data integrity issues	Content-driven data addressing to guarantee integrity

Source: IDC, 2022

The rapid growth of internet content and usage begs for a better way to store data, and it is clear that Web3 provides a more privacy-conscious, secure, and efficient way to do that. When using internet-based storage infrastructure services, most organizations interacting with public cloud providers like Amazon, Microsoft, Google, and Alibaba using the Web2 model rely on the vendor to enable storage and retrieval, safeguard their data, and deliver the agreed-upon services regardless of failures and outages.

The Web3 model can offer significant advantages to organizations using cloud-based storage services by:

- ▶ Lowering storage cost
- ▶ Improving data availability
- ▶ Verifying storage of data
- ▶ Understanding carbon footprint of storage nodes
- ▶ Meeting regulatory requirements
- ▶ Enabling application development

Furthermore, unlike Web2 public cloud-based storage services, Web3-based services can provide assurances of data integrity, avoid data lock-in, and meet data sovereignty requirements by allowing users to specify exactly where their data is stored geographically. In this ecosystem, organizations do not rely on the vagaries of public cloud providers and instead leverage a network of entities that run the same open source stack.

Organizations should familiarize themselves with this model of data storage. In fact, Filecoin is being used to store over 200PiB of data for financial services, research institutions, digital archive groups, healthcare, surveillance, higher education, and many other types of organizations. All Filecoin network participants, including thousands of geographically distributed storage providers and enterprise IT managers using the network to store and retrieve their organizations' private data, interact directly with each other to ensure data is stored quickly, securely, and without fail. New storage providers can add to Filecoin's storage capacity and participate in this Web3 way to store data. Worldwide (at the time this document was written), Filecoin offers over 17EiB of raw capacity, and the overall ecosystem is growing at greater than 150% per year.

The cost of storage has proven to be beyond 95% lower on a per-gigabyte basis than today's market rates for Web2-based public cloud storage providers (and can even be free in some cases).

How Filecoin Works

A blockchain is a decentralized ledger of transactions across a peer-to-peer network, allowing participants to confirm activity without the need for a central clearing authority. The goal of blockchain is to allow digital information to be recorded and distributed, but not edited. A blockchain structures its data into immutable blocks, each with its own exact time stamp, that are strung together, creating an irreversible timeline that is highly distributed in a decentralized way. The innovation with a blockchain is that it guarantees the fidelity and security of a record and generates trust without the need for a centralized organization that claims to be trustable. This concept is referred to as “trustless” and is a fundamental benefit of blockchain technology. Filecoin applies blockchain technology to record and verify the storage and retrieval of data.

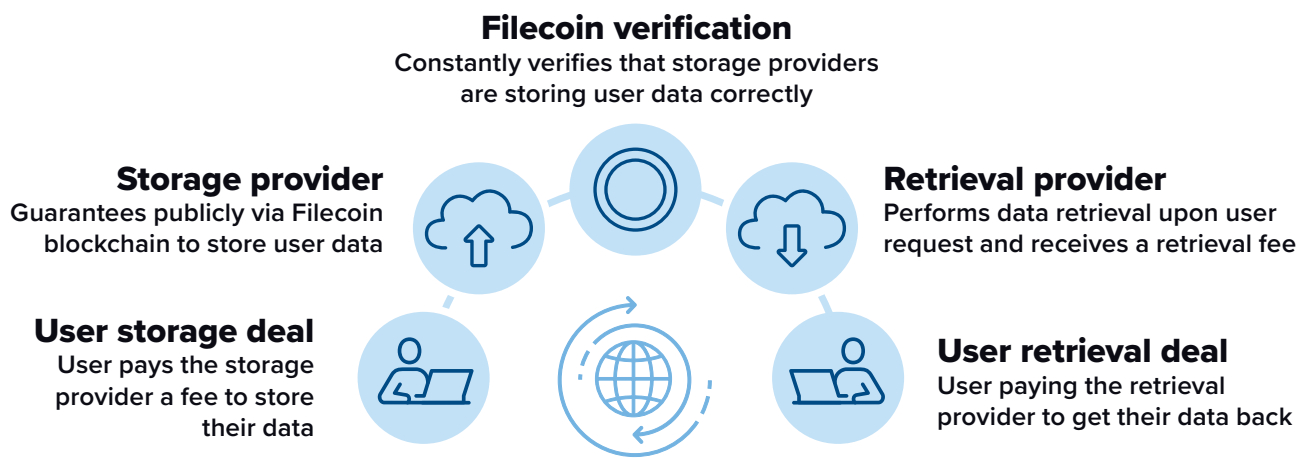
The foundation for the open source Filecoin network is thousands of “storage nodes” distributed throughout the world that actually store data. The Filecoin network is enhanced by thousands of developers that form an open source community in collaboration with Protocol Labs, the organization that created Filecoin and is focused on building foundational infrastructure for all of Web3. In fact, Protocol Labs created IPFS, the InterPlanetary File System protocol (IPFS), and libP2p, the library of modules that the open source community uses to develop new capabilities on the Filecoin network and Web3 as a whole. Filecoin leverages FIL, the cryptocurrency token of the Filecoin network to incent storage providers to be solvent contributors on the Filecoin network and reliable stewards of customer data. All FIL balances and transactions are recorded on the Filecoin blockchain and can be audited at any time, by anyone. The data itself is stored on hard disk drives (HDDs) at the storage providers’ facilities. Storage providers contribute storage to the Filecoin network in return for FIL, and customers pay the storage providers to store and retrieve the data for them as needed. **Figure 2** (next page) details how Filecoin works for the enterprise user.

Anyone with spare storage hardware can join this network, although most of the capacity comes from storage providers that have at least 1PiB+ of available storage. These storage providers are generally existing service companies and provide gateways or “on-ramps” for organizations to leverage the benefits of the Filecoin network. Interested parties can join the network by downloading the open source software from GitHub. The ecosystem provides multiple resources including virtual boot camps and in-person accelerator programs to get storage providers off the ground.

The Filecoin network is enhanced by **thousands of developers** that form an **open source community** in collaboration with **Protocol Labs**, the organization that created **Filecoin** and is focused on building foundational infrastructure for all of **Web3**.

The market value of storage capacity is set by the storage provider community but is effectively determined by the open market dynamics of the Filecoin ecosystem where pricing information is available to all. Today, the Filecoin network is distributed across 44 countries with 2,000+ systems having more than 1PiB of storage, 400 systems having more than 10PiB, and 40+ systems having more than 50PiB in available capacity. While today’s storage providers include everyone from hobbyists to enterprise-scale providers, the network is experiencing the highest growth with storage providers in the 1–10PiB range.

FIGURE 2
How Filecoin Works for the Enterprise User



Source: Filecoin, 2022

It’s important to note that the decentralized nature of the data storage process provides for its availability, contributes to its immutability, and determines how widely distributed the data is as well as where it is physically stored. On the Filecoin network, data updates are handled through an “append” rather than an “update in place” model, which is what gives written data its immutability. Furthermore, to add to the availability of the network, organizations can specify how many replicas are created each time data is written, giving redundancy and security to the data. Organizations can also specify parameters governing the geographical distribution of their data to accommodate for regulatory and environmental concerns. Encryption can also be leveraged if so desired by the data owner. All of this functionality is based on offerings that the storage providers build and on their business models, strategy, and goals.

Filecoin Value Proposition for Organizations

When it comes to storage, organizations tend to care about data integrity, security, performance, availability, and cost. By basing their data storage and retrieval services on Filecoin, storage providers can offer compelling advantages over existing Web2 public cloud-based storage providers for many types of popular enterprise workloads. Probably the most compelling initial reason for organizations to consider beginning to use the Filecoin network is cost. Today, Filecoin storage costs are at least 95% lower than current market rates offered by Web2 cloud storage providers. If that sounds tantalizing, consider the additional advantages previously mentioned such as security, availability, sustainability, and reliability.



Data Integrity

Web2-based storage approaches use T10 Data Integrity Field (T10 DIF) and other checksum-based approaches to validate data integrity each time the data is read or written. Colder data that may only be accessed infrequently may go long periods without being validated and may propagate data integrity errors that can unexpectedly arise in electronic systems. Filecoin validates all data, whether it is being accessed or not, on a daily basis to ensure its integrity using verifiable cryptographic hashing zk-SNARKs (or Zero-Knowledge Succinct Non-Interactive Argument of Knowledge). This provides advantages over Web2-based approaches that are particularly notable for colder data sets.



Security

Filecoin's blockchain technology leverages immutability and decentralization to provide storage that is more tamper resistant to malware and bad actor exploits than traditional block- or file-based storage. Filecoin never updates data in place — it always writes a new data object that is completely separate from the prior “version” (if there is one) without deleting the original copy. Once written, an object cannot be edited, providing read-only access to the data state at the time it was written but no ability to modify that data, making any kind of ransomware exploit extremely unlikely. Also, data at rest can be encrypted by storage providers using FIPS-certifiable 256-bit technology before it is uploaded to the Filecoin network.

Finally, data is distributed across many storage nodes in the Filecoin network. The method used to distribute data is unique to each storage provider, based upon their own resiliency requirements.

Organizations requiring higher resiliency can increase the number of replicas that get created for each new data object. Within this method, storage providers can allow their customers to determine the geographical distribution of data so it can stay within certain countries or regions and thereby meet various data sovereignty requirements that Web2-based public cloud providers cannot. The ability to specify physical data location can also be handy for distributed environments where organizations want to ensure that particular files are stored locally to deliver low-latency access.



Performance

Filecoin provides a key value store interface that uses replicas for data protection and, as such, can deliver comparable performance to Web2 cloud-based, object-based storage. While this means that it is not appropriate for low-latency, transactional, block-based storage workloads, it is very appropriate for many enterprise workloads that run on HDD-based storage systems. In addition to long-term backup and archive data sets, Filecoin is extensively used for a wide variety of use cases including digital archives, public data sets, research data, and genomics archives. Educational organizations use it for massive open online courses (MOOCs) and other education data sets. Enterprise organizations use the ecosystem for business analytics and as an alternative to tape backups. Other uses include non-fungible token (NFT) storage, surveillance data, drone data, and other Web3 workloads. It is also very effective for Web2 applications like climate analysis and historical internet archives.



Availability

Because organizations can specify the level of resiliency they need to meet availability requirements, they have the flexibility to go far beyond what any Web2-based public cloud storage provider will guarantee. No two replicas are ever stored on the same physical storage node, which has obvious benefits. The Filecoin network constantly monitors itself for failures and makes events noticeable on-chain to the network for the entire public to see. The “on-ramps” used to store data to the Filecoin network create new copies of data on failed nodes to bring data objects back to the original level of resiliency. If requirements change over time, organizations can increase the number of replicas made for each data object, further increasing the availability, redundancy, and reliability of their data.



Cost

The price to store data will vary over time as new nodes and providers join the network and increase its storage capacity. However, the overall trend in per-gigabyte pricing is expected to decrease as available capacity increases. Filecoin is by far the largest decentralized storage network in the world. In fact, since 4Q20 (Filecoin's initial launch), it has quintupled in size. Even with the majority of storage providers only offering 1–10PiB of available capacity, most of them find this to be a profitable business model and are adding to their capacity on a quarterly basis. Also related to price, high egress fees from existing Web2-based public cloud storage providers impose additional costs and create a vendor “lock-in” scenario that inhibits data movement. Filecoin storage providers, on the other hand, charge only to store and retrieve data — there are no egress fees.

IDC's March 2020 *Modernized Infrastructure Survey* revealed that unexpected costs is a top 3 reason why customers consider repatriating workloads and data away from Web2-based public cloud providers. Many organizations are building hybrid public cloud infrastructure where they will use the storage services of multiple public clouds and not limit organizations' workload deployment and optimization options.



Regulation

Filecoin helps organizations comply with environmental, geographical, financial, and many other regulatory considerations that dictate how organizations must store their information. For example, some governmental agencies require that data be stored within certain geographical boundaries. Some might also insist that the facility in which data is stored be environmentally responsible. If the time frame of storage is a concern, data can be stored with varying degrees of retention to ensure that it is not kept longer than necessary. If encryption is required, organizations can choose storage providers that offer that technology as a service. Other possibilities include, but are not limited to, data-breach coordination, data portability, data ownership, and risk management. All of these categories can be addressed by the many storage provider options available on the Filecoin network.



Carbon Neutrality

Much of the conversation around blockchain technology and climate issues has focused on the energy expenditure of proof of work chains. Little, however, has been said of how the development of Web3 will enable more transparent tracking and accountability for green technologies.

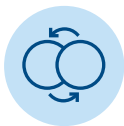
Filecoin Green is an initiative that seeks to make the Filecoin network carbon neutral and, in time, carbon negative. On Filecoin, storage providers have unique identities associated with their activity on the network. That activity can be used to model electricity consumption using on-chain formation. The filecoin.energy dashboard uses this Filecoin design feature to raise the bar for energy transparency across Web2 and Web3 alike, allowing anyone to estimate the energy use of any node in the network. Knowing the electricity use of Filecoin nodes, it is possible to match this use to renewable energy.

This was demonstrated in a partnership with Energy Web Zero to match Filecoin energy use with renewable energy certificates (RECs). Renewable purchases are recorded in Filrep, a reputation system that stores data on the Filecoin network. Each record keeps track of where the energy was produced and proves the ownership of the corresponding RECs. Furthermore, the Filecoin Green Storage Provider framework, a Protocol Labs initiative, is showing storage providers the standards to strive for and seeking pledges to achieve a climate-positive network over the next few years.



APIs

Filecoin strives to enable data onboarding for developers. A free and scalable application programming interface (API)-based storage layer solution called Web3.Storage can be used for applications looking for performant reads and writes. Developers can integrate with APIs and store data on the Filecoin network for fast backup and retrieval. An advantage of this is that developers do not need to manage their own infrastructure, and data can be easily migrated to different storage layers since it leverages content addressing and is saved on the Filecoin network. With Web3.Storage, things are both easy to use and trustless. Users get all the benefits of decentralized storage technologies with the frictionless experiences expected in a modern-day Web3 workflow.



Non-Fungible Token Storage

Filecoin is used to store over 80 million non-fungible tokens (NFTs), making it the largest NFT storage layer (by volume) in the world today. Some of the platforms the public might be familiar with (but are unaware that they leverage Filecoin storage) are OpenSea, Magic Eden, Rarible, Project Galaxy, MakersPlace, and Jigstack. In fact, the technology that these networks use is called NFT.Storage, a long-term storage service designed for off-chain NFT data (like metadata, images, and other assets) for up to 31GiB in size per individual upload. In this solution, data is content addressed using IPFS, meaning the URL is pointing to a piece of data that is completely unique. IPFS URLs and content identifiers (CIDs) are used in NFTs and metadata to ensure the NFT forever refers to the intended data.

Copies of uploaded NFTs on the public IPFS network are stored in two primary ways: either through IPFS servers managed by NFT.Storage or using a “decentralized storage” approach on Filecoin. In this way, there are always resilient copies available across multiple networks.



Integrations

By using ecosystem-provided tools such as Estuary, SenData, and Web3.Storage, data owners can leverage the Filecoin network using a variety of protocols. With a robust ecosystem of over 8,000 developers, new tooling is emerging to tackle the toughest challenges of Web2 data integration into the Web3 world.



Becoming a Storage Provider

Anybody can become a Storage Provider if they have the requisite collateral, hardware and technical expertise. Most of Filecoin’s Network capacity comes from providers that have at least 1PiB+ of available storage. These providers are generally existing service companies and provide on-ramps for organizations to leverage the benefits of the Filecoin network. Interested storage providers can join the network by downloading the open source software from GitHub and following the Filecoin storage provider instructions. The ecosystem provides multiple resources including virtual boot camps and in-person accelerator programs to get storage providers started.

Considering the Filecoin Value Proposition

Organizations are realizing that for certain data-intensive workloads, decentralized storage is more reliable, more available, more secure, more flexible (no vendor lock-in), less risky, and significantly less expensive than traditional Web2-based public cloud storage.

Current customers emphasize the immutability, geographic decentralization, and verifiability of their Filecoin-based data stores, all underlined by significant cost savings relative to today’s Web2 hyperscaler-based offerings.

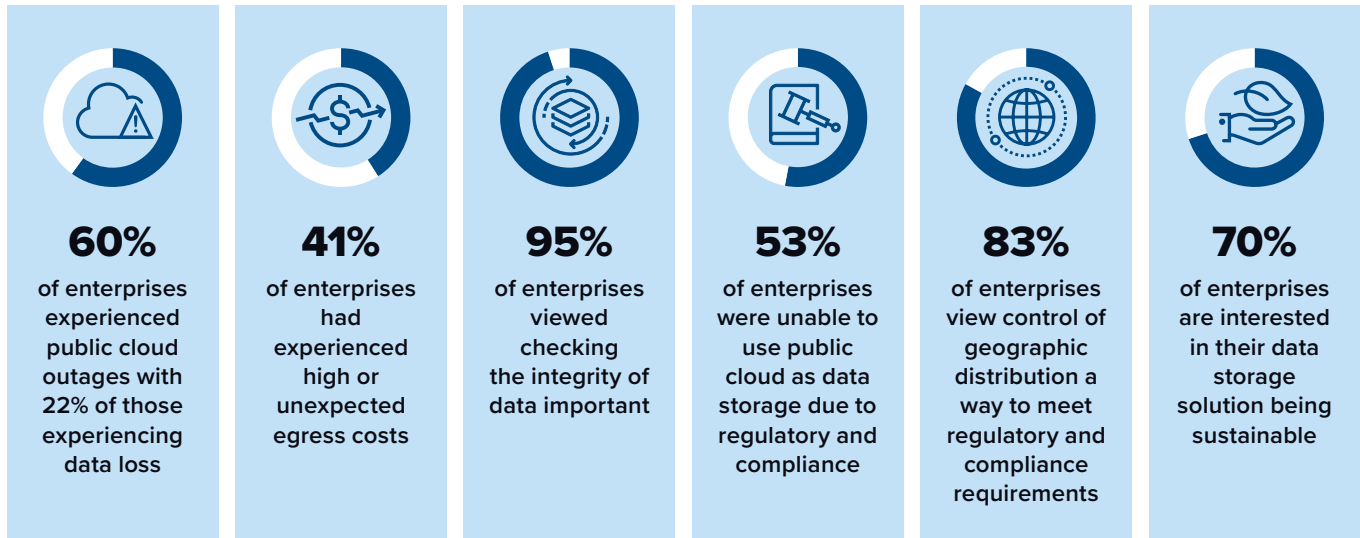
In 2Q22, IDC conducted the *Cloud Storage Survey* to explore organizations' perceptions of the drawbacks to existing Web2-based cloud storage providers; their biggest cloud-based data storage challenges; and their perceptions of Web3, blockchain technology, and decentralized storage and the biggest value propositions associated with using these technologies to address storage challenges.

The results were illuminating (see [Figure 3, next page](#)):

- ▶ Despite the fact that Filecoin was never mentioned, the survey revealed that the value proposition presented by Filecoin-based storage services—lower costs with at least the same durability, availability, safety, and performance as public cloud providers today—was preferred by 89.7% of the respondents.
- ▶ Over 88% of enterprises were at least somewhat familiar with decentralized storage while over 92% of respondents had heard of blockchain technology and almost 86% had a positive view of it (decentralized storage and blockchain technology are the key concepts around which the Filecoin network is based).
- ▶ 82% of enterprises indicated that a shift to an opex model and/or cost considerations were the initial reasons to move data into the cloud—both capabilities that storage services based on Filecoin provide.
- ▶ Recent public cloud outages have occurred for more than 60% of organizations, of which more than 21% incurred losses of \$5,000 or more per outage—obviously, cloud services that offer higher availability are viewed extremely positively.
- ▶ Over 95% of organizations viewed daily data validation (regardless of usage) to be an important capability that they wanted for their cloud-based data but were not getting, viewing it as a preferred service.
- ▶ Regulatory and compliance issues have been an obstacle for using public cloud-based storage for almost 53% of organizations, and over 83% viewed the ability to geographically distribute their data to meet regulatory requirements and better align with their business locations very positively.
- ▶ High or unexpected egress charges were an issue for 41% of organizations, and the top reason for driving workload repatriation away from public cloud-based storage was identified as compliance and GDPR requirements.
- ▶ Over 87% of organizations were at least somewhat concerned about public cloud provider lock-in, and more than 46% were very or extremely concerned about it.
- ▶ 70% of organizations were interested, very interested, or extremely interested in their data storage solution being sustainable.
- ▶ Over 92% of organizations were aware of blockchain technology, and almost 73% were familiar with Web3, while the perception of both these technologies was strongly positive for the majority of respondents.
- ▶ Faced with the inflexibility of current Web2-based public cloud offerings, almost 90% of respondents would like the flexibility to specify the number of copies a cloud-based service keeps of their data.

FIGURE 3

Filecoin’s Value Proposition Resonates with Organizations



Source: IDC, 2022

The Future of Filecoin

Today, storage providers are leveraging the Filecoin network to provide verifiable storage and retrieval services for a variety of surveillance, research, data analytics, and other data sets. With over 17EiB of available storage capacity, 200PiB+ of verified data onboarded to the network, and healthy growth that will continue to drive per-gigabyte storage costs down over time, Filecoin has emerged as the leading decentralized storage network and is servicing over 1 billion weekly retrieval requests. It is an open source project benefiting from community developments as well as focused engineering contributions from Protocol Labs, and it is firmly committed to the Web3 technologies that place control in the hands of users, not vendors.

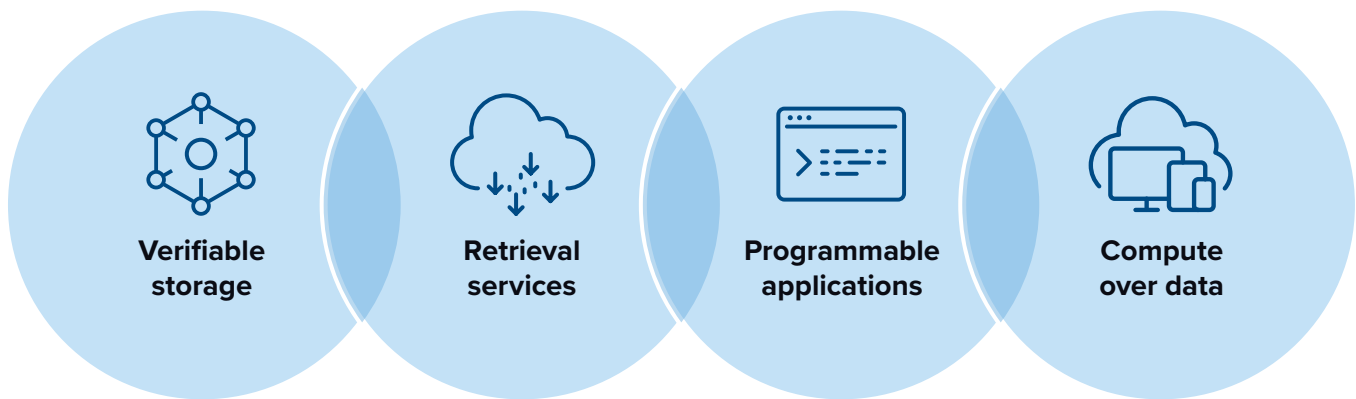
The Filecoin road map reveals an exciting future. The next phase of development will focus on providing high-quality content delivery with under one second of latency that will spearhead the network’s entrance into media streaming and other content delivery businesses.

The Filecoin network fits the definition of a “platform” whose benefits increase as more third parties leverage it.

Within the next year, the Filecoin Virtual Machine (FVM) will enable smart contract capabilities and allow Ethereum decentralized applications (dApps) to work on the Filecoin network. This functionality is expected to drive much higher transaction growth than even what we are seeing today on the storage side. Filecoin intends to expand beyond just storage to include computation services through partner integrations and be able to offer the same types of benefits over public cloud-based options that the network’s verifiable storage and retrieval services have already proven to offer.

The Filecoin network fits the definition of a “platform” whose benefits increase as more third parties leverage it. In this case, those third parties include storage providers leveraging it to deliver verifiable storage and retrieval services, as well as the organizations that access and use these services through providers of their choice. The fact that data integrity, security, performance, availability, and cost of Filecoin all improve as more storage providers and organizations participate in it is referred to as the “network effect.” In this case, this phenomenon occurs when increasing numbers of people or participants leverage a platform and, in turn, improve its value. The internet is a perfect example of a platform that benefits from the network effect (see **Figure 4**).

FIGURE 4
The High-Level Filecoin Road Map



Source: Filecoin, 2022

The fact that data integrity, security, performance, availability, and cost of Filecoin all improve as more storage providers and organizations participate in it is referred to as the “**network effect.**”

Challenges/Opportunities

Innovations that take advantage of the scale of the internet can offer breakthrough capabilities relative to more traditional offerings. As the world evolves in the direction of the Web3 transformation, storage challenges around availability, security, capacity, and cost that plagued Web2-based public cloud vendors will be resolved in part by newer innovations like blockchain technology.

Although William Gibson's quote "the future is already here, it's just not very evenly distributed" might suggest that there's nothing new under the sun, it also encourages innovators to be aware of what's already out there and how it may be repurposed to address additional challenges. While blockchain technology first gained notoriety as a distributed ledger for financial transactions, it brings significant benefits when applied to cloud-based storage that improves data integrity, security, and availability while significantly lowering costs.

While most IT personnel are aware of blockchain technology, they may not have thought about it in terms of storage. Filecoin delivers blockchain-based advantages for storage that are already appropriate for use with a variety of colder storage workloads and brings with it many other capabilities that are increasingly of interest to the emerging Web3-based world. The more participants in the Filecoin network use it, the better that network becomes in terms of lower costs and the breadth of special services offered by an ever-increasing ecosystem of storage providers. This is the "network effect" referred to previously, and organizations are very familiar with benefits of a "platform" approach to solutions by broad experience with vendors like Apple and VMware and internet-based services like Wikipedia and AI-driven search engines.

At this point, the two biggest challenges to leveraging a network like Filecoin are awareness and accurately being able to select the right workloads and data sets that can benefit the most from it. Thousands of storage providers that leverage the Filecoin network are already available, so once an enterprise decides to look into decentralized storage, they will likely have many options.

Conclusion

Public cloud storage based on Web2 technologies have provided an attractive alternative to on-premises storage infrastructure and forced changes in how storage is consumed and paid for no matter where it is located. Web2 technologies still have challenges; however, emerging Web3 technologies are addressing these challenges.

The Filecoin network, which has been storing customer data since 4Q20, uses Web3 technologies, offering integrity, security, availability, data resilience, and cost advantages for storing enterprise and public data sets.

Organizations currently using Web2 public cloud-based storage overwhelmingly indicated in IDC's 2022 *Cloud Storage Survey* that they find the Filecoin value propositions highly attractive for backup, archive, video, drone, neuroscience, MOOCs, business analytics, online archives (genomics, internet, historical, etc.), NFTs and other Web3 data storage and workloads. Furthermore, the extremely low cost of Filecoin-based storage will be extremely attractive to organizations currently storing backup and archive data in the public cloud.

While the Filecoin network is evolving to support additional, more performance-sensitive workloads over time, it is ready for the workloads listed previously. In fact, it is currently being used in production by a variety of higher education, research, healthcare, financial services, and other organizations. By familiarizing themselves with what the Filecoin network and its associated storage providers have to offer, organizations could save themselves a lot of money on storage while improving data integrity, resiliency, and availability and gaining more flexibility in being able to meet regulatory and governance requirements with public cloud-based storage.

Essentially, an enterprise will be future proofing when incorporating Filecoin as a component of a hybrid data storage strategy.

About the Analyst



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Ashish Nadkarni is Group Vice President within IDC's Worldwide Infrastructure Practice. He leads a team of analysts who engage in delivering qualitative and quantitative research on computing, storage, and data management infrastructure platforms and technologies, via syndicated research programs (subscription services), data products (IDC Trackers), and custom engagements. Ashish's vision for his team is to take a holistic, forward-looking, and long-term view on emerging as well as established infrastructure-related areas in the datacenter, in the cloud, and at the edge. His core research starts with an objective assessment of heterogeneous, accelerated, fog, edge, and quantum computing architectures, silicon, memory, and data persistence technologies, composable and disaggregated systems, rackscale design, software-defined infrastructure, modern operating system environments, and physical, virtual, and cloud computing software. It is complemented by research on current and next-gen applications and workloads, vertical and industry-specific use cases, emerging storage and server form factors and deployment models, and upcoming IT vendors. Ashish also takes a keen interest in tracking the ongoing influence of open and open-source communities like OpenStack and Open Compute Project on infrastructure.

[More about Ashish Nadkarni](#)

Message from the Sponsor

How to store data on Filecoin:

Whether you have personal data that needs to be accessed quickly or large enterprise datasets that must be secure, Filecoin Storage Providers can help.

Here is a link to get you started:

filecoin.io/store

To gather more information about becoming a Filecoin Storage Provider please visit:

sp.filecoin.io

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