An Introduction to Ethereum Classic
An Introduction to Ethereum Classic

Ethereum Classic is a global, open-source blockchain platform for decentralized applications (DApps), powered by smart contracts and embedded with a native digital currency, ether classic (ETC). On Ethereum Classic, code can be written to control the transmission of digital value based on programmable conditions without the possibility of interference by a central authority. ETC serves three main purposes on the network: (i) to store value, (ii) to settle transactions by allowing users to send or receive payments and (iii) to facilitate network operations (i.e., power DApps) via transaction fees paid in ETC, which are based on the computational costs of executing the code. Ethereum Classic is the original version of the Ethereum blockchain, which seeks to preserve the foundational principles of decentralization and immutability through its untampered transaction history.

The June 2016 hack of The DAO1 spurred the controversial hard fork of Ethereum, which resulted in the protocol splitting into two distinct networks: Ethereum Classic and Ethereum. At the time of the split, Ethereum Classic and Ethereum were nearly identical in terms of technical design but have since evolved in their own unique ways. Despite the controversy over the Ethereum Classic-Ethereum hard fork, Ethereum Classic has amassed support from a decentralized and global base of developers, users, investors, business operators, and independent organizations. More recently, interoperability between the Ethereum and Ethereum Classic networks has been enhanced as a result of the Agharta upgrade, allowing Ethereum Classic to directly benefit from quality upstream development work on the Ethereum blockchain. Today, Ethereum Classic is one of the top twenty digital currency networks by market cap.2

---

A Brief History of Ethereum Classic

In the following section, we will briefly cover three major periods in the history of Ethereum Classic: (i) the events leading up to the launch of the Ethereum network, (ii) the infamous hack of The DAO in June 2016 and (iii) major milestones in Ethereum Classic’s post-fork development.


Ethereum was first outlined as a proof-of-concept ‘world computer’ in the original 2013 whitepaper by Vitalik Buterin, an early Bitcoin contributor and co-founder of Bitcoin Magazine. As an early adopter of Bitcoin, Buterin developed the view that a digital currency and its associated blockchain could facilitate much more than simple P2P electronic value transfer. In pursuit of this grander vision, he set out to create a Turing-complete virtual ecosystem, featuring a global blockchain and smart contract programming platform. Both would be powered by a native digital currency, ether (ETH).

---

3. Ibid.
4. Ethereum Classic launched as the Ethereum network on July 30, 2015, however it wasn’t until July 20, 2016 following the hard fork that the network was rebranded as Ethereum Classic.
7. Ibid.
By integrating programming capabilities directly into the Ethereum protocol, developers all over the world would be able to design a new class of decentralized applications hosted on a public blockchain with payment automation using ETH. Through the use of smart contracts, applications built on Ethereum could automate the transmission of information and value under dynamic conditions, enabling tailored business models for a new Internet economy, or Web 3.0.9

After joining forces with Mihai Alisie, Amir Chetrit, Charles Hoskinson, Anthony Di Iorio, Dr. Gavin Wood, Joseph Lubin and Jeffrey Wilke in late 2013 and early 2014, Buterin and his colleagues founded Ethereum. Shortly thereafter, Dr. Wood coded the first functional implementation of Ethereum and detailed the technicalities of the protocol, including the Ethereum Virtual Machine (EVM) and smart contract programming language, Solidity, in the yellow paper. On a parallel path, two entities were formed and tasked with overseeing development of Ethereum: EthSuisse, the for-profit arm established in February 2014, and the Ethereum Foundation, its non-profit counterpart established in July 2014.

At network inception on July 30, 2015, 72 million ETH were created and allocated based on the approximate $18 million USD that was raised in the initial crowdsale, conducted between July and August 2014.5 Coinciding with the network launch, it was decided that EthSuisse would be dissolved, designating the Ethereum Foundation as the sole organization dedicated to accelerating adoption and usage.

FIGURE 2: ETH SUPPLY ALLOCATION AT INCEPTION\[8\]

11. Ibid.
Part 2: The DAO Hack (June 17, 2016)

On April 30, 2016, slock.it, a blockchain and Internet of Things (IoT) solutions company, announced the launch of ‘The DAO’ on Ethereum. The DAO was positioned to function as a decentralized venture capital fund in which over $150 million USD was raised within a 28-day crowdfunding window. The DAO granted voting rights to members, proportional to their investment, who could then vote to finance projects. If a project proved to be profitable, members would be rewarded based on the terms of the relevant smart contracts and their stake in The DAO.

However, The DAO did not work as planned. On June 17, 2016, an anonymous hacker exploited a bug in the smart contract code used to construct The DAO, syphoning approximately $60 million worth of ETH into a segregated wallet address. In response, the ETH market experienced a large-scale sell-off as investors rushed to liquidate their holdings.

Controversy ensued within the digital currency community over how to best rectify the situation given that the stolen funds could not be retrieved. Ultimately, it was decided that a hard fork would take place on July 20, 2016, and a new version of the Ethereum blockchain would be created. This version would be referred to as Ethereum, removing any record of the theft and restoring the stolen ETH to the original owners. The original Ethereum protocol was rebranded as Ethereum Classic, and its native token as ETC. It left the transaction history untampered, including The DAO theft, and preserved the foundational principles of decentralized governance and immutability.

Today, the Ethereum and Ethereum Classic networks coexist and in many ways are just now beginning to interoperate. While similar in functionality and real-world application capabilities, the base-layer separation between these two networks has driven important differences in their technical architectures, development philosophies, and governance principles over the past several years.

Part 3: Ethereum Classic is [Re]born

Since the time of the hard fork, there have been four major development milestones with some subdivided into multiple stages. Each stage is integrated into the main protocol as a hard fork, supplemented with comprehensive testing of features in network testnets. Over time, the roadmap has evolved to reflect community consensus. Contributions to the Ethereum Classic Project work towards reaching its final stage, in which the goal is to be a globally scalable payment network, smart-contract platform, and digital store of value resistant to centralized governance.

Milestone 1: Diehard Upgrade - January 2017
The Diehard upgrade delayed the “difficulty bomb” by a year in part to give network stakeholders more time to decide which consensus algorithm to pursue following the hard fork.14

Milestone 2: Monetary Policy Upgrade - November 2016 - December 2017
The Monetary Policy proposal was formally put forth as ECIP-1017 by Matt Mazur in November 2016. A joint statement in support of the monetary policy was released by several Ethereum Classic community stakeholders in March 2017 and the new monetary policy was officially implemented at block 5,000,000 in December 2017. The difficulty bomb was subsequently removed at block 5,900,000.

Stage 3: Atlantis Upgrade - September 2019
Atlantis activated at block 8,772,000, adopting Ethereum’s Byzantium protocol upgrade in addition to general stability upgrades. The motivation for this fork was to enhance EVM capabilities, developer tooling (i.e., smart-contract debugging tools) and interoperability between Ethereum Classic and Ethereum.

Stage 4: Agharta Upgrade - January 2020
Agharta activated on the Ethereum Classic network at block 9,573,000. Agharta introduced opcode updates that maximize compatibility and cross-chain communication between Ethereum Classic and Ethereum.15

For a comprehensive explanation of the features introduced in each of these milestones, please refer to Ethereum Classic Improvement Proposals.

---

Defining Characteristics of Ethereum Classic

The Ethereum Classic network was designed to expand upon the use cases afforded by Bitcoin and serve as a decentralized world computer and alternative digital store of value. While Bitcoin employs a limited scripting language that only permits P2P value transfer, Ethereum Classic was designed to be computationally universal, or Turing-complete, facilitating more advanced types of programmable digital interactions with ETC.

With that said, Ethereum Classic and Bitcoin share many of the following characteristics, though they are at different points on the spectrum of each.

- **Decentralization:** Ethereum Classic employs proof-of-work (PoW), effectively eliminating the need for a central authority (e.g., governments and financial institutions) to validate transactions or smart-contract based network operations. Buterin asserts that blockchains are politically and architecturally decentralized, but behave in a logically centralized way, in which the nodes hold equal power in the network and must collaborate to validate transactions.\(^\text{16}\)

  One caveat is that while governance is designed to be decentralized, there may be risks associated with the level of decentralization of mining pools in the Ethereum Classic network. As of February 15, 2020, the top two largest mining pools controlled over 50% of the hashrate of the network.\(^\text{17}\)

- **Permissionless:** Anyone can participate in the network.

- **Secure:** In PoW protocols, the network “is secure as long as honest nodes control more [power] than collective attacker nodes.”\(^\text{18}\) An attacker seeking to make a fraudulent transaction on the blockchain would have to locate the desired block, change the transaction data, then mine each consecutive block until the fraudulent one was accepted by the network, in what is called a 51% attack. The primary deterrent of these attacks is that they are computationally expensive with uncertain payoff, and as a result, are unlikely.\(^\text{19}\)

  In January 2019, the Ethereum Classic network was the target of a 51% attack in which blocks on the mainchain were reorganized and approximately 219,500 ETC (worth $1.1 million at the time) was double-spent through a series of fraudulent transactions.\(^\text{20}\) Since then, steps have been taken by service providers dealing in ETC.

---


as well as Ethereum Classic community members to mitigate the risk of
double-spending on the network, **including increasing the number of**
**required confirmations prior to accepting a transaction as final.** Since
then, there have not been any further reported attacks.

Furthermore, though the 2016 DAO hack raised concerns over the security
of the network, Atzei et al. (2016) identified vulnerabilities with Solidity, the
programming language used to design Ethereum smart contracts, as the
primary reason for the attack and not the network itself.21

- **Open-source:** The source code for the Ethereum Classic Project is
  available on the Internet, free for anyone to access, contribute to, or fork.
  This is an important characteristic for building trust and accumulating
  users, evidenced by the fact that the Ethereum Classic project boasts a
distributed, global base of active developers.

  Users can introduce Ethereum Classic Improvement Proposals (ECIPs),
  which are feature suggestions designed to improve the network and
  follow strict technical guidelines.

- **Transparent:** All transactions are recorded and publicly viewable on the
  Ethereum Classic blockchain from anywhere in the world.

- **Pseudo-anonymous:** Public wallet addresses are not directly linked
to any identifying personal information. However, in the current state,
complete anonymity is difficult to achieve. This is because addresses
involved in any Ethereum Classic transaction are permanently and
publicly viewable on the blockchain. Information like multiple transactions
originating from one wallet or data leaks from custody solutions or
exchanges can almost always trace back to one’s identity.22

- **Finite supply:** At inception, 72 million ETC were created and disseminated
to the public as part of the initial ETH crowdsale. Following the hard fork,
Ethereum Classic stakeholders and community members recognized the
need for a robust and transparent economic framework that balances
the long-term interests of investors, developers, and business operators.
On March 1, 2017, several members of the Ethereum Classic community
announced their commitment to implement a new monetary model.
Similar to Bitcoin, the new policy was built on the fundamental economic
principle that the value of an asset is a function of its utility and its scarcity.
As such, it established a hard cap on the total ETC issuance to bootstrap
network adoption. Due to slight variations in the block reward rate, it is
anticipated that the total supply of ETC will reach ~210 million and will
never exceed 230 million.

---

Key Features of Ethereum Classic

Ethereum Classic is the first digital asset to incorporate a platform with smart contract capability. It is comprised of the following elements, which are essential to understanding the network and its many applications.

**Ether Classic (ETC)**
ETC is the digital currency native to Ethereum Classic. It serves three main purposes: (i) to store value in ETC, (ii) to settle transactions by allowing users to send or receive payments in ETC and (iii) to facilitate network operations (i.e., power DApps) via transaction fees paid in ETC (known as ‘gas’), which are based on the computational costs of executing the code. Gas is the internal unit of value used for smart contract code execution, calculated by measuring the computational cost of executing a given instruction. Miners and smart contract programmers collect transaction fees in ETC, based on the equivalent amount of gas. Gas prices are measured in wei, the smallest unit of ETC, where $10^{18}$ wei is equal to 1 ETC.

**Smart Contracts**
Smart contracts are lines of code that facilitate the exchange of anything representative of value, such as money, information, property, or voting rights. They are uploaded onto the blockchain and transactions executed cannot be modified. Using smart contracts, users can send or receive ETC, create markets, store registries of debts or promises, represent ownership of property or a company, transfer funds given a set of logical instructions, and form new digital assets in compliant offerings or issuances. The concept of a smart contract was first proposed by Nick Szabo, a renowned computer scientist specializing in digital currencies and the creator of Bit Gold, and was explored in his 1997 whitepaper.

**Solidity**
Solidity is the primary programming language of Ethereum Classic. It is used to write smart contracts, develop DApps, structure DAOs, and operate IoT (Internet of Things) devices built on Ethereum Classic technology. Additional languages have recently been added to the Ethereum Classic network, such as Vyper, while others have been deprecated, like Serpent and Mutan.

**Decentralized Applications (DApps)**
Decentralized applications (DApps) are applications, programs, or tools that utilize smart contracts built into the Ethereum Classic network. DApps have potential use cases across many sectors, including financial services, asset management, supply chain management, identity management, and data storage encryption and transfer. Some popular DApps built on the Ethereum blockchain include MakerDAO, CryptoKitties, and IDEX. MakerDAO, in particular, is currently the largest decentralized financing (DeFi) platform. As a tangible application of Ethereum, it has the potential to democratize access to financial services. As of February 15, 2020, approximately 3.1 million ETH was locked up as collateral for DeFi purposes.

DAppl activity on Ethereum is more relevant within the context of the Agharta upgrade — the enhanced compatibility increases the likelihood the DApps already deployed on Ethereum can be more easily redeployed on Ethereum Classic. According to State of the DApps, there are 2,738 total DApps on Ethereum, while DApp Direct lists 36 currently operating on Ethereum Classic. As the two networks continue to scale their interoperability, we may see a convergence in these counts as DApp developers become agnostic between the two networks and seek to maximize their addressable markets.

**Decentralized Autonomous Organizations (DAOs)**
Decentralized Autonomous Organizations (DAOs) are organizations that function independent of a central governing body. Unlike traditional companies where ownership is divided amongst its shareholders, a DAO is owned by those who contribute tokens, who are also given voting rights. In addition, the rules of a DAO are determined by its accompanying collection of smart contracts.

**Ethash Algorithm**
Although both Ethereum Classic’s Ethash and Bitcoin’s SHA-256 utilize PoW, the two protocols differ in how they address ASICs (Application-Specific Integrated Circuits). In Ethash, GPUs (Graphical Processing Units) are the preferred choice of equipment and are relatively cheaper compared to ASICs, which are integral to SHA-256. As a result, the Ethereum Classic mining process is more egalitarian with a lower cost barrier to entry. It also reduces the probability of mining centralization, and subsequent risk of attacks on the network. However, the tradeoff for adopting Ethash is that computations are more memory intensive.

For more on the technicalities on Ethash, please refer to this open-source guide on Github.

**Ethereum Virtual Machine (EVM)**
The EVM was created by Dr. Gavin Wood in 2014 and detailed in the original Ethereum yellow paper, the technical version of the whitepaper. The EVM handles the state of the Ethereum blockchain and executes all smart contracts, DApps, and DAOs on the network. It is Turing-complete, meaning that the program will always run to completion given sufficient time and memory. This was a significant innovation in blockchain technology because it permitted sophisticated, conditional logic and provides the basis for more complex programs. Other virtual machines, such as SputnikVM, are in development for Ethereum Classic.

---

Mining Rewards
The miner reward of 5 ETC per block established at inception was reduced by 20% (to 4 ETC per block) at block 5,000,000 in December 2017, coinciding with the implementation of the new monetary policy outlined in ECIP-1017. The reward will continue to be reduced by 20% every five million blocks thereafter. A block of transactions is confirmed on the Ethereum Classic network about every 13 seconds. Like Bitcoin, Ethereum Classic miners may also be paid additional amounts of ETC to account for transaction fees.

FIGURE 4: ETHEREUM CLASSIC ISSUANCE SCHEDULE

Since inception, the history of block rewards is as follows:

- Block #0 to Block #5,000,000: 5 ETC
- Block #5,000,000 to 10,000,000: 4 ETC
- Block 10,000,000 to 15,000,000 (Estimated to begin in March 2020): 3.2 ETC

---

28. Ibid.
Potential Advantages of Ethereum Classic

The design of the Ethereum Classic protocol leads to three potential advantages when compared to traditional financial institutions, payment channels, and other digital asset networks:

1. **Pioneering smart contract compatibility in a ‘store-of-value’ protocol**\(^{29}\): Ethereum Classic set a precedent as the first smart-contract powered digital currency network to practically embody the governance and economic principles of Bitcoin, with a focus on immutability. This may allow ETC to play a complementary role to Bitcoin as an alternative digital store of value with the smart contract functionality of Ethereum.

2. **Active and decentralized community**: There is a growing base of developers, business operators, non-profits, and active community members driving development, education, and adoption of Ethereum Classic. Below we’ve provided a brief description of some of the active groups that are contributing to Ethereum Classic today:

   - **ETC Core** - The leading development team for the Ethereum Classic protocol at ETC Labs. Their work spans open-source tool development, driving improvement specifications from design to implementation, and maximizing the capabilities of the EthereumStack.\(^{30}\)

   - **ETC Consortium** - An association of individuals, companies, and organizations from various crypto and blockchain communities, originally formed in China. The mission of the institute is to propagate the Ethereum Classic fundamental values which are decentralization, immutability and censorship resistance.\(^{31}\)

   - **Ethereum Classic Cooperative (ECC)**\(^{32}\) The ECC is a 501(c)(3) non profit created to financially support the growth and development of the Ethereum Classic protocol. The ECC believes that the Ethereum Classic protocol can enhance the ways that information and value are shared in a digital economy, and is committed to doing its part to realize this potential. The ECC has established guidelines for the deployment of its capital across three core investment areas: (1) development; (2) marketing; and (3) community.\(^{33}\)

---


\(^{30}\) ETC Core. https://etccore.io/.


\(^{32}\) In order to promote the growth and development of the Ethereum Classic network, Grayscale intends, but is not obligated, to direct up to one-third of the annual fee of Grayscale Ethereum Classic Trust towards the Ethereum Classic Cooperative, whose initiatives support development, marketing, and community activities of the Ethereum Classic network. For more information, visit etccooperative.org.

3. **Lower barriers to entry for miners**: Ethereum Classic mining is more accessible to those who are limited by equipment, as the expense of confirming a block, in terms of electricity costs and computational capacity, is cheaper compared to Bitcoin. Therefore, Ethereum Classic mining may be attractive to potential marginal miners because it requires less processing power and has lower operating costs.

4. **Enhanced interoperability with Ethereum**: The Agharta and Atlantis upgrades introduced updates that maximize compatibility and cross-chain communication between Ethereum Classic and Ethereum. This allows Ethereum Classic to more easily tap into, and benefit from, upstream development on the Ethereum network, including DApps, new technologies, and a broader base of developers, tools and users.

### Potential Risks of Ethereum Classic

There are important trade offs to consider when choosing between different digital currency networks for use and investment. Selection will often depend on the one that best satisfies the needs of the user. We outline four key risks related to investing in Ethereum Classic:

#### Scalability Problems

Like many of its digital currency counterparts, Ethereum Classic faces limitations in terms of scalability. Currently, the network can only process an average of 15 transactions per second, compared to traditional payment channels such as VISA, which handles approximately 1,700 transactions per second (and claims to have the capacity to handle more than 24,000 per second).\(^34\) Ethereum Classic has already undergone several software modifications to adapt to the scaling challenges presented by its initial design. However, scalability continues to be one of the largest challenges for the Ethereum Classic network and remains an active area of research for developers.

There are two types of approaches being researched to resolve Ethereum Classic’s scalability issues: (i) on-chain, or Layer 1, which refers to the main blockchain and (ii) off-chain, or Layer 2, which refers to feature implementations outside of the main blockchain, such as Sidechains, Payment Channels, State Channels, or other scaling technologies built on interoperable blockchains, like Ethereum 2.0.

Many stakeholders prefer that Ethereum Classic remain a secure Layer 1 system to provide a stable financial network upon which ETC can fulfill the role of a Turing-complete internet reserve currency, like Bitcoin. Outsourcing the risks associated with experimental technologies or methods of performance optimization to Layer 2 solutions appears to be the favored approach.\(^35\)

---


Level of Decentralization
There may be risks associated with the level of decentralization of the
Ethereum Classic network, particularly with respect to mining pools.
For example, as of February 15, 2020, the top two largest mining pools
controlled over 50% of the network hashrate.36

Competition
Ethereum Classic faces strong competition from a broad spectrum of
general-purpose platform digital currency networks, including Ethereum,
Horizen, Eos, and Tezos, among others. Each of these may be viewed
as direct or indirect competitors to Ethereum Classic and it remains to
be seen whether decentralized applications, smart contract functionality,
or other use cases may be better served on one or some versus others.
It is also possible that these networks fail collectively, or that some
combination of them succeed alongside one another due to competitive
market forces.

Volatility with Smart Contracts
Since transactions resulting from smart contracts may be difficult to stop
or reverse, any vulnerabilities in the underlying code can weaken the
network. For example, the 2016 exploit of The DAO led to an unknown
attacker siphoning off approximately $60 million worth of ETH into a
segregated account. This event spurred the controversial hard fork of
Ethereum, resulting in the split into two networks: Ethereum and Ethereum
Classic. In 2017, Parity, the multi-sig wallet software created by Parity
Technologies, was also affected by two exploits. The first, in July 2017,
resulted in a theft of $30 million in ETH, and the second, in November
2017, led to an indefinite freeze of approximately $160 million in ETH.37
Smart contract technology is relatively new and still in open-source
development.

Regulatory Uncertainty
The SEC has stated that certain digital assets may be considered
“securities” under the federal securities laws. To date, the SEC has only
identified two digital assets, Bitcoin and Ethereum, for which it does not
intend to take the position that they are securities. While the argument
for not considering Ethereum Classic to be a security is likely the same
as Ethereum, the SEC has not specifically addressed Ethereum Classic as
of the date this report was released. As a result, any other digital asset,
including ETC, is at risk of being deemed a security, which may have
material adverse consequences for such digital assets. Moreover, there
are a number of regulatory considerations related to tokens, products,
and businesses built atop the open-source Ethereum Classic network that
could pose further risks to ETC prices.

Summary

Ethereum Classic initiated the second wave of innovation in blockchain technology, expanding upon the use cases afforded by Bitcoin and solidifying its own unique role in the digital currency ecosystem. In its final form, Ethereum Classic seeks to be a globally scalable payment network, smart-contract platform, and digital store of value resistant to centralized governance. Despite the 2016 hack of The DAO that resulted in the controversial hard fork, Ethereum Classic maintains its position among the top twenty largest digital currency networks by market cap. With its global network of users, developers, business operators, and supporters, Ethereum Classic has proven resilient with material social and technological momentum, while still retaining optionality to benefit from quality upstream developments introduced on Ethereum.

To learn more about other digital assets underpinning the Grayscale family of products, please visit the Building Blocks section of Grayscale Insights.
About Grayscale Investments, LLC

Grayscale Investments is the world’s largest digital currency asset manager. With a proven track record and unrivaled experience, we give investors the tools to make informed investing decisions in a burgeoning asset class. As part of Digital Currency Group, Grayscale accesses the world’s biggest network of industry intelligence to build better investment products. We have removed the barrier to entry so that institutions and individual investors can benefit from exposure to digital currencies. Now, forward-thinking investors can embrace a digital future with an institutional grade investment.

Grayscale is headquartered in New York City. For more information on Grayscale, please visit www.grayscale.co or follow us on Twitter @GrayscaleInvest.
Important Disclosures & Other Information

©Grayscale Investments, LLC. All content is original and has been researched and produced by Grayscale Investments, LLC (“Grayscale”) unless otherwise stated herein. No part of this content may be reproduced in any form, or referred to in any other publication, without the express consent of Grayscale.

This paper is for informational purposes only and does not constitute an offer to sell or the solicitation of an offer to sell or buy any security in any jurisdiction where such an offer or solicitation would be illegal. There is not enough information contained in this paper to make an investment decision and any information contained herein should not be used as a basis for this purpose. This paper does not constitute a recommendation or take into account the particular investment objectives, financial situations, or needs of investors. Investors are not to construe the contents of this paper as legal, tax or investment advice, and should consult their own advisors concerning an investment in digital assets. The price and value of assets referred to in this research and the income from them may fluctuate. Past performance is not indicative of the future performance of any assets referred to herein. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Investors should be aware that Grayscale is the sponsor of Grayscale Bitcoin Trust (BTC), Grayscale Bitcoin Cash Trust (BCH), Grayscale Ethereum Trust (ETH), Grayscale Ethereum Classic Trust (ETC), Grayscale Litecoin Trust (LTC), Grayscale Horizen Trust (ZEN), Grayscale Stellar Lumens Trust (XLM), Grayscale XRP Trust (XRP) and Grayscale Zcash Trust (ZEC) (each, a “Trust”) and the manager of Grayscale Digital Large Cap Fund LLC (the “Fund”). The Trusts and the Fund are collectively referred to herein as the “Products”. Any Product currently offering Share creations is referred to herein as an “Offered Product”. Information provided about an Offered Product is not intended to be, nor should it be construed or used as investment, tax or legal advice, and prospective investors should consult their own advisors concerning an investment in such Offered Product. This paper does not constitute an offer to sell or the solicitation of an offer to buy interests in any of the Products. Any offer or solicitation of an investment in a Product may be made only by delivery of such Product’s confidential offering documents (the “Offering Documents”) to qualified accredited investors (as defined under Rule 501(a) of Regulation D of the U.S. Securities Act of 1933, as amended), which contain material information not contained herein and which supersedes the information provided herein in its entirety.

The Products are private investment vehicles. Shares of Grayscale Bitcoin Trust (BTC), which are only offered on a periodic basis, are publicly quoted under the symbol: GBTC. The Products are not subject to the same regulatory requirements as exchange traded funds or mutual funds, including the requirement to provide certain periodic and standardized pricing and valuation information to investors. The Products are not registered with the Securities and Exchange Commission (the “SEC”), any state securities laws, or the U.S. Investment Company Act of 1940, as amended. There are substantial risks in investing in one or more Products. Any interests in each Product described herein have not been recommended by any U.S. federal or state, or non-U.S., securities commission or regulatory authority, including the SEC. Furthermore, the foregoing authorities have not confirmed the accuracy or determined the adequacy of this document. Any representation to the contrary is a criminal offense.

Certain of the statements contained herein may be statements of future expectations and other forward-looking statements that are based on Grayscale’s views and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in such statements. In addition to statements that are forward-looking by reason of context, the words “may, will, should, could, can, expects, plans, intends, anticipates, believes, estimates, predicts, potential, projected, or continue” and similar expressions identify forward-looking statements. Grayscale assumes no obligation to update any forward-looking statements contained herein and you should not place undue reliance on such statements, which speak only as of the date hereof. Although Grayscale has taken reasonable care to ensure that the information contained herein is accurate, no representation or warranty (including liability towards third parties), expressed or implied, is made by Grayscale as to its accuracy, reliability or completeness. You should not make any investment decisions based on these estimates and forward-looking statements.
Certain Risk Factors

Each Product is a private, unregistered investment vehicle and not subject to the same regulatory requirements as exchange traded funds or mutual funds, including the requirement to provide certain periodic and standardized pricing and valuation information to investors. There are substantial risks in investing in a Product or in digital assets directly, including but not limited to:

- **PRICE VOLATILITY**
  Digital assets have historically experienced significant intraday and long-term price swings. In addition, none of the Products currently operates a redemption program and may halt creations from time to time or, in the case of Grayscale Bitcoin Trust (BTC), periodically. There can be no assurance that the value of the common units of fractional undivided beneficial interest (“Shares”) of any Product will approximate the value of the digital assets held by such Product and such Shares may trade at a substantial premium over or discount to the value of the digital assets held by such Product. At this time, none of the Products is operating a redemption program and therefore Shares are not redeemable by any Product. Subject to receipt of regulatory approval from the SEC and approval by Grayscale, in its sole discretion, any Product may in the future operate a redemption program. Because none of the Products believes that the SEC would, at this time, entertain an application for the waiver of rules needed in order to operate an ongoing redemption program, none of the Products currently has any intention of seeking regulatory approval from the SEC to operate an ongoing redemption program.

- **MARKET ADOPTION**
  It is possible that digital assets generally or any digital asset in particular will never be broadly adopted by either the retail or commercial marketplace, in which case, one or more digital assets may lose most, if not all, of its value.

- **GOVERNMENT REGULATION**
  The regulatory framework of digital assets remains unclear and application of existing regulations and/or future restrictions by federal and state authorities may have a significant impact on the value of digital assets.

- **SECURITY**
  While each Product has implemented security measures for the safe storage of its digital assets, there have been significant incidents of digital asset theft and digital assets remains a potential target for hackers. Digital assets that are lost or stolen cannot be replaced, as transactions are irrevocable.

- **TAX TREATMENT OF VIRTUAL CURRENCY**
  For U.S. federal income tax purposes, Digital Large Cap Fund will be a passive foreign investment company (a “PFIC”) and, in certain circumstances, may be a controlled foreign corporation (a “CFC”). Digital Large Cap Fund will make available a PFIC Annual Information Statement that will include information required to permit each eligible shareholder to make a “qualified electing fund” election (a “QEF Election”) with respect to Digital Large Cap Fund. Each of the other Products intends to take the position that it is a grantor trust for U.S. federal income tax purposes. Assuming that a Product is properly treated as a grantor trust, Shareholders of that Product generally will be treated as if they directly owned their respective pro rata shares of the underlying assets held in the Product, directly received their respective pro rata shares of the Product’s income and directly incurred their respective pro rata shares of the Product’s expenses. Most state and local tax authorities follow U.S. income tax rules in this regard. Prospective investors should discuss the tax consequences of an investment in a Product with their tax advisors.

- **NO SHAREHOLDER CONTROL**
  Grayscale, as sponsor of each Trust and the manager of the Fund, has total authority over the Trusts and the Fund and shareholders’ rights are extremely limited.

- **LACK OF LIQUIDITY AND TRANSFER RESTRICTIONS**
  An investment in a Product will be illiquid and there will be significant restrictions on transferring interests in such Product. The Products are not registered with the SEC, any state securities laws, or the U.S. Investment Company Act of 1940, as amended, and the Shares of each Product are being offered in a private placement pursuant to Rule 506(c)
under Regulation D of the Securities Act of 1933, as amended (the “Securities Act”). As a result, the Shares of each Product are restricted Shares and are subject to a one-year holding period in accordance with Rule 144 under the Securities Act. In addition, none of the Products currently operates a redemption program. Because of the one-year holding period and the lack of an ongoing redemption program, Shares should not be purchased by any investor who is not willing and able to bear the risk of investment and lack of liquidity for at least one year. No assurances are given that after the one year holding period, there will be any market for the resale of Shares of any Product, or, if there is such a market, as to the price at such Shares may be sold into such a market.

- **POTENTIAL RELIANCE ON THIRD-PARTY MANAGEMENT; CONFLICTS OF INTEREST**

The Products and their sponsors or managers and advisors may rely on the trading expertise and experience of third-party sponsors, managers or advisors, the identity of which may not be fully disclosed to investors. The Products and their sponsors or managers and advisors and agents may be subject to various conflicts of interest.

- **FEES AND EXPENSES**

Each Product’s fees and expenses (which may be substantial regardless of any returns on investment) will offset each Product’s trading profits.

### Additional General Disclosures

Investors must have the financial ability, sophistication/experience and willingness to bear the risks of an investment. This document is intended for those with an in-depth understanding of the high risk nature of investments in digital assets and these investments may not be suitable for you. This document may not be distributed in either excerpts or in its entirety beyond its intended audience and the Products and Grayscale will not be held responsible if this document is used or is distributed beyond its initial recipient or if it is used for any unintended purpose.

The Products and Grayscale do not: make recommendations to purchase or sell specific securities; provide investment advisory services; or conduct a general retail business. None of the Products or Grayscale, its affiliates, nor any of its directors, officers, employees or agents shall have any liability, howsoever arising, for any error or incompleteness of fact or opinion in it or lack of care in its preparation or publication, provided that this shall not exclude liability to the extent that this is impermissible under applicable securities laws.

The logos, graphics, icons, trademarks, service marks and headers for each Product and Grayscale appearing herein are service marks, trademarks (whether registered or not) and/or trade dress of Grayscale Investments, LLC. (the “Marks”). All other trademarks, company names, logos, service marks and/or trade dress mentioned, displayed, cited or otherwise indicated herein (“Third Party Marks”) are the sole property of their respective owners. The Marks or the Third Party Marks may not be copied, downloaded, displayed, used as metatags, misused, or otherwise exploited in any manner without the prior express written permission of the relevant Product and Grayscale or the owner of such Third Party Mark.

The above summary is not a complete list of the risks and other important disclosures involved in investing in any Product or digital assets and is subject to the more complete disclosures contained in each Product’s Offering Documents, which must be reviewed carefully.
General Inquiries:

info@grayscale.co
Address: 250 Park Ave S 5th floor, New York, NY 10003
Phone: (212) 668-1427
@GrayscaleInvest