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CALL TO ACTION: DEVELOPING A NATIONAL STRATEGY FOR WEB3

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Executive Summary

The internet is on the verge of the next fundamental change. The third generation of the World Wide Web, known as Web3, is bringing an entirely new technology stack built on blockchain. Web3 leverages a decentralized and distributed architecture to increase privacy, security, and transparency. Section 1 describes the generational arc of web technologies and the new, unique features of Web3.

This new epoch of social interconnectivity blurs the lines between telecommunications and finance, compounding an already complex regulatory ecosystem. While Web3 is creating tremendous new opportunities, it is also at the center of major social, economic, and national security issues. A national strategy for Web3 is essential to the U.S. building on its early lead in the technology and to mitigate potential detrimental outcomes. The White House Executive Order on “Ensuring the Responsible Development of Digital Assets” brings into focus this need across the larger national security, global economic and geopolitical ramifications of Web3. Section 2 proposes policy objectives of a national strategy that encompasses the continuum of Web3 digital assets as follows:

- Foster a regulatory environment and investment ecosystem that enables development, deployment, and adoption of U.S.-based Web3 technologies at home and abroad.
- Promote policies that incentivize decentralized implementations of Web3 technologies to maximize security and democratization of governance.
- Establish and advocate internationally for technology and economic policies that promote Web3 technologies built upon core tenants of transparency and democratization and minimize adopting technologies are being developed and operated under the outsized influence of autocratic regimes.
- Combat use of Web3 infrastructure for fraud and illicit finance.
- Promote social equity in adoption and the opportunity created by Web3 technologies.

To support integration of interagency initiatives specified in the EO we propose coordination of activities around 3 major anchor points; Governance and the Regulatory Ecosystem, Economic Social and National Security Concerns and Creating American Opportunity. The following are specific recommendations aligned to these anchors that are described further in Section 3:

Governance and the Regulatory Ecosystem

1. The White House should launch an initiative to develop an integrated regulatory framework for Web3, which engages both regulatory stakeholders and market participants.
2. The U.S. Government should conduct a review and analysis of the current U.S. legal landscape and international treaties on key issues associated with Web3.
3. A multistakeholder group, organized through a non-profit organization, is necessary to support Web3 governance and self-regulation.
4. The U.S. government should engage internationally, and through allies, to homogenize emerging regulatory frameworks and open-source software and standards.

5. The U.S. government should establish a comprehensive program working with market participants for combatting fraud and illicit finance on Web3 technologies.

Economic Social and National Security Concerns

6. The White House should lead an interagency initiative to develop a national security strategy for Web3.
7. The U.S. government should build on the working groups established by the Federal Reserve to address broader cryptocurrency and FinTech developments, developing a regulatory sandbox and other mechanisms that encourage innovation, private sector input into the process, and foreign partner collaboration to help build broad public support and inform the legislative process.
8. Existing social equity and access initiatives being undertaken by the U.S. government should reflect and seek to address the emerging challenges and opportunities with Web3.
9. The U.S. government should continue to monitor developments in Web3 and the implications to federal and international taxation, ability to detect and counter financial crimes, and levy effective sanctions.
10. The U.S. government should actively promote global adoption of Web3 technologies based on proof-of-stake or other energy efficient approaches.

Creating American Opportunity

11. The White House should develop a strategy for transforming electronic government functions using Web3 technologies.
12. Federal science agencies should include Web3 under the broader umbrella of “advanced communications” as they plan their larger applied research agendas envisioned under legislation such as the Endless Frontiers Act.
13. The U.S. government should adopt policies that emphasize the role of the private sector and open-source communities in leading Web3 innovation, development, deployment, and operation.

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1 Epochs of the World Wide Web

Over the past forty years, the internet has transformed society—and society has transformed the internet. One measure of that change is in generations web technology. This section explores each generation of the web and provide an overview of Web3 technology and applications.

1.1 Web 1.0 and 2.0

In the 1980s and 1990s, the internet was highly distributed with a heterogeneity of different services operating over it. There were unique protocols for document retrieval, file sharing, chat, and email. In the early 1990s, one emerging service designed for “information management” began to build momentum: the World Wide Web¹. Using Hypertext Markup Language (HTML) to bring together multimedia and text in a linkable way and Hypertext Transport Protocol (HTTP) as an interoperable standard for accessing data on remote servers, *Web 1.0* was born.

The first generation of the web was driven heavily by static content primarily developed and published by companies, universities, and governments into web sites. With the rise of search engines, the information contained on these web

sites became discoverable and an entirely new knowledge economy was created where we could rapidly share information.

However, early web technologies had scalability issues. Individual web servers hosted by organizations struggled to keep up with traffic volume. With a dramatic increase of internet usership, more people wanted to produce, not just consume, information on the internet. These needs gave rise to both cloud computing and social media, which formed the basis of *Web 2.0*.

This second generation of the web led to centralization necessary for scale. Search, cloud, and social media companies became the backbone of the internet, building out vast data center and fiber optic infrastructure to service their users. Advertising became the business model to underwrite the infrastructure scaling costs, leveraging user-generated content to drive engagement and leveraged user data to target ads.

1.2 Web3

Meanwhile, within the open-source community, an alternative view of technology began to take hold. In 2008, under the alias Satoshi Nakamoto, an anonymous author published the paper entitled:

	<p>Blockchain</p>	<p>Blockchain is a ledger, where blocks of transactions are cryptographically linked together in a chain, making them impossible to change because it would disrupt the chain links. These ledgers are distributed across many internet servers communicating with each other to synchronize new transactions added to the chain.</p>
	<p>Fungible Token</p>	<p>Fungible tokens are interchangeable and subdividable. Their ownership and transfer of ownership is recorded on the blockchain, forming the basis of digital currency, or cryptocurrency. Computer programs dictate the rate at which new tokens are created and underpin a predictable monetary policy.</p>
	<p>Non-Fungible Token</p>	<p>Non-fungible tokens (NFTs) record ownership of a discrete asset on the blockchain, often as a link to a web address specifying the asset. While transacting digital artwork popularized NFTs, they can be used for a wide range of other applications, from real estate to intellectual property rights.</p>
	<p>Smart Contract</p>	<p>Smart contracts are computer programs residing on the blockchain that are able to transact fungible and non-fungible tokens based on the logic programmed into them. Distributed autonomous organizations (DAOs) are virtual organizations implemented as smart contracts without boards or management teams, governed directly by the shareholders of the cryptocurrencies that underpin them.</p>

Table 1. Web3 brings an entirely new vocabulary to the internet, built on top of the fundamental blockchain concept.

“Bitcoin: A Peer-to-Peer Electronic Cash System” that both proposed the concept of a blockchain and an entire system of currency based upon it²².

Building upon Bitcoin, Ethereum went live on July 30, 2015 and is based on a more full-featured blockchain technology³.

Ethereum supports three major building blocks, which now form the basis of *Web3* technology: fungible tokens, non-fungible tokens, and smart contracts. See a summary of each in Table 1.

There are many lenses through which to view Web3. From a technical perspective, it establishes an immutable, distributed, secure, transactional ledger as the foundation of a new internet. Rather than data being centralized and owned by the platform companies, transactional data is publicly available and owned by users. That ownership can be proven using tokens. Data and tokens can be transparently transacted through smart contracts.

Another lens through which to view Web3 is financial. Cryptocurrencies fuel operation of Web3, and through cryptoexchanges digital currency can be bought and sold using traditional currency. Web3 transactions extend also into the larger domain of tokenized smart contract-based

commerce. Under this paradigm a variety of digital assets ranging from digital art to online game avatars can be traded in a peer-to-peer format with no central clearing mechanism. This allows Web3’s users to essentially pay their own way for using Web3 services and as a result own equity in those services, establishing an alternative to advertising as the underpinning economic model for the internet.

A final lens is governance. Web3 seeks to democratize the rules by which the internet and its services operate and leverages smart contracts as transactional governance mechanisms. Rather than a management team and board of directors making decisions, smart contracts rely on a mutually-agreed-upon algorithm that resides within the blockchain itself.

Web3 espouses democratization and transparency in its approach; however, early deployments of the technology lack the financial, legal, and regulatory safeguards that would otherwise be required to secure greater adoption. Not all implementations of Web3 technology achieve decentralization, because distributed networks are controlled by relatively few stakeholders, undermining democratization objectives.

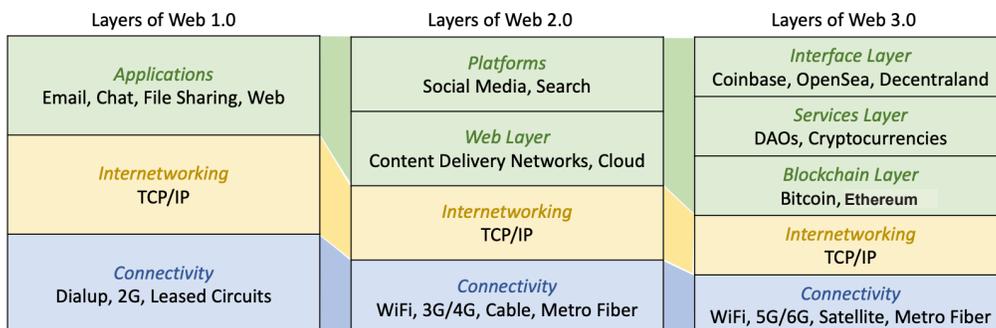


Figure 1. The structure of the internet is changing as technologies such as blockchain potentially displace cloud hyperscalers as the key building block of the web.

1.3 Web3 Applications

Web3 introduces a new technology stack to the internet, as depicted in Figure 1. Importantly the applications enabled by Web3 do not uniquely depend on the infrastructure built under Web 2.0: the large cloud platform companies, often termed *hyperscalers*.

Perhaps the most familiar application of Web3 is **digital currency**. It is the equivalent of users controlling numbered bank accounts whose transactions and balances are visible to everyone, but the identity of the account holder is not necessarily known. A wide range of financial services now support the digital currency economy, known as **decentralized finance** (DeFi). DeFi services operate natively on the blockchain as smart contracts, without humans in the loop and independent of legacy financial services institutions and provide banking services, currency exchange, annuities, loans, venture capital, and even gambling.

Another application is **decentralized social media** (DeSo). In DeSo, social media posts reside in a public blockchain supported by its own cryptocurrency, which is tradeable on external exchanges. Posting and liking posts all cost money but create economies where influencers can directly generate revenue based on their posts and those that engage with their content build equity in the brand of the influencer. As an influencer's individual currency appreciates in value, so too does the value of the cryptocurrency assets held by both the influencer generating the content and their fans engaging with it.

Decentralized gaming (GameFi) brings together the concepts of digital currency and digital assets into the virtual gaming environment. In many games, players complete tasks to generate value by earning in-game currency, discovering in-game items, and

increasing the level and experience of in-game characters. With decentralized games, the in-game currency is a tradeable cryptocurrency and in-game assets such as items and characters are tradeable NFTs. Thus by playing the game you can generate value that can be transferred into other digital or non-digital assets. The game *Axie Infinity* famously became the primary source of income for many people in the Philippines during pandemic lockdowns.⁴

Perhaps the most all-encompassing application of Web3 is the **decentralized metaverse**. By layering these applications on top of each other and using virtual reality and augmented reality to interact with them, we have the economic basis for a purely digital universe. Influencers and gamers, among many other professions, can create value that can be invested in virtual real estate and digital services. Through cryptoexchanges, currencies are sufficiently fungible to transfer assets between different blockchains and to/from traditional currency, intentionally blurring the lines between the digital world and analog world. While there are still competing views of the metaverse, the Web3 community is focused on one underpinned by its core values of transparency and democratization.

2 Objectives of a Web3 National Strategy

A national strategy for Web3 is needed to align public and private interests to ensure U.S. leadership of the next generation of the internet.

While cryptocurrency and gaming may not seem to be existential topics of national concern, consider the ramifications of prior generations of the web. The internet and Web 1.0, once exclusively used by scientists, now provides 93% of American adults with broadband access, which ultimately gave birth to a global information economy.⁵ They

also gave rise to the major cybersecurity challenges we now face. By interconnecting computer systems, we created the preconditions for cyber crime, cyber espionage, and cyber warfare.

Web 2.0 and social media saw a similar adoption cycle. Between 2006 and 2021 social media usage among American adults increased from 8% to 72%.⁶ Again, we've seen wide-ranging consequences of this adoption, both positive and negative. Social media has become the primary battleground for mis- and disinformation, concerns over privacy, and extremism.

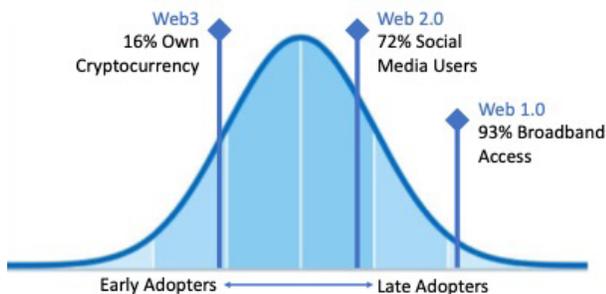


Figure 2. Current adoption of each generation of Web technology, with Web3 still in the early adoption stages but advancing quickly

Turning to Web3, 16% of American adults now own cryptocurrency, up from only 6% in 2019.^{7,8} Similar to earlier generations, Web3 will both create opportunity and solve challenges with earlier generations of the web but can also lead to new negative outcomes. A national strategy for Web3 seeks to invest in and accelerate the positive opportunities while mitigating the potential negative consequences.

On the global stage, Web3 will disrupt the economic and technological status quo. Other countries and competitive techno-economies could leverage this disruption to displace U.S. leadership. For example, U.S.-based hyperscalers

control a large enough portion of the international telecom backbone to allow a unilateral, global internet power projection. Similarly, the U.S. banking infrastructure is sufficiently coupled into international financial institutions to allow unilateral enactment and enforcement of economic sanctions. With two of the four *DIME* instruments of national power in flux, the U.S. must have a national strategy to offset potential risks.⁹

Emerging thought leadership from the Hoover Institution on digital currencies, and the recent White House Executive Order on “Ensuring the Responsible Development of Digital Assets” brings into focus this larger national security, global economic and geopolitical ramification of Web3. The EO is very much a welcome first step ‘call to action’ as it directs agencies to develop measures that address consumer and investor protection; financial stability; illicit finance; U.S. leadership in the global financial system and economic competitiveness; financial inclusion; and responsible innovation.

- To maximize the desired outcomes of the EO and to ensure U.S. leadership of the next generation of the internet, the new interagency coordination executive committee should aim to align public and private interests across the continuum of Web3 digital assets (in addition to cryptocurrencies). To this end, core values and policy objectives of a national strategy should include those listed below: Foster a regulatory environment and investment ecosystem that enables development, deployment, and adoption of U.S.-based Web3 technologies at home and abroad.
- Promote policies that incentivize decentralized implementations of Web3 technologies to maximize security and democratization of governance.

- Establish and advocate internationally for technology and economic policies that promote Web3 technologies built upon core tenants of transparency and democratization and minimize adopting technologies are being developed and operated under the outsized influence of autocratic regimes.
- Combat use of Web3 infrastructure for fraud and illicit finance.
- Promote social equity in adoption and the opportunity created by Web3 technologies.

3 Framework for a Web3 National Strategy

To support integration of interagency initiatives specified in the EO we propose coordination of activities around 3 major anchor points; Governance and the Regulatory Ecosystem, Economic Social and National Security Concerns and Creating American Opportunity. Specific recommendations aligned to these anchor points are detailed below:

3.1 Governance and the Regulatory Ecosystem

Because it intermingles telecommunications and finance, Web3 builds on top of what is already a complex regulatory landscape that includes federal regulators—Federal Reserve, Federal Deposit Insurance Corporation (FDIC), Office of the Comptroller of the currency (OCC), Federal Trade Commission (FTC), Federal Communication Commission (FCC), Consumer Financial Protection Bureau (CFPB), Securities and Exchange Commission (SEC), Commodity Futures Trading Commission (CFTC)—and non-government organizations—Financial Industry Regulatory Authority (FINRA), Municipal Securities Rulemaking Board (MSRB), National Futures Association (NFA), Internet Corporation for

Assigned Names and Numbers (ICANN)—and state regulators. In isolation, these ecosystems have systemic challenges addressing the needs of their constituents, but the overlay is even more complex. To be successful, we the U.S. must have an integrated and consistent approach to Web3.

Recommendation 1: As part of the comprehensive national strategy, the White House should launch an initiative to develop an integrated regulatory framework for Web3, which engages both regulatory stakeholders and market participants. The process should include commissioning a study via the National Academies to provide recommendations.

Recommendation 2: The U.S. government should conduct a review and analysis of the current U.S. legal landscape and international treaties on key issues associated with Web3, identifying (1) areas where laws and treaties already support the propagation of democracy-friendly models for Web3-associated technology and operational models and (2) areas where the law needs to adapt, making recommendations as to how discrete legal shifts can enable the health of democracy-supporting models in Web3.

Recommendation 3: A multistakeholder group, organized through a non-profit organization, is necessary to support Web3 governance and self-regulation. Such an organization could have aspects of FINRA and ICANN as part of its scope.

Recommendation 4: The U.S. government should engage internationally, and through allies, to homogenize emerging regulatory frameworks and open-source software and standards. Web3 is a unique opportunity for the U.S. to reassert its democratic view of technology and society on the global stage. Through establishing shared norms, standards, and regulatory environments, we can establish interoperability and global adoption of a common vision for Web3.

Recommendation 5: The U.S. government should establish a comprehensive program working with market participants for combatting fraud and

illicit finance on Web3 technologies, to include increasing transparency of Web3 service providers, helping consumers assess risk associated with providers akin to a credit bureau for decentralized autonomous organizations (DAOs), and providing law enforcement with more visibility into transnational transactions. Law enforcement organizations need entirely new processes, tools, and real-time analytics tailored to detecting and combatting fraud and illicit finance.

3.2 Economic, Social, and National Security Concerns

The extent to which Web3 disrupts the economic and technological status quo can cause a range of economic and national security concerns. Similarly, the technology has the potential to exacerbate existing social conditions. The U.S. needs to develop a comprehensive policy that spans foreign and domestic issues.

Recommendation 6: Web3 is an instrument of power vis-à-vis strategic competition between the U.S. and China. As part of a broader, compressive national strategy, the White House should lead an interagency initiative to develop a national security strategy for Web3. This strategy should address the expansive role Web3 will have across technology and economic infrastructure. Much as the internet has become the platform for cyber espionage and warfare and social media the platform for propaganda and influence operations, Web3 will ultimately be weaponized.

Recommendation 7: Cryptocurrency and DeFi are rapidly changing the financial technology (FinTech) landscape challenging regulators and other government organizations to stay abreast. The U.S. can lead in promoting responsible financial innovation through meaningful partnerships with industry, academia, and government, as well as engaging with and learning from other cryptocurrency pilots occurring internationally. The U.S. government should build on the working groups established by the Federal Reserve to

address broader cryptocurrency and FinTech developments, developing a regulatory sandbox and other mechanisms that encourage innovation, private sector input into the process, and foreign partner collaboration to help build broad public support and inform the legislative process.

Recommendation 8: Social equity is a major priority for the U.S. government, and Web3 has the potential to disenfranchise some portions of the American population, while creating opportunities for others. From emerging issues of harassment and abuse in the metaverse, to a disproportionate wealth inequality in cryptocurrency, to the dependence on access to broadband to participate in society, a range of social issues must be addressed as part of Web3. Conversely, Web3 can lower barriers to access for investment capital and income. Existing equity and access initiatives being undertaken by the U.S. government should reflect and seek to address the emerging challenges and opportunities with Web3.

Recommendation 9: Cryptocurrency-based profits fall under capital gains in the U.S. tax code by virtue of it being considered property, but the lack of reporting standards and enforcement has led to widespread fraud.¹⁰ However as cryptocurrency becomes the transactional economic fuel of Web3, the taxation aspects become considerably more complex. Arizona and Wyoming have pending legislation allowing payment of taxes in Bitcoin, which if adopted at the federal level, could be transformative.¹¹ The U.S. government should continue to monitor developments in Web3 and the implications to federal and international taxation, ability to detect and counter financial crimes, and ability to levy effective sanctions. The U.S. government should organize a group of subject matter experts on Web3 to enable development and extend successful methodologies, tools, and policies for taxation that will enable both enforcement and voluntary compliance.

Recommendation 10: Energy consumption and environmental impact are a concern for broader adoption of blockchain technologies. Some

blockchains, including Bitcoin, use *proof-of-work* to underpin their security where massive server farms repeatedly solve random math puzzles to prevent others from gaming the system. Because of these concerns, Ethereum plans to transition to an alternative approach—*proof-of-stake*—in June 2022 to dramatically cut its energy consumption.¹² The U.S. government should actively promote global adoption of Web3 technologies based on proof-of-stake or other energy efficient approaches.

3.3 Create American Opportunity

Web3 can create tremendous opportunity for modernizing many facets government services. Andreesen Horowitz calls out a range of opportunities in their Web3 policy handbook:¹³

- Digital identity
- Property rights and ownership, including of digital goods
- Securing financial systems
- Expanding access to financial services
- Individual data sovereignty and data usage
- Privacy-first architecture
- Systems resilience and cybersecurity

Recommendation 11: The White House should develop a strategy for transforming electronic government functions using Web3 technologies. This strategy should include using Web3 platforms and services to support presence, interaction, and transactions, and identify areas where government functions and services can be fully transformed using Web3. Additionally, the strategy should comprehensively address the concept of secure, interoperable digital identity, where the European Union has already made significant progress.¹⁴ Lastly, the strategy should promote investment in DAOs as a fundamental new building block in governance at all levels.

Recommendation 12: Federal science agencies should

include Web3 under the broader umbrella of “advanced communications” as they plan their larger applied research agendas, envisioned under legislation such as the Endless Frontiers Act. Large-scale research and development programs should be established across universities, national laboratories, and non-profit research institutions to cement U.S. leadership in Web3.

Recommendation 13: Arguably among the best way to harness American opportunity is enabling market participants, open-source communities, and the private sector to drive Web3, within a well-established regulatory ecosystem. Capitalize on the American history of software innovation and harness the agility of entrepreneurship to lead globally. The U.S. government should adopt policies that emphasize the role of the private sector and open-source communities in leading Web3 innovation, development, deployment, and operation.

Call to Action

Given the transformative nature of Web3 and early U.S. leadership, there is a significant opportunity for the U.S. to maintain its standing as a global technology leader if it creates an environment where Web3 can flourish and reflect western values. The Biden Administration must work with market participants to develop a comprehensive national strategy to cohere our approach to the technology.

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