



Ordinals: Bitcoin Artifacts
The Controversial New Use Case on Bitcoin Network



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Introduction

This report examines the Ordinals, a new development widely discussed in the Bitcoin community and across the industry. The project has sparked both excitement and debate among the Bitcoin community, with many voicing strong opinions for and against it. The Ordinals Protocol has already had a noticeable impact on the Bitcoin Network, and its influence continues to expand. Interestingly, the emergence of the Ordinals Protocol has reignited old Bitcoin debates.

Ordinals and Inscriptions

Created by Casey Rodarmor, the Ordinals enables individuals to embed data into the Bitcoin Blockchain. Casey's original idea was to create Non-fungible Tokens (NFTs) on Bitcoin in a truly Bitcoin-native way so that it has a cultural acceptability to Bitcoiners.

Ordinals Protocol consists of two levels, i.e., Ordinals and Inscriptions. Ordinals are a numbering convention anyone can opt into and accept as a tenet. Casey first published a blog post about Ordinal Theory (a hypothetical construct by him) in August 2022. According to his blog post, it is a numbering scheme for Satoshis that allows tracking and transferring individual Sats. Therefore, Ordinals provide a way to uniquely identify individual Sats (serialized Satoshis).

In Bitcoin Network, every Satoshi can be assigned a unique serial number (an Ordinal Number). The Satoshis are assigned serial numbers in the order they are mined, so they become ordinal numbers. In simple terms, an Ordinal Number gives the position of something in a sequential list. Thus, the serial number of a Satoshi gives its place in the total supply of Bitcoins in the network. Nonetheless, it is important to note that this is not a convention that exists on the Bitcoin base layer.

The second level, Inscriptions, is the concept where one could assign arbitrary content (any file that a web server can return and, hence, be viewable in a browser) to a Sat in an output transaction, using the Ordinals convention. An Inscribed Sat then effectively turns into a Non-fungible Token (NFT). However, the project promoters prefer to call them Bitcoin Artifacts rather than Bitcoin NFTs.

NFTs must attach arbitrary content/metadata to an on-chain identifier for it to be transferable. Bitcoin lacks native identifiers, making it impossible to link any content to it. With Ordinals, stable serial numbers, content can be linked to a specific Satoshi. Content can be inscribed to ordinals in two ways: on-chain by including the content's hash in a Bitcoin transaction or off-chain with a digital signature. Finally, these Sats can be transferred in a regular Bitcoin transaction.

Technically, in an Inscriptions transaction, content is included in the Witness portion of a Bitcoin Taproot transaction. The Witness section is usually used to include Signatures and Scripts as per Bitcoin's SegWit upgrade. The Taproot upgrade has enabled a scenario in which inscription content is stored in the witness as an input script, which Ordinals has taken advantage of. Before Taproot, there were instances of embedding data into the Bitcoin Blockchain, but Taproot's properties offer certain advantages.

One advantage of these Taproot transactions over non-Taproot transactions is that the witness input data never enters the UTXO set. The issue with data entering the UTXO set as outputs is that it can become burdensome on the network (because nodes have to download more data). There is also a possibility to increase efficiency by introducing Witness Pruning in the future. This means that Bitcoin nodes do not need to download the witnesses below a certain height (an outcome of SegWit).

The SegWit upgrade offers Inscriptions certain advantages, such as the witness discount. Inscriptions are charged a lower fee per real byte due to their higher proportion of witness data relative to virtual data (vBytes). At the same time, Taproot inputs can store data until the block size limit of 4 MB is reached.

The Ordinals convention provides a way to identify rare Sats and attach a numismatic value to them. For example, the first Satoshi in the Genesis block could be rare. Various events in the Bitcoin network, like Halving and Difficulty Adjustment, can also be used to determine the rarity of certain Sats. The project has suggested six rarity levels: Common, Uncommon, Rare, Epic, Legendary, and Mythic. Ultimately, it is up to the user to decide which Sats are rare or desirable.

However, since its inception, the main goal of the Ordinals Protocol has been to develop a better way to add digital art objects to the Bitcoin Blockchain, considering the perceived shortcomings of non-fungible tokens (NFTs). Or in other words, the purpose was not to identify rare Sats with the Ordinals convention, but it was a means to get to the main goal. Besides, if the intention was only to identify rares, there is no need for the Inscriptions part of the protocol.

Ordinals Protocol

The Ordinals Protocol is an open-source project comprised of multiple components. The Ordinals convention is outlined in a draft Bitcoin Improvement Proposal (BIP). The Ordinals Index interacts with a Bitcoin Core node to monitor every Satoshi, while the Ord Wallet manages Ordinals transactions. There is also a block explorer as part of the system. The software functionality also facilitates Inscribing satoshis with various digital artifacts.

At present, utilizing the Ordinals Protocol is somewhat challenging for those who are not tech-savvy. Anyone running Ordinal software has to download a Bitcoin Core full node (non-pruned) from which the Ord Software will fetch data. Ord Software is also command line (CLI) heavy. Not all Bitcoin wallets can facilitate Ordinals-aware transactions. Consequently, users must utilize the Ord wallet from the project directly or else look to other wallet services that provide the same feature.

Ordinals Incriptions: On-Chain Activity

The first mainnet inscription on Bitcoin Network occurred on December 14, 2022. However, the official mainnet launch of the 'ord client' happened on January 20, 2023.

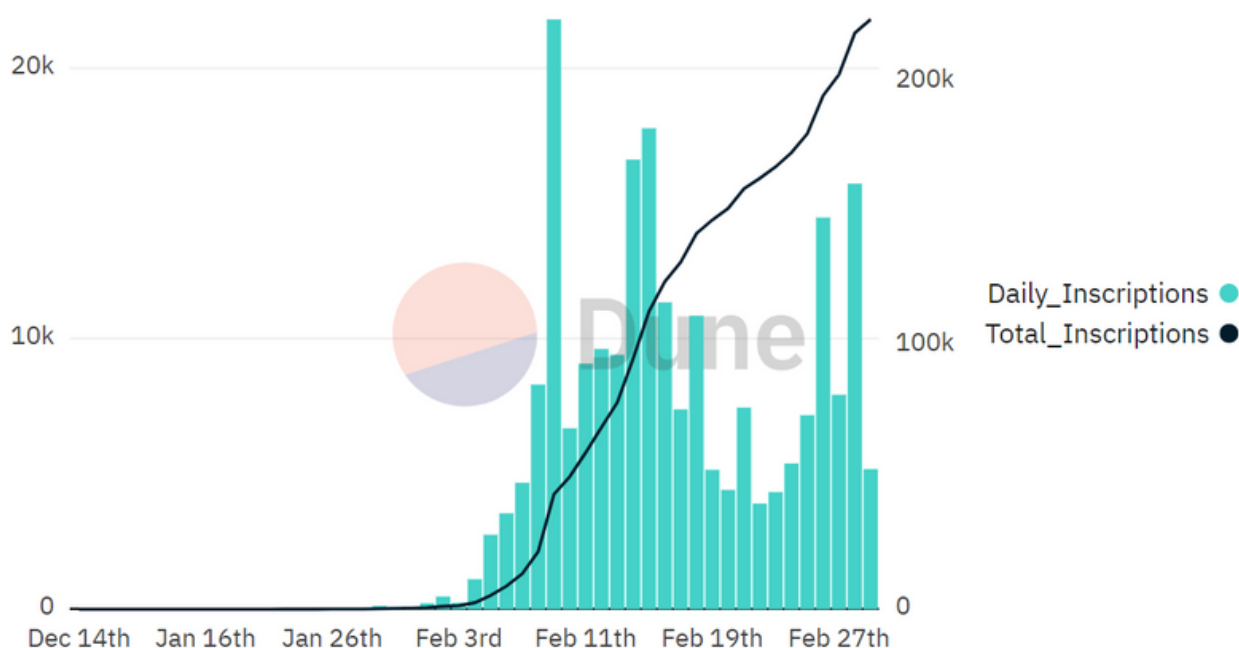


Figure 1: Ordinals: Incriptions (Overtime). Source: [@dgtl_assets](#) via Dune Analytics

As of writing, over 223k Incriptions have been performed on the Bitcoin network, with around ~10k Incriptions done daily. The minters have so far paid 59.42 Bitcoin in fees.

Types of Inscriptions

Analysis of Inscriptions on-chain reveals that seven different media types (also known as Multipurpose Internet Mail Extensions or MIME type) of content have been inscribed. There are also ~24 subtypes under these seven MIME types. The majority of these are images or text.

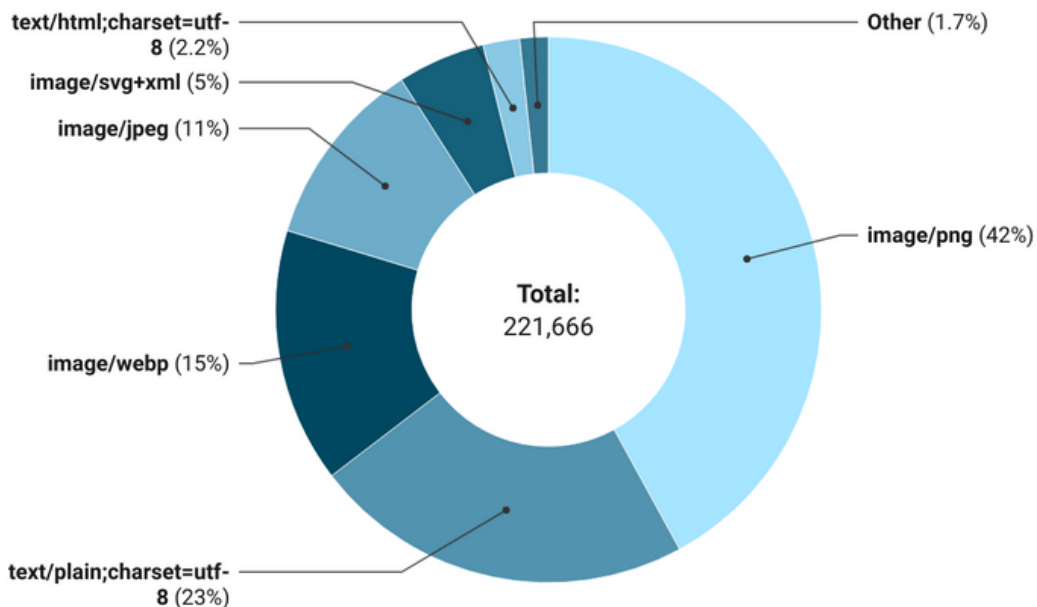


Figure 2: Inscriptions by type/subtype (to date). Source: @dgtl_assets via Dune Analytics. Created with Datawrapper. Data as at 01 March 2023 (09:20 EET)

At its peak, the number of Inscriptions recorded in a single day reached over 20,000. This figure has since reduced to approximately 5,000 - 10,000 daily Inscriptions.

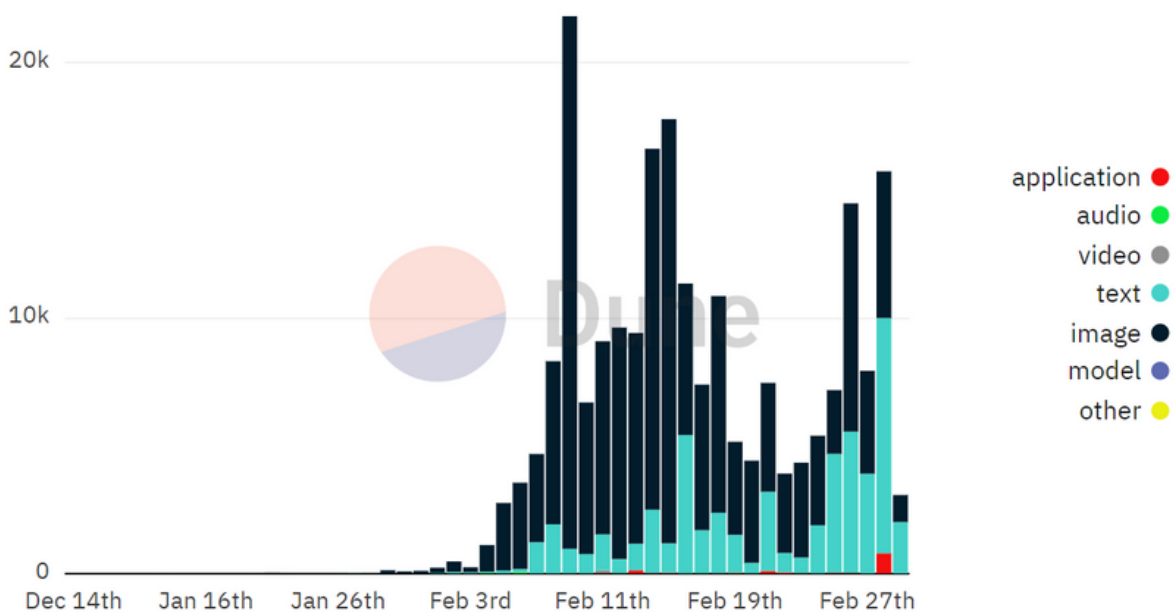


Figure 3: Ordinals: Inscriptions by type (Overtime). Source: @dgtl_assets via Dune Analytics

Sending Ordinals to wallets that do not support them is safe, as long as the UTXO containing them is not spent. However, caution should be taken when using the wallet to send Bitcoin, as it may choose the UTXO with the inscription to send or as payment for fees.

Ordinals Ecosystem

A noteworthy development is the emergence of an Ordinals and Inscriptions-centered ecosystem. The Ordinals and Inscriptions ecosystem comprises Inscriptions & Escrow Services, Wallets, Marketplaces, Listings, Directories, DeFi platforms, and Other Services. The Ordinals concept has already been replicated on the Litecoin network as a fork, which also attempts to capitalize on the excitement.

Although debatable from a philosophical standpoint, Ordinals have also been bridged over to the Ethereum ecosystem. Early indications also suggest that Ordinals DeFi use cases, such as lending and borrowing, are beginning to appear.

In a momentous move for the Ordinals ecosystem, Luxor, a Bitcoin Mining company, recently acquired OrdinalHub - an Ordinals marketplace. This could be considered as the first Ordinals ecosystem acquisition to take place.

Ordinals Ecosystem

Prepared By:

Inscriptions & Escrow Services

InscribeNOW

ORDIMINT

Other Services

BTC PEERS

BLOKMOON

OrdAPI

Marketplaces / Listings / Directories

Ordina.ls

ORDX

oe

ExtraOrdinal.net

Wallets

ExtraOrdinal.net

DeFi

OpenOrdex

Forks

Note: This table is for information purposes only and is not an endorsement of any of the projects here by D-Core.

The team is also fostering the concept of "**Teleburns**," which is the act of transporting NFTs from other chains to the Bitcoin Network as Ordinals (which involves burning the NFT on the original chain). To perform a Teleburn on the Ethereum network, an Inscriptions transaction must initially be conducted to obtain a unique, fixed Inscription ID. This ID is then used to generate an Ethereum address with no private key (a "burn address") and corresponds to the aforementioned Inscription ID.

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Ordinals Become a Hot Topic

Online searches for Ordinals-related terms have seen dramatic increases, as evidenced by data from various sources. This surge in interest corresponds to when the Ordinals Protocol was officially launched in late January 2023, which is also reflected in the rise of the Ordinals [website's ranking](#).

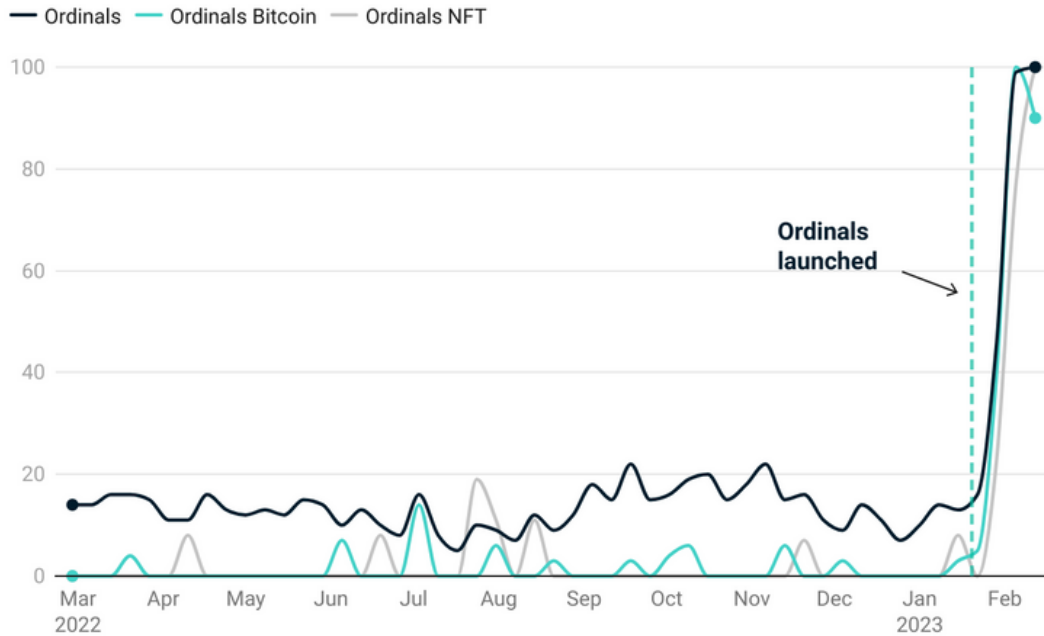


Figure 4: Search Trends Worldwide. Source: Google Trends. Created with Datawrapper

The project's promoter, [Casey Rodarmor](#), has seen a marked increase in his Twitter followers in the 30 days leading up to February 21st, 2023. His account has grown by approximately 99% in that period.

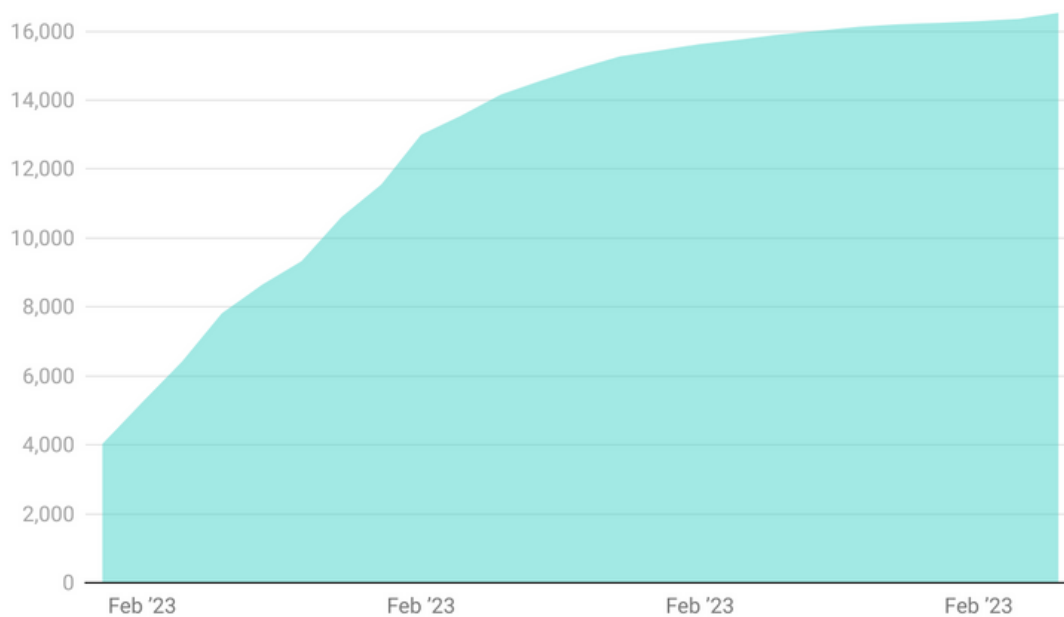


Figure 5: Founder Twitter followers. Source: Social Blade. Created with Datawrapper

Ordinals and the Bitcoin Network activity

The popularity of Ordinals Inscriptions appears to have brought about a spike in Bitcoin Network activity. Block Size usage has noticeably increased, although this is not evident in Stripped Size. This implies that users are increasingly taking advantage of SegWit technology. Therefore, the Block Size growth is likely associated with the recent rise in the utilization of Ordinals Inscriptions.

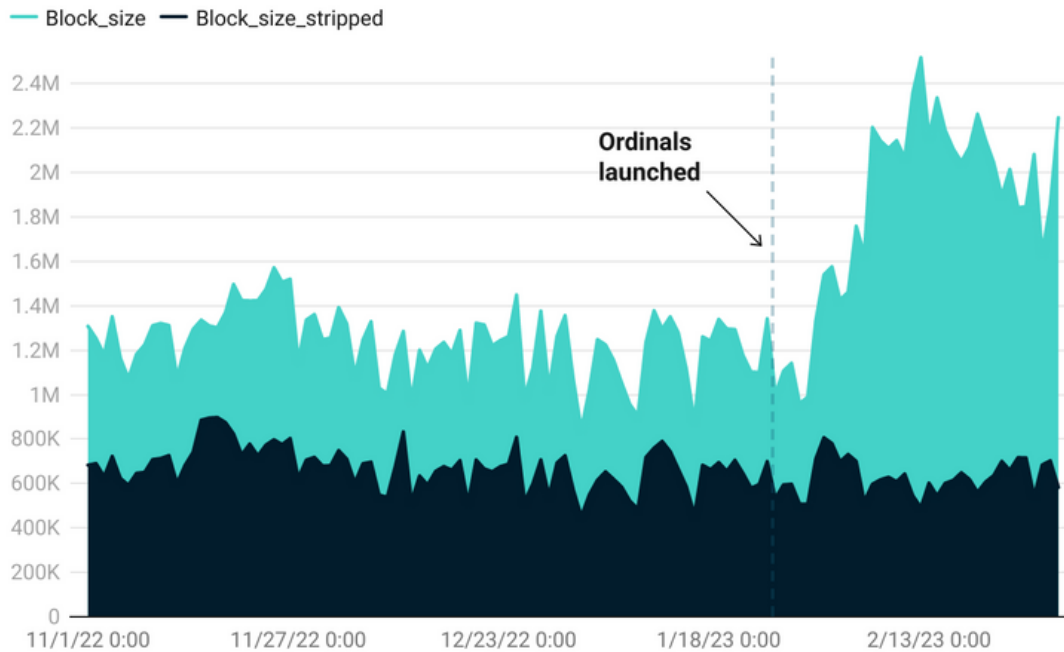


Figure 6: Block size usage . Source: [dgtl_assets](#) via [GeniiData](#). Created with [Datawrapper](#)

Another metric that confirms the above assumption is that there has been a notable rise in the number of Taproot transactions. This trend can directly be linked to the growth in Ordinals Inscriptions.

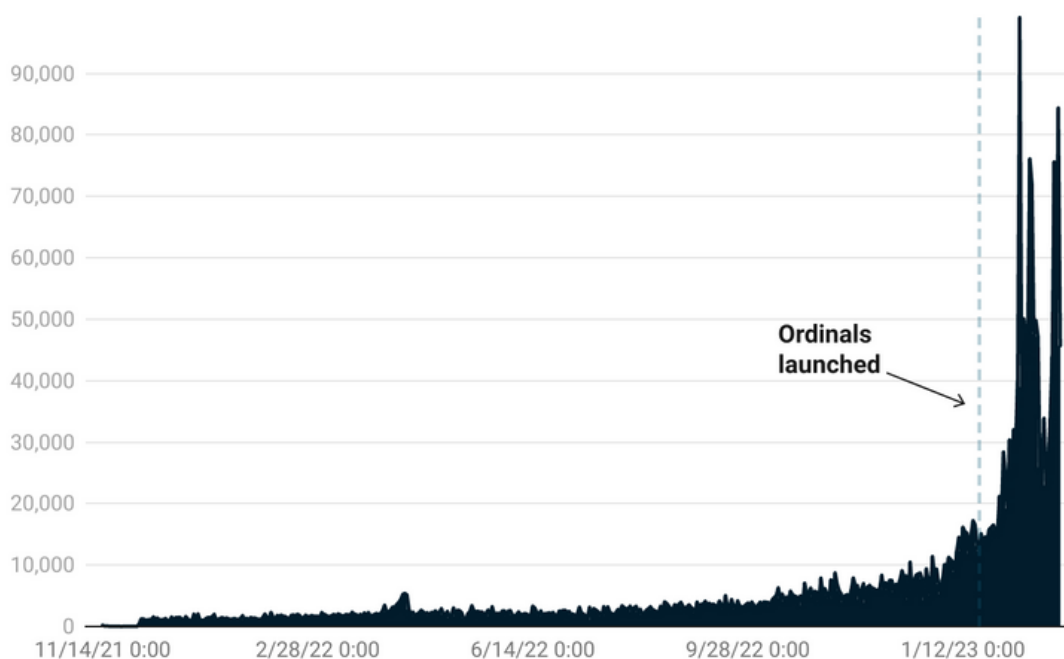


Figure 7: Taproot Usage. Source: [dgtl_assets](#) via [GeniiData](#). Created with [Datawrapper](#)

The implementation of the Ordinals Protocol calls for the downloading of Bitcoin Core full nodes (non-pruned). The project promotor believes this would ultimately improve Bitcoin network health by encouraging a broad and secure node infrastructure. Although not entirely attributable to the growth of Ordinals, the distribution of Bitcoin nodes across the Bitcoin Core version 24.0.1 has increased.

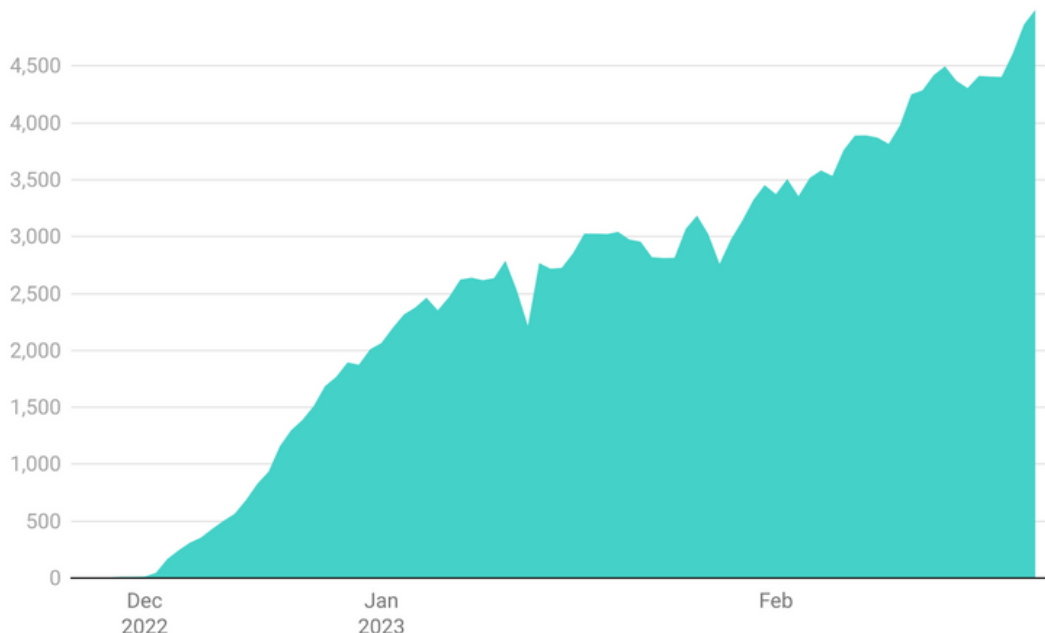


Figure 8: Bitcoin Node Distribution (User Agent Satoshi 24.0.1). Source: [Bitnodes](#) Created with Datawrapper

The Bitcoin Blockchain, however, has swollen significantly since the advent of the Ordinals Protocol, adding 0.281GB per day at a yearly growth rate of 22.43% (7d average). Comparatively, the figures in December 2022 were 0.170GB and 14.0%, respectively.

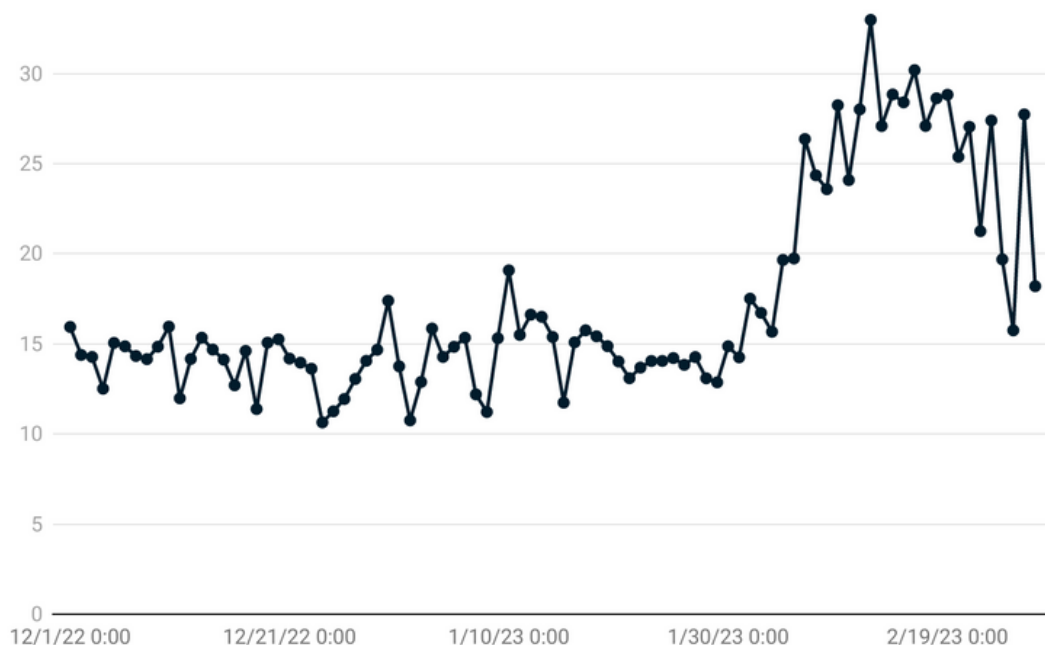


Figure 9: Annualized Growth Rate of the Chain Size. Source: [Bitcoin Visuals](#). Created with Datawrapper

In addition, Ordinals Inscriptions have visibly impacted the fees market, resulting in miners earning over 56 BTC. It is worth noting that Inscriptions usually pay lower fees per vByte, resulting in a lower total fee amount than traditional Bitcoin transactions. This trend indicates that the cost of data storage on the Bitcoin network is far lower than that on other chains. Whether this trend continues or changes significantly due to market forces remains to be seen. Yet, these transactions can still put pressure on the Mempool, competing for block space and potentially driving fees up.

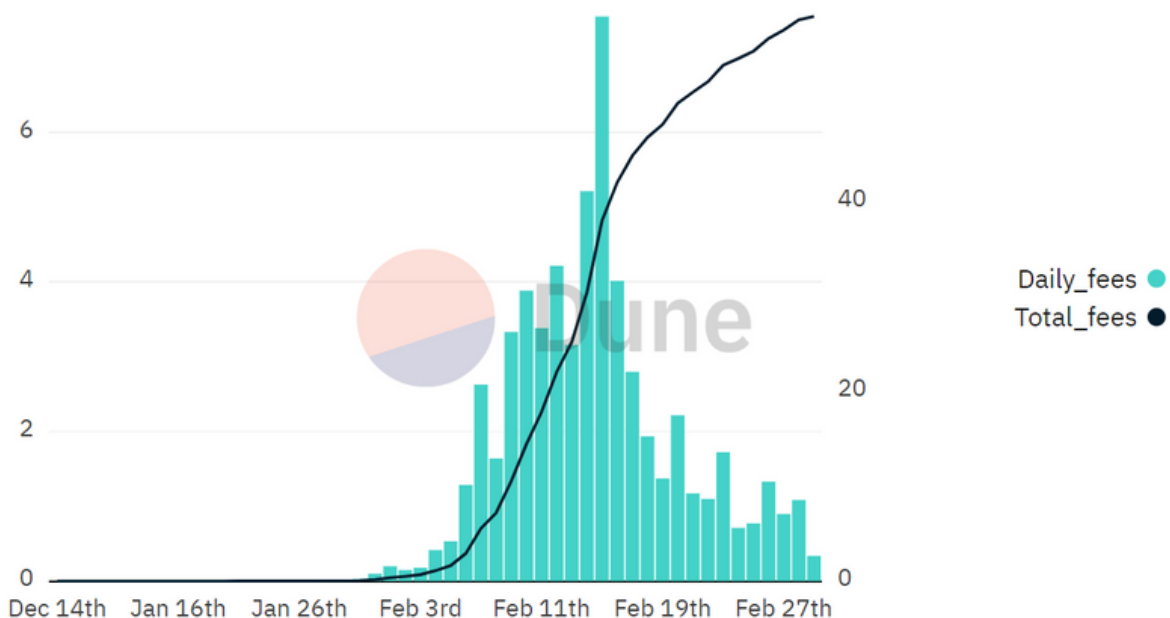


Figure 10: Inscriptions fees paid (Overtime). Source: @dgtl_assets via Dune Analytics

The Mempool graph below clearly illustrates a higher percentage of low-value (sat/vByte) transactions in the mempool when Ordinals Protocol saw a surge in usage. This trend is still visible in the data, suggesting that Ordinals Inscriptions dominate the Mempool.

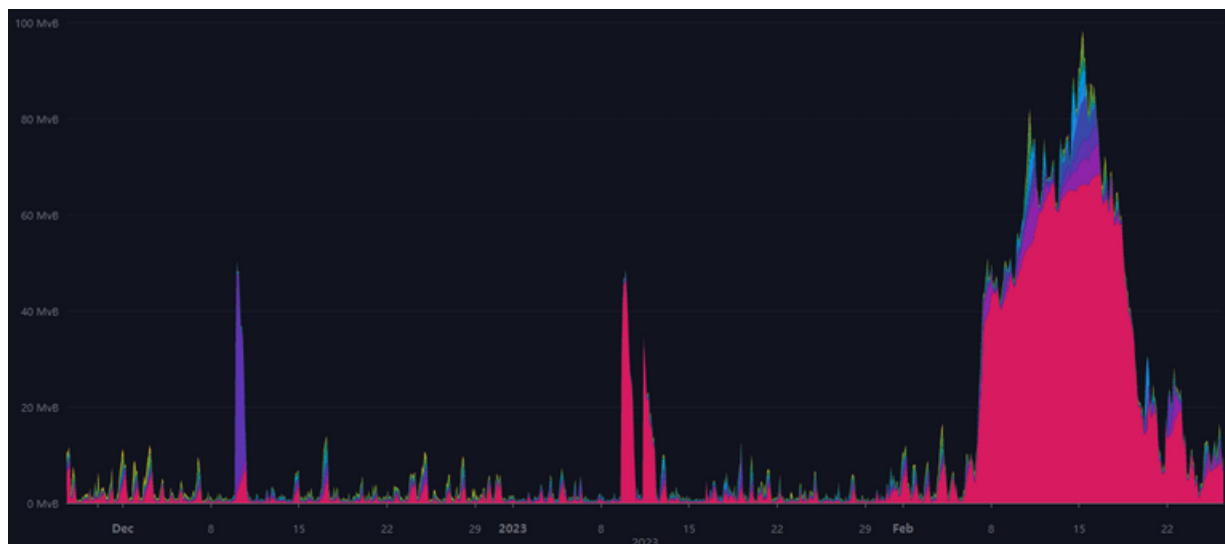


Figure 11: Mempool by vBytes (Sat/vByte). Source: Mempool.Space.

Concerns and Criticisms Related to Ordinals

Ordinals is not exempt from criticism, similar to many other aspects of Crypto.

Ordinals are spamming the network.

To combat what some believe to be spam on the Bitcoin Network, in the form of "ord" in witness scripts, node patches have been implemented as spam filters.

The MiniBolt considers the Inscriptions feature to be the most problematic element of the Ordinals Protocol. It further points out that Ordinals abuse the Bitcoin network and cause significant issues like

1. It is possible to push out financial transactions requiring urgent confirmation,
2. drive fees up,
3. it makes it costly to maintain nodes in the long run, and
4. illegal content.

Threat to Bitcoin decentralization.

Since the growth in Ordinals Inscriptions, the Bitcoin blockchain has rapidly grown in size. Concerns exist that the enlarged blockchain could increase expenses for operating full archival nodes.

Network congestion.

Inscriptions create a transaction backlog and reduce accessibility. Moreover, Inscriptions transactions pay a lower fee per vByte due to the witness discount.

Concluding Remarks

This is not the first time a similar use case has emerged in the Bitcoin ecosystem. It appears that the initial enthusiasm has started to subside.

Ordinals is a unique idea that became exciting unexpectedly. One key aspect is that its implementation does not demand any changes at the Bitcoin blockchain level. Furthermore, the introduction of Ordinals has resulted in an increase in the usage of Taproot. Although Taproot has been initially praised for its capabilities, it had seen little to no use until the surge of Ordinals Inscriptions.

For those who subscribe to the Ordinals convention, the value of a Legendary Satoshi does not derive from an inscribed content but rather from its rarity alone. In other words, the Inscriptions are merely a way of aesthetically enhancing an already interesting Satoshi. Common Sats, on the other hand, can be of value due to the content which is inscribed into them.

The Inscriptions process challenges the fungibility of Bitcoins - while they usually are considered fungible, an inscribed Satoshi holds a different value than a non-inscribed one. This raises questions about the true worth of the Bitcoin market capitalization figures, as part of the Satoshis has a new, altered worth. In a hypothetical situation where all Satoshis have an Inscription and are non-fungible, Bitcoin would no longer be classed as a fungible asset.

As Inscriptions are user-generated, there is potential for violations of laws. Additionally, certain content may be objectionable, as seen in a particular case. It is also necessary to consider Copy Rights and Trade Mark circumstances when Inscribing content to the blockchain.

The Ordinals ecosystem is still in its early stages of development, while triumphs and failures are expected on the journey ahead. What lies in the future for Ordinals and those engaged in the ecosystem remains to be seen.

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