Effectiveness of Bitswap Discovery Process

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Motivation

- We want to get rid of IPFS magic numbers
- Bitswap has a `ProviderSearchDelay` parameter whose value is set to 1 second
- Measure whether Bitswap is efficient to discover content

Measurements Setup

- Request CIDs collected by sniffing the Bitswap network
- Bitswap has 15 seconds to find and fetch the content
- Prevent DHT lookup inside Bitswap
- If Bitswap fails to discover content, verify if content is still available
- Prevent recursive content resolution
- Run on a Google Cloud VM in Central Europe

Discovery Process Stats

- 98.37% discovery success rate (within 15 seconds)
- On average 856 distinct remote peers are solicited for each Bitswap request
- On average 1714 messages are sent for each Bitswap request

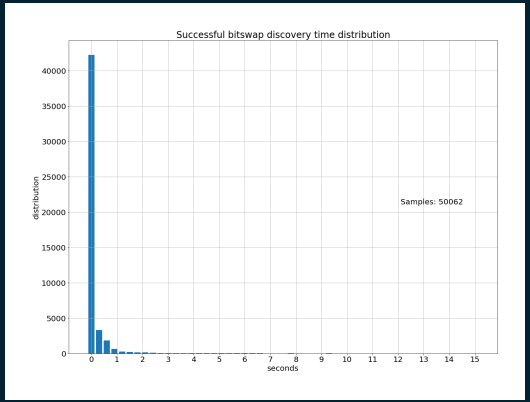
Content Providers Stats

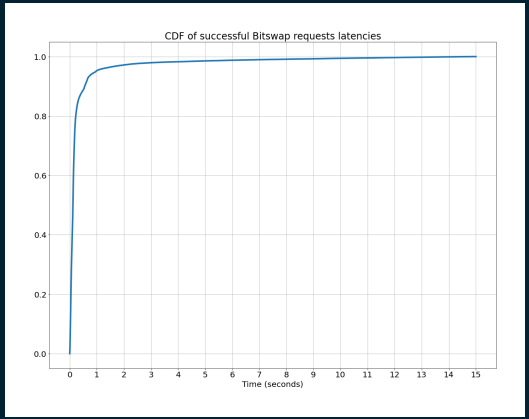
- Total requests: 50’062

Top N providers	Percentage of blocks served
Top 1	10.61%
Top 3	25.65%
Top 5	37.93%
Top 10	58.12%
Top 20	75.41%
Top 50	84.39%
Top 361	98.49%
Top 723	100.0%

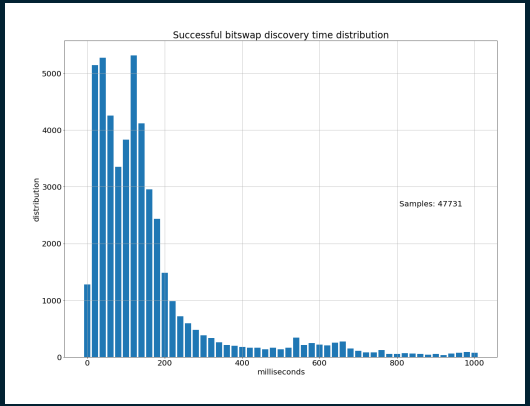
	PeerID	Number of blocks served	Operator
1.	12D3KooWGtRcWvihm4hX2gT6bQu3uyjb78rgyQR3hPhkxMwivscY	5398	
2.	12D3KooWLsSWaRsoCejZ6RMsGqdftpKbohczNqs3jvNfPgRwrMp2	4113	nft.storage
3.	12D3KooWGRJo1vLDBtfS8a4cVss2QVqvbCaPgtmwwgpUtW675QRa	3543	nft.storage
4.	12D3KooWAuBxG5uMBkeyFwHD9JyHaJGTqn7NhJbmmukNDPHSLKts	3167	nft.storage
5.	12D3KooWJc7GbwkjVg9voPNxdRnmEDS3i8NXNwRXD6kLattaMnE4	3085	nft.storage
6.	12D3KooWEGeZ19Q79NdzS6CJBoCwFZwujqi5hoK8BtRcLa48fJdu	2357	
7.	12D3KooWJ59N9z5CyLTtcUTnuTKnRTEVxiztjiiEAYbP16aZjQ3D	2287	nft.storage
8.	12D3KooWENiDwDCPnbEQKHHsDnSsE5Y3oLyXnxuyhjcCEBK9TvkU	2051	
9.	12D3KooWC9L4RjPGgqpzBUBkcVpKjJYofCkC5i5QdQftg1LdsFb2	1826	
10.	12D3KooWKd92H37a8gCDZPDAAGTYvEGAq7CNk1TcaCkcZedkTwFG	1750	nft.storage

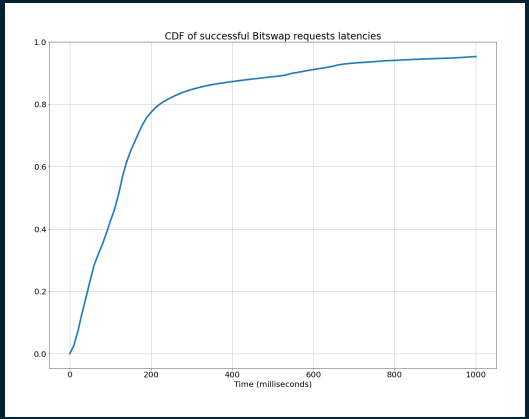
Bitswap Discovery + Fetch Latencies





Bitswap Discovery + Fetch Latencies Zoom





References

- Detailed report
- Complete measurement methodology
- Additional data and plots
- Improvement recommendations

RFM-16 Report

- Soon available at `https://github.com/protocol/network-measurements`