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CF Digital Asset Sector Composite Index

Modified Market Cap Weight Variants

Modified Equal Weight Variants

Methodology Guide

Version:

2.2

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1 Version History

Version	Date Issued	Summary of Change	Owner
V1.0	01 Dec 2021	n/a	CF Benchmarks Management
V1.1	09 Dec 2021	Addition of Brazil time zone variant	CF Benchmarks Management
V1.11	16 Dec 2021	Section 4 index name typo correction	CF Benchmarks Management
V1.2	25 Feb 2022	Addition of Digital Culture indices. Addition of real time index calculation. Addition of Constituent Calculation Window Table	CF Benchmarks Management
V1.3	18 Mar 2022	Change to Determination Time Definition of Aggregate Weight	CF Benchmarks Management
V1.4	29 Jul 2022	Parameter Tables: Updated Minimum Full Market Capitalization to Minimum Full Market Capitalization Ratio.	CF Benchmarks Management
V1.5	06 Sep 2022	Updated constituent list and observation windows	CF Benchmarks Management
V1.6	18 Nov 2022	Change Return Factor equation Update to Constituent List Introduction of Entry Float Factor	CF Benchmarks Management
V1.7	10 May 2023	Updated Settlement Network's constituent eligibility criteria Updated Constituent List	CF Benchmarks Management
V1.8	27 Oct 2023	Section 3.7.2 Clarification added to the 2nd bullet point Section 7 Restatement & Republishing policy updated The Oversight Function naming conventions updated across the document	CF Benchmarks Compliance Function
V1.9	13 Nov 2023	Update to logo & format	CF Benchmarks Marketing
V2.0	14 Nov 2023	Updated index parameter tables	CF Benchmarks Management
V2.1	20 Nov 2023	Updated logo (AKC v2)	CF Benchmarks Marketing
V2.2	06 Feb 2024	Updates to the Administrator communication procedures for Delayed Calculation & Publication; Calculation Failure; Restatement & Republishing and Market Failure Events	CF Benchmarks Compliance Function

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2 Introduction

2.1 Index Aims

The CF Digital Asset Sector Composite Index (the "***Index***") seeks to track the performance of specific Sectors within the crypto ecosystem through a portfolio of Digital Assets that are native to the protocols, information networks and blockchain networks that constitute the infrastructure necessary to deliver Sector products and services to end-users. To achieve this aim, it is necessary to construct a portfolio that will always comprise Digital Assets associated with all the segments of the value-chain that enable the effective functioning of the Sector ecosystem and delivery of products and services.

The Index has been designed to be investible and to be used as a benchmark as defined by ***UK Benchmarks Regulation*** ("***UK BMR***") including for:

- The performance benchmarking of actively managed portfolios of Digital Assets and to determine relative performance.
- The passive replication in investment funds and financial instruments and products
- The settlement of financial instruments including derivative contracts.
- As a means of valuing or "marking to market" portfolio holdings of cryptocurrency.

2.2 Requirements

For the Index to meet its stated aims it must be:

- Representative

To achieve true representation of the Sector ecosystem it is necessary to construct a portfolio that ensures exposure to all Digital Assets associated with the functionality required to deliver Sector products and services to end-users. Whilst most observers would associate the Sector ecosystem with Sector specific Decentralized Applications (dApps), it is important to remember that Sector Applications cannot deliver their services to end-users in isolation but are reliant on a variety of blockchain and service networks to do so. Given this the index should include Digital Assets native to these blockchain and services as constituents in sub-portfolios to ensure that the index has consistent exposure to the different Categories within the value chain.

- Replicable

Each index constituent is selected in accordance with a transparent set of rule-based inclusion criteria covering asset safekeeping, liquidity, asset turnover as well as rule-based buffering for exclusion of existing constituents at reconstitution. Index constituent pricing sources also utilise fully replicable rules-based methodologies. The Administrator does not utilise expert judgement in the day-to-day calculation.

- Reliable

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- The index aims would be best fulfilled by dividing the index into sub portfolios to gain exposure to the full value chain of the Sector. The weighting of sub-portfolios in the proportion to which they enable the Sector Applications to deliver services and products to end users. However, given the nascent nature of the ecosystem and its rapid evolution a more simplified weighting structure will be employed until such time that the proportionate contribution of the different sub-portfolios can be more reliably determined.
- The Index shall be capable of calculation and administration in a reliable and robust manner in accordance with all CF Benchmarks Administration Polices and the provisions of *UK BMR*.

2.3 Underlying Economic Reality

The Index is intended to measure the underlying economic reality of the value of the base assets in units of the quote asset as held in a portfolio that seeks to replicate the market beta of the Sector of the Digital Asset ecosystem. This is achieved by observing the exchange of the base assets for the quote asset and vice versa. This is accomplished using transactional input data from Constituent Exchanges, that are selected based on published Constituent Exchange Criteria. The Administrator shall undertake the selection process based on Meta Data pertaining to the Sector.

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3 Index Parameters

3.1 Portfolio Composition

The Index Portfolio shall be constituted of three sub-portfolios to ensure constant exposure to all the elements of the value chain that are necessary to deliver Sector products & services.

- **Sector Applications** - The sub-portfolio of Digital Assets shall include the primary token associated to the operation or governance of protocols that underpin decentralized applications that are delivering services associated with the sector.

- **On-chain Services** - The sub-portfolio shall include Digital Assets that are native to systems that enable the Sector Applications within the portfolio to interact with and deliver settlement between end-users on a blockchain network. These services include what are commonly referred to as; "Layer 2" blockchains, "Oracle" networks and "scaling solutions" or protocols that enable the value-chain for such decentralized applications by way of scaling, or other services.

- **Settlement Networks** - The sub-portfolio shall include the Digital Assets that are native to the blockchains where transactions generated by the Sector applications within the portfolio are settled between counterparties.

3.2 Eligible Index Constituents

The Index constituents shall be assets which are eligible under **CF Digital Asset Multi - Asset Series Ground Rules – Section 2 – Investable Universe.** There shall be a maximum number of total constituents to balance the fulfilment of the Index aims without undue burden on investors.
To be eligible for inclusion in the index, Constituents shall have a Full Market Capitalization that is above the **Minimum Full Market Cap** for the Index as defined in the Index Parameters. Full Market Capitalization shall be calculated in accordance with Section 4.2 of **CF Digital Asset Multi - Asset Series Ground Rules.**
Digital Assets that are, by their design, pegged to the value of other assets such as, but not limited to, fiat currency ("stablecoins"), a physical commodity or another Digital Asset, are not eligible for inclusion. Digital assets whose status is ambiguous or has been questioned by Regulatory and Supervisory Authorities of major jurisdictions including, but not limited to, the United States of America, the European Union and the United Kingdom are also not eligible for inclusion.
The eligible constituents for a Sector Index shall include:

1. The digital assets associated with software protocols that are classified as part of such sector applications in accordance with the **CF Digital Asset Classification Structure** ("DACS") and they shall form the constituents of the **Sector Applications** sub-portfolio.

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2. The digital assets associated with the software protocols that provide on-chain services that are utilised by the software protocols associated with the digital assets that comprise the **Sector Applications** sub-portfolio shall form the constituents of the **On-chain Services** sub-portfolio.
3. The digital assets that are native to the software protocol that is used to settle the transfer of assets, whether directly or indirectly, that are the result of transactions facilitated by the sector applications that comprise the **Sector Applications** sub-portfolio shall form the constituents of the **Settlement Networks** sub-portfolio. In addition to this, only digital assets of Settlement Networks that pass the minimum daily average of transferred assets as a percentage of the Network with the highest volume (minimum settlement volume), will be considered eligible. The average shall be computed using the 6 most recent months of transfer data. Should such data be partially unavailable, the Administrator shall use a shorter sample of data but equally representative of the Network's activity. Should transfer data be fully unavailable, the Administrator shall use the Sector constituent's total supply of digital assets on a given network instead and follow the same procedure as above i.e. compute its total supply ratio as a percentage of the total supply of the constituent's main Settlement Network.

To be able to reliably determine the pricing of any constituent of the Index any Digital Asset that is not listed on 2 (two) or more constituent exchanges shall not be eligible for Inclusion.

3.3 Index Denomination

The Index is denominated in a unique fiat as outlined in the **Index Parameter Tables.**

3.4 Index Return Types

The index is available in two return variants:

- **Total Return:** Inclusive of distributions (such as forks, airdrops amongst others) and deductions - the definition and treatment of distributions and deductions are defined in the ***CF Digital Asset Index Family - Multi Asset Series Ground Rules – Section 7 - Treatment of Distributions & Section 8 - Treatment of Deductions***.
- **Price Return:** Exclusive of distributions but inclusive of deductions.

3.5 Calculation & Publication Frequency

The Index shall be calculated once a day at a time as defined in the **Index Parameter Tables** and published soon after, 365 days a year.

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3.6 Constituent Reviews

Constituent Reviews are carried in accordance with the ***CF Benchmarks Multi Digital Asset Indices Ground Rules - Section 3 - Constituent Review*** and employ the below constituent review buffers.

Sector Applications:

- Where a Digital Asset that is not an existing constituent of the **Sector Application** sub-portfolio reaches a market capitalisation rank of ***12 or higher*** it will replace an existing constituent that is the lowest ranked by market capitalisation.
- Where a Digital Asset that is not an existing index Sector constituent reaches a market capitalisation rank of ***16*** then it will only enter the index and replace an existing index constituent if an existing index constituent falls to a market capitalisation rank of **28** or lower.
- Where a Digital Asset that is not an existing index Sector constituent reaches a market capitalisation rank of ***20*** then it will only enter the index and replace an existing index constituent if the existing index constituent falls to a market capitalisation rank of ***32*** or lower.

Where the number of the **Sector Applications** sub-portfolio's constituents are less than the maximum outlined below, the Administrator will modify the buffer parameters proportionately.

On-chain Services:

- Where a Digital Asset that is not an existing constituent of the **On-chain Services** sub-portfolio reaches a market capitalisation rank of ***6 or higher*** it will replace an existing constituent that is the lowest ranked by market capitalisation.
- Where a Digital Asset that is not an existing index Sector constituent reaches a market capitalisation rank of ***8*** then it will only enter the index and replace an existing index constituent if an existing index constituent falls to a market capitalisation rank of **14** or lower.
- Where a Digital Asset that is not an existing index Sector constituent reaches a market capitalisation rank of ***10*** then it will only enter the index and replace an existing index constituent if the existing index constituent falls to a market capitalisation rank of ***16*** or lower.

Where the number of the **On-chain Services** sub-portfolio's constituents are less than the maximum outlined below the Administrator will modify the buffer parameters proportionately.

Settlement Networks:

- Where a Digital Asset that is not an existing constituent of the **Settlement Networks** sub-portfolio reaches a market capitalisation rank of ***3 or higher*** it will replace an existing constituent that is the lowest ranked by market capitalisation.
- Where a Digital Asset that is not an existing index Sector constituent reaches a market capitalisation rank of ***4*** then it will only enter the index and replace an existing index constituent if an existing index constituent falls to a market capitalisation rank of **7** or lower.
- Where a Digital Asset that is not an existing index Sector constituent reaches a market capitalisation rank of ***5*** then it will only enter the index and replace an existing index constituent if the existing index constituent falls to a market capitalisation rank of ***8*** or lower.

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Where the number of the **Settlement Networks** sub-portfolio's constituents are less than the maximum outlined below, the Administrator will modify the buffer parameters proportionately.

3.7 Constituent Weighting

3.7.1 Weighting within each Sub-Portfolio

The Index is composed of three sub-portfolios with weights as per the **Index Parameter Tables**.
The Index constituents within each sub-portfolio are weighted as follows:

- **Sector Applications Sub-portfolio:** Allocated per the weighting method in the **Index Parameter Tables** across Sector protocols with a maximum of 20 assets to ensure adequate index exposure to a wide range of sector activities without hindering replication through the inclusion of small capitalization assets. Sector assets will be ranked by Full Market Capitalization to determine the top indices to be considered for inclusion in the Sector Index. As the crypto ecosystem matures and more meta data that may be used to inform constituent weights becomes available in the future, the Administrator may consider additional metrics in selecting assets to ensure the Index adequately represents the index sector activities.
- **On-chain Services:** Allocated across a maximum of 10 protocols in proportion to their usage and relevance to the selected Sector assets. However, until the ecosystem matures and liquidity improves, such weightings shall be allocated per the weighting method in the **Index Parameter Table**.
- **Settlement Networks:** Allocated across a maximum of 5 Settlement protocols in proportion to their usage and relevance to the Sector assets. However, until the ecosystem matures and liquidity improves, such weightings shall be allocated per the weighting method in the Index Parameter Table.

3.7.2 Entry Float Factor ("EFF") for Sector Composite Indices

To facilitate replicability and mitigate against liquidity risks caused by significant weight changes at each Reconstitution, the following shall apply only to any incoming Constituents entering the Index at any Reconstitution.

- Where an incoming Constituent would enter the index at a weight of 15% or higher, an EFF shall be applied.
- The EFF for an incoming Constituent shall be applied as a discount factor to the Free-Float Supply of the incoming Constituent at Reconstitution at each 15% weight increment above 15%. Should the discounting process of incoming Constituents that breach the 15% weight threshold lead to other initially non-breaching incoming Constituents also breach this threshold, the above process shall be reiterated. Note that in doing so, incoming Constituents' Free Float Supply can be discounted only once.

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Weight Increment	Discount
0-15%	0%
15-30%	70%
30-45%	90%
45-60%	97%
60-75%	100%
75-90%	100%
90-100%	100%

- The EFF shall be applied only at entry for the incoming Constituent. Subsequent rebalances shall be in accordance with the existing supply calculation and application rules set out in the ***CF Digital Asset Index Family - Multi Asset Series Ground Rules.***

3.8 Index Constituent Pricing Sources (Input Data)

3.8.1 Spot Rate

The Index Constituent Pricing Source shall be the CF Benchmarks Spot Rates available at https://www.cfbenchmarks.com/ or other CF Benchmarks pricing sources that utilise the same calculation methodology as CF Benchmarks single Asset Real Time and Spot Prices - see **Parameter Tables** for **Constituent Observation Windows and Partition Lengths**.

3.8.2 Settlement Price

The Index Constituent Pricing Source shall be the CF Benchmarks Reference Rates available on https://www.cfbenchmarks.com/ or other CF Benchmarks pricing sources that utilise the same calculation methodology as CF Benchmarks single Asset Reference and Settlement Prices - see **Parameter Tables** for **Observation Windows and Partition Lengths**.

The respective methodologies for each of these pricing benchmarks is available at https://www.cfbenchmarks.com/documentation/products/classification
Should these sources become permanently unavailable then ***CF Digital Asset Index Family - Multi Asset Series Ground Rules - Section 6 - Input Data Hierarchy*** shall be applied after review by the CF Cryptocurrency Index Family Oversight Function ("**the Function**" or "**the Oversight Function**").

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3.9 Rebalance Frequency

The Index shall be rebalanced per the frequency defined in the Index Parameters per the procedures described in the ***CF Benchmarks Multi Asset Index Ground Rules – Section 6 - Rebalance Procedure***.

3.9.1 Rebalance Determination Point

16:00:00 UTC on the day which is 8 business days prior to the Rebalance Implementation Point.

3.9.2 Rebalance Implementation Point

At the Index Calculation & Publication time on the first business day of the Rebalance month.

3.9.3 Rebalance Determination Pricing Source

The Index Rebalance Determination Pricing Source shall be the CF Benchmarks Reference Rates available on https://www.cfbenchmarks.com/ or other CF Benchmarks pricing sources that utilise the same calculation methodology as CF Benchmarks single Asset Reference and Settlement Prices - see Parameter table for observation windows and partition lengths.
The respective methodologies for each of these pricing benchmarks is available at https://www.cfbenchmarks.com/documentation/products/classification
Should these sources become permanently unavailable then ***CF Digital Asset Index Family - Multi Asset Series Ground Rules - Section 6 - Input Data Hierarchy*** shall be applied after review by the Oversight Function.

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4 Index Parameter Tables

4.1 DeFi - Modified Market Cap Variants

Index Name	**CF DeFi Composite Index – Modified Market Cap Weight - LDN**
Ticker (Price Return)	CFDFMWLDN_RR_PR
Ticker (Total Return)	CFDFMWLDN_RR_TR
Inception Date	01 December 2021
Inception Value	1,000
Base Currency	USD
Constituents	Finance-Sector Applications: maximum of 20 constituents On-chain Services: maximum of 10 constituents Settlement Networks: maximum of 5 constituents
Constituent Pricing Sources	CF Benchmarks Pricing Sources
Constituent Selection Method	Sector Applications: Full Market Capitalization rank of Sector applications that fall within the Sectors-Finance category of the CF Digital Asset Classification Structure. On-Chain Services: protocols utilized by the Sector Applications constituents Settlement Networks: protocols utilized by the Sector Applications constituents
Return Types	• Total Return • Price Return
Calculation & Publication Time	Between 16:05 and 16:30 London time
Calculation & Publication Frequency	Every day, 365 days a year.
Constituent Minimum Full Market Capitalization Ratio	0.10%
Constituent Minimum Liquidity Requirement	0.05%
Constituent Minimum Monthly Asset Turnover	2%
Minimum Settlement Volume	25%
Buffers for Exclusion of an Existing Constituent at Reconstitution	- 50% of the Minimum Full Market Cap - 50% of the Minimum Liquidity Ratio - 25% of the Minimum Turnover Ratio - 50% of the Minimum Settlement Volume

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Constituent Weighting	70% Sector Applications – Market Cap Weight between assets. 15% On-Chain Services – Market Cap Weight between assets. 15% Settlement Networks– Market Cap Weight between assets.
Weighting Caps	None
Weighting Floors	None
Rebalance Frequency / Month	Quarterly – 1st business day of March, June, Sep, Dec.
Rebalance Determination Time	16:00:00 UTC on the day which is 8 business days prior to the Rebalance Implementation Point
Rebalance Implementation Time	On the Calculation & Publication time, on the first business day of Rebalance month.

Index Name	**CF DeFi Composite Index - Modified Market Cap Weight - BRT**
Ticker (Price Return)	CFDFMWBRT_RR_PR
Ticker (Total Return)	CFDFMWBRT_RR_TR
Inception Date	01 December 2021
Inception Value	1,000
Base Currency	USD
Constituents	Finance-Sector Applications: maximum of 20 constituents On-chain Services: maximum of 10 constituents Settlement Networks: maximum of 5 constituents
Constituent Pricing Sources	CF Benchmarks Pricing Sources
Constituent Selection Method	Sector Applications: Full Market Capitalization rank of Sector applications that fall within the Sectors-Finance category of the CF Digital Asset Classification Structure. On-Chain Services: protocols utilized by the Sector Applications constituents. Settlement Networks: protocols utilized by the Sector Applications constituents.
Return Types	• Total Return • Price Return
Calculation & Publication Time	Between 16:05 and 16:30 Brasilia Time (BRT)
Calculation & Publication Frequency	Every day, 365 days a year.
Constituent Minimum Full Market Capitalization Ratio	0.10%
Constituent Minimum Liquidity Requirement	0.05%
Constituent Minimum Monthly Asset Turnover	2%
Minimum Settlement Volume	25%
Buffers for Exclusion of an Existing Constituent at Reconstitution	- 50% of the Minimum Full Market Cap - 50% of the Minimum Liquidity Ratio - 25% of the Minimum Turnover Ratio

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	- 50% of the Minimum Settlement Volume
Constituent Weighting	70% Sector Applications – Market Cap Weight between assets. 15% On-Chain Services – Market Cap Weight between assets. 15% Settlement Networks– Market Cap Weight between assets.
Weighting Caps	None
Weighting Floors	None
Rebalance Frequency / Month	Quarterly – 1st business day of March, June, Sep, Dec.
Rebalance Determination Time	16:00:00 UTC on the day which is 8 business days prior to the Rebalance Implementation Point
Rebalance Implementation Time	On the Calculation & Publication time, on the first business day of Rebalance month.

Index Name	**CF DeFi Composite Index - Modified Market Cap Weight - US**
Ticker (Price Return)	CFDFMWUS_RR_PR
Ticker (Total Return)	CFDFMWUS_RR_TR
Inception Date	01 December 2021
Inception Value	1,000
Base Currency	USD
Constituents	Finance-Sector Applications: maximum of 20 constituents On-chain Services: maximum of 10 constituents Settlement Networks: maximum of 5 constituents
Constituent Pricing Sources	CF Benchmarks Pricing Sources
Constituent Selection Method	Sector Applications: Full Market Capitalization rank of Sector applications that fall within the Sectors-Finance category of the CF Digital Asset Classification Structure. On-Chain Services: protocols utilized by the Sector Applications constituents. Settlement Networks: protocols utilized by the Sector Applications constituents.
Return Types	• Total Return • Price Return
Calculation & Publication Time	Between 16:05 and 16:30 US Eastern Standard Time (US)
Calculation & Publication Frequency	Every day, 365 days a year.
Constituent Minimum Full Market Capitalization Ratio	0.10%
Constituent Minimum Liquidity Requirement	0.05%
Constituent Minimum Monthly Asset Turnover	2%
Minimum Settlement Volume	25%
Buffers for Exclusion of an Existing Constituent at Reconstitution	- 50% of the Minimum Full Market Cap - 50% of the Minimum Liquidity Ratio

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	- 25% of the Minimum Turnover Ratio - 50% of the Minimum Settlement Volume
Constituent Weighting	70% Sector Applications – Market Cap Weight between assets. 15% On-Chain Services – Market Cap Weight between assets. 15% Settlement Networks– Market Cap Weight between assets.
Weighting Caps	None
Weighting Floors	None
Rebalance Frequency / Month	Quarterly – 1st business day of March, June, Sep, Dec.
Rebalance Determination Time	16:00:00 UTC on the day which is 8 business days prior to the Rebalance Implementation Point
Rebalance Implementation Time	On the Calculation & Publication time, on the first business day of Rebalance month.

4.2 Digital Culture - Modified Market Cap Variants

Index Name	**CF Digital Culture Composite Index – Modified Market Cap Weight - LDN**
Ticker (Price Return)	CFDCMWLDN_RR_PR
Ticker (Total Return)	CFDCMWLDN_RR_TR
Inception Date	01 February 2022
Inception Value	1,000
Base Currency	USD
Constituents	Culture-Sector Applications: maximum of 20 constituents On-chain Services: maximum of 10 constituents Settlement Networks: maximum of 5 constituents
Constituent Pricing Sources	CF Digital Asset Reference Rates
Constituent Selection Method	Sector Applications: Full Market Capitalization rank of Sector applications that fall within the Sectors-Culture category of the CF Digital Asset Classification Structure. On-Chain Services: protocols utilized by the Sector Applications constituents Settlement Networks: protocols utilized by the Sector Applications constituents
Return Types	• Total Return • Price Return
Calculation & Publication Time	Between 16:05 and 16:30 London time
Calculation & Publication Frequency	Every day, 365 days a year.
Constituent Minimum Full Market Capitalization Ratio	0.10%
Constituent Minimum Liquidity Requirement	0.05%
Constituent Minimum Monthly Asset Turnover	2%

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Minimum Settlement Volume	25%
Buffers for Exclusion of an Existing Constituent at Reconstitution	- 50% of the Minimum Full Market Cap - 50% of the Minimum Liquidity Ratio - 25% of the Minimum Turnover Ratio - 50% of the Minimum Settlement Volume
Constituent Weighting	70% Sector Applications – Market Cap Weight between assets. 15% On-Chain Services – Market Cap Weight between assets. 15% Settlement Networks– Market Cap Weight between assets.
Weighting Caps	None
Weighting Floors	None
Rebalance Frequency / Month	Quarterly – 1st business day of March, June, Sep, Dec.
Rebalance Determination Time	16:00:00 UTC on the day which is 8 business days prior to the Rebalance Implementation Point
Rebalance Implementation Time	On the Calculation & Publication time, on the first business day of Rebalance month.

Index Name	**CF Digital Culture Composite Index - Modified Market Cap Weight - BRT**
Ticker (Price Return)	CFDCMWBRT_RR_PR
Ticker (Total Return)	CFDCMWBRT_RR_TR
Inception Date	01 February 2022
Inception Value	1,000
Base Currency	USD
Constituents	Culture-Sector Applications: maximum of 20 constituents On-chain Services: maximum of 10 constituents Settlement Networks: maximum of 5 constituents
Constituent Pricing Sources	CF Digital Asset Reference Rates
Constituent Selection Method	Sector Applications: Full Market Capitalization rank of Sector applications that fall within the Sectors-Culture category of the CF Digital Asset Classification Structure. On-Chain Services: protocols utilized by the Sector Applications constituents. Settlement Networks: protocols utilized by the Sector Applications constituents.
Return Types	• Total Return • Price Return
Calculation & Publication Time	Between 16:05 and 16:30 Brasilia Time (BRT)
Calculation & Publication Frequency	Every day, 365 days a year.
Constituent Minimum Full Market Capitalization Ratio	0.10%
Constituent Minimum Liquidity Requirement	0.05%

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Constituent Minimum Monthly Asset Turnover	2%
Minimum Settlement Volume	25%
Buffers for Exclusion of an Existing Constituent at Reconstitution	- 50% of the Minimum Full Market Cap - 50% of the Minimum Liquidity Ratio - 25% of the Minimum Turnover Ratio - 50% of the Minimum Settlement Volume
Constituent Weighting	70% Sector Applications – Market Cap Weight between assets. 15% On-Chain Services – Market Cap Weight between assets. 15% Settlement Networks– Market Cap Weight between assets.
Weighting Caps	None
Weighting Floors	None
Rebalance Frequency / Month	Quarterly – 1st business day of March, June, Sep, Dec.
Rebalance Determination Time	16:00:00 UTC on the day which is 8 business days prior to the Rebalance Implementation Point
Rebalance Implementation Time	On the Calculation & Publication time, on the first business day of Rebalance month.

Index Name	**CF Digital Culture Composite Index - Modified Market Cap Weight - US**
Ticker (Price Return)	CFDCMWUS_RR_PR
Ticker (Total Return)	CFDCMWUS_RR_TR
Inception Date	01 February 2022
Inception Value	1,000
Base Currency	USD
Constituents	Culture-Sector Applications: maximum of 20 constituents On-chain Services: maximum of 10 constituents Settlement Networks: maximum of 5 constituents
Constituent Pricing Sources	CF Digital Asset Reference Rates
Constituent Selection Method	Sector Applications: Full Market Capitalization rank of Sector applications that fall within the Sectors-Culture category of the CF Digital Asset Classification Structure. On-Chain Services: protocols utilized by the Sector Applications constituents. Settlement Networks: protocols utilized by the Sector Applications constituents.
Return Types	• Total Return • Price Return
Calculation & Publication Time	Between 16:05 and 16:30 New York Time (US)
Calculation & Publication Frequency	Every day, 365 days a year.
Constituent Minimum Full Market Capitalization Ratio	0.10%

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Constituent Minimum Liquidity Requirement	0.05%
Constituent Minimum Monthly Asset Turnover	2%
Minimum Settlement Volume	25%
Buffers for Exclusion of an Existing Constituent at Reconstitution	- 50% of the Minimum Full Market Cap - 50% of the Minimum Liquidity Ratio - 25% of the Minimum Turnover Ratio - 50% of the Minimum Settlement Volume
Constituent Weighting	70% Sector Applications – Market Cap Weight between assets. 15% On-Chain Services – Market Cap Weight between assets. 15% Settlement Networks– Market Cap Weight between assets.
Weighting Caps	None
Weighting Floors	None
Rebalance Frequency / Month	Quarterly – 1st business day of March, June, Sep, Dec.
Rebalance Determination Time	16:00:00 UTC on the day which is 8 business days prior to the Rebalance Implementation Point
Rebalance Implementation Time	On the Calculation & Publication time, on the first business day of Rebalance month.

4.3 Constituent Observation Windows and Partition Lengths

Index Calculation Time Zone:

- London Variant: British Standard Time (BST)
- Brazil Variant: Brasilia Standard Time (BRT)
- US Variant: US Eastern Standard Time (EST)

CF DeFi Constituents	Partition Length	Partition Count	Index Calculation Time Zone	
			Window Start	Window End
AAVE	5 mins	12	15:00	16:00
UNI	5 mins	12	15:00	16:00
SNX	5 mins	12	15:00	16:00
YFI	5 mins	12	15:00	16:00
MKR	5 mins	12	15:00	16:00
COMP	5 mins	12	15:00	16:00
CRV	5 mins	12	15:00	16:00
MATIC	5 mins	12	15:00	16:00

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LINK	5 mins	12	15:00	16:00
GRT	5 mins	12	15:00	16:00
ETH	5 mins	12	15:00	16:00

CF Digital Culture Constituents	Partition Length	Partition Count	Index Calculation Time Zone	
			Window Start	Window End
MANA	5 mins	12	15:00	16:00
SHIB	5 mins	12	15:00	16:00
ENJ	5 mins	12	15:00	16:00
CHZ	5 mins	12	15:00	16:00
GALA	5 mins	12	15:00	16:00
APE	5 mins	12	15:00	16:00
MATIC	5 mins	12	15:00	16:00
LINK	5 mins	12	15:00	16:00
GRT	5 mins	12	15:00	16:00
ETH	5 mins	12	15:00	16:00

4.4 Expert Judgement

The Administrator does not utilise expert judgment in the day-to-day calculation of the index. In extraordinary circumstances Expert Judgement may be exercised by the Administrator in the calculation, constituent review and rebalance procedure for the index. This will be done in accordance with its codified policies and processes which are available upon request.

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5 Index Calculation Method

Usage of Parameter between Variants
Parameters are different between variants of this index family. Each section shall apply to each variant independently, except for those equations which have parameters marked with the variant label:

Type	Label
Spot Rate	RTI
Settlement Price	RR
Total Return	TR
Price Return	PR

5.1 Sector Composite Index methodology

The Sector Composite Index is a basket of baskets. The index is fixed weighted, i.e. the weight each constituent basket represent are fixed. Those fixed weights are set in the Index Parameter Table. The weighting methodology within each constituent basket can be either fix weighted or free float market capitalisation weighted. The methodology is specified in the Index Parameter Table as well as the weights if the methodology is fixed weighted.

The Sector Composite Index (SCI) value follows the methodology:

$$\forall k_i \leq t < k_{i+1},\ I_t^{SCI} = \frac{1}{d_{k_i}^{SCI}}\left(I_t^{Sector} * g_{k_i}^{Sector} + I_t^{Service} * g_{k_i}^{Service} + I_t^{Settlement} * g_{k_i}^{Settlement}\right)$$

Where I_t^{Sector}, $I_t^{Service}$ and $I_t^{Settlement}$ are independently calculated using Section 5.2.

Where g_t^{Sector}, $g_t^{Service}$ and $g_t^{Settlement}$ are calculated as per below:

The relative supply of the index constituents within the Digital Asset Sector are derived from the input weights:

$$At\ t = k_1, \begin{cases} g_{k_1}^{Sector} = \dfrac{w_{k_1}^{Sector} * I_{k_1}^{SCI,RR}}{I_{k_1}^{Sector,RR}} \\ g_{k_1}^{Service} = \dfrac{w_{k_1}^{Service} * I_{k_1}^{SCI,RR}}{I_{k_1}^{Service,RR}} \\ g_{k_1}^{Settlement} = \dfrac{w_{k_1}^{Settlement} * I_{k_1}^{SCI,RR}}{I_{k_1}^{Settlement,RR}} \end{cases}$$

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$$At\ i \geq 2, \begin{cases} g_{k_i}^{Sector} = \dfrac{w_i^{Sector} * S_i}{\varrho_{k_i}^{Sector,RR}} \\ g_{k_i}^{Service} = \dfrac{w_{k_i}^{Service} * S_i}{\varrho_{k_i}^{Service,RR}} \\ g_{k_i}^{Settlement} = \dfrac{w_{k_i}^{Settlement} * S_i}{\varrho_{k_i}^{Settlement,RR}} \end{cases}$$

$$with\ S_i = g_{k_{i-1}}^{Sector} * \varrho_{k_i}^{Sector,RR} + g_{k_{i-1}}^{Service} * \varrho_{k_i}^{Service,RR} + g_{k_{i-1}}^{Settlement} * \varrho_{k_i}^{Settlement,RR}$$

Where $d_{k_i}^{SCI}$:

$$\begin{cases} d_{k_1}^{SCI} = \dfrac{1}{I_{k_1}^{SCI}} \left(g_{k_1}^{Sector} * p_{k_1}^{Sector,RR} + g_{k_1}^{Service} * p_{k_1}^{Service,RR} + g_{k_1}^{Settlement} * p_{k_1}^{Settlement,RR} \right) \\ \forall i \geq 2,\ d_{k_i}^{SCI} = d_{k_{i-1}}^{SCI} . \dfrac{g_{k_i}^{Sector} * \varrho_{k_i}^{Sector,RR} + g_{k_i}^{Service} * \varrho_{k_i}^{Service,RR} + g_{k_i}^{Settlement} * \varrho_{k_i}^{Settlement,RR}}{g_{k_{i-1}}^{Sector} * \varrho_{k_i}^{Sector,RR} + g_{k_{i-1}}^{Service} * \varrho_{k_i}^{Service,RR} + g_{k_{i-1}}^{Settlement} * \varrho_{k_{i-1}}^{Settlement,RR}} \end{cases}$$

5.2 Methodologies

5.2.1 Definitions

Symbol	Name	Description
t	Effective time	The time at which the index is calculated
r_i	Rebalance Determination Time	The time when the rebalance parameters are determined for the i^{th} rebalance
k_i	Rebalance Implementation Time	The time when the rebalance parameters are implemented for the i^{th} rebalance
$c \in C_i$	Index Constituents	The list of constituents that are determined to be index constituents for the ith rebalance
p_t^c	Constituent Pricing Source	The price of constituent c at time t
ϱ_t^c	Determination Price	The price of constituent c used at time t used for rebalance, distribution and deduction. Note that this may be different from the Constituent Pricing Source
$w_{k_i}^c$	Weight	The weight of constituent c used for the ith rebalance
$g_{k_i}^c$	Relative supply	The relative supply of constituent c used for the ith rebalance
d_{k_i}	Divisor	Divisor used for the i^{th} rebalance.
R_t	Return factor	Return factor at time t
A_{r_i}	Return amount	Return amount used for the i^{th} rebalance
I_t	Index value	Index value at time t

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5.2.2 List of Methodologies

The index value is some factors times the sum for all constituents of the products of the constituent's weight and price:

$$I_i^B = R_{k_i}/d_i \sum_{c \in C_1} price(c,i) * supply(c,i)$$

Where B is a basket index.
Where R_{k_i} is to account for distributions and deductions.
Where d_i is the divisor needed for the index value to be continuous. More precision on the formula in Section 5.3.5.
The constituents' prices are given by the rebalance pricing source described in Section 3.8.
The Index weighting methodology must be one of the following:

1. Fix weight for all constituents.
2. Free Float Market Capitalisation for all constituents.

5.2.3 Weights Calculation

The relative supply $g_{k_i}^c$ and the weight $w_{r_i}^c$ relation is the following:

$$\begin{cases} g_{k_1}^c p_{k_1}^{c,RR} = w_{k_1}^c I_{k_1}^{RR} \\ \forall i \geq 2,\ g_{k_i}^c \varrho_{k_i}^{c,RR} = w_{k_i}^c \sum_{c' \in c_i} g_{k_{i-1}}^{c'} \varrho_{k_i}^{c',RR} \end{cases} (1)$$

The Index initial value is $I_{k_1}^{RR} = 1000$ if not specified otherwise in the **Index Parameter Table.**

Case 1: Fix Weights
The fix weights are given as inputs. They must respect the capping and flooring and the sum of all weights must be 100%. The relative supply is inferred using the equation (1) above.

Case 2: Free Float Market Capitalisation
The Free Float Market Capitalisation is based on the **Total Supply Likely to be Available for Trading** as detailed in ***CF Benchmarks Multi Asset Index Ground Rules – Section 4 Constituent Weighting.***

Note: In both *Case 1* and *Case 2*, the Rebalancing Implementation Time price ϱ_i^c is required to obtain both the supply $g_{k_i}^c$ *and the weight* $w_{k_i}^c$. Hence both are indicated to be also at Rebalancing Implementation Time, even if one of the two might be known and/or computed at the Rebalancing Determination Time.

Example:
Let's consider a fix weight index composed of two asset A and B with the following parameters:

$$\begin{cases} W^A = 50\% \\ W^B = 50\% \end{cases}, \begin{cases} p_{k_1}^{A,RR} = 50 \\ p_{k_1}^{B,RR} = 25 \end{cases} \text{and } I_{k_1}^{RR} = 1000.$$

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At $T{=}k_1$:

$$using\ (eq\ 1): \begin{cases} g_{t_1}^{A} = \dfrac{W^{A} * I_{k_1}^{RR}}{p_{k_1}^{A,RR}} = \dfrac{0.5 * 1000}{50} = 10\ (unit\ A) \\ g_{t_1}^{A} = \dfrac{W^{A} * I_{k_1}^{RR}}{p_{k_1}^{B,RR}} = \dfrac{0.5 * 1000}{25} = 20\ (unit\ B) \end{cases}$$

At $T{=}k_2$:
The suppose the rebalancing price is now:

$$\begin{cases} \varrho_{k_2}^{A,RR} = 50 \\ \varrho_{k_2}^{B,RR} = 40 \end{cases}$$

The index value before rebalancing is the following:

$$\sum_{c \in C_1} g_{k_1}^{c} \varrho_{k_2}^{c,RR} = 10 * 50 + 20 * 40 = 1300$$

Hence the new relative supply is:

$$using\ (eq\ 1): \begin{cases} g_{k_2}^{A} = \dfrac{W^{A} * \sum_{c \in C_1} g_{k_1}^{c} \varrho_{k_2}^{c,RR}}{\varrho_{k_2}^{A,RR}} = \dfrac{0.5 * 1300}{50} = 13 \\ g_{k_2}^{B} = \dfrac{W^{B} * \sum_{c \in C_1} g_{k_1}^{c} \varrho_{k_2}^{c,RR}}{\varrho_{k_2}^{B,RR}} = \dfrac{0.5 * 1300}{40} = 16.25 \end{cases}$$

5.2.4 Capping and Flooring

All methodology can apply a cap and floor on the constituents' weights. The case where no cap and floor are used is equivalent to a floor of 0% and a cap of 100%. Therefore, the following methodology is unique whether a cap and/or floor is applied.
The Capping value C and Flooring value F is given in the **Index Parameter Table**. The minimum capping and maximum flooring are: 1/ number of constituents.
Any constituent whose weight is greater than C is capped at C. Similarly, any constituent whose weight is smaller than F is floored at F. The **Aggregated Weight** to distribute is the difference between the weights lost due to capping and the weights added due to flooring.
Where the **Aggregated Weight** is positive, it shall be distributed proportionately on the constituents that are not capped. Where the **Aggregated Weight** is negative, it shall be subtracted proportionately from the constituents that are not floored.
This process is repeated until all constituents' weights are above or equal to F and below or equal to C.

5.2.5 Index Calculation

The index value at time t where $k_i \leq t < k_{i+1}$ is given by

$$I_t = \frac{R_t}{d_{k_i}} \sum_{c \in C_i} g_{k_i}^{c} p_t^{c}$$

About R_t:
At index inception there are no distributions or deductions hence $R_0 = 1$.
If the application point of distribution and deduction events is at time t, where $k_i \leq t < k_{i+1}$, let the Return Amount A_t be the sum of all Distribution Proceeds and Deductions Amounts from said events. Then the distribution adjustment factor shall be

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$$R_t = R_{t-1}\left(1 + \frac{A_t}{\sum_{c \in C_i} g_t^c \varrho_t^c}\right) (12)$$

Otherwise $R_t = R_{t-1}$.

About d_{k_i}:
The divisor is used to scale the index so that the value of the index is fixed at inception and continuous at each rebalancing. The divisor factor shall be:

$$\begin{cases} d_{k_1} = \frac{1}{I_{k_1}^{RR}} \sum_{c \in C_1} g_{k_1}^c \, p_{k_1}^{c,RR} \\ \forall i \geq 2, \; d_{k_i} = d_{k_{i-1}} . \frac{\sum_{c \in C_i} g_{k_i}^c \varrho_{k_i}^{c,RR}}{\sum_{c \in C_{i-1}} g_{k_{i-1}}^c \varrho_{k_i}^{c,RR}} \end{cases}$$

5.2.6 Metadata

The *index share* of a constituent is defined as the number of units of a constituent one needs to buy such that the composition of all constituents reproduces the value of the index.

Example:
The index value is 1000. Assume a return factor of 1.6.

$$share_i^c = \frac{R_{k_i}}{d_{k_i}} g_{k_i}^{c,RR}$$

Constituent	Price	Weight	Relative supply	Index share
A	$5	50%	62.5	100
B	$2	50%	156.25	250

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6 Contingency Calculation Rules

There may be instances where the Index cannot be calculated according to the calculation methodology.

6.1 Delayed Calculation and Dissemination

Where any Constituent Pricing Source for the calculation of the index is delayed, missing or otherwise not available for any index calculation time the index value shall be deemed delayed, where no index value will be published. The index shall resume publication when valid Constituent Pricing Source(s) are published.

Where any Determination Price for the calculation of the index is delayed, missing or otherwise not available for a Rebalance, Distribution or Deduction Implementation Point, the index value(s) on and subsequent from Rebalance Implementation Point shall be deemed delayed, where no index value(s) will be published. The index shall resume publication when valid Determination Price(s) are published.

Where for the above or any reason the Administrator is not able to calculate and publish the index within the Dissemination Time on any given Calculation Day then the Administrator shall publish a notification on its Statuspage informing index users that calculation and publication has been delayed. The Administrator will seek to publish the Index for that Calculation Day as soon as it is able to.

6.2 Calculation Failure

If the index cannot be calculated for a given Calculation Day before 23:59:59 London time, for instance because:

- A Constituent Pricing Source for the calculation time is not published, or published but not retrieved by the Calculation Agent before 23:59:59 London time
- A Determination Price for the Rebalance, Distribution or Deduction Implementation Point is not published, or published but not retrieved by the Calculation Agent before 23:59:59 London time
- Any other reason or circumstance that prevents the orderly calculation of the index

Then the index value for that calculation day is given by the index value on the previous Calculation Day and this index value shall be published with a marker of (*).

The occurrence of any index calculation failure is reported to the Oversight Function. Any Calculation Failure events will be clearly communicated to all licensees via Statuspage.

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7 Restatement & Republishing

The Administrator implemented CF Benchmarks Multi Asset Index Restatement Policy ("the Policy") which outlines circumstances; materiality thresholds and timing for the Administrator's restatement and republishing process. The Policy has been approved by the Oversight Function.

Where circumstances require to restate the stated index settlement price it will be restated and republished before 23:59:59 London time of that Calculation Day. For clarity where an error was identified on Day 1 but the process of investigating and agreeing corrective measures was concluded on Day 3 then it will be the Day 3 index settlement price that will be restated and republished before 23:59:59 London time of that Calculation Day. Restatement and Republishing announcements shall be clearly communicated to all licensees via Statuspage.

The Policy is subject to an internal review by the Administrator and the Oversight Function at least annually. It will also be reviewed in line with business changes and changes to regulation.

The latest Policy document is available here.

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8 Methodology Review and Changes to the Index

This methodology is subject to an internal review by the Administrator and the Oversight Function at least annually.

Any changes to this methodology are overseen by the Oversight Function, and in accordance with ***UK BMR Article 13***.

All *material* changes to the methodology shall only be implemented after a consultation process with users and relevant stakeholders that shall be conducted according to the Administrator's policies and overseen by the Oversight Function.

Should the Administrator deem it necessary to cease providing the Index it shall only do so after a consultation process with users and relevant stakeholders that shall be conducted according to the Administrator's policies and overseen by the Oversight Function.

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