



# Index Methodology Guide

**Tortoise**  
Global Cloud Infrastructure Index<sup>SM</sup>  
(TCLOUD/TCLOUDT)

January 2019

## Table of contents

Company background	3
Tortoise Global Cloud Infrastructure Index <sup>SM</sup> introduction	3
Constituent eligibility criteria	3
Constituent weightings	6
Index dissemination	6
Calculation of the Index	7
Corporate actions	8
Index Committee	10
Definitions	11
Disclaimer	11

## Company background

Tortoise offers passively managed products based on actively researched indices. Tortoise identifies investible asset classes that lack benchmarks that accurately represent those asset classes via exposure, investible representation, and/or quality. Quality benchmarks are vitally important for investment professionals, research analysts and industry executives to analyze relative performance. Our research-driven indices provide thought leadership in the universe of essential assets and may be used as underlying indices for exchange-traded products.

## Tortoise Global Cloud Infrastructure Index<sup>SM</sup> introduction

Cloud computing is among the most influential developments in the history of the computing industry and continues to shape our world. Not only does it change the way information is stored, processed and accessed, cloud computing supports cutting edge technologies such as machine learning, artificial intelligence and quantum computing. Cloud infrastructure has become an essential asset and will continue to engrain itself in everyday life.

Originally, processing and computing power came from a single mainframe computer. As computers evolved, they moved to a client/server computing model, where the client (each individual workstation) actually contained some of the logic required to execute various software or tasks, while the server contained the remaining logic to process user requests. The client would interact with the server as needed. Computers continued to decentralize from there, adding more and more “participants” in the decision making process between the client and the server.

For previous computing models, the server remains on premises, meaning the computing power is done locally by servers on-site. Buying and maintaining servers on-site is expensive, and IT spend can get very costly when a company requires a lot of computing power. This has historically been a barrier to entry for small companies, and at least a material cost for almost all companies.

Cloud computing is a way to avoid expensive up-front IT infrastructure costs. Cloud service providers maintain physical servers at an “off-site” location that are capable of providing large amounts of computing power. Users can share centrally stored information and only request access to data as needed. Individuals and businesses are then able to “rent” a portion of that computing power (the models can vary significantly) from the cloud service provider as they need it.

Cloud computing provides more efficient utilization of computing resources for the host because the servers are able to allocate resources efficiently based on who is using them, but its main economic benefit is that it allows companies to shift the cost of capex away from their business. They get the computing power they need and avoid owning massively under-utilized IT infrastructure.

The Tortoise Global Cloud Infrastructure Index<sup>SM</sup> (the “Index”) is a proprietary, rules-based, modified market capitalization-weighted, float-adjusted index comprised of companies that are materially engaged in the cloud infrastructure industry, including cloud systems/services, cloud consulting software/services, cloud security, cloud hardware and cloud data centers. Constituents are listed and traded on global developed market exchanges as listed below.

The index level is calculated on a USD price-return and a USD total-return basis. The real-time index level for the price-return version of the Index is available from major market data providers under the ticker “TCLLOUD.” The USD real-time total-return index level is available under the ticker “TCLLOUDT.”

The Index is independently calculated and distributed by Solactive AG. It has a base level of 1,000 as of December 21, 2012.

## Constituent eligibility criteria

The cloud infrastructure industry is comprised of a multitude of players that participate in various parts of the cloud infrastructure value chain. To be eligible for inclusion in the Tortoise Global Cloud Infrastructure Index<sup>SM</sup>, a company must be publicly traded and have at least 50% of gross revenues, operating income, EBITDA or assets in the cloud infrastructure industry.

**Global cloud infrastructure companies** are those that are directly involved in the process of providing access to cloud-based computing or improving the functionality thereof (security, hardware, management). We consider cloud infrastructure companies as companies whose primary business is comprised of one or a combination of the following categories:

**Cloud systems/services:** Companies that provide a variety of different IT resources remotely,

generally over the internet; this is the core of the cloud computing industry. Companies in this segment may provide full cloud services or specialize in a particular type of cloud services, such as data storage.

**Cloud consulting software/services:** Companies that provide software and services that help develop and organize how cloud based data interacts with the information stored on local servers and the different devices that rely on information from the cloud. Cloud users often maintain some level of data storage on their own servers, particularly sensitive data. Cloud users may need to integrate that data with market or other data. Cloud management software companies enable these various resources to interact efficiently.

**Cloud security:** Companies that provide user identification, authentication and/or general security for cloud related applications, such as remote desktop connections, to prevent unauthorized individuals from accessing data.

**Cloud hardware:** Companies that make and sell the hardware that supports cloud data center computing power. This includes servers and functioning components of servers that are essential in creating the computers that support remote access. Some companies in this group might also provide cloud services/software but create the hardware necessary to support those other business lines. Hardware is limited to functioning products, and does not include upper value chain component parts such as semiconductors.

**Cloud data centers:** Companies that own, operate, and/or lease access to real estate or data centers that cloud services companies utilize to store their computing power.

Companies are also eligible for inclusion in the Index if their revenue is in the top 10 globally. The purpose of an index is to represent a universe; the cloud systems/services segment is very concentrated, with more than 95% of global revenues for the cloud systems/services segment represented by the top 10 global market leaders.

Each current and potential constituent will be reviewed annually, and adjustments made at the March rebalance. New securities, generally via IPO or spin-off, that meet our index criteria will be reviewed and added to the Index at the next quarterly rebalance. Specific corporate actions such as spin-offs, mergers, and acquisitions will trigger a special review of the cloud infrastructure exposure of any constituent(s) involved, and adjustments to these names will be made at the next quarterly rebalance.

**Market capitalization** Companies must have a total equity market capitalization of at least U.S. \$400 million for two consecutive quarters prior to the reference date to be eligible for inclusion in the Index. To remain in the Index, a company must maintain an average equity market capitalization of at least U.S. \$300 million for a minimum of 20 trading days prior to rebalance reference dates.

**Liquidity** Companies must obtain a minimum liquidity turnover of at least 0.15 for two consecutive quarters prior to the reference date to be eligible for inclusion in the Index. Companies must maintain a minimum liquidity turnover of at least 0.10 to remain in the Index. (Liquidity turnover is calculated by dividing a company's three month average daily trading volume in USD, by the total market cap at the end of that three month period.) The Index is weighted by modified market cap, but the liquidity of potential constituents can materially deviate from the resulting index weight. Including a liquidity threshold that is proportional to market cap results in an index that represents a universe that is more investible.

Current index components will be dropped from this Index if they fail to meet a minimum of 0.10 liquidity turnover for two consecutive quarters. Any constituent that does not meet at least a 0.05 liquidity turnover will be dropped from the Index without the two quarter requirement.

**Security limits** A minimum of 30 securities will be in the Index. Should the number of securities that meet the index inclusion criteria fall below 30, the Index may include additional securities in the top 10 in global revenues in the cloud systems/services area that fall below the market cap or the liquidity turnover threshold requirements, but are otherwise eligible for inclusion.

**Listing exchange** A company must be listed on a developed market exchange. To be classified as a developed market, exchanges must be classified as developed by at least three of the following groups: Dow Jones, FTSE, MSCI, Russell and S&P. A list of countries that Tortoise considers developed, along with exchanges for each country that we consider as eligible as of September 30<sup>th</sup>, 2018 is below:

<b>Country</b>	<b>Exchanges</b>
Australia	Australian Securities Exchange
Austria	Vienna
Belgium	Euronext Brussels
Canada	Toronto, Venture
Denmark	Copenhagen, First North Denmark
Finland	Helsinki, First North Finland
France	Euronext Paris
Germany	Xtera, Frankfurt, Hamburg
Hong Kong	Hong Kong
Ireland	Dublin
Israel	Tel Aviv
Italy	Borsa Italiana
Japan	Tokyo, Nagoya
Luxembourg	Luxembourg
Netherlands	Euronext Amsterdam
New Zealand	New Zealand Stock Exchange
Norway	Oslo
Portugal	Euronext Lisbon
Singapore	Singapore Exchange
Spain	Sociedad de Bolsas, BME Electronic Outcry
Sweden	Stockholm, First North Stockholm, Nordic Growth Market, AktieTorget
Switzerland	Berne, SIX Swiss Exchange
United Kingdom	London, London International, NEX
United States	NYSE, NASDAQ

## Constituent weightings

No individual security in the Index may be more than a 4.5% weight of the total index market cap as of the rebalance reference date. Should the weighting of any individual security be more than 4.5% of the total index market cap as of the rebalance reference date, excess market cap will be distributed evenly to other members of the Index that do not currently exceed this threshold. Additionally, constituents that qualify for the Index as a top 10 global market leader, will be capped at a maximum of 20% of the Index.

## Index dissemination

### Distribution

The real-time index level for the price return version of the Index is available from major market data providers under the ticker "TLOUD." The real-time total return index level is available under the ticker "TLOUDT." The Index is published via the price marketing services of Boerse Stuttgart AG and is distributed to all affiliated vendors. Each vendor decides on an individual basis as to whether they will distribute/display the Index via their information systems. Additionally, index values, constituents and announcements regarding constituent changes, can be found by visiting [www.tortoiseadvisors.com](http://www.tortoiseadvisors.com).

### Prices and calculation frequency

The Index is calculated on each business day based on the prices on the respective exchanges on which the index components are listed. The most recent prices of all index components are used. Prices of index components not listed in the index currency are translated using spot foreign exchange rates (WM Rate). Should there be no current price available on Reuters, the most recent price or the trading price on Reuters for the preceding trading day is used in the calculation.

The Index is calculated every business day from 9:00am to 10:30pm, CET. If all exchanges fail to open or pricing data cannot be provided to Solactive, the Index may not be published for that day.

## Calculation of the Index

### Index formula

The index value on a business day at the relevant time is calculated in accordance with the following formula:

$$Index_t = \sum_{i=1}^n \frac{(x_{i,t} * p_{i,t} * f_{i,t})}{D_t}$$

With:

- $x_{i,t}$  = Number of index shares of the index component i on trading day t
- $p_{i,t}$  = Price of index component i on trading day t
- $f_{i,t}$  = Foreign exchange rate to convert the price of index component i on trading day t into the index currency
- $D_t$  = Divisor on trading day t

The initial divisor on the start date is calculated according to the following formula:

$$D_t = \frac{\sum_{i=1}^n (p_{i,t} * f_{i,t} * x_{i,t})}{100}$$

After the close of trading on each adjustment day t the new divisor is calculated as follows:

$$D_{t+1} = \frac{\sum_{i=1}^n (p_{i,t} * f_{i,t} * x_{i,t+1})}{Index_t}$$

This divisor is valid starting the immediately following business day.

### Accuracy

The value of the Index will be rounded to two decimal places.

Trading prices and foreign exchange rates will be rounded to six decimal places.

Divisors will be rounded to six decimal places.

### Adjustments

Indices need to be adjusted for systematic changes in prices once these become effective. This requires the new number of index shares of the affected index component and the divisor to be calculated on an ex-ante basis.

Following the Index Committee's decision, the Index is adjusted for distributions, capital increases and stock splits.

This procedure ensures that the first ex quote can be properly reflected in the calculation of the Index. This ex-ante procedure assumes the general acceptance of the index calculation formula as well as open access to the parameter values used. The calculation parameters are provided by the index calculator.

### Dividends and other distributions

Dividend payments and other distributions are not included in the price return index. Dividend payments and other distributions are included in the total return index. They cause an adjustment of the divisor. The new divisor is calculated as follows:

$$D_{t+1} = D_t * \frac{\sum_{i=1}^n (p_{i,t} * f_{i,t} * x_{i,t}) - (x_{i,t} * y_{i,t} * g_{i,t})}{\sum_{i=1}^n (p_{i,t} * f_{i,t} * x_{i,t})}$$

With:

- $p_{i,t}$  = Price of index component i on trading day t
- $f_{i,t}$  = Foreign exchange rate to convert the price of index component i on trading day t into the index currency
- $x_{i,t}$  = Number of index shares of the index component i on trading day t
- $y_{i,t}$  = Distribution of index component i with ex date t+1 multiplied by the dividend correction factor
- $g_{i,t}$  = Foreign exchange rate to convert the amount of the distribution of index component i on trading day t into the index currency

$D_t$  = Divisor on trading day t  
 $D_{t+1}$  = Divisor on trading day t+1

## Corporate actions

### Principles

Following the announcement by issuers of index components of the terms and conditions of a corporate action, the index calculator determines whether such corporate action has a dilutive, concentrative or similar effect on the price of the respective index component.

If this should be the case, the index calculator shall make the necessary adjustments that are deemed appropriate in order to take into account the dilutive, concentrative or similar effect and shall determine the date on which this adjustment shall come into effect.

Amongst other things, the index calculator can take into account the adjustment made by an affiliated exchange as a result of the corporate action with regard to option and futures contracts on the respective share traded on this affiliated exchange.

### Capital increases

In the case of capital increases with ex date t+1 the Index is adjusted as follows:

$$x_{i,t+1} = x_{i,t} * \frac{1 + B}{1}$$

With:

$x_{i,t+1}$  = Number of index shares of index component i on trading day t+1  
 $x_{i,t}$  = Number of index shares of index component i on trading day t  
 $B$  = Shares received for every share held

$$p_{i,t+1} = \frac{p_{i,t} + s * B}{1 + B}$$

With:

$p_{i,t+1}$  = Hypothetical price of index component i on trading day t+1  
 $p_{i,t}$  = Price of index component i on trading day t  
 $s$  = Subscription price in the index component currency  
 $B$  = Shares received for every share held

$$D_{t+1} = D_t * \frac{\sum_{i=1}^n (p_{i,t} * f_{i,t} * x_{i,t}) + \sum_{i=1}^n [(x_{i,t+1} * p_{i,t+1} * f_{i,t}) - (x_{i,t} * p_{i,t} * f_{i,t})]}{\sum_{i=1}^n (p_{i,t} * f_{i,t} * x_{i,t})}$$

With:

$D_{i,t+1}$  = Divisor on trading day t+1  
 $D_{i,t}$  = Divisor on trading day t  
 $p_{i,t}$  = Price of index component i on trading day t  
 $f_{i,t}$  = Foreign exchange rate to convert the price of index component i on trading day t into the index currency  
 $x_{i,t}$  = Number of index shares of the index component i on trading day t  
 $p_{i,t+1}$  = Hypothetical price of index component i on trading day t+1  
 $x_{i,t+1}$  = Number of index shares of the index component i on trading day t+1

### Share splits

In the case of share splits with ex date on trading day t+1 it is assumed that the prices change in ratio of the terms of the



split. The new number of index shares is calculated as follows:

$$x_{i,t+1} = x_{i,t} * B$$

With:

$x_{i,t+1}$  = Number of index shares of the affected index component on trading day t+1

$x_{i,t}$  = Number of index shares of the affected index component on trading day t

$B$  = Shares after the share split for every share held before the split

### Stock distributions

In the case of stock distributions with ex date on trading day t+1 it is assumed that the prices change according to the terms of the distribution. The new number of index shares is calculated as follows:

$$x_{i,t+1} = x_{i,t} * (1 + B)$$

With:

$x_{i,t+1}$  = Number of index shares of the affected index component on trading day t+1

$x_{i,t}$  = Number of index shares of the affected index component on trading day t

$B$  = Shares received for every share held

### Recalculation

Solactive AG makes the greatest possible efforts to accurately calculate and maintain its indices. However, the occurrence of errors in the index determination process cannot be ruled out. In such cases, Solactive AG adheres to its publicly available Correction Policy.

### Market disruption

In periods of market stress Solactive AG calculates its indices following predefined and exhaustive arrangements set out in its publicly available Disruption Policy.

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## Index Committee

The Index Committee of Tortoise Index Solutions, LLC (“Tortoise Index Solutions”) oversees the integrity of the rules governing constituent composition and index computation, and provides clarifying guidance on the rules-based methodology where required. Every effort is made to ensure the rules are clear and non-discretionary. The Index Committee approves quarterly rebalances and directs public announcement relating to the indices.

### Members

The Index Committee will consist of between three to five voting members. No members of the Tortoise Capital Advisors, L.L.C. Investment Committee or portfolio management team shall be members of the Index Committee. No portfolio managers or traders dedicated to Tortoise Index Solutions are eligible to serve on the Index Committee.

For their particular work on the Index Committee, Index Committee members will not receive a salary or other financial remuneration (or any benefit in kind).

### Meetings, quorum and voting

Index Committee members shall receive at least five business days’ notice of Index Committee meetings

A quorum of Index Committee members is required for all voting matters. “Quorum” is defined as at least two members, one of whom must be the Index Committee chair.

Each Index Committee member shall be entitled to one vote at each Index Committee meeting. All motions or matters before the Index Committee may be carried by simple majority.

### Confidentiality

Matters discussed or handled by the Index Committee will be considered confidential until such time as they are made public. Without limiting the generality of the foregoing, the minutes of the Index Committee are confidential information and may not be discussed with anyone outside of the Index Committee without the prior written approval of the Chair and the Chief Compliance Officer of Tortoise Index Solutions.

Decisions by the Index Committee regarding rules, ambiguous cases or discretionary additions or deletions from indices may be made public via such mechanic (internet or otherwise) as Tortoise Index Solutions decides from time to time.

### Conflicts of interest

Any Index Committee member who has a conflict of interest with respect to an issue before the Index Committee must excuse him/herself from participating or voting in relation to that issue. In participating in the Index Committee’s activities, all Index Committee members will aim to observe the highest standards of market practice, avoid appearances of impropriety, and remain mindful of their regulatory responsibilities surrounding issues such as market abuse, dealing ahead and insider trading. Without limiting the generality of the foregoing, the Board of Directors and the Index Committee are subject to, and shall comply with, the information barriers and other procedures set forth in Tortoise Index Solutions’ Procedures Governing Management of Passive Exchange-Traded Funds.

## Definitions

**Reference date:** The reference date for the rebalance occurs nine calendar days prior to the rebalance date (typically the preceding Wednesday). Underlying constituent shares and constituent caps will be applied as of the reference dates.

**Rebalance date:** The Index is rebalanced quarterly on the third Friday of each March, June, September and December, and rebalances are effective at the open of the next trading day. In the event major U.S. exchanges are closed on the third Friday of March, June, September or December, the rebalancing will take place after the market close on the immediately preceding trading day.

**Index rebalance:** The date at which the changes made on the reference date replace the existing index.

**Trading day:** The Index will be calculated on days on which U.S. exchanges are open. This includes partial trading days.

**Index calculation agent:** The current calculation agent for the Index is Solactive AG. The index calculation agent applies the index methodology rules to the list of included companies. They also provide daily constituent files to Tortoise and select data providers.

**Developed market:** To be classified as a developed market, exchanges must be classified as developed by at least three of the following groups: Dow Jones, FTSE, MSCI, Russell and S&P. A list of countries that Tortoise considers developed, along with exchanges for each country that we consider as eligible as of September 30th, 2018 is below: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom, and the United States.

**Index constituent:** Security included in the Index which fits all inclusion criteria specified in the methodology.

**Liquidity turnover:** Liquidity turnover is calculated by dividing a company's three month average daily trading volume in USD, by the total market cap at the end of that three month period.

$$\text{Liquidity turnover} = \frac{\text{3m average daily volume (in USD)}}{\text{Market Capitalization (in USD)}}$$

**Base date:** The start date for the index back-test or history. The Index has a base level of 1,000 as of December 21, 2012.

**Affiliated exchange:** An affiliated exchange is (with regard to an index component) an exchange, a trading or quotation system on which options and futures contracts on the index component in question are traded, as specified by the index calculator.

## Disclaimer

**This data is provided for informational purposes only and is not intended for trading purposes. This document shall not constitute an offering of any security, product or service. The addition, removal or inclusion of a security in the Index is not a recommendation to buy, sell or hold that security, nor is it investment advice. It is not possible to invest directly in an index. Index performance does not reflect the deduction of any fees and expenses. Past performance is not a guarantee of future returns.**

The information contained in this document is current as of the publication date. Tortoise makes no representations with respect to the accuracy or completeness of these materials and will not accept responsibility for damages, direct or indirect, resulting from an error or omission in this document. The methodology involves rebalancing and maintenance of the Index that is made periodically during each year and may not, therefore, reflect real-time information.

This document contains the underlying principles and regulations regarding the structure and the operating of the Index. Solactive AG shall make every effort to implement regulations. Solactive AG does not offer any explicit or tacit guarantee or assurance, neither pertaining to the results from the use of the Index nor the index value at any certain point in time nor in any other respect. The Index is merely calculated and published by Solactive AG and it strives to the best of its ability to ensure the correctness of the calculation. There is no obligation for Solactive AG – irrespective of possible obligations to issuers – to advise third parties, including investors and/or financial intermediaries, of any errors in the Index. The publication of the Index by Solactive AG is no recommendation for capital investment and does not contain any assurance or opinion of Solactive AG regarding a possible investment in a financial instrument based on this Index.