

SEC 17a-4(f), FINRA 4511(c) and CFTC 1.31(c)-(d) Compliance Assessment

Nutanix Objects

Abstract

BENEFIT FROM COHASSET'S INDUSTRY INSIGHT AND EXPERIENCE

Core to Cohasset's practice is its delivery of records management and information governance professional consulting services, education and training. Cohasset's expert consulting services are tailored to support a multitude of regulated organizations, including those in the financial services industry. Cohasset serves both domestic and multi-national clients, aligning information lifecycle controls with their organizations' business priorities and facilitating regulatory compliance and risk mitigation, all the while generating measurable business efficiencies.

Cohasset has assessed the spectrum of storage technologies and systems designed to meet the requirements of the Securities and Exchange Commission Rule 17a-4(f), as defined by 1) the No Action Letter in 1993 (allowing broker dealers to use non-rewriteable, non-erasable digital storage media); 2) the issuance of the Rule in 1997; and 3) the Interpretive Release in 2003, which authorizes the use of erasable storage, conditioned on integrated control codes, to prevent premature deletion of records.

Nutanix Objects, deployed and managed as part of the Nutanix™ Enterprise Cloud Platform, is a software-defined, hardware agnostic, scalable object storage solution designed with an S3-compatible REST API interface to handle large volumes of unstructured data.

The *Bucket Lock* and *Object Lock* features are designed to meet securities industry requirements for preserving records in a non-rewriteable, non-erasable format, for record objects.

In this Report, Cohasset Associates, Inc. (Cohasset) assesses the capabilities of Nutanix Objects (see Section 1.3, *Nutanix Objects Overview and Assessment Scope*) relative to:

- The recording and non-rewriteable, non-erasable storage requirements for electronic records, as specified by:
 - ◆ Securities and Exchange Commission (SEC) in 17 CFR § 240.17a-4(f), which regulates exchange members, brokers or dealers.
 - ◆ Financial Industry Regulatory Authority (FINRA) Rule 4511(c), which defers to the format and media requirements of SEC Rule 17a-4(f).
- The principles-based electronic records requirements of the Commodity Futures Trading Commission (CFTC) in 17 CFR § 1.31(c)-(d), which regulates commodity futures trading.

It is Cohasset's opinion that Nutanix Objects, Release 3.1, when *Bucket Lock* and *Object Lock* are properly set, retains records requiring time-based retention, in compliance with the recording and non-rewriteable, non-erasable storage of electronic records of SEC Rule 17a-4(f) and FINRA Rule 4511(c). Additionally, the assessed capabilities of Nutanix Objects meet the principles-based requirements of CFTC Rule 1.31(c)-(d).

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1 | Introduction

Regulators, world-wide, establish explicit requirements for regulated entities that elect to retain books and records¹ on electronic storage media. Given the prevalence of electronic books and records, these requirements apply to most broker-dealer and commodity futures trading firms and other organizations with similarly regulated operations.

This Introduction briefly summarizes the regulatory environment pertaining to this assessment, explains the purpose and approach for Cohasset's assessment, and provides an overview of Nutanix Objects and the scope of this assessment.

1.1 Overview of the Regulatory Requirements

1.1.1 SEC Rule 17a-4(f) Requirements

In 17 CFR §§ 240.17a-3 and 240.17a-4, the SEC stipulates recordkeeping requirements, including retention periods, for the securities broker-dealer industry. On February 12, 1997, the SEC adopted amendments to 17 CFR § 240.17a-4 (the Rule or Rule 17a-4). These amendments to paragraph (f) expressly allow books and records to be retained on electronic storage media, subject to explicit standards.

The Commission is adopting a rule today which, instead of specifying the type of storage technology that may be used, sets forth standards that the electronic storage media must satisfy to be considered an acceptable method of storage under Rule 17a-4.² [emphasis added]

Further, the SEC issued two Interpretive Releases (No. 34-44238 on May 1, 2001, and No. 34-47806 on May 7, 2003), which pertain specifically to the electronic storage media requirements of paragraph (f).

For additional information, refer to Section 5.1, *Overview of SEC Rule 17a-4(f) Electronic Records Storage Requirements*.

1.1.2 FINRA Rule 4511(c) Requirements

Financial Industry Regulatory Authority (FINRA) Rule 4511(c) explicitly defers to the format and media requirements of SEC Rule 17a-4, for the books and records it requires.

All books and records required to be made pursuant to the FINRA rules shall be preserved in a format and media that complies with SEA [Securities Exchange Act] Rule 17a-4.

¹ Regulators use the phrase *books and records* to describe information about certain business transactions, customers, personnel and other administrative activities that must be retained. Accordingly, Cohasset has used the term *record object* (versus *data* or *object*) to consistently recognize that the content is a required record.

² Exchange Act Release No. 38245 (Feb. 5, 1997), 62 FR 6470 (Feb. 12, 1997) ("Adopting Release").

1.1.3 CFTC Rule 1.31(c)-(d) Requirements

Effective August 28, 2017, 17 CFR § 1.31 (the CFTC Rule), the Commodity Futures Trading Commission (CFTC) promulgated principles-based requirements for organizations electing to retain electronic regulatory records. These amendments modernize and establish technology-neutral requirements for the *form and manner of retention, inspection and production* of regulatory records.

Refer to Section 3, *Summary Assessment of Compliance with CFTC Rule 1.31(c)-(d)*, which correlates the CFTC principles-based requirements to the capabilities of Nutanix Objects when *Bucket Lock* and *Object Lock* features are properly utilized. Additionally, refer to Section 5.3, *Overview of CFTC Rule 1.31(c)-(d) Electronic Regulatory Records Requirements*.

1.2 Purpose and Approach

To obtain an independent and objective assessment of the compliance capabilities of Nutanix Objects, Nutanix engaged Cohasset Associates, Inc. (Cohasset). As a highly respected consulting firm, Cohasset has recognized expertise and more than 40 years of experience with the legal, technical and operational issues associated with the records management practices of companies regulated by the SEC and CFTC. Additional information about Cohasset is provided in the last section of this report.

Nutanix engaged Cohasset to:

- Assess the capabilities of Nutanix Objects in comparison to the five requirements of SEC Rule 17a-4(f) for the recording and non-rewriteable, non-erasable storage of electronic records; see Section 2, *Assessment of Compliance with SEC Rule 17a-4(f)*;
- Associate the principles-based requirements of CFTC Rule 1.31(c)-(d) to the assessed capabilities of Nutanix Objects; see Section 3, *Summary Assessment of Compliance with CFTC Rule 1.31(c)-(d)*; and
- Prepare this Assessment Report, enumerating the results of its assessment.

In addition to applying the information in this Assessment Report, regulated entities must ensure that the combination of its policies, procedures and regulatory submissions, in conjunction with the capabilities of implemented electronic recordkeeping solutions, meet all applicable requirements.

This assessment represents the professional opinion of Cohasset and should not be construed as either an endorsement or a rejection, by Cohasset, of Nutanix Objects and its capabilities or other Nutanix products or services. The information utilized by Cohasset to conduct this assessment consisted of: (a) oral discussions, (b) system documentation, (c) user and system administrator guides, and (d) other directly related materials provided by Nutanix or obtained from publicly available resources.

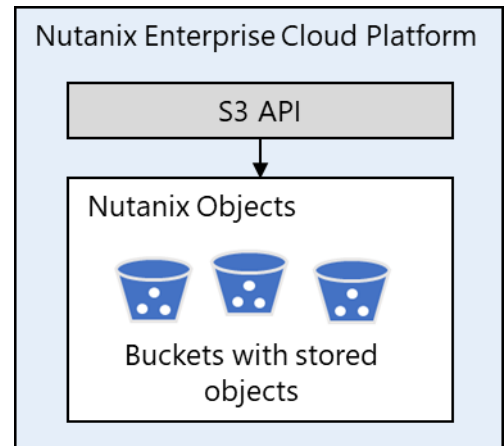
The content and conclusions of this assessment are not intended, and must not be construed, as legal advice. Relevant laws and regulations constantly evolve, and legal advice is tailored to the specific circumstances of the organization. Therefore, nothing stated herein should be substituted for the advice of competent legal counsel.

1.3 Nutanix Objects Overview and Assessment Scope

Nutanix Objects, deployed and managed as part of the Nutanix Enterprise Cloud Platform, is a software-defined, hardware agnostic, scalable object storage solution designed with an S3-compatible REST API interface to handle large volumes of unstructured data from a single namespace.

Nutanix Objects architecture (illustrated in the diagram) consists of the following components:

- ▶ **Nutanix™ Enterprise Cloud Platform** is a private cloud platform deployed on industry-leading infrastructure
- ▶ Amazon S3-compatible application programming interface (**S3 API**) is used to store, retrieve and retain record objects in Nutanix Objects
- ▶ **Nutanix Objects** is a simple, scalable S3-compatible object storage solution
- ▶ **Buckets** are storage resources available in Nutanix Objects to retain objects, which are comprised of the content and its metadata (index attributes)



Cohasset assessed the capabilities of Nutanix Objects, Release 3.1, when *Bucket Lock* and *Object Lock* are properly applied to stored record objects and when the solution is on-premises and is running on Nutanix qualified hardware. Other deployments are excluded from this assessment.

The following section documents Cohasset's assessment of Nutanix, relative to the pertinent requirements in SEC Rule 17a-4(f). Throughout this report, the above described operating environment of Nutanix will be assessed.

2 | Assessment of Compliance with SEC Rule 17a-4(f)

This section presents Cohasset's assessment of the capabilities of Nutanix Objects for compliance with the five requirements related to recording and non-rewriteable, non-erasable storage of electronic records, as stipulated in SEC Rule 17a-4(f).

For each of the five relevant requirements in SEC Rule 17a-4(f), this assessment is organized into the following four topics:

- **Compliance Requirement** – Excerpt of each electronic storage requirement in SEC Rule 17a-4(f) and Cohasset's interpretation of the requirement
- **Compliance Assessment** – Assessment of the relevant capabilities of Nutanix Objects
- **Nutanix Objects Capabilities** – Description of relevant capabilities
- **Additional Considerations** – Additional considerations related to meeting the specific requirement

The following subsections document Cohasset's assessment of the capabilities of Nutanix Objects, as described in Section 1.3, *Nutanix Objects Overview and Assessment Scope*, relative to each pertinent requirement of SEC Rule 17a-4(f).

2.1 Non-Rewriteable, Non-Erasable Record Format

2.1.1 Compliance Requirement [SEC 17a-4(f)(2)(ii)(A)]

As set forth in Section III(B) of the 2001 Interpretive Release, this requirement *"is designed to ensure that electronic records are capable of being accurately reproduced for later reference by maintaining the records in an unalterable form [for the required retention period]."*

SEC 17a-4(f)(2)(ii)(A): Preserve the records exclusively in a non-rewriteable, non-erasable format

The following statement in the 2003 Interpretive Release further clarifies that certain implementations of rewriteable and erasable media, such as magnetic disk or magnetic tape, meet the requirements of a non-rewriteable, non-erasable recording environment provided: (a) the storage solution delivers the prescribed functionality and (b) the functionality is delivered via appropriate integrated control codes for the SEC designated retention period associated with the stored records.

A broker-dealer would not violate the requirement in paragraph (f)(2)(ii)(A) of the rule if it used an electronic storage system that prevents the overwriting, erasing or otherwise altering of a record during its required retention period through the use of integrated hardware and software control codes. [emphasis added]

Further, Section IV of the 2003 Interpretive Release places requirements on the storage system for retaining records beyond the SEC-established retention period when certain circumstances occur, such as a subpoena or legal hold:

Moreover, there may be circumstances (such as receipt of a subpoena) where a broker-dealer is required to maintain records beyond the retention periods specified in Rule 17a-4 or other applicable Commission rules. Accordingly, a broker-dealer must take appropriate steps to ensure that records are not deleted during periods when the regulatory retention period has lapsed but other legal requirements mandate that the records continue to be maintained, and the broker-dealer's storage system must allow records to be retained beyond the retentions periods specified in Commission rules. [emphasis added]

This statement by the SEC clarifies that the storage system must have the capability to retain records beyond the retention period established at the time of initial recording when required for legal matters, external investigations or audits, or other similar circumstances.

2.1.2 Compliance Assessment

It is Cohasset's opinion that the features of Nutanix Objects, with *Bucket Lock* and *Object Lock*, meet this SEC requirement to retain records in non-rewriteable, non-erasable format for time-based³ retention periods and any applied legal holds, when (a) properly configured, as described in Section 2.1.3, and (b) the considerations described in Section 2.1.4 are satisfied.

2.1.3 Nutanix Objects Capabilities

This subsection describes the capabilities of Nutanix Objects that pertain to this SEC requirement for preserving electronic records (record objects) in a format that is non-rewriteable and non-erasable, for the required retention period and any associated legal holds.

Overview

- ▶ To meet the non-rewriteable, non-erasable requirements of SEC Rule 17a-4(f), Nutanix Objects offers two retention features:
 - *Bucket Lock*, when properly configured, automatically applies time-based retention controls to all record objects stored in the bucket.
 - *Object Lock* is optionally used to apply an explicit retention period that is longer than the bucket default retention duration to the record object.
- ▶ A *Legal Hold* may be placed on a record object to protect against modification, overwrite and deletion until the *Legal Hold* is released. Once the *Legal Hold* is released, immutability and retention are governed by the record object's default *Bucket Lock* or explicit *Object Lock* controls.

³ Time-based retention periods require records to be retained for a specified contiguous period of time from the date and time created and stored.

- ▶ With the above settings, Nutanix applies the following stringent integrated controls to the record object:
 - The record object and its immutable metadata cannot be modified, overwritten or deleted by any process or user, including the system administrator, until both (a) the applied retention duration has expired, and (b) any assigned *Legal Hold* has been released.
 - *Bucket Lock Enable WORM* configuration cannot be modified or removed from the bucket and subsequently protects all record objects stored in the bucket.
 - The *Bucket Lock Retention* duration cannot be shortened, only extended if necessary.

Nutanix Bucket Configurations

- ▶ For each Nutanix Objects bucket that will retain record objects required to comply with SEC Rule 17a-4(f), *Bucket Lock* must be configured by (a) selecting *Enable WORM* and (b) setting a *Bucket Lock Retention Period* (retention duration, e.g., 7 years).
 - The *Bucket Lock Enable WORM* feature may be configured at any time after the bucket is created.
 - *Bucket Lock Retention Period* is specified in seconds, days, months and years.
 - A 24-hour period must lapse for these controls to permanently apply to the bucket.
 - ◆ During the first 24-hours of enabling *Bucket Lock*, Nutanix Objects allows the creator of the bucket to remove the *Bucket Lock* and the applicable retention controls provided by the *Bucket Lock* feature.
 - ◆ After 24-hours has passed the *Bucket Lock* configuration is permanently applied to the bucket:
 - The *Bucket Lock Enable WORM* feature cannot be suspended or cleared (null) by any user, including the system administrator.
 - The *Bucket Lock Retention Period* may only be extended to retain record objects for a longer period of time, but cannot be not be shortened (i.e., a retention duration of five (5) years may be extended to six (6) years, but cannot be shortened to four (4) years). When the *Bucket Lock Retention Period* is extended, the new retention duration applies to previously stored, as well as new record objects.
 - ◆ Therefore, to be compliant with the Rule, an appropriate *Bucket Lock Retention Period* must be configured, and record objects may only be stored in a bucket after the *Bucket Lock* features are permanent (24 hours after *Bucket Lock Enable WORM* is set).
- ▶ Optionally, versioning may be enabled on any bucket that uses *Bucket Lock*, which means record objects that are updated are stored as new versions. When versioning is enabled, each version of a record object is separately managed.

Record Object Definition and Retention Controls

- ▶ Throughout this report, the term 'record object' pertains to either a unique stored object or a specific version of an object, when versioning is enabled.
- ▶ Each record object is comprised of:
 - Complete content of the record object,
 - Immutable metadata, which includes, but is not limited to, unique object *Key* name, version identifier (*VersionID*), unique *Object ID*, *creation date and time* (last modified date and time), and user-defined custom metadata (key-value pairs), and
 - Mutable metadata, which includes the *Retain Until Date*, which may be extended but not shortened, and *Legal Hold* status, which may be set to On or Off.
- ▶ The *Bucket Lock Retention Period*, as described in *Nutanix Bucket Configurations*, above, serves two purposes:
 1. It applies a default retention duration for record objects stored in the bucket, and
 2. It applies a minimum retention duration, when the *Object Lock* feature, described in the next bullet, is utilized.
- ▶ The fundamental capabilities of Nutanix Objects, when *Bucket Lock* is enabled, immutably store record objects and metadata, assuring that record objects are not overwritten.
- ▶ In addition to the *Bucket Lock* retention feature, Nutanix Objects S3 API supports *Object Lock*, exclusively using the *Compliance mode* (stricter retention setting with no bypass feature). Applying *Object Lock* controls is optional.
 - To apply *Object Lock* controls to a record object, the source application may transmit, with the record object, an explicit *Object Lock Retain Until Date* and *Object Lock* mode of *Compliance*.
 - ◆ When an explicit *Object Lock Retain Until Date* is transmitted with the Record Object, the *Bucket Lock Retention* duration is added to the record object creation date and time to calculate the minimum retention period for the record object. This date is then compared to the explicit *Object Lock Retain Until Date* and is stored as the record object's *Retain Until Date*, if it is longer than the minimum retention period calculated using the *Bucket Lock Retention Period*.
 - ◆ For record objects stored with an explicit *Retain Until Date*, the date may only be extended to a future date but cannot be shortened or cleared, by any user, including the account root user.
 - ◆ When versioning is enabled, extending the *Retain Until Date* does not create a new version of the record object.
 - *Object Lock* mode of *Governance*, a less stringent mode which allows authorized users to remove *Object Lock* from an object, is currently not supported, and results in an error message being returned to the source application.

- If the source application sends a record object with *Object Lock* mode of *Compliance* and *Bucket Lock* is not enabled, the write will be denied, and an error message returned to the source application.
- ▶ Each record object is protected from deletion, by any users, until:
 - The *Object Lock Retain Until Date* that was explicitly applied to the record is in the past.
 - The **current** *Bucket Lock Retention Period* added to the creation date and time is in the past.
 - ◆ NOTE: If the *Bucket Lock Retention Period* is extended, the longer period will be used to determine eligibility for deletion.
 - The *Legal Hold* status of the record object is released (Off).
- ▶ If the user attempts any of the following actions, the action is rejected:
 - Disable the *Enable WORM* functionality after 24-hours of configuration, when it is permanently applied to the bucket.
 - Shorten or remove the *Bucket Lock Retention Period*.
 - Shorten or remove a record object's explicit *Object Lock Retain Until Date*.
 - Delete a record object before it is eligible for deletion.
- ▶ The *Retain Until Date* for a record object can be verified by either: (a) get object *HEAD* command or (b) issuing 'get-object-retention' through the S3 API.

Legal Hold

When litigation, regulatory investigation, or a subpoena requires record objects to be placed on hold, which could entail preserving the record beyond the assigned retention period, the regulated entity must ensure the subject record objects are preserved for the duration of the Legal hold.

- ▶ The *Legal Hold* (On/Off) status may be applied to any record object stored in a bucket with the *Bucket Lock* feature enabled.
 - The *Legal Hold* status attribute is applied separately to each record object.
 - When the record object's *Legal Hold* status is set (On), it prohibits deleting the record object until the *Legal Hold* status is cleared (Off).
 - When the *Legal Hold* status is cleared (Off), this attribute no longer mandates preservation of the record object; however other retention controls continue to apply to the record object.
- ▶ When versioning is enabled, setting the *Legal Hold* status does not create a new version of the record object.
- ▶ The *Legal Hold* status for a record object can be verified by the object *HEAD* command through the S3 API.

Deletion Controls

- ▶ The *Retain Until Date* and *Legal Hold* status determine if the record object is eligible for deletion (eligibility for deletion does not cause automatic deletion). The following criteria must be met for a record object to be eligible for deletion:
 - The *Object Lock Retain Until Date* that was explicitly applied to the record is expired.
 - The **current** *Bucket Lock Retention Period* added to the creation date and time is expired.
 - ◆ NOTE: If the *Bucket Lock Retention Period* is extended, the longer period will be used to determine expiration and eligibility for deletion.
 - The *Legal Hold* status must be clear (Off).
- ▶ A Lifecycle action may be configured to automatically delete eligible record objects.
- ▶ The bucket cannot be deleted, until the bucket is empty.

Clock Management

To meet the requirements of the Rule, Cohasset asserts that every system clock must synchronize to an external time server, e.g., a network time protocol (NTP) clock.

- ▶ Nutanix Objects must be configured to enable NTP and regularly check the time of the external source (NTP) and resynchronize time. During initial configuration, the application server is synced with NTP and all users are restricted from modifying system time once the sync has occurred. These controls prevent or correct any inadvertent or intentional administrative modifications of the system clock, which could allow for premature deletion of record objects.

Security

- ▶ Nutanix is designed to meet Enterprise security and compliance requirements.
- ▶ Nutanix provides data encryption via the following options: (a) native software-based (SW) encryption (FIPS-140-2 Level-1), (b) self-encrypting drives (SED) (FIPS-140-2 Level-2), or (c) software + hardware encryption Dual encryption. Both SED and SW based encryption can be activated at the same time.
 - Nutanix software encryption provides native AES-256 data-at-rest encryption, which can either interact with any Key Management Interoperability Protocol or Trusted Computing Group compliant external Key Management System server (Vormetric, SafeNet, etc.) or the Nutanix native Key Management service.
- ▶ Micro-segmentation with a distributed stateful firewall (Flow) enables granular network monitoring and enforcement between entities.
- ▶ Nutanix Objects may be configured to protect data in-transit (data traveling to and from Nutanix Objects) using Secure Sockets Layer (SSL).

- ▶ Granular identity and access management (IAM), where the user is identified by access key and policy to allow S3 API (Application Programming Interface) calls. The permissions for each user are controlled through IAM Policies.
- ▶ Security Technical Implementation Guide (STIG) – defines the self-healing security configuration providing a point-in-time security baseline checking to a continuous monitoring/self-remediating baseline.

2.1.4 Additional Considerations

To assure compliance with the non-erasable and non-rewriteable requirements of the SEC Rule, the regulated entity is responsible for:

- ▶ Enabling the *Bucket Lock* (enabling WORM) and configuring an appropriate *Bucket Lock Retention Period* for buckets that will store record objects required for compliance with SEC Rule 17a-4(f). These configurations will assure that all record objects are stored with retention controls.
- ▶ When initially configuring *Bucket Lock* (one-time action per bucket), the *Bucket Lock* settings are permanent after the 24-hour modification window has lapsed; thereafter the *Bucket Lock* feature cannot be removed, and the *Bucket Lock Retention Period* cannot be shortened (though it may be extended). While record objects can be written to the bucket during the 24-hour modification window, it is recommended to start writing after the initial 24-hour modification window has lapsed to ensure the desired record/data protection.
- ▶ Setting a *Legal Hold* status to On, as needed, to preserve record objects for legal matters, government investigations, external audits and other similar circumstances; and, setting the *Legal Hold* status to Off, when preservation is no longer required.
- ▶ Storing record objects requiring event-based⁴ retention periods in a separate compliance system, since Nutanix Objects does not currently support event-based retention periods.
- ▶ Setting appropriate security controls to (a) restrict network ports and protocol access, (b) establish roles-based access, and (c) encrypt data in transit and while at rest.

2.2 Accurate Recording Process

2.2.1 Compliance Requirement [SEC 17a-4(f)(2)(ii)(B)]

The intent of this requirement is to ensure both the accuracy and quality of the recording process such that the records read from the storage media are precisely the same as those that were recorded.

This requirement includes both a quality verification of the recording process and post-recording verification processes.

SEC 17a-4(f)(2)(ii)(B): Verify automatically the quality and accuracy of the storage media recording process

⁴ Event-based or event-time-based retention periods require records to be retained indefinitely until a specified event occurs (e.g., a contract expires, or an employee terminates), after which the record is retained for a fixed final retention period.

2.2.2 Compliance Assessment

Cohasset affirms that the capabilities of Nutanix Objects, in conjunction with the inherent capabilities of advanced magnetic storage technology, meet this SEC requirement for accurate recording and post-recording verification.

2.2.3 Nutanix Objects Capabilities

Nutanix Objects has a combination of recording and post-recording verification processes, which are described in the following subsections.

Recording Process:

- ▶ An MD5 checksum must be transmitted with the record object from the source application at the time of record object creation. The record object will be stored only if the MD5 checksum value calculated by Nutanix Objects matches the uploaded checksum. If it does not match, an error is reported, and the record object must be re-uploaded.
- ▶ Nutanix Objects utilizes advanced electronic recording technology which applies a combination of checks and balances to assure that record objects are written in a high quality and accurate manner.

Post-Recording Verification Process:

- ▶ Integrity of the record object, during retrieval, is validated by comparing the calculated checksum to the original stored checksum.
- ▶ Nutanix Objects uses erasure coding to split the record object into strips of data blocks and calculates parity. Integrity of the record object is maintained by leveraging the parity to calculate any missing data blocks.
 - Nutanix Objects employs a background healing process that scans the data blocks of a record object for checking and correcting errors. If a data block is corrupt, an automatic recovery process is initiated to rebuild the data block from the other valid data and parity blocks.

2.2.4 Additional Considerations

There are no additional considerations related to this requirement.

2.3 Serialize the Original and Duplicate Units of Storage Media

2.3.1 Compliance Requirement [SEC 17a-4(f)(2)(ii)(C)]

This requirement, according to Section III(B) of the SEC's 2001 Interpretive Release, *"is intended to ensure both the accuracy and accessibility of the records by indicating the order in which records are stored, thereby making specific records easier to locate and authenticating the storage process."*

SEC 17a-4(f)(2)(ii)(C): Serialize the original and, if applicable, duplicate units of storage media, and time-date for the required period of retention the information placed on such electronic storage media

When the SEC Rule was issued in 1997, this requirement was thought to be more pertinent to tracking the individual units of removable media related to micrographic or optical storage. This requirement for non-unitized

electronic storage may be satisfied by capturing and storing immutable metadata, associated with each electronic record, to *uniquely* identify the record and the *date and time of recording*.

2.3.2 Compliance Assessment

Cohasset asserts that the capabilities of Nutanix Objects meet this SEC requirement to serialize the original and duplicate records.

2.3.3 Nutanix Objects Capabilities

- ▶ Each record object is serialized in Nutanix Objects using a combination of: (a) unique *Key* name, (b) Version identifier (*VersionID*), and (c) creation (storage) date and time (last modified date and time).
 - Every record object is assigned a unique *Key* name and *VersionID* at the time of creation.
 - The creation (storage) date and time (last modified date and time) is a system-managed attribute.
 - These attributes are immutable and stored with each record object.
- ▶ This combination of *Key* name, *VersionID* and creation (storage) date and time (last modified date and time) serializes each record object in both space and time.

2.3.4 Additional Considerations

There are no additional considerations related to this requirement.

2.4 Capacity to Download Indexes and Records

2.4.1 Compliance Requirement [SEC 17a-4(f)(2)(ii)(D)]

This requirement necessitates an adequate capacity to readily download records and associated indexes, in a format and on a medium acceptable under the Rule and as specified by the SEC or self-regulatory organization. This allows the SEC or self-regulatory organizations to take possession of the downloaded records and indexes.

SEC 17a-4(f)(2)(ii)(D): Have the capacity to readily download indexes and records preserved on the electronic storage media to any medium acceptable under this paragraph (f) as required by the Commission or the self-regulatory organizations of which the member, broker, or dealer is a member

2.4.2 Compliance Assessment

It is Cohasset's opinion that the capabilities of Nutanix Objects meet this SEC requirement to readily download records and metadata (index attributes), when the considerations described in Section 2.4.4 are addressed.

2.4.3 Nutanix Objects Capabilities

- ▶ Record objects and metadata (index attributes) may be identified using the Nutanix Objects S3 API.
 - List all the buckets that contain record objects.

- List the record objects, including each version and the date eligible for deletion, which is the longer of:
 - (a) the date calculated by adding the creation date and time to the *Bucket Lock Retention Period*, and
 - (b) the stored *Object Lock Retain Until Date*.
- ▶ Selected record objects and the associated metadata, or only the metadata, may be downloaded to a designated storage location.

2.4.4 Additional Considerations

The regulated entity is responsible for (a) authorizing user permissions, (b) maintaining hardware and software to access Nutanix Objects, (c) assuring that the regulator, self-regulatory organization or designated examining authority receive downloads of the requested record objects and associated metadata (index attributes), in the requested format and medium.

2.5 Duplicate Copy of the Records Stored Separately

2.5.1 Compliance Requirement [SEC 17a-4(f)(3)(iii)]

The intent of this requirement is to provide an alternate source for accessing the records, should the primary source be compromised, i.e., lost or damaged.

SEC 17a-4(f)(3)(iii): Store separately from the original, a duplicate copy of the record stored on any medium acceptable under § 240.17a-4 for the time required

Note: A *duplicate copy* is defined as a persistent copy that allows the complete and accurate record to be reestablished from data stored on a compliant storage system or medium. Whereas, a *backup copy* is defined as a non-persistent copy that is overwritten as it is *rotated* on a periodic basis, resulting in a much shorter retention period than the original.

2.5.2 Compliance Assessment

It is Cohasset's opinion that the current capabilities of Nutanix Objects meet this SEC requirement for a persistent duplicate copy of the record objects, when properly configured, as described in Section 2.5.3, and the additional consideration in 2.5.4 is met.

2.5.3 Nutanix Objects Capabilities

There are two options for meeting the conditions of this requirement to separately store a duplicate copy.

Duplicate Using Erasure Coding

- ▶ Nutanix Objects uses erasure coding (EC) to store data blocks of record objects redundantly across multiple nodes. In the event of a disk or node failure, the original record object can be regenerated.
 - Nodes can be spread across multiple blocks and racks.
 - A record object is regenerated from the erasure encoded data.
 - The erasure coded data segments are retained for the full retention period and any applied Legal Holds.

Duplicate Using Geo Replication

- ▶ Optionally, duplicate copies may be stored using uni-directional geo replication.
 - When configuring geo replication, the *Bucket Lock* settings must be manually configured with the same settings on both buckets.
 - ◆ If the *Bucket Lock* settings need to be changed, the system administrator must disassociate replication, then change the bucket configurations on both buckets and reenable replication.
 - When the *Bucket Lock Retention* or *Object Lock Retain Until Date* is modified or *Legal Hold* is set on record object on the primary storage, the attributes will be propagated between the buckets by the replication process.

2.5.4 Additional Considerations

- ▶ When using geo replication, the regulated entity must ensure that the initial configuration is the same across the primary and secondary storage.

3 | Summary Assessment of Compliance with CFTC Rule 1.31(c)-(d)

The objective of this section is to document Cohasset's assessment of the capabilities of Nutanix Objects, as described in Section 1.3, *Nutanix Objects Overview and Assessment Scope*, in comparison to the CFTC requirements.

The individual relevant requirements cited in Section 2, *Assessment of Compliance with SEC Rule 17a-4(f)*, are based on the wording in SEC Rule 17a-4(f) and Cohasset's interpretation of the requirements, given the associated SEC Interpretive Releases. Specifically, the SEC's 2003 Interpretive Release reiterates that the Rule sets forth standards that the electronic storage media must satisfy to be considered an acceptable method of storage under SEC Rule 17a-4:

A broker-dealer would not violate the requirement in paragraph (f)(2)(ii)(A) of the rule if it used an electronic storage system that prevents the overwriting, erasing or otherwise altering of a record during its required retention period through the use of integrated hardware and software control codes. [emphasis added]

Accordingly, it is Cohasset's opinion that the requirements set forth in SEC Rule 17a-4(f) are *technology-neutral* and apply to any electronic solution with (a) integrated control codes that extend to the electronic storage system and (b) features that deliver capabilities that meet the requirements of the Rule.

The August 28, 2017, amendments to CFTC Rule 1.31 establish *technology-neutral, principle-based* requirements. As illustrated in the table in this section, it is Cohasset's opinion that the requirements of the modernized CFTC Rule may be achieved by meeting the SEC requirements.

When comparing the capabilities of Nutanix Objects that align with the SEC requirements to the *principles-based* CFTC requirements, it is essential to recognize that the SEC Rule separately describes requirements for index data and audit trail, whereas the CFTC in 17 CFR § 1.31(a) establishes an expanded definition of an *electronic regulatory record* to include the information as specified in paragraph (i) and (ii) below.

Definitions. For purposes of this section:

Electronic regulatory records means all regulatory records other than regulatory records exclusively created and maintained by a records entity on paper.

Records entity means any person required by the Act or Commission regulations in this chapter to keep regulatory records.

Regulatory records means all books and records required to be kept by the Act or Commission regulations in this chapter, including any record of any correction or other amendment to such books and records, provided that, with respect to such books and records stored electronically, regulatory records shall also include:

(i) Any data necessary to access, search, or display any such books and records; and

(ii) All data produced and stored electronically describing how and when such books and records were created, formatted, or modified. [emphasis added]

The focus of Cohasset's assessment, presented in Section 2, pertains to Nutanix Objects, when *Bucket Lock* and *Object Lock* mode are properly utilized, which is highly restricted and assures that the storage solution applies

controls to (a) protect immutability of the record content and certain metadata (index attributes) and (b) prevent deletion over the applied retention period.

In the following table, Cohasset correlates the capabilities of Nutanix Objects, when *Bucket Lock* and *Object Lock* are properly utilized, to the *principles-based* CFTC requirements related to the *form and manner of retention* and the *inspection and production of regulatory records*.

The left-hand column lists the *principles-based* CFTC requirements. The middle column provides Cohasset's analysis and opinion regarding the ability of Nutanix Objects, when *Bucket Lock* and *Object Lock* are properly utilized to meet the requirements for electronic regulatory records in CFTC Rule 1.31(c)-(d). In addition, for ease of reference, the right-hand column lists the correlated SEC requirements.

CFTC 1.31(c)-(d) Requirement	Compliance Assessment Relative to CFTC 1.31(c)-(d)	SEC 17a-4(f) Requirements Listed in the Referenced Sections
<p>(c) Form and manner of retention. Unless specified elsewhere in the Act or Commission regulations in this chapter, all regulatory records must be created and retained by a records entity in accordance with the following requirements:</p> <p>(1) Generally. Each records entity shall retain regulatory records in a form and manner that ensures the <i>authenticity and reliability</i> of such regulatory records in accordance with the Act and Commission regulations in this chapter.</p> <p>(2) Electronic regulatory records. Each records entity maintaining electronic regulatory records shall establish appropriate systems and controls that ensure the <i>authenticity and reliability</i> of electronic regulatory records, including, without limitation:</p> <p>(i) Systems that <i>maintain</i> the security, signature, and data as necessary to ensure the <i>authenticity</i> of the information contained in electronic regulatory records and to monitor compliance with the Act and Commission regulations in this chapter;</p>	<p>It is Cohasset's opinion that Nutanix Objects capabilities, when <i>Bucket Lock</i> and <i>Object Lock</i> are properly utilized, as described in Sections 2.1 through 2.4 meet CFTC requirements (c)(1) and (c)(2)(i) for record objects.</p> <p>Additionally, for <i>records stored electronically</i>, the CFTC has expanded the definition of <i>regulatory records</i> in 17 CFR § 1.31(a) to include metadata:</p> <p><i>Regulatory records means all books and records required to be kept by the Act or Commission regulations in this chapter, including any record of any correction or other amendment to such books and records, provided that, with respect to such books and records stored electronically, regulatory records shall also include:</i></p> <p><i>(i) Any data necessary to access, search, or display any such books and records; and</i></p> <p><i>(ii) All data produced and stored electronically describing how and when such books and records were created, formatted, or modified. [emphasis added]</i></p> <p>It is Cohasset's opinion that Nutanix Objects, when <i>Bucket Lock</i> and <i>Object Lock</i> are properly utilized, retains certain immutable metadata (index attributes) as an integral part of the record object; and, therefore are subject to the same retention controls as the associated record object. Immutable record object metadata includes object <i>Key</i> name, <i>VersionID</i> (when enabled), creation/storage (last modified) date and time, and user-defined custom metadata (key-value pairs).</p> <p>Additionally, mutable (changeable) metadata stored for a record object include retention controls and Legal Hold status. The most recent values of mutable metadata are retained for the same time period as the associated record object.</p> <p>To satisfy this requirement for <i>other</i> essential data related to how and when the record objects were created, formatted, or modified, the regulated entity must retain this data in a compliant manner.</p>	<p>Section 2.1 Non-Rewriteable, Non-Erasable Record Format</p> <p><i>Preserve the records exclusively in a non-rewriteable, non-erasable format</i></p> <p>Section 2.2 Accurate Recording Process</p> <p><i>Verify automatically the quality and accuracy of the storage media recording process</i></p> <p>Section 2.3 Serialize the Original and Duplicate Units of Storage Media</p> <p><i>Serialize the original and, if applicable, duplicate units of storage media, and time-date for the required period of retention the information placed on such electronic storage media</i></p> <p>Section 2.4 Capacity to Download Indexes and Records</p> <p><i>Have the capacity to readily download indexes and records preserved on the electronic storage media to any medium acceptable under this paragraph (f) as required by the Commission or the self-regulatory organizations of which the member, broker, or dealer is a member</i></p>

CFTC 1.31(c)-(d) Requirement	Compliance Assessment Relative to CFTC 1.31(c)-(d)	SEC 17a-4(f) Requirements Listed in the Referenced Sections
<p>(ii) Systems that ensure the records entity is able to produce electronic regulatory records⁵ in accordance with this section, and <i>ensure the availability of such regulatory records in the event of an emergency or other disruption</i> of the records entity's electronic record retention systems; and</p>	<p>It is Cohasset's opinion that Nutanix Objects capabilities described in Section 2.5, including two options for duplicating the record objects, meet the CFTC requirements (c)(2)(ii) to <i>ensure the availability of such regulatory records in the event of an emergency or other disruption of the records entity's electronic record retention systems</i>.</p> <p>To satisfy this requirement for other essential data related to how and when the record objects were created, formatted, or modified, the regulated entity must retain this data in a compliant manner.</p>	<p>Section 2.5 Duplicate Copy of the Records Stored Separately <i>Store separately from the original, a duplicate copy of the record stored on any medium acceptable under §240.17a-4 for the time required</i></p>
<p>(iii) The creation and maintenance of an <i>up-to-date inventory</i> that identifies and describes each system that maintains information necessary for accessing or producing electronic regulatory records.</p>	<p>The regulated entity is required to create and retain an <i>up-to-date inventory</i>, as required for compliance with 17 CFR § 1.31(c)(iii).</p>	<p>N/A</p>
<p>(d) Inspection and production of regulatory records. Unless specified elsewhere in the Act or Commission regulations in this chapter, a records entity, at its own expense, must <i>produce or make accessible for inspection</i> all regulatory records in accordance with the following requirements:</p> <p>(1) <i>Inspection.</i> All regulatory records shall be open to inspection by any representative of the Commission or the United States Department of Justice.</p> <p>(2) <i>Production of paper regulatory records.</i> ***</p> <p>(3) <i>Production of electronic regulatory records.</i></p> <p>(i) A request from a Commission representative for electronic regulatory records will specify a <i>reasonable form and medium</i> in which a records entity must produce such regulatory records.</p> <p>(ii) A records entity must <i>produce such regulatory records in the form and medium requested promptly</i>, upon request, unless otherwise directed by the Commission representative.</p> <p>(4) <i>Production of original regulatory records.</i> ***</p>	<p>It is Cohasset's opinion that Nutanix Objects has features that support the regulated entity's efforts to comply with requests for inspection or production of record objects and associated metadata (i.e., index attributes).</p> <p>Specifically, it is Cohasset's opinion that Section 2.4, <i>Capacity to Download Indexes and Records</i>, describes use of Nutanix Objects to retrieve and download the record objects and the metadata retained by Nutanix Objects. As noted in the <i>Additional Considerations</i> in Section 2.4.4, the regulated entity is obligated to produce the record objects and associated metadata, in the form and medium requested.</p> <p>If the regulator requests additional data related to how and when the record objects were created, formatted, or modified, the regulated entity will need to provide this information from appropriate source systems.</p>	<p>Section 2.4 Capacity to Download Indexes and Records <i>Have the capacity to readily download indexes and records preserved on the electronic storage media to any medium acceptable under this paragraph (f) as required by the Commission or the self-regulatory organizations of which the member, broker, or dealer is a member</i></p>

⁵ 17 CFR § 1.31(a) includes indices (*Any data necessary to access, search, or display any such books and records*) in the definition of regulatory records.

4 | Conclusions

Cohasset assessed the capabilities of Nutanix Objects, Release 3.1, when *Bucket Lock* and *Object Lock* are properly utilized, in comparison to the five requirements related to the recording and non-rewriteable, non-erasable storage of electronic records, as set forth in SEC Rule 17a-4(f) and its associated Interpretive Releases. (See Section 1.3, *Nutanix Objects Overview and Assessment Scope*.)

Cohasset determined that Nutanix Objects, when properly configured, has the following capabilities, which meet the regulatory requirements:

- Maintains record objects and certain record object metadata in a non-erasable and non-rewriteable format for time-based retention periods, when (a) *Bucket Lock* is enabled and the default *Bucket Lock Retention* duration is applied or (b) an explicit *Object Lock Retain Until Date* is transmitted together with the *Object Lock* mode of *Compliance*.
- Allows a *Legal Hold* status to be applied to record objects subject to preservation requirements, which retains the record objects as immutable and prohibits deletion or overwrites until the *Legal Hold* status is cleared.
- Prohibits deletion of a record object and its immutable metadata until (a) the applied *Bucket Lock* and *Object Lock* retention periods have expired and (b) the *Legal Hold* status is clear (Off).
- Verifies the accuracy and quality of the recording process automatically utilizing (a) advanced storage recording technology and (b) an MD5 checksum that must be received from the source system. The MD5 checksum is stored as a metadata attribute and utilized for post-recording verification.
- Uses a unique combination of metadata attributes (*key name*, and storage date/time) to serialize each record object.
- Allows authorized users to access the record objects and metadata with the S3 API for local reproduction or transfer to a format and medium acceptable under the Rule.
- Regenerates an accurate replica of records and metadata (i.e., index attributes) from redundant data, should data be lost or damaged. Alternatively, the *Geo Replication* functionality, provides near synchronous replication of record objects and associated metadata between source and destination buckets, resulting in duplicate copies.

Cohasset also correlated the assessed capabilities of Nutanix Objects, when *Bucket Lock* and *Object Lock* are properly utilized, to the principles-based electronic records requirements in CFTC Rule 1.31(c)-(d).

Accordingly, Cohasset concludes that Nutanix Objects, when properly configured and utilized to retain time-based records, meets the five requirements of SEC Rule 17a-4(f) and FINRA Rule 4511(c), which relate to the recording and non-rewriteable, non-erasable storage of records. In addition, the assessed capabilities meet the principles-based electronic records requirements of CFTC Rule 1.31(c)-(d).

5 | Overview of Relevant Regulatory Requirements

This section establishes the context for the regulatory requirements that are the subject of this assessment by providing an overview of the regulatory foundation for allowing electronic records to be retained on a variety of compliant electronic storage media.

5.1 Overview of SEC Rule 17a-4(f) Electronic Records Storage Requirements

Recordkeeping requirements for the securities broker-dealer industry are stipulated by the United States Securities and Exchange Commission (SEC) Regulations, including 17 CFR §§ 240.17a-3 and 240.17a-4. Specifically, SEC Rule 17a-4(f), when adopted on February 12, 1997, expressly allow books and records to be retained on electronic storage media, subject to meeting certain conditions.

Three separate foundational documents collectively define and interpret the specific regulatory requirements that must be met for an electronic storage system to be compliant with SEC Rule 17a-4(f). These are:

- The Rule itself, as modified over time by the SEC. These modifications to the original Rule have not affected the requirements for electronic storage media, which are the basis of this assessment. However, certain Interpretive Releases have clarified the context and meaning of certain requirements and conditions of the Rule.
- SEC Interpretive Release No. 34-44238, *Commission Guidance to Broker-Dealers on the Use of Electronic Storage Media under the Electronic Signatures in Global and National Commerce Act of 2000 with Respect to Rule 17a-4(f)*, dated May 1, 2001 (the 2001 Interpretive Release).
- SEC Interpretive Release No. 34-47806, *Electronic Storage of Broker-Dealer Records*, dated May 7, 2003 (the 2003 Interpretive Release).

In the Rule and in the two subsequent interpretative releases, the SEC authorizes the use of electronic storage media and devices to satisfy the recordkeeping requirements of SEC Rules 17a-3 and 17a-4, when the system delivers the prescribed functionality. Specifically, SEC Rule 17a-4(f)(1)(ii) states:

(f) The records required to be maintained and preserved pursuant to §§ 240.17a-3 and 240.17a-4 may be immediately produced or reproduced on "micrographic media" (as defined in this section) or by means of "electronic storage media" (as defined in this section) that meet the conditions set forth in this paragraph and be maintained and preserved for the required time in that form.

(1) For purposes of this section:

(ii) The term electronic storage media means any digital storage medium or system and, in the case of both paragraphs (f)(1)(i) and (f)(1)(ii) of this section, that meets the applicable conditions set forth in this paragraph (f). [emphasis added]

The February 12, 1997, Federal Register issued the final rule allowing broker-dealers to use electronic storage media. When issuing the rule, the SEC recognized that technology evolves; and, it set forth standards that the electronic storage media must satisfy, rather than prescribing specific technology, as specified in the following excerpts:

SUMMARY: *The Securities and Exchange Commission (“Commission”) is amending its broker-dealer record preservation rule to allow broker-dealers to employ, under certain conditions, electronic storage media to maintain records required to be retained. The amendments reflect a recognition of technological developments that will provide economic as well as time-saving advantages for broker-dealers by expanding the scope of recordkeeping options while at the same time continuing to require broker-dealers to maintain records in a manner that preserves their integrity. The Commission is also issuing an interpretation of its record preservation rule relating to the treatment of electronically generated communications.*

II. Description of Rule Amendments

A. Scope of Permissible Electronic

Storage Media

****The Commission is adopting a rule today which, instead of specifying the type of storage technology that may be used, sets forth standards that the electronic storage media must satisfy to be considered an acceptable method of storage under Rule 17a-4. Specifically, because optical tape, CD-ROM, and certain other methods of electronic storage are available in WORM and can provide the same safeguards against data manipulation and erasure that optical disk provides, the final rule clarifies that broker-dealers may employ any electronic storage media that meets the conditions set forth in the final rule.*⁶ [emphasis added]

The 2003 Interpretive Release further clarifies that implementation of rewriteable and erasable media, such as magnetic tape or magnetic disk, meets the requirements of a non-rewriteable, non-erasable recording environment, if the system delivers the prescribed functionality and appropriate **integrated control codes** are in place. The 2003 Interpretive Release states:

A broker-dealer would not violate the requirement in paragraph (f)(2)(ii)(A) of the rule if it used an electronic storage system that prevents the overwriting, erasing or otherwise altering of a record during its required retention period through the use of integrated hardware and software control codes. [emphasis added]

The key words within this statement are 'integrated' and 'control codes'. The term 'integrated' means that the method used to achieve a non-rewriteable, non-erasable recording environment must be an integral part of the recording hardware and software. The term 'control codes' indicates the acceptability of using attribute codes (metadata), which are integral to the hardware and software of the recording process, to protect against overwriting or erasure of any records.

Examples of *integrated control codes* relevant to a non-rewriteable, non-erasable recording process are:

- A retention period during which the record cannot be erased, overwritten or otherwise modified;
- A unique record identifier that differentiates each record from all other records; and
- The date and time of recording, which in combination with the unique identifier “serializes” the record.

⁶ Exchange Act Release No. 38245 (Feb. 5, 1997), 62 FR 6469 (Feb. 12, 1997) (“Adopting Release”).

The 2003 Interpretive Release specifically notes that recording processes or applications which merely mitigate the risk of overwrite or erasure (rather than prevent them), such as relying solely on access control security, will not satisfy the requirements of SEC Rule 17a-4(f).

Further, the 2003 Interpretive Release requires the storage system to be capable of retaining records beyond the SEC-established retention period, when required by a subpoena, legal hold or other similar circumstances. In *Section IV. Discussion*, the 2003 Interpretive Release states:

Moreover, there may be circumstances (such as receipt of a subpoena) where a broker-dealer is required to maintain records beyond the retention periods specified in Rule 17a-4 or other applicable Commission rules. Accordingly, a broker-dealer must take appropriate steps to ensure that records are not deleted during periods when the regulatory retention period has lapsed but other legal requirements mandate that the records continue to be maintained, and the broker-dealer's storage system must allow records to be retained beyond the retentions periods specified in Commission rules. [emphasis added]

An important associated requirement of SEC Rule 17a-4(f)(2)(i) is that a member, broker or dealer electing to electronically store its records required by SEC Rules 17a-3 or 17a-4, must notify its designated examining authority at least ninety (90) days prior to employing any technology other than write-once read-many (WORM) optical media. Examining authorities are self-regulatory organizations (SROs) or designated examining authorities (DEAs) under the jurisdiction of the SEC, such as the Financial Industry Regulatory Authority (FINRA).

See Section 2, *Assessment of Compliance with SEC Rule 17a-4(f)*, for a list of the five SEC requirements relevant to the recording and non-rewriteable, non-erasable storage of electronic records and a description of the capabilities of Nutanix Objects related to each requirement.

5.2 Overview of FINRA Rule 4511(c) Electronic Records Storage Requirements

Financial Industry Regulatory Authority (FINRA) Rule 4511(c) explicitly defers to SEC Rule 17a-4(f), by stipulating:

(c) All books and records required to be made pursuant to the FINRA rules shall be preserved in a format and media that complies with SEA [Securities Exchange Act] Rule 17a-4.

5.3 Overview of CFTC Rule 1.31(c)-(d) Electronic Regulatory Records Requirements

Effective August 28, 2017, the Commodity Futures Trading Commission (CFTC) amended 17 CFR § 1.31 (CFTC Rule) to define principles-based requirements for organizations electing to retain electronic regulatory records. The CFTC requirements for electronic regulatory records evolved through amendments to Rule 1.31. The most substantive changes included:

- The June 28, 1999, amendment first implemented the technical provisions regarding the use of electronic storage media for required books and records.
- The November 2, 2012, amendment clarified the retention period for certain oral communications.
- The August 28, 2017, amendments modernize and make technology-neutral the form and manner in which regulatory records, including electronic regulatory records, must be retained and produced.

To address the transition to electronic regulatory records, the CFTC amended and modernized its recordkeeping regulation to adopt principles-based standards that are less prescriptive. This resulted in rephrasing and modernizing the requirements previously defined in 1999, as explained in the August 28, 2017, Federal Register in *III. Final Rules, D. Regulation 1.31(c): Form and Manner of Retention*:

Consistent with the Commission's emphasis on a less-prescriptive, principles-based approach, proposed § 1.31(d)(1) would rephrase the existing requirements in the form of a general standard for each records entity to retain all regulatory records in a form and manner necessary to ensure the records' and recordkeeping systems' authenticity and reliability. The Commission proposed to adopt § 1.31(d)(2) to set forth additional controls for records entities retaining electronic regulatory records. The Commission emphasized in the Proposal that the proposed regulatory text does not create new requirements, but rather updates the existing requirements so that they are set out in a way that appropriately reflects technological advancements and changes to recordkeeping methods since the prior amendments of § 1.31 in 1999. [emphasis added]

The definitions established in 17 CFR § 1.31(a) are paramount to applying the CFTC requirements.

Electronic regulatory records means all regulatory records other than regulatory records exclusively created and maintained by a records entity on paper.

Records entity means any person required by the Act or Commission regulations in this chapter to keep regulatory records.

Regulatory records means all books and records required to be kept by the Act or Commission regulations in this chapter, including any record of any correction or other amendment to such books and records, provided that, with respect to such books and records stored electronically, regulatory records shall also include:

(i) Any data necessary to access, search, or display any such books and records; and

(ii) All data produced and stored electronically describing how and when such books and records were created, formatted, or modified. [emphasis added]

These definitions establish that recordkeeping obligations apply to (a) all *records entities*, without exception, and (b) all *regulatory records*. Further, for *electronic regulatory records*, paragraphs (i) and (ii) establish an expanded definition of an electronic regulatory record to include information describing data necessary to access, search and display records, as well as information describing how and when such books and records were created, formatted, or modified.

The retention time periods for regulated records includes both time-based and event-time-based retention periods. Specifically, 17 CFR § 1.31(b)(1)-(b)(3) states:

Duration of retention. *Unless specified elsewhere in the Act or Commission regulations in this chapter:*

(1) A records entity shall keep regulatory records of any swap or related cash or forward transaction (as defined in § 23.200(i) of this chapter), other than regulatory records required by § 23.202(a)(1) and (b)(1)-(3) of this chapter, from the date the regulatory record was created until the termination, maturity, expiration, transfer, assignment, or novation date of the transaction and for a period of not less than five years after such date.

(2) A records entity that is required to retain oral communications, shall keep regulatory records of oral communications for a period of not less than one year from the date of such communication.

(3) A records entity shall keep each regulatory record other than the records described in paragraphs (b)(1) or (b)(2) of this section for a period of not less than five years from the date on which the record was created. [emphasis added]

For a list of the CFTC principles-based requirements and a summary assessment of Nutanix Objects in relation to each requirement, see Section 3, *Summary Assessment of Compliance with CFTC Rule 1.31(c)-(d)*.

About Cohasset Associates, Inc.

Cohasset Associates, Inc. (www.cohasset.com) is recognized as a leading professional consulting firm, specializing in records management and information governance. Drawing on more than forty years of experience, Cohasset provides its clients with innovative advice on managing their electronic information as the digital age creates operational paradigms, complex technical challenges and unprecedented legal issues.

Cohasset provides award-winning professional services in four areas: management consulting, education, thought-leadership and legal research.

Management Consulting: Cohasset strategizes with its multi-national and domestic clients, engaging in implementation activities to promote interdisciplinary information governance, achieve business objectives, optimize information value, improve compliance, and mitigate information-related risk.

Cohasset has been described as *the only management consulting firm in its field with its feet in the trenches and its eye on the horizon*. This fusion of practical experience and vision, combined with a commitment to excellence, results in Cohasset's extraordinary record of accomplishments.

Education: Cohasset is distinguished through its delivery of exceptional and timely education and training on records and information lifecycle management and information governance.

Thought-leadership: Cohasset regularly publishes thought-leadership white papers and surveys to promote the continuous improvement of information lifecycle management practices.

Legal Research: Cohasset is nationally respected for its direction on information governance legal issues – from retention schedules to compliance with the regulatory requirements associated with the use of electronic or digital storage media.

For domestic and international clients, Cohasset:

- *Formulates information governance implementation strategies*
- *Develops policies and standards for records management and information governance*
- *Creates clear and streamlined retention schedules*
- *Prepares training and communications for executives, the RIM network and all employees*
- *Leverages content analytics to improve lifecycle controls for large volumes of eligible information, enabling clients to classify information, separate high-value information and delete what has expired*
- *Designs and assists with the implementation of information lifecycle practices that avoid the cost and risk associated with over-retention*
- *Defines technical and functional requirements and assists with the deployment of enterprise content management and collaboration tools*

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